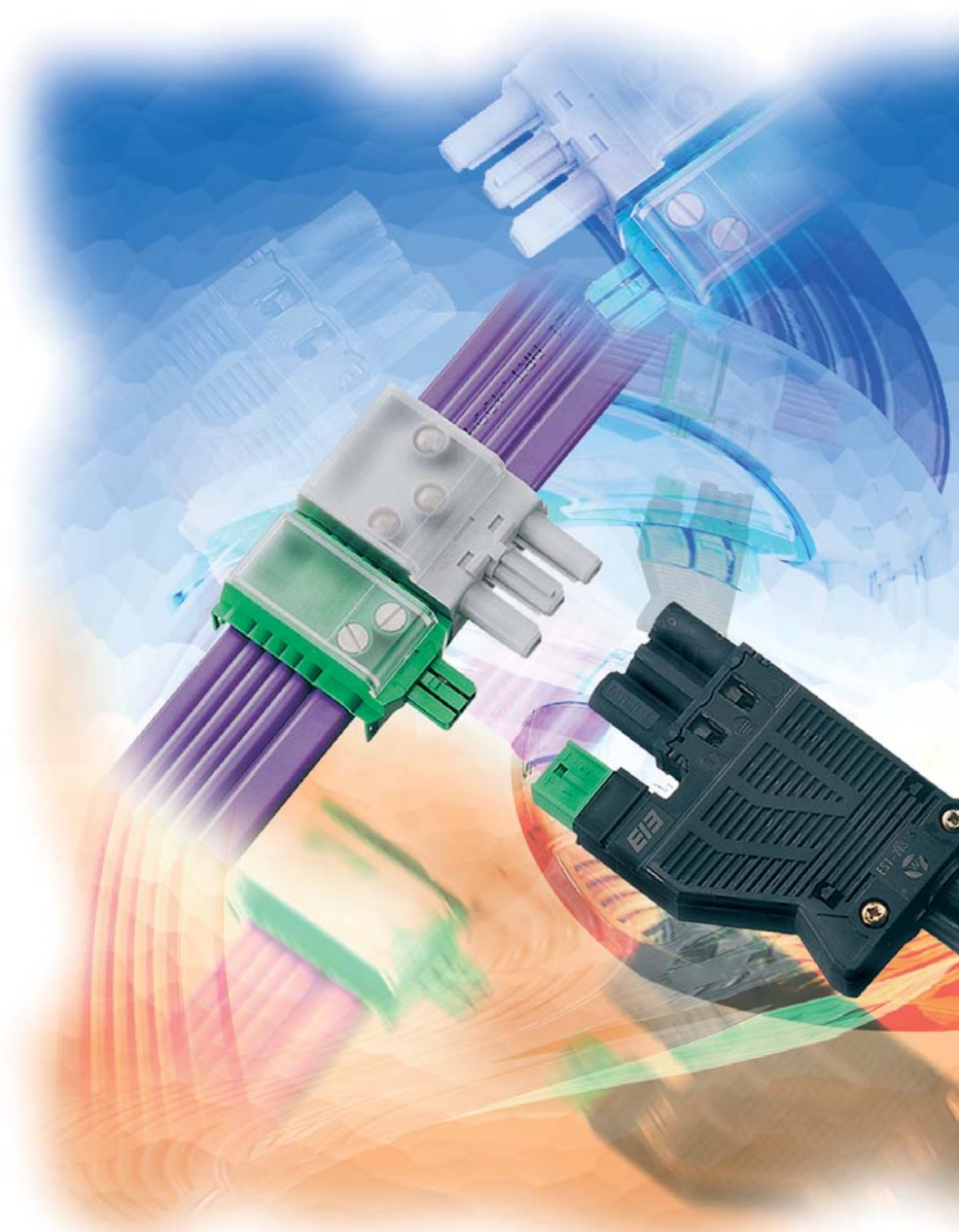
CABLING SYSTEMS

woertz



QUICK CONNECTION TECHNIQUE

Woertz AG
Hofackerstrasse 47, P.O. Box 948, CH-4132 Muttenz 1, Switzerland
Phone ++41 (0)61 466 33 33, Fax ++41 (0)61 461 96 06
www.woertz.ch

Introduction

Company profile

The Woertz company was founded in 1928; our head office is at Muttenz near Basle, Switzerland.

We are a family business with about 220 employees, known as a quality manufacturer of circuitry accessories, installation systems and electronic controls.

Our goals are:
- security,
- user-friendliness,
- and easy handling of our products.

We are certified according to ISO 9001 and ISO 14001.

Our range of products includes:
- terminals, junction boxes, grounding products, surge protection devices, profile bars and anchoring studs
- flat cable installation systems
- floor ducts, double floor systems, under-window ducts
- electronic modules and interfaces.

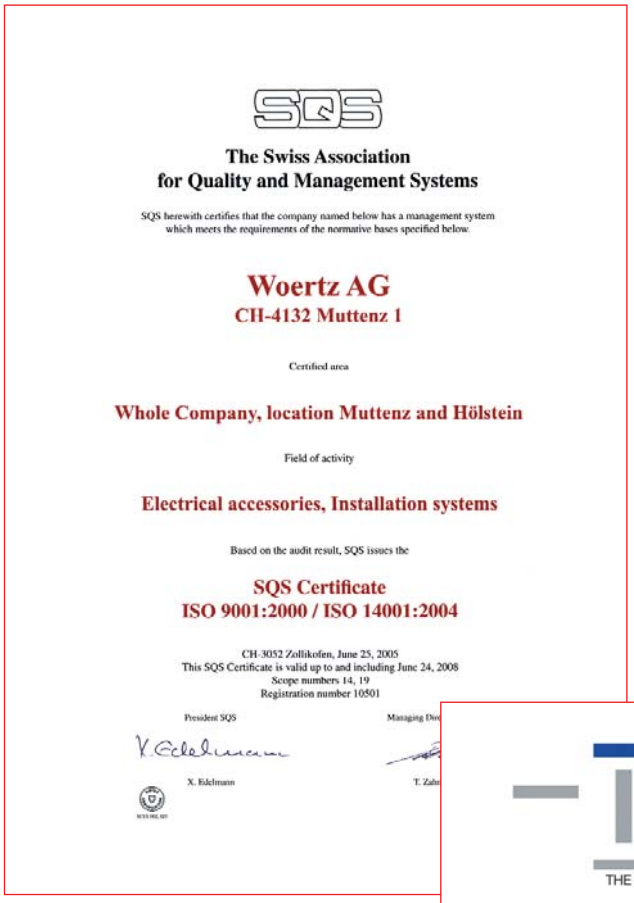
The circuitry accessories and the electronic controls are produced in our headquarters at Muttenz, the ducts and double floor systems in the branch located at Hölstein.

Muttenz head office

Hofackerstrasse 47, CH-4132 Muttenz, Switzerland
Tel. ++41 (0)61 466 33 33
Fax ++41 (0)61 461 96 06

Hölstein branch

Bärenmattenstrasse 3, CH-4434 Hölstein, Switzerland
Tel. ++ 41 (0)61 956 56 56
Fax ++ 41 (0)61 956 56 70



SQS

The Swiss Association for Quality and Management Systems

SQS herewith certifies that the company named below has a management system which meets the requirements of the normative bases specified below.

Woertz AG
CH-4132 Muttenz 1

Certified area

Whole Company, location Muttenz and Hölstein

Field of activity

Electrical accessories, Installation systems

Based on the audit result, SQS issues the

SQS Certificate
ISO 9001:2000 / ISO 14001:2004

CH-8052 Zollikofen, June 25, 2005
This SQS Certificate is valid up to and including June 24, 2008
Scope numbers 14, 19
Registration number 10501

President SQS

X. Edelmann

IQNet®

THE INTERNATIONAL CERTIFICATION NETWORK

CERTIFICATE

IQNet and SQS
hereby certify that the organization

Woertz AG
CH-4132 Muttenz 1

Certified area

Whole Company, location Muttenz and Hölstein

Field of activity

Electrical accessories, Installation systems

has implemented and maintains a
Management System
which fulfills the requirements of the following standards

ISO 9001:2000 / ISO 14001:2004

Scope Nos: 14, 19
Issued on: 2005-06-25
Validity date: 2008-06-24
Registration Number: ***CH-10501***

IQNet SQS

Dr. Fabio Roversi
President of IQNet

Theodor Zahner
Managing Director SQS

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IQNet is represented in the USA by the following partners: AFAQ, AIB-Vincotte International, CISQ, DQS, KEMA, NSAI, QMI and SAI Global

** The list of IQNet partners is valid at the time of issue of this certificate. Updated information is available under www.iqnet-certification.com*

The SQS certificate ISO 9001 was issued to us 1987 for the first time and renewed regularly. ISO 14001 since 1996.

Introduction

Design and use of flat cables

The flat cables are for stationary installations and not for mobile installations. They have cores of fine copper wires. On the flat cables are placed the flat cable boxes which are used to tap off current from the flat cables or to feed the flat cables with current. Flat cable boxes can be placed at any point on the whole length of the flat cables. The flat cable boxes consist of two parts with pointed screws or edges which pierce the flat cable sheaths and go into the cores of fine copper wires. The fine copper wires are first driven out by the entering pointed screws or edges and then the pointed screws or edges are clasped and hold tightly by the fine copper wires which ensures good current transfer (IEC Standard 60989-2-3, second edition). The condition for a safe function is the tolerance of not more than 0.3 mm between the pointed screws or edges of the flat cable boxes and the cores of the flat cables. The advantages of the flat cables are that tapping and feeding can be made in a very short time, that the flat cables are not cut and that wrong assembling is not possible. Flat cables can be compared with conductor rails.

Round cables have to be cut for derivations, dismantled and the cores stripped which requires more time than derivations from flat cables.
The simple connection with the flat cable boxes and the unlimited connecting possibilities all along the flat cables make flat cables to an interesting product especially if many connections have to be realized close side by side or if the definitive connection points can only be defined shortly before completion of a room.

Because flat cables are not cut and interrupted, installations with flat cables are superior to installations with round cables where many near to each other placed current consumers have to be connected (computers, assembly robots, sewing machines in the clothing industry, etc.)

Flat cable installations are superior to round cable installations in rooms where many times the current consumers are moved e.g. in offices which may temporarily be used as session rooms, training and conference rooms, packing area and therefore have to be always equipped with other devices. If flat cables are already installed in these rooms, only the connections have to be adapted to the changed conditions and this may happen in a few minutes with the flat cable boxes without disturbing the employees and without power cut.

Flat cable installations are superior to round cable installations in office buildings where at the time of installing only a part of the offices is rented. With a basic installation with flat cables the not yet known, future tenant will be satisfied and has the possibility to extend his installation without dust, dirt and noise. In offices the flat cables are laid in underwindow-ducts, wall ducts or floor ducts provided with sockets. With such ducts the planner of the electrical installations must no more decide where sockets have to be installed in the walls.

If for unforeseen reasons the installation of an office building is in delay and the tenants will move in, then comes the great chance for the flat cables. Once the measurements have been taken on the building site the flat cables are fitted with boxes and precisely labelled (with mention of the address in the building site). Thanks to the possibility of prewiring in his own workshop, the electrician will catch the time lost and the deadline will be met despite the initial delay.

Widely spread are flat cables for lighting installations. Flat cables are often used instead of lighting rails. The lighting rails are put together of pieces of 2.50 m or 3.00 m length. The last rail has to be cut to the right length and the remaining part cannot be used anymore. On the opposite flat cables can be cut to measure. No offcut. In hanging down ceilings the lighting appliances are arranged in a frame easy to feed with the flat cables.

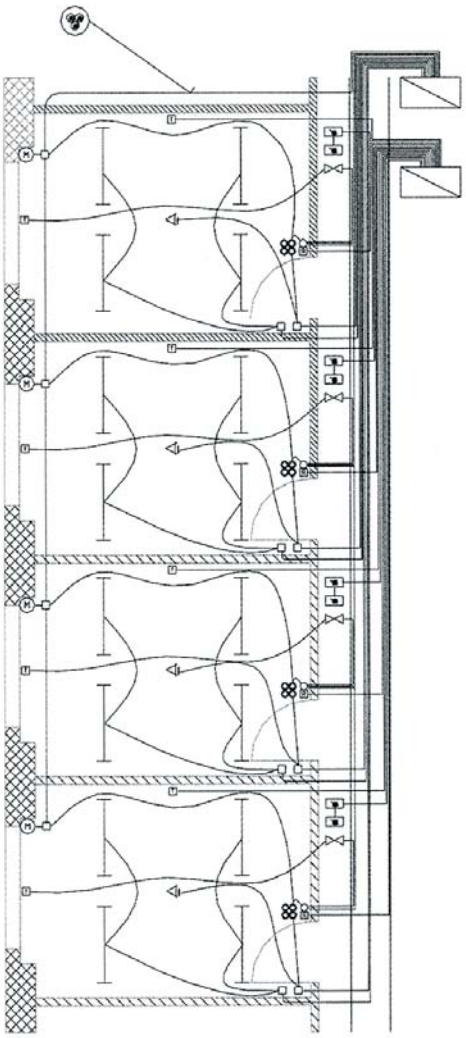
Flat cables with bus are the future for huge buildings. The bus is controlled by a PC. The purpose of the bus is to keep the energy consumption as low as possible e.g. open window - shut window, shutters down - shutters up or for the optimal control of lighting installations.

Comparison conventional installation / ecobus combi installation

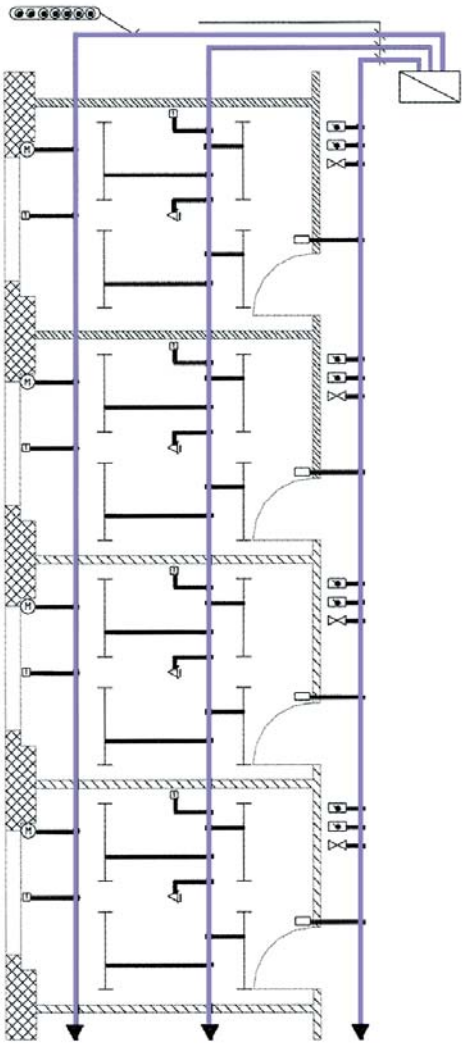
The signal for action comes over the bus part of the flat cable, the current for the drive motor for the window or for the shutters comes over the power part of the flat cables. Only one cable meeting both functions has to be laid which reduces labour.
The power supply to the starting points of the flat cables has to be made by round cables.
Flat cables should be installed where the advantages of many connections at any point, without dismantling and without cutting the flat cables can be used. If these advantages are not required and the cables just transport current eventually feeding some few current consumers in between then round cables are the right ones.
According to experience the part of flat cable is 10 to 20% of the total installation cabling in a building.

On the diagrams below a traditional installation has been compared to a modern ecobus combi flat cable installation. The decentral layout of sensors and actuators as well as the use of plug-type connectors enable the length of cable to be considerably reduced; installation and setting into operation will be realized in a very short space of time which necessarily means cost-saving.

Conventional installation with round cable 3x2.5 mm²

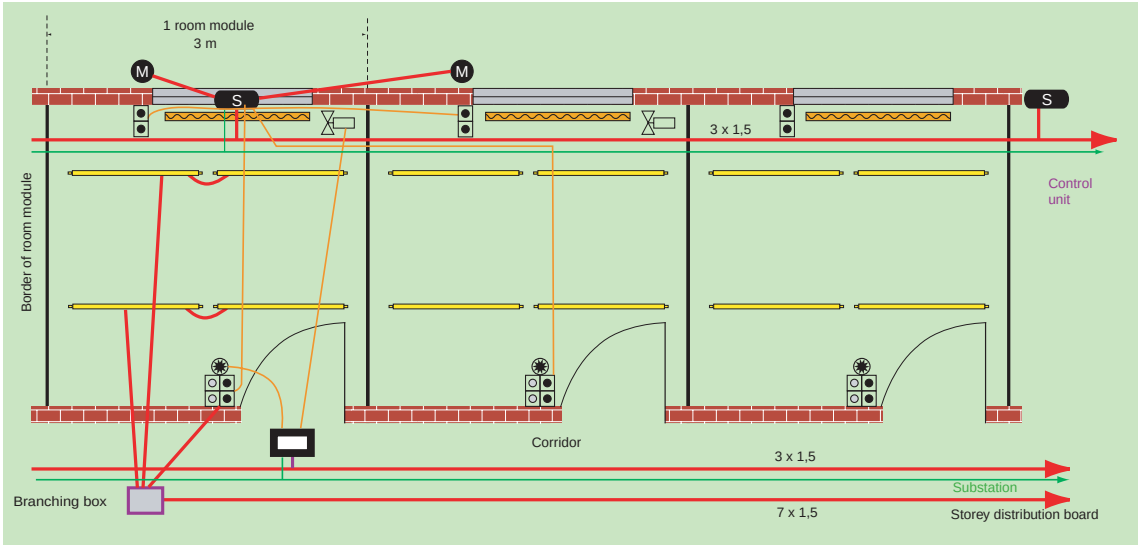


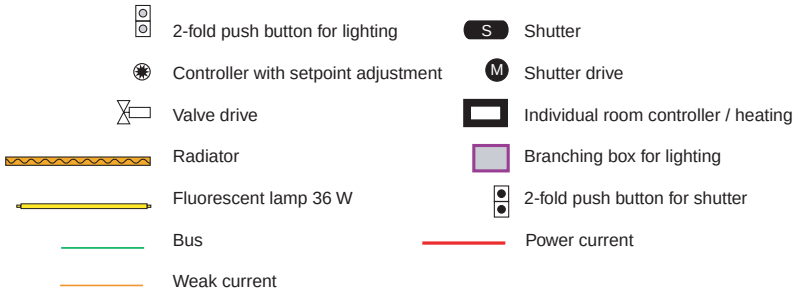
Modern ecobus combi installation with flat cable 5x2.5 mm² + 2x1.5 mm²



Introduction

Comparison of installations
Solution A: installation with round cable (common installation technique)

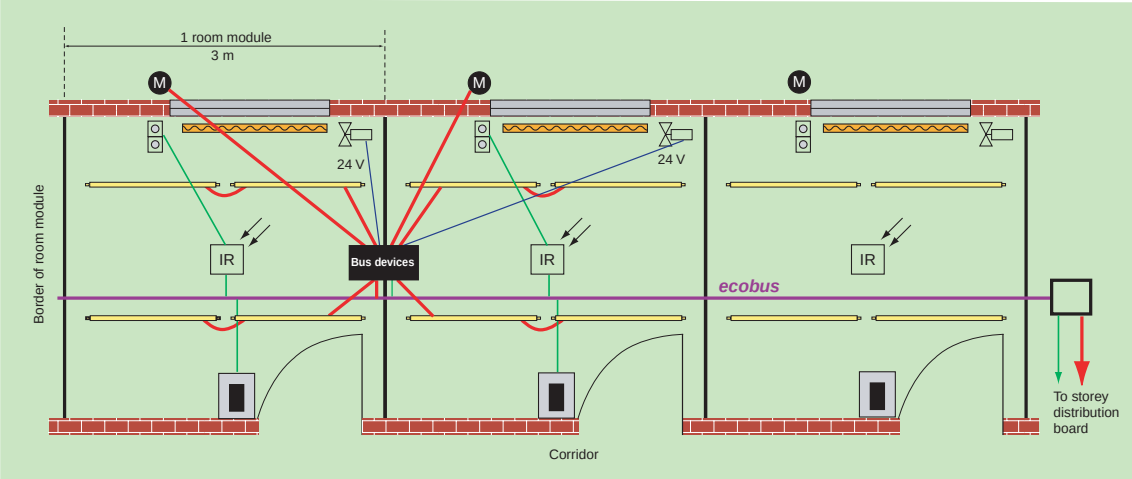


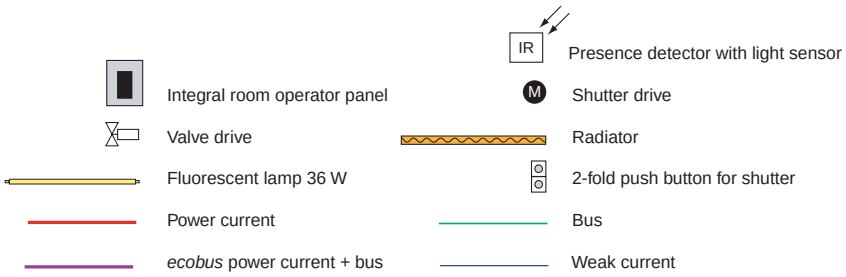


Total cable length and number of connections necessary for solution A, for lighting, shutters and individual room control.

	1 room module		40 room modules	
	Length (mm)	Number	Length (mm)	Number
Cables TT 2 x 1.5	8		320	
Connections TT 2 x 1.5		2		80
Cables TT 3 x 1.5	22		880	
Connections TT 3 x 1.5		15		600
Cables TT 4 x 1.5	3		120	
Connections TT 4 x 1.5		2		80
Cables TT 5 x 1.5	2		80	
Connections TT 5 x 1.5		1		40
Cables TT 7 x 1.5	18		720	
Connections TT 7 x 1.5		2		80
Cables U72 1 x 4	17		680	
Connections U72 1 x 4		6		240
Branching boxes 7 x 1.5		1		40
Total cable length, not prefabricated			**2800**	
Total cable length, prefabricated			**0**	
Total number of connections on site				**1120**

Comparison of installations
Solution B: installation with flat cable and EIB bus system (new installation technique)





Total cable length and number of connections necessary for solution B, for lighting, shutters and individual room control.

