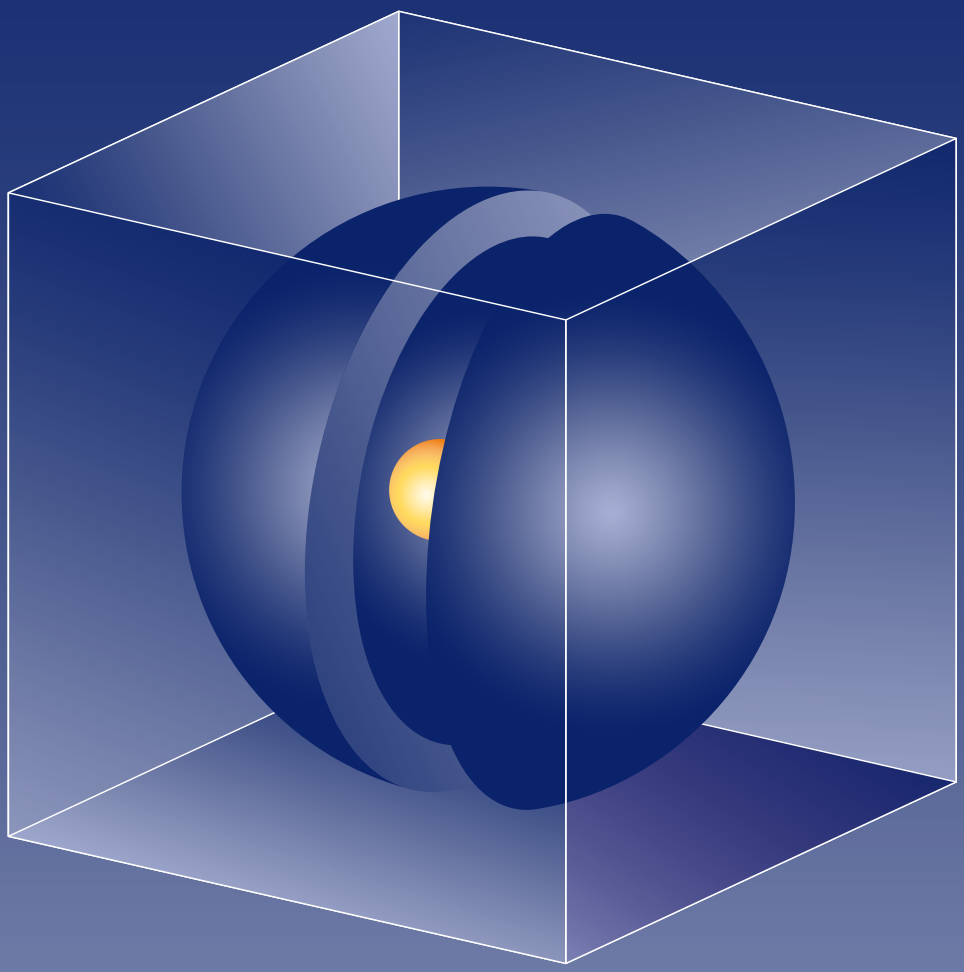
Fire systems



Swiss made

woertz

OUR RANGE OF PRODUCTS

CABLING SYSTEMS

BUILDING AUTOMATION

FIRE SYSTEMS

CABLE LAYING SYSTEMS

COMPONENTS FOR ELECTRICAL INSTALLATION TECHNOLOGY

ABOUT US

Head office in Muttenz

Subsidiary in Hölstein

FAMILY FIRM WITH AN INVENTIVE SPIRIT

Woertz has been working as a competent electrical installation technology partner for more than 80 years now. Our many decades of experience are your guarantee for the best possible results. We have the correct screw terminal, flat cable, or plinth duct for your requirements. As a Swiss family firm, we are committed to Swiss values, which are evident in the quality of our products and services as well as the innovation and inventiveness we exhibit in the areas of research and development. Our products are 100% «made in Switzerland».

PRODUCTS

Woertz is the leading provider of comprehensive installation systems and components for electrical installation technology in buildings and infrastructures. These networks form the unseen lifelines of the technical configuration of buildings.

A wide variety of technologies are firmly anchored
at Woertz. This fact allows us to address different customer requirements with a wide range of systems and services that meet these demands.

WOERTZ - YOUR PARTNER FOR COMPREHENSIVE SOLUTIONS

As a reliable partner, Woertz provides its customers with impeccable quality.
The development of pioneering innovations lies at the centre of our accomplishments.

This is evident across our entire company history since 1972 - the year of our first flat cable patent - and extends to the publishing of more than 20 patents.

THE FUTURE

New products have been developed in the area of building automation and security, including complete solutions in the area of tunnel construction.

Innovative development and many years' experience with flat cable technology form the basis for the design of a new safe flat cable. Our objective is to fulfill the strictest European guidelines ensuring a system guarantee of 100%.

SYSTEM AREAS

Our range can be seen in five different brochures:

- flat cable systems
- building automation
- safety systems
- cable laying systems
- components for electrical installation technology

Swiss made

CONTENTS

INTRODUCTION

Requirements for installation systems

Comfort, reliability, flexibility and optimum cost-effectiveness are the central requirements of builders and investors. Installation systems must guarantee high operational reliability of the controlled functions and efficient adaptation to changing user requirements after installation. System solutions from Woertz ensure that the desired comfort functions such as lighting, security, room temperature, weather protection and others can be implemented.

The quality of cabling systems is thus defined by the investment and maintenance costs for possible repairs and changes or alternatively expansions as well as the operational reliability of the functions connected to it. Misconceptions in the holistic view of the system can lead to increased material and installation costs as well as unexpected additional time and effort for planning and installation. On the other hand, misinterpreted savings can lead to considerable reliability risks as well as to high costs for troubleshooting and network expansion.

Summary

The requirements of a professional installation system can be summarised as follows:

1) efficient planning and quick, error-free installation
2) low-loss, operationally reliable connections
3) long service life with an option for subsequent changes / expansions
4) compatibility with upstream and downstream systems as well as new technologies
5) optimum cost-effectiveness in connection with the complete installation and service life

The following considerations concern cabling systems and product features for functional buildings, industrial building use and infrastructure buildings. The same principles apply to all types of buildings and infrastructure facilities.

Woertz: Inventors of innovative flat cable technology

Nr. 523 579 PATENTSCHRIFT Nr. 523 579

Internationale Klassifikation: H 01 b 7/08 H 02 g 3/08

SCHWEIZERISCHE EIDGENOSSENSCHAFT

EIDGENÖSSISCHES AMT FÜR GEISTIGES EIGENTUM

Gesuchsnummer: 4668/71
Anmeldungsdatum: 31. März 1971, 17 Uhr

Patent erteilt: 31. Mai 1972
Patentschrift veröffentlicht: 14. Juli 1972

HAUPTPATENT

Oskar Woertz, Inh. H. & O. Woertz, Basel

Elektrische Installationseinrichtung mit einem Flachkabel und mindestens einer zugehörigen Anschlussvorrichtung

Hans Woertz, Basel, und Oskar Woertz, Riehen, sind als Erfinder genannt worden

Flat cable system: patent No. 523 579, 1972

Conventional round cable systems are often incapable of fulfilling the high and diverse requirements of buildings and infrastructure buildings. As early as the start of the 1970s, Woertz decided to offer builders and investors an electrical installation concept that completely meets their demands. Woertz developed an innovative flat cable system and successfully patented it in 1973 as the legal inventor.

Woertz® flat cable technology has proven itself with planning and installation companies in the market up until now, and is constantly being developed even further. Other manufacturers recognize the benefits of this product solution as well and have integrated the Woertz® flat cable in their product ranges.

Safety cables in case of fire

Cabling systems used in infrastructures such as tunnels, underpasses or car parks have to meet stringent safety standards. Because of the dusty and damp environment and the use of high-pressure washing plant. electrotechnical installations are constantly exposed to strong and various demands. For builders and system integrators, those cabling systems must provide excellent results in terms of cost-effectiveness, while making installations always safer, more reliable and more flexible. In case of fire, tunnels, industrial buildings and every public establishment have to be evacuated as rapidly as possible. Simultaneously the power supply has to be maintained for the emergency lighting, the smoke outlets, the emergency evacuation signals and communication systems.

Especially for those areas of application, Woertz has designed cabling systems which meet stringent safety standards and are distinguished by their resistance to water and to fire. Those modular systems may furthermore be completely wired in advance. On the building site the pre-wired boxes have only to be positioned and connected to the flat cables; power supply interruptions may thus be substantially reduced in infrastructures.

Selection criteria, various notions

Cables have to be chosen early enough. The size of the project and the building‘s use for instance should be known.
A fire protection concept remains essential in the cases where the cabling system has to meet stringent safety standards. Some basic notions are listed below.

Safety cable

Compared to usual halogen-free cables, safety cables only burn close to the ignition source and prevent from fire propagation. The electrical function of the cable is not taken into account - only its passive behavior in the event of fire is important.
Safety cables show following features:

- low fire load
- low heat conductivity, self-extinguishing: no flame propagation can develop
- halogen-free: no development of corrosive gases. No corrosive substance will form in conjunction with extinguishing water.
- low smoke emission, visibility is not reduced

Safety cables without halogen according to IEC 60332-3 remain essential in cases where fire damages have to be reduced by fire compartments.

Fire and its effects are not modellable. 100% safety cannot be guaranteed - today no known material can withstand temperatures over 1000°C.

Normed tests only cover 95% of the cases which may occur and enable comparative values to be obtained in order to determine different levels of safety.

Insulation integrity FE

The basic test (according to IEC 60331) is designed to stress the insulation of a cable by submitting it to a flame temperature of at least 750°C (test length 50cm).
If the electrical current flows for the 180 experimental minutes, if no short-circuit occurs, the test turns out positive and the circuit integrity of the cable is classified as FE 180 (FE = effect of fire or flame).

Function integrity E

Testing the function integrity requires measuring the duration for which electrical current goes on feeding safety components such as emergency lighting and escape route guidance systems, smoke extraction systems or elevators specially meant for fire and rescue service.
The function integrity indicates the duration for which an installation should continue to function in case of fire. This applies to the whole installation, cables, boxes, cable ducts and fastening accessories.

Function integrity is designated by the letter E together with a figure. E 90 means that the installation should continue to function for 90 minutes. Further usual standards are E60 and E30. No short-circuit and no voltage failure should occur for the given durations.

Basic standards and concepts

The requirements in terms of function integrity are very high. And standards and system concepts are extensive.

All Woertz halogen-free cables (FRLS/0H) are conforming to following standards:

Features of flat cable system	Standards
Halogen-free (0H), non-corrosive gas	IEC 60754-2 EN 50267
Self-extinguishing (FR)	IEC 60332-1 EN 60332-1
Low heat conductivity	IEC 60332-3 CAT.C EN 50266-2-4
Low smoke (LS)	IEC 61034 EN 50268
Structure of the cable, on basis of	DIN VDE 250-214 and DIN VDE 0281

The Woertz system is also conforming to following standards:

Features of flat cable system	Standards
Insulation integrity FE180	IEC 60331-11/-21 (180 minutes) EN 50266-2-4
Function integrity E30 to E90	DIN 4102 part 12

Basic standards and concepts

A high protection degree requires the highest demands on the installation material.

The IP rating is used to specify the environmental protection - electrical enclosure - of electrical equipment (electrical devices, lighting or installations).

The degrees of protection are most commonly expressed as „IP“ followed by two characteristic numerals. The letters IP stands for Ingress Protection.

The first numeral indicates the degree of protection against accidental contacts and penetration of solid foreign bodies.
The second numeral indicates the degree of protection against harmful effects of water.

When the degree of protection corresponding to one of the numerals is not stated (be it unnecessary or unknown) it is, replaced by an X.

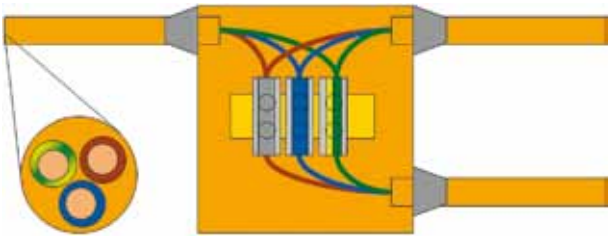
First characteristic numeral	Protection degree	Symbols
0	non-protected	
1	Protection against solid bodies exceeding 50mm dia. No protection against deliberate access.	
2	Protection against solid foreign bodies Ø > 12.5mm. Protection against contact of fingers.	
3	Protection against solid foreign bodies Ø > 12.5mm. Protection against contact of tools.	
4	Protection against solid foreign bodies Ø > 1mm. Protection against accidental contact with wires.	
5	Protection against dust penetration, total protection against any contact	
6	Total protection against dust penetration, total protection against any contact	

Second characteristic numeral	Protection degree	Symbols
0	non-protected	
1	Protection against vertically falling drops	
2	Protection against dripping water when tilted up to 15° in relation to its normal position	
3	Protection againt water falling at an angle up to 60° in relation to the vertical position	
4	Protection against splashing water	
5	Protection against water jets from any direction	
6	Protection against heavy seas or inundations	
7	Protection against the effects of immersion under defined conditions of pressure and time.	
8	Protection against prolonged submersion	

The principle of conventional cabling systems

A conventional cabling system comprises round cables and boxes meant for feeding and branching. Cables are cut at each branching point and connected again inside the branching boxes.
Such installations contain a high number of partitions and contact points with many potential risks and possible mistakes. Each cable break is a potential weak point and leads to energy loss. Cabling with round cable may be time-consuming and requires great quantity of cables.

