

—• Interface Modules

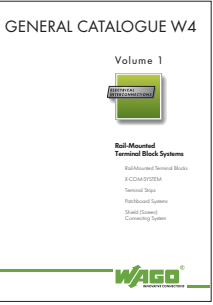
Full Line Catalog 2008/2009



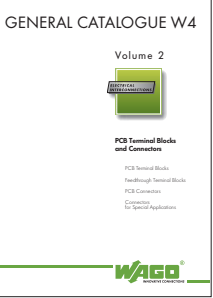
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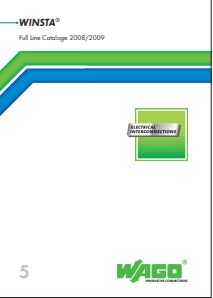
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Transducers, Relay and Optocoupler Modules, Relay Sockets with Pluggable Miniature Switching Relay, Pluggable Function Modules, A/D Converters, Relay Modules in DIN-Rail-Mountable Enclosure

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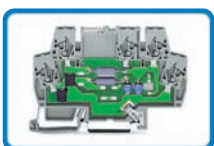


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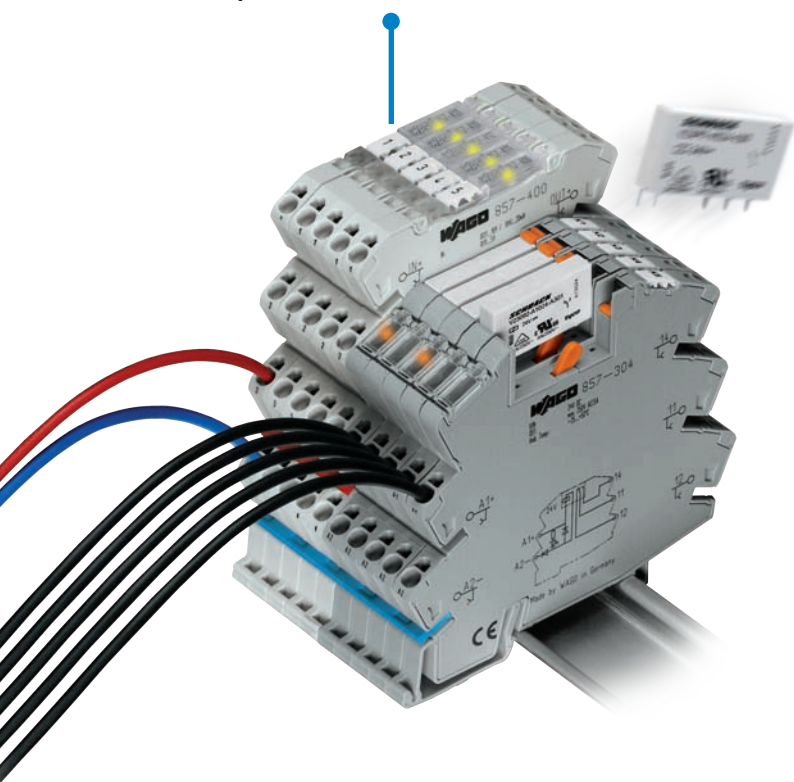
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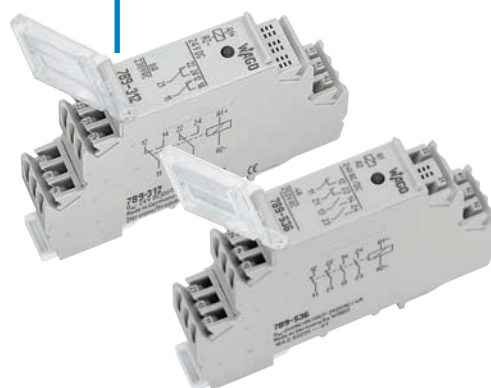
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An Interface Solution for

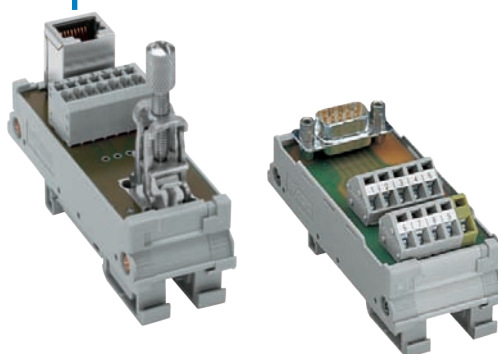
Transducers and
Relay Modules **Series 857**



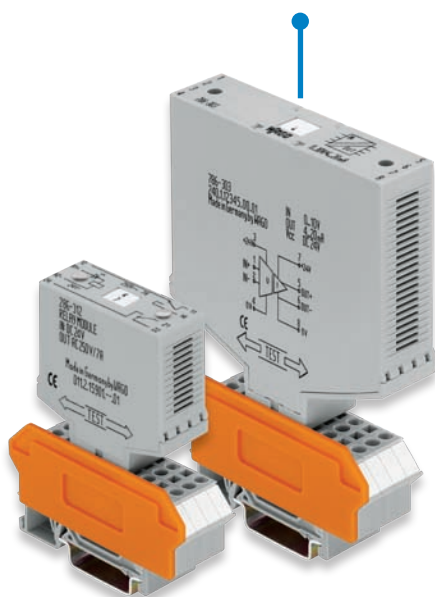
Relay Modules in
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Series 789



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Pluggable Function Modules
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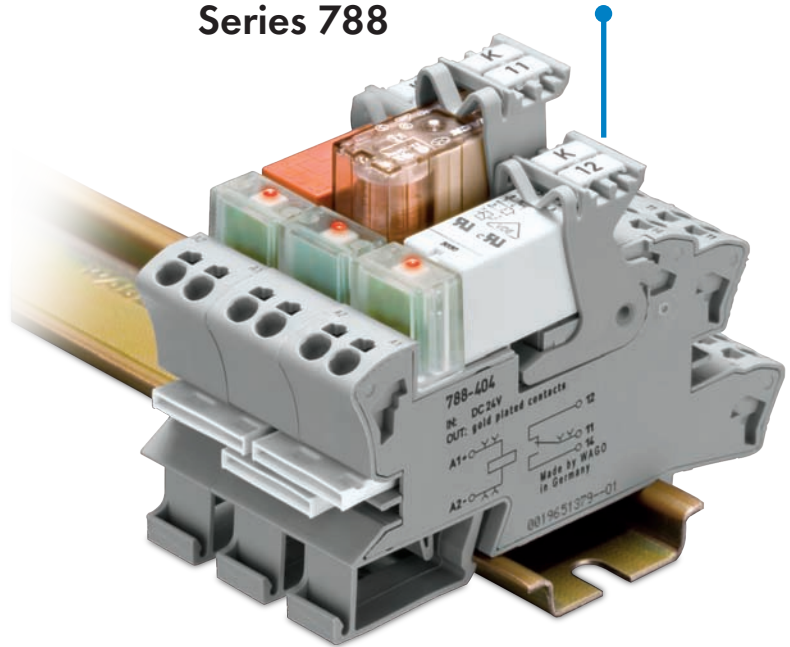
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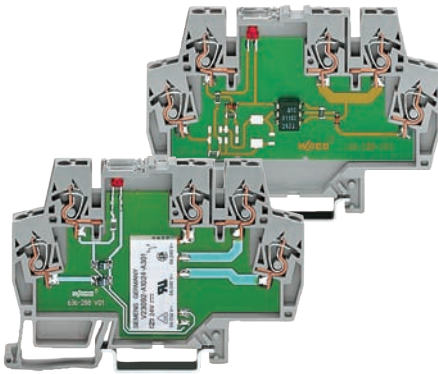
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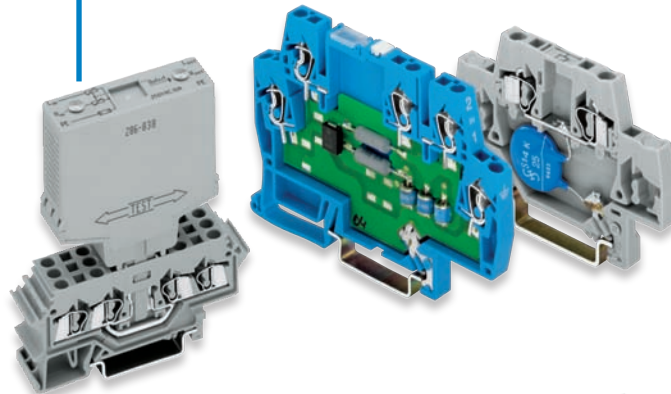
Relay Sockets with
Pluggable Miniature Switching Relay
Series 788



Relay Modules and
Optocoupler Modules
Series 859



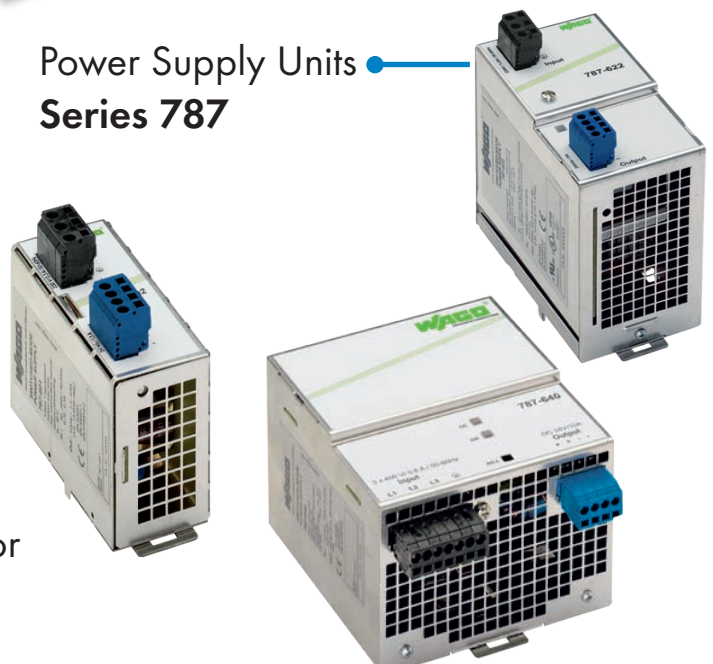
Overvoltage Protection
Series 288



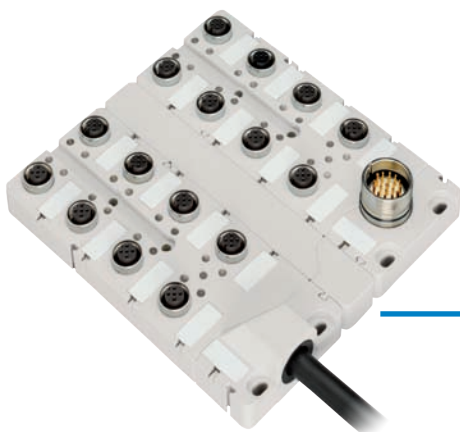
Radio Receiver
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WAGO Interface Modules

Design and housing possibilities

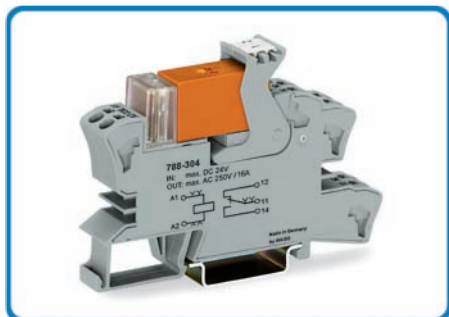
Nowadays when equipment is designed many scenarios need to be considered. Some of which are user and maintenance friendly, limited budgets, safety, availability, space requirements and simplicity in design and usage.

WAGO AUTOMATION offers interface modules in various shapes and sizes to overcome any of the restraints posed by space requirements.

This enables any demands and needs to be fulfilled using these different designs, such as pluggable function and interface modules, relay and optocoupler modules, etc.

Series 788 Relay Sockets with Pluggable Miniature Switching Relay

The WAGO Series 788 relay socket forms an excellent basis for switching applications using pluggable miniature switching relays (1 or 2 changeover contacts) in industrial and process automation.



Relay Socket with Pluggable Miniature Switching Relay

In addition to its compact design 15 x 53 x 86 mm (W x H x D), the relay socket also stands out thanks to a number of user-oriented features, with the associated benefits for the user.

The lever facilitates relay replacement even when the relay sockets are placed close to each other.

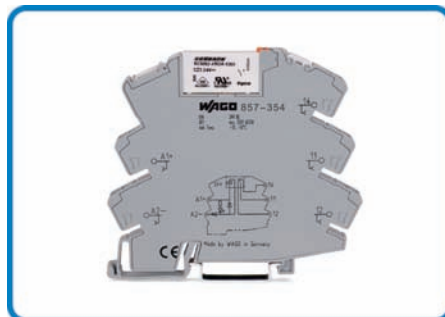
The sockets can be ordered as complete components including relay and status indication or as a single component.

Series 857 Transducers and Relay Modules



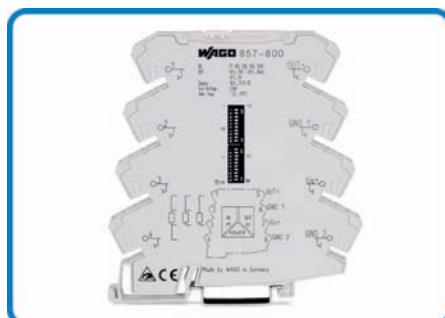
Transducers and Relay Modules

The new 6 mm-wide WAGO isolation amplifiers and transducers not only share a common profile, but in addition one in line jumper can be used to connect the supply voltages, etc, to all modules, doing away with the need to wire each connection. The smaller relay modules also fit perfectly in this scenario. The pluggable relays can simply be replaced from the top.



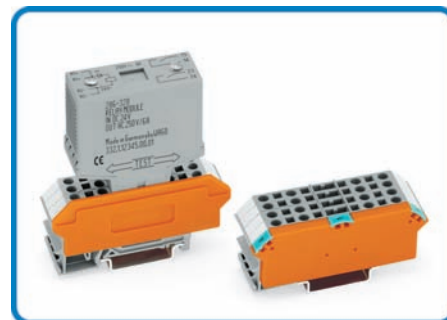
Relay Module with Pluggable Miniature Switching Relay

In order to cover all application areas with one product family, it is intended to offer five different groups for the transducers alone: these include fixed and configurable isolating amplifiers, passive isolators, power supply isolators (also for HART applications), signal duplicators and temperature transducers for PT 100 and thermocouples.



Transducer

Series 286 / 786 Pluggable Function Modules



Pluggable Function Modules

The terminal blocks for pluggable modules offer the greatest degree of flexibility and maintenance-friendly service. The terminal block for pluggable modules is mounted on the carrier rail and wired like a normal terminal block. If service is required, this element can be replaced in one step, without having to deal with the system wiring. This saves space and additional wiring effort.



Pluggable Function Modules

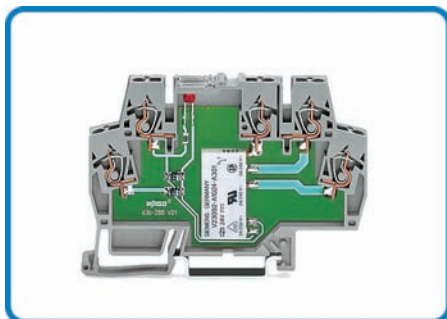
The optocoupler and relay modules are ideal additions to a comprehensive function module program, allowing any required functions to be implemented in a control cabinet by means of a pluggable module system. Large enclosures of the Series 786 are available for more complex functions, such as transducers.



Pluggable Signal Conditioning Modules

Series 859 Relay Modules and Optocoupler Modules

The Series 859 is a complete product series that is ideal for the interface level in any industrial application, thanks to the wide range of relays and optocouplers.

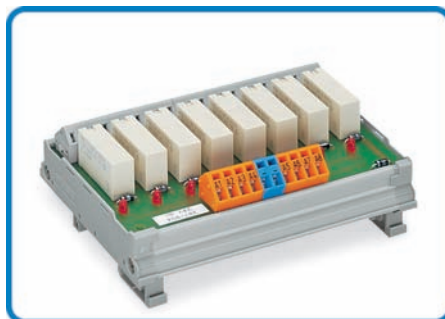


Relay Module

These units excel in tight spaces, thanks to their narrow 6 mm design. Simple commoning at the control and load side enables quick and easy looping through of common input and output potential.

Series 287 / 288 DIN-Rail-Mountable Modules - Relay Modules and Sockets

The relay and PLC interface modules in the mounting socket that can be fitted on carrier rails ensure quick and easy linking of signals from periphery devices. The fully wired modules, with up to 16 high-performance relay outputs, provide for direct switching of actuators and other coupling elements in the field.



DIN-Rail-Mountable Modules - Relay Modules

The requisite free-wheeling and reverse voltage protection diodes are also integrated to ensure a long service life of the products.

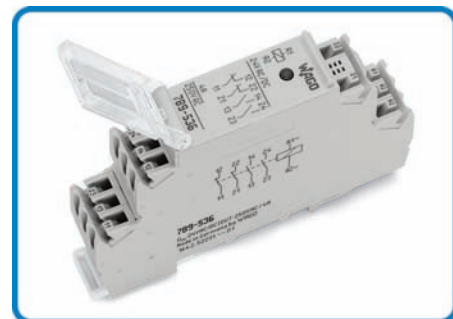
Other interface modules available as:

Multiple modules with plugged relays that are easy to replace, without affecting existing wiring.

Series 789 Relay Modules in DIN-Rail-Mountable Enclosure

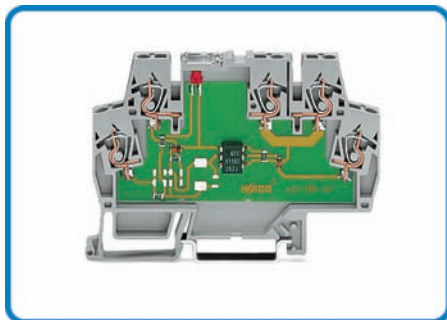
The range of uses for the WAGO latching relays and switching relays of Series 789 spans from simple lighting controls in building services, such as in construction of apartments, hotels, office buildings or parking garages, etc., up to installations in industrial control cabinets.

The 17.5 mm-wide design in series bay enclosures is particularly well-suited for installation in distribution boards and meter mounting boards.



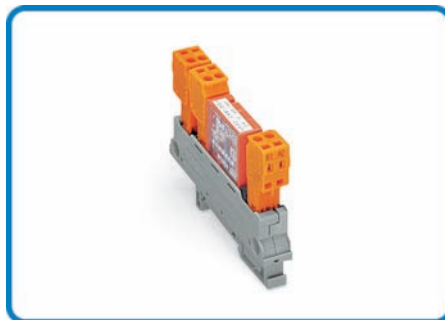
Relay Modules in DIN-Rail-Mountable Enclosure

The series bay enclosures are used for installation of other electronics devices having a large scope of functions and higher switching capacities; these come in sizes of 2 module spaces (35 mm) and 4 module spaces (70 mm).



Optocoupler Module

Its robust design and the shock-proof CAGE-CLAMP connecting technology used ensures continuous and uninterrupted operation of any kind of system.



DIN-Rail-Mountable Modules - Relay Modules



EnOcean Radio Receiver in DIN-Rail-Mountable Enclosure

PCB terminal blocks and connectors from the extensive WAGO program can be installed in the enclosures to obtain customized development of interface components.

Installation is quick and reliable on the 35 mm carrier rail.



Relay Socket

WAGO Transducers and Relay Modules

JUMPLFLEX Series 857



The perfect match of housing and electronics is the key to a highly successful device. This is exactly what has been achieved by WAGO with the transducers and relay modules of the Series 857.

Analog systems technology – Basics

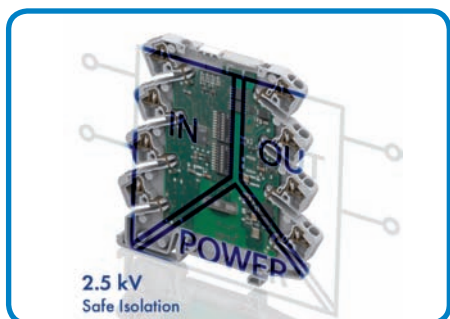
Problems can arise in signal processing in industrial systems of analog standard signals (such as 0 ... 10 V or 0 ... 20 mA) which can have an adverse effect on overall fault-free signal processing. Problems such as potential differentials arising from interlinked measuring circuits can be efficiently prevented using WAGO transducers, with their associated electrical isolation.

Decoupling (Isolation) methods

A basic distinction is made between active and passive isolation.

Active isolation

Depending on the design and model in use, devices are available that incorporate electrical 3-way isolation. 4-way isolation is provided in a signal duplicator. This means that all inputs, outputs and supply circuits are electrically isolated from one another with a 2.5 kV proof voltage.



This ensures that the greatest possible safety and reliability is achieved for the system and any devices connected to the system. For 3-way isolation provides for electrical isolation between the transducers and the control system and between the control system and the control elements.

At the input side the devices required active signals, i.e., the sensor signal is generated by a dedicated supply voltage.

These devices provide a filtered and amplified signal at the output side.

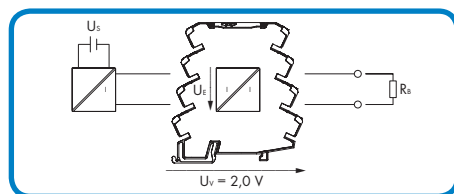
Passive isolation

A passive isolator draws power for signal transmission from the input circuit. In this case, the sensor must supply a power level adequate for the device and must also drive the working resistance.

As a result, it must be ensured that the current-driving power of the sensor is sufficient to drive the maximum current of 20 mA via the passive isolator (with the device-specific voltage drop), as well as the working resistance.

This can be calculated using the following equation:

$$U_S \geq U_E = U_V + 20 \text{ mA} \times R_B$$



Typical equation for a passive isolator (857-451) for a 20 mA signal.

$$U_S \geq U_E = 2.0 \text{ V} + 20 \text{ mA} \times 600 \Omega$$

$$U_S \geq U_E = 14 \text{ V}$$

Temperature measuring techniques

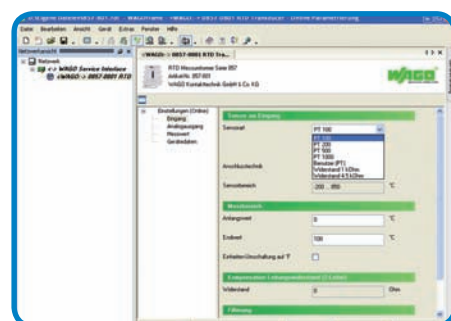
Resistance thermometers, such as PT100 sensors, alter their resistance level as a function of temperature. For example, a rise in temperature will result in an increase in the resistance level. This resistance level is registered by the JUMPLFLEX devices (for example 857-800) and transformed into an analog output signal and simultaneously electrically isolated using a 2.5 kV proof voltage.

The analog standard signal can be a current signal in the 0...20 mA, 4...20 mA 0...10 mA or 2...10 mA range, or a voltage signal in the 0...10 V, 2...10 V, 0...5 V or 1...5 V range.

Parameterization, commissioning and diagnostics using WAGO-frame

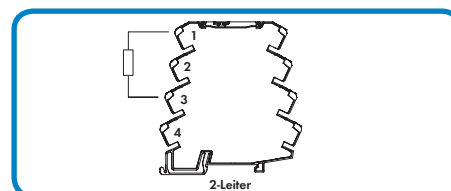
A portion of the JUMPLFLEX transducer can be configured for parameterization, commissioning and diagnostics of field devices using WAGOframe, a software based on the FDT/DTM standard.

The WAGOframe FDT frame application provides a wizard, which simplifies the operation of components, such as WAGO JUMPLFLEX DTMs. This wizard guides the user through the different operating modes of DTM device drivers.

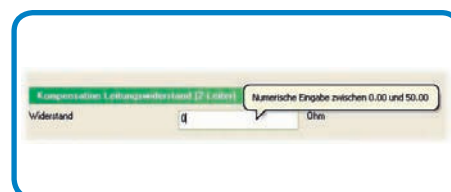


3 different connecting techniques are employed for acquisition of resistance thermometers:

2-wire connecting technique



The resistance thermometer is connected to the JUMPLFLEX transducer via a two-wire conductor. As the feed-in resistance can directly affect results, which would invalidate them, it must be ensured that the distance between the measuring point and the device is kept as small as possible. This distance should not exceed 10 m in this case. If this distance can not be ensured, the 857-801 unit can be used provide compensation for the incoming resistance using the configuration software.

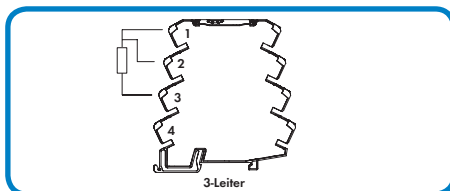


Compensation for line resistance (2-wire)

A resistance value can be input into this field for compensation of the line resistance for 2-wire sensors within a range of 0...50 Ω .

Adjusting the values for resistance compensation is only possible by setting the sensor wire connection to 2-wire. Otherwise the field is displayed in gray and no values can be entered. Using 3- and 4-wire sensors, the input cable resistance is compensated via the connection technology and does not enter into the measuring results.

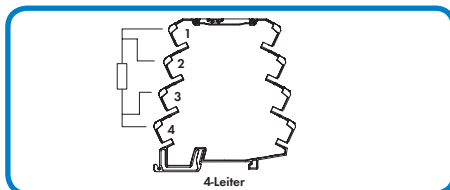
3-wire connecting technique



The 3-wire connecting technique minimizes the effect of line resistance. The resistance thermometer is gauged via two measuring circuits implemented in the JUMPFLEX transducer. One measuring circuit serves as the reference circuit. Line resistance can be compensated for in this manner.

The measuring results can, however, nevertheless be affected by different line lengths or by different ambient temperatures. No further line adjustment is usually necessary, as the same line lengths and the same ambient temperatures exist in most cases.

4-wire connecting technique



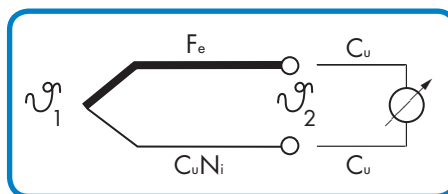
The most accurate measuring method employs the 4-wire connecting technique. This involves feeding in a low supply current via two fully isolated measuring circuits via two lines and measuring the voltage drop across the resistance thermometer via the other two lines. This method offers the advantage not being influenced by line resistance or temperature-induced fluctuations, as

the voltage drop for the incoming and outgoing lines can be measured separately and compensation provided for as required. Again, no line adjustment is required here.

Thermocouples

In contrast to resistance thermometers, thermocouples are active sources that generate output in the microvolts range. Thermocouples have very low resistance and are therefore noise-free. Preferred applications include tasks in environments with high temperatures, such as in ovens or machines in the plastics industry.

The joining of two different materials at the thermocouple results in different energy of formation of the metal atom electrons, yielding a thermoelectric voltage. The level of this thermoelectric voltage is a function of the material and of temperature.



If the temperature at measuring point 1 is the same as the temperature at reference point 2, no current will flow, as the two component voltages cancel one another out.

However, if the temperatures at the measuring point and at the reference point are different, differing voltage levels are produced which do not completely cancel one another out, resulting in a flow of current.

To summarize then, a thermocouple only measures a difference in temperature. This is yielded from the difference between the thermoelectric voltage levels at the measuring point and at the reference point. The voltage fluctuation produced by the thermoelectric effect is very low and is generally only a few microvolts per Kelvin. Therefore, only the difference between the thermoelectric voltages of the materials used is of significance, for example, thermocouple type J, iron (Fe) and constantan (CuNi).

Also of some significance in the connection point temperature. This temperature must be known in order to derive the ambient temperature from the thermoelectric voltage level. This is why the temperature at the connection point is measured by JUMPFLEX transducers. This value, also referred to as the reference or cold junction, can then be compensated for.

(cold junction compensation)

Cold-junction compensation can be activated and de-activated just by a click using the configuration software (default setting: ON (activated)).



Table for Thermocouples

Type of sensor	Thermocouple materials	Measuring range
J *)	Fe-CuNi	-210 °C ... +1200 °C
K *)	NiCr-Ni	-200 °C ... +1372 °C
E *)	NiCr-CuNi	-200 °C ... +1000 °C
N *)	NiCrSi-NiSi	-200 °C ... +1300 °C
R *)	Pt13Rh-Pt	+250 °C ... +1768 °C
S *)	Pt10Rh-Pt	-50 °C ... +1664 °C
T *)	Cu-CuNi	-200 °C ... +400 °C
B *)	Pt30Rh-Pt6Rh	+250 °C ... +1820 °C
C		0 °C ... +2320 °C

*) Thermocouples based on IEC 584 / EN 60584
Other thermocouples available upon request.

Relay modules with mounted miniature switching relays

The JUMPFLEX product family is rounded out by the relay modules that fit perfectly with the transducers.

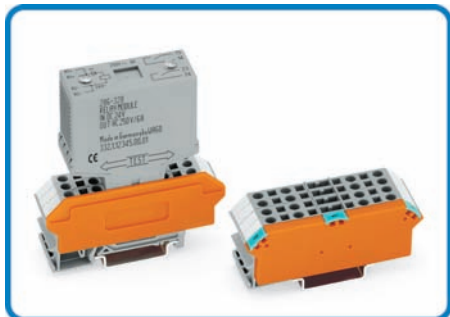
A logical enclosure concept with options for linking all levels offers a variety of synergy and cost-savings potential. This allows for efficient optimization of installation efforts.

The pluggable relays can be replaced quickly and easily when required.



For further information about the relays go to Page 10 - 12.

WAGO Relay Modules



WAGO Relay Modules. The professional interface between electronics and peripheral equipment.

Even in modern automation systems, electromechanical relays guarantee a safe connection between process control systems and process and signalling systems. They provide:

- a high isolation level between input and output circuit
- ability to match different signal levels
- signal amplification and/or signal multiplication, especially for different potentials in the input and output circuits.

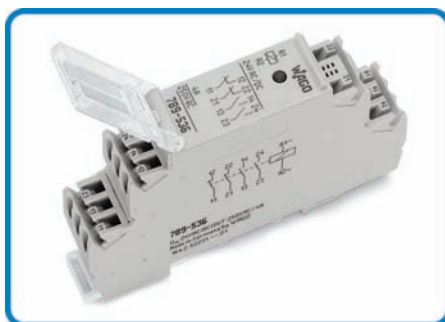
Modernized relays also offer the following advantages:

- unaffected by electromagnetic fields and surges
- high short-term overload capacity for the input and output sides
- small switching power losses
- a module for switching of AC or DC

WAGO AUTOMATION offers a complete range of relay modules that provide these functions for a wide range of applications.

Depending on the function and operating conditions, the relay modules are available with different contacts, contact materials, housings and shapes.

The following relay types are also available: bistable switching relays, time-delay relays, current pulse switching and safety relays with force-guided contacts.



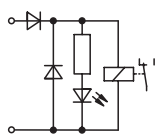
Definitions of several important technical terms

Coil-side information

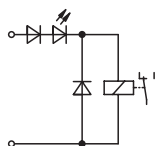
The relays can be used within the stated temperature range with nominal voltage plus tolerance at 100 % continuous duty rating.

According to the type and application, the relays are triggered with DC or AC signal.

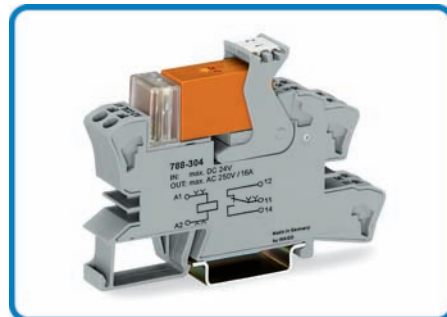
The DC versions (residual ripple $\leq 6\%$) are, unless otherwise stated, equipped with LED function indicators, a recovery diode and a reverse voltage protection diode.



For a nominal voltage of DC $\leq 12\text{ V}$, the LED is connected in parallel to the coil.



For a nominal voltage DC $\geq 24\text{ V}$, the LED is connected in series with the coil.



AC versions of select relays equipped with series connected rectifiers (refer to the wiring diagrams) can be triggered with AC and DC at the stated nominal voltage.

The free-wheel function is in this case actuated by the rectifier.

In order to guarantee a safe operation it has to be observed that "residual voltages" due to cable capacitance in case of long connecting lines or leakage currents of semi-conductor switches and their protection circuits are lower than the release voltage of the relay.

For DC relays, the release voltage is specified with a value of $\leq 5\%$ of the nominal voltage; for AC relays it is 15% of the nominal voltage (acc. to VDE 0435).

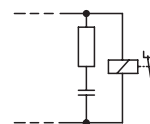
If a high residual voltage exists, it is possible that the relay will not reset.

Addition of a parallel connection of an RC element of:

$R = 100 \dots 220\ \Omega$

$C = 220 \dots 470\text{ nF}$

could remedy this situation.



Alternatively, the 286-904 relay module is available.

This specially developed module features a defined release point at AC $110\text{ V} \pm 10\%$ at an operating voltage (coil voltage) of AC 230 V .

Contact material

To ensure a long service life and low contact resistance, various materials may be used for relay contacts (depending on the load type, switching current, voltage and duty cycle).

Possible materials, their properties and advantages are shown in the table.

Contact material	Properties and use	Range of values
Ag Ni 0.15 + 5 μ Au	High corrosion resistance, low and constant contact resistance at small power ratings, for dry circuits	μ V ... 30 V μ A ... 0.2 A
Ag Ni plated with Au Ag + Au	Same properties as a 5 μ gold contact, however with five times greater resistance to wear, for all circuits from the μ W range up to 100 W/1 kVA	100 mV/10 μ A
Ag Cd 0 + 1 μ Au	Low tendency to contact weld, high resistance to contact burn-out at higher power rating, also suitable for lower power ratings	≥ 5 V ≥ 10 mA
Ag Cd 0, with gold flash	Low tendency to contact weld, high resistance to contact burn-out at higher power rating, with gold flash for additional protection during storage	≥ 12 V ≥ 100 mA
Ag Ni 0.15 + HV	High mechanical strength, low tendency to contact weld and low contact resistance, universal application at medium loads	≥ 12 V 5 mA - 10 A
Ag Sn O ₂	Small tendency to contact weld, high resistance to contact burn-out at higher power rating, small migration of material, for circuits with high input and output ratings, DC circuits	≥ 5 V/100 mA ≥ 10 V/10 mA ≥ 24 V/1 mA
Ag alloy, with gold flash	High mechanical strength, small tendency to contact weld, wide scope of application for low to medium ratings	10^{-3} W

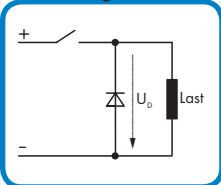
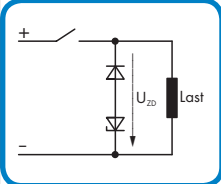
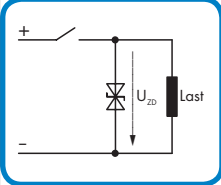
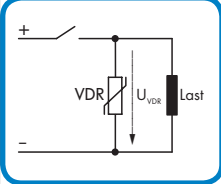
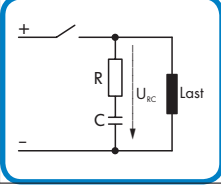
Contact switching protection

When switching inductive loads (e.g., for contractors or solenoid valves) transients with peak voltages up to thousands of volts will arise.

Suppression is necessary as these transients frequently exceed admissible EMC limits.

Moreover, they cause electric arcs at the switching contact that destroy the contact and significantly reduce the relay's service life and functional safety.

In practical use the following switching protections, which are connected directly at the source in parallel to the load, have proved to be efficient:

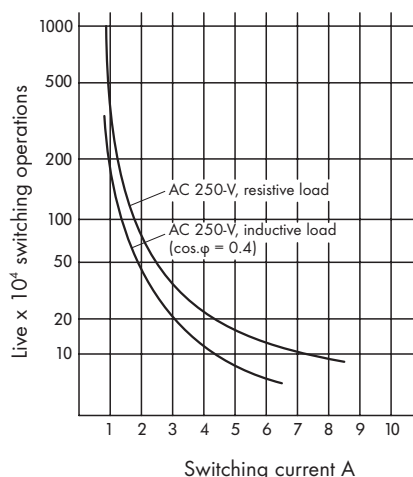
Switching of load	Additional off-delay	Defined limitation of inductive voltage	Attenuation when used with bipolar circuits	Advantages / disadvantages
Circulating diode 	large	yes (V_D)	no	Advantages: - simple device - cost-effective, reliable - sizing not critical - small inductive voltages Disadvantages: - limit only via load resistance - longer turn-off time
Series of diode / Zener diode 	medium to small	yes (V_{ZD})	no	Advantages: - sizing not critical Disadvantages: - limits only above V_{ZD}
Suppressor diode 	medium to small	yes (V_{ZD})	yes	Advantages: - cost-effective - sizing not critical - limitation of positive peaks - suitable for alternating voltages Disadvantages: - attenuation only above V_{ZD}
Varistor 	medium to small	yes (V_{VDR})	yes	Advantages: - high energy absorption - sizing not critical - suitable for AC voltages Disadvantages: - attenuation only above V_{VDR}
R/C combination 	medium to small	no	yes	Advantages: - limiting by energy storage - suitable for alternating voltages - limiting independent of level Disadvantages: - exact component values - high turn-on current pulse

WAGO Relay Modules

Service life

The difference between mechanical life and electrical life must be distinguished. Mechanical life consists the amount of switching operations without contact load; electrical life at maximum load refers to the amount of switching operations with maximum switching capacity and resistive load.

Smaller switching capacities increase the operation at maximum load. The following illustration shows the typical course between switching current and relay's operational life.



More details upon request.

After removing the control signal, the relay returns to its respective position and can only be switched over by a control signal circuit. The bistable switching relays are only available for direct voltage with positive or negative triggering.

Current pulse switching relay

One current pulse is needed to change the relay from the rest position to the working position and vice versa.

During the triggering process, one of two status indicators displays the actual contact position. The current pulse switching relay is available for direct and alternating voltage.

Safety relay

Force-guided safety relays, have become increasingly recommended and specified for self-regulated systems as they provide protection for personnel, machines and installations. Relays with force-guided contacts are an essentially safety component for these circuits, particularly when defects occur. WAGO offers these functions in special relay modules with force-guided contacts as based on to ZH1/457

(Specification of the employer's liability insurance association).

Example of circuit configuration:

As shown in the fig. "Example of Circuit Configuration," two SF relays are controlled by one output interface. The NO contacts 13–14/19–20 of relay A and B switch over the peripheral equipment. After switching off equipment a ... d the control circuit (NC contacts 5–6/11–12) verifies that all main circuits are interrupted.

When the control circuit is closed, the next operation cycle will be executed by the CPU or by the control logic. Depending on the safety requirements, an open control circuit prevents operation of either the entire machine or specified components.

If a partial or complete standstill is required in the event of a failure (for ex. in medical technology or chemical processes) each control contact can be polled and evaluated.

Independent of a single or complete control for the NO contact, the SF relay operates in such a way that the other equipment is switched off even if a NO contact is welded. The failure is recognized by the control contact while the other contacts are still able to open to interrupt circuits.

Time delay relays

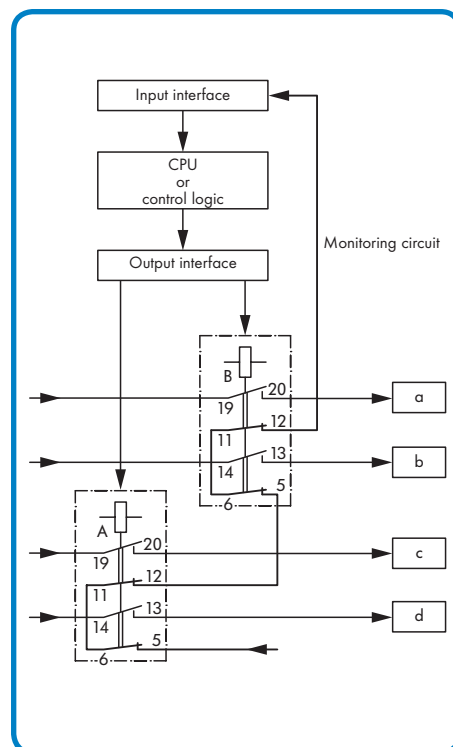
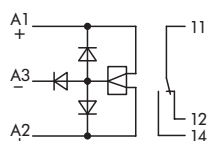
WAGO time delay relay modules are electromechanical time relays with an integrated time response, e.g., acc. VDE 0435, part 201/5.83. The time ranges can be adjusted via potentiometer for either continuously variable or linear operation. A status LED indicates the switching condition of the relay.

Description of select relays

Bistable switching relays

Bistable switching relays have 3 coil contacts. According to the wiring scheme, the relay is switched into "working condition"

(contacts 11–14 closed) by the common connection A 3 and the connection A 1 and into "rest position" (contacts 11–14 opened) by the connection A 2.



Control of different peripheral equipment (a, b, c, d) with monitoring

WAGO optocouplers: the modern and efficient alternative

As the connecting element between process interface and electronic control and signalling systems, the optocoupler modules offer the following advantages compared with mechanical relays:

- long service life, because there is no mechanical wear
- high switching frequency because of fast switching times
- unaffected by vibration
- no contacts
- "noiseless" switching
- low driving capacity.

For all interfaces between control and load circuits that rely on these advantages, WAGO AUTOMATION offers a complete optocoupler range for the following functions:

- electrical isolation between input and output circuit
- adaptation to different signal levels
- signal amplification.

The optocoupler modules are available in WAGO's component plug technology that is designed to plug directly into rail-mounted carrier terminal blocks.

The terminal blocks are fitted to the carrier rail and offer all advantages of CAGE CLAMP® technology, which provides safe and maintenance-free connection of the signal wires for cross sections ranging from 0.08 mm² to 2.5 mm² / AWG 28 - 12.

In addition to optimizing space through the combination of terminal points and the "function module," maximum flexibility and ease of service are also achieved.

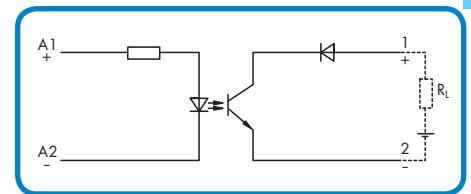


Input circuit

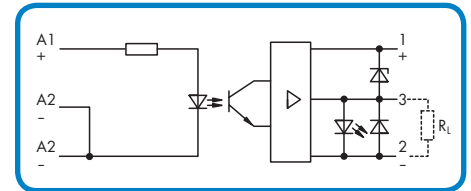
According to the type, triggering the optocoupler modules is performed via direct voltage (residual ripple $RR < 6\%$) or AC voltage (50 - 60 Hz).

In the DC type, a reverse voltage protection diode is always provided; in the AC type optocoupler element, a rectifier is included.

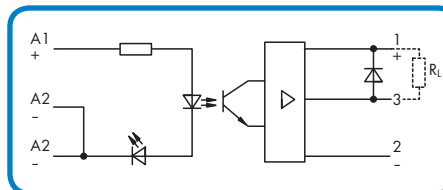
The optocoupler modules are equipped with a LED function indication at either the input side or at the load side, as shown in the wiring diagram.



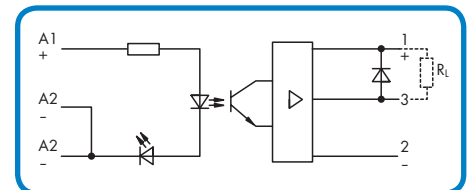
2-wire output



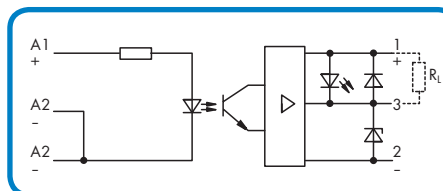
3-wire output positive switching



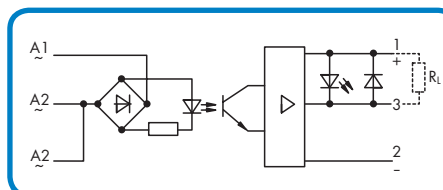
DC triggering with LED function indication in the triggering circuit



3-wire output negative switching



DC triggering with LED function indication in the load circuit



AC triggering with LED function indication in the load circuit

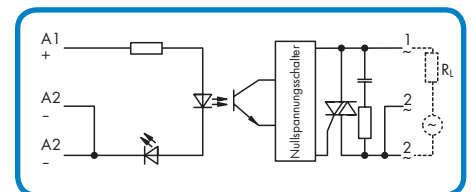
In addition to these different functional outputs, the output voltage range and the maximum switching current must be observed. Also note the correct polarity. In order to protect the output transistors, inductive loads must always be equipped with a protective circuit, e.g., a recovery diode. For other types of protective measures, the cut-off voltage peaks must be lower than the indicated cut-off voltage of the output transistors. For the AC outputs a Triac is used as the switching element.

Due to the low threshold voltages, care must be taken to ensure malfunctions are not caused by the capacitance of long signal lines or the residual off-current of semiconductor devices.

Output circuit

Depending on the application, an optocoupler module for the AC or DC supply may be chosen. In the case of DC outputs, they can be:

- 2-wire output
- 3-wire output positive switching
- 3-wire output negative switching.



In order to avoid high turn-on currents, the AC output is equipped with a zero-voltage switch which turns on the load at the zero-voltage point. In the current zero-crossing, the Triac will cut off the load, in case inductive loads do not exceed the maximum switching voltage and the maximum switching current.



Transducers for measurement technology

The Recording and processing of numbers of physical values, such as temperature, pressure, speed, humidity, etc., form the basis for modern process control. Special sensors supply these values as analog signals, which must be transmitted as standard analog signals to the processing instruments. These analog signals may be transmitted over long or short distances between sensors and controlling mechanisms, for example PLCs and computers, or in less sophisticated systems directly to relays or actuators. Various standards are used. Normally recognized signals are 0 – 10 V, 0 – 20 mA and 4 – 20 mA.

The transducer/transmitter may also linearize non-linear signals internally, before transmission. In order to prevent these relatively low power signals from distortion, WAGO AUTOMATION offers a complete range of modules for measurement and transmission of these signals, both with and without isolation between the module's input/output and the supply voltage (if necessary). Apart from the converters for various standardized signals, WAGO offers a complete selection of analog/digital and digital/analog converters with a resolution of 10 bits.

For A/D and D/A converters, the digital signals are connected via flat ribbon cable connectors.

Temperature transducers

Temperature sensing in the process industry is traditionally performed via "Thermocouple" or "RTD" (Platinum Resistance) elements. A popular RTD is the PT 100 element. Having a nominal resistance of 100 ohm at 0°C, and a typical operating temperature range of –200°C to + 650°C, its non-linear characteristics are compensated by the WAGO signal conditioning module, as the PT 100 element typically meets the IEC 60571 specification.

The WAGO PT 100 signal conditioning module is suitable for 2- or 3-wire RTD, with 3-wire RTDs offering greater accuracy over longer distances. Thermocouples consist of two different metals that are connected at the measuring point and utilize the "Dissimilar Metal (EMF) effect", which can be measured at the open ends of an element.

WAGO analog signal conditioning modules are designed to work with common types of "J" (Iron/Constantan) and "K" (Chromel/Alumel) thermocouples, which comply with IEC standard 60584 Pt. 1, with cold junction compensation. WAGO temperature transducers are available with industry standard output signals of 0 – 10 V, 0 – 20 mA or 4 – 20 mA.

Additionally, they have an integral wire break/short circuit detection. Visual LED fault indication is standard, but the WAGO modules also include an error output signal that may be used to initiate a safe shutdown before serious damage occurs in the event of a wire break or short circuit of the measuring sensor.

For this purpose, a transistor switches the output as soon as the operating voltage is correct and no error is present in the measuring circuit on VB– 2 V. The transistor blocks the output in the case of an error.

WAGO temperature transducers are available as follows:

- The "wire break" and "short circuit" error output is available on the PT 100 module.
- The "wire break" function is available on the J and K Thermocouple modules.

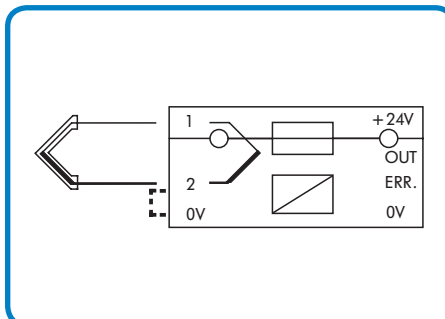
In the event of wire break, the outputs switch to the following values:

Output	Value
0(4) – 20 mA	≥ 20.5 mA
0 – 10 V	≥ 14 V

With PT 100 modules, and in case of short circuit, the outputs switch to 0 V or 0 mA, respectively.



The electronics are protected by an enclosure which can be snapped on a DIN 35 rail. The CAGE CLAMP® connection ensures a secure, maintenance-free connection for conductors sized from 0.08 mm² to 2.5 mm²/AWG 28-12.



- When using insulated thermocouples, terminal "2" has to be connected to 0 V.
- In the case of grounded (earthed) thermocouples, the design is such that terminal 2 is already connected to 0 V inside the thermocouple element. Therefore, it is not necessary to jumper 2 → 0 V.
- For commoning 2 → 0 V, 4-wire base terminals are recommended.



The mechanical assembly of pluggable modules for rail-mounted terminal blocks on DIN 35 rails offers all the advantages of CAGE CLAMP® connectivity. Additionally, the separation of wiring and function levels offer maximum flexibility and ease of service.

WAGO Interface Modules

Interface modules connect electronic to electromechanical functions at the control level.

They connect:

- signal transmission, control system ↔ field
- signal distribution, control system ↔ field.

They allow prefabricated plugs to interface to discrete field wiring.

WAGO AUTOMATION offers a wide range of interface modules for commonly used connector types. The use of these interface modules offers the following advantages in the system wiring:

- easy and time-saving planning and calculations
- rapid wiring, starting and fault elimination by clearly arranged wiring and clear pole marking, reduction of wiring faults
- safe and maintenance-free connection of the signal lines with the CAGE CLAMP® terminal strips
- high packing density creates space-saving modules

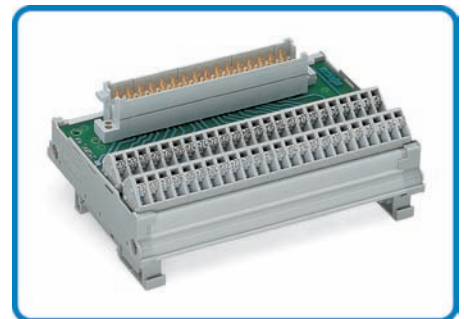
The interface modules are standard in a universal mounting carrier for DIN 35 carrier rails with the following connectors:

Subminiature-D-connectors acc. to DIN 41 652 or MIL-C-24308

Interface modules for male and female connectors are available with 9, 15, 25, 37 or 50 contacts. Compared with the standard solder connection, the mating connector with IDC connection offers additional advantages.

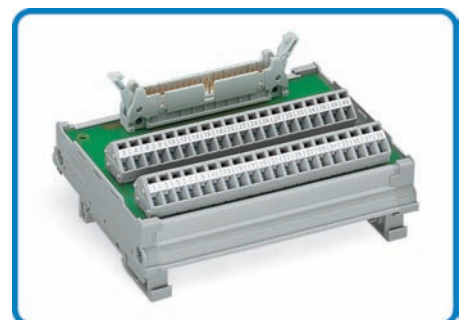
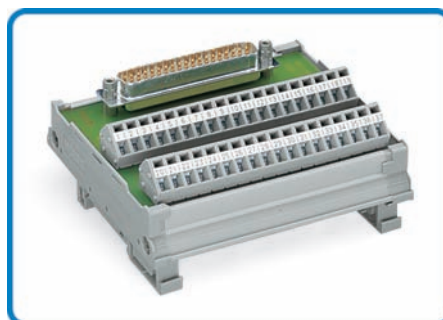
Connectors acc. to IEC 60603/DIN 41 612, types C, E and F

These connectors are frequently used for compact input and output component groups and are available for 32-, 48- and 64-pole pin and socket connectors, as well as for mating connectors with solder and IDC contacts.



Ribbon cable connectors acc. to IEC 60603-1 / DIN 41 651 or MIL-C-83503

Interface modules with 10-, 14-, 16-, 20-, 26-, 34-, 40-, 50- and 64-pole connectors are available for ribbon cable connectors.



WAGO Overvoltage Protection

WAGO overvoltage protection for increased safety and longer on-line operation

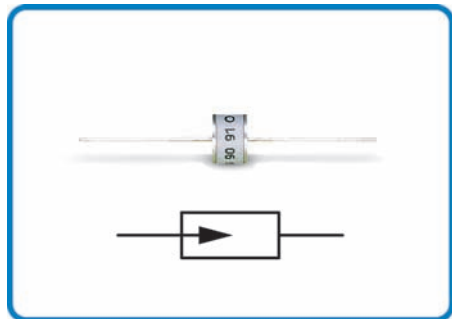
On-the-line overvoltages cause most operating failures for measuring, control, data and power lines. Failure of electronic and semiconductor components due to surges can cause operating interruptions. The overvoltage (also called transients) can be generated by switching electrical equipment on or off or by lightning discharges. Devices designed to protect electrical equipment from these voltages are called SPDs (Surge Protection Devices). SPDs may consist of either a single component or a combination of them. Various components may be subdivided in use by the protection type offered:

- Coarse protection
- Medium protection
- Fine protection.

The boundaries between these levels of protection may not be sharply defined, leading the devices chosen to vary accordingly. The following components have proven performance in these applications:

Gas-filled surge arresters and spark gaps

The gas filled surge arrester is comprised of two electrodes in a ceramic or glass tube filled with a pressurized inert gas. A spark gap is simply two electrodes in air, spaced a predetermined distance apart.



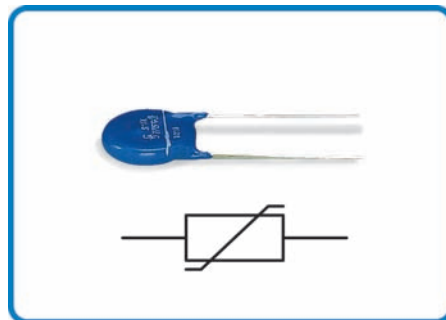
Once the ignition voltage is reached, resistance drops due to ionization and current begins to flow. The resistance of the device drops from high to low as it conducts. The voltage across the device after the arc is struck is typically 10 V ... 30 V. Therefore, the current will continue to flow until the voltage drops below this level. As this is not a guaranteed occurrence in typical power situations, a fuse must precede the device to ensure disconnection from the supply. The advantage of a gas-filled arrester: high current carrying capacity for its size. However, the key disadvantages: slow response speed and in AC applications, the crowbar action across the supply.

Varistor

A varistor is a voltage-dependent resistor. A common type of varistor is referred to as an MOV (Metal Oxide Varistor) due to its method of construction.

Varistors have a very high resistance until their threshold voltage is exceeded. Then they drop to a low resistance and are capable of carrying high currents for a short period of time. They have a fast response time, and have a current carrying capacity dependent on the surface area of metal oxide material. MOVs can be sized to handle currents exceeding of 100 kA.

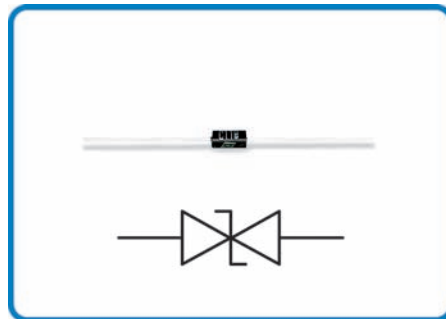
Undersized varistors can age with continued



surge conduction, resulting in lower impedance and higher leakage.

When subjected to continuous (AC or DC) voltages in excess to the device rating, MOVs can overheat, and even explode, in certain circumstances. This is why a quality surge protection device is important, it will incorporate protective measures to disconnect faulty components before safety is compromised.

Suppression diode (or silicon avalanche diode)

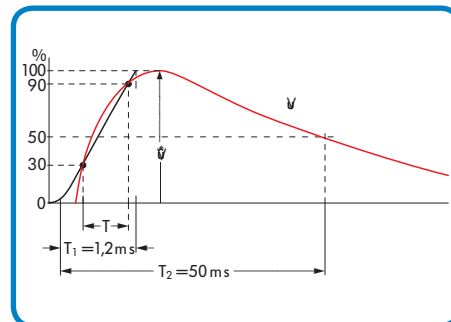


These devices have electrical characteristics similar to Zener diodes, but are rated for surge currents.

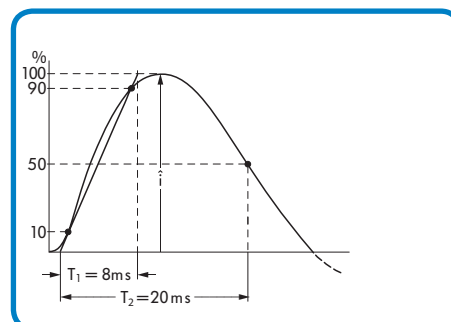
Once the rated breakdown voltage is exceeded (in the non-conductive direction), the diode becomes a conductor. The suppressor diode differs from a Zener in its higher current carrying capability and faster response time (in the picosecond range).

Test impulse

Surge arresters are subject to standardized test pulses in order to classify capabilities; the effectiveness of protection measures with reference to dissipation capacity and voltage arresting. The form and level of the test pulses are defined by IEC 60060-1/DIN VDE 0432, part 2. Preference is given to voltage pulses of 1.2/50 and current pulses of 8/20.



Voltage pulses 1.2 /50
per IEC 60060-1 /DIN VDE 0432 P. 2



Current pulses 8 /20
per IEC 60060-1 /DIN VDE 0432 P. 2

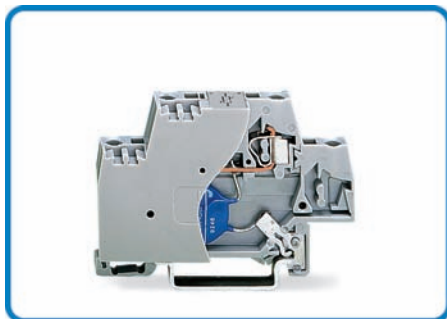
Application recommendations

The advantages of gas-filled surge arresters lie in their high current carrying capacity, making them ideal for coarse protection. One disadvantage, particularly in the medium protection range, is the relatively long response time, as well as the power follow current.

Varistors have a considerably shorter response time; however they also have lower leakage currents. This makes them more suitable for medium protection, as they offer limited applications for coarse protection. If the connection lines of electronic equipment are already "fine" protected, general coarse and medium protection measures are sufficient. If this is not the case, suppressor diodes with very short response time may be employed as fine protection.

WAGO AUTOMATION offers a complete range of modular terminal blocks with integrated surge arresters for coarse, medium and fine protection.

Depending on the application, one can choose the appropriate type from the previously mentioned surge arresters. These are electrically connected in the modular terminal blocks between the connection point and the mounting rail. Snapping the terminal block onto the grounded (earthed) mounting rail automatically ensures the required overvoltage protection.



Double-deck terminal block with varistor,
direct connection to the DIN 35 rail

Frequently, only one surge arrester is fitted for cost reasons. However, due to the fact that one surge arrester alone cannot optimally ensure several protection functions, combinations are recommended. Care must be taken to ensure that the single-stage protection devices are decoupled sufficiently by inductors or resistors.

In addition to single-stage surge arresters, WAGO AUTOMATION also offers multi-stage surge arresters, combining components for different applications. These pluggable modules are snapped into "carrier" terminal blocks. These are DIN rail-mounted and offer secure and maintenance-free CAGE CLAMP® terminations for conductors 0.08 mm²/AWG 28 to 2.5 mm²/AWG 14.



Pluggable surge suppression modules with on-unit warnings

Addition of interference suppression to surge suppression devices.
In addition to overvoltage protection, a high frequency interference filter can be added to the circuitry. This filter cannot only protect the equipment from high frequency energy transmitted by connecting wires, but also prevents a transmission of disturbances to the supply lines. The main component of a filter is an LC network, which produces a mismatch between the filter impedance and the impedance of the disturbance path. This reflects any disturbance back to its source.

Definition of several important technical terms

Nominal operating voltage (V_{BN})

The nominal operating voltage corresponds to the voltage which may be permanently connected to the appropriate connection terminals of the overvoltage protection module. Alternating voltages are quoted as effective values.

Max. operating voltage (V_{Bmax})

The maximum operating voltage corresponds to the voltage which may be permanently connected to the appropriate connection terminals without the operating properties changing or activating the individual module's protection elements.

Nominal current (I_N)

The nominal current corresponds to the current which may permanently flow through the connection terminals of the overvoltage protection device.

Nominal discharge current (I_{SN})

The nominal discharge current is the maximum value of a current having the 8/20 μ s waveform (DIN VDE 0432/10.78 part 3), which can flow through the surge arrester five times within a time period of 30 seconds (VDE) without destroying it.

Max. surge current (I_{Smax})

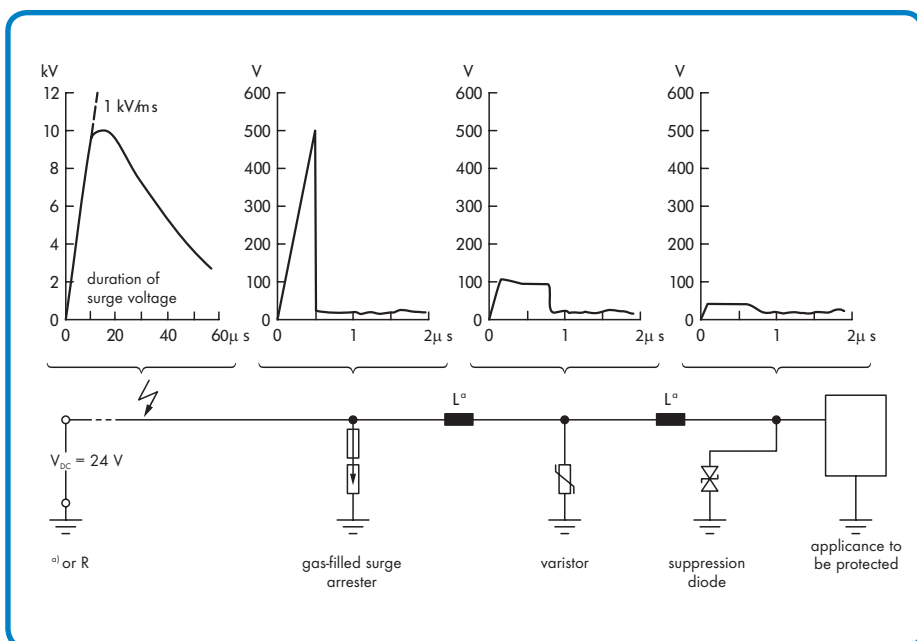
The maximum surge current I_{Smax} defines the maximum value of a current having the 8/20 μ s waveform, which can flow through the surge arrester once without destroying it.

Protection level

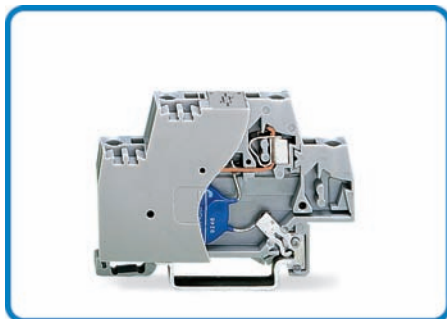
The protection level is the value of the residual voltage occurring on the "protected" side of the surge arrester when applying the rated discharge current.

Response time (t_{an})

The response time is primarily based on the physical properties of the surge arresters and is dependent upon the wave front duration of the surge voltage. WAGO's data refers to a voltage rise of 1 kV/ μ s.



Function diagram of a multi-stage surge voltage protection module



Double-deck terminal block with varistor,
direct connection to the DIN 35 rail

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Definition of several important technical terms

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The maximum operating voltage corresponds to the voltage which may be permanently connected to the appropriate connection terminals without the operating properties changing or activating the individual module's protection elements.

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The nominal current corresponds to the current which may permanently flow through the connection terminals of the overvoltage protection device.

Nominal discharge current (I_{SN})

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Max. surge current (I_{Smax})

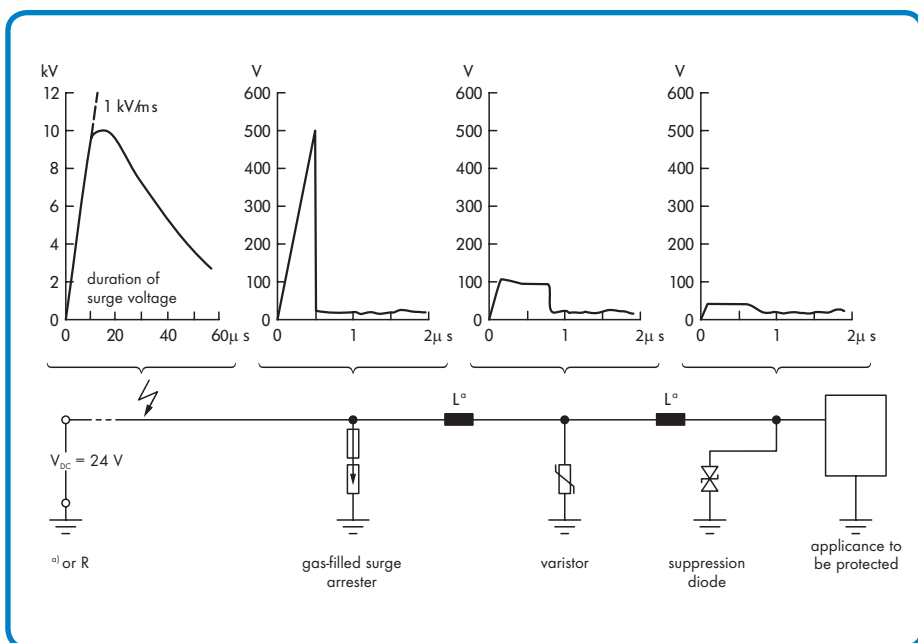
The maximum surge current I_{Smax} defines the maximum value of a current having the 8/20 μ s waveform, which can flow through the surge arrester once without destroying it.

Protection level

The protection level is the value of the residual voltage occurring on the "protected" side of the surge arrester when applying the rated discharge current.

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Function diagram of a multi-stage surge voltage protection module



**WAGO Application: Cerestar (Cargill GmbH),
Barby, Saxony-Anhalt, Germany**
Manufacturer of starches and starch derivatives.

WAGO Products:
Matrix Patchboards and Pluggable Electronic Modules



Overview Interface Modules Installation Notes

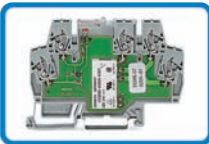
20 – 25
26 – 27



Series 857 – Transducers and Relay Modules, 6 mm / 0.236 in wide

Isolation Amplifiers, Repeater Power Supply, Signal Splitter, Temperature Transducers,
Relay Modules with Pluggable Miniature Switching Relay,
Accessories
WAGOframe

28 – 35



Series 859 – Relay and Optocoupler Modules, 6 mm / 0.236 in wide

Relay Modules
Optocouplers Modules
Relay and Optocouplers Modules with Extended Input Voltages
and Operating Temperature Ranges
Accessories

36 – 53



Series 788 – Relay Sockets with Pluggable Miniature Switching Relay

Relay Modules with 1 Changeover Contact, 16 A
Relay Modules with 2 Changeover Contact, 2x8 A
Relay Modules with Gold Contacts, 1 Changeover Contact/2 Changeover Contact
Relay Modules for Special Requirements
Accessories

54 – 69



Series 286 – Pluggable Function Modules

Relays and Time Delay Relays Modules, Optocouplers Modules
NAMUR Switching Amplifiers Modules, Temperature Transducers Modules
Current Flow Monitoring Modules and other Signal Conditioners
Relays and Time Delay Relays Modules with Extended Input Voltages
and Operating Temperature Ranges, Accessories

70 – 115



Series 786 – Pluggable Function Modules

Analog Signal Conditioning Modules, for Signal Transformation,
Amplification and Transmission with Electrical Isolation of
Input and Output of Standard Signals

116 – 119



Series 787 – A/D Converters in DIN-Rail-Mountable Enclosure

Analog/Digital Converter
Digital/Analog Converter

120 – 123



Series 288 and 287 – DIN-Rail-Mountable Modules - Relay Modules

Switching Relays
Safety Relays
Relay Sockets

124 – 135

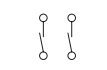
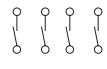


Series 789 – Relay Modules in DIN-Rail-Mountable Enclosure

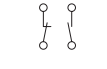
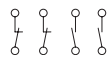
Switching Relays, Latching Relays, Accessories
4 Channel EnOcean Radio Receiver in DIN-Rail-Mountable Enclosure
Manual Control Module Digital, 4 Outputs
Manual Control Module Analog, 4 Outputs

136 – 143

Relays with make contacts

Nominal voltage		5 V		12 V		24 V		48 V		60 V		115 V		230 V	
1 make contact		Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page
	DC					286-364 70 788-355 61 288-364 124 288-320 130 287-475 131 287-474 132 789-571 140 286-376 77		286-365 70		286-366 70					
	AC					286-564 70						286-566 70		286-567 70 789-570 140	
	AC/DC					288-564 124		288-565 124				288-567 124			
Nominal voltage		5 V		12 V		24 V		48 V		60 V		115 V		230 V	
2 make contacts		Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page
	DC	286-326 74		286-327 74		286-328 74		286-329 74		286-330 74				286-332 74	
	AC														
	AC/DC														
Nominal voltage		5 V		12 V		24 V		48 V		60 V		115 V		230 V	
4 make contacts		Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page
	DC	286-350 76		286-351 76		286-352 76 789-352 139		286-353 76		286-354 76		286-355 76			
	AC					286-552 76						286-555 76		286-556 76	
	AC/DC			789-551 139		789-552 139									

Relays with break contacts and make contacts

Nominal voltage		5 V		12 V		24 V		48 V		60 V		115 V		230 V	
1 break contact		Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page
	DC					286-368 70 286-368 124		286-369 70		286-370 70					
	AC					286-568 70									
	AC/DC					288-568									
Nominal voltage		5 V		12 V		24 V		48 V		60 V		115 V		230 V	
1 break contact/ 1 make contact		Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page
	DC	286-318 74		286-319 74		286-320 74 286-906 78 286-571 79		286-321 74		286-322 74				286-324 74	
	AC					286-520 74								286-570 79	
	AC/DC														
Nominal voltage		5 V		12 V		24 V		48 V		60 V		115 V		230 V	
2 break contacts/ 2 make contacts		Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page
	DC	286-334 75		286-335 75		286-336 75 789-336 138		286-337 75		286-338 75		286-339 75			
	AC					286-536 75								286-540 75	
	AC/DC			789-535 138		789-536 138									
Nominal voltage		5 V		12 V		24 V		48 V		60 V		115 V		230 V	
1 break contact/ 3 make contacts		Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page
	DC	286-342 75		286-343 75		286-344 75		286-345 75		286-346 75		286-347 75			
	AC					286-544 75						286-547 75		286-548 75	
	AC/DC														
Nominal voltage		5 V		12 V		24 V		48 V		60 V		115 V		230 V	
Safety relays 4 break contacts/ 4 make contacts		Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page
	DC	288-412 133 288-422 133		288-413 133 288-423 133		288-435 132									
	AC													288-428 133 288-428 133	
	AC/DC					288-414 133 288-424 133		288-415 133 288-425 133		288-416 133 288-426 133					

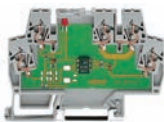
Relays with changeover contact

Nominal voltage		Timer range	On-delay		Off-delay		Pulsing		Pulse lengthening		
1 changeover contact			Item-No.	Page	Item-No.	Page	Item-No.	Page	Item-No.	Page	
	DC 24 V	0,1 s ... 1 s	286-600	80	286-440	82	286-460	83	286-426	81	
		1 s ... 10 s	286-602	80	286-442	82	286-462	83	286-427	81	
		10 s ... 100 s	286-604	80	286-444	82	286-464	83	286-428	81	
	AC 230 V	0,1 s ... 1 s	286-610	80	286-446	82	286-470	83			
		1 s ... 10 s	286-612	80	286-448	82	286-472	83			
		10 s ... 100 s	286-614	80	286-450	82	286-474	83			
	Multirange Timing Relay AC 24 V, AC 115 V, AC 230 V, DC 24 V		286-616	84							
	Multifunction Timing Relays DC 24 V		0,3 s ... 3 s 3 s ... 12 s 10 s ... 100 s 100 s ... 800 s	286-640 85 286-640/004-000 114 for use in railway							

Overview Optocouplers



Series 286



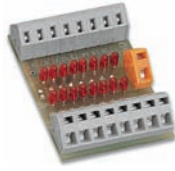
Series 859

Function	Input	Output	Max. perm. continuous. current	Series 859		Series 286	
				Item-No.	Page	Item-No.	Page
2 Wire Optocouplers	DC 5 V	DC 24 V	100 mA	859-795	44		
		DC 60 V		859-793	43		
	DC 24 V	859-796		44			
		859-794		45			
		859-730	46				
		859-740	46				
	DC 24 V	DC 60 V	100 mA	859-791	43	286-791	91
		2 x DC 24 V	2 x 250 mA			286-794	92
286-790	93						
					286-792	92	
2 Wire Optocouplers with zero volt switch	DC 5 V	AC 230 V	0.5 A	859-902	51		
	DC 12 V		1 A			286-732	90
	DC 24 V					286-733	90
						286-734	90
3 Wire Optocouplers positive switching	DC 5 V	DC 24 V	0.5 A	859-752	49	286-752/002000	89
	DC 24 V	DC 5 V		859-756	50	286-750	86
		DC 15 V				286-751	86
		DC 24 V		859-758	50	286-752	86
		DC 24 V	4 A			286-723	89
		DC 24 V programmable (L or H)	300 mA			286-938	93
	AC 230 V	DC 5 V	0.5 A			286-754	87
		DC 15 V				286-756	87
		DC 24 V				859-772	47
				859-702	48		
3 Wire Optocouplers negative switching	DC 5 V	DC 24 V	0.5 A			286-726	90
	DC 12 V	DC 110 V	1.6 A			286-728	90
	DC 24 V	DC 5 V	0.5 A	859-706	49	286-700	86
		DC 15 V				286-701	86
		DC 24 V		859-708	48	286-702	86
			2 A			286-720	88
			3 A	859-720	45		
		5 A			286-721	88	
	AC 230 V	DC 110 V	1.6 A			286-730	90
		DC 5 V	0.5 A			286-704	87
		DC 15 V				286-706	87
		DC 24 V				859-712	47
	AC/DC 10 ... 30 V		1 mA - 500 mA			286-725	91
Power Optocouplers	S0 current meter interface	AC output				286-740	94
		DC output				286-741	94
Supply Module	passive S0 current meter					286-742	95

Overview NAMUR Switching Amplifiers, Current Flow Monitoring Modules and other Function Modules



Series 286



Series 289

Function			Series 289		Series 286	
			Item-No.	Page	Item-No.	Page
NAMUR Switching Amplifiers	with relay output AC 250 V/DC 120 V				286-880	96
	with transistor output DC 24 V				286-881	96
Current Flow Monitoring Modules	AC/DC DC 15 mA/AC 35 mA ... 300 mA	Optocoupler			286-659	102
	AC 80 mA ... 6 A	Transformer			286-661	102
	AC 0.2 A ... 3 A	1 changeover contact			286-664	103
	AC 1 A ... 10 A	1 changeover contact			286-665	104
	DC 0.4 A ... 1.5 A	1 make contact			286-662	103
Switching Module	1-pole changeover	with changeover rocker switch			286-895	105
		with momentary switch			286-896	105
Bridge Rectifiers	AC 230 V / 1 A				280-804/281-419	107
	AC 230 V / 1 A	with varistor protection			286-840	106
	AC 24 V / 1 A				286-830	106
Fuse Module for replaceable microfuses 5 x 20 mm	Operating voltage AC/DC 24 V	Blown fuse indication, LED green			286-890	108
	Operating voltage AC/DC 230 V	Blown fuse indication, neon lamp			286-891	108
Diode Gate Modules	common anode	3 diodes			286-803	109
		5 diodes			286-805	109
		7 diodes			286-807	109
		9 diodes			286-809	109
	common cathode	3 diodes			286-813	109
		5 diodes			286-815	109
		7 diodes			286-817	109
		9 diodes			286-819	109
Polarized Diode Gate	common anode	14 diodes	289-121	172		
	common cathode	14 diodes	289-111	172		
Open Diode Gate	with 8 diodes, individual connection possible	Diode 1 N 4007	289-101	170		
		Diode P 600 B	289-103	170		
	with 9 diodes, individual connection possible	Diode 1 N 5408	289-105	171		
AND Gate Module	with 6 inputs, relay output with 1 make contact				286-826	110
Flip-Flop	Operating voltage DC 24 V				286-825	111
LED Indicator Module	with 8 LEDs	common cathode			286-822	110
LED Gate Module	with 16 LEDs	common anode	289-202	173		
		common cathode	289-201	173		
Lamp Test Circuit	with 20 diodes for testing 10 lamps		289-151	173		
Open Resistor Gate	with 8 resistors, individual connection possible		289-114	174		
Resistor Gate	with 1 end commoned, 8 resistors		289-113	174		
Fault Indicator Modules, with reset	Auxiliary and fault indication voltage AC 230 V	Alarm with continuous light			286-681	112
	DC 60 V	Alarm with continuous light			286-684	112
	DC 24 V	Indication of original fault with single flashing light			286-683	113
Connection Modules for sensors and actuators	8 x 3-conductor sensors		289-664	168		
		LED indicator for positive switching	289-665	168		
		LED indicator for negative switching	289-666	168		
	8 actuators		289-667	169		
		with ground (earth) contact	289-671	169		

Overview Isolation Amplifiers



Series 857 (JUMPFLEX)

Function	Input signal (calibNominal switchable)	Output signal (calibNominal switchable)	Configuration	Electrical isolation	Supply voltageV _N	Item-No.	Page
Isolation Amplifier	0 ... 20 mA, 4 ... 20 mA, 0 ... 5 V, 0 ... 10 V, 2 ... 10 V, 1 ... 5 V	0 ... 20 mA, 4 ... 20 mA, 0 ... 5 V, 0 ... 10 V, 2 ... 10 V, 1 ... 5 V	Dip switch	3 ways, 2.5 kV	DC 24 V	857-400	28
Isolation Amplifier, fixed setting	0(4) ... 20 mA	0(4) ... 20 mA	—	3 ways, 2.5 kV	DC 24 V	857-411	28
Isolation Amplifier, fixed setting	0(2) ... 10 V	0(2) ... 10 V	—	3 ways, 2.5 kV	DC 24 V	857-412	28
Repeater Power Supply	0 ... 20 mA, 4 ... 20 mA	0 ... 20 mA, 4 ... 20 mA, 0 ... 5 V, 0 ... 10 V, 2 ... 10 V, 1 ... 5 V	Dip switch	3 ways, 2.5 kV	DC 24 V	857-420	29
Repeater Power Supply,HART	4 ... 20 mA	4 ... 20 mA	-	3 ways, 2.5 kV	DC 24 V	857-421	29
Signal Splitter	0 ... 20 mA, 4 ... 20 mA, 0 ... 5 V, 0 ... 10 V, 2 ... 10 V, 1 ... 5 V	2 x 0(4) ... 20 mA	Dip switch	4 ways, 2.5 kV	DC 24 V	857-423	28
Passive isolator, 1 channel	0(4) ... 20 mA	0(4) ... 20 mA	—	2 ways, 2.5 kV	DC 24 V	857-451	28
Passive isolator, 2 channel	0(4) ... 20 mA	0(4) ... 20 mA	—	2 ways, 2.5 kV	DC 24 V	857-452	28



Series 786



Series 787

Function	Input	Output	Electrical isolation	Supply voltageV _N	Item-No.	Page
Analog Signal Conditioning Modules for Standard Signals	0 - 10 V	0 - 10 V	2 ways, 4 kV	DC 24 V	786-301	116
			3 ways, 4 kV		786-321	116
		0 - 20 mA	2 ways, 4 kV		786-302	116
			3 ways, 4 kV		786-322	116
		4 - 20 mA	2 ways, 4 kV		786-303	116
			3 ways, 4 kV		786-323	116
	0 - 20 mA	0 - 10 V	2 ways, 4 kV	DC 24 V	786-304	117
			3 ways, 4 kV		786-324	118
		0 - 20 mA	2 ways, 4 kV		786-305	117
			3 ways, 4 kV		786-325	118
		4 - 20 mA	2 ways, 4 kV		786-306	117
			3 ways, 4 kV		786-326	118
	4 - 20 mA	0 - 10 V	2 ways, 4 kV	DC 24 V	786-307	117
			3 ways, 4 kV		786-337	118
		0 - 20 mA	2 ways, 4 kV		786-308	117
			3 ways, 4 kV		786-338	118
		4 - 20 mA	2 ways, 4 kV		786-309	117
			3 ways, 4 kV		786-339	118
10 Bit A/D Converters	0 - 10 V	10 Bit		DC 24 V	787-501	120
	0 - 20 mA				787-502	120
	4 - 20 mA				787-503	121
10 Bit D/A Converters	10 Bit	0 - 10 V		DC 24 V	787-504	122
		0 - 20 mA			787-505	122
		4 - 20 mA			787-506	123

Overview Temperature Transducers



Series 857 (JUMPFLEX)

Function	Input signal	Connection	Output signal	Configuration	Electrical isolation	Supply voltage V_N	Item-No.	Page
Temperature Transducers for RTD	Pt 100, Pt 200, Pt 500, Pt 1000 0 ... 1 k Ω , 0 ... 4,5 k Ω	2 wire, 3 wire, 4 wire	0 ... 20 mA, 4 ... 20 mA, 0 ... 10 V, 2 ... 10 V, 0 ... 5 V, 1 ... 5 V, 0 ... 10 mA, 2 ... 10 mA	Dip switch	3 ways, 2.5 kV	DC 24 V	857-800	31
Temperature Transducers for RTD	Pt 100, Pt 200, Pt 500, Pt 1000 0 ... 1 k Ω , 0 ... 4,5 k Ω	2 wire, 3 wire, 4 wire	0 ... 20 mA, 4 ... 20 mA, 0 ... 10 V, 2 ... 10 V, 0 ... 5 V, 1 ... 5 V, 0 ... 10 mA, 2 ... 10 mA	Dip switch or configuration Software	3 ways, 2.5 kV	DC 24 V	857-801	31
Temperature Transducers for Thermocouples	Thermocouples of types J and K		0 ... 20 mA, 4 ... 20 mA, 0 ... 10 V, 2 ... 10 V, 0 ... 5 V, 1 ... 5 V, 0 ... 10 mA, 2 ... 10 mA	Dip switch	3 ways, 2.5 kV	DC 24 V	857-810	32
Temperature Transducers for Thermocouples	Thermocouples of types J and K		0 ... 20 mA, 4 ... 20 mA, 0 ... 10 V, 2 ... 10 V, 0 ... 5 V, 1 ... 5 V, 0 ... 10 mA, 2 ... 10 mA	Dip switch or configuration Software	3 ways, 2.5 kV	DC 24 V	857-811	32

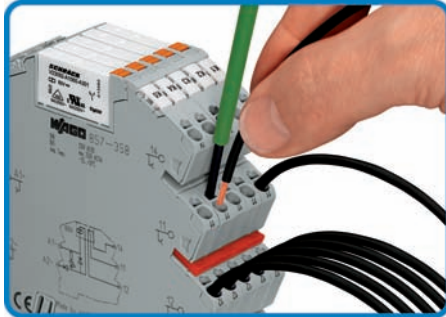


Series 286

Function	Input	Temperature range	Connection	Output	Electrical isolation	Supply voltageV _N	Item-No.	Page
Temperature Transducers	Pt 100	0 °C ... 100 °C	2 wire	0 - 10 V	—	DC 24 V	286-860	97
			3 wire				286-870	97
			2 wire	0 - 20 mA			286-861	97
			3 wire				286-871	97
			2 wire	4 - 20 mA			286-862	97
			3 wire				286-872	97
		-30 °C ... +150 °C	2 wire	0 - 10 V	—	DC 24 V	286-860/150-030	99
			3 wire				286-870/150-030	99
			2 wire	0 - 20 mA			286-861/150-030	99
			3 wire				286-871/150-030	99
			2 wire	4 - 20 mA			286-862/150-030	99
			3 wire				286-872/150-030	99
		0 °C ... 300 °C	2 wire	0 - 10 V	—	DC 24 V	286-860/000-300	100
			3 wire				286-870/000-300	100
			2 wire	0 - 20 mA			286-861/000-300	100
			3 wire				286-871/000-300	100
			2 wire	4 - 20 mA			286-862/000-300	100
			3 wire				286-872/000-300	100
	Pt 1000	0 °C ... 100 °C	2 wire	0 - 10 V	—	DC 24 V	286-873	101
				0 - 20 mA			286-874	101
				4 - 20 mA			286-875	101
	Thermocouples of type J	0 °C ... 750 °C		0 - 10 V	—	DC 24 V	286-863	98
				0 - 20 mA			286-865	98
				4 - 20 mA			286-867	98
	Thermocouples of type J	0 °C ... 1000 °C		0 - 10 V	—	DC 24 V	286-864	98
				0 - 20 mA			286-866	98
				4 - 20 mA			286-868	98

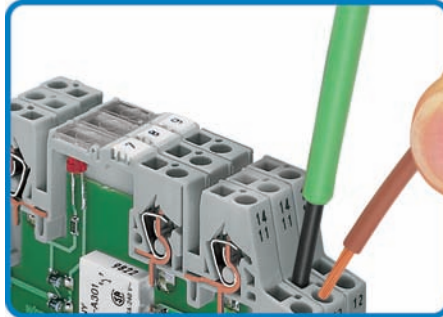
Installation Notes

Series 857 Transducers and Relay Modules



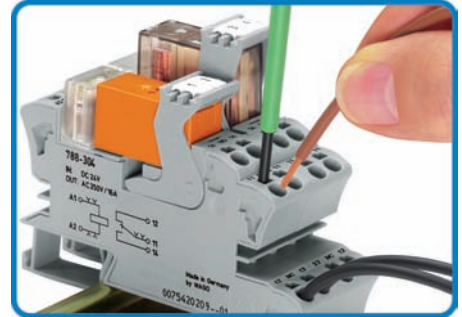
Connection of conductor

Series 859 Relay Modules and Optocoupler Modules

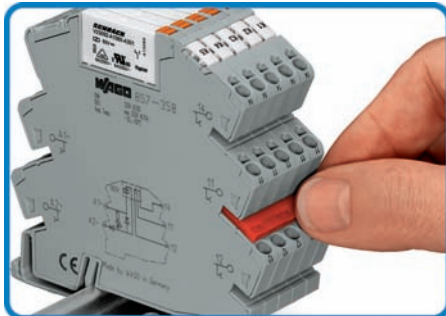


Connection of conductor

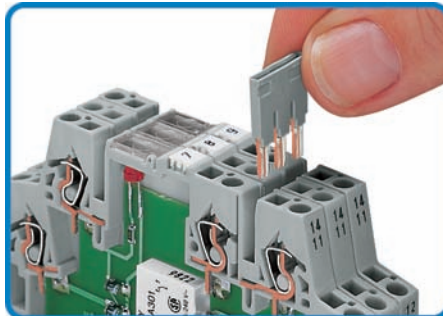
Series 788 Relay Sockets with Pluggable Miniature Switching Relay



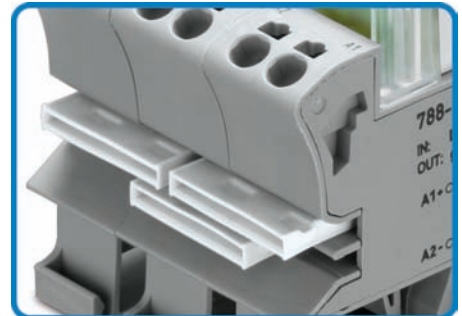
Connection of conductor



Easy commoning using adjacent jumpers



Easy commoning using adjacent jumpers



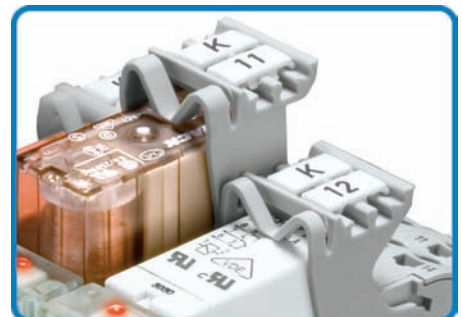
Easy commoning using adjacent jumpers



Marking using WMB Multi markers



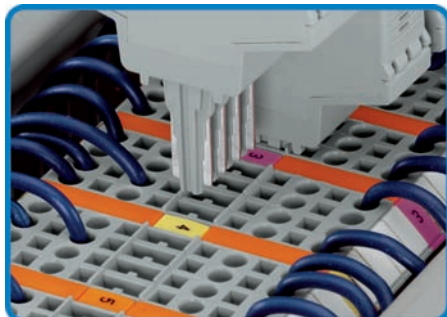
Marking using Miniature quick marking card



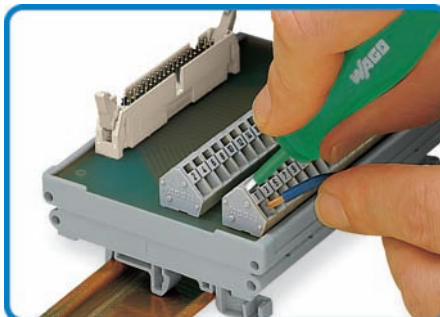
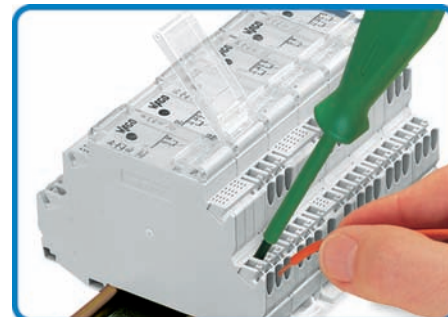
Marking using WMB Multi markers and group marker carriers



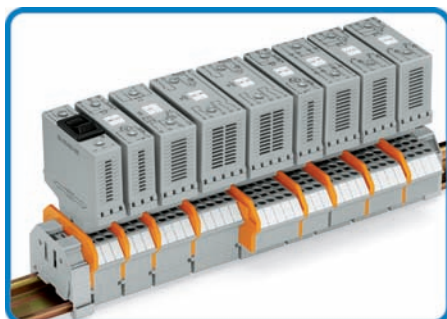
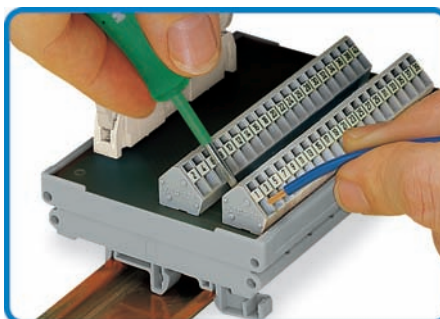
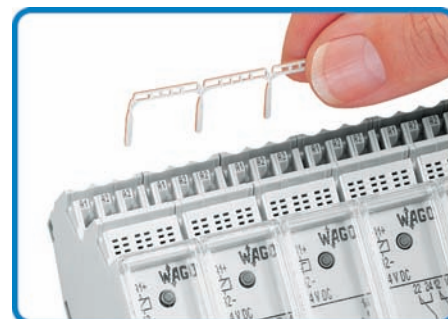
Operation of the relay ejector

Series 286 / 786
Pluggable Function Modules

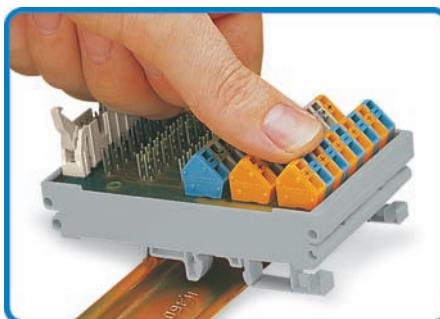
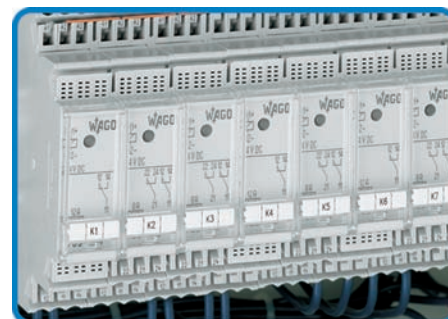
Coding ensures correct polarity

Series 287 / 288 DIN-Rail-Mountable
Modules - Relay Modules and SocketsConnection of conductor
"front-entry"**Series 789** Relay Modules in
DIN-Rail-Mountable Enclosure