	1 room module		40 room modules	
	Length (mm)	Number	Length (mm)	Number
Cables TT 5 x 1.5 (supply lead for distribution board)	1		40	
Connections TT 5 x 1.5		0.2		8
Cables U72 1 x 4 (supply lead for distribution board)	1		40	
Connections U72 1 x 4		0.2		8
7-fold junction box incl. mounting				4
ecobus combi flat cable 7x	3		120	
7-fold junction box, ecobus plug-in type, incl. mounting		0.5		20
2-fold junction box, ecobus plug-in type, incl. mounting		2		80
Cables U72, 1 side prefabricated	11		440	
Connection U72 1 x 4		2		80
6 plug-in connecting cables for lamp, prefabricated	12		480	
Connecting cable 4 x 1, 1 side prefabricated	3		120	
Connection for connecting cable 4 x 1 for shutters		1		40
Total cable length, not prefabricated			**200**	
Total cable length, prefabricated			**1040**	
Total number of connections on site				**136**

Introduction

Examples of applications and installations

- **OMM, Geneva**
  Use of flat cable system
  ecobus combi 5x2.5mm^2+2x1.5mm^2
  in cable troughs

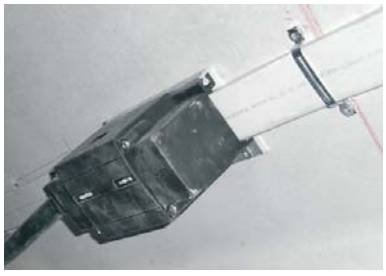
- **EuroAirport, Basle-Mulhouse**
  Use of flat cable system
  ecobus power 5x2.5mm^2
  in under-window ducts

- **La Défense, Paris**
  Use of flat cable system
  ecobus combi 5x2.5mm^2+2x1.5mm^2
  direct fastening to the ceiling

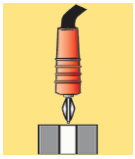
- **DaimlerChrysler, Stuttgart**
  Use of flat cable systems
  ecobus power 5x10mm^2 and ecobus data 2x1.5mm^2
  in skirting ducts

- **DVZ, Winterthur**
  Use of flat cable system
  ecobus combi 5x2.5mm^2 + 2x1.5mm^2
  direct fastening to the concrete floor

- **Aescher tunnel, Zurich**
  Use of flat cable system
  ecofil i 5x16mm^2
  direct fastening to the wall



screw-type connection

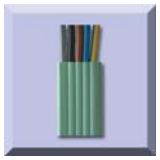


plug-type connection

spring-type connection

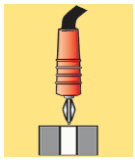
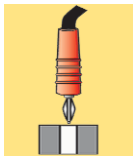
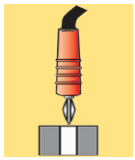
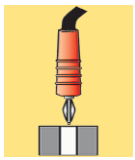
piercing tooth connection

ecoline P3
3x2.5 mm²
from page 5.2.16



ecobus power
5x2.5 mm²
from page 5.2.22

ecobus power
5x10 mm²
from page 5.2.38

	Connecting boxes for supply and branching	Connector (not suitable for the supply of the flat cables)	Connecting boxes for supply and branching	
 Sockets				
 Lighting				
 Bus devices, actuators, sensors				
 Appliances, venetian blinds, air conditioning units				
 Temporary connections				 
 Current supply				
 Machines				
 Motors, Motor starters				

Type of connection

ecobus combi 5x2.5 mm^2+2x1.5 mm^2 from page 5.2.44	ecobus data 2x1.5 mm^2 from page 5.2.66	multibus 4x1.5 mm^2 from page 5.2.74	ecofil i 7x2.5 mm^2 from page 5.2.86	ecofil i 5x16 mm^2 from page 5.2.94
Connecting boxes for supply and branching	Weak current 50 V	Weak current 50 V		

Overview

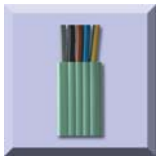
B U I L D I N G

ecoline P3
3x2.5 mm²
from page 5.2.16


page 5.2.20


page 5.2.21


page 5.2.19



ecobus power
5x2.5 mm²
from page 5.2.22


page 5.2.26

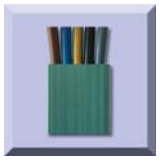

page 5.2.27


page 5.2.28

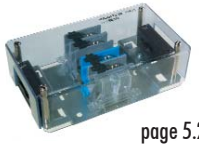

page 5.2.29


ab page 5.2.30


page 5.2.25

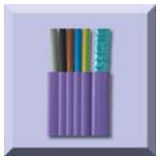


ecobus power
5x10 mm²
from page 5.2.38


page 5.2.42


page 5.2.43


page 5.2.41



ecobus combi
5x2.5 mm²+2x1.5 mm²
from page 5.2.44


page 5.2.48


page 5.2.49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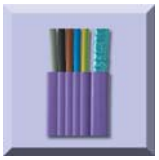
page 5.2.55

Overview



ecobus combi
5x2.5 mm^2+2x1.5 mm^2
from page 5.2.44


page 5.2.56


page 5.2.57


page 5.2.58


from page 5.2.59


page 5.2.47


page 5.2.47

ecobus data
2x1.5 mm^2
from page 5.2.66


page 5.2.70


page 5.2.71


page 5.2.72


page 5.2.69

multibus
4x1.5 mm^2
from page 5.2.74


from page 5.2.78

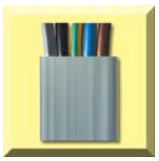

page 5.2.77

ecofil i
7x2.5 mm^2
from page 5.2.86


page 5.2.90


page 5.2.91


page 5.2.89

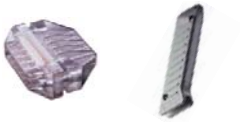


ecofil i
5x16 mm^2
from page 5.2.94


page 5.2.98


page 5.2.99


page 5.2.100


page 5.2.97

Quick connection technique ecoline P3 3 x 2.5 mm²

(patent applied)

No. 49687

No. 49695

Flat cable 1L+N+PE
3 x 2.5 mm²
(250V)
Overall dimensions 16.5 x 6 mm

The supply of the flat cable does usually not occur at the end of the cable, but by means of junction boxes connected at any point all along the flat cable.

Connecting box 3 x 2.5 mm², No. 49687, size: 55 x 33 x 33 mm
Flat cable connected by means of pointed screws, without the cable insulation having to be stripped
Connection of a round cable up to 3 x 2.5 mm² or of a second flat cable 3 x 2.5 mm² by means of screw terminals
It is recommended to use an electric screwdriver
Suitable for the supply of flat cable or for the branching from flat cables

Connector 3 x 2.5 mm², No. 49695, size: 90 x 30 x 34 mm
(not suitable for the supply of flat cables)
Flat cable connected by means of sheath piercing cutting teeth. The connector is fitted with a lever to fold back in order to perform quickly the connection
Connection of a round cable up to 3 x 2.5 mm² or of a second flat cable 3 x 2.5 mm² by means of screw terminals
It is recommended to use an electric screwdriver

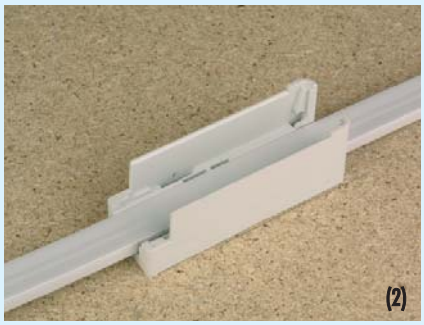
Where are these flat cables used?

- 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

It is easy to complete these flat cable installations with further connections.

Mounting procedure of the connector No. 49695 for the derivation of current from the flat cables 3x2.5mm² away to the current consumers (do not use the connector for the supply of the flat cable)

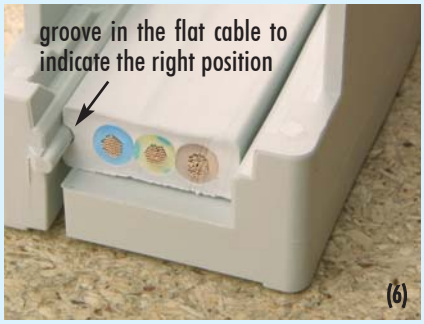

(1)


(2)


(3)


(4)


(5)



(6)

1. Position the base of the connector and screw it on to its support if required
2. Position the asymmetric flat cable (right position is shown by the groove in one narrow side of the cable sheath). Is the flat cable not in the right position, it cannot be inserted into the base - look at (6)
3. Cut the outgoing round cable 3x2.5mm² of black PVC to the desired length, dismantle it and introduce the leads. Tighten up the screws.
4. Snap together the upper part and the base with an audible click.
5. Fold back the lever. Lock!

Note: The connector may only be opened again by means of a tool.

On request the connectors may be pre-wired with outgoing round cable up to 3x2.5 mm² of black PVC.

Quick connection technique ecoline P3 3 x 2.5 mm²

Flat cable 3 x 2.5 mm²

The length of the installed cable has to guarantee the release of the overcurrent protection devices (circuit breakers) within 0.4 to 5 s. (contact voltage).
(Switzerland: see NIN "F2.8.4" "N4.3.4")

Environment: dry, UV-protected area

Ambient temperature: from -15°C up to +40°C

Installation temperature: min. +5°C

Designation	Flat cable of PVC asymmetric 1L+N+PE	Flat cable halogen-free asymmetric 1L+N+PE
No.	49685	49686
	Technical data	Technical data
Sheath	PVC according to IEC 227	Polyethylene Compound without corrosive gas acc. to DIN VDE 0472 Part 813
Colour of the sheath	Light grey RAL 7035	Light grey RAL 7035
Weight	185 g/m	185 g/m
Fire behaviour	Flame retardant according to IEC 60332-1	Flame retardant according to IEC 60332-1 Low fire propagation acc. to IEC 60332-3 Low smoke development acc. to IEC 61034-1/2 Marking on the sheath: FR/LSOH (Flame Retardant / Low Smoke / Zero Halogen)
No. of leads x cross-section	3 x 2.5 mm²	3 x 2.5 mm²
Copper conductors	tinned, highly flexible acc. to CENELEC HD 383 S2 Class 5	tinned, highly flexible acc. to CENELEC HD 383 S2 Class 5
Insulation of the leads	PVC according to IEC 227	Flame retardant, vulcanized and halogen-free Polyethylene Compound
Colour of the leads	brown, green/yellow, blue	brown, green/yellow, blue
Test voltage	4 kV, 50 Hz	4 kV, 50 Hz
Rated voltage	250 V	250 V
Current-carrying capacity	according to IEC 60364-5-523 and SEV NIN 42512.2	according to IEC 60364-5-523 and SEV NIN 42512.2
DC-resistance	7.98 Ω/km	7.98 Ω/km
Note	Flat cable also available with black strips **No. 49685/SM**	Flat cable also available with black strips **No. 49686/SM**

Accessories

Cable stripping tool
No. 49690

The cable has to be stripped at both ends for a distance of 19 mm so that the conductors of the flat cable can be inserted properly in the end pieces.
This tool offers the advantage of stripping neatly and easily the cable without damaging the insulation of the conductors.

Packing unit: 1 pce.

Cable end piece
No. 49689

To be mounted at both ends of the flat cable, so that the specified creepage distance will be observed. The cable has to be stripped for a distance of 19 mm.

Of polycarbonate, halogen-free, transparent
Dimensions: 45 x 24.5 x 9 mm
Weight: 6 g
Fire load: 0.06 kWh

Packing unit: 20 pce.

Shears
No. 49930

For cutting neatly and easily every type of flat cables up to 2.5 mm².
With sliding anvil. Teflon coated blades.

Packing unit: 1 pce.

Cable fastening clamp for screw fixing
No. 49693

Of polyamide 66, halogen-free, grey
Dimensions: 31 x 10 x 8.5 mm
Weight: 0.95 g
Fire load: 0.01 kWh

Packing unit: 100 pce.

Complete set:
Cable stripping tool + Shears
No. 49692

Packing unit: 1 Set

Insulating tape
No. 49960

When connections are removed or displaced, the boxes have to be left in position. If it is not possible, the holes produced by the pointed screws or by the cutting teeth have to be reinsulated correctly by means of the insulating tape trademark "Scotch 2210", synthetic caoutchouc-based product, PVC coated black.
Weatherproof, self-fusing.
Dimensions: 102 x 100 x 2.3 mm
Dielectric strength: max. 23 kV/mm
Temperature: max. +70°C
Packing unit: 10 pce.

Quick connection technique ecoline P3 3 x 2.5 mm²

Connecting box with screw connection to flat cables No. 49685 and 49686

Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

Designation — **Connecting box 3 x 2.5 mm²
For supply and branching
(no need to strip the insulation)**

No. — **49687**

Technical data

Weight	45 g
Fire load	0.24 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-1 / IEC 60998-2-3
Plastic parts	light grey / transparent, halogen-free
Metal parts	corrosion-resistant
No. of leads x cross-section	3 x 2.5 mm²
Connecting capacity	∅ 3.75 mm
Pointed screws	Tightening torque 0.7 Nm, screwdriver for Phillips recessed head screw No.1
Clamping screws	Tightening torque 0.7 Nm, screwdriver for Phillips recessed head screw No. 1
Cross-section of the conductors	2.5 mm²
Rated voltage	250 V
Test current	24A
Packing unit	10 pce.

Connection

Connection of a flexible round cable up to 3 x 2.5 mm² or of a second flat cable No. 49685/49686.

The connection of the round supply cable or of the second flat cable can be performed in the workshop. On site the connecting boxes have just to be positioned on the cable and the pointed screws to be tightened by means of an electric screwdriver.

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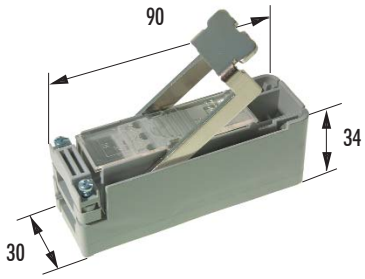
Quick connection technique ecoline P3 3 x 2.5 mm²

Connector with cutting teeth to flat cables No. 49685 and 49686

Not suitable for the supply of flat cables!



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patent applied

Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

Designation — **Connector 3 x 2.5 mm² for branching (no need to strip the insulation)**

No. — **49695**

Technical data

Weight	85 g
Fire load	0.36 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-1 / IEC 60998-2-3
Plastic parts	light grey / transparent, halogen-free
Metal parts	corrosion-resistant
No. of leads x cross-section	3 x 2.5 mm²
Connecting capacity	Ø 3.75 mm
Clamping screws	M3, tightening torque 0.7 Nm, screwdriver No.1
Cross-section of the conductors	2.5 mm²
Rated voltage	250 V
Test current	24A
Packing unit	10 pce.

Easier working on site!

On request the connectors No. 49695 can be prewired with flexible round cable 3 x 2.5 mm²

Connection

Connection of a flexible round cable up to 3 x 2.5 mm² or of a second flat cable No. 49685/49686 at the upper part of the connector.

The connection of the round supply cable or of the second flat cable can be performed in the workshop. On site the flat cable has just to be positioned in the base of the connector and the lever to be fold back.

Versions with plug-type connections

No. 49696
Connector No. 49695, prewired
with 10 cm round cable 3x1.5 mm²
with 3-pole Wieland connector, type GST 18i3 F B2 Z

No. 49697
Connector No. 49695, prewired
with 10 cm round cable 3x1.5 mm²
with 3-pole Ensto connector, type NAC32S

No. 49698
Connector No. 49695, prewired
with 10 cm round cable 3x1.5 mm²
with 3-pole Wago connector, type WINSTA

Quick connection technique ecobus power 5 x 2.5 mm²

Flat cable 3L+N+PE
5 x 2.5 mm²
(0.6/1kV)
Overall dimensions 24 x 6 mm

The supply of the flat cable does usually not occur at the end of the cable, but by means of junction boxes connected at any point all along the flat cable.

Connecting box 5 x 2.5 mm²
Flat cable connected by means of pointed screws, without the cable insulation having to be stripped
Connection of a round cable up to 5 x 2.5 mm² by means of screw terminals
It is recommended to use an electric screwdriver
Suitable for the supply of flat cables or for the branching from flat cables.
Connecting box, flat execution
Connecting boxes for different lamp connections

Where are these flat cables used?

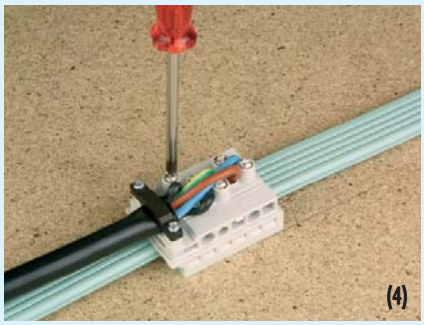
- in office buildings
- supermarkets
- shopping centres
- malls
- museums
- exhibitions
- trade fairs
- for the lighting of platforms on railway stations
- for the lighting of multi-storey car parks
- for light industry
- in watch factories
- in sewing workshops
- for temporary lighting installations on sites

Mounting procedure of connecting box No. 49701P


(1)


(2)


(3)


(4)


(5)


(6)

1. Place the connecting box on the asymmetric flat cable (no need to strip the insulation of the cable)
2. Push on the baseplate (light green). Should the box have been fitted to the cable in the wrong position, the bottom part of the box cannot be fitted with normal force; in this case the box has to be turned through 180°.
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.

To release the hood, insert a screwdriver in the slit provided for the purpose and lift slightly (6)

Possibility of pre-wiring:

In the workshop of the electrician the devices to be connected are wired in advance to the flat cable boxes. On the building site the flat cable boxes are placed on the flat cable, the baseplates are pushed on and the pointed screws drilled into the flat cable to make the electrical contact.

Quick connection technique ecobus power 5 x 2.5 mm²

Flat cable 5 x 2.5 mm²

The length of the installed cable has to guarantee the release of the overcurrent protection devices (circuit breakers) within 0.4 to 5 s. (contact voltage).
(Switzerland: see NIN "F2.8.4" "N4.3.4")

Environment: dry, UV-protected area

Ambient temperature: from -15°C up to +40°C

Installation temperature: min. +5°C

Designation	Flat cable of PVC asymmetric 3L+N+PE	Flat cable halogen-free asymmetric 3L+N+PE
No.	49845	49846
	Technical data	Technical data
Sheath	PVC according to IEC 227	Polyethylene Compound without corrosive gas acc. to DIN VDE 0472 Part 813
Colour of the sheath	Light green RAL 6027	Light green RAL 6027
Weight	259 g/m	247 g/m
Fire load	0.778 kWh/m	0.671 kWh/m
Fire behaviour	Flame retardant according to IEC 60332-1	Flame retardant according to IEC 60332-1 Low fire propagation acc. to IEC 60332-3 Low smoke development acc. to IEC 61034-1/2 Marking on the sheath: FR/LSOH (Flame Retardant / Low Smoke / Zero Halogen)
No. of leads x cross-section	5 x 2.5 mm²	5 x 2.5 mm²
Copper conductors	bare, highly flexible acc. to CENELEC HD 383 S2 Class 6	bare, highly flexible acc. to CENELEC HD 383 S2 Class 6
Insulation of the leads	PVC according to IEC 227	Flame retardant, vulcanized and halogen-free Polyethylene Compound
Colour of the leads	grey, black, brown, blue, green/yellow	grey, black, brown, blue, green/yellow
Test voltage	4 kV, 50 Hz	4 kV, 50 Hz
Rated voltage	0.6/1kV	0.6/1kV
Current-carrying capacity	according to IEC 60364-5-523 and SEV NIN 42512.2	according to IEC 60364-5-523 and SEV NIN 42512.2
DC-resistance	7.98 Ω/km	7.98 Ω/km
Note	Flat cable also available with black strips **No. 49845/SM**	Flat cable also available with black strips **No. 49846/SM**

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Accessories

Cable stripping tool
No. 49736

The cable has to be stripped at both ends for a distance of 19 mm so that the conductors of the flat cable can be inserted properly in the end pieces.
This tool offers the advantage of stripping neatly and easily the cable without damaging the insulation of the conductors.

Packing unit: 1 pce.

Cable end piece
No. 49734

To be mounted at both ends of the flat cable, so that the specified creepage distance will be observed. The cable has to be stripped for a distance of 19 mm.

Of polycarbonate, halogen-free, transparent
Dimensions: 43 x 32 x 9 mm
Weight: 7 g
Fire load: 0.06 kWh

Packing unit: 10 pce.

Shears
No. 49930

For cutting neatly and easily every type of flat cables up to 2.5 mm².
With sliding anvil. Teflon coated blades.

Packing unit: 1 pce.

Cable fastening clamp for screw fixing
No. 49731

Of polyamide 66, halogen-free, grey
Dimensions: 52 x 10 x 10 mm
Weight: 2 g
Fire load: 0.02 kWh

Packing unit: 100 pce.

Complete set:
Cable stripping tool + Shears
No. 49737

Packing unit: 1 Set

Cable fastening clamps
No. 49733
No. 49733A

No. 49733 for screwing on.
No. 49733A for sticking on.
Of polyamide 66, halogen-free, grey
Dimensions: 40 x 15 x 15 mm
Weight: 3.7 g
Fire load: 0.03 kWh

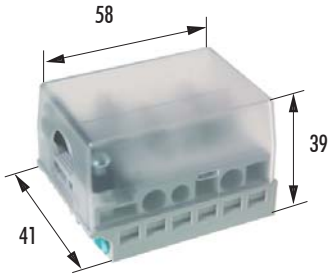
Packing unit: 100 pce.

Insulating tape
No. 49960

When connections are removed or displaced, the boxes have to be left in position. If it is not possible, the holes produced by the pointed screws have to be reinsulated correctly by means of the insulating tape trademark "Scotch 2210", synthetic caoutchouc-based product, PVC coated black.
Weatherproof, self-fusing.
Dimensions: 102 x 100 x 2.3 mm
Dielectric strength: max. 23 kV/mm
Temperature: max. +70°C
Packing unit: 10 pce.

Quick connection technique ecobus power 5 x 2.5 mm²

Connecting box with screw connection to flat cables No. 49845 and 49846



Environment: dry, UV-protected area

Ambient temperature: from -15°C up to +40°C
Installation temperature: min. +5°C

Degree of protection: IP20

Designation **Connecting box 5 x 2.5 mm²**
For supply and branching, with screw connection
with light green baseplate

No. **49701P**

Technical data

Weight	60 g
Fire load	0.33 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1, IEC 60998-2-1 and IEC 60998-2-3
Plastic parts	light grey / transparent, halogen-free
Metal parts	corrosion-resistant
No. of leads x cross-section	5 x 2.5 mm²
Connecting capacity	Ø 3.75 mm
Pointed screws	Tightening torque 0.7 Nm, screwdriver for Phillips recessed head screw No.1
Clamping screws	Tightening torque 0.7 Nm, screwdriver for Phillips recessed head screw No.1
Cross-section of the conductors	2.5 mm²
Rated voltage	690 V
Test current	24 A
Packing unit	50 pce.

On request the connecting boxes can be prewired with flexible supply cable 5 x 2.5 mm²

Information

To connect two cables or perform the supply at the end of the flat cable,
it is possible to use the following connecting box:

No. 49901

more information about this product in the brochure
5.1 "Flat cable system Technofil"
page 5.1.8

Easier working on site!

49713P/L2

49713P/L3

49713P/L1

Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

Designation — **Connecting boxes with socket 3-pole type GST 18i3 with light green baseplate**

No.	49713P/L1	49713P/L2	49713P/L3

Technical data

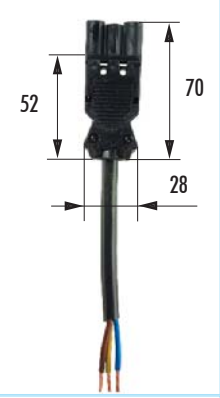
Weight	40 g
Fire load	0.18 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-3 Preliminary draft IEC 61535 / VDE 0628
Phase L1	light grey
Phase L2	dark grey
Phase L3	black
Plastic parts	coloured / transparent, halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 0.7 Nm, screwdriver for Phillips recessed head screw No.1
Rated voltage	250 V
Test current	24 A
Packing unit	50 pce.

Accessories

Connector 3-pole with 1 screw connection Type GST 18i3 S S1 Z Code 1: black No. 49743M
For 1 connecting cable up to 3 x 2.5 mm²
Height: 25 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.

Locking to connectors No. 49751
Length: 30 mm
To be clipped on the connector after removal of its cover.
Packing unit: 10 pce.

Prewired connectors 3-pole, type GST 18i3 F S2 Z
Height: 13 mm
with flexible round cable of black PVC
3 x 1.5 mm² **No. 49743/..M**
3 x 2.5 mm² **No. 49743/..M25**
Lengths see page 5.2.36



Locking to connectors No. 49750
Length: 37.5 mm
To be clipped on the connector.
Packing unit: 10 pce.

Quick connection technique ecobus power 5 x 2.5 mm²

Connecting box with 5-pole socket to flat cables No. 49845 and 49846

Environment: dry, UV-protected area

Ambient temperature: from -15°C up to +40°C
Installation temperature: min. +5°C

Degree of protection: IP20

Designation — **Connecting box with socket 5-pole type GST 18i5 with light green baseplate**

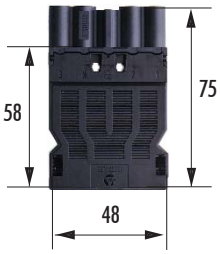
No. — **49715P**

Technical data

Weight	65 g
Fire load	0.27 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-3 Preliminary draft IEC 61535 / VDE 0628
Plastic parts	light grey / transparent, halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 0.7 Nm, screwdriver for Phillips recessed head screw No.1
Rated voltage	250 V / 400 V
Test current	24 A
Packing unit	50 pce.