Junction box wired on a conventional way with a 3-strand round cable



Serial placement of the junction boxes can result in a large-scale failure of the energy distribution in the event of a fault and downward power supply will not be ensured anymore.

Woertz® cabling systems with function integrity E90

Ambient conditions:
Temperature – Dampness – Impurities

The Woertz® cabling system with function integrity E90 fulfils the high requirements in terms of security needed in constructions and has been conceived for being used under stringent conditions such as severe temperature variations, dirty or damp environment or high-pressure washing plants.

This modular system meets the IP66/IP68 standards. The flat cable shows a smooth surface; the boxes are provided with silicone gaskets which have a long lifetime and make the whole system waterproof. The cable ducts are protected by a a dust-proof cover.

Lighting during construction of Gotthard base tunnel

The Woertz® flat cable systems consist of different types of flat cable and special junction boxes which allow loads to be connected at any point in an installation without the cable having to be interrupted. Cable connections and boxes can be moved, added or removed as required later on.

Woertz® flat cable system with function integrity E90

The lack of cable breaks means less respective contact resistance and loss in the electric circuit, as well as a reduction in potential sources of mistakes. At the same time, it results in increased operational reliability, as the failure of a junction box has no effect on the downstream units.

The amount of required cables is greatly reduced as well as the installating and wiring time: efficiency may be increased and reduces the risk of fire. This modular system enables furthermore receivers to be completely prewired; on the building site the electrical contact will be established within a few seconds and important time savings will be performed - to your advantage!

The modular solution Woertz® E90

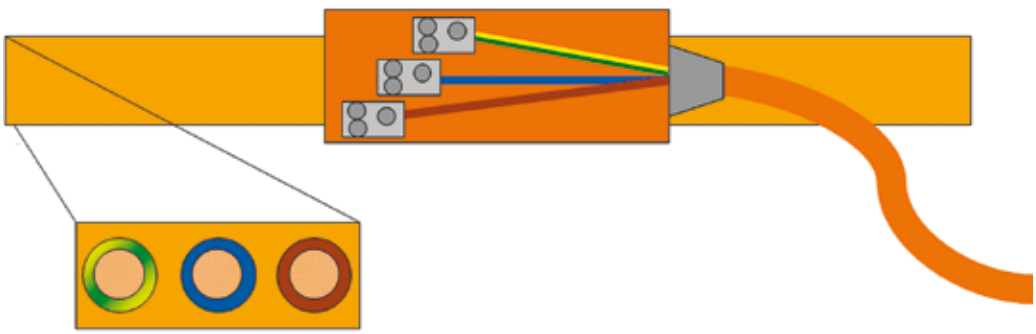
Woertz® flat cable systems with function integrity E90 comprise following modules:

Woertz® FE180 security cable

The Woertz flat cable belongs to the FE180 security cables. The leads run parallel in the flat cable; they are ceramically insulated and have an insulation integrity of 180 minutes. The distance from core to core has been accurately calculated so that no inadvertent contact and no short-circuit should occur between the individual wires, even if the sheath is completely damaged through burning.
As the leads in the flat cable run parallel, they may not cross or superimpose.
A rodent repellent has been incorporated into the cable sheath.

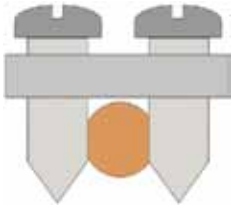
Woertz® branching and feeding box

It comprises an external casing which meets with the IP66/68 protection rating standards, i.e. it is protected against powerful jets of water and complete, continuous submersion in water. The metal parts inside the box are separated by a ceramic insulation. A metal frame maintains structural stability.



The leads in the flat cable run parallel and facilitate easy access to the individual leads via junction boxes that can be placed anywhere using the Woertz piercing® method that does not require stripping.
The asymmetric profile of the cable ensures that the boxes can only be mounted in a specific position, so that all leads and connections are automatically placed correctly.

The Woertz technique with double insulation piercing clamping units consists of two pointed screws and a metal bar which firmly clamp and maintain each core.

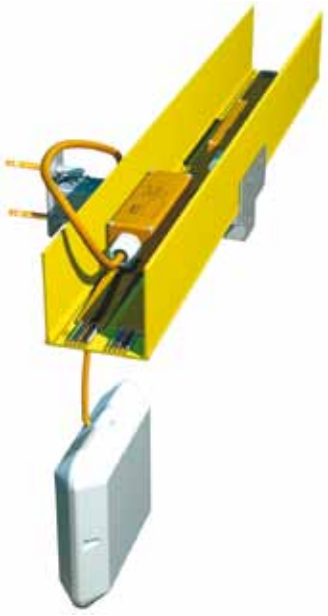


The contact will be maintained even if insulation and other layers are damaged in a fire.

Woertz duct system with fastening

In the event of an emergency, power supply will only be maintained provided that the appropriate fastenings are used. Woertz has got a wide range of products for laying cable horizontally or vertically or changing cable lay direction.

Cable ducts are made of halogen-free fibreglass reinforced polyester resin and contain a fire-proof fabric tape. The ducts can be fitted with a dust and dirt cover on request. The cable ducts are supported on steel brackets.

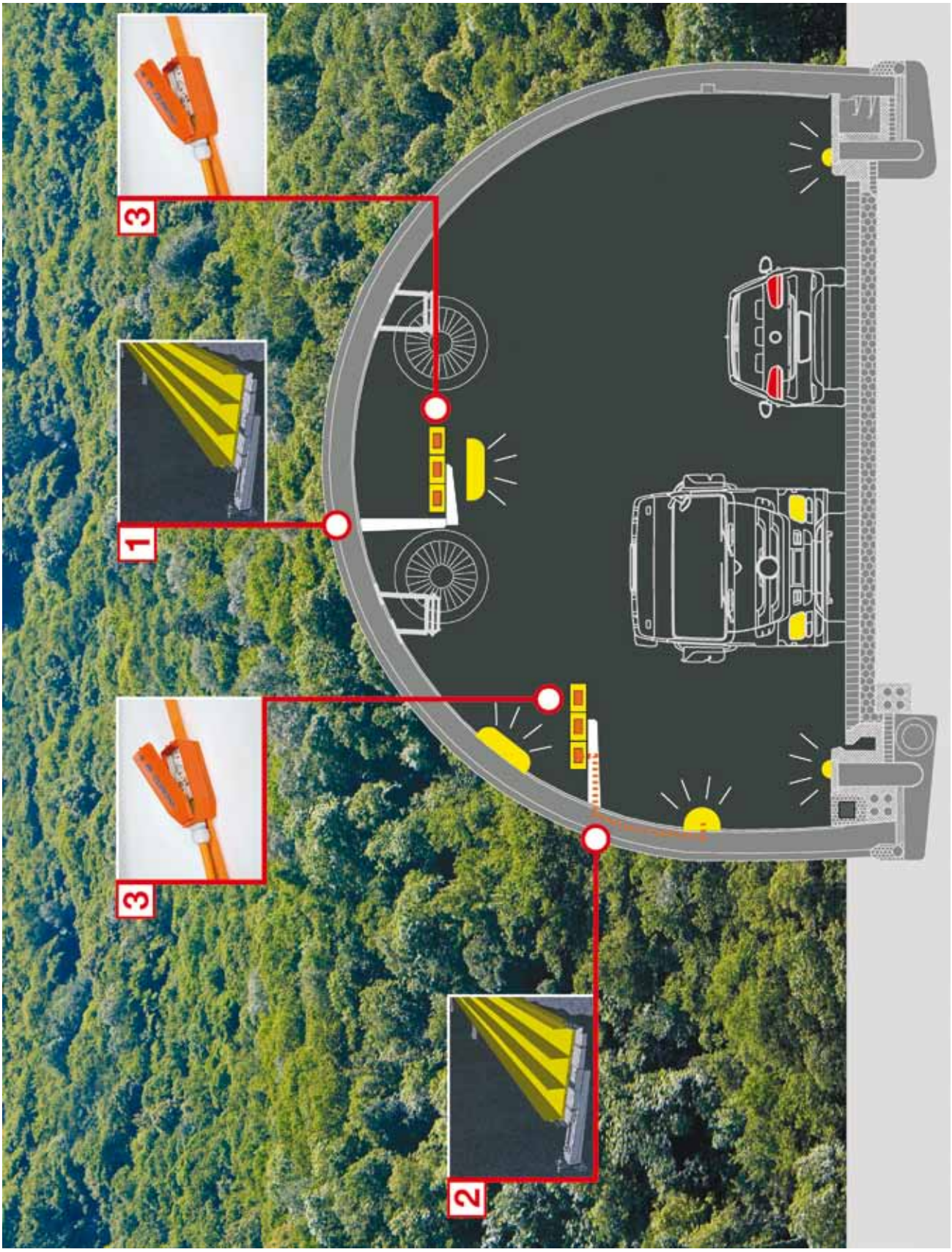


Time saving thanks to pre-wiring

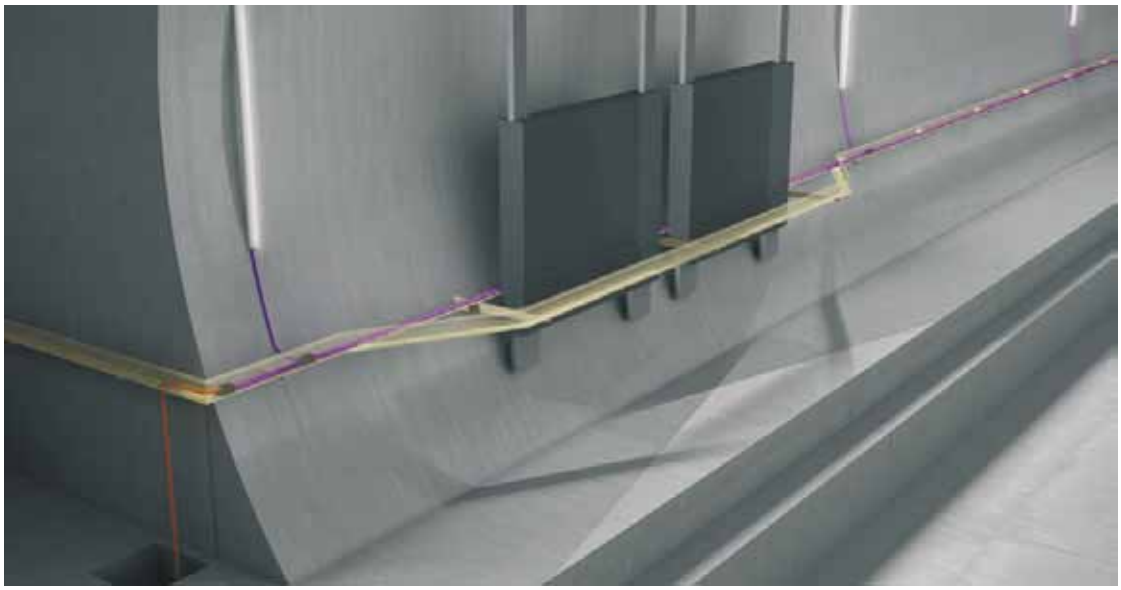
On request, Woertz will deliver prefabricated, ready-to-install flat cables including feed-in and branching boxes. On request, flat cable boxes can be provided with prefabricated outgoing round cables.

If need be, the consumers to be connected can also be delivered preinstalled and wired. The pre-assembled systems and components can be quickly and efficiently installed at the construction site afterwards.

1 Cable duct system and vertical bracket E90
2 Cable duct system and horizontal bracket E90
3 Feeding FE180/E90/IP68.
Cross-section of conductors:
3×2.5 mm^2 to 5×16 mm^2



Woertz®
A system with a future!



Benefits

Benefits in general
The tenants in a building – and thus their needs – will often change in the course of the building's useful life. Modern technical installations must be designed to cope with this. Woertz® flat cable systems provide a way for connections to be established or relocated at any point and at any time – and without cable breaks! Furthermore, all this with considerably reduced installation times.

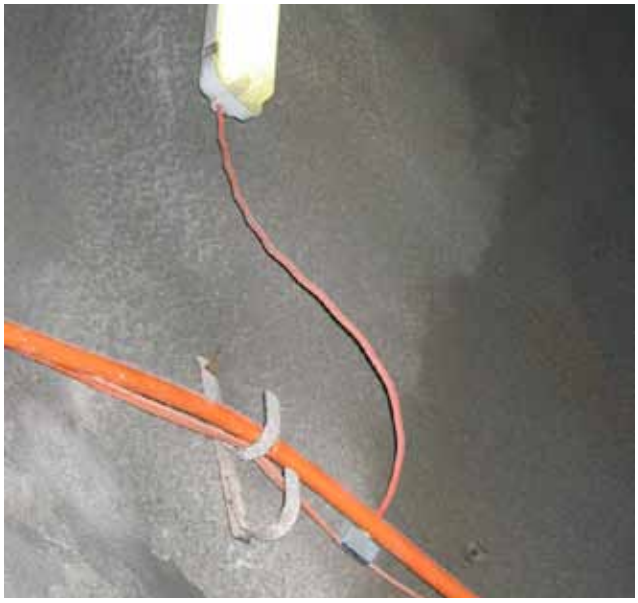
Benefits for builders/investors
Flexible installations can be adapted more easily to the changing requirements of the tenants – requirements that often don't yet exist when the building is under construction. With Woertz® flat cable systems, installations are ready to deal with the requirements of future office facilities. Smaller adjustments generate less work, noise and dust. Even in locations where workstations have to be frequently refitted, flat cable installations can be adapted with a minimum of effort.