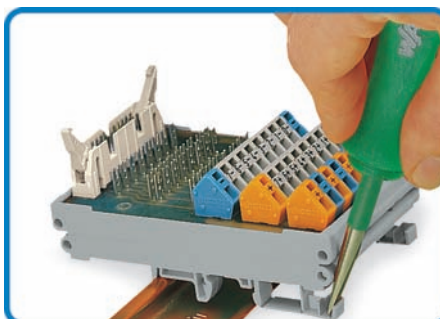
Connection of conductor

Pluggable electronic modules, for
application on 2- or 4-conductor
carrier terminal blocksConnection of conductor
"side-entry"Easy commoning using
adjacent jumpers

Marking using WMB Multi markers

Assembly of a module on the
carrier railMarking using Miniature quick marking
card

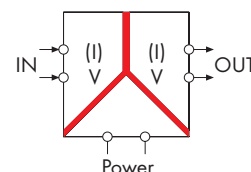
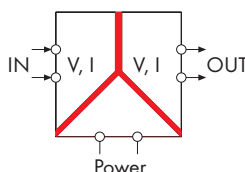
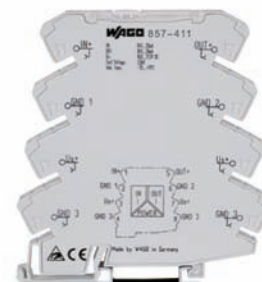
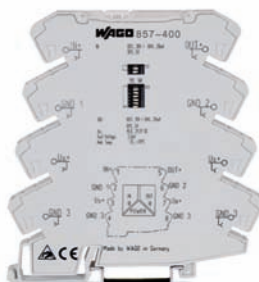
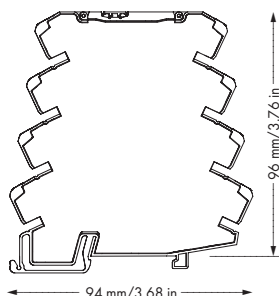
Easy testing at touchproof contacts

Removal of a module from the
carrier rail

1 Isolation Amplifiers, 6 mm / 0.236 in Wide

28

	Isolation amplifier, with zero/span adjustment	Isolation amplifiers, fixed setting for voltage or current signals
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Description	Item no.	Pack. unit	Item no.	Pack. unit
Isolation amplifier, for TS 35	Isolation amplifier, with zero/span adjustment	857-400 1	Isolation amplifier, fixed setting for current signals	857-411 1
			Isolation amplifier, fixed setting for voltage signals	857-412 1

Technical Data	Accessories see page 34		Accessories see page 34	
Configuration	DIP switch		-	
Input signal	0 ... 20 mA, 4 ... 20 mA, 0... 5 V, 0 ... 10 V, 2 ... 10 V, 1 ... 5 V (calibrated switchable)		0(4) ... 20 mA (857-411) 0(2) ... 10 V (857-412)	
Input resistance	$\leq 50 \Omega$ (In = mA) $\geq 100 \text{ k}\Omega$ (In = V)		$\leq 50 \Omega$ (In = mA) $\geq 100 \text{ k}\Omega$ (In = V)	
Output signal	0 ... 20 mA, 4 ... 20 mA, 0... 5 V, 0 ... 10 V, 2 ... 10 V, 1 ... 5 V (calibrated switchable)		0(4) ... 20 mA (857-411) 0(2) ... 10 V (857-412)	
Load impedance	600 Ω (Out = mA) 2 k Ω (Out = V) 500 Ω (Out = mA) ¹ 10 k Ω (Out = V) ¹ ¹) Differing technical data for extended supply voltage and ambient temperature range		600 Ω (857-411) 2 k Ω (857-412) 500 Ω (857-411) ¹ 10 k Ω (857-412) ¹ ¹) Differing technical data for extended supply voltage and ambient temperature range	
Max. operating frequency	100 Hz / > 5 kHz (switchable via DIP switch)		100 Hz	
Response time (T ₁₀₋₉₀)	< 3.5 ms / < 100 μ s		< 3.5 ms	
Zero / span adjustment	$\pm 3 \%$			
Supply voltage V _N	DC 24 V		DC 24 V	
Supply voltage typ. / extended	19.2 V ... 30.2 V / 16.8 V ... 31.2 V		19.2 V ... 30.2 V / 16.8 V ... 31.2 V	
Current consumption at 24 V DC	< 25 mA		< 25 mA	
Error of transmission	< 0.1 % of the full scale value		< 0.1 % of the full scale value	
Temperature coefficient	0.01 % /K		0.01 % /K	
Test voltage (Input / Output / Supply)	2.5 kV AC, 50 Hz, 1 min		2.5 kV AC, 50 Hz, 1 min	
Ambient operating temperature typ. / extended	-20 °C ... +65 °C / -25 °C ... +70 °C		-20 °C ... +65 °C / -25 °C ... +70 °C	
Storage temperature	-40 °C ... +85 °C		-40 °C ... +85 °C	
Dimensions (mm) W x H x L	6 x 96 x 94		6 x 96 x 94	
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP®S		Height from upper-edge of DIN 35 rail CAGE CLAMP®S	
Cross sections	solid: 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12 fine-stranded: 0.34 mm ² ... 2.5 mm ² / AWG 22 ... 12		solid: 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12 fine-stranded: 0.34 mm ² ... 2.5 mm ² / AWG 22 ... 12	
Stripped lengths	9 ... 10 mm / 0.37 in		9 ... 10 mm / 0.37 in	
Approvals	CE, , LISTED Class I Div 2 Groups A, B, C, D*		CE, , LISTED Class I Div 2 Groups A, B, C, D*	
	*in preparation		*in preparation	

Repeater Power Supply, 6 mm / 0.236 in Wide

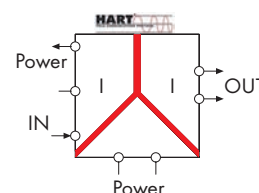
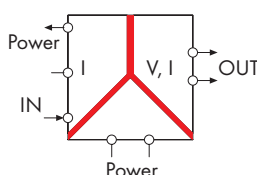
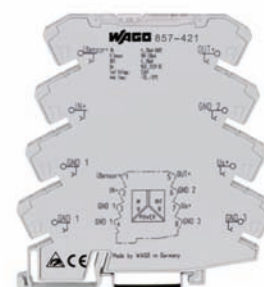
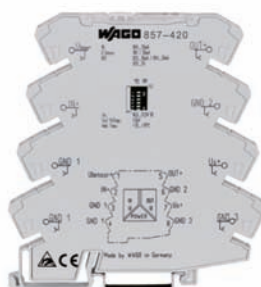
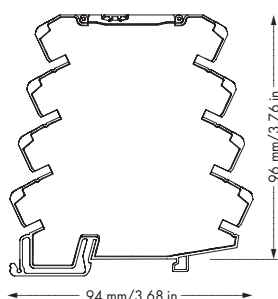
CAGE CLAMP®S

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	Repeater power supply, configurable with current and voltage output	Repeater power supply, HART
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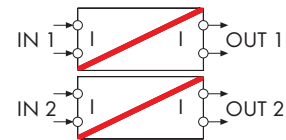
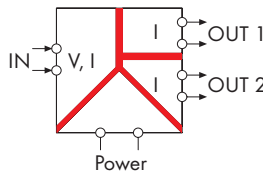
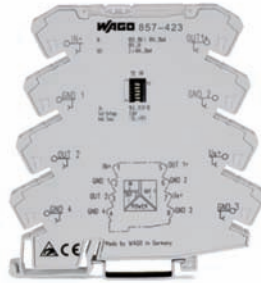
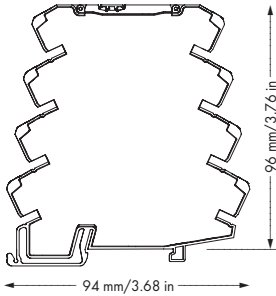


Description	Item no.	Pack. unit	Item no.	Pack. unit
Repeater power supply, for TS 35	Repeater power supply, configurable with current and voltage output	857-420 1	Repeater power supply, HART	857-421 1
Technical Data				
Accessories see page 34				
Configuration	DIP switch		-	
Input signal	0 ... 20 mA, 4 ... 20 mA (calibrated switchable)		4 ... 20 mA	
Input resistance	≤ 50 Ω		≤ 50 Ω	
Output signal	0 ... 20 mA, 4 ... 20 mA, 0 ... 5 V, 0 ... 10 V, 2 ... 10 V, 1 ... 5 V (calibrated switchable)		4 ... 20 mA	
Load impedance	600 Ω (Out = mA) 2 kΩ (Out = V) 500 Ω (Out = mA) ¹⁾ 10 kΩ (Out = V) ¹⁾		600 Ω (500 Ω) ¹⁾	
	¹⁾ Differing technical data for extended supply voltage and ambient temperature range		¹⁾ Differing technical data for extended supply voltage and ambient temperature range	
Max. operating frequency	100 Hz		100 Hz signal / ≥ 2.5 kHz HART	
Response time (T ₁₀₋₉₀)	< 3.5 ms		< 3.5 ms signal	
Supply voltage V _N	DC 24 V		DC 24 V	
Supply voltage typ. / extended	19.2 V ... 30.2 V / 16.8 V ... 31.2 V		19.2 V ... 30.2 V / 16.8 V ... 31.2 V	
Current consumption at 24 V DC	< 45 mA		< 45 mA	
Error of transmission	< 0.1 % of the full scale value		< 0.1 % of the full scale value	
Temperature coefficient	0.01 % / K		0.01 % / K	
Test voltage (Input / Output / Supply)	2.5 kV AC, 50 Hz, 1 min		2.5 kV AC, 50 Hz, 1 min	
Ambient operating temperature typ. / extended	-20 °C ... +65 °C / -25 °C ... +70 °C		-20 °C ... +65 °C / -25 °C ... +70 °C	
Storage temperature	-40 °C ... +85 °C		-40 °C ... +85 °C	
Dimensions (mm) W x H x L	6 x 96 x 94		6 x 96 x 94	
	Height from upper-edge of DIN 35 rail		Height from upper-edge of DIN 35 rail	
Wire connection	CAGE CLAMP®S		CAGE CLAMP®S	
Cross sections	solid: 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12 fine-stranded: 0.34 mm ² ... 2.5 mm ² / AWG 22 ... 12		solid: 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12 fine-stranded: 0.34 mm ² ... 2.5 mm ² / AWG 22 ... 12	
Stripped lengths	9 ... 10 mm / 0.37 in		9 ... 10 mm / 0.37 in	
Approvals	CE, Ⓢ, Ⓢ*, Ⓢ*, LISTED Class I Div 2 Groups A, B, C, D* *in preparation		CE, Ⓢ, Ⓢ*, Ⓢ*, LISTED Class I Div 2 Groups A, B, C, D* *in preparation	

1 Isolation Amplifiers, 6 mm / 0.236 in Wide

30

	Signal splitter with 2 configurable current outputs	Passive isolator, 1 channel, 2 channels
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Description	Item no.	Pack. unit	Item no.	Pack. unit		
Signal splitter, for TS 35	Signal splitter with 2 configurable current outputs	857-423	1	Passive isolator, 1 channel	857-451	1
				Passive isolator, 2 channels	857-452	1

Technical Data	Accessories see page 34	Accessories see page 34
Configuration	DIP switch	-
Input signal	0 ... 20 mA, 4 ... 20 mA, 0... 5 V, 0 ... 10 V, 2 ... 10 V, 1 ... 5 V (calibrated switchable)	0(4) ... 20 mA
Input resistance	$\leq 50 \Omega$ ($I_n = \text{mA}$) $\geq 100 \text{ k}\Omega$ ($I_n = \text{V}$)	
Voltage drop input		$< 2.0 \text{ V}$
Output signal	2 x 0(4) ... 20 mA (calibrated switchable)	0(4) ... 20 mA
Load impedance	2 x 300 Ω (2 x 250 Ω) ¹	600 Ω (500 Ω) ¹
	¹) Differing technical data for extended supply voltage and ambient temperature range	¹) Differing technical data for extended ambient temperature range
Max. operating frequency	100 Hz / 1 kHz (switchable via DIP switch)	100 Hz
Response time (T_{10-90})	$< 3.5 \text{ ms}$ / $< 300 \mu\text{s}$	$< 3.5 \text{ ms}$
Supply voltage V_N	DC 24 V	
Supply voltage typ. / extended	19.2 V ... 30.2 V / 16.8 V ... 31.2 V	
Current consumption at 24 V DC	$< 35 \text{ mA}$	
Error of transmission	$< 0.1 \%$ of the full scale value	$< 0.1 \%$ of the full scale value
Temperature coefficient	0.01 % / K	0.01 % / K
Test voltage (Input / Output / Supply)	2.5 kV AC, 50 Hz, 1 min	2.5 kV AC, 50 Hz, 1 min
Ambient operating temperature typ. / extended	-20 °C ... +65 °C / -25 °C ... +70 °C	-20 °C ... +65 °C / -25 °C ... +70 °C
Storage temperature	-40 °C ... +85 °C	-40 °C ... +85 °C
Dimensions (mm) W x H x L	6 x 96 x 94	6 x 96 x 94
	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP®S	CAGE CLAMP®S
Cross sections	solid: 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12 fine-stranded: 0.34 mm ² ... 2.5 mm ² / AWG 22 ... 12	solid: 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12 fine-stranded: 0.34 mm ² ... 2.5 mm ² / AWG 22 ... 12
Stripped lengths	9 ... 10 mm / 0.37 in	9 ... 10 mm / 0.37 in
Approvals	CE, , , LISTED Class I Div 2 Groups A, B, C, D* *in preparation	CE, , , LISTED Class I Div 2 Groups A, B, C, D* *in preparation

Temperature Transducers, 6 mm / 0.236 in Wide

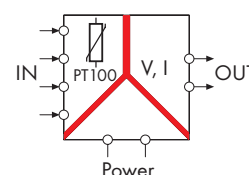
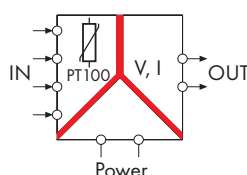
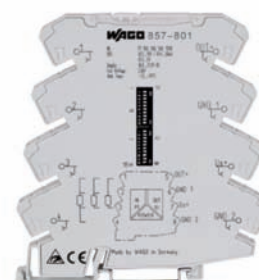
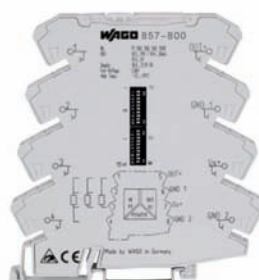
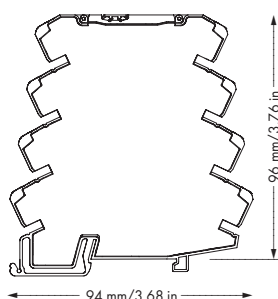
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	Temperature transducer for Pt 100, Pt 200, Pt 500 and Pt 1000 as well as resistors 0 ... 1 k Ω ; 0 ... 4.5 k Ω	Temperature transducer for Pt 100, Pt 200, Pt 500 and Pt 1000 * as well as resistors 0 ... 1 k Ω ; 0 ... 4.5 k Ω
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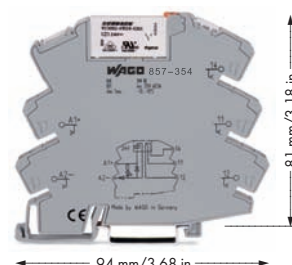


Description	Item no.	Pack. unit	Item no.	Pack. unit
Temperature transducer, for TS 35	Temperature transducer for Pt 100, Pt 200, Pt 500 und Pt 1000 as well as resistors 0 ... 1 k Ω ; 0 ... 4.5 k Ω	1	Temperature transducer for Pt 100, Pt 200, Pt 500 und Pt 1000 * as well as resistors 0 ... 1 k Ω 0 ... 4.5 k Ω " Available 3rd Quarter 2007 (* setting of other types of sensors as well as output signal inversion using the configuration software.)	1

Technical Data	Accessories see page 34	Accessories see page 34
Configuration	DIP switch	DIP switch or via software
Input signal	PT sensors and resistors	PT sensors and resistors
Output signal	0 ... 20 mA, 4 ... 20 mA, 0 ... 10 V, 2 ... 10 V, 0 ... 5 V, 1 ... 5 V, 0 ... 10 mA, 2 ... 10 mA	0 ... 20 mA, 4 ... 20 mA, 0 ... 10 V, 2 ... 10 V, 0 ... 5 V, 1 ... 5 V, 0 ... 10 mA, 2 ... 10 mA
Load impedance	$\leq 600 \Omega$ (Out = mA) $\geq 2 k\Omega$ (Out = V)	$\leq 600 \Omega$ (Out = mA) $\geq 2 k\Omega$ (Out = V)
Step response	180 ms (360 ms at 3-wire)	180 ms (360 ms at 3-wire)
Supply voltage V_N	DC 24 V	DC 24 V
Supply voltage typ. / extended	19.2 V ... 30.2 V / 16.8 V ... 31.2 V	19.2 V ... 30.2 V / 16.8 V ... 31.2 V
Current consumption at 24 V DC	< 40 mA	< 40 mA
Sensor types	Pt 100, Pt 200, Pt 500, Pt 1000	Pt 100, Pt 200, Pt 500, Pt 1000 *
Sensor connection	2-wire, 3-wire, 4-wire (switchable)	2-wire, 3-wire, 4-wire (switchable)
Temperature range	-200 °C ... +850 °C	-200 °C ... +850 °C
Resistor input	0 ... 1 k Ω , 0 ... 4.5 k Ω	0 ... 1 k Ω , 0 ... 4.5 k Ω
Error of transmission	≤ 0.1 % at max. measuring span	≤ 0.1 % at max. measuring span
Transmission error of set measuring span	((10 K / set measuring span [K]) + 0.1) %	((10 K / set measuring span [K]) + 0.1) %
Temperature coefficient	0.02 % / K	0.02 % / K
Ambient operating temperature typ. / extended	-20 °C ... +65 °C / -25 °C ... +70 °C	-20 °C ... +65 °C / -25 °C ... +70 °C
Storage temperature	-40 °C ... +85 °C	-40 °C ... +85 °C
Dimensions (mm) W x H x L	6 x 96 x 94	6 x 96 x 94
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP®S	Height from upper-edge of DIN 35 rail CAGE CLAMP®S
Cross sections	solid: 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12 fine-stranded: 0.34 mm ² ... 2.5 mm ² / AWG 22 ... 12	solid: 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12 fine-stranded: 0.34 mm ² ... 2.5 mm ² / AWG 22 ... 12
Stripped lengths	9 ... 10 mm / 0.37 in	9 ... 10 mm / 0.37 in
Approvals	CE, , LISTED Class I Div 2 Groups A, B, C, D* *in preparation	CE, , LISTED Class I Div 2 Groups A, B, C, D* *in preparation
Accessories		Configuration software - FDT frame application 759-370 - DTM (device driver) 759-380 WAGO USB Service Cable 750-923

CAGE CLAMP® S

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Technical Data	Accessories see page 34	Accessories see page 34
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Accessories for Relay Modules with Pluggable Miniature Switching Relay, 6 mm / 0.236 in Wide, Series 857

Push-in type jumper bar
859-402



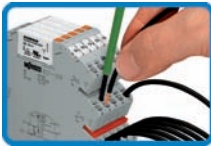
Description	Item no.	Pack. unit	
Push-in type jumper bars, light gray, insulated, 18 A,			
2-way	859-402	200	8 x 25
3-way	859-403	200	8 x 25
4-way	859-404	200	8 x 25
5-way	859-405	200	8 x 25
6-way	859-406	100	4 x 25
7-way	859-407	100	4 x 25
8-way	859-408	100	4 x 25
9-way	859-409	100	4 x 25
10-way	859-410	100	4 x 25
Additional item no. for colored push-in type jumper bars;			
yellow	... /000-029		
red	... /000-005		
blue	... /000-006		

WMB Multi marking system



Description	Item no.	Pack. unit
WMB Multi marking system, 10 strips with 10 markers, white with black printing;		
plain	793-501	5 cards
Marking software and printer/plotter see section 8		
Marking 1 ... 10 (10x)	793-502	5 cards
11 ... 20 (10x)	793-503	5 cards
21 ... 30 (10x)	793-504	5 cards
31 ... 40 (10x)	793-505	5 cards
41 ... 50 (10x)	793-506	5 cards
1 ... 50 (2x)	793-566	5 cards

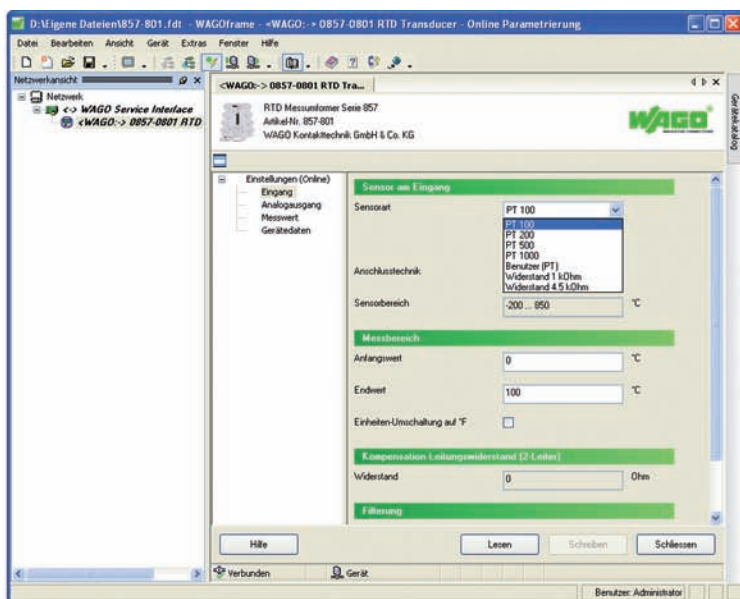
For additional marking systems see section 8.
End stop for DIN 35 rail see section 8.



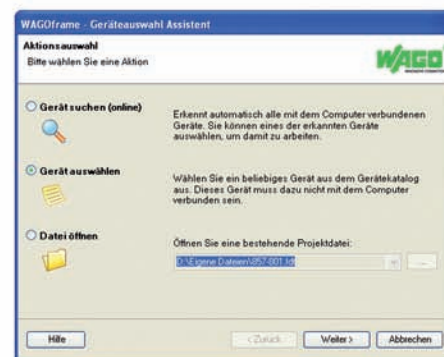
Description	Item no.	Pack. unit
Screwdriver with partially insulated shaft; type 2, blade 3.5 x 0.5 mm / 0.137 x 0.020 in	210-620	1

WAGOframe

FDT frame application for parameterization, commissioning and diagnostics of devices with DTM device driver



WAGOframe: Parameterizing a *JUMPLEX* transducer



WAGOframe: Wizard function

WAGOframe is an FDT/DTM-based software used for parameterization, commissioning and diagnostics of field devices. DTM device drivers for the devices employed are required to use the WAGOframe FDT frame application. The WAGOframe FDT frame application provides a wizard, which simplifies the operation of components, such as WAGO JUMPFLEX DTMs. For example, this wizard guides the user through the different operating modes of DTM device drivers. Depending on the PC communication interface used, an appropriate communication cable including DTM is required.

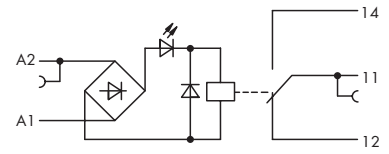
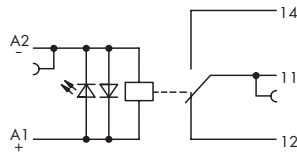
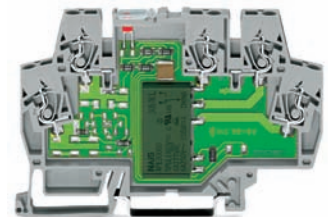
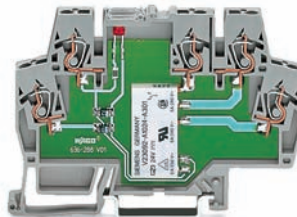
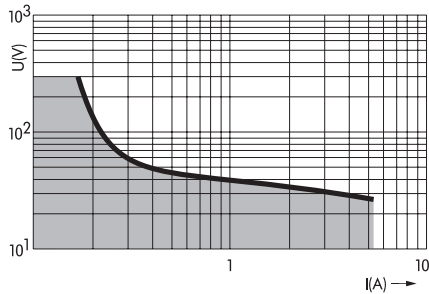
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1 Relay Modules, 6 mm / 0.236 in Wide

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Relay with 1 changeover contact for normal switching power
Nominal input voltage V_N
DC 5 V, 12 V, 24 V, 48 V, 60 V, 110 V, 230 V

Relay with 1 changeover contact for normal switching power
Nominal input voltage V_N
AC/DC 12 V, 24 V, 48 V, 60 V, 110 V, 230 V



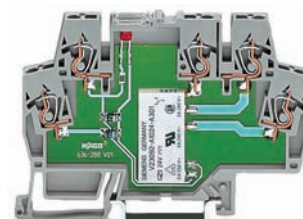
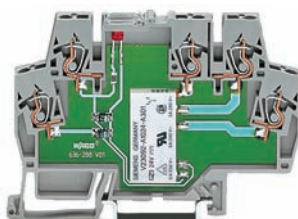
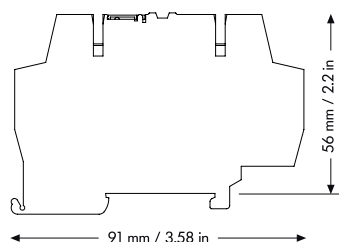
Note: Inductive loads have to be attenuated by an appropriate protective circuit in order to protect relay coils and contacts.

Description	V_N	I_N	Item no.	Pack. unit	V_N	I_N	Item no.	Pack. unit
Switching relay terminal block with miniature switching relay, for DIN 35 rail	DC 5 V	45 mA	859-302	1	UC 12 V	15 mA	859-353	1
	DC 12 V	17 mA	859-303	1	UC 24 V	8 mA	859-354	1
	DC 24 V	10 mA	859-304	1	UC 48 V	5.3 mA	859-355	1
	DC 48 V	6.5 mA	859-305	1	UC 115 V	3.5 mA	859-357	1
	DC 60 V	5.2 mA	859-306	1	UC 230 V	3.5 mA	859-358	1
	DC 120 V	3.5 mA	859-307	1				
	DC 230 V	3.2 mA	859-308	1				

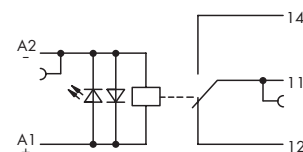
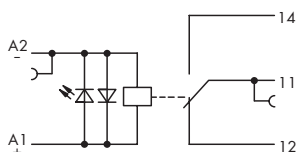
Technical Data		Accessories see page 52	Accessories see page 52
Contact material	AgSnO ₂	AgSnO ₂	AgSnO ₂
Input voltage range	V_N -15 % ... +10 %	V_N -15 % ... +10 %	V_N -15 % ... +10 %
Max. switching voltage	AC 250 V	AC 250 V	AC 250 V
Max. continuous current (terminal blocks in a row)	5 A	5 A	5 A
Max. switching power (resistive)	AC 1250 VA; DC see load limit curve	AC 1250 VA; DC see load limit curve	AC 1250 VA; DC see load limit curve
Recommended minimum load	≥ 100 mA / AC/DC 12 V	≥ 100 mA / AC/DC 12 V	≥ 100 mA / AC/DC 12 V
Max. switching rate with / without load	6 min ⁻¹ / 20 s ⁻¹	6 min ⁻¹ / 20 s ⁻¹	6 min ⁻¹ / 20 s ⁻¹
Operating power	< 320 mW	< 320 mW	< 300 mW
Pull-in/drop-out/bounce time typ.	5 ms / 6 ms / 5 ms	5 ms / 6 ms / 5 ms	5 ms / 6 ms / 5 ms
Nominal operating mode	continuous duty	continuous duty	continuous duty
Dielectric strength contact-coil	4 kV	4 kV	4 kV
Surge capacity contact-coil (1.2/50 μ s)	6 kV	6 kV	6 kV
Surge capacity open contact	1 kV	1 kV	1 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3	250 V / 4 kV / 3
Mechanical life	5 x 10 ⁶ switching operations	5 x 10 ⁶ switching operations	5 x 10 ⁶ switching operations
Mechanical life at max. load (resistance)	3 x 10 ⁵ switching operations	3 x 10 ⁴ switching operations	3 x 10 ⁴ switching operations
Ambient operating temperature (V_N)	-25 °C ... +50 °C	-25 °C ... +50 °C	-25 °C ... +50 °C
Ambient operating temperature (1.2 x V_N)	-25 °C ... +40 °C	-25 °C ... +40 °C	-25 °C ... +40 °C
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C	-40 °C ... +70 °C
Dimensions (mm) W x H x L	6 x 56 x 91	6 x 56 x 91	6 x 56 x 91
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP®	Height from upper-edge of DIN 35 rail CAGE CLAMP®	Height from upper-edge of DIN 35 rail CAGE CLAMP®
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	VDE 0110 / EN 60664; VDE 0435 / EN 61810-5; UL 508; EEx nC II T4 / DEMKO 02 ATEX 132280U; ☉	VDE 0110 / EN 60664; VDE 0435 / EN 61810-5; UL 508; EEx nC II T4 / DEMKO 02 ATEX 132280U; ☉	VDE 0110 / EN 60664; VDE 0435 / EN 61810-5; UL 508; EEx nC II T4 / DEMKO 02 ATEX 132280U; ☉

Relay with 1 changeover contact
Contacts 5 µm Au hard gold plated
for normal switching power
Nominal input voltage V_N DC 24 V

Relay with 1 changeover contact
Contacts 5 µm Au hard gold plated
for normal switching power
Nominal input voltage V_N DC 110 V



* In order to prevent the gold layer from being damaged these values should not be exceeded. Higher switching power leads to evaporation of the gold layer. The resulting deposits in the enclosure may cause sparkovers between the coil and the contact.



Description	V_N	I_N	Item no.	Pack. unit	V_N	I_N	Item no.	Pack. unit
Switching relay terminal block with miniature switching relay, for DIN 35 rail	DC 24 V	10 mA	859-314	1	DC 110 V	3.1 mA	859-317	1

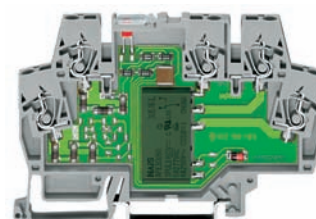
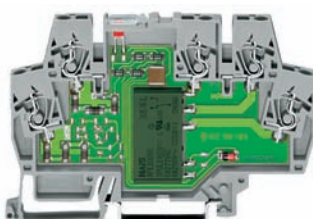
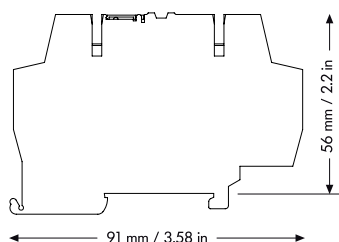
Technical Data		Accessories see page 52	Accessories see page 52
Contact material	AgSnO ₂ + 5 µm Au	AgSnO ₂ + 5 µm Au	AgSnO ₂ + 5 µm Au
Input voltage range	V_N -15 % ... +20 %	V_N -15 % ... +20 %	V_N -30 % ... +25 %
Max. switching voltage	DC 36 V *	DC 36 V *	DC 36 V *
Max. continuous current (terminal blocks in a row)	50 mA *	50 mA *	50 mA *
Recommended minimum load	10 µA / 100 mV	10 µA / 100 mV	10 µA / 100 mV
Max. switching rate with / without load	6 min ⁻¹ / 20 s ⁻¹	6 min ⁻¹ / 20 s ⁻¹	6 min ⁻¹ / 20 s ⁻¹
Operating power	< 320 mW	< 320 mW	< 320 mW
Pull-in/drop-out/bounce time typ.	5 ms / 6 ms / 5 ms	5 ms / 6 ms / 5 ms	5 ms / 6 ms / 5 ms
Nominal operating mode	continuous duty	continuous duty	continuous duty
Dielectric strength contact-coil	4 kV	4 kV	4 kV
Surge capacity contact-coil (1.2/50 µs)	6 kV	6 kV	6 kV
Surge capacity open contact	1 kV	1 kV	1 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3	250 V / 4 kV / 3
Mechanical life	5 x 10 ⁶ switching operations	5 x 10 ⁶ switching operations	5 x 10 ⁶ switching operations
Mechanical life at max. load (resistance)	5 x 10 ⁶ switching operations	5 x 10 ⁶ switching operations	5 x 10 ⁶ switching operations
Ambient operating temperature (V_N)	-25 °C ... +50 °C	-25 °C ... +50 °C	-25 °C ... +70 °C
Ambient operating temperature (1.2 x V_N)	-25 °C ... +40 °C	-25 °C ... +40 °C	-25 °C ... +70 °C
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C	-40 °C ... +70 °C
Dimensions (mm) W x H x L	6 x 56 x 91	6 x 56 x 91	6 x 56 x 91
Wire connection	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Cross sections	CAGE CLAMP®	CAGE CLAMP®	CAGE CLAMP®
Stripped lengths	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14
Approvals	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
	VDE 0110 / EN 60664; VDE 0435 / EN 61810-5;	VDE 0110 / EN 60664; VDE 0435 / EN 61810-5;	VDE 0110 / EN 60664; VDE 0435 / EN 61810-5;
	UL 508; EEx nC II T4 / DEMKO 02 ATEX 132280U; ☉	UL 508; EEx nC II T4 / DEMKO 02 ATEX 132280U; ☉	UL 508; EEx nC II T4 / DEMKO 02 ATEX 132280U; ☉

1 Relay Modules, 6 mm / 0.236 in Wide

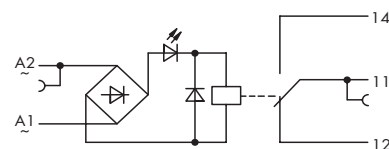
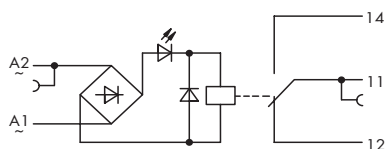
38

Relay with 1 changeover contact
Contacts 5 µm Au hard gold plated
for normal switching power
Nominal input voltage V_N AC 230 V

Relay with 1 changeover contact
Contacts 5 µm Au hard gold plated
for normal switching power
Nominal input voltage V_N AC 115 V



* In order to prevent the gold layer from being damaged these values should not be exceeded. Higher switching power leads to evaporation of the gold layer. The resulting deposits in the enclosure may cause sparkovers between the coil and the contact.

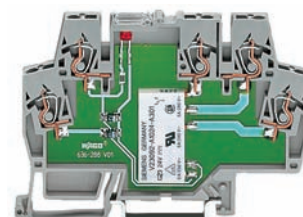
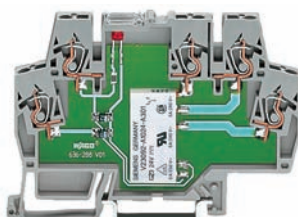
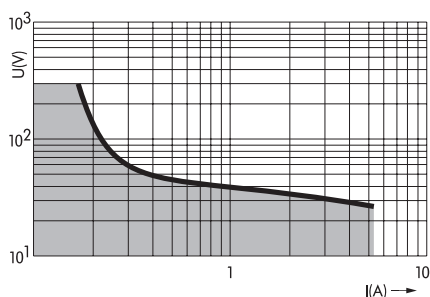


Description	V_N	I_N	Item no.	Pack. unit	V_N	I_N	Item no.	Pack. unit
Switching relay terminal block with miniature switching relay, for DIN 35 rail	AC 230 V	3.5 mA	859-359	1	AC 115 V	3.1 mA	859-360	1

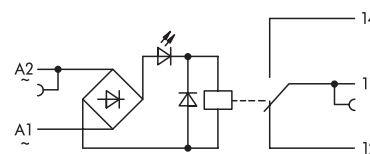
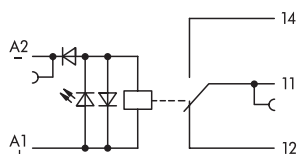
Technical Data		Accessories see page 52		Accessories see page 52	
Contact material	AgSnO ₂ + 5 µm Au	AgSnO ₂ + 5 µm Au		AgSnO ₂ + 5 µm Au	
Input voltage range	V_N -15 % ... +10 %	V_N -15 % ... +10 %		V_N -15 % ... +20 %	
Max. switching voltage	DC 36 V *	DC 36 V *		DC 36 V *	
Max. continuous current (terminal blocks in a row)	50 mA *	50 mA *		50 mA *	
Recommended minimum load	10 µA / 100 mV	10 µA / 100 mV		10 µA / 100 mV	
Max. switching rate with / without load	6 min ⁻¹ / 20 s ⁻¹	6 min ⁻¹ / 20 s ⁻¹		6 min ⁻¹ / 20 s ⁻¹	
Operating power	< 820 mW	< 820 mW		< 370 mW	
Pull-in/drop-out/bounce time typ.	5 ms / 6 ms / 5 ms	5 ms / 6 ms / 5 ms		5 ms / 6 ms / 5 ms	
Nominal operating mode	continuous duty	continuous duty		continuous duty	
Dielectric strength contact-coil	4 kV	4 kV		4 kV	
Surge capacity contact-coil (1.2/50 µs)	6 kV	6 kV		6 kV	
Surge capacity open contact	1 kV	1 kV		1 kV	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3		250 V / 4 kV / 3	
Mechanical life	5 x 10 ⁶ switching operations	5 x 10 ⁶ switching operations		5 x 10 ⁶ switching operations	
Mechanical life at max. load (resistance)	5 x 10 ⁶ switching operations	5 x 10 ⁶ switching operations		5 x 10 ⁶ switching operations	
Ambient operating temperature (V_N)	-25 °C ... +50 °C	-25 °C ... +50 °C		-25 °C ... +50 °C	
Ambient operating temperature (1.2 x V_N)	-25 °C ... +40 °C	-25 °C ... +40 °C		-25 °C ... +40 °C	
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C		-40 °C ... +70 °C	
Dimensions (mm) W x H x L	6 x 56 x 91	6 x 56 x 91		6 x 56 x 91	
	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail		Height from upper-edge of DIN 35 rail	
Wire connection	CAGE CLAMP®	CAGE CLAMP®		CAGE CLAMP®	
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14		0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14	
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in		5 ... 6 mm / 0.22 in	
Approvals	VDE 0110 / EN 60664; VDE 0435 / EN 61810-5; UL 508; EEx nC II T4 / DEMKO 02 ATEX 132280U; ®	VDE 0110 / EN 60664; VDE 0435 / EN 61810-5; UL 508; EEx nC II T4 / DEMKO 02 ATEX 132280U; ®		VDE 0110 / EN 60664; VDE 0435 / EN 61810-5; UL 508; EEx nC II T4 / DEMKO 02 ATEX 132280U; ®	

Relay with 1 changeover contact (1 u)
Contacts 5 µm Au hard gold plated
for low switching power
Nominal input voltage V_N DC 230 V

Relay with 1 changeover contact (1 u)
for normal switching power
Nominal input voltage V_N AC 115 V



* In order to prevent the gold layer from being damaged these values should not be exceeded. Higher switching power leads to evaporation of the gold layer. The resulting deposits in the enclosure may cause sparkover between the coil and the contact.



Description	V_N	I_N	Item no.	Pack. unit	V_N	I_N	Item no.	Pack. unit
Switching relay terminal block with miniature switching relay, for DIN 35 rail	DC 220 V	3.2 mA	859-318	1	AC 115 V	4.2 mA	859-367	1

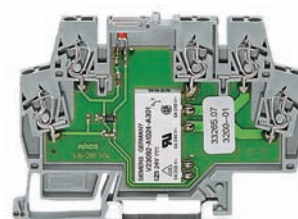
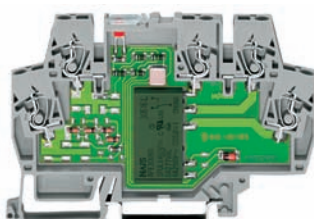
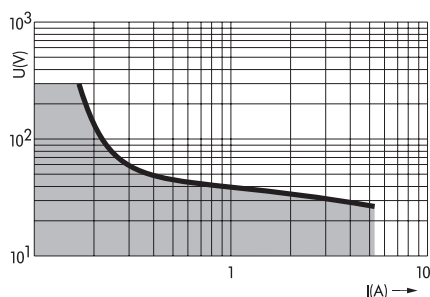
Technical Data		Accessories see page 52	Accessories see page 52
Contact material	AgSnO ₂ + 5 µm Au	AgSnO ₂	
Input voltage range	$V_N - 15 \% \dots + 20 \%$	$V_N \pm 10 \%$	
Turn-on threshold relay/LED		AC 95 V / AC 80 V	
Turn-off threshold relay/LED		AC 60 V / AC 60 V	
Max. switching voltage	DC 36 V *	AC 250 V	
Max. continuous current (terminal blocks in a row)	50 mA *	5 A	
Max. switching power (resistive)		AC 1250 VA; DC see load limit curve	
Recommended minimum load	50 mW	$\geq 100 \text{ mA} / \text{AC/DC } 12 \text{ V}$	
Max. switching rate with / without load	$6 \text{ min}^{-1} / 20 \text{ s}^{-1}$	$6 \text{ min}^{-1} / 20 \text{ s}^{-1}$	
Operating power	$< 750 \text{ mW}$	$< 820 \text{ mW}$	
Pull-in/drop-out/bounce time typ.	5 ms / 6 ms / 5 ms	5 ms / 6 ms / 5 ms	
Nominal operating mode	continuous duty	continuous duty	
Dielectric strength contact-coil	4 kV	4 kV	
Surge capacity contact-coil (1.2/50 µs)	6 kV	6 kV	
Surge capacity open contact	1 kV	1 kV	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3	
Mechanical life	5×10^6 switching operations	5×10^6 switching operations	
Mechanical life at max. load (resistance)	5×10^6 switching operations	3×10^4 switching operation	
Ambient operating temperature (V_N)	-25 °C ... +50 °C	-25 °C ... +50 °C	
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C	
Dimensions (mm) W x H x L	6 x 56 x 91	6 x 56 x 91	
Wire connection	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail	
	CAGE CLAMP®	CAGE CLAMP®	
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14	
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in	
Approvals	VDE 0435 (corresp. parts); DIN EN 61810; VDE 0140, DIN EN 61140 E175199, UL 508; ®	VDE 0160, DIN EN 50178; VDE 0435 (corresp. parts); DIN EN 61810; VDE 0140, DIN EN 61140; ®	

1 Relay Modules, 6 mm / 0.236 in Wide

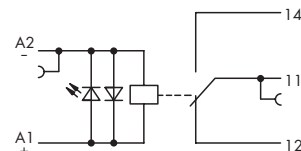
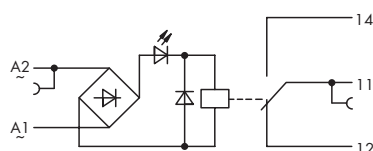
40

Relay with 1 changeover contact
defined turn-on/turn-off threshold for
normal switching power
Nominal input voltage V_N AC 230 V

Relay with 1 change over contact with an
extended input voltage and operating
temperature range
 $V_B = DC\ 24\ V\ -30\ \% +25\ \% -25\ ^\circ C$ to $+70\ ^\circ C$
for normal switching power
Nominal input voltage V_N DC 24 V



Note: Inductive loads have to be attenuated by an appropriate protective circuit in order to protect relay coils and contacts.

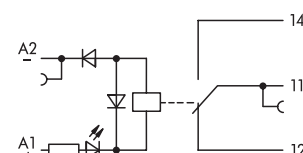
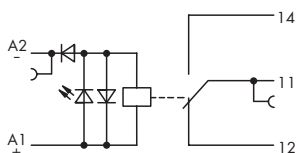
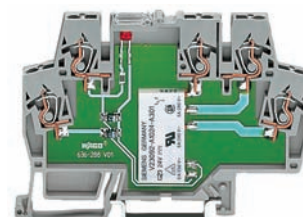
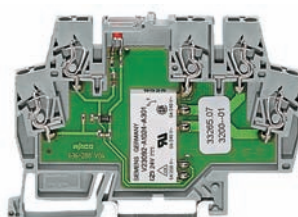
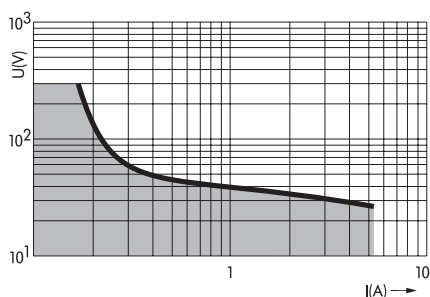


Description	V_N	I_N	Item no.	Pack. unit	V_N	I_N	Item no.	Pack. unit
Switching relay terminal block with miniature switching relay, for DIN 35 rail	AC 230 V	4.2 mA	859-368	1	DC 24 V	12 mA	859-390	1

Technical Data		Accessories see page 52		Accessories see page 52	
Contact material	AgSnO ₂	AgSnO ₂		AgSnO ₂	
Input voltage range	$V_N \pm 10\ \%$	$V_N \pm 10\ \%$		$V_N -30\ \% \dots +25\ \%$	
Turn-on threshold relay/LED	AC 190 V / AC 165 V	AC 190 V / AC 165 V		AC 190 V / AC 165 V	
Turn-off threshold relay/LED	AC 140 V / AC 150 V	AC 140 V / AC 150 V		AC 140 V / AC 150 V	
Max. switching voltage	AC 250 V	AC 250 V		AC 250 V	
Max. continuous current (terminal blocks in a row)	5 A	5 A		3 A	
Max. switching power (resistive)	AC 1250 VA; DC see load limit curve	AC 1250 VA; DC see load limit curve		AC 750 VA; DC see load limit curve	
Recommended minimum load	$\geq 100\ mA / AC/DC\ 12\ V$	$\geq 100\ mA / AC/DC\ 12\ V$		$\geq 100\ mA / AC/DC\ 15\ V$	
Max. switching rate with / without load	$6\ min^{-1} / 20\ s^{-1}$	$6\ min^{-1} / 20\ s^{-1}$		$6\ min^{-1} / 20\ s^{-1}$	
Operating power	$< 820\ mW$	$< 820\ mW$		$< 320\ mW$	
Pull-in/drop-out/bounce time typ.	5 ms / 6 ms / 5 ms	5 ms / 6 ms / 5 ms		5 ms / 6 ms / 5 ms	
Nominal operating mode	continuous duty	continuous duty		continuous duty	
Dielectric strength contact-coil	4 kV	4 kV		4 kV	
Surge capacity contact-coil (1.2/50 μs)	6 kV	6 kV		6 kV	
Surge capacity open contact	1 kV	1 kV		1 kV	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3		250 V / 4 kV / 3	
Mechanical life	5×10^6 switching operations	5×10^6 switching operations		5×10^6 switching operations	
Mechanical life at max. load (resistance)	3×10^4 switching operation	3×10^4 switching operation		3×10^5 switching operation	
Ambient operating temperature (V_N)	$-25\ ^\circ C \dots +50\ ^\circ C$	$-25\ ^\circ C \dots +50\ ^\circ C$		$-25\ ^\circ C \dots +70\ ^\circ C$	
Storage temperature	$-40\ ^\circ C \dots +70\ ^\circ C$	$-40\ ^\circ C \dots +70\ ^\circ C$		$-40\ ^\circ C \dots +70\ ^\circ C$	
Dimensions (mm) W x H x L	6 x 56 x 91	6 x 56 x 91		6 x 56 x 91	
	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail		Height from upper-edge of DIN 35 rail	
Wire connection	CAGE CLAMP®	CAGE CLAMP®		CAGE CLAMP®	
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14		0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14	
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in		5 ... 6 mm / 0.22 in	
Approvals	VDE 0110 / EN 60664; VDE 0435 / EN 61810-5; UL 508; EEx nC II T4 / DEMKO 02 ATEX 132280U; ®	VDE 0110 / EN 60664; VDE 0435 / EN 61810-5; UL 508; EEx nC II T4 / DEMKO 02 ATEX 132280U; ®		VDE 0110 / EN 60664; VDE 0435 / EN 61810-5; UL 508; EEx nC II T4 / DEMKO 02 ATEX 132280U; ®	

Relay with 1 change over contact with an extended input voltage and operating temperature range
 $V_B = \text{DC } 100 \text{ V } -30 \% +25 \% -25^\circ \text{C to } +70^\circ \text{C}$
 for normal switching power
 Nominal input voltage V_N DC 110 V

Relay with 1 changeover contact (1 u) with an extended input voltage and operating temperature range
 $V_B = \text{DC } 24 \text{ V } \pm 40 \% -25^\circ \text{C to } +70^\circ \text{C}$ for normal switching power
 Nominal input voltage V_N DC 24 V



NOTE: Inductive loads have to be attenuated by an appropriate protective circuit in order to protect relay coils and contacts.

Description	V_N	I_N	Item no.	Pack. unit	V_N	I_N	Item no.	Pack. unit
Switching relay terminal block with miniature switching relay, for DIN 35 rail	DC 110 V	2.7 mA	859-391	1	DC 24 V	14.4 mA	859-398	1

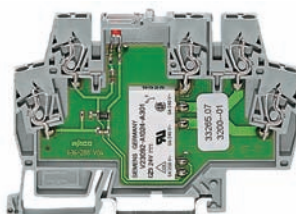
Technical Data

Accessories see page 52

Accessories see page 52

Contact material	AgSnO ₂	AgSnO ₂
Input voltage range	$V_N \pm 30 \%$	$V_N \pm 40 \%$
Max. switching voltage	AC 250 V	AC 250 V
Max. continuous current (terminal blocks in a row)	3 A	3 A
Max. switching power (resistive)	AC 750 VA; DC see load limit curve	AC 750 VA; DC see load limit curve
Recommended minimum load	$\geq 100 \text{ mA} / \text{AC/DC } 15 \text{ V}$	$\geq 100 \text{ mA} / \text{AC/DC } 12 \text{ V}$
Max. switching rate with / without load	$6 \text{ min}^{-1} / 20 \text{ s}^{-1}$	$6 \text{ min}^{-1} / 20 \text{ s}^{-1}$
Operating power	$< 370 \text{ mW}$	$< 400 \text{ mW}$
Pull-in/drop-out/bounce time typ.	5 ms / 6 ms / 5 ms	5 ms / 6 ms / 5 ms
Nominal operating mode	continuous duty	continuous duty
Dielectric strength contact-coil	4 kV	4 kV
Surge capacity contact-coil (1.2/50 μs)	6 kV	6 kV
Surge capacity open contact	1 kV	1 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Mechanical life	5×10^6 switching operations	1×10^7 switching operations
Mechanical life at max. load (resistance)	3×10^4 switching operation	3×10^4 switching operation
Ambient operating temperature (V_N)	$-25^\circ \text{C} \dots +70^\circ \text{C}$	$-25^\circ \text{C} \dots +70^\circ \text{C}$
Storage temperature	$-40^\circ \text{C} \dots +70^\circ \text{C}$	$-40^\circ \text{C} \dots +70^\circ \text{C}$
Dimensions (mm) W x H x L	6 x 56 x 91	6 x 56 x 91
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP®	Height from upper-edge of DIN 35 rail CAGE CLAMP®
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	VDE 0110 / EN 60664; VDE 0435 / EN 61810-5; UL 508; EEx nC II T4 / DEMKO 02 ATEX 132280U; ©	VDE 0160 and IEC 60255; VDE 0435 (corresp. parts); VDE 0140, DIN EN 61140; DIN VDE 0115 Part 200; DIN EN 50155; ©

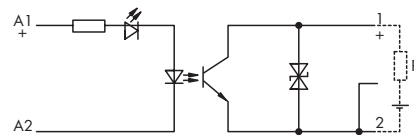
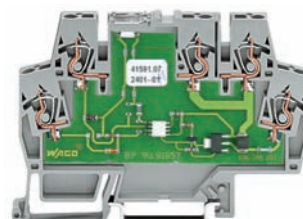
Relay with 1 change over contact with an extended input voltage and operating temperature range
VB = DC 24 V -30 % +25 % -25 °C to +70 °C
Contacts 5 µm Au hard gold plated for normal switching power



Description	V _N	I _N	Item no.	Pack. unit
Switching relay terminal block with miniature switching relay, for DIN 35 rail	DC 24 V	10 mA	859-392	1
Technical Data				
Accessories see page 52				
Contact material	AgSnO ₂ + 5 µm Au			
Input voltage range	V _N -30 % ... +25 %			
Max. switching voltage	DC 36 V *			
Max. continuous current (terminal blocks in a row)	50 mA *			
Recommended minimum load	10 µA / 100 mV			
Max. switching rate with / without load	6 min ⁻¹ / 20 s ⁻¹			
Operating power	< 320 mW			
Pull-in/drop-out/bounce time typ.	5 ms / 6 ms / 5 ms			
Nominal operating mode	continuous duty			
Dielectric strength contact-coil	4 kV			
Surge capacity contact-coil (1.2/50 µs)	6 kV			
Surge capacity open contact	1 kV			
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3			
Mechanical life	5 x 10 ⁶ switching operations			
Mechanical life at max. load (resistance)	2 x 10 ⁷ switching operations			
Ambient operating temperature (V _N)	-25 °C ... +70 °C			
Storage temperature	-40 °C ... +70 °C			
Dimensions (mm) W x H x L	6 x 56 x 91			
	Height from upper-edge of DIN 35 rail			
Wire connection	CAGE CLAMP®			
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14			
Stripped lengths	5 ... 6 mm / 0.22 in			
Approvals	VDE 0110 / EN 60664; VDE 0435 / EN 61810-5; VDE 0115 Part 200 / EN 50155; UL 508; EEx nC II T4 / DEMKO 02 ATEX 132280U; ®			

CAGE CLAMP®

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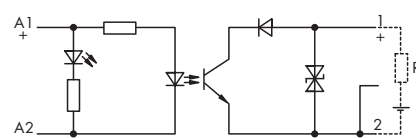
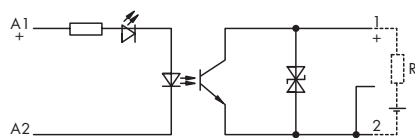
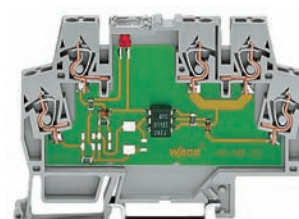
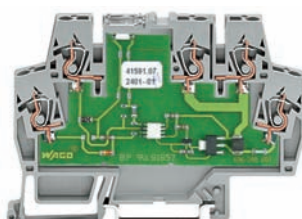
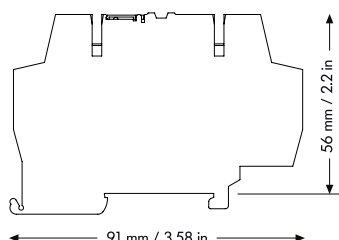


Technical Data	Accessories see page 52	Accessories see page 52
Nominal input voltage (V_N)	DC 5 V	DC 24 V
Input voltage range low level	DC 0 V ... 0.8 V	DC 0 V ... 5 V
Input voltage range high level	DC 2 V ... 6.25 V	DC 16 V ... 30 V
Input current range	DC 1.3 mA ... 10 mA	DC 2 mA ... 5.5 mA
Current at nominal voltage	DC 7.5 mA	DC 4 mA
Output nominal voltage	DC 24 V	DC 24 V
Output voltage range	DC 3 V ... 60 V	DC 7 V ... 60 V
Max. continuous current (20 °C)	100 mA	100 mA
Max. continuous current (70 °C)	50 mA	50 mA
Reverse voltage transistor	100 V	100 V
Switch on / switch off time	20 μ s / 120 μ s	20 μ s / 120 μ s
Max. operating frequency	1.5 kHz	3 kHz
Leakage current at nominal voltage	25 μ A	30 μ A
Voltage drop at output	$\leq$ 2.5 V	$\leq$ 1.5 V
Test voltage input / output	2.5 kV eff.	4 kV eff.
Nominal operating mode	continuous duty	continuous duty
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C
Max. operating temperature with reduced current	+70 °C	+70 °C
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C
Dimensions (mm) W x H x L	6 x 56 x 91	6 x 56 x 91
	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP®	CAGE CLAMP®
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	VDE 0110 / EN 60664; VDE 0435 / EN 61810-5; VDE 0115 Part 200 / EN 50155; UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U	VDE 0110 / EN 60664; VDE 0435 / EN 61810-5; VDE 0115 Part 200 / EN 50155; UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U

1 Optocoupler Modules, 6 mm / 0.236 in Wide

44

	Optocoupler Input: DC 24 V Output: DC 24 V/100 mA	Optocoupler Input: DC 5 V Output: DC 24 V/100 mA
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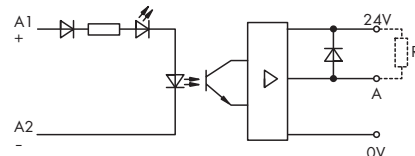
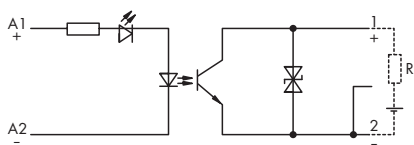
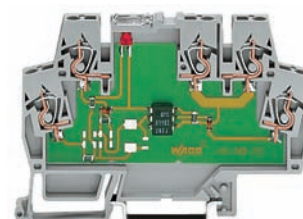
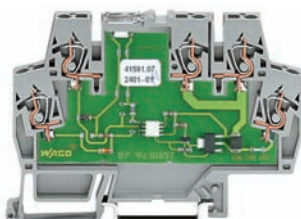
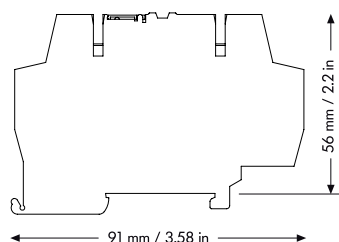


Description	U_N	Item no.	Pack. unit	U_N	Item no.	Pack. unit
Optocoupler terminal block, for DIN 35 rail	DC 24 V	859-796	1	DC 5 V	859-795	1

Technical Data		Accessories see page 52	Accessories see page 52
Nominal input voltage (V_N)	DC 24 V	DC 5 V	
Input voltage range low level	DC 0 V ... 5 V	DC 0 V ... 0.8 V	
Input voltage range high level	DC 18 V ... 30 V	DC 2 V ... 6.25 V	
Input current range	DC 3.8 mA ... 12.5 mA	DC 3.8 mA ... 23 mA	
Current at nominal voltage	DC 9.2 mA	DC 17.5 mA	
Output nominal voltage	DC 24 V	DC 24 V	
Output voltage range	DC 3 V ... 30 V	DC 3 V ... 30 V	
Max. continuous current (20 °C)	100 mA	100 mA	
Max. continuous current (70 °C)	50 mA	50 mA	
Reverse voltage transistor	65 V	65 V	
Switch on /switch off time	10 µs / 50 µs	10 µs / 50 µs	
Max. operating frequency	10 kHz	10 kHz	
Leakage current at nominal voltage	25 µA	25 µA	
Voltage drop at output	≤ 1 V	≤ 1 V	
Test voltage input / output	2.5 kV eff.	2.5 kV eff.	
Nominal operating mode	continuous duty	continuous duty	
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C	
Max. operating temperature with reduced current	+70 °C	+70 °C	
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C	
Dimensions (mm) W x H x L	6 x 56 x 91	6 x 56 x 91	
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP®	Height from upper-edge of DIN 35 rail CAGE CLAMP®	
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 14	0.08 mm² ... 2.5 mm² / AWG 28 ... 14	
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in	
Approvals	VDE 0110 / EN 60664; VDE 0435 / EN 61810-5; UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U	VDE 0110 / EN 60664; VDE 0435 / EN 61810-5; UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U	

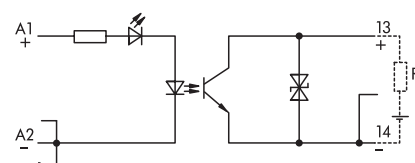
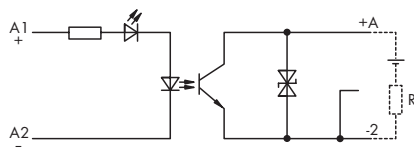
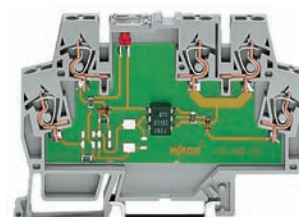
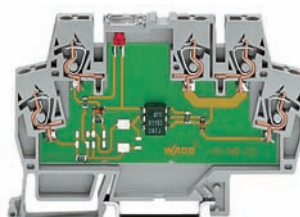
Optocoupler
Input: DC 24 V
Output: DC 24 V/100 mA

Optocoupler
Input: DC 24 V
Output: DC 24 V / 3 A
Negative switching Electrical isolation meets
DIN/VDE 0106, part 101



Description	U_N	Item no.	Pack. unit	U_N	Item no.	Pack. unit
Optocoupler terminal block, for DIN 35 rail	DC 24 V	859-794	1	DC 24 V	859-720	1

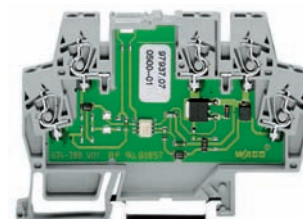
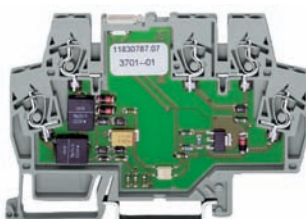
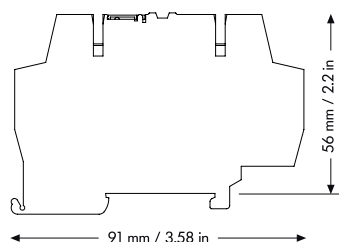
Technical Data		Accessories see page 52	Accessories see page 52
Nominal input voltage (V_N)	DC 24 V	DC 24 V	DC 24 V
Input voltage range		DC 0 V ... 5 V	DC 16 V ... 30 V
Input voltage range low level		DC 16 V ... 30 V	
Input voltage range high level		DC 2 mA ... 5.5 mA	DC 2.5 mA ... 5.5 mA
Input current range		DC 4.2 mA	DC 4 mA
Current at nominal voltage		DC 60 V	DC 24 V
Output nominal voltage		DC 9 V ... 60 V	DC 10 V ... 30 V
Output voltage range		100 mA/50 mA	3 A
Max. continuous current		100 V	20 A
Peak output current		20 μ s / 120 μ s	55 V
Reverse voltage transistor		1.5 kHz	25 μ s / 75 μ s
Switch on /switch off time			f < 500 Hz
Max. operating frequency			f < 1 kHz / f < 2 kHz / f < 3 kHz
Switching frequency		25 μ A	< 25 μ A
IL < 2 A / IL < 1 A / IL < 500 mA		≤ 2 V	≤ 0.5 V
Leakage current at nominal voltage		2.5 kV eff.	2.5 kV eff.
Collector / emitter voltage drop Uce sat		continuous duty	continuous duty
Voltage drop at output		-25 °C ... +40 °C	-25 °C ... +40 °C
Test voltage input / output		-40 °C ... +70 °C	-40 °C ... +70 °C
Nominal operating mode		6 x 56 x 91	6 x 56 x 91
Ambient operating temperature		Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Storage temperature		CAGE CLAMP®	CAGE CLAMP®
Dimensions (mm) W x H x L		0.08 mm² ... 2.5 mm² / AWG 28 ... 14	0.08 mm² ... 2.5 mm² / AWG 28 ... 14
Wire connection		5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Cross sections		VDE 0110 / EN 60664; VDE 0435 / EN 61810-5;	VDE 0110 / EN 60664; VDE 0435 / EN 61810-5;
Stripped lengths		UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U	UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U
Approvals			



Technical Data	Accessories see page 52	Accessories see page 52
Nominal input voltage (V_N)	DC 24 V	DC 24 V
Input voltage range low level	DC 0 V ... 5 V	DC 0 V ... 9 V
Input voltage range high level	DC 15 V ... 27 V	DC 19 V ... 27 V
Current at nominal voltage	DC 14 mA	DC 7 mA
Input circuit	Status LED (red)	status indication LED (yellow), reverse voltage protection
Output circuit	2-wire, isolated	2-wire, isolated, overvoltage protection
Output nominal voltage	DC 24 V	DC 24 V
Output voltage range	DC 3 V ... 30 V	DC 3 V ... 30 V
Max. continuous current	3 A	3 A
Peak output current	25 A	25 A
Reverse voltage transistor	55 V	
Voltage at drop	< 0.4 V	< 0.2 V
Switch on /switch off time	25 μ s / 450 μ s	25 μ s / 450 μ s
Switching frequency	f < 350 Hz	f < 350 Hz
Test voltage input / output	2.5 kV eff.	2.5 kV eff.
Nominal operating mode	continuous duty	continuous duty
Ambient operating temperature	-25 °C ... +55 °C	-25 °C ... +55 °C
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C
Dimensions (mm) W x H x L	6 x 56 x 91	6 x 56 x 91
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP®	Height from upper-edge of DIN 35 rail CAGE CLAMP®
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 14	0.08 mm² ... 2.5 mm² / AWG 28 ... 14
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	VDE 0110 / EN 60664; VDE 0435 / EN 61810-5; UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U	IEC 60664 / IEC 60664A / DIN VDE 0110; degree of pollution 2, overvoltage category III

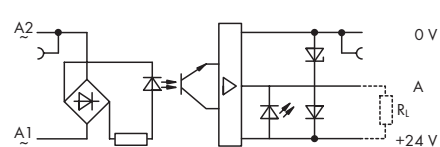
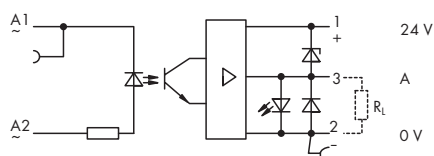
Optocoupler
Input: AC 230 V
Output: DC 24 V/0.5 A
Positive switching increased input frequency
up to 100 Hz Input voltage up to AC 270 V

Optocoupler
Input: DC 230 V
Output: DC 24 V /0.5 A
Negative switching



859-772

- Increased input frequency up to 100 Hz
- Input voltage up to AC 270 V



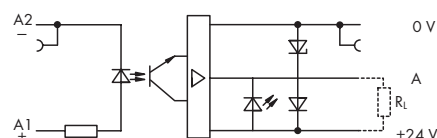
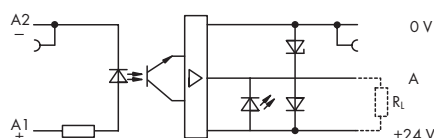
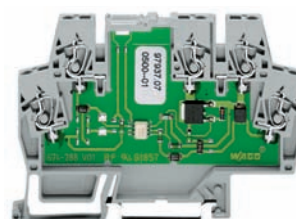
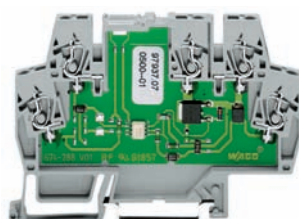
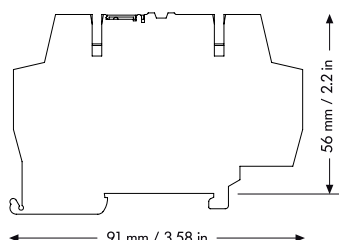
Description	U_N	Item no.	Pack. unit	U_N	Item no.	Pack. unit
Optocoupler terminal block, for DIN 35 rail	AC 230 V	859-772	1	AC 230 V	859-712	1

Technical Data		Accessories see page 52	Accessories see page 52
Nominal input voltage (V_N)	AC 230 V (50 Hz ... 60 Hz)	AC 230 V	AC 230 V
Input voltage range low level	AC 0 V ... 90 V	AC 0 V ... 90 V	AC 0 V ... 90 V
Input voltage range high level	AC 175 V ... 270 V	AC 175 V ... 250 V	AC 175 V ... 250 V
Input current range	0.04 mA ... 0.7 mA	0.4 mA ... 0.7 mA	0.4 mA ... 0.7 mA
Current at nominal voltage	0.6 mA	0.6 mA	0.6 mA
Input circuit	Overvoltage protection	Overvoltage protection	Overvoltage protection
Output circuit	Protection diode, operation indicator	Protection diode, operation indicator LED (red)	Protection diode, operation indicator LED (red)
Output nominal voltage	DC 24 V	DC 24 V	DC 24 V
Output voltage range	DC 20 V ... 30 V	DC 20 V ... 30 V	DC 20 V ... 30 V
Max. continuous current	500 mA	500 mA	500 mA
Reverse voltage transistor	80 V	80 V	80 V
Switch on /switch off time	< 30 ms / < 30 ms	< 30 ms / < 30 ms	< 30 ms / < 30 ms
Leakage current at nominal voltage	10 μ A	10 μ A	10 μ A
Collector / emitter voltage drop $U_{ce sat}$	< 1.2 V	< 1.2 V	< 1.2 V
Max. output (reverse current)	12 mA	11 mA	11 mA
Test voltage input / output	2.5 kV eff.	2.5 kV eff.	2.5 kV eff.
Nominal operating mode	continuous duty	continuous duty	continuous duty
Ambient operating temperature	-25 °C ... +55 °C	-25 °C ... +55 °C	-25 °C ... +55 °C
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C	-40 °C ... +70 °C
Dimensions (mm) W x H x L	6 x 56 x 91	6 x 56 x 91	6 x 56 x 91
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP®	Height from upper-edge of DIN 35 rail CAGE CLAMP®	Height from upper-edge of DIN 35 rail CAGE CLAMP®
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	VDE 0110 / EN 60664; UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U	VDE 0110 / EN 60664; UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U	VDE 0110 / EN 60664; UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U

1 Optocoupler Modules, 6 mm / 0.236 in Wide

48

	Optocoupler Input: DC 5 V Output: DC 24 V / 0.5A/25 kHz Negative switching	Optocoupler Input: DC 24 V Output: DC 24 V / 0.5A/25 kHz Negative switching
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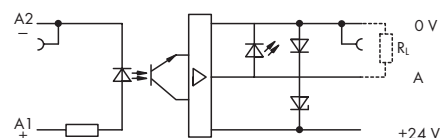
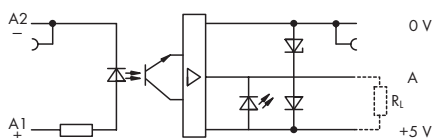
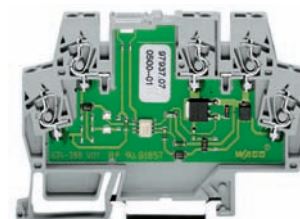
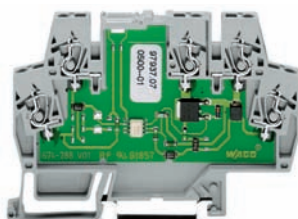
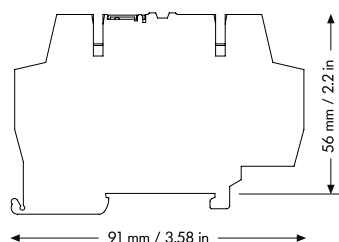


Description	U _N	Item no.	Pack. unit	U _N	Item no.	Pack. unit
Optocoupler terminal block, for DIN 35 rail	DC 5 V	859-702	1	DC 24 V	859-708	1

Technical Data		Accessories see page 52	Accessories see page 52
Nominal input voltage (V _N)	DC 5 V	DC 24 V	DC 24 V
Input voltage range low level	DC 0 V ... 1 V	DC 0 V ... 5 V	DC 0 V ... 5 V
Input voltage range high level	DC 4 V ... 6.25 V	DC 19 V ... 30 V	DC 19 V ... 30 V
Input current range	7 mA ... 13 mA	5.7 mA ... 10.2 mA	5.7 mA ... 10.2 mA
Current at nominal voltage	DC 9.6 mA	DC 7.7 mA	DC 7.7 mA
Input circuit	Reverse voltage protection	Reverse voltage protection	Reverse voltage protection
Output circuit	Protection diode, operation indicator LED (red)	Protection diode, operation indicator LED (red)	Protection diode, operation indicator LED (red)
Output nominal voltage	DC 24 V	DC 24 V	DC 24 V
Output voltage range	DC 20 V ... 30 V	DC 20 V ... 30 V	DC 20 V ... 30 V
Max. continuous current	500 mA	500 mA	500 mA
Reverse voltage transistor	80 V	80 V	80 V
Switch on /switch off time	< 7 µs / < 15 µs	< 10 µs / < 10 µs	< 10 µs / < 10 µs
Max. operating frequency	10 kHz	10 kHz	10 kHz
Leakage current at nominal voltage	< 10 µA	< 10 µA	< 10 µA
Collector / emitter voltage drop U _{CE sat}	< 1.2 V	< 1.2 V	< 1.2 V
Max. output (reverse current)	11 mA	11 mA	11 mA
Test voltage input / output	2.5 kV eff.	2.5 kV eff.	2.5 kV eff.
Nominal operating mode	continuous duty	continuous duty	continuous duty
Ambient operating temperature	-25 °C ... +55 °C	-25 °C ... +55 °C	-25 °C ... +55 °C
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C	-40 °C ... +70 °C
Dimensions (mm) W x H x L	6 x 56 x 91	6 x 56 x 91	6 x 56 x 91
	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP®	CAGE CLAMP®	CAGE CLAMP®
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 14	0.08 mm² ... 2.5 mm² / AWG 28 ... 14	0.08 mm² ... 2.5 mm² / AWG 28 ... 14
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	VDE 0110 / EN 60664; UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U	VDE 0110 / EN 60664; UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U	VDE 0110 / EN 60664; UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U

Optocoupler
Input: DC 24 V
Output: DC 5 V / 0.5 A / 25 kHz
Negative switching

Optocoupler
Input: DC 5 V
Output: DC 24 V / 0.5 A / 10 kHz
Positive switching



Description	U_N	Item no.	Pack. unit	U_N	Item no.	Pack. unit
Optocoupler terminal block, for DIN 35 rail	DC 24 V	859-706	1	DC 5 V	859-752	1

Technical Data

Accessories see page 52

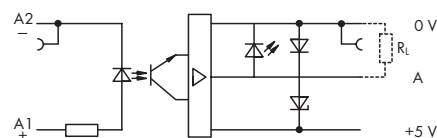
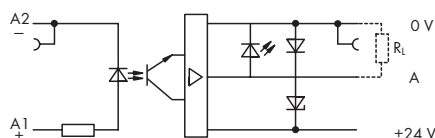
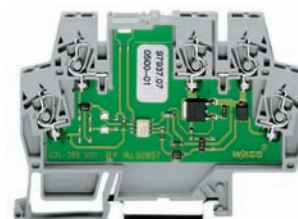
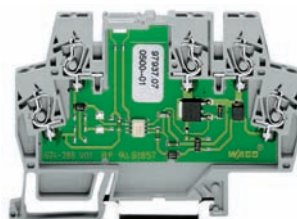
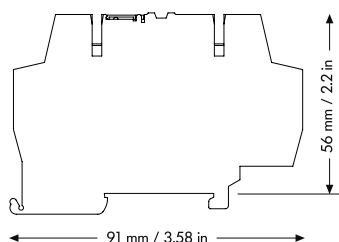
Accessories see page 52

Nominal input voltage (V_N)	DC 24 V	DC 5 V
Input voltage range low level	DC 0 V ... 5 V	DC 0 V ... 1 V
Input voltage range high level	DC 18 V ... 30 V	DC 4 V ... 6 V
Input current range	8 mA ... 14 mA	7 mA ... 13 mA
Current at nominal voltage	DC 11 mA	10 mA
Input circuit	Reverse voltage protection	Reverse voltage protection
Output circuit	Protection diode, operation indicator LED (red)	Protection diode, operation indicator LED (red)
Output nominal voltage	DC 5 V	DC 24 V
Output voltage range	DC 4 V ... 6.25 V	DC 20 V ... 30 V
Max. continuous current	500 mA	500 mA
Reverse voltage transistor	80 V	80 V
Switch on / switch off time	< 7 μ s / < 15 μ s	< 15 μ s / < 30 μ s
Max. operating frequency	10 kHz	10 kHz
Leakage current at nominal voltage	< 10 μ A	< 10 μ A
Collector / emitter voltage drop $U_{ce sat}$	< 1.2 V	< 1.2 V
Max. output (reverse current)	7 mA	12.5 mA
Test voltage input / output	2.5 kV eff.	2.5 kV eff.
Nominal operating mode	continuous duty	continuous duty
Ambient operating temperature	-25 °C ... +55 °C	-25 °C ... +40 °C
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C
Dimensions (mm) W x H x L	6 x 56 x 91	6 x 56 x 91
Wire connection	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Cross sections	CAGE CLAMP® 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14	CAGE CLAMP® 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	VDE 0110 / EN 60664; UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U	VDE 0110 / EN 60664; UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U

1 Optocoupler Modules, 6 mm / 0.236 in Wide

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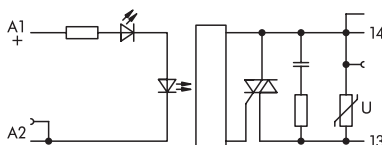
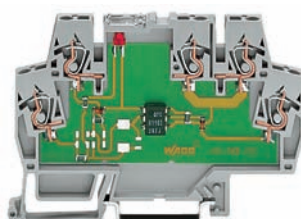
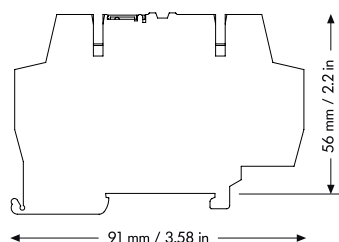
	Optocoupler Input: DC 24 V Output: DC 24 V/0.5 A/10 kHz Positive switching	Optocoupler Input: DC 24 V Output: DC 5 V/0.5 A/10 kHz Positive switching
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Description	U_N	Item no.	Pack. unit	U_N	Item no.	Pack. unit
Optocoupler terminal block, for DIN 35 rail	DC 24 V	859-758	1	DC 24 V	859-756	1

Technical Data		Accessories see page 52		Accessories see page 52	
Nominal input voltage (V_N)	DC 24 V	DC 24 V	DC 24 V	DC 24 V	DC 24 V
Input voltage range low level	DC 0 V ... 5 V	DC 0 V ... 5 V	DC 0 V ... 5 V	DC 0 V ... 5 V	DC 0 V ... 5 V
Input voltage range high level	DC 18 V ... 30 V	DC 18 V ... 30 V	DC 18 V ... 30 V	DC 18 V ... 30 V	DC 18 V ... 30 V
Input current range	5.5 mA ... 10.6 mA	5.5 mA ... 10.6 mA	8 mA ... 14.5 mA	8 mA ... 14.5 mA	8 mA ... 14.5 mA
Current at nominal voltage	8 mA	8 mA	11 mA	11 mA	11 mA
Input circuit	Reverse voltage protection	Reverse voltage protection	Reverse voltage protection	Reverse voltage protection	Reverse voltage protection
Output circuit	Protection diode, operation indicator LED (red)	Protection diode, operation indicator LED (red)	Protection diode, operation indicator LED (red)	Protection diode, operation indicator LED (red)	Protection diode, operation indicator LED (red)
Output nominal voltage	DC 24 V	DC 24 V	DC 5 V	DC 5 V	DC 5 V
Output voltage range	DC 20 V ... 30 V	DC 20 V ... 30 V	DC 4 V ... 6.25 V	DC 4 V ... 6.25 V	DC 4 V ... 6.25 V
Max. continuous current	500 mA	500 mA	500 mA	500 mA	500 mA
Reverse voltage transistor	80 V	80 V	80 V	80 V	80 V
Switch on /switch off time	< 15 μ s / < 30 μ s	< 15 μ s / < 30 μ s	< 15 μ s / < 30 μ s	< 15 μ s / < 30 μ s	< 15 μ s / < 30 μ s
Max. operating frequency	10 kHz	10 kHz	10 kHz	10 kHz	10 kHz
Leakage current at nominal voltage	< 10 μ A	< 10 μ A	< 10 μ A	< 10 μ A	< 10 μ A
Collector / emitter voltage drop $U_{ce sat}$	< 1.2 V	< 1.2 V	< 1.2 V	< 1.2 V	< 1.2 V
Max. output (reverse current)	11 mA	11 mA	4.5 mA	4.5 mA	4.5 mA
Test voltage input / output	2.5 kV eff.	2.5 kV eff.	2.5 kV eff.	2.5 kV eff.	2.5 kV eff.
Nominal operating mode	continuous duty	continuous duty	continuous duty	continuous duty	continuous duty
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C	-25 °C ... +40 °C	-25 °C ... +40 °C	-25 °C ... +40 °C
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C	-40 °C ... +70 °C	-40 °C ... +70 °C	-40 °C ... +70 °C
Dimensions (mm) W x H x L	6 x 56 x 91	6 x 56 x 91	6 x 56 x 91	6 x 56 x 91	6 x 56 x 91
	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP®	CAGE CLAMP®	CAGE CLAMP®	CAGE CLAMP®	CAGE CLAMP®
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 14	0.08 mm² ... 2.5 mm² / AWG 28 ... 14	0.08 mm² ... 2.5 mm² / AWG 28 ... 14	0.08 mm² ... 2.5 mm² / AWG 28 ... 14	0.08 mm² ... 2.5 mm² / AWG 28 ... 14
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	VDE 0110 / EN 60664; UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U	VDE 0110 / EN 60664; UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U	VDE 0110 / EN 60664; UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U	VDE 0110 / EN 60664; UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U	VDE 0110 / EN 60664; UL 508; EEx nA II T4 / DEMKO 02 ATEX 132280U

Optocoupler
Input: DC 5V
Output: AC 230V/0,5A
for normal switching power



Description	U_N	Item no.	Pack. unit
Optocoupler terminal block, for DIN 35 rail	DC 5 V	859-902	1
Technical Data			
Accessories see page 52			
Nominal input voltage (V_N)	DC 5 V		
Input voltage range low level	DC 0 V ... 1 V		
Input voltage range high level	DC 4 V ... 6.25 V		
Input current range	DC 5.6 mA ... 10.3 mA		
Current at nominal voltage	DC 7.7 mA		
Input circuit	Reverse voltage protection		
Output circuit	varistor /RC module		
Output nominal voltage	AC 230 V		
Output voltage range	AC 24 V ... 260 V (50 Hz ... 60 Hz)		
Max. continuous current (20 °C)	500 mA		
Surge current ($t=20$ ms)	30 A		
Min. load current	50 mA		
Peak reverse voltage Triac	600 V		
Switch on /switch off time	10 ms / 10 ms (1 half-wave)		
Leakage current at nominal voltage	< 1 mA		
Voltage drop at output	< 1 V		
Test voltage input / output	2.5 kV eff.		
Nominal operating mode	continuous duty		
Ambient operating temperature	-25 °C ... +55 °C		
Storage temperature	-40 °C ... +70 °C		
Dimensions (mm) W x H x L	6 x 56 x 91		
	Height from upper-edge of DIN 35 rail		
Wire connection	CAGE CLAMP®		
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14		
Stripped lengths	5 ... 6 mm / 0.22 in		
Approvals	IEC 60664 / IEC 60664A / DIN VDE 0110; degree of pollution 2, overvoltage category III		

Accessories for Relay and Optocoupler Modules, 6 mm / 0.236 Wide, Series 859

End and intermediate plate



Test pin



Marking pen with fibre tip

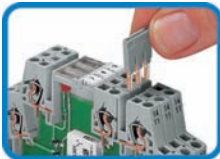


Description	Item no.	Pack. unit	UVPE
End and intermediate plate; 1 mm / 0.039 in thick, grey	859-525	100	4 * 25
Test pin; Ø 1 mm / 0.039 in ; test wire for sold. onto test plug	859-500	100	
Marking pen with fibre tip for permanent marking	210-110	1	

Push-in type jumper bar



Commoning using a 3-way 859 series push-in type jumper bar (2-way to 10-way).



Description	Item no.	Pack. unit	UVPE
Push-in type jumper bars, light gray, insulated, 18 A,			
2-way	859-402	200	8 * 25
3-way	859-403	200	8 * 25
4-way	859-404	200	8 * 25
5-way	859-405	200	8 * 25
6-way	859-406	100	4 * 25
7-way	859-407	100	4 * 25
8-way	859-408	100	4 * 25
9-way	859-409	100	4 * 25
10-way	859-410	100	4 * 25
Additional item no. for colored push-in type jumper bars;			
yellow	... /000-029		
blue	... /000-006		

Miniature quick marking card



Each clamping unit is marked individually

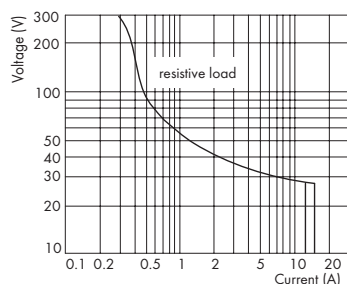


Description	Item no.	Pack. unit	UVPE
Miniature WSB quick marking system			
10 strips with 10 markers, white with black printing;			
plain	248-501	50	5 cards
Marking software and printer/plotter see section 8			
1 ...10 (10 x)	248-502	50	5 cards
11 ... 20 (10x)	248-503	50	5 cards
21 ... 30 (10x)	248-504	50	5 cards
31 ... 40 (10x)	248-505	50	5 cards
41 ... 50 (10 x)	248-506	50	5 cards
1 ... 50 (2 x)	248-566	50	5 cards
K 1 ... K 10 (10 x)	248-450	50	5 cards
K 11 ... K 20 (10 x)	248-451	50	5 cards
K 100 (10 x)	248-452	50	5 cards
U 1 ... U 10 (10 x)	248-453	50	5 cards
U 11 ... U 20 (10 x)	248-454	50	5 cards
U 100 (10 x)	248-455	50	5 cards

Relay Sockets with Pluggable Miniature Switching Relay

**Relay socket
with DC relay and status indication
1 changeover contact**

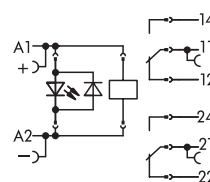
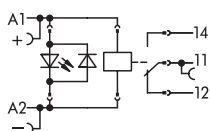
**Relay socket
with DC relay and status indication
2 changeover contacts**



Load limit curve for 788-303 to 788-307, 788-506, 788-507 and 788-508



Note: Inductive loads have to be attenuated by an appropriate protective circuit in order to protect relay coils and contacts.



Description	V _N	I _N	Item no.	Pack. unit	V _N	I _N	Item no.	Pack. unit
Relay socket with relay and status indication, for DIN 35 rails	DC 12 V	36 mA	788-303	20	DC 12 V	36 mA	788-311	20
	DC 24 V	19.1 mA	788-304	20	DC 24 V	19.1 mA	788-312	20
	DC 48 V	11 mA	788-305	20	DC 48 V	11 mA	788-313	20
	DC 60 V	10.5 mA	788-306	20	DC 60 V	10.5 mA	788-314	20
	DC 110 V	6 mA	788-307	20	DC 110 V	6 mA	788-315	20

Technical Data

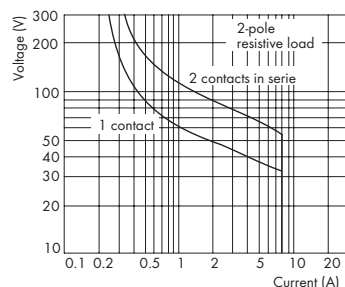
Accessories see pages 64 ... 69

Accessories see pages 64 ... 69

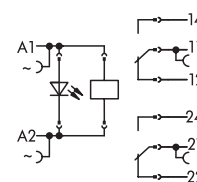
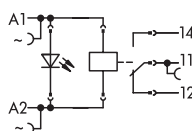
Contact material	AgNi 90/10	AgNi 90/10
Input voltage range	V _N ± 10 %	V _N ± 10 %
Max. switching voltage	AC 250 V	AC 250 V
Max. continuous current	16 A	2 x 8 A
Max. make current (resistive) at a 10 % duty cycle	4 s (AC) 30 A	4 s (AC) 15 A
Max. switching power (resistive)	AC 4 kVA, DC see load limit curve	AC 2 x 2 kVA, DC see load limit curve
Max. switching rate with / without load	6 min ⁻¹ / 1200 min ⁻¹	6 min ⁻¹ / 1200 min ⁻¹
Operating power	400 mW typ.	400 mW typ.
Pull-in/drop-out/bounce time typ.	7 ms / 3 ms / 3 ms	7 ms / 2 ms / 3 ms
Nominal operating mode	continuous duty	continuous duty
Dielectric strength contact-coil	5 kV	5 kV
Dielectric strength open contact	1 kV	1 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Mechanical life	30 x 10 ⁶ switching operations	30 x 10 ⁶ switching operations
Degree of protection	IP 20	IP 20
Ambient operating temperature	-25 °C ... +50 °C	-25 °C ... +50 °C
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C
Dimensions (mm) W x H x L	15 x 53 x 86	15 x 53 x 86
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP®S	Height from upper-edge of DIN 35 rail CAGE CLAMP®S
Cross sections	0.34 mm ² ... 2.5 mm ² / AWG 22 ... 12	0.34 mm ² ... 2.5 mm ² / AWG 22 ... 12
Stripped lengths	9 ... 10 mm / 0.37 in	9 ... 10 mm / 0.37 in
Approvals	DIN VDE 0140 part 1, DIN EN 61140; DIN VDE 0160, EN 50178; degree of protection II; UL 508	DIN VDE 0140 part 1, DIN EN 61140; DIN VDE 0160, EN 50178; degree of protection II; UL 508

Relay socket
with AC relay and status indication
1 changeover contact

Relay socket
with AC relay and status indication
2 changeover contacts



Load limit curve for 788-311 to 788-315, 788-512, 788-515 and 788-516



Description	V_N	I_N	Item no.	Pack. unit	V_N	I_N	Item no.	Pack. unit
Relay socket with relay and status indication, for DIN 35 rails	AC 24 V	34 mA	788-506	20	AC 24 V	34 mA	788-512	20
	AC 115 V	8 mA	788-507	20	AC 115 V	8 mA	788-515	20
	AC 230 V	4.3 mA	788-508	20	AC 230 V	3 mA	788-516	20

Technical Data

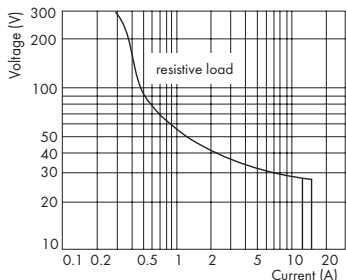
Accessories see pages 64 ... 69

Accessories see pages 64 ... 69

Contact material	AgNi 90/10	AgNi 90/10
Input voltage range	$V_N \pm 10\%$	$V_N \pm 10\%$
Max. switching voltage	AC 250 V	AC 250 V
Max. continuous current	16 A	2 x 8 A
Max. make current (resistive) at a 10 % duty cycle	4 s (AC) 30 A	4 s (AC) 15 A
Max. switching power (resistive)	AC 4 kVA, DC see load limit curve	AC 2 x 2 kVA, DC see load limit curve
Max. switching rate with / without load	6 min ⁻¹ / 1200 min ⁻¹	6 min ⁻¹ / 1200 min ⁻¹
Operating power	0.75 VA	0.75 VA
Pull-in/drop-out/bounce time typ.	7 ms / 3 ms / 3 ms	7 ms / 2 ms / 3 ms
Nominal operating mode	continuous duty	continuous duty
Dielectric strength contact-coil	5 kV	5 kV
Dielectric strength open contact	1 kV	1 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Mechanical life	10 x 10 ⁶ switching operations	5 x 10 ⁶ switching operations
Degree of protection	IP 20	IP 20
Ambient operating temperature	-25 °C ... +50 °C	-25 °C ... +50 °C
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C
Dimensions (mm) W x H x L	15 x 53 x 86	15 x 53 x 86
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP®S	Height from upper-edge of DIN 35 rail CAGE CLAMP®S
Cross sections	0.34 mm ² ... 2.5 mm ² / AWG 22 ... 12	0.34 mm ² ... 2.5 mm ² / AWG 22 ... 12
Stripped lengths	9 ... 10 mm / 0.37 in	9 ... 10 mm / 0.37 in
Approvals	DIN VDE 0140 part 1, DIN EN 61140; DIN VDE 0160, EN 50178; degree of protection II; Ⓢ ; UL 508	DIN VDE 0140 part 1, DIN EN 61140; DIN VDE 0160, EN 50178; degree of protection II; Ⓢ ; UL 508

Relay Sockets with Pluggable Miniature Switching Relay

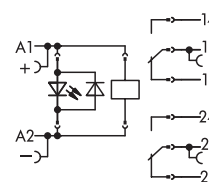
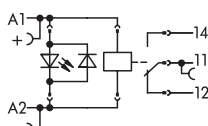
	Relay socket with DC relay and status indication; 1 changeover contact (gold contacts)	Relay socket with DC relay and status indication; 2 changeover contact (gold contacts)
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Load limit curve for 788-404, 788-607 and 788-608



* In order to prevent the gold layer from being damaged these values should not be exceeded. Higher switching power leads to evaporation of the gold layer. The resulting deposits in the enclosure may cause sparkovers between the coil and the contact.