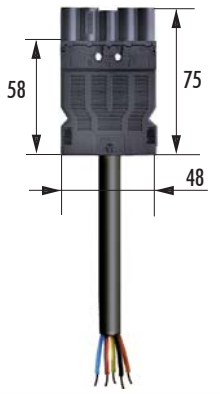
Accessories

Connector 5-pole with 1 screw connection Type GST 18i5 S S1 Z No. 49745M
For 1 connecting cable up to 5 x 2.5 mm²
Height: 17 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.



Locking to connectors No. 49750
Length: 37.5 mm
To be clipped on the connector.
Packing unit: 10 pce.

Prewired connectors 5-pole, type GST 18i5 S S1 Z
Height: 17 mm
with flexible round cable of black PVC
5 x 1.5 mm² **No. 49745/..M**
5 x 2.5 mm² **No. 49745/..M25**
Lengths see page 5.2.37



Locking to connectors No. 49750
Length: 37.5 mm
To be clipped on the connector.
Packing unit: 10 pce.

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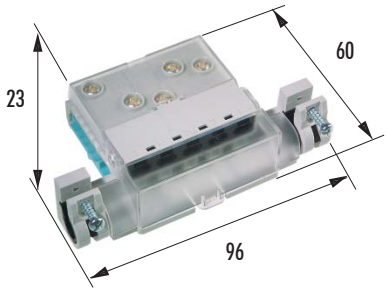
Quick connection technique ecobus power 5 x 2.5 mm²

Connecting box, flat execution to flat cables No. 49845 and 49846



CE

Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

Designation — **Connecting box 3P+N+PE**
Flat execution with light green baseplate

No. — **49703P**

Technical data

Weight	72 g
Fire load	0.38 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-2 / IEC 60998-2-3
Plastic parts	light grey / transparent, halogen-free
Metal parts	corrosion-resistant
Connecting capacity	Ø 6-13 mm
Nominal cross-section	for flexible round cable of PVC up to 5 x 1.5 mm² with end sleeves for strands DIN 46228T4 or rigid round cables up to 5 x 2.5 mm²
Pointed screws	Tightening torque 0.7 Nm, screwdriver for Phillips recessed head screw No.1
Spring clamp terminals	to connect 2 round cables per pole
Rated voltage	690 V
Test current	24 A
Packing unit	50 pce.

On request the connecting boxes can be prewired with one or two flexible round cables:

of 1 m 5 x 1.5 mm²
of 2 m 5 x 1.5 mm²
of 3 m 5 x 1.5 mm²

Easier working on site!

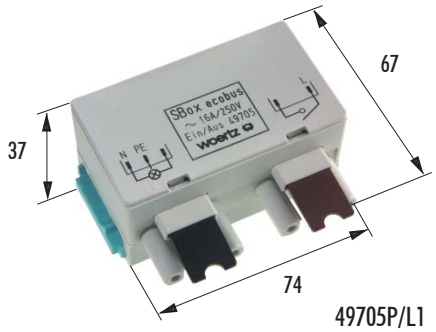
Connection

Cable connection:

strip the round cable 70 mm
and the conductors 10 mm

Quick connection technique ecobus power 5 x 2.5 mm²

Connecting boxes SBox for lamp connections with I/O switch to flat cables No. 49845 and 49846



CE

Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

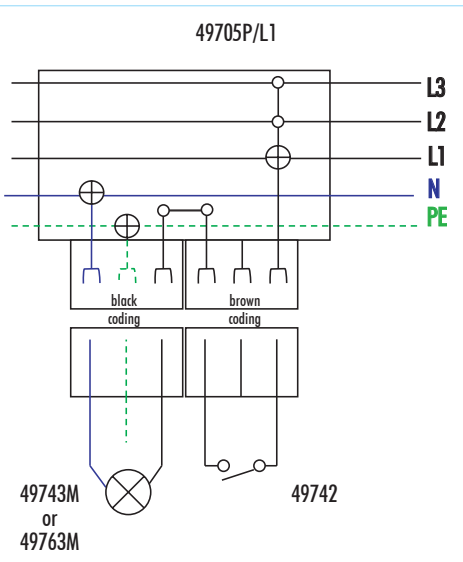
Designation	Connecting boxes with I/O switch with light green baseplate		
No.	49705P/L1	49705P/L2	49705P/L3

prewired connectors see pages 5.2.34 & 5.2.36

Technical data

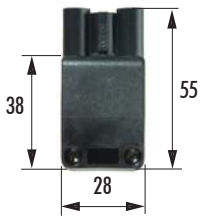
Weight	94 g
Fire load	0.20 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-3 Preliminary draft IEC 61535 / VDE 0628
Phase L1	light grey
Phase L2	dark grey
Phase L3	black
Connector for switch	type GST 18i3, code 4 brown
Connector for lamp	type GST 18i3, code 1 black
Plastic parts	halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 0.7 Nm, screwdriver for Phillips recessed head screw No.1
Rated voltage	250 V
Test current	24 A
Packing unit	50 pce.

Wiring diagram

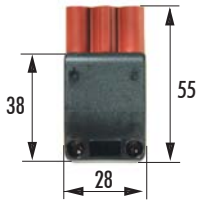


Accessories

Connector 3-pole with 1 screw connection for lamps
Type GST 18i3 S S1 Z
Code 1 black
No. 49743M
For 1 connecting cable up to 3 x 2.5mm²
Height: 25 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.



Connector 3-pole with 1 screw connection for switch
Type GST 18i3 S S1 Z
Code 4 brown
No. 49742
For 1 connecting cable up to 3 x 2.5mm²
Height: 25 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.



Connector 3-pole with 2 spring clamp connections per pole for lamps / Type GST 18i3 F S2 Z
Code 1 black
No. 49763M
For 2 connecting cables up to 3 x 2.5mm²
Height: 15.5 mm
Fire load: 0.11 kWh
Packing unit: 10 pce.

Baseplate with fixing brackets
No. 49738P
Light green.
To fix the boxes on a surface.
Packing unit: 10 pce.

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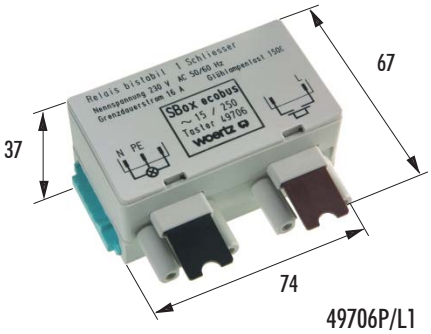


CE

Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

Designation — **Connecting boxes with impulse switch with light green baseplate**

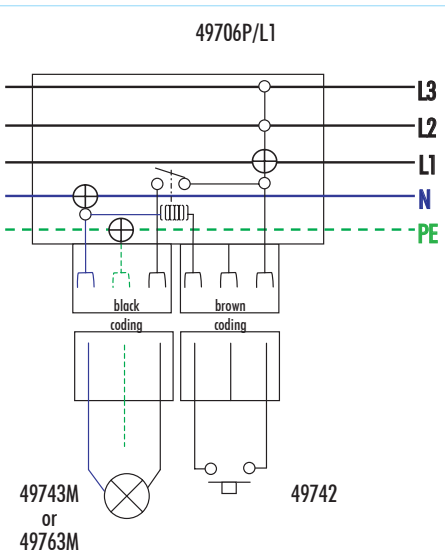
No.	49706P/L1	49706P/L2	49706P/L3

prewired connectors see pages 5.2.34 & 5.2.36

Technical data

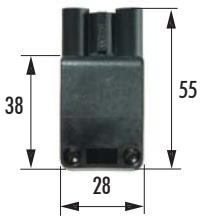
Weight	110 g
Fire load	0.20 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-3 Preliminary draft IEC 61535 / VDE 0628
Phase L1	light grey
Phase L2	dark grey
Phase L3	black
Connector for switch	type GST 18i3, code 4 brown
Connector for lamp	type GST 18i3, code 1 black
Plastic parts	halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 0.7 Nm, screwdriver for Phillips recessed head screw No.1
Rated voltage	250 V
Test current	24 A
Packing unit	50 pce.

Wiring diagram

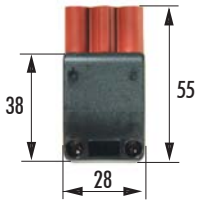


Accessories

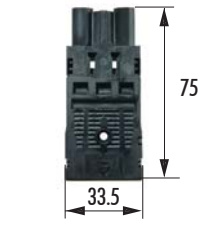
Connector 3-pole with 1 screw connection for lamps
Type GST 18i3 S S1 Z
Code 1 black
No. 49743M
For 1 connecting cable up to 3 x 2.5mm²
Height: 25 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.



Connector 3-pole with 1 screw connection for switch
Type GST 18i3 S S1 Z
Code 4 brown
No. 49742
For 1 connecting cable up to 3 x 2.5mm²
Height: 25 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.



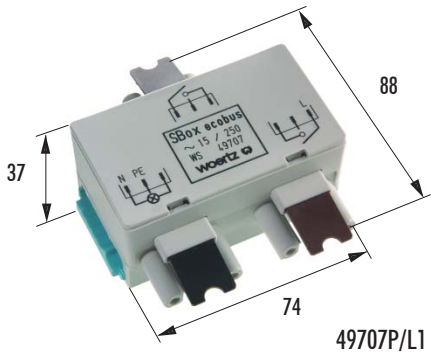
Connector 3-pole with 2 spring clamp connections per pole for lamps / Type GST 18i3 F S2 Z
Code 1 black
No. 49763M
For 2 connecting cables up to 3 x 2.5mm²
Height: 15.5 mm
Fire load: 0.11 kWh
Packing unit: 10 pce.



Baseplate with fixing brackets
No. 49738P
Light green.
To fix the boxes on a surface.
Packing unit: 10 pce.

Quick connection technique ecobus power 5 x 2.5 mm²

Connecting boxes SBox for lamp connections with changeover contact to flat cables No. 49845 and 49846



CE

Environment: dry, UV-protected area

Ambient temperature: from -15°C up to +40°C
Installation temperature: min. +5°C

Degree of protection: IP20

Designation — **Connecting boxes with changeover contact with light green baseplate**

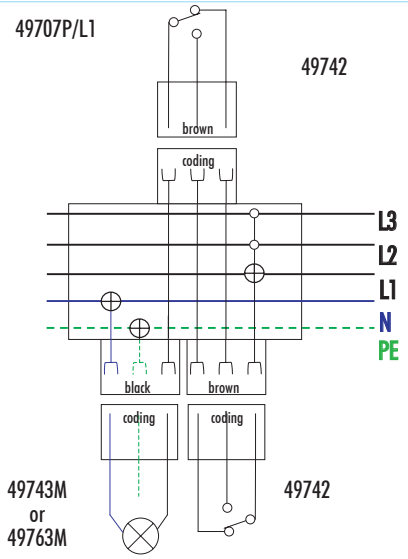
No.	49707P/L1	49707P/L2	49707P/L3

prewired connectors see pages 5.2.34 & 5.2.36

Technical data

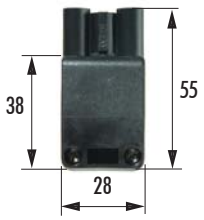
Weight	120 g
Fire load	0.20 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-3 Preliminary draft IEC 61535 / VDE 0628
Phase L1	light grey
Phase L2	dark grey
Phase L3	black
Connector for switch	type GST 18i3, code 4 brown
Connector for lamp	type GST 18i3, code 1 black
Plastic parts	halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 0.7 Nm, screwdriver for Phillips recessed head screw No.1
Rated voltage	250 V
Test current	24 A
Packing unit	50 pce.

Wiring diagram

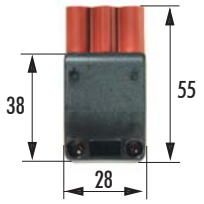


Accessories

Connector 3-pole with 1 screw connection for lamps
Type GST 18i3 S S1 Z
Code 1 black
No. 49743M
For 1 connecting cable up to 3 x 2.5mm²
Height: 25 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.



Connector 3-pole with 1 screw connection for switch
Type GST 18i3 S S1 Z
Code 4 brown
No. 49742
For 1 connecting cable up to 3 x 2.5mm²
Height: 25 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.



Connector 3-pole with 2 spring clamp connections per pole for lamps / Type GST 18i3 F S2 Z
Code 1 black
No. 49763M
For 2 connecting cables up to 3 x 2.5mm²
Height: 15.5 mm
Fire load: 0.11 kWh
Packing unit: 10 pce.

Baseplate with fixing brackets
No. 49738P
Light green.
To fix the boxes on a surface.
Packing unit: 10 pce.

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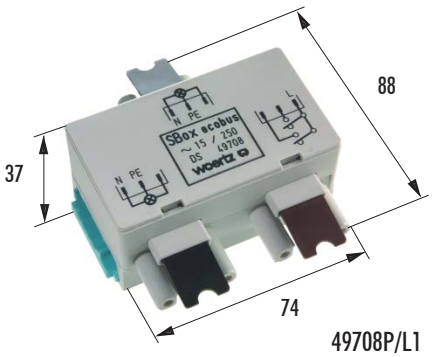


CE

Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

Designation — **Connecting boxes with series connection with light green baseplate**

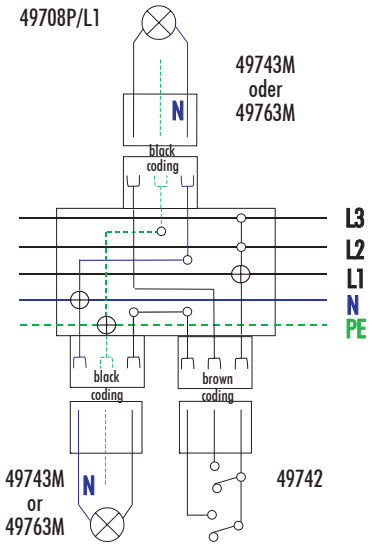
No.	49708P/L1	49708P/L2	49708P/L3

prewired connectors see pages 5.2.34 & 5.2.36

Technical data

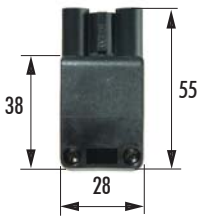
Weight	120 g
Fire load	0.20 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-3 Preliminary draft IEC 61535 / VDE 0628
Phase L1	light grey
Phase L2	dark grey
Phase L3	black
Connector for switch	type GST 18i3, code 4 brown
Connector for lamp	type GST 18i3, code 1 black
Plastic parts	halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 0.7 Nm, screwdriver for Phillips recessed head screw No.1
Rated voltage	250 V
Test current	24 A
Packing unit	50 pce.

Wiring diagram

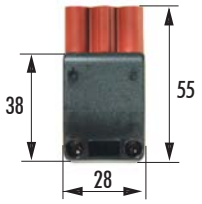


Accessories

Connector 3-pole with 1 screw connection for lamps
Type GST 18i3 S S1 Z
Code 1 black
No. 49743M
For 1 connecting cable up to 3 x 2.5mm²
Height: 25 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.



Connector 3-pole with 1 screw connection for switch
Type GST 18i3 S S1 Z
Code 4 brown
No. 49742
For 1 connecting cable up to 3 x 2.5mm²
Height: 25 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.



Connector 3-pole with 2 spring clamp connections per pole for lamps / Type GST 18i3 F S2 Z
Code 1 black
No. 49763M
For 2 connecting cables up to 3 x 2.5mm²
Height: 15.5 mm
Fire load: 0.11 kWh
Packing unit: 10 pce.

Baseplate with fixing brackets
No. 49738P
Light green.
To fix the boxes on a surface.
Packing unit: 10 pce.

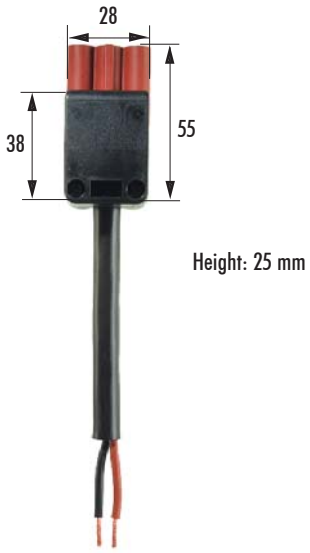
Prewired connectors
3-pole, P+N+PE, type GST 18i3 S S1 Z
Code 4 brown

Height: 25 mm
with flexible round cable of PVC, black, 3 x 1.5 mm²

Length 1 m: No. 49742/1
Length 2 m: No. 49742/2
Length 3 m: No. 49742/3
Length 5 m: No. 49742/5
Length 7 m: No. 49742/7
Length 10 m: No. 49742/10

Stripping length of sheath 35 mm, stripping length of insulation 9 mm
Leads compressed by ultrasound at the ends

Packing unit: 1 pce.

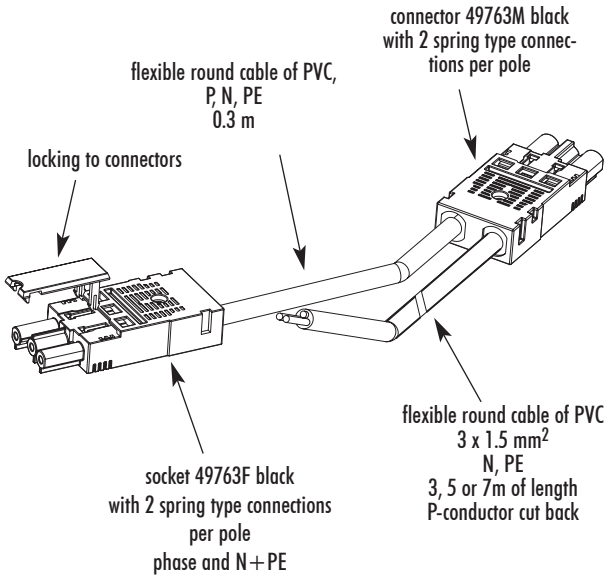


Connecting lines for devices, ready to use

with 3-pole connector P+N+PE
type GST 18i3 F S2 Z for 2 connection points per pole
with round flexible PVC cable, black, 3 x 1.5 mm², 0.3 m
and 3-pole socket P+N+PE
type GST 18i3 F B2 Z with locking to connectors
one free cable end

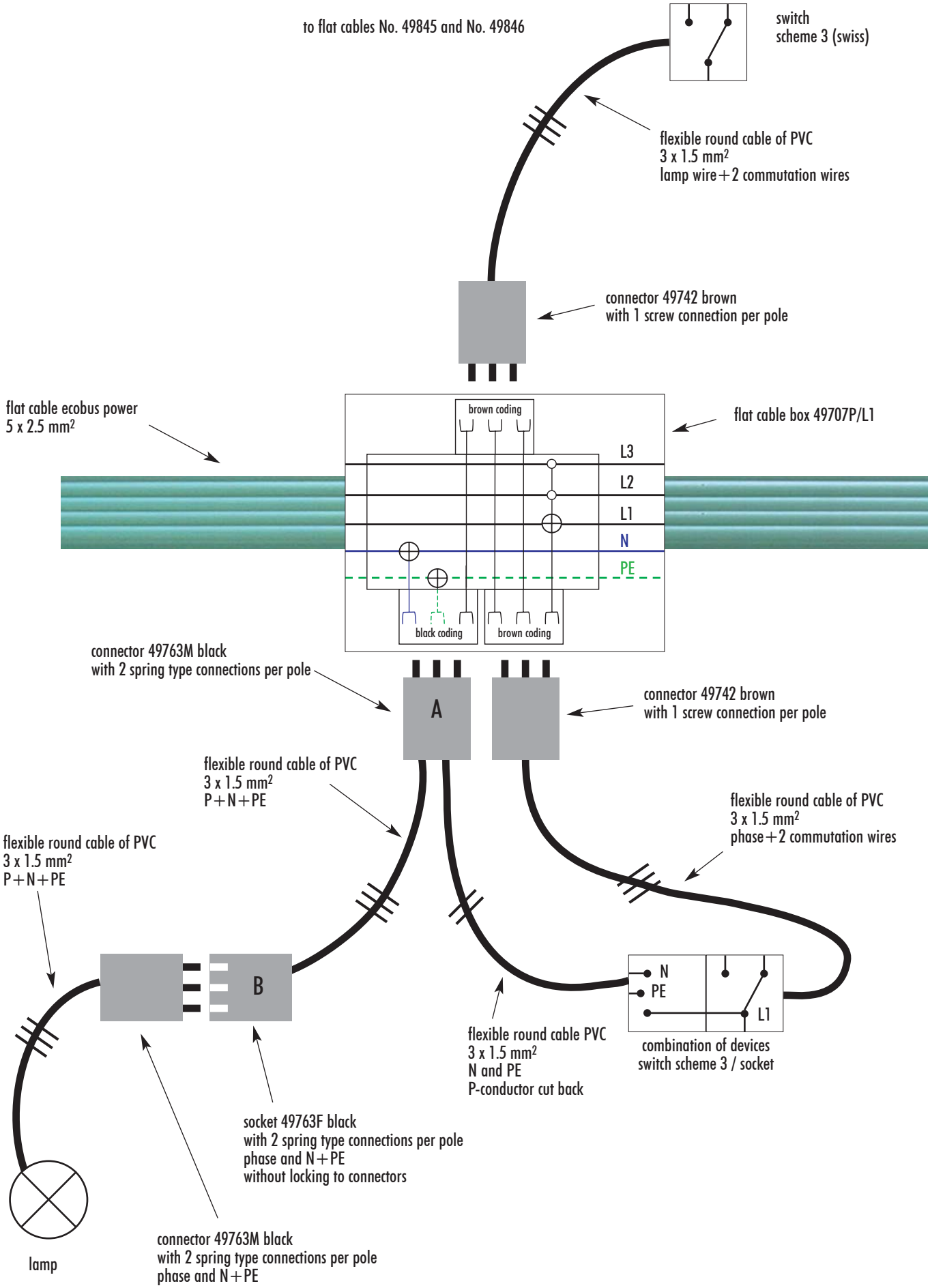
Length 3 m: No. 49760/3 complete set
Length 5 m: No. 49760/5 complete set
Length 7 m: No. 49760/7 complete set

Packing unit: 10 pce.

