

Weidmüller Service

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Best advice, best solutions

Services tailored to customers' needs

Service – at Weidmüller that means diversity. And it also means that you can take advantage of our comprehensive resources:

- Production of terminal rails and enclosures fitted with our modular terminals and other modules, and prewired
- Fitting of cable glands and the marking of terminals, conductors and enclosures according to your specification
- Competence in the processing of enclosure materials such as aluminium, plastics, sheet steel and stainless steel
- Flexibility in the product selection: besides Weidmüller products we can also integrate yours and even those of other manufacturers

This range of services enables Weidmüller to act as an external service provider to increase your capacities. And demanding standards guarantee a high level of quality every time.

The best advice for the best solutions

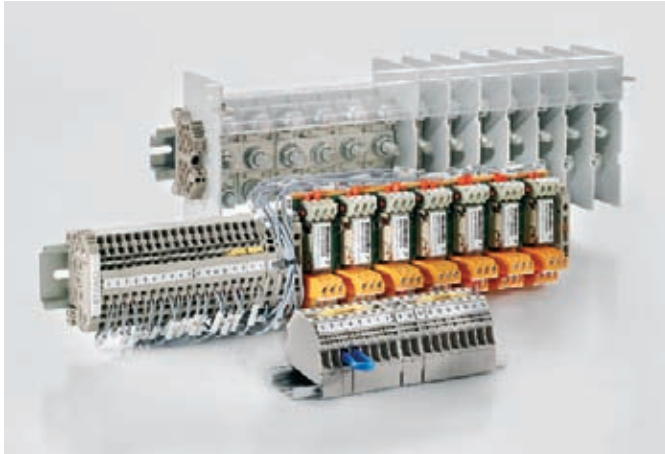
The start of a good partnership is always characterised by an intensive exchange of information to define the respective positions. Our contribution focuses on detailed advice with respect to:

- Optimum choice of products
- Practical pre-assembly
- Integration into your systems
- Consideration of requirements such as certification, classes of protection or hazard protection as required by your industry

That avoids mistakes right from the start – totally in keeping with the effective handling of the project, totally in keeping with perfect results. Our experience helps you create the foundation for good business and satisfied customers.



Overview of services

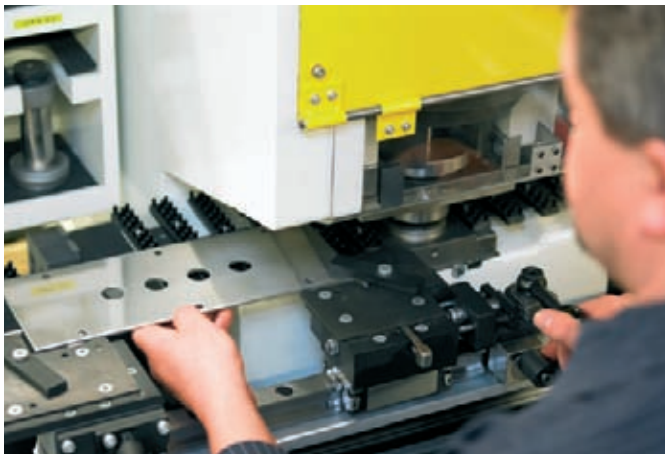


Production of terminal rails

Terminal rails are manufactured from steel, stainless steel, aluminium or copper to suit the diverse applications. And we can produce terminal rails with elongated or round holes, or in other forms to suit your requirements exactly. Terminal rails are fitted with modular terminals or electronic products, prewired and marked according to your specification.

The benefits for you

- No need to procure individual components
- No need to mount individual components
- No unnecessary stocks
- Just one order number for your pre-assembled terminal rail
- Constant high quality



Production of enclosures

High-tech brings benefits. Our state-of-the-art production methods open up new options for you:

- Inclusion of holes and threads in the enclosure
- Enclosure cover with hinges and other accessories if required
- More complex machining such as milling of contours or reaming of holes
- Special paint finishes: To protect against the effects of the weather, your enclosures can be painted individually. Simply specify the colour and printing you require. Special paint finishes and powder coating are also possible.

Enclosures are adapted to suit the intended application exactly. You get a tailored, individual product and the quality is guaranteed by our adherence to demanding standards. Does your product require a special approval? Our accredited laboratory can test the complete product and confirm that its design complies with the standards! With every delivery we document the corresponding approvals (e.g., ATEX, GL, UL, GOST, etc.).



The benefits for you

- Enclosures in various sizes and materials
- Inclusion of optional accessories such as hinges and locks
- Complex machining processes and special packaging
- Ready-to-use, certified products for all types of applications.

Overview of services



Electronics production

We manufacture according to your specifications: ranging from PCB assembly to 100%-tested component assemblies. We bring the individual parts together according to your documents: whether for materials procurement, provision, or withdrawal from our stock. All production processes and the entire range of qualified expertise are at our disposal: from hand assembly to SMD assembly. Our state-of-the-art production and testing facilities guarantee consistent quality.

The benefits for you

- Solutions for custom tasks
- Complex component assemblies including enclosures from a single-source supplier
- Reduction of your procurement and storage of individual parts

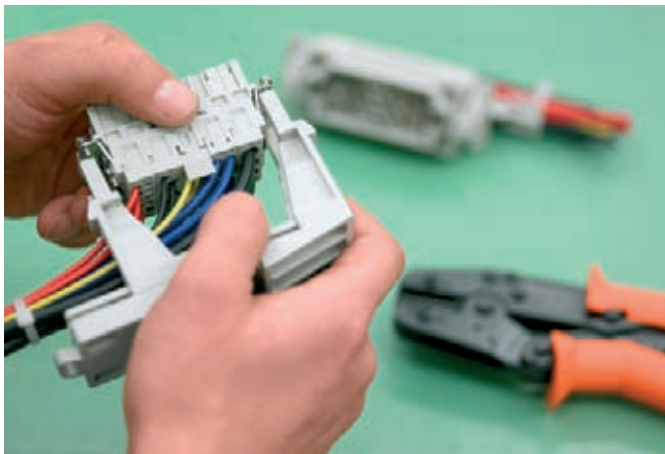


„RockStar“ heavy-duty connectors and cable assembly

To help ensure that your switchgear cabinets and installations are put into operation without delay, Weidmüller can supply pre-fabricated components such as heavy-duty connectors. These are assembled and prewired according to your specification and are supplied ready to connect. If required, we can also supply the finished enclosure with the heavy-duty connectors already integrated. An entire spectrum of application possibilities are available with our ConCept modular connector system. This modular system enables the flexible combination of diverse modules. Custom crimping and cabling is included on request! Do you prefer a personal touch? We can laser-label your company logo and article number onto our RockStars! In total compliance with your requirements.

The benefits for you

- Special requirements with respect to font, number of characters, material and printing durability for your markers
- Prewiring of connectors saves you valuable installation time
- Modular connector system can be ordered pre-crimped



Marking

Whether multi-line labelling, white or coloured terminal markers or group designations, the Weidmüller range can cater for every marking task – fast, clear and according to European standards. However, we can also supply you with preprinted markers to match your specification. Simply tell us the type of marker you require, the colour, the printing sequence and the text, and we'll look after the rest. If required, we can also install the finished markers during assembly.

Equipment labelling

Device markers are essential for marking your electrical installations. Therefore, Weidmüller can supply rating plates designed specially for your application. A wide range of different shapes, colours, materials and fixings – riveted, screwed or bonded with adhesive – are available from which to choose. And a whole range of different fonts mean that we can handle every request.

Integration of special accessories

In some cases it is necessary to integrate special accessories. This is no problem for Weidmüller because we can integrate buttons, switches, warning lamps, plugs or couplings – all properly planned, fitted, connected and tested. And that includes the products of other manufacturers as well as our own. We shall also be happy to advise you on standard accessories such as hinges.

The benefits for you

- Rating plates in various materials
- Individual printing or laser engraving
- Equipment and accessories to your specification



Digital support

RailDesigner®

RailDesigner® is a Weidmüller program for planning, assembling and ordering both terminal rails and enclosures. And it's so easy to use:

- Fast acquisition of all necessary data
- Realistic-looking graphic user interface and ideal conditions for simple assembly of your terminal rails and enclosures with all the necessary components
- Simply click on all the products you need and add accessories such as markers or cross-connectors
- To configure an individual enclosure, simply choose an enclosure type from a standard range and then add holes and other accessories to suit your requirements

These parameters form the foundation for a perfect software assistant. You can view the enclosure on the screen complete with all the configured products, and print out a hardcopy, or simply send the file to Weidmüller via e-mail in the form of an order. RailDesigner® provides you with optimum planning security and clarity during the design phase. And hence simplifies the ordering process enormously.

M-Print® PRO label designer

The comprehensive range of Weidmüller services includes the M-Print® PRO software.

This is a professional-standard, Windows®-based program for printing and ordering labels and markers that is coordinated with our current printing systems and marking materials.

M-Print® PRO enables you to design your labelling materials professionally and quickly. Texts, borders, lines, graphics, barcodes, serial numbers and photographs are all possible. The interface to RailDesigner® or your CAE system enables the transfer of all your configured data.

Online catalogue

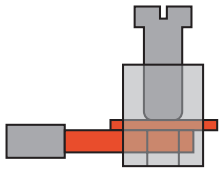
If you have questions about the specifications and details of our products, perhaps even outside normal business hours, then our online catalogue at <http://catalog.weidmueller.com> open 24 hours a day, 365 days a year – is the perfect source of information. Besides product features and part numbers, it contains extensive additional information on all product groups. And for further information, offers and your personal contact, simply consult the Weidmüller website at www.weidmueller.com.



Technical appendix

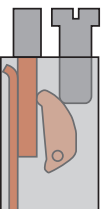
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Free choice of connection technology



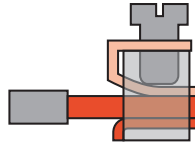
Clamping yoke connection technology

The **Weidmüller clamping yoke system** is an optimum combination of the specific properties of steel and copper. This clamping yoke system has proved its worth in billions of Weidmüller products over many decades. Both the clamping yoke and the clamping screw are made from hardened steel. This clamping yoke arrangement generates the necessary contact force. The clamping yoke presses the incoming conductor against a current bar made of copper or high-quality brass. The hardened Weidmüller clamping yoke ensures a gas-tight, vibration-resistant connection between conductor and current bar.



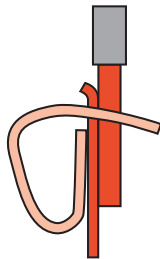
TOP connection technology

The Weidmüller **TOP connection system** ensures that the conductor can be inserted and the clamping screw tightened from the same direction. Such an arrangement eases the wiring work in certain installations, e.g. when there is little space at the sides in terminal boxes. The TOP connection system combines the specific properties of steel and copper. The hardened steel lever presses the conductor directly against a current bar made of copper or high-quality brass. The high contact force guarantees a gas-tight connection between conductor and current bar.



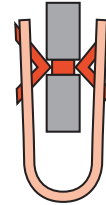
Leaf spring connection technology

Weidmüller's patented **leaf clamp connection system** is a screw connection system for large conductor cross-sections. The insertion of large conductors into the clamping point is made easier here by the fact that the clamping unit can be removed first. The conductor can then be placed directly on the current bar before re-inserting the clamping unit and tightening the screw to grip the conductor.



Tension clamp connection technology

The **Weidmüller tension clamp system** functions similarly to the tried-and-tested clamping yoke. Here again, the mechanical and electrical functions are kept separate. The spring made from high-quality rustproof and acid-proof steel pulls the conductor against the tin-plated copper current bar. Treating the copper in this way ensures low contact resistance and high corrosion resistance. The compensating effect of the spring ensures a secure contact for the lifetime of the terminal.