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Technical Data

Accessories see pages 64 ... 69

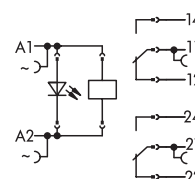
Accessories see pages 64 ... 69

Contact material	AgNi + 5 μ AU	AgNi + 5 μ AU
Input voltage range	V _N $\pm$ 10 %	V _N $\pm$ 10 %
Max. switching voltage	AC 250 V / DC 36 V*	AC 250 V / DC 36 V*
Max. continuous current	50 mA*	2 x 50 mA*
Max. switching power (resistive)	AC 4 kVA, DC see load limit curve	AC 2 x 2 kVA, DC see load limit curve
Pull-in/drop-out time typ.	7 ms / 3 ms	7 ms / 3 ms
Nominal operating mode	continuous duty	continuous duty
Dielectric strength contact-coil	5 kV	5 kV
Dielectric strength open contact	1 kV	1 kV
Dielectric strength contact-contact		2.5 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Mechanical life	3 x 10 ⁷ switching operations	3 x 10 ⁷ switching operations
Degree of protection	IP 20	IP 20
Ambient operating temperature	-25 °C ... +50 °C	-25 °C ... +50 °C
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C
Dimensions (mm) W x H x L	15 x 53 x 86	15 x 53 x 86
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP®S	Height from upper-edge of DIN 35 rail CAGE CLAMP®S
Cross sections	0.34 mm ² ... 2.5 mm ² / AWG 22 ... 12	0.34 mm ² ... 2.5 mm ² / AWG 22 ... 12
Stripped lengths	9 ... 10 mm / 0.37 in	9 ... 10 mm / 0.37 in
Approvals	DIN VDE 0140 part 1, DIN EN 61140; DIN VDE 0160, EN 50178; degree of protection II	DIN VDE 0140 part 1, DIN EN 61140; DIN VDE 0160, EN 50178; degree of protection II

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* In order to prevent the gold layer from being damaged these values should not be exceeded. Higher switching power leads to evaporation of the gold layer. The resulting deposits in the enclosure may cause sparkovers between the coil and the contact.

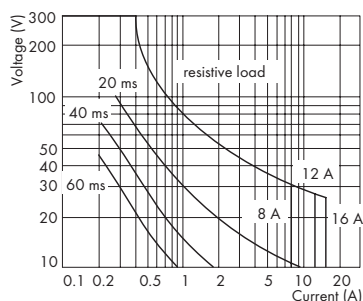


Technical Data	Accessories see pages 64 ... 69	Accessories see pages 64 ... 69
Contact material	AgNi + 5µ AU	AgNi + 5µ AU
Input voltage range	V _N ± 10 %	V _N ± 10 %
Max. switching voltage	AC 250 V / DC 36 V*	AC 250 V / DC 36 V*
Max. continuous current	50 mA*	2 x 50 mA*
Max. switching power (resistive)	AC 4 kVA, DC see load limit curve	AC 2 x 2 kVA, DC see load limit curve
Pull-in/drop-out time typ.	7 ms / 3 ms	7 ms / 3 ms
Nominal operating mode	continuous duty	continuous duty
Dielectric strength contact-coil	5 kV	5 kV
Dielectric strength open contact	1 kV	1 kV
Dielectric strength contact-contact	2.5 kV	2.5 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Mechanical life	3 x 10 ⁷ switching operations	3 x 10 ⁷ switching operations
Degree of protection	IP 20	IP 20
Ambient operating temperature	-25 °C ... +50 °C	-25 °C ... +50 °C
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C
Dimensions (mm) W x H x L	15 x 53 x 86	15 x 53 x 86
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP®S	Height from upper-edge of DIN 35 rail CAGE CLAMP®S
Cross sections	0.34 mm² ... 2.5 mm² / AWG 22 ... 12	0.34 mm² ... 2.5 mm² / AWG 22 ... 12
Stripped lengths	9 ... 10 mm / 0.37 in	9 ... 10 mm / 0.37 in
Approvals	DIN VDE 0140 part 1, DIN EN 61140; DIN VDE 0160, EN 50178; degree of protection II; Ⓢ	DIN VDE 0140 part 1, DIN EN 61140; DIN VDE 0160 EN 50178; degree of protection II; Ⓢ

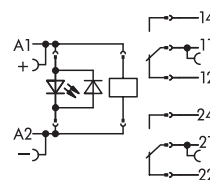
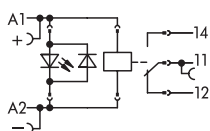
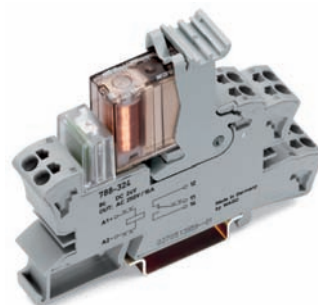
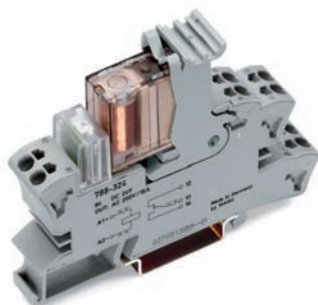
Relay Sockets with Pluggable Miniature Switching Relay

Relay socket
with DC relay and status indication;
1 changeover contact

Relay socket
with DC relay and status indication;
2 changeover contact



Load limit curve for 788-324 and 788-528



Description	V_N	I_N	Item no.	Pack. unit	V_N	I_N	Item no.	Pack. unit
Relay socket with relay and status indication, for DIN 35 rails	DC 24 V	22 mA	788-324	20	DC 24 V	22 mA	788-334	20

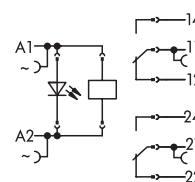
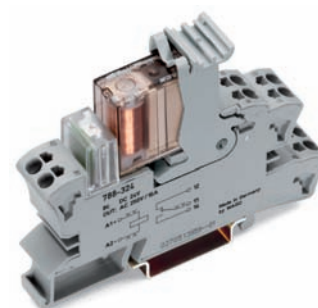
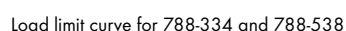
Technical Data

Accessories see pages 64 ... 69

Accessories see pages 64 ... 69

Contact material	AgCdO	AgCdO
Input voltage range	$V_N \pm 10\%$	$V_N \pm 10\%$
Max. switching voltage	AC 250 V	AC 250 V
Max. continuous current	16 A	2 x 8 A
Max. make current (resistive) at a 10 % duty cycle	4 s (AC) 25 A	4 s (AC) 14 A
Max. switching power (resistive)	AC 4 kVA, DC see load limit curve	AC 2 x 2 kVA, DC see load limit curve
Max. switching rate with / without load	10 min ⁻¹ / 1200 min ⁻¹	10 min ⁻¹ / 1200 min ⁻¹
Operating power	500 mW typ.	500 mW typ.
Pull-in/drop-out/bounce time typ.	8 ms / 2 ms / 4 ms	9 ms / 3 ms / 3 ms
Nominal operating mode	continuous duty	continuous duty
Dielectric strength contact-coil	4 kV	4 kV
Dielectric strength open contact	1 kV	1 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Mechanical life	30 x 10 ⁶ switching operations	20 x 10 ⁶ switching operations
Degree of protection	IP 20	IP 20
Ambient operating temperature	-25 °C ... +50 °C	-25 °C ... +50 °C
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C
Dimensions (mm) W x H x L	15 x 63 x 86	15 x 63 x 86
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP®S	Height from upper-edge of DIN 35 rail CAGE CLAMP®S
Cross sections	0.34 mm ² ... 2.5 mm ² / AWG 22 ... 12	0.34 mm ² ... 2.5 mm ² / AWG 22 ... 12
Stripped lengths	9 ... 10 mm / 0.37 in	9 ... 10 mm / 0.37 in
Approvals	DIN VDE 0140 part 1, DIN EN 61140; DIN VDE 0160, EN 50178; degree of protection II; UL 508 (max. 40 °C)	DIN VDE 0140 part 1, DIN EN 61140; DIN VDE 0160, EN 50178; degree of protection II; UL 508 (max. 40 °C)

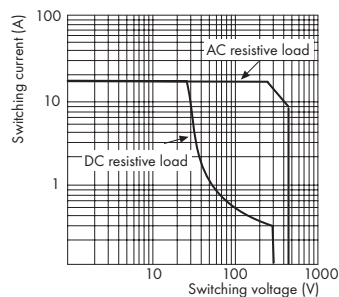
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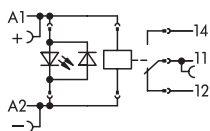
Technical Data	Accessories see pages 64 ... 69	Accessories see pages 64 ... 69
Contact material	AgCdO	AgCdO
Input voltage range	$V_N \pm 10\%$	$V_N \pm 10\%$
Max. switching voltage	AC 250 V	AC 250 V
Max. continuous current	16 A	2 x 8 A
Max. make current (resistive) at a 10 % duty cycle	4 s (AC) 14 A	4 s (AC) 14 A
Max. switching power (resistive)	AC 4 kVA, DC see load limit curve	AC 2 x 2 kVA, DC see load limit curve
Max. switching rate with / without load	$10 \text{ min}^{-1} / 1200 \text{ min}^{-1}$	$10 \text{ min}^{-1} / 1200 \text{ min}^{-1}$
Operating power	500 mW typ.	500 mW typ.
Pull-in/drop-out/bounce time typ.	8 ms / 2 ms / 4 ms	9 ms / 3 ms / 3 ms
Nominal operating mode	continuous duty	continuous duty
Dielectric strength contact-coil	4 kV	4 kV
Dielectric strength open contact	1 kV	1 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Mechanical life	30×10^6 switching operations	20×10^6 switching operations
Degree of protection	IP 20	IP 20
Ambient operating temperature	-25 °C ... +50 °C	-25 °C ... +50 °C
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C
Dimensions (mm) W x H x L	15 x 63 x 86	15 x 63 x 86
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP®S	Height from upper-edge of DIN 35 rail CAGE CLAMP®S
Cross sections	0.34 mm² ... 2.5 mm² / AWG 22 ... 12	0.34 mm² ... 2.5 mm² / AWG 22 ... 12
Stripped lengths	9 ... 10 mm / 0.37 in	9 ... 10 mm / 0.37 in
Approvals	DIN VDE 0140 part 1, DIN EN 61140; DIN VDE 0160, EN 50178; degree of protection II; Ⓢ ; UL 508 (max. 40 °C)	DIN VDE 0140 part 1, DIN EN 61140; DIN VDE 0160, EN 50178; degree of protection II; Ⓢ ; UL 508 (max. 40 °C)

Relay Sockets with Pluggable Miniature Switching Relay

**Relay socket
with DC relay and status indication;
1 changeover contact**



Type of load	Capability	Electrical life
Incandescent lamp	2200 W	20.000
Halogen lamp AC 230 V	1400 W	50.000
Halogen trafo	120 VA	20.000
Fluorescent lamp not comp., CB, cos φ 0,4-0,6	20 x 58 W	25.000
Fluorescent lamp comp., Conv. ballast, C parallel	9 x 58 W	25.000
Fluorescent lamp comp., Conv. ballast, Duo-circuit	600 W	20.000
Fluorescent lamp with electronic ballast	12 x 58 W	25.000
Energy saving lamp 15 W	25 pcs	20.000
Energy saving lamp 13 W	30 pcs	20.000
Energy saving lamp 9 W	38 pcs	20.000



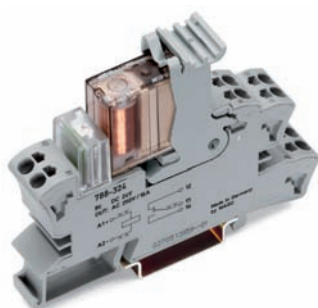
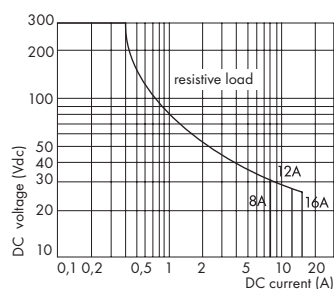
Description	V _N	I _N	Item no.	Pack. unit
Relay socket with relay and status indication, for DIN 35 rails	DC 24 V	19 mA	788-354	20

Technical Data

Accessories see pages 64 ... 69

Contact material	Ag alloy
Input voltage range	U _N -15 % ... +20 %
Max. switching voltage	AC 250 V
Max. continuous current	16 A
Max. make current (resistive) at a 10 % duty cycle	(50 ms) 120 A at AC 230 V
Recommended minimum load	> 100 mA / AC/DC 12 V
Max. switching power (resistive)	AC 4 kVA, DC see load limit curve
Recommended minimum load	> 100 mA / AC/DC 12 V
Operating power	400 mW
Pull-in/drop-out/bounce time typ.	15 ms / 5 ms / -
Nominal operating mode	100 % ED
Dielectric strength contact-coil	5 kV
Dielectric strength open contact	1 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3 500 V / 4 kV / 2
Mechanical life	10 x 10 ⁶ switching operations
Mechanical life at max. load (resistance)	min. 100.000 switching operations
Service life at lamp load	see table lamp loads
Degree of protection	IP 20
Type of relay	ALZ
Ambient operating temperature	-25 °C ... +50 °C
Storage temperature	-40 °C ... +70 °C
Dimensions (mm) W x H x L	15 x 53 x 86
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP®S
Cross sections	0.34 mm ² ... 2.5 mm ² / AWG 22 ... 12
Stripped lengths	9 ... 10 mm / 0.37 in
Approvals	DIN VDE 0140 part 1, DIN EN 61140; DIN VDE 0160, EN 50178; degree of protection II; UL 508

**Relay socket
with DC relay and status indication;
1 make contact**

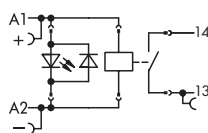


Contact life at different lamp loads
Load

Switching operations

12 A, AC 250 V, $\cos \varphi = 1$
TV 8 acc. to UL 508
2500 W, AC 230 V Halogen lamp
1000 W, AC 250 V Incandescent lamp
3000 W, AC 250 V Incandescent lamp
1500 VA, Fluorescent lamp 163 μ F

3×10^5
 25×10^3
 $> 10^4$
 2.3×10^5
 3.6×10^4
 10^4



Description	V _N	I _N	Item no.	Pack. unit
Relay socket with relay and status indication, for DIN 35 rails	DC 24 V	21.8 mA	788-355	20

Technical Data

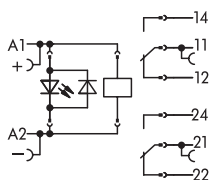
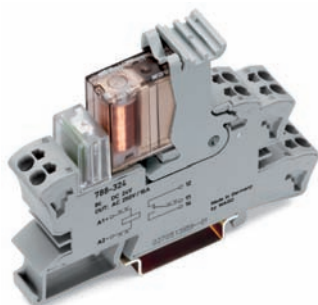
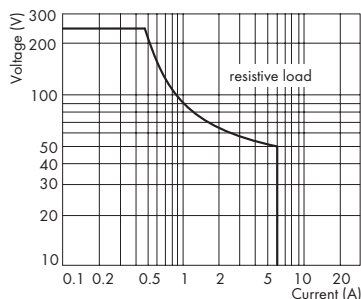
Accessories see pages 64 ... 69

Contact material	AgSnO ₂
Input voltage range	U _N -15 % ... +20 %
Max. switching voltage	AC 250 V
Max. continuous current	16 A
Max. make current (resistive) at a 10 % duty cycle	4 s (AC) 25 A
Peak inrush current	20 ms / 120 A
Recommended minimum load	> 100 mA / AC/DC 12 V
Max. switching power (resistive)	AC 4 kVA, DC see load limit curve
Recommended minimum load	> 100 mA / AC/DC 12 V
Operating power	500 mW
Pull-in/drop-out/bounce time typ.	8 ms / 2 ms / 2 ms
Nominal operating mode	100 % ED
Dielectric strength contact-coil	4 kV
Dielectric strength open contact	1 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3
Mechanical life	30 x 10 ⁶ switching operations
Service life at lamp load	see table lamp loads
Degree of protection	IP 20
Type of relay	RP3SL
Ambient operating temperature	-25 °C ... +50 °C
Storage temperature	-40 °C ... +70 °C
Dimensions (mm) W x H x L	15 x 63 x 86
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP®S
Cross sections	0.34 mm ² ... 2.5 mm ² / AWG 22 ... 12
Stripped lengths	9 ... 10 mm / 0.37 in
Approvals	DIN VDE 0140 part 1, DIN EN 61140; DIN VDE 0160, EN 50178; degree of protection II; UL 508

1 Relay Sockets with Pluggable Safty Relay SR2M

62

Relay socket with safety relay SR2M
with forced guided contacts
and status indication,
2 changeover contacts



In accordance with EN 50205, it is only permitted to use
1 make contact / 1 break contact for safety circuits
(11-14 and 22-21 or 12-11 and 21-24)

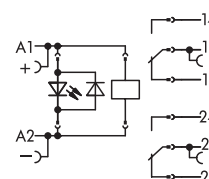
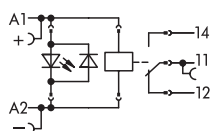
Description	V _N	I _N	Item no.	Pack. unit	
Relay socket with safety relay SR2M with forced guided contacts and status indication, for DIN 35 rails	DC 24 V	31 mA	788-384	20	

Technical Data

Accessories see pages 64 ... 69

Contact material	AgNi	
Input voltage range	V _N ± 10 %	
Max. switching voltage	AC 250 V	
Max. continuous current	6 A	
Max. make current (resistive) at a 10 % duty cycle	4 s (AC) 14 A	
Recommended minimum load	> 50 mW	
Max. switching power (resistive)	AC 1500 VA; DC see load limit curve	
Max. switching rate with / without load	6 min ⁻¹ / 300 min ⁻¹	
Operating power	700 mW	
Pull-in/drop-out time typ.	10 ms / 4 ms	
Nominal operating mode	continuous duty	
Dielectric strength contact-coil	4 kV	
Dielectric strength open contact	1.5 kV	
Dielectric strength contact-contact	3 kV	
Clearance and creepage distance contact / coil	8 mm	
Adjacent contacts	5.5 mm	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	
Mechanical life	10 x 10 ⁶ switching operations	
Degree of protection	IP 20	
Ambient operating temperature	-25 °C ... +50 °C	
Storage temperature	-40 °C ... +70 °C	
Dimensions (mm) W x H x L	15 x 63 x 86	
	Height from upper-edge of DIN 35 rail	
Wire connection	CAGE CLAMP®S	
Cross sections	0.34 mm ² ... 2.5 mm ² / AWG 22 ... 12	
Stripped lengths	9 ... 10 mm / 0.37 in	
Approvals	EN 50205; UL 508	

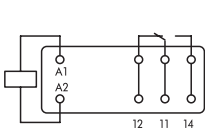
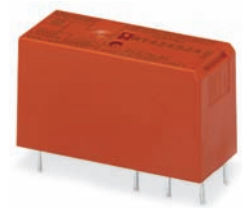
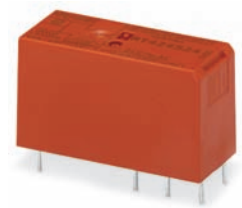
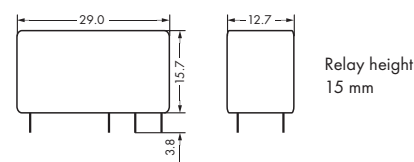
CAGE CLAMP® S



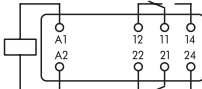
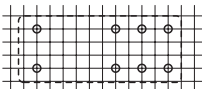
Technical Data	Accessories see pages 64 ... 69	Accessories see pages 64 ... 69
Contact material	AgCdO	AgCuNi
Input voltage range	$V_N \pm 10\%$	$V_N \pm 10\%$
Max. switching voltage	AC 250 V	AC 250 V
Max. continuous current	16 A	8 A
Max. make current (resistive) at a 10 % duty cycle	20 ms (AC) 50 A	20 ms (AC) 30 A
Max. switching power (resistive)	AC 4 kVA	AC 2 kVA
Max. switching rate	360 / h	360 / h
Operating power	500 mW typ.	500 mW typ.
Pull-in/drop-out/bounce time typ.	8 ms / 3 ms / AK 0.5 ms, RK 5 ms	8 ms / 3 ms / AK 0.5 ms, RK 5 ms
Nominal operating mode	continuous duty	continuous duty
Dielectric strength contact-coil	5 kV	5 kV
Dielectric strength open contact	1 kV	1 kV
Dielectric strength contact-contact		2.5 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Mechanical life	50×10^6 switching operations	50×10^6 switching operations
Degree of protection	IP 20	IP 20
Ambient operating temperature	-25 °C ... +50 °C	-25 °C ... +50 °C
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C
Dimensions (mm) W x H x L	15 x 63 x 86	15 x 63 x 86
	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP®S	CAGE CLAMP®S
Cross sections	0.34 mm² ... 2.5 mm² / AWG 22 ... 12	0.34 mm² ... 2.5 mm² / AWG 22 ... 12
Stripped lengths	9 ... 10 mm / 0.37 in	9 ... 10 mm / 0.37 in
Approvals	DIN VDE 0140 part 1, DIN EN 61140; DIN VDE 0160, EN 50178; degree of protection II; UL 508	DIN VDE 0140 part 1, DIN EN 61140; DIN VDE 0160, EN 50178; degree of protection II; UL 508

Accessories for Relay Sockets with Pluggable Miniature Switching Relay, Series 788

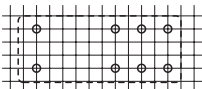
	Pluggable miniature switching relays 1 changeover contact	Pluggable miniature switching relays 2 changeover contacts
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Pinning 5 mm

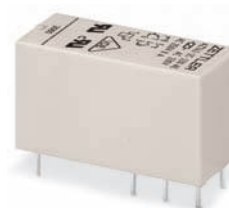
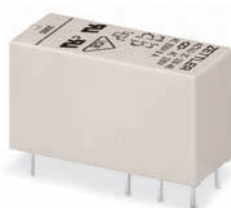


Pinning 5 mm



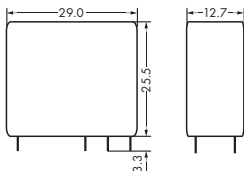
Description	Nominal input voltage (V _N)	Item no.	Pack. unit	Nominal input voltage (V _N)	Item no.	Pack. unit
Pluggable miniature switching relays	DC 12 V	788-150	20	DC 12 V	788-152	20
	DC 24 V	788-154	20	DC 24 V	788-156	20
	DC 48 V	788-158	20	DC 48 V	788-160	20
	DC 60 V	788-162	20	DC 60 V	788-164	20
	DC 110 V	788-166	20	DC 110 V	788-168	20
	AC 24 V	788-170	20	AC 24 V	788-172	20
	AC 115 V	788-174	20	AC 115 V	788-176	20
	AC 230 V	788-178	20	AC 230 V	788-180	20

Technical Data		
Contact material	AgNi	AgNi
Switching current	16 A	2 x 8 A
Inrush current	30 A	15 A
Max. switching voltage	AC 250 V	AC 250 V
Switching power	4 kVA	2 kVA
Min. Switching current	10 mA	10 mA
Nominal consumption, typ	400 mW	400 mW
Pull-in/drop-out time typ.	7 ms / 3 ms	7 ms / 3 ms
Nominal operating mode	continious duty	continious duty
Mechanical life AC coil	> 10 x 10 ⁶ switching operations	> 5 x 10 ⁶ switching operations
Mechanical life DC coil	> 30 x 10 ⁶ switching operations	> 30 x 10 ⁶ switching operations
Dielectric strength contact-coil	5 kV	5 kV
Dielectric strength open contact	1 kV	1 kV
Dielectric strength contact-contact		2.5 kV
Weight	approx. 13.5 g	approx. 13.3 g
Degree of protection	IP 40	IP 40
Ambient operating temperature AC coil	-40 °C ... +70 °C	-40 °C ... +70 °C
Ambient operating temperature DC coil	-40 °C ... +85 °C	-40 °C ... +85 °C
Flammability acc. to UL 94	V0	V0

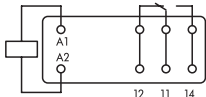
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Accessories for Relay Sockets with Pluggable Miniature Switching Relay, Series 788

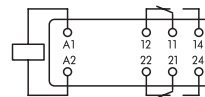
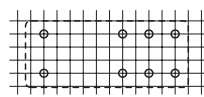
	Pluggable miniature switching relays 1 changeover contact	Pluggable miniature switching relays 2 changeover contacts
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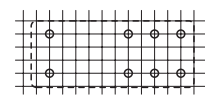
Relay height
25 mm



Pinning 5 mm



Pinning 5 mm



Description	Nominal input voltage (V _N)	Item no.	Pack. unit	Nominal input voltage (V _N)	Item no.	Pack. unit
Pluggable miniature switching relays	DC 12 V	788-182	20	DC 12 V	788-183	20
	DC 24 V	788-184	20	DC 24 V	788-185	20
	DC 48 V	788-186	20	DC 48 V	788-187	20
	DC 60 V	788-188	20	DC 60 V	788-189	20
	DC 110 V	788-190	20	DC 110 V	788-191	20
	AC 230 V	788-192	20	AC 230 V	788-193	20

Technical Data

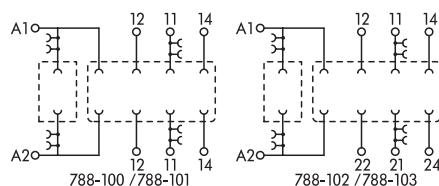
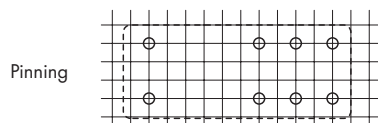
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CAGE CLAMP® S

1
67

1

1 changeover contact 2 changeover contacts

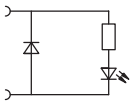


Accessories for Relay Sockets with Pluggable Miniature Switching Relay, Series 788

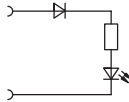
Status indication



DC



AC

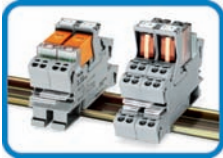


Description	Power consumption at V _N	Item no.	Pack. unit
Status indication			
DC 24 V (12 V ... 24 V)	2.4 mA	788-120	1
DC 48 V (48 V ... 60 V)	1.9 mA	788-121	1
DC 110 V	1.9 mA	788-122	1
AC 24 V	2.1 mA	788-123	1
AC 115 V	1.7 mA	788-124	1
AC 230 V	1.6 mA	788-125	1

Push-in type jumper bar 788-113



Push-in type jumper bar 859-402



Insulated, pluggable jumper system suitable for both coil and load side

Description	Item no.	Pack. unit
Push-in type jumper bar (module/module), I max. 18 A, 2-way	788-113	200
Push-in type jumper bars, light gray, insulated, 18 A, 2-way	859-402	200

WMB Multi marking system

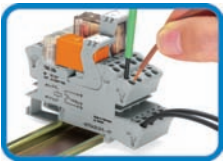


Group marker carrier



Description	Item no.	Pack. unit
WMB Multi marking system, 10 strips with 10 markers, white with black printing;		
plain	793-501	5 cards
Marking software and printer/plotter see section 8		
Marking 1 ... 10 (10x)	793-502	5 cards
11 ... 20 (10x)	793-503	5 cards
21 ... 30 (10x)	793-504	5 cards
31 ... 40 (10x)	793-505	5 cards
41 ... 50 (10x)	793-506	5 cards
1 ... 50 (2x)	793-566	5 cards
Group marker carrier	209-112	50

Screwdriver



CAGE CLAMP®S connection Both solid conductors and flexible conductors with ultrasonically bonded wire ends or ferrules can be simply pushed in - without using a screwdriver

Description	Item no.	Pack. unit
Screwdriver with partially insulated shaft; type 2, blade 3.5 x 0.5 mm / 0.137 x 0.020 in	210-620	1

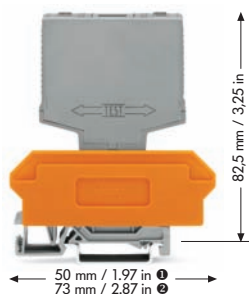
Ferrule



Description	Sleeve for mm ² / AWG	Item no.	Pack. unit
Ferrule, red insulated, 12 mm	2 x 1 mm ² / 2 x 18	216-542	500

Pluggable Modules - Relay Modules

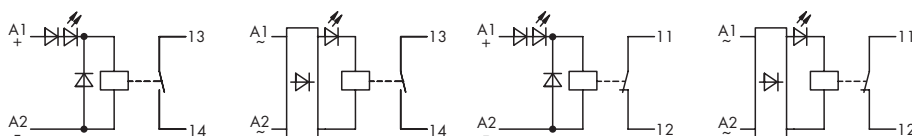
	Relay with 1 make contact	Relay with 1 break contact
	Module width 10 mm / 0.394 in	Module width 10 mm / 0.394 in



WSB marker cards

- Marking K; Item No.: 209-782
- Marking 1 ... 10; Item No.: 209-702
- Marking A1, A2, 13, 14; Item No.: 209-952
- Marking A1, A2, 11, 12; Item No.: 209-953

5 cards, each containing 10 strips with 10 markers

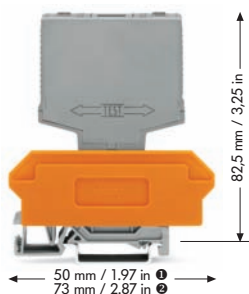


Description	V _N	I _N	Item no.	Pack. unit	V _N	I _N	Item no.	Pack. unit
Switching relay module	DC 24 V	7.4 mA	286-364	1	DC 24 V	20.4 mA	286-368	1
	DC 48 V	8.6 mA	286-365	1	DC 48 V	11.1 mA	286-369	1
	DC 60 V	7.3 mA	286-366	1	DC 60 V	10.7 mA	286-370	1
	AC 24 V	10.2 mA	286-564	1	AC 24 V	18.5 mA	286-568	1
	AC 115 V	10.5 mA	286-566	1				
	AC 230 V	7.3 mA	286-567	1				

Technical Data	Accessories see page 115		Accessories see page 115	
Contact material	Ag Cd O + 1 µ Au		Ag Cd O	
Max. switching voltage	DC 30 V / AC 250 V		DC 250 V / AC 250 V	
Max. make / break current	5 A / 5 A		8 A / 8 A	
Max. continuous current	5 A		5 A	
Max. switching power (resistive)	150 W / 1250 VA		150 W / 1250 VA	
Pull-in / operating power	100 mW / 200 mW		300 mW / 450 mW	
Pull-in/drop-out/bounce time typ.	6 ms / 6 ms / 2 ms		10 ms / 4 ms / 3 ms	
Dielectric strength contact-coil (AC, 1 min)	2.5 kV		4 kV	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 2.5 kV / 3		250 V / 4 kV / 3	
Mechanical life	2 x 10 ⁷ switching operations		1 x 10 ⁷ switching operations	
Mechanical life at max. load (resistance)	1 x 10 ⁵ switching operations		1 x 10 ⁵ switching operations	
Ambient operating temperature	-25 °C ... +40 °C		-25 °C ... +40 °C	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ① with 4-conductor terminal blocks, orange separator ② with 4-conductor terminal blocks, marker plate ③ wire range 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in	12 mm / 0.472 in wide	280-618	1	12 mm / 0.472 in wide
	12 mm / 0.472 in wide	280-608	1	12 mm / 0.472 in wide
	15 mm / 0.591 in wide	280-762	1	15 mm / 0.591 in wide

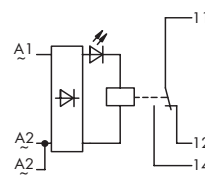
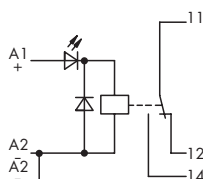
	Relay with 1 changeover contact	Relay with 1 changeover contact
	Module width 15 mm / 0.591 in	Module width 15 mm / 0.591 in



WSB marker cards

- Marking K; Item No.: 209-782
- Marking 1 ... 10; Item No.: 209-702
- Marking A1, A2, A2, 11, 12, 14, A1, A2, A2;
Item No.: 209-994

5 cards, each containing 10 strips with 10 markers



Description	V _N	I _N	Item no.	Pack. unit	V _N	I _N	Item no.	Pack. unit
Switching relay module	DC 5/6 V	94.3 mA	286-302	1	UC 5/6 V	94.3 mA	286-502	1
	DC 12 V	49.4 mA	286-303	1	UC 12 V	49.4 mA	286-503	1
	DC 24 V	19.4 mA	286-304	1	UC 24 V	21.8 mA	286-504	1
	DC 48 V	11.4 mA	286-305	1	UC 48 V	11.4 mA	286-505	1
	DC 60 V	9.2 mA	286-306	1	UC 60 V	9.2 mA	286-506	1
	DC 115 V	4.8 mA	286-307	1	AC 115 V	4.8 mA	286-507	1
	DC 230 V	6.1 mA	286-308	1	AC 230 V	6.1 mA	286-508	1

Technical Data

Accessories see page 115

Accessories see page 115

Contact material	AgNi 0.15 + HV	AgNi 0.15 + HV
Max. switching voltage	DC 300 V / AC 250 V	DC 300 V / AC 250 V
Max. make / break current	16 A / 8 A (10 % ED)	16 A / 8 A (10 % ED)
Max. continuous current	7 A	7 A
Max. switching power (resistive)	192 W / 1750 VA	192 W / 1750 VA
Pull-in / operating power	261 mW / 533 mW	261 mW / 533 mW
Pull-in/drop-out/bounce time typ.	8 ms / 6 ms / 4 ms	8 ms / 6 ms / 4 ms
Dielectric strength contact-coil (AC, 1 min)	4 kV	4 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Mechanical life	30 x 10 ⁶ switching operations	30 x 10 ⁶ switching operations
Mechanical life at max. load (resistance)	1 x 10 ⁵ switching operations	1 x 10 ⁵ switching operations
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C

Accessories

Item no.

Pack. unit

Item no.

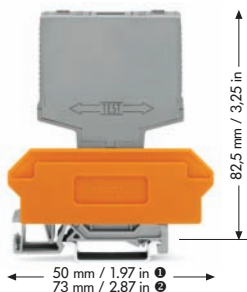
Pack. unit

Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶	17 mm / 0.669 in wide	280-619	1	17 mm / 0.669 in wide	280-619	1
with 4-conductor terminal blocks, orange separator ❷	17 mm / 0.669 in wide	280-609	1	17 mm / 0.669 in wide	280-609	1
with 4-conductor terminal blocks, marker plate ❸	20 mm / 0.787 in wide	280-763	1	20 mm / 0.787 in wide	280-763	1
wire range 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in						

1 Pluggable Modules - Relay Modules

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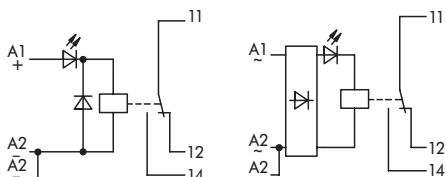
	Relay with 1 changeover contact Contact 5 µm hard gold plated	
	Module width 15 mm / 0.591 in	



WSB marker cards

- Marking K; Item No.: 209-782
- Marking 1 ... 10; Item No.: 209-702
- Marking A1, A2, A2, 11, 12, 14, A1, A2, A2;
Item No.: 209-994

5 cards, each containing 10 strips with 10 markers

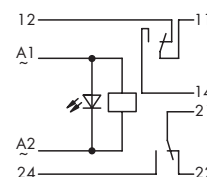
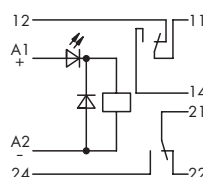
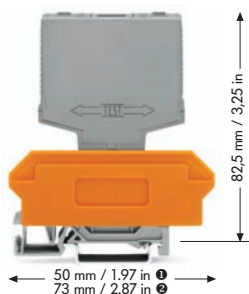


Description	V _N	I _N	Item no.	Pack. unit
Switching relay module	DC 24 V	21.8 mA	286-394	1
	DC 48 V	11.4 mA	286-395	1
	UC 24 V	21.8 mA	286-594	1

Technical Data		Accessories see page 115	
Contact material	AgNi + 5µ Au		
Max. switching voltage	DC 36 V		
Max. continuous current	1 A		
Max. switching power (resistive)	25 W / -		
Pull-in / operating power	261 mW / 533 mW		
Pull-in/drop-out/bounce time typ.	9 ms / 3 ms / 2 ms		
Dielectric strength contact-coil (AC, 1 min)	4 kV		
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3		
Mechanical life	30 x 10 ⁶ switching operations		
Mechanical life at max. load (resistance)	1 x 10 ⁵ switching operations		
Ambient operating temperature	-25 °C ... +40 °C		

Accessories	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶	17 mm / 0.669 in wide 280-619	1
with 4-conductor terminal blocks, orange separator ❷	17 mm / 0.669 in wide 280-609	1
with 4-conductor terminal blocks, marker plate ❸	20 mm / 0.787 in wide 280-763	1
wire range 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in		

	Relay with 2 changeover contacts	Relay with 2 changeover contacts
	Module width 20 mm / 0.787 in	Module width 20 mm / 0.787 in



WSB marker cards

- Marking K; Item No.: 209-782
- Marking 1 ... 10; Item No.: 209-702
- Marking 12, A1, A2, 24, 11, 14, 21, 22;
Item No.: 209-995

5 cards, each containing 10 strips with 10 markers

Description	V _N	I _N	Item no.	Pack. unit	V _N	I _N	Item no.	Pack. unit
Switching relay module	DC 5/6 V	82.8 mA	286-310	1	AC 5/6 V	174 mA	286-510	1
	DC 12 V	46.1 mA	286-311	1	AC 12 V	89 mA	286-511	1
	DC 24 V	21.8 mA	286-312	1	AC 24 V	47 mA	286-512	1
	DC 48 V	10.3 mA	286-313	1	AC 48 V	23.3 mA	286-513	1
	DC 60 V	8.8 mA	286-314	1	AC 60 V	18.1 mA	286-514	1
	DC 115 V	4.9 mA	286-315	1	AC 115 V	10.5 mA	286-515	1
	DC 230 V	5 mA	286-316	1	AC 230 V	5.5 mA	286-516	1

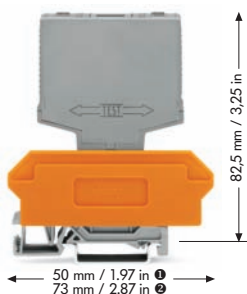
Technical Data		Accessories see page 115		Accessories see page 115	
Contact material	Ag Ni 0.15	Ag Ni 0.15		Ag Ni 0.15	
Max. switching voltage	DC 300 V / AC 250 V	DC 300 V / AC 250 V		DC 300 V / AC 250 V	
Max. make / break current	0.2 s 30 A / 10 A	0.2 s 30 A / 10 A		0.2 s 30 A / 10 A	
Max. continuous current	7 A	7 A		7 A	
Max. switching power (resistive)	210 W / 1750 VA	210 W / 1750 VA		210 W / 1750 VA	
Pull-in / operating power	600 mW / 1000 mW	0.8 VA / 1 VA		0.8 VA / 1 VA	
Pull-in/drop-out/bounce time typ.	18 ms / 3 ms / 2 ms	15 ms / 5 ms / 2 ms		15 ms / 5 ms / 2 ms	
Dielectric strength contact-coil (AC, 1 min)	4 kV	4 kV		4 kV	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3		250 V / 4 kV / 3	
Mechanical life	30 x 10 ⁷ switching operations	30 x 10 ⁷ switching operations		30 x 10 ⁷ switching operations	
Mechanical life at max. load (resistance)	2.5 x 10 ⁵ switching operations	2.5 x 10 ⁵ switching operations		2.5 x 10 ⁵ switching operations	
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C		-25 °C ... +40 °C	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶	22 mm / 0.866 in wide 280-638	1	22 mm / 0.866 in wide 280-638	1
with 4-conductor terminal blocks, orange separator ❷	22 mm / 0.866 in wide 280-628	1	22 mm / 0.866 in wide 280-628	1
with 4-conductor terminal blocks, marker plate ❸	25 mm / 0.984 in wide 280-764	1	25 mm / 0.984 in wide 280-764	1
wire range 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in				

1 Pluggable Modules - Relay Modules

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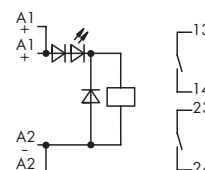
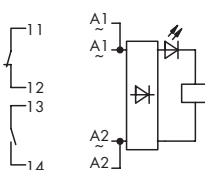
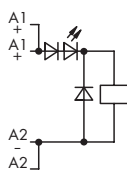
	Relay with 1 break and 1 make contact	Relay with 2 make contacts
	Module width 20 mm / 0.787 in	Module width 20 mm / 0.787 in



WSB marker cards

- Marking K; Item No.: 209-782
- Marking 1 ... 10; Item No.: 209-702
- Marking A1, A1, A2, A2, 11, 12, 13, 14, 23, 24; Item No.: 209-693

5 cards, each containing 10 strips with 10 markers

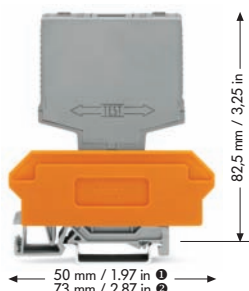


Description	V _N	I _N	Item no.	Pack. unit	V _N	I _N	Item no.	Pack. unit
Switching relay module	DC 5/6 V	47.2 mA	286-318	1	DC 5/6 V	47.2 mA	286-326	1
	DC 12 V	19.9 mA	286-319	1	DC 12 V	19.9 mA	286-327	1
	DC 24 V	7.4 mA	286-320	1	DC 24 V	7.4 mA	286-328	1
	DC 48 V	3.9 mA	286-321	1	DC 48 V	3.9 mA	286-329	1
	DC 60 V	3.9 mA	286-322	1	DC 60 V	3.9 mA	286-330	1
	DC 220 V	3.7 mA	286-324	1	DC 220 V	3.7 mA	286-332	1
	AC 24 V	8.3 mA	286-520	1				

Technical Data		Accessories see page 115		Accessories see page 115	
Contact material	Ag Sn O ₂	Ag Sn O ₂		Ag Sn O ₂	
Max. switching voltage	DC 250 V / AC 380 V	DC 250 V / AC 380 V		DC 250 V / AC 380 V	
Max. make / break current	1 s 15 A / 8 A	1 s 15 A / 8 A		1 s 15 A / 8 A	
Max. continuous current	6 A	6 A		6 A	
Max. switching power (resistive)	150 W / 2000 VA	150 W / 2000 VA		150 W / 2000 VA	
Pull-in / operating power	150 mW / 240 mW	150 mW / 240 mW		150 mW / 240 mW	
Pull-in/drop-out/bounce time typ.	10 ms / 4 ms / 1 ms	10 ms / 4 ms / 1 ms		10 ms / 4 ms / 1 ms	
Dielectric strength contact-coil (AC, 1 min)	3 kV	3 kV		3 kV	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3		250 V / 4 kV / 3	
Mechanical life	5 x 10 ⁷ switching operations	5 x 10 ⁷ switching operations		5 x 10 ⁷ switching operations	
Mechanical life at max. load (resistance)	1 x 10 ⁵ switching operations	1 x 10 ⁵ switching operations		1 x 10 ⁵ switching operations	
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C		-25 °C ... +40 °C	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶	22 mm / 0.866 in wide 280-638	1	22 mm / 0.866 in wide 280-638	1
with 4-conductor terminal blocks, orange separator ❷	22 mm / 0.866 in wide 280-628	1	22 mm / 0.866 in wide 280-628	1
with 4-conductor terminal blocks, marker plate ❸	25 mm / 0.984 in wide 280-764	1	25 mm / 0.984 in wide 280-764	1
wire range 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in				

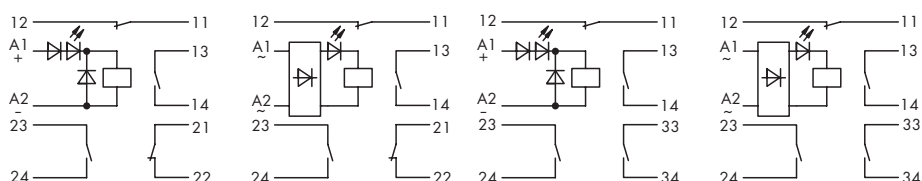
	Relay with 2 break contacts and 2 make contacts Module width 25 mm / 0.984 in	Relay with 1 break contact and 3 make contacts Module width 25 mm / 0.984 in
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WSB marker cards

- Marking K; Item No.: 209-782
- Marking 1 ... 10; Item No.: 209-702
- Marking 12, A1, A2, 23, 24, 11, 13, 14, 21, 22; Item No.: 209-691
- Marking 12, A1, A2, 23, 24, 11, 13, 14, 33, 34; Item No.: 209-690

5 cards, each containing 10 strips with 10 markers



Description	V _N	I _N	Item no.	Pack. unit	V _N	I _N	Item no.	Pack. unit
Switching relay module	DC 5/6 V	42.3 mA	286-334	1	DC 5/6 V	42.3 mA	286-342	1
	DC 12 V	22.2 mA	286-335	1	DC 12 V	22.2 mA	286-343	1
	DC 24 V	8.5 mA	286-336	1	DC 24 V	8.5 mA	286-344	1
	DC 48 V	5.7 mA	286-337	1	DC 48 V	5.7 mA	286-345	1
	DC 60 V	5.7 mA	286-338	1	DC 60 V	5.7 mA	286-346	1
	DC 115 V	6.6 mA	286-339	1	DC 115 V	6.6 mA	286-347	1
	AC 24 V	11.2 mA	286-536	1	AC 24 V	11.2 mA	286-544	1
	AC 230 V	16.2 mA	286-540	1	AC 115 V	10.6 mA	286-547	1
					AC 230 V	16.2 mA	286-547	1

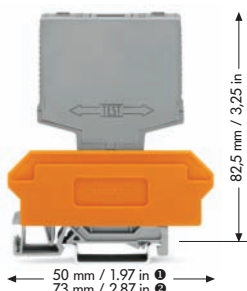
Technical Data		Accessories see page 115		Accessories see page 115	
Contact material	AuAg10 over AgNi 15	AuAg 10 over Ag Ni 15		AuAg 10 over Ag Ni 15	
Max. switching voltage	DC 250 V / AC 250 V	DC 250 V / AC 250 V		DC 250 V / AC 250 V	
Max. make / break current	20 A / 5 A	20 A / 5 A		20 A / 5 A	
Max. continuous current	5 A	5 A		5 A	
Max. switching power (resistive)	100 W / 1000 VA	100 W / 1000 VA		100 W / 1000 VA	
Pull-in / operating power	50 mW / 205 mW	50 mW / 205 mW		50 mW / 205 mW	
Pull-in/drop-out/bounce time typ.	8 ms / 5 ms / 1 ms	9 ms / 5 ms / 2 ms		9 ms / 5 ms / 2 ms	
Dielectric strength contact-coil (AC, 1 min)	1.5 kV	1.5 kV		1.5 kV	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 2.5 kV / 3	250 V / 2.5 kV / 3		250 V / 2.5 kV / 3	
Mechanical life	2 x 10 ⁸ switching operations	2 x 10 ⁸ switching operations		2 x 10 ⁸ switching operations	
Mechanical life at max. load (resistance)	1 x 10 ⁵ switching operations	1 x 10 ⁵ switching operations		1 x 10 ⁵ switching operations	
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C		-25 °C ... +40 °C	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶	27 mm / 1.063 in wide 280-639	1	27 mm / 1.063 in wide 280-639	1
with 4-conductor terminal blocks, orange separator ❷	27 mm / 1.063 in wide 280-629	1	27 mm / 1.063 in wide 280-629	1
with 4-conductor terminal blocks, marker plate ❸	30 mm / 1.181 in wide 280-765	1	30 mm / 1.181 in wide 280-765	1
wire range 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in				

1 Pluggable Modules - Relay Modules

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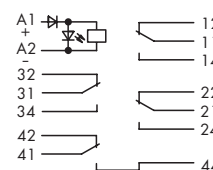
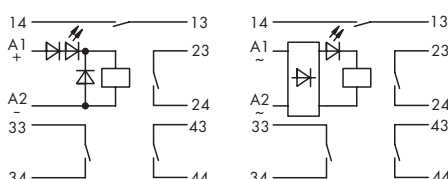
	Relay with 4 make contacts	Relay with 4 changeover contacts
	Module width 25 mm / 0.984 in	Module width 35 mm / 1.378 in



WSB marker cards

- Marking K; Item No.: 209-782
- Marking 1 ... 10; Item No.: 209-702
- Marking 14, A1, A2, 33, 34, 13, 23, 24, 43, 44; Item No.: 209-692
- Marking A1, A2, 32, 31, 34, 42, 41, 12, 11, 14; Item No.: 249-656

5 cards, each containing 10 strips with 10 markers



Description	V _N	I _N	Item no.	Pack. unit	V _N	I _N	Item no.	Pack. unit
Switching relay module	DC 5/6 V	42.3 mA	286-350	1	DC 24 V	32 mA	286-375	1
	DC 12 V	22.2 mA	286-351	1	AC 110/120 V	9.2 mA	286-578	1
	DC 24 V	8.5 mA	286-352	1	AC 230 V	9.9 mA	286-579	1
	DC 48 V	5.7 mA	286-353	1				
	DC 60 V	5.7 mA	286-354	1				
	DC 115 V	6.6 mA	286-355	1				
	AC 24 V	11.2 mA	286-552	1				
	AC 115 V	10.6 mA	286-555	1				
	AC 230 V	16.2 mA	286-556	1				

Technical Data

Accessories see page 115

Accessories see page 115

Contact material	Au Ag 10 over Ag Ni 15	Ag Cd O
Max. switching voltage	DC 250 V / AC 250 V	DC 60 V / AC 250 V
Max. make / break current	20 A / 5 A	2 A / 4 A
Max. continuous current	5 A	AC/DC 4 A
Max. switching power (resistive)	100 W / 1000 VA	60 W / 1000 VA
Pull-in / operating power	50 mW / 205 mW	500 mW / 770 mW
Pull-in/drop-out/bounce time typ.	10 ms / 5 ms / 2 ms	6 ms / 7 ms / 2 ms
Dielectric strength contact-coil (AC, 1 min)	1.5 kV	1.5 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 2.5 kV / 3	250 V / 1.5 kV / 3
Mechanical life	2 x 10 ⁸ switching operations	5 x 10 ⁷ switching operations
Mechanical life at max. load (resistance)	1 x 10 ⁵ switching operations	1 x 10 ⁵ switching operations
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C

Accessories

Item no.

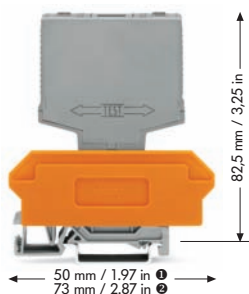
Pack. unit

Item no.

Pack. unit

Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ①	27 mm / 1.063 in wide	280-639	1		
with 4-conductor terminal blocks, orange separator ②	27 mm / 1.063 in wide	280-629	1	37 mm / 1.457 in wide	280-636 1
with 4-conductor terminal blocks, marker plate ③	30 mm / 1.181 in wide	280-765	1		
wire range 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in					

	Relay with 1 make contact for higher DC loads	Relay with 2 changeover contacts Contacts 5 µm Au
	Module width 15 mm / 0.591 in	Module width 20 mm / 0.787 in

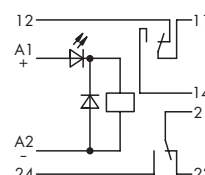
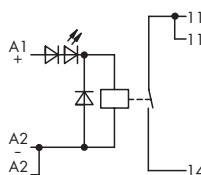


* In order to prevent the gold layer from being damaged these values should not be exceeded. Higher switching power leads to evaporation of the gold layer. The resulting deposits in the enclosure may cause sparkovers between the coil and the contact.

WSB marker cards

- Marking K; Item No.: 209-782
- Marking 1 ... 10; Item No.: 209-702
- Marking 12, A1, A2, 24, 11, 14, 21, 22; Item No.: 209-995

5 cards, each containing 10 strips with 10 markers



Description	V _N	I _N	Item no.	Pack. unit	V _N	I _N	Item no.	Pack. unit
Switching relay module	DC 24 V	20 mA	286-376	1	DC 24 V	19.4 mA	286-384	1

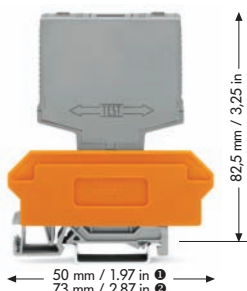
Technical Data		Accessories see page 115		Accessories see page 115	
Contact material	AgNi 0.15	AgCdO + 5 µm Au			
Max. switching voltage	DC 250 V / AC 250 V	DC 36 V *			
max. make current (resistive)	4 s 14 A				
max. break current DC 250 V	0.6 A / 1.7 A / 5 A				
Recommended minimum load	> 12 V / AC/DC 10 mA				
Max. switching frequency with load / without load	10 min ⁻¹ / 1200 min ⁻¹				
Max. continuous current	5 A	50 mA *			
Max. switching power (resistive)	2000 VA				
max. switching power DC 250V	150 W187 W300 W				
Pull-in / operating power	480 mW	500 mW			
Pull-in/drop-out/bounce time typ.	9 ms / 3 ms / 5 ms	9 ms / 3 ms / 3 ms			
Dielectric strength contact-coil (AC, 1 min)	4 kV	4 kV			
Open circuit	2 kV	1 kV			
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3			
Mechanical life	20 x 10 ⁶ switching operations	1 x 10 ⁷ switching operations			
Mechanical life at max. load (resistance)	2 x 10 ⁵ switching operations AC 3 x 10 ⁵ Schaltspiele	1 x 10 ⁵ switching operations			
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C			
Approvals	DIN VDE 01110/1.89 / DIN VDE 0160 and IEC 60255 / DIN VDE 0435 (corresponding parts)				

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶	17 mm / 0.669 in wide 280-619	1	22 mm / 0.866 in wide 280-638	1
with 4-conductor terminal blocks, orange separator ❷	17 mm / 0.669 in wide 280-609	1	22 mm / 0.866 in wide 280-628	1
with 4-conductor terminal blocks, marker plate ❸	20 mm / 0.787 in wide 280-763	1	25 mm / 0.984 in wide 280-764	1
wire range 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in				

1 Pluggable Modules - Relay Modules

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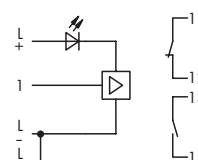
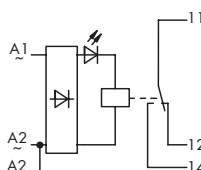
	Switching relay with specified switching threshold: $V_{on} 180 V \pm 10 \%$ $V_{off} 150 V \pm 10 \%$; 1 changeover contact	Low power ($\geq 7 mW$) relay module Low power drive relay (0.3 mA) through amplifier $V_{cc} = DC 24 V$ 1 break and 1 make contact
	Module width 15 mm / 0.591 in	Module width 20 mm / 0.787 in



WSB marker cards

- Marking K; Item No.: 209-782
- Marking 1 ... 10; Item No.: 209-702
- Marking A1, A2, A2, 11, 12, 14, A1, A2, A2; Item No.: 209-994
- Marking L+, 1, L-, L-, 11, 12, 13, 14; Item No.: 209-954

5 cards, each containing 10 strips with 10 markers

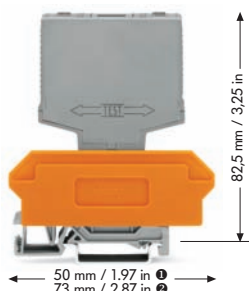


Description	V_N	I_N	Item no.	Pack. unit	V_N	I_N	Item no.	Pack. unit
Switching relay module	AC 230 V	4 mA	286-904	1	DC 24 V	10 mA	286-906	1

Technical Data	Accessories see page 115			Accessories see page 115		
Contact material	AgCdO			AgCdO, with gold flash		
Max. switching voltage	DC 250 V / AC 380 V			DC 250 V / AC 380 V		
Max. make / break current	4 s 25 A / 18 A			1 s 15 A / 8 A		
Max. continuous current	5 A			6 A		
Max. switching power (resistive)	90 W / 1900 VA			150 W / 2000 VA		
Pull-in / operating power	0.8 VA / 1 VA			150 mW / 240 mW		
Pull-in/drop-out/bounce time typ.	10 ms / 5 ms / 5 ms			10 ms / 4 ms / 1 ms		
Dielectric strength contact-coil (AC, 1 min)	4 kV			3 kV		
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3			250 V / 4 kV / 3		
Mechanical life	5×10^7 switching operations			5×10^7 switching operations		
Mechanical life at max. load (resistance)	1×10^5 switching operations			1×10^5 switching operations		
Ambient operating temperature	-25 °C ... +40 °C			-25 °C ... +40 °C		
Turn-on threshold relay / status indication	180 V $\pm 10 \%$ / 122 V $\pm 10 \%$					
Turn-off threshold relay / status indication	150 V $\pm 10 \%$ / 113 V $\pm 10 \%$					
Control voltage output 0				DC -2 V ... 3 V		
Control voltage output 1				DC 8 V ... 30 V		

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ①	17 mm / 0.669 in wide 280-619	1	22 mm / 0.866 in wide 280-638	1
with 4-conductor terminal blocks, orange separator ②	17 mm / 0.669 in wide 280-609	1	22 mm / 0.866 in wide 280-628	1
with 4-conductor terminal blocks, marker plate ③	20 mm / 0.787 in wide 280-763	1	25 mm / 0.984 in wide 280-764	1
wire range 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in				

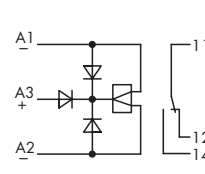
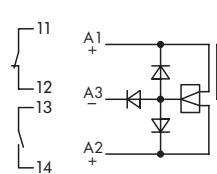
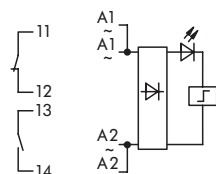
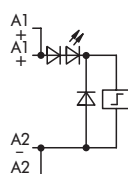
	Latching relay with 1 break contact and 1 make contact Module width 20 mm / 0.787 in	Bistable relay with 1 changeover contact positive switching negative switching Module width 15 mm / 0.591 in
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WSB marker cards

- Marking K; Item No.: 209-782
- Marking 1 ... 10; Item No.: 209-702
- Marking A1, A1, A2, A2, 11, 12, 13, 14, 23, 24; Item No.: 209-693
- Marking A1, A3, A2, 11, 12, 14; Item No.: 249-607

5 cards, each containing 10 strips with 10 markers



Description	V _N	I _N	Item no.	Pack. unit	V _N	I _N	Item no.	Pack. unit
Switching relay module	DC 24 V	20.9 mA	286-571	1	DC 24 V	41.5 mA	286-380	1
	AC 230 V	20.9 mA	286-570	1	DC 24 V	41.5 mA	286-381	1

Technical Data

Accessories see page 115

Accessories see page 115

Contact material	AuAg10 over AgNi 15	AgNi 0.15 + HV
Max. switching voltage	DC 30 V / AC 250 V	DC 250 V / AC 250 V
Max. make / break current	20 A / 5 A	20 A / 8 A
Max. continuous current	5 A	6 A
Max. switching power (resistive)	100 W / 1000 VA	192 W / 1500 VA
Pull-in / operating power	50 mW / 205 mW	261 mW / 533 mW
Pull-in/drop-out/bounce time typ.	8 ms / 5 ms / 1 ms	9 ms / 3 ms / 2 ms
Dielectric strength contact-coil (AC, 1 min)	1.5 kV	4 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Mechanical life	2 x 10 ⁸ switching operations	30 x 10 ⁶ switching operations
Mechanical life at max. load (resistance)	1 x 10 ⁵ switching operations	1 x 10 ⁵ switching operations
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C

Accessories

Item no.

Pack. unit

Item no.

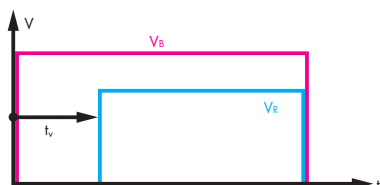
Pack. unit

Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶	22 mm / 0.866 in wide	280-638	1	17 mm / 0.669 in wide	280-619	1
with 4-conductor terminal blocks, orange separator ❷	22 mm / 0.866 in wide	280-628	1	17 mm / 0.669 in wide	280-609	1
with 4-conductor terminal blocks, marker plate ❸	25 mm / 0.984 in wide	280-764	1	20 mm / 0.787 in wide	280-763	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in						

1 Pluggable Modules - Time Relay Modules

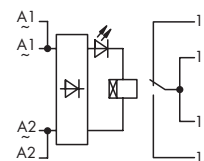
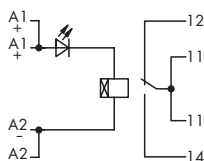
80

	On-delay timing 1 changeover contact specified time acc. to IEC 255, part 1	On-delay timing 1 changeover contact specified time acc. to IEC 255, part 1
	Module width 20 mm / 0.787 in	Module width 20 mm / 0.787 in



V_B = operating voltage; V_{si} = control voltage;
 V_R = voltage on relay; t_v = delay time

On-delay time relay
 V_B on A1+ and A2- applied: relay stays in rest position
 delay time t_v is over: relay switches to working condition
 WSB marker cards
 • Marking K; Item No.: 209-782
 • Marking 1 ... 10; Item No.: 209-702
 • Marking A1, A1, A2, A2, 12, 11, 11, 14;
 Item No.: 209-996
 5 cards, each containing 10 strips with 10 markers



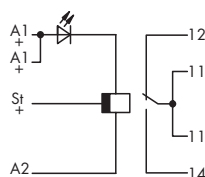
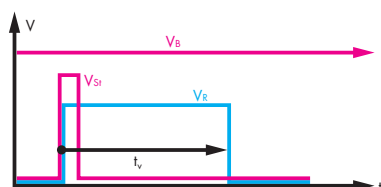
Description	Time range	Item no.	Pack. unit	Time range	Item no.	Pack. unit
Time relay module	0.1 - 1 s	286-600	1	0.1 - 1 s	286-610	1
	1 - 10 s	286-602	1	1 - 10 s	286-612	1
	10 - 100 s	286-604	1	10 - 100 s	286-614	1

Technical Data		Accessories see page 115		Accessories see page 115	
Nominal input voltage (V_{Ni})	DC 24 V			AC 230 V	
Current input at rated voltage (coil 20 °C)	12.5 mA			14.4 mA	
Contact material	AgCdO, with gold flash			AgCdO, with gold flash	
Max. switching voltage	DC 250 V / AC 380 V			DC 250 V / AC 380 V	
Max. make / break current	1 s 15 A / 8 A			1 s 15 A / 8 A	
Max. continuous current	6 A			6 A	
Max. switching power (resistive)	150 W / 2000 VA			150 W / 2000 VA	
Operating power	300 mW			3.3 VA	
Pull-in/drop-out/bounce time typ.	- / 15 ms / 1 ms			- / 15 ms / 1 ms	
Reset time	100 ms			100 ms	
Repeat accuracy	±0.5 %			±0.5 %	
Dielectric strength contact-coil (AC, 1 min)	3 kV			3 kV	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3			250 V / 4 kV / 3	
Mechanical life	5 x 10 ⁷ switching operations			5 x 10 ⁷ switching operations	
Mechanical life at max. load (resistance)	1 x 10 ⁵ switching operations			1 x 10 ⁵ switching operations	
Ambient operating temperature	-25 °C ... +40 °C			-25 °C ... +40 °C	
Dimensions (mm) L x H x W incl. terminal block	22 x 82.5 x 50 or 73			22 x 82.5 x 50 or 73	
	Height from upper-edge of DIN 35 rail			Height from upper-edge of DIN 35 rail	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ①	22 mm / 0.866 in wide 280-638	1	22 mm / 0.866 in wide 280-638	1
with 4-conductor terminal blocks, orange separator ②	22 mm / 0.866 in wide 280-628	1	22 mm / 0.866 in wide 280-628	1
with 4-conductor terminal blocks, marker plate ③	25 mm / 0.984 in wide 280-764	1	25 mm / 0.984 in wide 280-764	1
wire range 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in				

**Pulse lengthening, with trigger voltage 1
changeover contact**

Module width 20 mm / 0.787 in



V_B = operating voltage; V_{St} = control voltage;

V_R = voltage on relay; t_v = delay time

Pulse lengthening time relay, with auxiliary voltage

V_B on A1+ and A2- applied: relay stays in rest position; V_{St} - pulse on St+: relay switches to working condition and switches off after t_v is over.

WSB marker cards

- Marking K; Item No.: 209-782
- Marking 1 ... 10; Item No.: 209-702
- Marking A1, A1, St, A2, A2, 12, 11, 11, 14; Item No.: 209-601

5 cards, each containing 10 strips with 10 markers

Description	Time range	Item no.	Pack. unit
Time relay module	0.1 - 1 s	286-426	1
	1 - 10 s	286-427	1
	10 - 100 s	286-428	1

Technical Data

Accessories see page 115

Nominal input voltage (V_N)	DC 24 V
Current input at rated voltage (coil 20 °C)	15.0 mA
Contact material	AgCdO, with gold flash
Max. switching voltage	DC 250 V / AC 380 V
Max. make / break current	1 s 15 A / 8 A
Max. continuous current	6 A
Max. switching power (resistive)	150 W / 2000 VA
Operating power	360 mW
Pull-in/drop-out/bounce time typ.	10 ms / - / 1 ms
Trigger voltage	DC 24 V
Reset time	100 ms
Repeat accuracy	±0.5 %
Dielectric strength contact-coil (AC, 1 min)	3 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3
Mechanical life	5 x 10 ⁷ switching operations
Mechanical life at max. load (resistance)	1 x 10 ⁵ switching operations
Ambient operating temperature	-25 °C ... +40 °C
Dimensions (mm) L x H x W incl. terminal block	22 x 82.5 x 50 or 73
	Height from upper-edge of DIN 35 rail

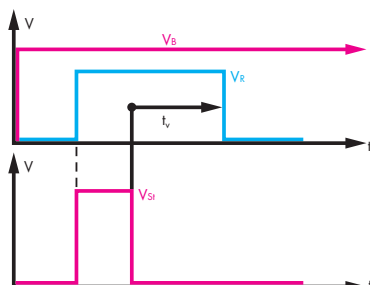
Accessories

	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶	22 mm / 0.866 in wide 280-638	1
with 4-conductor terminal blocks, orange separator ❷	22 mm / 0.866 in wide 280-628	1
with 4-conductor terminal blocks, marker plate ❸	25 mm / 0.984 in wide 280-764	1
wire range 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in		

1 Pluggable Modules - Time Relay Modules

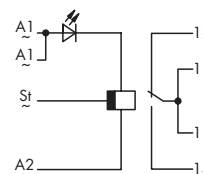
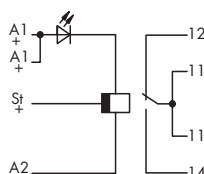
82

	Off-delay timing with trigger voltage 1 changeover contact specified time acc. to IEC 255, part 1	Off-delay timing with trigger voltage 1 changeover contact specified time acc. to IEC 255, part 1
	Module width 20 mm / 0.787 in	Module width 20 mm / 0.787 in



V_B = operating voltage; V_{St} = control voltage;
 V_R = voltage on relay; t_d = delay time

Off-delay time relay with auxiliary voltage
 V_B on A1+ and A2- applied: relay stays in rest position;
 V_{St} on St+ applied: relay switches to working condition
 V_{St} interrupted: t_d is activated; t_d is over: relay switches off
 WSB marker cards
 • Marking K; Item No.: 209-782
 • Marking 1 ... 10; Item No.: 209-702
 • Marking A1, A1, St, A2, A2, 12, 11, 11, 14;
 Item No.: 209-601
 5 cards, each containing 10 strips with 10 markers

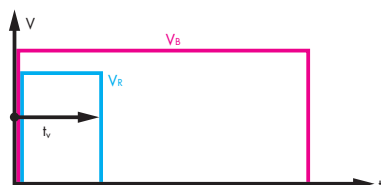


Description	Time range	Item no.	Pack. unit	Time range	Item no.	Pack. unit
Time relay module	0.1 - 1 s	286-440	1	0.1 - 1 s	286-446	1
	1 - 10 s	286-442	1	1 - 10 s	286-448	1
	10 - 100 s	286-444	1	10 - 100 s	286-450	1

Technical Data		Accessories see page 115		Accessories see page 115	
Nominal input voltage (V_N)	DC 24 V	AC 230 V		AC 230 V	
Current input at rated voltage (coil 20 °C)	16.0 mA	16.8 mA		16.8 mA	
Contact material	Ag-Leg., with gold flash	Ag-Leg., with gold flash		Ag-Leg., with gold flash	
Max. switching voltage	DC 250 V / AC 250 V	DC 250 V / AC 250 V		DC 250 V / AC 250 V	
Max. make / break current	26 A / 5 A	26 A / 5 A		26 A / 5 A	
Max. continuous current	5 A	5 A		5 A	
Max. switching power (resistive)	100 W / 1250 VA	100 W / 1250 VA		100 W / 1250 VA	
Operating power	400 mW	3.7 VA		3.7 VA	
Pull-in/drop-out/bounce time typ.	15 ms / - / 2 ms	15 ms / - / 2 ms		15 ms / - / 2 ms	
Trigger voltage	DC 24 V	AC 230 V		AC 230 V	
Reset time	15 ms	15 ms		15 ms	
Repeat accuracy	±0.5 %	±0.5 %		±0.5 %	
Dielectric strength contact-coil (AC, 1 min)	2 kV	2 kV		2 kV	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 2.5 kV / 3	250 V / 2.5 kV / 3		250 V / 2.5 kV / 3	
Mechanical life	5 x 10 ⁷ switching operations	5 x 10 ⁷ switching operations		5 x 10 ⁷ switching operations	
Mechanical life at max. load (resistance)	1 x 10 ⁵ switching operations	1 x 10 ⁵ switching operations		1 x 10 ⁵ switching operations	
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C		-25 °C ... +40 °C	
Dimensions (mm) L x H x W incl. terminal block	22 x 82.5 x 50 or 73	22 x 82.5 x 50 or 73		22 x 82.5 x 50 or 73	
	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail		Height from upper-edge of DIN 35 rail	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ① with 4-conductor terminal blocks, orange separator ② with 4-conductor terminal blocks, marker plate ③ wire range 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in	22 mm / 0.866 in wide	280-638	1	22 mm / 0.866 in wide
	22 mm / 0.866 in wide	280-628	1	22 mm / 0.866 in wide
	25 mm / 0.984 in wide	280-764	1	25 mm / 0.984 in wide
	25 mm / 0.984 in wide	280-764	1	25 mm / 0.984 in wide

	Pulse time delay relay 1 changeover contact specified time acc. to IEC 255, part 1	Pulse time delay relay 1 changeover contact specified time acc. to IEC 255, part 1
	Module width 20 mm / 0.787 in	Module width 20 mm / 0.787 in



V_B = operating voltage; V_{St} = control voltage; V_K = voltage on relay; t_v = delay time

Pulse time delay relay

V_B on A1+ and A2- applied: relay switches to working condition;

t_v is over: relay switches off

WSB marker cards

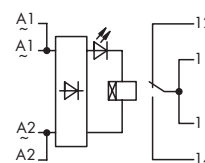
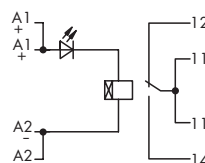
• Marking K; Item No.: 209-782

• Marking 1 ... 10; Item No.: 209-702

• Marking A1, A1, A2, A2, 12, 11, 11, 14;

Item No.: 209-996

5 cards, each containing 10 strips with 10 markers



Description	Time range	Item no.	Pack. unit	Time range	Item no.	Pack. unit
Time relay module	0.1 - 1 s	286-460	1	0.1 - 1 s	286-470	1
	1 - 10 s	286-462	1	1 - 10 s	286-472	1
	10 - 100 s	286-464	1	10 - 100 s	286-474	1

Technical Data		Accessories see page 115		Accessories see page 115	
Nominal input voltage (V_N)	DC 24 V			AC 230 V	
Current input at rated voltage (coil 20 °C)	37.8 mA			39.7 mA	
Contact material	AgCdO, with gold flash			AgCdO, with gold flash	
Max. switching voltage	DC 250 V / AC 380 V			DC 250 V / AC 380 V	
Max. make / break current	1 s 15 A / 8 A			1 s 15 A / 8 A	
Max. continuous current	6 A			6 A	
Max. switching power (resistive)	150 W / 2000 VA			150 W / 2000 VA	
Operating power	910 mW			10 VA	
Pull-in/drop-out/bounce time typ.	15 ms / - / 1 ms			15 ms / - / 1 ms	
Reset time	100 ms			100 ms	
Repeat accuracy	±0.5 %			±0.5 %	
Dielectric strength contact-coil (AC, 1 min)	3 kV			3 kV	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 2.5 kV / 3			250 V / 2.5 kV / 3	
Mechanical life	5 x 10 ⁷ switching operations			5 x 10 ⁷ switching operations	
Mechanical life at max. load (resistance)	1 x 10 ⁵ switching operations			1 x 10 ⁵ switching operations	
Ambient operating temperature	-25 °C ... +40 °C			-25 °C ... +40 °C	
Dimensions (mm) L x H x W incl. terminal block	22 x 82.5 x 50 or 73			22 x 82.5 x 50 or 73	
	Height from upper-edge of DIN 35 rail			Height from upper-edge of DIN 35 rail	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶	22 mm / 0.866 in wide 280-638	1	22 mm / 0.866 in wide 280-638	1
with 4-conductor terminal blocks, orange separator ❷	22 mm / 0.866 in wide 280-628	1	22 mm / 0.866 in wide 280-628	1
with 4-conductor terminal blocks, marker plate ❸	25 mm / 0.984 in wide 280-764	1	25 mm / 0.984 in wide 280-764	1
wire range 0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in				

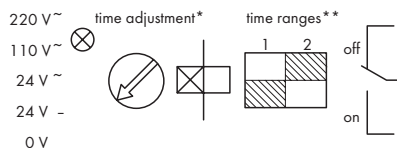
1 Pluggable Modules - Time Relay Modules

84

**Multirange timing relay,
on-delay 4 selectable time ranges,
4 voltage ranges
1 changeover contact**

Module width 25 mm / 0.984 in

Time range	0.3-3s	3-12s	10-100s	100-800s	Switch
Switch-position	OFF	ON	ON	OFF	1
	ON	OFF	OFF	ON	2



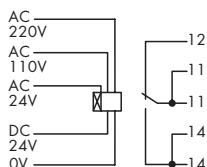
* with trimming potentiometer; ** DIL switch

Within these time ranges, time adjustment can be made with the timing potentiometer.

WSB marker cards

- Marking K; Item No.: 209-782
- Marking 1 ... 10; Item No.: 209-702
- Marking U1, U2, U3, U4, 0V, 12, 11, 14, 14; Item No.: 209-951

5 cards, each containing 10 strips with 10 markers



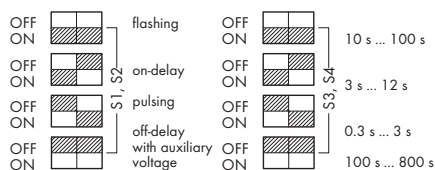
Description	Item no.	Pack. unit
Multirange timing relay module; on-delay, 4 voltage ranges AC 230 V, AC 115 V, AC 24 V, DC 24 V; 0.3 s ... 3 s, 3 s ... 12 s, 10 s ... 100 s, 100 s ... 800 s Time ranges selectable with DIL switch	286-616	1

Technical Data	Accessories see page 115	
Nominal input voltage (V _N)	AC 230 V, AC 115 V, AC 24 V, DC 24 V	
Current input at rated voltage (coil 20 °C)	30.4 mA, 32.6 mA, 20.2 mA, 17.5 mA	
Contact material	AgNi with gold flash	
Max. switching voltage	DC 30 V / AC 240 V	
Max. make / break current	5 A / 5 A	
Max. continuous current	5 A	
Max. switching power (resistive)	120 W / 600 VA	
Pull-in/drop-out/bounce time typ.	- / 15 ms / 3 ms	
Reset time	100 ms	
Repeat accuracy	±0.5 %	
Dielectric strength contact-coil (AC, 1 min)	2 kV	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	
Mechanical life	2 x 10 ⁷ switching operations	
Mechanical life at max. load (resistance)	1 x 10 ⁵ switching operations	
Ambient operating temperature	-25 °C ... +40 °C	
Dimensions (mm) L x H x W incl. terminal block	27 x 82.5 x 50 or 73	
	Height from upper-edge of DIN 35 rail	

Accessories	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ①	27 mm / 1.063 in wide 280-639	1
with 4-conductor terminal blocks, orange separator ②	27 mm / 1.063 in wide 280-629	1
with 4-conductor terminal blocks, marker plate ③	30 mm / 1.181 in wide 280-765	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in		

**Multifunction timing relay,
4 selectable time ranges,
4 functions
1 changeover contact**

Module width 20 mm / 0.787 in



Switch position / Function	Switch position / Time range
S1	S2
OFF	OFF
OFF	ON
ON	OFF
ON	ON
OFF	OFF
OFF	ON
ON	OFF
ON	ON
OFF	OFF
OFF	ON
ON	OFF
ON	ON



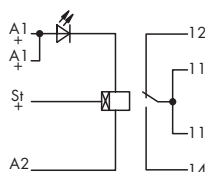
Fine adjustment of time within these time ranges can be made with the trimming potentiometer.

St+ will only be connected for the function „off-delay“ with auxiliary voltage.

WSB marker cards

- Marking K; Item No.: 209-782
- Marking 1 ... 10; Item No.: 209-702
- Marking A1, A1, St, A2, A2, 12, 11, 11, 14; Item No.: 209-601

5 cards, each containing 10 strips with 10 markers



Description	Item no.	Pack. unit
Multifunction timing relay module; on-delay, off-delay with auxiliary voltage, pulsing in make position, flashing; input voltage DC 24 V; 0.3 s ... 3 s, 3 s ... 12 s, 10 s ... 100 s, 100 s ... 800 s	286-640	1
Function and timing range are selected with a DIL switch		

Technical Data

Accessories see page 115

Nominal input voltage (V _N)	DC 24 V
Current input at rated voltage (coil 20 °C)	24 mA
Contact material	Ag-Leg., with gold flash
Max. switching voltage	DC 300 V / AC 440 V
Max. make / break current	26 A / 5 A
Max. continuous current	5 A
Max. switching power (resistive)	150 W / 1250 VA
Pull-in/drop-out/bounce time typ.	- / - / 2 ms
Trigger voltage	DC 24 V
Reset time	100 ms
Repeat accuracy	±1 %
Dielectric strength contact-coil (AC, 1 min)	3 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3
Mechanical life	1.5 x 10 ⁷ switching operations
Mechanical life at max. load (resistance)	1 x 10 ⁵ switching operations
Ambient operating temperature	-25 °C ... +40 °C
Dimensions (mm) L x H x W incl. terminal block	22 x 82.5 x 50 or 73
	Height from upper-edge of DIN 35 rail

Accessories

Item no.

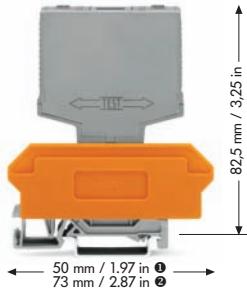
Pack. unit

Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶	22 mm / 0.866 in wide	280-638	1
with 4-conductor terminal blocks, orange separator ❷	22 mm / 0.866 in wide	280-628	1
with 4-conductor terminal blocks, marker plate ❸	25 mm / 0.984 in wide	280-764	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in			

1 Pluggable Modules - Optocoupler Modules

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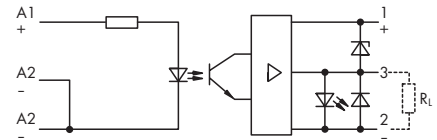
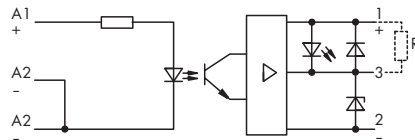
	Optocoupler Input DC 24 V Output DC 5 V/500 mA DC 15 V/500 mA DC 24 V/500 mA negative switching Module width 15 mm / 0.591 in	Optocoupler Input DC 24 V Output DC 5 V/500 mA DC 15 V/500 mA DC 24 V/500 mA positive switching Module width 15 mm / 0.591 in
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WSB marker cards

- Marking U; Item No.: 209-789
- Marking 1 ... 10; Item No.: 209-702
- Marking A1, A2, A2, 1, 3, 2, A1, A2, A2;
Item No.: 209-685

5 cards, each containing 10 strips with 10 markers

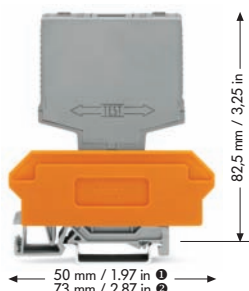


Description	Output	Item no.	Pack. unit	Output	Item no.	Pack. unit
Optocoupler module	DC 5 V (DC 3 V ... 6 V)	286-700	1	DC 5 V (DC 3 V ... 6 V)	286-750	1
	DC 15 V (DC 10 V ... 20 V)	286-701	1	DC 15 V (DC 10 V ... 20 V)	286-751	1
	DC 24 V (DC 20 V ... 30 V)	286-702	1	DC 24 V (DC 20 V ... 30 V)	286-752	1

Technical Data		Accessories see page 115		Accessories see page 115	
Nominal input voltage (V _N)	DC 24 V			DC 24 V	
Input voltage range	DC 12 V ... 30 V			DC 12 V ... 30 V	
Input current range	DC 5 mA ... 20 mA			DC 5 mA ... 20 mA	
Current at nominal voltage	DC 15 mA			DC 15 mA	
Reverse voltage transistor / Triac	DC 80 V			DC 80 V	
Max. permissible continuous current	500 mA			500 mA	
Switch on / Switch off time	< 5 µs / < 15 µs			< 7 µs / < 15 µs	
Max. operating frequency	25 kHz			25 kHz	
Leakage current at nominal voltage	2.5 µA			2.5 µA	
Collector / emitter voltage drop V _{ce sat}	≤ 1.2 V			≤ 1.2 V	
Max. output (reverse current)	5 mA; 10 mA; 13 mA			5 mA; 10 mA; 12 mA	
Test voltage input / output	2.5 kV			2.5 kV	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3			250 V / 4 kV / 3	
Ambient operating temperature	-25 °C ... +40 °C			-25 °C ... +40 °C	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶	17 mm / 0.669 in wide	280-619	1	17 mm / 0.669 in wide
	17 mm / 0.669 in wide	280-609	1	17 mm / 0.669 in wide
	20 mm / 0.787 in wide	280-763	1	20 mm / 0.787 in wide
with 4-conductor terminal blocks, marker plate ❷				
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in				

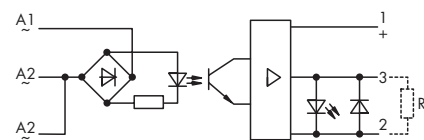
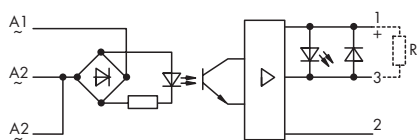
	Optocoupler Input AC 230 V Output DC 5 V/500 mA DC 15 V/500 mA DC 24 V/500 mA negative switching Module width 15 mm / 0.591 in	Optocoupler Input AC 230 V Output DC 5 V/500 mA DC 15 V/500 mA DC 24 V/500 mA positive switching Module width 15 mm / 0.591 in
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WSB marker cards

- Marking U; Item No.: 209-789
- Marking 1 ... 10; Item No.: 209-702
- Marking A1, A2, A2, 1, 3, 2, A1, A2, A2;
Item No.: 209-685

5 cards, each containing 10 strips with 10 markers



Description	Output	Item no.	Pack. unit	Output	Item no.	Pack. unit
Optocoupler module	DC 5 V (DC 3.5 V ... 7 V)	286-704	1	DC 5 V (DC 3.5 V ... 7 V)	286-754	1
	DC 15 V (DC 10 V ... 20 V)	286-706	1	DC 15 V (DC 10 V ... 20 V)	286-756	1
	DC 24 V (DC 20 V ... 30 V)	286-708	1	DC 24 V (DC 20 V ... 30 V)	286-758	1

Technical Data

Accessories see page 115

Accessories see page 115

Nominal input voltage (V _N)	AC 230 V	AC 230 V
Input voltage range	AC 40 V ... 250 V	AC 40 V ... 250 V
Input current range	AC 0.2 mA ... 2.9 mA	AC 0.2 mA ... 2.9 mA
Current at nominal voltage	AC 2.6 mA	AC 2.6 mA
Reverse voltage transistor / Triac	DC 80 V	DC 80 V
Max. permissible continuous current	500 mA	500 mA
Switch on / Switch off time	< 10 ms / < 50 ms	< 10 ms / < 40 ms
Leakage current at nominal voltage	2.5 µA	2.5 µA
Collector / emitter voltage drop V _{ce sat}	≤ 1.2 V	≤ 1.2 V
Max. output (reverse current)	5 mA; 6 mA; 5 mA	5 mA; 7.5 mA; 7.5 mA
Test voltage input / output	2.5 kV	2.5 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C

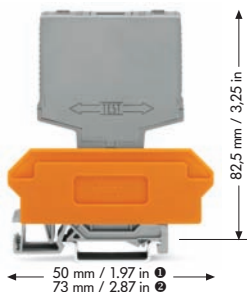
Accessories

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules,				
with 2-conductor terminal blocks, orange separator ❶	17 mm / 0.669 in wide 280-619	1	17 mm / 0.669 in wide 280-619	1
with 4-conductor terminal blocks, orange separator ❷	17 mm / 0.669 in wide 280-609	1	17 mm / 0.669 in wide 280-609	1
with 4-conductor terminal blocks, marker plate ❸	20 mm / 0.787 in wide 280-763	1	20 mm / 0.787 in wide 280-763	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14;				
stripped length 8 ... 9 mm / 0.33 in				

1 Pluggable Modules - Optocoupler Modules

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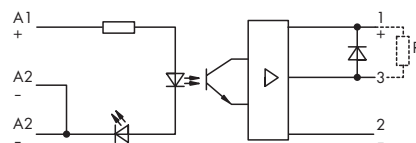
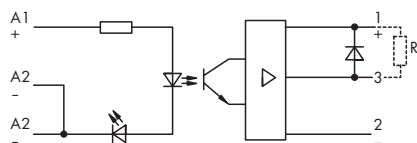
	Optocoupler Input DC 24 V Output DC 24 V/2 A negative switching	Optocoupler Input DC 24 V Output DC 24 V/5 A negative switching
	Module width 15 mm / 0.591 in	Module width 15 mm / 0.591 in



WSB marker cards

- Marking U; Item No.: 209-789
- Marking 1 ... 10; Item No.: 209-702
- Marking A1, A2, A2, 1, 3, 2, A1, A2, A2;
Item No.: 209-685

5 cards, each containing 10 strips with 10 markers



Description	Item no.	Pack. unit	Item no.	Pack. unit
Optocoupler module	286-720	1	286-721	1

Technical Data	Accessories see page 115		Accessories see page 115	
Nominal input voltage (V_N)	DC 24 V		DC 24 V	
Input voltage range	DC 15 V ... 30 V		DC 15 V ... 30 V	
Input current range	DC 7.5 mA ... 18 mA		DC 7.5 mA ... 18 mA	
Current at nominal voltage	DC 13.5 mA		DC 13.5 mA	
Output nominal voltage	DC 24 V		DC 24 V	
Output voltage range	DC 15 V ... 40 V		DC 15 V ... 40 V	
Reverse voltage transistor / Triac	DC 50 V		DC 50 V	
Max. permissible continuous current	2 A		5 A	
Switch on / Switch off time	< 15 μ s / < 40 μ s		< 20 μ s / < 80 μ s	
Max. operating frequency	1 kHz		1 kHz	
Leakage current at nominal voltage	2.5 μ A		2.5 μ A	
Collector / emitter voltage drop $V_{ce sat}$	≤ 0.5 V		≤ 0.5 V	
Test voltage input / output	2.5 kV		2.5 kV	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3		250 V / 4 kV / 3	
Ambient operating temperature	-25 °C ... +40 °C		-25 °C ... +40 °C	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules,				
with 2-conductor terminal blocks, orange separator ①	17 mm / 0.669 in wide 280-619	1	17 mm / 0.669 in wide 280-619	1
with 4-conductor terminal blocks, orange separator ②	17 mm / 0.669 in wide 280-609	1	17 mm / 0.669 in wide 280-609	1
with 4-conductor terminal blocks, marker plate ③	20 mm / 0.787 in wide 280-763	1	20 mm / 0.787 in wide 280-763	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14;				
stripped length 8 ... 9 mm / 0.33 in				

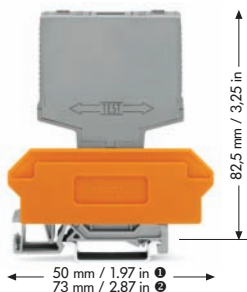
Accessories see page 115

Pack.
unit

1 Pluggable Modules - Optocoupler Modules

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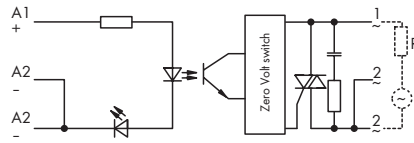
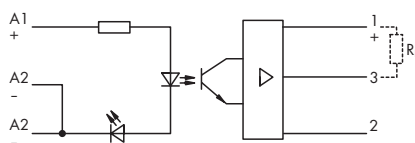
	Optocoupler Input DC 5 V DC 12 V DC 24 V Output DC 110 V/1.6 A negative switching	Optocoupler Input DC 5 V DC 12 V DC 24 V Output AC 230 V/50 mA ... 1 A
	Module width 15 mm / 0.591 in	Module width 15 mm / 0.591 in



WSB marker cards

- Marking U; Item No.: 209-789
- Marking 1 ... 10; Item No.: 209-702
- Marking A1, A2, A2, 1, 3, 2, A1, A2, A2;
Item No.: 209-685
- Marking A1, A2, A2, 1, 2, 2, A1, A2, A2;
Item No.: 209-686

5 cards, each containing 10 strips with 10 markers

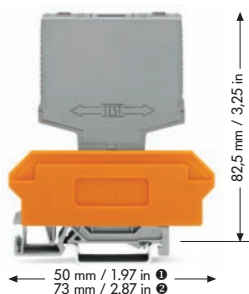


Description	Input	Item no.	Pack. unit	Input	Item no.	Pack. unit
Optocoupler module	DC 5 V (DC 4.5 V ... 6.5 V)	286-726	1	DC 5 V (DC 3.5 V ... 7.5 V)	286-732	1
	DC 12 V (DC 10 V ... 20 V)	286-728	1	DC 12 V (DC 9 V ... 18 V)	286-733	1
	DC 24 V (DC 15 V ... 30 V)	286-730	1	DC 24 V (DC 10 V ... 30 V)	286-734	1

Technical Data		Accessories see page 115		Accessories see page 115	
Input current range	DC 6.5 mA ... 20 mA; DC 4 mA ... 12 mA; DC 3.5 mA ... 8 mA			DC 0.5 mA ... 17 mA; DC 2 mA ... 8 mA; DC 2 mA ... 8 mA	
Current at nominal voltage	DC 6.5 mA; DC 6.4 mA; DC 6.2 mA			DC 6 mA	
Output nominal voltage	DC 110 V			AC 230 V	
Output voltage range	DC 99 V ... 121 V			AC 24 V ... 280 V	
Reverse voltage transistor / Triac	DC 150 V			AC 600 V	
Max. permissible continuous current	1.6 A at 69 R			1 A	
Switch on / Switch off time	≤ 20 μs / ≤ 0.5 ms			1 half-wave / 1 half-wave	
Max. operating frequency	350 Hz				
Leakage current at nominal voltage	3 μA			5 mA	
Collector / emitter voltage drop Vce sat	≤ 0.5 V				
Voltage drop at output				< AC 1.7 V	
Test voltage input / output	2.5 kV eff.			2.5 kV eff.	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3			250 V / 4 kV / 3	
Ambient operating temperature	-25 °C ... +40 °C			-25 °C ... +40 °C	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ①	17 mm / 0.669 in wide	280-619	1	17 mm / 0.669 in wide
	17 mm / 0.669 in wide	280-609	1	17 mm / 0.669 in wide
	20 mm / 0.787 in wide	280-763	1	20 mm / 0.787 in wide
with 4-conductor terminal blocks, orange separator ②				
with 4-conductor terminal blocks, marker plate ②				
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in				

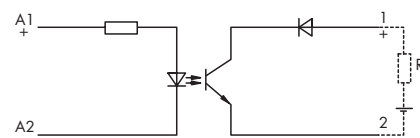
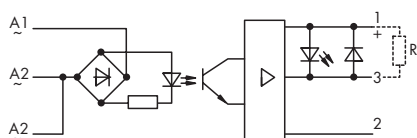
	Optocoupler Input AC/DC 10 V ... 30 V Output DC 24 V/1 mA ... 0.5 A negative switching	Optocoupler Input DC 24 V Output DC 60 V/100 mA
	Module width 15 mm / 0.591 in	Module width 10 mm / 0.394 in



WSB marker cards

- Marking U; Item No.: 209-789
- Marking 1 ... 10; Item No.: 209-702
- Marking A1, A2, A2, 1, 3, 2, A1, A2, A2;
Item No.: 209-685
- Marking A1, A2, A2, 1, 2, 2, A1, A2, A2;
Item No.: 209-686

5 cards, each containing 10 strips with 10 markers



Description	Item no.	Pack. unit	Item no.	Pack. unit
Optocoupler module	286-725	1	286-791	1

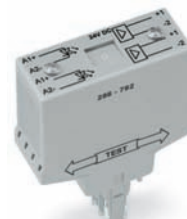
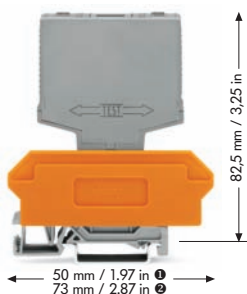
Technical Data	Accessories see page 115		Accessories see page 115	
Nominal input voltage (V_N)	AC/DC 10 V ... 30 V		DC 24 V	
Input voltage range	AC/DC 10 V ... 30 V		DC 15 V ... 30 V	
Input current range	AC/DC 2 mA ... 7 mA		DC 7.5 mA ... 18 mA	
Current at nominal voltage			14 mA	
Output nominal voltage	DC 24 V		DC 60 V	
Output voltage range	DC 20 V ... 30 V		DC 20 V ... 60 V	
Reverse voltage transistor / Triac	DC 80 V		DC 80 V	
Max. permissible continuous current	500 mA		100 mA	
Switch on / Switch off time	< 5 ms / < 30 ms		10 μ s / 50 μ s	
Max. operating frequency			3 kHz	
Leakage current at nominal voltage	max. 2.5 μ A		2.5 μ A	
Collector / emitter voltage drop $V_{ce sat}$	≤ 1 V			
Max. output (reverse current)	DC 6.5 mA ... 10 mA			
Voltage drop at output			≤ 2 V	
Test voltage input / output	2.5 kV eff.		2.5 kV eff.	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3		250 V / 4 kV / 3	
Ambient operating temperature	-25 °C ... +40 °C		-25 °C ... +40 °C	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules,				
with 2-conductor terminal blocks, orange separator ①	17 mm / 0.669 in wide 280-619	1	12 mm / 0.472 in wide 280-618	1
with 4-conductor terminal blocks, orange separator ②	17 mm / 0.669 in wide 280-609	1	12 mm / 0.472 in wide 280-608	1
with 4-conductor terminal blocks, marker plate ③	20 mm / 0.787 in wide 280-763	1	15 mm / 0.591 in wide 280-762	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14;				
stripped length 8 ... 9 mm / 0.33 in				

1 Pluggable Modules - Optocoupler Modules

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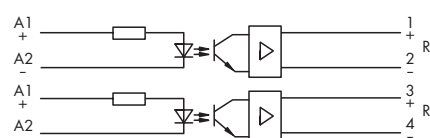
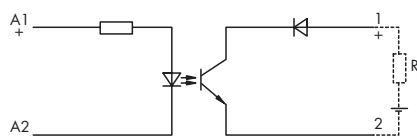
	Optocoupler Input DC 24 V Output DC 60 V/100 mA	Dual channel optocoupler 2 inputs 2 x DC 24 V 2 outputs 2 x DC 24 V/2 x 250 mA
	Module width 10 mm / 0.394 in	Module width 20 mm / 0.787 in



WSB marker cards

- Marking U; Item No.: 209-789
- Marking 1 ... 10; Item No.: 209-702
- Marking A1, A2, A2, 1, 2, 2, A1, A2, A2;
Item No.: 209-686
- Marking A1+, A1+, A2-, A2-, 1, RL1, RL2, 2;
Item No.: 209-955
- Marking A1+, A1+, A2-, A2-, 1+, 1+, A, 2-;
Item No.: 249-651

5 cards, each containing 10 strips with 10 markers



Description	Item no.	Pack. unit	Item no.	Pack. unit
Optocoupler module	286-794	1	286-792	1

Technical Data	Accessories see page 115		Accessories see page 115	
Nominal input voltage (V_N)	DC 24 V		DC 24 V	
Input voltage range	DC 18 V ... 30 V		DC 7.5 V ... 30 V	
Input current range	DC 2 mA ... 5 mA		DC 4 mA ... 19 mA	
Current at nominal voltage	DC 4 mA		DC 15 mA	
Output nominal voltage	DC 60 V		DC 24 V	
Output voltage range	DC 20 V ... 60 V		DC 20 V ... 30 V	
Reverse voltage transistor / Triac	DC 80 V		DC 80 V	
Max. permissible continuous current	100 mA		250 mA	
Switch on / Switch off time	80 μ s / 100 μ s		< 60 μ s / < 120 μ s	
Max. operating frequency	1.5 kHz		1.5 kHz	
Leakage current at nominal voltage	2.5 μ A		2.6 μ A	
Collector / emitter voltage drop $V_{ce sat}$			< 2.5 V	
Voltage drop at output	≤ 2 V			
Test voltage input / output	2.5 kV eff.		2.5 kV eff.	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3		250 V / 4 kV / 3	
Ambient operating temperature	-25 °C ... +60 °C		-25 °C ... +40 °C	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules,				
with 2-conductor terminal blocks, orange separator ①	12 mm / 0.472 in wide 280-618	1	22 mm / 0.866 in wide 280-638	1
with 4-conductor terminal blocks, orange separator ②	12 mm / 0.472 in wide 280-608	1	22 mm / 0.866 in wide 280-628	1
with 4-conductor terminal blocks, marker plate ③	15 mm / 0.591 in wide 280-762	1	25 mm / 0.984 in wide 280-764	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14;				
stripped length 8 ... 9 mm / 0.33 in				

1 Pluggable Modules - S0 Optocoupler Modules

94

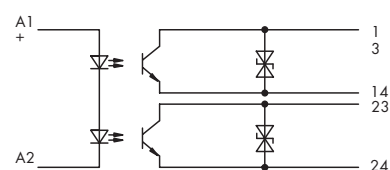
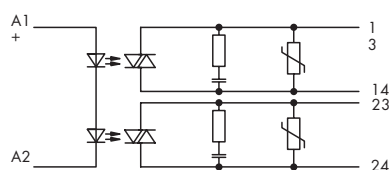
	Power Optocoupler for S0 current meter interface with AC output	Power Optocoupler for S0 current meter interface with DC output
	Module width 20 mm / 0.787 in	Module width 20 mm / 0.787 in



The optocoupler for the S0 current meter interface sends counter pulses from the supply lines.

