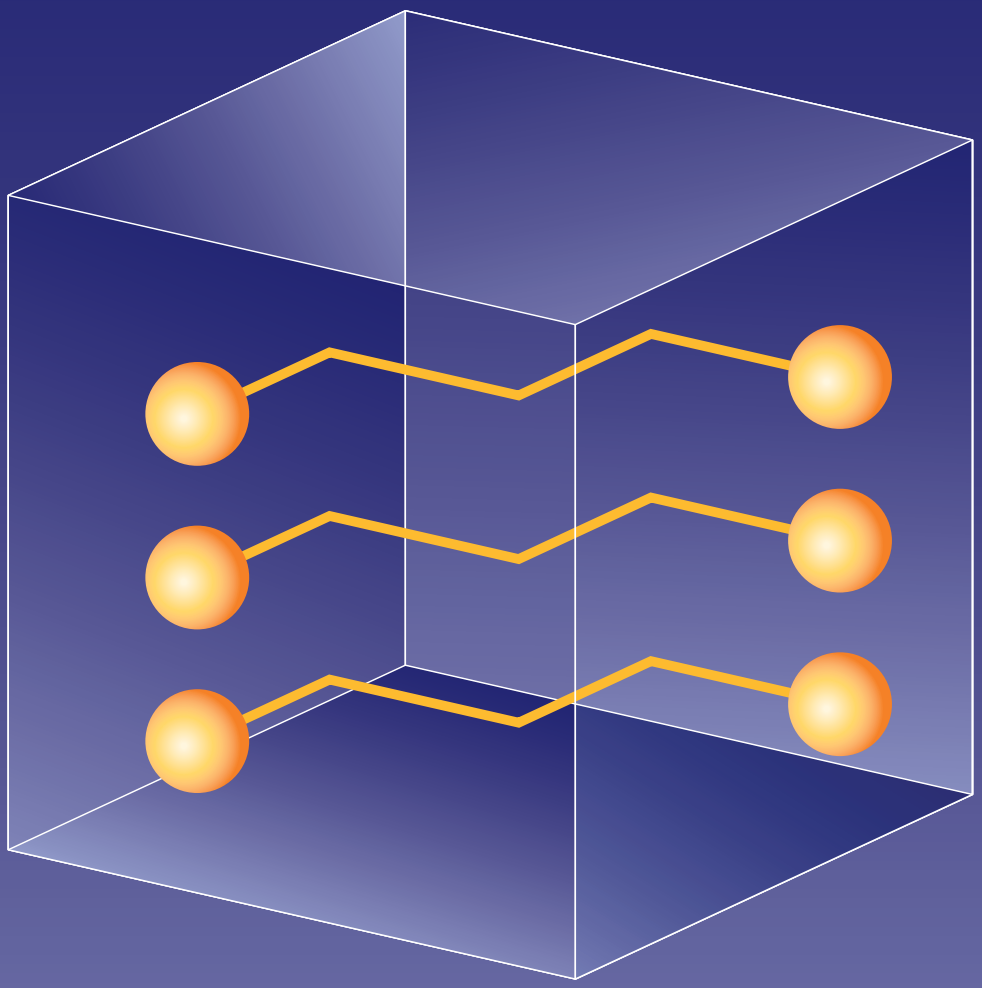
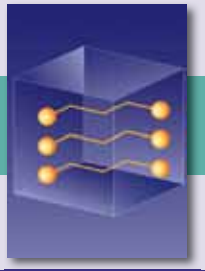
Cabling systems



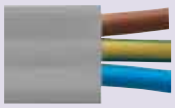
Swiss made

woertz

OUR RANGE OF PRODUCTS



CABLING SYSTEMS



BUILDING AUTOMATION

SAFETY SYSTEMS

CABLE LAYING SYSTEMS

COMPONENTS FOR ELECTRICAL INSTALLA-TION TECHNOLOG

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

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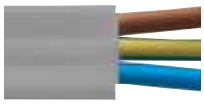
P | 28 multibus 4×1.5 mm²



P | 34 3G2.5 mm²
3G4 mm²

P | 38 Technofil 5G1.5 mm²
and 5G2.5 mm²
to be used only in Switzerland

P | 44 power 5G2.5 mm²

P | 50 combi 5G2.5 mm² +
2×1.5 mm²

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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

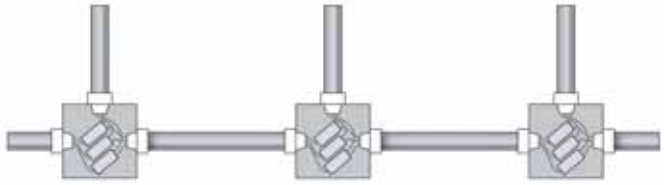
The requirements of a professional installation system can be summarised as follows:

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

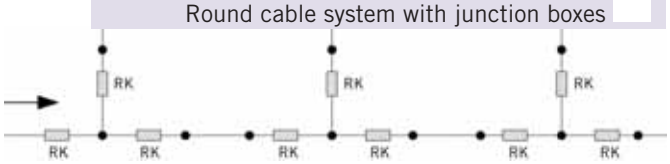
The following considerations concern cabling systems and product features for functional buildings, industrial building use and infrastructure buildings. The same principles apply to all types of buildings and infrastructure facilities.

We differentiate between two types of cable installation

The principle of conventional cabling systems



Round cable system with junction boxes



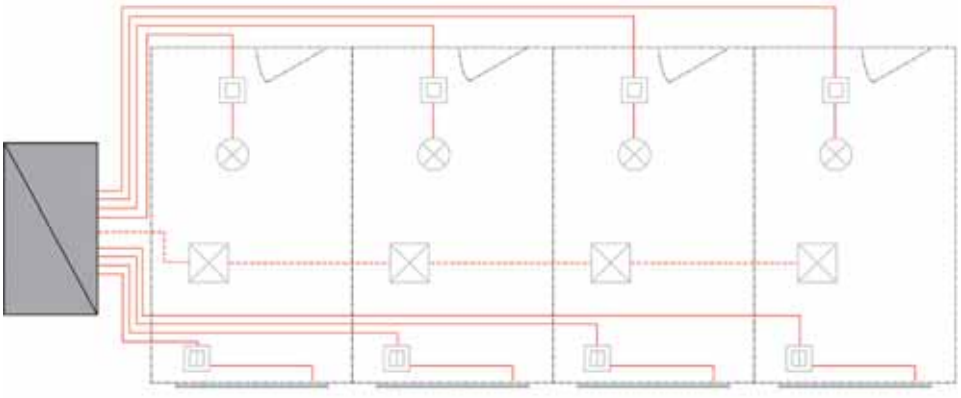
Equivalent circuit diagram with contact resistance

Junction box wired with a three-strand round cable

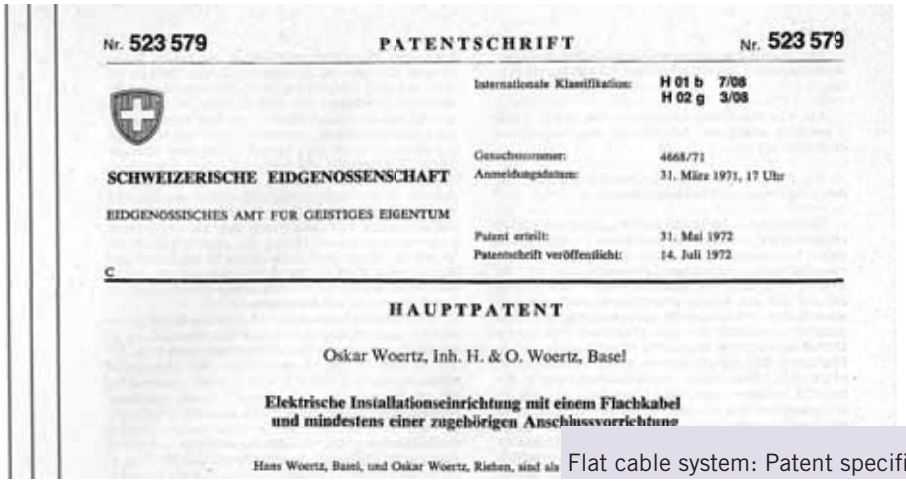
The planned cabling concept is adapted locally during the installation. That way planning mistakes can still be corrected and changes can be taken into consideration at short notice. This applies in particular to subsequent expansion of the cable network.

Electrical installation systems using round cables contain a high number of partition and contact points with many potential risks and possible mistakes. The installation work can thus only be performed by qualified workers. Each cable break is a potential weak point and leads to energy loss. Serial placement of the junction boxes can result in a large-scale failure of the energy distribution in the event of a fault.

Conventional installation



Woertz®: Inventors of innovative flat cable technology



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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

Flat cable system: Patent specification 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.

The concept of Woertz® flat cable systems

The flat cable system has the following advantages compared to conventional cabling systems:

- a modular, flexible and economical installation system with high operational reliability and capacity

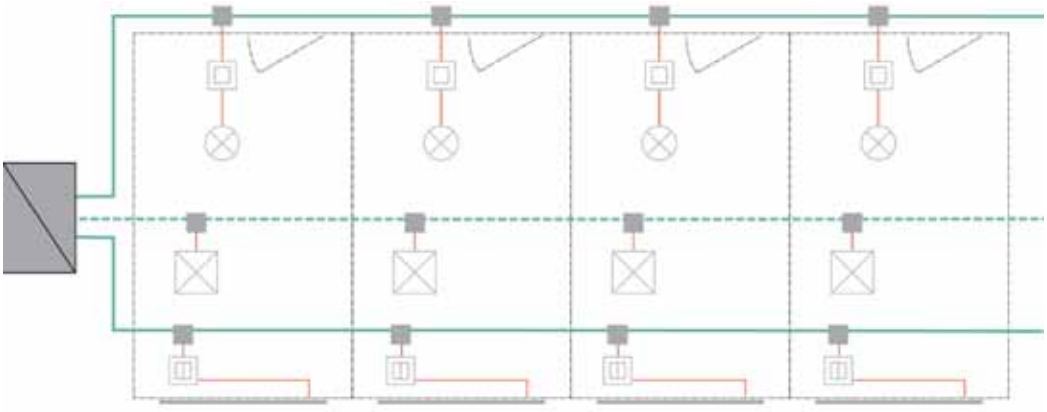
- the leads in the flat cable run parallel and facilitate easy access to the individual leads via junction boxes that can be placed anywhere using a piercing method that does not require stripping,

- reverse polarity protected installation with a short commissioning time and a great reduction in the amount of cable required (fire load reduction), short installation times and less risk of making mistakes,

- the flat cable system allows for pre-assembly of ready-to-install cable segments, and can be adapted at short notice to changed requirements in all phases of construction and utilisation,

- expansion options with data cables for power supply and control of building automation modules without additional cabling

Flat cable installation - general

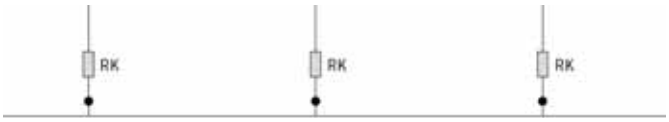


Security

No breaks are required in the Woertz® flat cable system at any point during installation or expansion. Fewer contact points and less cable overall mean fewer potential risks. The quantity of cable is reduced, so the thermal load can be reduced.

Functional principle

Flat cable systems with junction boxes



Equivalent circuit diagram with contact resistance

Woertz® flat cable with connecting box

The principle of Woertz® flat cable systems is that connections and branches can be created at any point directly and efficiently without any cable breaks. Cable connections and boxes can be moved, added or removed as required later on.

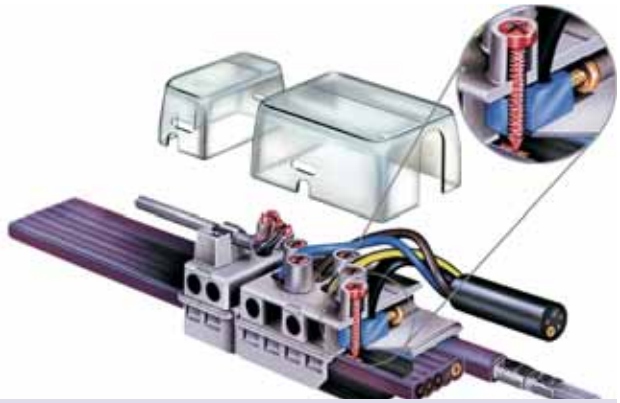
The parallel running leads in the cable make it possible to easily access the individual leads through quick installation of feed-in and branching boxes that use an insulation-piercing method.
Preparatory work such as stripping cables, separating leads or preparing the ends is completely unnecessary. 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 lack of cable breaks means less 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 planned cabling concept can still be adapted on-site during the installation, by changing a cable length or the number of junction boxes, for example. Planning mistakes can thus be corrected and changes at short notice can be accommodated.

This flexibility reduces the prior planning and measuring work as well as the amount of cable material that is necessary. The considerable savings in cable material, installation work and time clearly improves profitability. This modular system also permits pre-assembly of ready-to-install flat cable lengths that can be installed on-site at the construction site in a relatively short amount of time, and thus efficiency and yield also increase.

Woertz® flat cable connector

The Woertz® connecting principle consists of mounting the junction boxes on the flat cable with an insulation-piercing method. These clamping devices consist of screws or blades that pierce the insulation of the cable by screwing or cutting in respectively thereby establishing a contact with the individual leads. The outgoing leads are then connected to the screws or blades so that they become live. The main line – i.e. the flat cable – does not have to be stripped or cut during this procedure, and the junction boxes can be attached at any place on the cable.



Piercing screws

Woertz combi cable

The insulation-penetrating piercing screws are shown in red. The contact elements and connecting screws for the outgoing leads are in blue and gold. Tapping screws pierce the insulation of the flat cable and the individual leads (black jacket in this case) and contact the copper lead reliably and without stripping.

The patented Woertz® piercing method

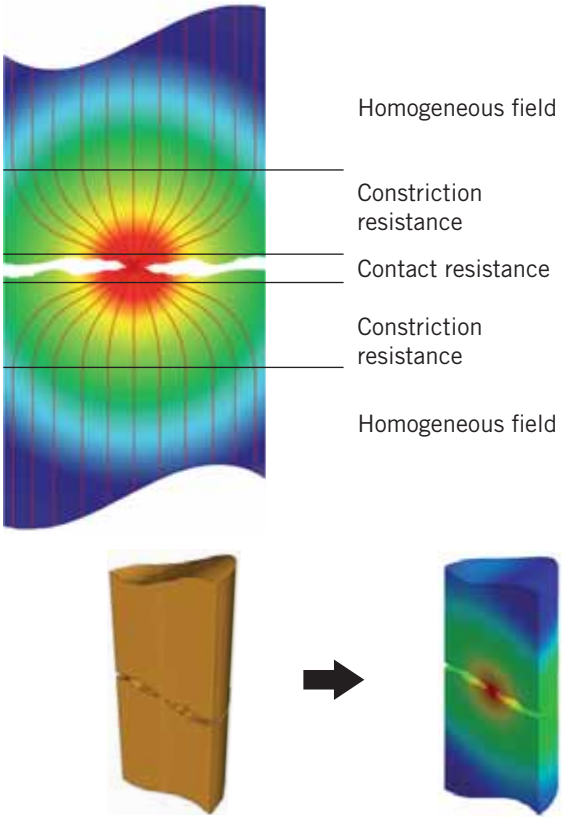
Contacting metal parts

At least two elements are required for a contact. Only careful matching of both elements can lead to an optimum result. One-sided adaptation of one element cannot compensate for any inadequacies in the other.

The most important value of an electrical contact is the transition resistance, which is determined by the following physical characteristics:

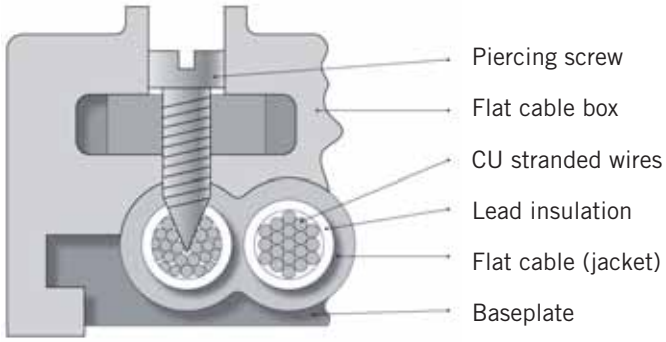
The increased connection resistance in the live elements resulting from the construction-related constriction of the current paths to the contact surfaces.

The actual contact resistance from one contact element to the other. This is essentially affected by the size of the contact surface, coupling of materials, surface quality, impurity layers and surface pressure. In addition, there are direct cross-connections and dependencies between these parameters.



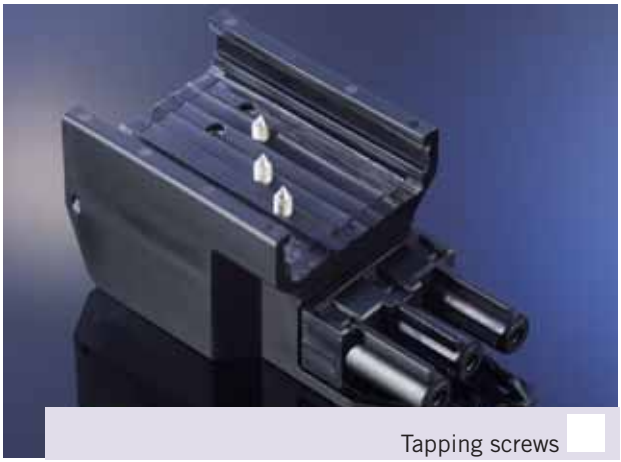
Electrical lines, contact set-up

Woertz® flat cable connector with piercing screws

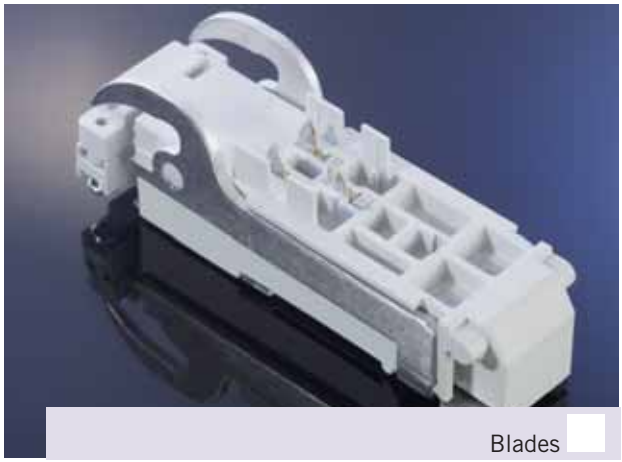


Piercing contact with flat cables

This principle requires a specific set-up regarding penetration of the insulation, the contact and the pressure build-up at the contact points, as well as the long-term reliability, and it places specific requirements on the cable leads. A piercing contact makes use of special tapping screws or blades and is always on cable strands.



Tapping screws



Blades

The tapping screw or the blade penetrates the insulation of the flat cable and enters the cable strand. This process pushes the stranded wires apart and as a result the individual wires come into contact with a large area of the screw or blade.

Due to the tension on the individual wires, there is surface pressure on the contact surfaces. This large-area pressure on the contact elements promotes the current transfer between the individual wires and ensures low resistance values.

Force development on the contact surfaces and between the individual wires for Woertz® contacts

Variations of the Woertz® piercing method

Contact: Tapping screws

Connection: Screwed

Contact: Tapping screws

Connection: Plugged

Contact: Blades

Connection: Screwed

Piercing contact with Woertz® data cables

In the "building automation" field of application, the flat cable from Woertz® is used in combination with a data cable. In order to prevent interference, the data cable is shielded by closed foil running longitudinally.

A tapping screw or a blade with an insulated intermediate piece is used (Woertz® patent) for the piercing contact of such a data cable. Any possible short-circuit between the lead and the shielding is excluded by this conductor insulation.

The cable shielding - a solution patented by Woertz® - guarantees that the insulated screw or blade never encounters a shield overlap. The retracted shielding foil ensures a clean piercing method and prevents faults.

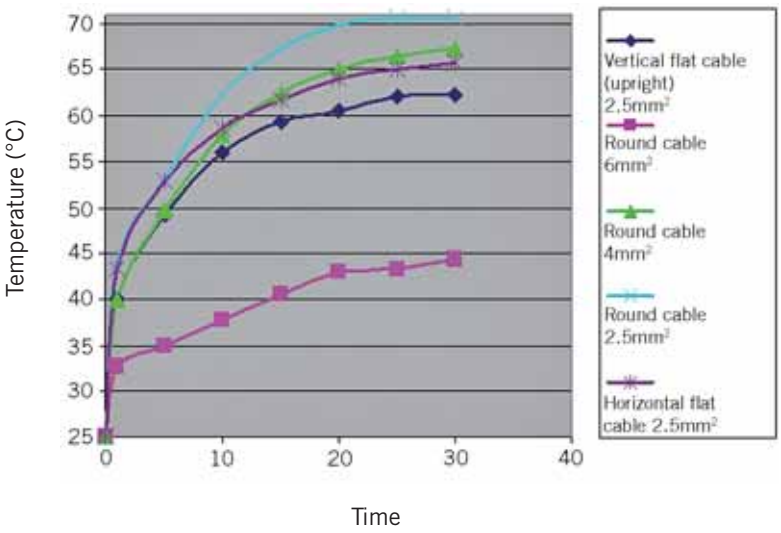
Woertz® flat cable for high cost-effectiveness and efficiency

Capacity of Woertz® flat cable systems

With a flat cable, the heat from the individual leads is given off directly to the outside. In addition, flat cables ensure efficient air cooling and hence greater capacity due to the considerably larger external surface compared to a round cable. In round cables, there is a converse negative effect, because the leads heat each other up due to the compact placement.

This phenomenon means that a flat cable has a lower temperature than a round cable under the same load and can thus carry considerably more current.

Temperature development of a flat cable compared to a round cable



Tests have shown that with the same temperature increase, a flat cable can bear more than twice as much. A flat cable with a smaller Cross-section than a round cable can be used for the same load, which means direct cost savings. Depending on the Cross-section and taking the laying system into consideration, the capacity is regulated by standards and laying regulations.

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. Morn 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 do not 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, prewiring options with 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 who is working to deadlines.

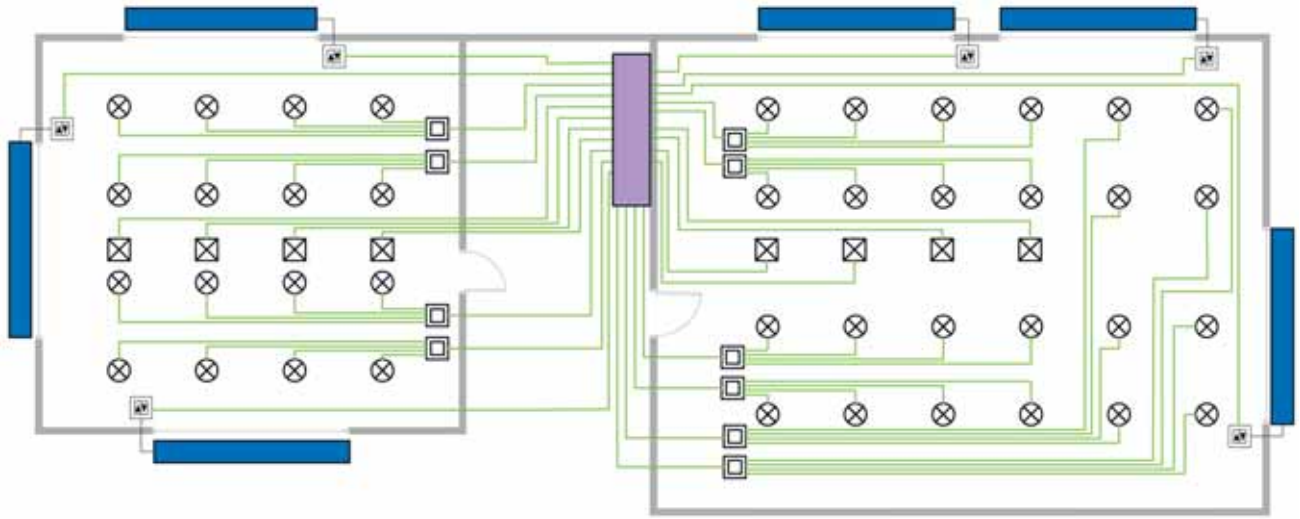
Time saving thanks to prefabrication

On request, Woertz® will deliver pre-assembled, ready-to-install flat cables including feed-in and junction boxes. On request, we can provide flat cable boxes with pre-assembled connection lines. 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.