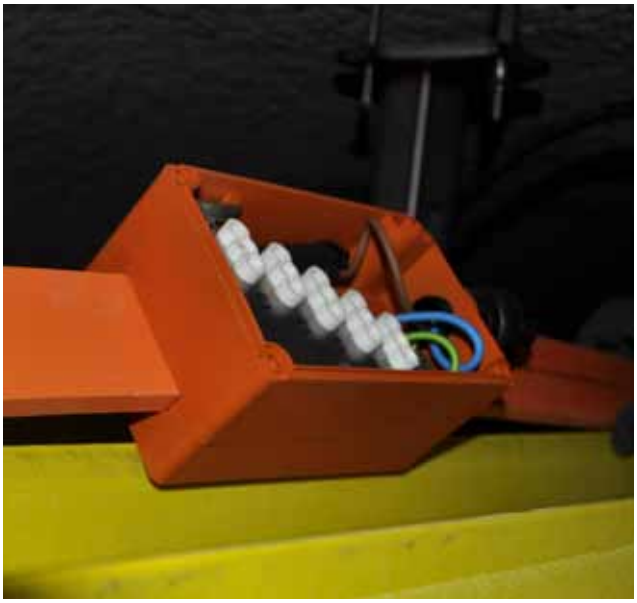
Benefits for planners
Woertz® flat cable systems provide the necessary flexibility in situations in which connection points cannot be defined in advance. The installation outlay is significantly reduced for cases where many connections are required in close mutual proximity. High quality planning sets the course for future use, and can react flexibly to short-term changes during the set-up phase – because with flat cable installations from Woertz®, the planner is on the safe side.

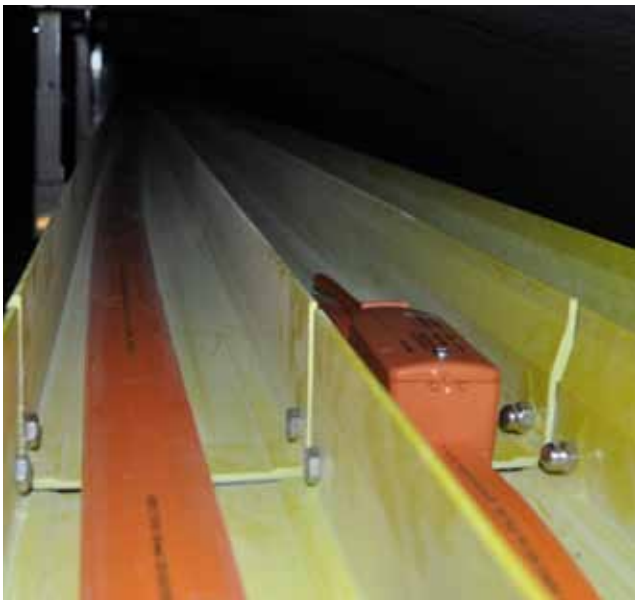
Benefits for electrical contractors
Fewer cable breaks and less wiring means fewer potential sources of faults. Thanks to the asymmetric profile of the Woertz® flat cable, the risk of incorrect connections can be practically excluded. The modular system also supports the electrical contractor when he is working to deadlines: He can pre-assemble entire batteries of sockets or lamp connections in his workshop and install the ready-to-use flat cable on location at the construction site in next to no time.

Time saving thanks to pre-wiring
On request, Woertz will deliver prefabricated, ready-to-install flat cables including feed-in and branching boxes. On request, flat cable boxes can be provided with prefabricated outgoing round cables. If need be, the consumers to be connected can also be delivered preinstalled and wired. The pre-assembled systems and components can be quickly and efficiently installed at the construction site afterwards.

Woertz® flat cable: examples of application

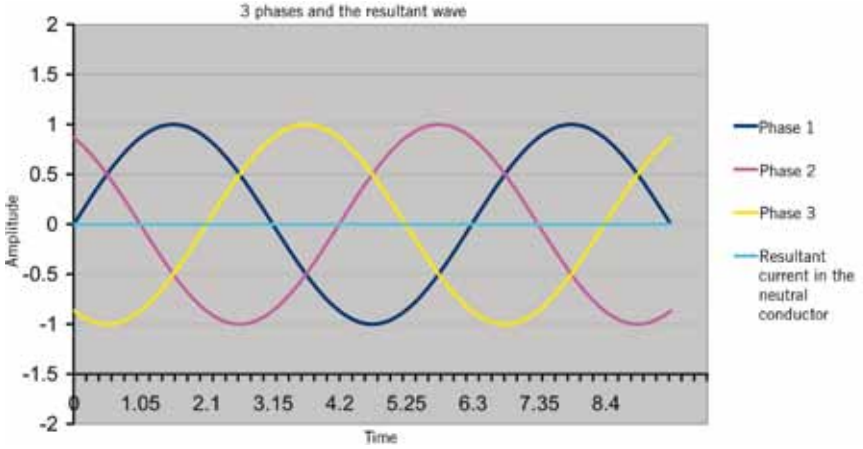




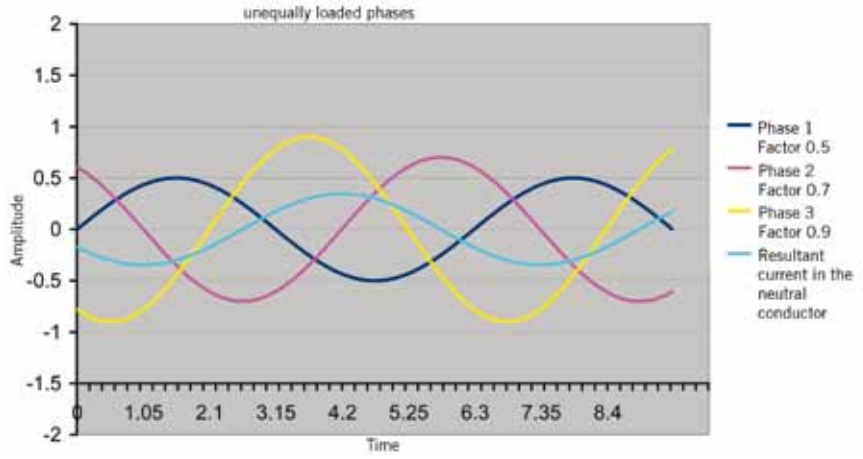


Neutral current

In a single-phase network, the same current always has to flow in the neutral conductor, as in the phase conductor.

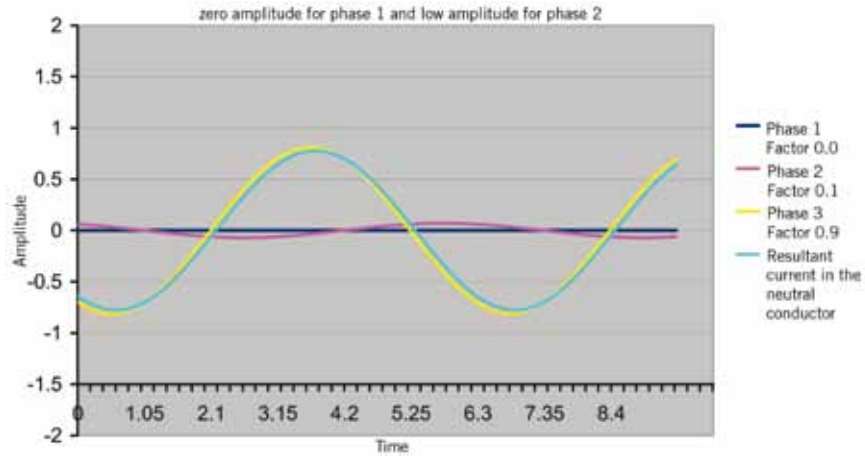


In electrical networks with three phases, voltages with a periodic sinusoidal form are generated in the phase conductors, but the sequences are shifted time-wise by a third of a period. In this case, as a result of these processes that are running periodically, when the voltages are combined together (neutral point), the result at each point in time is „0“.



For a symmetrical load (each phase the same as the load) the currents are cancelled out, and no current subsequently flows in the neutral conductor either. If the individual phases have different loads (different resistances, due to heavier inductive or capacitive loading of different phasings), the currents no longer balance out, a resulting current remains, and this runs in the neutral conductor back to the power source.

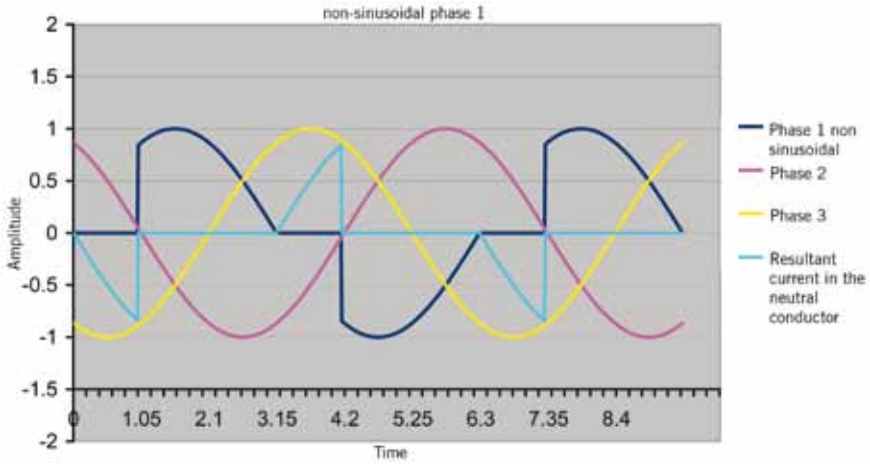
Due to the basic principles of physics and as can be seen from the vector diagram if one or two phases fail and only the remaining one is loaded, this then results in the most extreme asymmetry.



Even in this case, however, it is easy to see (and mathematically deducible) that the maximum neutral current cannot exceed the phase current. (=> basic principle of dimensioning – conductor cross-section for neutral conductor is the same as for phase conductor).

Periodic but non-sinusoidal load

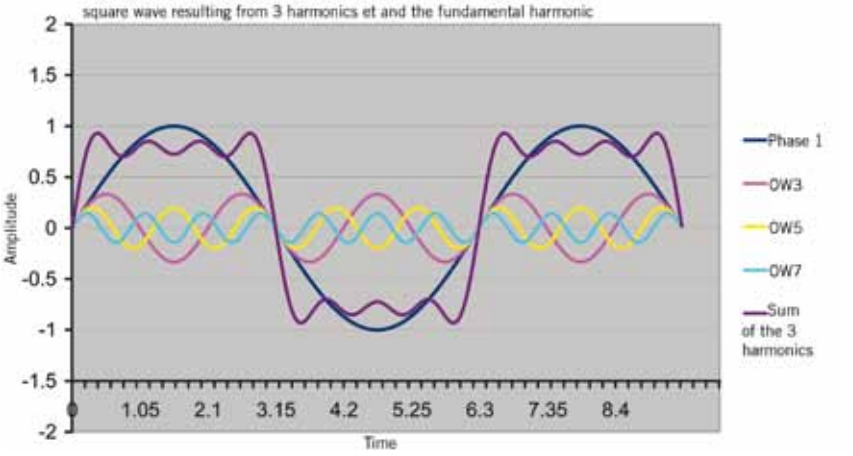
For modern electrical devices, especially in office equipment (computers, printers, etc.), electronically regulated power supplies are often used.

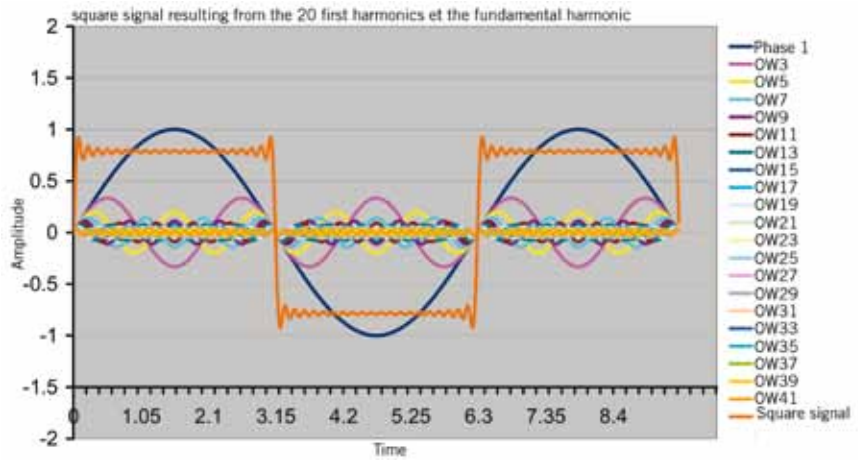


Due to their mode of operation, these devices create non-sinusoidal loads in the electric circuits. The individual phases are therefore not only different in the sizes and phasings of the current, the shape of the flowing current is no longer sinusoidal either.