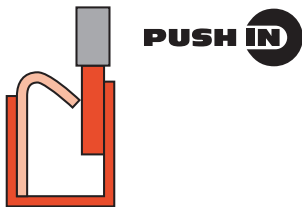
IDC connection technology

The **IDC connection technology** (Insulation Displacement Connection) is a type of connection for copper conductors that does not require the conductor to be prepared in any way – so no stripping and no crimping.

When connecting the conductor, the insulation of the conductor is penetrated and an electrically conductive contact between conductor and current bar produced at the same time.

The Weidmüller IDC principle, like Weidmüller's other types of connection, again keeps mechanical and electrical functions separate.

A spring made from rustproof stainless steel presses the current bar onto the conductor and therefore guarantees a low contact resistance and a gas-tight, vibration-resistant connection.



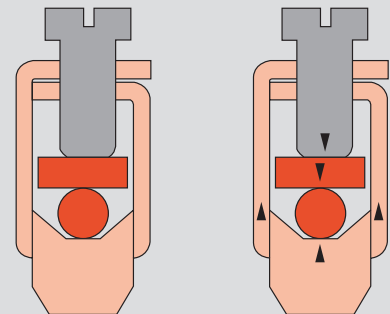
Push In-Connection technology

In the **Push In connection technology** the stripped solid conductor is simply inserted into the clamping point as far as it will go. And that completes the connection! No tools are required and the result is a reliable, vibration-resistant and gas-tight connection. Even flexible conductors with crimped wire end ferrules or ultrasonic-welded conductors can be connected without any problems. A stainless steel spring, which is fitted in a separate housing, guarantees a high contact force between the conductor and the current bar (tin-plated copper). The conductor pull-out force for this system is even higher than that for the tension clamp system. Spring stop plus conductor stop in a steel housing ensure optimum connection conditions and a guide for the screwdriver needed to detach the conductor.

The principle of vibration resistance

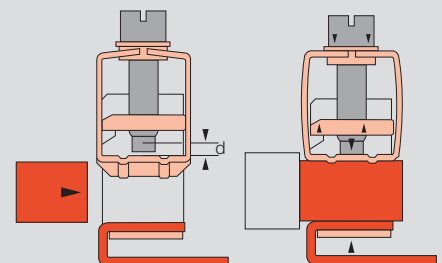
Clamping yoke

As the clamping screw is tightened, the ensuing force causes the upper threaded part to spring back and exert a locknut effect on the screw. The Weidmüller clamping yoke system is vibration-resistant. The relaxation of the conductor is compensated for by the elastic behaviour of the Weidmüller clamping yoke. It is therefore not necessary to retighten the clamping screw.



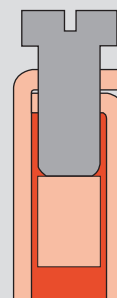
Leaf clamp

The distance “d” between the shaft of the clamping screw and the leaf clamp causes elastic deformation of the spring as the screw is tightened. The vibration resistance depends on the magnitude of the spring force of the leaf clamp, and this force also compensates for relaxation phenomena in the conductor. It is therefore not necessary to retighten the clamping screw.



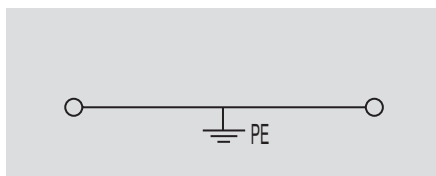
TOP

Like with the clamping yoke, the force exerted by the steel lever as the screw is tightened forces apart the two threaded parts of the TOP connection. This exerts a locking effect on the screw and guarantees excellent vibration resistance.



Definitions of the various types

PE terminals

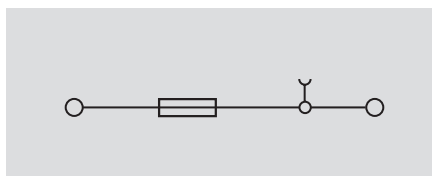


A PE terminal is a component with one or several clamping points for connecting and/or branching PE conductors (PE and PEN conductors) with a conductive connection to their mountings. Partly insulated PE terminals are insulated from adjacent live parts of terminals; the partial insulation is coloured green/yellow.

Applications (IEC 60947-7-2)

This standard applies to PE terminals with PE function up to 120 mm² and to PE terminals with PEN function for sizes upwards of 10 mm² with clamping points with or without screws for connecting round copper conductors with a cross-section between 0.2 and 120 mm² (AWG 24/250 kcmil) for circuits up to 1000 Vac 1000 Hz or up to 1500 Vdc. PE terminals are used to produce the electrical and mechanical connections between copper conductors and the mounting.

Fuse terminals



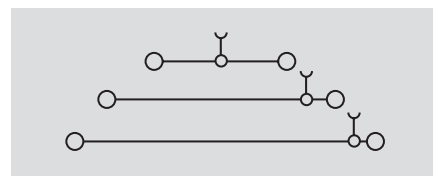
Fuse terminals consist of a terminal base and a cartridge fuse holder. In the case of fuse terminals for low-voltage cartridge fuses (D-system), the technical data are defined by IEC 60947-7-3 in conjunction with VDE 0636 part 301.

In the case of fuse terminals for device protection cartridge fuses, the technical data are defined by IEC 60947-7-3, which covers the range of applications of such products.

Fuse terminals for protecting devices are rated for a certain maximum power loss on the basis of IEC 60127-2, which covers G-type cartridge fuses.

The product pages contain details of the maximum power loss for individual or group arrangements for short-circuit and/or overload protection.

Multi-level distribution terminals



A multi-level distribution terminal is a unit with clamping points for connecting and/or linking phase, neutral and PE conductors to their mountings with a conductive PE connection. They have several connection levels, all isolated from each other.

Applications IEC 60947-7-1 / IEC 60947-7-2

DIN VDE 0611-4 (partly)

These standards apply to multi-level distribution terminals with clamping points with/without screws for connecting or linking solid, stranded or flexible copper conductors. In distribution terminals, phase conductor and/or N and PE conductor connections are all realised in a compact space.

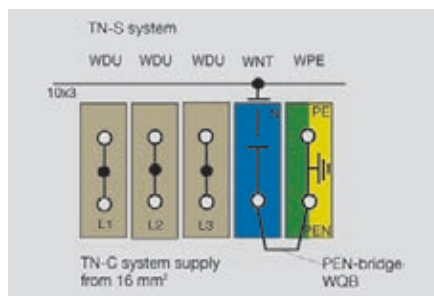
The N-conductor can be disconnected for insulation measurements; it is not used for disconnecting or switching.

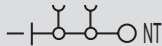
PEN function

According to IEC 60947-7-2, only copper terminal rails may be used for the PEN function. Steel terminal rails may not be used.

Use of TS 35 x 15

In order to comply with the current-carrying ability required by IEC 60947-7-2, the TS 35 x 15 terminal rail must be used for PE terminals with a rated cross-section of 16 mm² and upwards.

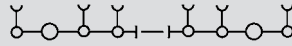


N-conductor disconnect terminals

A neutral-conductor disconnect terminal is a special type of test-disconnect terminal with lateral disconnection. It is connected to a neutral-conductor busbar. It will be covered in the scope of the IEC 60947-7-1 (2008 edition – Appendix D). The terminals are used for measuring the insulation resistance relative to the earth. They enable simple testing without the need to disconnect the neutral conductor.

Dimensioning of clearance and creepage distances:



400 V applies to
 phase conductor–phase conductor
 250 V applies to
 phase conductor–N-conductor
 phase conductor–PE conductor
 N-conductor–PE conductor

Test-disconnect terminals

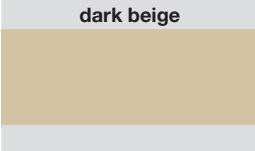


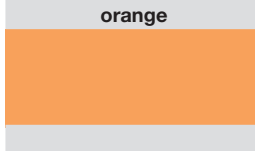

Test-disconnect terminals are used for the short-term separation of circuits in order to perform test and measurements in a no-voltage state. They will be covered in the scope of the IEC 60947-7-1 (2008 edition – Appendix D). The dimensions for the clearance and creepage distances of the opened disconnect points are not evaluated. However the rated surge voltage resistance (supplied by the manufacturer) must be verified at the opened disconnect point.

Insulating materials

In order to do justice to the most diverse requirements placed on our products, it is necessary to use different insulating materials tailored to the needs of the applications. None of the insulating materials used by Weidmüller contain any hazardous substances. Above all, the use of cadmium-free materials is very high on our agenda. Furthermore, our insulating materials contain neither pigments based on heavy metals nor any substances that lead to the formation of dioxin or furan.

		Ceramics	Thermosetting plastics	
	Plastic Abbreviation	Ceramics	Gemin KrG	Epoxy resin EP
		Ceramics are excellent materials for electrical engineering because they fulfil all the requirements. Ceramics are resistant to heat, fluids and sparks, and are tested for leakage currents. Thanks to their high mechanical strength, low losses and good heat resistance, these materials have a very high chemical stability and are preferred because of their very low wear.	Thermosetting plastics exhibit high dimensional stability, low water absorption, extremely good tracking resistance and excellent fire resistance. The continuous operating temperatures are higher than those of thermoplastics. At higher thermal loads the deformation resistance of thermosetting plastics is better than that of thermoplastics. The disadvantage in comparison with thermoplastics is the reduced flexibility of thermosetting plastics.	
		Insulating material	Melamine resin moulding compound, MF type 150 (DIN EN ISO 14 528) inorganic filler	Epoxy resin with inorganic filler
Colour		white	medium yellow 	black 
Description		highest continuous operating temperature high fire resistance fluids-repellent high tracking resistance inherently flame-retardant	high continuous operating temperature high fire resistance high tracking resistance inherently flame-retardant halogen-free flame-retardant agent	very good electrical properties very high continuous operating temperature resistant to high-energy radiation halogen- and phosphor-free flame-retardant agent
Properties				
	Specific volume resistance to IEC 60093 $\Omega \times \text{cm}$	-	10^{11}	10^{14}
	Electric strength to IEC 60243-1 kV / mm	>10	10	160
	Tracking resistance (A) to IEC 60112 CTI	≥ 600	≥ 600	≥ 600
	Upper max. permissible temperature °C	250	130	160
	Lower max. permissible temperature, static °C	-60	-60	-60
	Flamability class to UL 94	V-0 (5 V-B)	V-0 (5 V-A)	V-0
	Fire behaviour to railway standard			

Thermoplastics

Wemid	Polyamide PA	Polyamide PAGF	Polybutylene-terephthalate PBT	Polycarbonate PC
<p>Wemid is a modified thermoplastic whose properties have been specially devised to suit the requirements of Weidmüller connectors. The advantages in comparison with PA are the better fire protection and the higher continuous operating temperature. Wemid fulfils the strict requirements placed on applications for railway rolling stock to NF F 16-101.</p>	<p>Polyamide (PA) is one of the most common commercial plastics. The advantages of this material are its very good electrical and mechanical properties, its flexibility and resistance to breakage. Furthermore, owing to its chemical structure PA achieves good fire resistance even without the use of flame-retardant agents.</p>	<p>Glass fibre-reinforced polyamide (PAGF) offers excellent dimensional stability and very good mechanical properties. That makes this material ideal for use in end brackets. Compared with unreinforced PA, this material can achieve UL 94 flammability class HB.</p>	<p>This thermoplastic polyester (PBT) offers excellent dimensional stability (and is therefore ideal for plug-in connectors) and a high continuous operation temperature. But the tracking resistance is lower than other insulating materials.</p>	
special Weidmüller insulating material	insulating material	insulating material	with or without glass fibre reinforcement depending on application	with or without glass fibre reinforcement depending on application
dark beige	beige	beige	orange	grey
				
<p>higher continuous operating temperature</p> <p>improved fire resistance</p> <p>halogen- and phosphor-free flame-retardant agent</p> <p>flame-retardant agent low smoke development in fire</p> <p>certified for railway applications to NF F 16-101</p>	<p>flexible, virtually unbreakable</p> <p>good electrical and mechanical properties</p> <p>self-extinguishing behaviour</p> <p>halogen-free flame-retardant agent</p>	<p>excellent dimensional stability</p> <p>very good mechanical properties</p> <p>halogen-free flame-retardant agent</p>	<p>high dimensional stability</p> <p>good electrical and mechanical properties</p> <p>flame-retardant substances do not lead to the formation of dioxin or furan</p>	<p>high dimensional stability</p> <p>high continuous operating temperature</p> <p>high electrical insulation capacity</p> <p>halogen-free flame-retardant agent</p>
10 ¹²	10 ¹²	10 ¹²	10 ¹³	10 ¹⁶
25	30	30	28	≥ 30
600	600	500	200	≥ 175
120	100	100	115 / 130	115 / 125
-50	-50	-50	-50	-50
V-0	V-2	HB	V-0	V-2 / V-0
I2 / F2 *)				I2 / F2
*) also certified to LUL E 1042				

Metals

Only materials that have proved suitable for electrical engineering applications are used in Weidmüller products.