Installation comparison

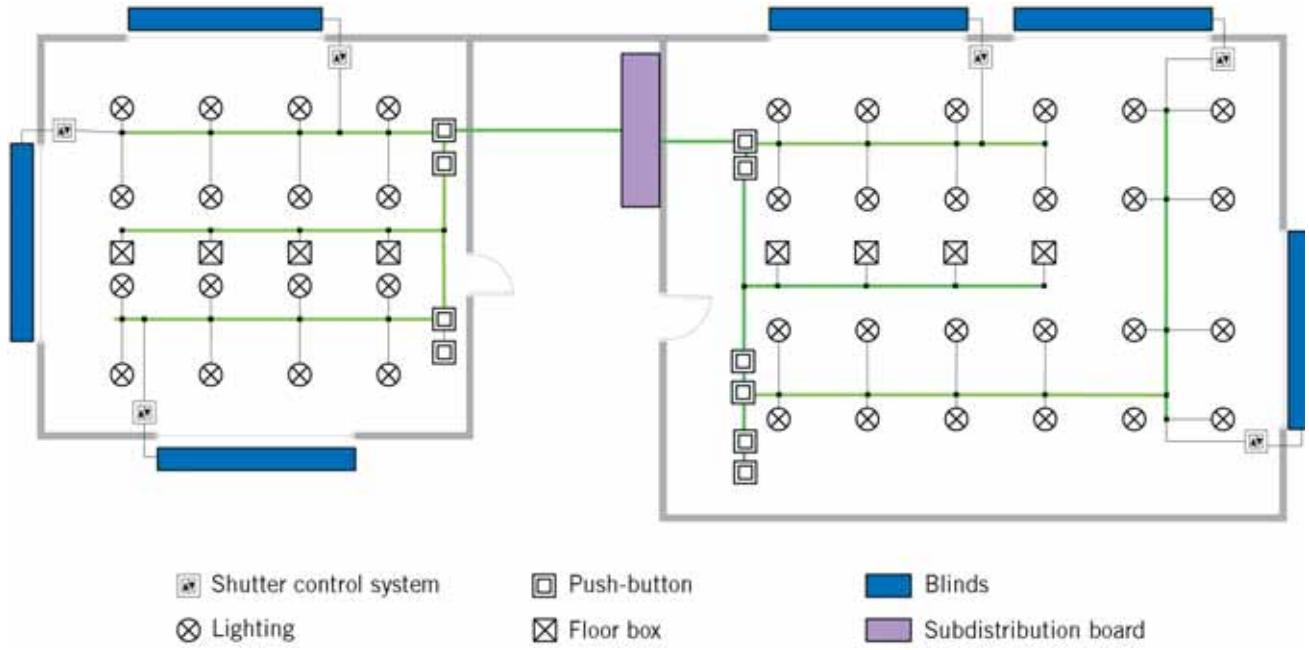
Installation with round cable

used cable length: 320 m



Installation with Woertz flat cable

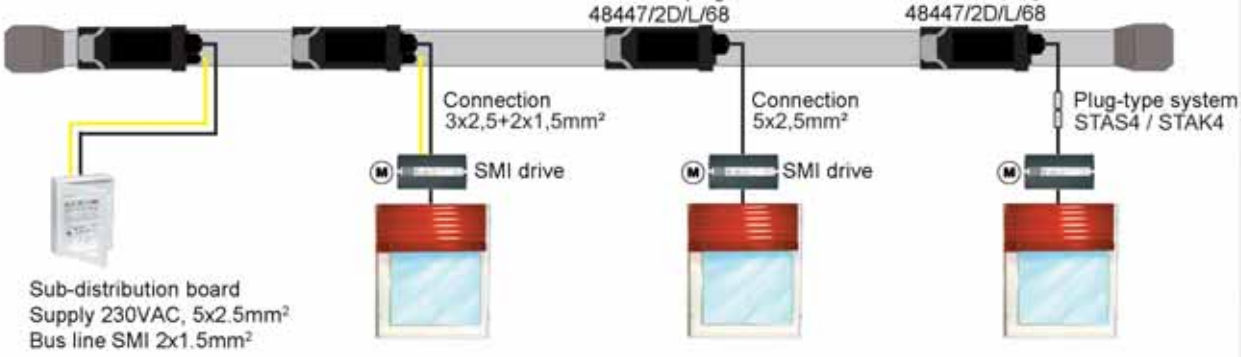
used cable length: 50 m



SMI cabling concept with Woertz® flat cable systems

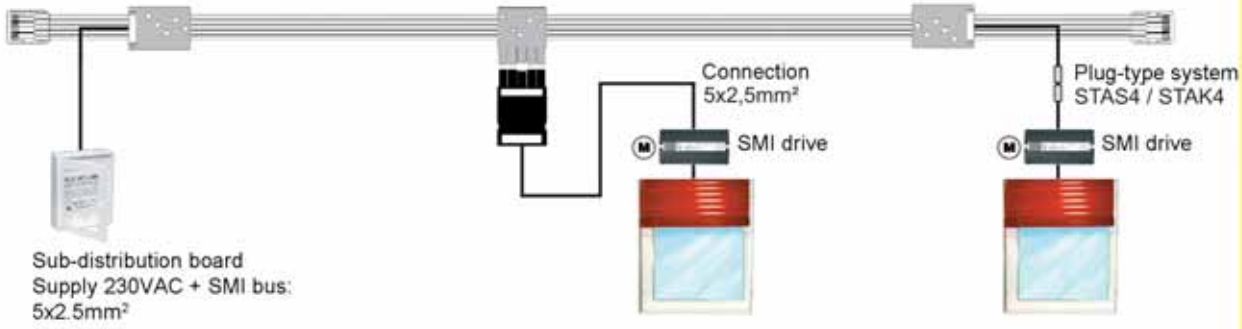
SMI drives 230VAC with flat cable system 5x2.5+2x1.5mm² IP68

(Flat cable 49864/FRNC, end piece 48510/07)



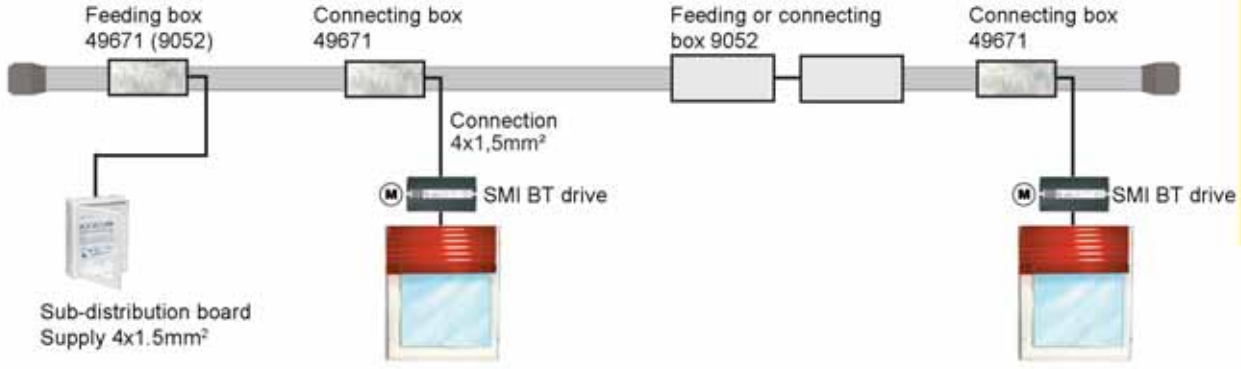
SMI drives 230VAC with flat cable system 5x2.5

(Flat cable 49845 PCV or 49846 FR/LSOH, end piece 48510/05 / Flat cable 5x2.5, IP68 may also be used)



SMI BT drives with flat cable system Multibus 4x1.5mm²

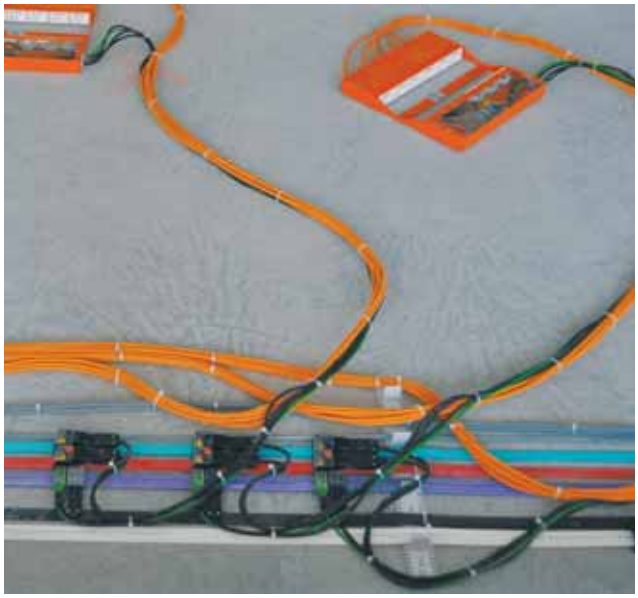
(Flat cable 49651, end piece 48510/06)

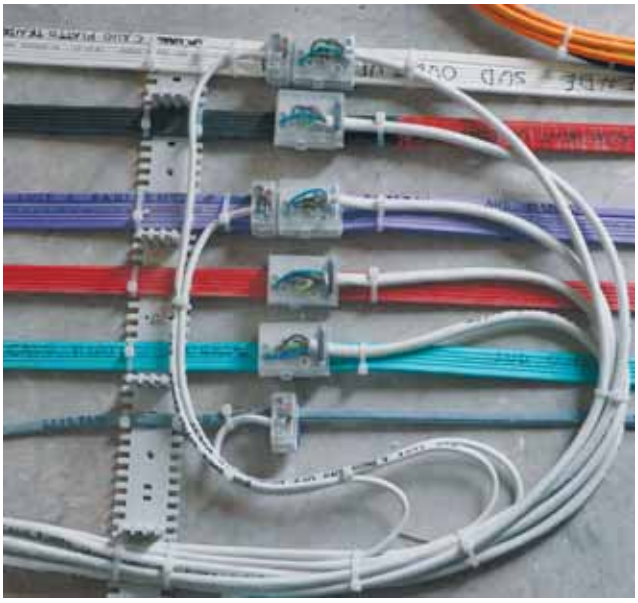


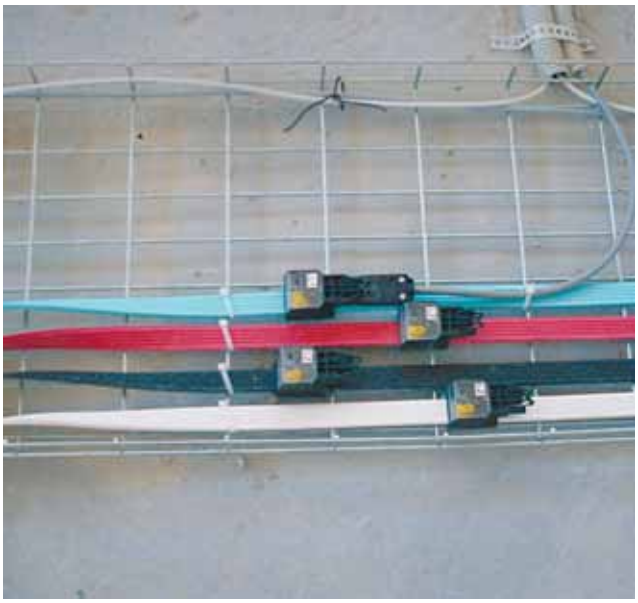
For outdoor use (facades)

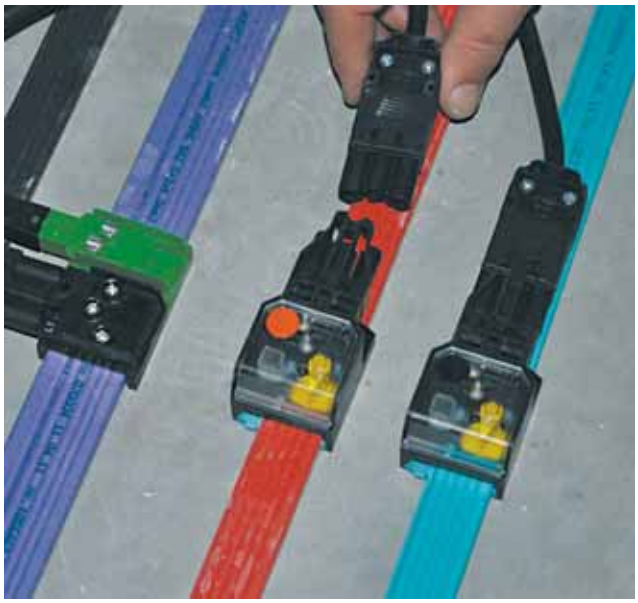
Flat cable installation for indoor use (ceiling, floor, duct)

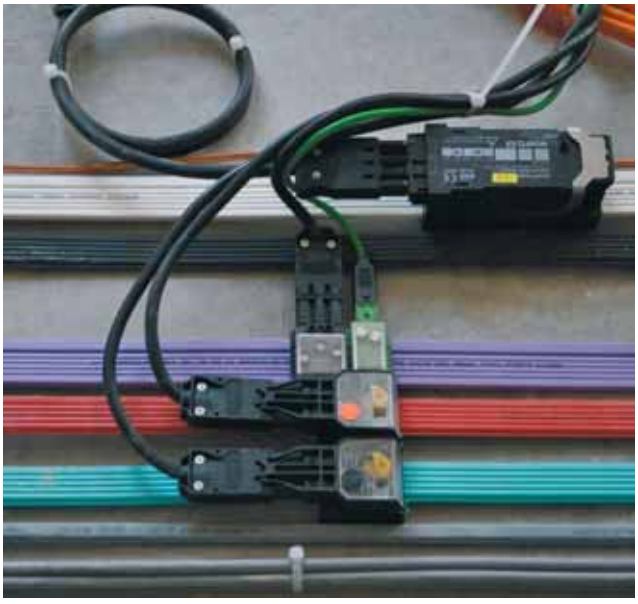
Woertz® flat cable: examples of application











Properties of materials and standards

1) Flame-retardant, self-extinguishing to IEC 60332-1-2 ☑, 2) halogen-free, non corrosive gas to IEC 60754-1/2 ☑

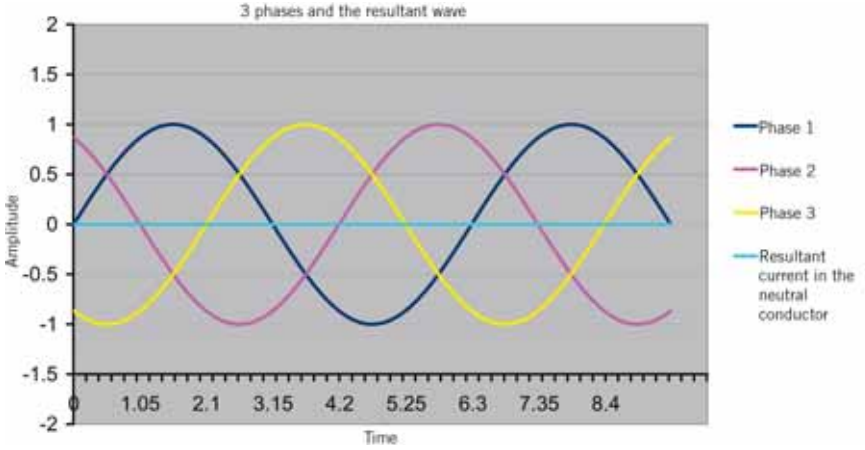
Cross-sectional view	No.	Designation	Type	Copper conductors according to IEC 60228
	49949	Woertz data 2x1.5 mm²	PVC	Tinned copper, highly flexible, class 5
	49948	Woertz data 2x1.5 mm²	FR/LS0H	Tinned copper, highly flexible, class 5
	49651	Woertz multibus 4x1.5 mm²	FR/LS0H	Tinned copper, highly flexible, class 5
	49685	Woertz 3G2.5 mm²	PVC ölbeständig	Tinned copper, highly flexible, class 5
	49686	Woertz 3G2.5 mm²	FR/LS0H	Tinned copper, highly flexible, class 5
	49646	Woertz 3G4 mm²	FR/LS0H	Tinned copper, highly flexible, class 5
	9040	Woertz technofil 5G1.5 mm²	PVC	Tinned copper, highly flexible, class 5
	9055	Woertz technofil 5G2.5 mm²	PVC	Tinned copper, highly flexible, class 5
	49900	Woertz technofil 5G2.5 mm²	FR/LS0H	Tinned copper, highly flexible, class 5
	49845	Woertz power 5G2.5 mm²	PVC	Tinned copper, highly flexible, class 5
	49846	Woertz power 5G2.5 mm²	FR/LS0H	Tinned copper, highly flexible, class 5
	49863/FRNC	Woertz power IP 5G2.5 mm²	FR/LS0H	Tinned copper, highly flexible, class 5
	49404	Woertz 5G4 mm²	PVC	Tinned copper, highly flexible, class 5
	49405	Woertz 5G4 mm²	FR/LS0H	Tinned copper, highly flexible, class 5
	48780/FRNC	Woertz power IP 5G6 mm²	FR/LS0H	Tinned copper, highly flexible, class 5
	49884	Woertz power 5G10 mm²	PVC	Bare copper, highly flexible, class 5
	49885	Woertz power 5G10 mm²	FR/LS0H	Bare copper, highly flexible, class 5
	49605	Woertz 5G16 mm²	PVC ölbeständig	Bare copper, highly flexible, class 5
	49606	Woertz 5G16 mm²	FR/LS0H	Bare copper, highly flexible, class 5
	49600	Woertz 7G2.5 mm²	PVC ölbeständig	Tinned copper, highly flexible, class 5
	49601	Woertz 7G2.5 mm²	FR/LS0H	Tinned copper, highly flexible, class 5
	49401	Woertz 7G4 mm²	FR/LS0H	Tinned copper, highly flexible, class 5
	49945	Woertz combi 5G2.5 mm²+ 2x1.5 mm	PVC	Tinned copper, highly flexible, class 5
	49946	Woertz combi 5G2.5 mm²+ 2x1.5 mm	FR/LS0H	Tinned copper, highly flexible, class 5
	49864/FRNC	Woertz combi IP 5G2.5 mm²+ 2x1.5 mm	FR/LS0H	Tinned copper, highly flexible, class 5
	48250/FE180/NS/OR 48450/FE180/NS/OR	Woertz FE180 3G2.5 mm² Woertz FE180 3G4 mm²	FR/LS0H	Bare copper, solid conductors, class 1
	48350/FE180/NS/OR 48650/FE180/NS/OS	Woertz FE180 5G2.5 mm² Woertz FE180 5G4 mm²	FR/LS0H	Bare copper, solid conductors, class 1
	48950/FE180/NS/OR	Woertz FE180 5G16 mm²	FR/LS0H	Bare copper, multistrand conductors, class 2

3) Low fire propagation according to IEC 60332-3-24 ☑, 4) Low smoke generation according to IEC 61034-2 ☑, 5) Insulation integrity FE180 according to IEC 60331 ☑

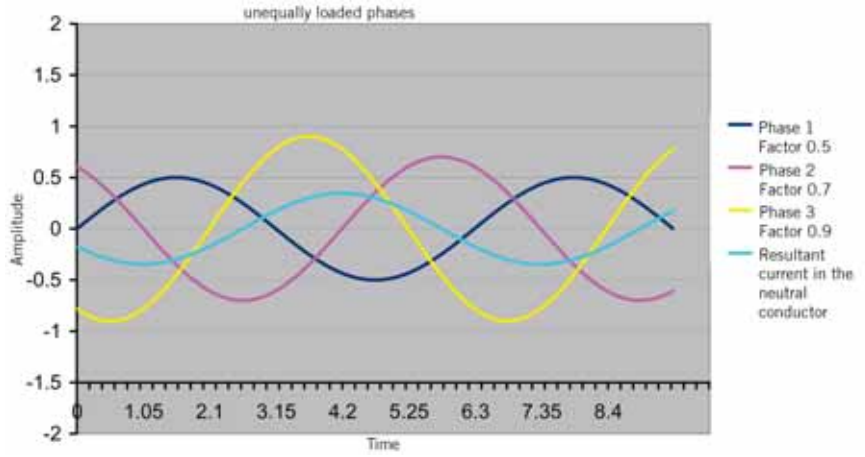
Wire insulation	External sheath	 1	 2	 3	 4	 5
PE according to **EN 50290-2-23** with aluminium shield	PVC according to **EN 50363-4**	☑				
PE according to EN 50290-2-23 with aluminium shield	PE halogen-free according to **IEC 60502-1**	☑	☑	☑	☑	
PE halogen-free according to **HD 604-5H**	PE halogen-free according to **IEC 60502-1**	☑	☑	☑	☑	
PVC according to **EN 50363-3**	PVC according to **EN 50363-4** Oil restisting according to **HD 603-S1**	☑				
PE halogen-free according to **HD 604-5H**	PE halogen-free according to **IEC 60502-1**	☑	☑	☑	☑	
PE halogen-free according to **HD 604-5H**	PE halogen-free according to **IEC 60502-1**	☑	☑	☑	☑	
PVC according to **EN 50363-3**	PVC according to **EN 50363-4**	☑				
PVC according to **EN 50363-3**	PVC according to **EN 50363-4**	☑				
PE halogen-free according to **HD 604-5H**	PE halogen-free according to **IEC 60502-1**	☑	☑	☑	☑	
PVC according to **EN 50363-3**	PVC according to **EN 50363-4**	☑				
PE halogen-free according to **HD 604-5H**	PE halogen-free according to **IEC 60502-1**	☑	☑	☑	☑	
PE halogen-free according to **HD 604-5H**	PE halogen-free according to **IEC 60502-1**	☑	☑	☑	☑	
PVC according to **EN 50363-3**	PVC according to **EN 50363-4**	☑				
PE halogen-free according to **HD 604-5H**	PE halogen-free according to **IEC 60502-1**	☑	☑	☑	☑	
PE halogen-free according to **HD 604-5H**	PE halogen-free according to **IEC 60502-1**	☑	☑	☑	☑	
PVC according to **EN 50363-3**	PVC according to **EN 50363-4**	☑				
PE halogen-free according to **HD 604-5H**	PE halogen-free according to **IEC 60502-1**	☑	☑	☑	☑	
PVC according to **EN 50363-3**	PVC according to **EN 50363-4** Oil restisting according to **HD 603-S1**	☑				
PE halogen-free according to **HD 604-5H**	PE halogen-free according to **IEC 60502-1**	☑	☑	☑	☑	
PVC according to **EN 50363-3**	PVC according to **EN 50363-4** Oil restisting according to **HD 603-S1**	☑				
PE halogen-free according to **HD 604-5H**	PE halogen-free according to **IEC 60502-1**	☑	☑	☑	☑	
PE according to **HD 604-5H**	PE halogen-free according to **IEC 60502-1**	☑	☑	☑	☑	
Power current: PVC according to **EN 50363-3** **Bus:** PE according to **EN 50290-2-23** with aluminium shield	PVC according to **EN 50363-4**	☑				
Power current: PVC according to **EN 50363-3** **Bus:** PE according to **EN 50290-2-23** with aluminium shield	PE halogen-free according to **IEC 60502-1**	☑	☑	☑	☑	
Power current: PVC according to **EN 50363-3** **Bus:** PE according to **EN 50290-2-23** without shield	PE halogen-free according to **IEC 60502-1**	☑	☑	☑	☑	
Double-layer insulation, special compound, **according to VDE 0266**	PE halogen-free according to **IEC 60502-1**	☑	☑	☑	☑	☑
Double-layer insulation, special compound, **according to VDE 0266**	PE halogen-free according to **IEC 60502-1**	☑	☑	☑	☑	☑
Double-layer insulation, special compound, **according to VDE 0266**	PE halogen-free according to **IEC 60502-1**	☑	☑	☑	☑	☑

Neutral current

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

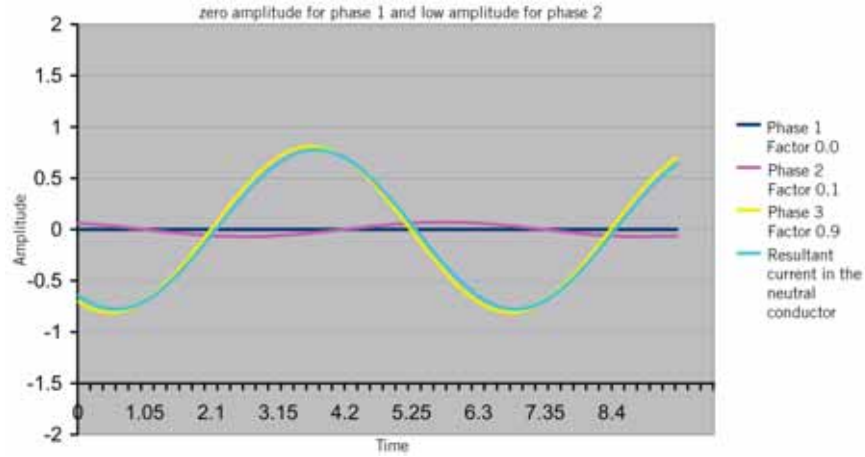


In electrical networks with three phases, voltages with a periodic sinusoidal form are generated in the phase conductors, but the sequences are shifted time-wise by a third of a period. In this case, as a result of these processes that are running periodically, when the voltages are combined together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

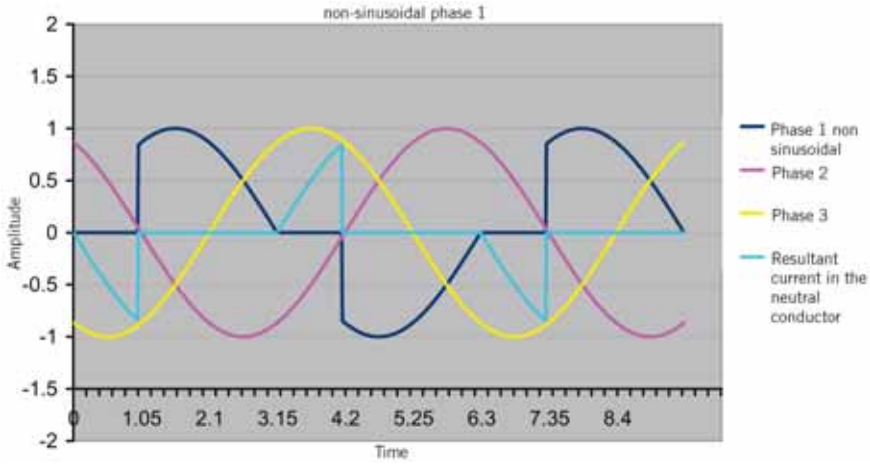
Due to the basic principles of physics and as can be seen from the vector diagram if one or two phases fail and only the remaining one is loaded, this then results in the most extreme asymmetry.



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

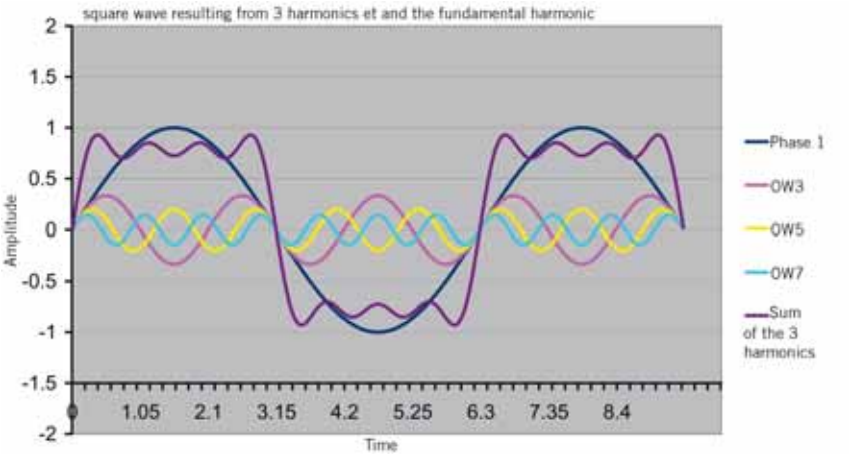
For most electrical devices, especially in office equipment (computers, printers, etc.), electronically regulated power supplies are often used.

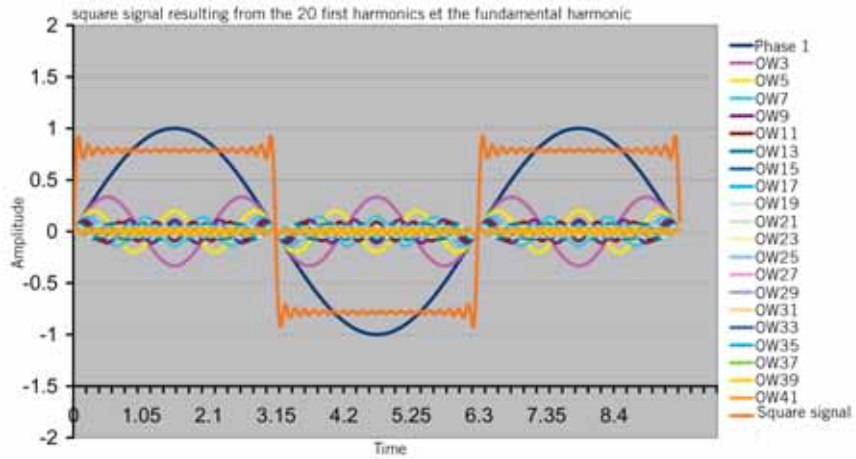


Due to their mode of operation, these devices create non-sinusoidal loads in the electric circuits. The individual phases are therefore not only different in the sizes and phasings of the current, the shape of the flowing current is no longer sinusoidal either.

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

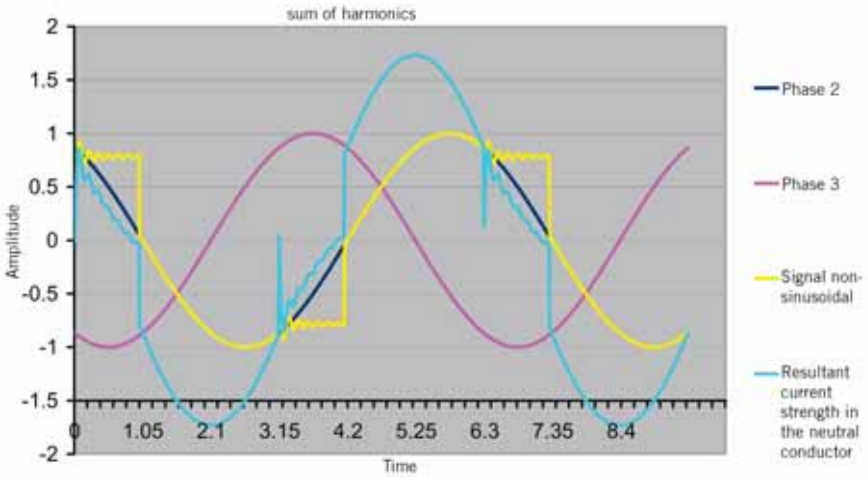
In order to be able to calculate the conditions, we have to go back to basic mathematical principles.
The following is applicable as mathematically proven: Each periodic oscillation can be composed as a result of sinusoidal oscillations with different frequencies and amplitudes (Fourier).
If the half 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.