Result The individual phase currents can no longer cancel each other out, and a neutral current flows.

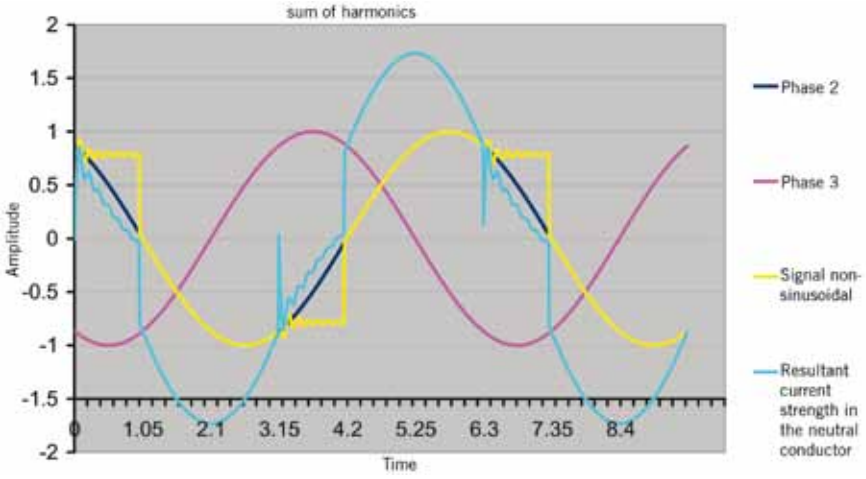
In order to be able to calculate the conditions, we have to go back to basic mathematical principles.
The following is applicable as mathematically proven: Each periodic oscillation can be composed as a result of sinusoidal oscillations with different frequencies and amplitudes (Fourier).
If the half periods are symmetrical mirror images (+ and – parts are equal), only an odd plural number of fundamental oscillations occur:
$Y(t) = A1\sin(\omega t) + A3\sin 3\omega t + A5\sin(5\omega t) + A7\sin(7\omega t)\ldots.$
Fundamental wave *Harmonics*





If the fundamental waves have a 1/3 phase shift, they cancel each other out. However, the third harmonics (period length 1/3 of the fundamental waves), despite the phase shift of the fundamental wave, have the same phase as the other third harmonics.

Result The fundamental waves have an effect of mutual attenuation on each other, but the 3rd harmonics fall into the same phasing and are added together.

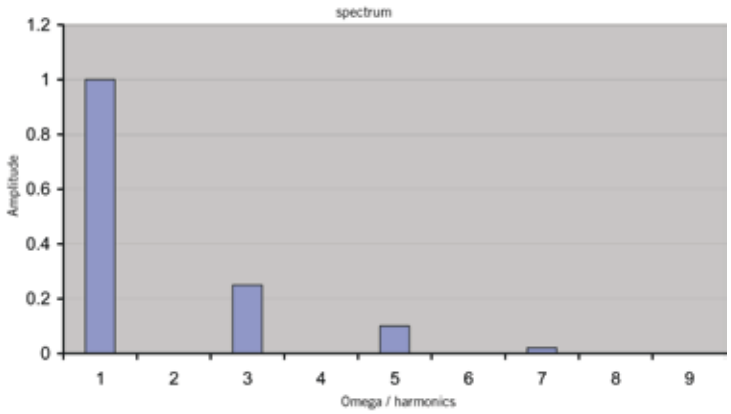


Regardless of the fundamental waves and possible conditions that may exist in practice, without calculations and measurements, you can jump to the wrong conclusion that the neutral conductor may be overloaded.
In practice, you have to analyse actual conditions using basic mathematical principles. If there is a rise in temperature, the effective total current is always a definitive factor. In the pole conductors, this comprises the fundamental wave and the sum of the odd harmonics.

$I_{eff} = \mathbf{I_{eff}}$ **50Hz** + I_{eff} 150 Hz + I_{eff} 250 Hz + I_{eff} 350 Hz + ...

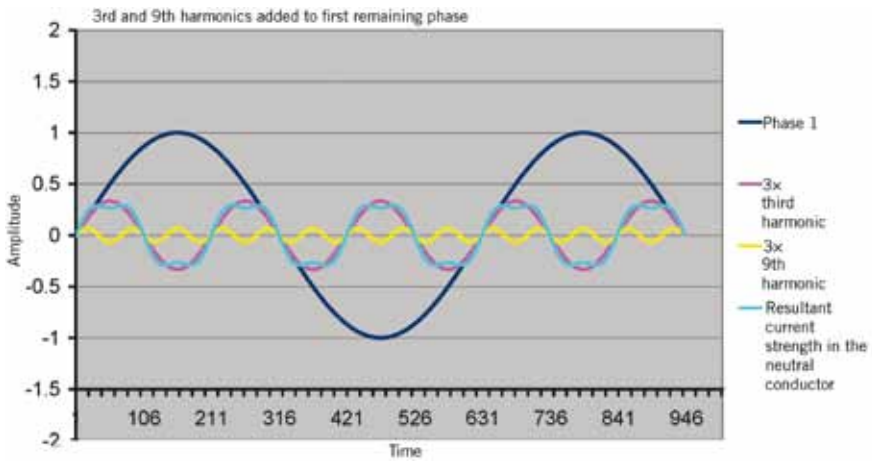
In the neutral conductors, the only flowing elements that strengthen are the 3rd and 9th harmonics.
The fundamental wave and the other harmonics have an effect of mutual attenuation on each other.

I_{eff} N = 3x I_{eff} 150 Hz + 3x I_{eff} 450 Hz + ...



Numerous tests have proven that even under extreme conditions, the effective value of the total neutral current cannot reach the value of a phase current.

(see „Neutralleiterströme / Elektrotechnik“ chapter 9 section 2 by Arnold / Lovack).



Note

Neutral currents are produced regardless of the cable type used (round or flat cable).
Even under selected adverse conditions, the neutral currents (especially the sum of the harmonics) can in practice not exceed the loading of the pole conductor. As a result of the greater capacity of flat cables due to the larger surface area for the same conductor cross-sections, flat cables can withstand operational loading with very little increase in temperature.

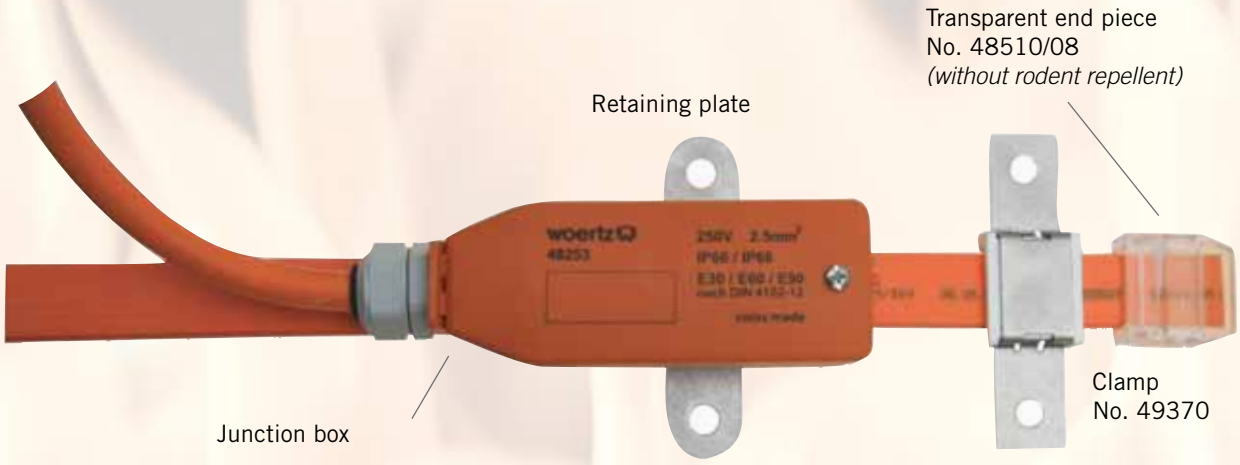
Dr. Tamas Onodi

Security in case of fire: a new definition

Woertz® cabling systems with function integrity E90

The new Woertz system allows important appliances such as emergency lighting and escape route guidance systems or smoke extraction systems to be continuously supplied even in case of fire. The Woertz® cabling system with function integrity E90 fulfils the high requirements in terms of security needed in constructions and has been conceived for being used under stringent conditions such as severe temperature variations, dirty or damp environments or high-pressure washing plants. The system is IP66/IP68 certified.

The Woertz® cabling system with function integrity E30 to E90 is made up of following modules:



The Woertz security cables FE180 with additional specification E30/E60/E90 ensure functional integrity when used together with the tested Woertz components (boxes and cable ducts)

Woertz range

The Woertz® safety flat cables with insulation integrity FE 180 are shown on the following pages. The system also comprises feeding and branching boxes as well as corresponding accessories.

For further information about the complete Woertz® cabling system with function integrity E30 to E90, see following pages.

Sheath materials and standards

Cross-sectional view	Art. No.	Description	Type	Flame propagation IEC 60332-1-2	Halogen-free IEC 60754-1/2	Smoke density	Flame spread EN 603323	Circuit integrity IEC 60331	System circuit integrity DIN 4102	IP68-System	FE180-System	
Safety cable (Security cable)												
	482500R	Woertz FE180 3G2.5 mm²	Halogenfree	☑	☑	☑	☑	☑	E90*	☑		P.24
	484500R	Woertz FE180 3G4 mm²	Halogenfree	☑	☑	☑	☑	☑	E90*	☑		P.27
	483500R	Woertz FE180 5G2.5 mm²	Halogenfree	☑	☑	☑	☑	☑	E90*	☑		P.31
	486500R	Woertz FE180 5G4 mm²	Halogenfree	☑	☑	☑	☑	☑	E90*	☑		P.33
	489500R	Woertz FE180 5G16 mm²	Halogenfree	☑	☑	☑	☑	☑	E90*	☑		P.36

Insulation of the leads halogen-free coat VDE 0266, **Outside halogen-free coat VDE 0266**

Woertz cables are made of high-quality, flame-resistant material, are flame retardant and self-extinguishing.

Flame retardant
Standards: IEC 60332-1-2 und EN 60332-1-2

Woertz cables are halogen-free and reduce to a minimal possible damage to health or property.

Halogen-free and no corrosive gases
Standards: IEC 60 754-1/2 und EN 50 267-2-1/2

Woertz cable under the influence of fire, developes minimal smoke emission. Thus, escape and emergency routes are not affected.

Smoke density
Standards: IEC 61 034-2 und EN 61 034-2

Woertz cables have a low fire acceleration. The spread of fire from the ignition point, is therefore severely restricted.

Flame spread
Standards: IEC 60 332-3-24 und EN 60 332-3-24

Woertz cables with insulation endurance FE180, guarantee, the functioning of a cable, in case of a fire over a period of 180 minutes.

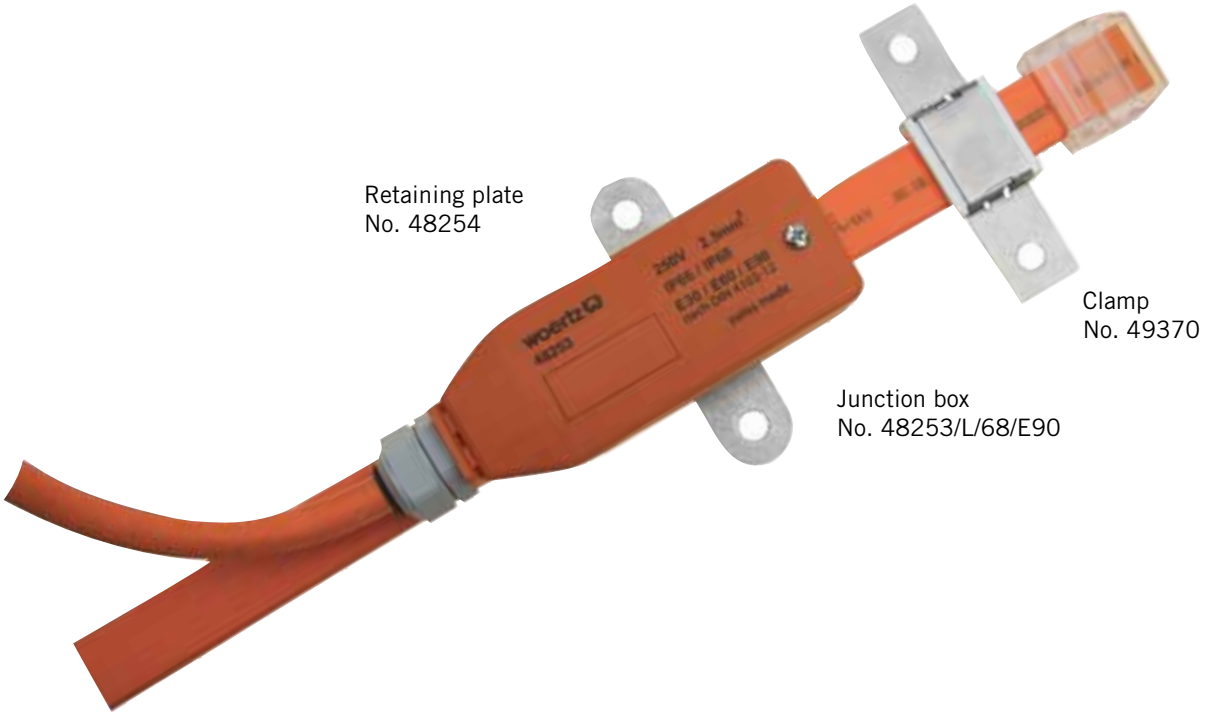
Circuit integrity FE180
Standards: IEC 60331-21

Woertz cables, including fastening systems garatee the functioning of the entire electric cable system over a defined period of time.