Via this interface the user has the possibility to access data which is created by pulse generating current meters with a S0 current meter interface in accordance with DIN 43 864. The user can extract the data without affecting the S0 circuit and use them for their own evaluations, for example, optimizing energy consumption by reducing peak demands.

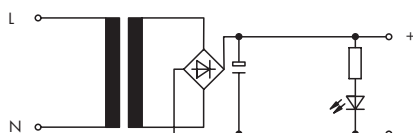
The optocoupler gets the input signal via a shunt resistance that is integrated in a terminal block for pluggable modules. Two parallel connected electrical contacts at the output allow reading of the S0 counter pulses. The optocoupler can be replaced without having to open the current meter circuit. When using passive metering systems, S0 power packs have to be added.



Description	Item no.	Pack. unit	Item no.	Pack. unit
S0 Interface	286-740	1	286-741	1
Terminal block for pluggable modules, with shunt resistance	22 mm / 0.866 in wide 286-740/001-000	1	22 mm / 0.866 in wide 286-740/001-000	1

Technical Data	Accessories see page 115	Accessories see page 115
Input current I-Signal (H)	> 10 mA ... < 27 mA	> 10 mA ... < 27 mA
Input current I-Signal (L)	< 2 mA	< 2 mA
Switch-on threshold	> 8.5 mA	> 8.5 mA
Switch-off threshold	< 7 mA	< 7 mA
Transmission frequency		< 100 Hz
Input circuit	reverse protection diode	reverse protection diode
Operating voltage range	AC 24 V ... 280 V (50 Hz ... 60 Hz)	DC 15 V ... 120 V
Peak reverse voltage	AC 600 V	DC 200 V
Continuous current	2 x 1 A	2 x 750 mA
Surge current t = 20 ms	60 A	3 A
Min. load current	30 mA	
Voltage drop at I max	< 1.2 V	< 1.2 V
Leakage current when turned off	< 2 mA	
Switch on / Switch off time	10 ms / 10 ms	5 ms / 3 ms
Output circuit	RC module / varistor	suppressor diode
Test voltage input / output	2.5 kV eff.	2.5 kV eff.
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Ambient operating temperature	-25 °C ... +60 °C (at 0.4 A continuous current)	-25 °C ... +60 °C (at 200 mA continuous current)
Storage temperature	-40 °C ... +80 °C	-40 °C ... +80 °C
Approvals	DIN VDE 0110	DIN VDE 0110
Mounting position	any	any
Dimensions (mm) L x H x W incl. terminal block	20 x 82.5 x 73	20 x 82.5 x 73

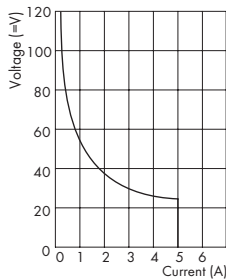
Module width 25 mm / 0.984 in

1
$$25 \times 82.5 \times 73$$

WSB marker card with marking: +/-

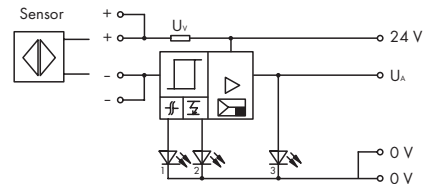
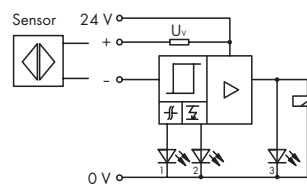
Pluggable Modules - NAMUR Switching Amplifier Modules

	NAMUR Switching Amplifier with relay output (the switching amplifier has got an isolated output, e.g. for the connection of a PLC)	NAMUR switching amplifier with relay output (the electronic output VA provides the status of the NAMUR sensor)
	Module width 20 mm / 0.787 in	Module width 20 mm / 0.787 in



NAMUR switching amplifier for the supply of NAMUR sensors and the evaluation and amplification of the sensor signals in accordance with DIN 19234 and DIN 50 227. A line break or a sensor short circuit are monitored by the module and indicated via LEDs.

- LED 1 yellow: Line break
- LED 2 yellow: Short circuit
- LED 3 red: Output active



Description	Item no.	Pack. unit	Item no.	Pack. unit
NAMUR Switching Amplifier	286-880	1	286-881	1

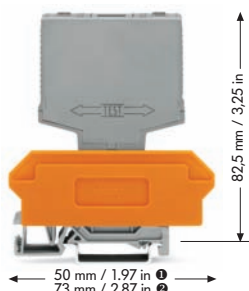
Technical Data	Accessories see page 115	Accessories see page 115
Supply voltage V_B	DC 24 V ($\pm 10\%$)	DC 24 V ($\pm 10\%$)
Nominal input current	20 mA	20 mA
Input	2-wire NAMUR proximity sensor	2-wire NAMUR proximity sensor
Nominal voltage	DC 8 V	DC 8 V
Current limitation	8 mA	8 mA
Signal current (1)	≥ 2 mA	≥ 2 mA
Signal current (0)	≤ 1.7 mA	≤ 1.7 mA
Switching delay	10 ms	10 ms
Max. operating frequency		50 Hz
Short circuit monitoring	$I \geq 7$ mA	$I \geq 7$ mA
Line break monitoring	$I \leq 0.2$ mA	$I \leq 0.2$ mA
Output	relay 1 changeover contact	transistor
Contact material	AgNi 0.15	
Max. switching voltage	AC 250 V / DC 120 V	DC 24 V
Switching current	3 A	0.5 A
Output voltage V_A		$22 \text{ V} \pm 10\%$
Max. breaking capacity (resistive)	AC 750 VA; DC see load limit curve	
Recommended minimum load	100 mA / AC/DC 10 V (1 W, 1 VA)	
Pull-in/drop-out/bounce time typ.	8 ms / 5 ms / 4 ms	
Dielectric strength contact-coil (AC, 1 min)	4 kV	
Open circuit	1 kV	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	
Mechanical life	1×10^8 switching operations	
Mechanical life at max. load (resistance)	3×10^5 switching operations	
Ambient operating temperature	$-25^\circ\text{C} \dots +40^\circ\text{C}$	$-25^\circ\text{C} \dots +40^\circ\text{C}$
Storage temperature	$-40^\circ\text{C} \dots +70^\circ\text{C}$	$-40^\circ\text{C} \dots +70^\circ\text{C}$
Approvals	DIN VDE 0160 and IEC 60255, DIN VDE 0435 (corresponding parts) DIN 19234, DIN 50227	DIN VDE 0160 and IEC 60255, DIN VDE 0435 (corresponding parts) DIN 19234, DIN 50227

Pluggable Modules - Temperature Transducers Modules

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97

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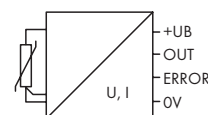
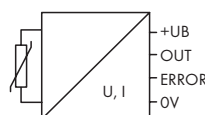
	Input: PT 100 type RTD element 2-wire, with error output for broken wire and short circuit of sensor Module width 20 mm / 0.787 in	Input: PT 100 type RTD element 3-wire, with error output for broken wire and short circuit of sensor Module width 20 mm / 0.787 in
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Other temperature ranges contact factory.
LED indication of broken wire or short circuit
WSB marker card

- Marking 1 ... 10; Item No.: 209-702
- Marking 1, 2, 3, 0V, +UB, OUT, ERR., 0V;
Item No.: 249-622
- Marking 1, 2, 0V, +UB, OUT, ERR., 0V;
Item No.: 249-623

5 cards, each containing 10 strips with 10 markers



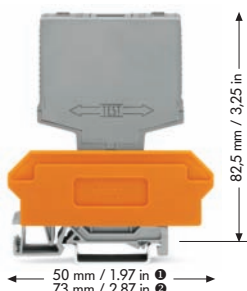
Description	Output	Item no.	Pack. unit	Output	Item no.	Pack. unit
Temperature Transducer	0 - 10 V	286-860	1	0 - 10 V	286-870	1
	0 - 20 mA	286-861	1	0 - 20 mA	286-871	1
	4 - 20 mA	286-862	1	4 - 20 mA	286-872	1

Technical Data	Accessories see page 115		Accessories see page 115	
Temperature range	0 °C ... 100 °C		0 °C ... 100 °C	
Operating voltage	DC 24 V (± 10 %)		DC 24 V (± 10 %)	
Nominal current	I _{BN} 30 mA		I _{BN} 30 mA	
Load impedance	≥ 2 kΩ (Out = V) ≤ 500 Ω (Out = mA)		≥ 2 kΩ (Out = V) ≤ 500 Ω (Out = mA)	
Error output - low upon error (fail safe)	V _B / max. 20 mA		V _B / max. 20 mA	
Transmission error (measuring range)	≤ 0.3 %		≤ 0.3 %	
Temperature coefficient	0.02 %/K		0.02 %/K	
Ambient operating temperature	0 °C ... -55 °C		0 °C ... -55 °C	
Electromagnetic compatibility test acc. IEC 801-2/4/5	B acc. EN 50082 T2 (E3.94)		B acc. EN 50082 T2 (E3.94)	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶	22 mm / 0.866 in wide 280-638	1	22 mm / 0.866 in wide 280-638	1
with 4-conductor terminal blocks, orange separator ❷	22 mm / 0.866 in wide 280-628	1	22 mm / 0.866 in wide 280-628	1
with 4-conductor terminal blocks, marker plate ❸	25 mm / 0.984 in wide 280-764	1	25 mm / 0.984 in wide 280-764	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in				

Pluggable Modules - Temperature Transducers Modules

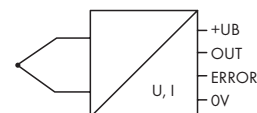
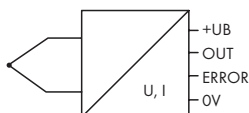
	Thermocouple input Thermocouple J (Fe-CuNi) with error output for broken wire Module width 20 mm / 0.787 in	Thermocouple input Thermocouple K (NiCr-Ni) with error output for broken wire Module width 20 mm / 0.787 in
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Other temperature ranges contact factory.
LED indication of broken wire or short circuit
WSB marker card

- Marking 1 ... 10; Item No.: 209-702
- Marking 1, 2, 3, 0V, +UB, OUT, ERR., 0V;
Item No.: 249-622
- Marking 1, 2, 0V, +UB, OUT, ERR., 0V;
Item No.: 249-623

5 cards, each containing 10 strips with 10 markers

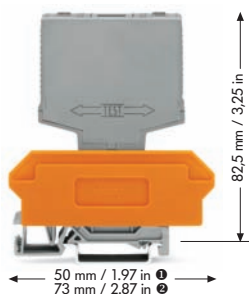


Description	Output	Item no.	Pack. unit	Output	Item no.	Pack. unit
Temperature Transducer	0 - 10 V	286-863	1	0 - 10 V	286-864	1
	0 - 20 mA	286-865	1	0 - 20 mA	286-866	1
	4 - 20 mA	286-867	1	4 - 20 mA	286-868	1

Technical Data		Accessories see page 115		Accessories see page 115	
Temperature range	0 °C ... 750 °C			0 °C ... 1000 °C	
Operating voltage	DC 24 V (± 10 %)			DC 24 V (± 10 %)	
Nominal current	$I_{BN} \leq 30 \text{ mA}$ (Out = V)			$I_{BN} \leq 30 \text{ mA}$ (Out = V)	
	$I_{BN} \leq 50 \text{ mA}$ (Out = mA)			$I_{BN} \leq 50 \text{ mA}$ (Out = mA)	
Load impedance	$\geq 2 \text{ k}\Omega$ (Out = V)			$\geq 2 \text{ k}\Omega$ (Out = V)	
	$\leq 500 \Omega$ (Out = mA)			$\leq 500 \Omega$ (Out = mA)	
Error output - low upon error (fail safe)	$V_B / \text{max. } 20 \text{ mA}$			$V_B / \text{max. } 20 \text{ mA}$	
Transmission error (measuring range)	$\leq 2 \%$			$\leq 2 \%$	
Temperature coefficient	0.02 %/K			0.02 %/K	
Ambient operating temperature	0 °C ... -55 °C			0 °C ... -55 °C	
Electromagnetic compatibility test acc. IEC 801-2/4/5	B acc. EN 50082 T2 (E3.94)			B acc. EN 50082 T2 (E3.94)	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ① with 4-conductor terminal blocks, orange separator ② with 4-conductor terminal blocks, marker plate ③ wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in	22 mm / 0.866 in wide	280-638	22 mm / 0.866 in wide	280-638
	22 mm / 0.866 in wide	280-628	22 mm / 0.866 in wide	280-628
	25 mm / 0.984 in wide	280-764	25 mm / 0.984 in wide	280-764

	Input: PT 100 type RTD element 2-wire, with error output for broken wire and short circuit of sensor -30 °C ... +150 °C Module width 20 mm / 0.787 in	Input: PT 100 type RTD element 3-wire, with error output for broken wire and short circuit of sensor -30 °C ... +150 °C Module width 20 mm / 0.787 in
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Linear temperature curve

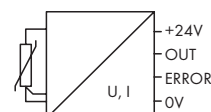
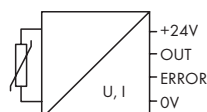
Other temperature ranges contact factory.

LED indication of broken wire or short circuit

WSB marker card

- Marking 1 ... 10; Item No.: 209-702
- Marking 1, 2, 3, 0V, +UB, OUT, ERR., 0V; Item No.: 249-622
- Marking 1, 2, 0V, +UB, OUT, ERR., 0V; Item No.: 249-623

5 cards, each containing 10 strips with 10 markers



Description	Output	Item no.	Pack. unit	Output	Item no.	Pack. unit
Temperature Transducer	0 ... 10 V	286-860/150-030	1	0 ... 10 V	286-870/150-030	1
	0 ... 20 mA	286-861/150-030	1	0 ... 20 mA	286-871/150-030	1
	4 ... 20 mA	286-862/150-030	1	4 ... 20 mA	286-872/150-030	1

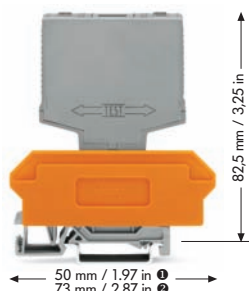
Technical Data		Accessories see page 115	Accessories see page 115
Temperature range	-30 °C ... 150 °C	-30 °C ... 150 °C	-30 °C ... 150 °C
Operating voltage	DC 24 V (± 10 %)	DC 24 V (± 10 %)	DC 24 V (± 10 %)
Nominal current	I_N 30 mA	I_N 30 mA	I_N 30 mA
Load impedance	$\geq 2 \text{ k}\Omega$ (Out = V) $\leq 500 \Omega$ (Out = mA)	$\geq 2 \text{ k}\Omega$ (Out = V) $\leq 500 \Omega$ (Out = mA)	$\geq 2 \text{ k}\Omega$ (Out = V) $\leq 500 \Omega$ (Out = mA)
Error output (closed-current principle)	V_B / 20 mA	V_B / 20 mA	V_B / 20 mA
Transmission error (full scale)	$\leq 0.2 \%$	$\leq 0.2 \%$	$\leq 0.2 \%$
Temperature coefficient	$\leq 0.02 \%/K$	$\leq 0.02 \%/K$	$\leq 0.02 \%/K$
Ambient operating temperature	0 °C ... -55 °C	0 °C ... -55 °C	0 °C ... -55 °C
Electromagnetic compatibility test acc. IEC 801-2/4/5	B acc. EN 50082 T2 (E3.94)	B acc. EN 50082 T2 (E3.94)	B acc. EN 50082 T2 (E3.94)

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶	22 mm / 0.866 in wide 280-638	1	22 mm / 0.866 in wide 280-638	1
with 4-conductor terminal blocks, orange separator ❷	22 mm / 0.866 in wide 280-628	1	22 mm / 0.866 in wide 280-628	1
with 4-conductor terminal blocks, marker plate ❸	25 mm / 0.984 in wide 280-764	1	25 mm / 0.984 in wide 280-764	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in				

1 Pluggable Modules - Temperature Transducers Modules

100

	Input: PT 100 type RTD element 2-wire, with error output for broken wire and short circuit of sensor 0 °C ... +300 °C	Input: PT 100 type RTD element 3-wire, with error output for broken wire and short circuit of sensor 0 °C ... +300 °C
	Module width 20 mm / 0.787 in	Module width 20 mm / 0.787 in



Linear temperature curve

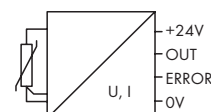
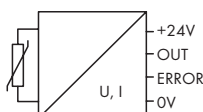
Other temperature ranges contact factory.

LED indication of broken wire or short circuit

WSB marker card

- Marking 1 ... 10; Item No.: 209-702
- Marking 1, 2, 3, 0V, +UB, OUT, ERR., 0V; Item No.: 249-622
- Marking 1, 2, 0V, +UB, OUT, ERR., 0V; Item No.: 249-623

5 cards, each containing 10 strips with 10 markers



Description	Output	Item no.	Pack. unit	Output	Item no.	Pack. unit
Temperature Transducer	0 ... 10 V	286-860/000-300	1	0 ... 10 V	286-870/000-300	1
	0 ... 20 mA	286-861/000-300	1	0 ... 20 mA	286-871/000-300	1
	4 ... 20 mA	286-862/000-300	1	4 ... 20 mA	286-872/000-300	1

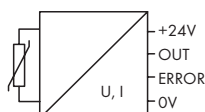
Technical Data	Accessories see page 115		Accessories see page 115	
Temperature range	0 °C ... 300 °C		0 °C ... 300 °C	
Operating voltage	DC 24 V (± 10 %)		DC 24 V (± 10 %)	
Nominal current	I _N 30 mA		I _N 30 mA	
Load impedance	≥ 2 kΩ (Out = V) ≤ 500 Ω (Out = mA)		≥ 2 kΩ (Out = V) ≤ 500 Ω (Out = mA)	
Error output (closed-current principle)	V _B / 20 mA		V _B / 20 mA	
Transmission error (full scale)	≤ 0.2 %		≤ 0.2 %	
Temperature coefficient	≤ 0.02 %/K		0.02 %/K	
Ambient operating temperature	0 °C ... -55 °C		0 °C ... -55 °C	
Electromagnetic compatibility test acc. IEC 801-2/4/5	B acc. EN 50082 T2 (E3.94)		B acc. EN 50082 T2 (E3.94)	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶	22 mm / 0.866 in wide	280-638	22 mm / 0.866 in wide	280-638
	22 mm / 0.866 in wide	280-628	22 mm / 0.866 in wide	280-628
	25 mm / 0.984 in wide	280-764	25 mm / 0.984 in wide	280-764
	25 mm / 0.984 in wide	280-764	25 mm / 0.984 in wide	280-764
with 4-conductor terminal blocks, orange separator ❷				
with 4-conductor terminal blocks, marker plate ❸				
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in				

Module width 20 mm / 0.787 in



5 cards, each containing 10 strips with 10 markers

1

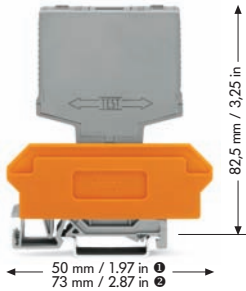
B acc. EN 50082 T2 (E3.94)

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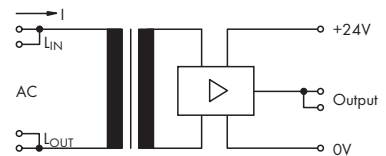
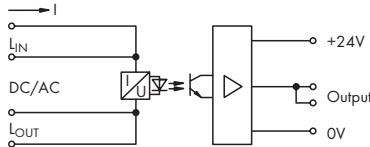
1 Pluggable Modules - Current Flow Monitoring

102

	AC/DC Current Flow Monitoring Module DC 15 mA/AC 35 mA ... 300 mA	AC Current Flow Monitoring Module 80 mA ... 6 A
	Module width 20 mm / 0.787 in	Module width 20 mm / 0.787 in



WSB marker card
• Marking U; Item No.: 209-789
• Marking 1 ... 10; Item No.: 209-702
• Marking Lin, Lin, Lout, Lout, 24V, UA, UA, 0V;
Item No.: 209-957
5 cards, each containing 10 strips with 10 markers

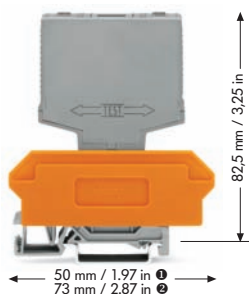


Description	Item no.	Pack. unit	Item no.	Pack. unit
Current Flow Monitoring Module	286-659	1	286-661	1

Technical Data	Accessories see page 115	Accessories see page 115
Current monitoring range	DC 15 mA / AC 35 mA ... 300 mA Current < 15/35 mA Output 24 V DC Current > 15/35 mA Output 0 V	AC 80 mA ... 6 A Current < 80 mA Output 24 V DC Current > 80 mA Output 0 V
Voltage range	AC/DC 10 V ... 250 V	AC 5 V ... 250 V
Nominal power consumption min / max	45 mW / 900 mW	1 mVA / 2.8 VA
Voltage drop	3 V	13 mV ... 460 mV
Response time	5 ms	40 ms
Operating voltage	DC 24 V	DC 24 V
Current consumption	61 mA	41 mA
Switching current	50 mA	50 mA
Switching voltage	DC 24 V	DC 24 V
Switching power	1.2 W	1.2 W
Dielectric strength input / output	2 kV	2 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C
Status indication	Operation: LED = green output LOW, current interruption: LED = red output HIGH	Operation: LED = green output LOW, current interruption: LED = red output HIGH

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules,				
with 2-conductor terminal blocks, orange separator ①	22 mm / 0.866 in wide 280-638	1	22 mm / 0.866 in wide 280-638	1
with 4-conductor terminal blocks, orange separator ②	22 mm / 0.866 in wide 280-628	1	22 mm / 0.866 in wide 280-628	1
with 4-conductor terminal blocks, marker plate ③	25 mm / 0.984 in wide 280-764	1	25 mm / 0.984 in wide 280-764	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14;				
stripped length 8 ... 9 mm / 0.33 in				

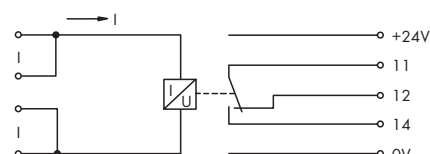
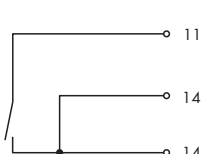
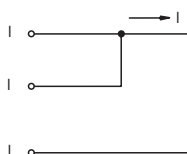
	DC Current Flow Monitoring Module 0.4 A ... 3.5 A 1 make contact	AC Current Flow Monitoring Module 0.2 A ... 3 A, adjustable 1 changeover contact
	Module width 15 mm / 0.591 in	Module width 25 mm / 0.984 in



WSB marker card

- Marking U; Item No.: 209-789
- Marking 1 ... 10; Item No.: 209-702
- Marking Lin, Lin, Lout, 11, 14, 14, Lin, Lin, Lout; Item No.: 249-654
- Marking Lin, Lin, Lout, Lout, 24V, 11, 12, 14, 0V; Item No.: 209-997

5 cards, each containing 10 strips with 10 markers



Description	Item no.	Pack. unit	Item no.	Pack. unit
Current Flow Monitoring Module	286-662	1	286-664	1

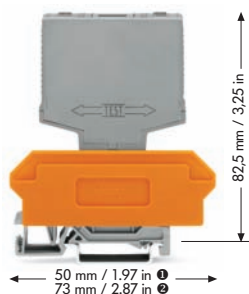
Technical Data	Accessories see page 115		Accessories see page 115	
Current monitoring range	DC 0.4 A ... 3.5 A (-20 °C ... +40 °C); DC 0.4 A ... 3 A (-20 °C ... +60 °C); DC 0.4 A ... 2 A (-20 °C ... +70 °C)		AC 0.2 A ... 3 A	
Voltage range	DC 12 V ... 28 V		9 mVA / 1.3 VA	
Nominal power consumption min / max	45 mW / 630 mW		min. 0.2 A	
Switching threshold (adjustable)	0.35 A / 0.07 A		44 mV ... 430 mV	
Turn on / off point	24 mV ... 210 mV		300 ms	
Voltage drop	0.5 ms		1 changeover contact	
Response time	1 make contact		DC 24 V	
Output	Operating voltage		17 mA	
Operating voltage	Current consumption		5 A	
Current consumption	Switching current		DC 200 V	
Switching current	Switching voltage		10 W	
Switching voltage	Switching power		1250 VA	
Switching power	Dielectric strength input / output		2.5 kV	
Dielectric strength input / output	Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1		250 V / 4 kV / 3	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	Ambient operating temperature		-25 °C ... +40 °C	
Ambient operating temperature	Status indication		Current < switching threshold LED red, Relay switched	
Status indication				

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules,				
with 2-conductor terminal blocks, orange separator ❶	17 mm / 0.669 in wide 280-619	1	27 mm / 1.063 in wide 280-639	1
with 4-conductor terminal blocks, orange separator ❷	17 mm / 0.669 in wide 280-609	1	27 mm / 1.063 in wide 280-629	1
with 4-conductor terminal blocks, marker plate ❸	20 mm / 0.787 in wide 280-763	1	30 mm / 1.181 in wide 280-765	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14;				
stripped length 8 ... 9 mm / 0.33 in				

1 Pluggable Modules - Current Flow Monitoring

104

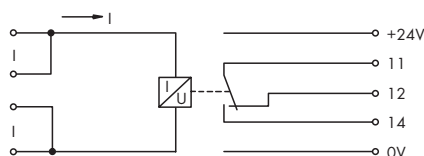
	AC Current Flow Monitoring Module 1 A ... 10 A, adjustable 1 changeover contact Module width 25 mm / 0.984 in	
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WSB marker card

- Marking U; Item No.: 209-789
- Marking 1 ... 10; Item No.: 209-702
- Marking Lin, Lin, Lout, Lout, 24V, 11, 12, 14, 0V; Item No.: 209-997

5 cards, each containing 10 strips with 10 markers



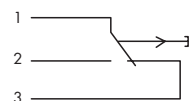
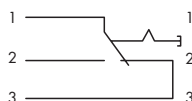
Description	Item no.	Pack. unit	
Current Flow Monitoring Module	286-665	1	

Technical Data		Accessories see page 115	
Current monitoring range	AC 1 A ... 10 A		
Nominal power consumption min / max	23 mVA / 8.5 VA		
Switching treshold (adjustable)	min. 1 A		
Voltage drop	23 mV ... 850 mV		
Response time	200 ms		
Output	1 changeover contact		
Operating voltage	DC 24 V		
Current consumption	28 mA		
Switching current	5 A		
Switching voltage	AC 250 V		
Switching power	1250 VA		
Dielectric strength input / output	2.5 kV		
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3		
Ambient operating temperature	-25 °C ... +40 °C		
Status indication	Current < switching treshold LED red, Relay switched		

Accessories	Item no.	Pack. unit	
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ①	27 mm / 1.063 in wide 280-639	1	
with 4-conductor terminal blocks, orange separator ②	27 mm / 1.063 in wide 280-629	1	
with 4-conductor terminal blocks, marker plate ③	30 mm / 1.181 in wide 280-765	1	
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in			

Technical drawing showing the front view of the cable gland assembly. The drawing includes dimensions:

- Overall height: 82.5 mm / 3.25 in
- Width: 50 mm / 1.97 in (with a note indicating a tolerance or alternative dimension of 73 mm / 2.87 in)



5 cards, each containing 10 strips with 10 markers

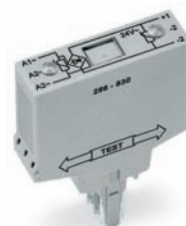
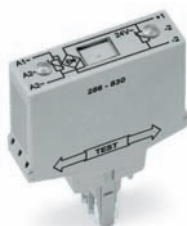
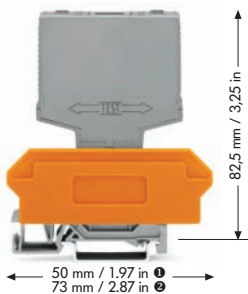
Accessories see page 115

Pack. unit



Pluggable Modules - Bridge Rectifiers

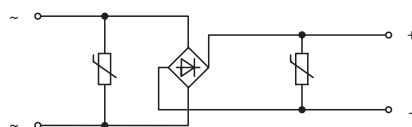
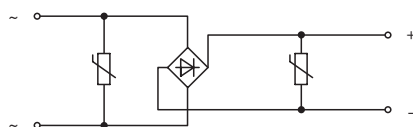
	Bridge with varistor protection for input voltage AC 24 V/1 A Module width 15 mm / 0.591 in	Bridge with varistor protection for input voltage AC 250 V/1 A Module width 15 mm / 0.591 in
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WSB marker card

- Marking V; Item No.: 209-784
- Marking 1 ... 10; Item No.: 209-702
- Marking +/-; Item No.: 209-652

5 cards, each containing 10 strips with 10 markers

[illegible]

Technical Data

Accessories see page 115

Accessories see page 115

[illegible]

Accessories

Item no.

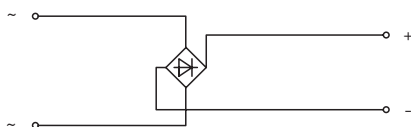
Pack.
unit

Item no.

Pack.
unit

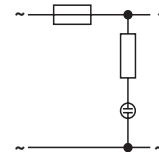
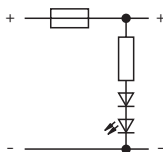
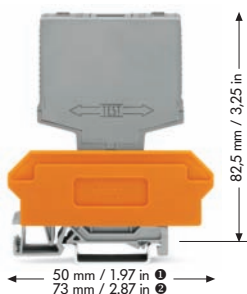
Accessories		Item no.	Pack. unit		Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ①	17 mm / 0.669 in wide	280-619	1	17 mm / 0.669 in wide	280-619	1
with 4-conductor terminal blocks, orange separator ②	17 mm / 0.669 in wide	280-609	1	17 mm / 0.669 in wide	280-609	1
with 4-conductor terminal blocks, marker plate ②	20 mm / 0.787 in wide	280-763	1	20 mm / 0.787 in wide	280-763	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in						

Module width 10 mm / 0.394 in

1

Pluggable Fuse Modules

	Fuse modules for replaceable microfuses 5 x 20 mm; max. 6.3 A with blown fuse indication LED green AC/DC 24 V Module width 10 mm / 0.394 in	Fuse modules for replaceable microfuses 5 x 20 mm; max. 6.3 A with blown fuse indication Neon lamp AC/DC 230 V Module width 10 mm / 0.394 in
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WSB marker card

- Marking F1 ... F10; Item No.: 209-787
- Marking 1 ... 10; Item No.: 209-702
- Marking +/-; Item No.: 209-652

5 cards, each containing 10 strips with 10 markers

Description	Item no.	Pack. unit	Item no.	Pack. unit
Fuse Module, with blown fuse indication	286-890	1	286-891	1

Technical Data	Accessories see page 115		Accessories see page 115	
Operating voltage	AC/DC 24 V		AC/DC 230 V	
Max. fuse capacity	6.3 A		6.3 A	
Operating power	100 mW		100 mW	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3		250 V / 4 kV / 3	
Ambient operating temperature	-25 °C ... +40 °C		-25 °C ... +40 °C	
Leakage current in case of blown fuse	5 mA		0.5 mA	
Test voltage	2.5 kV		2.5 kV	

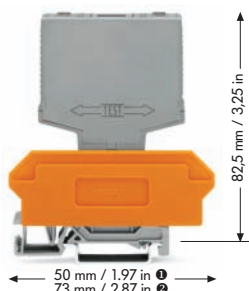
Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ①	12 mm / 0.472 in wide 280-618	1	12 mm / 0.472 in wide 280-618	1
with 4-conductor terminal blocks, orange separator ②	12 mm / 0.472 in wide 280-608	1	12 mm / 0.472 in wide 280-608	1
with 4-conductor terminal blocks, marker plate ③	15 mm / 0.591 in wide 280-762	1	15 mm / 0.591 in wide 280-762	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in				

Pluggable Modules - Diode Gates

1
109

1

	Diode Gate Module with 3, 5, 7 or 9 diodes 1 N 4007, common anode	Diode Gate Module with 3, 5, 7 or 9 diodes 1 N 4007, common cathode
	Module width see Item No.	Module width see Item No.



WSB marker card

- Marking V; Item No.: 209-784
- Marking 1 ... 10; Item No.: 209-702
- Marking +/-; Item No.: 209-652

5 cards, each containing 10 strips with 10 markers



Description	Module width	Item no.	Pack. unit	Module width	Item no.	Pack. unit
Diode Gate Module						
with 3 diodes	10 mm / 0.394 in	286-803	1	10 mm / 0.394 in	286-813	1
with 5 diodes	15 mm / 0.591 in	286-805	1	15 mm / 0.591 in	286-815	1
with 7 diodes	20 mm / 0.787 in	286-807	1	20 mm / 0.787 in	286-817	1
with 9 diodes	25 mm / 0.984 in	286-809	1	25 mm / 0.984 in	286-819	1

Technical Data

Accessories see page 115

Accessories see page 115

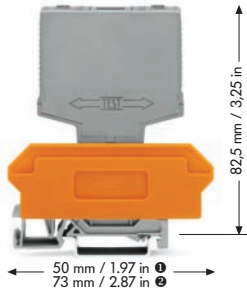
Operating voltage	AC/DC 250 V	AC/DC 250 V
Peak reverse voltage	1000 V	1000 V
Rectified current for each diode, resistive	1 A	1 A
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C

Accessories

	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules,				
with 2-conductor terminal blocks, orange separator ❶	12 mm / 0.472 in wide 280-618	1	12 mm / 0.472 in wide 280-618	1
with 4-conductor terminal blocks, orange separator ❷	12 mm / 0.472 in wide 280-608	1	12 mm / 0.472 in wide 280-608	1
with 4-conductor terminal blocks, marker plate ❸	15 mm / 0.591 in wide 280-762	1	15 mm / 0.591 in wide 280-762	1
Terminal block for pluggable modules,				
with 2-conductor terminal blocks, orange separator ❶	17 mm / 0.669 in wide 280-619	1	17 mm / 0.669 in wide 280-619	1
with 4-conductor terminal blocks, orange separator ❷	17 mm / 0.669 in wide 280-609	1	17 mm / 0.669 in wide 280-609	1
with 4-conductor terminal blocks, marker plate ❸	20 mm / 0.787 in wide 280-763	1	20 mm / 0.787 in wide 280-763	1
Terminal block for pluggable modules,				
with 2-conductor terminal blocks, orange separator ❶	22 mm / 0.866 in wide 280-638	1	22 mm / 0.866 in wide 280-638	1
with 4-conductor terminal blocks, orange separator ❷	22 mm / 0.866 in wide 280-628	1	22 mm / 0.866 in wide 280-628	1
with 4-conductor terminal blocks, marker plate ❸	25 mm / 0.984 in wide 280-764	1	25 mm / 0.984 in wide 280-764	1
Terminal block for pluggable modules,				
with 2-conductor terminal blocks, orange separator ❶	27 mm / 1.063 in wide 280-639	1	27 mm / 1.063 in wide 280-639	1
with 4-conductor terminal blocks, orange separator ❷	27 mm / 1.063 in wide 280-629	1	27 mm / 1.063 in wide 280-629	1
with 4-conductor terminal blocks, marker plate ❸	30 mm / 1.181 in wide 280-765	1	30 mm / 1.181 in wide 280-765	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14;				
stripped length 8 ... 9 mm / 0.33 in				

Pluggable Modules - AND Gate Function and LED Indicator Module

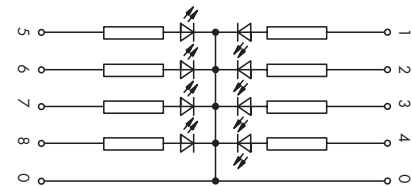
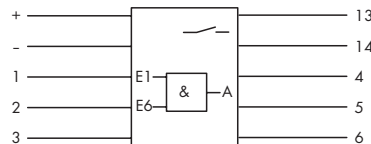
	AND gate module with 6 inputs Relay output with 1 make contact Module width 25 mm / 0.984 in	LED indicator module with 8 LED, common cathode Module width 25 mm / 0.984 in
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WSB marker card

- Marking D; Item No.: 209-783
- Marking 1 ... 10; Item No.: 209-702
- Marking +, -, 1, 2, 3, 13, 14, 4, 5, 6; Item No.: 249-608

5 cards, each containing 10 strips with 10 markers



Description	Item no.	Pack. unit	Item no.	Pack. unit
Gate Module	286-826	1	286-822	1

Technical Data	Accessories see page 115	Accessories see page 115
Operating voltage	DC 24 V	DC 24 V
Operating voltage range	DC 24 V ... 27.5 V	DC 20 V ... 26 V
Gate voltage - input	DC 24 V	
Power consumption at V_N	max. 34.6 mA	5.1 mA each LED
Relay output	make contact	
Max. switching voltage	AC 250 V / DC 120 V	
Max. continuous current	3 A	
Max. switching power (resistive)	120 W / 750 VA	
Dielectric strength input / output	2.5 kV	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ①	27 mm / 1.063 in wide 280-639	1	27 mm / 1.063 in wide 280-639	1
with 4-conductor terminal blocks, orange separator ②	27 mm / 1.063 in wide 280-629	1	27 mm / 1.063 in wide 280-629	1
with 4-conductor terminal blocks, marker plate ③	30 mm / 1.181 in wide 280-765	1	30 mm / 1.181 in wide 280-765	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in				

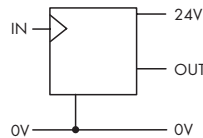
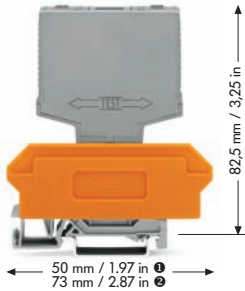
Pluggable Modules - Flip-Flop

1

111

1

	Flip-Flop Operating voltage DC 24 V	
	Module width 15 mm / 0.591 in	

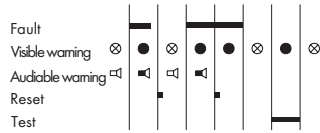


Description	Item no.	Pack. unit	
Flip-Flop	286-825	1	
Technical Data			
Accessories see page 115			
Input voltage	DC 24 V (± 10 %)		
Input current	0.25 mA		
Input voltage (High Signal)	> 7 V		
Input voltage (Low Signal)	< 3 V		
Pulse frequency	5 kHz		
Min. output voltage	V _B - 1.5 V		
Max. output current	0.5 A		
Operating voltage	DC 24 V		
Operating voltage range	DC 20 V ... 30 V		
Current consumption	7.5 mA		
Reverse voltage transistor	80 V		
Test voltage input/output	2.5 kV		
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3		
Ambient operating temperature	0 °C ... -55 °C		
Accessories			
Terminal block for pluggable modules,	Item no.	Pack. unit	
with 2-conductor terminal blocks, orange separator ❶	17 mm / 0.669 in wide 280-619	1	
with 4-conductor terminal blocks, orange separator ❷	17 mm / 0.669 in wide 280-609	1	
with 4-conductor terminal blocks, marker plate ❸	20 mm / 0.787 in wide 280-763	1	
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14;			
stripped length 8 ... 9 mm / 0.33 in			

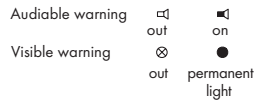
1 Pluggable Modules - Fault Indication

112

	Fault indicator module with reset Alarm with continuous light with outputs for visible and audible warning Auxiliary and fault indication voltage AC 230 V Module width 20 mm / 0.787 in	Fault indicator module with reset Alarm with continuous light with outputs for visible and audible warning Extensible to collective fault indicator by means of diode gates Auxiliary and fault indication voltage DC 60 V Module width 20 mm / 0.787 in
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Explanation of signs



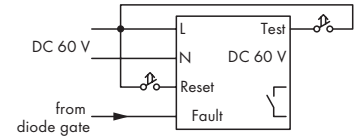
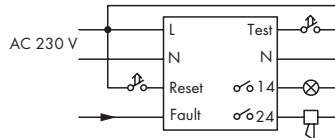
Accessories for collective fault indication (for 286-684)

- Diode gate 286-813 to 286-819, see page 442
- Diode gate 289-111 with common cathode, see page 504

WSB marker card

- Marking D; Item No.: 209-783
- Marking 1 ... 10; Item No.: 209-702
- Marking L, N, Quitt, Stör, A1, A2, Test, N, 14, 24; Item No.: 249-606

5 cards, each containing 10 strips with 10 markers



Description	Item no.	Pack. unit	Item no.	Pack. unit
Fault Indicator Module with reset	286-681	1	286-684	1

Technical Data	Accessories see page 115		Accessories see page 115	
Nominal voltage	AC 230 V		DC 60 V / RW ≤ 6%	
Tolerance	-10 % ... +5 %		± 10 %	
Current consumption	15 mA		9 mA	
Output for visible warning	AC 230 V / 0.5 A		DC 60 V / 0.5 A	
Output for audible warning	AC 230 V / 2 A		electrically isolated make contact	
Max. switching voltage	AC 250 V		AC 250 V	
Max. switching current	2 A		2 A	
Max. switching capacity	500 VA		500 VA	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3		250 V / 4 kV / 3	
Ambient operating temperature	-25 °C ... +40 °C		-25 °C ... +40 °C	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ①	22 mm / 0.866 in wide 280-638	1	22 mm / 0.866 in wide 280-638	1
with 4-conductor terminal blocks, orange separator ②	22 mm / 0.866 in wide 280-628	1	22 mm / 0.866 in wide 280-628	1
with 4-conductor terminal blocks, marker plate ③	25 mm / 0.984 in wide 280-764	1	25 mm / 0.984 in wide 280-764	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in				

Overview Pluggable Modules – Switching Relays

with an extended input voltage and operating temperature range $V_N -30\% \dots +25\%$ Ambient operating temperature $-25\text{ °C} \dots +70\text{ °C}$

Switching relay module



Description	Nominal input voltage (V_N)	Input voltage range	Max. switching voltage	Module width	Item no.	Pack. unit
Switching relay module,						
Relay with 1 changeover contact	DC 24 V	$V_N -30\% \dots +25\%$	AC/DC 250 V	15 mm / 0.591 in	286-304/004-000	1
Relay with 1 changeover contact	DC 24 V	$V_N -30\% \dots +25\%$	DC 36 V	15 mm / 0.591 in	286-394/004-000	1
Relay with 1 changeover contact	110 V	$V_N -30\% \dots +25\%$	AC/DC 250 V	15 mm / 0.591 in	286-307/004-000	1
Relay with 2 changeover contacts	DC 24 V	$V_N -30\% \dots +25\%$	AC 250 V / DC 200 V	20 mm / 0.787 in	286-312/004-000	1
Relay with 1 break contact and 1 make contact	DC 24 V	$V_N -30\% \dots +25\%$	AC 250 V / DC 200 V	20 mm / 0.787 in	286-320/004-000	1
Relay with 1 break contact and 1 make contact, bistable	DC 24 V	$V_N -30\% \dots +25\%$	AC/DC 250 V	20 mm / 0.787 in	286-571/001-000	1
Relay with 1 break contact and 1 make contact, control power $\leq 7\text{ mW}$	DC 24 V	$V_N -30\% \dots +25\%$	AC 250 V / DC 250 V	15 mm / 0.591 in	286-906/004-000	1
Relay with 1 make contact	DC 24 V	$V_N -30\% \dots +25\%$	AC 250 V	10 mm / 0.394 in	286-364/004-000	1
Relay with 2 make contacts	DC 24 V	$V_N -30\% \dots +25\%$	AC 250 V / DC 200 V	20 mm / 0.787 in	286-328/004-000	1
Relay with 3 make contacts and 1 break contact	DC 24 V	$V_N -30\% \dots +25\%$	AC 250 V / DC 200 V	25 mm / 0.984 in	286-344/004-000	1
Relay with 4 make contacts	DC 24 V	$V_N -30\% \dots +25\%$	AC 250 V / DC 30 V	25 mm / 0.984 in	286-352/004-000	1
Time relay (on-delay timing) with 1 changeover contact	DC 24 V	$V_N -30\% \dots +25\%$	AC 250 V / DC 200 V	20 mm / 0.787 in	286-604/004-000	1
Multifunction timing relay with 1 changeover contact	DC 24 V	$V_N -30\% \dots +25\%$	AC 250 V / DC 120 V	20 mm / 0.787 in	286-640/004-000	1

For additional technical data see: www.wago.com

Terminal Blocks for Pluggable Modules

2-conductor terminal block



4-conductor terminal block



Description	Item no.	Pack. unit
Terminal block for pluggable modules,		1
with 2-conductor terminal blocks, orange separator	12 mm / 0.472 in wide	280-618
with 4-conductor terminal blocks, orange separator	12 mm / 0.472 in wide	280-608
with 4-conductor terminal blocks, marker plate	15 mm / 0.591 in wide	280-762
Terminal block for pluggable modules,		
with 2-conductor terminal blocks, orange separator	17 mm / 0.669 in wide	280-619
with 4-conductor terminal blocks, orange separator	17 mm / 0.669 in wide	280-609
with 4-conductor terminal blocks, marker plate	20 mm / 0.787 in wide	280-763
Terminal block for pluggable modules,		
with 2-conductor terminal blocks, orange separator	22 mm / 0.866 in wide	280-638
with 4-conductor terminal blocks, orange separator	22 mm / 0.866 in wide	280-628
with 4-conductor terminal blocks, marker plate	25 mm / 0.984 in wide	280-764
Terminal block for pluggable modules,		
with 2-conductor terminal blocks, orange separator	27 mm / 1.063 in wide	280-639
with 4-conductor terminal blocks, orange separator	27 mm / 1.063 in wide	280-629
with 4-conductor terminal blocks, marker plate	30 mm / 1.181 in wide	280-765
Terminal block for pluggable modules,		
with 2-conductor terminal blocks, orange separator	37 mm / 1.457 in wide	280-636

Wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; Stripped lengths 8 ... 9 mm / 0.33 in

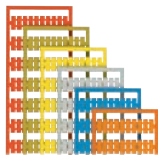
WSB marker cards

1
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Miniature quick marking card



Description	Item no.	Pack. unit
Marking:		
K	209-782	5 cards
1 ... 10	209-702	5 cards
A1, A2, 13, 14, A1, A2, 13, 14	209-952	5 cards
A1, A2, 11, 12, A1, A2, 11, 12	209-953	5 cards
A1, A2, A2, 11, 12, 14, A1, A2, A2	209-994	5 cards
A1, A2, 11, 12, 14, 21, 22, 24	209-995	5 cards
A1, A2, A1, A2, 11, 12, 14, 23, 24	209-693	5 cards
A1, A2, 11, 12, 13, 14, 21, 22, 23, 24	209-691	5 cards
A1, A2, 11, 12, 13, 14, 23, 24, 33, 34	209-690	5 cards
A1, A2, 13, 14, 23, 24, 33, 34, 43, 44	209-692	5 cards
A1, A2, 11, 12, 14, 31, 32, 34, 41, 42	249-656	5 cards
L+, L-, L-, 1, 11, 12, 13, 14	209-954	5 cards
A1, A2, A3, 11, 12, 14	249-607	5 cards
A1, A1, A2, A2, 11, 11, 12, 14	209-996	5 cards
A1, A1, A2, A2, 11, 11, 12, 14, St	209-601	5 cards
U1, U2, U3, U4, OV, 11, 11, 12, 14	209-951	5 cards
U	209-789	5 cards
A1, A2, A2, 1, 2, 3, A1, A2, A2	209-685	5 cards
A1, A2, A2, 1, 2, 2, A1, A2, A2	209-686	5 cards
A1+, A1+, A2-, A2-, 1, 2, RL1, RL2	209-955	5 cards
A1+, A1+, A2-, A2-, 1+, 1+, A, 2-	249-651	5 cards
+/-	209-552	5 cards
1, 2, 3, OV, +UB, OUT, ERR., OV	249-622	5 cards
1, 2, OV, +UB, OUT, ERR., OV	249-623	5 cards
Lin, Lin, Lout, Lout, 24V, UA, UA, OV	209-957	5 cards
Lin, Lin, 14, Lout, 11, Lin, Lin, 14, Lout	249-654	5 cards
Lin, Lout, 24V, 11, 12, 14, OV	209-997	5 cards
S	209-682	5 cards
V	209-784	5 cards
F1 ... F10	209-787	5 cards
D	209-783	5 cards
+, -, 1, 2, 3, 13, 14, 4, 5, 6	249-608	5 cards
L, N, Quitt, Stör., A1, A2, Test, N, 14, 24	249-606	5 cards
A1, A2, Quitt, Stör., 12, 11, 11, 14	249-653	5 cards



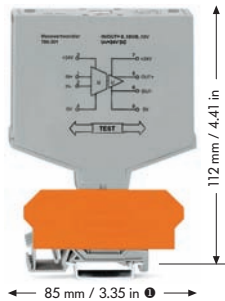
Description	Item no.	Pack. unit
Marker cards and tags WSB 4 mm/0.157 in		
(plain)	209-701	5 cards
Marking software and printer/plotter see section 8		
white		
yellow	209-701/000-002	5 cards
red	209-701/000-005	5 cards
blue	209-701/000-006	5 cards
gray	209-701/000-007	5 cards
orange	209-701/000-012	5 cards
light green	209-701/000-017	5 cards
green	209-701/000-023	5 cards
violet	209-701/000-024	5 cards

5 cards, each containing 10 strips with 10 markers

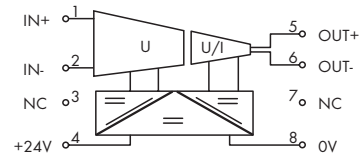
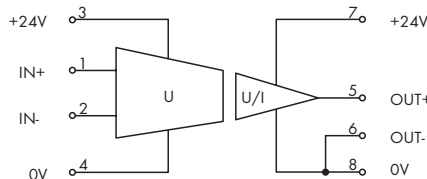
1 Pluggable Analog Signal Conditioning Modules

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	Separate supply voltage for input/output Isolation voltage input/output 4 kV Input signal 0 V ... 10 V Module width 20 mm/ 0.787 in	Electrically isolated supply of input/output via DC/DC converter Isolation voltage input/output/supply voltage 4 kV Input signal 0 V ... 10 V Module width 20 mm/ 0.787 in
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WSB marker card
• Marking V; Item No.: 209-784
• Marking 1 ... 10; Item No.: 209-702
• Marking +/-; Item No.: 209-652
5 cards, each containing 10 strips with 10 markers

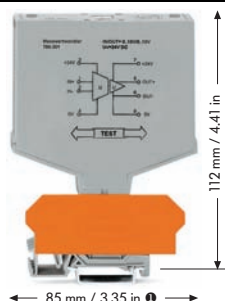


Description	Output signal	Item no.	Pack. unit	Output signal	Item no.	Pack. unit
Analog signal conditioning modules, for signal transformation, amplification and transmission with electrical isolation of input and output of standard signals.	0 - 10 V	786-301	1	0 - 10 V	786-321	1
	0 - 20 mA	786-302	1	0 - 20 mA	786-322	1
	4 - 20 mA	786-303	1	4 - 20 mA	786-323	1

Technical Data		Accessories see page 115		Accessories see page 115	
Input signal	0 V ... 10 V			0 V ... 10 V	
Max. input voltage	13 V			13 V	
Input resistance	100 kΩ			100 kΩ	
Load impedance	≥ 2 kΩ (Out = V); ≤ 750 Ω (Out = mA)			≥ 2 kΩ (Out = V); ≤ 750 Ω (Out = mA)	
Line break detection	Measuring output (LED green = off) at 786-303			Measuring output (LED green = off) at 786-323	
Transmission error (full scale)	≤ 0.15 %			≤ 0.15 %	
Error of transmission typ.	≤ 0.1 %			≤ 0.1 %	
Temperature coefficient (full scale)	≤ 0.02 %/K			≤ 0.02 %/K	
Critical frequency (sinus)	1 kHz			1 kHz	
Isolation voltage input / output	4 kV, 50 Hz, 1 min			4 kV, 50 Hz, 1 min	
Supply voltage RR ≤ 6 % input/output	DC 20 V ... 30 V			DC 20 V ... 28 V	
Power consumption input	8 mA ... 20 mA			60 mA	
Power consumption output	15 mA ... 40 mA			60 mA	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3			250 V / 4 kV / 3	
Ambient operating temperature	0 °C ... + 55 °C			0 °C ... + 55 °C	
Storage temperature	-40 °C ... +80 °C			-40 °C ... +80 °C	
Approvals	EMC testing IEC 60801-2/4/5, Grade B met acc. to EN 50 082 Part 2 (suppl. 3.94)			EMC testing IEC 60801-2/4/5, Grade B met acc. to EN 50 082 Part 2 (suppl. 3.94)	

Accessories		Item no.	Pack. unit		Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶	22 mm / 0.866 in wide	280-638	1	22 mm / 0.866 in wide	280-638	1
with 4-conductor terminal blocks, orange separator ❷	22 mm / 0.866 in wide	280-628	1	22 mm / 0.866 in wide	280-628	1
with 4-conductor terminal blocks, marker plate ❸	25 mm / 0.984 in wide	280-764	1	25 mm / 0.984 in wide	280-764	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in						

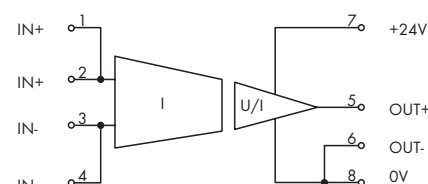
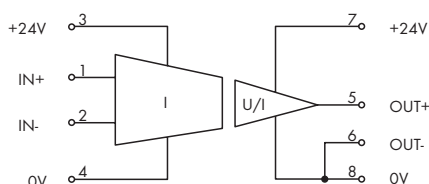
	Separate supply voltage for input/output Isolation voltage input/output 4 kV Input signal 0 mA ... 20 mA Module width 20 mm/ 0.787 in	Separate supply voltage for input/output Isolation voltage input/output 4 kV Input signal 4 mA ... 20 mA Module width 20 mm/ 0.787 in
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WSB marker card

- Marking V; Item No.: 209-784
- Marking 1 ... 10; Item No.: 209-702
- Marking +/-; Item No.: 209-652

5 cards, each containing 10 strips with 10 markers



Description	Output signal	Item no.	Pack. unit	Output signal	Item no.	Pack. unit
Analog signal conditioning modules, for signal transformation, amplification and transmission with electrical isolation of input and output of standard signals.	0 - 10 V	786-304	1	0 - 10 V	786-307	1
	0 - 20 mA	786-305	1	0 - 20 mA	786-308	1
	4 - 20 mA	786-306	1	4 - 20 mA	786-309	1

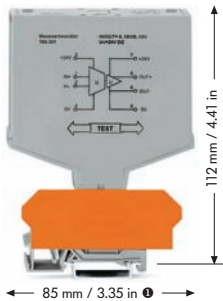
Technical Data		Accessories see page 115		Accessories see page 115	
Input signal	0 mA ... 20 mA			4 mA ... 20 mA	
Max. input current	22 mA			22 mA	
Input resistance	≤ 50 Ω			≤ 400 Ω	
Max. voltage drop at input				≤ 8 V	
Load impedance	≥ 2 kΩ (Out = V); ≤ 750 Ω (Out = mA)			≥ 2 kΩ (Out = V); ≤ 750 Ω (Out = mA)	
Line break detection	Measuring output (LED green = off) at 786-306			Measuring input (LED green = off) and Measuring output (LED green = off) at 786-309	
Transmission error (full scale)	≤ 0.15 %			≤ 0.15 %	
Error of transmission typ.	≤ 0.1 %			≤ 0.1 %	
Temperature coefficient (full scale)	≤ 0.02 %/K			≤ 0.02 %/K	
Critical frequency (sinus)	1 kHz			1 kHz	
Isolation voltage input / output	4 kV, 50 Hz, 1 min			4 kV, 50 Hz, 1 min	
Supply voltage RR ≤ 6 % input/output	DC 20 V ... 30 V			DC 20 V ... 30 V	
Power consumption input	7 mA ... 18 mA			7 mA ... 18 mA	
Power consumption output	9 ... 16 mA; 13 ... 35 mA; 22 ... 40 mA			25 mA; 50 mA; 50 mA	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3			250 V / 4 kV / 3	
Ambient operating temperature	0 °C ... +55 °C			0 °C ... +55 °C	
Storage temperature	-40 °C ... +80 °C			-40 °C ... +80 °C	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶	22 mm / 0.866 in wide 280-638	1	22 mm / 0.866 in wide 280-638	1
with 4-conductor terminal blocks, orange separator ❷	22 mm / 0.866 in wide 280-628	1	22 mm / 0.866 in wide 280-628	1
with 4-conductor terminal blocks, marker plate ❸	25 mm / 0.984 in wide 280-764	1	25 mm / 0.984 in wide 280-764	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in				

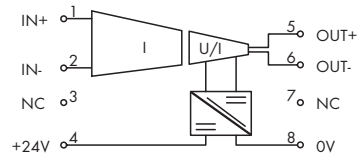
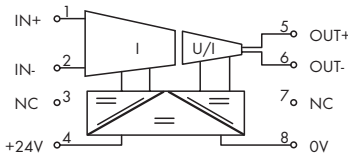
1 Pluggable Analog Signal Conditioning Modules

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	Electrically isolated supply of input/output via DC/DC converter Isolation voltage input/output/supply voltage 4 kV Input signal 0 mA ... 20 mA Module width 20 mm/ 0.787 in	Electrically isolated supply of input/output via DC/DC converter Isolation voltage input/output/supply voltage 4 kV Input signal 0 mA ... 20 mA Module width 20 mm/ 0.787 in
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WSB marker card
 • Marking V; Item No.: 209-784
 • Marking 1 ... 10; Item No.: 209-702
 • Marking +/-; Item No.: 209-652
 5 cards, each containing 10 strips with 10 markers



Description	Output signal	Item no.	Pack. unit	Output signal	Item no.	Pack. unit
Analog signal conditioning modules, for signal transformation, amplification and transmission with electrical isolation of input and output of standard signals.	0 - 10 V	786-324	1	0 - 10 V	786-337	1
	0 - 20 mA	786-325	1	0 - 20 mA	786-338	1
	4 - 20 mA	786-326	1	4 - 20 mA	786-339	1

Technical Data		Accessories see page 115		Accessories see page 115	
Input signal	0 mA ... 20 mA	4 mA ... 20 mA			
Max. input current	22 mA	22 mA			
Input resistance	≤ 50 Ω	≤ 400 Ω			
Max. voltage drop at input		≤ 8 V			
Load impedance	≥ 2 kΩ (Out = V); ≤ 750 Ω (Out = mA)	≥ 2 kΩ (Out = V); ≤ 750 Ω (Out = mA)			
Line break detection	Measuring input (LED green = off) at 786-326	Measuring input (LED green = off) and Measuring output (LED green = off) at 786-339			
Transmission error (full scale)	≤ 0.15 %	≤ 0.15 %			
Error of transmission typ.	≤ 0.1 %	≤ 0.1 %			
Temperature coefficient (full scale)	≤ 0.02 %/K	≤ 0.02 %/K			
Critical frequency (sinus)	1 kHz	1 kHz			
Isolation voltage input / output	4 kV, 50 Hz, 1 min	4 kV, 50 Hz, 1 min			
Supply voltage RR ≤ 6 % input/output	DC 20 V ... 28 V	DC 20 V ... 28 V			
Power consumption input	70 mA; 90 mA; 95 mA	35 mA; 60 mA; 60 mA			
Power consumption output	70 mA; 90 mA; 95 mA	35 mA; 60 mA; 60 mA			
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3			
Ambient operating temperature	0 °C ... + 55 °C	0 °C ... + 55 °C			
Storage temperature	-40 °C ... +80 °C	-40 °C ... +80 °C			

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶ with 4-conductor terminal blocks, orange separator ❷ with 4-conductor terminal blocks, marker plate ❸ wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in	22 mm / 0.866 in wide	280-638	1	22 mm / 0.866 in wide
	22 mm / 0.866 in wide	280-628	1	22 mm / 0.866 in wide
	25 mm / 0.984 in wide	280-764	1	25 mm / 0.984 in wide

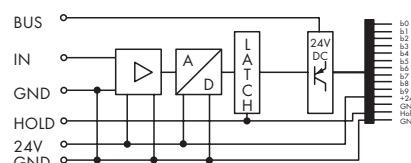
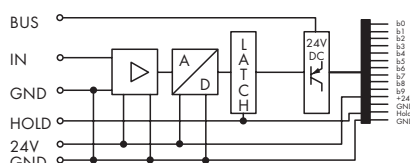
10 Bit A/D Converter in DIN-Rail-Mountable Enclosure

	10 bit analog /digital converter with HOLD and BUS signal input Input signal 0 V ... 10 V Module width 22.5 mm / 0.886 in	10 bit analog /digital converter with HOLD and BUS signal input Input signal 0 mA ... 20 mA Module width 22.5 mm / 0.886 in
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A/D converters are used for the conversion of standard analog signals into digital coded signals, allowing a digital computer to process analog signals. The digital BUS interface allows the connection of any number of converters, which are individually controlled through their BUS signal input as follows:

A high level at the BUS input triggers the data word, which has first been digitally converted, to the computer BUS, a low level inactivates the BUS driver stage of the converter, - the internal conversion being continued!! - thus allowing another parallel connected converter to transmit data to the computer BUS.

A high level at the HOLD input allows storage of the digitally converted value, for later retrieval synchronously by the computer. However, a low level deactivates the storage function, therefore if this feature is not desired, the HOLD input should be held low.

[illegible]

Technical Data

Input signal (max.)	13 V	100 mA
Input resistance	200 kΩ	< 50 Ω
Resolution (1 LSB)	9.7 mV	19.5 μA
Sampling rate (free-running mode)	1 kHz	1 kHz
Control signals (BUS, HOLD) Input level 1-signal "H"	DC 20 V ... 30 V	DC 20 V ... 30 V
Control signals (BUS, HOLD) Input level 0-signal "L"	< 5 V or open connection	< 5 V or open connection
Output signal	10 bits	10 bits
Output signal output level 1-signal "H"	V _B - 3 V	V _B - 3 V
Output signal output level 0-signal "L"	Open output	Open output
Output current	max. 20 mA / bit	max. 20 mA / bit
Supply voltage VB	DC 24 V (± 10 %)	DC 24 V ± 10 %
Power consumption	75 mA	75 mA
Protective measure	Suppressor diode	Suppressor diode
Error of transmission	± 1 LSB	± 1 LSB
Ambient operating temperature	0 °C ... + 55 °C	0 °C ... + 55 °C
Wire connection	CAGE CLAMP® (WAGO Series 257); Flat cable connector 14-pole acc. to DIN 41651	CAGE CLAMP® (WAGO Series 257); Flat cable connector 14-pole acc. to DIN 41651
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12	0.08 mm² ... 2.5 mm² / AWG 28 ... 12
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in

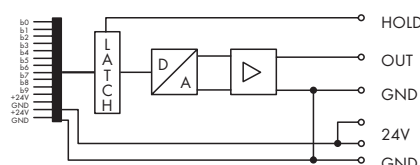
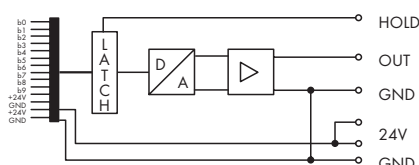
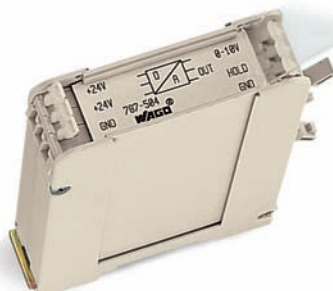
10 Bit D/A Converter in DIN-Rail-Mountable Enclosure

	10 bit digital /analog converter with HOLD signal input Output signal 0 V ... 10 mA Module width 22.5 mm / 0.886 in	10 bit digital /analog converter with HOLD signal input Output signal 0 mA ... 20 mA Module width 22.5 mm / 0.886 in
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D/A converters are used for the conversion of digital coded processor signals into standard analog signals, allowing the direct triggering of analog final controlling device via the digital processor BUS. This BUS allows the connection of any number of converters which are individually controlled through their HOLD signal input as follows:

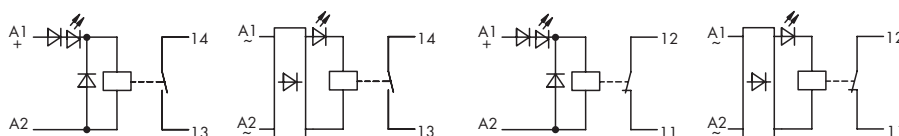
Whilst a low level at the HOLD input actuates the analog conversion of the data word pending at the processor BUS, a high level deactivates the converter whilst the analog value converted last is available at the converter output for the duration of the high level.

During the "startup" period of the processor it is recommended that all connected converters are set into a defined state (for ex. 0 V) and to output the desired analog values in cycles.

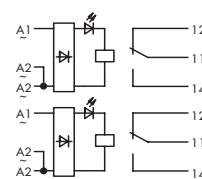
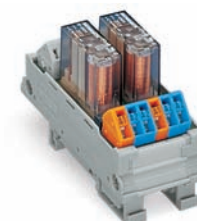
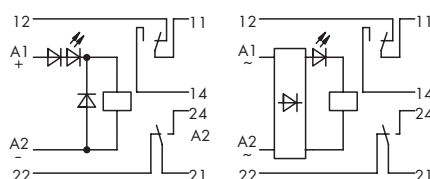
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Technical Data

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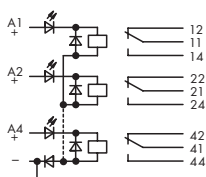


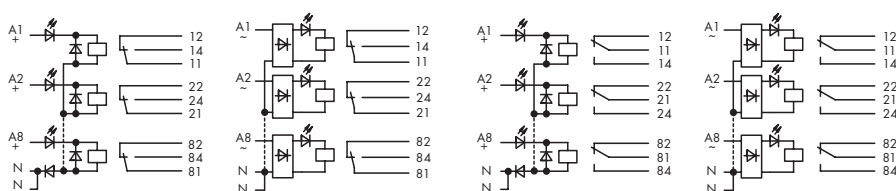
Technical Data		
Contact material	AgNi 0.15 + HV	AgNi 0.15 + HV
Max. switching voltage	DC 250 V / AC 250 V	DC 250 V / AC 250 V
Max. make / break current	4 s 16 A / 8 A	4 s 16 A / 8 A
Max. continuous current	6 A	6 A
Max. switching power (resistive)	100 W/ 1500 VA	100 W/ 1500 VA
Pull-in / operating power	240 mW / 500 mW	240 mW / 500 mW
Pull-in/drop-out/bounce time typ.	4 ms / 6 ms / 2 ms	4 ms / 6 ms / 2 ms
Dielectric strength contact-coil (AC, 1 min)	4 kV	4 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Mechanical life	30 x 10 ⁶ switching operations	30 x 10 ⁶ switching operations
Mechanical life at max. load (resistance)	2 x 10 ⁵ switching operations	2 x 10 ⁵ switching operations
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C
Dimensions (mm) L x W x H	13 x 85 x 47	13 x 85 x 47
incl. mounting carrier and relay	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP® (WAGO Series 236)	CAGE CLAMP® (WAGO Series 236)
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Accessories		
WMB Multi marking system for mounting carrier	see page 279	see page 279
Marker strips for mounting carrier	white 709-198 / transparent 709-197	white 709-198 / transparent 709-197



Technical Data		
Contact material	AgNi 0.15 + HV	AgNi 0.15 + HV
Max. switching voltage	DC 250 V / AC 250 V	DC 300 V / AC 250 V
Max. make / break current	4 s 14 A / 8 A	20 A / 8 A
Max. continuous current	6 A	6 A
Max. switching power (resistive)	100 W/ 1500 VA	192 W/ 1500 VA
Pull-in / operating power	261 mW / 533 mW	261 mW / 533 mW
Pull-in/drop-out/bounce time typ.	8 ms / 3 ms / 2 ms	9 ms / 3 ms / 2 ms
Dielectric strength contact-coil (AC, 1 min)	2.5 kV	4 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 2.5 kV / 3	250 V / 4 kV / 3
Mechanical life	30 x 10 ⁶ switching operations	30 x 10 ⁶ switching operations
Mechanical life at max. load (resistance)	1 x 10 ⁵ switching operations	1 x 10 ⁵ switching operations
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C
Dimensions (mm) L x W x H	22.5 x 85 x 48	38.5 x 85 x 48
incl. mounting carrier and relay	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP® (WAGO Series 236)	CAGE CLAMP® (WAGO Series 236)
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Accessories		
WMB Multi marking system for mounting carrier	see page 279	see page 279
Marker strips for mounting carrier	white 709-198 / transparent 709-197	white 709-198 / transparent 709-197

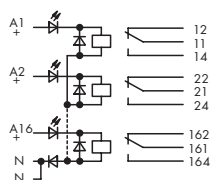
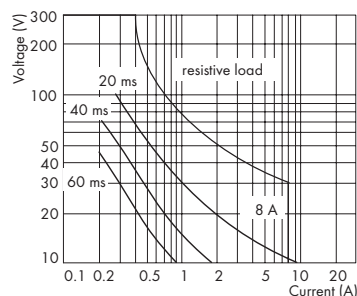
	with 4 relays, 1 changeover contact each Relay in socket with universal mounting carrier	
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A photograph of a rack-mounted terminal block. It features a series of white and orange modules mounted on a green printed circuit board (PCB) within a grey metal frame. The modules are arranged in a row, and the entire unit is designed for easy access and secure connection.

Technical Data		
Contact material	AgNi 0.15 + HV	AgNi 0.15 + HV
Max. switching voltage	DC 250 V / AC 250 V	DC 300 V / AC 250 V
Max. make / break current	4 s 30 A / 8 A	20 A / 8 A
Max. continuous current	6 A	6 A
Max. switching power (resistive)	90 W / 1500 VA	192 W / 1500 VA
Pull-in / operating power	170 mW / 245 mW	261 mW / 533 mW
Pull-in/drop-out/bounce time typ.	7 ms / 3 ms / 2 ms	9 ms / 3 ms / 2 ms
Dielectric strength contact-coil (AC, 1 min)	4 kV	4 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 2.5 kV / 3	250 V / 2.5 kV / 3
Mechanical life	20 x 10 ⁶ switching operations	20 x 10 ⁶ switching operations
Mechanical life at max. load (resistance)	2 x 10 ⁵ switching operations	2 x 10 ⁵ switching operations
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C
Dimensions (mm) L x W x H	127 x 85 x 38	127 x 85 x 58
incl. mounting carrier and relay	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP® (WAGO Series 236)	CAGE CLAMP® (WAGO Series 236)
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12	0.08 mm² ... 2.5 mm² / AWG 28 ... 12
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Accessories		
WMB Multi marking system for mounting carrier	see page 279	see page 279
Marker strips for mounting carrier	white 709-198 / transparent 709-197	white 709-198 / transparent 709-197

with 16 relays, 1 changeover contact each
Relay in socket
with universal mounting carrier



Description	V _N	I _N	Item no.	Pack. unit	
Switching relay module	DC 12 V	43.8 mA	287-853	1	
	DC 24 V	21.8 mA	287-854	1	

Technical Data

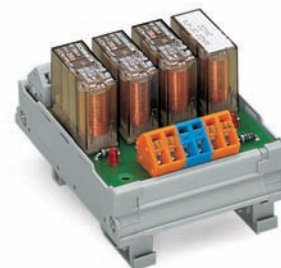
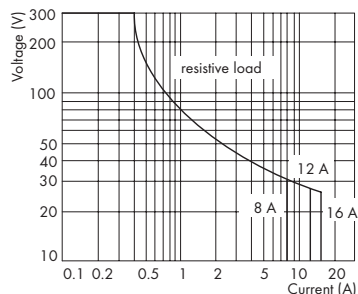
Input voltage range	V _N -15 % ... +20 %	
Contact material	AgNi 0.15	
Max. switching voltage	DC 250 V / AC 250 V	
Max. make / break current	4 s (AC) 16 A / 5 A (DC 24 V)	
Max. continuous current	6 A	
Max. switching power (resistive)	AC 1500 VA; DC see load limit curve	
Recommended minimum load	100 mA / AC/DC 10 V (1 W, 1 VA)	
Pull-in / operating power	533 mW	
Pull-in/drop-out/bounce time typ.	10 ms / 4 ms / 2 ms	
Nominal operating mode	continuous duty	
Dielectric strength contact-coil (AC, 1 min)	4 kV	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 2.5 kV / 3	
Mechanical life	30 x 10 ⁶ switching operations	
Mechanical life at max. load (resistance)	1 x 10 ⁵ switching operations	
Ambient operating temperature	-25 °C ... +40 °C	
Storage temperature	-40 °C ... +70 °C	
Dimensions (mm) L x W x H	287 x 85 x 58	
incl. mounting carrier and relay	Height from upper-edge of DIN 35 rail	
Wire connection	CAGE CLAMP® (WAGO Series 236)	
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12	
Stripped lengths	5 ... 6 mm / 0.22 in	
Approvals	DIN VDE 0140, DIN VDE 0160 and IEC 60255, DIN VDE 0435 (corresponding parts)	
Accessories		
WMB Multi marking system for mounting carrier	see page 279	
Marker strips for mounting carrier	white 709-198 / transparent 709-197	

1 DIN-Rail-Mountable Modules - Relay Modules

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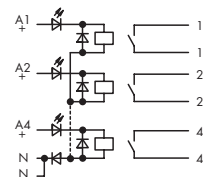
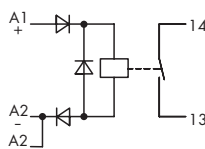
Relay with 1 make contact
Relay direct soldered
with universal mounting carrier
Designed for switching high inrush current
loads i.e. filament lamp loads

with 4 relays, 1 make contact each
Relay direct soldered
with universal mounting carrier
Designed for switching high inrush current
loads i.e. filament lamp loads



Contact life at lamp load

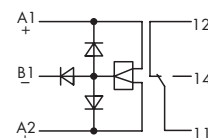
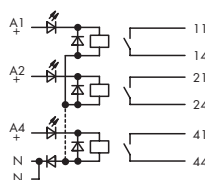
Load	Switch. oper.
12 A, AC 250 V, $\cos \phi = 1$	3×10^5
TV 8 acc. UL 508	25×10^3
2500 W, AC 230 V halogen	$> 10^4$
1000 W, AC 250 V incandescent	$2,3 \times 10^5$
3000 W, AC 250 V incandescent	$3,6 \times 10^4$
1500 VA, fluorescent 163 μ F	10^4



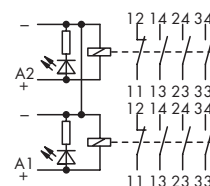
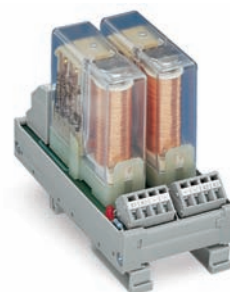
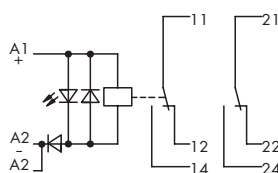
Description	V_N	I_N	Item no.	Pack. unit	V_N	I_N	Item no.	Pack. unit
Switching relay module	DC 24 V	21.8 mA	288-320	1	DC 24 V	21.8 mA	287-475	1

Technical Data

Input voltage range	$V_N -15\% \dots +20\%$	$V_N -15\% \dots +20\%$
Contact material	AgSnO ₂	AgSnO ₂
Max. switching voltage	AC 440 V	AC 440 V
Max. make / break current	4 s 25 A	4 s 25 A
Peak inrush current	20 ms/120 A	20 ms/120 A
Max. continuous current	16 A	16 A
Max. switching power (resistive)	AC 4000 VA; DC see load limit curve	AC 4000 VA; DC see load limit curve
Recommended minimum load	> 100 mA / AC/DC 12 V	> 100 mA / AC/DC 12 V
Pull-in / operating power	500 mW	500 mW
Pull-in/drop-out/bounce time typ.	8 ms / 2 ms / 2 ms	8 ms / 2 ms / 2 ms
Nominal operating mode	continuous duty	continuous duty
Dielectric strength contact-coil (AC, 1 min)	4 kV	4 kV
Open circuit	1 kV	1 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Mechanical life	30×10^6 switching operations	30×10^6 switching operations
Service life at lamp load	see lamp load table	see lamp load table
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C
Dimensions (mm) L x W x H	20,5 x 85 x 47	64 x 85 x 47
incl. mounting carrier and relay	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP® (WAGO Series 236)	CAGE CLAMP® (WAGO Series 236)
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	DIN VDE 0140 Part 18.01 for AC 250 V; DIN VDE 0160 and IEC 60255; DIN VDE 0435 (corresponding parts); UL 508	DIN VDE 0140 Part 18.01 for AC 250 V; DIN VDE 0160 and IEC 60255; DIN VDE 0435 (corresponding parts); UL 508
Accessories		
WMB Multi marking system for mounting carrier	see page 279	see page 279
Marker strips for mounting carrier	white 709-198 / transparent 709-197	white 709-198 / transparent 709-197

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Technical Data		
Input voltage range	$V_N - 15 \% \dots + 20 \%$	$V_N - 15 \% \dots + 20 \%$
Contact material	AgCdO	AgNi 0.15 + HV
Max. switching voltage	DC 250 V / AC 250 V	DC 300 V / AC 250 V
Max. make / break current	1 s (AC) 25 A	4 s 20 A / 8 A
Max. continuous current	16 A	6 A
Max. switching power (resistive)	AC 4000 VA; DC see load limit curve	192 W / 1750 VA
Recommended minimum load	> 100 mA / AC/DC 12 V	
Pull-in / operating power	500 mW	261 mW / 533 mW
Pull-in/drop-out/bounce time typ.	8 ms / 2 ms / 2 ms	9 ms / 3 ms / 2 ms
Nominal operating mode	continuous duty	
Dielectric strength contact-coil (AC, 1 min)	4 kV	4 kV
Open circuit	1 kV	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Mechanical life	30×10^6 switching operations	30×10^6 switching operations
Mechanical life at max. load (resistance)	1×10^5 switching operations	1×10^5 switching operations
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C
Storage temperature	-40 °C ... +70 °C	
Dimensions (mm) L x W x H	64 x 85 x 47	20,5 x 85 x 48
incl. mounting carrier and relay	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP® (WAGO Series 236)	CAGE CLAMP® (WAGO Series 236)
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12	0.08 mm² ... 2.5 mm² / AWG 28 ... 12
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	DIN VDE 0160 and IEC 60255; DIN VDE 0435 (corresponding parts)	
Accessories		
WMB Multi marking system for mounting carrier	see page 279	see page 279
Marker strips for mounting carrier	white 709-198 / transparent 709-197	white 709-198 / transparent 709-197

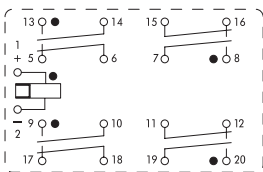
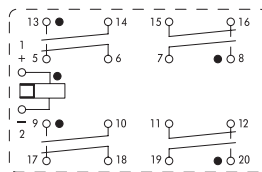
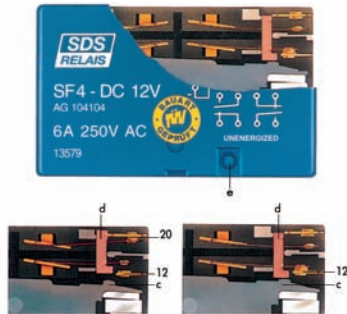


Technical Data		
Contact material	AgNi 10 + 5 µm Au	AgCdO + 0.2 µm Au
Contact type	3 make contacts / 1 break contact	3 make contacts / 1 break contact
Max. switching voltage	60 V	DC 300 V / AC 230 V
Max. make / break current	0.3 A	10 A / 7 A
Max. continuous current	5 A	6 A
Max. switching power (resistive)	7 W / 7 VA	120 W / 2000 VA
Recommended minimum load	1 mA / AC/DC 100 mV	300 mA / 12 V
Pull-in / operating power	- / 800 mW	- / 1200 mW
Max. switching rate		5 x / s
Pull-in/drop-out/bounce time typ.	15 ms / 12 ms / -	23 ms / 20 ms / -
Nominal operating mode	continuous duty	continuous duty
Dielectric strength contact-coil (AC, 1 min)	4 kV	2.5 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 2.5 kV / 3	
Test voltage coil - contact	4 kV (1 min)	2500 V eff
Test voltage contact - contact	1 kV (1 min)	2500 V eff
Test voltage contacts - yoke		2500 V eff
Mechanical life	50 x 10 ⁷ switching operations	1 x 10 ⁷ switching operations
Mechanical life at max. load (resistance)	1 x 10 ⁵ switching operations	
Ambient operating temperature	-40 °C ... +85 °C	-25 °C ... +70 °C
Relay fixing mechanism	soldered	plastic holden with locking latches (by relay manufacturer)
Dimensions (mm) L x W x H	19 x 85 x 38	57 x 107 x 90
incl. mounting carrier and relay	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP® (WAGO Series 236)	CAGE CLAMP® (WAGO Series 736)
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Accessories		
WMB Multi marking system for mounting carrier	see page 279	see page 279
Marker strips for mounting carrier	white 709-198 / transparent 709-197	white 709-198 / transparent 709-197

If required a breathing hole can be made in the cover. However be aware that the degree of waterproof protection will reduce from IP 67 to IP 30!