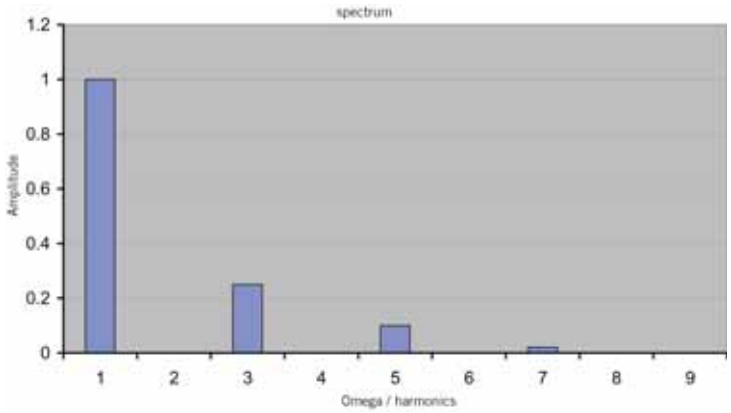


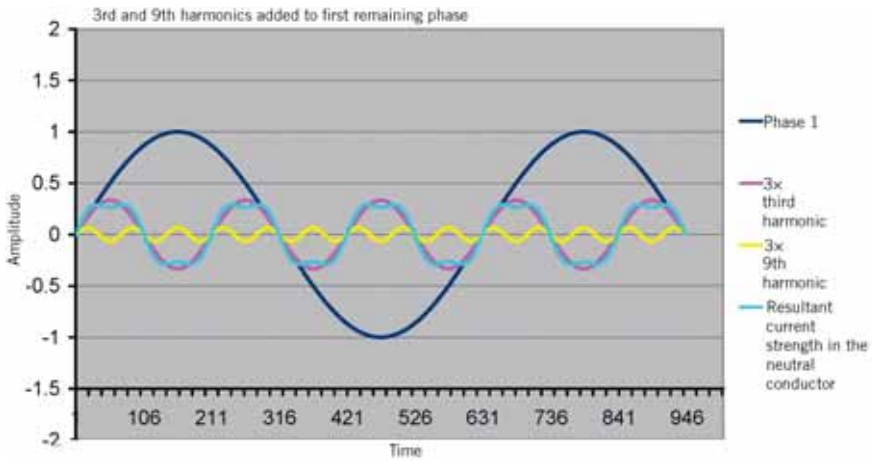
Regardless of the fundamental waves and possible conditions that may exist in practice, without calculations and measurements, you can jump to the wrong conclusion that the neutral conductor may be overloaded.
In practice, you have to analyse actual conditions using basic mathematical principles. If 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 = **Ieff 50Hz** + Ieff 150 Hz + Ieff 250 Hz + Ieff 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.

Ieff N = 3x Ieff 150 Hz + 3x Ieff 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

flat cable 1.5 - 16 mm²

Cabling Systems

Woertz data 2×1.5 mm²

An exceptional bus flat cable which allows to perform various functions in the field of building automation.

Where are these flat cables used?

- In the field of building automation, to connect intelligent devices such as actuators or sensors via bus.
- Specific use with KNX, DALI, LON etc.

Woertz data 2×1.5 mm²

Flat cable bus 2×1.5 mm²

	PVC		halogen-free	
	No.	Eldas-No.	**No.**	Eldas-No.
	49949	113 397 300	**49948**	113 397 307
	49949/SM*	113 397 309		

*** on request**

Technical data			
Dimension	mm	11×6	11×6
Weight	g/m	90	86
Fire load	kWh/m	0.48	0.44
No. of leads x cross-section	mm²	2×1.5	2×1.5
Cu weight	kg/km		

Bus part			
Copper conductors		tinned	tinned
Insulation of the leads		polyethylene	polyethylene
Colour of the leads		neutral	neutral
Shield		double shield of aluminium	double shield of aluminium
Cross-section	mm²	1.5	1.5
Test voltage	kV / Hz	4 / 50	4 / 50
Rated voltage	V	50	50
Max. rated current	A	3	3
DC-resistance	Ω/km	13.7	13.7
Capacitance	pF/m	70	70
Attenuation at 1Hz	dB/100m	nom. 1.2	nom. 1.2
Charact. impedance at 1MHz	Ω	nom. 75	nom. 75
Cu weight	kg/km	29	29

Woertz data 2×1.5 mm²

Branching boxes to flat cable No. 49948 and No. 49949

for KNX with socket 2-pole		Technical data		bus part	
No.	Eldas-No.	L×W×H mm	47×18×23.5	*Cross-section mm²*	*1.5*
49720	150 706 137	Weight g	12	*Rated voltage V*	*50*
		Fire load kWh	0.08	*Max. rated current A*	*3*
		socket	type BST14i2	*tightening torque Nm*	*1.0*
			code KNX	*screwdriver No.*	*3*
		Plastic parts	halogen-free		
		Metal parts	corrosion-resistant		
		Packing unit pce.	50		
		Degree of protection	IP20	*Pre-wired connectors see page 76*	

for bus with socket 2-pole		Technical data		bus part	
No.	Eldas-No.	L×W×H mm	47×18×23.5	Cross-section mm²	1.5
49721	150 706 237	Weight g	12	Rated voltage V	50
		Fire load kWh	0.08	Max. rated current A	3
		socket	type BST14i3	tightening torque Nm	1.0
			code 3	screwdriver No.	3
		Plastic parts	halogen-free		
		Metal parts	corrosion-resistant		
		Packing unit pce.	50		
		Degree of protection	IP20	*Pre-wired connectors see page 77*	

for bus with socket 2-pole		Technical data		bus part	
No.		L×W×H mm	47×18×23.5	Cross-section mm²	1.5
49727		Weight g	12	Rated voltage V	50
		Fire load kWh	0.08	Max. rated current A	3
		socket	code Woertz	tightening torque Nm	1.0
		Plastic parts	halogen-free	screwdriver No.	3
		Metal parts	corrosion-resistant		
		Packing unit pce.	50		
		Degree of protection	IP20	*Pre-wired connectors see page 76*	

Connecting box to flat cable No. 49948 and No. 49949

with micro-terminal		Technical data		bus part	
No.	Eldas-No.	L×W×H mm	37×18×23.5	Cross-section mm²	1.5
49722	150 706 337	Weight g	12	Rated voltage V	50
		Fire load kWh	0.08	Max. rated current A	3
		Plastic parts	halogen-free	tightening torque Nm	1.0
		Metal parts	corrosion-resistant	screwdriver No.	3
		Packing unit pce.	50		
		Degree of protection	IP20		
					

Woertz data 2×1.5 mm²

Accessories

Cable end piece		Technical data		
No.	Eldas-No.	L×W×H mm	20×14×9	of polycarbonate, halogen-free; silicone gel
49732	150 901 117	Weight g	1.5	
		Fire load kWh	0.02	Note:
		Packing unit pce.	200	Cut neatly both ends of the cable before mounting the end pieces. No need to strip the cable. Cable end piece may only be mounted once.

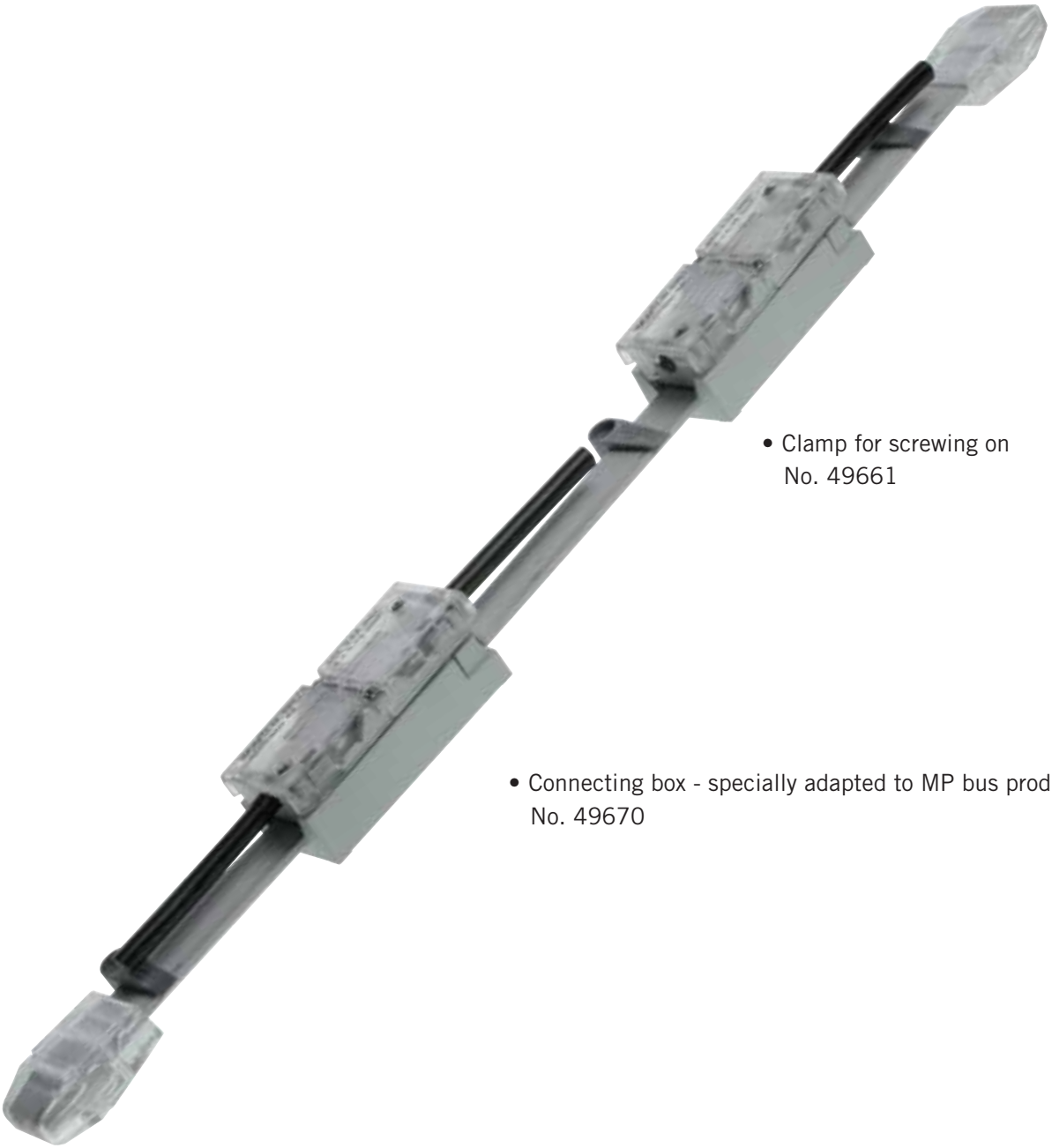
Clamp for screwing on		Technical data		
No.	Eldas-No.	L×W×H mm	31×10×8.5	of polyamide 6.6, halogen-free, grey
49693	120 008 607	Weight g	1.2	
		Fire load kWh	0.01	
		Packing unit pce.	100	

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

Insulating tape		Technical data		
No.	Eldas-No.	L×W×H mm	102×100×2.3	To reinsulate correctly the holes due to pointed screws or cutting teeth when removing or displacing connections.
49960	171 013 004	Dielectric strength max. kV/mm	23	
		Temperature max. °C	+70	Weatherproof, self-fusing
		Packing unit pce.	10	

Woertz® multibus 4×1.5 mm²

Without the cable insulation having to be stripped!



- Cable end piece IP68
  No. 48510/06
- Clamp for screwing on
  No. 49661
- Connecting box - specially adapted to MP bus products
  No. 49670

Where are these flat cables used?

- for low voltage installations (rugged version for high mechanical strains).
- as a complement to the flat cable system ecobus combi.
- for heating, ventilating and air-conditioning processes (HVAC).
- for basic controls in buildings.
- specially adapted to MP bus products of the company Belimo.
- for SMI BT applications

Woertz multibus 4×1.5 mm²

flat cable 4×1.5 mm²

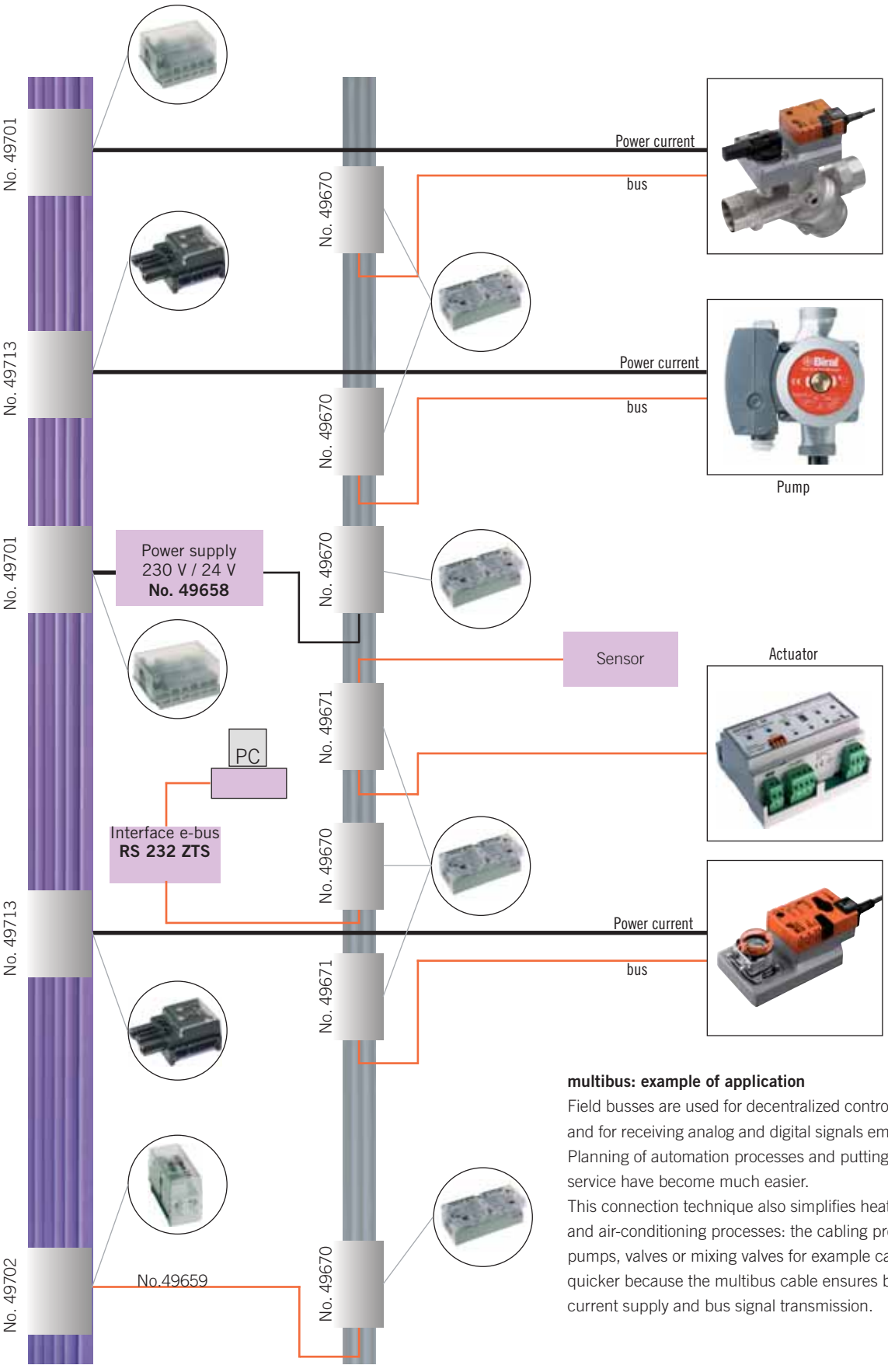
	halogen-free
No.	Eldas-No.
49651	113 277 509

Technical data		
Dimension	mm	16×4.6
Weight	g/m	125
Fire load	kWh/m	0.73
No. of leads x cross-section	mm²	4×1.5

Power current part		
Copper conductors		tinned, highly flexible
Insulation of the leads		polyethylene
Colour of the leads		black, red, white, brown
Cross-section	mm²	1.5
Test voltage	kV / Hz	4 / 50
Rated voltage	V	300
DC-resistance	Ω/km	13
Cu weight	kg/km	58

Woertz multibus 4×1.5 mm²

Examples of application: Belimo - Multitherm



multibus: example of application

Field busses are used for decentralized controlling of actuators and for receiving analog and digital signals emitted by sensors. Planning of automation processes and putting them into service have become much easier.

This connection technique also simplifies heating, ventilating and air-conditioning processes: the cabling procedures of pumps, valves or mixing valves for example can be performed quicker because the multibus cable ensures both power current supply and bus signal transmission.

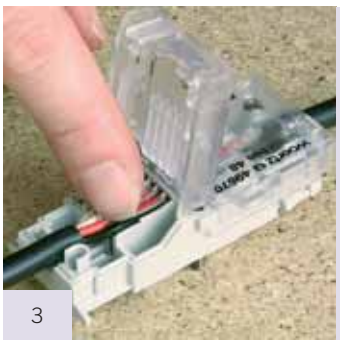
Mounting procedure of connecting box No. 49670 / 49671

1

Position the base part of the box and screw it on to its support if required.

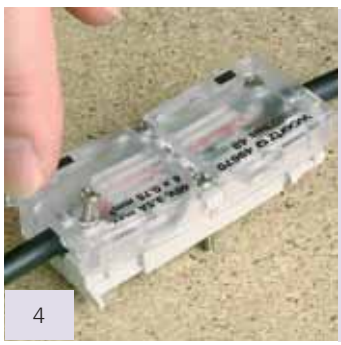
2

Position the asymmetric multibus flat cable in the right position.



3

Cut the outgoing round cable to the desired length and dismantle it. Introduce the leads in the provided partitions (the conductors don't have to be stripped of insulation).



4

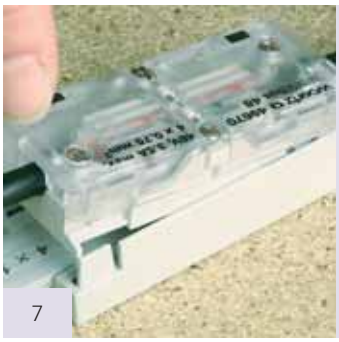
Fold back the cover - Lock.

5

Tighten up the screws of the cover.

6

Snap together the upper part and the base.



7

Fold down the upper part.

8

Tighten up the fastening screws.

Note:
if necessary, the connecting boxes may be marked by means of self-adhesive labels.

The mounting procedure may also occur in a changed order: 1, 2, 6, 7, 8, 3, 4, 5.

Possibility of pre-wiring:

Service to our customers.

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

Boxes for pumps, valves or mixing valves for HVAC installations for instance may be prewired with outgoing round cables in our workshops (fig. 3-5). On the building site the prewired boxes have only to be positioned on the flat cable. The electrical contact will be established within a few seconds by means of an electric screw-drive

Woertz multibus 4×1.5 mm²

Connecting boxes with 3 or 4 contacts to flat cable No. 49651

Connecting box		Technical data		
No.	Eldas No.	L×B×H mm	76×32×27	For 2 round cables 4×0.75 mm² flex with
49670	150 701 317	Weight g	55.5	with 1 connector and 3 contacts for supply
		Fire load kWh	0.4	and branching.
		Rated voltage V	48	specially adapted to MP bus devices
		Max. rated current A	3.5	from the company Belimo.
		Plastic parts	halogen-free	
		Metal parts	corrosion-resistant	
		Packing unit pce.	25	tightening torque Nm 0.7
		Degree of protection	IP20	screwdriver No. 1
49670/1 prewired 1m round cable				
49670/2 prewired 2m round cable				*further lengths on request*
for bus with socket 3-poles		**Technical data**		
No.	F.ldas No.	L×B×H mm	76×32×27	For 2 round cables 4x0.75mm2 flex
	701 347	Weight g	55.5	with 4 contacts for supply and branching
		Fire load kWh	0.4	
		Rated voltage V	48	
		Max. rated current A	3.5	
		Plastic parts	halogen-free	
		Metal parts	corrosion-resistant	tightening torque Nm 0.7
		Packing unit pce.	25	screwdriver No. 1
		Degree of protection	IP20	

Accessories

Power supply and coupler		Technical data	
No.	Eldas No.	Power supply 230V/24VDC consisting of	
49658	960 905 107	1 power supplyNetzgerät,	
		1 Dose No. 49670,	
		1 Dose No. 49701	
No.	Eldas No.	Bus coupler between flat cable multibus and combi, consisting of	
49659	150 700 017	1 box No. 49670,	
		1 box No. 49702,	
		1 cable No. 49665,	
Cable end piece		**Technical data**	
No.	Eldas No.	L×B×H mm 40×36×16	of polycarbonate, halogen-free; silicone gel
48510/06	120 900 507	Weight g 10.6	
		Packing unit pce. 4	Note:
		Degree of protection IP68	Cut neatly both ends of the cable before mounting the end pieces. No need to strip the cable. Cable end piece may only be mounted once.
Connecting box		**Technical data**	
No.	Eldas No.	Weight g 46.3	for the supply with rigid strands or strands with
9052	150 706 037	Plastic parts halogen-free	a cross section different from 0.75mm2
		Metal parts corrosion-resistant	

Woertz multibus 4×1.5 mm²

Accessories

Flexible round cable		Technical data		
No.	Eldas-No.	Diameter mm	6.8 mm	
49665	113 271 047	Fire load kWh/m	0.02	
		Temperature range	-30°C to +90°C	
		Packing unit m	500	

Stopper		Technical data		
No.	Eldas-No.	Weight g	0.5	To obturate unused cable outlets. 1 stopper delivered with connecting boxes No. 49670 and 49671.
49675	120 660 007	Packing unit pce.	25	
				

Clamp		Technical data		
No.	Eldas-No.	L×W×H mm	31×10×7	of polyamide 6.6, halogen-free
49661	120 008 407	Weight g	6.0	
		Fire load kWh	0.01	
		Packing unit pce.	100	

Clamp		Technical data		
No.	Eldas-No.	L×W×H mm	70×10×10	of polyamide 6.6, halogen-free
49664	120 008 507	Weight g	2.0	
		Fire load kWh	0.02	
		Packing unit pce.	50	

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

Insulating tape		Technical data		
No.	Eldas-No.	Dimension mm×m	50×1	To reinsulate correctly the holes due to pointed screws or cutting teeth when removing or displacing connections.
49632	150 901 147	Weight g	50.1	
		Dielectric strength max. kV/mm	18	
		Temperature max. °C	+70	
		Packing unit m	1	Weatherproof, self-fusing.

Woertz® 3G2.5 mm² and Woertz® 3G4 mm²

The efficiency of this system is related to its great flexibility and extension facility, anywhere, anytime.

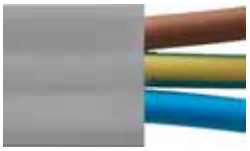
Where are these flat cables used?

- in offices where the number of computers is liable to be increased and the furniture to be displaced.
- in workshops and laboratories equipped with small-sized machines and devices. The flat cables are then laid into floor-, ceiling- or wall ducts
- in shops and show windows where the connecting points may often change
- for the installation of prefabricated houses
- in hanging ceilings for the supply of lamps.

Flat cable enables installations to be completed easily with further connections.

Woertz 3G2.5 mm²

flat cable 3G2.5 mm²



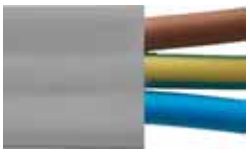
L+N+PE

	PVC		halogen-free	
	No.	Eldas-No.	**No.**	Eldas-No.
	49685 **49685/SM***	113 297 807	**49686** **49686RT** **SC49686RT** **49686/SM***	113 307 807
	*** on request**			

Technical data			
Dimensions	mm	16.5×6	16.5×6
Weight	g/m	185	185
Fire load	kWh/m	0.583	1.02
No. of leads x cross-section	mm²	3×2.5	3×2.5
Power current part			
Copper conductors		tinned, highly flexible	tinned, highly flexible
Insulation of the leads		PVC	vulcanized, flame retardant, polyethylene
Colour of the leads		brown, green/yellow, blue	brown, green/yellow, blue
Cross-section	mm²	2.5	2.5
Test voltage	kV / Hz	4 / 50	4 / 50
Rated voltage	kV	0.6/1	0.6/1
DC-resistance	Ω/km	7.98	7.98
Cu weight	kg/km	72	72

Woertz 3G4 mm²

flat cable 3G4 mm²



L+N+PE

	PVC		halogen-free	
	No.	Eldas-No.	**No.**	Eldas-No.
			49646	

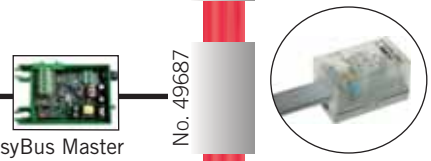
Technical data			
Dimensions	mm		16.5×6
Weight	g/m		224
Fire load	kWh/m		0.95
No. of leads x cross-section	mm²		3×4
Power current part			
Copper conductors			tinned, highly flexible
Insulation of the leads			vulcanized, flame retardant, polyethylene
Colour of the leads			brown, green/yellow, blue
Cross-section	mm²		3×4
Test voltage	kV / Hz		4 / 50
Rated voltage	kV		0.6/1
DC-resistance	Ω/km		5.09
Cu weight	kg/km		116

Woertz 3G2.5 mm² and Woertz 3G4 mm²

Example of application: SCHAKO EasyBus

Compatible with:
KNX
LON
BacNet
ModBus etc

EasyBus Master

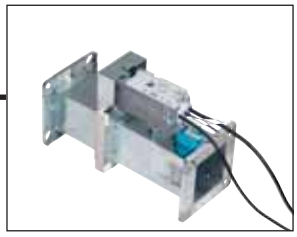


No. 49687

No. 49695

bus + power current

Fire damper square



No. 49695

bus + power current

Fire damper circular

Smoke detector
RMS

No. 49695

bus + power current

Variable air volume box

No. 49695

No. 49687

Woertz 3×2.5mm²
No. SC49686RT

Easy:
- an only cable for both control and supply
- max. cable length 1000m
- 128 participants (CHP, VAV, etc.)
- vereinfachter Anschluss

Safe:
- no faulty wiring
- no connection loss
- arbitrary topology
- easy maintenance
- low fire load

Advantageous
- installing, planning of automation processes and putting them into service have become much easier
- no sub-distribution boxes: enormous - space is gained
- compatible with standard control systems
- participants may be addressed without any tool

Example of application
Field busses are used for decentralised controlling of actuators and for receiving analog and digital signals emitted by sensors.
Planning of automation processes and putting them into service have become much easier.

This connection technique also simplifies heating, ventilating and air-conditioning processes: the cabling procedures of pumps, valves or mixing valves for example can be performed quicker because an only cable ensures both power current supply and bus signal transmission.

More information under
http://www.easybus-system.ch

Woertz 3G2.5 mm² and Woertz 3G4 mm²

Connecting box and connector to flat cable No. 49685, 49686 and 49646

Connecting box		Technical data		
No.	No. Eldas	L×B×H mm	55×33×33	for supply and branching no need to strip the insulation
49687	150 701 407	Fire load kWh	0.24	
		Connecting capacity Ø in mm	3.75	
		Rated voltage V	250	Plastic parts: halogen-free Metal parts: corrosion-resistant
		Max. rated current A	16	
		Weight g	45	
		Packing unit pce.	10	tightening torque Nm 0.7
		Degree of protection	IP20	screwdriver No. 1

Branching box		Technical data		
No.	No. Eldas	L×B×H mm	90×30×34	for branching no need to strip the insulation
49695	150 701 457	Fire load kWh	0.36	
		Connecting capacity Ø in mm	3.75	
		Rated voltage V	250	Plastic parts: halogen-free Metal parts: corrosion-resistant
		Max. rated current A	16	
		Weight g	85	
		Packing unit pce.	10	tightening torque Nm 0.7
		Degree of protection	IP20	screwdriver No. 1
49695/1 prewired 1m round cable				*further lengths on request*
49695/2 prewired 2m round cable				

Pre-wired connector		Technical data		
No.		L×B×H mm	260×30×34	Pre-wired connector No. 49695 with 10 cm round cable 3G1.5 mm² and Kupplung 3-poles, type GST 18i3 F B2 Z
49696F		Weight g	200	
		Packing unit pce.	1	*Pre-wired connectors see page 78*
49696/1F prewired 1m round cable				
49696/2F prewired 2m round cable				*further lengths on request*

Accessories

End piece		Technical data		
No.	No. Eldas	L×B×H mm	40×25×15	of polycarbonate, halogen-free; silicone gel
48510/03	120 900 307	Weight g	9.5	
		Fire load kWh	n.a.	Note: Cut neatly both ends of the cable before mounting the end pieces. No need to strip the cable.
		Packing unit pce.	8	
		Degree of protection	IP68	Cable end piece may only be mounted once.