All materials are subjected to the rigorous quality control measures of a QM system certified to DIN EN ISO 9001.

Environmental compatibility plays a crucial role in the selection of materials.

The selection, processing and surface treatment of all the metals used by Weidmüller are carried out according to the latest technical standards.

Steels

Steel parts required to maintain the contact force permanently are electro-galvanised and treated with an additional passivation technique.

The surface protection conforms to the highest standards. Experience gained from laboratory tests has been incorporated into the design of the surface protection.

Zinc protects against corrosion for a long time even after the zinc coating has been partially damaged by scratches or pores. In the presence of an electrolyte, zinc acts as a cathode (i.e. negative) with respect to steel. The metal ions of the zinc migrate to the steel, which provides long-term protection for the parent metal.

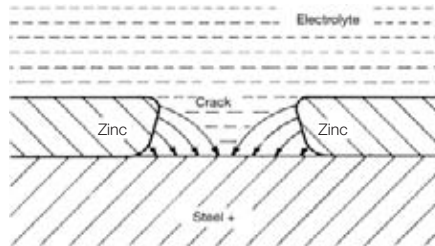
Conductive materials

The current-carrying materials copper, brass and bronze are characterised by their high conductivity and good mechanical properties.

The surfaces are usually given a coating of tin, which creates an extremely good, "malleable" contact with a low contact resistance. Apart from ensuring consistently good electrical properties, the tin coating provides excellent protection against corrosion.

Solder connections are also given a coating of tin. In order to guarantee the long-term solderability (shelf life), brass parts are given an additional nickel coating as a diffusion barrier.

The nickel coating provides effective protection against the loss of zinc atoms from the brass.



International Standards



Modular terminals to IEC 60947-7-1

Low-voltage switchgear and controlgear

Part 7-1:

Auxiliary devices – Terminals for copper conductors

This standard has been ratified by CENELEC on a European level and is as such valid in all CENELEC member countries.

In conjunction with this and having an overriding importance:
IEC 60947-1

Low-voltage switchgear and controlgear –General stipulations

(IEC 60947-7-1)
(EN 60947-7-1)

This standard defines requirements for feed-through and disconnect-test terminals (Edition 2008) with screw or screwless terminal points which are primarily intended for industrial applications or similar and are attached to a carrier to produce an electrical and mechanical connection between copper cables.

The standard is valid for modular terminals for connecting round copper conductors with a cross-section between 0.2 und 300 mm² (AWG 24/600 kcmil), for electric circuits up to 1000 V AC/ 1000 Hz or up to 1500 V DC.

This standard can be used as a guide for:

- Terminals that require the attachment of special fixtures to the conductor such as tab or wire-wrap connectors and so forth.
- Terminals that directly contact the conductor through cutting or creates contact points by penetrating the insulation, for example as in insulation displacement connections and so forth

Feed-through terminal

An insulating component that supports one or more clamping arrangements insulated from one another and which is designed to be fixed to a supporting rail.

Rated cross-section

The rated cross-section of a modular terminal is the size – as specified by the manufacturer – of the conductor cross-section that can be connected to the terminal, on which certain thermal, mechanical and electrical requirements are based, and which is intrinsic to the marking on the terminal.

The rated cross-section is selected from the following standard cross-sections:
0.2 - 0.5 - 0.75 - 1.0 - 1.5 - 2.5 - 4.0 - 6.0 - 10 - 16 - 25 - 35 - 50 - 70 - 95 - 120 - 150 - 240 - 300 mm².

The modular terminals possess a rated connection capacity that is at least two steps smaller than the rated cross-section. The conductors may be solid, multi-strand or fine-strand components, if necessary with the ends of the conductors prepared for the connection.

Verification of the rated cross-section is carried out with a gauge, according to IEC 60947-1.

**Rated current
IEC 60947-7-1**

Test currents are assigned to the rated cross-sections in accordance with IEC 60947-7-1. No non-permissible rise in the temperature of the terminal occurs in conjunction with these rated currents:

mm ²	1,5	2,5	4,0	6,0
A	17,5	24	32	41

mm ²	10	16	25	35
A	57	76	101	125

mm ²	50	70	95	120
A	150	192	232	269

mm ²	150	185	240	300
A	309	353	415	520

Conventional free-air thermal current (I_{th})

The conventional free-air thermal current (I_{th}) is the largest test current used for temperature rise tests on open devices in free air. Refer to section 4.3.2.1 of IEC 60947-1.

This applies exclusively to terminal blocks with multiple connection levels (multi-tier terminals) and to test-disconnect terminals for which a current reduction is permissible. The reduced current values are then designated as conventional thermal current in free air (I_{th}). If the test current is not required to be reduced for the associated rated cross-section, then the term remains “rated current”.

**Rated voltage
IEC 60947-7-1**

The rated voltage of a modular terminal is the rated insulation voltage on which the insulation tests and creepage distances are based. They are determined according to IEC 60664-1.

**Rated impulse withstand voltage
IEC 60947-7-1**

This is the value of a surge voltage to which the modular terminals can be subjected and on which the clearances to IEC 60947-1 or IEC 60664-1 are based.

**Pollution severity
IEC 60947-7-1**

The pollution severity specifies the influence of solid, liquid or gaseous foreign matter that could reduce the electric strength of the specific surface resistance.

Pollution severity 3 has been specified for modular terminals for industrial applications: the occurrence of conductive contamination or dry, non-conductive contamination which becomes conductive because condensation is expected.

The minimum clearance is defined in IEC 60947-7-1 in conjunction with the rated impulse withstand voltage.

Operating conditions

The modular terminals can be used in the following standard conditions:

- Ambient temperature -5 °C...+40 °C, average value over 24 h: +35 °C
- Attitudes up to 2000 m above sea level

- Relative humidity 50 % at +40 °C, 90 % at +20 °C

CE marking

The manufacturer is responsible for CE labelling in accordance with the corresponding EU Directive. This confirms conformance with the Directive for the attention of government authorities. It is designed to guarantee the free movement of goods within Europe. Cable connectors from ≥ 50 V~/75 V- fulfil the fundamental safety requirements stipulated in the Low Voltage Directive 2006/95/EC. This is printed on the packaging. Together with the appropriate technical documentation declarations of conformity are kept available for review by the responsible monitoring authority.

**(EMC)
Interference immunity**

Terminals utilized in applications that fall under the scope of the IEC/EN 60947-7-1 are immune to electromagnetic disturbances. For that reason no immunity tests are required.

Emitted interference

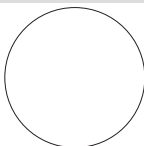


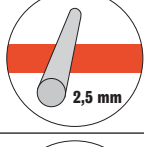
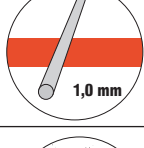
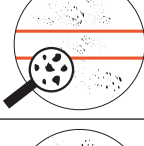

Terminals utilized in applications that fall under the scope of the IEC/EN 60947-7-1 do not generate electromagnetic disturbances. For that reason no emitted interference tests are required.

IP class of protection to DIN EN 60529

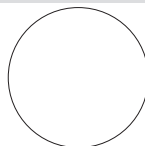
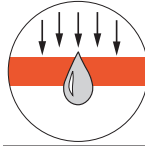
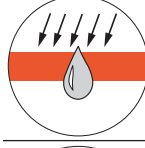
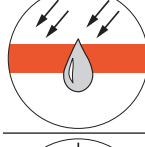
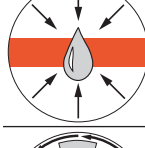
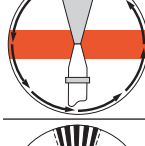
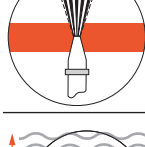
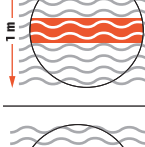
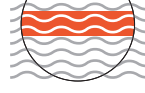
The ingress protection class or IP rating is indicated by a code consisting of the two letters IP and two digits representing the class of protection.

Example: **IP 6 5**
 | 2nd digit: protection from liquids
 | 1st digit: protection from solid bodies

Protection against intrusion of external particle matter (1st digit)

Kennziffer	
0	 No protection
1	 Protection against ingress of large solid bodies with diameter > 50 mm. (Protection to prevent dangerous parts being touched with the back of the hand.)
2	 Protection against ingress of large solid bodies with diameter > 12.5 mm. (Protection to prevent dangerous parts being touched with the fingers.)
3	 Protection against ingress of large solid bodies with diameter > 2.5 mm. (Protection to prevent dangerous parts being touched with a tool.)
4	 Protection against ingress of large solid bodies with diameter > 1 mm. (Protection to prevent dangerous parts being touched with a piece of wire.)
5	 Protection against harmful deposits of dust, which cannot enter in an amount sufficient to interfere with satisfactory operation.
6	 Complete protection against ingress of dust.

Protection against penetration of liquids (2nd digit)

Kennziffer	
0	 No protection
1	 Protection against drops of condensed water falling vertically.
2	 Protection against drops of liquid falling at an angle of 15° with respect to the vertical.
3	 Protection against drops of liquid falling at an angle of 60° with respect to the vertical.
4	 Protection against liquids splashed from any direction.
5	 Protection against water jets projected by a nozzle from any direction.
6	 Protection against water from heavy sea on ships' decks.
7	 Protection against immersion in water under defined conditions of pressure and time.
8	 Protection against indefinite immersion in water under defined conditions of pressure (which must be agreed between manufacturer and user and must be more adverse than number 7).

Conversion table for AWG to mm² conductors

AWG

AWG is the abbreviation for „**A**merican **W**ire **G**auge“. This designation bears no resemblance to the actual cross-section of the conductor.

The relationship between AWG and mm² is shown in the following table.