Safety relay type SDS SF 4
with 4 break contacts and 4 make contacts
with 1 relay with universal mounting carrier

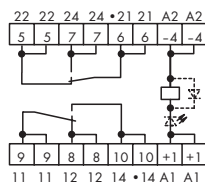
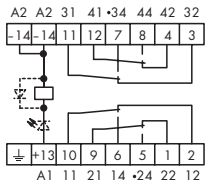
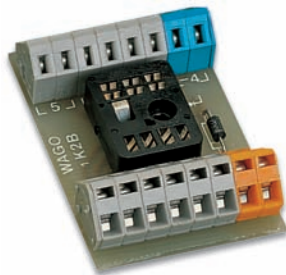
Safety relay type SDS SF 4
with 4 break contacts and 4 make contacts
with 2 relays with universal mounting carrier



Description	V _N	I _N	Item no.	Pack. unit	V _N	I _N	Item no.	Pack. unit
Switching relay module	DC 5 V	100 mA	288-412	1	DC 5 V	100 mA	288-422	1
	DC 12 V	41.7 mA	288-413	1	DC 12 V	41.7 mA	288-423	1
	UC 24 V	20.9 mA	288-414	1	UC 24 V	20.9 mA	288-424	1
	UC 48 V	10.5 mA	288-415	1	UC 48 V	10.5 mA	288-425	1
	UC 60 V	8.4 mA	288-416	1	UC 60 V	8.4 mA	288-426	1
	AC 230 V	9.4 mA	288-418	1	AC 230 V	9.4 mA	288-428	1
Technical Data								
Contact material	Ag Sn O 0.1 µm Au				Ag Sn O 0.1 µm Au			
Max. switching voltage	AC 250 V				AC 250 V			
Max. make / break current	20 A / 6 A				20 A / 6 A			
Max. continuous current	6 A				6 A			
Max. switching power (resistive)	150 W / 1500 VA				150 W / 1500 VA			
Pull-in / operating power	280 mW / 500 mW				280 mW / 500 mW			
Pull-in/drop-out/bounce time typ.	18 ms / 6 ms / 4 ms				18 ms / 6 ms / 4 ms			
Dielectric strength contact-coil (AC, 1 min)	2.5 kV				2.5 kV			
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 2.5 kV / 3				250 V / 2.5 kV / 3			
Mechanical life	1 x 10 ⁷ switching operations				1 x 10 ⁷ switching operations			
Mechanical life at max. load (resistance)	1 x 10 ⁵ switching operations				1 x 10 ⁵ switching operations			
Ambient operating temperature	-40 °C ... +70 °C				-40 °C ... +70 °C			
Dimensions (mm) L x W x H	63.5 x 85 x 40				127 x 85 x 40			
incl. mounting carrier and relay	Height from upper-edge of DIN 35 rail				Height from upper-edge of DIN 35 rail			
Wire connection	CAGE CLAMP® (WAGO Series 256)				CAGE CLAMP® (WAGO Series 236)			
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12				0.08 mm² ... 2.5 mm² / AWG 28 ... 12			
Stripped lengths	5 ... 6 mm / 0.22 in				5 ... 6 mm / 0.22 in			
Relay Approvals	SEV approvals, no. D 3.31/192; SUVA approvals, no. 36 62 (delayed operation 5 Amp fuse); TÜV test no. 945/EL 178/88; UL recognized, file no. E 43149				SEV approvals, no. D 3.31/192; SUVA approvals, no. 36 62 (delayed operation 5 Amp fuse); TÜV test no. 945/EL 178/88; UL recognized, file no. E 43149			
Accessories								
WMB Multi marking system for mounting carrier	see page 279				see page 279			
Marker strips for mounting carrier	white 709-198 / transparent 709-197				white 709-198 / transparent 709-197			

Rail-Mounted Modules - Relay Sockets

	Socket for European standard industrial relay, size 1 with 4 changeover contacts	Socket for KAMMRELAIS® Size I with 2 changeover contacts
		KAMMRELAIS® is a registered trade mark of SIEMENS AG



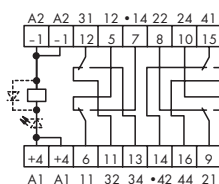
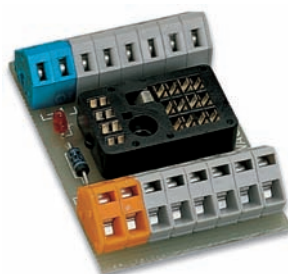
Description	Item no.	Pack. unit	Item no.	Pack. unit
Relay socket, for AC/DC relays	288-111	1	288-131	1
Relay socket, for DC relays with free-wheeling diode	288-112	1	288-132	1
Relay socket, for DC relays with free-wheeling diode and LED	288-113	1	288-133	1

Technical Data				
Relay socket	14-pole		8-pole	
Operating voltage (dependent on the relay voltage)	max. AC / DC 250 V		max. AC / DC 250 V	
Nominal current	5 A		5 A	
Max. coil current of the LED version	25 mA		25 mA	
Dimensions (mm) L x W x H	42.5 x 62.5 x 32		42.5 x 62.5 x 32	
incl. mounting carrier and universal mounting feet	Height from upper-edge of DIN 35 rail		Height from upper-edge of DIN 35 rail	
Wire connection	Terminal strips with CAGE CLAMP® connection (WAGO Series 236)		Terminal strips with CAGE CLAMP® connection (WAGO Series 236)	
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)		0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)	
Stripped lengths	5 ... 6 mm / 0.22 in		5 ... 6 mm / 0.22 in	
Examples of suitable relays	Schrack RA4 and ZG4; Siemens V23 100; SDS HC 4; P+B KH/KHA; Aromat HC+HQ; OMRON MY; IDES RM/RV		Schrack ZL2; Siemens V23 154; Siemens V 23 162; SDS K2; P+B R 10; Aromat K	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Mounting carrier, for screw-fixing or DIN-rail mounting (with snap-fit type universal mounting feet to be ordered separately)	288-001	1	288-001	1
Universal mounting foot; snap-fit type; suitable for DIN 15, 32 and 35 rails (also see page 258)	288-002	10	288-002	10

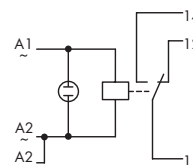
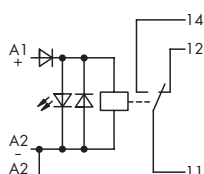
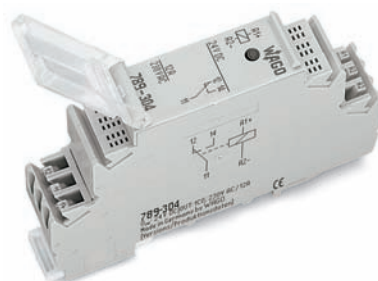
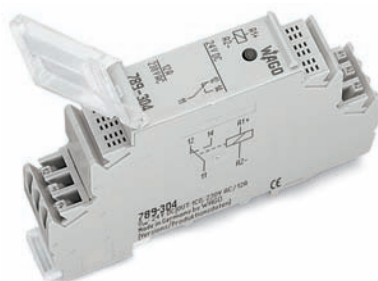
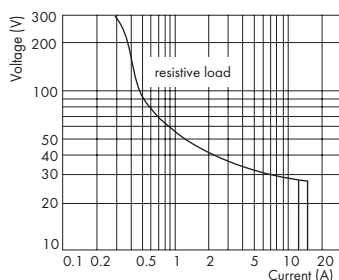
Socket for KAMMRELAIS® Size II
with 4 changeover contacts

KAMMRELAIS® is a registered
trade mark of SIEMENS AG



Description	Item no.	Pack. unit	
Relay socket, for AC/DC relays	288-151	1	
Relay socket, for DC relays with free-wheeling diode	288-152	1	
Relay socket, for DC relays with free-wheeling diode and LED	288-153	1	
Technical Data			
Relay socket	14-pole		
Operating voltage (dependent on the relay voltage)	max. AC / DC 250 V		
Nominal current	5 A		
Max. coil current of the LED version	25 mA		
Dimensions (mm) L x W x H incl. mounting carrier and universal mounting feet	42.5 x 62.5 x 32		
Wire connection	Height from upper-edge of DIN 35 rail Terminal strips with CAGE CLAMP® connection (WAGO Series 236)		
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)		
Stripped lengths	5 ... 6 mm / 0.22 in		
Examples of suitable relays	Schrack ZL4; Siemens V23 154; Siemens V 23 162; SDS K4; P+B R 10; Aromat K		
Accessories			
Mounting carrier, for screw-fixing or DIN-rail mounting (with snap-fit type universal mounting feet to be ordered separately)	288-001	1	
Universal mounting foot; snap-fit type; suitable for DIN 15, 32 and 35 rails (also see page 258)	288-002	10	

	Relay with 1 changeover contact	Relay with 1 changeover contact
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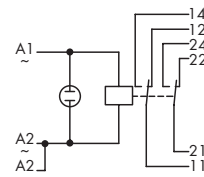
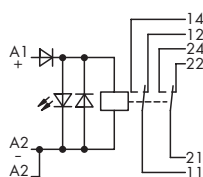
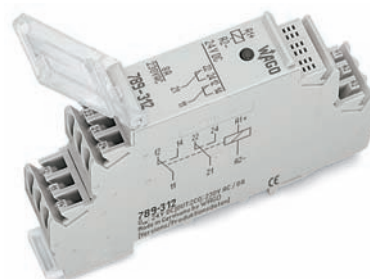
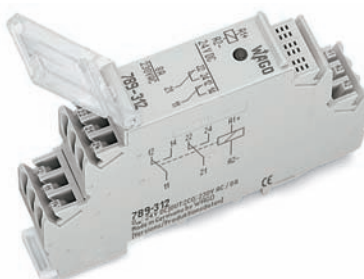
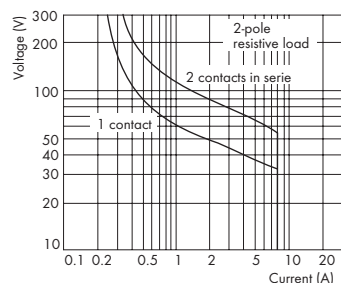
Other coil voltages contact factory

[illegible]

Technical Data	Accessories see page 141	Accessories see page 141
Contact material	AgNi 90/10	AgNi 90/10
Input voltage range	V _N -15 % ... +10 %	V _N -15 % ... +10 %
Max. switching voltage	AC/DC 250 V	AC/DC 250 V
Max. make current (resistive) at a 10 % duty cycle	4 s (AC) 25 A	4 s (AC) 25 A
Max. continuous current	12 A	12 A
Max. switching power (resistive)	AC 3000 VA, DC see load limit curve	AC 3000 VA, DC see load limit curve
Recommended minimum load	> 100 mA / AC / DC 12 V	> 100 mA / AC / DC 12 V
Operating power	400 mW	0.96 VA
Pull-in/drop-out/bounce time typ.	7 ms / 3 ms / 3 ms	15 ms / 15 ms / 3 ms
Nominal operating mode	continuous duty	continuous duty
Dielectric strength contact-coil (AC, 1 min)	5 kV	5 kV
Dielectric strength open contact	1 kV	1 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Mechanical life at 1000 W, AC 250 V	30 x 10 ⁶ switching operations	30 x 10 ⁶ switching operations
Service life at lamp load	1.2 x 10 ³ switching operations	1.2 x 10 ³ switching operations
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C
Storage temperature	-40 °C ... +85 °C	-40 °C ... +85 °C
Dimensions (mm) W x H x L	17.5 x 55 x 90	17.5 x 55 x 90
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP®	Height from upper-edge of DIN 35 rail CAGE CLAMP®
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	DIN VDE 0160 and IEC 60255; DIN VDE 0435 (corresp. parts)	DIN VDE 0160 and IEC 60255; DIN VDE 0435 (corresp. parts)

Relay with 2 changeover contacts

Relay with 2 changeover contacts



Other coil voltages contact factory

Description	V _N	I _N	Item no.	Pack. unit	V _N	I _N	Item no.	Pack. unit
Switching Relay Module	DC 24 V	21 mA	789-312	1	UC 24 V	22 mA	789-512	1
	DC 48 V	13 mA	789-313	1	AC 115 V	7.6 mA	789-515	1
	DC 110 V	6 mA	789-315	1	AC 230 V	4.2 mA	789-516	1

Technical Data

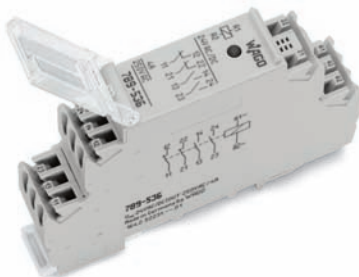
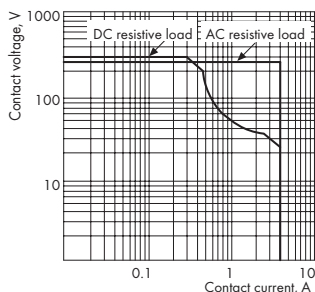
Accessories see page 141

Accessories see page 141

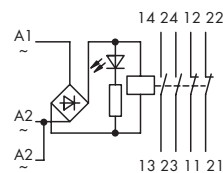
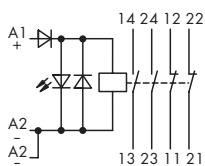
Contact material	AgNi 90/10	AgNi 90/10
Input voltage range	V _N -15 % ... +10 %	V _N -15 % ... +10 %
Max. switching voltage	AC/DC 250 V	AC/DC 250 V
Max. make current (resistive) at a 10 % duty cycle	4 s / 15 A	4 s / 15 A
Max. continuous current	8 A	8 A
Max. switching power (resistive)	AC 2000 VA, DC see load limit curve	AC 2000 VA, DC see load limit curve
Recommended minimum load	> 100 mA / AC / DC 12 V	> 100 mA / AC / DC 12 V
Operating power	400 mW	0.96 VA
Pull-in/drop-out/bounce time typ.	7 ms / 2 ms / 3 ms	7 ms / 2 ms / 3 ms
Nominal operating mode	continuous duty	continuous duty
Dielectric strength contact-coil (AC, 1 min)	5 kV	5 kV
Dielectric strength open contact	1 kV	1 kV
Dielectric strength contact-contact	2.5 kV	1.5 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Mechanical life	3 x 10 ⁷ switching operations	5 x 10 ⁶ switching operation
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C
Storage temperature	-40 °C ... +85 °C	-40 °C ... +85 °C
Dimensions (mm) W x H x L	17.5 x 55 x 90	17.5 x 55 x 90
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP®	Height from upper-edge of DIN 35 rail CAGE CLAMP®
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	DIN VDE 0160 and IEC 60255; DIN VDE 0435 (corresp. parts)	DIN VDE 0160 and IEC 60255; DIN VDE 0435 (corresp. parts)

Relay Modules in DIN-Rail-Mountable Enclosure

	Relay with 2 break and 2 make contacts	Relay with 2 break and 2 make contacts
--	--	--



Note: Inductive loads have to be attenuated by an appropriate protective circuit in order to protect relay coils and contacts!

[illegible]

Technical Data

Accessories see page 141

Accessories see page 141

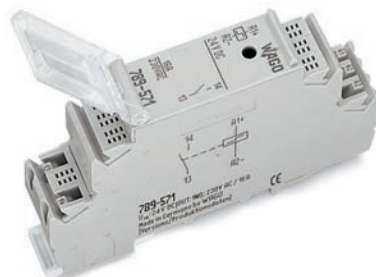
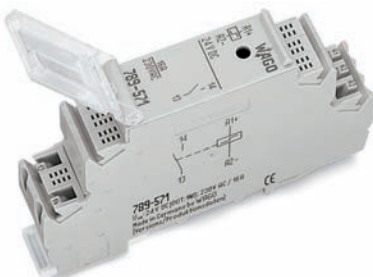
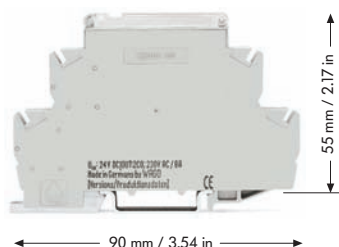
Contact material	AuAg10 over AgNi 15	AuAg10 over AgNi 15
Input voltage range	$V_N -15 \% \dots +10 \%$	$V_N -15 \% \dots +10 \%$
Max. switching voltage	AC 250 V / DC 30 V	AC 250 V / DC 30 V
Switching current max	AC 4 A / DC 3 A	AC 4 A / DC 3 A
Max. switching power (resistive)	1000 VA / 90 W, resistive see load limit curve	1000 VA / 90 W, resistive see load limit curve
Recommended minimum load	$> 100 \mu\text{A}$ / DC 100 mV	$> 100 \mu\text{A}$ / DC 100 mV
Pull-in/drop-out/bounce time typ.	15 ms / 10 ms / 1 ms	20 ms / 20 ms / 1 ms
Nominal operating mode	continuous duty	continuous duty
Max. switching frequency with load	6 min^{-1}	6 min^{-1}
Dielectric strength contact-coil (AC, 1 min)	1.5 kV	1.5 kV
Dielectric strength open contact	0.75 kV	0.75 kV
Dielectric strength contact-contact	1 kV	1 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	230 V / 2.5 kV / 3	230 V / 2.5 kV / 3
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C
Storage temperature	-40 °C ... +85 °C	-40 °C ... +85 °C
Dimensions (mm) W x H x L	17.5 x 55 x 90	17.5 x 55 x 90
	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP®	CAGE CLAMP®
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 14	0.08 mm² ... 2.5 mm² / AWG 28 ... 14
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	DIN VDE 0110 Part1 / 4.97 IEC 60 664-1; DIN VDE 0435 (corresp. parts), EN 61 810	DIN VDE 0110 Part1 / 4.97 IEC 60 664-1; DIN VDE 0435 (corresp. parts), EN 61 810

1 Relay Modules in DIN-Rail-Mountable Enclosure

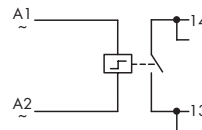
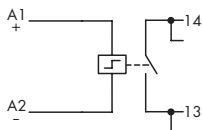
140

Latching relay with 1 make contact

Latching relay with 1 make contact



Lamp load: max. load 1500 W
Fluorescent lamp, dual circuit:
max. load 20 x 58 W series compensated
Electronic ballasts: 10 x 58 W



Description	V _N	I _N	Item no.	Pack. unit	V _N	I _N	Item no.	Pack. unit
Switching Relay Module	DC 24 V	42 mA	789-571	1	AC 230 V	10 mA	789-570	1

Technical Data

Accessories see page 141

Accessories see page 141

Contact material	AgCdO	AgCdO
Input voltage range	V _N -15 % ... +10 %	V _N -15 % ... +10 %
Max. switching voltage	AC 400 V	AC 400 V
Switching current min	0.1 A	0.1 A
Switching current max	50 A (20 ms)	50 A (20 ms)
Max. continuous current	16 A	16 A
Max. switching power (resistive)	AC 4000 VA / DC 300 W	AC 4000 VA / DC 300 W
Minimum switch-on time	40 ms	40 ms
Minimum break time	180 ms	180 ms
Coil control	Impuls	Impuls
Fuse protection	circuit breaker max. 16 A B-characteristic	circuit breaker max. 16 A B-characteristic
Nominal operating mode	continuous duty	continuous duty
Max. switching frequency with load	6 min ⁻¹	6 min ⁻¹
Max. switching frequency without load	4 s ⁻¹	4 s ⁻¹
Dielectric strength contact-coil (AC, 1 min)	4 kV	4 kV
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Mechanical life	1 x 10 ⁵ switching operations	1 x 10 ⁵ switching operations
Mechanical life at max. load (resistance)	5 x 10 ⁴ switching operations	5 x 10 ⁴ switching operations
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C
Storage temperature	-40 °C ... +85 °C	-40 °C ... +85 °C
Dimensions (mm) W x H x L	17.5 x 55 x 90	17.5 x 55 x 90
	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP®	CAGE CLAMP®
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	DIN VDE 0160 and IEC 60255; DIN VDE 0435 (corresp. parts); DIN VDE 0632	DIN VDE 0160 and IEC 60255; DIN VDE 0435 (corresp. parts); DIN VDE 0632

Accessories for Relay Modules in DIN-Rail-Mountable Enclosure, Series 789

Push-in type jumper bars



Commoning with push-in type jumper bar



Description	Item no.	Pack. unit	UVPE
Push-in type jumper bars , IN 16 A uninsulated, 12-way, to be cut to the required length	789-112	100	4*25

Marking pen with fibre tip

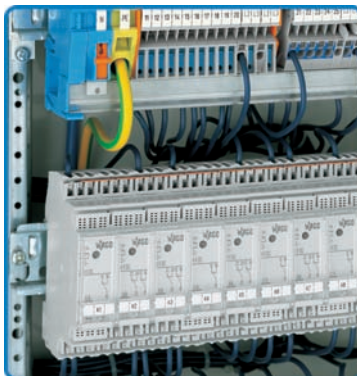
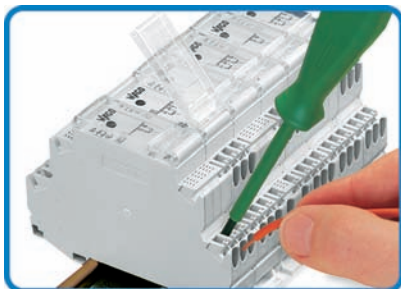


Description	Item no.	Pack. unit
Marking pen with fibre tip for permanent marking	210-110	1

Miniature quick marking card



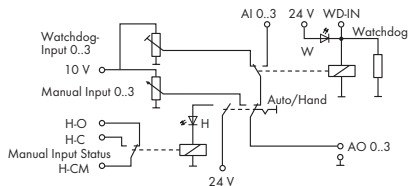
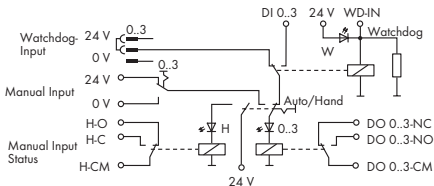
Description	Item no.	Pack. unit
Miniature WSB quick marking system 10 strips with 10 markers, white with black printing;		
plain	248-501	5
Marking software and printer/plotter see section 8		
1 ... 10 (10 x)	248-502	5
11 ... 20 (10x)	248-503	5
21 ... 30 (10x)	248-504	5
31 ... 40 (10x)	248-505	5
41 ... 50 (10 x)	248-506	5
1 ... 50 (2 x)	248-566	5
K 1 ... K 10 (10 x)	248-450	5
K 11 ... K 20 (10 x)	248-451	5
K 100 (10 x)	248-452	5
U 1 ... U 10 (10 x)	248-453	5
U 11 ... U 20 (10 x)	248-454	5
U 100 (10 x)	248-455	5



	Manual Control Module, Digital, 4 Outputs	Manual Control Module, Analog, 4 Outputs
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The digital manual control module 789-810 controls the different outputs 0 ... 3 and indicates their status via green LEDs and the changeover contact of the power relay. Depending on both the manual/automatic switch and watchdog input, the states 0 or 1 are transmitted in an electrically isolated form to the output via a relay.

The analog manual control module 789-811 controls the different analog outputs 0 ... 3. Depending on both the manual/automatic switch and watchdog input, the voltages set between 0 ... 10 V are transmitted to the output.



Description	Item no.	Pack. unit	Item no.	Pack. unit
Hand / Auto Module	789-810	1	789-811	1
Technical Data				
Voltage supply	DC 24 V ± 20 %		DC 24 V ± 20 %	
Dielectric strength input / output	4 kV		4 kV	
Ambient operating temperature	0 °C ... +50 °C		0 °C ... +50 °C	
Storage temperature	-25 °C ... +70 °C		-25 °C ... +70 °C	
Dimensions (mm) W x H x L	106 x 58 x 90		106 x 58 x 90	
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP® (WAGO Series 734 and 231)		Height from upper-edge of DIN 35 rail CAGE CLAMP® (WAGO Series 734 and 231)	
Cross sections	0.08 mm² ... 1.5 mm² / AWG 28 ... 14 0.08 mm² ... 2.5 mm² / AWG 28 ... 12		0.08 mm² ... 1.5 mm² / AWG 28 ... 14 0.08 mm² ... 2.5 mm² / AWG 28 ... 12	
Stripped lengths	7 mm / 0.28 in 8 ... 9 mm / 0.33 in		7 mm / 0.28 in 8 ... 9 mm / 0.33 in	
Approvals	VDE 0110 (corresponding parts)		VDE 0110 (corresponding parts)	
Inputs	24 V Operating voltage supply GND ground		24 V Operating voltage supply GND ground	
No. 1/10	DI-0 ... 3; Input 0 ... 3; 24 V/max. 20 mA		AI-0 ... 3; Input 0 ... 3; 0-10 V/max. 20 mA	
No. 2	WD-IN; Watchdog input; 24 V/max. 20 mA		WD-IN; Watchdog input; 24 V/max. 20 mA	
No. 3 ... 6				
No. 11				
Outputs	H-C; Manual operation "closed"		H-C; Manual operation "closed"	
No. 7	H-CM; Manual operation "common"		H-CM; Manual operation "common"	
No. 8	H-O; Manual operation "open"		H-O; Manual operation "open"	
No. 9				
No. 12/15/18/21	DO-0 ... 3-NC; Break contact; channel 0 ... 3		GND	
No. 13/16/19/22	DO-0 ... 3-CM; Common; channel 0 ... 3		AO-0 ... 3; Output 0 ... 3; 0-10 V/max. 20 mA	
No. 14/17/20/23	DO-0 ... 3-NO; Make contact; channel 0 ... 3		GND	
Max. switching voltage channel nos. 12 ... 23	AC 250 V / DC 30 V			
Max. switching current channel nos. 12 ... 23	AC 8 A / DC 8 A			



WAGO Application: Traffic Control System in Canton of Tessin (Gotthard Route), Switzerland

WAGO Products:
 WAGO-I/O-SYSTEM (ETHERNET, CANopen),
 WAGO X-COM®-SYSTEM,
 MULTICONNECTION SYSTEM,
 TOPJOB®S Rail-Mounted Terminal Blocks

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Series 289 – Interface Modules	
Interface Modules with Subminiature D-Male and D-Female Connector	148 – 155



Interface Modules for Ribbon Cable Connectors acc. to DIN 41651 and Ribbon Cable Connectors acc. to DIN 41612, (Type E, F and C)	156 – 161
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Interface Modules for Siemens-SIMATIC® S5-/S7, Specialty Connectors	162 – 165
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ETHERNET Interface Modules	166 – 167
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Connection Modules for Sensors and Actuators	168 – 169
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Diode Gate Modules	170 – 174
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Modules for Building Custom Circuits	175
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WAGO Interface Modules

WAGO Interface Modules

Interface modules connect electronic to electromechanical functions at the control level.

They connect:

- signal transmission, control system ↔ field
- signal distribution, control system ↔ field.

They allow prefabricated plugs to interface to discrete field wiring.

WAGO AUTOMATION offers a wide range of interface modules for commonly used connector types. The use of these interface modules offers the following advantages in the system wiring:

- easy and time-saving planning and calculations
- rapid wiring, starting and fault elimination by clearly arranged wiring and clear pole marking, reduction of wiring faults
- safe and maintenance-free connection of the signal lines with the CAGE CLAMP® terminal strips
- high packing density creates space-saving modules

The interface modules are standard in a universal mounting carrier for DIN 35 carrier rails with the following connectors:

Subminiature-D-connectors

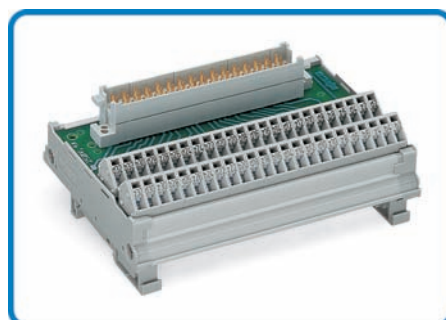
acc. to DIN 41 652 or MIL-C-24308

Interface modules for male and female connectors are available with 9, 15, 25, 37 or 50 contacts. Compared with the standard solder connection, the mating connector with IDC connection offers additional advantages.

Connectors

acc. to IEC 60603/DIN 41 612, types C, E and F

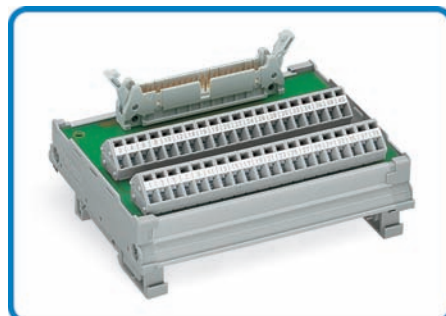
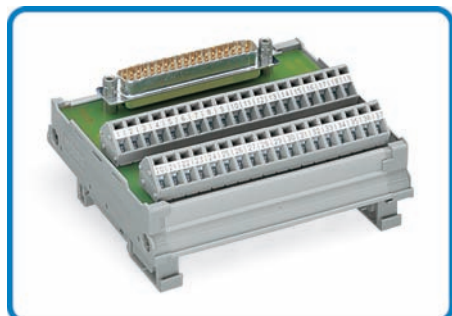
These connectors are frequently used for compact input and output component groups and are available for 32-, 48- and 64-pole pin and socket connectors, as well as for mating connectors with solder and IDC contacts.



Ribbon cable connectors

acc. to IEC 60603-1 / DIN 41 651 or MIL-C-83503

Interface modules with 10-, 14-, 16-, 20-, 26-, 34-, 40-, 50- and 64-pole connectors are available for ribbon cable connectors.

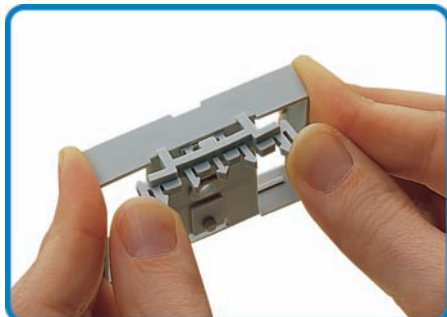


Series 289 Interface Modules

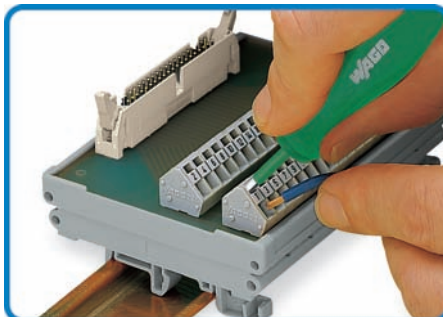
Series 289 Interface Modules

Series 289 Interface Modules

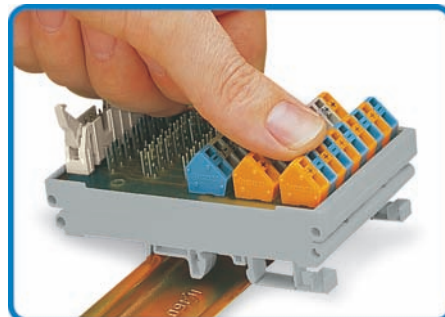
2



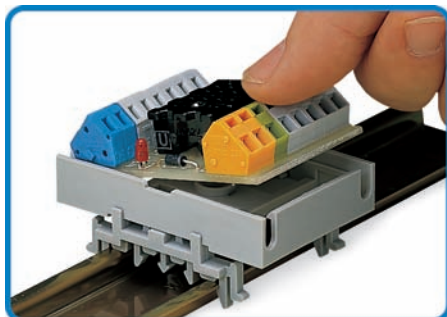
Mounting carrier, grey, snap-fit mounting of universal mounting feet



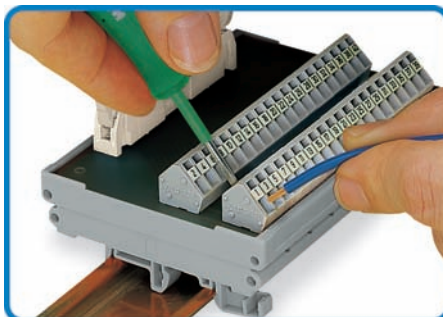
Connection of conductor "front-entry"



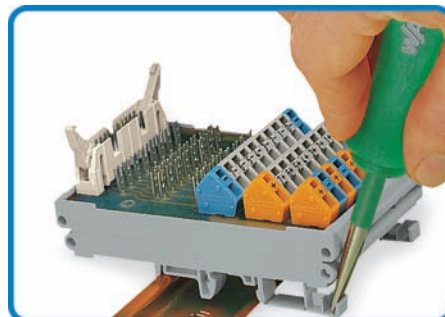
Assembly of a module on the carrier rail



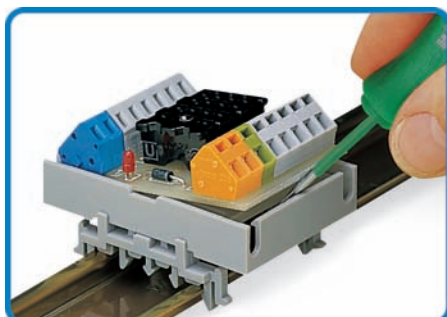
Fitting of an individual module to the mounting carrier



Connection of conductor "side-entry"

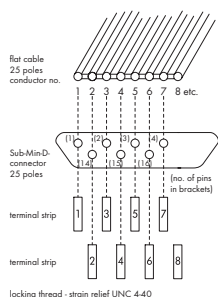


Removal of a module from the carrier rail

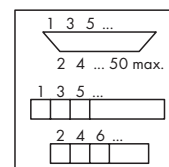
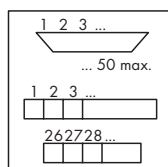


Removal of an individual module from the mounting carrier

	Interface module with subminiature D-male connector, for mating connectors with solder connection, mating direction vertical, mounting feet for DIN 35 rail	Interface module with subminiature D-male connector, for mating connectors with IDC, mating direction vertical, mounting feet for DIN 35 rail
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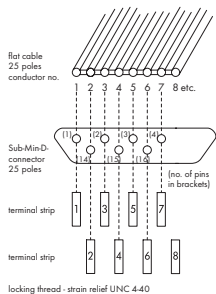
289-440 to 289-444

[illegible]

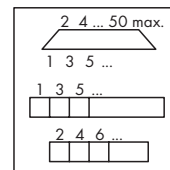
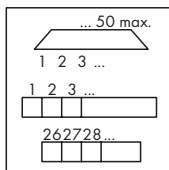
Technical Data

[illegible]

	Interface module with subminiature D-female connector, for mating connectors with solder connection, mating direction vertical, mounting feet for DIN 35 rail	Interface module with subminiature D-female connector, for mating connectors with IDC, mating direction vertical, mounting feet for DIN 35 rail
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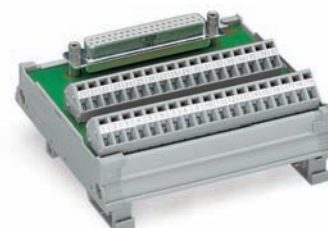
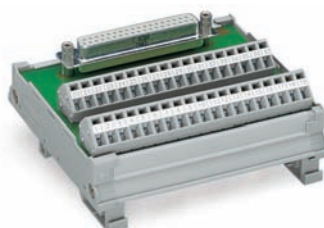


289-450 to 289-454

[illegible]

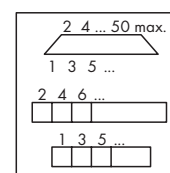
Technical Data

[illegible]

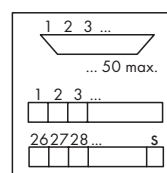
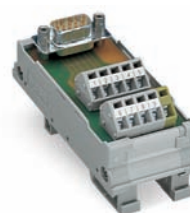
2

... 50 max.

1 2 3 ...

[illegible]

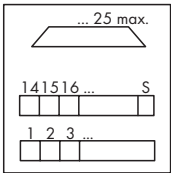
	Interface module with subminiature D-female connector, for mating connectors with solder connection, mating direction vertical, shield (screen) connection, mounting carrier for DIN 35 rail	Interface module with subminiature D-male connector, for mating connectors with solder connection, mating direction vertical, shield (screen) connection, mounting carrier for DIN 35 rail
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[illegible]

Technical Data

[illegible]

	Interface module Mini D-sub female connector with shield (screen) connection Mounting carrier for DIN 35 rail	
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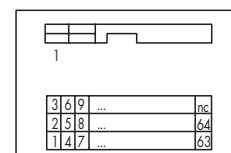
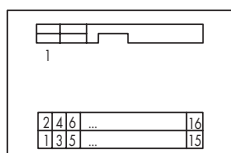
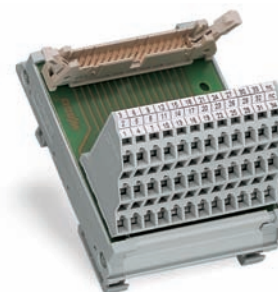


Description	No. of poles	"L" mm	Item no.	Pack. unit	
Interface module	9	33	289-650	1	
	25	68.5	289-652	1	

Technical Data		
Operating voltage	AC / DC 125 V	
Nominal current	2A	
Connector contact	plating, 0.5 µm ... 0.8 µm Au over 2 µm Ni	
Contact resistance	< 10 mΩ	
Performance level	2 / 200 mating cycles	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	125 V / 0.8 kV / 2	
Mounting direction	vertical	
Pull relief stud bolt	UNC 4-40	
Ambient operating temperature	-20 °C ... +50 °C	
Storage temperature	-40 °C ... +70 °C	
Dimensions (mm) L x W x H	L x 85 x 48	
incl. mounting feet or mounting carrier	Height from upper-edge of DIN 35 rail	
Wire connection	CAGE CLAMP® (WAGO Series 736)	
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12	
Stripped lengths	5 ... 6 mm / 0.22 in	
Accessories		
WMB Multi marking system for mounting carrier	see page 279	
Marker strips for mounting carrier	white 709-198 / transparent 709-197	

Interface module for ribbon cable connectors
acc. to DIN 41651
mounting carrier for DIN 35 rail

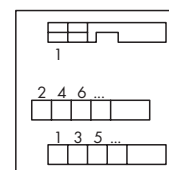
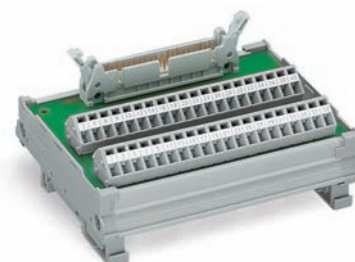
Interface module for ribbon cable connectors
acc. to DIN 41651
mounting carrier for DIN 35 rail



Description	No. of poles	"L" mm	Item no.	Pack. unit	No. of poles	"L" mm	Item no.	Pack. unit
Interface module	10	35	289-611	1	20	35	289-614	1
	14	40	289-612	1	26	40	289-615	1
	16	45	289-613	1	34	45	289-616	1
					40	74	289-617	1
					50	88	289-618	1
					64	114	289-619	1

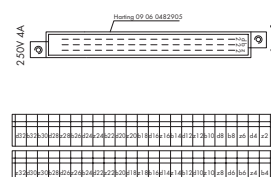
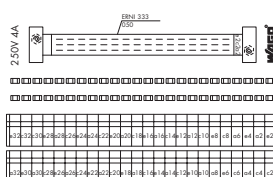
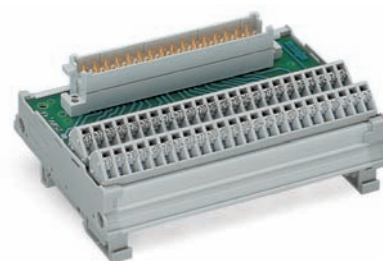
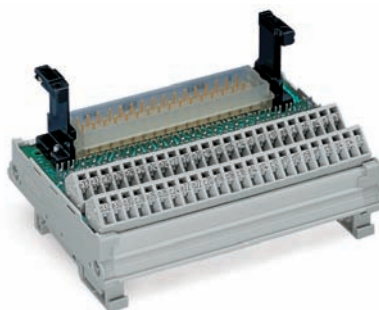
Technical Data

Operating voltage	AC / DC 125 V	AC / DC 125 V
Nominal current	1 A	1 A
Connector contact	phosphor-bronze, 0.38 µm Au selectively over 1.3 µm Ni	phosphor-bronze, 0.38 µm Au selectively over 1.3 µm Ni
Performance level	3	3
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	125 V / 0.8 kV / 2	125 V / 0.8 kV / 2
Mounting direction	vertical	vertical
Ambient operating temperature	-20 °C ... +55 °C	-20 °C ... +55 °C
Storage temperature	-40 °C ... +70 °C	-40 °C ... +70 °C
Dimensions (mm) L x W x H	L x 85 x 48	L x 85 x 62
incl. mounting feet or mounting carrier	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP® (WAGO Series 736)	CAGE CLAMP® (WAGO Series 737)
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12	0.08 mm² ... 2.5 mm² / AWG 28 ... 12
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	IEC 60603-1 / DIN 41651 Part 1 and 2	IEC 60603-1 / DIN 41651 Part 1 and 2
Accessories		
WMB Multi marking system for mounting carrier	see page 279	see page 279
Marker strips for mounting carrier	white 709-198 / transparent 709-197	white 709-198 / transparent 709-197

2

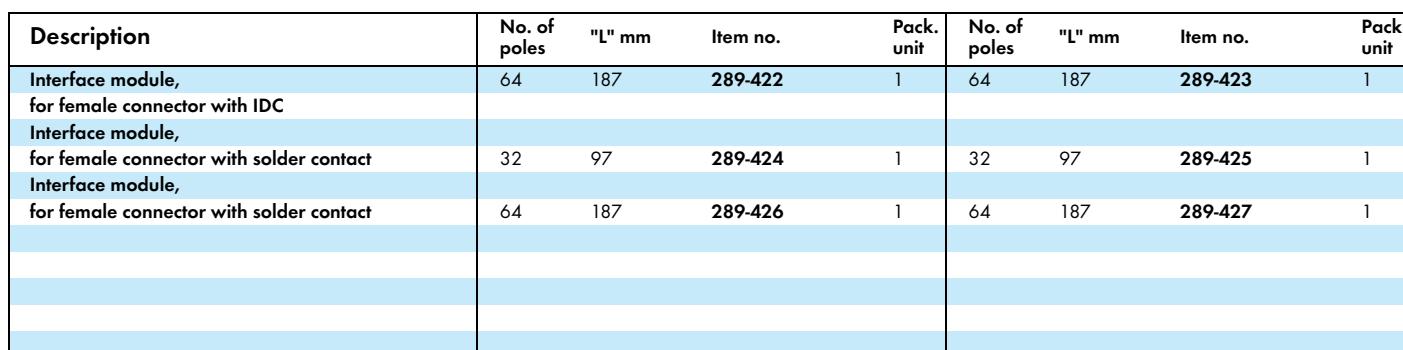
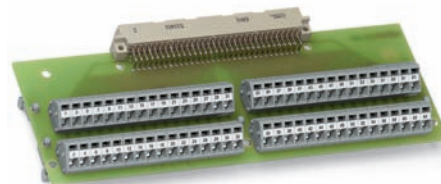
Technical Data		
Operating voltage	AC / DC 125 V	AC / DC 125 V
Nominal current	1 A	1 A
Connector contact	phosphor-bronze, 0.38 µm Au selectively over 1.3 µm Ni	phosphor-bronze, 0.38 µm Au selectively over 1.3 µm Ni
Performance level	3	3
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	50 V / 0.8 kV / 2	125 V / 0.8 kV / 2
Dimensions (mm) L x W x H	L x 63.5 x 28	L x 85 x 36
incl. mounting feet or mounting carrier	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP® (WAGO Series 236)	CAGE CLAMP® (WAGO Series 236)
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12	0.08 mm² ... 2.5 mm² / AWG 28 ... 12
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Accessories		
WMB Multi marking system for mounting carrier		see page 279
Marker strips for mounting carrier		white 709-198 / transparent 709-197

	Interface module for connectors acc. to DIN 41 612, with female connector, type E, with strain relief device for ERNI mating connector, Mounting carrier for DIN 35 rail	Interface module for connectors acc. to DIN 41 612, with female connector, type F, with strain relief device for Harting mating connector Mounting carrier for DIN 35 rail
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[illegible]

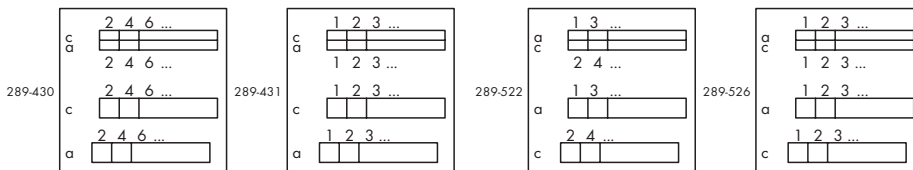
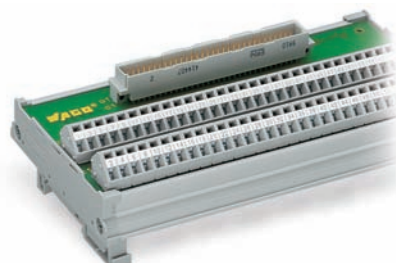
Technical Data

[illegible]

2

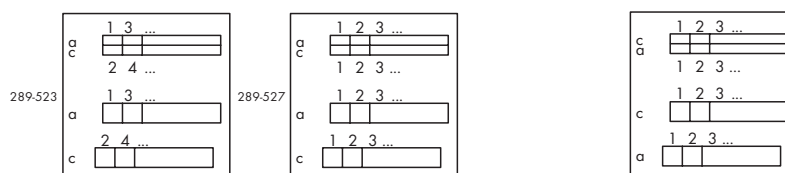
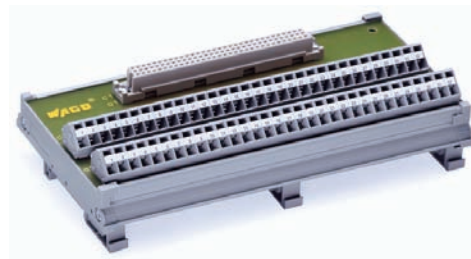
Operating voltage	AC / DC 125 V	AC / DC 125 V
Nominal current	1 A	1 A
Connector contact	Copper alloy, gold plated	Copper alloy, gold plated
Contact resistance	≤ 20 mΩ	≤ 20 mΩ
Performance level	2 / 400 mating cycles	2 / 400 mating cycles
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	50 V / 0.8 kV / 2	50 V / 0.8 kV / 2
Dimensions (mm) L x W x H	L x 63,5 x 21	L x 63,5 x 21
incl. mounting feet or mounting carrier	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP® (WAGO Series 236)	CAGE CLAMP® (WAGO Series 236)
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12	0.08 mm² ... 2.5 mm² / AWG 28 ... 12
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in

	Interface module for connectors acc. to DIN 41 612, with female connector, type C, mating direction vertical, for male connector with solder contact, mounting feet for DIN 35 rail	Interface module for connectors acc. to DIN 41 612, with female connector, type C, mating direction vertical, for female connector with IDC connection or with solder contact, mounting feet for DIN 35 rail
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[illegible]

Technical Data

[illegible]

2[illegible]

Operating voltage	AC / DC 125 V	AC / DC 125 V
Nominal current	1 A	1 A
Connector contact	Copper alloy, gold plated	Copper alloy, gold plated
Contact resistance	≤ 20 mΩ	≤ 20 mΩ
Performance level	2 / 400 mating cycles	2 / 400 mating cycles
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	125 V / 0.8 kV / 2	125 V / 0.8 kV / 2
Dimensions (mm) L x W x H	L x 85 x 34	L x 85 x 34
incl. mounting feet or mounting carrier	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP® (WAGO Series 236)	CAGE CLAMP® (WAGO Series 236)
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12	0.08 mm² ... 2.5 mm² / AWG 28 ... 12
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in

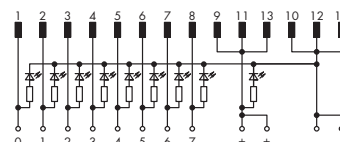
WMB Multi marking system for mounting carrier	see page 279	see page 279
Marker strips for mounting carrier	white 709-198 / transparent 709-197	white 709-198 / transparent 709-197

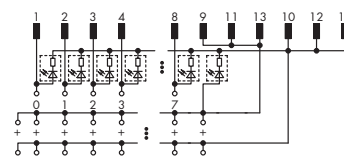
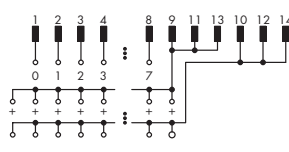
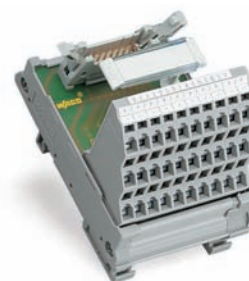
Interface Modules, for Siemens-SIMATIC® S5-95 U to 155 U, S7-300/ET 200 M und S7-400

Interface module SIMATIC® is a registered trademark of the Siemens AG

**Interface module, 8-pole,
for Siemens-SIMATIC® S5-95 U to 155 U,
S7-300/ET 200 M und S7-400
Single-wire connection, without LED
Mounting carrier for DIN 35 rail**

**Interface module, 8-pole,
for Siemens-SIMATIC® S5-95 U to 155 U,
S7-300/ET 200 M und S7-400
Single-wire connection,
Mounting carrier for DIN 35 rail**

[illegible]

2

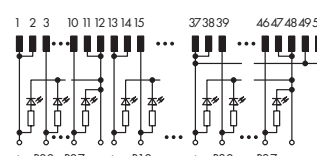
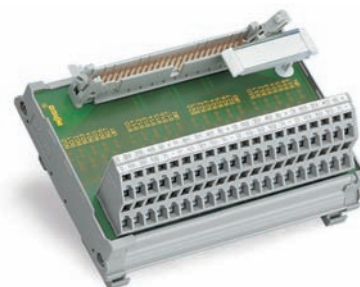
Technical Data		
Operating voltage	AC / DC 125 V	DC 24 V
Nominal current per signal wire	1 A	1 A
Max. total current (supply)	2 A	2 A
Connector contact	phosphor-bronze, 0.38 µm Au selectively over 1.3 µm Ni	phosphor-bronze, 0.38 µm Au selectively over 1.3 µm Ni
Performance level	3	3
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	125 V / 0.8 kV / 2	
Dimensions (mm) L x W x H	54 x 85 x 62	54 x 85 x 62
incl. mounting feet or mounting carrier	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP®	CAGE CLAMP®
	(WAGO Series 737)	(WAGO Series 737)
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12	0.08 mm² ... 2.5 mm² / AWG 28 ... 12
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Accessories		
WMB Multi marking system for mounting carrier	see page 279	see page 279
Marker strips for mounting carrier	white 709-198 / transparent 709-197	white 709-198 / transparent 709-197

Interface Modules, for Siemens-SIMATIC® S5-95 U to 155 U, S7-300/ET 200 M und S7-400

Interface module SIMATIC® is a registered trademark of the Siemens AG

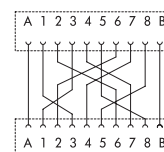
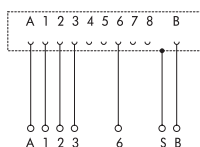
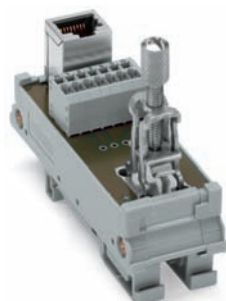
**Interface module, 32-pole,
for Siemens-SIMATIC® S5-95 U to 155 U,
S7-300/ET 200 M und S7-400
Single-wire connection, without LED
Mounting carrier for DIN 35 rail**

**Interface module, 32-pole,
for Siemens-SIMATIC® S5-95 U to 155 U,
S7-300/ET 200 M und S7-400
Single-wire connection,
Mounting carrier for DIN 35 rail**

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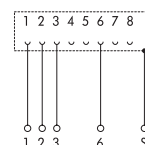
22

	ETHERNET interface module Y-ConJack-22 connection with shield clamping unit for WAGO shield (screen) clamping saddle Series 790 (not included), Mounting carrier for DIN 35 rail	ETHERNET interface module Y-ConJack-22, connection cross-over, Mounting carrier for DIN 35 rail
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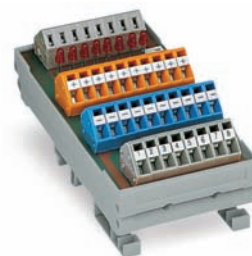
Technical Data

Connecting cable	min. CAT5	min. CAT5
Max. transmission length	100 m	100 m
Connector	Y-ConJack-22 shielded	Y-ConJack-22 shielded
Min. mating cycles	1000	1000
Current load	≤ 2.1 A	≤ 2.1 A
Voltage load	AC 35 V / DC 50 V	AC 35 V / DC 50 V
Insulation resistance	> 500 MΩ	> 500 MΩ
Dielectric strength contact-contact	1 kV eff.	1 kV eff.
Contact resistance	typ. 40 mΩ	typ. < 40 mΩ
WAGO shield (screen) clamping saddle	11 mm wide; cable diameter up to 8 mm	
Ambient operating temperature	-20 °C ... +85 °C	-20 °C ... +85 °C
Dimensions (mm) L x W x H	30 x 85 x 67	21 x 85 x 44
incl. mounting feet or mounting carrier	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP® (WAGO Series 739)	
Cross sections	0.08 mm² ... 1.5 mm² / AWG 28 ... 14	
Stripped lengths	5 ... 6 mm / 0.22 in	
Approvals	ISO/IEC 11801: 2002-09; EN 55022	ISO/IEC 11801: 2002-09; EN 55022
Accessories		
WMB Multi marking system for mounting carrier	see page 279	see page 279
Marker strips for mounting carrier	white 709-198 / transparent 709-197	white 709-198 / transparent 709-197

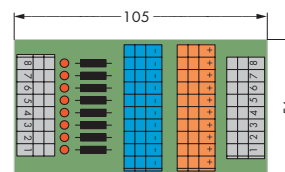
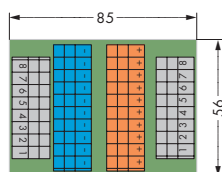
2

Technical Data		
Connecting cable	min. CAT5	min. CAT5
Max. transmission length	100 m	100 m
Connector	RJ-45 shielded	RJ-45 shielded
Min. mating cycles	500	500
Current load	≤ 1.5 A	≤ 1.5 A
Insulation resistance	> 500 MΩ	> 500 MΩ
Dielectric strength contact-contact	1 kV eff.	1 kV eff.
Contact resistance	typ. < 20 mΩ	typ. < 20 mΩ
Ambient operating temperature	-20 °C ... +85 °C	-20 °C ... +85 °C
Dimensions (mm) L x W x H	24 x 85 x 40	24 x 85 x 40
incl. mounting feet or mounting carrier	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP® (WAGO Series 739)	CAGE CLAMP® (WAGO Series 739)
Cross sections	0.08 mm² ... 1.5 mm² / AWG 28 ... 14	0.08 mm² ... 1.5 mm² / AWG 28 ... 14
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	ISO/IEC 11801: 2002-09; EN 55022	ISO/IEC 11801: 2002-09; EN 55022
Accessories		
WMB Multi marking system for mounting carrier	see page 279	see page 279
Marker strips for mounting carrier	white 709-198 / transparent 709-197	white 709-198 / transparent 709-197
WAGO shield (screen) clamping saddle	790-108 (11 mm wide; cable diameter up to 8 mm)	790-108 (11 mm wide; cable diameter up to 8 mm)

	Connection module for 8 x 3-conductor sensors	Connection module for 8 x 3-conductor sensors LED indicator for positive or negative switching
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Graphic 289-665

[illegible]

Operating voltage	AC / DC 125 V	DC 24 V (± 10 %)
Max. current per connection	1 A	1 A
Max. total current	8 A	8 A
Power consumption LED		5.2 mA
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	125 V / 1.5 kV / 2	
Dimensions (mm) L x W x H	56 x 85 x 34	56 x 105 x 34
incl. mounting feet or mounting carrier	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP® (WAGO Series 236)	CAGE CLAMP® (WAGO Series 236)
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12	0.08 mm² ... 2.5 mm² / AWG 28 ... 12
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in

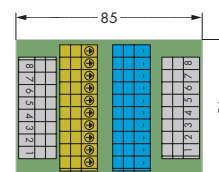
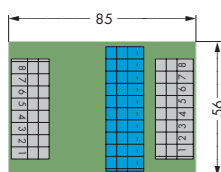
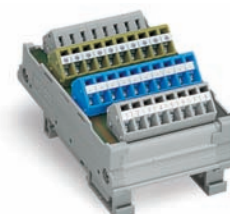
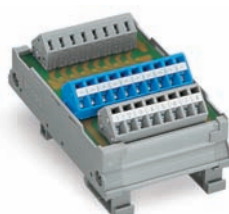
Accessories

WMB Multi marking system for mounting carrier
Marker strips for mounting carrier

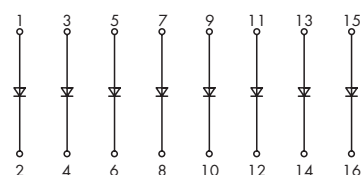
see page 279

white 709-198 / transparent 709-197

see page 279
white 709-198 / transparent 709-197

2[illegible]

Open diode gate - 8 diodes 1 N 4007
can be connected individually



* Max. admissible current acc. to the manufacturer's data sheet. With all diodes loaded, the continuous current must be reduced.

Description

Technical Data

Operating voltage

Accessories

Mounting carrier, for screw-fixing or DIN-rail mounting (with snap-fit type universal mounting feet to be ordered separately)

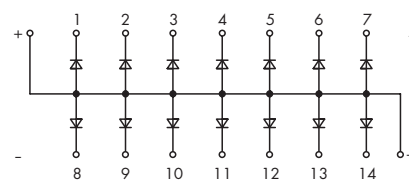
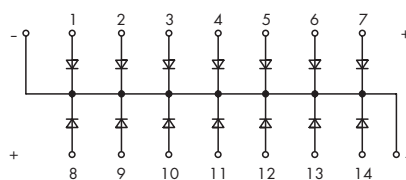
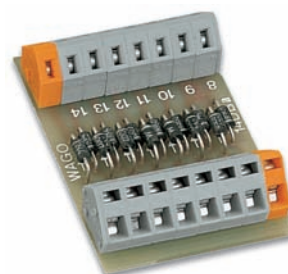
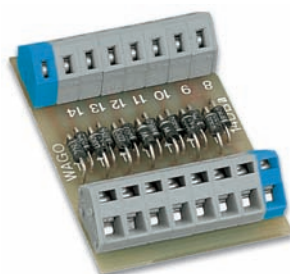
Universal mounting foot; snap-fit type; suitable for DIN 15, 32 and 35 rails (also see page 258)

2 Rail-Mounted Modules - Diode Gate Modules

172

Polarized diode gate with 14 diodes 1 N 4007
common cathode

Polarized diode gate with 14 diodes 1 N 4007
common anode



* Max. admissible current acc. to the manufacturer's data sheet. With all diodes loaded, the continuous current must be reduced.

Description	Item no.	Pack. unit	Item no.	Pack. unit
Polarized diode gate	289-111	1	289-121	1

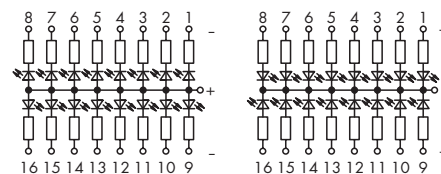
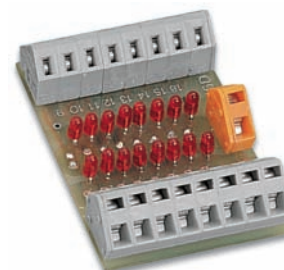
Technical Data

Operating voltage	AC/DC 250 V	AC/DC 250 V
Peak reverse voltage	1000 V	1000 V
Rectified current for each diode *	1 A	1 A
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C
Dimensions (mm) L x W x H	47 x 65.5 x 31.5	47 x 65.5 x 31.5
incl. mounting carrier and universal mounting feet	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP® (WAGO Series 236)	CAGE CLAMP® (WAGO Series 236)
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12	0.08 mm² ... 2.5 mm² / AWG 28 ... 12
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in

Accessories

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Mounting carrier, for screw-fixing or DIN-rail mounting (with snap-fit type universal mounting feet to be ordered separately)	288-001	1	288-001	1
Universal mounting foot; snap-fit type; suitable for DIN 15, 32 and 35 rails (also see page 258)	288-002	10	288-002	10

Lamp test circuit module with 20 diodes for testing 10 lamps with mounting feet for DIN 35 rail



Description

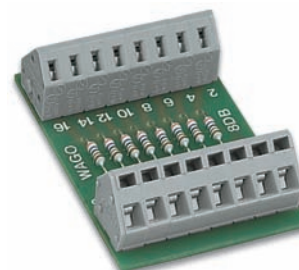
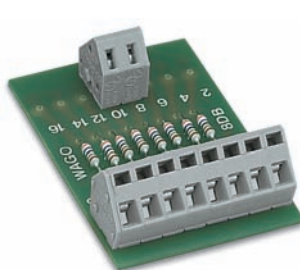
Technical Data

Accessories

2 Rail-Mounted Modules - Resistor Gate Modules

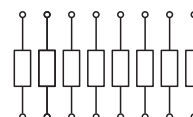
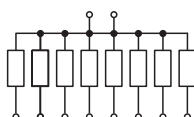
174

	Resistor gate with 1 end commoned, 8 resistors 2 k 2; 1 W	Open resistor gate with 8 resistors 2 k 7; 0.6 W individual connection possible
--	--	--



other resistors – contact factory

* Max. admissible power dissipation of a single resistor.
With all resistors loaded, the max. admissible power
dissipation must be reduced.



Description	Item no.	Pack. unit	Item no.	Pack. unit
Resistor gate	289-113	1	289-114	1

Technical Data

Operating voltage	AC/DC 40 V	AC/DC 40 V
Resistor type	DIN 0414	DIN 0207
Temperature coefficient	50 ppm	50 ppm
Tolerance	± 1%	± 1%
Power dissipation *	1 W	0,6 W
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +40 °C
Dimensions (mm) L x W x H	47 x 65.5 x 31.5	47 x 65.5 x 31.5
incl. mounting carrier and universal mounting feet	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP® (WAGO Series 236)	CAGE CLAMP® (WAGO Series 236)
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12	0.08 mm² ... 2.5 mm² / AWG 28 ... 12
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Mounting carrier, for screw-fixing or DIN-rail mounting (with snap-fit type universal mounting feet to be ordered separately)	288-001	1	288-001	1
Universal mounting foot; snap-fit type; suitable for DIN 15, 32 and 35 rails (also see page 258)	288-002	10	288-002	10



**WAGO Application: Danone Group,
Ochsenfurt Plant, Germany**
Producer of yogurt and other dairy-based products

WAGO Products:
WAGO-I/O-SYSTEM with PROFIBUS Couplers



System Overview

178 - 179



M12 Sensor/Actuator Box

- 4-way, 4 poles, 5 m Connecting Cable
- 4-way, 4 poles, 10 m Connecting Cable
- 6-way, 4 poles, 5 m Connecting Cable
- 6-way, 4 poles, 10 m Connecting Cable
- 8-way, 4 poles, 5 m Connecting Cable
- 8-way, 4 poles, 10 m Connecting Cable
- 8-way, 4 poles, 25 m Connecting Cable

180 - 181

M12 Sensor/Actuator Box

- 4-way, 5 poles, 5 m Connecting Cable
- 4-way, 5 poles, 10 m Connecting Cable
- 6-way, 5 poles, 5 m Connecting Cable
- 6-way, 5 poles, 10 m Connecting Cable
- 8-way, 5 poles, 5 m Connecting Cable
- 8-way, 5 poles, 10 m Connecting Cable
- 8-way, 5 poles, 25 m Connecting Cable

182 - 183



M12 Sensor/Actuator Box

- 4-way, 4 poles, M23 Connector
- 6-way, 4 poles, M23 Connector
- 8-way, 4 poles, M23 Connector

184 - 185

M12 Sensor/Actuator Box

- 4-way, 5 poles, M23 Connector
- 6-way, 5 poles, M23 Connector
- 8-way, 5 poles, M23 Connector
- 8-way, 5 poles, without LED, M23 Connector

186 - 187



M8 Sensor/Actuator Box

- 4-way, 3 poles, 5 m Connecting Cable
- 4-way, 3 poles, 10 m Connecting Cable
- 6-way, 3 poles, 5 m Connecting Cable
- 6-way, 3 poles, 10 m Connecting Cable
- 8-way, 3 poles, 5 m Connecting Cable
- 8-way, 3 poles, 10 m Connecting Cable
- 10-way, 3 poles, 5 m Connecting Cable
- 10-way, 3 poles, 10 m Connecting Cable

188 - 189



M8 Sensor/Actuator Box

- 4-way, 3 poles, M16 Connector
- 6-way, 3 poles, M16 Connector
- 8-way, 3 poles, M16 Connector
- 10-way, 3 poles, M16 Connector

190 - 191



Accessories

192 - 203

IP67



Illustration:

Sensor /Actuator boxes
with spacer module

M12 Sensor /Actuator Boxes

Converting completely from IP20 to IP67 automation is usually not an option for the user, because IP67 fieldbus technology does not offer the flexibility and efficiency required by most applications. Combining IP67 and IP20 technologies is typically the most appealing solution.

The new M12 sensor /actuator boxes from WAGO offer IP67 degree of protection allowing the signals to be collected local to the machine. Connecting these M12 boxes to the WAGO-I/O-SYSTEM 750, which is mounted inside a switchgear cabinet (IP20 degree of protection), offers the best possible effectiveness, flexibility and convenience (fieldbus technology, scalability, programmability, etc.) to the user. As a result, installation and service costs can be reduced since switchgear cabinets and cable materials can be saved. Also, commercially available M12/ M23 connectors allow for simple and safe connection during installation. With this solution, even complex automation requirements can be easily and economically accomplished using the WAGO-I/O-SYSTEM product range.

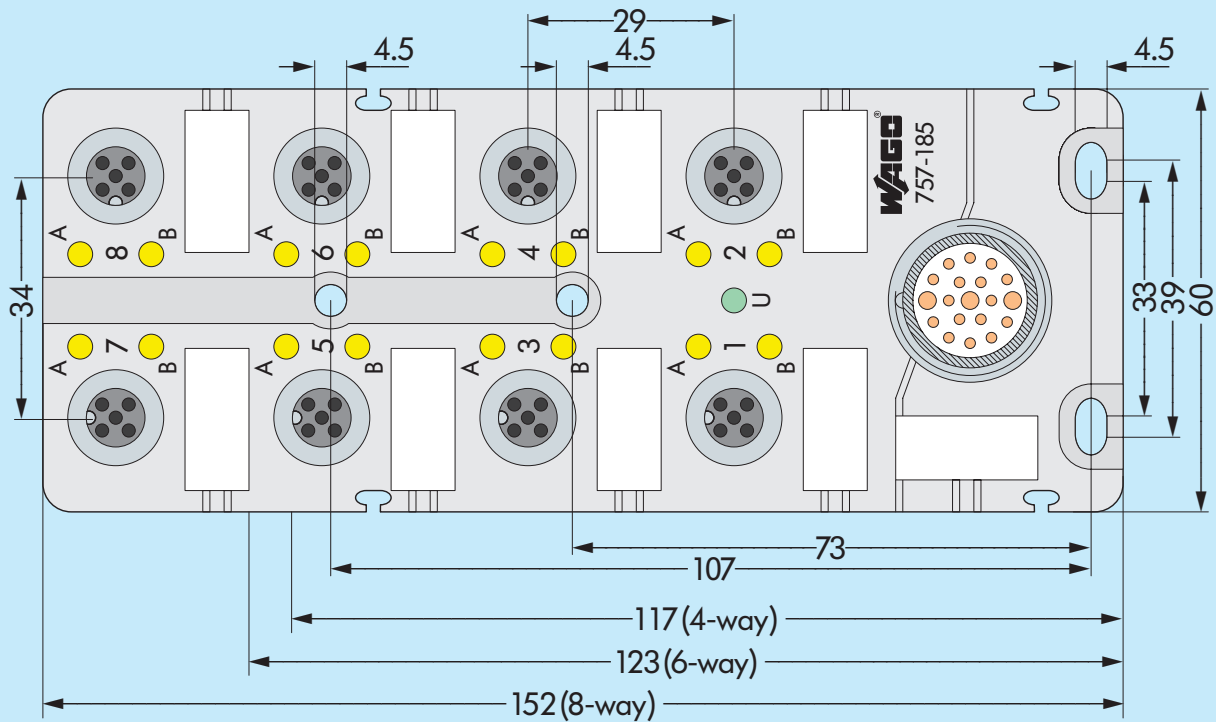
Two different versions of M12 sensor /actuator boxes are available. One version is equipped with M23 connectors and is ideal when the installation or machine needs to be transported or a quick disconnection is required in the event of maintenance (e.g. a defective cable). The version with preassembled cable is best suited for installations when the laying of cables equipped with connectors is not possible due to difficulties in the cable routing.

The M12 sensor /actuator boxes from WAGO have an extremely small, robust design, and fulfill the requirements of the IP67 protection degree. Furthermore, individual adjacent boxes can be clipped to one another using spacer modules, which allow for safe, practical, easy handling and maintenance.

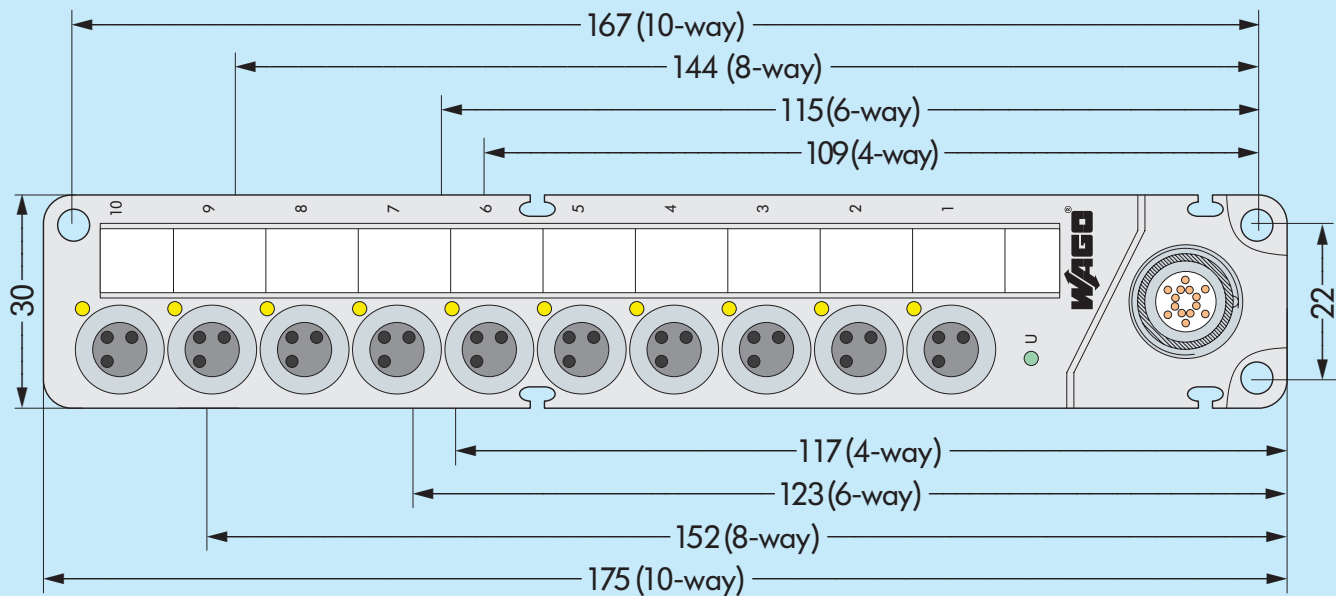
Dimensions and Mounting Dimensions of Sensor /Actuator Boxes

(also valid for M12 or M8 sensor /actuator boxes with cable connection)

M12 Sensor /Actuator box with M23 connector

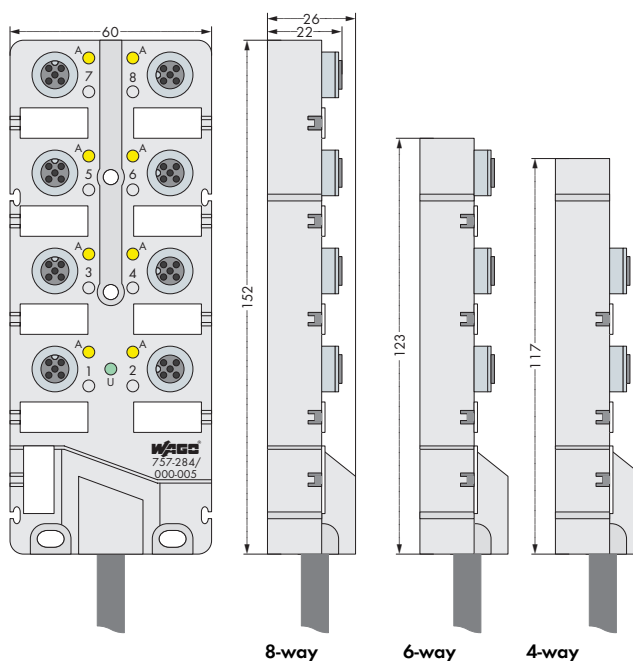


M8 Sensor /Actuator box with M16 connector



Dimensions in mm

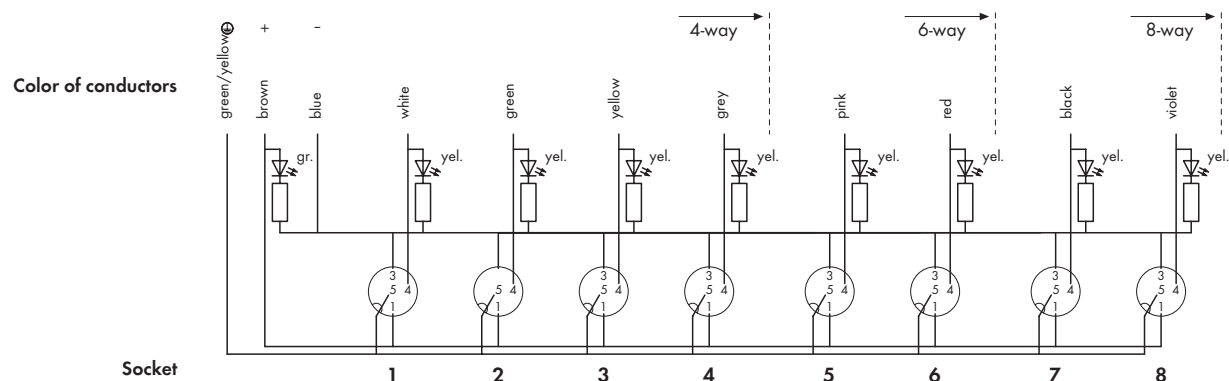
4 poles, with cable connection



- 4-, 6- and 8-way sensor /actuator boxes
- 4 poles (1 signal per contact)
- Cable length 5 and 10 m
- Green LED operating indicator
- Yellow LED status indicator
- incl. Markers (10 pcs)
- incl. M12 protective caps (2 pcs)

Description	Item no.	Pack. unit
M12 sensor/actuator box		
4-way, 4 poles, 5m connecting cable	757-244/000-005	1
4-way, 4 poles, 10m connecting cable	757-244/000-010	1
6-way, 4 poles, 5m connecting cable	757-264/000-005	1
6-way, 4 poles, 10m connecting cable	757-264/000-010	1
8-way, 4 poles, 5m connecting cable	757-284/000-005	1
8-way, 4 poles, 10m connecting cable	757-284/000-010	1
8-way, 4 poles, 25m connecting cable	757-284/000-025	1
Accessories	Item no.	
Marker card, marking pen, spacer module and protective cap	see page 192	
IP67 cables and connectors	see pages 193... 194	
Approvals		
UL 508	E 175199, UL 508, Class 2 Equipment	
	Components are designed to be supplied through Class 2 power supplies in accordance with UL 1310 or Class 2 transformers in accordance with UL 1585	

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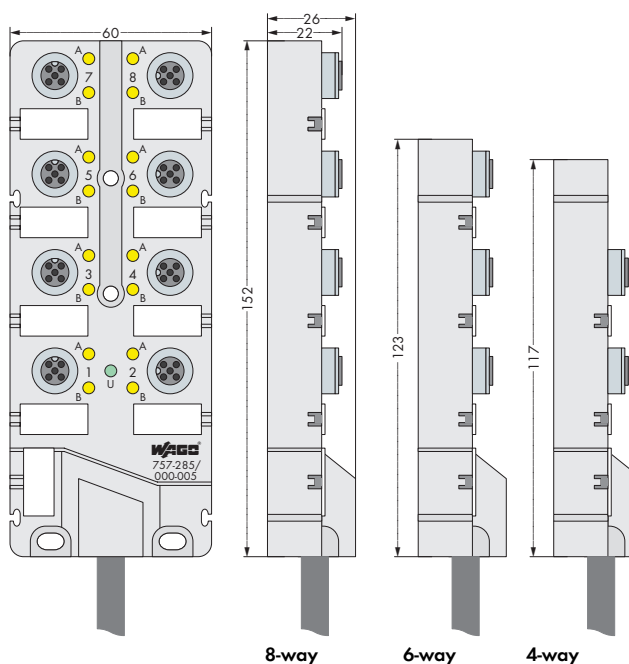
Mechanical Data

Degree of protection	IP 68 acc. to EN 60529 In fully locked position with the appropriate plugs or protective caps
Operating temperature	-25 °C ... +80 °C (current load according to derating curve)
Mounting	Screw mounting
Dimensions (mm) W x H x L	4-way: 60 x 117 x 26 6-way: 60 x 123 x 26 8-way: 60 x 152 x 26
Weight	4-way: 165 g 6-way: 180 g 8-way: 215 g without cable
Fitting position	any
Vibration resistance	acc. to IEC60068-2-6
Shock resistance	acc. to IEC60068-2-27

Material Data

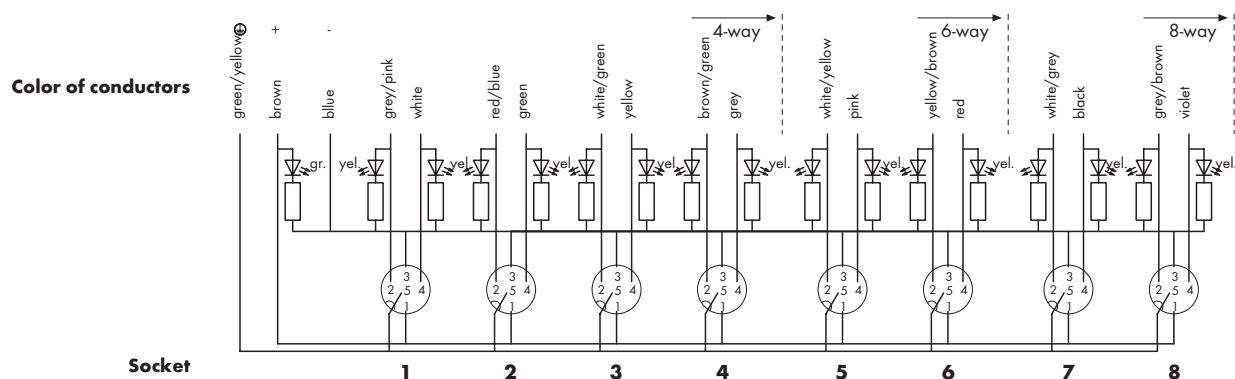
General	Silicon and halogen free
Potting	Fully encapsulated with conformal coating (UL 94 V0)
Enclosure	PA 66 (UL 94 V0); RAL 7035
Contacts	
I/O slot	Socket, M12 x 1, 4-pole incl. PE
Contact	CuSn, pre-nickel and 0.8 µm gold-plated
Tapped bush	Zn diecast nickel-plated
Seal	Viton
Connection cycles	50
Connecting cable	
Cable design	Outer sheath PUR halogen-free Black Cable end 100 mm stripped
Cable Ø	7.5 mm SA box 4-way 7.8 mm SA box 6-way 8.2 mm SA box 8-way
Conductor design	n x 0.34mm ² + 3 x 1.00mm ² conductor 0.34mm ² extra-fine stranded 43 x 0.1mm conductor 1.00mm ² extra-fine stranded 55 x 0.15mm color identification of conductors
Suitable for drag chain applications	
bending radius	min. 10 x cabel Ø
amb. temperature range	-40 °C ... +90 °C stagnant; -5 °C ... +80 °C moving

5 poles, with cable connection



- | Electrical data: | |
|---------------------------|--------------------------------|
| Contact resistance | $\leq 10 \text{ m}\Omega$ |
| Operating voltage | DC 10 V ... 30 V |
| Current carrying capacity | 2 A per signal; 9 A per SA box |
| Rated voltage | 32 V ~ eff. |
| Insulation voltage | 1 kV / 3 s |
| Insulation resistance | $> 10^9 \Omega$ |
| Degree of pollution | 3 acc. to VDE 0110 |
| Switching function | PNP |

Description	Item no.	Pack. unit
M12 sensor/actuator box		
4-way, 5 poles, 5m connecting cable	757-245/000-005	1
4-way, 5 poles, 10m connecting cable	757-245/000-010	1
6-way, 5 poles, 5m connecting cable	757-265/000-005	1
6-way, 5 poles, 10m connecting cable	757-265/000-010	1
8-way, 5 poles, 5m connecting cable	757-285/000-005	1
8-way, 5 poles, 10m connecting cable	757-285/000-010	1
8-way, 5 poles, 25m connecting cable	757-285/000-025	1
Accessories	Item no.	
Marker card, marking pen, spacer module and protective cap	see page 192	
IP67 cables and connectors	see pages 193... 194	
Approvals		
UL 508	E 175199, UL 508, Class 2 Equipment	
	Components are designed to be supplied through Class 2 power supplies in accordance with UL 1310 or Class 2 transformers in accordance with UL 1585	



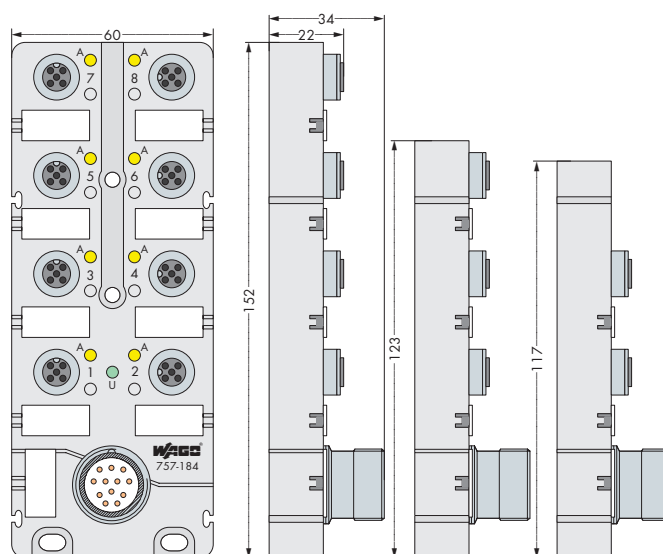
Mechanical Data

Degree of protection	IP 68 acc. to EN 60529 In fully locked position with the appropriate plugs or protective caps
Operating temperature	-25 °C ... +80 °C (current load according to derating curve)
Mounting	Screw mounting
Dimensions (mm) W x H x L	4-way: 60 x 117 x 26 6-way: 60 x 123 x 26 8-way: 60 x 152 x 26
Weight	4-way: 165 g 6-way: 185 g 8-way: 225 g without cable
Fitting position	any
Vibration resistance	acc. to IEC60068-2-6
Shock resistance	acc. to IEC60068-2-27

Material Data

General	Silicon and halogen free
Potting	Fully encapsulated with conformal coating (UL 94 V0)
Enclosure	PA 66 (UL 94 V0); RAL 7035
Contacts	
I/O slot	Socket, M12 x 1, 5-pole incl. PE
Contact	CuSn, pre-nickel and 0.8 µm gold-plated
Tapped bush	Zn diecast nickel-plated
Seal	Viton
Connection cycles	50
Connecting cable	
Cable design	Outer sheath PUR halogen-free Black Cable end 100 mm stripped
Cable Ø	8.2 mm SA box 4-way 8.8 mm SA box 6-way 9.7 mm SA box 8-way
Conductor design	n x 0.34mm ² + 3 x 1.00mm ² conductor 0.34mm ² extra-fine stranded 43 x 0.1mm conductor 1.00mm ² extra-fine stranded 55 x 0.15mm color identification of conductors
Suitable for drag chain applications	
bending radius	min. 10 x cabel Ø
amb. temperature range	-40 °C ... +90 °C stagnant; -5 °C ... +80 °C moving

4 poles, with M23 connection



8-way

6-way

4-way

- 4-, 6- and 8-way sensor /actuator boxes
- 4 poles (1 signal per contact)
- M23 connector (12 poles)
- Green LED operating indicator
- Yellow LED status indicator
- incl. Markers (10 pcs)
- incl. M12 protective caps (2 pcs)

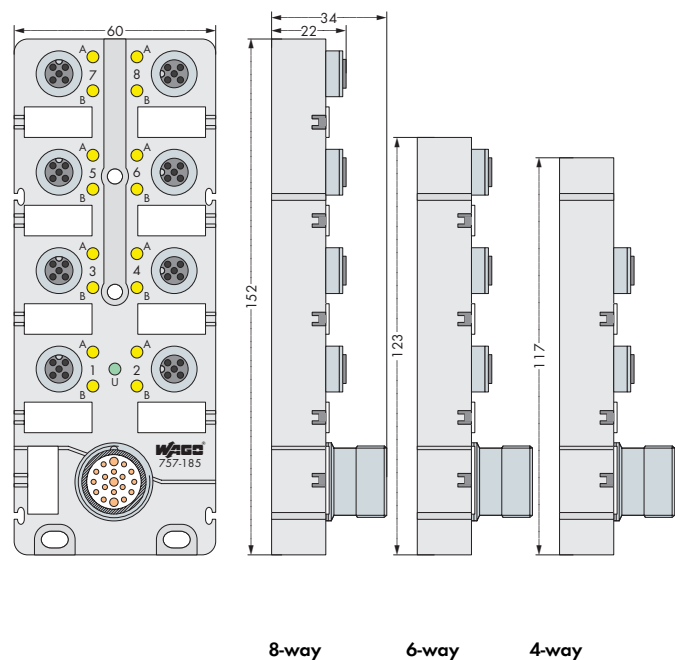
Description	Item no.	Pack. unit
M12 sensor/actuator box	757-144	1
4-way, 4 poles, M23 connector		
6-way, 4 poles, M23 connector	757-164	1
8-way, 4 poles, M23 connector	757-184	1
Accessories	Item no.	
Marker card, marking pen, spacer module and protective cap	see page 192	
IP67 cables and connectors	see pages 193... 194	
Approvals		
UL 508	E 175199, UL 508, Class 2 Equipment	
	Components are designed to be supplied through Class 2 power supplies in accordance with UL 1310 or Class 2 transformers in accordance with UL 1585	

Electrical data:	
Contact resistance	$\leq 10 \text{ m}\Omega$
Operating voltage	DC 10 V ... 30 V
Current carrying capacity	2 A per signal; 9 A per SA box
Rated voltage	32 V ~ eff.
Insulation voltage	1 kV / 3 s
Insulation resistance	$> 10^9 \Omega$
Degree of pollution	3 acc. to VDE 0110
Switching function	PNP

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M12 Sensor/Actuator Boxes

5 poles, with M23 connection



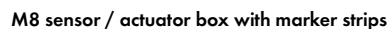
- 4-, 6- and 8-way sensor /actuator boxes
- 5 poles (1 signal per contact)
- M23 connector (19 poles)
- Green LED operating indicator
- Yellow LED status indicator
- incl. Markers (10 pcs)
- incl. M12 protective caps (2 pcs)

Description	Item no.	Pack. unit
M12 sensor/actuator box	757-145	1
4-way, 5 poles, M23 connector		
6-way, 5 poles, M23 connector	757-165	1
8-way, 5 poles, M23 connector	757-185	1
8-fach, 5-polig, without LED, M23 connector	757-185/100-000	1
Accessories	Item no.	
Marker card, marking pen, spacer module and protective cap	see page 192	
IP67 cables and connectors	see pages 193... 194	
Approvals		
UL 508	E 175199, UL 508, Class 2 Equipment	
	Components are designed to be supplied through Class 2 power supplies in accordance with UL 1310 or Class 2 transformers in accordance with UL 1585	

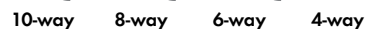
Electrical data:	
Contact resistance	≤ 10 mΩ
Operating voltage	DC 10 V ... 30 V
Current carrying capacity	2 A per signal; 9 A per SA box
Rated voltage	32 V ~ eff.
Insulation voltage	1 kV / 3 s
Insulation resistance	> 10 ⁹ Ω
Degree of pollution	3 acc. to VDE 0110
Switching function	PNP



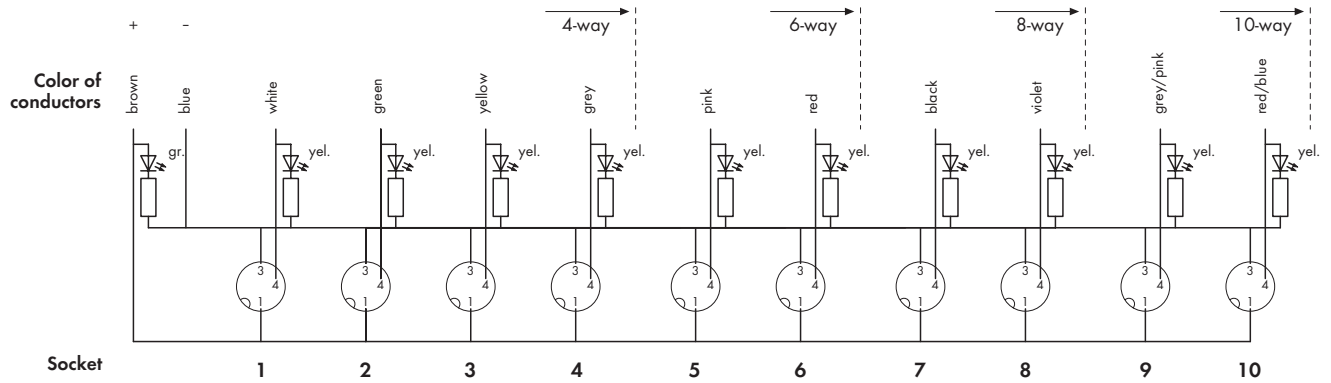
3 poles, with cable connection



- M8 sensor/actuator boxes, 4-, 6-, 8- and 10-way
- 3-pole (1 signal per contact)
- Cable length 5 m or 10 m
- Green LED operating indicator
- Yellow LED status indicator
- incl. marker strips (note: WMB markers can also be used)
- incl. M8 protective caps (2 pcs)



Electrical data:	
Contact resistance	$\leq 10 \text{ m}\Omega$
Operating voltage	DC 10 V ... 30 V
Current carrying capacity	2 A per signal; 6 A per SA box
Rated voltage	32 V ~ eff.
Insulation voltage	1 kV / 3 s
Insulation resistance	$> 10^9 \Omega$
Degree of pollution	3 acc. to VDE 0110
Switching function	PNP



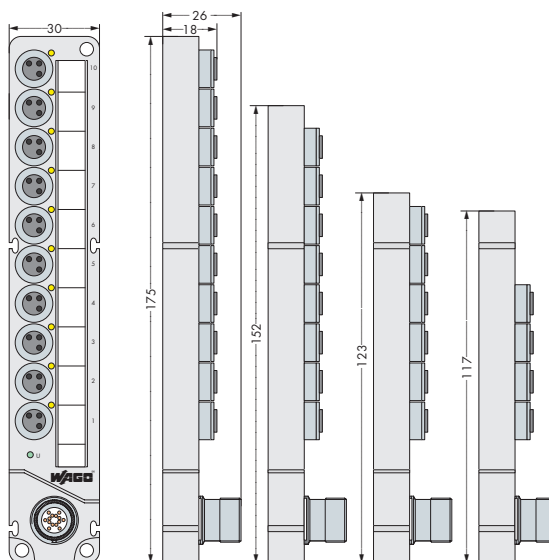
Mechanical Data

Degree of protection	IP 68 acc. to EN 60529 In fully locked position with the appropriate plugs or protective caps
Operating temperature	-25 °C ... +80 °C (current load according to derating curve)
Mounting	Screw mounting
Dimensions (mm) W x H x L	4-way: 30 x 117 x 20 6-way: 30 x 123 x 20 8-way: 30 x 152 x 20 10-way: 30 x 175 x 20
Weight	4-way: 85 g 6-way: 95 g 8-way: 110 g 10-way: 130 g without cable
Fitting position	any
Vibration resistance	acc. to IEC60068-2-6
Shock resistance	acc. to IEC60068-2-27

Material Data

General	Silicon and halogen free
Potting	Fully encapsulated with conformal coating (UL 94 V0)
Enclosure	PA 66 (UL 94 V0); RAL 7035
Contacts	
I/O slot	Socket, M8 x 1, 3-pole
Contact	CuSn, pre-nickel and 0.8 µm gold-plated
Tapped bush	Zn diecast nickel-plated
Seal	Viton
Connection cycles	50
Connecting cable	
Cable design	Outer sheath PUR halogen-free Black Cable end 100 mm stripped
Cable Ø	6.4mm SA box 4-way 6.4mm SA box 4-way 6.4mm SA box 4-way 6.4mm SA box 4-way
Conductor design	n x 0.34mm ² + 2 x 0.75mm ² conductor 0.34mm ² extra-fine stranded 43 x 0.1mm conductor 0.75mm ² extra-fine stranded 21 x 0.205mm color identification of conductors
Suitable for drag chain applications	
bending radius	min. 10 x cable Ø
amb. temperature range	-40 °C ... +90 °C stagnant; -5 °C ... +80 °C moving

3 poles, with M16 connection



10-way 8-way 6-way 4-way

- M8 sensor/actuator boxes, 4-, 6-, 8- and 10-way
- 3-pole (1 signal per contact)
- M16 connector (14-pole)
- Green LED operating indicator
- Yellow LED status indicator
- incl. marker strips (note: WMB markers can also be used)
- incl. M8 protective caps (2 pcs)

Description	Item no.	Pack. unit
M8 sensor/actuator box		
4-way, 3 poles, M23 connector	757-343	1
6-way, 3 poles, M23 connector	757-363	1
8-way, 3 poles, M23 connector	757-383	1
10-way, 3 poles, M23 connector	757-303	1
Accessories	Item no.	
Marker strips, marking pen, spacer module and protective cap	see page 192	
IP67 cables and connectors	see pages 193... 194	
Approvals		
UL 508	E 175199, UL 508, Class 2 Equipment	
	Components are designed to be supplied through Class 2 power supplies in accordance with UL 1310 or Class 2 transformers in accordance with UL 1585	

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Accessories for the WAGO-I/O-SYSTEM 757

Marking cards



Marker strips for Series 757

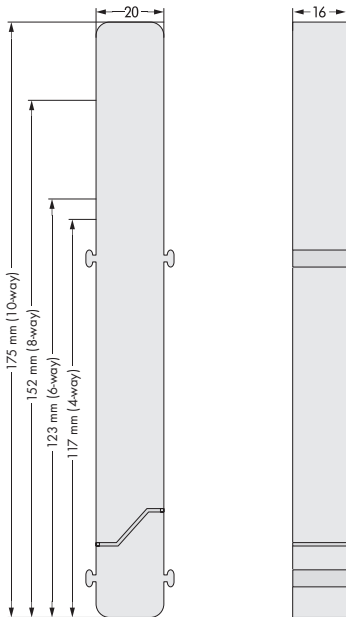
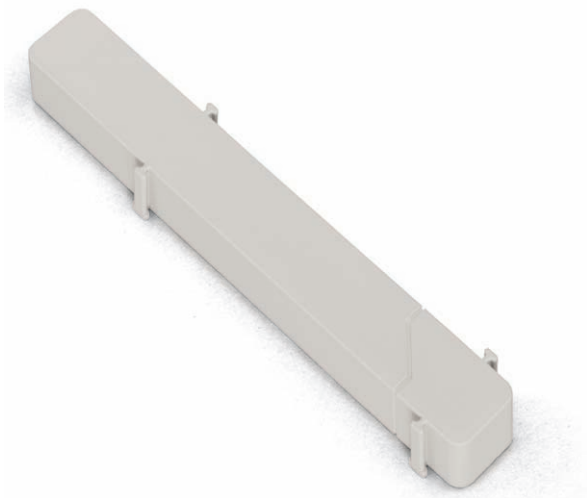


Marking pen with fibre tip



Description		Item no.	Pack. unit
Marker card (40 tags)	for M12 sensor/actuator box	755-891	10
Marker strips for M8 sensor/actuator box			
4-ways		757-0041	100
6-ways		757-0061	100
8-ways		757-0081	100
10-ways		757-0001	100
Marking pen with fibre tip for permanent marking	with fibre tip for permanent marking	210-110	1

Spacer module



Description		Item no.	Pack. unit
Spacer module for sensor/actuator box 4-way		757-040	10
Spacer module for sensor/actuator box 6-way		757-060	10
Spacer module for sensor/actuator box 8-way	(see illustration)	757-080	10
Spacer module for sensor/actuator box 10-way		757-000	10



WAGO-I/O-SYSTEM 756

IP67 Cables and Connectors

Series 756 offers a wide range of accessories for the connection of inductive or capacitive proximity switches, light barriers, flow control devices, push buttons etc. to the WAGO-I/O-SYSTEMS 751 (IP67 AS-Interface), 755 (IP67 fieldbus technology), 757 (IP67 sensor/actuator boxes) and WAGO-Speedway 767 (modular IO system IP67). The cables are not only a protection against dust and water, the design of their coupling nuts also provides protection against mechanical loosening when exposed to vibrations. In addition to that, fixed cables offer bend protection.