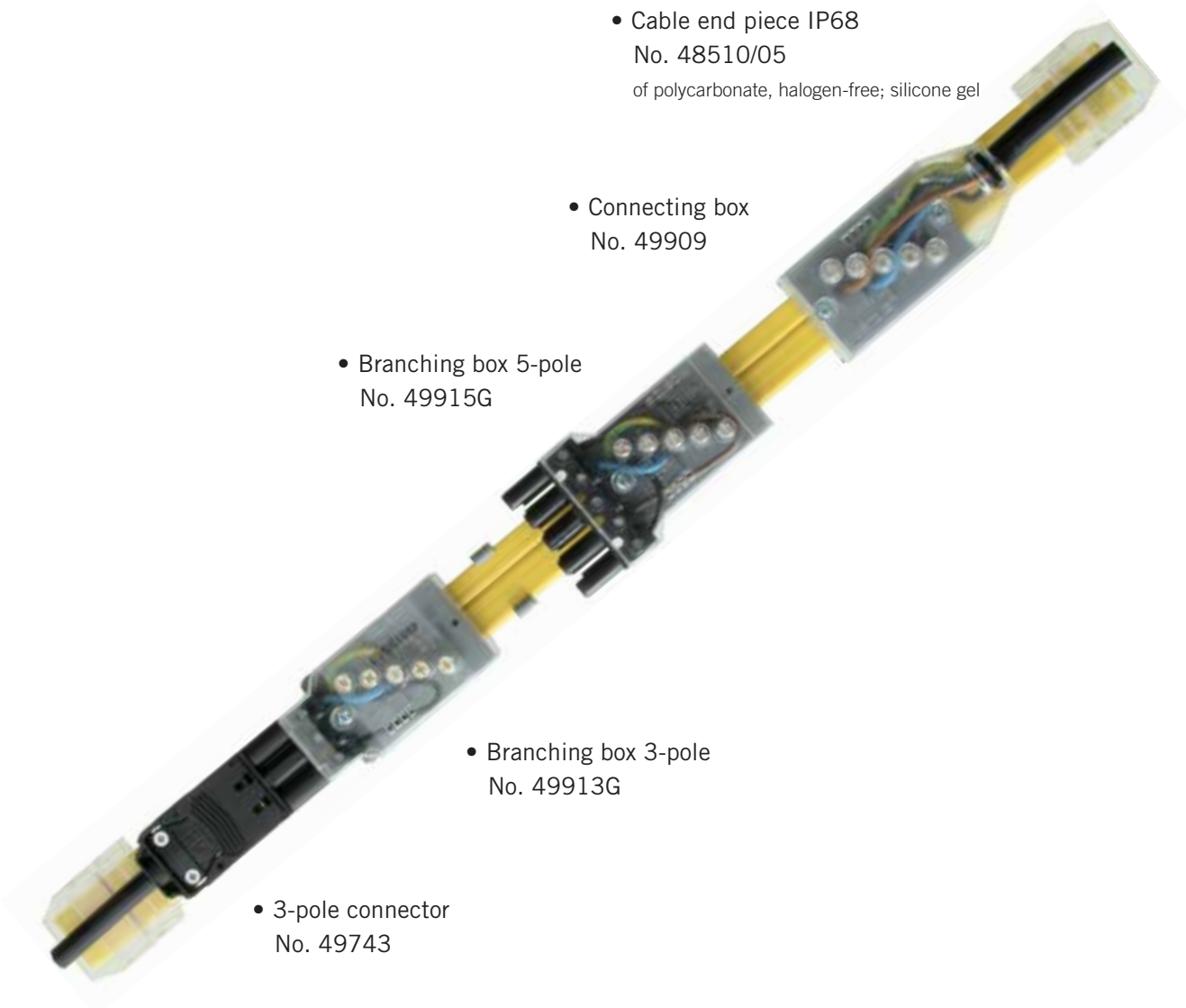
Clamp for screw fixing		Technical data		
No.	No. Eldas	L×B×H mm	31×10×8.5	of polyamide 6.6, halogen-free
49693	120 008 607	Weight g	0.95	
		Fire load kWh	0.01	
		Packing unit pce.	100	

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

Insulating tape		Technical data		
No.	No. Eldas	Dimension mm	102×100×2.3	To reinsulate correctly the holes due to pointed screws or cutting teeth when removing or displacing connections.
49960	171 013 004	Weight g	33	
		Dielectric strength max. kV/mm	23	
		Temperature max. °C	+70	
		Packing unit pce.	10	Weatherproof, self-fusing

Woertz® Technofil 5G1.5 mm² and Woertz® Technofil 5G2.5 mm²

Max. 10A per connection. Only to be used in Switzerland!



Where are these flat cables used?

The wide range of flat cable boxes enables numerous connecting problems on receiver circuits to be solved.

Following connectors may be combined thus:

- alternately single-pole or multi-pole receivers
- receivers may be assigned to different switching groups (economy circuits)
- alternate distribution of single-pole receivers among the three phase conductors (load compensation)
- assignation of selected receivers such as emergency light, cash box etc... to emergency supply or safety supply
- permanent connections or plug-type connections (service works become easier)

Woertz Technofil 5G1.5 mm²

flat cable 5G1.5 mm²

		PVC		halogen-free	
		No.	Eldas-No.	**No.**	Eldas-No.
		**9040** **9040/SM***	113 307 609 113 307 619		
3 L+N+PE		*** on request**			
Technical data					
Dimensions	mm	23×6			
Weight	g/m	235			
Fire load	kWh/m	0.92			
No. of leads x cross-section	mm²	5×1.5			
Power current part					
Copper conductors		bare, highly flexible			
Insulation of the leads		PVC			
Colour of the leads		brown, blue, green/yellow, brown, black			
Cross-section	mm²	1.5			
Test voltage	kV	2.5			
Rated voltage	kV	0.6 / 1			
DC-resistance	Ω/km	13.3			
Cu weight	kg/km	72			

Woertz Technofil 5G2.5 mm²

flat cable 5G2.5 mm²

		PVC		halogen-free	
		No.	Eldas-No.	**No.**	Eldas-No.
		**9055** **9055/SM***	113 308 007 113 308 017	**49900** **49900/SM***	113 298 007 113 298 017
3 L+N+PE		*** on request**			
Technical data					
Dimensions	mm	23×6		23×6	
Weight	g/m	275		277	
Fire load	kWh/m	0.87		1.37	
No. of leads x cross-section	mm²	5×2.5		5×2.5	
Power current part					
Copper conductors		bare, highly flexible		tinned, highly flexible	
Insulation of the leads		PVC		vulcanized, flame retardant, polyethylene	
Colour of the leads		brown, blue, green/yellow, black, grey		brown, blue, green/yellow, black, grey	
Cross-section	mm²	2.5		2.5	
Test voltage	kV	2.5		2.5	
Rated voltage	kV	0.6 / 1		0.6 / 1	
DC-resistance	Ω/km	7.1		7.1	
Cu weight	kg/km	120		120	

Woertz Technofil 5G1.5 mm² and 5G2.5 mm²

Supply and connecting boxes and boxes for several connection points to flat cable No. 9040, 9055 and 49900

Connecting box		Technical data		
No.	Eldas-No.	L×W×H mm	95×40×27	for the connection of 2 cables or supply at the end of the cable
49901	150 708 037	Weight g	87	
		Fire load kWh	0.33	
		Cross-section mm²	1 round cable - 5×2.5 2 flat cable - 5×2.5	Plastic parts: halogen-free Metal parts: corrosion-resistant
		Connecting capacity mm²	2×2.5	
		Rated voltage V	500	
		Max. rated current max. A	16	tightening torque Nm 0.7
		Packing unit pce.	25	screwdriver No. 1
		Degree of protection	IP20	

Connecting box		Technical data		
No.	Eldas-No.	L×W×H mm	70×40×18	for the connection of 2 cables or supply at the end of the cable
9052	150 706 037	Weight g	47	
		Fire load kWh	0.11	
		Cross-section mm²	1 round cable - 5×2.5 1 flat cable - 5×2.5	Plastic parts: halogen-free Metal parts: corrosion-resistant
		Connecting capacity mm²	1×2.5	
		Rated voltage V	500	
		Max. rated current max. A	16	tightening torque Nm 0.7
		Packing unit pce.	50	screwdriver No. 1
		Degree of protection	IP20	

Connecting box		Technical data		
No.	Eldas-No.	L×W×H mm	61×38×44.5	for 1 cable outlet with 1 connection point Ø 10 mm
9045	150 700 037	Weight g	60	
		Fire load kWh	0.30	Plastic parts: halogen-free
		for outlet with 1 Td cable max. mm²	5×1.5	Metal parts: corrosion-resistant
		Connecting capacity Ø	3.75	
		Rated voltage V	500	
		Max. rated current max. A	10	tightening torque Nm (Pointed screws) 0.7
		Packing unit pce.	50	screwdriver No. 1
		Degree of protection	IP20	tightening torque Nm (Clamping screws) 0.7
				screwdriver No. 1

Connecting box		Technical data		
No.	Eldas-No.	L×W×H mm	61×38×44.5	for 1 cable outlet with 1 connection point Ø 12 mm
9047	150 702 037	Weight g	60	
		Fire load kWh	0.30	Plastic parts: halogen-free
		for outlet with 1 Td cable max. mm²	5×1.5	Metal parts: corrosion-resistant
		Connecting capacity Ø	3.75	
		Rated voltage V	500	tightening torque Nm (Pointed screws) 0.7
		Max. rated current max. A	10	screwdriver No. 1
		Packing unit pce.	50	tightening torque Nm (Clamping screws) 0.7
		Degree of protection	IP20	screwdriver No. 1

Connecting box		Technical data		
No.	Eldas-No.	L×W×H mm	61×38×44.5	for 1 cable outlet with 1 connection point Ø 14.5 mm
49905	150 702 137	Weight g	60	
		Fire load kWh	0.30	Plastic parts: halogen-free
		for outlet with 1 halogen free cable max. mm²	5×1.5	Metal parts: corrosion-resistant
		Connecting capacity Ø	3.75	
		Rated voltage V	500	tightening torque Nm (Pointed screws) 0.7
		Max. rated current max. A	10	screwdriver No. 1
		Packing unit pce.	50	tightening torque Nm (Clamping screws) 0.7
		Degree of protection	IP20	screwdriver No. 1

Connecting box		Technical data		
No.	Eldas-No.	L×W×H mm	60×38×44.5	for 2 cable outlets with 2 connection points Ø 9.5 mm
9046	150 701 037	Weight g	60	
		Fire load kWh	0.31	Plastic parts: halogen-free
		for outlets with 2 Td cables max. mm²	4×1.5	Metal parts: corrosion-resistant
		Connecting capacity Ø	3.75	
		Rated voltage V	500	
		Max. rated current max. A	10	
		Packing unit pce.	25	tightening torque Nm 0.7
		Degree of protection	IP20	screwdriver No. 1

Woertz Technofil 5G1.5 mm² and 5G2.5 mm²

Flat cable boxes for several connection points to flat cable No. 9040, 9055 and 49900

Connecting box		Technical data			
No.	Eldas-No.	L×W×H mm	60×38×54	for 3 cable outlets with 3 connection points	
9053	150 707 037	Weight g	60	Ø 8.5 mm	
		Fire load kWh	0.34		
		For outlets with 3 Td cables max mm²	3×1.5	Plastic parts: halogen-free	
		Connecting capacity Ø	3.75	Metal parts: corrosion-resistant	
		Rated voltage V	500		
		Max. rated current max. A	10	tightening torque Nm	0.7
		Packing unit pce.	50	screwdriver No.	1
		Degree of protection	IP20		

Connecting box		Technical data			
No.	Eldas-No.	L×W×H mm	62×38×31	with visiible pointed screws	
49908	150 704 337	Weight g	57	Marking with labels	
		Fire load kWh	0.30	Plastic parts: halogen-free	
		Lateral outlets with 3 Td cables max mm²	3×1.5	Metal parts: corrosion-resistant	
		Connecting capacity Ø	3.75		
		Rated voltage V	500		
		Max. rated current max. A	10	tightening torque Nm (Pointed screws)	0.7
		Packing unit pce.	50	screwdriver No.	1
		Degree of protection	IP20	tightening torque Nm (Clamping screws)	0.7
				screwdriver No.	1

Connecting box		Technical data			
No.	Eldas-No.	L×W×H mm	62×38×31	with masked pointed screws	
49906	150 704 237	Weight g	57		
		Fire load kWh	0.30	Plastic parts: halogen-free	
		Lateral outlets with 3 Td cables max mm²	3×1.5	Metal parts: corrosion-resistant	
		Connecting capacity Ø	3.75		
		Rated voltage V	500	tightening torque Nm (Pointed screws)	0.7
		Max. rated current max. A	10	screwdriver No.	1
		Packing unit pce.	50	tightening torque Nm (Clamping screws)	0.7
		Degree of protection	IP20	screwdriver No.	1

Connecting box		Technical data			
No.	Eldas-No.	L×W×H mm	62×38×31	with visiible pointed screws	
49909	150 704 437	Weight g	57	Marking with labels	
		Fire load kWh	0.30	Plastic parts: halogen-free	
		Lateral outlet with 1 Td cables max mm²	5×1.5	Metal parts: corrosion-resistant	
		Connecting capacity Ø	3.75		
		Rated voltage V	500	tightening torque Nm (Pointed screws)	0.7
		Max. rated current max. A	10	screwdriver No.	1
		Packing unit pce.	50	tightening torque Nm (Clamping screws)	0.7
		Degree of protection	IP20	screwdriver No.	1

Connecting box		Technical data			
No.	Eldas-No.	L×W×H mm	62×38×27	for insulated cable outlets	
9049	150 704 037	Weight g	38		
		Fire load kWh	0.28	Plastic parts: halogen-free	
		Cross-section for insulated wires max. mm²	1.5	Metal parts: corrosion-resistant	
		Outlets for 2x2 insulated wires on each narrow side			
		Rated voltage V	500		
		Max. rated current max. A	10		
		Packing unit pce.	100	tightening torque Nm	0.7
		Degree of protection	IP20	screwdriver No.	1

Connecting box		Technical data			
No.	Eldas-No.	L×W×H mm	65×38×20	for insulated cable outlets	
9051	150 705 037	Weight g	54	flat execution	
		Fire load kWh	0.27		
		Cross-section for insulated wires max. mm²	1.5	Plastic parts: halogen-free	
		Outlets for insulated wires on all sides		Metal parts: corrosion-resistant	
		Rated voltage V	500		
		Max. rated current max. A	10		
		Packing unit pce.	10	tightening torque Nm	0.7
		Degree of protection	IP20	screwdriver No.	1

Woertz Technofil 5G1.5 mm² and 5G2.5 mm²

Branching boxes with socket to flat cable No. 9040, 9055 and 49900

Branching box 3-pole

No.	Eldas-No.
49913G/L1	150 748 037
49913G/L2	150 758 037
49913G/L3	150 768 037

Technical data

L×W×H mm	88×38×38	with socket
Weight g	71	longitudinal connection
Fire load kWh	0.42	
Rated voltage V	250	
Max. rated current max. A	10	tightening torque Nm 0.7
Plastic parts	halogen-free	screwdriver No. 1
Metal parts	corrosion-resistant	
Packing unit pce.	50	*Pre-wired connectors see page 78*
Degree of protection	IP20	

Branching box 5-pole

No.	Eldas-No.
49915G	150 716 037

Technical data

L×W×H mm	88×49×38	with socket
Weight g	96	longitudinal connection
Fire load kWh	0.51	
Rated voltage V	250/400	
Max. rated current max. A	10	tightening torque Nm 0.7
Plastic parts	halogen-free	screwdriver No. 1
Metal parts	corrosion-resistant	
Packing unit pce.	50	*Pre-wired connectors see page 78*
Degree of protection	IP20	

Feeding box

No.	Eldas-No.
49903	150 709 037

No.	Eldas-No.
49904	120 900 197

Technical data

L×W×H mm	95×40×27	consists of box No. 49901 and 20 cm heat shrinkable sleeve
Fire load kWh	0.78	
For connection of 1 round cable - mm²	5×2.5	
For connection of 1 flat cable - mm²	5×2.5	splashproof and dustproof IP54
Rated voltage V	500	
Max. rated current max. A	16	
Plastic parts	halogen-free	
Metal parts	corrosion-resistant	tightening torque Nm 0.7
Packing unit pce.	25	screwdriver No. 1
Degree of protection	IP54	

Connecting box

No.	Eldas-No.
9059M	150 712 037

Technical data

L×W×H mm	85×44×32	splashproof and dustproof IP54
Weight g	160	
Fire load kWh	0.55	two lateral cable outlets with thread M16 for 1 Td cable up to 3×1.5 mm²
Rated voltage V	500	
Max. rated current max. A	10	
Plastic parts	halogen-free	
Metal parts	corrosion-resistant	tightening torque Nm (Pointed screws) 0.7
Packing unit pce.	50	screwdriver No. 1
Degree of protection	IP54	tightening torque Nm (Clamping screws) 0.7
		screwdriver No. 1

Cable glands

No.	Eldas-No.
87098M	121 680 407

Technical data

Weight g	56.2	Of nickel-plated brass
	M16×1.5	
Ø Diameter of cables mm	11-20.5	
Metal parts	corrosion-resistant	
Packing unit pce.	50	

Blind plug

No.	Eldas-No.
87100M	126 222 420

Technical data

Weight g	7.9	Of nickel-plated brass
	M16×1.5	
Metal parts	corrosion-resistant	
Packing unit pce.	25	

Woertz Technofil 5G1.5 mm² and 5G2.5 mm²

Accessories

Cable end piece

No. 48510/05 — Eldas-No. 120 900 407

Technical data		
LxWxH mm	40x36x16	of polycarbonate, halogen-free; silicone gel
Weight g	14.3	
Packing unit pce.	5	Note:
Degree of protection	IP68	Cut neatly both ends of the cable before mounting the end pieces. No need to strip the cable. Cable end piece may only be mounted once

Clamp

No. 9054 — Eldas-No. 120 018 007

Technical data		
LxWxH mm	28.5x13.5x8	**for screwing on**
Weight g	1.5	for fastening cables along ceiling
Fire load kWh	0.01	of polyamide 6.6, halogen-free
Packing unit pce.	100	

No. 9042 — Eldas-No. 120 008 007

Technical data		
LxWxH mm	42x8.5x10	**for screwing on**
Weight g	2.4	to be used when cable is placed on a base
Fire load kWh	0.02	of polyamide 6.6, halogen-free
Packing unit pce.	100	

No. 9041 — Eldas-No. 120 088 007

Technical data		
LxWxH mm	42x24x10	**for hanging up**
Weight g	6.5	for laying flat cable along wire ropes
Fire load kWh	0.04	of polyamide 6.6, halogen-free
Packing unit pce.	50	

No. 9072 — Eldas-No. 120 068 107

Technical data		
LxWxH mm	69x9x8	**for clipping on**
Weight g	2	for laying cables into profiles EN 50022-35
Fire load kWh	0.02	of polyamide 6.6, halogen-free
Packing unit pce.	100	

Cable stripping tool

No. 49933 — Eldas-No. 983 050 627

Technical data		
Weight g	279	This tool offers the advantage of stripping neatly and easily the cable without damaging the insulation of the conductors.
Packing unit pce.	1	

Shears

No. 49930 — Eldas-No. 983 045 007

Technical data		
Weight g	223	For cutting neatly and easily every type of flat cables (max. width 32mm).
Packing unit pce.	1	With sliding anvil. Teflon coated blades.

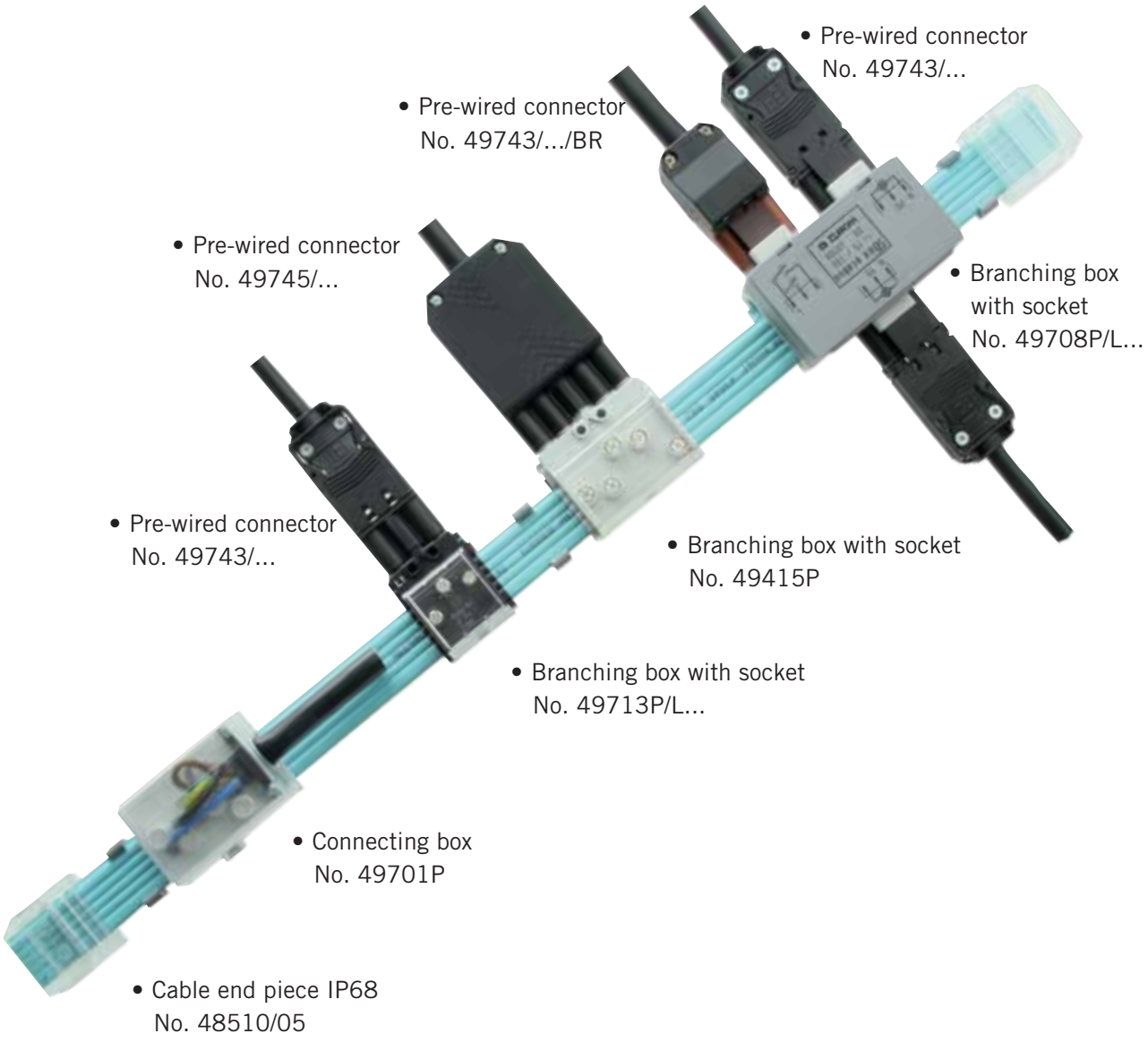
Insulating tape

No. 49960 — Eldas-No. 171 013 004

Technical data		
LxWxH mm	102x100x2.3	To reinsulate correctly the holes due to pointed screws or cutting teeth when removing or displacing connections.
Weight g	33	
Dielectric strength max. kV/mm	23	
Temperature max. °C	+70	
Packing unit pce.	10	Weatherproof, self-fusing.

Woertz power 5G2.5 mm²

Boxes placed wherever you want.
Displaced whenever you need!



Where are these flat cables used?

- in offices
- in supermarkets and shopping centres
- in museums and exhibitions
- for the lighting of platforms on railway stations and car parks
- for light industry
- for temporary lighting installations on sites

Flat cable enables installations to be completed easily with further connections.