System circuit integrity E90
Standards: DIN 4102-12

Woertz FE180
3G2.5 mm² + 3G4 mm²

Thanks to this installation system based upon flat cable, all the components related to safety are continuously supplied, even in case of fire. The high degree of protection enables this system to be used even under stringent conditions.



Where are these flat cables used?

- In installations running under stringent conditions
- For feeding safety components: emergency lighting and escape route guidance systems, smoke extraction systems or elevators specially meant for fire and rescue services.
- Quick and safe installation for industrial or functionnal buildings (offices or shopping centres)
- The high degree of protection enables this system to be used in tunnels or on industrial sites
- The system turns out to be very flexible and robust in building and utilization phases
- IP68 enables the system to be used in damp environment; the boxes are dust proof and may be used thus in workshops (joiner‘s) or similar industrial rooms.
- Labor intensive sealing of the boxes is not necessarys: as the cable never has to be interrupted there is no source of possible error.

Thanks to the flat cable additional loads may be connected anytime at any point.

Woertz FE180 3G2.5 mm²

flat cable for E30 to E90 application

	halogen-free
	No.
	**48250OR** **48250GE**
1L+N+PE	

Technical data		
Dimension	mm	24×6
Weight	g/m	247
Fire load	kWh/m	1.48
No. of leads x cross-section	mm²	3×2.5

High current part		
Copper conductors		bare copper wire
Insulation of the leads		flame retardant, high temperature resistant
Colour of the leads		brown, blue, yellow/green
Cross-section	mm²	2.5
Test voltage	kV / Hz	4 / 50
Rated voltage	kV	0.6/1
Sheath material		FRNC/LSOH
Additives in sheath		rodent repellent
Insulation integrity		FE180
Function integrity		E90
Conductor-resistance	Ω/km	7.98
Operating temperature		-15 °C to +90 °C
min. Installation temperature		+5 °C
Cu weight	kg/km	72

Junction box	**Technical data**		
No.			
48253/01	with cable gland D 6.0-8.0	M20x1.5	
48253/02	with cable gland D 8.0-11.0		Contacts of copper alloy
48253/03	with cable gland D 11.0-15.0		
			Plastic parts: halogen-free
			Metal parts: V4A
	LxWxH mm	137×50×49 (without cable gland)	
	Weight g	330	
	Test current A	24	
	Test voltage kV/Hz	4/50	
	Rated voltage V/Hz	690/50	
	Degree of protection	IP66/IP68 (2 m, 30 min.)	
	Function integrity	E90	
	Thread of cable gland	M20×1.5	
	Contacts	Woertz Piercing	
	Packing unit pce.	1	
	Fuse protection on request		

Flat cable box for E30 to E90 applications

Cable end piece		Technical data		
No.	Eldas-No.	LxWxH mm	40x36x16	polycarbonate, halogen-free, with silicone gel
48510/08	120 900 617	Fire load kWh/m	k.A.	
		Packing unit pce.	5	Note: Cut cable ends cleanly and smoothly. Then mount the end pieces. No need to strip insulation. Cable end pieces can only be mounted once.
		Protection degree	IP68	

Cable end piece	Technical data		
No.	LxWxH mm	40x36x16	synthetic, rodent-repellent, white, halogen-free silicone gel
48510/08/NS	Fire load kWh	k.A.	
	Packing unit pce.	5	Note: Cut cable ends cleanly and smoothly. Then mount the end pieces. No need to strip insulation. Cable end pieces can only be mounted once.
	Protection degree	IP68	

Clamp	Technical data		
No.	Material	high quality steel V4A and ceramic	Mounting distance max. 800 mm
49370	LxWxH mm	103.5x32x12.5	
	Mounting shaft mm	80	
	for E30 to E90 application		
	Packing unit pce.	10	

Shears	Technical data		
No.	Eldas-No.	Weight g	223	For cutting neatly and easily every type of flat cables of max. width 32mm.
49930	983 045 007	Packing unit pce.	1	
				With sliding anvil. Teflon coated blades.

Cable glands	Technical data		
No.	Diameter of cables mm		polyamide, grey
48560/02/M20	6.0-8.0		M20x1.5
48560/03/M20	8.0-11.0		
48560/05/M20	11.0-15.0		delivered with O-ring seal made of NBR
	Packing unit pce.		halogen-free

Retaining plate	Technical data		
No.	Material	high quality steel V4A	
48254	LxW mm	80x105	
	mounting shaft mm	80	
	fastening hole mm	ø9.5	
	Packing unit pce.	10	

Woertz FE180 3G4 mm²

flat cable for E30 to E90 application

	halogen-free
	No.
	**484500R**
1L+N+PE	

Technical data		
Dimension	mm	24×7
Weight	g/m	330
Fire load	kWh/m	1.75
No. of leads x cross-section	mm²	3×4

High current part		
Copper conductors		bare copper wire
Insulation of the leads		flame retardant, high temperature resistant
Colour of the leads		brown, blue, yellow/green
Cross-section	mm²	4
Test voltage	kV / Hz	4 / 50
Rated voltage	kV	0.6/1
Sheath material		FRNC/LSOH
Additives in sheath		rodent repellent
Insulation integrity		FE180
Function integrity		E90
Conductor-resistance	Ω/km	4.61
Operating temperature		-15 °C to +90 °C
min. Installation temperature		+5 °C
Cu weight	kg/km	116

Connecting box	**Technical data**		
No.			
48453/01	with cable gland D 6.0-8.0	M20x1.5	Contacts of copper allo
48453/02	with cable gland D 8.0-11.0		
48453/03	with cable gland D 11.0-15.0		Plastic parts: halogen-free Metal parts: V4A
	LxWxH mm	137×50×49 (without cable gland)	
	Weight g	330	
	Test current A	24	
	Test voltage kV/Hz	4/50	
	Rated voltage V/Hz	690/50	
	Degree of protection	IP66/IP68 (2 m, 30 min.)	
	Function integrity	E90	
	Thread of cable gland	M20×1.5	
	Contacts	Woertz Piercing	
	Packing unit pce.	1	
	Fuse protection on request		

Accessories

Flat cable box for E30 to E90 applications

Heat-shrinkable cap

No.
48511/42

Technical data	
L×Ø mm	105×42
Weight g	33.8
Packing unit pc.	5

End cap with adhesive and sealant

Note: Cut cable ends cleanly and smoothly. Then mount the end pieces. No need to strip insulation.

Cable end pieces can only be mounted once.

Halogen-free

Clamp

No.
49370

Technical data	
Material	high quality steel V4A andceramic
LxWxH mm	103.5x32x12.5
Mounting shaft mm	80
for E30 to E90 application	
Packing unit pce.	10

Mounting distance max. 800 mm

Shears

No.	Eldas-No.
49930	983 045 007

Technical data	
Weight g	223
Packing unit pce.	1

For cutting neatly and easily every type of flat cables of max. width 32mm.

With sliding anvil. Teflon coated blades.

Cable glands

No.	Eldas-No.	Diameter of cables mm	
48560/02/M20		6.0-8.0	of polyamide, grey M20×1.5
48560/03/M20	121 682 607	8.0-11.0	
48560/05/M20	121 682 617	11.0-15.0	delivered with O-ring seal made of NBR
		Packing unit pce.	halogen-free

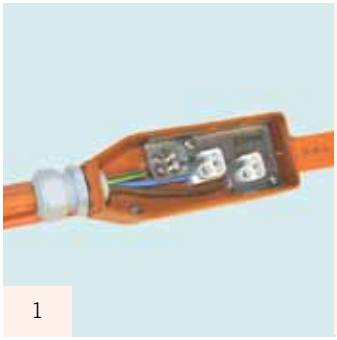
Retaining plate

No.
48254

Technical data	
Material	stainless steel V4A
LxW mm	80x105
mounting shaft mm	80
fastening hole mm	ø9.5
Packing unit pce.	10

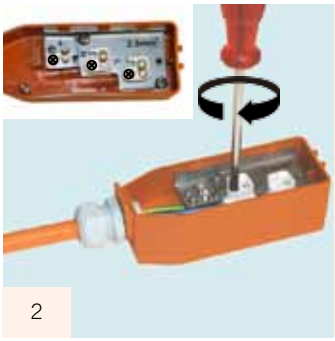
Mounting procedure of junction box No. 48253/L/68/E90

(may be used for both feeding and branching)



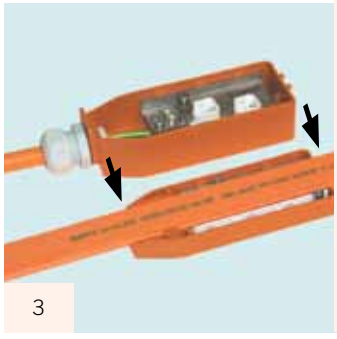
1

Remove the cover plate of the box. The cable gland has to be prepared and mounted on the branching cable (round cable). Cut the latter to the desired length and dismantle it. Introduce the stripped leads.



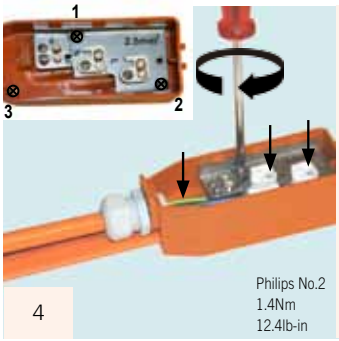
2

Tighten up the 3 screws. Once the O-ring is positioned correctly in the cable gland, tighten up the latter.



3

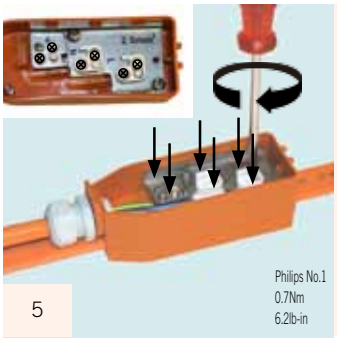
Position the flat cable in the right position. The ridge in the base acts as a reference point. It has to match the ridge of the flat cable. In case of incorrect mounting the box cannot be fitted with normal force. The cable must be cleaned, gel and oil must be removed.



4

Philips No.2
1.4Nm
12.4lb-in

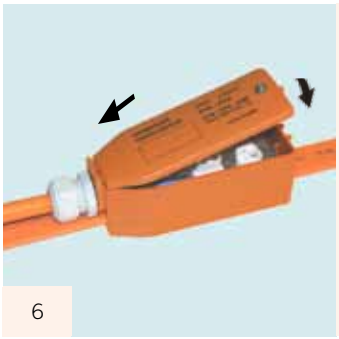
Snap together the upper part and the base. Tighten up the 3 fastening screws of the base.



5

Philips No.1
0.7Nm
6.2lb-in

Tighten up the 6 piercing screws (Twin-Piercing) in order to establish contact with the flat cable cores.



6

Replace the cover plate carefully and tighten up the screws. The box may be marked if necessary.

Pre-wiring means time-saving

Service to our customers.

On request the boxes may be provided in advance with round outgoing cables.