Cables with one or two preassembled wire ends are used. Cables with one preassembled wire end are often used when the length of the cable cannot be predetermined exactly or when the cable assembly with connectors proves to be difficult. Cables with one free wire end can therefore be adapted to individual prerequisites. Cables with two preassembled wire ends drastically reduce assembly and installation time.

Sensor/actuator cables, fitted with one socket

3-pole

- 1 brown (+)
3 blue (-)
4 black (S)

M8 Sensor/actuator cables, fitted with one socket		Cable Ø	Item no.	Pack. units
3-pole,	M8 socket, straight, one free wire end, 1.5 m	4.0 mm ± 0.1	756-5101/030-015	10
	M8 socket, straight, one free wire end, 5.0 m	4.0 mm ± 0.1	756-5101/030-050	10

3-pole

- 1 brown (+)
3 blue (-)
4 black (S)

M8 Sensor/actuator cables, fitted with one socket		Cable Ø	Item no.	Pack. units
3-pole,	M8 socket, right angle, one free wire end, 1.5 m	4.0 mm ± 0.1	756-5102/030-015	10
	M8 socket, right angle, one free wire end, 5.0 m	4.0 mm ± 0.1	756-5102/030-050	10

Technical drawing of a cable with a connector. The drawing shows a side view of the cable and a detailed cross-sectional view of the connector. The side view shows a black cable with a white connector. The cross-sectional view shows the internal structure of the connector, including the cable jacket, insulation, and conductors. Dimensions are provided in millimeters: outer diameter 14.5, thread M12, length 12.5, total length 45, and inner diameter 8.5 to 10.

3-pole

- 1 brown (+)
- 2 white (Ö)
- 3 blue (-)
- 4 black (S)
- 5 grey

M8 Sensor/actuator cables, fitted with one socket		Cable Ø	Item no.	Pack. unit
3-pole,	M8 socket, straight, one free wire end, 1.5 m	4.3 mm ± 0.2	756-5301/030-015	10
	M8 socket, straight, one free wire end, 5.0 m	4.3 mm ± 0.2	756-5301/030-050	10
4-pole,	M8 socket, straight, one free wire end, 1.5 m	4.7 mm ± 0.2	756-5301/040-015	10
	M8 socket, straight, one free wire end, 5.0 m	4.7 mm ± 0.2	756-5301/040-050	10
5-pole,	M8 socket, straight, one free wire end, 1.5 m	5.0 mm ± 0.2	756-5301/050-015	10
	M8 socket, straight, one free wire end, 5.0 m	5.0 mm ± 0.2	756-5301/050-050	10

3-pole

- 1 brown (+)
- 2 white (Ö)
- 3 blue (-)
- 4 black (S)
- 5 grey

M8 Sensor/actuator cables, fitted with one socket		Cable Ø	Item no.	Pack. units
3-pole,	M8 socket, right angle, one free wire end, 1.5 m	4.3 mm ± 0.2	756-5302/030-015	10
	M8 socket, right angle, one free wire end, 5.0 m	4.3 mm ± 0.2	756-5302/030-050	10
4-pole,	M8 socket, right angle, one free wire end, 1.5 m	4.7 mm ± 0.2	756-5302/040-015	10
	M8 socket, right angle, one free wire end, 5.0 m	4.7 mm ± 0.2	756-5302/040-050	10
5-pole,	M8 socket, right angle, one free wire end, 1.5 m	5.0 mm ± 0.2	756-5302/050-015	10
	M8 socket, right angle, one free wire end, 5.0 m	5.0 mm ± 0.2	756-5302/050-050	10

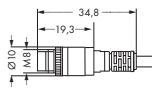
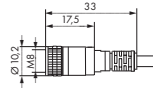
Special lengths on request

WAGO-I/O-SYSTEM 756 IP67 Cables and Connectors

Sensor/actuator cables, both ends of the cable are fitted with plug/socket

M8 Socket

M8 Plug



Pin 1 - 4: 0.25 mm²

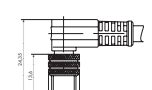
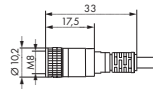


1 brown (+)
3 blue (-)
4 black (S)

M8/M8 Sensor/actuator cables, both ends of the cable are fitted with plug/socket		Cable Ø	Item no.	Pack. unit
3-pole,	M8 socket, straight/M8 plug, straight, 1.0 m	4.0 mm ± 0.1	756-5201/030-010	10
	M8 socket, straight/M8 plug, straight, 2.0 m	4.0 mm ± 0.1	756-5201/030-020	10

M8 Socket

M8 Plug



Pin 1 - 4: 0.34 mm²

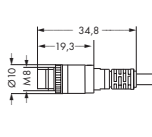
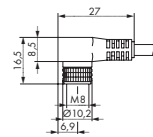


1 brown (+)
3 blue (-)
4 black (S)

M8/M8 Sensor/actuator cables, both ends of the cable are fitted with plug/socket		Cable Ø	Item no.	Pack. unit
3-pole,	M8 socket, straight/M8 plug, right angle, 1.0 m	4.3 mm ± 0.2	756-5202/030-010	10
	M8 socket, straight/M8 plug, right angle, 2.0 m	4.3 mm ± 0.2	756-5202/030-020	10

M8 Socket

M8 Plug



Pin 1 - 4: 0.25 mm²

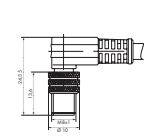
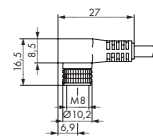


1 brown (+)
3 blue (-)
4 black (S)

M8/M8 Sensor/actuator cables, both ends of the cable are fitted with plug/socket		Cable Ø	Item no.	Pack. unit
3-pole,	M8 socket, right angle/M8 plug, straight, 1.0 m	4.0 mm ± 0.1	756-5203/030-010	10
	M8 socket, right angle/M8 plug, straight, 1.0 m	4.0 mm ± 0.1	756-5203/030-020	10

M8 Socket

M8 Plug



Pin 1 - 4: 0.34 mm²



1 brown (+)
3 blue (-)
4 black (S)

M8/M8 Sensor/actuator cables, both ends of the cable are fitted with plug/socket		Cable Ø	Item no.	Pack. unit
3-pole,	M8 socket, right angle/M8 plug, right angle, 1.0m	4.3 mm ± 0.2	756-5204/030-010	10
	M8 socket, right angle/M8 plug, right angle, 2.0m	4.3 mm ± 0.2	756-5204/030-020	10

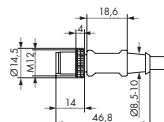
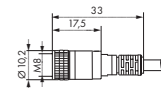
Special lengths on request

WAGO-I/O-SYSTEM 756 IP67 Cables and Connectors

Sensor/actuator cables, both ends of the cable are fitted with plug/socket

M8 Socket

M12 Plug



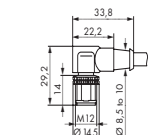
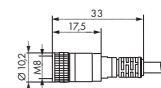
Pin 1 - 4: 0.25 mm²

1 brown (+)
2 white (Ö)
3 blue (-)
4 black (S)

M8/M12 Sensor/actuator cables, both ends of the cable are fitted with plug/socket		Cable Ø	Item no.	Pack. unit
3-pole,	M8 socket, straight/M12 plug, straight, 1.0 m	4.0 mm ± 0.1	756-5507/030-010	10
	M8 socket, straight/M12 plug, straight, 2.0 m	4.0 mm ± 0.1	756-5507/030-020	10
4-pole,	M8 socket, straight/M12 plug, straight, 1.0 m	4.0 mm ± 0.1	756-5507/040-010	10
	M8 socket, straight/M12 plug, straight, 2.0 m	4.0 mm ± 0.1	756-5507/040-020	10

M8 Socket

M12 Plug



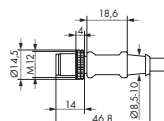
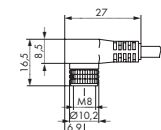
Pin 1 - 4: 0.25 mm²

1 brown (+)
2 white (Ö)
3 blue (-)
4 black (S)

M8/M12 Sensor/actuator cables, both ends of the cable are fitted with plug/socket		Cable Ø	Item no.	Pack. unit
3-pole,	M8 socket, straight/M12 plug, right angle, 1.0 m	4.0 mm ± 0.1	756-5508/030-010	10
	M8 socket, straight/M12 plug, right angle, 2.0 m	4.0 mm ± 0.1	756-5508/030-020	10
4-pole,	M8 socket, straight/M12 plug, right angle, 1.0 m	4.0 mm ± 0.1	756-5508/040-010	10
	M8 socket, straight/M12 plug, right angle, 2.0 m	4.0 mm ± 0.1	756-5508/040-020	10

M8 Socket

M12 Plug



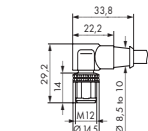
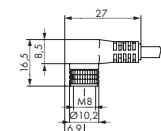
Pin 1 - 4: 0.25 mm²

1 brown (+)
2 white (Ö)
3 blue (-)
4 black (S)

M8/M12 Sensor/actuator cables, both ends of the cable are fitted with plug/socket		Cable Ø	Item no.	Pack. unit
3-pole,	M8 socket, right angle/M12 plug, straight, 1.0 m	4.0 mm ± 0.1	756-5509/030-010	10
	M8 socket, right angle/M12 plug, straight, 2.0 m	4.0 mm ± 0.1	756-5509/030-020	10
4-pole,	M8 socket, right angle/M12 plug, straight, 1.0 m	4.0 mm ± 0.1	756-5509/040-010	10
	M8 socket, right angle/M12 plug, straight, 2.0 m	4.0 mm ± 0.1	756-5509/040-020	10

M8 Socket

M12 Plug



Pin 1 - 4: 0.25 mm²

1 brown (+)
2 white (Ö)
3 blue (-)
4 black (S)

M8/M12 Sensor/actuator cables, both ends of the cable are fitted with plug/socket		Cable Ø	Item no.	Pack. unit
3-pole,	M8 socket, right angle/M12 plug, right angle, 1.0 m	4.0 mm ± 0.1	756-5510/030-010	10
	M8 socket, right angle/M12 plug, right angle, 2.0 m	4.0 mm ± 0.1	756-5510/030-020	10
4-pole,	M8 socket, right angle/M12 plug, right angle, 1.0 m	4.0 mm ± 0.1	756-5510/040-010	10
	M8 socket, right angle/M12 plug, right angle, 2.0 m	4.0 mm ± 0.1	756-5510/040-020	10

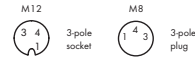
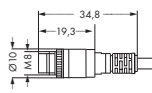
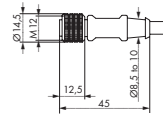
Special lengths on request

WAGO-I/O-SYSTEM 756 IP67 Cables and Connectors

Sensor/actuator cables, both ends of the cable are fitted with plug/socket

M12 Socket

M8 Plug



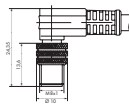
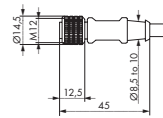
Pin 1 - 4: 0.25 mm²

1 brown (+)
3 blue (-)
4 black (S)

M12/M8 Sensor/actuator cables, both ends of the cable are fitted with plug/socket		Cable Ø	Item no.	Pack. unit
3-pole,	M12 socket, straight/M8 plug, straight, 1.0 m	4.0 mm ± 0.1	756-5501/030-010	10
	M12 socket, straight/M8 plug, straight, 2.0 m	4.0 mm ± 0.1	756-5501/030-020	10

M12 Socket

M8 Plug



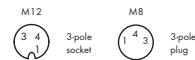
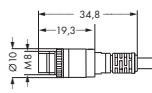
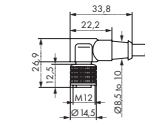
Pin 1 - 4: 0.34 mm²

1 brown (+)
3 blue (-)
4 black (S)

M12/M8 Sensor/actuator cables, both ends of the cable are fitted with plug/socket		Cable Ø	Item no.	Pack. unit
3-pole,	M12 socket, straight/M8 plug, right angle, 1.0 m	4.3 mm ± 0.2	756-5502/030-010	10
	M12 socket, straight/M8 plug, right angle, 2.0 m	4.3 mm ± 0.2	756-5502/030-020	10

M12 Socket

M8 Plug



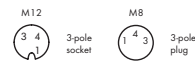
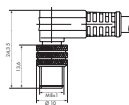
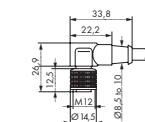
Pin 1 - 4: 0.25 mm²

1 brown (+)
3 blue (-)
4 black (S)

M12/M8 Sensor/actuator cables, both ends of the cable are fitted with plug/socket		Cable Ø	Item no.	Pack. unit
3-pole,	M12 socket, right angle/M8 plug, straight, 1.0 m	4.0 mm ± 0.1	756-5503/030-010	10
	M12 socket, right angle/M8 plug, straight, 2.0 m	4.0 mm ± 0.1	756-5503/030-020	10

M12 Socket

M8 Plug



Pin 1 - 4: 0.34 mm²

1 brown (+)
3 blue (-)
4 black (S)

M12/M8 Sensor/actuator cables, both ends of the cable are fitted with plug/socket		Cable Ø	Item no.	Pack. unit
3-pole,	M12 socket, right angle/M8 plug, right angle, 1.0 m	4.3 mm ± 0.2	756-5504/030-010	10
	M12 socket, right angle/M8 plug, right angle, 2.0 m	4.3 mm ± 0.2	756-5504/030-020	10

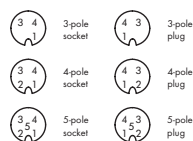
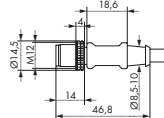
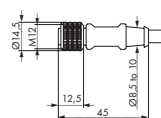
Special lengths on request

WAGO-I/O-SYSTEM 756 IP67 Cables and Connectors

Sensor/actuator cables, both ends of the cable are fitted with plug/socket

M12 Socket

M12 Plug



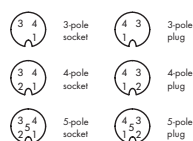
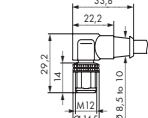
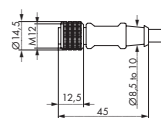
Pin 1 - 5: 0.34 mm²

1 brown (+)
2 white (Ö)
3 blue (-)
4 black (S)
5 grey

M12/M12 Sensor/actuator cables, both ends of the cable are fitted with plug/socket		Cable Ø	Item no.	Pack. unit
3-pole,	M12 socket, straight/M12 plug, straight, 1.0 m	4.3 mm ± 0.2	756-5401/030-010	10
	M12 socket, straight/M12 plug, straight, 2.0 m	4.3 mm ± 0.2	756-5401/030-020	10
4-pole,	M12 socket, straight/M12 plug, straight, 1.0 m	4.7 mm ± 0.2	756-5401/040-010	10
	M12 socket, straight/M12 plug, straight, 2.0 m	4.7 mm ± 0.2	756-5401/040-020	10
5-pole,	M12 socket, straight/M12 plug, straight, 1.0 m	5.0 mm ± 0.2	756-5401/050-010	10
	M12 socket, straight/M12 plug, straight, 2.0 m	5.0 mm ± 0.2	756-5401/050-020	10

M12 Socket

M12 Plug



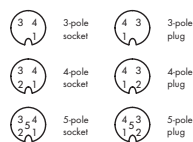
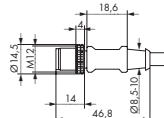
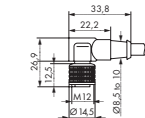
Pin 1 - 5: 0.34 mm²

1 brown (+)
2 white (Ö)
3 blue (-)
4 black (S)
5 grey

M12/M12 Sensor/actuator cables, both ends of the cable are fitted with plug/socket		Cable Ø	Item no.	Pack. unit
3-pole,	M12 socket, straight/M12 plug, right angle, 1.0 m	4.3 mm ± 0.2	756-5402/030-010	10
	M12 socket, straight/M12 plug, right angle, 2.0 m	4.3 mm ± 0.2	756-5402/030-020	10
4-pole,	M12 socket, straight/M12 plug, right angle, 1.0 m	4.7 mm ± 0.2	756-5402/040-010	10
	M12 socket, straight/M12 plug, right angle, 2.0 m	4.7 mm ± 0.2	756-5402/040-020	10
5-pole,	M12 socket, straight/M12 plug, right angle, 1.0 m	5.0 mm ± 0.2	756-5402/050-010	10
	M12 socket, straight/M12 plug, right angle, 2.0 m	5.0 mm ± 0.2	756-5402/050-020	10

M12 Socket

M12 Plug



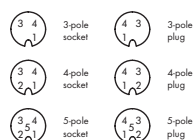
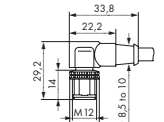
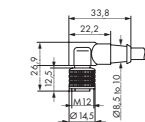
Pin 1 - 5: 0.34 mm²

1 brown (+)
2 white (Ö)
3 blue (-)
4 black (S)
5 grey

M12/M12 Sensor/actuator cables, both ends of the cable are fitted with plug/socket		Cable Ø	Item no.	Pack. unit
3-pole,	M12 socket, right angle/M12 plug, straight, 1.0 m	4.3 mm ± 0.2	756-5403/030-010	10
	M12 socket, right angle/M12 plug, straight, 2.0 m	4.3 mm ± 0.2	756-5403/030-020	10
4-pole,	M12 socket, right angle/M12 plug, straight, 1.0 m	4.7 mm ± 0.2	756-5403/040-010	10
	M12 socket, right angle/M12 plug, straight, 2.0 m	4.7 mm ± 0.2	756-5403/040-020	10
5-pole,	M12 socket, right angle/M12 plug, straight, 1.0 m	5.0 mm ± 0.2	756-5403/050-010	10
	M12 socket, right angle/M12 plug, straight, 2.0 m	5.0 mm ± 0.2	756-5403/050-020	10

M12 Socket

M12 Plug



Pin 1 - 5: 0.34 mm²

1 brown (+)
2 white (Ö)
3 blue (-)
4 black (S)
5 grey

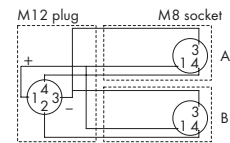
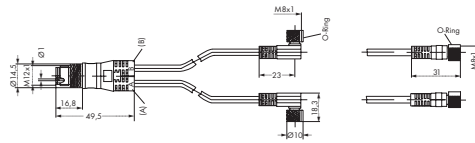
M12/M12 Sensor/actuator cables, both ends of the cable are fitted with plug/socket		Cable Ø	Item no.	Pack. unit
3-pole,	M12 socket, right angle/M12 plug, right angle, 1.0 m	4.3 mm ± 0.2	756-5404/030-010	10
	M12 socket, right angle/M12 plug, right angle, 2.0 m	4.3 mm ± 0.2	756-5404/030-020	10
4-pole,	M12 socket, right angle/M12 plug, right angle, 1.0 m	4.7 mm ± 0.2	756-5404/040-010	10
	M12 socket, right angle/M12 plug, right angle, 2.0 m	4.7 mm ± 0.2	756-5404/040-020	10
5-pole,	M12 socket, right angle/M12 plug, right angle, 1.0 m	5.0 mm ± 0.2	756-5404/050-010	10
	M12 socket, right angle/M12 plug, right angle, 2.0 m	5.0 mm ± 0.2	756-5404/050-020	10

Special lengths on request

WAGO-I/O-SYSTEM 756 IP67 Cables and Connectors

Sensor-/actuator distribution components

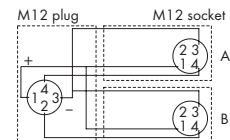
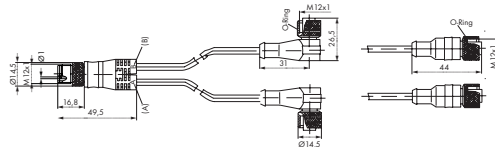
M12 Distribution Plug



Pin 1 - 4: 0.25 mm²

M8/M12 Sensor/actuator distribution cables, both ends of the cable are fitted with plug/socket		Cable Ø	Item no.	Pack. unit
4-pole,	2 x M8 socket, straight/M12 plug, straight, 1.0 m	4.3 mm ± 0.2	756-5513/040-010	10
	2 x M8 socket, straight/M12 plug, straight, 2.0 m	4.3 mm ± 0.2	756-5513/040-020	10
	2 x M8 socket, right angle/M12 plug, straight, 1.0 m	4.3 mm ± 0.2	756-5514/040-010	1
	2 x M8 socket, right angle/M12 plug, straight, 2.0 m	4.3 mm ± 0.2	756-5514/040-020	10

M12 Distribution Plug

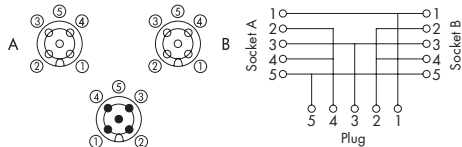


Pin 1 - 4: 0.34 mm²

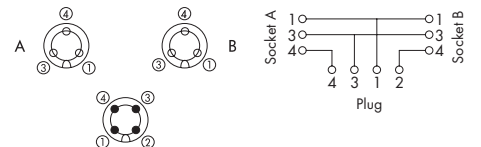
M12/M12 Sensor/actuator distribution cables, both ends of the cable are fitted with plug/socket		Cable Ø	Item no.	Pack. unit
4-pole,	2 x M12 socket, straight/M12 plug, straight, 1.0 m	4.7 mm ± 0.2	756-5516/040-010	10
	2 x M12 socket, straight/M12 plug, straight, 2.0 m	4.7 mm ± 0.2	756-5516/040-020	10
	2 x M12 socket, right angle/M12 plug, straight, 1.0 m	4.7 mm ± 0.2	756-5517/040-010	10
	2 x M12 socket, right angle/M12 plug, straight, 2.0 m	4.7 mm ± 0.2	756-5517/040-020	10

Special lengths on request

M12/M12



M8/M12



Sensor/actuator twin distribution connector	Item no.	Pack. unit
M12/M12 twin distribution connector	755-881	10
M8/M12 twin distribution connector	755-888	8

M8



M12

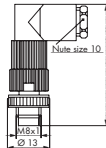
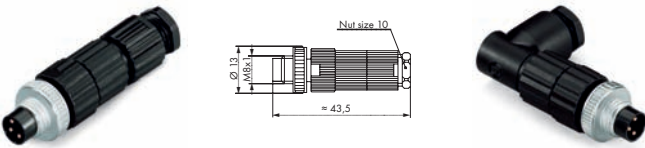


Protective caps (for unused sensor/actuator connections)	Item no.	Pack. unit
M8 protective cap	756-8101	10
M12 protective cap	756-8102	10

WAGO-I/O-SYSTEM 756 IP67 Cables and Connectors

Connectors for self assembly

M8 Plug



Conductor sizes
Ø 4 ... 5 mm/0.14 ... 0.34 mm²

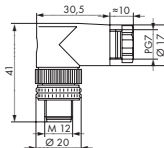
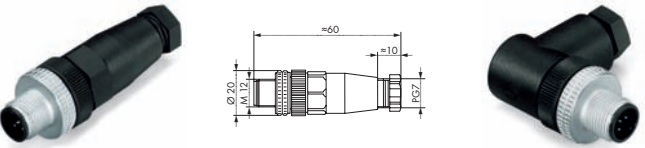
M8 Plug, for self assembly

Item no. Pack. unit

3-pole, M8 plug, straight, pin penetration
M8 plug, right angle, pin penetration

756-9102/030-000 5
756-9105/030-000 5

M12 Plug



Conductor sizes
Ø 4 ... 6 mm/max. 0.75 mm²
(screw clamp connection)
Ø 4 ... 6 mm/max. 0.50 mm²
(spring clamp technology)

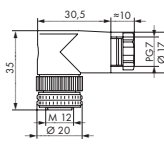
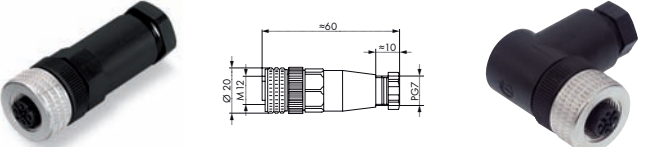
M12 Plug, for self assembly

Item no. Pack. unit

4-pole, M12 plug, straight, screw clamp connection
M12 plug, right angle, screw clamp connection
M12 plug, straight, spring clamp technology
M12 plug, right angle, spring clamp technology
5-pole, M12 plug, straight, screw clamp connection
M12 plug, right angle, screw clamp connection
M12 plug, straight, spring clamp technology
M12 plug, right angle, spring clamp technology

756-9201/040-000 5
756-9204/040-000 5
756-9202/040-000 5
756-9205/040-000 5
756-9201/050-000 5
756-9204/050-000 5
756-9202/050-000 5
756-9205/050-000 5

M12 Socket



Conductor sizes
Ø 4 ... 6 mm/max. 0.75 mm²
(screw clamp connection)
Ø 4 ... 6 mm/max. 0.50 mm²
(spring clamp technology)

M12 Socket, for self assembly

Item no. Pack. unit

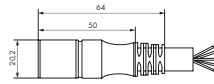
4-pole, M12 socket, straight, screw clamp connection
M12 socket, right angle, screw clamp connection
M12 socket, straight, spring clamp technology
M12 socket, right angle, spring clamp technology
5-pole, M12 socket, straight, spring clamp technology
M12 socket, right angle, spring clamp technology

756-9211/040-000 5
756-9214/040-000 5
756-9212/040-000 5
756-9215/040-000 5
756-9212/050-000 5
756-9215/050-000 5

WAGO-I/O-SYSTEM 756 IP67 Cables and Connectors

Distribution cables for the WAGO-I/O-SYSTEM 757

M16 Socket



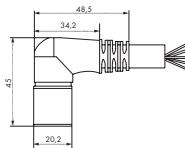
Pin A, L: 0.75 mm²
Pin C - J, N - T: 0.34 mm²

A	brown	N	pink-brown
C	white-pink	O	violet
E	black	P	white
G	pink	R	red
J	green	S	grey
L	blue	T	yellow
M	commoned with A	U	commoned with L

M16 Distribution cables for connecting M8 sensor /actuator boxes

		Cable Ø	Item no.	Pack. unit
14-pole,	M16 socket, straight, one free wire end, 5 m	9.1 mm ± 0.2	756-3205/140-050	1
	M16 socket, straight, one free wire end, 10 m	9.1 mm ± 0.2	756-3205/140-100	1
	M16 socket, straight, one free wire end, 15 m	9.1 mm ± 0.2	756-3205/140-150	1

M16 Socket



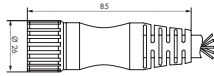
Pin A, L: 0.75 mm²
Pin C - J, N - T: 0.34 mm²

A	brown	N	pink-brown
C	white-pink	O	violet
E	black	P	white
G	pink	R	red
J	green	S	grey
L	blue	T	yellow
M	commoned with A	U	commoned with L

M16 Distribution cables for connecting M8 sensor /actuator boxes

		Cable Ø	Item no.	Pack. unit
14-pole,	M16 socket, right angle, one free wire end, 5 m	9.1 mm ± 0.2	756-3206/140-050	1
	M16 socket, right angle, one free wire end, 10 m	9.1 mm ± 0.2	756-3206/140-100	1
	M16 socket, right angle, one free wire end, 15 m	9.1 mm ± 0.2	756-3206/140-150	1

M23 Socket



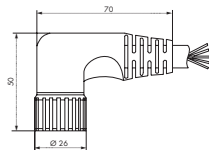
Pin 9, 11, 12: 1.00 mm²; Pin 1 - 8: 0.34 mm²
1 white 5 pink 9 blue
2 green 6 red 10 commoned with 9
3 yellow 7 black 11 brown
4 grey 8 violet 12 green-yellow

Pin 6, 12, 19: 1.00 mm²; Pin 1 - 5, 7 - 11, 13 - 19: 0.34 mm²
1 violet 8 white-green 15 white
2 red 9 white-yellow 16 yellow
3 grey 10 white-grey 17 pink
4 red-blue 11 black 18 grey-brown
5 green 12 green-yellow 19 brown
6 blue 13 yellow-brown
7 grey-pink 14 brown-green

M23 Distribution cables for connecting M8 sensor /actuator boxes

		Cable Ø	Item no.	Pack. unit
12-pole,	M23 socket, straight, one free wire end, 5 m	8.6 mm ± 0.3	756-3201/120-050	1
	M23 socket, straight, one free wire end, 10 m	8.6 mm ± 0.3	756-3201/120-100	1
	M23 socket, straight, one free wire end, 15 m	8.6 mm ± 0.3	756-3201/120-150	1
19-pole,	M23 socket, straight, one free wire end, 5 m	9.7 mm ± 0.3	756-3203/190-050	1
	M23 socket, straight, one free wire end, 10 m	9.7 mm ± 0.3	756-3203/190-100	1
	M23 socket, straight, one free wire end, 15 m	9.7 mm ± 0.3	756-3203/190-150	1

M23 Socket



Pin 9, 11, 12: 1.00 mm²; Pin 1 - 8: 0.34 mm²
1 white 5 pink 9 blue
2 green 6 red 10 commoned with 9
3 yellow 7 black 11 brown
4 grey 8 violet 12 green-yellow

Pin 6, 12, 19: 1.00 mm²; Pin 1 - 5, 7 - 11, 13 - 19: 0.34 mm²
1 violet 8 white-green 15 white
2 red 9 white-yellow 16 yellow
3 grey 10 white-grey 17 pink
4 red-blue 11 black 18 grey-brown
5 green 12 green-yellow 19 brown
6 blue 13 yellow-brown
7 grey-pink 14 brown-green

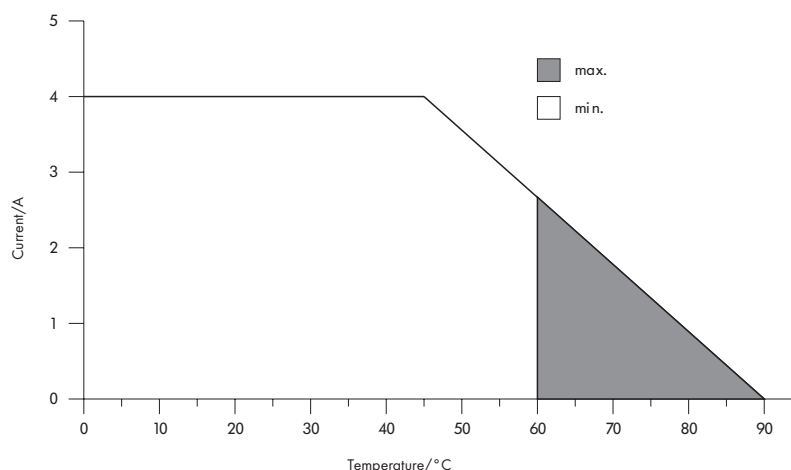
M23 Distribution cables for connecting M8 sensor /actuator boxes

		Cable Ø	Item no.	Pack. unit
12-pole,	M23 socket, right angle, one free wire end, 5 m	8.6 mm ± 0.3	756-3202/120-050	1
	M23 socket, right angle, one free wire end, 10 m	8.6 mm ± 0.3	756-3202/120-100	1
	M23 socket, right angle, one free wire end, 15 m	8.6 mm ± 0.3	756-3202/120-150	1
19-pole,	M23 socket, right angle, one free wire end, 5 m	9.7 mm ± 0.3	756-3204/190-050	1
	M23 socket, right angle, one free wire end, 10 m	9.7 mm ± 0.3	756-3204/190-100	1
	M23 socket, right angle, one free wire end, 15 m	9.7 mm ± 0.3	756-3204/190-150	1

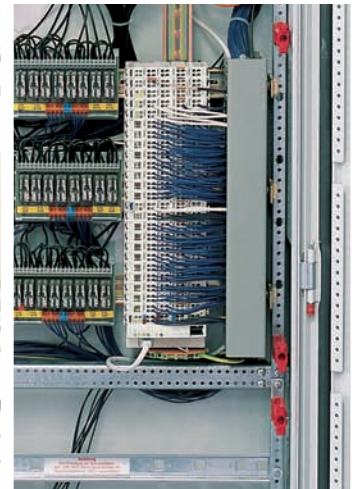
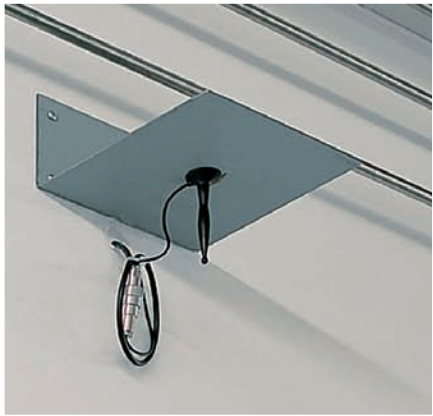
Special lengths on request

Technical Data	M8 connecting cable	M12 connecting cable
General		
Operating voltage		
3-pole	AC/DC 60 V	AC/DC 250 V
4-pole	- /-	AC/DC 250 V
5-pole	- /-	AC/DC 50 V
Operating current (see also derating curve)	max. 4 A	
Rated surge voltage (IEC 61076-2-101)		
3-pole	2.5 kV	- /-
4-pole	- /-	2.5 kV
5-pole	- /-	1.5 kV
Insulation resistance (IEC 61076-2-101)	≥ 10 ⁹ Ω	
Contact resistance (IEC 61076-2-101)	≤ 10 mΩ	
Resistance of conductor	≤ 60 Ω/km	
Degree of pollution (VDE 0110)	III	
Degree of protection (IEC 60529)	IP68 (in fully locked position)	
Operating temperature (see also derating curve)		
moved	-25 °C ... +90 °C ¹⁺²⁾	
static	-50 °C ... +90 °C ¹⁾	
	¹⁾ according to UL max. 80 °C	
	²⁾ in drag chains or under high mechanical stress + 60 °C	
Suitable for drag chain applications		
Bending radius	min. 10 x cable Ø	
Bending cycles	≥ 2 million	
Acceleration	max. 5 m/s ²	
Path feed rate	max. 200 m/min	
Path	max. 5 m horizontal, max. 2 m vertical	
Torsional load	± 180° per meter length	
Other characteristics	Silicone and CFC free, resistant to oil, hydrolysis and microbes	
Cables		
Designation	Li9YH-11YH	
Comment	designed according to UL + CSA, UL AWM style 21198, core style 10493	
Conductors (3/4/5 Conductor 0.34 mm ²)	fine-stranded bare copper conductors (43 x 0.1 mm)	
Conductor insulation	PP9Y or TPM, halogen free	
Outer jacket	Polyurethane (PUR), halogen free acc. to DIN VDE 0472 part 815	
	flame retardant acc. to IEC 332-2, self-extinguishing	
	color: black (≈ RAL9005)	
Cable Ø 3-pole	Ø 4.3 mm ± 0,2	
Cable Ø 4-pole	- /-	Ø 4.7 mm ± 0,2
Cable Ø 5-pole	- /-	Ø 5.0 mm ± 0,2
Connectors		
Moulded body/housing material	PA, Polyurethane (PUR), black (≈ RAL9005)	
Contact material	CuSn (BZ4)	
Contact plating	Cu/Au 0.6	
Knurled nut	Zinc die cast (ZnAlCu)	
Knurled nut (surface)	Zn/CuNi	
Sealing ring	Viton	

Derating curve (DIN IEC 512 Part 2: 5/94)



Technical Data	M16 connecting cable	M23 connecting cable
General		
Operating voltage		
12-pole	- / -	300 V
14-pole	150 V	- / -
19-pole	- / -	150 V
Operating current		
12-pole	- / -	8 A
14-pole	4 A (0.34 mm ²); 6 A (0.75 mm ²)	- / -
19-pole	- / -	10 A (contacts 6,12,19); 8 A (other contacts)
Rated surge voltage		
12-pole	- / -	AC 2.5 KV
14-pole	1.2 KV	- / -
19-pole	- / -	AC 1,5 KV
Insulation resistance	- / -	≥ 10 ¹² Ω
Contact resistance	- / -	≤ 3 mΩ
Resistance of conductor		
0.34-mm ²	≤ 53.5 Ω/Km	≤ 54.1 Ω/km
0.75-mm ²	≤ 26.0 Ω/Km	- / -
1.0-mm ²	- / -	≤ 18.7 Ω/km
Degree of pollution (VDE 0110)	II / III	III
Degree of protection (IEC 60529)	IP67 (in fully locked position)	
Operating temperature		
moved	-30 °C ... +90 °C	-5 °C ... +80 °C
static		-40 °C ... +90 °C
Suitable for drag chain applications		
Bending radius		min. 10 x cable Ø
Bending cycles		≥ 2 million
Acceleration		max. 5 m/s ²
Path feed rate		max. 200 m/min
Path		max. 5 m horizontal, max. 2 m vertical
Cables		
Designation	LiFwYw11Y	Li9YH-11Y unshielded
Comment		designed according to UL style 21198, core style 10493, 100 mm stripped wire end
Conductors		fine-stranded bare copper conductors
12-pole (8 wires 0.34 mm ² ; 3 wires 1.0 mm ²)	- / -	43 x 0.1 mm; 128 x 0.1 mm
14-pole (10 wires 0.34 mm ² ; 2 wires 0.75 mm ²)	42 x 0.1 mm; 95 x 0.1 mm	- / -
19-pole (16 wires 0.34 mm ² ; 3 wires 1.0 mm ²)	- / -	43 x 0.1 mm; 55 x 0.1 mm
Conductor insulation	PVC YI 8 acc. to DIN VDE 0207	PP9Y halogen free
Core wrapping		Fleece
Outer jacket	PUR Polyurethane	Polyurethane (PUR), halogen free flame retardant acc. to DIN VDE 0472, part 804 color: black (≈ RAL9005)
Cable Ø 12-pole	- / -	Ø 8.6 mm ± 0,3
Cable Ø 14-pole	Ø 9.1 mm ± 0,2	- / -
Cable Ø 19-pole	- / -	Ø 9.7 mm ± 0,3
Connectors		
Mechanical life		50 mating cycles
Moulded body	Polyamide (PA) /UL 94 V0	Thermoplastic Polyester (PBT), Polyamide (PA 66) / UL 94 V0
Housing material	CuZn /Ni	Machined part of Copper-Zinc alloy (CuZn), Die casting part of Zinc (GD-Zn) Polyurethane (PUR), plastic injection moulding
Contact material		CuZn
Contact plating	Gold (Au)	Nickel (Ni) with gold plating (Au) or passivated finish
Sealing and O-ring	CR (Neoprene)	Fluorocarbon rubber (FPM)



**WAGO Application: Plastic Technology
Center (SKZ) in Würzburg, Germany**

WAGO Products:
WAGO-I/O-SYSTEM with ETHERNET
Controllers, DALI and EnOcean Components



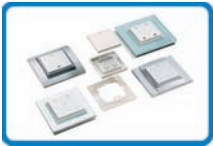
System Overview	206 - 207
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Series 789 – EnOcean Radio Receiver in DIN-Rail-Mountable Enclosure	
4-channel EnOcean Radio Receiver with 4 Changeover Contacts, 8 A	
4-channel EnOcean Radio Receiver with 4 Make Contacts, 16 A	208



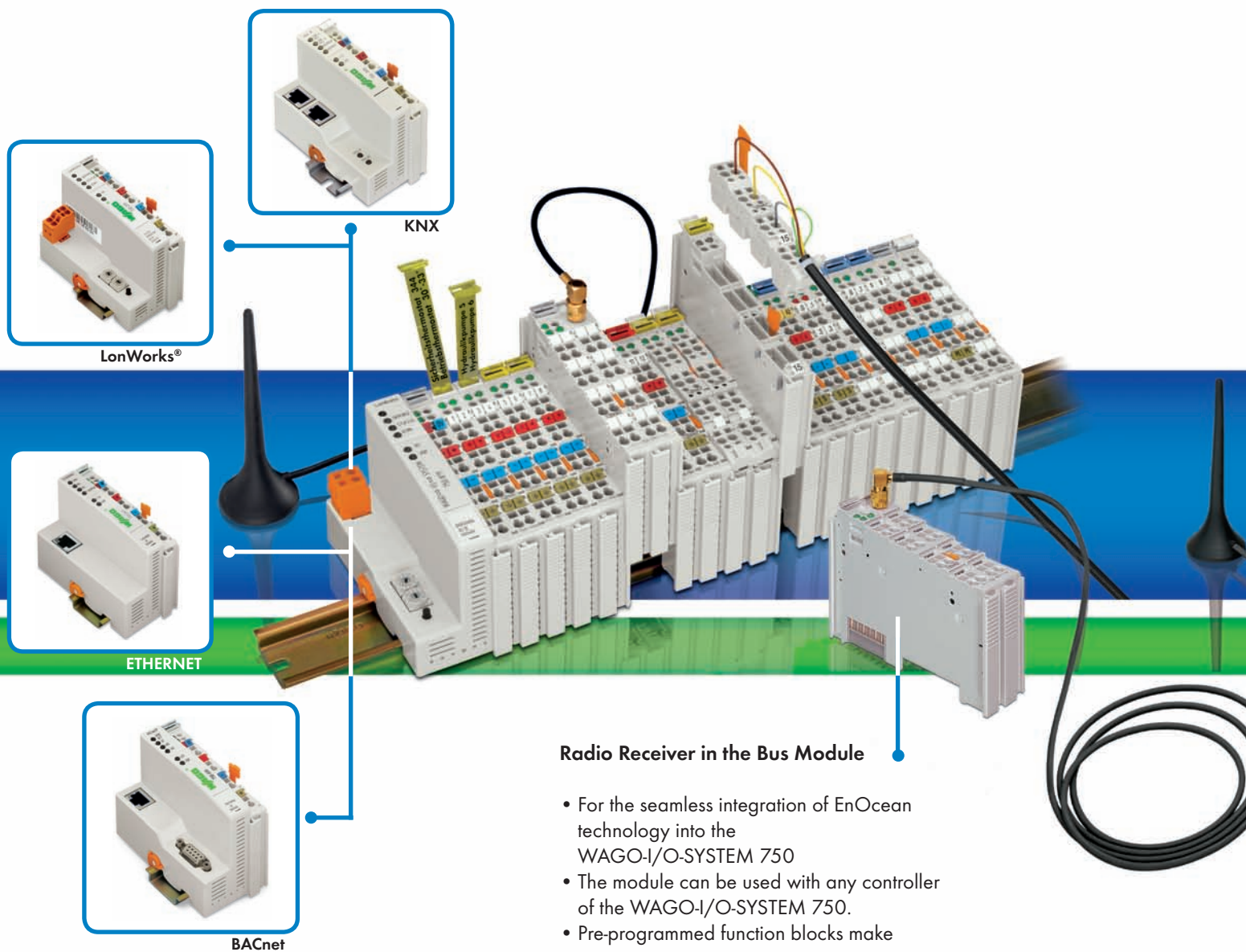
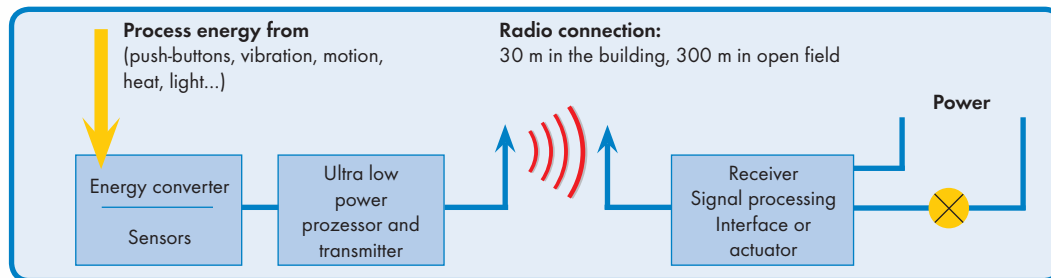
Series 770 – WINSTA® Radio Receiver	
4-channel Radio Receiver with 4 Make Contacts	
2-channel Radio Receiver with Sunblind Outputs	209



Series 758 – Radio Receiver and Transmitter	
External Antenna	
Radio Transmitter, EnOcean	210

WAGO Radio receiver with EnOcean Technology

The benefits for electronic and radio technology



Radio Receiver in the Bus Module

- For the seamless integration of EnOcean technology into the WAGO-I/O-SYSTEM 750
- The module can be used with any controller of the WAGO-I/O-SYSTEM 750.
- Pre-programmed function blocks make integration easy
- The number of sensors is almost illimited

Item-No. 750-642



enocean®

Radio Receiver in DIN-Rail Mountable Enclosure

The stand-alone solution for DIN rail mounting:
4-channel radio receiver module in 70 mm
DIN-rail mountable enclosure.

Version 1: 4 make contacts,
up to 16 A load carrying capacity

Version 2: 4 changeover contacts,
up to 8 A load carrying capacity per channel.

Item-No. 789-601 (make contacts)

Item-No. 789-602 (changeover contacts)

Radio Transmitter

Radio transmitter integrated in
universal switch insert.

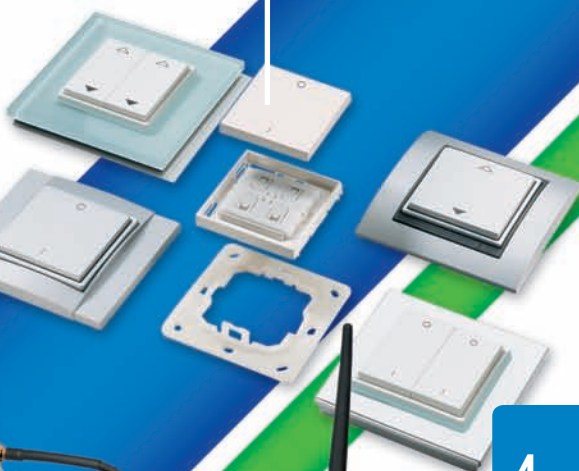
Item-No.

758-940/001-000 (2-channel light)

758-940/003-000 (4-channel light)

758-940/002-000 (2-channel roller blinds)

758-940/004-000 (4-channel roller blinds)



Radio Receiver in WINSTA® Box

All integrated: e.g. a complete blinds control (2-way
sunblind outputs for 230 V / 2 A) or a 4-channel module
for lighting control (4-way switch output 230 V / 16 A)
with receiver and all required switching relay.
The WINSTA® boxes are suitable for wall-, floor- and
ceiling-mounting.

Item-No. 770-629/102-000 (sunblinds control)

Item-No. 770-629/101-000 (lighting control)

External Antenna

The antenna fits to all WAGO
products shown here and is
connected using an SMA socket.
The antenna has a magnetic stand
and a 2.5 m long coax cable.

Item-No. 758-910

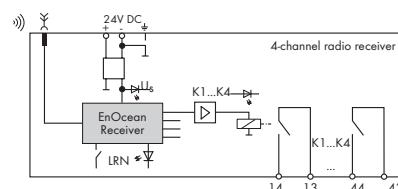
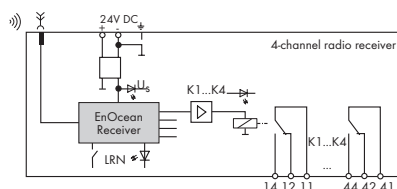


208

	4-Channel Enocan Radio Receiver with 4 Changeover Contacts, 8 A	4-Channel Enocan Radio Receiver with 4 Make Contacts, 16 A
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The 4-channel radio receiver in DIN-rail mountable enclosure is used to switch 4 independent electrical devices or loads. The radio receiver processes telegrams transmitted by sensors (binary information) using EnOcean radio technology (PTM + STM modules). The outputs are switched via relay contacts.

- Radio receiver for battery-less and wireless sensors
- LED indication of switch status
- External antenna for optimum transmission range (required)
- Frequency band 868 MHz
- Transmitter-to-receiver assignment via learn mode

[illegible]

Technical Data

Voltage supply	DC 24 V	DC 24 V
Voltage range	-15 % ... + 20 %	-15 % ... + 20 %
Current consumption (internal)	max. 90 mA	max. 90 mA
Number of receive channels	40 (10 per output)	40 (10 per output)
Number of channels	4 (relay outputs)	4 (relay outputs)
Output current (per channel)	max. 8 A, AC1	max. 16 A, AC1
Type of load	resistive / motor load	resistive / lamp load
Switching frequency	max. < 5 Hz	max. < 5 Hz
Delay time transmitter /output command	< 100 ms; 40 ms ... 70 ms typ.	< 100 ms; 40 ms ... 70 ms typ.
Switching voltage	AC 230 V	AC 230 V
Fuse protection	Loads: wire breaker, max.16 A	Loads: wire breaker, max.16 A
Isolation	potential free contacts	potential free contacts
Ambient operating temperature	0 °C ... +55 °C	0 °C ... +55 °C
Storage temperature	-25 °C ... +85 °C	-25 °C ... +85 °C
Relative air humidity (no condensation)	85 %	85 %
Degree of pollution	2	2
Degree of protection	IP 20	IP 20
Fitting position	any	any
Dimensions (mm) W x H x L	70 x 55 x 90	70 x 55 x 90
	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP® (WAGO Series 236)	CAGE CLAMP® (WAGO Series 236)
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)	0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	Vibration and shock resistance acc. to IEC 60068-2-6 and IEC 60068-2-27	Vibration and shock resistance acc. to IEC 60068-2-6 and IEC 60068-2-27
Accessories:		
RF magnetic antenna incl. 3 m connecting cable with SMA connector	758-910	758-910

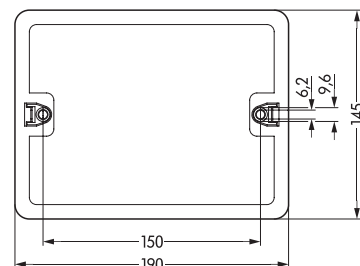
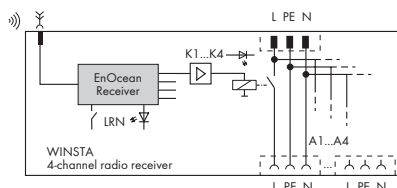
	4-Channel Radio Receiver with 4 Make Contacts	2-Channel Radio Receiver with Sunblind Outputs
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The 4-channel radio receiver is used to switch 4 independent electrical devices. The 2-channel radio receiver has 2 sunblind outputs that can be controlled independently from each other. The radio receiver processes telegrams transmitted by switches using EnOcean radio technology (STM modules). The outputs are switched via relay contacts.

- Radio receiver for battery-less and wireless sensors
- LED indication of switch status
- External antenna for optimum transmission range (required)
- Frequency band 868 MHz
- Transmitter-to-receiver assignment via learn mode
- The state of outputs can be predefined for a power failure scenario
- Wire connection using WINSTA connectors



Illustration and block diagram for 770-629/101-000



Description	Item no.	Pack. unit	Item no.	Pack. unit
WINSTA® Radio Receiver	770-629/101-000	1	770-629/102-000	1

Technical Data

Voltage supply	AC 230 V, 50 Hz ... 60 Hz, max. 16 A	AC 230 V, 50 Hz ... 60 Hz, max. 16 A
Voltage range	± 10 %	± 10 %
Current consumption (internal)	max. 21 mA	max. 21 mA
Number of channels	4	2
Output current (per channel)	max. 16 A / 4 A	2 A motor load
Total current	max. 16 A	max. 4 A
Inrush current	max. 120 A / 50 ms	25 A
Type of load	resistive / lamp load	resistive / inductive
Switching frequency	max. 5 Hz	max. 5 Hz
Isolation	isolated internal voltage supply 2500 V impulse withstand voltage	isolated internal voltage supply 2500 V impulse withstand voltage
Fuse protection	External, 16 A max.	External, 16 A max.
Ambient operating temperature	0 °C ... +55 °C	0 °C ... +55 °C
Storage temperature	-25 °C ... +85 °C	-25 °C ... +85 °C
Relative air humidity (no condensation)	85 %	85 %
Degree of pollution	2	2
Degree of protection	IP 20	IP 20
Fitting position	any	any
Dimensions (mm) W x H x L	200 x 145 x 30	200 x 145 x 30
Type of mounting	Wall screw fixing	Wall screw fixing
Approvals	Vibration and shock resistance acc. to IEC 60068-2-6 and IEC 60068-2-27	Vibration and shock resistance acc. to IEC 60068-2-6 and IEC 60068-2-27
Accessories:		
RF magnetic antenna incl. 3 m connecting cable with SMA connector	758-910	758-910
Connection accessories WINSTA connectors	Input: socket, 3 poles, e.g. 770-103; 4-channel output: plug, 3 poles, e.g. 770-113	Input: socket, 3 poles, e.g. 770-103; 2-channel output: plug, 4 poles, e.g. 770-114

External antenna,
GSM 900/1800



Description	Technical Data	Item no.	Pack. unit
External antenna	Frequency band: 870 MHz ... 960 MHz; 1710 MHz ... 1880 MHz VSWR: 870 MHz ... 960 MHz < 1.5; 1710 MHz ... 1880 MHz < 1.5 Gain: 870 MHz ... 960 MHz 0 dB; 1710 MHz ... 1880 MHz 0 dB Max. Power: 20 W Cable length: 250 cm Connector: SMA right angle plug + ferrite bead	758-910	1

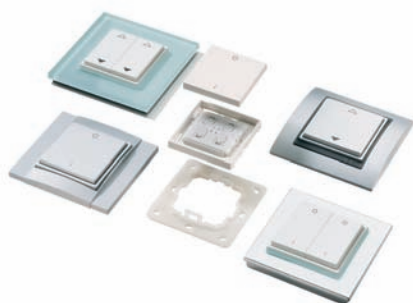
Notes on operating the antenna with WAGO EnOcean radio receivers:

The antenna is to be mounted on a plate measuring at least 9.8 x 9.8 inches (25 x 25 mm)

The distance of interfering sources to the antenna and antenna line must be at least 11.8 inches (30 mm) and the free space between the antenna and the next wall must be at least 13.78 inches (35 mm).

The antenna cable should, under no circumstances, be bent sharply, since irreversible damage may result to the antenna (RG 174 bend radius > 0.6 inches/15mm)

Radio transmitter,
EnOcean easyfit PTM 250



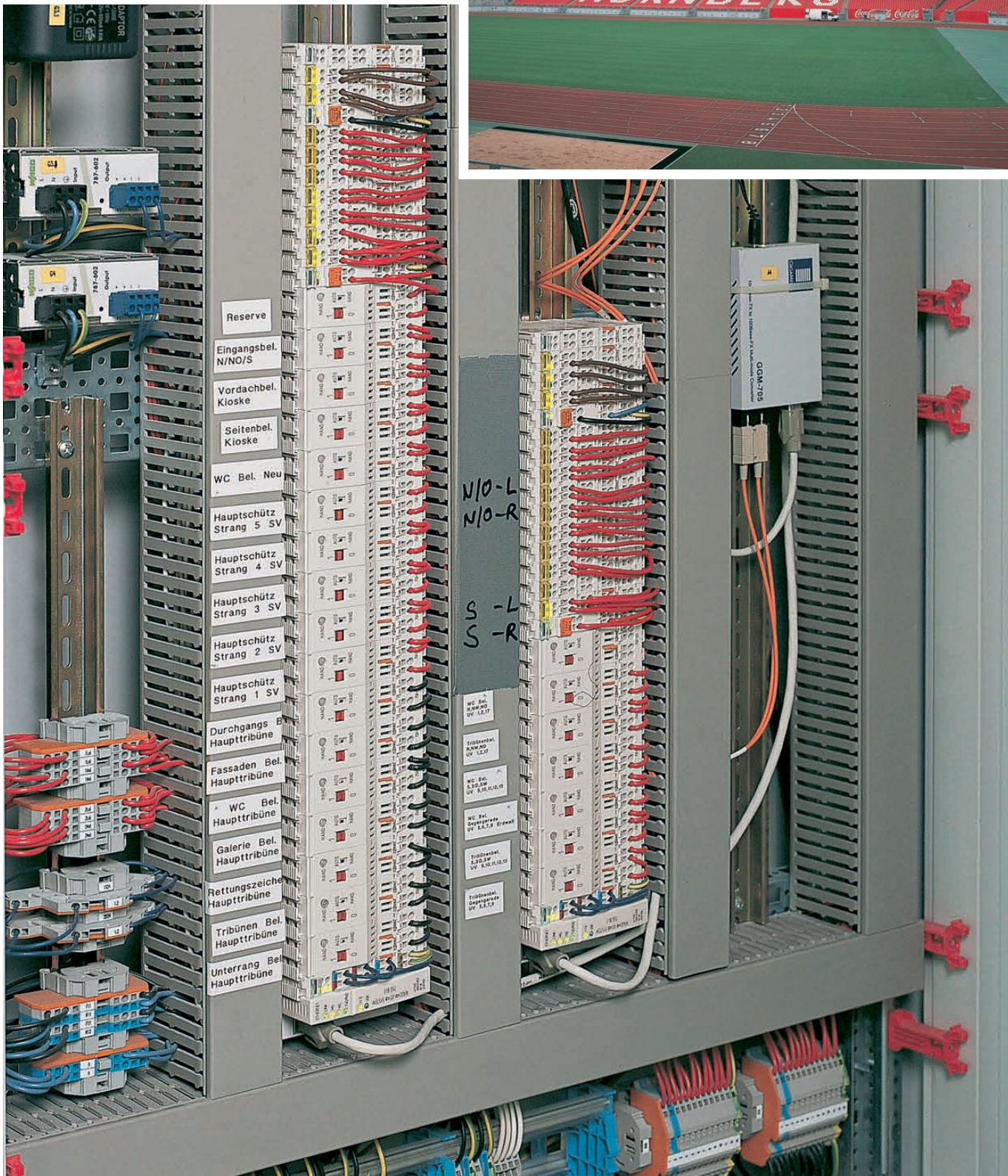
Description	Technical Data	Item no.	Pack. unit
2-channel Light	Integrated Radio Transmitter: EnOcean PTM 200 Energy Harvesting Source: electrodynamic energy generator, maintenance free Radio Technology /Range: EnOcean 868 MHz, RPS Type 2; 300 m free field, typ. 30 m within buildings Total Installation Height: 14 mm (frame lies directly against the wall)	758-940/001-000	1
4-channel Light		758-940/003-000	1
2-channel Roller Blind		758-940/002-000	1
4-channel Roller Blind	Dimensions of Rocker /Frame Cut-out /Central Plate: 50 x 50 mm / 55 x 55 mm / 71 x 71 mm Color: white	758-940/004-000	1

The universal switch insert can be integrated into numerous control programmes by different manufacturers, e.g.: BERKER, GIRA, JUNG and MERTEN.

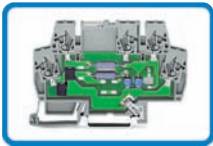
Delivery is without frame. Frames of the desired control programm have be ordenen separately.

**WAGO Application: Lighting Control System,
easyCredit Stadium in Nuremberg, Germany**

WAGO Products:
WAGO-I/O-SYSTEM with ETHERNET Controllers,
Power Supply Units and
Rail-Mounted Terminal Blocks



System Overview	214 - 215
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Series 792 – Rail-Mounted Terminal Blocks with Overvoltage Protection, 6 mm/0.236 in wide	
Overvoltage Protection for Information Technology Systems	216 - 219
Accessories	



Series 280 – Rail-Mounted Terminal Blocks with Surge Suppression Devices, 5 mm/ 0.197 in or 10 mm/ 0.394 in wide	
Rail-Mounted Terminal Blocks with Surge Suppression Device and Direct Connection to DIN 35 Rail	220 - 223



Series 286 – Pluggable Surge Suppression Modules	
Surge Suppression Modules	224 - 228

WAGO Overvoltage Protection

WAGO overvoltage protection for increased safety and longer on-line operation

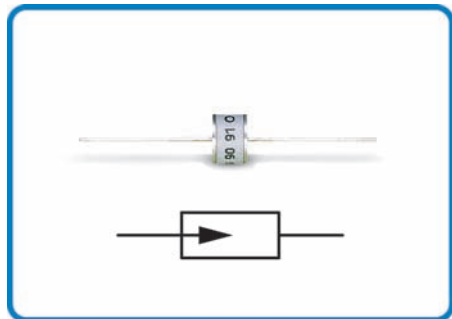
On-the-line overvoltages cause most operating failures for measuring, control, data and power lines. Failure of electronic and semiconductor components due to surges can cause operating interruptions. The overvoltage (also called transients) can be generated by switching electrical equipment on or off or by lighting discharges. Devices designed to protect electrical equipment from these voltages are called SPDs (Surge Protection Devices). SPDs may consist of either a single component or a combination of them. Various components may be subdivided in use by the protection type offered:

- Coarse protection
- Medium protection
- Fine protection.

The boundaries between these levels of protection may not be sharply defined, leading the devices chosen to vary accordingly. The following components have proven performance in these applications:

Gas-filled surge arresters and spark gaps

The gas filled surge arrester is comprised of two electrodes in a ceramic or glass tube filled with a pressurized inert gas. A spark gap is simply two electrodes in air, spaced a predetermined distance apart.



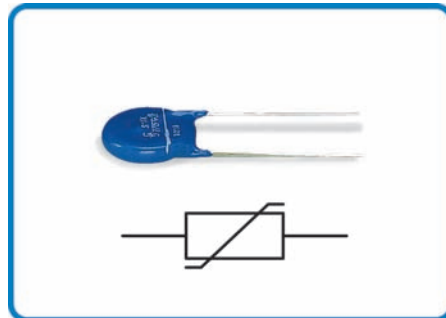
Once the ignition voltage is reached, resistance drops due to ionization and current begins to flow. The resistance of the device drops from high to low as it conducts. The voltage across the device after the arc is struck is typically 10 V ... 30 V. Therefore, the current will continue to flow until the voltage drops below this level. As this is not a guaranteed occurrence in typical power situations, a fuse must precede the device to ensure disconnection from the supply. The advantage of a gas-filled arrester: high current carrying capacity for its size. However, the key disadvantages: slow response speed and in AC applications, the crowbar action across the supply.

Varistor

A varistor is a voltage-dependent resistor. A common type of varistor is referred to as an MOV (Metal Oxide Varistor) due to its method of construction.

Varistors have a very high resistance until their threshold voltage is exceeded. Then they drop to a low resistance and are capable of carrying high currents for a short period of time. They have a fast response time, and have a current carrying capacity dependent on the surface area of metal oxide material. MOVs can be sized to handle currents exceeding of 100 kA.

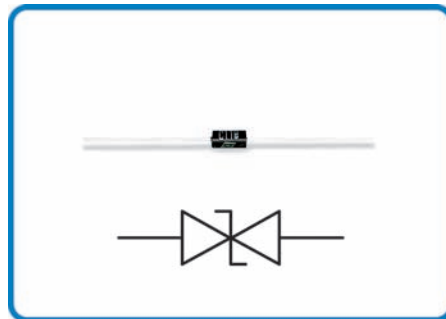
Undersized varistors can age with continued



surge conduction, resulting in lower impedance and higher leakage.

When subjected to continuous (AC or DC) voltages in excess to the device rating, MOVs can overheat, and even explode, in certain circumstances. This is why a quality surge protection device is important, it will incorporate protective measures to disconnect faulty components before safety is compromised.

Suppression diode (or silicon avalanche diode)

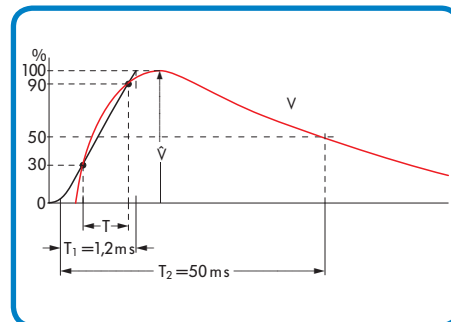


These devices have electrical characteristics similar to Zener diodes, but are rated for surge currents.

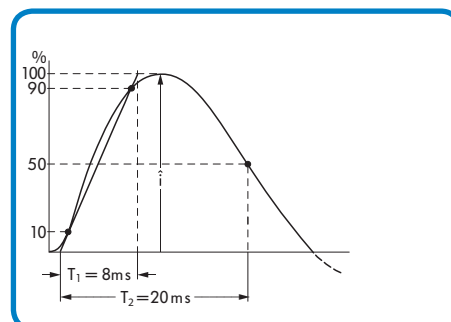
Once the rated breakdown voltage is exceeded (in the non-conductive direction), the diode becomes a conductor. The suppressor diode differs from a Zener in its higher current carrying capability and faster response time (in the picosecond range).

Test impulse

Surge arresters are subject to standardized test pulses in order to classify capabilities; the effectiveness of protection measures with reference to dissipation capacity and voltage arresting. The form and level of the test pulses are defined by IEC 60060-1/DIN VDE 0432, part 2. Preference is given to voltage pulses of 1.2/50 and current pulses of 8/20.



Voltage pulses 1.2 /50
per IEC 60060-1 /DIN VDE 0432 P. 2



Current pulses 8 /20
per IEC 60060-1 /DIN VDE 0432 P. 2

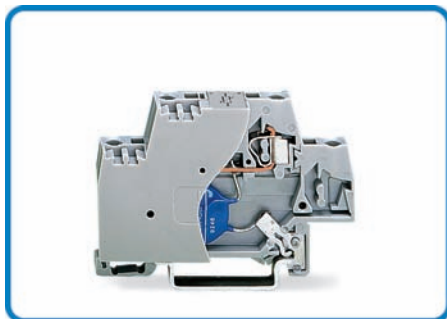
Application recommendations

The advantages of gas-filled surge arresters lie in their high current carrying capacity, making them ideal for coarse protection. One disadvantage, particularly in the medium protection range, is the relatively long response time, as well as the power follow current.

Varistors have a considerably shorter response time; however they also have lower leakage currents. This makes them more suitable for medium protection, as they offer limited applications for coarse protection. If the connection lines of electronic equipment are already "fine" protected, general coarse and medium protection measures are sufficient. If this is not the case, suppressor diodes with very short response time may be employed as fine protection.

WAGO AUTOMATION offers a complete range of modular terminal blocks with integrated surge arresters for coarse, medium and fine protection.

Depending on the application, one can choose the appropriate type from the previously mentioned surge arresters. These are electrically connected in the modular terminal blocks between the connection point and the mounting rail. Snapping the terminal block onto the grounded (earthed) mounting rail automatically ensures the required overvoltage protection.



Double-deck terminal block with varistor,
direct connection to the DIN 35 rail

Frequently, only one surge arrester is fitted for cost reasons. However, due to the fact that one surge arrester alone cannot optimally ensure several protection functions, combinations are recommended. Care must be taken to ensure that the single-stage protection devices are decoupled sufficiently by inductors or resistors.

In addition to single-stage surge arresters, WAGO AUTOMATION also offers multi-stage surge arresters, combining components for different applications. These pluggable modules are snapped into "carrier" terminal blocks. These are DIN rail-mounted and offer secure and maintenance-free CAGE CLAMP® terminations for conductors 0.08 mm²/AWG 28 to 2.5 mm²/AWG 14.



Pluggable surge suppression modules with on-unit warnings

Addition of interference suppression to surge suppression devices.

In addition to overvoltage protection, a high frequency interference filter can be added to the circuitry. This filter cannot only protect the equipment from high frequency energy transmitted by connecting wires, but also prevents a transmission of disturbances to the supply lines. The main component of a filter is an LC network, which produces a mismatch between the filter impedance and the impedance of the disturbance path. This reflects any disturbance back to its source.

Definition of several important technical terms

Nominal operating voltage (V_{BN})

The nominal operating voltage corresponds to the voltage which may be permanently connected to the appropriate connection terminals of the overvoltage protection module. Alternating voltages are quoted as effective values.

Max. operating voltage (V_{Bmax})

The maximum operating voltage corresponds to the voltage which may be permanently connected to the appropriate connection terminals without the operating properties changing or activating the individual module's protection elements.

Nominal current (I_N)

The nominal current corresponds to the current which may permanently flow through the connection terminals of the overvoltage protection device.

Nominal discharge current (I_{SN})

The nominal discharge current is the maximum value of a current having the 8/20 μ s waveform (DIN VDE 0432/10.78 part 3), which can flow through the surge arrester five times within a time period of 30 seconds (VDE) without destroying it.

Max. surge current (I_{Smax})

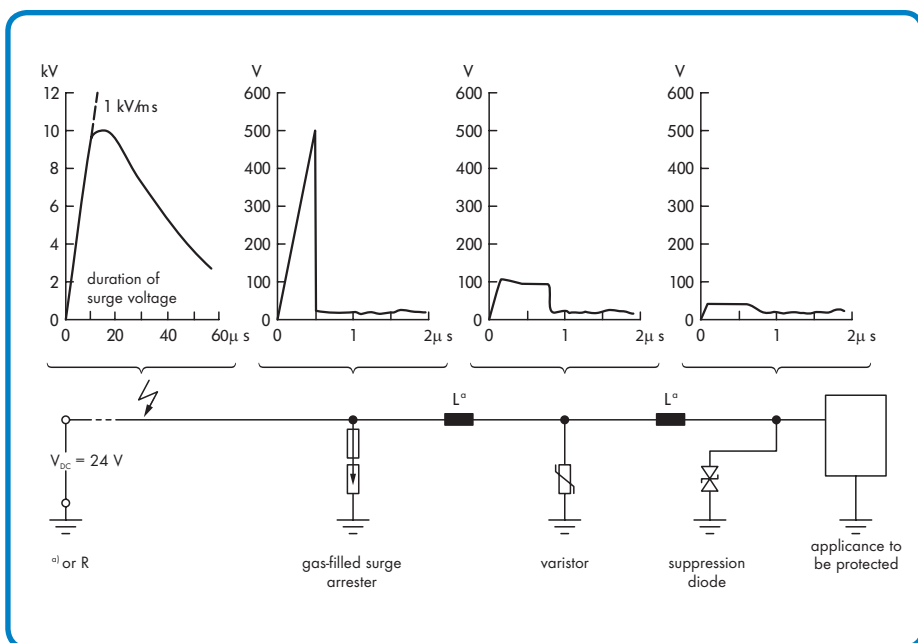
The maximum surge current I_{Smax} defines the maximum value of a current having the 8/20 μ s waveform, which can flow through the surge arrester once without destroying it.

Protection level

The protection level is the value of the residual voltage occurring on the "protected" side of the surge arrester when applying the rated discharge current.

Response time (t_{an})

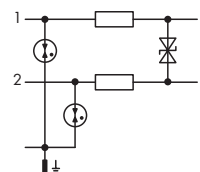
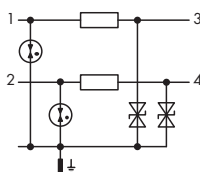
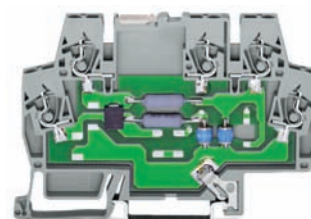
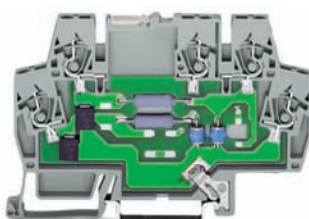
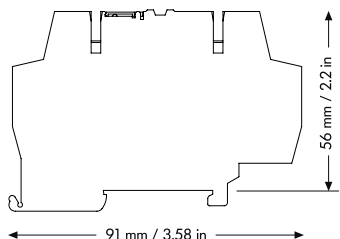
The response time is primarily based on the physical properties of the surge arresters and is dependent upon the wave front duration of the surge voltage. WAGO's data refers to a voltage rise of 1 kV/ μ s.



Function diagram of a multi-stage surge voltage protection module

Rail-Mounted Terminal Blocks with Overvoltage Protection, 6 mm / 0.236 in Wide

	Overvoltage Protection for Information Technology Systems ME24 DC 24 V; for protection of 2 single lines (line/protected ground), unbalanced interfaces as well as RS-485 and RS-422 interfaces	Overvoltage Protection for Information Technology Systems MD24 DC 24 V; for protection of balanced interfaces (line/line) with electrical isolation (telecommunications)
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The coordination characteristics give information about the let-through energy of the overvoltage protector and the protection capacity.

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Technical Data

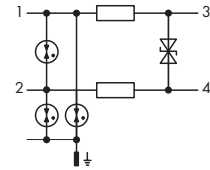
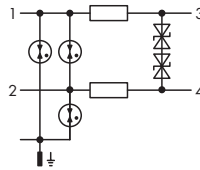
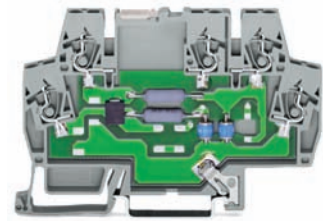
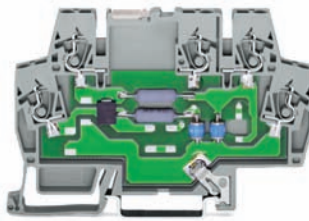
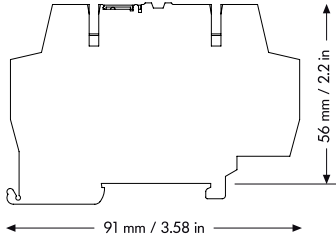
Accessories see page 219

Accessories see page 219

Nominal voltage	DC 24 V	DC 24 V
Max. cont. operating voltage	DC 33 V / AC 23 V	DC 33 V / AC 23 V
Nominal current	0.5 A	0.5 A
Nominal discharge current I_{SN} (8/20) μ s	5 kA per line ; 10 kA total	5 kA per line ; 10 kA total
Voltage protection level at I_N category C2	≤ 65 V (line/protected ground); ≤ 110 V (line/line)	≤ 50 V (line/line); ≤ 750 V (line/protected ground)
Voltage protection level at 1 kV/ μ s category C3	≤ 45 V (line/protected ground); ≤ 90 V (line/line)	≤ 45 V (line/line); ≤ 650 V (line/protected ground)
Coordination characteristics	X / 1	X / 1
Series impedance R / line	1.8 Ω	1.8 Ω
Response time t_a	≤ 1 ns	≤ 100 ns (line/protected ground); ≤ 1 ns (line/line)
Limiting frequency	6 MHz line/protected ground	6 MHz line/protected ground
Capacitance C	≤ 1.0 nF (line/protected ground); ≤ 0.5 nF (line/line)	≤ 5 pF (line/protected ground); ≤ 1 nF (line/line)
Degree of protection	IP00	IP00
Degree of protection with end and intermediate plate	IP20	IP20
Operating temperature	-40 °C ... +80 °C	-40 °C ... +80 °C
Storage temperature	-40 °C ... +80 °C	-40 °C ... +80 °C
Dimensions (mm) W x H x L	6 x 56 x 91	6 x 56 x 91
	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP®	CAGE CLAMP®
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 14	0.08 mm² ... 2.5 mm² / AWG 28 ... 14
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	IEC 61643-21	IEC 61643-21

Rail-Mounted Terminal Blocks with Overvoltage Protection, 6 mm / 0.236 in Wide

	Overvoltage Protection for Information Technology Systems MD48LON 48 DC 24 V; for protection of LON networks (FTT 10 or LPT 10)	Overvoltage Protection for Information Technology Systems MDHF5 DC 5 V; for protection of PROFIBUS networks
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The coordination characteristics give information about the let-through energy of the overvoltage protector and the protection capacity.

[illegible]

Technical Data

Accessories see page 219

Accessories see page 219

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Accessories for Rail-Mounted Terminal Blocks with Overvoltage Protection, 6 mm / 0.236 Wide, Series 859

End and intermediate plate



Test pin



Marking pen with fibre tip

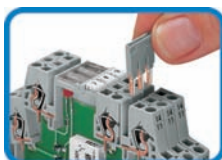


Description	Item no.	Pack. unit	UVPE
End and intermediate plate; 1 mm / 0.039 in thick, grey	859-525	100	4 * 25
Test pin; 1 mm / 0.039 in Ø; test wire for sold. onto test plug	859-500	100	
Marking pen with fibre tip for permanent marking	210-110	1	

Push-in type jumper bar



Commoning using a 3-way push-in type jumper bar, series 859.
Two-way to 10-way jumper bars are now available



Description	Item no.	Pack. unit	UVPE
Push-in type jumper bar (intern), I max. 18 A,			
2-way	859-402	200	8 * 25
3-way	859-403	200	8 * 25
4-way	859-404	200	8 * 25
5-way	859-405	200	8 * 25
6-way	859-406	100	4 * 25
7-way	859-407	100	4 * 25
8-way	859-408	100	4 * 25
9-way	859-409	100	4 * 25
10-way	859-410	100	4 * 25
Additional item no. for colored push-in type jumper bars;			
yellow	... /000-029		
blue	... /000-006		

Miniature quick marking card



Each clamping unit is marked individually



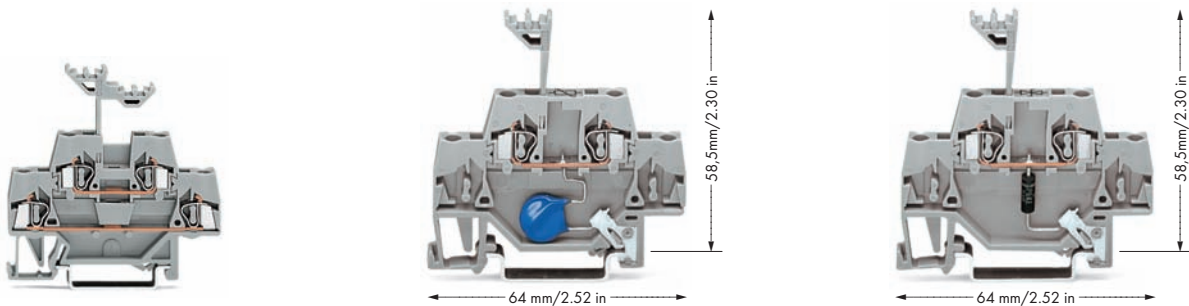
Description	Item no.	Pack. unit	UVPE
Miniature WSB quick marking system			
10 strips with 10 markers, white with black printing;			
plain	248-501	50	5 cards
Marking software and printer/plotter see section 8			
1 ... 10 (10 x)	248-502	50	5 cards
11 ... 20 (10x)	248-503	50	5 cards
21 ... 30 (10x)	248-504	50	5 cards
31 ... 40 (10x)	248-505	50	5 cards
41 ... 50 (10 x)	248-506	50	5 cards
1 ... 50 (2 x)	248-566	50	5 cards
K 1 ... K 10 (10 x)	248-450	50	5 cards
K 11 ... K 20 (10 x)	248-451	50	5 cards
K 100 (10 x)	248-452	50	5 cards
U 1 ... U 10 (10 x)	248-453	50	5 cards
U 11 ... U 20 (10 x)	248-454	50	5 cards
U 100 (10 x)	248-455	50	5 cards

5

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Rail-Mounted Terminal Blocks with Surge Suppression Devices

	With Varistor V_{BN} AC/DC 24 V ... 110/120 V; I_{SN} 60 A ... 130 A Rated Current 20 A Terminal block width 5 mm/0.197 in	With Suppressor Diode V_{BN} AC/DC 24 V ... AC 230 V; I_{SN} 11 A ... 122 A Rated Current 20 A Terminal block width 5 mm/0.197 in
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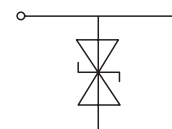
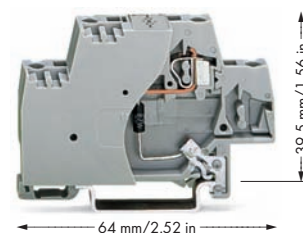
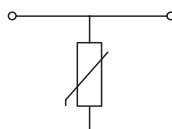
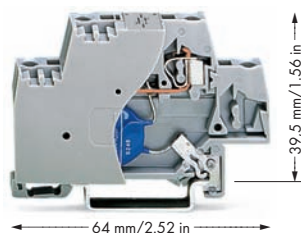


Through terminal blocks with the same shape see W4
Volume 1 page 2.30



Description		V _N	Item no.	Pack. unit	V _N	Item no.	Pack. unit
Terminal Block with Surge Suppression Device and Direct Connection to DIN 35 Rail		DC 24 V	280-502/281-609	50	DC 24 V	280-502/281-602	50
		DC 48 V	280-502/281-610	50	DC 48 V	280-502/281-603	50
		DC 60 V	280-502/281-611	50	DC 60 V	280-502/281-604	50
		DC 115 V	280-502/281-612	50	DC 115 V	280-502/281-605	50
		AC 24 V	280-502/281-613	50	AC 24 V	280-502/281-606	50
		AC 110/120 V	280-502/281-614	50	AC 110/120 V	280-502/281-607	50
					AC 230 V	280-502/281-608	50

	With Varistor V_{BN} AC/DC 24 V ... AC 230 V; I_{SN} 300 A ... 1 kA Rated Current 20 A Terminal block width 10 mm/0.394 in	With Suppressor Diode V_{BN} AC/DC 24 V ... AC 230 V; I_{SN} 37 A ... 305 A Rated Current 20 A Terminal block width 10 mm/0.394 in
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Description	V_N	Item no.	Pack. unit	V_N	Item no.	Pack. unit
Terminal Block with Surge Suppression Device and Direct Connection to DIN 35 Rail	DC 24 V	280-502/281-582	25	DC 24 V	280-502/281-589	25
	DC 48 V	280-502/281-583	25	DC 48 V	280-502/281-590	25
	DC 60 V	280-502/281-584	25	DC 60 V	280-502/281-591	25
	DC 115 V	280-502/281-585	25	DC 115 V	280-502/281-592	25
	AC 24 V	280-502/281-586	25	AC 24 V	280-502/281-593	25
	AC 110/120 V	280-502/281-587	25	AC 110/120 V	280-502/281-594	25
	AC 230 V	280-502/281-588	25	AC 230 V	280-502/281-595	25

Technical Data	V_N	Max. operating voltage V_B max.	Nominal discharge current I_{SN}	Max. surge current I_S max.	Capacity	Protection level
Terminal blocks with varistor and end plate	DC 24 V	DC 31 V	300 A	1 kA	≤ 4.6 nF	DC 77 V
	DC 48 V	DC 56 V	300 A	1 kA	≤ 2.8 nF	DC 135 V
	DC 60 V	DC 85 V	1 kA	4.5 kA	≤ 1.7 nF	DC 165 V
	DC 115 V	DC 150 V	1 kA	4.5 kA	≤ 0.8 nF	DC 300 V
	AC 24 V	AC 30 V	300 A	1 kA	≤ 3.5 nF	AC 93 V
	AC 110/120 V	AC 150 V	1 kA	4.5 kA	≤ 0.57 nF	AC 360 V
	AC 230 V	AC 275 V	1 kA	4.5 kA	≤ 0.32 nF	AC 710 V
Terminal blocks with varistor and end plate	DC 24 V	DC 28 V	305 A		≤ 2.7 nF	DC 59 V
	DC 48 V	DC 53 V	162 A		≤ 1.7 nF	DC 111 V
	DC 60 V	DC 70 V	123 A		≤ 1.35 nF	DC 146 V
	DC 115 V	DC 128 V	68 A		≤ 0.85 nF	DC 265 V
	AC 24 V	AC 26 V	258 A		≤ 2.4 nF	AC 70 V
	AC 110/120 V	AC 133 V	46 A		≤ 0.63 nF	AC 388 V
	AC 230 V	AC 253 V	37 A		≤ 0.4 nF	AC 706 V

Technical Data

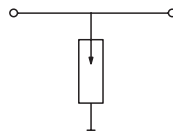
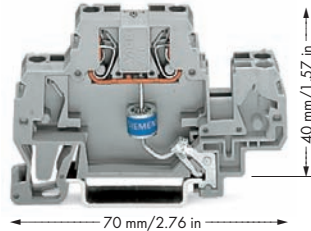
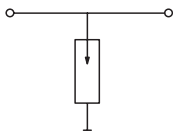
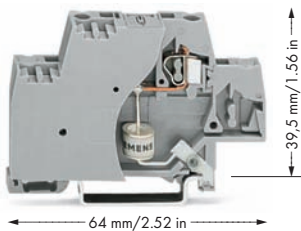
Wire connection	CAGE CLAMP®	CAGE CLAMP®
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 14	0.08 mm² ... 2.5 mm² / AWG 28 ... 14
Stripped lengths	8 ... 9 mm / 0.33 in	8 ... 9 mm / 0.33 in

5

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Rail-Mounted Terminal Blocks with Surge Suppression Devices

	With Gas Filled Surge Arrester V_{BN} AC 24 V ... 230 V; I_{SN} 5 kA Rated Current 20 A Terminal block width 10 mm/0.394 in	With Gas Filled Surge Arrester V_{BN} AC 24 V ... 230 V; I_{SN} 5 kA Rated Current 20 A Terminal block width 10 mm/0.394 in
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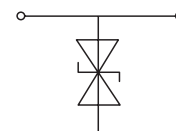
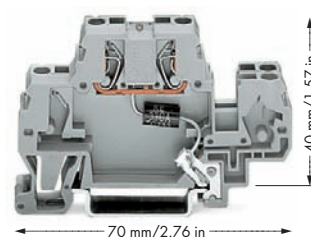
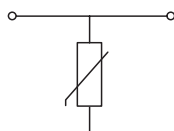
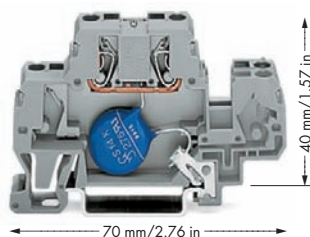


Description	V_N	Item no.	Pack. unit	V_N	Item no.	Pack. unit
Terminal Block with Surge Suppression Device and Direct Connection to DIN 35 Rail	AC/DC 24 V	280-503/281-579	25	AC/DC 24 V	870-523/281-579	25
	AC/DC 110/120 V	280-503/281-580	25	AC/DC 110/120 V	870-523/281-580	25
	AC/DC 230 V	280-503/281-581	25	AC/DC 230 V	870-523/281-581	25

Technical Data						
Max. operating voltage V_B max.	AC 70 V/DC 90 V AC 180 V/DC 230 V AC 450 V/DC 600 V			AC 70 V/DC 90 V AC 180 V/DC 230 V AC 450 V/DC 600 V		
Nominal discharge current I_{SN}	5 kA			5 kA		
Capacity	≤ 2 pF			≤ 2 pF		
Protection level	AC 600 V AC 650 V AC 1100 V			AC 600 V AC 650 V AC 1100 V		
Wire connection	CAGE CLAMP®			CAGE CLAMP®COMPACT		
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 14			0.08 mm² ... 2.5 mm² / AWG 28 ... 14		
Stripped lengths	8 ... 9 mm / 0.33 in			6 ... 7 mm / 0.26 in		

Accessories		Item no.	Pack. unit
 End and Intermediate Plate, 2 mm/0.079 in thick			
	gray	870-518	100 (4*25)
	orange	870-519	100 (4*25)

	With Varistor V_{BN} AC/DC 24 V ... AC 230 V; I_{SN} 300 A ... 1 kA Rated Current 20 A Terminal block width 10 mm/0.394 in	With Suppressor Diode V_{BN} AC/DC 24 V ... AC 230 V; I_{SN} 37 A ... 305 A Rated Current 20 A Terminal block width 10 mm/0.394 in
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Description	V_N	Item no.	Pack. unit	V_N	Item no.	Pack. unit
Terminal Block with Surge Suppression Device and Direct Connection to DIN 35 Rail	DC 24 V	870-523/281-582	25	DC 24 V	870-523/281-589	25
	DC 48 V	870-523/281-583	25	DC 48 V	870-523/281-590	25
	DC 60 V	870-523/281-584	25	DC 60 V	870-523/281-591	25
	DC 115 V	870-523/281-585	25	DC 115 V	870-523/281-592	25
	AC 24 V	870-523/281-586	25	AC 24 V	870-523/281-593	25
	AC 110/120 V	870-523/281-587	25	AC 110/120 V	870-523/281-594	25
	AC 230 V	870-523/281-588	25	AC 230 V	870-523/281-595	25

Technical Data	V_N	Max. operating voltage V_B max.	Nominal discharge current I_{SN}	Max. surge current I_S max.	Capacity	Protection level
Terminal block with varistor	DC 24 V	DC 31 V	300 A	1 kA	≤ 4.6 nF	DC 77 V
	DC 48 V	DC 56 V	300 A	1 kA	≤ 2.8 nF	DC 135 V
	DC 60 V	DC 85 V	1 kA	4.5 kA	≤ 1.7 nF	DC 165 V
	DC 115 V	DC 150 V	1 kA	4.5 kA	≤ 0.8 nF	DC 300 V
	AC 24 V	AC 30 V	300 A	1 kA	≤ 3.5 nF	AC 93 V
	AC 110/120 V	AC 150 V	1 kA	4.5 kA	≤ 0.57 nF	AC 360 V
	AC 230 V	AC 275 V	1 kA	4.5 kA	≤ 0.32 nF	AC 710 V
Terminal block with suppressor diode	DC 24 V	DC 28 V	169 A		≤ 2.7 nF	DC 59 V
	DC 48 V	DC 53 V	90 A		≤ 1.7 nF	DC 111 V
	DC 60 V	DC 70 V	69 A		≤ 1.35 nF	DC 146 V
	DC 115 V	DC 128 V	68 A		≤ 0.85 nF	DC 265 V
	AC 24 V	AC 26 V	258 A		≤ 2.4 nF	AC 70 V
	AC 110/120 V	AC 133 V	46 A		≤ 0.63 nF	AC 388 V
	AC 230 V	AC 253 V	37 A		≤ 0.4 nF	AC 706 V

Technical Data

Wire connection	CAGE CLAMP®COMPACT	CAGE CLAMP®COMPACT
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 14
Stripped lengths	6 ... 7 mm / 0.26 in	6 ... 7 mm / 0.26 in

Single stage suppression for 3-wire control,
signal or power circuits
No interruption of current flow when
changing module AC/DC 24 V

**Single stage suppression for 3-wire control,
signal or power circuits**
**No interruption of current flow when
changing module AC 110 V / 120 V; AC 230 V**

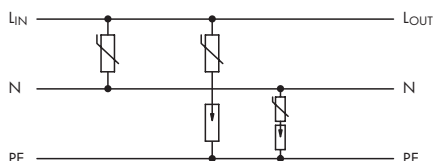
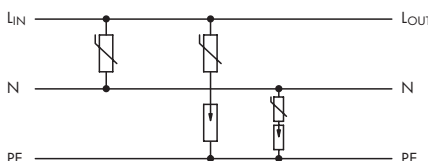


For isolation measurements the ground (earth) contact at the transient suppression module must be disconnected.