Woertz power 5G2.5 mm²

flat cable 5G2.5 mm²

3 L+N+PE

	PVC		halogen-free	
	No.	Eldas-No.	**No.**	Eldas-No.
	49845	113 383 804	**49846**	113 383 904
			49846GR	
	49845RT		**49846RT**	
	49845SW		**49846SW**	
	49845WS		**49846WS**	
	49845/SM*	113 383 814	**49846/SM***	113 383 954
	*** on request**			

Technical data			
Dimension	mm	24×6	24×6
Weight	g/m	259	247
Fire load	kWh/m	0.778	1.28
No. of leads x cross-section	mm²	5×2.5	5×2.5
Power current part			
Copper conductors		tinned, highly flexible	tinned, highly flexible
Insulation of the leads		PVC	vulcanized, and flame retardant polyethylene
Colour of the leads		grey, black, brown, blue, green/yellow	grey, black, brown, blue, green/yellow
Cross-section	mm²	2.5	2.5
Test voltage	kV / Hz	4 / 50	4 / 50
Rated voltage	kV	0.6/1	0.6/1
DC-resistance	Ω/km	7.98	7.98
Cu weight	kg/km	120	120

Woertz power 5G2.5 mm²

Connecting box to flat cable No. 49845 and 49846

Connecting box		Technical data		
No.	Eldas-No.	L×W×H mm	58×41×39	with screw-type connection
49701P	150 776 037	Fire load kWh	0.33	for supply and branching no need to strip the insulation
		Cross-section mm²	5×2.5	Plastic parts: halogen-free
		Connecting capacity Ø	3.75	Metal parts: corrosion-resistant
		Rated voltage V	690	
		Max. rated current max. A	16	tightening torque Nm (Pointed screws) 0.7
		Packing unit pce.	50	screwdriver No. 1
		Degree of protection	IP20	tightening torque Nm (Clamping screws) 0.7
				screwdriver No. 1

Connecting box		Technical data		
No.	Eldas-No.	L×W×H mm	95×40×27	with screw-type connection
49901	150 708 037	Fire load kWh	0.33	
		Cross-section for 1 round cable bis mm²	5×2.5	for the connection of 2 cables or supply at the end of the cable
		Cross-section for 1 flat cable bis mm²	5×2.5	
		Rated voltage V	500	Plastic parts: halogen-free
		Max. rated current max. A	16	Metal parts: corrosion-resistant
		Packing unit pce.	25	
		Degree of protection	IP20	tightening torque Nm 0.7
				screwdriver No. 1

Connecting box flat execution		Technical data		
No.	Eldas-No.	L×W×H mm	96×60×23	for supply and branching, no need to
49703P	150 701 017	Fire load kWh	0.38	strip the insulation, flat execution 3P+N+PE
		Connecting capacity Ø mm	6-13	
		Spring clamp terminals	2/Pol	for two flexible round cable of PVC up to
		Rated voltage V	690	5×1.5 mm² with end sleeves for strands or rigid
		Max. rated current max. A	16	round cables up to 5×2.5 mm²
		Cross-section mm²	(2×) 5×2.5 Packing unit pce. 50	Plastic parts: halogen-free
				Metal parts: corrosion-resistant
		Degree of protection	IP20	tightening torque Nm 0.7
				screwdriver No. 1

Branching box with socket		Technical data		
No.	Eldas-No.	L×W×H mm	34.5×57.5×25.7	3-pole
49713P/L1	150 710 137	Fire load kWh	0.18	
49713P/L2	150 710 237	socket	type GST18i3 code 1	lateral connection
49713P/L3	150 710 117			
		Rated voltage V	250	Plastic parts: halogen-free
		Max. rated current max. A	16	Metal parts: corrosion-resistant
		Packing unit pce.	50	tightening torque Nm 0.7
				screwdriver No. 1
		Degree of protection	IP20	
				Pre-wired connectors see page 78

Branching box with socket		Technical data		
No.	Eldas-No.	L×W×H mm	48×40×34	3-pole with phase selection
49413P	150 710 127	Fire load kWh	0.32	
		socket	type GST18i3 code 1	longitudinal connection
		Rated voltage V	250	Plastic parts: halogen-free
		Max. rated current max. A	16	Metal parts: corrosion-resistant
		Packing unit pce.	25	tightening torque Nm 0.7
				screwdriver No. 1
		Degree of protection	IP20	
				Pre-wired connectors see page 78

Branching box with socket		Technical data		
No.	Eldas-No.	L×W×H mm	54×57.5×25.7	5-pole
49715P	150 710 337	Fire load kWh	0.27	
		socket	type GST18i5 code 1	lateral connection
		Rated voltage V	250/400	Plastic parts: halogen-free
		Max. rated current max. A	16	Metal parts: corrosion-resistant
		Packing unit pce.	50	tightening torque Nm 0.7
				screwdriver No. 1
		Degree of protection	IP20	
				Pre-wired connectors see page 78

Woertz power 5G2.5 mm²

Connecting box to flat cable No. 49845 and 49846

Connecting box SBox		Technical data		
No.	Eldas-No.	L×W×H mm	74×67×37	for lighting installations with I/O switch or impulse switch
49705P/L1	150 711 317	Fire load kWh	0.51	
49705P/L2	150 711 337	Colour of box L1/L2/L3	l'grey/d'grey/black	Plastic parts: halogen-free
49705P/L3	150 711 357	Socket switch	type GST18i3 code 4 (brown)	Metal parts: corrosion-resistant
		Socket lamps	type GST18i3 code 1	tightening torque Nm 0.7
		Rated voltage V	250	screwdriver No. 1
		Max. rated current max. A	16	
		Packing unit pce.	50	
		Degree of protection	IP20	*Pre-wired connectors see page 77/78*

Connecting box SBox		Technical data		
No.	Eldas-No.	L×W×H mm	74×67×37	for lighting installations with I/O switch or impulse switch
49706P/L1	150 712 317	Fire load kWh	0.51	
49706P/L2	150 712 337	Colour of box L1/L2/L3	l'grey/d'grey/black	Plastic parts: halogen-free
49706P/L3	150 712 357	Socket switch	type GST18i3 code 4 (brown)	Metal parts: corrosion-resistant
		Socket lamps	type GST18i3 code 1	tightening torque Nm 0.7
		Rated voltage V	250	screwdriver No. 1
		Max. rated current max. A	16	
		Packing unit pce.	50	
		Degree of protection	IP20	*Pre-wired connectors see page 77/78*

Connecting box SBox		Technical data		
No.	Eldas-No.	L×W×H mm	74×88×37	for lighting installations with changeover contact
49707P/L1	150 713 317	Fire load kWh	0.54	
49707P/L2	150 713 337	Colour of box L1/L2/L3	l'grey/d'grey/black	Plastic parts: halogen-free
49707P/L3	150 713 357	Socket switch	type GST18i3 code 4 (brown)	Metal parts: corrosion-resistant
		Socket lamps	type GST18i3 code 1	tightening torque Nm 0.7
		Rated voltage V	250	screwdriver No. 1
		Max. rated current max. A	16	
		Packing unit pce.	50	
		Degree of protection	IP20	*Pre-wired connectors see page 77/78*

Connecting box SBox		Technical data		
No.	Eldas-No.	L×W×H mm	74×88×37	for lighting installations with series connection
49708P/L1	150 714 317	Fire load kWh	0.54	
49708P/L2	150 714 337	Colour of box L1/L2/L3	l'grey/d'grey/black	Plastic parts: halogen-free
49708P/L3	150 714 357	Socket switch	type GST18i3 code 4 (brown)	Metal parts: corrosion-resistant
		Socket lamps	type GST18i3 code 1	tightening torque Nm 0.7
		Rated voltage V	250	screwdriver No. 1
		Max. rated current max. A	16	
		Packing unit pce.	50	
		Degree of protection	IP20	*Pre-wired connectors see page 77/78*

Accessories

Cable end piece

No.	Eldas-No.
48510/05	120 900 407

Technical data		
L×W×H mm	40×36×16	of polycarbonate, halogen-free; silicone gel
Weight g	14.3	
Fire load kWh	n.a.	Note:
Packing unit pce.	5	Cut neatly both ends of the cable before mounting the end pieces. No need to strip the cable.
Degree of protection	IP68	Cable end piece may only be mounted once.

Clamp for screwing on

No.	Eldas-No.
49731	120 008 107

Technical data		
L×W×H mm	52×10×10	for cable fastening
Weight g	2	
Fire load kWh	0.02	of polyamide 6.6, halogen-free
Packing unit pce.	100	

Cable fastening clamp

No.	Eldas-No.
49733	150 900 117
49733A	150 900 107

Technical data		
L×W×H mm	40×15×15	**49733** for screwing on
Weight g	3.7	**49733A** for sticking on
Fire load kWh	0.03	
Packing unit pce.	100	of polyamide 6.6, halogen-free

Shears

No.	Eldas-No.
49930	983 045 007

Cable stripping tool

No.	Eldas-No.
49933	983 050 627

Technical data		
Weight g	223	For cutting neatly and easily every type of flat cables (max. width 32mm).
Packing unit pce.	1	
		With sliding anvil. Teflon coated blades.
		Cable stripping tool to feeding box 49901, 9052

Insulating tape

No.	Eldas-No.
49960	171 013 004

Technical data		
L×W×H mm	102×100×2.3	To reinsulate correctly the holes due to pointed screws or cutting teeth when removing or displacing connections.
Weight g	33	
Dielectric strength max. kV/mm	23	
Temperature max. °C	+70	
Packing unit pce.	10	Weatherproof, self-fusing

Baseplate with fixing brackets

No.	Eldas-No.
49738P	150 901 027

Technical data		
Packing unit pce.	10	Suitable for connecting boxes for lighting installations
		To fix the boxes on a surface.

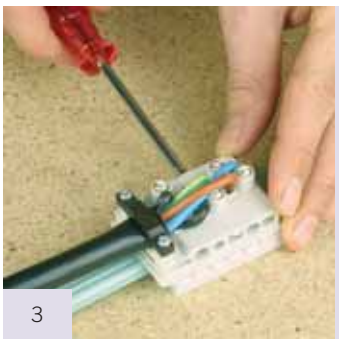
Mounting procedure of connecting box No. 49701P


1

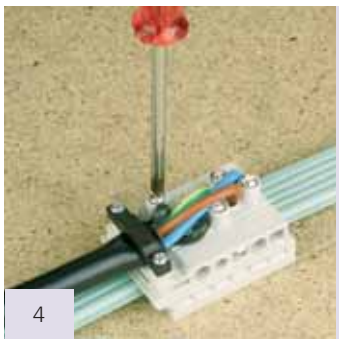
Place the connecting box on the flat cable - the different lugs prevent the box from incorrect mounting.


2

Push on the baseplate (light green). In case of incorrect mounting the bottom part of the box cannot be fitted with normal force.


3

Introduce the round cable into the flat cable box. Tighten the strain relief clamp to maintain the round cable.


4

Turn in the pointed screws as far as they will go.


5

Clip the hood.

The mounting procedure may also occur in a changed order: 3, 1, 2, 4, 5.


6

To release the hood, insert a screwdriver in the slit provided for the purpose and lift slightly.

The overcurrent protection devices will be chosen in relation to the length of installed cables so that esponse time conform to specifications in case of malfunction.

Possibility of pre-wiring:

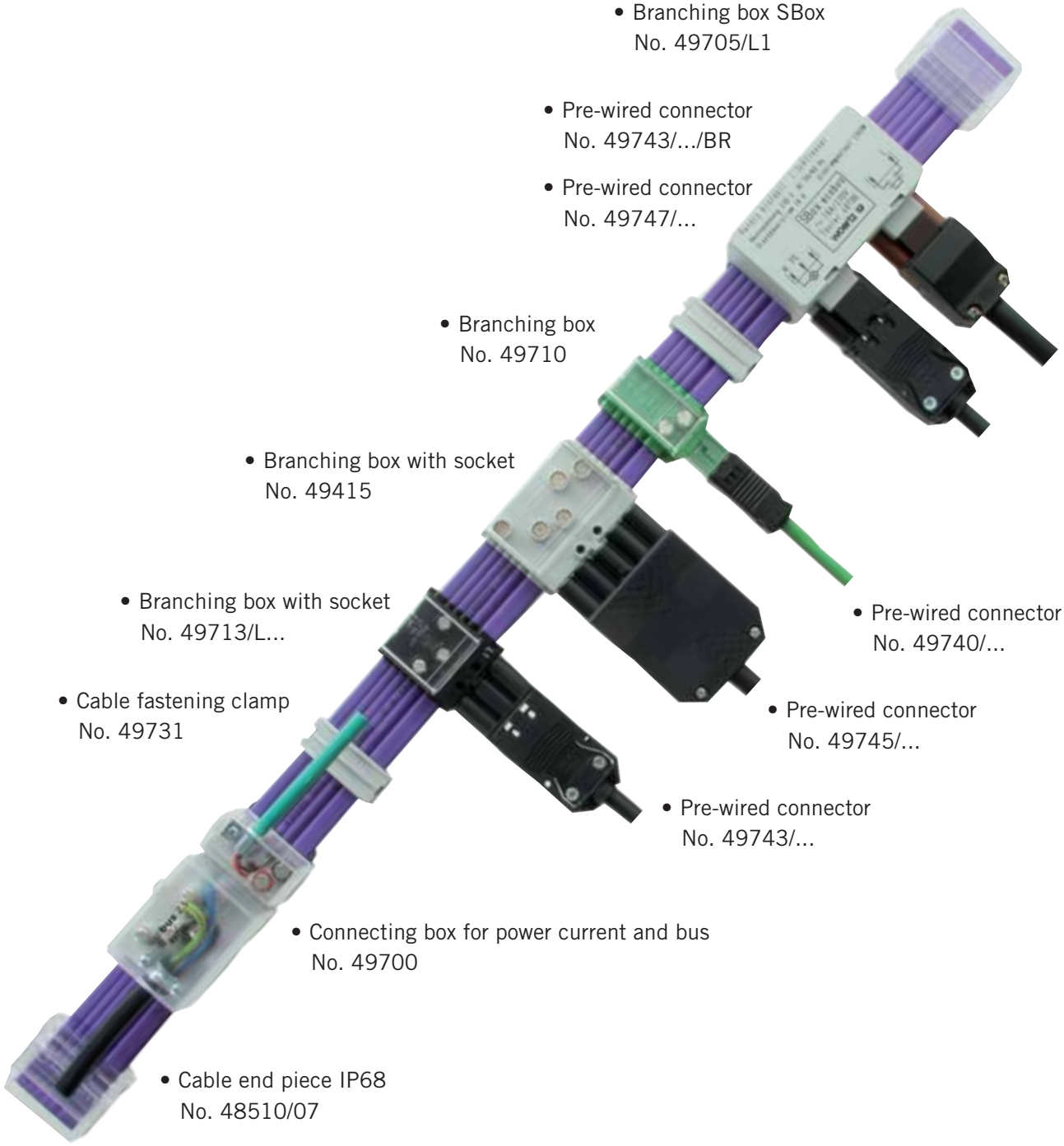
the installation becomes more rational!

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

On the building site the pre-wired boxes have only to be positioned - sockets and lighting circuits will be ready to function in a matter of seconds - to your advantage

Woertz combi
5G2.5 mm² + 2×1.5 mm²

Power current and data lines combined in one cable.



Where are these flat cables used?

- in office buildings
- in hospitals, clinics and residential facilities
- in industrial buildings
- in hotels

Flat cable enables installations to be completed easily with further connections.

Woertz combi 5G2.5 mm² + 2×1.5 mm²

flat cable Woertz combi 5G2.5 mm² + 2×1.5 mm²

3L+N+PE+2Bus

	PVC		halogen-free	
	No.	Eldas-No.	**No.**	Eldas-No.
	49945	113 388 083	**49946**	113 388 007
	49945RT		**49946RT**	
	49945SW		**49946SW**	
	49945WS		**49946WS**	
	49945/SM*	113 388 084	**49946/SM***	113 388 004
	49945/OS (without shield)			
	***** on request**		**49945/OS (without Shield)**	

Technical data			
Dimension	mm	32×6	32×6
Weight	g/m	350	340
Fire load	kWh/m	1.18	1.79
No. of leads x cross-section	mm²	5×2.5 + 2×1.5	5×2.5 + 2×1.5
Power current part			
Copper conductors		tinned, highly flexible	tinned, highly flexible
Insulation of the leads		PVC	vulcanized and Flame retardant polyethylene
Colour of the leads		grey, black, brown, blue, yellow/green	grey, black, brown, blue, yellow/green
Cross-section	mm²	2.5	2.5
Test voltage	kV / Hz	4 / 50	4 / 50
Rated voltage	kV	0.6/1	0.6/1
DC-resistance	Ω/km	7.98	7.98
Cu weight	kg/km	120	120
bus part			
Copper conductors		tinned	tinned
Insulation of the leads		PVC	polyethylene
Colour of the leads		neutral	neutral
Shield		double shield of aluminium	double shield of aluminium
Cross-section	mm²	1.5	1.5
Test voltage	kV / Hz	4 / 50	4 / 50
Rated voltage	V	50	50
Max. rated current	A	3	3
DC-resistance	Ω/km	13.7	13.7
Capacitance	pF/m	70	70
Attenuation at 1Hz	dB/m	1.2	1.2
Charact. impedance at 1 MHz	nom Ω	nom. 75	nom. 75
Cu weight	kg/km	29	29

Woertz combi 5G2.5 mm² + 2×1.5 mm²

Connecting box with screw-type connection to flat cable No. 49945 and 49946

Connecting box 5-pole with bus		Technical data			
No.	Eldas-No.	L×W×H mm	76×41×39	for supply and branching, for power current and bus	
49700	150 775 137	Weight g	86		
		Fire load kWh	0.47	Plastic parts	halogen-free
		Cross-section mm²	5×2.5+ 2×1.5	Metal parts	corrosion-resistant
		Connecting capacity Ø	3.75 + 3.2	Packing unit pce.	50
		Rated voltage Power current V	690		
		Max. rated current Power current A	16		
		Rated voltage bus part V	50		
		Max. rated current max. bus part A	3		
		Degree of protection	IP20		

Connecting box 5-pole		Technical data			
No.	Eldas-No.	L×W×H mm	58×41×39	for supply and branching, for bus	
49701	150 775 037	Weight g	55		
		Fire load kWh	0.33		
		Cross-section mm²	5×2.5	Plastic parts	halogen-free
		Connecting capacity Ø	3.75	Metal parts	corrosion-resistant
		Rated voltage Power current V	690		
		Max. rated current Power current A	16		
		Packing unit pce.	50	tightening torque Nm	0.7
		Degree of protection	IP20	screwdriver No.	1

Connecting box for bus		Technical data			
No.	Eldas-No.	L×W×H mm	21×41×39	for supply and branching, for bus	
49702	150 732 037	Weight g	23		
		Fire load kWh	0.14	Plastic parts	halogen-free
		Cross-section mm²	2×1.5	Metal parts	corrosion-resistant
		Connecting capacity Ø	3.2		
		Rated voltage bus part V	50		
		Max. rated current max. bus part A	3		
		Packing unit pce.	50	tightening torque Nm	1.0
		Degree of protection	IP20	screwdriver No.	3

Connecting box, flat execution to flat cable No. 49945 and 49946

Connecting box		Technical data			
No.	Eldas-No.	L×W×H mm	96×60×23	for supply and branching, no need to strip the insulation, flat execution 3P+N+PE	
49703	150 701 007	Weight g	71.1		
		Fire load kWh	0.38		
		Spring clamp terminals per pole	2	for two flexible round cable of PVC up to 5×1.5 mm² with end sleeves for strands or rigid round cables up to 5×2.5 mm²	
		Connecting capacity Ø	6-13 mm		
		Rated voltage V	690		
		Max. rated current max. A	16		
		Cross-section mm²	(2×) 5×2.5		
		Plastic parts	halogen-free		
		Metal parts	corrosion-resistant		
		Packing unit pce.	50	tightening torque Nm	0.7
				screwdriver No.	1
		Degree of protection	IP20		

Woertz combi 5G2.5 mm² + 2×1.5 mm²

Branching boxes with socket to flat cable No. 49945 and 49946

Branching box 3-pole		Technical data		
No.	Eldas-No.	L×W×H mm	34.5×57.5×25.7	lateral connection
49713/L1	150 700 137	Weight g	40	
49713/L2	150 700 237	Fire load kWh	0.18	Plastic parts halogen-free
49713/L3	150 700 117	Socket	type GST18i3 code 1	Metal parts corrosion-resistant
		Rated voltage V	250	tightening torque Nm 0.7
		Max. rated current max. A	16	screwdriver No. 1
		Packing unit pce.	50	
		Degree of protection	IP20	*Pre-wired connectors see page 78*

Branching box 3-pole		Technical data		
No.	Eldas-No.	L×W×H mm	48×40×34	longitudinal connection
49413/C	150 700 127	Weight g	55	Phase selection
		Fire load kWh	0.32	Plastic parts halogen-free
		Socket	type GST18i3 code 1	Metal parts corrosion-resistant
		Rated voltage V	250	tightening torque Nm 0.7
		Max. rated current max. A	16	screwdriver No. 1
		Packing unit pce.	25	
		Degree of protection	IP20	*Pre-wired connectors see page 78*

Branching box 5-pole		Technical data		
No.	Eldas-No.	L×W×H mm	54×57.5×25.7	with socket
49715	150 700 337	Weight g	65	lateral connection
		Fire load kWh	0.27	Plastic parts halogen-free
		Socket	type GST18i5 code 1	Metal parts corrosion-resistant
		Rated voltage V	250/400	tightening torque Nm 0.7
		Max. rated current max. A	16	screwdriver No. 1
		Packing unit pce.	50	
		Degree of protection	IP20	*Pre-wired connectors see page 78*

Branching box 2-pole for KNX		Technical data		
No.	Eldas-No.	L×W×H mm	27×57.5×25.7	with socket
49710	150 701 187	Weight g	18	lateral connection
		Fire load kWh	0.12	Plastic parts halogen-free
		Socket	type BST14i2 code KNX	Metal parts corrosion-resistant
		Rated voltage V	50	tightening torque Nm 1.0
		Max. rated current max. A	3	screwdriver No. 3
		Packing unit pce.	50	
		Degree of protection	IP20	*Pre-wired connectors see page 76*

Branching box 2-pole for bus		Technical data		
No.	Eldas-No.	L×W×H mm	27×57.5×25.7	with socket
49711	150 702 237	Weight g	18	lateral connection
		Fire load kWh	0.12	Plastic parts halogen-free
		Socket	type BST14i3 code 3	Metal parts corrosion-resistant
		Rated voltage V	50	tightening torque Nm 1.0
		Max. rated current max. A	3	screwdriver No. 3
		Packing unit pce.	50	
		Degree of protection	IP20	*Pre-wired connectors see page 77*

Branching box 2-pole for bus		Technical data		
No.		L×W×H mm	27×57.5×25.7	lateral connection
49717		Weight g	18	
		Fire load kWh	0.12	Plastic parts halogen-free
		Socket	code Woertz	Metal parts corrosion-resistant
		Rated voltage V	50	
		Max. rated current max. A	3	tightening torque Nm 1.0
		Packing unit pce.	50	screwdriver No. 3
		Degree of protection	IP20	*Pre-wired connectors see page 76*

Woertz combi 5G2.5 mm² + 2×1.5 mm²

Branching boxes with socket to flat cable No. 49945 and 49946

Branching box 2-pole for KNX

No.	Eldas-No.
49720/C	150 707 137

Technical data

L×W×H mm	44×39.5×28
Weight g	19
Fire load kWh	0.12
Socket	type BST14i2 code KNX
Rated voltage V	50
Max. rated current max. A	3
Packing unit pce.	50
Degree of protection	IP20

longitudinal connection

Plastic parts	halogen-free
Metal parts	corrosion-resistant
tightening torque Nm	1.0
screwdriver No.	3

Pre-wired connectors see page 76

Branching box 2-pole for bus

No.	Eldas-No.
49721/C	150 707 237

Technical data

L×W×H mm	44×39.5×28
Weight g	19
Fire load kWh	0.12
Socket	type BST14i3 code 3
Rated voltage V	50
Max. rated current max. A	3
Packing unit pce.	50
Degree of protection	IP20

longitudinal connection

Plastic parts	halogen-free
Metal parts	corrosion-resistant
tightening torque Nm	1.0
screwdriver No.	3

Pre-wired connectors see page 77

Branching box 2-pole for bus

No.	Eldas-No.
49727/C	150 707 337

Technical data

L×W×H mm	44×39.5×28
Weight g	19
Fire load kWh	0.12
Socket	code Woertz
Rated voltage V	50
Max. rated current max. A	3
Packing unit pce.	50
Degree of protection	IP20

longitudinal connection

Plastic parts	halogen-free
Metal parts	corrosion-resistant
tightening torque Nm	1.0
screwdriver No.	3

Pre-wired connectors see page 76

Branching box 2- and 3-pole

No.	Eldas-No.
49723/L1	150 701 137
49723/L2	150 701 237
49723/L3	150 701 117

Technical data

L×W×H mm	59.5×57.5×25.7
Weight g	57.5
Fire load kWh	0.29
Socket	type GST18i3 + BST14i2 code KNX
Rated voltage Power current V	250
Rated voltage bus V	50
Max. rated current max. Power current A	16
Max. rated current max. bus A	3
Degree of protection	IP20

lateral connection

Plastic parts	halogen-free
Metal parts	corrosion-resistant
Packing unit pce.	50
tightening torque Nm (Power current)	0.7
screwdriver No. (Power current)	1
tightening torque Nm (bus part)	1.0
screwdriver No. (bus part)	3

Pre-wired connectors see page 76/78

Branching box 2- and 3-pole

No.	Eldas-No.
49724/L1	150 703 037
49724/L2	150 703 137
49724/L3	150 703 017

Technical data

L×W×H mm	59.5×57.5×25.7
Weight g	57.5
Fire load kWh	0.29
Socket	type GST18i3 + BST14i3 code 3
Rated voltage Power current V	250
Rated voltage bus V	50
Max. rated current max. Power current A	16
Max. rated current max. bus A	3
Degree of protection	IP20

lateral connection

Plastic parts	halogen-free
Metal parts	corrosion-resistant
Packing unit pce.	50
tightening torque Nm (Power current)	0.7
screwdriver No. (Power current)	1
tightening torque Nm (bus part)	1.0
screwdriver No. (bus part)	3

Pre-wired connectors see page 77/78

Branching box 2- and 5-pole

No.	Eldas-No.
49725	150 705 137

Technical data

L×W×H mm	79×57.5×25.7
Weight g	82
Fire load kWh	0.40
Socket	type GST18i5 + BST14i2 code KNX
Rated voltage Power current V	250/400
Rated voltage bus V	50
Max. rated current max. Power current A	16
Max. rated current max. bus A	3
Degree of protection	IP20

lateral connection

Plastic parts	halogen-free
Metal parts	corrosion-resistant
Packing unit pce.	50
tightening torque Nm (Power current)	0.7
screwdriver No. (Power current)	1
tightening torque Nm (bus part)	1.0
screwdriver No. (bus part)	3

Pre-wired connectors see page 76/78

Woertz combi 5G2.5 mm² + 2×1.5 mm²

Branching box and connecting box to flat cable No. 49945 and 49946

branching box 2- and 5-pole		Technical data			
No.	Eldas-No.	L×W×H mm	79×57.5×25.7	lateral connection	
49726	150 705 237	Weight g	82	Plastic parts	halogen-free
		Fire load kWh	0.40	Metal parts	corrosion-resistant
		Socket	type GST18i5 + BST14i3 code 3	Packing unit pce.	50
		Rated voltage Power current V	250/400	tightening torque Nm (Power current)	0.7
		Rated voltage bus V	50	screwdriver No. (Power current)	1
		Max. rated current max. Power current A	16	tightening torque Nm (bus part)	1.0
		Max. rated current max. bus A	3	screwdriver No. (bus part)	3
		Degree of protection	IP20	*Pre-wired connectors see page 77/78*	

Connecting box SBox		Technical data			
No.	Eldas-No.	L×W×H mm	74×67×37	for lighting installations with I/O switch	
49705/L1	150 711 307	Weight g	94		
49705/L2	150 711 327	Fire load kWh	0.20	Plastic parts	halogen-free
49705/L3	150 711 347	Colour of box L1/L2/L3	l'grey/d'grey/black	Metal parts	corrosion-resistant
		Socket switch	type GST18i3 code 4 (brown)	Packing unit pce.	50
		Socket lamps	type GST18i3 code 1	tightening torque Nm	0.7
		Rated voltage V	250	screwdriver No.	1
		Max. rated current max. A	16		
		Degree of protection	IP20	*Pre-wired connectors see page 77/78*	

Connecting box SBox		Technical data			
No.	Eldas-No.	L×W×H mm	74×67×37	for lighting installations with impulse switch	
49706/L1	150 712 307	Weight g	110		
49706/L2	150 712 327	Fire load kWh	0.20	Plastic parts	halogen-free
49706/L3	150 712 347	Colour of box L1/L2/L3	l'grey/d'grey/black	Metal parts	corrosion-resistant
		Socket switch	type GST18i3 code 4 (brown)	Packing unit pce.	50
		Socket lamps	type GST18i3 code 1	tightening torque Nm	0.7
		Rated voltage V	250	screwdriver No.	1
		Max. rated current max. A	16		
		Degree of protection	IP20	*Pre-wired connectors see page 77/78*	

Connecting box SBox		Technical data			
No.	Eldas-No.	L×W×H mm	74×88×37	for lighting installations with changeover contact	
49707/L1	150 713 307	Weight g	120		
49707/L2	150 713 327	Fire load kWh	0.20	Plastic parts	halogen-free
49707/L3	150 713 347	Colour of box L1/L2/L3	l'grey/d'grey/black	Metal parts	corrosion-resistant
		Socket switch	type GST18i3 code 4 (brown)	Packing unit pce.	50
		Socket lamps	type GST18i3 code 1	tightening torque Nm	0.7
		Rated voltage V	250	screwdriver No.	1
		Max. rated current max. A	16		
		Degree of protection	IP20	*Pre-wired connectors see page 77/78*	

Connecting box SBox		Technical data			
No.	Eldas-No.	L×W×H mm	74×88×37	for lighting installations with series connection	
49708/L1	150 714 307	Weight g	120	Plastic parts	halogen-free
49708/L2	150 714 327	Fire load kWh	0.20	Metal parts	corrosion-resistant
49708/L3	150 714 347	Colour of box L1/L2/L3	l'grey/d'grey/black	Packing unit pce.	50
		Socket switch	type GST18i3 code 4 (brown)	tightening torque Nm	0.7
		Socket lamps	type GST18i3 code 1	screwdriver No.	1
		Rated voltage V	250		
		Max. rated current max. A	16		
		Degree of protection	IP20	*Pre-wired connectors see page 77/78*	

Raptor actuators - see separate flyer **„building automation"**

Woertz combi 5G2.5 mm² + 2×1.5 mm²

Accessories

Cable end piece

No.	Eldas-No.
48510/07	120 900 607

Technical data		
L×W×H mm	40×44×16	of polycarbonate, halogen-free; silicone gel
Weight g	16.8	
Fire load kWh	n.a.	Note:
Packing unit pce.	4	Cut neatly both ends of the cable before mounting the end pieces. No need to strip the cable.
Degree of protection	IP68	Cable end piece may only be mounted once.

Cable fastening clamp

No.	Eldas-No.
49731	120 008 107

Technical data		
L×W×H mm	52×10×10	for cable fastening
Weight g	2	
Fire load kWh	0.02	of polyamide 6.6, halogen-free
Packing unit pce.	100	

Clamp for screwing on

No.	Eldas-No.
49733	150 900 117
49733A	150 900 107

Technical data		
L×W×H mm	40×15×15	**49733** for screwing on
Weight g	3.7	**49733A** for sticking on
Fire load kWh	0.03	
Packing unit pce.	100	of polyamide 6.6, halogen-free

Shears

No.	Eldas-No.
49930	983 045 007

Technical data		
Weight g	223	For cutting neatly and easily every type of flat cables (max. width 32mm).
Packing unit pce.	1	
		With sliding anvil. Teflon coated blades.