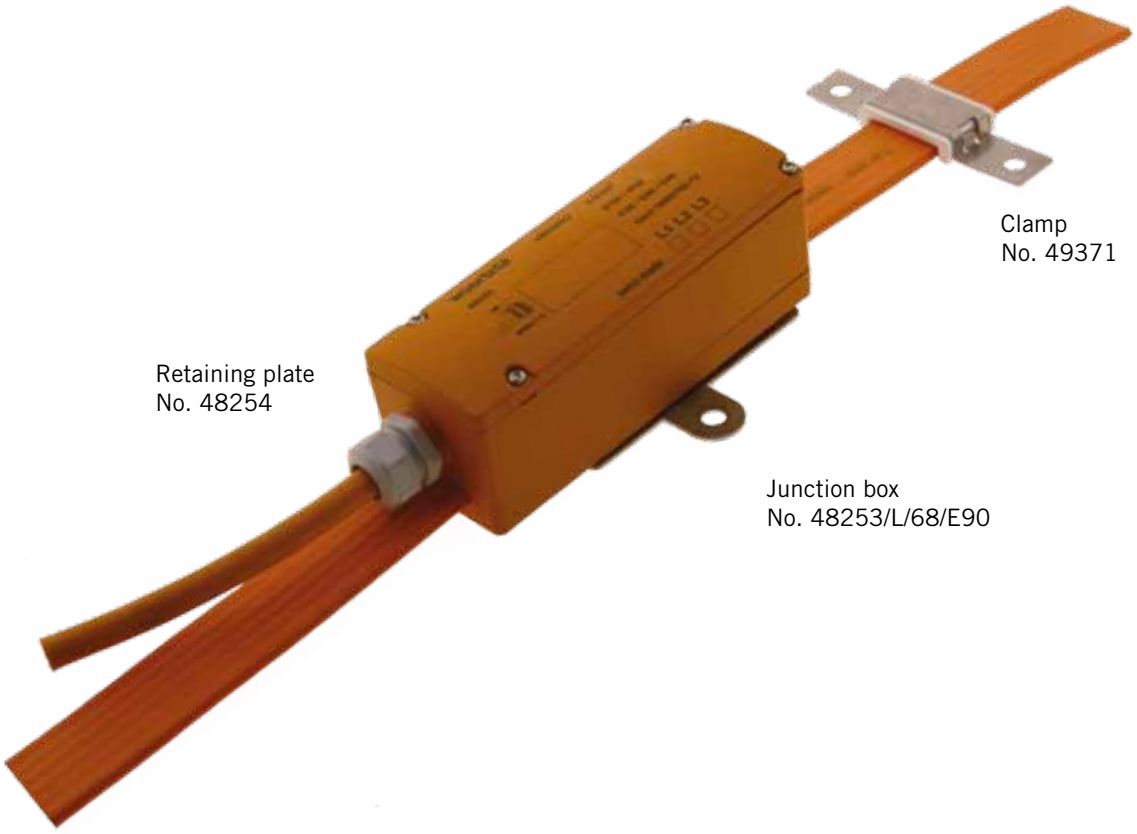
The overcurrent protection devices will be chosen in relation to the length of installed cables so that their response time conforms to specifications in case of malfunction.The circuit integrity E90 will only be maintained if the Woertz components are correctly used and fastened with the prescribed material

The box will be connected to the cable only once. If it has to be displaced, the degree of protection of the box and of the whole system will not be guaranteed anymore. The box may only be used later as a box with protection degree IP40. The holes in the sheath have to be reinsulated to maintain the protection degree. We cannot accept any liability for damage caused by incorrect use.

A high IP degree of protection imposes particularly high requirements in terms of installation material. The Woertz guarantee only applies to original products finished in our workshops such as flat cables, boxes and round cables with connectors.

Woertz FE180 E30/E90
5G2.5 mm² + 5G4 mm²

Thanks to this installation system based upon flat cable, all the components related to safety are continuously supplied, even in case of fire. The high degree of protection enables this system to be used even under stringent conditions.



Where are these flat cables used?

- In installations running under stringent conditions
- For feeding safety components: emergency lighting and escape route guidance systems, smoke extraction systems or elevators specially meant for fire and rescue services.
- Quick and safe installation for industrial or functionnal buildings (offices or shopping centres)
- The high degree of protection enables this system to be used in tunnels or on industrial sites
- The system turns out to be very flexible and robust in building and utilization phases
- IP68 enables the system to be used in damp environments; the boxes are dust proof and may be used thus in workshops (joiner‘s) or similar industrial rooms.
- Labor intensive sealing of the boxes is not necessary: as the cable never has to be interrupted there is no source of possible error.

Thanks to the flat cable additionnal loads may be connected anytime at any point.

Woertz FE180 5G2.5 mm²

flat cable for E30 to E90 applications

	halogen-free
	No.
	**483500R**
3L+N+PE	

Technical data		
Dimension	mm	37×6
Weight	g/m	420
Fire load	kWh/m	2.36
No. of leads x cross-section	mm²	5×2.5

High current part		
Copper conductors		Bare copper wire
Insulation of the leads		flame retardant, high temperature resistant
Colour of the leads		grey, black, brown, blue, yellow/green
Cross-section	mm²	2.5
Test voltage	kV / Hz	4 / 50
Rated voltage	kV	0.6/1
Sheath material		FRNC/LSOH
Additives in sheath		rodent repellent
Insulation integrity		FE180
Function integrity		E90
Conductor-resistance	Ω/km	7.41
Operating temperature		-15 °C to +90 °C
min. Installation temperature		+5 °C
Cu weight	kg/km	120

Connecting boxes	**Technical data**		
No.			
48353/01 **48353/02** **48353/03**	with cable gland D 6.0-8.0 with cable gland D 8.0-11.0 with cable gland D 11.0-15.0	M20x1.5	Contacts of copper alloy
48355/01 **48355/02**	with cable gland D 12.5-16.0 with cable gland D 16.0-20.5	M25x1.5	Plastic parts: halogen-free Metal parts: V4A
	L×W×H mm	185×65×70 (without cable gland)	
	Test current A	24	
	Test voltage kV/Hz	4/50	
	Rated voltage V/Hz	690/50	
	Degree of protection	IP66/IP68 (2 m, 30 min.)	
	Function integrity	E90	
	Contacts	Woertz Piercing	
	Packing unit pce.	1	
	Fuse protection on request		

Flat cable box for E30 to E90 applications

Heat-shrinkable cap	Technical data		
No.	L×Ø mm	105×42	End cap with adhesive and sealant
48511/42	Weight g	33.8	
	Packing unit pc.	5	Note: Cut cable ends cleanly and smoothly. Then mount the end pieces. No need to strip insulation.
			Cable end pieces can only be mounted once.
			Halogen-free

Clamp	Technical data		
No.	Material	high quality steel V4A and ceramic	Mounting distance max. 800 mm
49370	LxWxH mm	103.5x32x12.5	
	Mounting shaft mm	80	
	for E30 to E90 application		
	Packing unit pce.	10	

Shears		Technical data		
No.	Eldas-No.	Weight g	223	For cutting neatly and easily every type of flat cables of max. width 32mm.
49930	983 045 007	Packing unit pce.	1	
				With sliding anvil. Teflon coated blades.

Cable glands		Technical data		
No.	Eldas-No.	Diameter of cables mm		polyamide, grey
48560/02/M20		6.0-8.0		M20×1.5
48560/03/M20	121 682 607	8.0-11.0		
48560/05/M20	121 682 617	11.0-15.0		delivered with O-ring seal made of NBR
		Packing unit pce.		halogen-free

Retaining plate	Technical data		
No.	Material	high quality steel V4A	
48254	LxW mm	80x105	
	mounting shaft mm	80	
	fastening hole mm	ø9.5	
	Packing unit pce.	10	

Woertz FE180 5G4 mm²

flat cable for E30 to E90 applications

	halogen-free
	No.
	**483500R**
3L+N+PE	

Technical data		
Dimension	mm	37×7
Weight	g/m	500
Fire load	kWh/m	2.52
No. of leads x cross-section	mm²	5×4

High current part		
Copper conductors		Bare copper wire
Insulation of the leads		flame retardant, high temperature resistant
Colour of the leads		grey, black, brown, blue, yellow/green
Cross-section	mm²	4
Test voltage	kV / Hz	4 / 50
Rated voltage	kV	0.6/1
Sheath material		FRNC/LSOH
Additives in sheath		rodent repellent
Insulation integrity		FE180
Function integrity		E90
Conductor-resistance	Ω/km	7.41
Operating temperature		-15 °C bis +90 °C
min. Installation temperature		+5 °C
Cu weight	kg/km	192

Connecting boxes	**Technical data**		
No.			
48653/01	with cable gland D 6.0-8.0	M20x1.5	
48653/02	with cable gland D 8.0-11.0		
48653/03	with cable gland D 11.0-15.0		Contacts of copper allo
48655/01	with cable gland D 12.5-16.0	M25x1.5	Plastic parts: halogen-free
48655/02	with cable gland D 16.0-20.5		Metal parts: V4A
	L×W×H mm	185×65×70 (without cable gland)	
	Test current A	24	
	Test voltage kV/Hz	4/50	
	Rated voltage V/Hz	690/50	
	Degree of protection	IP66/IP68 (2 m, 30 min.)	
	Function integrity	E90	
	Contacts	Woertz Piercing	
	Packing unit pce.	1	
	Fuse protection on request		

Flat cable box for E30 to E90 applications

Heat-shrinkable cap	Technical data		
No.	L×Ø mm	105×42	End cap with adhesive and sealant
48511/42	Weight g	33.8	
	Packing unit pc.	5	Note: Cut cable ends cleanly and smoothly. Then mount the end pieces. No need to strip insulation.
			Cable end pieces can only be mounted once.
			Halogen-free

Clamp	Technical data		
No.	Material	high quality steel V4A and ceramic	Mounting distance max. 800 mm
49370	LxWxH mm	103.5x32x12.5	
	Mounting shaft mm	80	
	for E30 to E90 application		
	Packing unit pce.	10	

Shears		Technical data		
No.	Eldas-No.	Weight g	223	For cutting neatly and easily every type of flat cables of max. width 32mm.
49930	983 045 007	Packing unit pce.	1	
				With sliding anvil. Teflon coated blades.

Cable glands		Technical data		
No.	Eldas-No.	Diameter of cables mm		polyamide, grey
48560/02/M20		6.0-8.0		M20×1.5
48560/03/M20	121 682 607	8.0-11.0		
48560/05/M20	121 682 617	11.0-15.0		delivered with O-ring seal made of NBR
48560/03/M25		Packing unit pce.		halogen-free
48560/05/M25				
				

Retaining plate	Technical data		
No.	Material	high quality steel V4A	
48254	LxW mm	80x105	
	mounting shaft mm	80	
	fastening hole mm	ø9.5	
	Packing unit pce.	10	

Mounting procedure of junction box No. 48253/L/68/E90

(may be used for both feeding and branching)

1

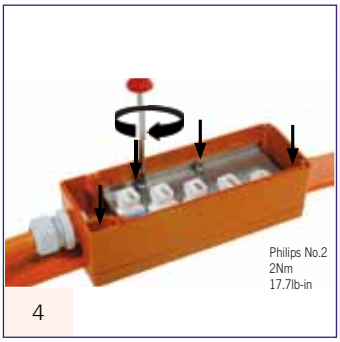
Remove the cover plate of the box. The cable gland has to be prepared and mounted on the branching cable (round cable). Cut the latter to the desired length and dismantle it. Introduce the stripped leads.

2

Tighten up the 3 screws. Once the O-ring is positioned correctly in the cable gland, tighten up the latter.

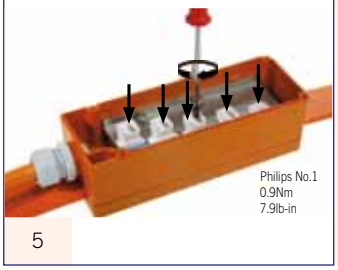
3

Position the flat cable in the right position. The ridge in the base acts as a reference point. It has to match the ridge of the flat cable. In case of incorrect mounting the box cannot be fitted with normal force. The cable must be cleaned, gel and oil must be removed.



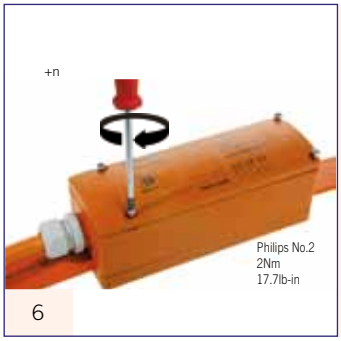
4

Snap together the upper part and the base. Tighten up the 3 fastening screws of the base.



5

Tighten up the 6 piercing screws (Twin-Piercing) in order to establish contact with the flat cable cores.



6

Replace the cover plate carefully and tighten up the screws. The box may be marked if necessary.

Pre-wiring means time-saving

Service to our customers.

On request the boxes may be provided in advance with round outgoing cables.

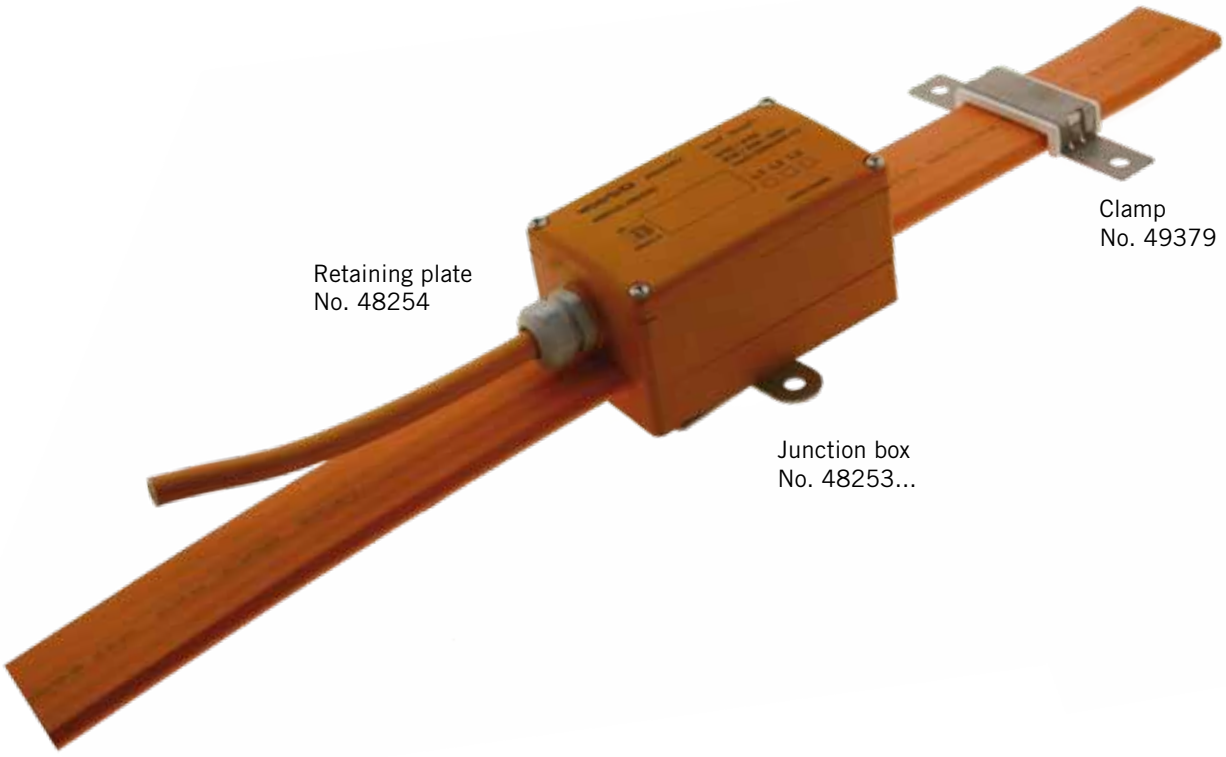
The overcurrent protection devices will be chosen in relation to the length of installed cables so that their response time conforms to specifications in case of malfunction.The circuit integrity E90 will only be maintained if the Woertz components are correctly used and fastened with the prescribed material

The box will be connected to the cable only once. If it has to be displaced, the degree of protection of the box and of the whole system will not be guaranteed anymore. The box may only be used later as a box with protection degree IP40. The holes in the sheath have to be reinsulated to maintain the protection degree. We cannot accept any liability for damage caused by incorrect use.