AWG	mm ²
28	0,08
26	0,13
24	0,21
22	0,22
20	0,52
19	0,65
18	0,82
17	1,04
16	1,31
15	1,65
14	2,08
13	2,63
12	3,31
11	4,17
10	5,26
9	6,63
8	8,37
7	10,55
6	13,30
5	16,77
4	21,15
3	26,67
2	33,63
1	42,41
0	53,48

Plug gauge to IEC 60947-1

Insertion of unprepared round conductors with the largest prescribed cross-section

Test with defined gauge, insertion simply under self-weight



Conductor cross-section		Plug gauge						
		Form A			Form B			
Flexible conductor mm ²	Rigid conductor (solid or stranded) mm ²	Designation	Diameter a mm	Width b mm	Designation	Diameter a mm	Permissible deviation for a and b mm	
1,5	1,5	A 1	2,4	1,5	B 1	1,9	0 – 0,05	
2,5	2,5	A 2	2,8	2,0	B 2	2,4		
2,5	4	A 3	2,8	2,4	B 3	2,7		
4	6	A 4	3,6	3,1	B 4	3,5	0 – 0,06	
6	10	A 5	4,3	4,0	B 5	4,4		
10	16	A 6	5,4	5,1	B 6	5,3		
16	25	A 7	7,1	6,3	B 7	6,9	0 – 0,07	
25	35	A 8	8,3	7,8	B 8	8,2		
35	50	A 9	10,2	9,2	B 9	10,0		
50	70	A 10	12,3	11,0	B 10	12,0	0 – 0,08	
70	95	A 11	14,2	13,1	B 11	14,0		
95	120	A 12	16,2	15,1	B 12	16,0		
120	150	A 13	18,2	17,0	B 13	18,0		

Design of the clearances and creepage distances in electrical equipment – general



Since April 1997 the sizing of clearances and creepage distances has been covered by IEC 60664-1 “Insulation coordination for electrical equipment in low-voltage systems”.

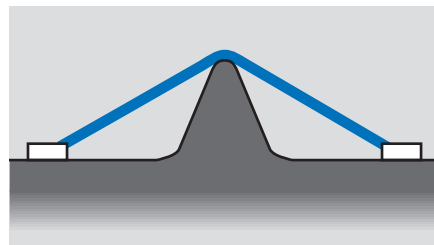
The design data resulting from these provisions is – if applicable – specified in this catalogue for each product.

For the design of clearances and creepage distances, application of the regulations for insulation coordination produces the following interrelationships:

Clearances

Clearances are rated in accordance with the following factors:

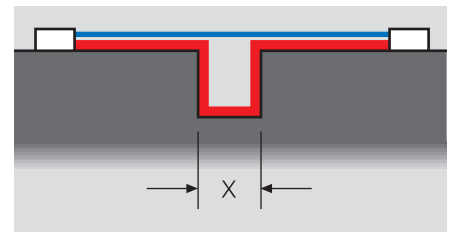
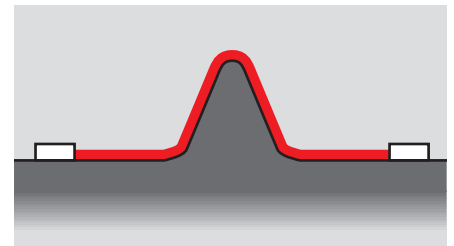
- Anticipated overvoltage
rated impulse withstand voltage
- Used
overvoltage protection precaution
- Measures to prevent pollution
pollution severity



Creepage distances

Creepage distances are rated in accordance with the following factors:

- Planned
rated voltage
- Insulation materials used
insulation group
- Measures to prevent pollution
pollution severity



Slots are taken into account when measuring creepage distances if their minimum width x is dimensioned according to the following table:

Pollution severity	min. width X [mm]
1	0.25
2	1.0
3	1.5
4	2.5

If the associated clearance in air is less than 3 mm, the minimum slot width can be reduced to 1/3 of the clearance.

Design of clearances and creepage distances in electrical equipment – influencing factors

Rated impulse withstand voltage

The rated impulse withstand voltage is derived from:

- **Voltage conductor – earth**
(the rated voltage of the network, taking into account all networks)
- **Surge category**

Table 1: Rated impulse withstand voltages for electrical equipment

Rated voltage of power supplies system *) in V		Rated impulse withstand voltage in kV			
Three-phase systems	Single-phase systems with neutral point	Electrical equipment at the supplies point of the installation (Surge category IV)	Electrical equipment as part of the permanent installation (Surge category III)	Electrical equipment to be connected to the permanent installation (Surge category II)	Specially protected electrical equipment (Surge category I)
	120 to 240	4.00	2.50	1.50	0.80
230/400 277/480		6.00	4.00	2.50	1.50
400/690		8.00	6.00	4.00	2.50
1000		Values depend on the particular project of, if no values are available, the values of the preceding line apply.			
*) to IEC 38					

Surge categories

are stipulated in accordance with the German standard DIN VDE 0110-1 (for electrical equipment fed directly from the low-voltage network).

Surge category I

- Equipment that is intended to be connected to the permanent electrical installation of a building. Measures to limit transient surges to the specific level are taken outside the equipment, either in the permanent installation or between the permanent installation and the equipment.

Surge category II

- Equipment to be connected to the permanent electrical installation of a building, e.g. household appliances, portable tools, etc.

Surge category III

- Equipment that is part of the permanent electrical installation and other equipment where a higher degree of availability is expected, e.g. distribution boards, circuit-breakers, wiring systems (including cables, busbars, junction boxes, switches, power sockets) in the permanent installation, and equipment for industrial use and some other equipment, e.g. stationary motors with permanent connections to the permanent installation.

Surge category VI

- Equipment for use at or near the power supplies in the electrical installations of buildings, between the principal distribution and the mains, e.g. electricity meters, circuit-breakers and centralised ripple controllers.

Pollution severity categories

Pollution severity category 1

- No pollution, or only dry, non-conductive pollution that has no influence.

Pollution severity category 2

- Non-conductive pollution only; occasional condensation may cause temporary conductivity.

Pollution severity category 3

- Conductive pollution, or dry, non-conductive pollution that is liable to be rendered conductive through condensation.

Pollution severity category 4

- Contamination results in constant conductivity, e.g. caused by conductive dust, rain or snow.

Unless explicitly stated otherwise, the dimensioning of clearance and creepage distances and the resulting rating data for electromechanical products (terminals, terminal strips, PCB connection terminals and plug-in connectors) is based on pollution severity 3 and surge category III, taking account of all network types.

Design of clearances and creepage distances in electrical equipment – influencing factors

Rated voltage

The rated voltage is derived from the nominal voltage of the power supply and the corresponding network type.

Single-phase 2- or 3-wire AC or DC systems

Rated voltage of the power supply (mains) ^{*)}	Voltages for table 4	
	For insulation phase-to-phase ¹⁾	For insulation phase-to-earth ¹⁾
	All systems	3-wire systems neutral pt. earthing
V	V	V
12.5	12.5	–
24 / 25	25	–
30	32	–
42 / 48 / 50 ^{**)}	50	–
60	63	–
30–60	63	32
100 ^{**)}	100	–
110 / 120	125	–
150 ^{**)}	160	–
220	250	–
110–220	250	125
120–240	–	–
300 ^{**)}	320	–
220–440	500	250
600 ^{**)}	630	–
480–960	1000	500
1000 ^{**)}	1000	–

3-phase 3- or 4-wire AC systems

Rated voltage of the power supply (mains) ^{*)}	Voltages for table 4		
	For insulation phase-to-phase	For insulation phase-to-earth	
	All systems	3-phase 4-wire systems with earthed neutral wire ²⁾	3-phase 3-wire systems unearthed ¹⁾ or phase-earthed
V	V	V	V
60	63	32	63
110/120/127	125	80	125
150 ^{**)}	160	–	160
208	200	125	200
220/230/240	250	160	250
300 ^{**)}	320	–	320
380/400/415	400	250	400
440	500	250	500
480/500	500	320	500
575	630	400	630
600 ^{**)}	630	–	630
660/690	630	400	630
720/830	800	500	800
960	1000	630	1000
1000 ^{**)}	1000	–	1000

1) Phase-to-earth insulation levels for unearthed or impedance-earthed systems are equal to those of phase-to-phase because the operating voltage to earth of any phase can, in practice, reach full phase-to-phase voltage. This is because the actual voltage to earth is determined by the insulation resistance and capacitive reactance of each phase to earth; thus, a low (but acceptable) insulation resistance of one phase can earth it and raise the other two to full phase-to-phase voltage to earth.

2) For electrical equipment for use in both 3-phase 4-wire and 3-phase 3-wire supplies, earthed and unearthed, use the values for 3-wire systems only.

*) It is assumed that the rated voltage of the electrical equipment is not lower than the nominal voltage of the power supply.

***) Because of the common changes, the meaning of the ** symbol has not been used in table 1; i.e. the / symbol indicates a 4-wire 3-phase distribution system. The lower value is the phase-to-neutral voltage, while the higher value is the phase-to-phase voltage. Where only one value is indicated, it refers to 3-wire 3-phase systems and specifies the value phase-to-phase. The values given in table 1 are still taken into account in tables 3a and 3b by the ** symbol.

Insulating material group

The insulating materials are divided into four groups depending on the comparative figures for creepage distance (CTI = comparative tracking index):

Insulating material group

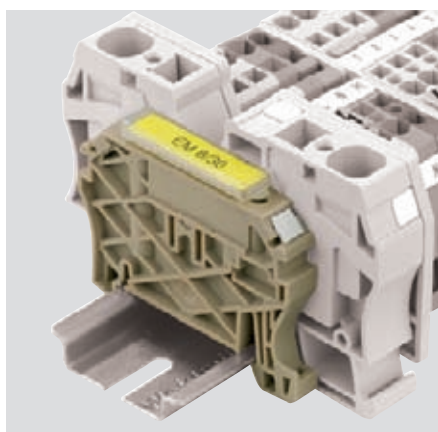
I	600 ≤ CTI
II	400 ≤ CTI < 600
III a	175 ≤ CTI < 400
III b	100 ≤ CTI < 175

The comparative tracking index must be determined using special samples produced for this purpose with test solution A in compliance with IEC 60112 (DIN IEC 60112/DIN VDE 0303-1).

The installation of terminal strips

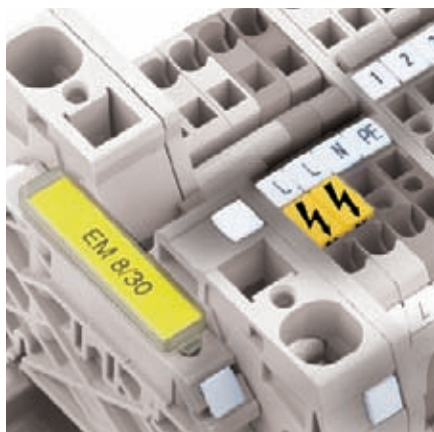
Assembly and end brackets

- Assemble terminal strips from left to right.
- Closed side on the left, open on the right.
- Always close off the open side of a modular terminal with an end plate or partition plate (WAP/TW, ZAP/TW and IAP).
- Fit end brackets to both ends of a terminal strip.
- End brackets can be omitted adjacent to PE terminals, with the exception of WDK/PE and ZPE + WPE 1.5 / R 3.5.



Combinations of various terminals

- Always fit an end plate or partition plate (WAP/TW, ZAP/TW and IAP) at changes of profile.
- Always fit end plates or partition plates (WAP/TW, ZAP/TW and IAP) between adjacent terminals with different rated voltages in order to maintain the respective voltages.
- When a PE terminal is required adjacent to or between associated feed-through terminals of the same series and size, the rated voltage and rated impulse withstand voltage of the feed-through terminals are not affected.



Dimensions

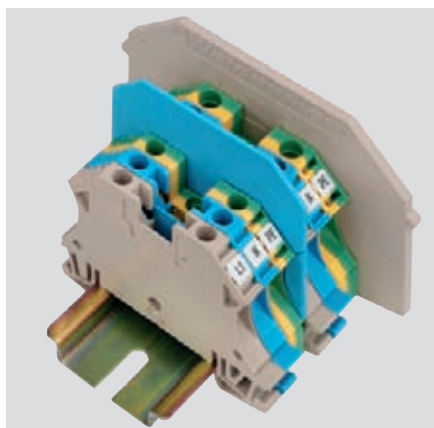
The dimensions specified are those of the enclosing housing to the modular terminal, including fixing components but excluding tolerances. A mounting tolerance of 0.2 mm on the specified terminal width should be allowed for in the planning.