Insulating tape

No.	Eldas-No.
49960	171 013 004

Technical data		
L×W×H mm	102×100×2.3	To reinsulate correctly the holes due to pointed screws or cutting teeth when removing or displacing connections.
Weight g	33	
Dielectric strength max. kV/mm	23	
Temperature max. °C	+70	
Packing unit pce.	10	Weatherproof, self-fusing

Baseplate with fi xing brackets

No.	Eldas-No.
49738	150 901 017

Technical data		
Packing unit pce.	10	Suitable for connecting boxes for lighting installations
		To fix the boxes on a surface.

Mounting procedure of connecting box No. 49700 / 49701

1

Place the connecting box on the flat cable - the different lugs prevent the box from incorrect mounting.

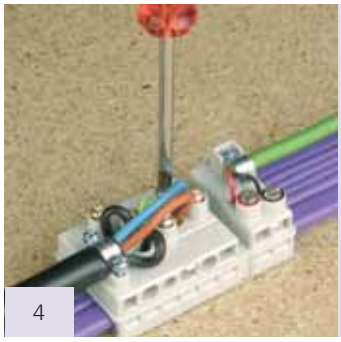
2

Push on the baseplate (violet). In case of incorrect mounting the bottom part of the box cannot be fitted with normal force.

3

Power current and bus parts

Introduce the round cable into the flat cable box. Tighten the strain relief clamp to maintain the round cable.



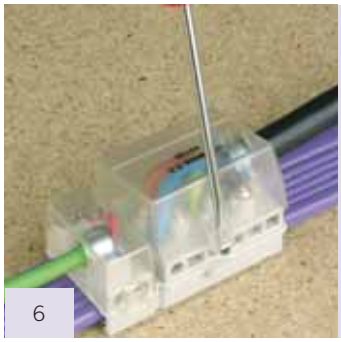
4

Turn in the pointed screws as far as they will go.

5

Clip the hood.

The mounting procedure may also occur in a changed order: 3, 1, 2, 4, 5.



6

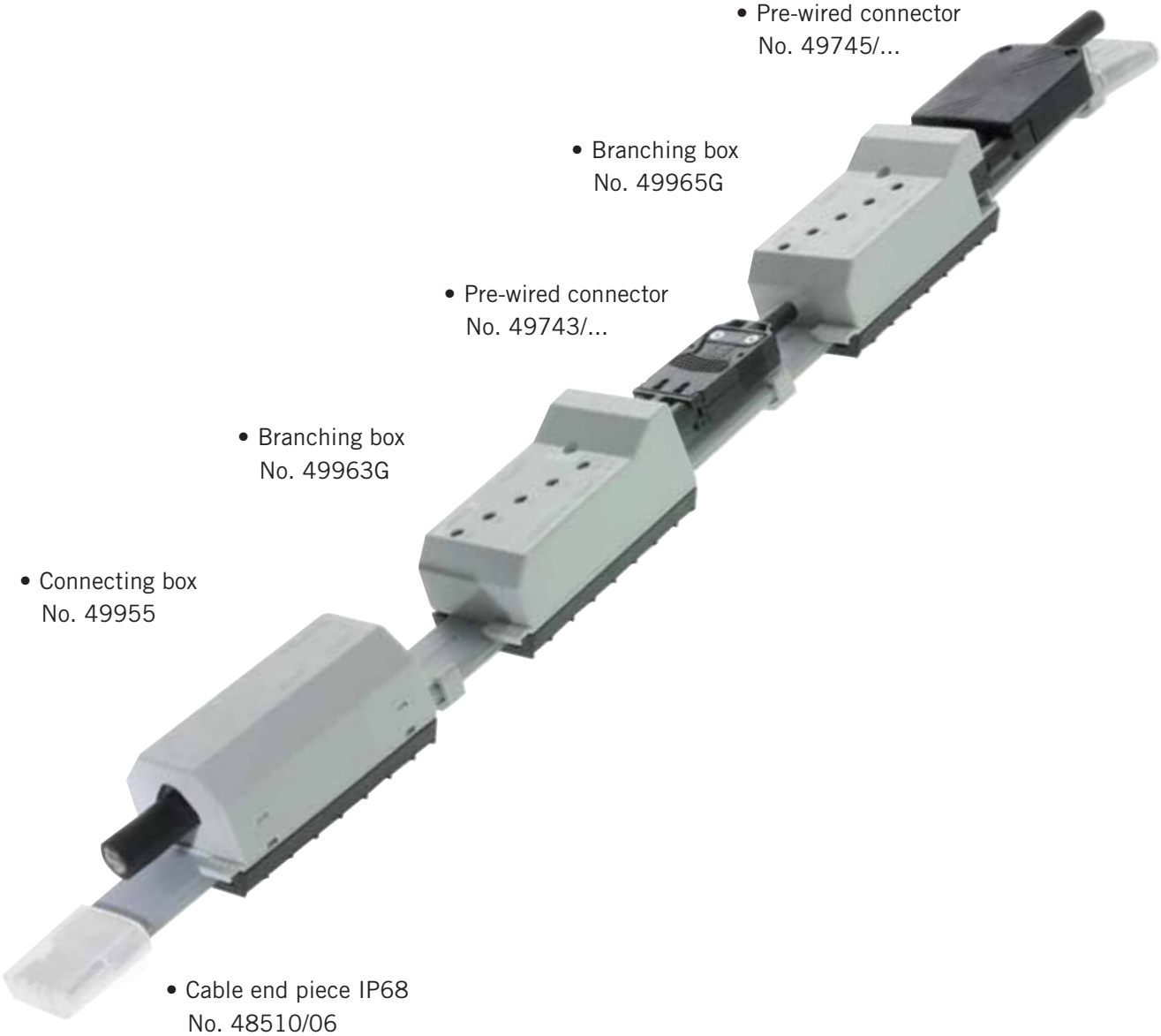
To release the hood, insert a screwdriver in the slit provided for the purpose and lift slightly.

Possibility of pre-wiring:

Service to our customers.
On request, the connectors may be provided in advance with round outgoing cables.

The connecting boxes which are dedicated to be placed at regular intervals in office buildings may be mounted in advance (fig. 1-3 above) in our workshops. It is also possible to prewire all the sockets which are mounted in under-window ducts or floor ducts. On the building site, the connection to the flat cable will be done in a matter of seconds! Important time savings will be performed - to your advantage!

Woertz 5G4 mm²



Where are these flat cables used?

- in long corridors and spacious offices
- in supermarkets
- for the lighting of railway stations, car parks or halls
- for light industry

Woertz 5G4 mm²

flat cable 5G4 mm²

	PVC		halogen-free	
	No.	Eldas-No.	**No.**	Eldas-No.
 3L+N+PE	**49404**	113 284 480	**49405**	113 294 480

Technical data			
Dimensions	mm	26.6×6.7	26.6×6.7
Weight	g/m	410	410
Fire load	kWh/m	1.298	1.82
No. of leads x cross-section	mm²	5×4	5×4
Power current part			
Copper conductors		tinned, highly flexible	tinned, highly flexible
Insulation of the leads		PVC	vulcanized, flame retardant polyethylene
Colour of the leads		grey, black, green/yellow, blue, brown	grey, black, green/yellow, blue, brown
Cross-section	mm²	4	4
Test voltage	kV / Hz	4 / 50	4 / 50
Rated voltage	kV	0.6/1	0.6/1
DC-resistance	Ω/km	5.09	5.09
Cu weight	kg/km	192	192

Branching boxes without wire stripping to flat cable No. 49404 and 49405

Box with socket 3-pole		Technical data		
No.	Eldas-No.	L×W×H mm	112×49×43	with socket 3-pole
49963G	150 721 007	Weight g	133	longitudinal connection
		Fire load kWh	0.57	Plastic parts halogen-free
		Socket	type GST18i3	Metal parts corrosion-resistant
		Rated voltage V	250/400	tightening torque Nm (Pointed screws) 0.7
		Max. rated current max. A	16	screwdriver No. 1
		Packing unit pce.	50	tightening torque Nm (Clamping screws) 0.7
		Degree of protection	IP20	screwdriver No. 1
				Pre-wired connectors see page 78

Box with socket 5-pole		Technical data		
No.	Eldas-No.	L×W×H mm	112×49×43	with socket 5-pole
49965G	150 721 017	Weight g	143	longitudinal connection
		Fire load kWh	0.58	Plastic parts halogen-free
		Socket	type GST18i5	Metal parts corrosion-resistant
		Rated voltage V	250/400	tightening torque Nm (Pointed screws) 0.7
		Max. rated current max. A	16	screwdriver No. 1
		Packing unit pce.	50	tightening torque Nm (Clamping screws) 0.7
		Degree of protection	IP20	screwdriver No. 1
				Pre-wired connectors see page 78

Connecting box for power current to flat cable No. 49404 and 49405

Connecting box		Technical data		
No.	Eldas-No.	L×W×H mm	95×49×44	for supply and branching
49955	150 724 037	Weight g	122.5	Plastic parts halogen-free
		Fire load kWh	0.56	Metal parts corrosion-resistant
		Rated voltage V	690	
		Max. rated current max. A	25	
		Packing unit pce.	50	tightening torque Nm (Pointed screws) 0.7
				screwdriver No. 1
		Degree of protection	IP20	tightening torque Nm (Clamping screws) 0.7
				screwdriver No. 1

Woertz 5G4 mm²

Accessories

Cable end piece	Technical data		
No.	L×W×H mm	35×31×22	of polycarbonate, halogen-free; silicone gel
48510/06	Weight g	14.3	
	Fire load kWh	0.06	Note: Cut neatly both ends of the cable before mounting the end pieces. No need to strip the cable.
	Packing unit pce.	10	
	Degree of protection	IP68	Cable end piece may only be mounted once

Clamp for screwing on		Technical data		
No.	Eldas-No.	L×W×H mm	32×15×8	for cable fastening
49981	120 009 007	Weight g	1.5	
		Fire load kWh	0.01	of polyamide 6.6, halogen-free
		Packing unit pce.	500	

Shears		Technical data		
No.	Eldas-No.	Weight g	223	For cutting neatly and easily every type of flat cables (max. width 32mm).
49930	983 045 037	Packing unit pce.	1	
				

Insulating tape		Technical data		
No.	Eldas-No.	L×W×H mm×m	50×1	To reinsulate correctly the holes due to pointed screws or cutting teeth when removing or displacing connections.
49632	150 901 147	Weight g	50.1	
		Dielectric strength max. kV/mm	18	
		Temperature max.	+70 °C	
		Packing unit m	1	Weatherproof, self-fusing.

Woertz 7G2.5 mm² and Woertz 7G4 mm²

The advantage of a higher protection degree and a wider field of application.

Where are these flat cables used?

- for the industrial automation
- 5 conductors for supply voltage 3L+N+PE and 2 conductors for low voltage 24V/48V or control voltage 230VAC.

Woertz 7G2.5 mm²

flat cable 7G2.5 mm²

		PVC		halogen-free	
		No.	Eldas-No.	**No.**	Eldas-No.
		**49600**	113 288 780	**49601**	113 298 780
5L+N+PE					
Technical data					
Dimensions	mm	35×6		35×6	
Weight	g/m	402		401	
Fire load	kWh/m	1.31		2.02	
No. of leads x cross-section	mm²	7×2.5		7×2.5	
Power current part					
Copper conductors		tinned, highly flexible		tinned, highly flexible	
Insulation of the leads		PVC		flame retardant polyethylene	
Colour of the leads		brown/black/grey/blue/green-yellow/red/white		brown/black/grey/blue/green-yellow/red/white	
Cross-section	mm²	2.5		2.5	
Test voltage	kV / Hz	4 / 50		4 / 50	
Rated voltage	kV	0.6/1		0.6/1	
DC-resistance	Ω/km	8.21		8.21	
Cu weight	kg/km	168		168	

Woertz 7G4 mm²

flat cable 7G4 mm²

		PVC		halogen-free	
		No.	Eldas-No.	**No.**	Eldas-No.
				**49401**	
5L+N+PE					
Technical data					
Dimensions	mm			35×6	
Weight	g/m			491	
Fire load	kWh/m			1.98	
No. of leads x cross-section	mm²			7×4	
Power current part					
Copper conductors				tinned, highly flexible	
Insulation of the leads				flame retardant polyethylene	
Colour of the leads				brown/black/grey/blue/green-yellow/red/white	
Cross-section	mm²			4	
Test voltage	kV / Hz			4 / 50	
Rated voltage	kV			0.6/1	
DC-resistance	Ω/km			5.09	
Cu weight	kg/km			270	

Woertz 7G2.5 mm² and 7G4 mm²

Connecting box to flat cable No. 49600, 49601 and 49401

Connecting box 7-pole		**Technical data**		
No.	Eldas-No.	*LxWxH mm*	*172x57x60*	for supply and branching without wire stripping
49613	150 077 037	*Weight g*	*350*	with 1 outlet M25x1.5
		*Fire load kWh*	*1.68*	
		Connecting capacity mm	*2.8x3.8*	tightening torque Nm (Pointed screws) 0.7
		Rated voltage V	*250/400*	screwdriver No. 1
		Max. rated current max. A	*16*	tightening torque Nm (Clamping screws) 0.7
		Plastic parts	*halogen-free*	screwdriver No. 1
		Metal parts	*corrosion-resistant*	Degree of protection IP65
		Packing unit pce.	*5*	

Connecting base and connector to flat cable No. 49600, 49601 and 49401

Connecting base		**Technical data**		
No.	Eldas-No.	LxWxH mm	135x57x53	to Connector No. 49626
49611	150 077 437	Weight g	200	
		Fire load kWh	0.83	
		Rated voltage V	250/400	
		Max. rated current max. A	16	
		Plastic parts	halogen-free	
		Metal parts	corrosion-resistant	tightening torque Nm 0.7
		Packing unit pce.	5	screwdriver No. 1
		Degree of protection	IP65	

Connector 7-pole		**Technical data**		
No.	Eldas-No.	LxWxH mm	83x56x73	with 1 outlet M25x1.5 to connecting base No. 49611
49626	150 977 437	Weight g	160	
		Fire load kWh	0.47	
		Rated voltage V	250/400	
		Max. rated current max. A	16	
		Plastic parts	halogen-free	
		Metal parts	corrosion-resistant	
		Packing unit pce.	5	
		Degree of protection	IP65	

Cable gland (to be ordered separately)

see page 74

Woertz 7G2.5 mm² and 7G4 mm²

Accessories

Cable end piece		Technical data		
No.	Eldas-No.	L×W×H mm	62×23×53	of polycarbonate, halogen-free
49620	150 901 137	Weight g	32	
		Fire load kWh	0.22	Before mounting the cable, first strip it at both ends for a distance of 19 mm so that the specified creepage distance will be observed.
		Packing unit pce.	10	
		Degree of protection	IP65	

Heat-shrinkable end cap	Technical data		
No.	L×Ø mm	105×42	Provided with adhesive and sealing compound inside
48511/42	Weight g	33.8	*Note:* Cut neatly both ends of the cable before mounting the end pieces. No need to strip the cable
	Packing unit pce.	5	may only be mounted once.
	Degree of protection	IP68	

Clamp		Technical data		
No.	Eldas-No.	L×W×H mm	52×10×10	for cable fastening
49731	120 008 107	Weight g	2	
		Fire load kWh	0.02	of polyamide 6.6, halogen-free
		Packing unit pce.	100	

Cable stripping tool		Technical data		
No.	Eldas-No.	Weight g	273	This tool offers the advantage of stripping neatly and easily the cable without damaging the insulation of the conductors.
49623	983 053 107	Packing unit pce.	1	
				Note: The cable has to be stripped at both ends for a distance of 19mm so that the conductors can be inserted properly in the end pieces..

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

Insulating tape		Technical data		
No.	Eldas-No.	L×W×H mm×m	50×1	To reinsulate correctly the holes due to pointed screws or cutting teeth when removing or displacing connections.
49632	150 901 147	Weight g	50.1	
		Dielectric strength max. kV/mm	18	
		Temperature max.	+70 °C	
		Packing unit m	1	Weatherproof, self-fusing

Protection cover		Technical data		
No.	Eldas-No.	Weight g	15.5	Cover IP65 to connecting base No. 49611
49627	150 900 907	Fire load kWh	0.16	
		Packing unit pce.	5	halogen-free

Woertz power 5G10 mm²

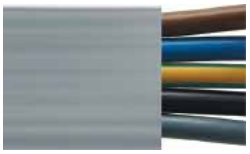
When you need more power.

Where are these flat cables used?

- For the lighting of halls
- For the supply of loads in open-plan offices through round or flat cables
- In data processing centers
- In hotels/restaurants
- In shopping centers
- In hospitals, clinics, residential facilities

Woertz power 5G10 mm²

flat cable 5G10 mm²

	PVC		halogen-free	
	No.	Eldas-No.	**No.**	Eldas-No.
	**49884**	113 289 518	**49885**	113 389 504
3 L+N+PE				

Technical data			
Dimension	mm	38.5×10	38.5×10
Weight	g/m	845	845
Fire load	kWh/m	2.12	3.43
No. of leads x cross-section	mm²	5×10	5×10
Power current part			
Copper conductors		bare, highly flexible	bare, highly flexible
Insulation of the leads		PVC	vulcanized, and flame retardant polyethylene
Colour of the leads		brown, blue, green/yellow, black, grey	brown, blue, green/yellow, black, grey
Cross-section	mm²	10	10
Test voltage	kV / Hz	4 / 50	4 / 50
Rated voltage	kV	0.6/1	0.6/1
DC-resistance	Ω/km	1.91	1.91
Packing unit	m	250/500	250/500
Cu weight	kg/km	480	480

Woertz power 5G10 mm²

Connecting-/branching box to flat cable No. 49884 and 49885

Connecting box		Technical data		
No.	Eldas-No.	L×W×H mm	160×90×55	for the supply at the end of the cable
49971	150 724 047	Weight g	556	
		Fire load kWh	1.20	
		Connecting capacity mm	5.2×9	
		Rated voltage V	750	
		Max. rated current max. A	57	
		Plastic parts	halogen-free	
		Metal parts	corrosion-resistant	
		Packing unit pce.	2	
		Degree of protection	IP20	

Branching box		Technical data		
No.	Eldas-No.	L×W×H mm	110×51×48	for 5×4 mm² round cables, without wire stripping
49970	150 705 337	Weight g	156	
		Fire load kWh	0.62	
		Connecting capacity mm	3.9×3.4	tightening torque Nm 1.4
		Rated voltage V	690	screwdriver No. 2
		Max. rated current max. A	25	
		Plastic parts	halogen-free	
		Metal parts	corrosion-resistant	
		Packing unit pce.	25	
		Degree of protection	IP20	

Woertz power 5G10 mm²

Accessories

Cable end piece		Technical data		
No.	Eldas-No.	L×W×H mm	47×40×17	Before mounting the cable, first strip it at both ends for a distance of 19 mm so that the specified creepage distance will be observed.
49972	120 900 007	Weight g	11.5	
		Fire load kWh	0.10	
		Packing unit pce.	10	

Set of two clamps		Technical data		
No.	Eldas-No.	L×W×H mm (one half)	56×15×12	for screwing on - To fix the cable
49977	120 000 007	Weight g	6.5	
		Fire load kWh	0.04	of polyamide 6.6, halogen-free
		Ø fixing holes mm	4.5	
		Distance between fixing holes mm	47	
		Packing unit pce.	100	

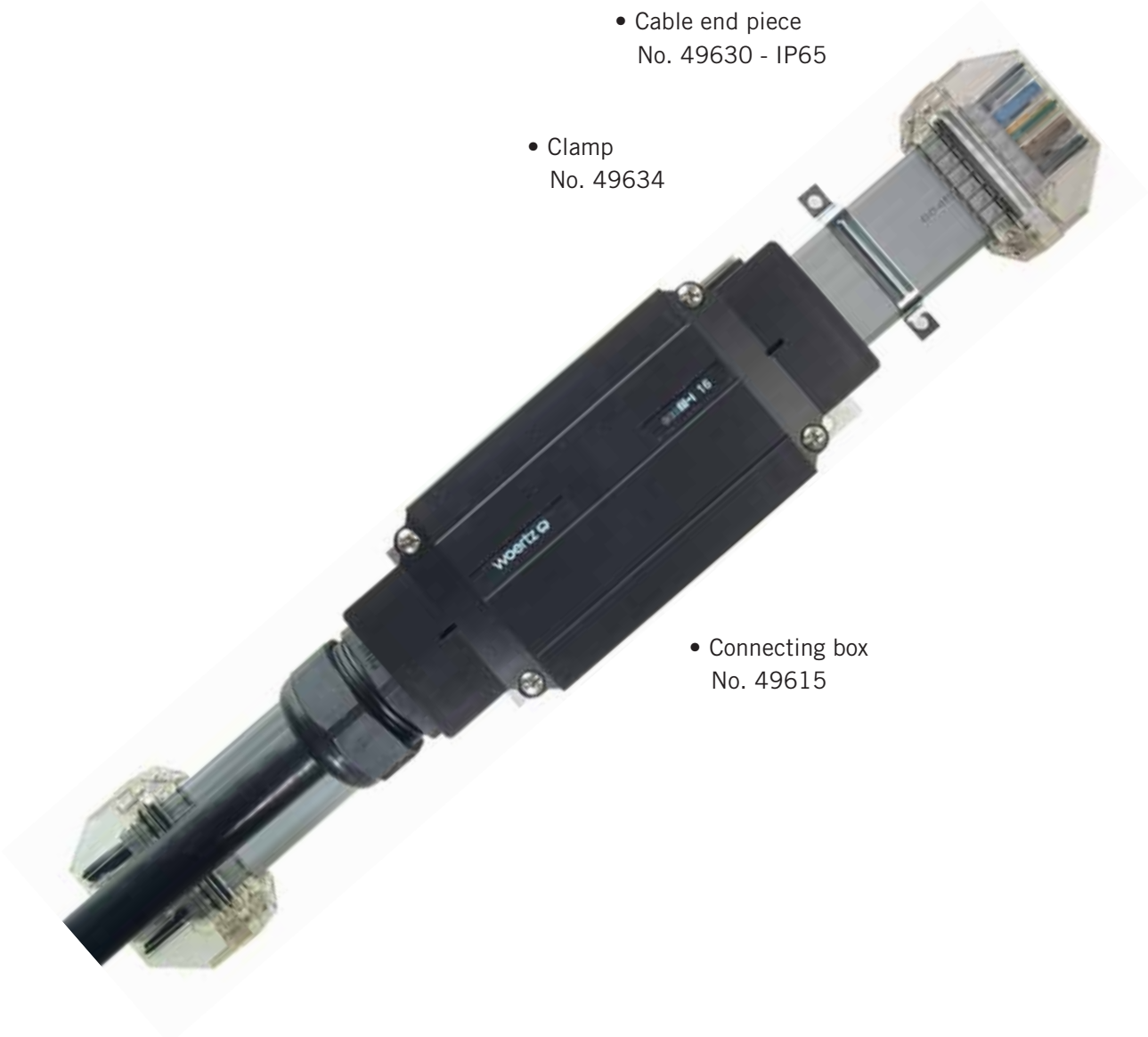
Cable stripping tool		Technical data		
No.	Eldas-No.	Weight g	60.5	The cable stripping tool allows the sheath to be split up on the narrow sides of the cable. Both sheath parts may then be cut by means of the shears. Note: The cable has to be stripped at both ends for a distance of 20 mm so that the conductors can be inserted properly in the end pieces.
49976	983 050 727	Packing unit pce.	1	

Shears		Technical data		
No.	Eldas-No.	Weight g	582	For cutting neatly and easily every type of flat cables (max. width 32mm).
49929	983 045 037	Packing unit pce.	1	

Insulating tape		Technical data		
No.	Eldas-No.	L×W×H mm	102×100×2.3	To reinsulate correctly the holes due to pointed screws or cutting teeth when removing or displacing connections.
49960	171 013 004	Weight g	33	
		Dielectric strength max. kV/mm	23	
		Temperature max.	+70 °C	Weatherproof, self-fusing
		Packing unit pce.	10	

Woertz 5G16 mm²

Efficient cabling for both power supply and distribution and also for feeding distribution boxes.



Where are these flat cable used?

- As flexible power rails for the supply of machinery
- As rising mains
- For the supply of distribution blocks
- For exhibitions and trade fairs
- For temporary installations on building sites
- For the lighting of tunnels
- For the shipbuilding
- For the lighting of halls
- For the supply of open-spaces (flat cable or round cable for feeding the receivers)
- Socket circuits with decentralised protection

Woertz 5G16 mm²

flat cable 5G16 mm²

		PVC		halogen-free	
		No.	Eldas-No.	**No.**	Eldas-No.
		**49605**	113 289 680	**49606**	113 299 680
3 L+N+PE					
Technical data					
Dimension	mm	48.5×11.3		48.5×11.3	
Weight	g/m	1300		1300	
Fire load	kWh/m	2.95		4.96	
No. of leads x cross-section	mm²	5×16		5×16	
Power current part					
Copper conductors		bare, highly flexible		bare, highly flexible	
Insulation of the leads		PVC		polyethylene Compound	
Colour of the leads		brown, blue, green/yellow, black, grey		brown, blue, green/yellow, black, grey	
Cross-section	mm²	16		16	
Test voltage	kV / Hz	4 / 50		4 / 50	
Rated voltage	kV	0.6/1		0.6/1	
DC-resistance	Ω/km	1.21		1.21	
Packing unit	m	250/500		250/500	
Cu weight	kg/km	768		768	

Woertz 5G16 mm²

Connecting box and branching box to flat cable No. 49605 and 49606

Connecting box		**Technical data**		
No.	Eldas-No.	L×W×H mm	200×85×91	Connecting box 5×16 mm²
49615	150 285 037	Weight g	800	with 1 outlet M40×1.5 for 1 Zuleitung with round
		Fire load kWh	3.30	cable 5×16 mm²
		Rated Cross-section mm²	16	
		Rated voltage V	690	Degree of protection IP65
		Max. rated current max. A	63	tightening torque Nm (Pointed screws) 3.5
		Plastic parts	halogen-free	screwdriver No. 2
		Metal parts	corrosion-resistant	tightening torque Nm (Clamping screws) 2
		Packing unit pce.	1	screwdriver No. 2
Branching box		**Technical data**		
No.	Eldas-No.	L×W×H mm	200×85×73	branching box 5×10 mm² with 2 outlets M25×1.5
49616	150 713 037	Weight g	650	for max. 1 round cable 5×10 mm² or
		Fire load kWh	2.97	2 round cable 5×6 mm²
		Rated Cross-section mm²	16	
		Rated voltage V	690	
		Max. rated current max. A	63	tightening torque Nm (Pointed screws) 3.5
		Plastic parts	halogen-free	screwdriver No. 2
		Metal parts	corrosion-resistant	tightening torque Nm (Clamping screws) 2
		Packing unit pce.	1	screwdriver No. 2
		Degree of protection	IP65	
with baseplate of aluminium				
No.				
49615A				
49616A				

Cable glands *(see page 74)*

Woertz 5G16 mm²

Accessories

Cable end piece		Technical data		
No.	Eldas-No.	L×W×H mm	80×30×57	Before mounting the cable, first strip it at both ends for a distance of 19 mm so that the specified creepage distance will be observed.
49630	150 901 137	Weight g	44	
		Fire load kWh	0.31	
		Packing unit pce.	4	
		Degree of protection	IP65	

Heat-shrinkable end cap	Technical data		
No.	L×Ø mm	165×55	Provided with adhesive and sealing compound inside
48511/55	Weight g	76.6	*Note:* Cut neatly both ends of the cable before mounting the end pieces. No need to strip the cable
	Packing unit pce.	5	may only be mounted once
	Degree of protection	IP68	

Clamp		Technical data		
No.	Eldas-No.	Dimension mm	10×77×1	Of galvanized steel
49634	120 018 017	Weight g	7	
		Packing unit pce.	100	

Cable stripping tool		Technical data		
No.	Eldas-No.	Weight g	59	The cable stripping tool allows the sheath to be split up on the narrow sides of the cable. Both sheath parts may then be cut by means of the shears.
49633	983 053 057	Packing unit pce.	1	
				Note: The cable has to be stripped at both ends for a distance of 25 mm so that the conductors can be inserted properly in the end pieces.