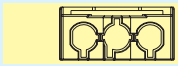


Quick connection technique ecobus power 5 x 2.5 mm²

Example of application of a connecting box for lamp connections with changeover contact

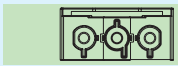


Connecting lines for devices equipped with 3-pole socket, P+N+PE
type GST 18i3 F B2 Z, height 13 mm, without locking to connectors
with flexible round cable of PVC black
stripping length of sheath 35 mm, stripping length of insulation 9 mm, leads compressed by ultrasound at the ends



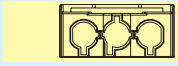
	Connecting lines with one free cable end 3 x 1.5 mm²	Connecting lines with one free cable end 3 x 2.5 mm²
Length 1 m	49743/1F	49743/1F25
Length 2 m	49743/2F	49743/2F25
Length 3 m	49743/3F	49743/3F25
Length 4 m	49743/4F	49743/4F25
Length 5 m	49743/5F	49743/5F25
Length 6 m	49743/6F	49743/6F25
Length 7 m	49743/7F	49743/7F25
Length 8 m	49743/8F	49743/8F25

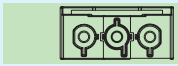
Connecting lines for devices equipped with 3-pole connector, P+N+PE
type GST 18i3 F S2 Z, height 13 mm, without locking to connectors
with flexible round cable of PVC black
stripping length of sheath 35 mm, stripping length of insulation 9 mm, leads compressed by ultrasound at the ends



	Connecting lines with one free cable end 3 x 1.5 mm²	Connecting lines with one free cable end 3 x 2.5 mm²
Length 1 m	49743/1M	49743/1M25
Length 2 m	49743/2M	49743/2M25
Length 3 m	49743/3M	49743/3M25
Length 4 m	49743/4M	49743/4M25
Length 5 m	49743/5M	49743/5M25
Length 6 m	49743/6M	49743/6M25
Length 7 m	49743/7M	49743/7M25
Length 8 m	49743/8M	49743/8M25

Connecting lines for devices equipped with 3-pole socket, P+N+PE
type GST 18i3 F B2 Z, height 13 mm, without locking to connectors
and **equipped with 3-pole connector, P+N+PE**
type GST 18i3 F S2 Z, height 13 mm, without locking to connectors
with flexible round cable of PVC black





	Connecting lines socket-connector 3 x 1.5 mm²	Connecting lines socket-connector 3 x 2.5 mm²
Length 1 m	49743/1MF	49743/1MF25
Length 2 m	49743/2MF	49743/2MF25
Length 3 m	49743/3MF	49743/3MF25
Length 4 m	49743/4MF	49743/4MF25
Length 5 m	49743/5MF	49743/5MF25
Length 6 m	49743/6MF	49743/6MF25
Length 7 m	49743/7MF	49743/7MF25
Length 8 m	49743/8MF	49743/8MF25

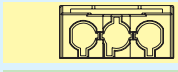
Connecting lines for devices equipped with 5-pole socket, 3P+N+PE
type GST 18i5 S B1 Z, height 17 mm, without locking to connectors
with flexible round cable of PVC black
stripping length of sheath 35 mm, stripping length of insulation 7 mm, leads compressed by ultrasound at the ends

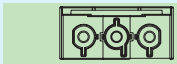
	Connecting lines with one free cable end 5 x 1.5 mm²	Connecting lines with one free cable end 5 x 2.5 mm²
Length 1 m	49745/1F	49745/1F25
Length 2 m	49745/2F	49745/2F25
Length 3 m	49745/3F	49745/3F25
Length 4 m	49745/4F	49745/4F25
Length 5 m	49745/5F	49745/5F25
Length 6 m	49745/6F	49745/6F25
Length 7 m	49745/7F	49745/7F25
Length 8 m	49745/8F	49745/8F25

Connecting lines for devices equipped with 5-pole connector, 3P+N+PE
type GST 18i5 S S1 Z, height 17 mm, without locking to connectors
with flexible round cable of PVC black
stripping length of sheath 35 mm, stripping length of insulation 7 mm, leads compressed by ultrasound at the ends

	Connecting lines with one free cable end 5 x 1.5 mm²	Connecting lines with one free cable end 5 x 2.5 mm²
Length 1 m	49745/1M	49745/1M25
Length 2 m	49745/2M	49745/2M25
Length 3 m	49745/3M	49745/3M25
Length 4 m	49745/4M	49745/4M25
Length 5 m	49745/5M	49745/5M25
Length 6 m	49745/6M	49745/6M25
Length 7 m	49745/7M	49745/7M25
Length 8 m	49745/8M	49745/8M25

Connecting lines for devices equipped with 5-pole socket, 3P+N+PE
type GST 18i5 S B1 Z, height 17 mm, without locking to connectors
and **equipped with 5-pole connector, 3P+N+PE**
type GST 18i5 S S1 Z, height 17 mm, without locking to connectors
with flexible round cable of PVC black





	Connecting lines socket-connector 5 x 1.5 mm²	Connecting lines socket-connector 5 x 2.5 mm²
Length 1 m	49745/1MF	49745/1MF25
Length 2 m	49745/2MF	49745/2MF25
Length 3 m	49745/3MF	49745/3MF25
Length 4 m	49745/4MF	49745/4MF25
Length 5 m	49745/5MF	49745/5MF25
Length 6 m	49745/6MF	49745/6MF25
Length 7 m	49745/7MF	49745/7MF25
Length 8 m	49745/8MF	49745/8MF25

Quick connection technique ecobus power 5 x 10 mm²

Flat cable 3L+N+PE
5 x 10 mm²
(690V)
Overall dimensions 38.5 x 10 mm

The supply occurs at the end of the cable by means of a supply box 5 x 10 mm² No. 49971 or through direct connection to the distribution board
It is recommended to use an electric screwdriver

No. 49970

No. 49971

Branching box 5 x 4 mm² No. 49970
with insulation piercing pointed screws and spring type connections.
Place an usual safety cutout after the branching box.

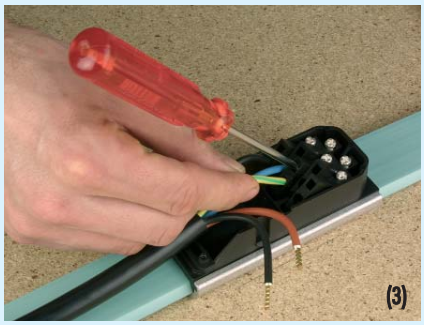
Where are these flat cables used?

- for great lengths where 2.5 mm² are not sufficient because of voltage drop
- for the lighting of halls
- laid into ducts placed along the walls of open place offices, for the supply of flat cables 3 x 2.5 mm² or 5 x 2.5 mm² which are led towards the center of the room
- laid into ducts along corridors for the supply of flat cables 3 x 2.5 mm² or 5 x 2.5 mm²
- for the supply of several distribution boards, as for exemple for class rooms

Mounting procedure of connecting box 5 x 4 mm² No. 49970


(1)


(2)


(3)


(4)


(5)


(6)

1. Place the connecting box on the asymmetric flat cable (no need to strip the insulation of the cable)
2. Push on the baseplate.
3. Connect the round cable leads to the spring type connections. 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.

To release the hood, insert a screwdriver in the slits provided for the purpose and lift slightly (6)

Quick connection technique ecobus power 5 x 10 mm²

Flat cable 5 x 10 mm²

The length of the installed cable has to guarantee the release of the overcurrent protection devices (circuit breakers) within 0.4 to 5 s. (contact voltage).
(Switzerland: see NIN "F2.8.4" "N4.3.4")

CE

Environment: dry, UV-protected area

Ambient temperature: from -15°C up to +40°C

Installation temperature: min. +10°C

Designation	Flat cable of PVC 3L+N+PE asymmetric	Flat cable halogen-free 3L+N+PE asymmetric
No.	49884	49885
	Technical data	**Technical data**
Sheath	PVC according to IEC 227	Polyethylene Compound without corrosive gas acc. to DIN VDE 0472 Part 813
Colour of the sheath	Light green RAL 6027	Light green RAL 6027
Weight	845 g/m	845 g/m
Fire load	2.12 kWh/m	1.84 kWh/m
Fire behaviour	Flame retardant according to IEC 60332-1	Flame retardant according to IEC 60332-1 Low fire propagation acc. to IEC 60332-3 Low smoke development acc. to IEC 61034-1/2 Marking on the sheath: FR/LS0H (Flame Retardant / Low Smoke / Zero Halogen)
No. of leads x cross-section	5 x 10 mm²	5 x 10 mm²
Copper conductors	bare, highly flexible acc. to DIN VDE 0295 Class 5	bare, highly flexible acc. to DIN VDE 0295 Class 5
Insulation of the leads	PVC according to IEC 227	Flame retardant, vulcanized and halogen-free Polyethylene Compound
Colour of the leads	brown, blue, green/yellow, black, grey	brown, blue, green/yellow, black, grey
Test voltage	4 kV, 50 Hz	4 kV, 50 Hz
Rated voltage	0.6/1kV	0.6/1kV
Current-carrying capacity	according to IEC 60364-5-523 and SEV NIN 42512.2	according to IEC 60364-5-523 and SEV NIN 42512.2
DC-resistance	1.91 Ω/km	1.91 Ω/km

Accessories

Cable stripping tool
No. 49976

The cable has to be stripped at both ends for a distance of 20 mm so that the conductors of the flat cable can be inserted properly in the end pieces.
Use this tool to split up the sheath on the narrow sides of the cable. Then cut both sheath parts by means of the shears.

Packing unit: 1 pce.

Cable end piece
No. 49972

To be mounted at the free end of the flat cable, so that the specified creepage distance will be observed. The cable has to be stripped for a distance of 20 mm.

Of polycarbonate, halogen-free, transparent
Dimensions: 47 x 40 x 17 mm
Weight: 11.5 g
Fire load: 0.10 kWh

Packing unit: 10 pce.

Shears
No. 49929

For cutting neatly and easily every type of flat cables.

Packing unit: 1 pce.

Set of 2 cable clamps to screw on
No. 49977

Diameter of the fixing holes 4.5 mm. Distance between fixing holes 47 mm.
Of polyamide 66, fibre glass reinforced, halogen-free, black

Dimensions: 56 x 15 x 12 mm
Weight: 6.5 g
Fire load: 0.04 kWh

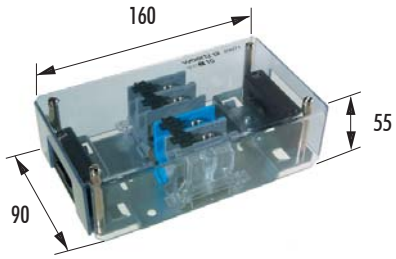
Packing unit: 100 pce.

Insulating tape
No. 49960

When connections are removed or displaced, the boxes have to be left in position. If it is not possible, the holes produced by the pointed screws have to be reinsulated correctly by means of the insulating tape trademark "Scotch 2210", synthetic caoutchouc-based product, PVC coated black.
Weatherproof, self-fusing.
Dimensions: 102 x 100 x 2.3 mm
Dielectric strength: max. 23 kV/mm
Temperature: max. +70°C
Packing unit: 10 pce.

Quick connection technique ecobus power 5 x 10 mm²

Connecting box for supply at the end of flat cables No. 49884 and 49885



Environment: dry, UV-protected area

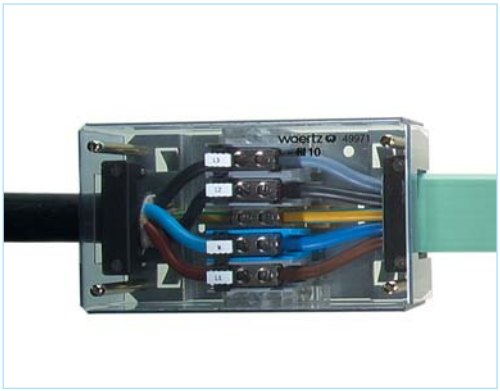
Ambient temperature: from -15°C up to +40°C
Installation temperature: min. +10°C

Degree of protection: IP20

Designation	**Connecting box 5 x 10 mm²**
No.	**49971**

Technical data

Weight	556 g
Fire load	1.20 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60947-7-1
Plastic parts	transparent, halogen-free
Metal parts	corrosion-resistant
No. of leads x cross-section	5 x 10 mm²
Connecting capacity	5.2 x 9 mm
Rated voltage	750 V
Rated current	57 A
Packing unit	2 pce.



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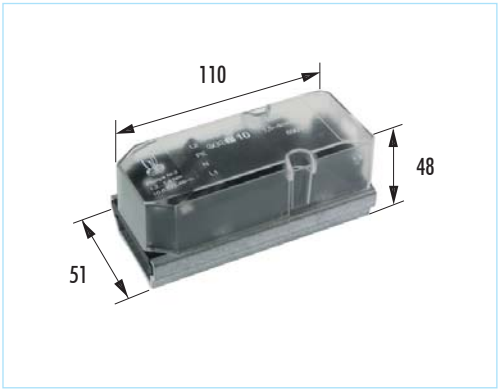
Quick connection technique ecobus power 5 x 10 mm²

Branching box to flat cables No. 49884 and 49885



Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +10°C
Degree of protection:	IP20

Designation	**Branching box 5 x 4 mm² with spring-type connection**
No.	**49970**

Technical data

Weight	156 g
Fire load	0.62 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-5 / IEC 60947-7-1
Plastic parts	transparent, halogen-free
Metal parts	corrosion-resistant
No. of leads x cross-section	5 x 4 mm²
Connecting capacity	3.9 x 3.4 mm
Pointed screws	Tightening torque 1.4 Nm, Phillips recessed head screw No. 2
Rated voltage	690 V
Test current	32 A
Packing unit	25 pce.

Place an usual safety cutout after the branching box

Quick connection technique ecobus combi 5 x 2.5 mm² + 2 x 1.5 mm²
(Pat.)

Flat cable 3L+N+PE + 2 Bus
5 x 2.5 mm² + 2 x 1.5 mm²
(0.6/1kV)+(50V, 3A)
Overall dimensions 32 x 6 mm

The supply of the flat cable does usually not occur at the end of the cable, but by means of junction boxes connected at any point all along the flat cable.

Connecting box 5 x 2.5 mm²+2 x 1.5 mm²

Power current

Flat cable connected by means of pointed screws, without the cable insulation having to be stripped
Connection of a round cable up to 5 x 2.5 mm² by means of screw terminals

Bus part

Both conductors 1.5mm² are laid parallel
Double shield of aluminium, electrically isolated
Do not connect the shielding to earth
Flat cable connected by means of pointed screws, without the cable insulation having to be stripped
Connection of a round cable up to 2 x 1.5 mm² by means of screw terminals

It is recommended to use an electric screwdriver

Suitable for the supply of flat cables or for the branching from flat cables

Connecting box, flat execution
Connecting boxes for different lamp connections

Where are these flat cables used?

- in office buildings
- banks
- insurance companies
- hospitals
- in administration buildings etc. using the bus system for saving energy and for the security.

As a complement for low voltages the flat cable system multibus has been developed, see pages 5.2.74 to 5.2.85.

Mounting procedure of connecting box No. 49700

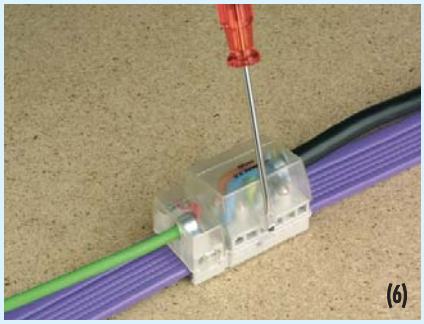

(1)


(2)


(3)


(4)


(5)


(6)

1. Place the connecting box on the asymmetric flat cable (no need to strip the insulation of the cable)
2. Push on the baseplate (violet). Should the box have been fitted to the cable in the wrong position, the bottom part of the box cannot be fitted with normal force; in this case the box has to be turned through 180°.

Power current and bus part

3. Introduce the round cables into the flat cable box. Tighten the strain relief clamps to maintain the round cable.
4. Turn in the pointed screws as far as they will go.
5. Clip the hoods.

To release the hoods, insert a screwdriver in the slit provided for the purpose and lift slightly (6)

Possibility of pre-wiring:

In the workshop of the electrician the devices for power and control are wired in advance to the flat cable boxes. On the building site the flat cable boxes are placed on the flat cable, the baseplates are pushed on and the pointed screws drilled into the flat cable to make the power and the control contact.

Quick connection technique ecobus combi 5 x 2.5 mm² + 2 x 1.5 mm²

Flat cable 5 x 2.5 mm² + 2 x 1.5 mm²

The length of the installed cable has to guarantee the release of the overcurrent protection devices (circuit breakers) within 0.4 to 5 s. (contact voltage).
(Switzerland: see NIN "F2.8.4" "N4.3.4")

Environment: dry, UV-protected area

Ambient temperature: from -15°C up to +40°C

Installation temperature: min. +5°C

Designation	Flat cable of PVC asymmetric 3L+N+PE+2 Bus	Flat cable halogen-free asymmetric 3L+N+PE+2 Bus
No.	49945	49946
	Technical data	**Technical data**
Sheath	PVC according to IEC 227	Polyethylene Compound without corrosive gas acc. to DIN VDE 0472 Part 813
Colour of the sheath	violet RAL 4005	violet RAL 4005
Weight	350 g/m	340 g/m
Fire load	1.18 kWh/m	0.99 kWh/m
Fire behaviour	Flame retardant according to IEC 60332-1	Flame retardant according to IEC 60332-1 Low fire propagation acc. to IEC 60332-3 Low smoke development acc. to IEC 61034-1/2 Marking on the sheath: FR/LSOH (Flame Retardant / Low Smoke / Zero Halogen)
No. of leads x cross-section	5 x 2.5 mm² + 2 x 1.5 mm²	5 x 2.5 mm² + 2 x 1.5 mm²
Power current		
Copper conductors	bare, highly flexible acc. to CENELEC HD 383 S2 Class 6	bare, highly flexible acc. to CENELEC HD 383 S2 Class 6
Insulation of the leads	PVC according to IEC 227	Flame retardant, vulcanized and halogen-free Polyethylene compound
Colour of the leads	grey, black, brown, blue, green/yellow	grey, black, brown, blue, green/yellow
Cross-section of the conductors	2.5 mm²	2.5 mm²
Test voltage	4 kV, 50 Hz	4 kV, 50 Hz
Rated voltage	0.6/1kV	0.6/1kV
Current-carrying capacity	acc. to IEC 60364-5-523 and SEV NIN 42512.2	acc. to IEC 60364-5-523 and SEV NIN 42512.2
DC-resistance	7.98 Ω/km	7.98 Ω/km
Bus part		
Copper conductors	tinned acc. to CENELEC HD 383 S2 Class 5	tinned acc. toCENELEC HD 383 S2 Class 5
Insulation of the leads	Polyethylene acc. to DIN VDE 0207 Part 2, 2YI2	Polyethylene acc. to DIN VDE 0207 Part 2, 2YI2
Colour of the leads	neutral	neutral
Shield	Double shield of aluminium, electrically isolated	Double shield of aluminium, electrically isolated
Cross-section of the conductors	1.5 mm²	1.5 mm²
Max. operating voltage	50 V	50 V
Max. rated current	3 A	3 A
DC-resistance	13.7 Ω/km	13.7 Ω/km
Capacitance	70 pF/m	70 pF/m
Attenuation at 1 MHz	nom. 1.2 dB/100 m	nom. 1.2 dB/100 m
Charact. impedance at 1 MHz	nom. 75 Ω	nom. 75 Ω
Note	Flat cable also available with black strips **No. 49945/SM**	Flat cable also available with black strips **No. 49946/SM**

Accessories

Cable stripping tool
No. 49736

The cable has to be stripped at both ends for a distance of 19 mm so that the conductors of the flat cable can be inserted properly in the end pieces.
This tool offers the advantage of stripping neatly and easily the cable without damaging the insulation of the conductors.

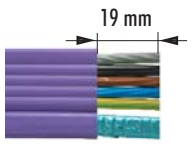
Packing unit: 1 pce.

Cable end piece
No. 49730

To be mounted at both ends of the flat cable, so that the specified creepage distance will be observed. The cable has to be stripped for a distance of 19 mm.

Of polycarbonate, halogen-free, transparent
Dimensions: 41 x 40 x 9 mm
Weight: 10 g
Fire load: 0.08 kWh

Packing unit: 10 pce.



Shears
No. 49930

For cutting neatly and easily every type of flat cables up to 2.5 mm².
With sliding anvil. Teflon coated blades.

Packing unit: 1 pce.

Cable fastening clamp for screw fixing
No. 49731

Of polyamide 66, halogen-free, grey
Dimensions: 52 x 10 x 10 mm
Weight: 2 g
Fire load: 0.02 kWh

Packing unit: 100 pce.

Complete set:
Cable stripping tool + Shears
No. 49737

Packing unit: 1 Set

Cable fastening clamps
No. 49733
No. 49733A

No. 49733 for screwing on.
No. 49733A for sticking on.
Of polyamide 66, halogen-free, grey
Dimensions: 40 x 15 x 15 mm
Weight: 3.7 g
Fire load: 0.03 kWh

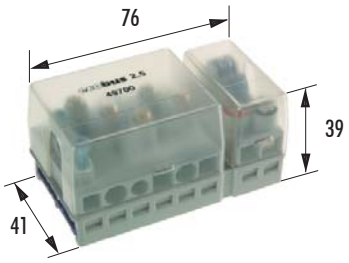
Packing unit: 100 pce.

Insulating tape
No. 49960

When connections are removed or displaced, the boxes have to be left in position. If it is not possible, the holes produced by the pointed screws have to be reinsulated correctly by means of the insulating tape trademark "Scotch 2210", synthetic caoutchouc-based product, PVC coated black.
Weatherproof, self-fusing.
Dimensions: 102 x 100 x 2.3 mm
Dielectric strength: max. 23 kV/mm
Temperature: max. +70°C
Packing unit: 10 pce.

Quick connection technique ecobus combi 5 x 2.5 mm² + 2 x 1.5 mm²

Connecting box with screw connection for power current and bus to flat cables No. 49945 and 49946



Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

Designation — **Connecting box 5 x 2.5 mm² + 2 x 1.5 mm² for supply and branching, with screw connection for power current and bus, with violet baseplate**

No. — **49700**

Technical data

Weight	86 g
Fire load	0.47 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1, IEC 60998-2-1 and IEC 60998-2-3 according to EIB manual
Plastic parts	light grey / transparent, halogen-free
Metal parts	corrosion-resistant
No. of leads x cross-section	5 x 2.5 mm² + 2 x 1.5 mm²
Connecting capacity	∅ 3.75 mm + ∅ 3.2 mm
Power current	
Pointed screws	Tightening torque 0.7 Nm Phillips recessed head screw No.1
Clamping screws	Tightening torque 0.7 Nm Phillips recessed head screw No.1
Cross-section of the conductors	2.5 mm²
Rated voltage	690 V
Test current	24 A
Bus part	
Pointed screws	Tightening torque 1.0 Nm, screwdriver No.3
Clamping screws	Tightening torque 0.7 Nm Phillips recessed head screw No.1
Cross-section of the conductors	1.5 mm²
Rated voltage	50 V
Rated current	3 A
Packing unit	50 pce.

Technical information

Pointed screws for bus part are partially isolated to avoid a short circuit between shield and copper conductors when they pierce the double metallic shield and go into the cores of the copper conductors.


Pointed screw for bus part

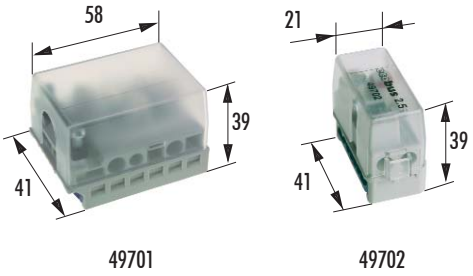

Pointed screw for power current

patent applied

woertz

Quick connection technique ecobus combi 5 x 2.5 mm² + 2 x 1.5 mm²

Connecting boxes with screw connection for power current or bus to flat cables No. 49945 and 49946



49701 49702

Environment: dry, UV-protected area

Ambient temperature: from -15°C up to +40°C
Installation temperature: min. +5°C

Degree of protection: IP20

Designation	Connecting box 5 x 2.5 mm² for supply or branching, for power current, with screw connection, with violet baseplate	Connecting box 2 x 1.5 mm² for supply or branching, for bus, with screw connection, with violet baseplate
No.	49701	49702
	Technical data	Technical data
Weight	55 g	23 g
Fire load	0.33 kWh	0.14 kWh
Fire behaviour	UL 94-V2	UL 94-V2
Test specifications	IEC 60998-1, IEC 60998-2-1 and IEC 60998-2-3	IEC 60998-1, IEC 60998-2-1 and IEC 60998-2-3 according to EIB manual
Plastic parts	light grey / transparent, halogen-free	light grey / transparent, halogen-free
Metal parts	corrosion-resistant	corrosion-resistant
No. of leads x cross-section	5 x 2.5 mm²	2 x 1.5 mm²
Connecting capacity	Ø 3.75 mm	Ø 3.2 mm
Power current		
Pointed screws	Tightening torque 0.7 Nm, Phillips recessed head screw No.1	
Clamping screws	Tightening torque 0.7 Nm, Phillips recessed head screw No.1	
Cross-section of the conductors	2.5 mm²	
Rated voltage	690 V	
Test current	24 A	
Bus part		
Pointed screws		Tightening torque 1.0 Nm, screwdriver No.3
Clamping screws		Tightening torque 0.7 Nm, Phillips recessed head screw No.1
Cross-section of the conductors		1.5 mm²
Rated voltage		50 V
Rated current		3 A
Packing unit	50 pce.	50 pce.