Partition plate

A partition plate is required to create a visual distinction between electric circuits, or to ensure electrical isolation between neighbouring cross-connections.

Separation plate

Separation plates can be retrofitted between cross-connections or sockets



on modular terminals up to a terminal width of max. 12 mm.

Maintaining the rated insulation voltage

The required stripping length is specified in mm for every Weidmüller product. These lengths, e.g. $6 \pm 0,5$ mm, $\geq 10 \pm 1$ mm, must be maintained. This also applies when using wire end ferrules. The outside dimensions of crimped wire end ferrules must comply with IEC 60947-1, 1999 edition.

Working on electrical connections with non-insulated screwdrivers



The use of non-insulated screwdrivers is only permitted on electrical systems that have been isolated. To ensure that the electrical components have been dis-



connected from the power supply, the following five safety rules must be adhered to before carrying out any work and guaranteed for the duration of the work:

- isolation
- prevention of reconnection
- verification of disconnection
- earthing and short-circuiting
- covering or guarding of adjacent parts still connected to the power supply

These five safety rules represent the safety measures to be taken when working on electrical systems and equipment. The individual measures to be carried out taking into account the operational and local conditions, e.g. exposed high- or low-voltage lines, cables or switchgear, are specified in VDE 0105 part 100.

Unused clamping points connected to the power supply

Suitable covers, e.g. ADP 1...4, must be fitted to prevent electrical shock caused through accidental contact with unused clamping points that could conduct electricity. The clamping screws of all unused clamping points, even those isolated from the electricity supply, must be screwed fully home.

**VDE 0105 part 100
Operation of power supplies:
work on such systems**

Perform troubleshooting operations with a 2-pole voltage tester including test prod to IEC 61243-3.



Tightening torques for clamping screws

Tightening the clamping screw with the appropriate torque guarantees:

- a secure and gas-tight connection
- no mechanical damage to the clamping parts
- a voltage drop well below the permissible limit

The test torque to IEC 60947-1 or the torque as specified by the manufacturer is the lower value of the permissible torque range. This ensures that all tests are satisfied.

The upper value of the permissible torque range is the maximum torque that may be applied by the user.

An electric screwdriver should preferably be set to a torque in the middle of the range. The values given in the table are general figures. Torques specific to the products have been specified directly for each product.

Products with screw with slotted head		
Thread	Tightening torque	
	Steel screws	
	min. 8.8	A 2/A 4-80
	[Nm]	[Nm]
M 2	0.2...0.35	0.2...0.35
M 2.5	0.4...0.8	0.4...0.8
M 3	0.5...1.0	0.5...1.0
M 3.5	0.8...1.6	0.8...1.6
M 4	1.2...2.4	...
M 5	2.0...4.0	...
M 6	2.5...5.0	...

Products with screw with hexagon socket		
Thread	Tightening torque	
	Non-ferrous screws	
	Cu 2 (CuZn)	Cu 5 (CuNi 60)
	[Nm]	[Nm]
M 2.5	0.4...0.45	...
M 3	0.5...0.6	0.5...1.0
M 3.5	...	0.8...1.6
M 4	1.2...1.9	1.2...2.4
M 5	2.0...3.0	2.0...4.0
M 6	...	2.5...5.0

Products with screw with hexagon socket	
Thread	Tightening torque
	Steel screws
	[Nm]
M 4	1.2...2.4
M 5	2.0...4.0
M 6	3.0...6.0
M 8	6.0...12
M 10	10.0...20
M 12	14.0...31
M 16	25.0...60

Connecting the terminals

Two conductors at one clamping point

The optimum solution for allocation of individual circuits, labelling and the break-down into separate functional units is best achieved by connecting just one conductor at every clamping point.

However, if it is necessary to connect two conductors with the same cross-section at one clamping point, then this is possible with the modular terminals of the W-Series (screw connection).

According to DIN IEC 60999-1, twin wire end ferrules must be used when connecting two conductors at one clamping point in modular terminals of the Z-Series (tension clamp).

But DIN IEC 60999-1 prohibits the connection of two conductors at one point in the screwless IDC system (I series).

- Continuous current rating with two conductors**

The total current of two conductors may not exceed the continuous current rating of the modular terminal. The continuous current rating is the maximum current that a modular terminal can accommodate without the temperature rise exceeding 45 K.

- Rated voltage**

The Rated voltage of the modular terminal does not change when two conductors are connected properly.

File E60693	Torque Nm	Voltage	Current	WI Catalog No.
Multi wire test for:				
sec 38	0.8	600	25	WDU 2.5
sec 38	1	600	35	WDU 4
sec 38	1.6	600	50	WDU 6
sec 38	2.4	600	65	WDU 10
sec 38	4	600	85	WDU 16
sec 38	5	1000	125	WDU 35
sec 38	0.8			WPE 2.5
sec 38	1			WPE 4
sec 38	1.6			WPE 6
sec 38	2.4			WPE 10
sec 38	4			WPE 16
sec 38	5			WPE 35
sec 38	0.8	300	20	WDK 2.5...
sec 38	0.8	300	20	WDK 2.5/DU-PE
sec 38	0.5	300	20	WDU 1.5/ZZ
sec 38	0.5			WPE 1.5/ZZ
sec 38	0.8	300	20/10	WDU 2.5/1.5/ZR
sec 38	0.5			
sec 38	0.8			WPE 2.5/1.5/ZR
sec 38	0.5			
sec 38	0.8	300	10	WPO 4
sec 38	0.5	300	10	WDU 1.5/BLZ 5.08
sec 38	0.8	300	10	WDK 2.5/BLZ 5.08
sec 38	0.8	300	16	WDU 2.5 F
sec 38	0.8	300	16	WDK 2.5 F
sec 47	0.5	300	10	BLZ 5.08/2
sec 38				WDU 50N
sec 38				WPE 50N
sec 75				WDU 70N
sec 75				WPE 70N
sec 38				WDK 2.5/TR DU/σTNHE
sec 38				WDK 2.5/TR DU-PE/σTNHE
sec 38				WTR 2.5
				WDU 50N
				WPE 50N
				WDU 70N
				WPE 70N
				WDK 2.5/TR DU/σTNHE
				WDK 2.5/TR DU-PE/σTNHE
				WTR 2.5
				WDK 4N
				WDK 4N PE
				WDK 4N V
				WDU 4/ZR
				WDU 4/ZZ
				WPE 4/ZR
				WPE 4/ZZ
				WTR 4/ZR
				WTR 4/ZR STB 2.3
				WTR 4/ZZ
				WTR /ZZ STB 2.3
				WTL 4/2 STB
				WTL 4
				WTR 4
				WTR 4 STB
				KDKS 1/EN4
				KDKS 1 PE/35
				MAK 2.5 DB

¹⁾ Passed with lowered current rating

²⁾ Passed with differing number of wires

³⁾ Still in work

UL Rated Terminal Blocks																		
Wire Size AWG (mm²)																		
#30 (0.05)	#28 (0.08)	#26 (0.13)	#24 (0.21)	#22 (0.33)	#20 (0.5)	#18 (0.75)	#16 (1.5)	#14 (2.5)	#12 (4)	#10 (6)	#8 (10)	#6 (16)	#4 (25)	#2 (35)	#1 (40)	1/0 (50)	2/0 (70)	3/0 (80)
Number of the Same Size Wires per Terminal																		
4	4	4	4	4	4	3	3	2	1	-	-	-	-	-	-	-	-	-
-	-	-	-	4	4 (29 A) ¹⁾	3	3	2	1	1	-	-	-	-	-	-	-	-
-	-	-	-	4	4 (30 A) ¹⁾	3	3	3	2	1	1	-	-	-	-	-	-	-
-	-	-	-	4	4	4	4 (46 A) ¹⁾	3 (50 A) ¹⁾	2 (50 A) ¹⁾	1	1	1	-	-	-	-	-	-
-	-	-	-	-	-	-	4 (67 A) ¹⁾	4 (62 A) ¹⁾	3 (71 A) ¹⁾	2 (67 A) ¹⁾	1	1	1	-	-	-	-	-
-	-	-	-	-	-	-	-	3	3	3 (90 A) ¹⁾	2	2 (114 A) ¹⁾	1	1	1	-	-	-
4	4	4	4	4	4	3	3	2	1	-	-	-	-	-	-	-	-	-
-	-	-	-	4	4	3	3	2	1	1	-	-	-	-	-	-	-	-
-	-	-	-	4	4	3	3	3	2	1	1	-	-	-	-	-	-	-
-	-	-	-	4	4	4	4	3	2	1	1	1	-	-	-	-	-	-
-	-	-	-	-	-	-	4	4	3	2	1	1	1	-	-	-	-	-
-	-	-	-	-	-	-	-	3	3	3	2	2	1	1	1	-	-	-
4	4	4	4	4	4	3	2	2	1	-	-	-	-	-	-	-	-	-
4	4	4	4	4	4	3	2	2	1	-	-	-	-	-	-	-	-	-
-	-	4	4	4	3	1	1	1	-	-	-	-	-	-	-	-	-	-
-	-	4	4	4	3	1	1	1	-	-	-	-	-	-	-	-	-	-
4	4	4	4	4	4	3	3	2	1	-	-	-	-	-	-	-	-	-
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-	-	4	4	4	3	1	1	1	-	-	-	-	-	-	-	-	-	-
-	-	4	4	4	2 ²⁾	3	2	2	1	-	-	-	-	-	-	-	-	-
-	-	4	4	4	3	1	1	1	-	-	-	-	-	-	-	-	-	-
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4	4	4	4	4	4	3	2	2	1	-	-	-	-	-	-	-	-	-
4	4	4	4	4	4	2	1	1	-	-	-	-	-	-	-	-	-	-
											2	2	1	1	1	1		
											2	2	1	1	1	1		
								5	5	5	2	2	2	1	1	1	1	
								5	5	5	2	2	2	1	1	1	1	
				4	4	3	2	1	1									
				4	4	3	2	1	1									
4	4	4 ³⁾	4 ³⁾	3 ³⁾	3 ³⁾	3 ³⁾	3 ³⁾	2 ³⁾	1									
											2	2	1	1	1	1		
											2	2	1	1	1	1		
								5	5	5	2	2	2	1	1	1	1	
								5	5	5	2	2	2	1	1	1	1	
				4	4	3	2	1	1									
				4	4	3	2	1	1									
4	4	4	4	3	3	3	3	2	1									
covered by 1492-JD4C																		
covered by 1492-JD4C																		
				4 ²⁾	4 ²⁾	3 ²⁾	3 ²⁾	2 ²⁾	1 ²⁾	1 ²⁾								
covered by 1492-JKD4Q																		
covered by 1492-JKD4Q																		
covered by 1492-JKD4Q																		
covered by 1492-JKD4Q																		
covered by 1492-JKD4Q																		
covered by 1492-JKD4Q																		
				4 ²⁾	4 ²⁾	3 ²⁾	3 ²⁾	2 ²⁾	1 ²⁾	1 ²⁾								
covered by 1492-JKD4Q																		
				4 ²⁾	4 ²⁾	3 ²⁾	3 ²⁾	2 ²⁾	1 ²⁾	1 ²⁾								
				4 ²⁾	4 ²⁾	3 ²⁾	3 ²⁾	2 ²⁾	1 ²⁾	1 ²⁾								
				4 ²⁾	4 ²⁾	3 ²⁾	3 ²⁾	2 ²⁾	1 ²⁾	1 ²⁾								
covered by 1492-JKD4																		
covered by 1492-JDG3FB																		
4 ²⁾	4 ²⁾	4 ²⁾	4 ²⁾	4 ²⁾	4 ²⁾	3 ²⁾	3 ²⁾	2 ²⁾	1 ²⁾	1 ²⁾								
4 ²⁾	4 ²⁾	4 ²⁾	4 ²⁾	4 ²⁾	4 ²⁾	3 ²⁾	3 ²⁾	2 ²⁾	1 ²⁾	1 ²⁾								

Connecting the terminals

Cross-connections systems

Weidmüller can supply the cross-connections WQV and ZQV – fully insulated against electric shock – with various numbers of poles (2- to 20-pole). Please note that the rated voltage is reduced when using cross-connections.