A high IP degree of protection imposes particularly high requirements in terms of installation material. The Woertz guarantee only applies to original products finished in our workshops such as flat cables, boxes and round cables with connectors.

Woertz FE180 E30/E90 5G16 mm²

Thanks to this installation system based upon flat cable, all the components related to safety are continuously supplied, even in case of fire. The high degree of protection enables this system to be used even under stringent conditions.



Where are these flat cables used?

- In installations running under stringent conditions
- For feeding safety components: emergency lighting and escape route guidance systems, smoke extraction systems or elevators specially meant for fire and rescue services.
- Quick and safe installation for industrial or functionnal buildings (offices or shopping centres)
- The high degree of protection enables this system to be used in tunnels or on industrial sites
- The system turns out to be very flexible and robust in building and utilization phases
- IP68 enables the system to be used in damp environments; the boxes are dust proof and may be used thus in workshops (joiner‘s) or similar industrial rooms.
- Labor intensive sealing of the boxes is not necessary: as the cable never has to be interrupted there is no source of possible error.

Thanks to the flat cable additionnal loads may be connected anytime at any point.

Woertz FE180 5G16 mm²

flat cable for E30 to E90 applications

	halogen-free
	No.
	**48950OR**
3L+N+PE	

Technical data		
Dimension	mm	52×11
Weight	g/m	1436
Fire load	kWh/m	4.96
No. of leads x cross-section	mm²	5×16

High current part		
Copper conductors		Bare copper wire
Insulation of the leads		flame retardant, high temperature resistant
Colour of the leads		grey, black, brown, blue, yellow/green
Cross-section	mm²	16
Test voltage	kV / Hz	4 / 50
Rated voltage	kV	0.6/1
Sheath material		FRNC/LSOH
Additives in sheath		rodent repellent
Insulation integrity		FE180
Function integrity		E90
Conductor-resistance	Ω/km	1.15
Operating temperature		-15 °C to +90 °C
min. Installation temperature		+5 °C
Cu weight	kg/km	768

Caution

The cable has to be cut with a bandsaw.

Branching boxes	**Technical data**		
No.			
48353/01	with cable gland D 6.0-8.0	M20x1.5	
48353/02	with cable gland D 8.0-11.0		
48353/03	with cable gland D 11.0-15.0		Contacts of copper allo
48355/01	with cable gland D 12.5-16.0	M25x1.5	Plastic parts: halogen-free
48355/02	with cable gland D 16.0-20.5		Metal parts: V4A
	L×W×H mm	146×85×77 (without cable gland)	
	Weight g	820	
	Test current A	24	
	Test voltage kV/Hz	4/50	
	Rated voltage V/Hz	690/50	
	Degree of protection	IP66/IP68 (2 m, 30 min.)	
	Function integrity	E90	
	Contacts	Woertz Piercing	
	Packing unit pce.	1	
	Safety clip on request		

Flat cable box for E30 to E90 applications

Heat-shrinkable cap	Technical data		
No.	L×Ø mm	105×42	End cap with adhesive and sealant
48511/55	Weight g	33.8	
	Packing unit pc.	5	Note: Cut cable ends cleanly and smoothly. Then mount the end pieces. No need to strip insulation. Cable end pieces can only be mounted once. Halogen-free

Clamp	Technical data		
No.	Material	high quality steel V4A andceramic	
49379	LxWxH mm	103.5x32x12.5	
	Mounting shaft mm	80	
	for E30 to E90 application		
	Packing unit pce.	10	

Cable glands		Technical data	
No.	Eldas-No.	Diameter of cables mm	of polyamide, grey
48560/02/M20		6.0-8.0	M20×1.5
48560/03/M20	121 682 607	8.0-11.0	
48560/05/M20	121 682 617	11.0-15.0	delivered with O-ring seal made of NBR
48560/03/M25			
48560/05/M25		Packing unit pce.	halogen-free
			

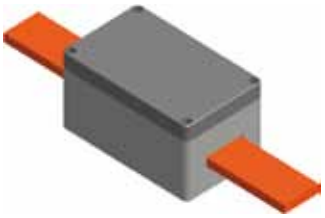
Retaining plate	Technische Angaben		
No.	Material	high quality steel V4A	
48954	LxW mm	80x105	
	mounting shaft mm	80	
	fastening hole mm	ø9.5	
	Packing unit pce.	10	

Accessories

Flat cable box for E30 to E90 applications

Connecting box 5G16 FK/FK

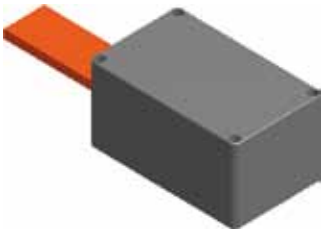
No. 49318



Technical data		
LxWxH mm	180x110x90	Plastic partshalogen-free
Test current	76	Metal parts: V2A/V4A
Test voltage kV/Hz	4/50	
Rated voltage V/Hz	690/50	Contact elements
Protection class (with cast resin)	IP66/IP68	Copper alloy ceramic isolated
Function integrity	E30 to E90	
Packing unit pce.	1	

Termination socket 5G16

No. 49319



Technical data		
LxWxH mm	180x110x90	Plastic partshalogen-free
Test current	76	Metal parts: V2A/V4A
Test voltagte kV/Hz	4/50	
Rated voltage V/Hz	690/50	Contact elements
Protection class (with cast resin)	IP66/IP68	Copper alloy ceramic isolated
Function integrity	E30 to E90	
Packing unit pce.	1	

Connecting box 5G16 RK/FK

No. 49320

Technical data		
LxWxH mm	180x110x90	Plastic partshalogen-free
Test current	76	Metal parts: V2A/V4A
Test voltagte kV/Hz	4/50	
Rated voltage V/Hz	690/50	Contact elements
Protection class (with cast resin)	IP66/IP68	Copper alloy ceramic isolated
Function integrity	E30 to E90	
Packing unit pce.	1	
+counter nut included cable gland		

Mounting procedure of junction box No. 48253/L/68/E90

(may be used for both feeding and branching)

1

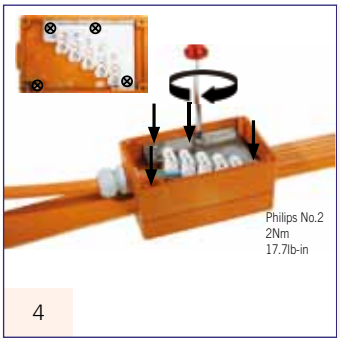
Remove the cover plate of the box. The cable gland has to be prepared and mounted on the branching cable (round cable). Cut the latter to the desired length and dismantle it. Introduce the stripped leads.

2

Tighten up the 3 screws. Once the O-ring is positioned correctly in the cable gland, tighten up the latter.

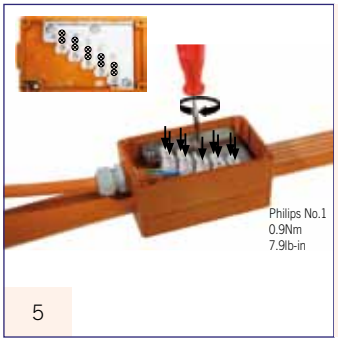
3

Position the flat cable in the right position. The ridge in the base acts as a reference point. It has to match the ridge of the flat cable. In case of incorrect mounting the box cannot be fitted with normal force. The cable must be cleaned, gel and oil must be removed.



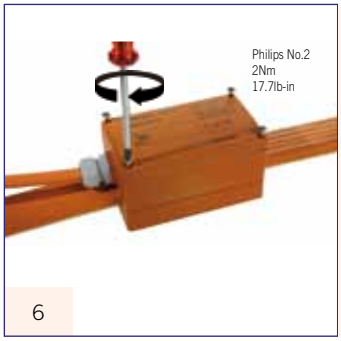
4

Snap together the upper part and the base. Tighten up the 3 fastening screws of the base.



5

Tighten up the 6 piercing screws (Twin-Piercing) in order to establish contact with the flat cable cores.



6

Replace the cover plate carefully and tighten up the screws. The box may be marked if necessary.

Pre-wiring means time-saving

Service to our customers.

On request the boxes may be provided in advance with round outgoing cables.

The overcurrent protection devices will be chosen in relation to the length of installed cables so that their response time conforms to specifications in case of malfunction.The circuit integrity E90 will only be maintained if the Woertz components are correctly used and fastened with the prescribed material

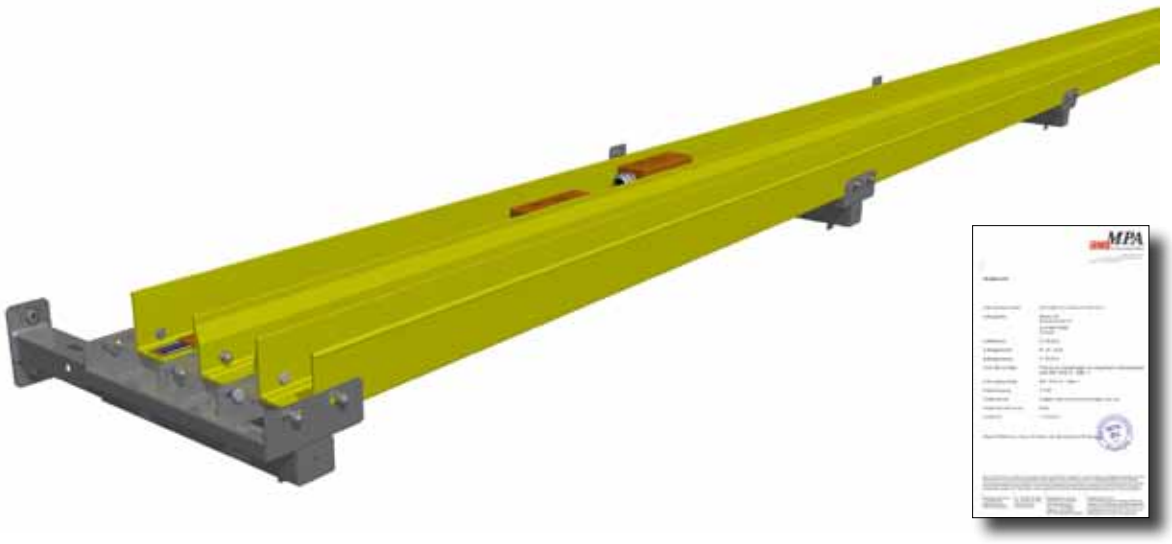
The box will be connected to the cable only once. If it has to be displaced, the degree of protection of the box and of the whole system will not be guaranteed anymore. The box may only be used later as a box with protection degree IP40. The holes in the sheath have to be reinsulated to maintain the protection degree. We cannot accept any liability for damage caused by incorrect use.

A high IP degree of protection imposes particularly high requirements in terms of installation material. The Woertz guarantee only applies to original products finished in our workshops such as flat cables, boxes and round cables with connectors.