WSB marker card

- Marking F; Item No.: 209-791
- Marking 1 ... 10; Item No.: 209-702
- Marking Lin, N, PE Lout, N, PE, Lin, N, PE; Item No.: 249-655

5 cards, each containing 10 strips with 10 markers

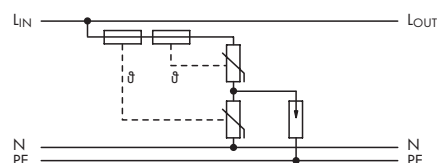


Description	Nominal operating voltage V _{BN}	Item no.	Pack. unit	Nominal operating voltage V _{BN}	Item no.	Pack. unit
Surge Suppression Module	AC/DC 24 V	286-836	1	AC 230 V	286-835	1
				AC 115 V	286-835/115-000	1

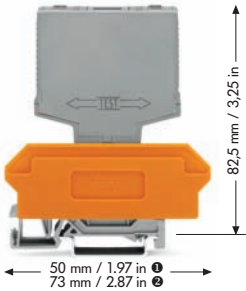
Technical Data Accessories see page 115 Accessories see page 115

Nominal operating voltage V_{BN}	AC/DC 24 V	AC 230 V; AC 115 V
Operating voltage	AC 35 V / DC 45 V	AC 275 V; AC 150 V
Nominal current	10 A	10 A
Nominal discharge current between L/N and PE	300 A	1 kA
Nominal discharge current between L and N	300 A	1 kA
Max. surge current between L/N and PE	1 kA	4.5 kA
Max. surge current between L and N	1 kA	4.5 kA
Protection level between L/N and PE	700 V	1.3 kV; 1 kV
Protection level between L and N	100 V	700 V; 400 V
Response time between L/N and PE	1 μ s	1 μ s
Response time between L and N	25 ns	25 ns
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Ambient operating temperature	-25 °C ... +85 °C	-25 °C ... +85 °C
Dimensions (mm) L x H x W incl. terminal block	17 x 82.5 x 73	17 x 82.5 x 73

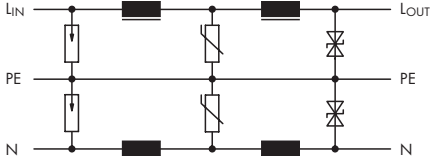
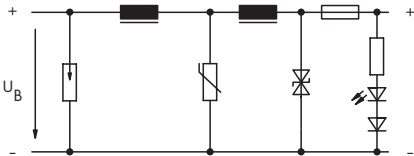
5 cards, each containing 10 strips with 10 markers

5

	Three-stage suppression for 2-wire data, measuring and control circuits DC 24 V	Three-stage suppression for 3-wire data, measuring and control circuits DC 12 V
	Module width 20 mm / 0.787 in	Module width 20 mm / 0.787 in



Note:
For isolation measurements the ground (earth) contact at the transient suppression module must be disconnected.
WSB marker card
• Marking F; Item No.: 209-791
• Marking 1 ... 10; Item No.: 209-702
• Marking +/-; Item No.: 209-652
• Marking Lin, PE, PE, N, Lout, PE, PE, N;
Item No.: 249-652
5 cards, each containing 10 strips with 10 markers

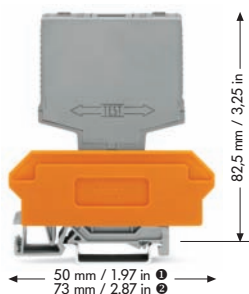


Description	Nominal operating voltage V_{BN}	Item no.	Pack. unit	Nominal operating voltage V_{BN}	Item no.	Pack. unit
Surge Suppression Module	DC 24 V	286-833	1	DC 12 V	286-834	1

Technical Data	Accessories see page 115		Accessories see page 115	
Nominal operating voltage V_{BN}	DC 24 V		DC 12 V	
Operating voltage	DC 30 V		DC 14 V	
Nominal current	0.05 A		6 A	
Nominal discharge current between L/N and PE	5 kA		1.5 kA	
Nominal discharge current between L and N	5 kA		1.5 kA	
Max. surge current between L/N and PE	5 kA		1.5 kA	
Max. surge current between L and N	5 kA		1.5 kA	
Protection level between L/N and PE	≤ 59 V		≤ 22 V	
Protection level between L and N	≤ 59 V		≤ 22 V	
Response time between L/N and PE	≤ 10 ns		≤ 10 ns	
Response time between L and N	≤ 10 ns		≤ 10 ns	
Through resistance / inductivity	20 mΩ / 2 x 7 μH		50 mΩ / 14 μH	
Ambient operating temperature	-25 °C ... +85 °C		-25 °C ... +85 °C	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶	22 mm / 0.866 in wide 280-638	1	22 mm / 0.866 in wide 280-638	1
with 4-conductor terminal blocks, orange separator ❷	22 mm / 0.866 in wide 280-628	1	22 mm / 0.866 in wide 280-628	1
with 4-conductor terminal blocks, marker plate ❸	25 mm / 0.984 in wide 280-764	1	25 mm / 0.984 in wide 280-764	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in				

	Three-stage suppression for 3-wire data, measuring and control circuits DC 24 V	Two-stage suppression for 3-wire control, signal or power circuits AC/DC 24 V
	Module width 20 mm / 0.787 in	Module width 20 mm / 0.787 in

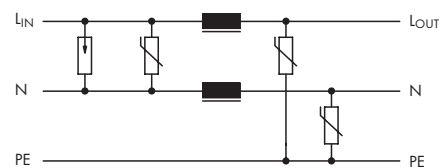
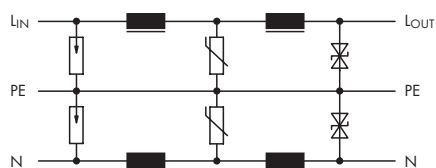

Note:

For isolation measurements the ground (earth) contact at the transient suppression module must be disconnected.

WSB marker card

- Marking F; Item No.: 209-791
- Marking 1 ... 10; Item No.: 209-702
- Marking Lin, PE, PE, N, Lout, PE, PE, N; Item No.: 249-652
- Marking PE, N, Lin, PE, N, Lout; Item No.: 209-911

5 cards, each containing 10 strips with 10 markers



Description	Nominal operating voltage V_{BN}	Item no.	Pack. unit	Nominal operating voltage V_{BN}	Item no.	Pack. unit
Surge Suppression Module	DC 24 V	286-834/024-000	1	AC/DC 24 V	286-831	1

Technical Data

Accessories see page 115

Accessories see page 115

Nominal operating voltage V_{BN}	DC 24 V	AC/DC 24 V
Operating voltage	DC 30 V	AC 30 V / DC 38 V
Nominal current	6 A	6 A
Nominal discharge current between L/N and PE	1.5 kA	200 A
Nominal discharge current between L and N	1.5 kA	1.5 kA
Max. surge current between L/N and PE	1.5 kA	500 A
Max. surge current between L and N	1.5 kA	1.5 kA
Protection level between L/N and PE	≤ 59 V	≤ 93 V
Protection level between L and N	≤ 93 V	≤ 93 V
Response time between L/N and PE	≤ 10 ns	≤ 25 ns
Response time between L and N	≤ 25 ns	≤ 25 ns
Through resistance / inductivity	50 mΩ / 14 μH	25 mΩ / 2 x 7 μH
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3
Ambient operating temperature	-25 °C ... +85 °C	-25 °C ... +85 °C

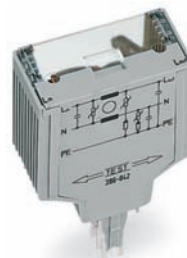
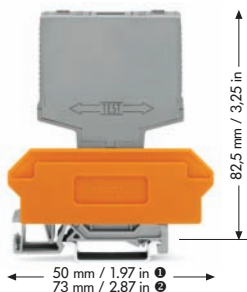
Accessories

	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶	22 mm / 0.866 in wide 280-638	1	22 mm / 0.866 in wide 280-638	1
with 4-conductor terminal blocks, orange separator ❷	22 mm / 0.866 in wide 280-628	1	22 mm / 0.866 in wide 280-628	1
with 4-conductor terminal blocks, marker plate ❸	25 mm / 0.984 in wide 280-764	1	25 mm / 0.984 in wide 280-764	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in				

5 Pluggable Modules - Surge Suppression Devices

228

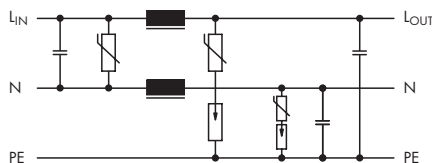
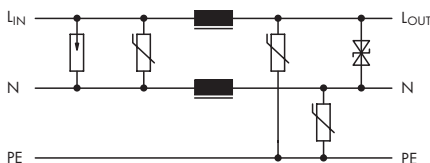
	Two-stage suppression for 3-wire control, signal or power circuits AC/DC 24 V	Two-stage suppression for 3-wire control, signal or power circuits with filter DC 115 V, DC 230 V, AC 110 V / 120 V, AC 230 V
	Module width 20 mm / 0.787 in	Module width 25 mm / 0.984 in



Note:
For isolation measurements the ground (earth) contact at the transient suppression module must be disconnected.
WSB marker card

- Marking F; Item No.: 209-791
- Marking 1 ... 10; Item No.: 209-702
- Marking PE, N, L_{IN}, PE, N, L_{OUT}; Item No.: 209-911

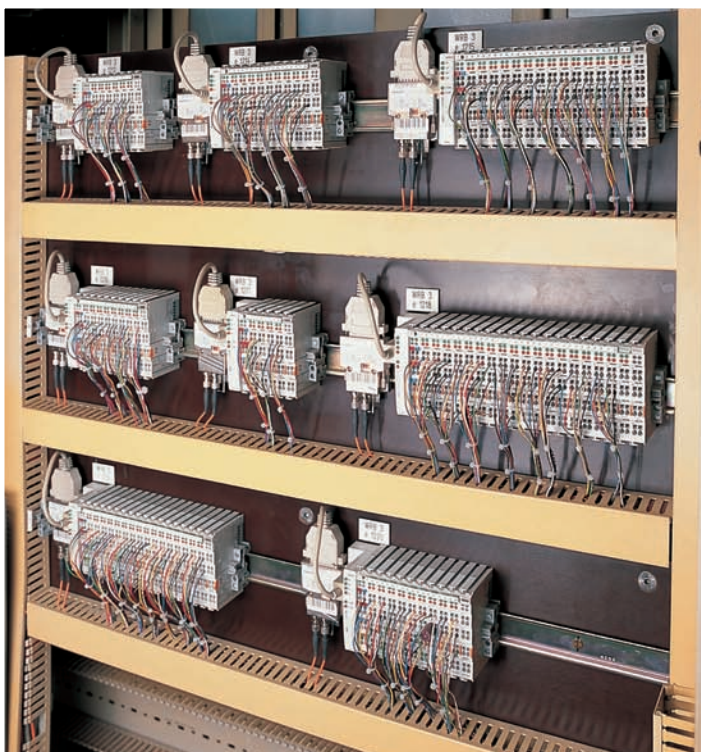
5 cards, each containing 10 strips with 10 markers



Description	Nominal operating voltage V_{BN}	Item no.	Pack. unit	Nominal operating voltage V_{BN}	Item no.	Pack. unit
Surge Suppression Module	AC/DC 24 V	286-832	1	DC 115 V	286-844	1
				AC 110 V/120 V	286-843	1
				DC 230 V	286-841	1
				AC 230 V	286-842	1

Technical Data		Accessories see page 115		Accessories see page 115	
Nominal operating voltage V_{BN}	AC/DC 24 V	DC 115 V; AC 110 V/120 V; DC 230 V; AC 230 V		DC 115 V; AC 110 V/120 V; DC 230 V; AC 230 V	
Operating voltage	AC 30 V / DC 38 V	DC 180 V; AC 140 V; DC 320 V; AC 250 V		DC 180 V; AC 140 V; DC 320 V; AC 250 V	
Nominal current	6 A	6 A		6 A	
Nominal discharge current between L/N and PE	200 A	600 A		600 A	
Nominal discharge current between L and N	1.5 kA	600 A		600 A	
Max. surge current between L/N and PE	500 A	1.5 kA		1.5 kA	
Max. surge current between L and N	1.5 kA	1.5 kA		1.5 kA	
Protection level between L/N and PE	≤ 93 V	≤ 900 V		≤ 900 V	
Protection level between L and N	≤ 59 V	≤ 650 V		≤ 650 V	
Response time between L/N and PE	≤ 25 ns	≤ 1 μs		≤ 1 μs	
Response time between L and N	≤ 5 ns	≤ 25 ns		≤ 25 ns	
Through resistance / inductivity	25 mΩ / 2 x 7 μH	- / 2 x 0.8 mH		- / 2 x 0.8 mH	
Nominal voltage acc. to VDE 0110 Part 1/4.97, IEC 60664-1	250 V / 4 kV / 3	250 V / 4 kV / 3		250 V / 4 kV / 3	
Ambient operating temperature	-25 °C ... +85 °C	-25 °C ... +85 °C		-25 °C ... +85 °C	
Insertion loss		20 dB ... 40 dB / 0.15 MHz ... 30 MHz		20 dB ... 40 dB / 0.15 MHz ... 30 MHz	

Accessories	Item no.	Pack. unit	Item no.	Pack. unit
Terminal block for pluggable modules, with 2-conductor terminal blocks, orange separator ❶	22 mm / 0.866 in wide 280-638	1	27 mm / 1.063 in wide 280-639	1
with 4-conductor terminal blocks, orange separator ❷	22 mm / 0.866 in wide 280-628	1	27 mm / 1.063 in wide 280-629	1
with 4-conductor terminal blocks, marker plate ❸	25 mm / 0.984 in wide 280-764	1	30 mm / 1.181 in wide 280-765	1
wire range 0.08 mm² ... 2.5 mm² / AWG 28 ... 14; stripped length 8 ... 9 mm / 0.33 in				



**WAGO Application: Steag, Power Plant in Voerde,
Germany**

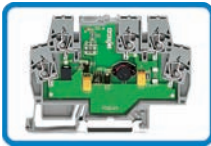
WAGO Products:
WAGO-I/O-SYSTEM with Modbus Couplers



Series 787 – Primary Switch Mode Power Supply Units
Primary Switch Mode Power Supply Units, for DIN 35 rail
Power Supply Units for AS-Interface Networks, for DIN 35 rail 232 – 239



Series 288 and 289 – Rail-Mounted Modules - Constant Voltage Sources
Constant Voltage Sources
Power Supply Units, with Universal Mounting Carrier 240 – 245



Series 859 – Rail-Mounted Terminal Blocks with DC/DC Converters, 6 mm/0.236 in wide
DC/DC Converter for DIN 35 Rail 246 – 247



Series 289 – Rail-Mounted Modules - DC/DC Converter
DC/DC Converter 248

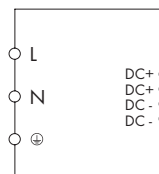
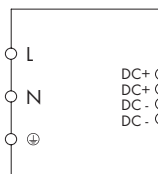


Series 288 – Back-up Capacitor Module
Back-up Capacitor Module; Smoothes Unstable DC 24 V Power Supplies 249

6 Primary Switch Mode Power Supply Units

232

	Output voltage DC 12 V; 2 A open circuit and short circuit protected, adjustable output voltage, LED status indication	Output voltage DC 12 V; 4 A open circuit and short circuit protected, adjustable output voltage, LED status indication, parallel connection possible, thermal overload protection
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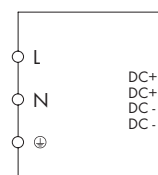
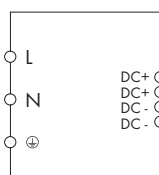
- prepared for class I equipment
- natural convection cooling when horizontally mounted
- encapsulated, for use in switchgear cabinets

Description	Nominal output voltage Vo	Item no.	Pack. unit	Nominal output voltage Vo	Item no.	Pack. unit
primary switch mode power supply units, for DIN 35 rail	DC 12 V, SELV	787-601	1	DC 12 V, SELV	787-611	1

Technical Data						
Nominal input voltage Vi	AC 230 V			AC 230 V		
Input voltage range	AC 90 V ... 264 V; DC 130 V ... 300 V (use of DC requires external protection)			AC 90 V ... 264 V; DC 130 V ... 300 V (use of DC requires external protection)		
Frequency	50 Hz ... 60 Hz			50 Hz ... 60 Hz		
Input current Ii	0.3 A typ. at AC 230 V			0.6 A typ. at AC 230 V		
Inrush current	< 10 A _p			< 15 A _p		
Mains failure hold-up time	> 20 ms at AC 230 V			> 20 ms at AC 230 V		
Overvoltage protection	varistor at primary circuit			varistor at primary circuit		
Nominal output voltage Vo	DC 12 V, SELV			DC 12 V, SELV		
Output voltage range	DC 11 V ... 15 V adjustable			DC 11 V ... 15 V adjustable		
Output current Io	2 A at DC 12 V			4 A at DC 12 V		
Residual ripple	< 100 mV _{pp} to 20 MHz			< 100 mV _{pp} to 20 MHz		
Derating	-3 % / K (>50 °C)			-3 % / K (>50 °C)		
Adjustment accuracy	1.5 %			2 %		
Current limitation	from approx. 1.5 x Io			from approx. 1.1 x Io		
Efficiency typ.	78 % typ.			81 % typ.		
Test voltage pri.-gr. / pri.-sec. / sec.-gr.	- / 4.2 kV / -			- / 4.2 kV / -		
Degree of protection	IP20			IP20		
Operational indication	LED green (12 V o.k.)			LED green (12 V o.k.)		
Type of mounting	DIN rail mounting (DIN EN 50022)			DIN rail mounting (DIN EN 50022)		
Ambient operating temperature	-10 °C ... +70 °C			-10 °C ... +70 °C		
Storage temperature	-25 °C ... +85 °C			-25 °C ... +85 °C		
Dimensions (mm) W x H x L	40 x 95 x 90			51 x 133 x 120		
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP® (WAGO Series 231)			Height from upper-edge of DIN 35 rail CAGE CLAMP® (WAGO Series 231)		
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)			0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)		
Stripped lengths	8 ... 9 mm / 0.33 in			8 ... 9 mm / 0.33 in		
Weight	approx. 300 g			approx. 690 g		
Approvals	EN 60950, EN 50081-1, EN 61000-6-2			EN 60950, EN 50081-1, EN 61000-6-2		

Output voltage DC 12 V;
8 A open circuit and short circuit protected,
adjustable output voltage,
LED status indication,
parallel connection possible,
thermal overload protection

Output voltage DC 24 V;
1 A open circuit and short circuit protected,
adjustable output voltage,
LED status indication



- prepared for class I equipment
- Natural convection cooling when horizontally mounted
- encapsulated, for use in switchgear cabinets

Description	Nominal output voltage V_o	Item no.	Pack. unit	Nominal output voltage V_o	Item no.	Pack. unit
primary switch mode power supply units, for DIN 35 rail	DC 12 V, SELV	787-621	1	DC 24 V, SELV	787-602	1

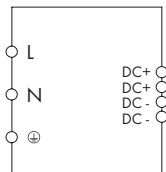
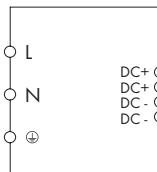
Technical Data

Nominal input voltage V_i	AC 230 V	AC 230 V
Input voltage range	AC 90 V ... 264 V; DC 130 V ... 300 V (use of DC requires external protection)	AC 90 V ... 264 V; DC 130 V ... 300 V (use of DC requires external protection)
Frequency	50 Hz ... 60 Hz	50 Hz ... 60 Hz
Input current I_i	1.2 A typ. at AC 230 V	0.3 A typ. at AC 230 V
Inrush current	< 15 A _p	< 10 A _p
Discharge current		900 µA typ.
Mains failure hold-up time	> 20 ms at AC 230 V	> 20 ms at AC 230 V
Overvoltage protection	varistor at primary circuit	varistor at primary circuit
Nominal output voltage V_o	DC 12 V, SELV	DC 24 V, SELV
Output voltage range	DC 11 V ... 15 V adjustable	DC 21.6 V ... 26.4 V adjustable
Output current I_o	8 A at DC 12 V	1.3 A at DC 24 V
Residual ripple	< 100 mV _{pp} to 20 MHz	< 100 mV _{pp} to 20 MHz
Derating	-3 % / K (>50 °C)	-3 % / K (>50 °C)
Adjustment accuracy	2 %	1.5 %
Current limitation	from approx. 1.1 x I_o	from approx. 1.5 x I_o
Efficiency typ.	81 % typ.	78 % typ.
Test voltage pri.-gr. / pri.-sec. / sec.-gr.	- / 4.2 kV / -	- / 4.2 kV / -
Degree of protection	IP20	IP20
Operational indication	LED green (12 V o.k.)	LED green (24 V o.k.)
Type of mounting	DIN rail mounting (DIN EN 50022)	DIN rail mounting (DIN EN 50022)
Ambient operating temperature	-10 °C ... +70 °C	-10 °C ... +70 °C
Storage temperature	-25 °C ... +85 °C	-25 °C ... +85 °C
Dimensions (mm) W x H x L	67 x 133 x 120	40 x 95 x 90
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP® (WAGO Series 231)	Height from upper-edge of DIN 35 rail CAGE CLAMP® (WAGO Series 231)
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)	0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)
Stripped lengths	8 ... 9 mm / 0.33 in	8 ... 9 mm / 0.33 in
Weight	approx. 890 g	approx. 300 g
Approvals	EN 60950, EN 50081-1, EN 61000-6-2	EN 60950, EN 50081-1, EN 61000-6-2

6 Primary Switch Mode Power Supply Units

234

	Output voltage DC 24 V; 2.5 A open circuit and short circuit protected, adjustable output voltage, LED status indication, parallel connection possible, thermal overload protection	Output voltage DC 24 V; 5 A open circuit and short circuit protected, adjustable output voltage, LED status indication, parallel connection possible, thermal overload protection
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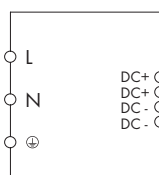
- prepared for class I equipment
- natural convection cooling when horizontally mounted
- encapsulated, for use in switchgear cabinets

Description	Nominal output voltage Vo	Item no.	Pack. unit	Nominal output voltage Vo	Item no.	Pack. unit
primary switch mode power supply units, for DIN 35 rail	DC 24 V, SELV	787-612	1	DC 24 V, SELV	787-622	1

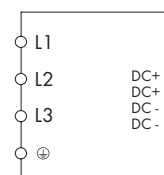
Technical Data						
Nominal input voltage Vi	AC 230 V			AC 230 V		
Input voltage range	AC 90 V ... 264 V; DC 130 V ... 300 V (use of DC requires external protection)			AC 90 V ... 264 V; DC 130 V ... 300 V (use of DC requires external protection)		
Frequency	50 Hz ... 60 Hz			50 Hz ... 60 Hz		
Input current Ii	0.6 A typ. at AC 230 V			1.2 A typ. at AC 230 V		
Inrush current	< 10 A _p			< 15 A _p		
Discharge current	940 µA typ.			550 µA typ.		
Mains failure hold-up time	> 20 ms at AC 230 V			> 20 ms at AC 230 V		
Overvoltage protection	varistor at primary circuit			varistor at primary circuit		
Nominal output voltage Vo	DC 24 V, SELV			DC 24 V, SELV		
Output voltage range	DC 22 V ... 28.8 V adjustable			DC 22 V ... 28.8 V adjustable		
Output current Io	2.5 A at DC 24 V			5 A at DC 24 V		
Residual ripple	< 100 mVpp to 20 MHz			< 100 mVpp to 20 MHz		
Derating	-3 % / K (>55 °C)			-3 % / K (>55 °C)		
Adjustment accuracy	1.5 %			1.5 %		
Current limitation	from approx. 1.1 x Io			from approx. 1.1 x Io		
Efficiency typ.	81 % typ.			81 % typ.		
Test voltage pri.-gr. / pri.-sec. / sec.-gr.	- / 4.2 kV / -			- / 4.2 kV / -		
Degree of protection	IP20			IP20		
Operational indication	LED green (24 V o.k.)			LED green (24 V o.k.)		
Type of mounting	DIN rail mounting (DIN EN 50022)			DIN rail mounting (DIN EN 50022)		
Ambient operating temperature	-10 °C ... +70 °C			-10 °C ... +70 °C		
Storage temperature	-25 °C ... +85 °C			-25 °C ... +85 °C		
Dimensions (mm) W x H x L	51 x 133 x 120			67 x 133 x 120		
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP® (WAGO Series 231)			Height from upper-edge of DIN 35 rail CAGE CLAMP® (WAGO Series 231)		
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)			0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)		
Stripped lengths	8 ... 9 mm / 0.33 in			8 ... 9 mm / 0.33 in		
Weight	approx. 690 g			approx. 890 g		
Approvals	EN 60950, EN 50081-1, EN 61000-6-2			EN 60950, EN 50081-1, EN 61000-6-2		

Output voltage DC 24 V;
10 A open circuit and short circuit protected,
adjustable output voltage,
LED status indication,
parallel connection possible,
thermal overload protection

Output voltage DC 24 V;
10 A open circuit and short circuit protected,
adjustable output voltage,
LED status indication



- prepared for class I equipment
- natural convection cooling when horizontally mounted
- encapsulated, for use in switchgear cabinets



Description	Nominal output voltage Vo	Item no.	Pack. unit	Nominal output voltage Vo	Item no.	Pack. unit
primary switch mode power supply units, for DIN 35 rail	DC 24 V, SELV	787-632	1	DC 24 V, SELV	787-640	1

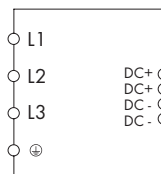
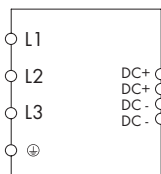
Technical Data

Nominal input voltage Vi	AC 230 V / 115 V (switchable)	3 x AC 400 V
Input voltage range	AC 176 V ... 264 V / AC 90 V ... 132 V	AC 325 V ... 550 V; DC 460 V ... 770 V (use of DC requires external protection)
Frequency	50 Hz ... 60 Hz	50 Hz ... 60 Hz
Input current Ii	2.8 A at AC 230 V (6 A at AC 115 V)	3 x 0.6 A at AC 400 V
Inrush current	< 30 A _p	< 30 A _p
Discharge current	0.5 A at AC 240 V	
Mains failure hold-up time	>20 ms at AC 230 V, DC 24 V, 10 A	> 10 ms at AC 400 V
Internal /external fuse	6.3 A / 16 A recommended	none / 3 x 3.15 AT necessary
Overvoltage protection	max. DC 35 V	max. DC 35 V
Nominal output voltage Vo	DC 24 V, SELV	DC 24 V, SELV
Output voltage range	DC 22.8 V ... 28.8 V adjustable	DC 22.8 V ... 28.8 V adjustable
Output current Io	10 A at DC 24 V	10 A at DC 24 V
Residual ripple	< 100 mV _{ss}	< 100 mV _{ss}
Derating	-3 % / K (>50 °C)	-3 % / K (>40 °C)
Adjustment accuracy	3 %	
Adjustment accuracy		2 %
Efficiency typ.	83 % typ.	83 % typ.
Test voltage pri.-gr. / pri.-sec. / sec.-gr.	1.5 kV / 4.2 kV / 0.5 kV	1.5 kV / 4.2 kV / 0.5 kV
Degree of protection	IP20 (EN 60529, 1991)	IP20 (EN 60529, 1991)
Operational indication	LED green at Vo > DC 18 V / LED red at overcurrent	LED green at Vo / LED red at overcurrent
Type of mounting	DIN rail mounting (DIN EN 50022)	DIN rail mounting (DIN EN 50022)
Ambient operating temperature	-10 °C ... +70 °C	-10 °C ... +60 °C
Storage temperature	-25 °C ... +85 °C	-25 °C ... +85 °C
Dimensions (mm) W x H x L	115 x 87 x 140	115 x 87 x 140
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP® (WAGO Series 231)	Height from upper-edge of DIN 35 rail CAGE CLAMP® (WAGO Series 231)
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)	0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)
Stripped lengths	8 ... 9 mm / 0.33 in	8 ... 9 mm / 0.33 in
Weight	approx. 1100 g	approx. 940 g
Approvals	EN 60950, EN 50178, EN 50081-1	EN 60950, EN 50178, EN 50081-1

6 Primary Switch Mode Power Supply Units

236

	Output voltage DC 24 V; 20 A open circuit and short circuit protected, adjustable output voltage, LED status indication	Output voltage DC 24 V; 40 A open circuit and short circuit protected, adjustable output voltage, LED status indication, parallel connection possible, thermal overload protection
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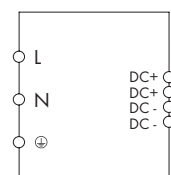
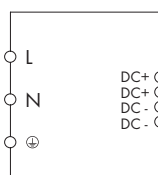
- prepared for class I equipment
- natural convection cooling when horizontally mounted
- encapsulated, for use in switchgear cabinets

Description	Nominal output voltage Vo	Item no.	Pack. unit	Nominal output voltage Vo	Item no.	Pack. unit
primary switch mode power supply units, for DIN 35 rail	DC 24 V, SELV	787-642	1	DC 24 V, SELV	787-644	1

Technical Data						
Nominal input voltage Vi	3 x AC 400 V			3 x AC 400 V		
Input voltage range	AC 325 V ... 550 V; DC 460 V ... 770 V (use of DC requires external protection)			AC 325 V ... 550 V; DC 460 V ... 770 V (use of DC requires external protection)		
Frequency	50 Hz ... 60 Hz			50 Hz ... 60 Hz		
Input current Ii	3 x 1.2 A at AC 400 V			3 x 2.4 A typ. at AC 400 V		
Inrush current	< 30 A _p			< 30 A _p		
Mains failure hold-up time	> 10 ms at AC 400 V			> 10 ms at AC 400 V		
Internal /external fuse	none / 3 x 6.3 AT necessary			none / 3 x 6.3 AT necessary		
Overvoltage protection	max. DC 35 V			max. DC 35 V		
Nominal output voltage Vo	DC 24 V, SELV			DC 24 V, SELV		
Output voltage range	DC 22.8 V ... 28.8 V adjustable			DC 22.8 V ... 28.8 V adjustable		
Output current Io	20 A			40 A		
Residual ripple	< 200 mV _{ss}			< 200 mV _{ss}		
Derating	-3 % / K (>50 °C)			-3 % / K (>50 °C)		
Adjustment accuracy	2 %			2 %		
Efficiency typ.	87 % typ.			87 % typ.		
Test voltage pri.-gr. / pri.-sec. / sec.-gr.	1.5 kV / 4.2 kV / 0.5 kV			1.5 kV / 4.2 kV / 0.5 kV		
Degree of protection	IP20 (EN 60529, 1991)			IP20		
Operational indication	LED green at Vo /LED red at overcurrent			LED green at Vo /LED red at overcurrent		
Type of mounting	DIN rail mounting (DIN EN 50022)			DIN rail mounting (DIN EN 50022)		
Ambient operating temperature	-10 °C ... +70 °C			-10 °C ... +70 °C		
Storage temperature	-25 °C ... +85 °C			-25 °C ... +85 °C		
Dimensions (mm) W x H x L	205 x 87 x 140			253 x 120 x 145		
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP® (WAGO Series 231)			Height from upper-edge of DIN 35 rail CAGE CLAMP® (WAGO Series 231)		
Wire connection secondary				Power connectors, 4 poles; 0.5 mm² ... 6 mm² / AWG 20 ... 07		
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)			0.08 mm² ... 2.5 mm² / AWG 20 ... 12 (THHN, THWN)		
Stripped lengths	8 ... 9 mm / 0.22 in			8 ... 9 mm / 0.33 in		
Weight	approx. 2000 g			approx. 3600 g		
Approvals	EN 60950, EN 50178, EN 50081-1			EN 60950, UL 60950, EN 50178, UL 508, EN 50081-1 class B, EN 50082-2, EN 61000-4-2/-3/-4/-5/-6/-11		

Output voltage DC 48 V;
1 A open circuit and short circuit protected,
adjustable output voltage,
LED status indication,
parallel connection possible

Output voltage DC 48 V;
2 A open circuit and short circuit protected,
adjustable output voltage,
LED status indication,
parallel connection possible



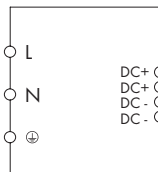
- Thermal overload protection
- Parallel connection possible
- Prepared for class I equipment
- Natural convection cooling when horizontally mounted
- Encapsulated, for use in switchgear cabinets

Description	Nominal output voltage V_o	Item no.	Pack. unit	Nominal output voltage V_o	Item no.	Pack. unit
primary switch mode power supply units, for DIN 35 rail	DC 48 V, SELV	787-613	1	DC 48 V, SELV	787-623	1

Technical Data

Nominal input voltage V_i	AC 230 V	AC 230 V
Input voltage range	AC 90 V ... 264 V; DC 130 V ... 300 V (use of DC requires external protection)	AC 90 V ... 264 V; DC 130 V ... 300 V (use of DC requires external protection)
Frequency	50 Hz ... 60 Hz	50 Hz ... 60 Hz
Input current I_i	0.6 A typ. at AC 230 V	1.2 A typ. at AC 230 V
Inrush current	< 50 A _p	< 50 A _p
Mains failure hold-up time	> 20 ms at AC 230 V	> 20 ms at AC 230 V
Overvoltage protection	varistor at primary circuit	varistor at primary circuit
Nominal output voltage V_o	DC 48 V, SELV	DC 48 V, SELV
Output voltage range	DC 43.2 V ... 52.8 V adjustable	DC 42 V ... 52.8 V adjustable
Output current I_o	1 A at DC 48 V	2 A at DC 48 V
Residual ripple	< 200 mV _{pp} at 20 MHz	< 200 mV _{pp} at 20 MHz
Derating	-3 % / K (>60 °C)	-3 % / K (>55 °C)
Adjustment accuracy	2 %	2 %
Current limitation	from 1.1 x I_a	from 1.1 x I_a
Efficiency typ.	90 % typ.	88 % typ.
Test voltage pri.-gr. / pri.-sec. / sec.-gr.	- / 4.2 kV / -	- / 4.2 kV / -
Degree of protection	IP20	IP20
Operational indication	LED green (48 V o.k.)	LED green (48 V o.k.)
Type of mounting	DIN rail mounting (DIN EN 50022)	DIN rail mounting (DIN EN 50022)
Ambient operating temperature	-10 °C ... +70 °C	-10 °C ... +70 °C
Storage temperature	-25 °C ... +85 °C	-25 °C ... +85 °C
Dimensions (mm) W x H x L	51 x 133 x 120	67 x 133 x 120
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP® (WAGO Series 231)	Height from upper-edge of DIN 35 rail CAGE CLAMP® (WAGO Series 231)
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12 (THHN, THWN)	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12 (THHN, THWN)
Stripped lengths	8 ... 9 mm / 0.33 in	8 ... 9 mm / 0.33 in
Weight	approx. 690 g	approx. 800 g
Approvals	UL 60950, UL 508, EN 61000-6-3, EN 61000-6-2	UL 60950, UL 508, EN 61000-6-3, EN 61000-6-2

	Output voltage DC 48 V; 5 A open circuit and short circuit protected, adjustable output voltage, LED status indication, parallel connection possible	
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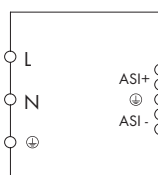
- Thermal overload protection
- Parallel connection possible
- Prepared for class I equipment
- Natural convection cooling when horizontally mounted
- Encapsulated, for use in switchgear cabinets

Description	Nominal output voltage Vo	Item no.	Pack. unit	
primary switch mode power supply units, for DIN 35 rail	DC 48 V	787-633	1	

Technical Data

Nominal input voltage Vi	AC 230 V / 115 V (switchable)	
Input voltage range	AC 176 V ... 264 V / 90 V ... 132 V	
Frequency	50 Hz ... 60 Hz	
Input current Ii	2.8 A typ. at AC 230 V / 6.0 A typ. at AC 115 V	
Inrush current	< 50 A _p	
Mains failure hold-up time	> 20 ms at AC 230 V	
Overvoltage protection	varistor at primary circuit	
Nominal output voltage Vo	DC 48 V	
Output voltage range	DC 43.2 V ... 52.8 V adjustable	
Output current Io	5 A at DC 48 V	
Residual ripple	< 200 mV _{pp} at 20 MHz	
Derating	-3 % / K (>50 °C)	
Adjustment accuracy	3 %	
Current limitation	from 1.2 x Ia	
Efficiency typ.	85 % typ.	
Test voltage pri.-gr. / pri.-sec. / sec.-gr.	- / 4.2 kV / -	
Degree of protection	IP20	
Operational indication	LED green (48 V o.k.)	
Type of mounting	DIN rail mounting (DIN EN 50022)	
Ambient operating temperature	-10 °C ... +70 °C	
Storage temperature	-25 °C ... +85 °C	
Dimensions (mm) W x H x L	115 x 87 x 140	
	Height from upper-edge of DIN 35 rail	
Wire connection	CAGE CLAMP® (WAGO Series 231)	
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)	
Stripped lengths	8 ... 9 mm / 0.33 in	
Weight	approx. 940 g	
Approvals	UL 60950, UL 508, EN 61000-6-3, EN 61000-6-2	

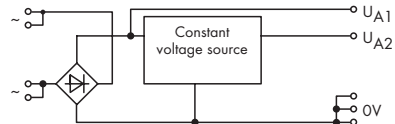
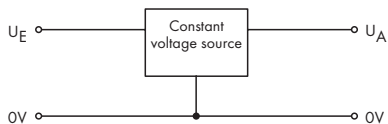
**Power supply unit for AS-Interface;
Input AC 115 V / 230 V;
Output DC 30.5 V; 3 A**



- ASI+ (⊕)
- ASI- (⊖)

6

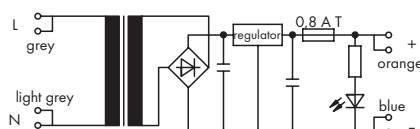
	DC 24 V; 3 A Input DC 27 V ... 35 V Mounting feet for DIN 35 rail	DC 24 V; 3 A Input AC 24 V +10 %, 50 Hz ... 60 Hz Mounting carrier for DIN 35 rail
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Technical Data

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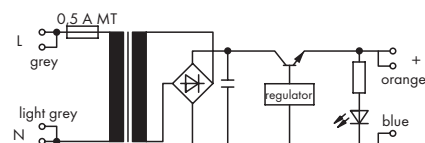
Mounting carrier for DIN 35 rail



1

Nominal input voltage V_i	AC 115 V	AC 230 V
Input voltage range	$\pm 10 \%$	$\pm 10 \%$
Frequency	50 Hz ... 60 Hz	50 Hz ... 60 Hz
Power consumption at nominal load	30 VA	30 VA
Nominal output voltage V_o	DC 24 V	DC 24 V
Output voltage range	$\pm 4 \%$	$\pm 4 \%$
Output current I_o	0.5 A	0.5 A
Residual ripple	$\leq 10 \text{ mV}_{ss}$	$< 10 \text{ mV}_{ss}$
Output fuse	0.8 A slow	0.8 A slow
Ambient operating temperature	0 °C ... +50 °C	0 °C ... +50 °C
Weight	570 g	570 g
Dimensions (mm) L x W x H	89 x 105 x 52	89 x 105 x 52
incl. mounting feet or mounting carrier	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP® (Series 236)	CAGE CLAMP® (Series 236)
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)	0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	Transformer acc. to VDE 0551	Transformer acc. to VDE 0551

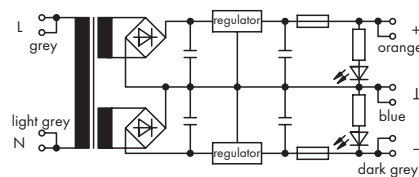
see page 279



Technical Data

6

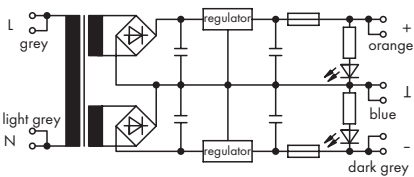
Mounting carrier for DIN 35 rail

1

Nominal input voltage Vi	AC 230 V	AC 230 V
Input voltage range	± 10 %	± 10 %
Frequency	50 Hz ... 60 Hz	50 Hz ... 60 Hz
Power consumption at nominal load	80 VA	27 VA
Nominal output voltage Vo	DC 24 V	DC ± 12 V; DC 15 V
Output voltage range	± 10 %	± 4 %
Output current Io	2 A	2 x 0.5 A
Residual ripple	≤ 80 mVss	≤ 10 mVss
Input fuse	0.5 A medium-slow	
Output fuse	electronic, short-circuit protected	2 x 0.8 A slow
Short-circuit current	2.5 A	
Ambient operating temperature	0 °C ... +40 °C	0 °C ... +40 °C
Weight	2 kg	680 g
Dimensions (mm) L x W x H	184 x 105 x 98	94 x 105 x 57
incl. mounting feet or mounting carrier	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP® (Series 256)	CAGE CLAMP® (Series 256)
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)	0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in
Approvals	Transformer acc. to VDE 0551	Transformer acc. to VDE 0551

see page 279
white 709-198 / transparent 709-197

	AC 230 V / DC ± 15 V; 2 x 1 A short circuit proof Output voltage indication by LED Mounting carrier for DIN 35 rail	
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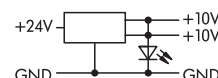
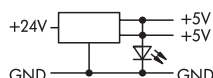
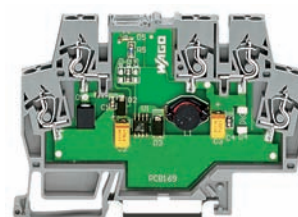
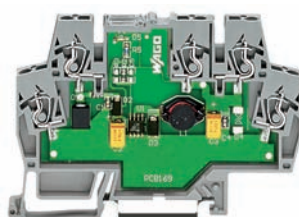
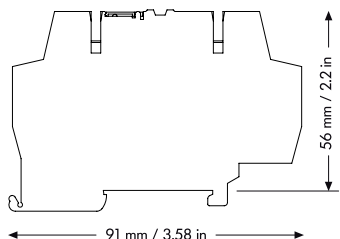


Description	Item no.	Pack. unit	
Power Supply Unit, with universal mounting carrier	288-816	1	

Technical Data			
Nominal input voltage V_i	AC 230 V		
Input voltage range	$\pm 10\%$		
Frequency	50 Hz ... 60 Hz		
Power consumption at nominal load	53 VA		
Nominal output voltage V_o	DC ± 15 V		
Output voltage range	$\pm 4\%$		
Output current I_o	2 x 1 A		
Residual ripple	≤ 10 mVss		
Short-circuit current	approx. 1.5 A		
Ambient operating temperature	0 °C ... +40 °C		
Weight	1000 g		
Dimensions (mm) L x W x H	135 x 105 x 87		
incl. mounting feet or mounting carrier	Height from upper-edge of DIN 35 rail		
Wire connection	CAGE CLAMP® (Series 256)		
Cross sections	0.08 mm ² ... 2.5 mm ² / AWG 28 ... 12 (THHN, THWN)		
Stripped lengths	5 ... 6 mm / 0.22 in		
Approvals	Transformer acc. to VDE 0551		
Accessories			
WMB Multi marking system for mounting carrier	see page 279		
Marker strips for mounting carrier	white 709-198 / transparent 709-197		

Rail-Mounted Terminal Blocks with DC/DC Converter, 6 mm / 0.236 in Wide

	DC/DC converter DC 24 V / 5 V, 0.5 A	DC/DC converter DC 24 V / 10 V, 0.5 A
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Technical Data

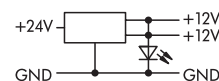
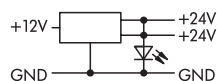
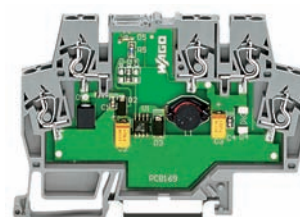
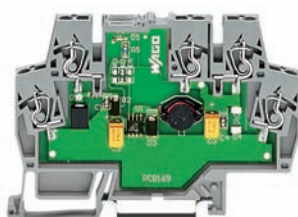
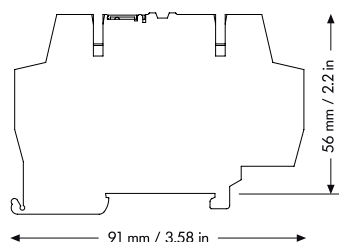
Accessories see page 52 or 219

Accessories see page 52 or 219

Nominal input voltage (V _N)	DC 24 V	DC 24 V
Input voltage range	DC 10 V ... 30 V	DC 15 V ... 30 V
Output voltage	DC 5 V (± 2 %)	DC 10 V (± 2 %)
Output current max.	500 mA	500 mA
Line regulation, max. (full load, over input voltage range)	2 %	0.5 %
Max. load regulation		
(no load to full load, nominal input voltage)	0.5 %	0.7 %
Efficiency at full load (DC 24 V in)	70 %	85 %
Output noise peak-to-peak max. (20 MHz bandwidth)	150 mV	20 mV
Switching frequency	200 kHz (nominal)	200 kHz (nominal)
Isolation	non-isolated	non-isolated
Reverse voltage protection, input	yes	yes
Minimum load requirement	no	no
Max. transient recovery time (recovery time for load change from 25 % to 75% of full load)	40 µs	500 µs
Max. startup time (DC 24 V in, full load)	3 ms	3 ms
Max. hold time (nominal input voltage, full load)	1 ms	500 µs
Input fuse	TVS diode	TVS diode
Output short circuit protection	temporary (short circuit of the output for 1 minute without damage to the device)	temporary (short circuit of the output for 1 minute without damage to the device)
Temperature coefficient	70 ppm/°C	100 ppm/°C
Ambient operating temperature	0 °C ... +40 °C	-25 °C ... +55 °C
Dimensions (mm) W x H x L	6 x 56 x 91	6 x 56 x 91
	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	CAGE CLAMP®	CAGE CLAMP®
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 14	0.08 mm² ... 2.5 mm² / AWG 28 ... 14
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in

DC/DC converter DC 12 V / 24 V, 250 mA

DC/DC converter DC 24 V / 12 V, 0.5 A



Description	V _N / V _O	Item no.	Pack. unit	V _N / V _O	Item no.	Pack. unit
DC/DC converter, for DIN 35 rail	DC 12 V / DC 24 V	859-804	1	DC 24 V / DC 12 V	859-805	1

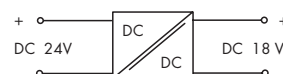
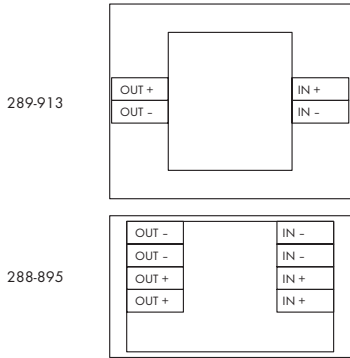
Technical Data

Accessories see page 52 or 219

Accessories see page 52 or 219

Nominal input voltage (V _N)	DC 12 V	DC 24 V
Input voltage range	DC 8 V ... 16 V	DC 15 V ... 30 V
Output voltage	DC 24 V (± 1 %)	DC 12 V (± 2 %)
Output current max.	250 mA	500 mA
Line regulation, max. (full load, over input voltage range)	0.5 %	0.5 %
Max. load regulation		
(no load to full load, nominal input voltage)	0.5 %	0.7 %
Efficiency at full load (DC 24 V in)	83 %	85 %
Output noise peak-to-peak max. (20 MHz bandwidth)	40 mV	20 mV
Switching frequency	1.2 MHz (nominal)	200 kHz (nominal)
Isolation	non-isolated	non-isolated
Reverse voltage protection, input	yes	yes
Minimum load requirement	no	no
Max. transient recovery time (recovery time for load change from 25 % to 75% of full load)	50 µs	500 µs
Max. startup time (DC 24 V in, full load)	8 ms	3 ms
Max. hold time (nominal input voltage, full load)	500 µs	500 µs
Input fuse	TVS diode	TVS diode
Output short circuit protection	fuse	temporary (short circuit of the output for 1 minute without damage to the device)
Temperature coefficient	100 ppm/°C	100 ppm/°C
Ambient operating temperature	-25 °C ... +55 °C	-25 °C ... +55 °C
Dimensions (mm) W x H x L	6 x 56 x 91	6 x 56 x 91
Wire connection	Height from upper-edge of DIN 35 rail CAGE CLAMP®	Height from upper-edge of DIN 35 rail CAGE CLAMP®
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 14	0.08 mm² ... 2.5 mm² / AWG 28 ... 14
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in

	DC 24 V / DC 24 V; 0.21 A	DC 24 V / DC 18 V; 0.4 A
	Mounting feet for DIN 35 rail	Mounting carrier for DIN 35 rail

[illegible]

Technical Data

Input voltage	DC 24 V	DC 24 V
Input voltage range	± 10 %	DC 18 V ... 36 V
Output voltage	DC 24 V (± 3 %)	DC 18 V (± 1 %)
Nominal output current	210 mA	400 mA
Peak output current	315 mA	
Efficiency typ.	65 % ... 75 %	82 %
Test voltage input/output	DC 500 V	DC 1500 V
Short circuit protection	Thermal cut-out	permanent
Ambient operating temperature	-25 °C ... +40 °C	-25 °C ... +70 °C
Weight	approx. 90 g	approx. 90 g
Dimensions (mm) L x W x H	77 x 83 x 25	50 x 85 x 25
incl. mounting feet or mounting carrier	Height from upper-edge of DIN 35 rail	Height from upper-edge of DIN 35 rail
Wire connection	Terminal strips with CAGE-CLAMP® (Series 236)	Terminal strips with CAGE-CLAMP® (Series 236)
Cross sections	0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)	0.08 mm² ... 2.5 mm² / AWG 28 ... 12 (THHN, THWN)
Stripped lengths	5 ... 6 mm / 0.22 in	5 ... 6 mm / 0.22 in

Accessories

WMB Multi marking system for mounting carrier
Marker strips for mounting carrier

see page 279

	Back-up capacitor module; smoothes unstable DC 24 V power supplies Mounting carrier for DIN 35 rail	
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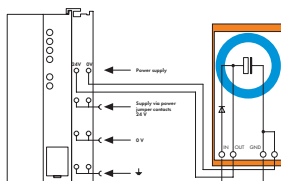
This module is equipped with a capacitor which smoothes unstable 24 V DC power supplies in case the voltage tolerances mentioned in our data sheets cannot be ensured. Reasons for voltage transients could be:

- voltage disconnections (switching transients) on primary side
- overloads on secondary side
- switching of inductive or capacitive loads

The back-up capacitor module is connected between the 24 V power supply and the electronic device which has to be protected.

Attention:

If using a non-filtered single-phase power supply, the capacitor causes a voltage increase.

[illegible]

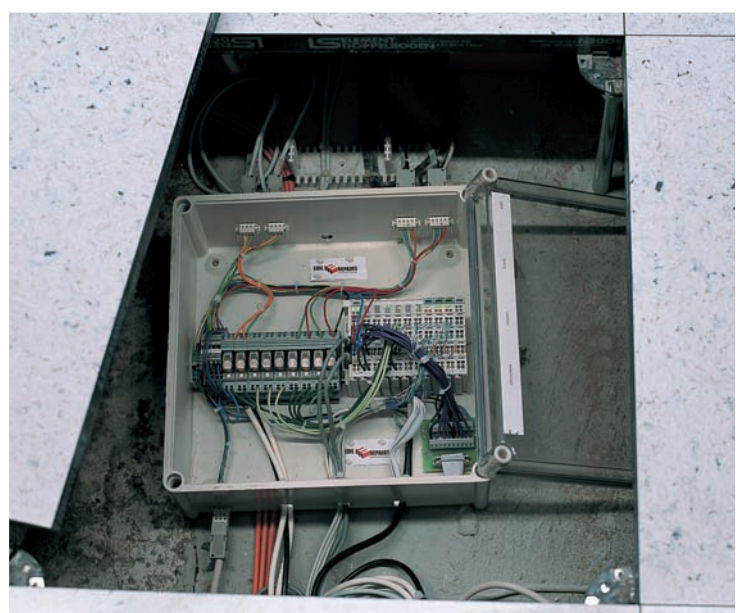
Technical Data

[illegible]



WAGO Application: Bellinzona Business Center (Tessin), Switzerland

WAGO Products:
WAGO-I/O-SYSTEM with ETHERNET Controllers,
Power Supply Units and Interface Modules





Series 286 and 786

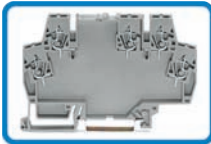
Empty Component Plug Housings for Building Custom Circuits on Terminal Blocks for Pluggable Modules

252 – 253

Series 280

Empty Component Plug Housings for Building Custom Circuits on Carrier Terminal Blocks or through Terminal Blocks

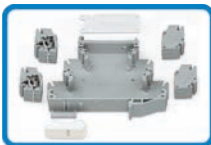
254



Series 859

Empty Electronic Terminal Block Housing

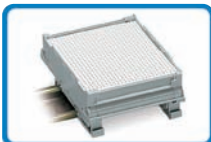
255



Series 789

Empty Housing According to DIN 43880

256 – 257



Series 288, 209 and 210

Mounting Carriers and Feet for DIN-Rail Mounting PCBs

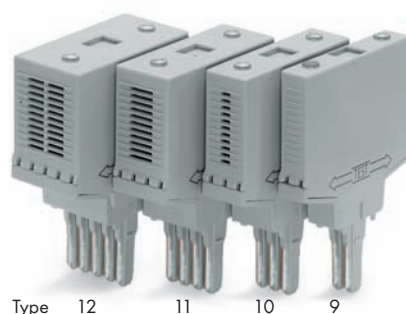
258 – 261

Empty Component Plug Housings for Building Custom Circuits Series 286

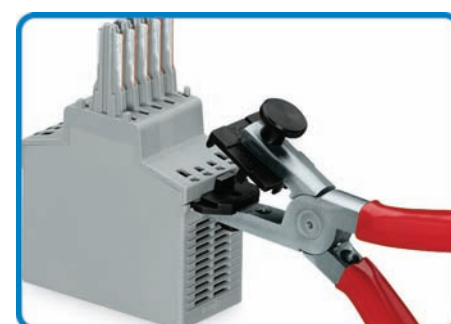
Plug width 10 / 15 / 20 or 25 mm
(0.394 / 0.591 / 0.787 or 0.984 in)
250 V/4 kV/3 ❶

Module height 82.5 mm/3.25 in
(from upper-edge of DIN 35 rail)

- ❶ 250 V = rated voltage
4 kV = rated surge voltage
3 = pollution degree

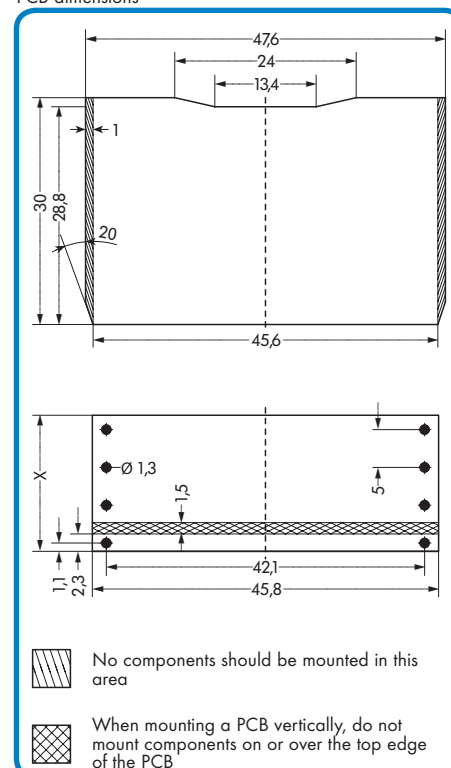


Adjust the pliers to the proper housing width



Insert the pliers into the locking slots . . .

PCB dimensions



Module width	10	15	20	25
Component height	4.2	9.2	14.2	19.2
X = total height of PCB	8	13	18	23

Empty component plug housings and accessories			Item-No.	Pack.-unit pcs
	Empty component plug housing, type 9, 4-pole	10 mm / 0.394 in wide	286-110	1
	250 V/4 kV/3	PCB dimensions and		
	6 A per contact	component height see drawing and table		
	Empty component plug housing, type 10, 6-pole	15 mm / 0.591 in wide	286-111	1
	250 V/4 kV/3	PCB dimensions and		
	6 A per contact	component height see drawing and table		
	Empty component plug housing, type 11, 8-pole	20 mm / 0.787 in wide	286-112	1
	250 V/4 kV/3	PCB dimensions and		
	6 A per contact	component height see drawing and table		
	Empty component plug housing, type 12, 10-pole	25 mm / 0.984 in wide	286-113	1
	250 V/4 kV/3	PCB dimensions and		
	6 A per contact	component height see drawing and table		
	Unlocking pliers for component plug housing		210-492	1
WSB-Marker cards		plain	209-501	
color marker cards see page 269				
10 strips with 10 markers each		1 ... 10	209-702	
Terminal block for pluggable modules			Item-No.	Pack.-unit pcs
	Terminal block for pluggable modules, 0.08 - 2.5 mm²/	4-pole/ 12 mm wide	280-618	1
	AWG 28 - 14, 2-conductor term. block, polarized, with orange separator, stripped length 8 - 9 mm/0.33 in	6-pole/ 17 mm wide	280-619	1
		8-pole/ 22 mm wide	280-638	1
		10-pole/27 mm wide	280-639	1
	Terminal block for pluggable modules, 0.08 - 2.5 mm²/	4-pole/ 12 mm wide	280-608	1
	AWG 28 - 14, 4-conductor term. block, polarized, with orange separator, stripped length 8 - 9 mm/0.33 in	6-pole/ 17 mm wide	280-609	1
		8-pole/ 22 mm wide	280-628	1
		10-pole/27 mm wide	280-629	1
X-COM terminal block for pluggable modules				
see W4 Volume 1				

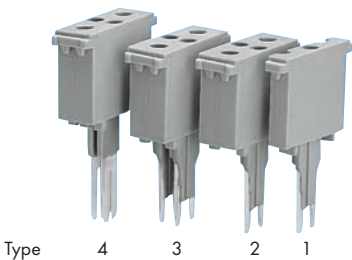
7
253

7

Empty Component Plug Housings for Building Custom Circuits

Plug width 5 mm / 0.197 in
or 10 mm / 0.394 in
250 V/4 kV/3 ①
6 A max.

- ① 250 V = rated voltage
4 kV = rated surge voltage
3 = pollution degree
- ② Marking on both sides
- ③ Marking in center position



Press screwdriver into appropriate slot (1) and remove cover with levering action (2).



Introduce cover in the outer groove of the plug and press completely down until snap-fit engaged.

Empty component plugs for carrier terminal blocks		Item-No.	Pack.-unit pcs
	Empty component plug housing, type 1, 2-pole	5 mm/0.197 in wide	
	250 V/4 kV/3; 6 A max.	Inside dimensions 280-801	100
	Empty component plug housing, type 2, 2-pole	10 mm/0.394 in wide	
	250 V/4 kV/3; 6 A max.	of plug W/H/D 3.2/15/15 mm (0.126/0.591/0.591 in)	50
	Empty component plug housing, type 3, 4-pole	10 mm/0.394 in wide	
	250 V/4 kV/3; 6 A max.	Inside dimensions 280-804	50
		of plug W/H/D 8.2/15/15 mm (0.323/0.591/0.591 in)	

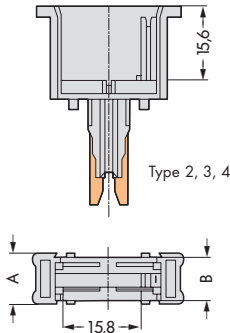
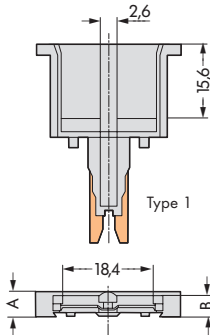
Carrier terminal blocks		Item-No.	Pack.-unit pcs
	2-cond. term. block, gray	terminal block width 5 mm/0.197 in	
	0.08 - 2.5 mm ² /AWG 28 - 14	280-616 ② 280-916 ③	100
	3-cond. term. block, gray	terminal block width 5 mm/0.197 in	
	0.08 - 2.5 mm ² /AWG 28 - 14	280-610	100
	4-cond. term. block, gray	terminal block width 5 mm/0.197 in	
	0.08 - 2.5 mm ² /AWG 28 - 14	280-606 ② 280-686 ③	100
	Stripped length 8 - 9 mm/0.33 in		

For accessories like end plates, jumpers as well as further carrier terminal blocks see W4 Volume 1

Empty component plugs for through terminal blocks		Item-No.	Pack.-unit pcs
	Empty component plug housing, type 4, 2-pole	10 mm/0.394 in wide	
	250 V/4 kV/3; 6 A max.	Inside dimensions 280-803	50
		of plug W/H/D 8.2/15/15 mm (0.323/0.591/0.591 in)	

Through terminal blocks		Item-No.	Pack.-unit pcs
	Front-entry 2-cond. term. bl., gray	terminal block width 5 mm/0.197 in	
	0.08 - 2.5 mm ² /AWG 28 - 12	280-601 ② 280-901 ③	100
	Front-entry 3-cond. term. bl., gray	terminal block width 5 mm/0.197 in	
	0.08 - 2.5 mm ² /AWG 28 - 12	280-681	100
	Front-entry 4-cond. term. bl., gray	terminal block width 5 mm/0.197 in	
	0.08 - 2.5 mm ² /AWG 28 - 14	280-621 ② 280-833 ③	100
	Side-entry terminal block	terminal block width 5 mm/0.197 in	
	0.08 - 2.5 mm ² /AWG 28 - 14	gray 280-101	100
	Stripped length 8 - 9 mm/0.33 in		

For accessories like end plates, jumpers etc. see W4 Volume 1

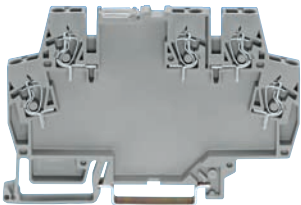


Type	1	2	3	4
A	5	10	10	10
B	3.2	8.2	8.2	8.2

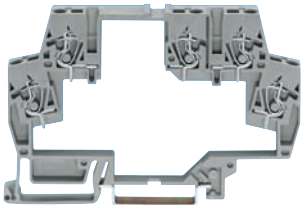
Empty Electronic Terminal Block Housing

	Empty housing for DIN 35 rail Width 6 mm/0.236 in	
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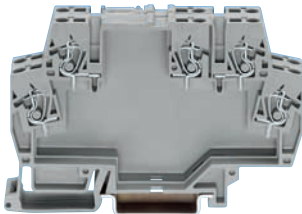
859-110



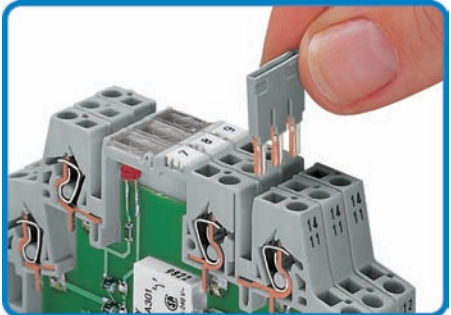
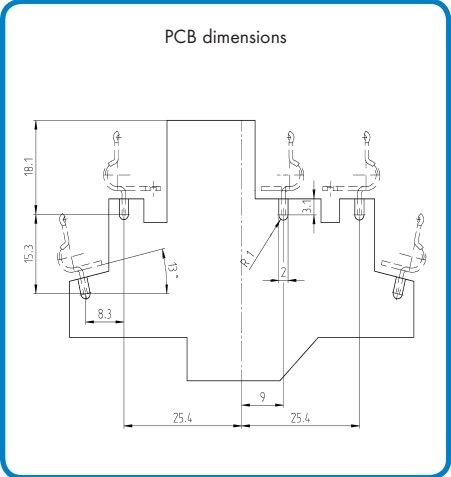
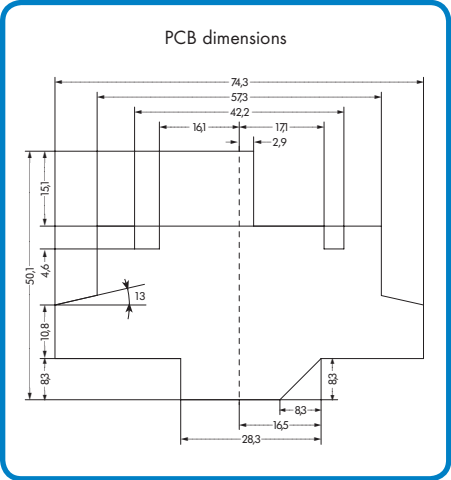
859-501



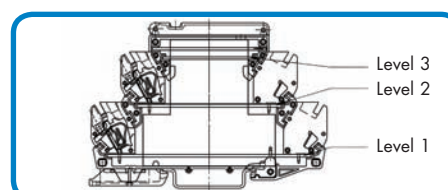
859-110 and 859-501

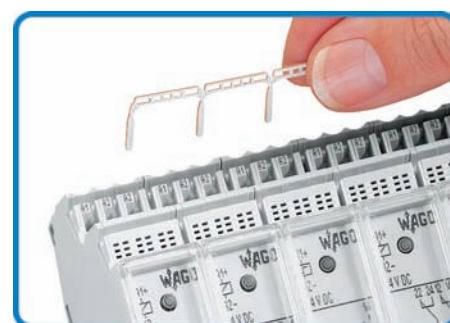
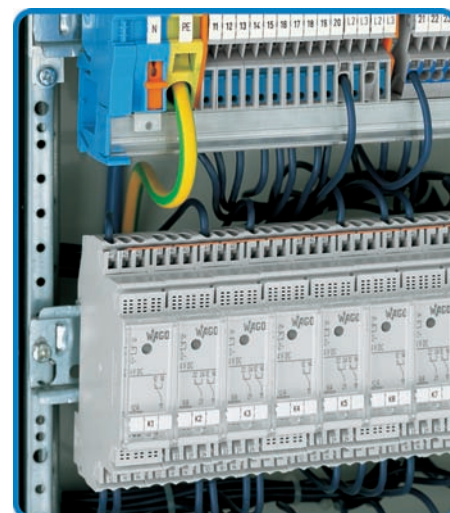
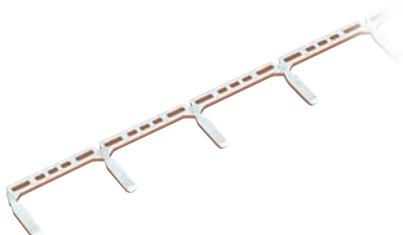


Description		Item-No.	Item-No.	Pack.-unit pcs
Modular housing for mounting electronic components in a rail-mounted terminal block format		859-110		1
Frame to enlarge the terminal block width			859-501	1
Technical Data				
Housing material		PA 6.6		
Flammability rating		V0 (UL94)		
Color		gray		
Degree of protection		IP20		
perm. ambient temperature		-25 °C ... +70 °C		
Storage temperature		-40 °C ... +85 °C		
Width		6 mm	8 mm	
Mounting position		any		
Dimensions (W x H x L)		(6 x 56* x 91) mm		
		* from upper-edge of DIN 35 rail		
Wire connection		CAGE CLAMP®		
Stripped length		0.08 mm² ... 2.5 mm²-/AWG 28 ... 14		
		5 ... 6 mm /0.22 in		
Accessories		Item-No.		Pack.-unit pcs
	End and intermediate plate	1 mm/0.039 in thick		
		gray	859-525	100 (4*25)
	Push-in type jumper bar,	2-pole	859-402	200 (8*25)
	light gray, insulated, 18 A	3-pole	859-403	200 (8*25)
		4-pole	859-404	200 (8*25)
		5-pole	859-405	200 (8*25)
		:	:	
		10-pole	859-410	100 (4*25)
Item-no. suffix for colored push-in type jumper bars		yellow	.../000-029	
		blue	.../000-006	
	Test pin, 1 mm/0.039 in Ø,			
	Test wire for solder onto test plug	859-500		1

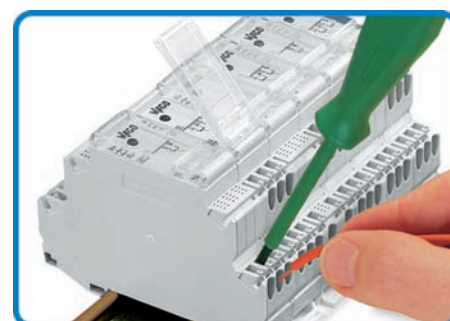


Commoning using a 3-pole push-in type jumper bar, jumpers are available from 2 to 10-pole in the 859 Series housing.





Commoning with push-in type jumper bar

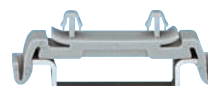


Connection of conductors using a screwdriver

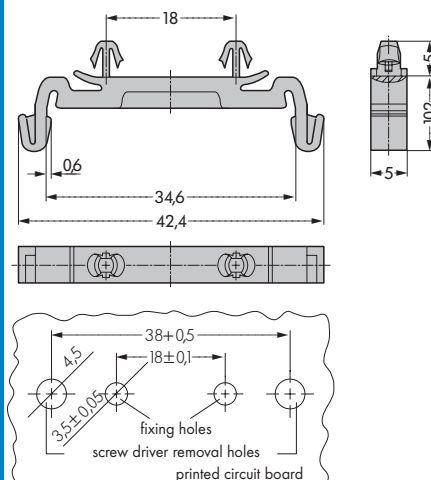
Accessories		Item-No.	Pack.-unit pcs	
	Push-in type jumper bars, I _N 16 A uninsulated, 13-way, to be cut to the required length	789-112	100 (4*25)	
	Marking pen with fibre tip, for permanent marking	210-110	1	
	Miniature quick marking card, 10 strips with 10 markers each, white with black printing	Marking plain	248-501 5	
		1 ... 10 (10x)	248-502	5
		11 ... 20 (10x)	248-503	5
		21 ... 30 (10x)	248-504	5
		31 ... 40 (10x)	248-505	5
		41 ... 50 (10x)	248-506	5
		1 ... 50 (2x)	248-566	5
		K 1 ... K 10 (10x)	248-450	5
		K 11 ... K 20 (10x)	248-451	5
		K 100 (10x)	248-452	5
		U 1 ... U 10 (10x)	248-453	5
		U 11 ... U 20 (10x)	248-454	5
		U 100 (10x)	248-455	5

258

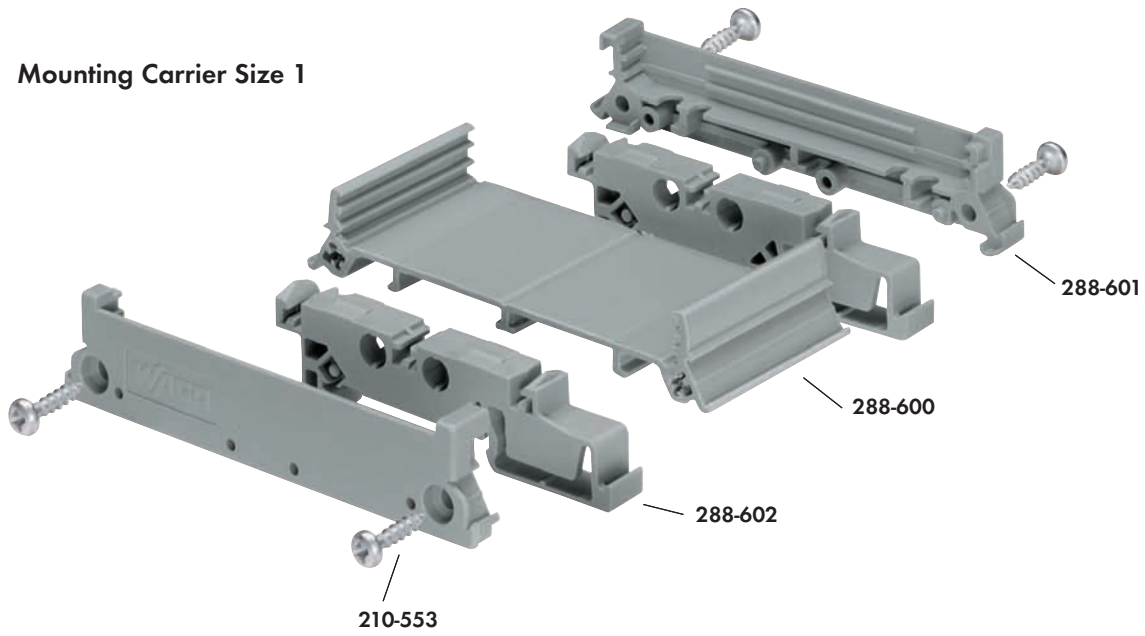
Mounting foot for snap-fit mounting to PCBs, suitable for DIN 35 carrier rail



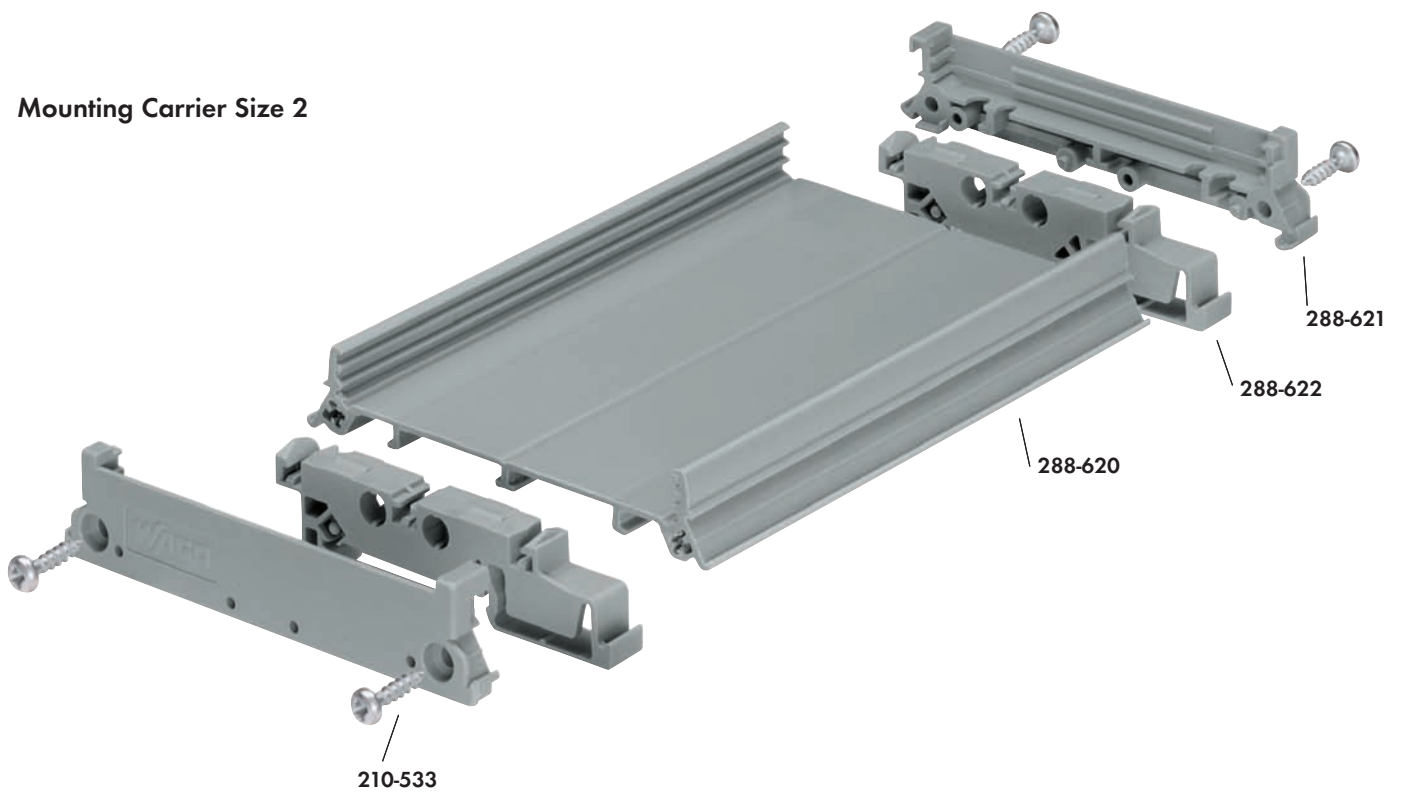
Application notes, Dimensions (in mm)



Mounting Carrier Size 1



Mounting Carrier Size 2

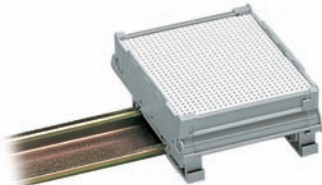


7

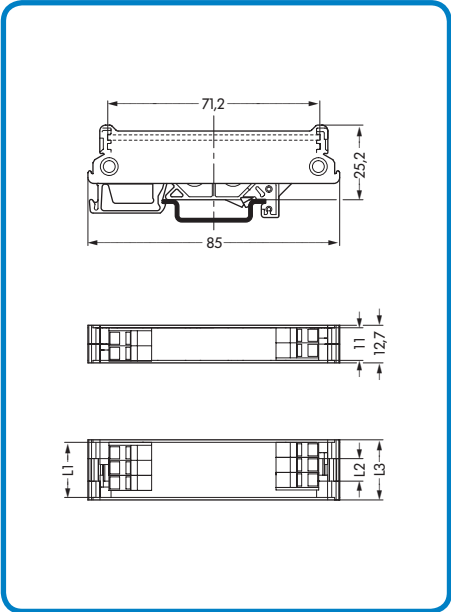
260

Mounting Carrier for DIN-Rail Mounting PCBs

		Mounting carrier, size 1, 85 mm /3.346 in wide, for rail-mounting of 71.2 mm /2.803 in wide PCBs
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	Description	Item-No.	Pack.-unit pcs
	Lateral cover, size 1, small, 6.35 mm /0.25 in thick	288-601	1
	Fixing foot for mounting on DIN 35 rails	288-602	1
	Track section, size 1, 1 m /3'3'' long	288-600	1
	Phillips screw 2.9 x 13*	210-533	25
	* To be used from a module length of 35 mm/1.378 in. For smaller modules the lateral covers have to be riveted. Rivet length depends on module length. Rivets not in the WAGO product range.		
Accessories	Item-No.	Pack.-unit pcs	Dimensions
Marker strips			
7.5x0.5mm on roll 5x1m, white	709-198	1	
Marker strips			
7.5x0.5mm on roll 5x1m, transparent	709-197	1	



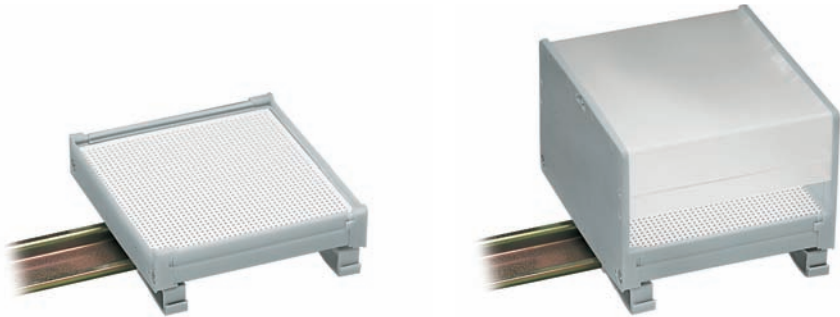
In order to determine the length of a complete mounting carrier:

Length of PCB L1
Length of track section L2 = L1 – 11 mm /0.433 in
Length of mounting carrier L3 = L1 + 1.7 mm/0.067 in

with lateral cover size 1, 6.35 mm/0.25 in thick.

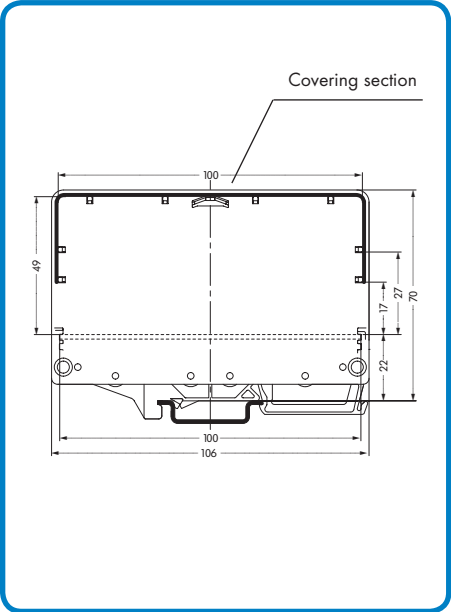
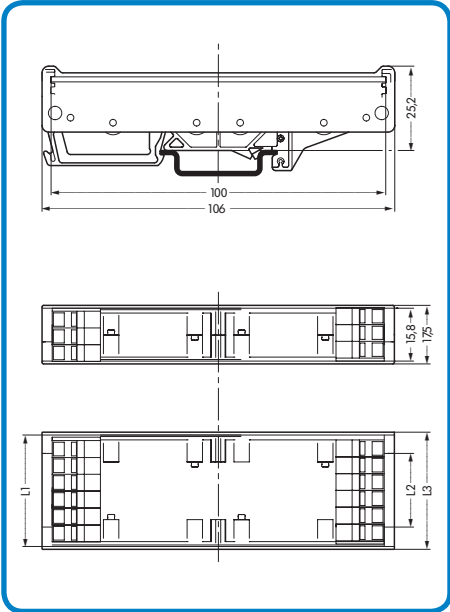
Distance between PCB and upper groove of track section is 5 mm/0.197 in

	Mounting carrier, size 2, small, 106 mm /4.173 in wide, for rail-mounting of 100 mm /3.937 in wide PCBs	Mounting carrier, size 2, large, with covering section
--	--	---



Description	Item-No.	Pack.-unit pcs	Item-No.	Pack.-unit pcs
Lateral cover, size 2, small*, 8.75 mm /0.344 in thick	288-621	1		
Fixing foot for mounting on DIN 35 rails	288-622	1		
Track section, size 2, 1 m /3'3" long	288-620	1		
Lateral cover, size 2, big* 8.75 mm /0.344 in thick			288-626	1
Covering section, size 2, 1 m /3'3" long			288-627	1
* without receptacle for covering section				
Phillips screw 2.9 x 13**				
	210-533	25	210-533	25
** To be used from a module length of 35 mm/1.378 in. For smaller modules the lateral covers have to be riveted. Rivet length depends on module length. Rivets not in the WAGO product range.				

Dimensions



In order to determine the length of a complete mounting carrier:

Length of PCB	L1
Length of track section	L2 = L1 – 15,8 mm/0.622 in
Length of mounting carrier	L3 = L1 + 1.7 mm/0.067 in
Length of covering section	L4 = L1

with lateral cover, size 2, 8.75 mm/0.344 in thick

Distance between PCB and upper groove of track section is 5 mm/0.197 in

**WAGO Application: Stockholm-Arlanda Airport,
Sweden
Automated Passenger Boarding Bridges**

WAGO Products:
WAGO-I/O-SYSTEM with DeviceNet Couplers and
Rail-Mounted Terminal Blocks





Series 790

Shield (Screen) Connecting System

264 – 267



ProServe

Designing, Assembly and Marking
Thermal Transfer Printers and Accessories
Engraving Plotter with Engraver and Accessories

268 – 278



Marking Accessories

WMB Multi Marking System, Miniature Quick Marking Card,
WMB Inline, Marker Cards and Group Marker Carriers

279



Series 211

WAGO Wire and Cable Marking

280 – 281



Series 210

Carrier Rails

282

Series 249 and 210

End Stop for DIN 35 Rails and Angled Support Bracket

283



Series 206

Wire Cutter and Stripping Tools

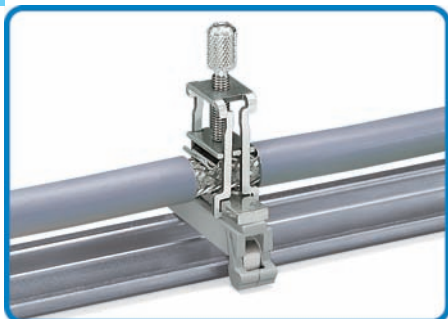
284

Series 206 and 210

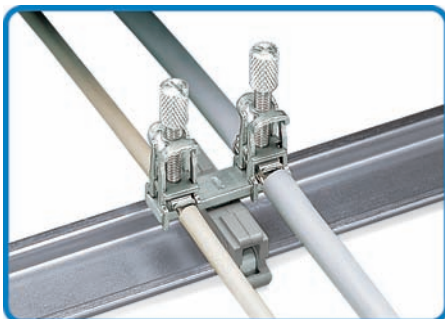
Operating Tools and Voltage Tester

285

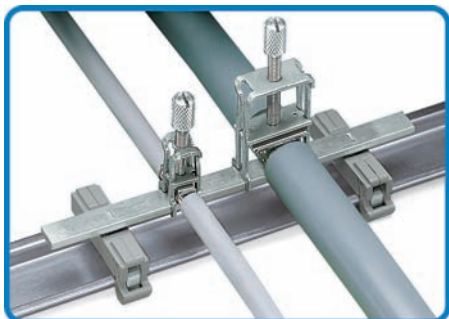
Shield (Screen) Connecting System Description and Handling



Carrier with grounding foot
45 mm/1.772 in long, busbar 90° to the rail
Item-No. 790-113

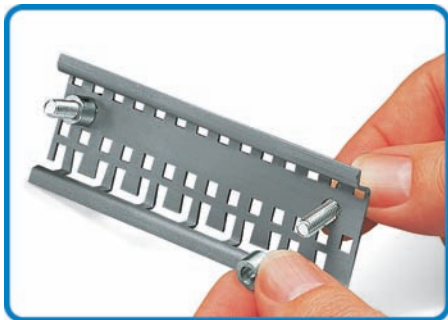


Carrier with grounding foot
45 mm/1.772 in long, busbar parallel to the rail
Item-No. 790-114

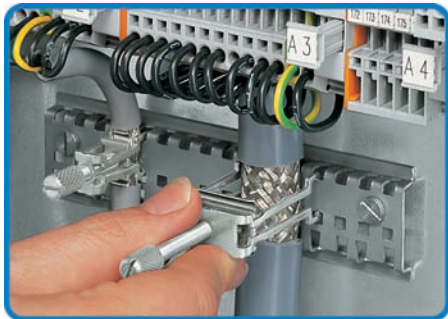
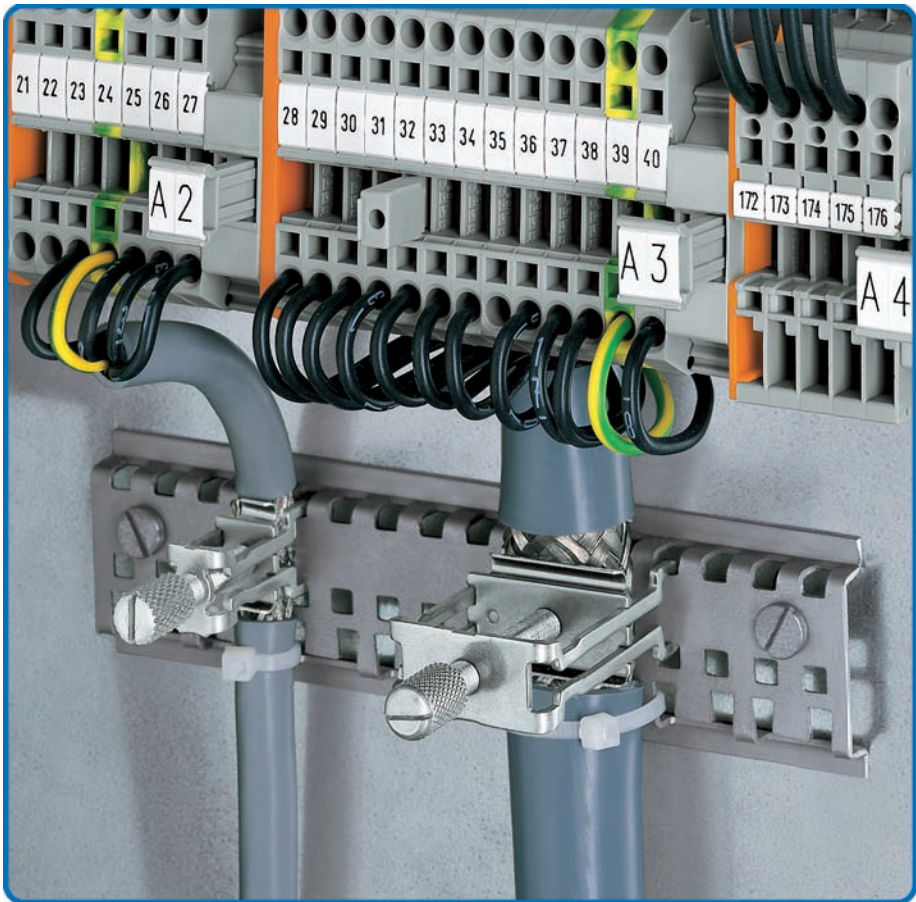


Carrier with 2 grounding feet
125 mm/4.921 in long, busbar parallel to the rail
Item-No. 790-115

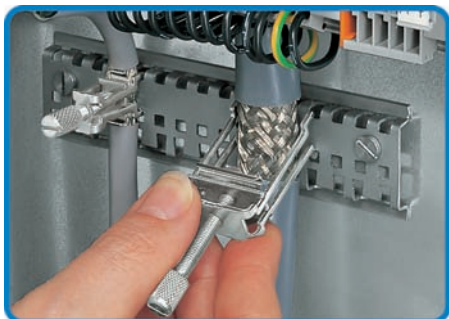
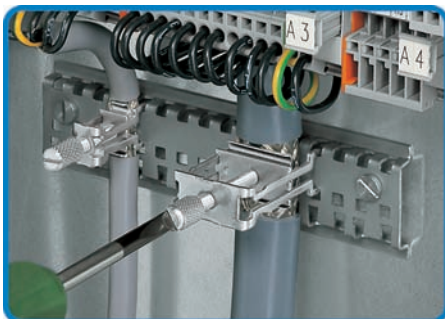
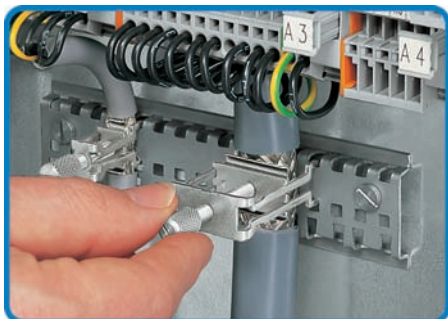
for all sizes of shield (screen) clamping saddles



Using a stand off
with a special slotted carrier rail



Addition of a shield (screen) clamping saddle.

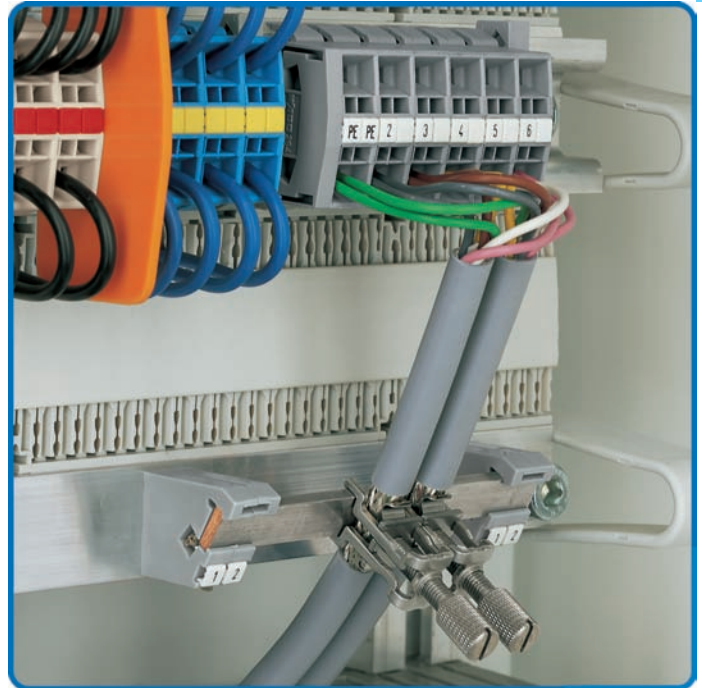


Tightening/releasing a shield (screen) clamping saddle. To attach the clamping saddle, tighten the knurled screw. To remove, unscrew until ratcheted mechanism is released, then slightly tip saddle and remove the clamping saddle.

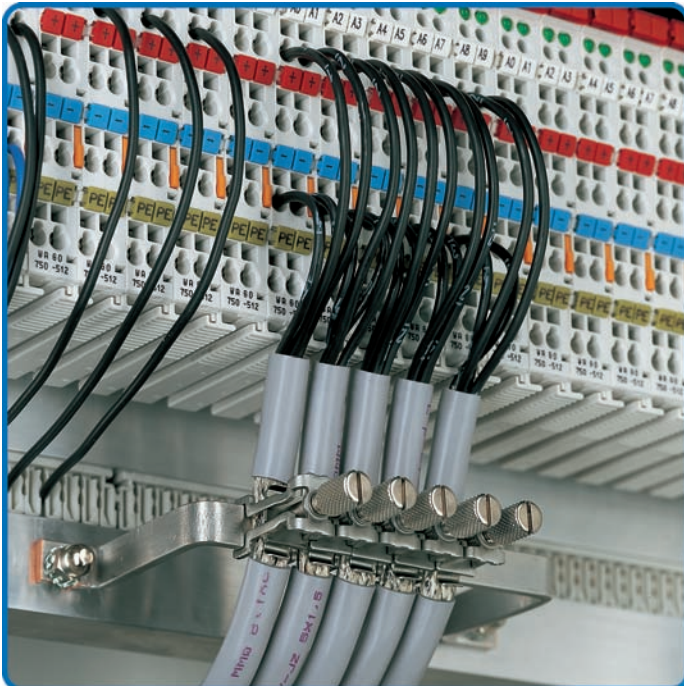
Mounting Options Based on Application



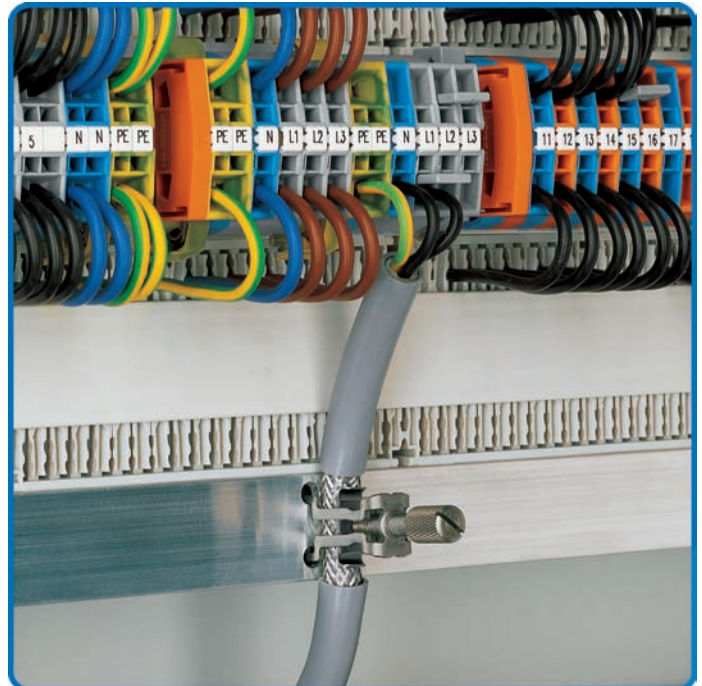
– carrier with grounding foot, busbar parallel to the rail



– isolated mounting carriers for a common shield (screen) reference potential, independent of the housing potential

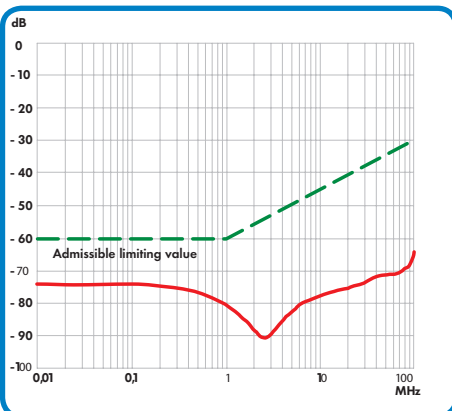


– U-shaped copper busbar 10 mm (0.394 in) x 3 mm (0.118 in)



– snap into any metal plate up to max. thickness 3 mm/0.118 in

Negative shield (screen) attenuation

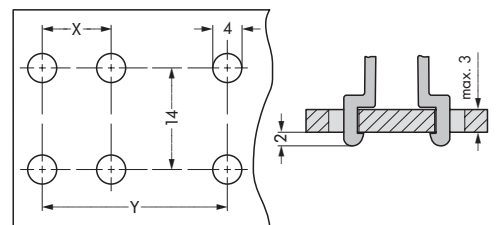


The WAGO shield (screen) connecting system is highly effective because the clamping unit can be brought very close to the unshielded part of the cable. Additionally, the spring material is part of the clamping saddle, giving good electrical connection and compensating for any deformation in the braiding. The system also acts as a partial strain relief.