Protection against electric shock is not provided at the ends of shortened cross-connections.

Such cross-connections must be used with partition plates or end plates in order to maintain the rated voltage.

Leaf clamp conductor connection for large cross-sections

It is no longer the case that conductors with large cross-sections have to be forced into the clamping point. Instead, they can now be easily laid in the modular terminal.

In addition to the individual form, every type of terminal can also be supplied in the form of 3-, 4- and 5-pole blocks. All the blocks are permanently screwed together and therefore guarantee additional rigidity.

Direct mounting is possible thanks to the elongated holes on the underside of the terminals. Terminal blocks can be screwed directly to mounting plates with a 25 mm pitch.

The other advantages are:

- Constant force transfer through self-adjusting connection system
- Mounting in any direction
- Electric shock protection (finger-proof) to German standard VBG 4, also with cross-connections
- Extremely resistant to distortion



Open cover and remove screw assembly.



Insert conductor and replace screw assembly.



Close cover and tighten screw with Allen key.

The use of aluminium conductors

Weidmüller modular terminals are suitable for the direct connection of **solid round and sector aluminium conductors**.

In contrast to copper, aluminium exhibits certain characteristics that must be taken into account when using this material as a conductor in electrical engineering.

A thin, non-conductive layer of oxide forms immediately on the unprotected surface of the aluminium as soon as it is exposed to the air.

This layer increases the contact resistance between the aluminium conductor and the current bar of the modular terminal. And that, in unfavourable conditions, can lead to poor contact.

And in stranded conductors the contact resistances of the individual strands are added together. Despite these disadvantages, aluminium conductors can be connected to Weidmüller modular terminals, provided the reduced rated currents for aluminium conductors and the following installation conditions are adhered to.

1. Scrape the stripped end of the conductor carefully, eg. with a knife, to remove the layer of oxide.

Caution: Do not use brushes, files or emery paper because particles of aluminium can be deposited on other conductors.

2. After removing the layer of oxide, coat the end of the conductor immediately with a neutral grease, e.g. acid- and alkali-free Vaseline, and connect it to the terminal immediately.

3. Repeat the above procedure if at any time the conductor is disconnected and reconnected.

4. The above installation instructions are valid for solid round or sector aluminium conductors only.

Solid round and sector conductors

Terminal type	Rated cross-section	Reduced rated current when connecting an aluminium conductor	Clamping screw thread size	Tightening torque
W-Series	mm ²	„A“		Nm
WDU 2.5	2.5	20	M 2.5	0.5-0.8
WDU 4	4	27	M 3	0.6-1.0
WDU 6	6	35	M 3.5	1.2-1.6
WDU 10	10	48	M 4	2.0-2.4
WDU 16	16	64	M 5	3.0-4.0
WDU 35	35	105	M 6	4.0-6.0
WDU 70	70	163	M 8	10.0-12.0
WDU 120	120	230	M 10	15.0-20.0
WDU 240	240	–	M 10	12.0-20.0
SAK-Series				
SAK 2.5	2.5	20	M 2.5	0.5-0.8
SAK 4	4	27	M 3	0.6-1.0
SAK 6	6	35	M 3.5	1.2-1.6
SAK 10	10	48	M 4	2.0-2.4
SAK 16	16	64	M 4	2.0-2.4
SAK 35	35	105	M 6	4.0-6.0

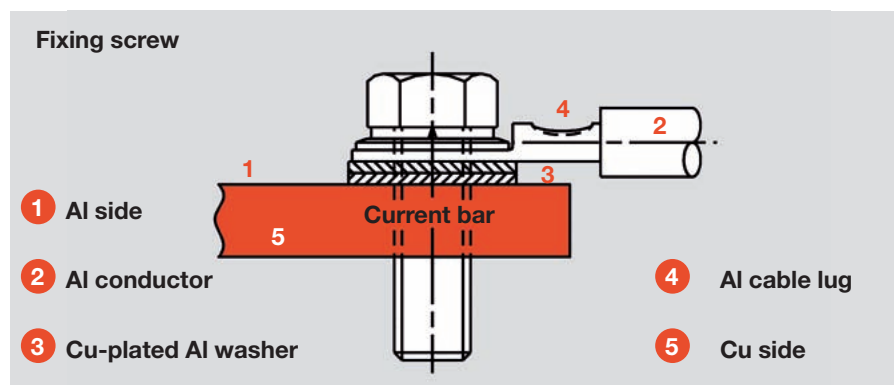
Stranded conductors

W-Series				
WFF 35	35	105	M 6	3.0-6.0
WFF 70	70	163	M 8	6.0-12.0
WFF 120	120	230	M 10	10.0-20.0
WFF 185	185	300	M 12	15.5-31.0
WFF 300	300	409	M 16	30.0-60.0

Installation advice when using flat cable lugs

When tightening the terminal it is advisable to hold the conductor to prevent deformation of the terminal rail and to avoid twisting the foot of the terminal. When connecting **stranded aluminium conductors** to modular terminals, it is advisable to use an aluminium cable lug chosen to match the type of conductor and connected according to the instructions of the cable lug manufacturer. It is

necessary to fit a copper-plated aluminium washer between the aluminium cable lug and the copper current bar of the modular terminal. This is the only way of guaranteeing a reliable transition between the copper and the aluminium. Fit the washer in such a way that the copper side is in contact with the current bar, and the aluminium side in contact with the cable lug.



ATEX terminals blocks

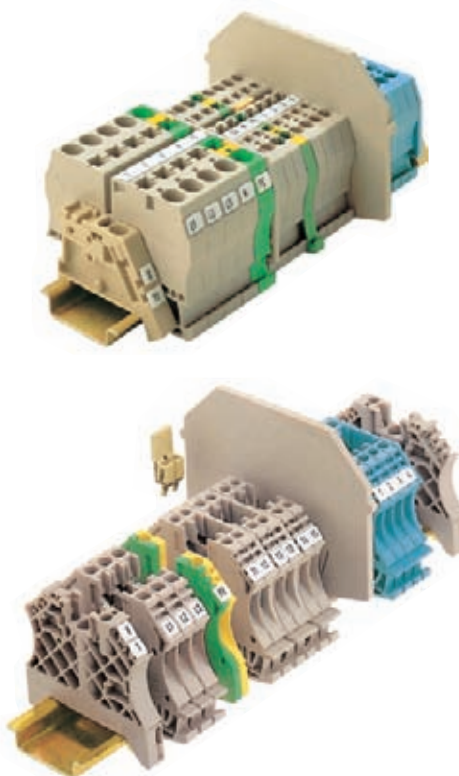
Modular terminals for explosive conditions – complying with the European ATEX Directive 94/9/EC

Principles

IEC 60947-7-1 (EN 60 947-7-1/VDE 0611pt.1) and IEC 60 947-7-2 (EN 60 947-7-2/ VDE 0611pt.3) specify the basic provisions for modular terminals or PE terminals. In addition, when used in hazardous areas the standard EN 60079-0 applies; where increased safety 'e' is required EN 60079-7 applies. According to EN 60079-0 modular terminals for explosive conditions are so-called explosion-proof components. Components are those parts and assemblies that are necessary for the safe operation of devices and protective systems without themselves fulfilling an autonomous function. In accordance with the European ATEX Directive 94/9/EC the components do not carry the CE mark. Modular terminals for explosive areas are certified for the increased safety "e" type of protection.

The certifying body approved under the Directive RL 94/9/EC issue EC Type Approval Certificates in accordance with EN 60079-0/60079-7 and the ATEX Directive 94/9/EC. By issuing the 'Production Quality Assurance Notification' the approved certifying authority KEMA confirms that the manufacturer has fulfilled the requirements contained in the ATEX Directive in accordance with the Appendices IV and VII. Copies of the EC Type Approval Certificates, the notifying committee and the Declarations of Conformity are available via the Internet.

The clamping yoke, tension clamp, insulation displacement and the Push In terminal block system offer increased protection against accidental loosening and have been designed in such a manner that the ends of flexible wire conductors need no preparation.



Marking

RL94/9EG: Ⓔ II 2 G-D

- Ⓔ Equipment for explosive conditions
- II 2-G Equipment group II category 2 (Zone 1 equipment)
- II 2-D Equipment group II category 2 (Zone 21 equipment)

EN 60079-7: Ex e II

- Ex Explosion protection
- e Increased safety
- II Equipment group

KEMA 97ATEX4677U (example)

- KEMA Notified body
- ATEX Conformity with 94/9/EG
- U Component

Certified for the European Directive 94/9/EG – ATEX –

Electrical data

The values for current-carrying capacity as stated in the catalogue are based on an ambient temperature of 40°C. When loaded with the rated current + 10%, the temperature of the current bar of the modular terminal may not rise more than 40 K.

Taking into account a further safety factor according to EN 60079-0, we reach the following definitions:

Temperature class	Ambient temperature
T6	-50 °C to +40 °C
T5 to T1	-50 °C to +55 °C

Current-carrying capacity of cables and lines

Rated currents

Cross-sect.	VDE 0298 part 4 (IEC364-5-523) Current-carrying capacity of lines		EN 60079-7 2nd edition Type of ignition "increased safety" Connection terminals Ambient temperature 40 °C, 40 K temperature rise Current equivalent to the conductor connected A
	Ambient temperature 30 °C Factor 1.0 - Installation type C + 3 current-carrying wires PVC 70 °C A	Ambient temperature 40 °C Factor 0.87 - Installation type C + 3 current-carrying wires PVC 70 °C A	
1.5	17.5	15.225	15
2.5	24	20.88	21
4	32	27.84	28
6	41	35.67	36
10	57	49.59	50
16	76	66.12	66
25	101	87.87	88
35	125	108.75	109
50	150	130.5	131
70	192	167.04	167
90	232	201.84	202
120	269	234.03	234
150	309	268.83	267
185	353	307.11	307
240	415	361.05	361
300	520	452.4	452

The current-carrying capacity of cables and lines in the installation is defined by VDE 0298 part 4 as normal at an ambient temperature of 30 °C. At 40 °C the operating current must be reduced by a factor of 0.87.

If the actual ambient temperature is higher, then the permissible rated current must be reduced accordingly.

The continuous operating temperature to EN 60079-0 for the material KRG is 130 °C, for Wemid it is 120 °C and for the material PA it is 80 °C.

Accessories

The accessories listed can be used and included in the ATEX certification. Where necessary, end plates or partitions must be installed as described to ensure adherence to creepage and clearance distances for Ex e applications.

Design for Ex i

Terminals for intrinsically-safe circuits ("i") are passive components. Therefore, for use in intrinsically-safe circuits, you do not need an EC-standard examination certificate. The blue terminals are recommended for clear labelling and easy recognition. The construction type of these terminals must comply with EN 60079-11.

Additional information about using the Weidmüller terminals in intrinsically-safe circuits can be requested from the manufacturer.

Accessories

The accessories listed can be used and comply with EN 60079-11.