Easier working on site

On request the connecting boxes can be prewired with flexible supply cable 5 x 2.5 mm²

Pointed screws for bus part are partially isolated
see page 5.2.48

Quick connection technique ecobus combi 5 x 2.5 mm² + 2 x 1.5 mm²

Connecting boxes with 3-pole socket to flat cables No. 49945 and 49946

49713/L2

49713/L3

49713/L1

Environment: dry, UV-protected area

Ambient temperature: from -15°C up to +40°C
Installation temperature: min. +5°C

Degree of protection: IP20

Designation	Connecting boxes, for power current, with socket 3-pole type GST 18i3 with violet baseplate		
No.	49713/L1	49713/L2	49713/L3

Technical data

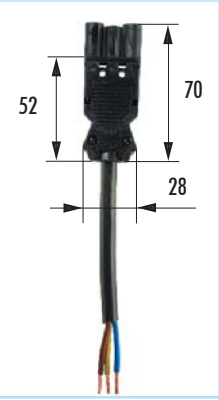
Weight	40 g
Fire load	0.18 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-3 Preliminary draft IEC 61535 / VDE 0628
Phase L1	light grey
Phase L2	dark grey
Phase L3	black
Plastic parts	coloured / transparent, halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 0.7 Nm, Phillips recessed head screw No. 1
Rated voltage	250 V
Test current	24 A
Packing unit	50 pce.

Accessories

Connector 3-pole
with 1 screw connection
Type GST 18i3 S S1 Z
Code 1: black
No. 49743M
For 1 connecting cable up to 3 x 2.5 mm²
Height: 25 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.

Locking to connectors
No. 49751
Length: 30 mm
To be clipped on the connector after removal of its cover.
Packing unit: 10 pce.

Prewired connectors
3-pole, type GST 18i3 F S2 Z
Height: 13 mm
with flexible round cable of black PVC
3 x 1.5 mm² **No. 49743/..M**
3 x 2.5 mm² **No. 49743/..M25**
Lengths see page 5.2.64

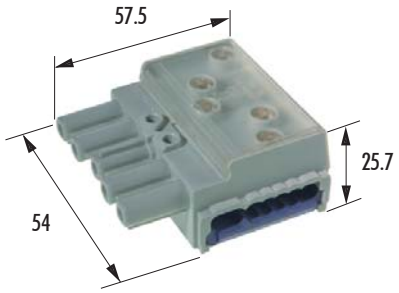


Locking to connectors
No. 49750
Length: 37.5 mm
To be clipped on the connector.
Packing unit: 10 pce.

woertz

Quick connection technique ecobus combi 5 x 2.5 mm² + 2 x 1.5 mm²

Connecting box with 5-pole socket to flat cables No. 49945 and 49946



Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

Designation — **Connecting box for power current with socket 5-pole type GST 18i5 with violet baseplate**

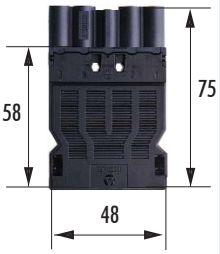
No. — **49715**

Technical data

Weight	65 g
Fire load	0.27 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-3 Preliminary draft IEC 61535 / VDE 0628
Plastic parts	light grey / transparent, halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 0.7 Nm, Phillips recessed head screw No. 1
Rated voltage	250 V / 400 V
Test current	24 A
Packing unit	50 pce.

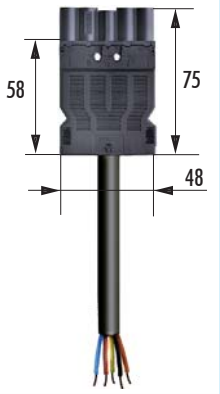
Accessories

Connector 5-pole with 1 screw connection Type GST 18i5 S S1 Z No. 49745M
For 1 connecting cable up to 5 x 2.5 mm²
Height: 17 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.



Locking to connectors No. 49750
Length: 37.5 mm
To be clipped on the connector.
Packing unit: 10 pce.

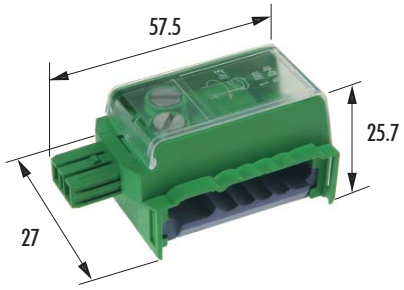
Prewired connectors 5-pole, type GST 18i5 S S1 Z
Height: 17 mm
with flexible round cable of black PVC
5 x 1.5 mm² **No. 49745/..M**
5 x 2.5 mm² **No. 49745/..M25**
Lengths see page 5.2.65



Locking to connectors No. 49750
Length: 37.5 mm
To be clipped on the connector.
Packing unit: 10 pce.

Quick connection technique ecobus combi 5 x 2.5 mm² + 2 x 1.5 mm²

Connecting box with 2-pole socket to flat cables No. 49945 and 49946



Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

Designation — **Connecting box for bus with socket 2-pole type BST 14i2, with KNX/EIB coding with violet baseplate**

No. — **49710**

Technical data

Weight	18 g
Fire load	0.12 kWh
Fire behaviour	UL 94-V2
Test specifications	according to EIB manual
Plastic parts	green / transparent, halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 1.0 Nm, screwdriver No. 3
Rated voltage	50 V
Test current	3 A
Packing unit	50 pce.

Technical information

Pointed screws for bus part are partially isolated to avoid a short circuit between shield and copper conductors when they pierce the double metallic shield and go into the cores of the copper conductors.

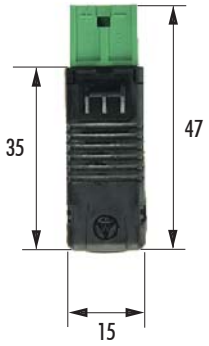
Pointed screw for bus part

patent applied

Accessories

Connector 2-pole type BST 14i2 F S1 Z No. 49740

with spring connection, black/green.
Prescribed for every EIB application with plug-in connection.
Height: 14.4 mm
Fire load: 0.04 kWh
Packing unit: 10 pce.



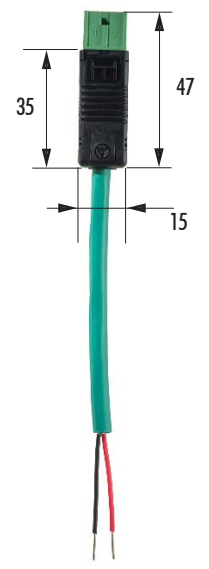
Prewired connectors 2-pole type BST 14i2 F S1 Z
Height: 14.4 mm
with cable EIB (ST) green
2 x 0.8 mm²

Length 1 m: **No. 49740/1**

Length 2 m: **No. 49740/2**

Length 3 m: **No. 49740/3**

Further lengths on request
Packing unit: 1 pce.



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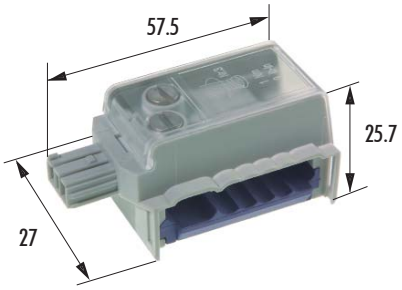
Quick connection technique ecobus combi 5 x 2.5 mm² + 2 x 1.5 mm²

Connecting box with 2-pole socket to flat cables No. 49945 and 49946



Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

Designation — **Connecting box for bus with socket 2-pole type BST 14i3, with specific coding, with violet baseplate**

No. — **49711**

Technical data

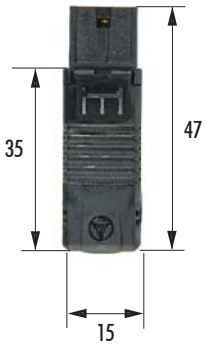
Weight	18 g
Fire load	0.12 kWh
Fire behaviour	UL 94-V2
Plastic parts	light grey / transparent, halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 1.0 Nm, screwdriver No. 3
Rated voltage	50 V
Test current	3 A
Packing unit	50 pce.

Pointed screws for bus part are partially isolated
see page 5.2.52

Technical information

Accessories

Connector 3-pole (shield not connected) type BST 14i3 F S1 Z No. 49741
with spring connection, black.
For every bus application with plug-in connection and specific coding (different from EIB coding)
Height: 14.4 mm
Fire load: 0.05 kWh
Packing unit: 10 pce.



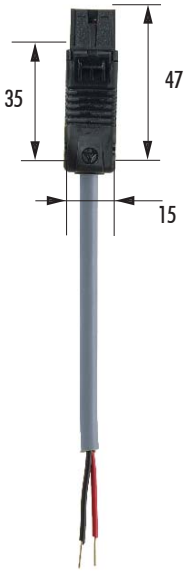
Prewired connectors 3-pole (shield not connected) type BST 14i3 F S1 Z
Height: 14.4 mm
with cable (ST) grey 2 x 0.8 mm²

Length 1 m: **No. 49741/1**

Length 2 m: **No. 49741/2**

Length 3 m: **No. 49741/3**

Further lengths on request
Packing unit: 1 pce.

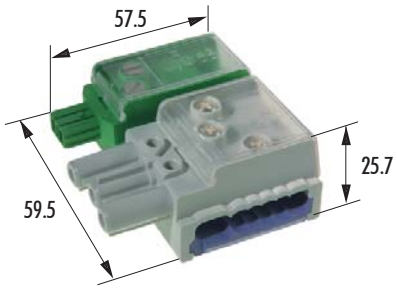


Quick connection technique ecobus combi 5 x 2.5 mm² + 2 x 1.5 mm²

Connecting boxes with sockets 2-pole and 3-pole to flat cables No. 49945 and 49946

49723/L2

49723/L3



49723/L1

Environment: dry, UV-protected area

Ambient temperature: from -15°C up to +40°C
Installation temperature: min. +5°C

Degree of protection: IP20

Designation — **Connecting boxes with socket type EST 2i3 and KNX/EIB coding with violet baseplate**

No.	49723/L1	49723/L2	49723/L3

Technical data

Weight	57.5 g
Fire load	0.29 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-3 Preliminary draft IEC 61535 / VDE 0628 according to EIB manual
Plastic parts	coloured / transparent, halogen-free
Metal parts	corrosion-resistant
Power current	
Phase L1	light grey
Phase L2	dark grey
Phase L3	black
Pointed screws	Tightening torque 0.7 Nm, Phillips recessed head screw No. 1
Rated voltage	250 V
Test current	24 A
Bus part	
Pointed screws	Tightening torque 1.0 Nm, screwdriver No. 3
Rated voltage	50 V
Rated current	3 A
Packing unit	50 pce.

Technical information

Pointed screws for bus part are partially isolated to avoid a short circuit between shield and copper conductors when they pierce the double metallic shield and go into the cores of the copper conductors.

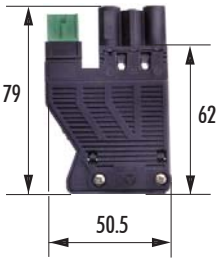
Pointed screw for bus part

Pointed screw for power current

patent applied

Accessories

Connector
bus 2-pole, network 3-pole
type EST 2i3 FS S1 Z
No. 49753
Network: with screw connection
Bus: with spring connection, black/green
Prescribed for every EIB application with plug-in connection.
Coding according to EIB specification.
Height: 15.5 mm
Fire load: 0.17 kWh
Packing unit: 10 pce.



Locking to connectors
No. 49750
Length: 37.5 mm
To be clipped on the connector.
Packing unit: 10 pce.

Prewired connectors
Bus 2-pole, network 3-pole
type EST 2i3 FS S1 Z
with flexible double round cable of PVC black 3 x 1.5 mm² + 2 x 0.5 mm²

Length 1 m: **No. 49753/1**

Length 2 m: **No. 49753/2**

Length 3 m: **No. 49753/3**

Further lenghts on request
Packing unit: 1 pce.

Locking to connectors
No. 49750
Length: 37.5 mm
To be clipped on the connector.
Packing unit: 10 pce.

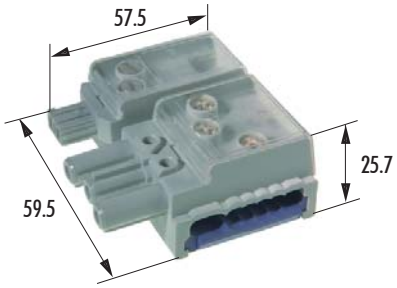
woertz

Quick connection technique ecobus combi 5 x 2.5 mm² + 2 x 1.5 mm²

Connecting boxes with sockets 2-pole and 3-pole to flat cables No. 49945 and 49946

49724/L2

49724/L3



49724/L1

Environment: dry, UV-protected area

Ambient temperature: from -15°C up to +40°C
Installation temperature: min. +5°C

Degree of protection: IP20

Designation — **Connecting boxes with socket type EST 3i3 and specific coding, mit violet baseplate**

No.	49724/L1	49724/L2	49724/L3

Technical data

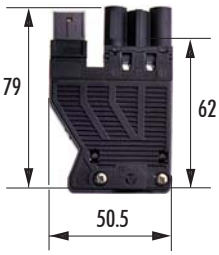
Weight	57.5 g
Fire load	0.29 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-3 Preliminary draft IEC 61535 / VDE 0628
Plastic parts	coloured / transparent, halogen-free
Metal parts	corrosion-resistant
Power current	
Phase L1	light grey
Phase L2	dark grey
Phase L3	black
Pointed screws	Tightening torque 0.7 Nm, Phillips recessed head screw No. 1
Rated voltage	250 V
Test current	24 A
Bus part	
Pointed screws	Tightening torque 1.0 Nm, screwdriver No. 3
Rated voltage	50 V
Rated current	3 A
Packing unit	50 pce.

Technical information

Pointed screws for bus part are partially isolated
see page 5.2.54

Accessories

Connector: bus 3-pole (shield not connected), network 3-pole type EST 3i3 FS S1 Z
No. 49754
Network: with screw connection
Bus: with spring connection, black
For every bus application with plug-in connection and specific coding (different from EIB coding)
Height: 15.5 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.



Locking to connectors
No. 49750
Length: 37.5 mm
To be clipped on the connector.
Packing unit: 10 pce.

Prewired connectors
bus 3-pole (shield not connected), network 3-pole type EST 3i3 FS S1 Z
with flexible double round cable of PVC black 3 x 1.5 mm² + 2 x 0.5 mm²
Length 1 m: **No. 49754/1**

Length 2 m: **No. 49754/2**

Length 3 m: **No. 49754/3**

Further lengths on request
Packing unit: 1 pce.

Locking to connectors
No. 49750
Length: 37.5 mm
To be clipped on the connector.
Packing unit: 10 pce.

Quick connection technique ecobus combi 5 x 2.5 mm² + 2 x 1.5 mm²

Connecting box with sockets 5-pole and 2-pole to flat cables No. 49945 and 49946

Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

Designation — **Connecting box with socket type EST 2i5 and KNX/EIB coding with violet baseplate**

No. — **49725**

Technical data

Weight	82 g
Fire load	0.40 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-3 Preliminary draft IEC 61535 / VDE 0628 according to EIB manual
Plastic parts	light grey / transparent, halogen-free
Metal parts	corrosion-resistant
Power current	
Pointed screws	Tightening torque 0.7 Nm, Phillips recessed head screw No. 1
Rated voltage	250 V / 400 V
Test current	24 A
Bus part	
Pointed screws	Tightening torque 1.0 Nm, screwdriver No. 3
Rated voltage	50 V
Rated current	3 A
Packing unit	50 pce.

Technical information

Pointed screws for bus part are partially isolated to avoid a short circuit between shield and copper conductors when they pierce the double metallic shield and go into the cores of the copper conductors.

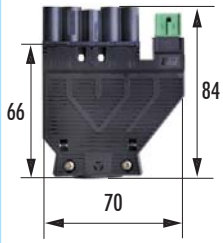

Pointed screw for bus part


Pointed screw for power current

patent applied

Accessories

Connector: network 5-pole, bus 2-pole
type EST 2i5 FS S1 Z
No. 49755
Network: with screw connection
Bus: with spring connection, black/green
Prescribed for every EIB application with plug-in connection.
Coding according to EIB specification.
Height: 17 mm
Fire load: 0.24 kWh
Packing unit: 10 pce.



Locking to connectors
No. 49750
Length: 37.5 mm
To be clipped on the connector.
Packing unit: 10 pce.

Prewired connectors
network 5-pole, bus 2-pole
type EST 2i5 FS S1 Z
with flexible double round cable of PVC violet 5 x 2.5 mm² + 2 x 0.5 mm²

Length 1 m: **No. 49755/1**

Length 2 m: **No. 49755/2**

Length 3 m: **No. 49755/3**

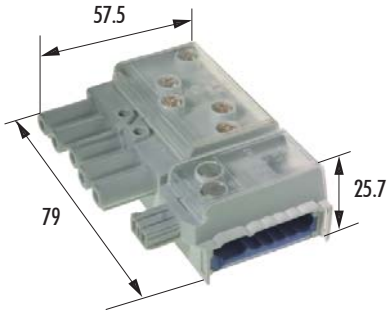
Further lengths on request
Packing unit: 1 pce.

Locking to connectors
No. 49750
Length: 37.5 mm
To be clipped on the connector.
Packing unit: 10 pce.

woertz

Quick connection technique ecobus combi 5 x 2.5 mm² + 2 x 1.5 mm²

Connecting box with sockets 5-pole and 2-pole to flat cables No. 49945 and 49946



CE

Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

Designation — **Connecting box with socket type EST 3i5 and specific coding, with violet baseplate**

No. — **49726**

Technical data

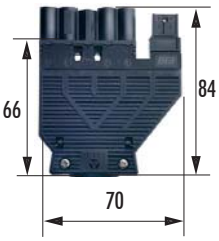
Weight	82 g
Fire load	0.40 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-3 Preliminary draft IEC 61535 / VDE 0628
Plastic parts	light grey / transparent, halogen-free
Metal parts	corrosion-resistant
Power current	
Pointed screws	Tightening torque 0.7 Nm, Phillips recessed head screw No. 1
Rated voltage	250 V / 400 V
Test current	24 A
Bus part	
Pointed screws	Tightening torque 1.0 Nm, screwdriver No. 3
Rated voltage	50 V
Rated current	3 A
Packing unit	50 pce.

Pointed screws for bus part are partially isolated
see page 5.2.56

Technical information

Accessories

Connector: network 5-pole, bus 3-pole (shield not connected) type EST 3i5 FS S1 Z
No. 49756
Network: with screw connection
Bus: with spring connection, black
For every bus application with plug-in connection and specific coding (different from EIB coding)
Height: 17 mm
Fire load: 0.24 kWh
Packing unit: 10 pce.



Locking to connectors
No. 49750
Length: 37.5 mm
To be clipped on the connector.
Packing unit: 10 pce.

Prewired connectors network 5-pole, bus 3-pole (shield not connected) type EST 3i5 FS S1 Z
with flexible double round cable of PVC violet 5 x 2.5 mm² + 2 x 0.5 mm²

Length 1 m: **No. 49756/1**

Length 2 m: **No. 49756/2**

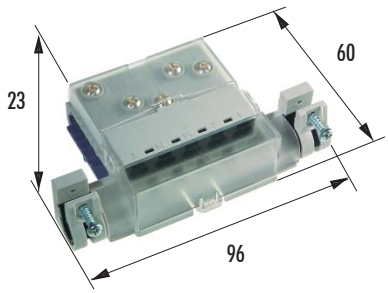
Length 3 m: **No. 49756/3**

Further lengths on request
Packing unit: 1 pce.

Locking to connectors
No. 49750
Length: 37.5 mm
To be clipped on the connector.
Packing unit: 10 pce.

Quick connection technique ecobus combi 5 x 2.5 mm² + 2 x 1.5 mm²

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



CE

Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

Designation — **Connecting box 3P+N+PE**
Flat execution with violet baseplate

No. — **49703**

Technical data

Weight	72 g
Fire load	0.38 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-2 / IEC 60998-2-3
Plastic parts	light grey / transparent, halogen-free
Metal parts	corrosion-resistant
Connecting capacity	∅ 6-13 mm
Nominal cross-section	for flexible round cable of PVC up to 5 x 1.5 mm² with end sleeves for strands DIN 46228T4 or rigid round cables up to 5 x 2.5 mm²
Pointed screws	Tightening torque 0.7 Nm, screwdriver for Phillips recessed head screw No.1
Spring clamp terminals	to connect 2 round cables per pole
Rated voltage	690 V
Test current	24 A
Packing unit	50 pce.

On request the connecting boxes can be prewired with one or two flexible round cables:

of 1 m 5 x 1.5 mm²
of 2 m 5 x 1.5 mm²
of 3 m 5 x 1.5 mm²

Easier working on site!

Connection

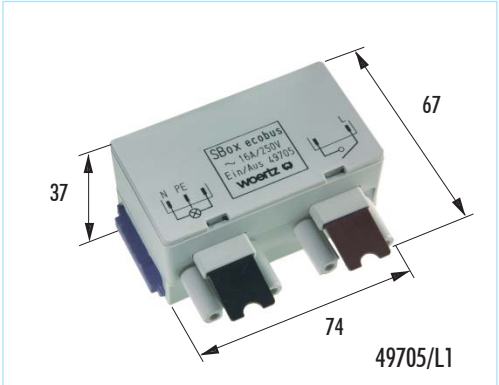
Cable connection:

strip the round cable 70 mm
and the conductors 10 mm

woertz

Quick connection technique ecobus combi 5 x 2.5 mm² + 2 x 1.5 mm²

Connecting boxes SBox for lamp connections with I/O switch to flat cables No. 49845 and 49846



CE

Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

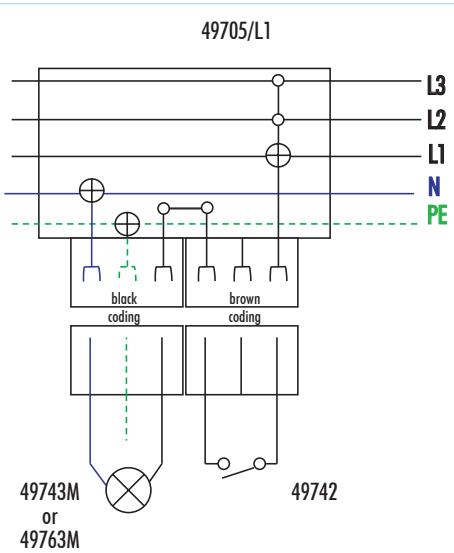
Designation	Connecting boxes with I/O switch with violet baseplate		
No.	49705/L1	49705/L2	49705/L3

prewired connectors see pages 5.2.63 & 5.2.64

Technical data

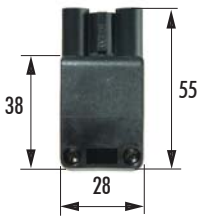
Weight	94 g
Fire load	0.20 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-3 Preliminary draft IEC 61535 / VDE 0628
Phase L1	light grey
Phase L2	dark grey
Phase L3	black
Connector for switch	type GST 18i3, code 4 brown
Connector for lamp	type GST 18i3, code 1 black
Plastic parts	halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 0.7 Nm, screwdriver for Phillips recessed head screw No.1
Rated voltage	250 V
Test current	24 A
Packing unit	50 pce.

Wiring diagram

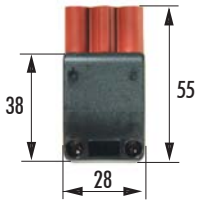


Accessories

Connector 3-pole with 1 screw connection for lamps
Type GST 18i3 S S1 Z
Code 1 black
No. 49743M
For 1 connecting cable up to 3 x 2.5mm²
Height: 25 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.



Connector 3-pole with 1 screw connection for switch
Type GST 18i3 S S1 Z
Code 4 brown
No. 49742
For 1 connecting cable up to 3 x 2.5mm²
Height: 25 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.



Connector 3-pole with 2 spring clamp connections per pole for lamps / Type GST 18i3 F S2 Z
Code 1 black
No. 49763M
For 2 connecting cables up to 3 x 2.5mm²
Height: 15.5 mm
Fire load: 0.11 kWh
Packing unit: 10 pce.