Shears		Technical data		
No.	Eldas-No.	Weight g	582	For cutting neatly and easily every type of flat cables (max. width 32mm).
49929	983 045 037	Packing unit pce.	1	
				

Insulating tape		Technical data		
No.	Eldas-No.	Dimension mm×m	50×1	To reinsulate correctly the holes due to pointed screws or cutting teeth when removing or displacing connections.
49632	150 901 147	Weight g	50.1	
		Dielectric strength max. kV/mm	18	
		Temperature max. °C	+70	
		Packing unit m	1	Weatherproof, self-fusing

Cable glands

Cable glands		Technical data		
No.	Eldas-No.	Weight g	23.3	of polyamide
49628	121 730 607		M25×1.5	delivered with O-ring seal of NBR, Ø 22×2 mm
		Ø Diameter of cables mm	9.0-16.0	
		Packing unit pce.	5	

Cable glands		Technical data		
No.	Eldas-No.	Weight g	22.6	of polyamide
49629	121 730 617		M25×1.5	delivered with O-ring seal of NBR, Ø 22×2 mm
		Ø Diameter of cables mm	13.0-18.0	halogen-free
		Packing unit pce.	5	

Cable glands		Technical data		
No.	Eldas-No.	Weight g	76.4	Of plastic material
49635	121 720 807		M40×1.5	delivered with O-ring seal of NBR
		Ø Diameter of cables mm	20.0-26.0	
		Packing unit pce.	5	

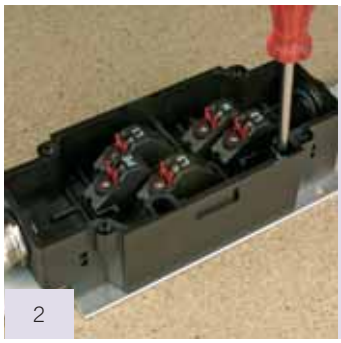
Cable glands		Technical data		
No.	Eldas-No.	Weight g	56.2	Of nickel-plated brass
49637	121 100 607		M25×1.5	delivered with O-ring seal of NBR, Ø 22×2 mm
		Ø Diameter of cables mm	11.0-20.5	corrosion-resistant
		Packing unit pce.	5	

Blind plug		Technical data		
No.	Eldas-No.	Weight g	7.9	Of plastic material
49639	126 227 014		M25×1.5	delivered with O-ring
		Packing unit pce.	5	halogen-free

Mounting procedure of connecting box No. 49615

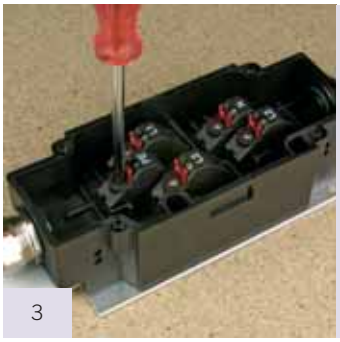
1

Open the baseplate. Insert the flat cable between box and baseplate.



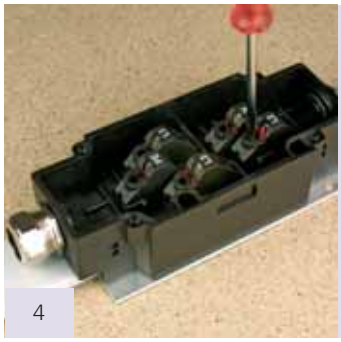
2

Fold the baseplate back and tighten up both fastening screws.



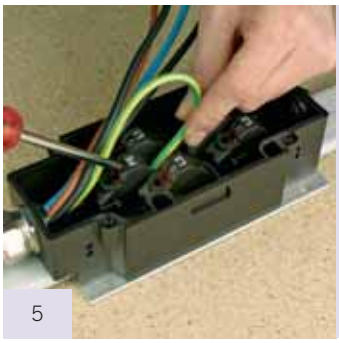
3

Turn in the pointed screws...



4

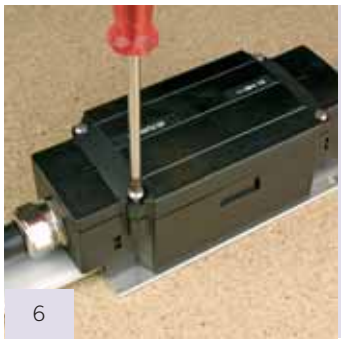
... until the red indicators are recessed.



5

Connect the round cable leads to the connecting terminals.

Mounting can also be performed in a different order:
5, 1, 2, 3, 4, 6.



6

Place the cover and tighten up the screws.

Possibility of pre-wiring:

Service to our customers.

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

For temporary installations, distribution blocks, cabines and machines for example, prewiring may be performed beforehand in our workshops (fig. 4). On the mounting site, there is no need to cut cables. The connection to the flat cable will be done in a matter of seconds, just using a screwdriver! Important time savings will thus be performed - to your advantage!

Connectors

Connector and socket KNX 2-pole

No.	Eldas-No.
connector	
49740M	157 800 288
type BST 14i2 F S1 Z	
socket	
49740F	150 901 127
type BST 14i2 F B1 Z	

Technical data

with spring connection, with code KNX.
to single-wire and highly flexible leads
0.25-0.75 mm²
with strain relief and locking,
to leads ø 5-7mm.

Height mm	14.4
Fire load kWh	0.04
Packing unit pce.	50

Snap-in KNX 2-pole

No.	
49420M	**(see picture)**
type BST 14i2	
49420F	
type BST 14i2	

Technical data

with spring connection, with code KNX.
to single-wire and highly flexible leads
0.25-0.75 mm², with locking.

Dimensions L×W×H mm	23.5×19.5×29.5
Mounting opening: mm	17.8×17.8
Sheet thickness mm	0.5-2.5
Fire load kWh	0.04
Packing unit pce.	25

Pre-wired connectors

No.	Eldas-No.
49740/1M	157 881 288
49740/2M	157 882 288
49740/3M	157 883 288
49740/1F	
49740/2F	
49740/3F	
49740/... *different lenghts on request*	

Technical data

Connector with one free cable end, 2-pole
type BST 14i2 KF-S, code KNX
with flexible round cable 2×0.5 mm², green

stripping length of sheath mm	20
stripping length of insulation mm	8
Height mm	14.4
Length m	1, 2, 3 etc..
Packing unit pce.	1

Connector and bus socket 2-pole

No.	
Connector	
49747M	
socket	
49747F	

Technical data

with spring connection, with code Woertz
(incompatible with code KNX)
to single-wire and highly flexible leads
0.25-0.75mm².
with strain relief and locking to leads ø 5-7mm.

Height mm	14.4
Fire load kWh	0.04
Packing unit pce.	50

Snap-in bus 2-pole

No.	
49421M	
49421F	**(see picture)**

Technical data

with spring connection, with code Woertz
(incompatible with code KNX)
to single-wire and highly flexible leads
0.25-0.75 mm², with locking.

Dimensions L×W×H mm	23.5×19.5×29.5
Mounting opening mm	17.8×17.8
Sheet thickness mm	0.5-2.5
Fire load kWh	0.04
Packing unit pce.	25

Pre-wired connectors

No.	Eldas-No.
49747/1M	157 881 238
49747/2M	157 882 238
49747/3M	157 883 238
49747/1F	
49747/2F	
49747/3F	
49747/... *different lenghts on request*	

Technical data

Connector with one free cable end 2-pole
(shield not connected)
code Woertz
with flexible round cable 2×0.5 mm², grey

stripping length of sheath mm	20
stripping length of insulation mm	8
Height mm	14.4
Length m	1, 2, 3 uws.
Packing unit pce.	1

Connector and bus socket 2-pole

No.	Eldas-No.
Connector	
49741M	157 804 218
type BST 14i3 F S1 Z	
Socket	
49741F	
type BST 14i3 F B1 Z	

Technical data

with spring connection, with code 3 (incompatible with code KNX).
to single-wire and highly flexible leads 0.25-0.75mm².
with strain relief and locking to leads ø 5-7mm.

Height mm	14.4
Fire load kWh	0.04
Packing unit pce.	50

Pre-wired connectors

No.	Eldas-No.
49741/1M	157 881 238
49741/2M	157 882 238
49741/3M	157 883 238
49741/1F	
49741/2F	
49741/3F	
49741/... *different lenghts on request*	

Technical data

Connector with one free cable end 2-pole (shield not connected)
type BST 14i3 F S1 Z, code 3
with flexible round cable 2×0.5 mm², grey

stripping length of sheath mm	20
stripping length of insulation mm	8
Height mm	14.4
Length m	1, 2, 3 uws.
Packing unit pce.	1

Pre-wired connectors

No.
49743/1M/BR
49743/2M/BR
49743/3M/BR
49743/1F/BR
49743/2F/BR
49743/3F/BR
49743/... *different lenghts on request*

Technical data

connector with free cable end 3-pole P+N+PE
type GST 18i3 S S1 Z, code 4 (brown)
locking possibility
with flexible round cable 3G1.5 mm², PVC, black

Height mm	25
Length m	1, 2, 3 uws.
Packing unit pce.	1

Mains connector 3-pole

No.	Eldas-No.
49743/M/BR	157 800 328

Technical data

with screw-type connection, black/brown, with code 4 (brown)
type GST 18i3 S S1 Z
to single-wire and highly flexible leads 1.5-2.5 mm²
with cord-grip ø 8-11 mm.

Height mm	25
Fire load kWh	0.18
Packing unit pce.	10

Locking

No.	Eldas-No.
49750	150 900 118

Technical data

Mechanical link between box and connector

Length mm	37.5
Packing unit pce.	10

Distributor block

No.	
49782/2SF2P	2-pole, KNX, 2 outputs F, 1 input M
49783/2SF3P	3-pole, GST, 2 outputs F, 1 input M
49783/3SF3P	3-pole, GST, 3 outputs F, 1 input M
49783/5SF3P	3-pole, GST, 5 outputs F, 1 input M
49785/1SFL1	5-pole, 1 output F 5P, 1 1 output F 3PL1
49785/1SFL2	5-pole, 1 output F 5P, 1 1 output F 3PL2
49785/1SFL3	5-pole, 1 output F 5P, 1 1 output F 3PL3
49785/2SF5P	5-pole, GST, 2 outputs F, 1 input M
49785/2SF5P/BL	5-pole, GST, 2 outputs F, 1 input M/BL
49785/3SF5P	5-pole, GST, 3 outputs F, 1 input M

Connector and mains socket 3-pole

No.	Eldas-No.
49743M	157 800 318
Socket	
49743F	

Technical data

with screw-type connection, with code 1
type GST 18i3 S S1 Z
for one connection cable up to 3×2.5 mm²

Height mm	13
Fire load kWh	0.11
Packing unit pce.	10

Pre-wired connectors - Connector and socket free end

different lenghts and colours on request

Connector - free end	
No. 3G1.5 mm²	**No. 3G2.5 mm²**
49743/1M	**49743/1M25**
49743/2M	**49743/2M25**
49743/3M	**49743/3M25**
socket - free end	
49743/1F	**49743/1F25**
49743/2F	**49743/2F25**
49743/3F	**49743/3F25**

Technical data

with free end 3-pole
type GST 18i3 locking possibility
with flexible round cable PVC, black

Height mm	13
Length m	1, 2, 3 etc.
	halogen-free also available
Packing unit pce.	1

Brass lead tips or ultrasonically compressed cable ends on request

Extensions - Connector and socket 3-pole

different lenghts and colours on request

Connector - socket 3G1.5 mm²
No.
49743/1MF
49743/2MF
49743/3MF
Connector - socket 3G2.5 mm²
49743/1MF25
49743/2MF25
49743/3MF25

Technical data

type GST 18i3 locking possibility
with flexible round cable PVC, black

Height mm	13
Length m	1, 2, 3 etc.
	halogen-free also available
Packing unit pce.	1

Connector and mains socket 5-pole

No.	Eldas-No.
49745M	157 800 518
Socket	
49745F	

Technical data

with screw-type connection, with code 1
type GST 18i5 S S1 Z
for one connection cable up to 5×2.5 mm²

Height mm	17
Fire load kWh	0.18
Packing unit pce.	10

Pre-wired connectors - Connector and socket free end

different lenghts and colours on request

Connector - free end	
No. 5G1.5 mm²	**No. 5G2.5 mm²**
49745/1M	**49745/1M25**
49745/2M	**49745/2M25**
49745/3M	**49745/3M25**
socket - free end	
49745/1F	**49745/1F25**
49745/2F	**49745/2F25**
49745/3F	**49745/3F25**

Technical data

with free end 5-pole
type GST 18i5 locking possibility
with flexible round cable PVC, black

Height mm	17
Length m	1, 2, 3 etc.
	halogen-free also available
Packing unit pce.	1

Extensions - Connector and socket 5-pole

different lenghts and colours on request

Connector - socket 5G1.5 mm²
No.
49745/1MF
49745/2MF
49745/3MF
Connector - socket 5G2.5 mm²
49745/1MF25
49745/2MF25
49745/3MF25

Technical data

type GST 18i5with locking
with flexible round cable PVC, black

Height mm	17
Length m	1, 2, 3 etc.
	halogen-free also available
Packing unit pce.	1

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.

IP68 Quick connection system

IP68 Quick connection system

Woertz IP 3G2.5 mm² and Woertz IP 3G4 mm²

A high protection degree, short installation procedures, easy handling and expansion possibilities are the main features of the system: anytime, anywhere, IP68 protected.

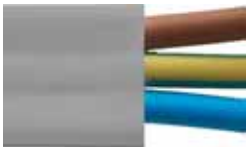
Where are these flat cables used?

- In installations related to stringent requirements. Its high protection degree allows this system to be used in tunnels, where many connections have to be made. Thanks to the rapid installation substantial time savings will be performed.
- Flexibility and robustness make the system ideal for building constructions, public works and open cast works in both construction and exploitation phases.
- In industrial washing plants, car wash sites or cleaning installations for tunnels or underground parking where powerful jets of water are used.
- The reliable components also suit outdoor applications such as market places, trade fairs and openair events.
- IP66/68 allows not only the use in wet but also in dusty environment. The system therefore suits workshops, joineries or industrial plants.
- No need to seal the connecting boxes or to sever the cable, new potential sources of errors are thus avoided.

Flat cable enables installations to be completed easily with further connections anywhere, anytime.

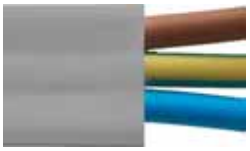
Woertz IP 3G2.5 mm²

flat cable IP 3G2.5 mm²

		PVC		halogen-free	
		No.	Eldas-No.	**No.**	Eldas-No.
 L+N+PE		**49685**		**49686**	
Technical data					
Dimensions	mm	16.5×6		16.5×6	
Weight	g/m	185		185	
Fire load	kWh/m	0.583		1.02	
No. of leads x cross-section	mm²	3×2.5		3×2.5	
Power current part					
Copper conductors		tinned, highly flexible		tinned, highly flexible	
Insulation of the leads		PVC oil resisting		vulcanized, flame retardant polyethylene	
Colour of the leads		brown, green/yellow, blue		brown, green/yellow, blue	
Cross-section	mm²	2.5		2.5	
Test voltage	kV / Hz	4 / 50		4 / 50	
Rated voltage	kV	0.6/1		0.6/1	
DC-resistance	Ω/km	7.98		7.98	
Cu weight	kg/km	72		72	

Woertz IP 3G4 mm²

flat cable IP 3G4 mm²

		PVC		halogen-free	
		No.	Eldas-No.	**No.**	Eldas-No.
 L+N+PE				**49646**	
Technical data					
Dimensions	mm			16.5×6	
Weight	g/m			224	
Fire load	kWh/m			0.95	
No. of leads x cross-section	mm²			3×4	
Power current part					
Copper conductors				tinned, highly flexible	
Insulation of the leads				vulcanized, flame retardant polyethylene	
Colour of the leads				brown, green/yellow, blue	
Cross-section	mm²			4	
Test voltage	kV / Hz			4 / 50	
Rated voltage	kV			0.6/1	
DC-resistance	Ω/km			5.09	
Cu weight	kg/km			116	

Woertz IP 3G2.5 mm² and Woertz IP 3G4 mm²

Woertz Quick connection technique to flat cable No. 49685, 49686 and 49646

IP68 box to flat cable

No.	Eldas-No.
48243/L/68	150 701 467

Technical data

L×W×H mm	120×30.5×42.5
Fire load kWh	0.29
Fire behaviour	UL 94-V0
Rated voltage V/Hz	690/50
Test current A	24
Cable gland thread	M16×1.5
Installation temperature min.	+5 °C
Packing unit pce.	5
Degree of protection	IP66/IP68 (2 m, 30 min)

Woertz patented piercing technique, without any tool

Protection IP68 (single contacting) / Protection IP40 (multiple contacting)

tightening torque Nm	0.7
screwdriver No.	1

IP68 LED box to flat cable

No.
48243/LED/230V

Technical data

L×W×H mm	17.5×30.5×54.5
Power consumption W	7
Luminous flux lm	380
Colour temperature K	5000
max. ambient temperature °C	80
Angle of radiation °	120
Supply voltage VAC	230
Current consumption mA	30
Packing unit pce.	5

Light source (Light emitting diode), LED

Colour of light white

Degree of protection IP65/IP68 (2 m, 30 min)

Cable glands

No.	Eldas-No.
48560/01/M16	121 682 507
48560/03/M16	121 682 517
48560/05/M16	121 682 527

Technical data

Diameter of cables M16×1.5 mm	4.5-6.0
	6.0-8.0
	8.0-10.5
Packing unit pce.	5

of polyamide, grey

delivered with O-ring seal of NBR

halogen-free

Woertz IP 3G2.5 mm² and Woertz IP 3G4 mm²

Accessories

End piece without stripping

No. Eldas-No.
48510/03 120 900 307

Technical data

L×W×H mm	40×25×15
Weight g	
Fire load kWh	na
Packing unit pce.	8
Degree of protection	IP68

of polycarbonate, halogen-free; silicone gel

Note:
Cut neatly both ends of the cable before mounting the end pieces. No need to strip the cable. Cable end piece may only be mounted once..

Clamp

No. Eldas-No.
49693 120 008 607

Technical data

L×W×H mm	31×10×8.5
Fire load kWh	0.01
Packing unit pce.	100

of polyamide 6.6, halogen-free, grey

Shears

No. Eldas-No.
49930 983 045 007

Technical data

Packing unit pce.	1

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

With sliding anvil. Teflon coated blades.

Insulating tape

No. Eldas-No.
49960 171 013 004

Technical data

Dimension mm	102×100×2.3
Dielectric strength max. kV/mm	23
Temperature max. °C	+70
Packing unit m	10

To reinsulate correctly the holes due to pointed screws or cutting teeth when removing or displacing connections.

Weatherproof, self-fusing.

Woertz power IP 5G2.5 mm²

Every connection you need where you need it…
Hard conditions don‘t affect products with a high IP protection degree…

- Cable end piece IP68
  No. 48510/08
- Quick connection box IP68
  No. 48385/L/68
- Quick connection box IP68 with fastening possibility for secure mounting
  No. 48385/L/68/S

Where are these flat cables used?

- In installations related to stringent requirements. Its high protection degree allows this system to be used in tunnels, where many connections have to be made. Thanks to the rapid installation substantial time savings will be performed.
- Flexibility and robustness make the system ideal for building constructions, public works and open cast works in both construction and exploitation phases.
- Three-phase loads may be supplied through this system. The lamps are distributed over the different pole conductors and individually switched.
- In industrial washing plants, car wash sites or cleaning installations for tunnels or underground parking where powerful jets of water are used.
- IP66/68 allows not only the use in wet but also in dusty environment. The system therefore suits workshops, joineries or industrial plants.
- No need to seal the connecting boxes or to sever the cable, new potential sources of errors are thus avoided.

Flat cable enables installations to be completed easily with further connections anywhere, anytime.

Woertz power IP 5G2.5 mm²

flat cable IP 5G2.5 mm²

3 L+N+PE

	halogen-free
No.	Eldas-No.
49863/FRNC	150 710 317

Technical data			
Dimension	mm		24×6
Weight	g/m		247
Fire load	kWh/m		0.671
No. of leads x cross-section	mm²		5×2.5
Power current part			
Copper conductors			tinned, highly flexible
Insulation of the leads			vulcanized and flame retardant polyethylene
Colour of the leads			grey, black, brown, blue, green/yellow
Cross-section	mm²		2.5
Test voltage	kV / Hz		4 / 50
Rated voltage	kV		0.6/1
DC-resistance	Ω/km		7.98
Max. operating temperature			-15 °C bis +90 °C
Min. Installation temperature			+5 °C
Bending radius			min. 6× cable thickness
Cu weight	kg/km		120

Connecting box for IP68 applications

Supply and pre-wired connector

Box		**Technical data**		
No.	Eldas-No.	L×W×H without cable gland mm	155×50×55	mounting without any tool
48385/L/68	150 710 407	L×W×H with fastening facility mm	155×75×55	
		Fire load kWh	0.74	Thread of cable gland: M20×1.5
		Fire behaviour	UL 94-V0	
		Connecting capacity mm	3.0×3.5	Fastening (screws or cable ties)
		Cross-section mm²	2.5	
		Cross-section with Litzenhülse mm²	4	
		Rated voltage V/Hz	400/50	
		Test voltage kV/Hz	4 / 50	
		Test current power max. A	24	
		Packing unit pce.	1	
Fastening:				
48385/L/68/S	150 710 417			
		Degree of protection	IP65/IP68 (2 m, 30 min)	

Accessories

End piece without stripping		Technical data		
No.	Eldas-No.	L×W×H mm	40×36×16	of polycarbonate, halogen-free; silicone gel
48510/05	120 900 617	Weight g	14.3	
		Fire load kWh	n.a.	Note:
		Packing unit pce.	5	Cut neatly both ends of the cable before mounting the end pieces. No need to strip the cable.
		Degree of protection	IP68	Cable end piece may only be mounted once.

Cable fastening clamp		Technical data		
No.	Eldas-No.	L×W×H mm	52×10×10	for cable fastening
49731	120 008 107	Weight g	2	
		Fire load kWh	0.02	of polyamide 6.6, halogen-free
		Packing unit pce.	100	

Clamp for screwing on		Technical data		
No.	Eldas-No.	L×W×H mm	40×15×15	**49733** for screwing on
49733	150 900 117	Weight g	3.7	**49733A** for sticking on
49733A	150 900 107	Fire load kWh	0.03	
		Packing unit pce.	100	of polyamide 6.6, halogen-free

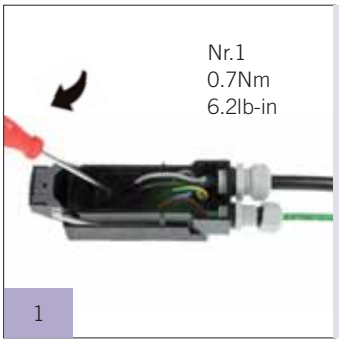
Shears		Technical data		
No.	Eldas-No.	Weight g	223	For cutting neatly and easily every type of flat cables (max. width 32mm).
49930	983 045 007	Packing unit pce.	1	
				With sliding anvil. Teflon coated blades.

Insulating tape		Technical data		
No.	Eldas-No.	L×W×H mm	102×100×2.3	To reinsulate correctly the holes due to pointed screws or cutting teeth when removing or displacing connections.
49960	171 013 004	Weight g	33	
		Dielectric strength max. kV/mm	23	
		Temperature max. °C	70	
		Packing unit pce.	10	Weatherproof, self-fusing.

Cable glands		Technical data		
No.	Eldas-No.			of polyamide, grey
48560/03/M20	121 682 607	Diameter of cables mm	8.0-11.0	M20×1.5
48560/05/M20	121 682 617		11.0-15.0	
				delivered with O-ring seal of NBR
		Packing unit pce.	5	halogen-free

Mounting procedure of the connecting box No. 48385/L/68

(can be used for supply and branching!)



1

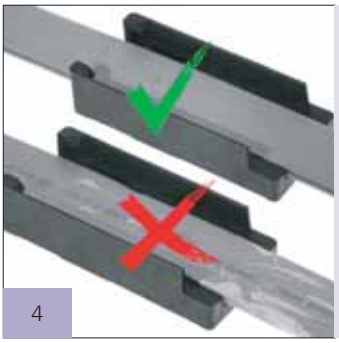
Open the cover. Put the cable gland on the round cable. Cut the round cable to the desired length and remove the sheath. Introduce the leads after having stripped off the insulation and tighten the clamping screws. Check if the O-ring seal is at the right position and tighten the cable gland.

2

Mount the cover again.

3

Position the base of the connecting box and screw it on to its support if required.



4

Position the asymmetric fl at cable (right position is shown by the groove in one narrow side of the cable sheath). Is the fl at cable not in the right position, it cannot be inserted into the base. The cable has to be clean, undamaged, free from grease and oil residue.

5

Snap together the upper part and the base.

6

Fold back the lever. It must audibly click into place. The box is thus connected and locked. It is also possible to secure the lever by using the supplied screw. The cover may be marked if necessary.

Possibility of pre-wiring:

Service to our customers.

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

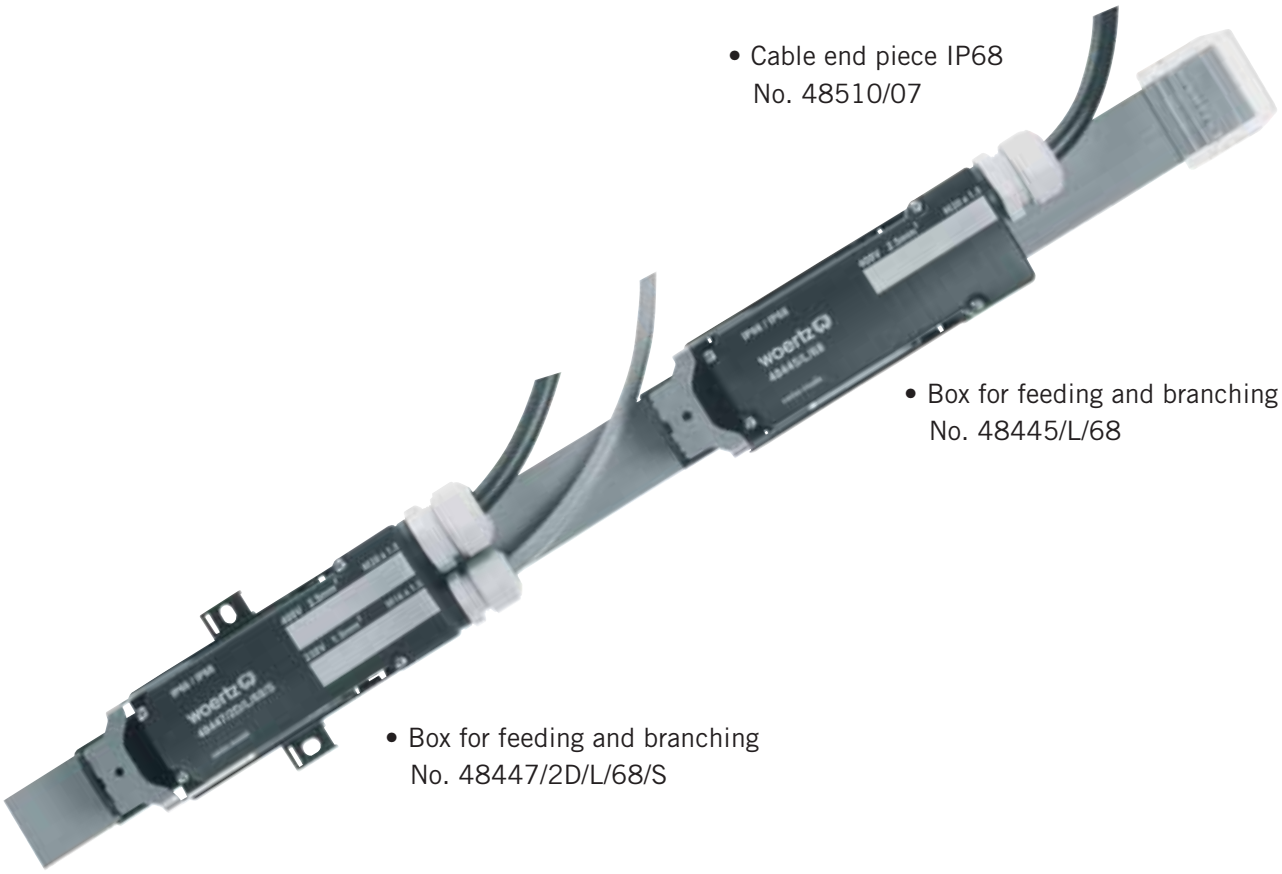
The overcurrent protection devices will be chosen in relation to the length of installed cables so that their response time conform to specifi cations in case of malfunction.