Installation

The general statements regarding standard applications are also valid for Ex i applications. In particular, the Ex i requirements always apply to the entire circuit, i.e. also to parts in areas not at risk of explosion.

Clamping of two conductors in Ex e applications

It is generally permitted to connect two conductors per clamping point in all the terminals of our W-Series. However, please make sure that these have the same cross-section and do not exceed the rated cross-section.

ATEX directives

Since July 1, 2003, all new facilities in explosion risk zones must be certified according to ATEX Directive 94/9/EG or ATEX 95 (ATEX: ATmosphère EXplosive = explosive atmosphere). This directive is one of the “New-Approach” directives. It is valid in all European Union countries, as well as Iceland, Lichtenstein and Norway. In these countries, the directive refers to the sale and commissioning of products which have been designed particularly for high explosion risk environments (where explosive atmospheres exist due to gases, vapours, mists, or dusts). It now also covers the mining sector and purely mechanical devices.

Class of protection

Type of protection	Code	CENELEC EN	IEC	Product category explosion protect.
General requirements	–	60079-0	60079-0	–
Oil immersion	o	60079-6	60079-6	2
Pressurised apparatus	p	60079-2	60079-2	2
Powder filling	q	60079-5	60079-5	2
Flameproof enclosure	d	60079-1	60079-1	2
Increased safety	e	60079-7	60079-7	2
Intrinsic safety	ia	60079-11	60079-11	1
Intrinsic safety	ib	60079-11	60079-11	2
Intrinsic safety	ic	60079-11	60079-11	3
Type n (Ex n)	n	60079-15	60079-15	3
Encapsulation	m	60079-18	60079-18	2

Classification for potentially explosive areas

CENELEC classification IEC60079-10	Presence of potentially explosive atmosphere	Product category	US classification NEC 500	Combustible media
Zone 0	permanent, long-term	1G	Class I, Div 1	gases, vapours
Zone 20	or frequently	1D	Class II, Div 1	dust
Zone 1	occasionally	2G	Class I, Div 1	gases, vapours
Zone 20		2D	Class II, Div 1	dust
Zone 2	rarely and	3G	Class I, Div 2	gases, vapours
Zone 22	briefly	3D	Class II, Div 2	dust

Explosion groups

Gas (e.g.)	CENELEC	NEC 500
Propane	IIA	D
Ethylene	IIB	C
Hydrogen	IIC	B
Acetylene	IIC	A
Methane (mining)	I	mining (MSHA)

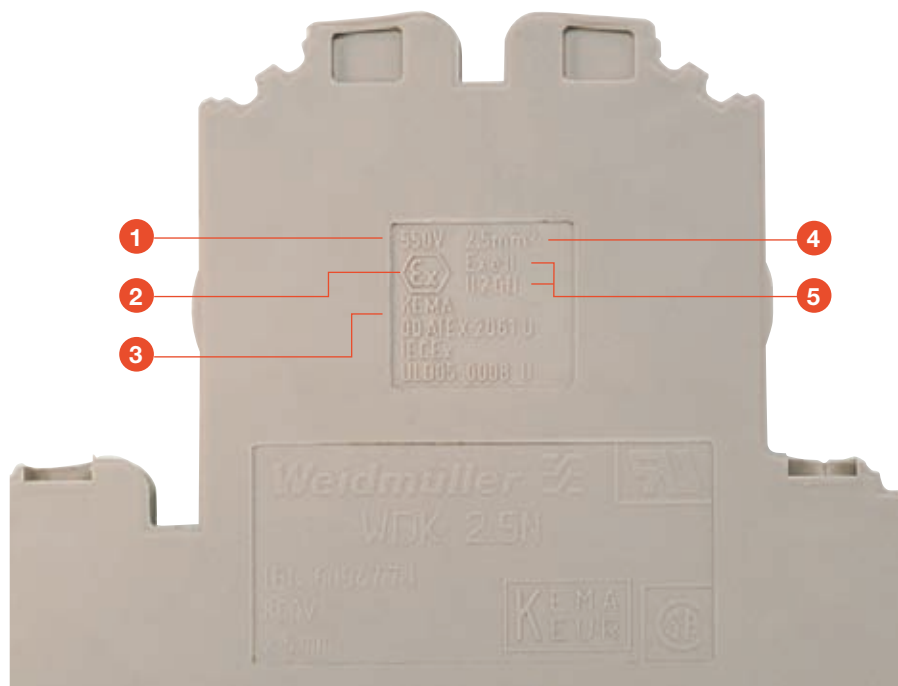
Temperature classes

Max. surface temperature (°C)	Temperature class CENELEC	Temperature class NEC 500-3
450	T1	T1
300	T2	T2
280	–	T2A
260	–	T2B
230	–	T2C
215	–	T2D
200	T3	T3
180	–	T3A
165	–	T3B
160	–	T3C
135	T4	T4
120	–	T4A
100	T5	T5
85	T6	T6

ATEX codes

Example of marking – modular terminal WDK 4 N V

- 1 • Rated voltage
- 2 • European symbol for explosion protection.
- 3 • Certificate number
- 4 • Rated conductor cross-section
- 5 • CENELEC explosion protection type „e“ – Group II (gases, vapours, mists)
 - Device category 2 – Application in Zone 1 or 2
 - Approval for applications in gases („G“) or dusts („D“).

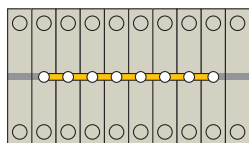


ATEX cross-connection instructions

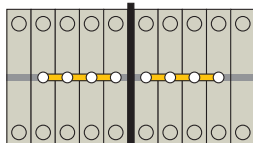
Arrangements of terminals and cross-connections

The maximum voltages for Ex e applications given below are determined on the basis of the terminals used, their cross-connections and which of the arrangements (A to J) is used.

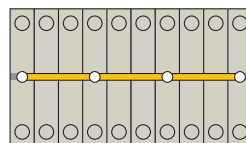
A Continuous



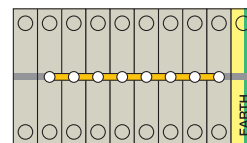
C Adjacent (used with QV) separated with a partition



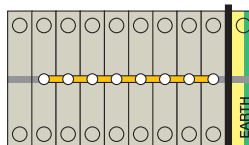
D Bypassing bridging one or several unconnected terminals (e.g. every third)



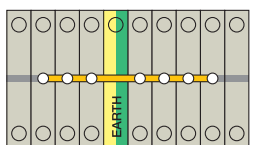
E Adjacent to a PE terminal (earth) Without partition



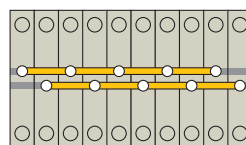
F Adjacent to a PE terminal (earth) with partition



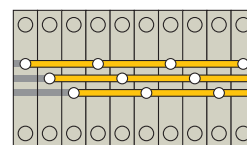
G Bypassing a PE terminal (earth)



H 2 parallel cross-connections



I 3 parallel cross-connections



Maximum voltage

Range ¹⁾	Certificate No.	Rated voltage / V	Rated current / A	Rated current with QV / A	Nominal cross-section / mm ²
AKZ...					
AKZ 1.5	SIRA 02ATEX3001 U	176	15	15	1,5
AKZ 2.5	SIRA 02ATEX3001 U	176	21	21	2,5
AKZ 4	SIRA 02ATEX3001 U	275	28	28	4
BK...					
BK 2/E ... BK 12/E	SIRA 01ATEX3247 U	275	28	25	4
DK 4 ...					
DK 4	SIRA 02ATEX3316 U	275	28	21	4
DK 4Q	SIRA 02ATEX3316 U	275	28	21	4
DK 4QV	SIRA 02ATEX3316 U	275	28	21	4
I ... Series					
IDK 1.5N	KEMA 02ATEX2241 U	275	15	15	1,5
IDK 1.5N/V	KEMA 02ATEX2241 U	275	15	15	1,5
IDU 1.5N	KEMA 02ATEX2241 U	275	15	15	1,5
IDU 1.5N/2x2AN	KEMA 02ATEX2241 U	275	15	15	1,5
IDU 1.5N/ZF	KEMA 02ATEX2241 U	275	15	15	1,5
IDU 1.5N/3AN/ZF	KEMA 02ATEX2241 U	275	15	15	1,5
IDU 1.5N/ZB	KEMA 02ATEX2241 U	275	15	15	1,5
IDU 1.5N/3AN/ZB	KEMA 02ATEX2241 U	275	15	15	1,5
IDU 2.5N	DEMKO 03ATEX134054 U	550	21	21	2,5
IDU 2.5N/3AN	DEMKO 03ATEX134054 U	550	21	21	2,5
IDU 2.5N/4AN	DEMKO 03ATEX134054 U	550	21	21	2,5
IDU 2.5N/2x2AN	DEMKO 03ATEX134054 U	550	21	21	2,5
IDU 2.5N/ZF	DEMKO 03ATEX134054 U	550	21	21	2,5
IDU 2.5N/ZB	DEMKO 03ATEX134054 U	550	21	21	2,5
MK ...					
MK 3/.../E	SIRA 01ATEX3248U	275	21	21	2,5
MK 6/.../E	SIRA 01ATEX3249U	440	36	36	6

¹⁾ Please refer to the catalogue and the certificate for details of precisely which article is approved.

Maximum voltage (V)							
(letters refer to the above diagrams)							
A	C	D	E	F	G	H	I
176	176	--	176	176	--	--	--
176	176	--	176	176	--	--	--
275	275	--	275	275	--	--	--
176	--	--	--	--	--	--	--
275	275	--	275	275	--	--	--
275	275	--	275	275	--	--	--
275	275	--	275	275	--	--	--
275	275	275	--	--	--	--	--
275	275	275	275	275	275	275	--
275	275	275	275	275	275	275	--
275	275	275	275	275	275	275	--
550	550	550	550	550	550	--	--
550	550	550	550	550	550	--	--
550	550	550	550	550	550	--	--
550	550	550	550	550	550	--	--
550	550	275	550	550	275	--	--
550	550	275	550	550	275	--	--
176	--	--	--	--	--	--	--
275	--	--	--	--	--	--	--