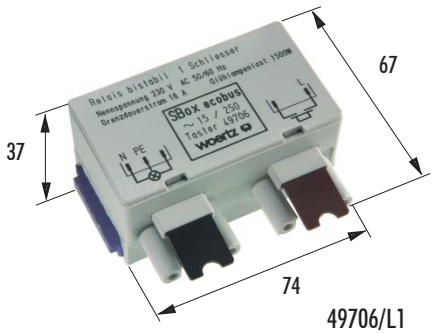
Baseplate with fixing brackets
No. 49738
violet
To fix the boxes on a surface.
Packing unit: 10 pce.

Quick connection technique ecobus combi 5 x 2.5 mm² + 2 x 1.5 mm²

Connecting boxes SBox for lamp connections with impulse switch to flat cables No. 49945 and 49946


49706/L2


49706/L3



CE

Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

Designation — **Connecting boxes with impulse switch with violet baseplate**

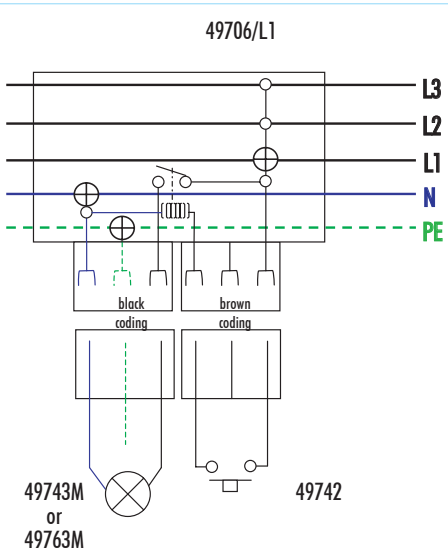
No.	49706/L1	49706/L2	49706/L3

prewired connectors see pages 5.2.63 & 5.2.64

Technical data

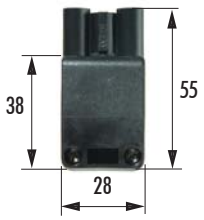
Weight	110 g
Fire load	0.20 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-3 Preliminary draft IEC 61535 / VDE 0628
Phase L1	light grey
Phase L2	dark grey
Phase L3	black
Connector for switch	type GST 18i3, code 4 brown
Connector for lamp	type GST 18i3, code 1 black
Plastic parts	halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 0.7 Nm, screwdriver for Phillips recessed head screw No.1
Rated voltage	250 V
Test current	24 A
Packing unit	50 pce.

Wiring diagram

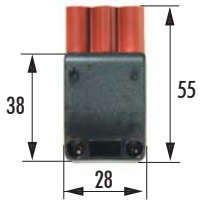


Accessories

Connector 3-pole with 1 screw connection for lamps
Type GST 18i3 S S1 Z
Code 1 black
No. 49743M
For 1 connecting cable up to 3 x 2.5mm²
Height: 25 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.



Connector 3-pole with 1 screw connection for switch
Type GST 18i3 S S1 Z
Code 4 brown
No. 49742
For 1 connecting cable up to 3 x 2.5mm²
Height: 25 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.



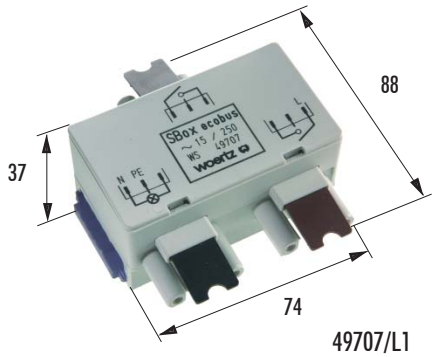
Connector 3-pole with 2 spring clamp connections per pole for lamps / Type GST 18i3 F S2 Z
Code 1 black
No. 49763M
For 2 connecting cables up to 3 x 2.5mm²
Height: 15.5 mm
Fire load: 0.11 kWh
Packing unit: 10 pce.

Baseplate with fixing brackets
No. 49738
violet
To fix the boxes on a surface.
Packing unit: 10 pce.

woertz

Quick connection technique ecobus combi 5 x 2.5 mm² + 2 x 1.5 mm²

Connecting boxes SBox for lamp connections with changeover contact to flat cables No. 49945 and 49946



CE

Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

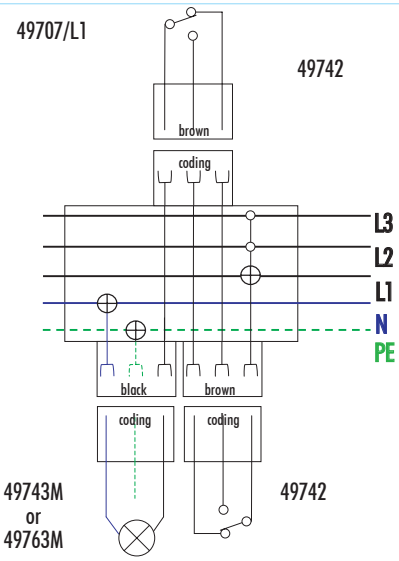
Designation	Connecting boxes with changeover contact with violet baseplate		
No.	49707/L1	49707/L2	49707/L3

prewired connectors see pages 5.2.63 & 5.2.64

Technical data

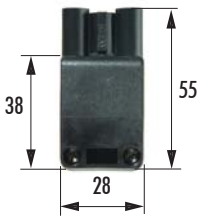
Weight	120 g
Fire load	0.20 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-3 Preliminary draft IEC 61535 / VDE 0628
Phase L1	light grey
Phase L2	dark grey
Phase L3	black
Connector for switch	type GST 18i3, code 4 brown
Connector for lamp	type GST 18i3, code 1 black
Plastic parts	halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 0.7 Nm, screwdriver for Phillips recessed head screw No.1
Rated voltage	250 V
Test current	24 A
Packing unit	50 pce.

Wiring diagram

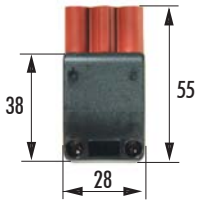


Accessories

Connector 3-pole with 1 screw connection for lamps
Type GST 18i3 S S1 Z
Code 1 black
No. 49743M
For 1 connecting cable up to 3 x 2.5mm²
Height: 25 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.



Connector 3-pole with 1 screw connection for switch
Type GST 18i3 S S1 Z
Code 4 brown
No. 49742
For 1 connecting cable up to 3 x 2.5mm²
Height: 25 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.



Connector 3-pole with 2 spring clamp connections per pole for lamps / Type GST 18i3 F S2 Z
Code 1 black
No. 49763M
For 2 connecting cables up to 3 x 2.5mm²
Height: 15.5 mm
Fire load: 0.11 kWh
Packing unit: 10 pce.

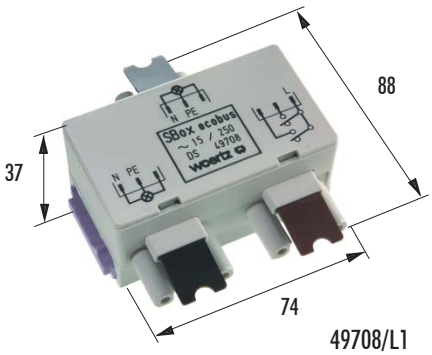
Baseplate with fixing brackets
No. 49738
violet
To fix the boxes on a surface.
Packing unit: 10 pce.

Quick connection technique ecobus combi 5 x 2.5 mm² + 2 x 1.5 mm²

Connecting boxes SBox for lamp connections with series connection to flat cables No. 49945 and 49946


49708/L2


49708/L3



CE

Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

Designation — **Connecting boxes with series connection with violet baseplate**

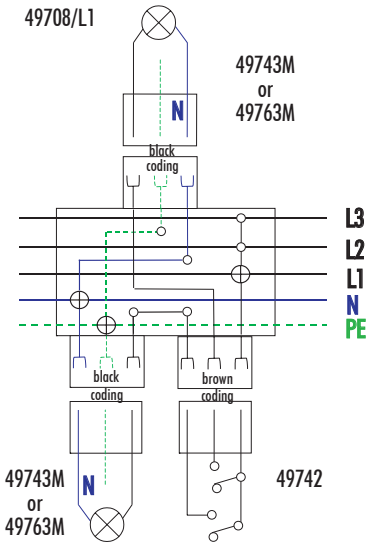
No.	49708/L1	49708/L2	49708/L3

prewired connectors see pages 5.2.63 & 5.2.64

Technical data

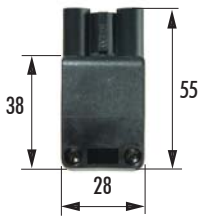
Weight	120 g
Fire load	0.20 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1 / IEC 60998-2-3 Preliminary draft IEC 61535 / VDE 0628
Phase L1	light grey
Phase L2	dark grey
Phase L3	black
Connector for switch	type GST 18i3, code 4 brown
Connector for lamp	type GST 18i3, code 1 black
Plastic parts	halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 0.7 Nm, screwdriver for Phillips recessed head screw No.1
Rated voltage	250 V
Test current	24 A
Packing unit	50 pce.

Wiring diagram

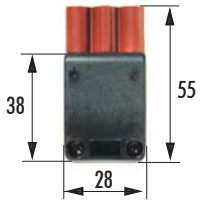


Accessories

Connector 3-pole with 1 screw connection for lamps
Type GST 18i3 S S1 Z
Code 1 black
No. 49743M
For 1 connecting cable up to 3 x 2.5mm²
Height: 25 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.



Connector 3-pole with 1 screw connection for switch
Type GST 18i3 S S1 Z
Code 4 brown
No. 49742
For 1 connecting cable up to 3 x 2.5mm²
Height: 25 mm
Fire load: 0.18 kWh
Packing unit: 10 pce.



Connector 3-pole with 2 spring clamp connections per pole for lamps / Type GST 18i3 F S2 Z
Code 1 black
No. 49763M
For 2 connecting cables up to 3 x 2.5mm²
Height: 15.5 mm
Fire load: 0.11 kWh
Packing unit: 10 pce.

Baseplate with fixing brackets
No. 49738
violet
To fix the boxes on a surface.
Packing unit: 10 pce.

woertz

Prewired connectors
3-pole, P+N+PE, type GST 18i3 S S1 Z
Code 4 brown

Height: 25 mm
with flexible round cable of PVC, black, 3 x 1.5 mm²

Length 1 m: No. 49742/1
Length 2 m: No. 49742/2
Length 3 m: No. 49742/3
Length 5 m: No. 49742/5
Length 7 m: No. 49742/7
Length 10 m: No. 49742/10

Stripping length of sheath 35 mm, stripping length of insulation 9 mm
Leads compressed by ultrasound at the ends

Packing unit: 1 pce.

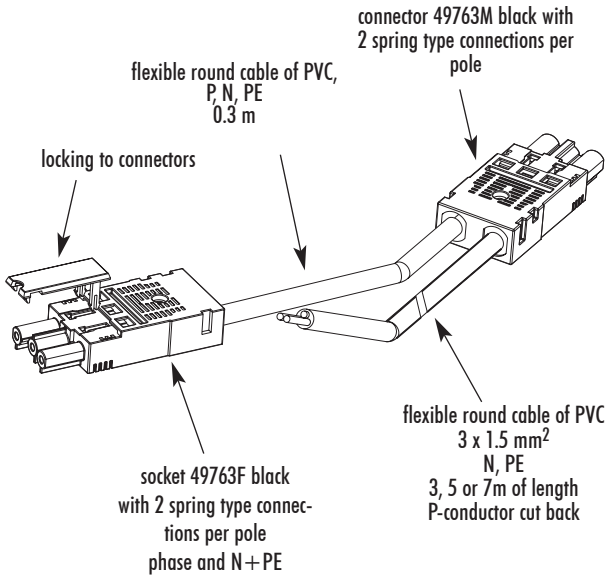
Height: 25 mm

Connecting lines for devices, ready to use

with 3-pole connector P+N+PE
type GST 18i3 F S2 Z for 2 connection points per pole
with round flexible PVC cable, black, 3 x 1.5 mm², 0.3 m
and 3-pole socket P+N+PE
type GST 18i3 F B2 Z with locking to connectors
one free cable end

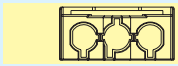
Length 3 m: No. 49760/3 complete set
Length 5 m: No. 49760/5 complete set
Length 7 m: No. 49760/7 complete set

Packing unit: 10 pce.



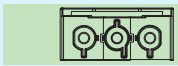
Example of application of a connecting box for lamp connections with changeover contact see page 5.2.35

Connecting lines for devices equipped with 3-pole socket, P+N+PE
type GST 18i3 F B2 Z, height 13 mm, without locking to connectors
with flexible round cable of PVC black
stripping length of sheath 35 mm, stripping length of insulation 9 mm, leads compressed by ultrasound at the ends



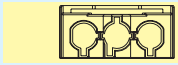
	Connecting lines with one free cable end 3 x 1.5 mm²	Connecting lines with one free cable end 3 x 2.5 mm²
Length 1 m	49743/1F	49743/1F25
Length 2 m	49743/2F	49743/2F25
Length 3 m	49743/3F	49743/3F25
Length 4 m	49743/4F	49743/4F25
Length 5 m	49743/5F	49743/5F25
Length 6 m	49743/6F	49743/6F25
Length 7 m	49743/7F	49743/7F25
Length 8 m	49743/8F	49743/8F25

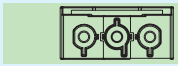
Connecting lines for devices equipped with 3-pole connector, P+N+PE
type GST 18i3 F S2 Z, height 13 mm, without locking to connectors
with flexible round cable of PVC black
stripping length of sheath 35 mm, stripping length of insulation 9 mm, leads compressed by ultrasound at the ends



	Connecting lines with one free cable end 3 x 1.5 mm²	Connecting lines with one free cable end 3 x 2.5 mm²
Length 1 m	49743/1M	49743/1M25
Length 2 m	49743/2M	49743/2M25
Length 3 m	49743/3M	49743/3M25
Length 4 m	49743/4M	49743/4M25
Length 5 m	49743/5M	49743/5M25
Length 6 m	49743/6M	49743/6M25
Length 7 m	49743/7M	49743/7M25
Length 8 m	49743/8M	49743/8M25

Connecting lines for devices equipped with 3-pole socket, P+N+PE
type GST 18i3 F B2 Z, height 13 mm, without locking to connectors
and **equipped with 3-pole connector, P+N+PE**
type GST 18i3 F S2 Z, height 13 mm, without locking to connectors
with flexible round cable of PVC black





	Connecting lines socket-connector 3 x 1.5 mm²	Connecting lines socket-connector 3 x 2.5 mm²
Length 1 m	49743/1MF	49743/1MF25
Length 2 m	49743/2MF	49743/2MF25
Length 3 m	49743/3MF	49743/3MF25
Length 4 m	49743/4MF	49743/4MF25
Length 5 m	49743/5MF	49743/5MF25
Length 6 m	49743/6MF	49743/6MF25
Length 7 m	49743/7MF	49743/7MF25
Length 8 m	49743/8MF	49743/8MF25

Connecting lines for devices equipped with 5-pole socket, 3P+N+PE
type GST 18i5 S B1 Z, height 17 mm, without locking to connectors
with flexible round cable of PVC black
stripping length of sheath 35 mm, stripping length of insulation 7 mm, leads compressed by ultrasound at the ends

	Connecting lines with one free cable end 5 x 1.5 mm²	Connecting lines with one free cable end 5 x 2.5 mm²
Length 1 m	49745/1F	49745/1F25
Length 2 m	49745/2F	49745/2F25
Length 3 m	49745/3F	49745/3F25
Length 4 m	49745/4F	49745/4F25
Length 5 m	49745/5F	49745/5F25
Length 6 m	49745/6F	49745/6F25
Length 7 m	49745/7F	49745/7F25
Length 8 m	49745/8F	49745/8F25

Connecting lines for devices equipped with 5-pole connector, 3P+N+PE
type GST 18i5 S S1 Z, height 17 mm, without locking to connectors
with flexible round cable of PVC black
stripping length of sheath 35 mm, stripping length of insulation 7 mm, leads compressed by ultrasound at the ends

	Connecting lines with one free cable end 5 x 1.5 mm²	Connecting lines with one free cable end 5 x 2.5 mm²
Length 1 m	49745/1M	49745/1M25
Length 2 m	49745/2M	49745/2M25
Length 3 m	49745/3M	49745/3M25
Length 4 m	49745/4M	49745/4M25
Length 5 m	49745/5M	49745/5M25
Length 6 m	49745/6M	49745/6M25
Length 7 m	49745/7M	49745/7M25
Length 8 m	49745/8M	49745/8M25

Connecting lines for devices equipped with 5-pole socket, 3P+N+PE
type GST 18i5 S B1 Z, height 17 mm, without locking to connectors
and **equipped with 5-pole connector, 3P+N+PE**
type GST 18i5 S S1 Z, height 17 mm, without locking to connectors
with flexible round cable of PVC black

	Connecting lines socket-connector 5 x 1.5 mm²	Connecting lines socket-connector 5 x 2.5 mm²
Length 1 m	49745/1MF	49745/1MF25
Length 2 m	49745/2MF	49745/2MF25
Length 3 m	49745/3MF	49745/3MF25
Length 4 m	49745/4MF	49745/4MF25
Length 5 m	49745/5MF	49745/5MF25
Length 6 m	49745/6MF	49745/6MF25
Length 7 m	49745/7MF	49745/7MF25
Length 8 m	49745/8MF	49745/8MF25

Quick connection technique ecobus data 2 x 1.5 mm²

No. 49722

No. 49720

No. 49740

Bus flat cable 2 x 1.5 mm²
(50V, 3A)
Overall dimensions 11 x 6 mm

The supply of the flat cable does usually not occur at the end of the cable, but by means of junction boxes connected at any point all along the flat cable.
Both conductors 1.5 mm² are laid parallel
Double shield of aluminium, electrically isolated
Do not connect the shield to earth

Connecting boxes 2-pole
Flat cable connected by means of pointed screws, without the cable having to be stripped
Connection of a round cable by means of a connector or of a micro-terminal
It is recommended to use an electric screwdriver

Where are these bus flat cables used?

- in installations where bus will be integrated in a further step
- with flat cable systems with large sections of 10 mm² or 16 mm²

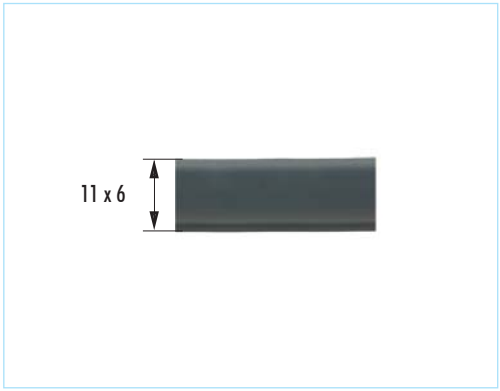
Mounting procedure of connecting box No. 49720

1. Place the connecting box on the asymmetric bus flat cable (no need to strip the insulation of the cable)
2. Push on the baseplate
3. Turn in the pointed screws as far as they will go.
4. Clip the hood.

To release the hood, insert a screwdriver in the slit provided for the purpose and lift slightly (5)

Quick connection technique ecobus data 2 x 1.5 mm²

Bus flat cable 2 x 1.5 mm²



Environment: dry, UV-protected area

Ambient temperature: from -15°C up to +40°C

Installation temperature: min. +5°C

Designation	Bus flat cable of PVC asymmetric	Bus flat cable halogen-free asymmetric
No.	49949	49948
	Technical data	Technical data
Sheath	PVC according to IEC 227	Polyethylene compound without corrosive gas acc. to DIN VDE 0472 Part 813
Colour of the sheath	dark grey	dark grey
Weight	90 g/m	86 g/m
Fire load	0.48 kWh/m	0.44 kWh/m
Fire behaviour	Flame retardant according to IEC 60332-1	Flame retardant according to IEC 60332-1 Low fire propagation acc. to IEC 60332-3 Low smoke development acc. to IEC 61034-1/2 Marking on the sheath: FR/LSOH (Flame Retardant / Low Smoke / Zero Halogen)
No. of leads x cross-section	2 x 1.5 mm²	2 x 1.5 mm²
Copper conductors	tinned according to CENELEC HD 383 S2 Class 5	tinned according to CENELEC HD 383 S2 Class 5
Insulation of the leads	Polyethylene compound acc. to DIN VDE 0207 Part 2, 2YI2	Polyethylene compound acc. to DIN VDE 0207 Part 2, 2YI2
Colour of the leads	neutral	neutral
Shield	double shield of aluminium, electrically isolated	double shield of aluminium, electrically isolated
Test voltage	4 kV, 50 Hz	4 kV, 50 Hz
Max. operating voltage	50 V	50 V
Max. rated current	3 A	3 A
DC-resistance	13.7 Ω/km	13.7 Ω/km
Capacitance	70 pF/m	70 pF/m
Attenuation at 1 MHz	nom. 1.2 dB/100m	nom. 1.2 dB/100m
Charact. impedance at 1 MHz	nom. 75 Ω	nom. 75 Ω

Note

Flat cable also available with black strips
No. 49949/SM

Accessories

Shears
No. 49930

For cutting neatly and easily every type of flat cables up to 2.5 mm².
With sliding anvil. Teflon coated blades.

Packing unit: 1 pce.

Cable end piece
No. 49732

Mounted at both ends of the cable. The conductors of the flat cable can be inserted in the end-pieces without being stripped.

Of polycarbonate, halogen-free, transparent
Dimensions: 20 x 14 x 9 mm
Weight: 1.5 g
Fire load: 0.02 kWh

Packing unit: 10 pce.

Insulating tape
No. 49960

When connections are removed or displaced, the boxes have to be left in position. If it is not possible, the holes produced by the pointed screws have to be reinsulated correctly by means of the insulating tape trademark "Scotch 2210", synthetic caoutchouc-based product, PVC coated black.
Weatherproof, self-fusing.
Dimensions: 102 x 100 x 2.3 mm
Dielectric strength: max. 23 kV/mm
Temperature: max. +70°C
Packing unit: 10 pce.

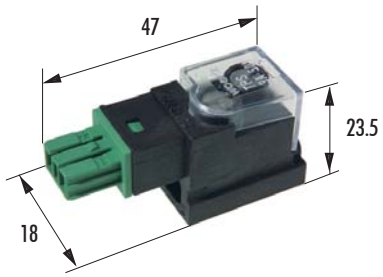
Cable fastening clamp for screw fixing
No. 49693

Of polyamide 66, halogen-free, grey
Dimensions: 31 x 10 x 8.5 mm
Weight: 1.2 g
Fire load: 0.01 kWh

Packing unit: 100 pce.

Quick connection technique ecobus data 2 x 1.5 mm²

Connecting box with 2-pole socket to bus flat cables No. 49949 and 49948



CE

EIB

Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

Designation — **Connecting box with socket 2-pole type BST 14i2, with KNX/EIB coding, for supply or branching**

No. — **49720**

Technical data

Weight	12 g
Fire load	0.08 kWh
Fire behaviour	UL 94-V2
Test specifications	according to EIB manual
Plastic parts	black/green / transparent, halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 1.0 Nm, screwdriver No. 3
Rated voltage	50 V
Rated current	3 A
Packing unit	50 pce.

Technical information

Pointed screws for bus part are partially isolated to avoid a short circuit between shield and copper conductors when they pierce the double metallic shield and go into the cores of the copper conductors.

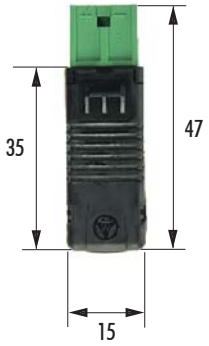
Pointed screw for bus part

patent applied

Accessories

Connector 2-pole type BST 14i2 F S1 Z No. 49740

with spring connection, black/green.
Prescribed for every EIB application with plug-in connection.
Height: 14.4 mm
Fire load: 0.04 kWh
Packing unit: 10 pce.