Hole dimensions for panel mounting

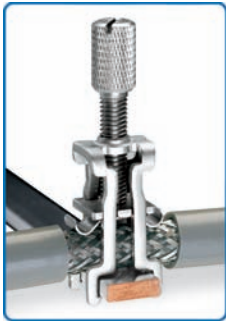
Shield (screen) clamping saddle size

Distance X	11 mm	9.5 mm
Distance Y	19 mm	17.5 mm
	27 mm	25.5 mm
	43 mm	41.5 mm



Shield (Screen) Clamping Saddles and Shield (Screen) Clamps

Shield (Screen)
Clamping Saddles



Description	Diameter of connectable conductor		Item no.	VPE
Shield (screen) clamping saddle, incl. knurled screw	11 mm/0.433 in wide	up to 8 mm/0.315 in	790-108	50 (5x10)
	19 mm/0.748 in wide	7 mm/0.276 in to 16 mm/0.63 in	790-116	50 (5x10)
	27 mm/1.063 in wide	6 mm/0.236 in to 24 m/0.944 in	790-124	50 (5x10)
	43 mm/1.693 in wide	22 mm/0.866 in to 40 mm/1.575 in	790-140	50 (5x10)

Note: Not for ground connections!

Recommended tightening torque: 0.5 Nm

Assembly: The shield (screen) clamping saddle is shipped ready for direct connection to the busbar 10 mm (0.394 in) x 3 mm (0.118 in) or to a drilled mounting plate. After connection, tighten the knurled screw to complete the installation.

Removal: To remove a shield (screen) clamping saddle, unscrew until ratcheted mechanism is released, then slightly tip saddle and remove the clamping saddle.

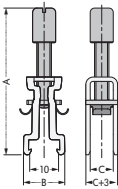
Assembly



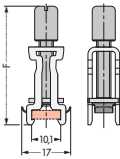
Removal



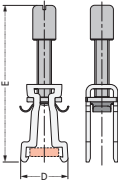
Installation
position delivery



Closed position

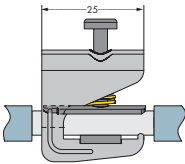
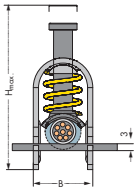


Removal position



Item-No.	Dimensions in mm					
	A	B	C	D	E	F
790-108	51	15	8	16	55	42
790-116	53	15	16	16	57	45
790-124	78	15	24	16	83	58
790-140	97	15	40	16	100	73

Shield (Screen) Clamps



Description	Diameter of connectable conductor		Item no.	VPE
Shield (Screen) Clamps	H _{max} 40 mm, B 10 mm	1.5 mm/0.059 in to 6.5 mm/0.256 in	791-107	50
	H _{max} 47 mm, B 17 mm	5 mm/0.197 in to 11 mm/0.434 in	791-111	50
	H _{max} 63 mm, B 23 mm	10 mm/0.394 in to 17 mm/0.670 in	791-117	50
	H _{max} 78 mm, B 30 mm	16 mm/0.631 in to 24 mm/0.946 in	791-124	50

Note: Not for ground connections!

Accessories for Shield (Screen) Clamping Saddles and Shield (Screen) Clamps

Carrier with Grounding Foot



Description		Item no.	VPE
Carrier with grounding foot	bar 90° to the rail, 10 mm (0.394 in) x 3 mm (0.118 in), bar a. foot - Cu with tin plating, 45 mm/1.774 in long	790-113	25
Carrier with grounding foot	bar parallel to the rail, 10 mm (0.394 in) x 3 mm (0.118 in), bar a. foot - Cu with tin plating, 15 mm/0.591 in long	790-110	25
Carrier with grounding foot	bar parallel to the rail, 10 mm (0.394 in) x 3 mm (0.118 in), bar a. foot - Cu with tin plating, 25 mm/0.986 in long	790-112	25
Carrier with grounding foot	bar parallel to the rail, 10 mm (0.394 in) x 3 mm (0.118 in), bar a. foot - Cu with tin plating, 45 mm/1.774 in long	790-114	25
Carrier with 2 grounding feet	bar parallel to the rail, 10 mm (0.394 in) x 3 mm (0.118 in), bar a. foot - Cu with tin plating, 125 mm/4.929 in long	790-115	25

Suitable Shield (Screen) Clamping Saddle or Shield (Screen)

Clamps for Carrier with Grounding Foot 790-110 = 790-108;

Carrier with Grounding Foot 790-112 = 790-108, 790-116, 791-111, 791-117;

Carrier with Grounding Foot 790-114 = 790-108, 790-116, 790-124, 790-140, 791-107, 791-111, 791-117, 791-124

Carrier Rail



Stand Off



Shield Termination



Description		Item no.	VPE
Carrier rail	special slotted, 1000 mm/3'3" long, Cu with tin plating, special lengths on request	790-145	1
Stand off	for special slotted carrier rail, use M 5 size screw	790-144	200 (2x100)
Shield Termination including cable tie for shield diameter 5 mm /0.197 in to 10 mm /0.394 in	55 mm/2.169 in long	709-350	100 (4x25)
	150 mm/ 5.914 in long	709-352	100 (4x25)

Straight Busbar



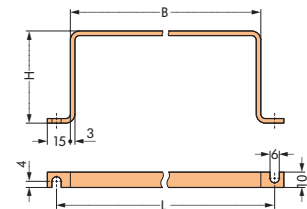
Isolated Mounting Foot



Isolated Mounting Foot

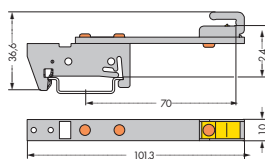


U-Shaped Busbar

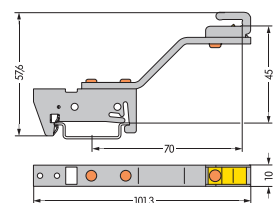


Description		Item no.	VPE
Straight busbar,	1000 mm/3'3" long	210-133	20 (20x1)
10 mm (0.394 in) x 3 mm (0.118 in), bar -	30 mm/1.181 in long	790-133	20 (20x1)
Cu with tin plating	50 mm/1.969 in long	790-134	20 (20x1)
Isolated mounting foot	for busbar, with standard screw M 4 x 8 mm	790-100	50 (2x25)
Isolated mounting foot	for busbar, with sheet metal screw (3.5 x 9) mm	790-101	50 (2x25)
U-shaped busbar,	Dimensions (W x H x L) mm; 63 x 60 x 83	790-190	25 (5x5)
10 mm (0.394 in) x 3 mm (0.118 in),	Dimensions (W x H x L) mm; 100 x 60 x 118	790-191	25 (25x1)
Cu with tin plating	Dimensions (W x H x L) mm; 63 x 35 x 83	790-192	25 (5x5)
	Dimensions (W x H x L) mm; 100 x 35 x 118	790-193	25 (25x1)

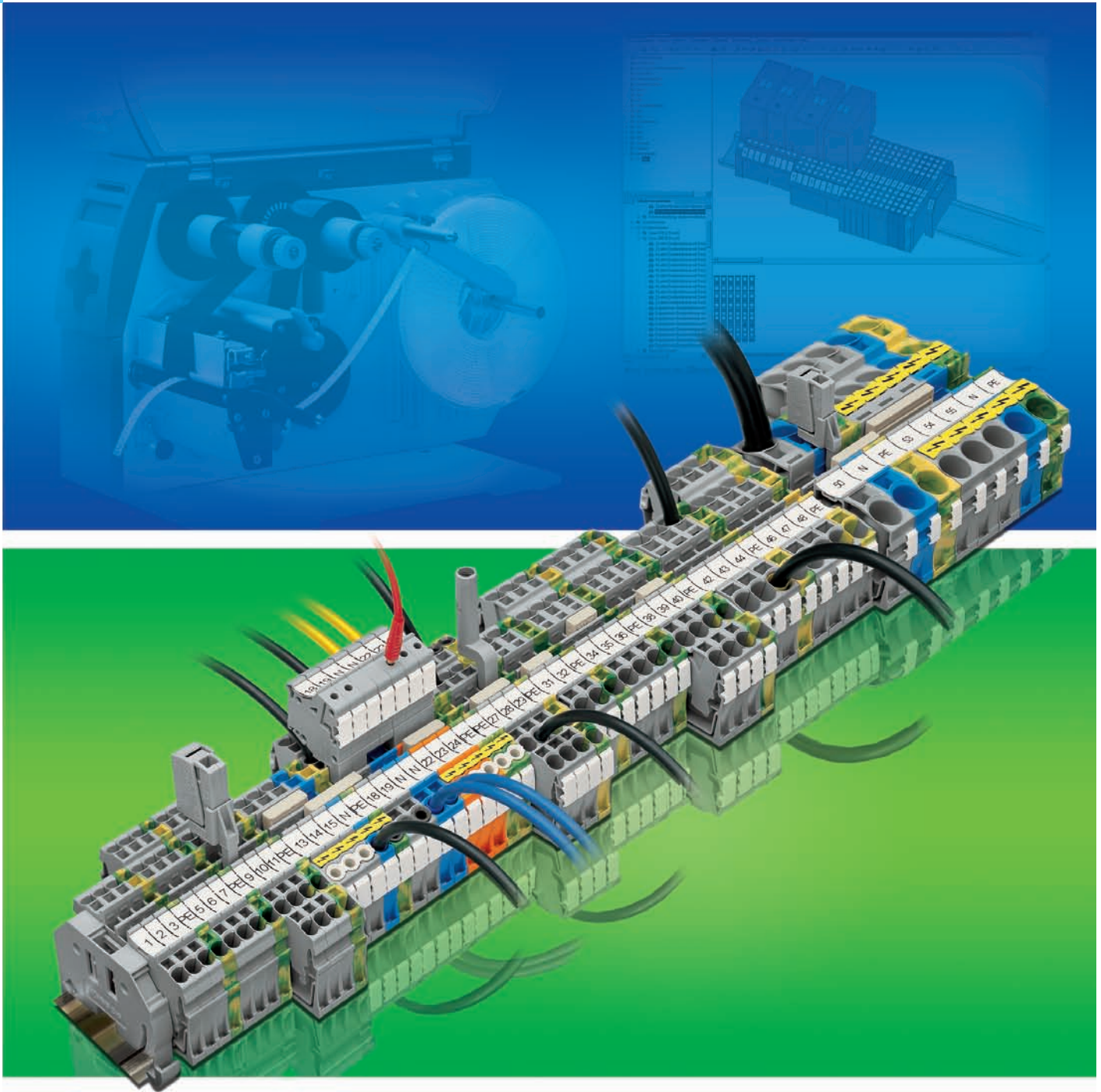
Busbar Carrier

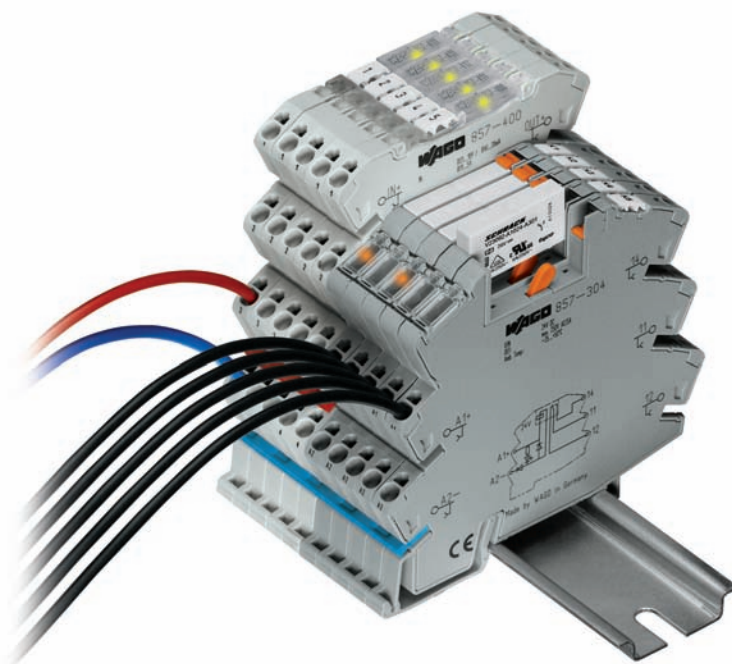


Busbar Carrier, angulate



Description		Item no.	VPE
Busbar Carrier	for busbars, 10 mm (0.394 in) x 3 mm (0.118 in) - Cu with tin plating	790-300	10
Busbar Carrier, angulate	for busbars, 10 mm (0.394 in) x 3 mm (0.118 in) - Cu with tin plating	790-301	10



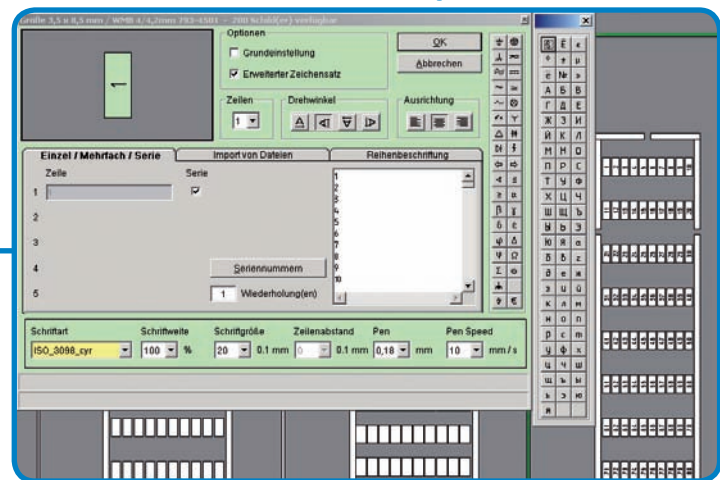


The benefits of ProServe are at your disposal every day. With unique features such as accuracy checking, ProServe does a lot of the work for you, therefore saving you time and money.

Immediate access to professional and sophisticated services allows for error-free applications, higher flexibility in your daily business and better customer service. With 50 years of WAGO expertise at your disposal, put ProServe to work for you in your next application.

ProServe Marking: Now easier than ever

Configuration and marking of rail assemblies and I/O nodes, stand-alone or in combination with CAE systems.



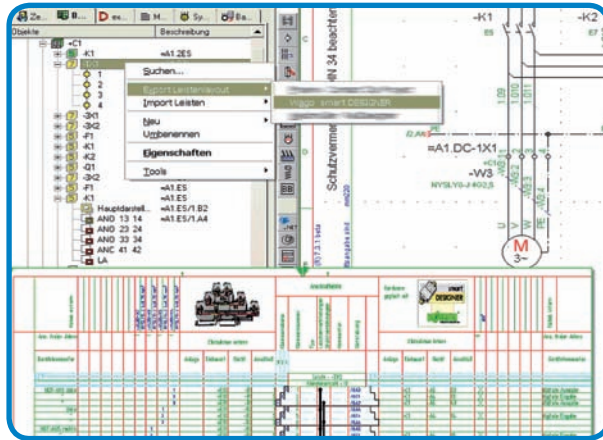
smartMARKING

- Extensive import functions from CAE systems, MS Office and WAGO smartDESIGNER
- WYSIWYG marking
- Automatic plotter calibration
- Extensive library including marker carriers
- Symbol library
- Text length checking
- Different languages available
- Output of East European characters
- Fully compatible with EG 450 engraving unit
- Direct output on thermal transfer printer
- Creation of custom markers for the engraver/plotter

smartMARKING

ProServe: Open for all

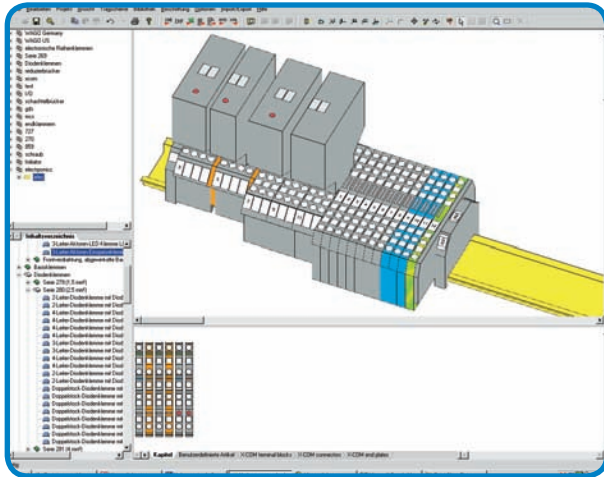
One for all: WAGO ProServe has an interface suitable for most of the standard CAD/CAE systems.



System	Manufacturer	Article master data	Macros	ASCII data to smart-DESIGNER	XML data to smart-DESIGNER	XML data from smart-DESIGNER	XML data from product-LOCATOR
	Aucos	●	●		●	●	●
	Aucotec	●	●		●	●	●
	Aucotec	●	●	●	●	●	●
	Aucotec			●			
	CIM Team	●	●	●	●	●	
	Innotec	●			●	●	
	ECS/MuM	●	●		●	●	
	EPLAN	●	●	●	●	●	●
	Ige-xao	●					
	TCS	●			●	●	
	WS CAD	●	●		●		

ProServe: Planning at a new level

WAGO ProServe means finding instead of searching, drawing instead of scribbling. ProServe navigates safely through the WAGO range of products, generates parts lists and assembly drawings and even 3D views.



smart
DESIGNER

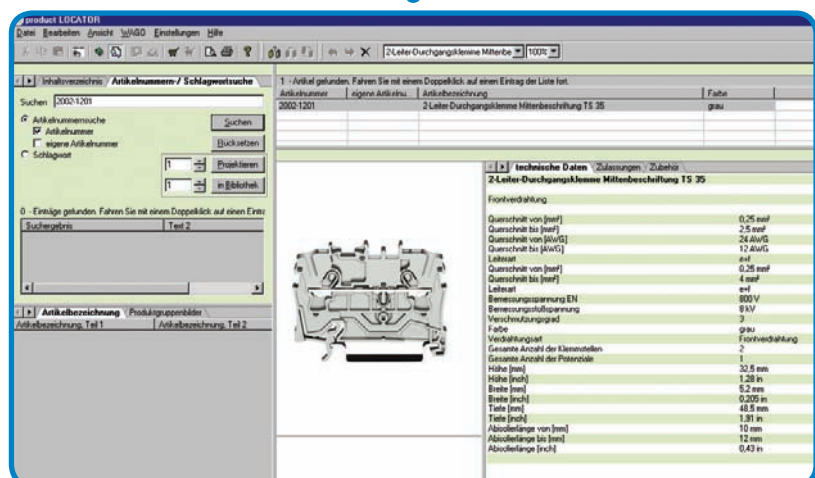
A graphic with a green diagonal band across a white background. The word "product" is in white on the green band on the left, and "LOCATOR" is in white on the green band on the right. In the bottom right corner, there is a small icon of a blue square with rounded corners containing a white circle with a yellow arrow pointing right.

**smartDESIGNER and
productLOCATOR**

- XML interfaces to CAE and M CAD programs
- Output in PDF and HTML
- Different search functions allow for quick selection of products
- Creation of part lists including product pictures and custom part numbers
- Complex rail assemblies can be easily designed in 3D
- Facility to create custom part numbers
- Creation of custom articles to design third-party products
- Default parts (favourites) can be defined individually for time saving design
- Intelligent, user-optimized accuracy check features
- 15 languages available
- 16,000 items

Marking:

- Direct creation and output of marking data to plotter or thermal transfer printer



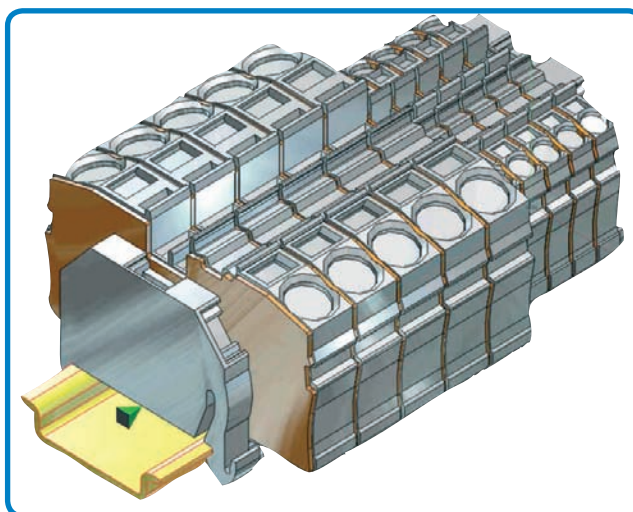
ProServe: Thinking in all dimensions

Rail-mounted terminal blocks are becoming even more efficient and more complex: Multilevel as well as base receptacle terminal blocks with different conductor entry angles can no longer be represented by a simple view. The 3D view provides a clear representation during planning and assembly.

Use our data in your system – now also online.

CAD

DXF - Step - IGS - DWG



- Create your 2D or 3D CAD files from WAGO ProServe. Now also online!

Benefits in overview:

- Quick design
- Quick ordering
- User-friendly
- Extensive and user-specific documentation
- Network compatibility
- Several software products on a single CD (smartDESIGNER, productLOCATOR, smartMARKING, WAGO SCRIPT)
- A price list is included

...all for free!



Thermal Transfer Printer
WAGO TP 343 and TP 298



Consumables for the PrintersTP 298 and TP 343

Item No.	Ink ribbon	Width	Marking Accessories	Printers
258-143	resin/wax	60 mm	Labels (paper) up to 60 mm print width	TP 298 & TP 343
258-144	resin/wax	100 mm	Labels (paper) up to 100 mm print width Wire Marking 211-155 and 211-156	TP 298 & TP 343 TP 298 & TP 343
258-145	resin	38 mm	Marking Strip Series 2009 Marking Strip Series 709 WMB Inline	TP 298 & TP 343 TP 298 & TP 343 TP 298
258-149	resin	50 mm	Marking Strip Series 2009 Marking Strip Series 709 WMB Inline	TP 298 & TP 343 TP 298 & TP 343 TP 298
258-150	resin	76 mm	Cable Marking 211-111 and 211-121 Labels (polyester) 210-707	TP 298 & TP 343 TP 298 & TP 343

Description	Item no.	Pack. unit
Thermal Transfer Printer TP 343	258-343	1
Resolution 300 dpi incl. ProServe Software		
Technical Data		
Printing method	Thermal/thermal transfer	
Printhead system	Thin-film transfer head	
Print resolution	300 dpi	
Print speed	up to 76 mm/sec.	
Print width	6 - 104 mm (0.25" - 4.09")	
Print length	up to 990 mm (39")	
Memory	2 MB DRAM, 1 MB Flash	
Interfaces	Parallel Centronics (LPT), RS-232 (COM), USB	
Sensors	Label sensor (material end, foil end, bottom reflective sensor)	
Other	2 cardboard cores (104 mm) for ink ribbon rewinder	
	Operating instructions in German and English	
Voltage supply	Universal power supply unit	
Operating voltage	AC 100 V ... 240 V / 50 Hz ... 60 Hz	
Dimensions (mm) W x H x L	230 x 200 x 290	
Dimension with winder	approx. 450 mm length	
Enclosure	Double-walled plastic	
Weight	approx. 1800 g	
Available as an option	Ethernet card	
Software	ProServe Version 5.1; smartMARKING	
Safety Approvals	CE, FCC Class A, UL, CUL, TUV	

Description	Item no.	Pack. unit
Thermal Transfer Printer TP 298	258-298	1
Resolution 300 dpi incl. ProServe Software and Print Roller (258-178) for WMB Inline		
Technical Data		
Printing method	Thermal/thermal transfer	
Printhead system	Thick-film	
Print resolution	300 dpi	
Print speed	100 mm/sec.	
Print width	108,4 mm	
See-through/reflective sensor	standard	
Processor 32 Bit ColdFire/clock rate	64 MHz	
Memory	8 MB RAM	
Program memory	4 MB Flash	
Slot for memory card	CompactFlash Type 1	
Interfaces	ETHERNET 10/100 Base T, RS-232 (COM), USB	
Accessories (optional)	Cutter, external unwinder, external rewinder, memory card Compact Flash Type 16-512 MB	
Operating voltage	AC 100 V ... 240 V / 50 Hz ... 60 Hz, PFC	
Dimensions (mm) W x H x L	242 x 274 x 446	
Weight	approx. 9000 g	
Operating temperature	10 °C ... 35 °C	
rel. humidity	30 % ... 85 %	
Safety Approvals	CE, FCC class 1	

Ink ribbon for marker strips



Ink ribbon for labels



External coil mounting system



Cutter TP 298



Spare roller TP 298



Description	Item no.
Ink ribbon for marker strips and WMB Inline	
resin, width 38 mm x 360 mm	258-145
Ink ribbon for labels	
resin/wax, width 60 mm x 300 m	258-143
resin/wax, width 100 mm x 300 m	258-144
Ink ribbon for cable marking	
90 mm/3.54 in width, 300 m roll	258-150
External coil mounting system	
for 300 m rolls (2009-130), for WMB Inline 8,000 markers (2009-135)	258-169
Cutter TP 298	258-161
Spare roller TP 298 labels	(up to item no. 40.000) 258-162
Spare roller TP 298 labels	(up to item no. 40.000) 258-177
Spare roller TP 298 WMB Inline	(up to item no. 40.000) 258-166
Spare roller TP 298 WMB Inline	(up to item no. 40.000) 258-178
Carrying case for TP 298	258-171
Carrying case for TP 297	258-172
Retractable handle for carrying case TP 297 / TP 298	258-173
Label dispenser TP 298	258-165

WMB Inline



Marker card for TT Printer



Marker card for Plotter



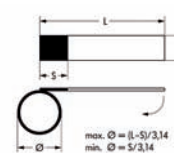
Labels on roll



Labels on DIN A4 sheets

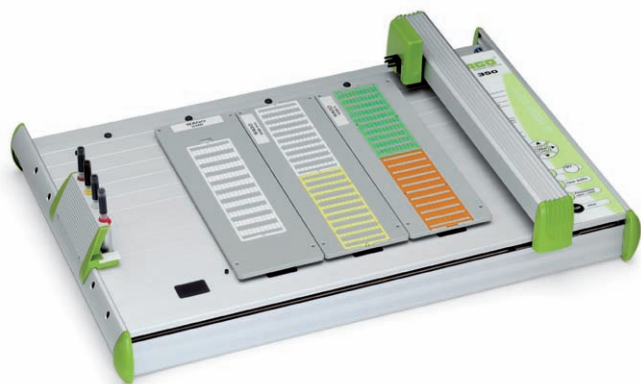


Dimensions of self-laminating label



Description	Item no.
WMB Inline, pitch 5 mm, stretchable, 5 mm ... 5.2 mm, on reel	
white, 1.500 pieces	2009-115
white, 8.000 pieces	2009-135
Marker card for	
TT Printer, 12 mm	211-111
Plotter, 12 mm (the receptacle 258-370 is required for plotting)	211-110
Marker card for	
TT Printer, 23 mm	211-121
Plotter, 23 mm (the receptacle 258-370 is required for plotting)	211-120
Labels on roll for thermal transfer printer	
Marker surface "S"=8 mm, "B"=18 mm, "L"=35 mm for max. cable Ø 9 mm, 9.000 labels per roll	211-155
Marker surface "S"=13 mm, "B"=23 mm, "L"=51 mm for max. cable Ø 12 mm, 5.000 labels per roll	211-156
Labels on DIN A4 sheets for laser printer (the receptacle 258-383 is required for plotting)	
Marker surface "S"=9 mm, "B"=17 mm, "L"=35 mm for max. cable Ø 8 mm, 70 labels per roll	211-150
Marker surface "S"=13 mm, "B"=21 mm, "L"=56 mm for max. cable Ø 14 mm, 32 labels per roll	211-151
Marking sleeve* 12 mm, for wire Ø	
1.6 mm ... 3.2 mm or 0.25 mm ² ... 1.5 mm ²	211-112
2.2 mm ... 4.5 mm or 0.5 mm ² ... 4 mm ²	211-113
3.7 mm ... 5.9 mm or 2.5 mm ² ... 6 mm ²	211-114
4.8 mm ... 7.5 mm or 6 mm ² ... 16 mm ²	211-115
Marking sleeve* 23 mm, for wire Ø	
1.6 mm ... 3.2 mm or 0.25 mm ² ... 1.5 mm ²	211-122
2.2 mm ... 4.5 mm or 0.5 mm ² ... 4 mm ²	211-123
3.7 mm ... 5.9 mm or 2.5 mm ² ... 6 mm ²	211-124
4.8 mm ... 7.5 mm or 6 mm ² ... 16 mm ²	211-125
Marking sleeve* for cable tie	211-129
Cable tie (2.5 x 100) mm	807-090/101-100

Plotter IP 350 A3 / Plotter IP 350 A4

[illegible]

Description	Item no.	Pack. unit
EG 450 Engraver	258-450	1
as an extension of IP 350 Flat Plotter. Consisting of "EC 450" Control Unit and "VC 450" Vacuum Cleaner, including graver 0.3 mm + 0.4 mm		
Technical Data		
1. Engraving spindle		
Speed	min. 5000 rpm, max. 50000 rpm	
Torque	6 Ncm	
Frequency	83 Hz ... 830 Hz	
Energy consumption max.	60 W	
Collets	Diameter of mandrel 3 mm	
Tensioning mechanism	Head tension	
Run-out with collet	0.03 mm	
Motor type	three-phase, asynchronous, brushless	
Enclosure	Aluminium	
Clamping diameter	25 mm	
Type of ball bearing	Steel, permanent lubrication	
Cooling system	integrated fan	
Field of application	exclusively engraving	
Operating time of bearing	min. 1000 hrs if handled properly	
Attention: Never clean engraving spindle using compressed air, do not use lubricants when engraving.		
2. Control unit VEB 500		
Operating voltage	AC 100 V ... 240 V / 50 Hz ... 60 Hz	
3. Vacuum cleaner VC 500		
Vacuum cleaner bag	Typ Y98	
General Specifications		
Dimensions (mm) W x H x L	Control unit + Vacuum cleaner 240 x 290 x 315 (an top of each other)	
Weight	Engraving spindle + Control unit + Vacuum cleaner + Accessories 8 kg	

Full plotter package



Description	Item no.
Version 1 1 plotter incl. power supply and centronics cable; 1 ProServe Software; 4 WMB carrier plates 5 mm/0.197 in;	258-350/000-001
20 WMB marker cards 5 mm/0.197 in;	
1 Plotter Pen, line width 0.25 mm disposable; 1 Plotter Pen, line width 0.35 mm disposable	
Version 2 1 plotter incl. power supply and centronics cable; 1 ProServe Software; 4 WSB carrier plates; 20 WSB marker cards;	258-350/000-002
1 Plotter Pen, line width 0.25 mm disposable;	
1 Plotter Pen, line width 0.35 mm disposable	
Version 3 1 plotter incl. power supply and centronics cable; 1 ProServe Software; 2 WMB (5 mm/0.197 in) carrier plates;	258-350/000-003
2 miniature WSB carrier plates; 10 WMB (5 mm/0.197 in) marker cards; 10 miniature WSB marker cards;	
1 Plotter Pen, line width 0.25 mm disposable; 1 Plotter Pen, line width 0.35 mm disposable	
Version 4 1 plotter incl. power supply and centronics cable; 1 ProServe Software; 1 WMB carrier plate 5 mm/0.197 in;	258-350/000-004
1 WSB carrier plate 5 mm/0.197 in; 1 miniature WSB carrier plate; 1 WSB carrier plate 4 mm/0.157 in;	
5 WMB marker cards 5 mm/0.197 in; 5 WSB marker cards 5 mm/0.197 in; 5 miniature WSB marker cards;	
5 WMB marker cards 4 mm/0.157 in; 1 Plotter Pen, line width 0.25 mm disposable; 1 Plotter Pen, line width 0.35 mm disposable	

Plotter is suitable for marking any type of WAGO marker card or competitor's markers. Includes the ProServe DVD-ROM and WAGO smartMARKING software.

Plotter accessories



Description	Item no.
WAGO Plotter Pen	line width 0.18 mm/0.007 in
	line width 0.25 mm/0.010 in
	line width 0.35 mm/0.014 in
	line width 0.50 mm/0.020 in
WAGO Plotterpen (Disposable)	line width 0.18 mm/0.007 in
	line width 0.25 mm/0.010 in
	line width 0.35 mm/0.014 in
Cover	
Service Kit	(4 alternative pen storage units)
WAGO Cleaning Set	suitable for cleaning all EKS Pens
WAGO Pen Cleaner	
WAGO Ink Cartridges	black, for permanent marking, not refillable (5 x 1 ml)
Graver set	line width 0.2/0.3/0.4/0.5/0.7/1.0 mm
Graver	line width of graver 0.2 mm
	line width of graver 0.3 mm
	line width of graver 0.4 mm
	line width of graver 0.5 mm
	line width of graver 0.7 mm
	line width of graver 1.0 mm
Vacuum cleaner bag for Engraver EG 450	

The WAGO Plotter Pen is suitable for any kind of smooth surfaces. No additional adapter is required.

Marker card carrier
plates for plotter IP 350



Description		Item no.
Carrier plates for marker cards	WSB 5 mm/0.197 in (209-501)	258-361
	WSB 4 mm/0.157 in (209-701)	258-362
	Miniature WSB (248-501)	258-363
	Group marking carriers (209-112)	258-364
	WCB (249-200)	258-366
	WTB (799-501)	258-367
	WMB 5/5.2 mm (793-5501); WMB 4/4.2 mm (793-4501)	258-368
	Marker tags (209-199 + 209-200)	258-369
	Marker strips (2009-110 + 2009-130 and 790-...)	258-410
	WMB-Inline (2009-115 + 2009-135)	258-412
Carrier plates for murrplastik	MP-400; KS 4/12, 4/18, 4/23, 4/30	258-370
	MP-401; KES, KLG, KMR, KPX, KS 15x17/27/49/67, KSA, KSF, KSI, KSK, KSO, KSS, KTE, KWI, SKS, WGO, KAB	258-371
	BS 5/6	258-397
	KPX	258-396
	KSEX; 10/500	258-470
	KSEX; 18/500	258-471
Carrier plates for Conta-Clip	Universal	258-398
Carrier plates for Phoenix	ZBM	258-372
	ZB	258-373
	ZBN	258-374
	ZBFM	258-375
	BNZ	258-377
	BN-ZB	258-378
	SS-ZB	258-379
	LBHZ	258-380
	PAB	258-381
	GPE	258-382
Universal Carrier plates	DIN A4	258-383
	DIN A3	258-472
Carrier plates for Weidmüller	MC Universal	258-387
	MC SF4-6	258-388
Carrier plates for Wörtz/Allen Bradley	Universal	258-389
Carrier plates for Möller	XB M22-XST	258-390
Carrier plates for Partex	PA+1	258-391
	PA+2	258-392
	PK2 PVC	258-393
	PA+ 2	258-399
Carrier plates for ABB Entelec	Universal	258-394
	Siemens SPS	258-473

Marking System

WMB Multi marking system



Miniature quick marking card



Colored marker cards



WMB Inline



Description		Item No.	VPE
WMB Multi marking system			
Marker cards WMB 5 – 5.2 mm/0.197 in – 0.205 in	plain	793-501	5 cards
Marker cards WMB 4 – 4.2 mm/0.157 in – 0.165 in	plain	793-4501	5 cards
Marker cards WMB 5 – 5.2 mm/0.197 in – 0.205 in	plain	793-5501	5 cards
Miniature WSB quick marking system	plain	248-501	5 cards
Marker cards and tags WSB 4 mm/0.157 in (plain)	plain	209-701	5 cards
Additional item no. for colored marker cards	yellow	.../000-002	5 cards
	red	.../000-005	5 cards
	blue	.../000-006	5 cards
	gray	.../000-007	5 cards
	orange	.../000-012	5 cards
	light green	.../000-017	5 cards
	green	.../000-023	5 cards
	violet	.../000-024	5 cards
WMB Inline, pitch 5 mm, stretchable, 5 mm ... 5.2 mm, on reel			
	white, 1.500 pieces	2009-115	1 Coil
	white, 8.000 pieces	2009-135	1 Coil

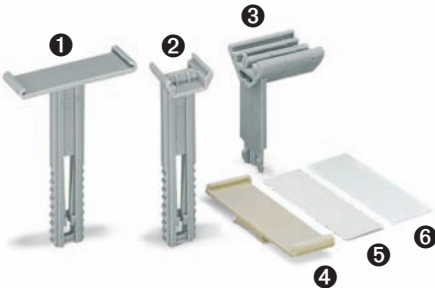


Separation of a strip from the WMB Marker card



Stretching of a strip, stretchable from 4 mm up to 4.2 mm, stretchable from 5 mm up to 5.2 mm

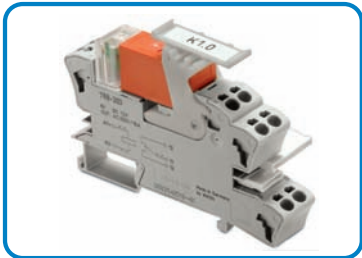
Group marker carrier



Group marker carrier adjustable in height 249-118 for end stops



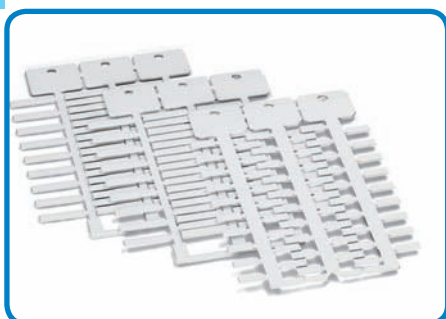
Group marker carrier 209-112 to be on Series 788 relay sockets with pluggable miniature switching relay



Description		Item No.	VPE
Mini-WSB-Schnellbezeichnungssystem, for end stops 249-116 and 249-117	for 1 marker card or self-adhesive label and transparent cover protection	249-119 ❶	50 (2x25)
	for 2 WSB Quick markers or 1 x continuous marking strip	249-118 ❷	100 (4x25)
Group marker carrier	for up to 3 WMB markers, 15 mm/0.591 in wide	209-140 ❸	50 (2x25)
Group marker carrier	for snapping into screwless end stops, 10 mm/0.394 in wide	209-112 ❹	100 (2x50)
Marker card	from white cardboard, for self-marking, 100 markers per sheet	209-113 ❺	100 (100x1)
Protection cover	transparent	209-114 ❻	500 (10x50)

WAGO Wire and Cable Marking

Wire marking



The following marker cards are available:
Marker cards for plotter marking ...



... or marker cards on roll
for thermal transfer printing



Slide the marker card into the marking sleeve
receptacle.
Changing the marking is also
possible after the wire has been connected



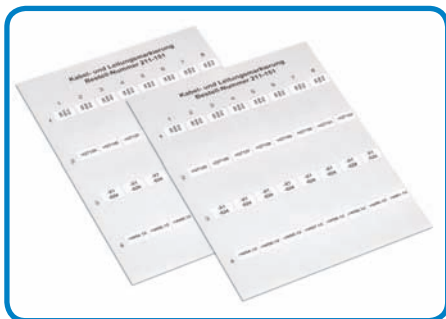
Remove the rest of the card by twisting it off



Fix the marking sleeve 211-129 using cable ties to
individual wire or cable



Cable marking



Self-laminating labels are available on A4 sheets
for the laser printer (plotter) ...



... or are supplied on roll for the thermal transfer
printer



Remove the printed label from the sheet or roll and
wrap it around the wire or cable.
The transparent laminate protects the marking

Marking sleeve
12 mmMarking sleeve
23 mmMarking sleeve
23 mm, for cable tie

Description		Item no.	Pack. unit
Marking sleeve* 12 mm, for wire Ø	1.6 mm ... 3.2 mm or 0.25 mm ² ... 1.5 mm ²	211-112	2000
	2.2 mm ... 4.5 mm or 0.5 mm ² ... 4 mm ²	211-113	2000
	3.7 mm ... 5.9 mm or 2.5 mm ² ... 6 mm ²	211-114	1000
	4.8 mm ... 7.5 mm or 6 mm ² ... 16 mm ²	211-115	1000
Marking sleeve* 23 mm, for wire Ø	1.6 mm ... 3.2 mm or 0.25 mm ² ... 1.5 mm ²	211-122	2000
	2.2 mm ... 4.5 mm or 0.5 mm ² ... 4 mm ²	211-123	2000
	3.7 mm ... 5.9 mm or 2.5 mm ² ... 6 mm ²	211-124	1000
	4.8 mm ... 7.5 mm or 6 mm ² ... 16 mm ²	211-125	1000
Marking sleeve* for cable tie	23 mm, for wires from 10 mm ²	211-129	1000
Cable tie (2.5 x 100) mm		807-090/101-100	25

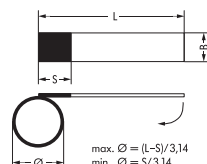
* halogen-free

Marker card



Description		Item no.	Pack. unit
Marker card for	TT Printer, 12 mm	211-111	1
	Plotter, 12 mm (the receptacle 258-370 is required for plotting)	211-110	18
Marker card for	TT Printer, 23 mm	211-121	1
	Plotter, 23 mm (the receptacle 258-370 is required for plotting)	211-120	30

Labels on roll

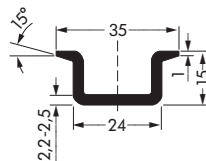
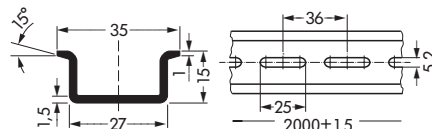
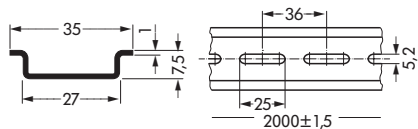
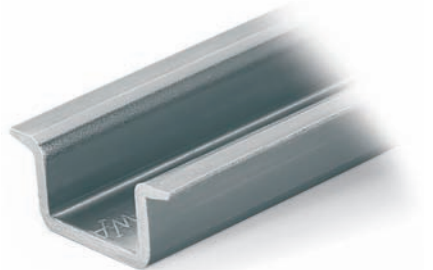
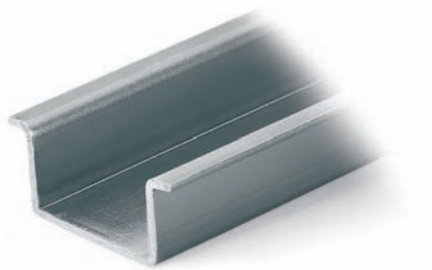
Labels on
DIN A4 sheetsDimensions of
self-laminating label

Description		Item no.	Pack. unit
Labels on roll for thermal transfer printer	Marker surface "S"=8 mm, "B"=18 mm, "L"=35 mm for max. cable Ø 9 mm,	211-155	1
	9.000 labels per roll		
	Marker surface "S"=13 mm, "B"=23 mm, "L"=51 mm for max. cable Ø 12 mm,	211-156	1
	5.000 labels per roll		
Labels on DIN A4 sheets for laser printer (the receptacle 258-383 is required for plotting)	Marker surface "S"=9 mm, "B"=17 mm, "L"=35 mm for max. cable Ø 8 mm,	211-150	20
	70 labels per roll		
	Marker surface "S"=13 mm, "B"=21 mm, "L"=56 mm for max. cable Ø 14 mm,	211-151	25
	32 labels per roll		

Carrier rail 35 x 7.5 mm,
1 mm/0.039 in thick,
acc. to EN 50022,
Steel, galvanized and yellow chromated
I_N 76 A (referred to a length of 1 m)

Carrier rail 35 x 15 mm,
1.5 mm/0.059 in thick,
analogous with EN 50022,
Steel, galvanized and yellow chromated
I_N 125 A (referred to a length of 1 m)

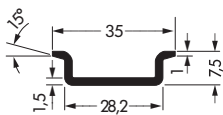
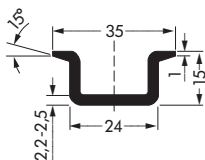
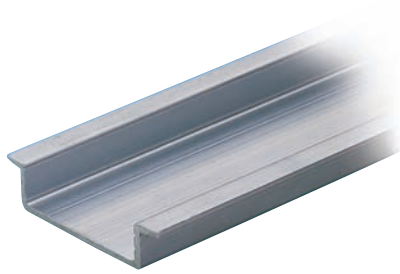
Carrier rail 35 x 15 mm,
2.3 mm/0.091 in thick,
acc. to EN 50022,
Steel, galvanized and yellow chromated
I_N 125 A (referred to a length of 1 m)



Item-No.	Pack.-unit pcs	Item-No.	Pack.-unit pcs	Item-No.	Pack.-unit pcs
2 m/6'6" long		2 m/6'6" long		2 m/6'6" long	
Steel rail 35x7.5 mm, 1 mm/0.039 in th., unslotted		Steel rail 35x15 mm, 1.5 mm/0.059 in th., unslotted		Steel rail 35x15 mm, 2.3 mm/0.091 in th., unslotted	
210-113	10	210-114	10	210-118	10
Steel rail 35x7.5 mm, 1 mm/0.039 in th., slotted		Steel rail 35x15 mm, 1.5 mm/0.059 in th., slotted			
210-112	10	210-197	10		

Carrier rail 35 x 15 mm,
2.3 mm/0.091 in thick,
acc. to EN 50022,
Copper, unplated
I_N 309 A (referred to a length of 1 m)

Carrier rail 35 x 7.5 mm,
1.5 mm/0.059 in thick,
analogous with EN 50022,
Aluminum, unplated
I_N 76 A (referred to a length of 1 m)

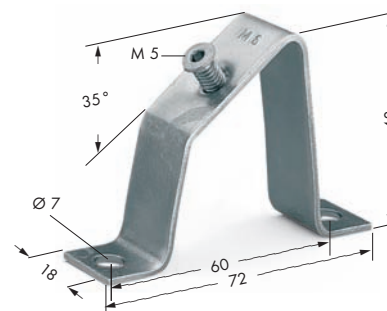
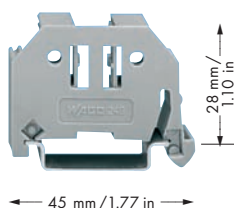
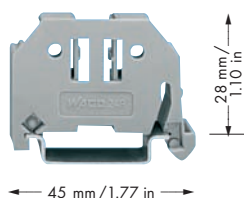


Attention!
The components of series 750 and 752 have a direct electrical contact to the rail in order to conduct electromagnetic disturbances.
Please see that the electrical connection is always in a perfect condition.
Oxidation may reduce conductivity.

Item-No.	Pack.-unit pcs	Item-No.	Pack.-unit pcs
2 m/6'6" long		2 m/6'6" long	
Copper carrier rail 35 x 15 mm, 2.3 mm/0.091 in thick, unslotted		Aluminum carrier rail 35 x 7.5 mm, 1.5 mm/0.059 in thick, unslotted	
210-198	10	210-196	10

End Stop for DIN 35 Rails and Angled Support Bracket

End stop for DIN 35 rail, End stop width 6 mm / 0.236 in	End stop for DIN 35 rail, End stop width 10 mm / 0.394 in	Angled support bracket steel, zinc-plated and yellow chromated
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Item-No.	Pack.-unit pcs	Item-No.	Pack.-unit pcs	Item-No.	Pack.-unit pcs
End stop, for DIN 35 rail 6 mm/0.236 in wide		End stop , for DIN 35 rail 10 mm/0.394 in wide		Angled support bracket, without screw	
249-116	100 (4*25)	249-117	50 (2*25)	210-148	10
				Screw M 5 x 8	
				210-149	100 (5*20)

Application Notes

Simply snap on – and forget!

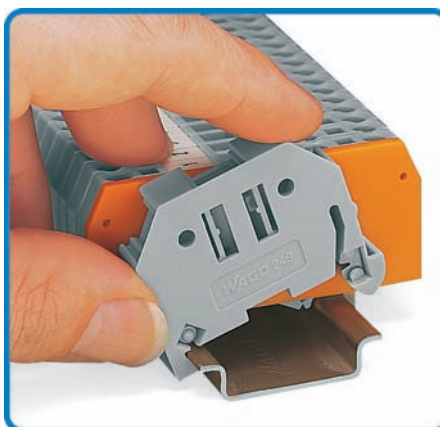
Assembling the WAGO screwless end stops is as simple and quick as snapping a WAGO rail-mounted terminal block onto the rail.

Without any tools!

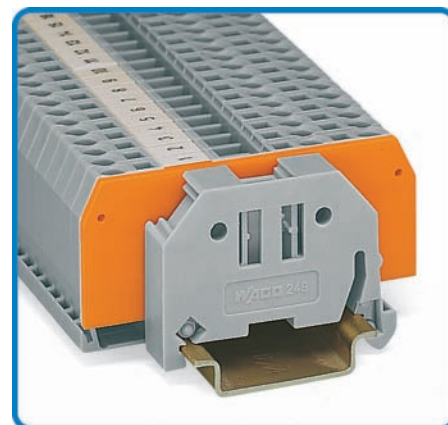
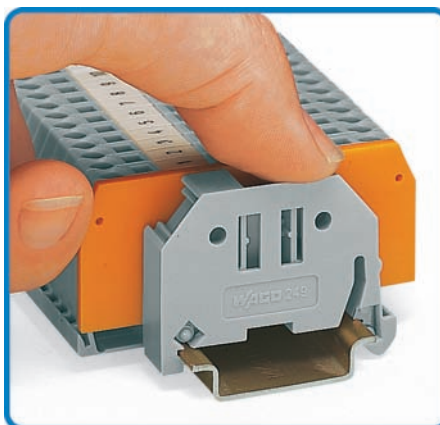
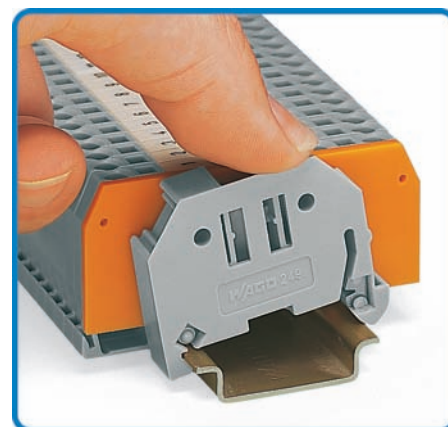
This way rail-mounted terminal blocks are safely secured at low cost against any movement on all carrier rails DIN 35 acc. to DIN EN 50 022 (35 x 7.5 mm; 25 x 15 mm).

Entirely without screws!

The “secret” of the excellent tight fit lies in the two small clamping plates which keep the end stop in position, even if the rails are mounted vertically.



Snap on . . .



... that's it!

Wire Cutter and Stripping Tools

Microstrip wire stripper 0.14 mm ² – 1.5 mm ² /AWG 24-16 solid and stranded, with wire cutter up to 1.5 mm ² /AWG 16 solid and stranded Weight 76 g/0.166lbs	Quickstrip 10 wire stripper 0.08 mm ² – 10 mm ² /AWG 28-8 stranded (6 mm ² /AWG 10 solid), with wire cutter up to 10 mm ² /AWG 8 stranded (6 mm ² /AWG 10 solid) Weight 210 g/0.463 lbs	Quickstrip 16 wire stripper 4 mm ² – 16 mm ² /AWG 12 – 6 stranded (6 mm ² /AWG 10 solid), with wire cutter up to 10 mm ² /AWG 8 stranded (6 mm ² /AWG 10 solid) Weight 210 g/0.463 lbs
---	--	---



Item-No.	Pack.-unit pcs	Item-No.	Pack.-unit pcs	Item-No.	Pack.-unit pcs
Microstrip wire stripper and cutter		Stripping and cutting tool Quickstrip 10		Stripping and cutting tool Quickstrip 16	
206-501	1	206-124	1	206-125	1
Accessories					
	Spare stripping unit, complete		Standard blade cassette		Blade cassette 16 mm²/AWG 6
206-502	1	206-126	1	206-128	1
	Spare blade, for wire cutter		"V" blade cassette		
206-503	1	206-127	1		

Application Notes

- Automatic adjustment to wire size.
- No damage to wire strands.
- Gripping pressure of jaws adjusts automatically to wire insulation diameter.
- Full cycle strip - jaws open after stripping, ensures no nicked strands.
- Exact strip length may be set by sliding of red setting stop.
- Replaceable stripping jaw assembly.
- Self-sharpening, fully protected wire cutter, also replaceable.*

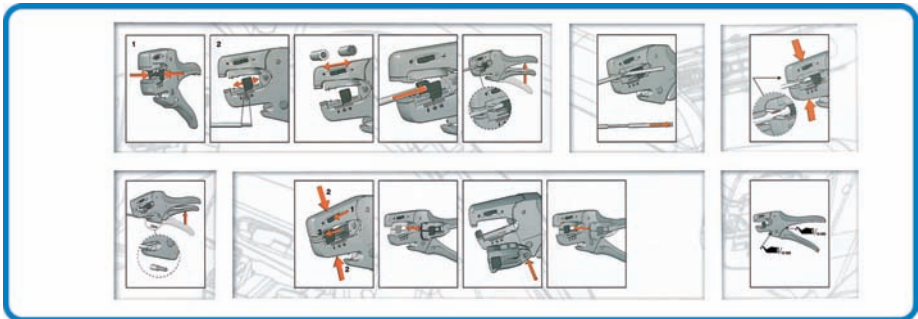
* for Microstrip



Quickstrip 10. Cutting of wire



Quickstrip 10. Stripping of wire



Operating instructions are enclosed in the packaging.

Operating Tools and Voltage Tester

Wire cutter acc. to VDE for copper and aluminum wires up to 35 mm ² /AWG 2 Weight 200 g/0.441 lbs	Screwdriver with partially insulated shaft for optimum handling of CAGE CLAMP® con- nection in terminal blocks and connectors	Voltage tester "Profipol" AC 12 V to 400 V DC 12 V to 500 V Weight 138 g/0.304 lbs
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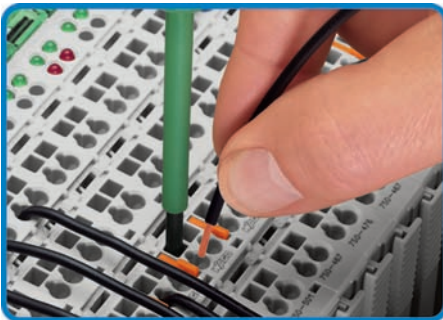


Item-No.	Pack.-unit pcs	Item-No.	Pack.-unit pcs	Item-No.	Pack.-unit pcs
Wire cutter		Screwdriver with partially insulated shaft,		Voltage tester "Profipol"	
206-118	1	type 1, blade 2.5 x 0.4 mm/0.098 x 0.016 in for series 750, 752, 753		206-802	1
		210-619	1	Voltage range AC 12 V to 400 V	
				DC 12 V to 500 V	
		Screwdriver with partially insulated shaft,		LED indication AC 12 V, 50 V, 100 V, 230 V, 400 V	
		type 2, blade 3.5 x 0.5 mm/0.137 x 0.020 in for series 750		DC 12 V, 60 V, 120 V, 280 V, 500 V	
		210-620	1	Degree of protection IP 65	
		Screwdriver with partially insulated shaft,		Operating time 30 s max.	
		- Set -,		Temperature range -10° to +50°C	
		type 1 and 2 see above			
		type 3, blade 5.5 x 0.8 mm/0.217 x 0.031 in			
		210-622	1		

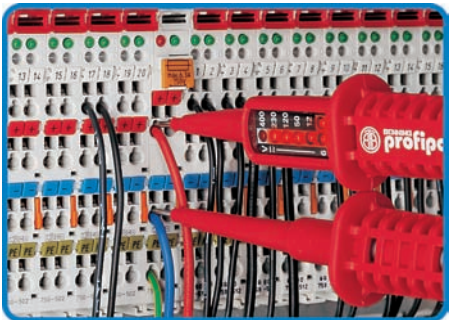
Application Notes



Cutting of wire

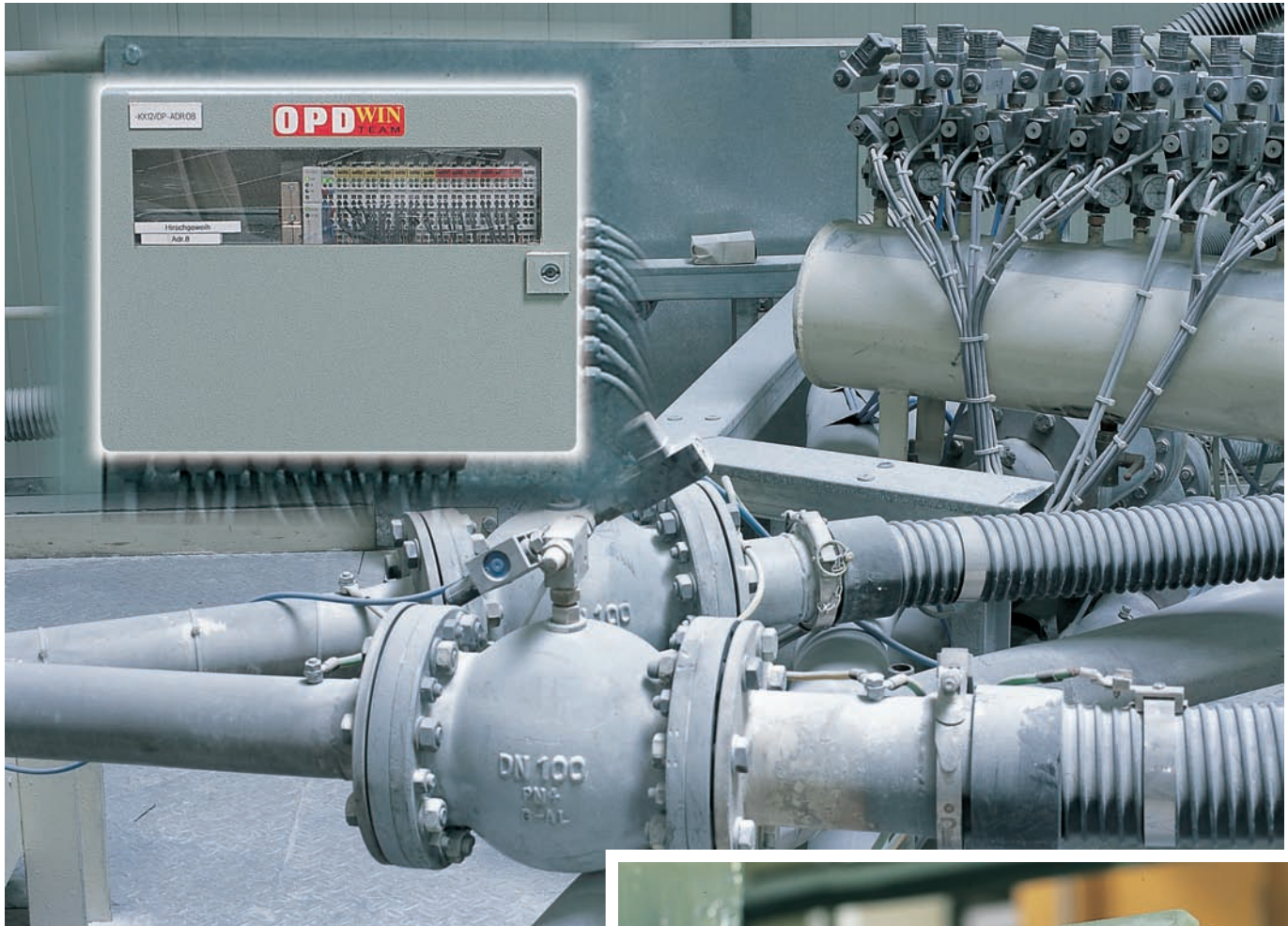


The screwdrivers are particularly appropriate for the operation of front-entry terminal blocks and connectors.
(the picture shows the I/O-System 750).



Voltage testing at the I/O-System 750

- LED band provides clear voltage range readings
(white scale = AC voltage
red scale = DC voltage)
- LED indication of polarity
- double-pole voltage testing
- IP 65 type of protection
- switching is not necessary
- 85 cm long highly flexible and nonskid test cable



**WAGO Application: Opdenhoff Technologie GmbH
in Hennef, Germany**

Control Systems for Weighing, Mixing and
Conveyance of Bulk Material and Liquids

WAGO Products:
WAGO-I/O-SYSTEM with PROFIBUS Couplers,
Rail-Mounted Terminal Blocks





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Product Support From

Consulting Services

- Selection of the fieldbus
- Use of components
- Combination of components
- Cooperation with other suppliers



- Contact:
Your national WAGO company
or distributor.

The Very Beginning...

Experienced

- Trained staff
- PLC & PC control
- Multiple Fieldbuses
- Programming languages
- Projects:

Automotive industry

Machine building

Chemical industry

Food processing

Building automation

Process engineering

Process control

and many more



We will help you

- Product documentation
- Manuals
- Application Notes
- By telephone
- On-site
- Contact:

WAGO Kontakttechnik GmbH & Co. KG
Technical Support

Phone +44 1788 568008

Fax +44 1788 568050

E-Mail: uksales@wago.com

Web: www.wago.com



EC Directives and CE Marking

The following EC directives apply to the products of the WAGO-I/O-SYSTEM (series 750, 752, 755, and 758)

73/23/EEC

- Low voltage directive

In the low voltage directive, products are considered electrical equipment if used for applications at nominal voltages between 50 V and 1000 V AC and between 75 V and 1500 V DC.

The EMC requirements listed below were part of the product tests.

You will find the results in the product documentation in this catalog.

89/336/EEC

- EMC directive

This directive applies to any apparatus, equipment and system containing electric or electronic components. The BAPT (Bundesamt für Post und Telekommunikation / Federal Office for Post and Telecommunication) is authorized to differ between elementary and complex components.

Elementary components such as resistors, transformers, ICs, relays etc. are not provided with marking. In regards to complex components such as electromotors, electronic cards, thermostats etc., the EMC directives apply only if these components are sold directly to the end user.

98/37/EEC

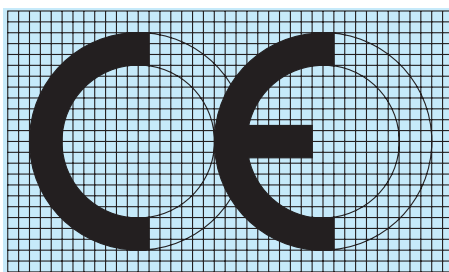
- Machine directive

This directive applies to complete machines or equipment.

The manufacturers of machines or equipment are obliged to use components that meet the corresponding EC directives, for example the low voltage or EMC directives.

Conformity with these directives is the precondition of free exchange of goods in Europe.

The EC directives are legally binding specifications of the European Union. Their aim is the alignment of legal and administrative specifications in the various EC member states, in order to prevent trading hindrances arising from different national specifications. In order to launch a product on the market it has to comply with the relevant directives. Several directives may apply to a product, for example the EMC and the low voltage directives.



With the CE marking WAGO Kontakttechnik GmbH & Co. KG proves the conformity of the product with the relevant EC directives.

The CE marking is indicated on the smallest packing-unit. Apart from the CE marking the manufacturer issues a declaration of EC conformity for the product.

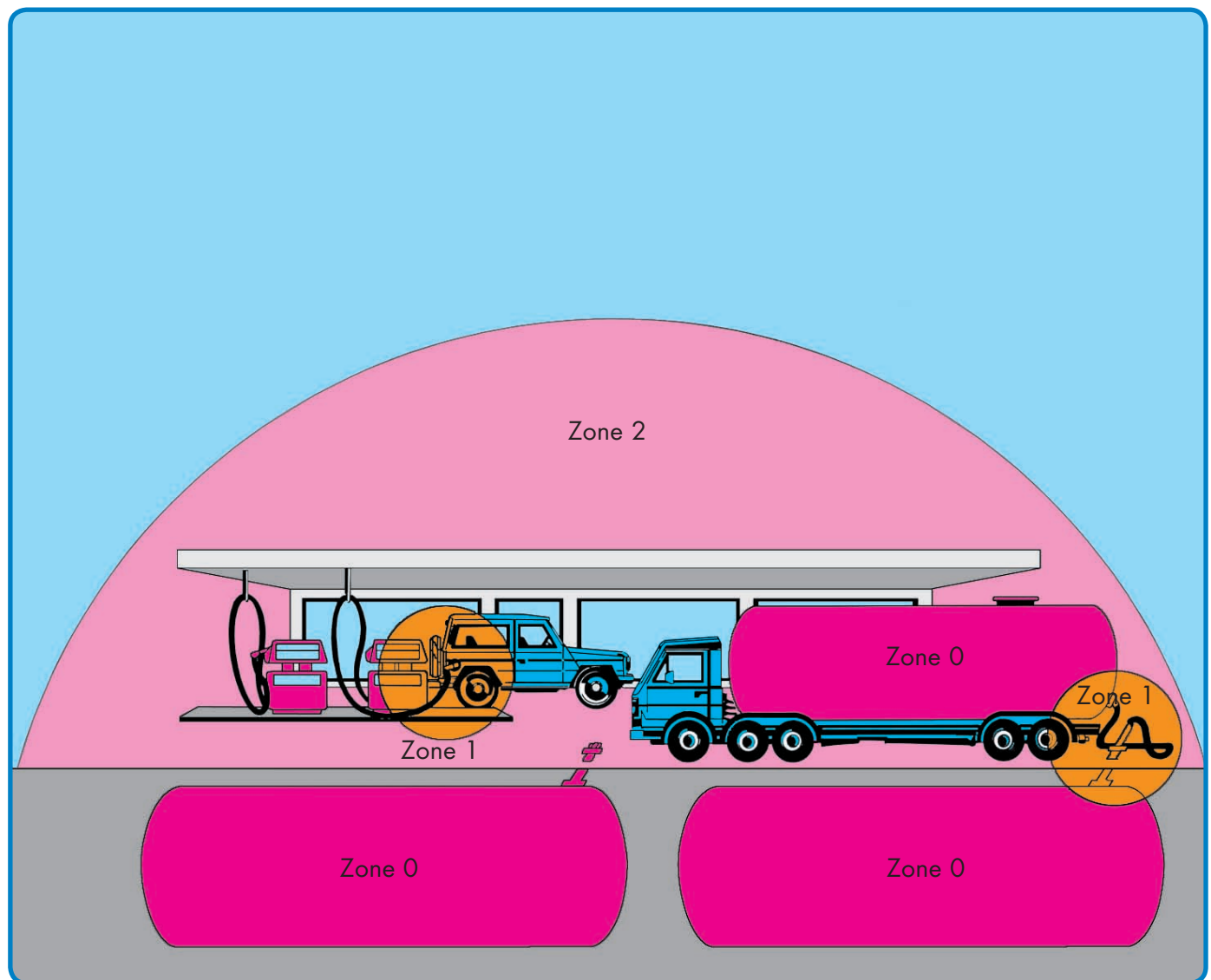
These declarations can be ordered from:

WAGO Kontakttechnik GmbH
Hansastr. 27
D-32423 Minden
or
WAGO Corporation
Freistadt Road
Germantown, WI 53022
USA

The WAGO-I/O-SYSTEM 750 is approved for the use in hazardous environments of zone 2.

Depending on the time and place of an explosive atmosphere, hazardous environments are divided up into several zones.

The areas of application are explained below.



Hazardous environments as a result of combustible gases, vapors or mist.

Zone 0

areas in which an explosive gas/air mixture is continuously present or present for long periods.

Zone 1

areas in which an explosive atmosphere can occur during normal operation.

Zone 2

areas in which an explosive atmosphere is unlikely to occur under normal operation and if it does it will be for a short period.

The approvals as well as the national or international construction regulations have to be taken into consideration when using the WAGO-I/O-SYSTEM 750 in hazardous environments.

Please refer to the manuals for more information on explosion protection.

Electromagnetic compatibility and mechanical strength (Industrial- and residential areas)

Immunity to interference for industrial areas acc. to EN 61000-6-2 (2001)

Test specification	Test values	Strength class	Evaluation criteria *)
EN 61000-4-2 ESD	4 kV/8 kV (contact/air)	2/3	B
EN 61000-4-3 electromagnetic fields	10 V/m 80 MHz ... 1 GHz	3	A
EN 61000-4-4 burst	1 kV/2 kV (data/supply)	2/3	B
EN 61000-4-5 surge	Data: -/- / 1 kV (line : line / line : earth) DC supply: 0.5 kV/0.5 kV (line : line / line : earth) AC supply: 1 kV/2 kV (line : line / line : earth)		B B B
EN 61000-4-6 RF disturbances	10 V/m 80 % AM (0.15 MHz ... 80 MHz)	3	A

*) Criteria A: The device must work in accordance with the regulations during and after the test.

Criteria B: The device must work in accordance with the regulations after the test.

Emission of interference for industrial areas acc. to EN 61000-6-4 (2001)

Test specification	Limit values/ (Quasi Peak)	Frequency range	Distance
EN 55011 AC supply, conducted	79 dB (µV)	150 kHz ... 500 kHz	
	73 dB (µV)	500 kHz ... 30 MHz	
EN 55011 radiated	40 dB (µV/m)	30 MHz ... 230 MHz	10 m
	47 dB (µV/m)	230 MHz ... 1 GHz	10 m

Emission of interference for residential areas acc. to EN 61000-6-3 (2001)

Test specification	Limit values/ (Quasi Peak)	Frequency range	Distance
EN 55022 AC supply, conducted	66 ... 56 dB (µV)	150 kHz ... 500 kHz	
	56 dB (µV)	500 kHz ... 5 MHz	
	60 dB (µV)	5 MHz ... 30 MHz	
EN 55022 DC supply/ data, conducted	40 ... 30 dB (µA)	150 kHz ... 500 kHz	
	30 dB (µA)	500 kHz ... 30 MHz	
EN 55022 radiated	30 dB (µV/m)	30 MHz ... 230 MHz	10 m
	37 dB (µV/m)	230 MHz ... 1 GHz	10 m

Mechanical strength acc. to IEC 61131-2

Test specification	Frequency range	Limit values
IEC 60068-2-6 vibration	$5 \text{ Hz} \leq f < 9 \text{ Hz}$	1.75 mm amplitude (permanent) 3.5 mm amplitude (short term)
	$9 \text{ Hz} \leq f < 150 \text{ Hz}$	0.5 g (permanent) 1 g (short term)
	Note on vibration test: a) Frequency change: max. 1 octave/minute b) Vibration direction: 3 axes	
IEC 60068-2-27 shock		15 g
	Note on shock test: a) Type of shock: half sine b) Shock duration: 11 ms c) Shock direction: 3x in positive and 3x in negative direction for each of the three mutually perpendicular axes of the test specimen	

Immunity to interference acc. to Germanischer Lloyd (2003)

Test specification	Test values	Strength class	Evaluation criteria *)
IEC 61000-4-2 ESD	6 kV/8 kV (contact/air)	3/3	B
IEC 61000-4-3 electromagnetic fields	10 V/m 80 MHz ... 2 GHz	3	A
IEC 61000-4-4 burst	1 kV /2 kV (data/supply)	2/3	A
IEC 61000-4-5 surge, DC supply surge, AC supply	0.5 kV /1 kV (line : line / line : earth)	1	A
	0.5 kV /1 kV (line : line / line : earth)	2	A
IEC 61000-4-6 RF disturbances	10 V/m 80 % AM (0.15 ... 80 MHz)	3	A
Type Test: AF disturbances (harmonic waves)	3 V, 2 W	-	A
Type Test: high voltage	755 V DC	-	-
	1500 V AC	-	-

*) Criteria A: The device must work in accordance with the regulations during and after the test.

Criteria B: The device must work in accordance with the regulations after the test.

Emission of interference acc. to Germanischer Lloyd (2003)

Test specification	Limit values/ (Quasi Peak)	Frequency range	Distance
Typ Test EMC 1, conducted (allows for ship bridge control applications)	96 ... 50 dB (µV)	10 kHz ... 150 kHz	
	60 ... 50 dB (µV)	150 kHz ... 350 kHz	
	50 dB (µV)	350 kHz ... 30 MHz	
Typ Test EMC 1, radiated (allows for ship bridge control applications)	80 ... 52 dB (µV/m)	150 kHz ... 300 kHz	3 m
	52 ... 34 dB (µV/m)	300 kHz ... 30 MHz	3 m
except for:	54 dB (µV/m)	30 MHz ... 2 GHz	3 m
	24 dB (µV/m)	156 MHz ... 165 MHz	3 m

Mechanical strength acc. to Germanischer Lloyd (2003)

Test specification	Frequency range	Limit values
IEC 60068-2-6 vibration (category A-D)	$2 \text{ Hz} \leq f < 25 \text{ Hz}$	±1.6 mm Amplitude (permanent)
	$25 \text{ Hz} \leq f < 100 \text{ Hz}$	4 g (permanent)
	Note on vibration test: a) Frequency change: max. 1 octave/minute b) Vibration direction: 3 axes	

In particular the following standards apply to the design and the application of the terminal blocks and connectors contained in this catalog:

DIN VDE 0100
/.. Construction of high current installations with nominal voltages up to 1000V

EN 50110-1, 10.97
DIN VDE 0105, part 1, 10.97
/Operation of electrical installations

IEC 61140, 11.97
prEN 61140, 05.00
DIN VDE 0106, part 100, 03.83
/Protection against electric shock
- Regulations for positioning parts liable to shock hazards

DIN VDE 0106, part 101, 11.86 + A1, 02.89
/Protection against electric shock
- Basic requirements for protective separation in electric equipment

IEC 60664-1:2000
HD 625.1 S1, 04.97
DIN VDE 0110, part 1, 04.97
/Insulation coordination for equipment within low-voltage systems
- Principles, requirements and tests

IEC 60204-1: 2000
EN 60204-1: 1997
VDE 0113, part 1, 11.98
/Safety of machinery
- General requirements

EN 50155, 11.02
VDE 0115, part 200, 06.00
/Railway applications - Electronic equipment used on rolling stock

EN 50178: 1997
DIN VDE 0160, 04.98
/Electronic equipment to be used in electrical power installations and their assembly into electrical power installations

IEC 60079-14, 12.96
EN 60079-14: 1997
DIN VDE 0165, part 1, 08.98
/Installation of electrical apparatus in hazardous areas

IEC 60079-0, 06.00
EN 50014: 1997 + A2: 1999
DIN VDE 0170, part 1, 02.00
/Electrical apparatus for potentially explosive atmospheres
- General requirements

IEC 60079-7, 08.90 Ed. 2.2
EN 50019: 2000
DIN VDE 0170, part 6, 06.01
/Electrical apparatus for potentially explosive atmospheres
- increased safety "e"

IEC 60079-11, 02.99
EN 50020: 1994
DIN VDE 0170, part 7, 04.96
/Electrical apparatus for potentially explosive atmospheres
- intrinsic safety "i"

IEC 60079-15, 02.01
EN 50021: 1998
DIN VDE 0170, part 16, 02.00
/Electrical apparatus for potentially explosive atmospheres
- Type of protection "n"

VDE V 0185, part 1, 11.02
/ Lightning protection - Part 1:
- General principles

IEC 60060-1, 11.89
HD 588.1, 08.91
VDE 0432, part 1, 06.94
/High-voltage test techniques - General definitions and test requirements

IEC 60085, :1984
DIN IEC 60085, :03.93
HD 566S1, : 1990
/Thermal evaluation and classification of electrical insulation

IEC 60255, :2000
EN 60255-5, :2001
/Electrical relays - Part 5: Insulation coordination for measuring relays and protection equipment - Requirements and tests

IEC 61810-1, 04.98
EN 61810-1: 1998
DIN VDE 0435, part 201, 04.99
/Electromechanical non-specified time all-or-nothing relays

IEC 60529, 02.01
EN 60529, 10.91 + A1: 2000
DIN VDE 0470, part 1, 09.00
/Testing equipment and testing method
- Degrees of protection provided by enclosures (IP-Code)

IEC 60603-1, :1991 + A1 :1992
EN 60603-1, 07.98
/Connectors for frequencies below 3 MHz for use with printed boards
- Part 1: Generic specification - General requirements and guide for the preparation of detail specifications, with assessed quality

IEC 60617-2, :1996
EN 60617-2, 08.97
/Graphical symbols for diagrams
- Part 2: Symbol elements, qualifying symbols and other symbols having general information

IEC 60742, 01.83 + A1, 05.92
EN 60742:1995
DIN VDE 0551, 09.95
/Isolating transformers and safety
isolating transformers
- Requirements

IEC 60999-1, 11.99
EN 60999-1: 2000
DIN VDE 0609, part 1, 12.00
/Safety requirements for screw-type
and screwless-type clamping units
for electrical copper conductors
0,5 mm² up to 35 mm² (included)

IEC 60947-7-1, 08.99 Ed. 1.1
EN 60947-7-1:1991 + A1: 1998
DIN VDE 0611, part 1, 05.00
/ - Ancillary equipment; Terminal
blocks for copper conductors

IEC 60998-2-2, 10.91
EN 60998-2-2, 1993
DIN VDE 0613 part 2-2, 08.94
/ - Special requirements for connec-
ting devices as standalone devices
with screwless-type terminals

DIN VDE 0627, 06.86
/Connectors and plug-and-socket
devices; for rated voltages up to
1000 V AC, up to 1200 V DC and
rated currents up to 500 A for each
pole

IEC 60947-1, 10.00
EN 60947-1: 1999 + A1: 2000
DIN VDE 0660, part 100, 12.99 +
A1, 08.01
/Low-voltage switchgear and
controlgear
- General rules

EN 50227 :1997
VDE 0660, part 212
/Low-voltage switchgear and con-
trolgear -control circuit devices and
switching elements -DC interface
for proximity sensors and switching
amplifiers (NAMUR)

IEC 60439-1, 11.98
EN 60439-1: 1999
DIN VDE 0660, part 500, 08.00
/Low-voltage switchgear and con-
trolgear assemblies
- Requirements for type testing and
partial type testing for assemblies

DIN VDE 0675, part 6, 11.89 + A1
03.96 + A2 11.96
/Surge arresters for use in AC
supply systems with rated voltages
ranging from 100 V to 1000 V

VDI /VDE 3692 part 1 and
2, 06.87
/Fiber optic technology for
industrial application; general
aspects; fiber optics

IEC 60950, :1999 + C. 01.00
EN 60950, :2000
DIN VDE 0805, 10.99
/Information technology equipment
- Safety - Part 1: General require-
ments

IEC 60127-6, 04.94 + A1, 03.96
EN 60127-6:1994 + A1:1996
DIN VDE 0820, part 6, 12.96
/Miniature fuses
- Fuse-holders for miniature cart-
ridge fuse-links

IEC 60068-2-6, 03.95
EN 60068-2-6, :1995
/Environmental testing - Part 2: Tests
- Test Fc: Vibration (sinusoidal)

IEC 60068-2-27, :1987
EN 60068-2-27, :1993
/Environmental testing - Part 2: Tests
- Test Ea and guidance: Shock

IEC 60068-2-42, :1982
IEC 60068-2-42, 12.01 (draft)
IEC 48B/1073/CD, :2001
/Environmental testing - Part 2: Tests
- Test Kc: Sulphur dioxide test for
contacts and connections

IEC 60068-2-43, :1976
IEC 60068-2-43, 12.01 (draft)
IEC 48B/1074/CD, :2001
/Environmental testing - Part 2: Tests
- Test Kd: Hydrogen sulphide test for
contacts and connections

IEC 60801-2, :1991
EN 60801-2, :1993
/Electromagnetic compatibility for
industrial-process measurement and
control equipment - Part 2: Electro-
static discharge requirements

IEC 61000-3-2, :2000
EN 61000-3-2, :2000
VDE 0838-2, 10.98
/Electromagnetic compatibility
(EMC)
-Part 3-2: Limits -Limits for harmonic
current emissions (equipment input
current ≤ 16 A per phase)

IEC 61000-6-3, 1996 EN 61000-6-3, 2004 (EN 50081-1, :1992) VDE 0839-81-1, 03.93 /Electromagnetic compatibility (EMC) - Generic standards: Emission standard for residential, commercial and light-industrial environments	IEC 61000-4-2, :1995 + A2 :2000 EN 61000-4-2, :1995 + A2 :2001 VDE 0847-4-2, 03.96 /Electromagnetic compatibility (EMC) - Part 4-2: Testing and measurement techniques -Electrostatic discharge immunity test	IEC 61000-4-11, :1994 + A1 :2000 EN 61000-4-11, :1994 + A1 :2001 /Electromagnetic compatibility (EMC) - Part 4-11: Testing and measurement techniques -Voltage dips, short interruptions and voltage variations immunity test
IEC 61000-6-4, 1997 EN 61000-6-4, 2001 (EN 50081-2, :1993) VDE 0839-81-2, 03.94 /Electromagnetic compatibility (EMC) - Generic standards: Emission standard for industrial environments	IEC 61000-4-3, :1995 + A2 :2000 EN 61000-4-3, :1996 + A2 :2001 VDE 0847-4-3, 06.99 /Electromagnetic compatibility (EMC) - Part 4-3: Testing and measurement techniques - Radiated, radio-frequency, electromagnetic field immunity test	IEC 61131-1, :1992 EN 61131-1, :1994 /Programmable controllers - Part 1: General information IEC 61131-2, 09.92 EN 61131-2, :1994 VDE 00411-500, 05.95 /Programmable controllers - Part 2: Equipment requirements and test
IEC 61000-6-2, 01.99 EN 61000-6-2, 2002 (EN 50082-2, :1996) VDE 0839-82-2, 02.96 /Electromagnetic compatibility (EMC) - Generic standards: Immunity for industrial environments	IEC 61000-4-4, :1995 + A1 :2000 EN 61000-4-4, :1995 + A1 :2001 VDE 0847-4-4, 03.96 /Electromagnetic compatibility (EMC) - Part 4-4: Testing and measurement techniques - Section 4: Electrical fast transient/burst immunity test. Basic EMC Publication	IEC 61131-3, :1993 EN 61131-3, :1993 /Programmable controllers - Part 3: Programming languages IEC 61131-4, :1995 EN 61131 Beiblatt 1, 04.96 /Programmable controllers - Part 4: User guidelines
IEC 61643-11, :2002 EN 61643-11, 12.02 /Low voltage surge protective devices - Part 11: Surge protective devices connected to low-voltage power systems - Requirements and tests	IEC 61000-4-5, :1995 + A1 :2000 EN 61000-4-5, :1995 + A1 :2001 VDE 0847-4-5, 09.96 /Electromagnetic compatibility (EMC) - Part 4-5: Testing and measurement techniques - Surge immunity test	CISPR 11 :1997 + A1 :1999 EN 55011, :1998 + A1 :1999 VDE 0875-11, 12.98 /Industrial, scientific and medical (ISM) radio frequency equipment - Radio disturbance characteristics - Limits and methods of measurement
IEC 61643-21, :2001 EN 61643-21, 03.02 VDE 0845, 04.76 /VDE 0845, 04.76 /Low voltage surge protective devices - Part 21: Surge protective devices connected to telecommunications and signalling networks - Performance requirements and testing methods	IEC 61000-4-6, :1996 + A1 :2000 EN 61000-4-6, :1996 + A1 :2001 VDE 0847-4-6, 04.97 /Electromagnetic compatibility (EMC) - Part 4-6: Testing and measurement techniques -Immunity to conducted disturbances induced by radio-frequency fields	CISPR 22 :1997 + A1 :2000 EN 55022, :1998 + A1 :2000 VDE 0878-22, 05.98 /Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement

EN 50170/A1, :1997 /General purpose field communication system	UL 1059 (01.00) Standards for safety (Terminal Blocks)	LR (Lloyd's Register) Type Approval System Test Specification Number 1-1996
EN 50254, :1998 /High efficiency communication subsystem for small data packages	UL 486 E (01.01) Equipment Wiring Terminals for use with aluminum and/or copper conductors	RINA (Registro Italiano Navale) Rules for the classification of ships Part C - Machinery, systems and fire protection Ch. 3, Sect. 6, Table 1 Edition 2000
DIN 66259-1, 05.81 ITU-T V.28, 03.93 /Electrical characteristics for unbalanced double-current interchange circuits	UL 508 (04.96) Industrial Control Equipment	
ISO 11898, :1993 /Road vehicles -Interchange of digital information - Controller area network (CAN) for high-speed communication	UL 1604 Electrical Equipment for use in Class I, and Class II division 2, and Class III hazardous locations	
EN 50022: 1977 /Industrial low-voltage switchgear – carrier rail	ABS (American Bureau of Shipping) Steel Vessels 2003 Part 4 Vessel Systems and Machinery	
EN 50045: 1980 /Carrier rails, symmetric DIN 15 mm	BV (Bureau Veritas) Rules for the Classification of steel ships and offshore units	
EN 60555-1, :1987 /Disturbances in supply systems caused by household appliances and similar electrical equipment	DNV (Det Norske Veritas) Standard for Certification Environmental Test Specification for Instrumentation and Automation Equipment, April 2001	
	GL (Germanischer Lloyd) Rules for Classification and Construction VI Additional Rules and Guidelines 7 Type Test 3 Guidelines for the Performance of Type Test, Part 1- Test Requirements for Electrical/Electronic Equipment, Computers and Peripherals Edition 2001	

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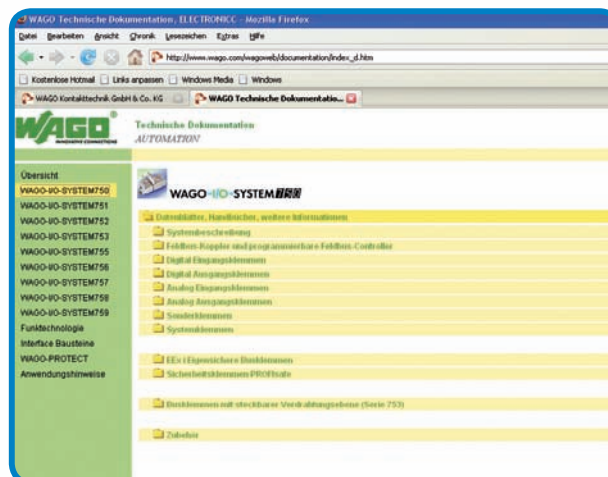
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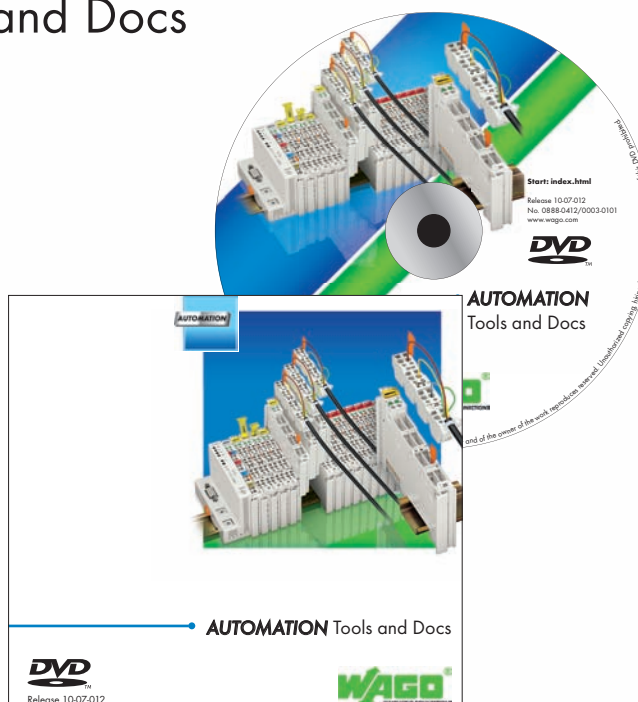
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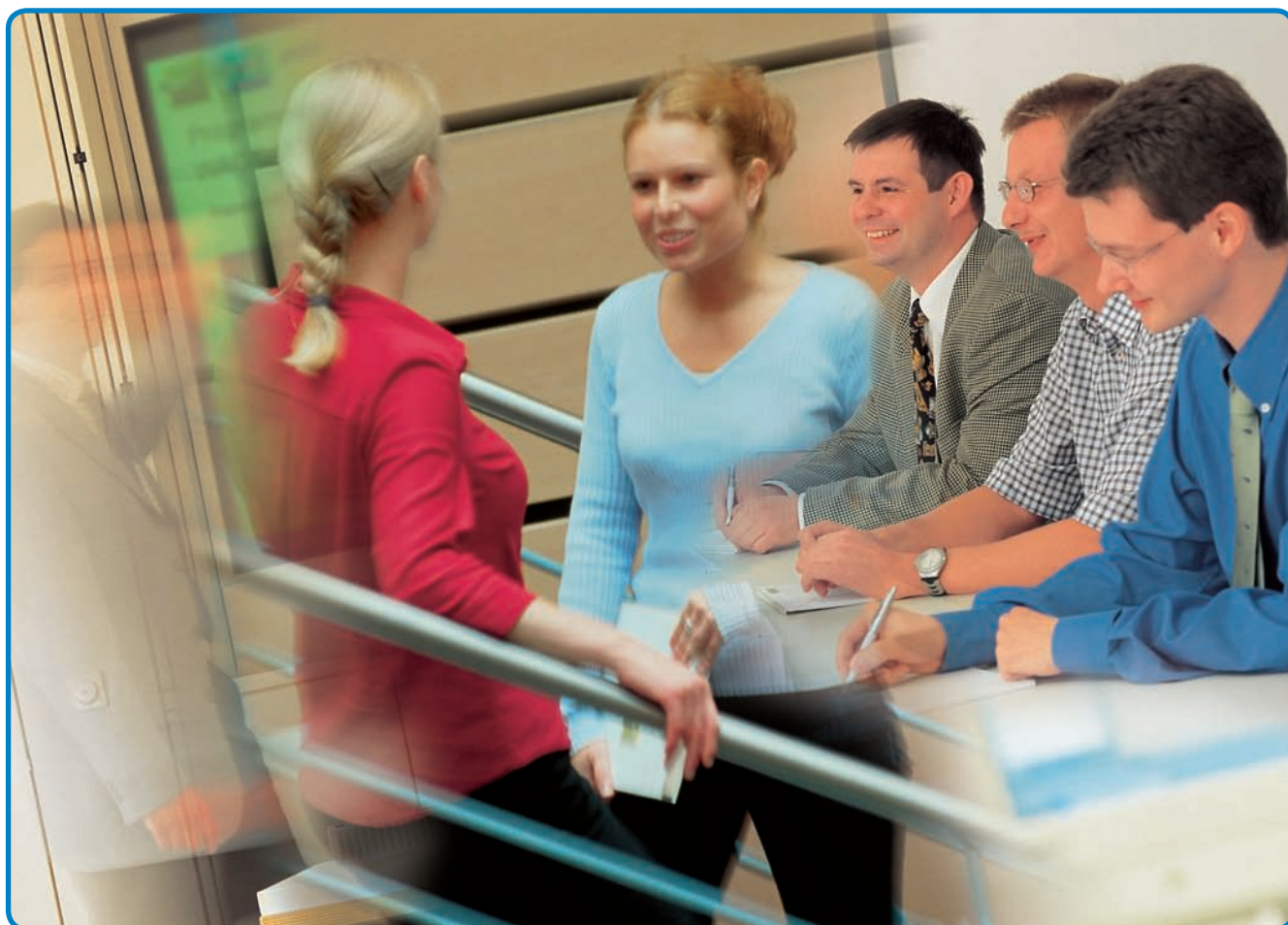
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