Maximum voltage

Range ¹⁾	Certificate No.	Rated voltage	Rated current	Rated current with QV	Nominal cross-section
P ...		/ V	/ A	/ A	/ mm ²
PDU 2.5/4	KEMA 06ATEX0177U	550	29	25,5	4
PDU 2.5/4/3AN	KEMA 06ATEX0177U	550	29	25,5	4
PDU 2.5/4/4AN	KEMA 06ATEX0177U	550	29	26,5	4
PDU 6/10	KEMA 06ATEX0177U	550	37	26,5	6
PDU 6/10/3AN	KEMA 06ATEX0177U	550	36,5	29,5	6
PDU 16	KEMA 06ATEX0177U	550	59	57,5	16
PEI 16	KEMA 06ATEX0177U	550	66,5	25 (37) ⁴⁾	16
SAK ...TS 32/TS 35					
SAK 2.5	KEMA 97ATEX1798 U	550	21	21	2,5
SAK 4	KEMA 97ATEX1798 U	550	28	28	4
SAK 6N	KEMA 97ATEX1798 U	550	36	36	6
SAK 10	KEMA 97ATEX1798 U	550	50	50	10
SAK 16	KEMA 97ATEX1798 U	690	66	66	16
SAK 35	KEMA 97ATEX1798 U	550	109	99	35
SAK ... EN on TS32					
SAK 2.5 EN	KEMA 97ATEX1798 U	440	21	21	2,5
SAK 4 EN	KEMA 97ATEX1798 U	440	28	28	4
SAK 6N EN	KEMA 97ATEX1798 U	440	36	36	6
SAK 10 EN	KEMA 97ATEX1798 U	440	50	50	10
SAK 16 EN	KEMA 97ATEX1798 U	440	66	66	16
SAK 35 EN	KEMA 97ATEX1798 U	440	109	109	35
SAK ... EN on TS35					
SAK 2.5 EN	KEMA 97ATEX1798 U	690	21	21	2,5
SAK 4 EN	KEMA 97ATEX1798 U	690	28	28	4
SAK 6N EN	KEMA 97ATEX1798 U	690	36	36	6
SAK 10 EN	KEMA 97ATEX1798 U	690	50	50	10
SAK 16 EN	KEMA 97ATEX1798 U	690	66	66	16
SAK 35 EN	KEMA 97ATEX1798 U	690	109	109	35
SAK 4 EP/SAKH 6-35 EP					
SAK 4 EP/SW	KEMA05ATEX2061U	550	32	32	4
SAKH 6 EP/SW	KEMA05ATEX2061U	1100	57	57	10
SAKH 10 EP/SW	KEMA05ATEX2061U	1100	57	57	10
SAKH 35 EP/SW	KEMA05ATEX2061U	1100	125	125	35
SAKK ...					
SAKK 4	SIRA 03 ATEX3425 U	275	28	28	4
SAKK 10	SIRA 03 ATEX3425 U	275	50	50	10
W ...					
WDK 1.5/R3.5	KEMA 99ATEX6545 U	275	14	11	1,5
WDK 2.5	KEMA 98ATEX1687 U	275	21	21	2,5
WDK 2.5V	KEMA 98ATEX1687 U	275	21	21	2,5
WDK 2.5DU-PE	KEMA 98ATEX1687 U	275	21	21	2,5
WDK 2.5/EX	KEMA 98ATEX1687 U	440	24	22	2,5
WDK 2.5N	KEMA 00ATEX2061 U	550	21	21	2,5
WDK 2.5N V	KEMA 00ATEX2061 U	550	21	21	2,5
WDK 4N	KEMA 00ATEX2061 U	550	28	28	4
WDK 4N V	KEMA 00ATEX2061 U	550	28	28	4
WDU 1.5/ZZ	KEMA 98ATEX1685 U	550	15	15	1,5
WDU 2.5/1.5/ZR	KEMA 98ATEX1685 U	550	15	15	1,5
WDU 1.5/R3.5	KEMA 99ATEX6545 U	275	15	11	1,5
WDU 2.5N	KEMA 98ATEX1683 U	440	21	21	2,5
WDU 2.5	KEMA 98ATEX1683 U	550	21	21	2,5
WDU 4	KEMA 98ATEX1683 U	690	28	28	4
WDU 4N	TÜV 04ATEX2630 U	440	27	27	4
WDU 6	KEMA 98ATEX1683 U	550	36	36	6
WDU 10	KEMA 98ATEX1683 U	550	50	50	10
WDU 16	KEMA 98ATEX1683 U	690	66	66	16
WDU 35	KEMA 98ATEX1683 U	690	109	109	35
WDU 50N	KEMA 98ATEX1683 U	690	126	126	50
WDU 70N	KEMA 98ATEX1683 U	690	167	167	70
WDU 70/95	KEMA 98ATEX1686 U	690	202	202	95

¹⁾ Please refer to the catalogue and the certificate for details of precisely which article is approved.⁴⁾ For PDU 2.5/4 and ZQV 2.5 cross-connection: 25 A; For PDU 6/10 and ZQV 6N cross-connection: 37 A

Maximum voltage (V)							
(letters refer to the above diagrams)							
A	C	D	E	F	G	H	I
275	550	176	275	275	176	176	
275	550	176	275	275	176	176	
275	550	176	275	275	176	176	
550	550	275	550	550	--	220	
550	550	275	550	550	--	220	
275	550	--	275	275	--	110	
275	--	--	--	--	--	--	
550	550	176	550	550	--	--	--
550	550	176	550	550	--	--	--
550	550	176	550	550	--	--	--
550	550	176	550	550	--	--	--
550	550	176	550	550	--	--	--
440	440	440	440	440	--	--	--
440	440	440	440	440	--	--	--
440	440	440	440	440	--	--	--
440	440	440	440	440	--	--	--
440	440	440	440	440	--	--	--
440	440	440	440	440	--	--	--
690	690	440	690	690	--	--	--
690	690	690	690	690	--	--	--
690	690	690	690	690	--	--	--
690	690	690	690	690	--	--	--
690	690	690	690	690	--	--	--
690	690	690	690	690	--	--	--
550	550	176	550	550	--	--	--
1100	1100	176	1100	1100	--	--	--
1100	1100	176	1100	1100	--	--	--
1100	1100	440	1100	1100	--	--	--
275	275	--	275	275	--	--	--
275	275	--	275	275	--	--	--
176	275	--	--	--	--	--	--
275	275	60	275	275	60	--	--
275	275	60	275	275	60	--	--
275	275	60	275	275	60	--	--
440	440	176	440	440	176	--	--
550	550	275	550	550	275	--	--
550	550	275	550	550	275	--	--
550	550	275	550	550	275	--	--
550	550	110	550	550	110	110	--
550	550	110	550	550	110	110	--
176	275	--	--	--	--	--	--
440	440	110	440	440	110	--	--
550	550	110	440	550	110	110 ²⁾	60 ³⁾
690	690	110	440	690	110	--	--
440	275	69	440	440	69	69	--
550	550	110	440	550	110	--	--
550	550	110	440	550	110	--	--
690	690	110	690	690	110	--	--
690	690	110	690	690	110	--	--
550	--	--	550	550	--	--	--
550	--	--	550	550	--	--	--
690	--	--	690	690	--	--	--

²⁾ The outer cross-connection openings must be used for type ZQV.³⁾ Only possible with ZQV.

Maximum voltage

Range ¹⁾	Certificate No.	Rated voltage	Rated current	Rated current with QV	Nominal cross-section
W ...		/ V	/ A	/ A	/ mm ²
WDU 95N/120N	KEMA 98ATEX1683 U	880	243	243	120
WDU 120/150	KEMA 98ATEX1686 U	1100	234	234	120
WDU 240	KEMA 01ATEX2186 U	1100	350	270	240
WDU 4 SL	SIRA 02ATEX3242 U	275	28	28	4
WDU 6 SL	SIRA 02ATEX3242 U	275	36	36	6
WDU 10 SL	SIRA 02ATEX3242 U	275	50	50	10
Z ...					
ZDK 2.5/1.5	KEMA 97ATEX4677 U	275	18	18	2,5
ZDK 2.5/1.5V	KEMA 97ATEX4677 U	420	20	19	2,5
ZDK 2.5/1.5NDU	KEMA 97ATEX4677 U	275	20	20	2,5
ZDK 2.5/1.5NPE	KEMA 97ATEX4677 U	275	20	20	2,5
ZDK 2.5/1.5DU-PE	KEMA 97ATEX4677 U	275	20	20	2,5
ZDK 2.5-2	KEMA 97ATEX4677 U	550	20	18	2,5
ZDK 2.5-2V	KEMA 97ATEX4677 U	550	22	18	2,5
ZDK 2.5-2DU-PE	KEMA 97ATEX4677 U	550	20	18	2,5
ZDK 2.5/3AN	KEMA 06ATEX0271U	550	21,5	21	2,5
ZDK 2.5/3AN V	KEMA 06ATEX0271U	550	21	18,5	2,5
ZDK 2.5/3AN DU-PE	KEMA 06ATEX0271U	550	21	21	2,5
ZDU 1.5	KEMA 01ATEX2106 U	550	15	15	1,5
ZDU 1.5/3AN	KEMA 01ATEX2106 U	550	15	15	1,5
ZDU 1.5/4AN	KEMA 01ATEX2106 U	550	15	15	1,5
ZDU 2.5	KEMA 97ATEX2521 U	550	21	21	2,5
ZDU 2.5/3AN	KEMA 97ATEX2521 U	550	21	21	2,5
ZDU 2.5/4AN	KEMA 97ATEX2521 U	550	21	21	2,5
ZDU 2.5N	KEMA 06ATEX0271U	550	20,5	19	2,5
ZDU 2.5N/3AN	KEMA 06ATEX0271U	550	21,5	21	2,5
ZDU 2.5N/4AN	KEMA 06ATEX0271U	550	21	20	2,5
ZDU 4	KEMA 97ATEX2521 U	550	28	28	4
ZDU 4/3AN	KEMA 00ATEX2107 U	550	28	28	4
ZDU 4/4AN	KEMA 00ATEX2107 U	550	28	28	4
ZDU 6	KEMA 97ATEX2521 U	550	36	36	6
ZDU 6/3AN	KEMA 00ATEX2107 U	550	36	36	6
ZDU 10	KEMA 99ATEX5514 U	550	50	50	10
ZDU 10/3AN	KEMA 00ATEX2107 U	550	50	50	10
ZDU 16	KEMA 99ATEX5514 U	550	66	66	16
ZDU 35	KEMA 00ATEX2107 U	690	109	100	35
ZDU 2.5-2/2AN	KEMA 97ATEX4677 U	550	21	20	2,5
ZDU 2.5-2/3AN	KEMA 97ATEX4677 U	550	21	21	2,5
ZDU 2.5-2/4AN	KEMA 97ATEX4677 U	550	21	21	2,5
ZDU 4-2/2AN	KEMA 97ATEX4677 U	550	28	26	4
ZDU 4-2/3AN	KEMA 97ATEX4677 U	550	28	26	4
ZDU 4-2/4AN	KEMA 97ATEX4677 U	550	28	26	4
ZDU 6-2/2AN	KEMA 97ATEX4677 U	550	36	30	6
ZDU 6-2/3AN	KEMA 97ATEX4677 U	550	36	36	6
ZDUA 2.5-2	KEMA 97ATEX4678 U	275	20	19	2,5

¹⁾ Please refer to the catalogue and the certificate for details of precisely which article is approved.

Maximum voltage (V)

(letters refer to the above diagrams)

A	C	D	E	F	G	H	I
880	--		880	880	--	--	--
1100	--	--	1100	1100	--	--	--
--	--	--	--	--	--	--	--
275	275	176	275	275	176	176	--
275	275	176	275	275	176	176	--
275	275	176	275	275	176	176	--
275	275	275	275	275	275	--	--
275	275	275	275	275	275	--	--
275	275	275	275	275	275	--	--
275	275	275	275	275	275	--	--
440	440	275	440	440	275	--	--
440	440	275	440	440	275	--	--
440	440	275	440	440	275	--	--
275	275	275	275	275	--	--	--
275	275	275	275	275	--	--	--
275	275	176	275	275	176	176	--
275	275	176	275	275	176	176	--
275	275	176	275	275	176	176	--
275	275	275	275	275	275	60	--
275	275	275	275	275	275	--	--
275	275	275	275	275	275	--	--
440	550	275	440	440	--	--	--
440	550	275	440	440	--	--	--
440	550	275	440	440	--	--	--
275	275	275	275	275	275	--	--
550	550	275	--	--	--	--	--
550	550	275	--	--	--	--	--
275	275	275	275	275	275	--	--
550	550	275	--	--	--	--	--
550	--	--	--	--	--	--	--
550	550	--	--	--	--	--	--
550	--	--	--	--	--	--	--
550	550	--	550	550	--	--	--
440	440	275	440	--	275	176	--
440	440	275	440	--	275	176	--
440	440	275	440	--	275	176	--
440	440	275	440	--	275	110	--
440	440	275	440	--	275	110	--
440	440	110	440	--	110	--	--
440	440	110	440	--	110	--	--
275	275	110	275	275	110	--	--