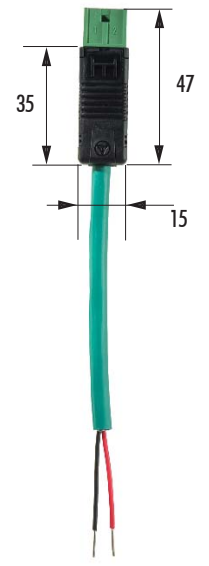
Prewired connectors 2-pole type BST 14i2 F S1 Z
Height: 14.4 mm
with cable EIB (ST) green
2 x 0.8 mm²

Length 1 m: **No. 49740/1**

Length 2 m: **No. 49740/2**

Length 3 m: **No. 49740/3**

Further lengths on request
Packing unit: 1 pce.



woertz

CE

Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

Designation **Connecting box with socket 2-pole type BST 14i3, with specific coding, for supply or branching**

No. **49721**

Technical data

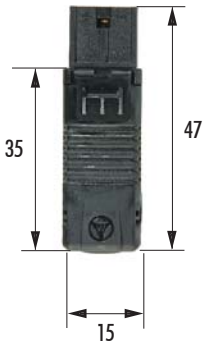
Weight	12 g
Fire load	0.08 kWh
Fire behaviour	UL 94-V2
Plastic parts	black / transparent, halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 1.0 Nm, screwdriver No. 3
Rated voltage	50 V
Rated current	3 A
Packing unit	50 pce.

Pointed screws for bus part are partially isolated
see page 5.2.70.

Technical information

Accessories

Connector 3-pole (shield not connected) type BST 14i3 F S1 Z No. 49741
with spring connection, black.
For every bus application with plug-in connection and specific coding (different from EIB coding)
Height: 14.4 mm
Fire load: 0.05 kWh
Packing unit: 10 pce.



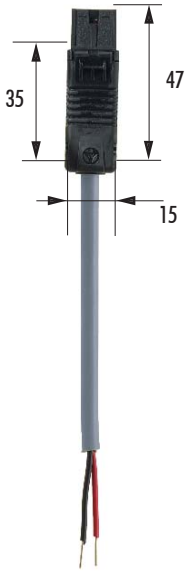
Prewired connectors 3-pole (shield not connected) type BST 14i3 F S1 Z
Height: 14.4 mm
with cable (ST) grey 2 x 0.8 mm²

Length 1 m: **No. 49741/1**

Length 2 m: **No. 49741/2**

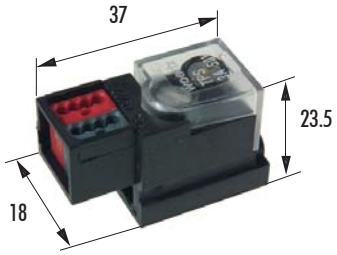
Length 3 m: **No. 49741/3**

Further lengths on request
Packing unit: 1 pce.



Quick connection technique ecobus data 2 x 1.5 mm²

Connecting box with micro-terminal to bus flat cables No. 49949 and 49948



CE

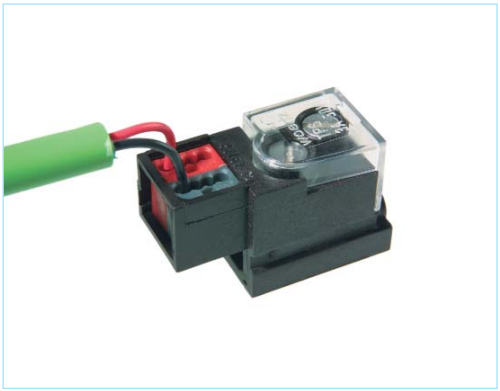
Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

Designation — **Connecting box 2 x 1.5 mm² with micro-terminal for supply or branching**

No. — **49722**

Technical data

Weight	14 g
Fire load	0.08 kWh
Fire behaviour	UL 94-V2
Plastic parts	black / transparent, halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 1.0 Nm, screwdriver No. 3
Rated voltage	50 V
Rated current	3 A
Packing unit	50 pce.



Technical information

Pointed screws for bus part are partially isolated to avoid a short circuit between shield and copper conductors when they pierce the double metallic shield and go into the cores of the copper conductors.

Pointed screw for bus part

patent applied

woertz

Quick connection technique flat cable multibus 4 x 1.5 mm^2

developed for low voltages (oversized because of the mechanical stress)
Flat cable 4 x 1.5 mm^2
Overall dimensions 16 x 4.6 mm
used as a low voltage system and also as a complement to the flat cable system ecobus combi 5 x 2.5 mm^2 + 2 x 1.5 mm^2

No. 49671

The supply of the flat cable does usually not occur at the end of the cable, but by means of junction boxes connected at any point all along the flat cable.

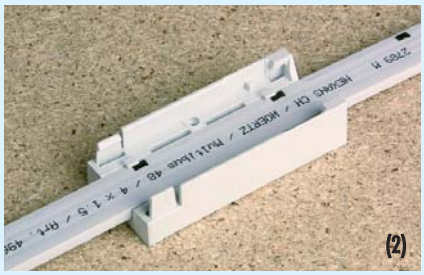
Junction boxes 4 x 0.75 mm^2, 48V, 3.5A max., dimensions: 76 x 32 x 27 mm
With piercing points which pierce the flat cable and the round cable sheaths. The conductors don't have to be stripped of insulation. Manual connection by snapping together both parts of the box before tightening the fastening screws.
Suitable for the supply of flat cables or for the branching from flat cables.
Gateway multibus KNX/EIB type UK 24 EIB.

Where is this flat cable used?

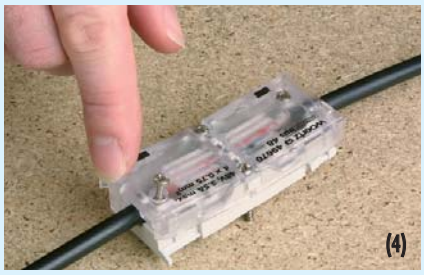
- For heating, ventilating and air-conditioning processes
  (specially in connection with products of the company Belimo)

Mounting procedure of junction boxes No. 49670 / 49671


(1)


(2)


(3)


(4)


(5)


(6)


(7)


(8)

1. Position the base part of the junction box and screw it on its support if necessary
2. Position the asymmetric multibus flat cable in the right position. If it is not in the right position, the base part has to be turned through 180°
3. Cut the round cable(s) to the desired length, dismantle it and introduce the leads in the adapter (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 its fastening screws

Note
If needed, the connector may be marked by means of self-adhesive labels

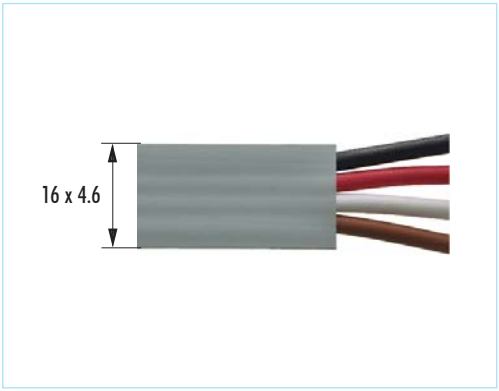
Possibility of prewiring:

Prewired boxes may be delivered on request.

The mounting procedure may also occur in a different order: (1), (2), (6), (7), (8), (3), (4), (5) .
Cabling will be achieved last.

Quick connection technique flat cable multibus 4 x 1.5 mm²

Flat cable 4 x 1.5 mm²



CE

Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C

Designation	**Flat cable halogen-free asymmetric, 4 x 1.5 mm² for low current applications**
No.	**49651**

Technical data

Sheath	Polyethylene compound, halogen-free without corrosive gas acc. to DIN VDE 0472 Part 813 with polarizing notch
Colour of the sheath	light grey RAL 7035
Weight	125 g/m
Fire load	7.137 kWh/m
Fire behaviour	Flame retardant according to IEC 60332-1 Low smoke development acc. to IEC 61034-1/2 Marking on the sheath: FR/LSOH (Flame Retardant / Low Smoke / Zero Halogen)
No. of leads x cross-section	4 x 1.5 mm²
Copper conductors	bare, highly flexible acc. to CENELEC HD 383 S2 Class 5
Insulation of the leads	Polyethylene compound, halogen-free
Colour of the leads	black, red, white, brown
Test voltage	4 kV, 50 Hz
Rated voltage	300 V
Current-carrying capacity	10 A, VDE 0298/T4/Tb6 according to IEC 60364 and SEV NIN 42512.2
DC-resistance	13.3 Ω/km according to IEC 228 Class 5
Bend radius	> 20 mm
Packing unit	500 m

woertz

Accessories

Shears
No. 49930

For cutting neatly and easily every type of flat cables up to 2.5 mm².
With sliding anvil. Teflon coated blades.

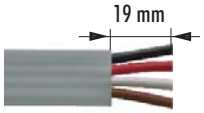
Packing unit: 1 pce.

Cable end piece
No. 9039

To be mounted at both ends of the flat cable, so that the specified creepage distance will be observed. The cable has to be stripped for a distance of 19 mm.
Of polycarbonate, halogen-free, transparent

Dimensions: 35 x 28 x 18.5 mm
Weight: 7 g
Fire load: 0.06 kWh

Packing unit: 10 pce.



Insulating tape
No. 49632

When connections are removed or displaced, the boxes have to be left in position. If it is not possible, the holes produced by the piercing points have to be reinsulated correctly by means of the insulating tape trademark "Scotch VM", synthetic caoutchouc-based product, PVC coated black.
Weatherproof, self-fusing.
Dimensions: 50 mm x 1 m
Dielectric strength: max. 18 kV/mm
Temperature: max. +70°C
Packing unit: 1 m

Cable fastening clamp for screw fixing, single
No. 49661

to flat cable multibus
of polyamide 66, halogen-free

Dimensions: 31 x 10 x 7 mm
Weight: 1 g
Fire load: 0.01 kWh

Packing unit: 100 pce.

Cable fastening clamp for screw fixing, double
No. 49664

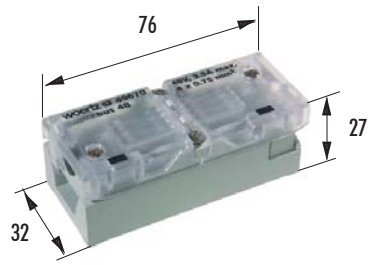
to flat cables multibus/ecobus combi
of polyamide 66, halogen-free

Dimensions: 70 x 10 x 10 mm
Weight: 2 g
Fire load: 0.02 kWh

Packing unit: 50 pce.

Quick connection technique flat cable multibus 4 x 1.5 mm²

Junction boxes with 3 contacts and 1 connector



CE

Environment:	dry, UV-protected area
Temp. of application:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

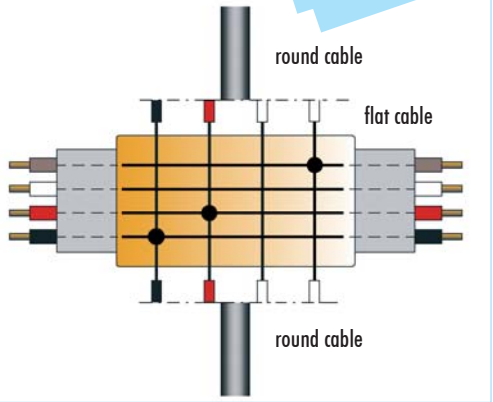
Designation — **Junction box for 2 round cable outlets 4 x 0.75 mm² with 3 flat cable contacts and 1 connector for supply or branching**

No. — **49670**

Specially adapted to MP bus devices from the company Belimo

Technical data

Weight	55.5 g
Fire load	0.4 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1, IEC 60998-2-3
Plastic parts	transparent, halogen-free
Metal parts	corrosion-resistant
Screwed sealing plugs	PT screws Tightening torque 0.7 Nm Phillips recessed head screw No. 1
Number of contacts with flat cable	3
Connector (round cable/round cable)	1
Rated voltage	48 V
Rated current	max. 3.5 A
Colour	light grey
Packing unit	25 pce.



Technical information

- connection round cable/flat cable by means of pointed edges without the conductors having to be stripped of insulation
- contact established through folding down the connector
- flat cable with polarizing notch
- delivered with 1 stopper No. 49675

Accessories

Round cable flexible
No. 49665
of PVC, black, 4 x 0.75mm²
for connecting devices
strip the sheath 28 mm
Colour of the leads:
black/red/white/white.
Temperature of application:
-30°C up to +90°C
Fire behaviour: Flame retardant according to IEC 60332.1, Low smoke development acc. to IEC 61034-1/2

Packing unit: 500 m

diameter 6.8 mm

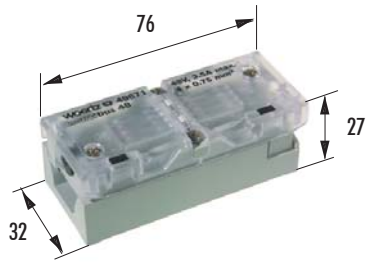
Stopper
No. 49675
To obturate unused cable outlets

Packing unit: 25 pce.

woertz

Quick connection technique flat cable multibus 4 x 1.5 mm²

Junction boxes with 4 contacts



CE

Environment:	dry, UV-protected area
Temp. of application:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP20

Designation **Junction box for 2 round cable outlets 4 x 0.75 mm² with 4 flat cable contacts for supply or branching**

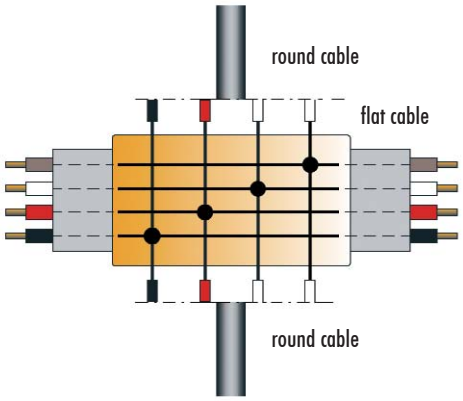
No. **49671**

Technical data

Weight	55.5 g
Fire load	0.4 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1, IEC 60998-2-3
Plastic parts	transparent, halogen-free
Metal parts	corrosion-resistant
Screwed sealing plugs	PT screws Tightening torque 0.7 Nm Phillips recessed head screw No. 1
Number of contacts with flat cable	4
Rated voltage	48 V
Rated current	max. 3.5 A
Colour	light grey
Packing unit	25 pce.

contact bridges

connections
flat cable-round cable



Technical information

- connection round cable/flat cable by means of pointed edges without the conductors having to be stripped of insulation
- contact established through folding down the connector
- flat cable with polarizing notch
- delivered with 1 stopper No. 49675

Accessories

Round cable flexible
No. 49665
of PVC, black, 4 x 0.75mm²
for connecting devices
strip the sheath 28 mm
Colour of the leads:
black/red/white/white.
Temperature of application:
-30°C up to +90°C
Fire behaviour: Flame retardant according to IEC 60332.1, Low smoke development acc. to IEC 61034-1/2

Packing unit: 500 m

diameter 6.8 mm

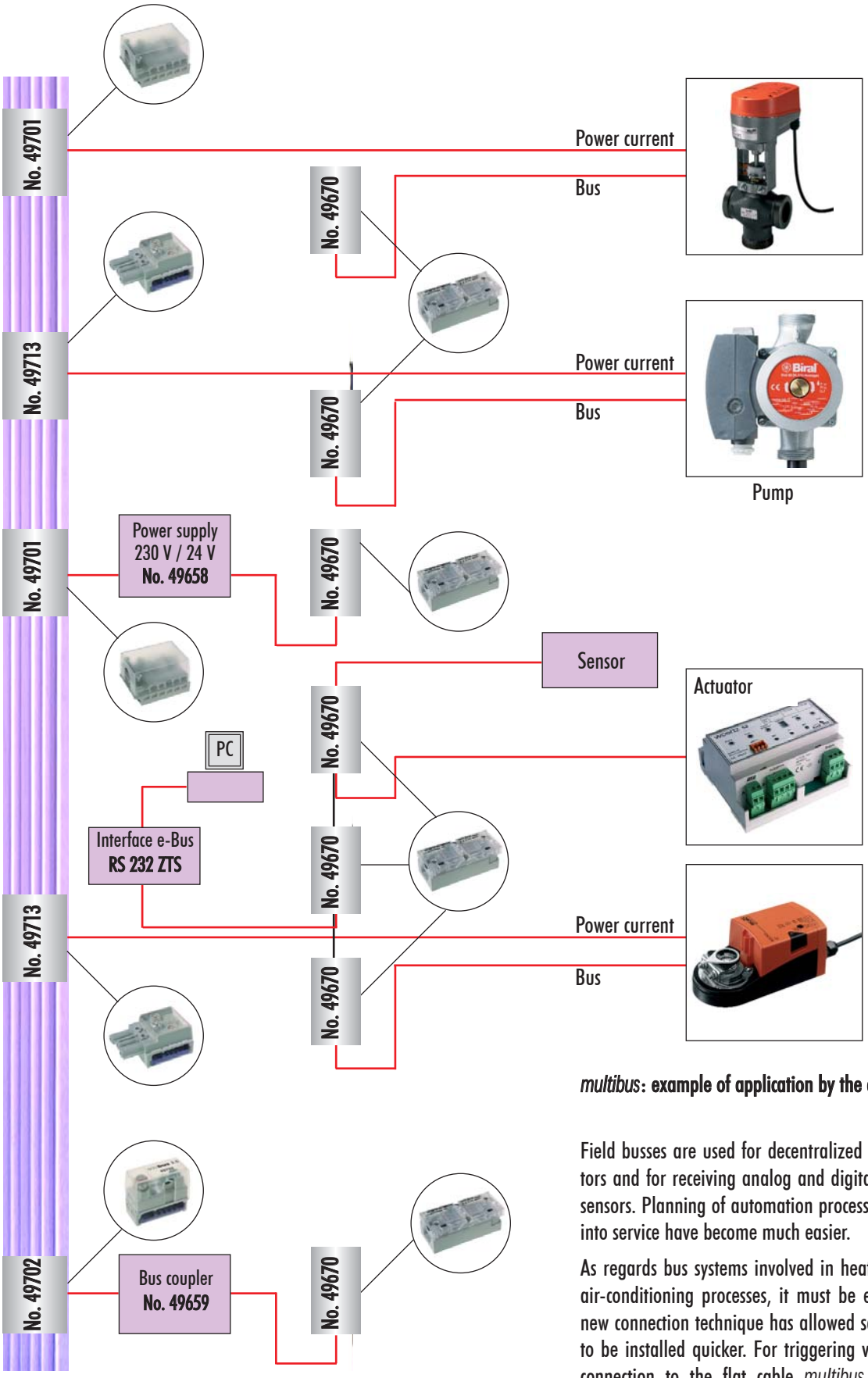
Stopper
No. 49675
To obturate unused cable outlets

Packing unit: 25 pce.

Quick connection technique flat cable multibus 4 x 1.5 mm²

Power supply and bus coupler
Supply through flat cable system ecobus combi 5 x 2.5 mm² + 2 x 1.5mm²

Designation	**Power supply 230 V / 24 VDC consisting of 1 power supply, 1 box 49670, 1 box 49701, ready to be connected**	**Bus coupler for EIB-, LON-Bus, ... consisting of 1 box 49670, 1 box 49702, 1 connection cable 49665, ready to be connected**
No.	**49658**	**49659**
	Technical data	**Technical data**
Weight	394 g	94 g
AC/DC adapter:		
Type	FW7301/24	
Voltage range at net input	100-240 V AC (47-63 Hz)	
Output voltage	24 VDC	
Output current	1.25 A	
Connection cable:		No. 49665 round cable 4 x 0.75 mm²
Packing unit	1 pce.	1 pce.



Flat cable *ecobus combi* PVC
No. 49945
5x2.5 mm² + 2x1.5 mm²
(EIB, LON, e-Bus in heating processes...)

Flat cable *multibus* halogen-free
No. 49651
4x1.5 mm² (MP-Bus,...)

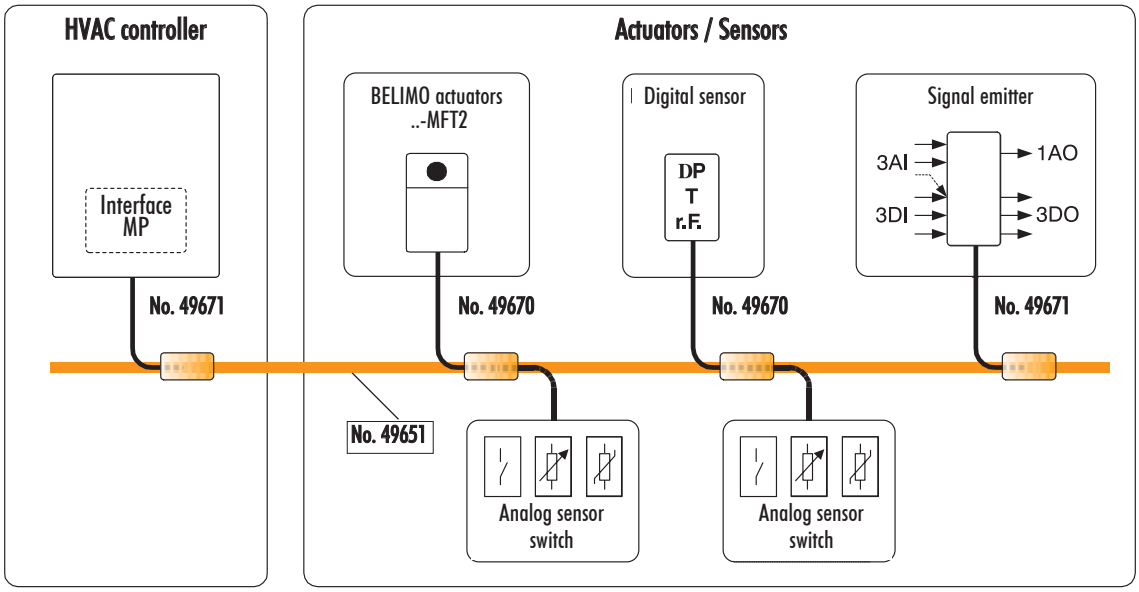
***multibus*: example of application by the company Belimo**

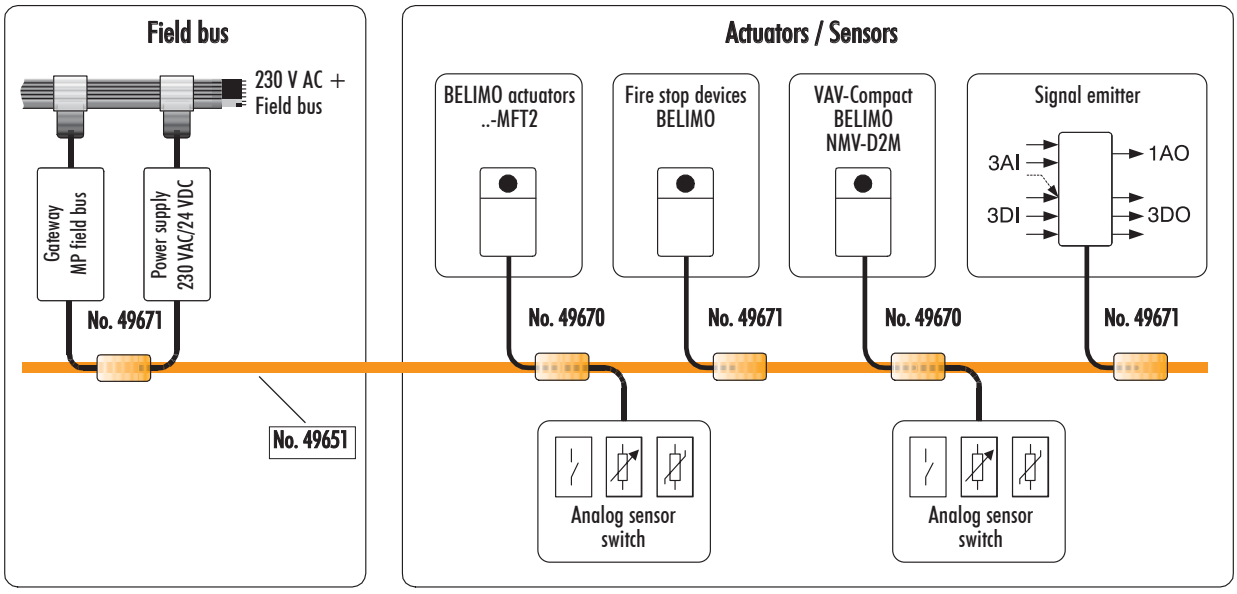
Field busses are used for decentralized controlling of actuators and for receiving analog and digital signals emitted by sensors. Planning of automation processes and putting them into service have become much easier.