Construction with one channel

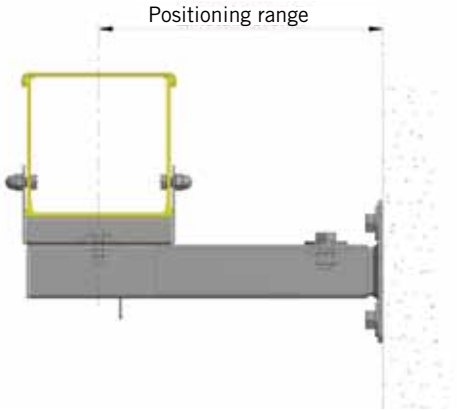
Construction with two parallel channels

Construction with a 3 chamber channel



Accessories to duct system 80×80 and 120×120

Construction with one channel



Duct cover	80×80	120×120	Technical data
	**No.** **49332/80** W×H ext. dim mm 96×13 Length of profile mm 3000	**49332/120** W×H ext. dim mm 126×13 Length of profile mm 3000	Material: fibreglass reinforced polyester resin UL94VO further dimensions on request

Channel duct profile	80×80	120×120	Technical data
	**No.** **49331/80** W×H int. dim. mm 80×80 W×H ext. dim mm 90×83 Length of profile mm 3000	**49331/120** W×H int. dim. mm 120×120 W×H ext. dim mm 130×123 Length of profile mm 3000	Material: fibreglass reinforced polyester resin UL94VO further dimensions on request

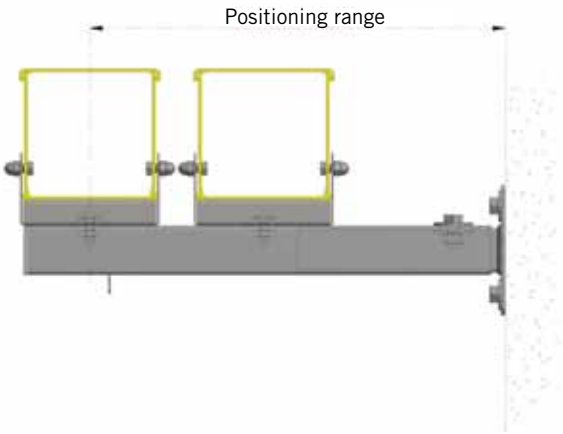
Channel guide support	80×80	120×120	Technical data
	**No.** **49333/80** Material V4A Required accessories : > Mounting equipment - Profile to guide support **No. 49357** - Guide support to extension **No. 49356**	**49333/120** Material V4A	to solve problems like gradients, angles and deviations etc. – just ask Other materials on request

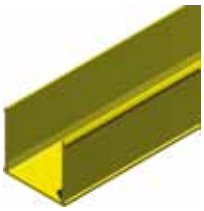
Extension	80×80	120×120	Technical data
	**No.** **49337/80/K1** Positioning range mm 250-350 Material V4A **No.** **49337/80/L1** Positioning range mm 250-350 Material V4A Required accessories: > Mounting equipment - Extension to bracket **No. 49355**	**49337/120/K1** Positioning range mm 250-350 Material V4A **49337/120/L1** Positioning range mm 250-350 Material V4A	Positioning range Center of channel to mounting plate Further versions on request

Bracket			Technical data
	**No.** **49350/1**		Dimensions mm 200 x 125 x 65 Material V4A - 1.4571 Positioning range mm 100 Ceiling versions on request

Accessories to duct system (80×80)x2 and (120×120)x2

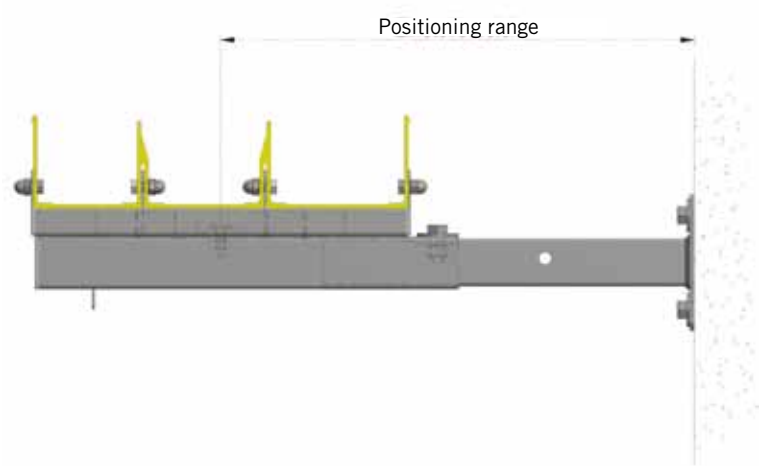
Construction with two parallel channels



Duct cover	**80×80**	**120×120**	**Technical data**
	**No.** **49332/80** W×H ext. dim mm 96×13 Length of profile mm 3000	**49332/120** W×H ext. dim mm 126×13 Length of profile mm 3000	Material: fibreglass reinforced polyester resin UL94VO further dimensions on request
Profile	**80×80**	**120×120**	**Technical data**
	**No.** **49331/80** W×H int. dim. mm 80×80 W×H ext. dim mm 90×83 Length of profile mm 3000	**49331/120** W×H int. dim. mm 120×120 W×H ext. dim mm 130×123 Length of profile mm 3000	Material: fibreglass reinforced polyester resin UL94VO further dimensions on request
Guidance	**80×80**	**120×120**	**Technical data**
	**No.** **49333/80** Material V4A Required accessories : > Mounting equipment - Profile to guide support **No. 49357** - Guide support to extension **No. 49356**	**49333/120** Material V4A	to solve problems like gradients, angles and deviations etc. – just ask Other materials on request
Extension	**für 2x (80×80)**	**für 2x (120×120)**	**Technical data**
	**No.** **49337/80/K2** Positioning range mm 350-450 Material V4A **No.** **49337/80/L2** Positioning range mm 450-550 Material V4A Required accessories: > Mounting equipment - Extension to bracket **No. 49355**	**49337/120/K2** Positioning range mm 400-500 Material V4A **49337/120/L2** Positioning range mm 500-600 Material V4A	Range of adjustment Centre axis of duct front face/ mounting plate further versions on request
Bracket			**Technical data**
	**No.** **49350/1**		Dimensions mm 200x125x65 Material V4A - 1.4571 Positioning range mm 100 Ceiling versions on request

Accessories to the 3 chamber channel 120/100/90x80

Construction with a 3 chamber channel



Channel duct profile	**3 chamber**	**Technical data**
	**No.** **49301** W×H int. dim. mm 120/100/90x80 W×H ext. dim mm 341x83 Length of profile mm 3000	Material: fibreglass reinforced polyester resin UL94V0 Further dimensions on request
Channel guide support	**3 chamber**	**Technical data**
	**No.** **49314** Material V4A	to solve problems like gradients, angles and deviations etc. – just ask Other materials on request Required accessories: > Mounting equipment - Profile to guide support **No. 49313** - Guide support to extension **No. 49356**
Extension	**3 chamber**	**Technical data**
	**No.** **49306** Range of adjustment mm 350-450 Material V4A **49307** Range of adjustment mm 450-550 Material V4A **49308** Range of adjustment mm 550-650 Material V4A	Positioning range: Center of channel to mounting plate other versions on request Required accessories: > Mounting equipment - Extension to bracket **No. 49355**
Bracket	**3 chamber**	**Technical data**
	**No.** **49304**	Dimensions mm 340 x 125 x 65 Material V4A Range of adjustment mm 100 further versions on request

Accessories to duct systems 80×80 and 120×120

Fastening accessories	Technical data		
No. **49355** **fastening of extension to bracket** 	Material	V4A	

Fastening accessories	Technical data		
No. **49356** **fastening of guidance to extension** 	Material	V4A	

Fastening accessories	Technical data		
No. **49357** **fastening of profile to guidance** 	Material Designed for all types of ducts	V4A	

Accessories

Torque screwdriver 0.6–2.0 Nm		Technical data
No. **49825** 	Application: For controlled tightening of screws in areas containing live parts up to 1,000 V AC, to be used only in combination with a slim-Torque VDE bit holder for 6mm slimBits.	Grip: Torque is infinitely variable with torque setter adjusting tool (included in the delivery). Ergonomic multi-component grip, protective insulation 1,000 V AC, tested for safety by the German TÜV (Technical Inspection Association). Grip size adjusted optimally to torque area. A click signals that the preset torque value has been reached. Standards: Manufactured in accordance with IEC 60900:2004. EN ISO 6789, BS EN 26789, ASME B107.14M. Precision: ±6%, traceable back to national standards. Holder: slimTorque VDE bit holder (included in the delivery) for 6mm slimBits.

General terms and conditions

1. Prices for Swiss market
Prices are understood as EXW in CHF excluding VAT (sales tax). The prices in effect at the date of receipt of order apply; surcharges taking account increases of costs of metals are reserved.

2. Packaging and delivery costs
All articles – depending on their weight and bulk – will be shipped by mail, parcel post, truck, airmail or ship, in each case under the liability of the recipient. Additional costs for express deliveries or unusual packaging are at the expense of the recipient. Pallets, boxes, containers, cable drums shall be invoiced at cost price. We will not take back special crates, disposable pallets and boxes. We will not replace breakages, damage and losses during transport free of charge. The transport company should be immediately notified of any damage.

3. Performance
Productions of special drawings, as well as changes to drawings that depart from the performance offered shall be invoiced according to time outlay incurred. This likewise applies for additional project planning effort. Additional work (such as adaptations, special parts, sections, cutouts, notches etc.) that is not detailed in the tender shall be invoiced separately, according to time outlay. The additional work incurred for retrospective individual orders or special versions or reworking shall be invoiced. The tools required for customized orders shall be invoiced according to previously stated prices. Such tools shall remain our property. If we are not awarded the order, we reserve the right to submit invoices for specially-manufactured patterns as well as our work in developing the project. We reserve the right to deviations due to raw materials and production within the permitted tolerances, and these do not place us under obligation to accept returned goods.

4. Invoicing and payment conditions for Swiss market
Orders with a value under CHF 50.00 shall be invoiced with a minimum charge of CHF 50.00 (excl. surcharges). Orders with a value under CHF 100.00 shall be invoiced net at list price. Invoices are payable within 10 days from the invoice data with 2% discount or within 30 days net. A processing fee will be levied in the event of arrears. Deliveries to recipients who are unknown to us and have previously not fulfilled their payment obligations shall be against cash on delivery or advance payment. We reserve the right to share our payment experiences with an information pool.

5. Execution of orders
The cancellation or suspension of orders by the ordering party requires our express agreement, and must occur within 7 days of notification. In particular with the delivery of custom-made articles we reserve an under- or over-delivery of up to 10%. If orders are cancelled any additional costs thereby incurred will be invoiced. Goods ordered on a standby basis must be accepted within the defined period.

6. Delivery date
The specified delivery dates shall be observed wherever possible. We are released from the obligation to respect the delivery date by: Operational disruptions, material deficiencies, official regulations, labour disputes, call up of reservists and other cases of force majeure. Claims due to late delivery will be rejected. The delivery period starts on the date on which we are in possession of all required technical, design and commercial specifications from the ordering party relating to design modifications etc.

7. Warranty
For material or design faults on the articles delivered, we extend a warranty such that we will replace products that we recognize as being faulty at no extra charge in the 12 months after the installation of the respective products, however no later than 18 months thereafter. These must be forwarded to us with an enclosed delivery note. This warranty shall lapse if improper work is carried out on the product. If circumstances do not allow the corrective work to be carried out at our workshops, the warranty is limited to the free of charge replacement of the device. We do not accept expenditure or time outlays that have been caused outside our company.

8. System guarantee
The Woertz guarantee only applies to original products finished in our workshops such as flat cables, boxes and round cables with connectors.

9. Liability
Any claims by the ordering party other than those expressly named in these conditions of delivery, regardless of the legal basis on which they are made, especially all claims for compensation for damages, abatement and cancellation of the contract or withdrawal from the contract, are excluded. We only accept liability in the context of mandatory statutory provisions.

10. Reservation of proprietary rights
All delivered goods remain our property until all demands in respect of these goods have been fulfilled. We reserve the right to enter the reservation of ownership in the official registers in accordance with respective national laws. The costs for such entries shall be borne by the purchaser.

11. Return deliveries
Each return delivery requires our previous agreement and should occur within 12 months after delivery. A delivery note shall be enclosed with the return delivery. In the case of returns of standard equipment that are not due to incorrect delivery on our part, there will only be a reimbursement if the value of goods exceeds CHF 100.00, and we shall charge at least 25% of the value of goods for our own outlays. Returns can only be accepted in the original packaging and with a delivery note. Return of custom-made products of any kind is excluded.

12. Claims
Claims regarding to the number of items, weight, faults, etc. can only be taken into account if they are made within 7 days of receipt of the goods.

13. Export
Prices are understood as EXW in CHF or in EUR excl. VAT (sales tax). This will be separately charged in accordance with the respectively applicable statutory rate. For exports, the minimum invoice value is EUR 300.00/CHF 500.- or USD 500.-. Deliveries are against advance payment or by mutual agreement. The export of products and parts thereof may be subject to export licensing requirements due to their nature or foreseen use.

14. Proprietary rights
Our goods are largely protected by patents in Switzerland and in other countries. Transgressions of these proprietary rights will be prosecuted.

15. Place of fulfilment and legal venue
The place of fulfilment is Muttenz and the legal venue in all events is Arlesheim, Switzerland.

General points

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Business hours
Monday-Friday
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13:15–17:15
(except for public holidays)
Tel.: +41 61 466 33 44
Fax: +41 61 461 37 53

Collections:
07:00–16:00
You can collect any pre-ordered products at the customer counter one hour later.

OUR STRENGTHS

Technical advice appropriate to the application.

High availability of standard products.

Custom designs for special applications.

Fast, flexible, and professional.

Woertz:
More than 80 years' experience in the field of electrical installation technology.

SYSTEM GUARANTEE

The Woertz system guarantee applies exclusively to original Woertz products and Woertz system solutions, that is, Woertz® contact boxes, Woertz® flat cables, or other products that have been checked and approved by Woertz for these contacts.

Edition september 2015

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09/2015 No. 44443E