The box has only to be connected to the cable once. If the box has to be displaced, the protection degree of the system will no more be fulfi lled. However the box may be used as IP40 box. It is absolutely necessary to reinsulate correctly the holes due to the cutting teeth by means of the insulating tape, in order to ensure the IP protection degree. We do not assume liability for defects occuring through improper operation!

A high IP protection degree requires the highest demands on the installation material. The Woertz System guarantee only applies to original products fi nished in our workshops (such as fl at cables, boxes and accessories) or provided by appropriate, controlled suppliers.

Woertz combi IP 5G2.5 mm² + 2×1.5 mm²

For the first time bus technology finds application under more stringent requirements. Power current conductors and bus conductors are moulded here in a single cable sheath.



- Cable end piece IP68
  No. 48510/07
- Box for feeding and branching
  No. 48445/L/68
- Box for feeding and branching
  No. 48447/2D/L/68/S

Where is this flat cable system used?

- Three-phase loads may be supplied through this system. The same cable may also carry bus data.
- The flat cable ecobus combi with shielded bus cable finds broad application in the KNX technology for instance; power bus systems like DALI may be fed through the ecobus combi flat cable with unshielded bus cable.
- Flexibility and robustness make the system ideal for building constructions, public works and open cast works in both construction and exploitation phases.
- For the first time bus technology finds application under more stringent requirements. The high protection degree enables for instance DALI light control to be used in street tunnels.
- In industrial washing plants, car wash sites or cleaning installations for tunnels or underground parking where powerful jets of water are used.
- IP66/68 allows not only the use in wet but also in dusty environment. The system therefore suits workshops, joineries or industrial plants.
- No need to seal the connecting boxes or to sever the cable, new potential sources of errors are thus avoided.

Flat cable enables installations to be completed easily with further connections anywhere, anytime.

Woertz combi IP 5G2.5 mm² + 2×1.5 mm² - **without shield**

flat cable combi IP 5G2.5 mm² + 2×1.5 mm²

		PVC		halogen-free	
		No.	Eldas-No.	**No.**	Eldas-No.
 3L+N+PE+2 bus without shield				**49864/FRNC**	
Technical data					
Dimension	mm			33×6	
Weight	g/m			340	
Fire load	kWh/m			1.9	
No. of leads x cross-section	mm²			5×2.5 + 2×1.5	
Power current part					
Copper conductors				CU tinned, class 5	
Insulation of the leads				vulcanized and flame retardant polyethylene	
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	
DC-resistance	Ω/km			7.98	
Cu weight	kg/km			120	
Bus part					
Copper conductors				CU tinned, class 5	
Insulation of the leads				vulcanized and flame retardant polyethylene	
Colour of the leads				neutral	
Cross-section	mm²			1.5	
Test voltage	kV / Hz			4 / 50	
Rated voltage	V			230	
Max. rated current	A			3	
DC-resistance	Ω/km			13.3	
Capacitance	pF/m			70	
Attenuation at 1Hz	dB/100m			1.2/100	
Charact. impedance at 1 MHz	nom Ω			nom. 75	
max. operating temperature				-15 °C to +90 °C	
min. Installation temperature				+5 °C	
Cu weight	kg/km			29	

Woertz combi IP 5G2.5 mm² + 2×1.5 mm² - **without shield**

Boxes for feeding and branching, for IP68 applications

Feeding and branching box		Technical data			
No.	Eldas-No.	Weight g	210	No. of leads x cross-section mm²	5×2.5
48445/L/68	150 703 707	L×W×H mm,without cable gland	155×50×55	Cross-section of wires with end sleeves mm²	4
		L×W×H mm, with fastening facility	155×75×55	Test current power power current part A	24
		Fire load kWh	0.74	Test voltage kV/Hz	4 / 50
		Fire behaviour	UL 94-V0	Rated voltage Power current V/Hz	400/50
		Connecting capacity mm	3.0×3.5	Thread of cable gland	M20×1.5
with fastening facility:		Plastic parts	halogen-free		
No.	Eldas-No.	Metal parts	corrosion-resistant	tightening torque Nm	0.7
48445/L/68/S	150 703 717	Degree of protection	IP65/IP68 (2 m, 30 min)	screwdriver No.	1

Feeding and branching box		Technical data			
No.	Eldas-No.	Weight g	210	No. of leads x cross-section mm²	5×2.5+2×1.5
48447/2D/L/68	150 703 607	L×W×H mm, without cable gland	155×50×55	Cross-section of wires with	
		L×W×H mm, with fastening facility	155×75×55	end sleeves mm²	4 + 1.5
		Fire load kWh	0.74	Test current power power current part A	24
		Fire behaviour	UL 94-V0	Test voltage kV/Hz	4 / 50
		Connecting capacity mm	3.0×3.5	Rated voltage Power current V/Hz	400/50
with fastening facility:		Plastic parts	halogen-free	Rated voltage bus V/Hz	230/50
No.	Eldas-No.	Metal parts	corrosion-resistant	Max. rated current bus part A	3
48447/2D/L/68/S	150 703 617	Degree of protection	IP65/IP68 (2 m, 30 min)	Thread of cable gland	M20×1.5 & M16×1.5
				tightening torque Nm	0.7
				screwdriver No.	1

Woertz combi IP 5G2.5 mm² + 2×1.5 mm²

Accessories

Cable end piece

No.	Eldas-No.
48510/07	120 900 607

Technical data		
L×W×H mm	40×44×16	of polycarbonate, halogen-free; silicone gel
Weight g	16.8	
Fire load kWh	n.a.	Note:
Packing unit pce.	4	Cut neatly both ends of the cable before mounting the end pieces. No need to strip the cable.
Degree of protection	IP68	Cable end piece may only be mounted once.

Cable fastening clamp

No.	Eldas-No.
49731	120 008 107

Technical data		
L×W×H mm	52×10×10	for cable fastening
Weight g	2	
Fire load kWh	0.02	of polyamide 6.6, halogen-free
Packing unit pce.	100	

Clamp for screwing on

No.	Eldas-No.
49733	150 900 117
49733A	150 900 107

Technical data		
L×W×H mm	40×15×15	**49733** for screwing on
Weight g	3.7	**49733A** for sticking on
Fire load kWh	0.03	
Packing unit pce.	100	of polyamide 6.6, halogen-free

Shears

No.	Eldas-No.
49930	983 045 007

Technical data		
Weight g	223	for cutting neatly and easily every type of flat cables (max. width 32mm).
Packing unit pce.	1	
		With sliding anvil. Teflon coated blades

Insulating tape

No.	Eldas-No.
49960	171 013 004

Technical data		
L×W×H mm	102×100×2.3	to reinsulate correctly the holes due to cutting teeth when removing or displacing connections.
Weight g	33	
Dielectric strength max. kV/mm	23	
Temperature max. °C	+70	
Packing unit pce.	10	Weatherproof, self-fusing.

Cable glands

No.	Eldas-No.
48560/01/M16	121 682 507
48560/03/M16	121 682 517
48560/05/M16	121 682 527
48560/03/M20	121 682 607
48560/05/M20	121 682 617

Technical data		
		of polyamide, grey
Diameter of cables M16×1.5 mm	4.5-6.0	
	6.0-8.0	delivered with O-Ring seal of NBR
	8.0-10.5	
Diameter of cables M20×1.5 mm	8.0-11.0	halogen-free
	11.0-15.0	
Packing unit pce.	5	

Woertz power IP 5G6 mm²

Every connection you need where you need it... Hard conditions don‘t affect products with a high IP protection degree...

• Quick connection box IP68
No. 48785/L/68

• Quick connection box IP68 with fastening possibility for secure mounting
No. 48785/L/68/S

Where are these flat cables used?

- In installations related to stringent requirements. Its high protection degree allows this system to be used in tunnels, where many connections have to be made. Thanks to the rapid installation substantial time savings will be performed.
- Flexibility and robustness make the system ideal for building constructions, public works and open cast works in both construction and exploitation phases.
- In industrial washing plants, car wash sites or cleaning installations for tunnels or underground parking where powerful jets of water are used.
- The reliable components also suit outdoor applications such as market places, trade fairs and openair events.
- IP66/68 allows not only the use in wet but also in dusty environment. The system therefore suits workshops, joineries or industrial plants.
- No need to seal the connecting boxes or to sever the cable, new potential sources of errors are thus avoided.

Flat cable enables installations to be completed easily with further connections anywhere, anytime.

Woertz power IP 5G6 mm²

flat cable IP 5G6 mm²

	PVC		halogen-free	
	No.	Eldas-No.	**No.**	Eldas-No.
 3L+N+PE			■ **48780/FRNC**	
Technical data				
Dimensions	mm		32×7.5	
Weight	g/m		510	
Fire load	kWh		1.8	
No. of leads x cross-section	mm²		5×6	
Power current part				
Copper conductors			tinned, class 5	
Insulation of the leads			vulcanized, flame retardant polyethylene	
Colour of the leads			grey, black, green/yellow, blue, brown	
Cross-section	mm²		6	
Test voltage	kV / Hz		4 / 50	
Rated voltage	kV		0.6/1	
DC-resistance	Ω/km		3.39	
Cu weight	kg/km		288	

Flat cable boxes for IP68 application

Feeding and branching box

Box		Technical data		
No.	Eldas-No.	LxWxH without cable gland mm	155×50×55	may be mounted without any tool
48785/L/68		LxWxH with fastening facility mm	155×75×55	Thread of cable glands: M20×1.5
		Fire load kWh	0.74	
		Fire behaviour	UL 94-V0	Fastening facility by means of screws and cable ties
		Connecting capacity mm	3.0×3.5	
		Cross-section mm	2.5	
		Cross-section with Litzenhülse mm	4	
		Rated voltage V/Hz	400/50	
		Test voltage V/Hz	4 / 50	
		Test current power max. A	24	
		Weight g	210	
		Packing unit pce.	1	
fastening facility: 48785/L/68/S				
		Degree of protection	IP65/IP68 (2 m, 30 min)	

Accessories

Heat-shrinkable end cap

No.
48511/24

Technical data		
L×Ø mm	77×26	Provided with adhesive and sealing compound inside
Weight g	10.6	*Note:* Cut neatly both ends of the cable before mounting the end pieces. No need to strip the cable
Packing unit pce.	5	may only be mounted once.
Degree of protection	IP68	

Cable clamp for screwing on

No.	Eldas-No.
49981	120 009 007

Technical data		
L×W×H mm	32×15×8	for cable fastening
Weight g	1.5	
Fire load kWh	0.01	of polyamide 6.6, halogen-free
Packing unit pce.	500	

Shears

No.	Eldas-No.
49930	983 045 037

Technical data		
Weight g	223	For cutting neatly and easily every type of flat cables (max. width 32mm).
Packing unit pce.	1	

Insulating tape

No.	Eldas-No.
49632	150 901 147

Technical data		
L×W×H mm×m	50×1	To reinsulate correctly the holes due to pointed screws or cutting teeth when removing or displacing connections.
Weight g	50.1	
Dielectric strength max. kV/mm	18	
Temperature max.	+70 °C	
Packing unit m	1	Weatherproof, self-fusing.

Cable glands

No.	Eldas-No.
48560/03/M20	121 682 607
48560/05/M20	121 682 617

Technical data		
		of polyamide, grey
Diameter of cables mm	8.0-11.0	M20×1.5
	11.0-15.0	
		delivered with O-ring seal of NBR
Packing unit pce.	5	halogen-free

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).

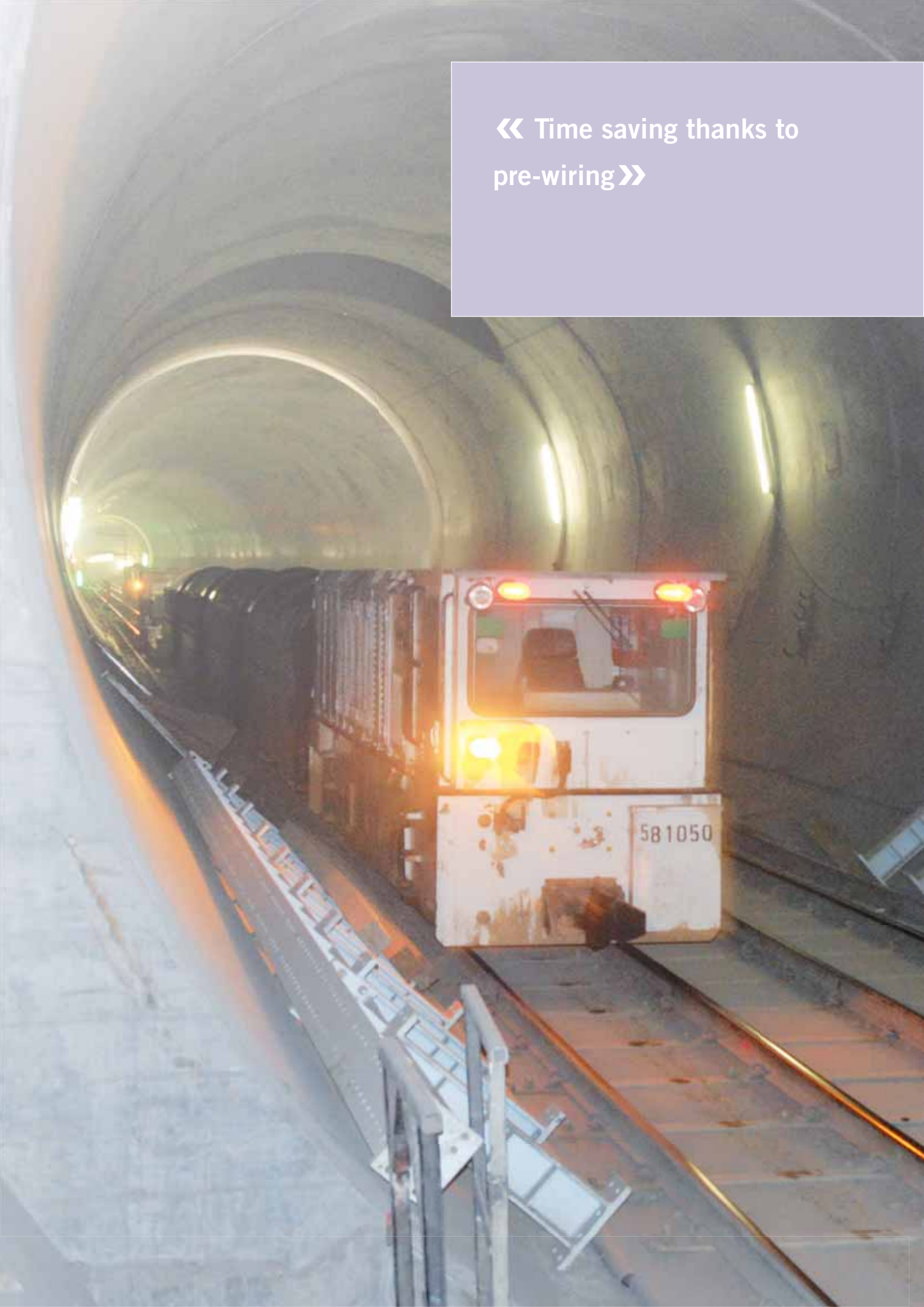
The degrees of protection are most commonly expressed as „IP“ followed by two characteristic numerals. The letters IP stands for Ingress Protection.

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 bodies exceeding 12.5mm dia. Keep fingers away.	
3	Protection against solid bodies exceeding 2.5mm dia. Keep away tools and wires.	
4	Protection against solid bodies exceeding 1mm dia. Keep away tools and 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 long submersion	



« Time saving thanks to pre-wiring »

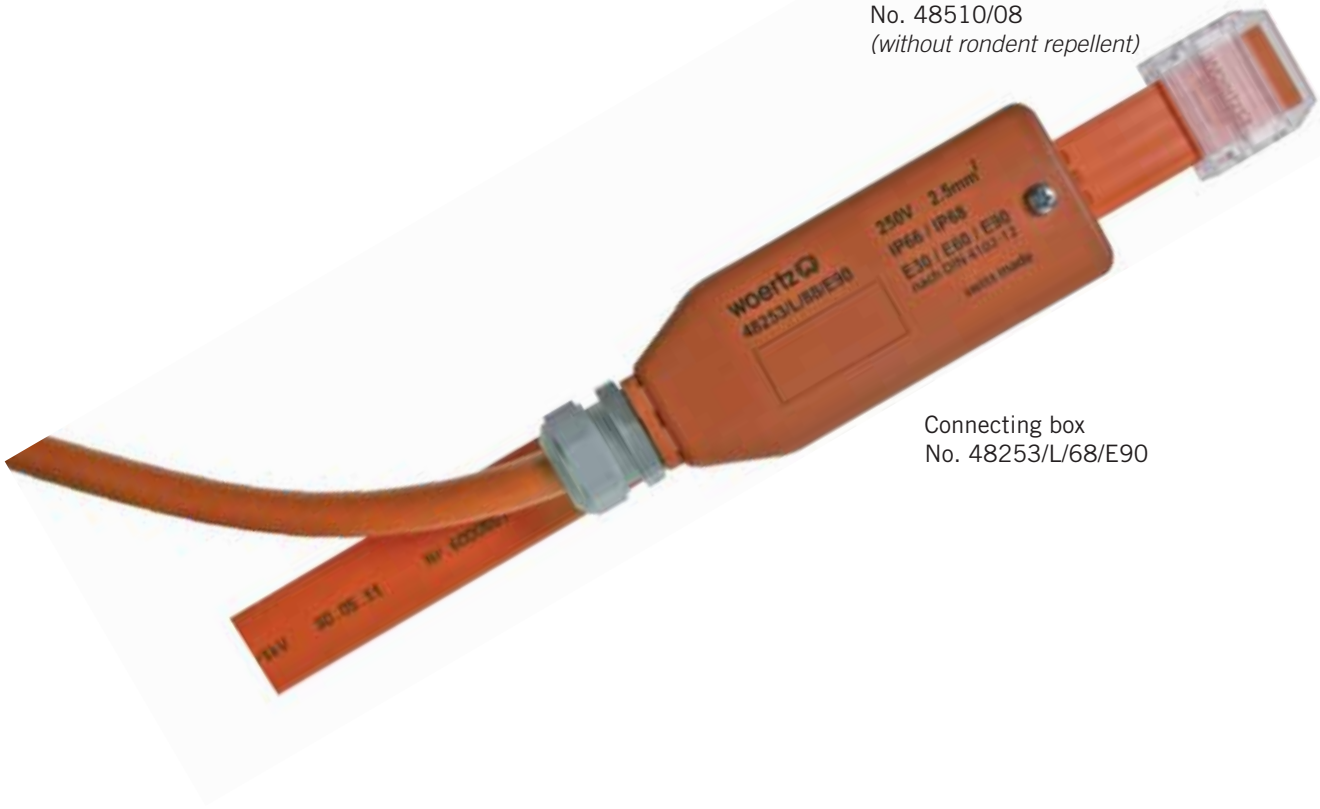
Safety systems FE180

Brandschutz FE180

Woertz FE180 3G2.5 mm²
Woertz FE180 5G2.5 mm²
Woertz FE180 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.

Transparent endi piece
No. 48510/08
(without rondent repellent)



Connecting box
No. 48253/L/68/E90

Where are these flat cables used?

- In installations running under stringent conditions
- For feeding safety components: emergency lighting and way guidance systems, smoke extraction systems or elevators specially meant for fire and rescue service.
- 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 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 3G2.5 mm²

flat cable for E90 application

	halogen-free
	No.
	**48250/FE180/NS/OR** **48250/FE180/NS/GE**
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
Power current part		
Copper conductors		CU bare
Insulation of the leads		ceramic insulated live parts
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
Properties of material		FRNC/LS0H
Additives in sheath		to keep away rodents
Insulation integrity		FE180
Function integrity		E90 (see catalogue **Safety Systems**)
DC-resistance	Ω/km	7.98
max. operating temperature (at conductor)		-15 °C to +90 °C
min. Installation temperature		+5 °C
Cu weight	kg/km	72

Woertz FE180 3G2.5 mm²

Flat cable box for E90 applications

Connecting box		Technical data		
No.	Eldas-No.	L×W×H mm	137×50×49 (without cable gland)	Plastic parts, halogen-free Metal parts: V4A Contacts of copper alloy
48253/L/68/E90		Weight g	330	
		Test current A	24	
		Test voltage kV/Hz	4/50	
		Rated voltage V/Hz	690/50	
		Protection degree	IP66/IP68 (2 m, 30 min.)	
		Function integrity	E90	Tightening torque Nm 0.7
		Thread of cable gland	M20×1.5	Screwdriver No. 1
		Contacts	Woertz Piercing	
		Packing unit pce.	3	

Accessories

End piece		Technical data		
No.	Eldas-No.	L×W×H mm	40×36×16	Of polycarbonate, halogen-free, with silicone gel
48510/08	120 900 617	Fire load kWh/m	non communiqué	
		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	

End piece		Technical data		
No.		L×W×H mm	40×36×16	of synthetic, rodent-repellent, white, halogen-free silicone gel
48510/08/NS		Fire load kWh	non communiqué	
		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	

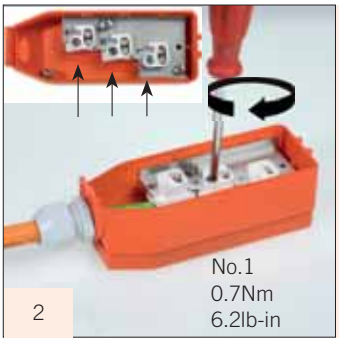
Shears		Technical data		
No.	Eldas-No.	Weight g	223	For cutting neatly and easily every type of flat cables of max. width 32mm.
49930	983 045 007	Packing unit pce.	1	
				With sliding anvil. Teflon coated blades.

Cable glands		Technical data		
No.	Eldas-No.	Diameter of cables mm	8.0-11.0	of polyamide, grey
48560/03/M20	121 682 607		11.0-15.0	M20×1.5
48560/05/M20	121 682 617	Packing unit pce.	5	delivered with O-ring seal of NBR
				halogen-free

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

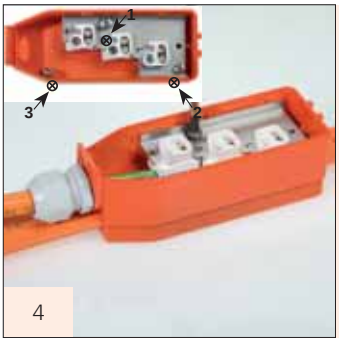
(may be used for both feeding and branching)

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.

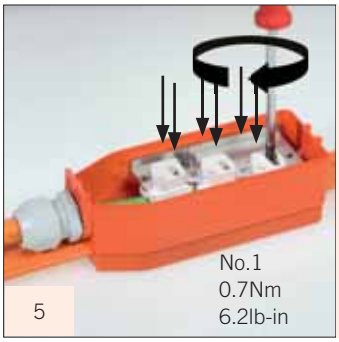


Tighten up the 3 screws. Once the O-ring positions correctly in the cable gland, tighten up the latter.

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



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



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

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

Pre-wiring means cost-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 specifi cations 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 fi nished in our workshops such as fl at cables, boxes and round cables with connectors.

Woertz FE180 5G2.5 mm²

flat cable for E90 applications

		halogen-free
		No.
		**48350/FE180/NS/OR**
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

Power current part		
Copper conductors		CU bare
Insulation of the leads		ceramic insulated live parts
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
Properties of material		FRNC/LS0H
Additives in sheath		to keep away rodents
Insulation integrity		FE180
Function integrity		E90 (see catalogue **Safety Systems**)
DC-resistance	Ω/km	7.98
max. operating temperature (at conductor)		-15 °C bis +90 °C
min. Installation temperature		+5 °C
Cu weight	kg/km	120

Woertz FE180 5G2.5 mm²

Flat cable box for E90 applications

Connecting boxes		Technical data		
No.		LxWxH mm	185x65x70 (without cable gland)	Plastic parts, halogen-free Metal parts: V4A Contacts of copper alloy
48353/L/68/E90				
Thread of cable gland	M20x1.5	Test current A	24	
		Test voltage kV/Hz	4/50	
48355/L/68/E90		Rated voltage V/Hz	690/50	
Thread of cable gland	M25x1.5	Protection degree	IP66/IP68 (2 m, 30 min.)	
		Function integrity	E90	Tightening torque Nm 0.9
		Contacts	Woertz Piercing	Screwdriver No. 1
		Packing unit pce.	5	

Accessories

Heat-shrinkable cap	Technical data		
No.	L×Ø mm	105x42	End cap with adhesive and sealant
48511/42	Weight g	33.8	
	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. Halogen-free

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	8.0-11.0	of polyamide, grey
48560/03/M20	121 682 607		11.0-15.0	M20x1.5
48560/05/M20	121 682 617	Packing unit pce.	5	delivered with O-ring seal of NBR halogen-free

Cable glands		Technical data		
No.	Eldas-No.	Diameter of cables mm	9.0-16.0	of polyamide, grey
49628	121 730 607		und 13-18	M25x1.5
49629	121 730 617	Packing unit pce.	5	delivered with O-ring seal of NBR halogen-free

Woertz FE180 5G16 mm²

flat cable for E90 applications

		halogen-free
		No.
		**48950/FE180/NS/OR**
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

Power current part		
Copper conductors		CU bare
Insulation of the leads		ceramic insulated live parts
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
Properties of material		FRNC/LS0H
Additives in sheath		to keep away rodents
Insulation integrity		FE180
Function integrity		E90 (see catalogue **Safety Systems**)
DC-resistance	Ω/km	1.15
max. operating temperature (at conductor)		-15 °C to +90 °C
min. Installation temperature		+5 °C
Cu weight	kg/km	768

Woertz FE180 5G16 mm²

Flat cable box for E90 applications

Branching boxes		Technical data		
No.		LxWxH mm	146x85x77 (without cable gland)	Plastic parts, halogen-free Metal parts: V4A Contacts of copper alloy
48953/L/68/E90				
Thread of cable gland	M20x1.5	Weight g	820	
		Test current A	24	
48955/L/68/E90		Test voltage kV/Hz	4/50	
Thread of cable gland	M25x1.5	Rated voltage V/Hz	690/50	
		Protection degree	IP66/IP68 (2 m, 30 min.)	Tightening torque Nm 0.9
		Function integrity	E90	Screwdriver No. 1
		Contacts	Woertz Piercing	
		Packing unit pce.	5	

Accessories

Heat-shrinkable end cap	Technical data		
No.	LxØ mm	165x55	end cap with adhesive and sealant
48511/55	Weight g	76.6	
	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. halogen-free

Cable glands		Technical data		
No.	Eldas-No.	Diameter of cables mm	8.0-11.0	of polyamide, grey
48560/03/M20	121 682 607		11.0-15.0	M20x1.5
48560/05/M20	121 682 617	Packing unit pce.	5	delivered with O-ring seal of NBR halogen-free

Cable glands		Technical data		
No.	Eldas-No.	Diameter of cables mm	9.0-16.0	of polyamide, grey
49628	121 730 607		und 13-18	M25x1.5
49629	121 730 617	Packing unit pce.	5	delivered with O-ring seal of NBR halogen-free

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 E90	DIN 4102 part 12

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 way 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.

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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SALES

Business hours
Monday-Friday
07:00–12:00
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.

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