As regards bus systems involved in heating, ventilating and air-conditioning processes, it must be emphasized that the new connection technique has allowed sensors and actuators to be installed quicker. For triggering valves or pumps, the connection to the flat cable *multibus* occurs via suitable gateways supported by the flat cable *ecobus combi* - the latter also delivers heavy current and transmits the bus signals towards EIB, LONWORKS or e-Bus for heating systems in an interference-free way.

Quick connection technique flat cable multibus 4 x 1.5 mm²

Application: by the company Belimo - Multitherm

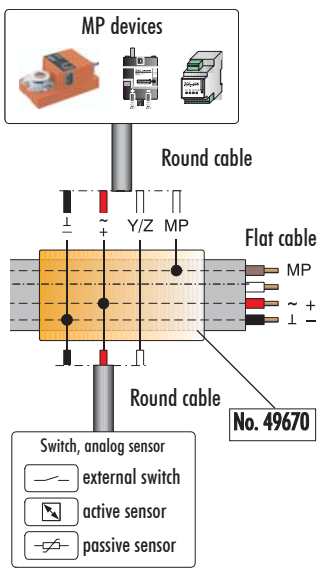




The modern bus technology goes together with a worked out connecting technique. The bus connecting system which is shown here is based on a flat cable system and its specially conceived connectors: actuators and sensors may be directly connected at any point of an installation without the cable having to be interrupted. Even later if necessary! These connection boxes may be used as well for supply as for branching.

The advantages are:

◊ Reliable and safe installations, with highest level of flexibility
◊ Time and money saving when
  - planning
  - installing
  - putting into operation
◊ Extensions may be easily achieved following any new situation
◊ Low fire load



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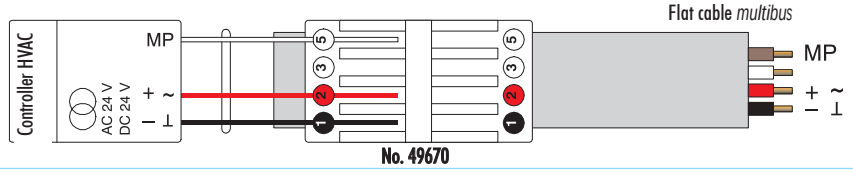
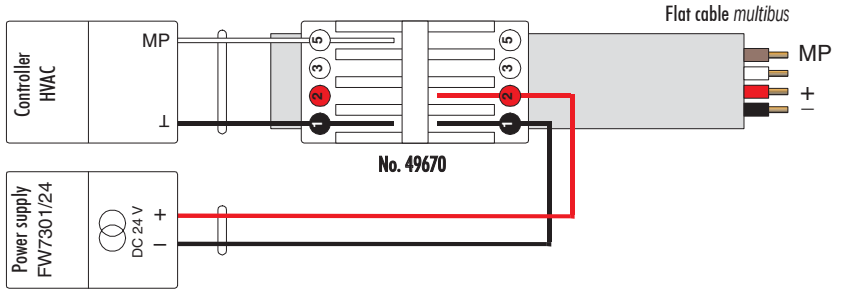
Connecting HVAC controllers

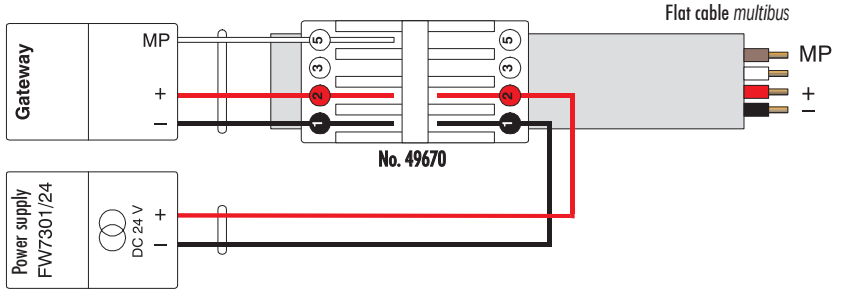
Integrated transformator



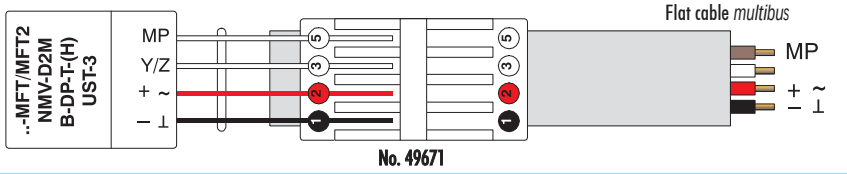
External transformator



Connecting gateways (UK 24 LON, *multibus* Gateway EIB)



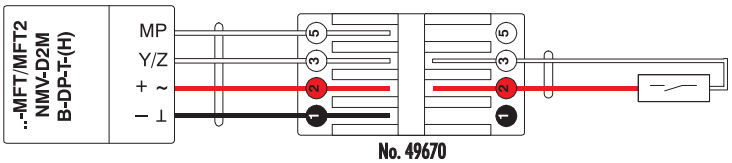
Connecting MP devices (drives, sensors, signal emitters)



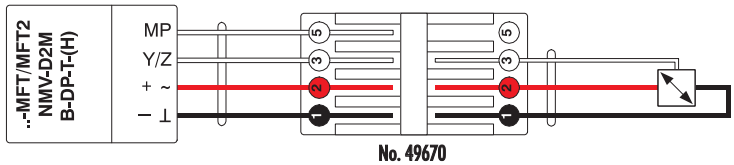
Connecting external switches and analog sensors

An analog sensor may be connected to a MP device. It may be an active sensor (output DC 0 ... 10 V for example) or a passive resistance sensor [1] (Pt 1000, Ni 1000 or NTC). The analog signal of the sensors may be digitized thanks to the MP devices and transmitted to the regulator or to the gateway via MP communication.

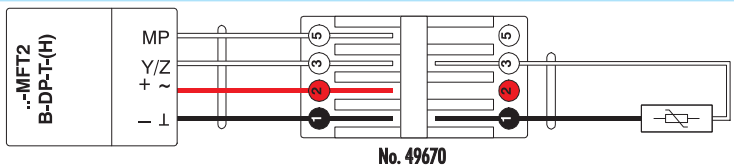
External switch



Active sensor



Passive sensor

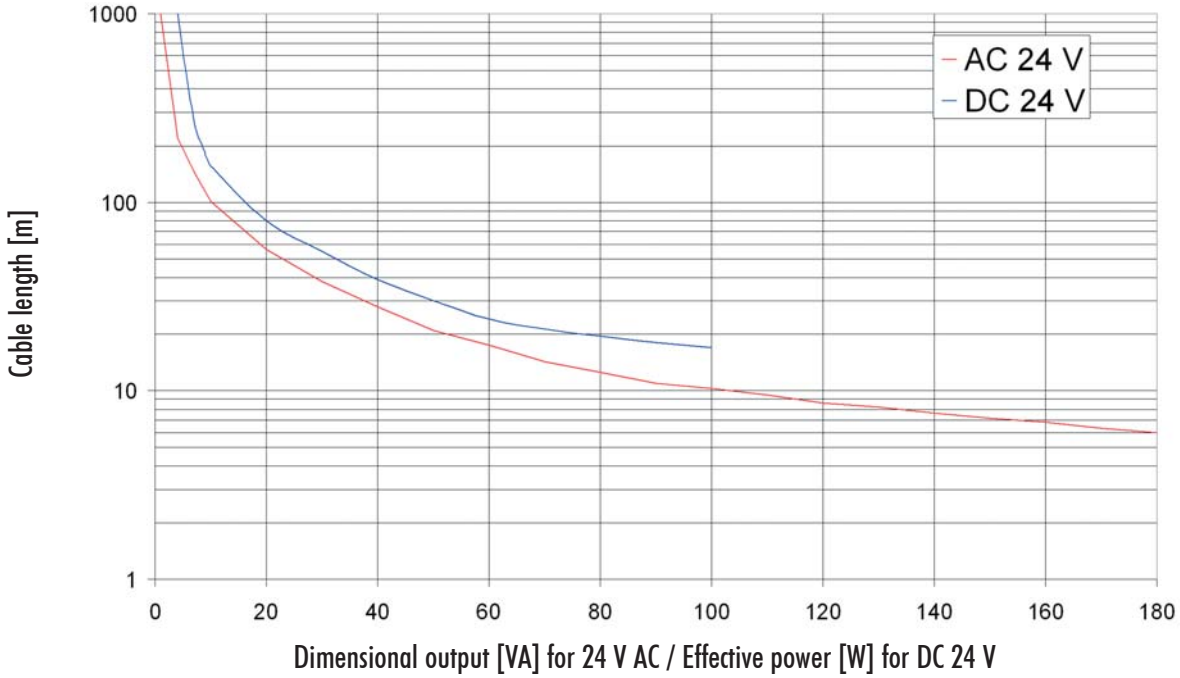


Note [1]
Passive sensors cannot be connected to
- drives...
- MFT actuators
- NMV-D2M VAV-Compact controller

Quick connection technique flat cable multibus 4 x 1.5 mm²

Application: by the company Belimo - Multitherm
Bus cable lengths

Max. cable length in case of flat cable *multibus* No. 49651 (4 x 1.5 mm²)
supply AC: min. transformer voltage AC 21.6 V
supply DC: min. supply voltage DC 24 V



Cable length (m)	AC 24 V	DC 24 V
0	2000	4000
1	1000	
4	220	1000
7	145	266
9	115	185
10	101	156
20	56	80
30	38	88
40	28	39
50	21	30
60	17.4	24
70	14.3	21.2
80	12.5	19.5
90	11	18
100	10.3	17
110	9.5	
120	8.6	
130	8.2	
140	7.6	
150	7.2	
160	6.8	
170	6.35	
180	6	

Determination of the max. cable lengths

For the connected MP devices, the dimensional output (VA) and the effective power have to be added (W); the corresponding cable lengths may be found in the table left.

Cable lengths are limited

- by the sum of dimensional output and effective power characterizing the connected MP bus devices
- by the type of power supply (24 V AC or 24 V DC)
- by the conductor cross section

Quick connection technique ecofil i 7 x 2.5 mm²

Degree of protection IP65 (patent applied)

No. 49611
with 49626

No. 49613

Flat cable 5L+N+PE
7 x 2.5 mm²
(0.6/1kV)
Overall dimensions 35 x 6 mm

The supply of the flat cable does usually not occur at the end of the cable, but by means of junction boxes connected at any point all along the flat cable.

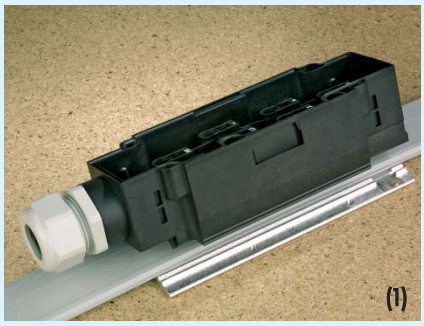
Connecting box 7 x 2.5 mm²
Flat cable connected by means of pointed screws, without the cable insulation having to be stripped
Connection of a round cable up to 7 x 2.5 mm² by means of screw terminals
It is recommended to use an electric screwdriver
Suitable for the supply of flat cables or for the branching from flat cables.

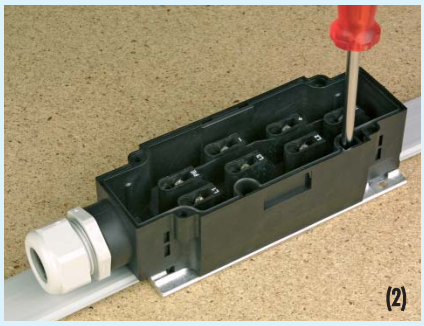
Connecting bases 7 x 2.5 mm² with pointed screws and sockets to receive a 7-pole connector

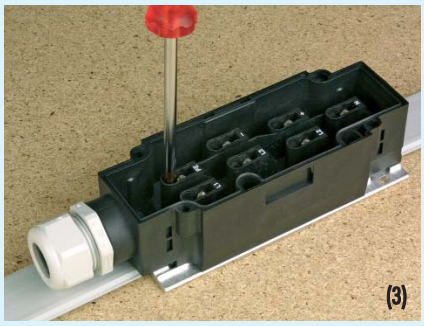
What are these flat cables used for?

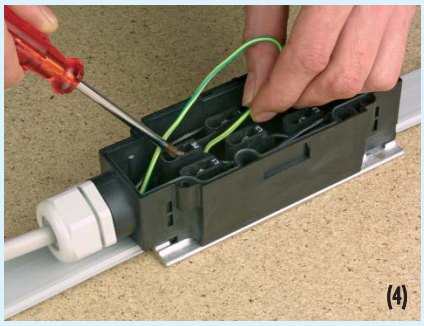
- for the industrial automation
- 5 conductors for supply voltage 3L+N+PE and 2 conductors for low voltage 24 V

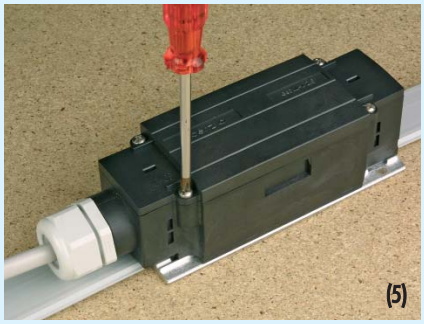
Mounting procedure of connecting box No. 49613











1. Open the folding baseplate and position the asymmetric flat cable between box and baseplate (no need to strip the insulation of the cable).
2. Fold the baseplate back and tighten up both fastening screws.
3. Turn in the pointed screws as far as they will go.
4. Connect the round cable leads to the connecting terminals.
5. Place the cover and tighten up the screws.
6. Mask the screws of the cover by means of coverings.

Quick connection technique ecofil i 7 x 2.5 mm²

Flat cable 7 x 2.5 mm²

The length of the installed cable has to guarantee the release of the overcurrent protection devices (circuit breakers) within 0.4 to 5 s. (contact voltage).
(Switzerland: see NIN "F2.8.4" "N4.3.4")

Environment: UV-protected area

Ambient temperature: from -15°C up to +40°C

Installation temperature: min. +5°C

Designation	Flat cable of PVC, oil resisting asymmetric 5L+N+PE	Flat cable halogen-free asymmetric 5L+N+PE
No.	49600	49601
	Technical data	Technical data
Sheath	PVC according to IEC 227, oil resisting	Polyolefines, halogen-free without corrosive gas acc. to IEC 60754-2
Colour of the sheath	Light grey RAL 7035	Light grey RAL 7035
Weight	402 g/m	401 g/m
Fire load	1.31 kWh/m	1.30 kWh/m
Fire behaviour	Flame retardant according to IEC 60332-1	Flame retardant acc. to DIN VDE 0207 Part 24 HM2 Low fire propagation acc. to IEC 60332-3 Low smoke development acc. to IEC 61034 Marking on the sheath FR/LSOH (Flame Retardant / Low Smoke / Zero Halogen)
No. of leads x cross-section	7 x 2.5 mm²	7 x 2.5 mm²
Copper conductors	bare, highly flexible acc. to CENELEC HD 383 S2 Class 6	bare, highly flexible acc. to CENELEC HD 383 S2 Class 6
Insulation of the leads	PVC according to IEC 227	Polyethylene compound, halogen-free flame retardant acc. to CENELEC HD 22
Colour of the leads	brown, black, grey, blue, green/yellow, red, white	brown, black, grey, blue, green/yellow, red, white
Test voltage	4 kV, 50 Hz	4 kV, 50 Hz
Rated voltage	0.6/1kV	0.6/1kV
Current-carrying capacity	according to IEC 60364-5-523 and SEV NIN 42512.2	according to IEC 60364-5-523 and SEV NIN 42512.2
Application	either the 7 conductors for power current or 2 conductors for control and 5 conductors for power current	

Accessories

Cable stripping tool
No. 49623

The cable has to be stripped at both ends for a distance of 19 mm so that the conductors of the flat cable can be inserted properly in the end pieces.
This tool offers the advantage of stripping neatly and easily the cable without damaging the insulation of the conductors.

Packing unit: 1 pce.

Cable end piece
No. 49620

To be mounted at both ends of the flat cable, so that the specified creepage distance will be observed. The cable has to be stripped for a distance of 19 mm.

Of polycarbonate, halogen-free, transparent
Dimensions: 62 x 23 x 53 mm
Weight: 32 g
Fire load: 0.22 kWh

Packing unit: 10 pce.

Shears
No. 49930

For cutting neatly and easily every type of flat cables up to 2.5 mm².
With sliding anvil. Teflon coated blades.

Packing unit: 1 pce.

Cable fastening clamp for screw fixing
No. 49731

Of polyamide 66, halogen-free, grey
Dimensions: 52 x 10 x 10 mm
Weight: 2 g
Fire load: 0.02 kWh

Packing unit: 100 pce.

Insulating tape
No. 49632

When connections are removed or displaced, the boxes have to be left in position. If it is not possible, the holes produced by the pointed screws have to be reinsulated correctly by means of the insulating tape trademark "Scotch VM", synthetic caoutchouc-based product, PVC coated black.
Weatherproof, self-fusing.
Dimensions: 50 mm x 1 m
Dielectric strength: max. 18 kV/mm
Temperature: max. +70°C
Packing unit: 1 m

Quick connection technique ecofil i 7 x 2.5 mm²

Connecting box for supply and branching

CE

Environment:	UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP65

Designation	**Connecting box 7 x 2.5 mm² with 1 outlet M25x1.5**
No.	**49613**

Technical data

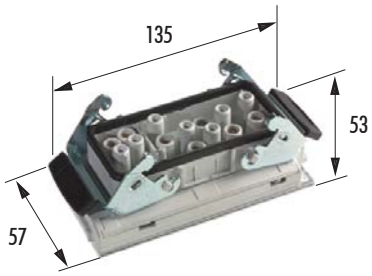
Weight	350 g
Fire load	1.68 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1, IEC 60998-2-1, IEC 60998-2-3 and IEC 60529
Plastic parts	black, halogen-free
Metal parts	corrosion-resistant
No. of leads x cross-section	7 x 2.5 mm²
Connecting capacity	2.8 x 3.8 mm
Pointed screws	Tightening torque 0.7 Nm, Phillips recessed head screw No. 1
Clamping screws	Tightening torque 0.7 Nm, Phillips recessed head screw No. 1
Cross-section of the conductors	2.5 mm²
Rated voltage	690V
Test current	24 A
Packing unit	5 pce.

Accessories

Cable gland
No. 49628
of polyamide, grey
M25 x 1.5
diameter of cables ∅ 9-16 mm
delivered with O-ring seal of NBR, ∅ 22 x 2 mm
Packing unit: 5 pce.

Cable gland
No. 49629
of polyamide, grey
M25 x 1.5
diameter of cables ∅ 13-18 mm
delivered with O-ring seal of NBR, ∅ 22 x 2 mm
Packing unit: 5 pce.

woertz



CE

	Environment:	UV-protected area
	Ambient temperature: Installation temperature:	from -15°C up to +40°C min. +5°C
	Degree of protection:	IP65

Designation — **Connecting base 7 x 2.5 mm² to connector No. 49626**

No. — **49611**

Technical data

Weight	200 g
Fire load	0.83 kWh
Fire behaviour	UL 94-V2
Test specifications	IEC 60998-1, IEC 60998-2-3, Preliminary draft IEC 61535 and IEC 60529
Plastic parts	light grey, halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 0.7 Nm, Phillips recessed head screw No. 1
Rated voltage	690V
Test current	24 A
Packing unit	5 pce.
	Consists of: one part with 5 contacts and one part with 2 contacts
Application	either the 7 conductors for power current or 2 conductors for control and 5 conductors for power current

Accessories

Protection cover
No. 49627
Cover IP65
Fire load: 0.16 kWh

Packing unit: 5 pce.

Quick connection technique ecofil i 7 x 2.5 mm²

Connector to connecting base

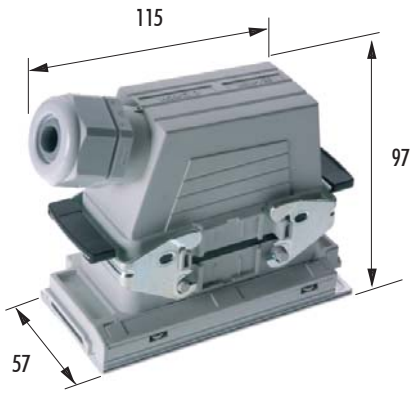
Environment:	dry, UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +5°C
Degree of protection:	IP65

Designation — **Connector 7 pole, 2.5 mm², 16A with 1 outlet M25x1.5 to connecting base No. 49611**

No. — **49626**

Technical data

Weight	160 g
Fire load	0.47 kWh
Fire behaviour	UL 94-V2
Plastic parts	light grey, halogen-free
Metal parts	corrosion-resistant
Rated voltage	690 V
Test current	24 A
Packing unit	5 pce.
Application	either the 7 conductors for power current or 2 conductors for control and 5 conductors for power current



Accessories

Cable gland
No. 49628
of polyamide, grey
M25 x 1.5
diameter of cables ∅ 9-16 mm
delivered with O-ring seal of NBR, ∅ 22 x 2 mm
Packing unit: 5 pce.

Cable gland
No. 49629
of polyamide, grey
M25 x 1.5
diameter of cables ∅ 13-18 mm
delivered with O-ring seal of NBR, ∅ 22 x 2 mm
Packing unit: 5 pce.

woertz

Quick connection technique ecofil i 5 x 16 mm^2

Degree of protection IP65

No. 49615

Flat cable 3L+N+PE
5 x 16 mm^2
(0.6/1kV)
Overall dimensions 48.5 x 11.3 mm

The supply of the flat cable does usually not occur at the end of the cable, but by means of junction boxes connected at any point all along the flat cable.

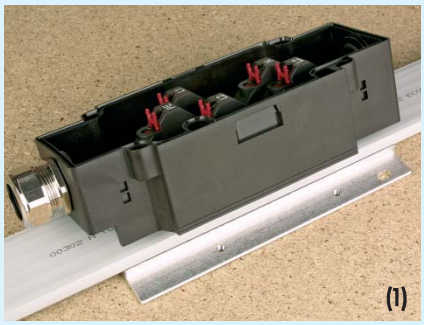
Connecting box 5 x 16 mm^2
Flat cable connected by means of pointed screws, without the cable insulation having to be stripped
Connection of a round cable up to 5 x 16 mm^2 by means of screw terminals
It is recommended to use an electric screwdriver
Suitable for the supply of flat cables or for the branching from flat cables.

Branching boxes with distribution blocks and safety cutouts.

Where are these flat cables used?

- as flexible power rails to supply the machinery
- as rising mains in the domestic buildings (upstream from counters)
- for the electrical installation of hotel rooms and class rooms
- for the supply of distribution blocks
- for exhibitions and trade fairs
- as provisional installations on building sites
- for the lighting of tunnels
- for the supply of cabines on passenger ships, laid over the corridors

Mounting procedure of connecting box No. 49615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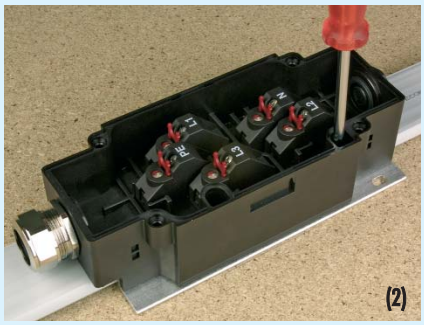
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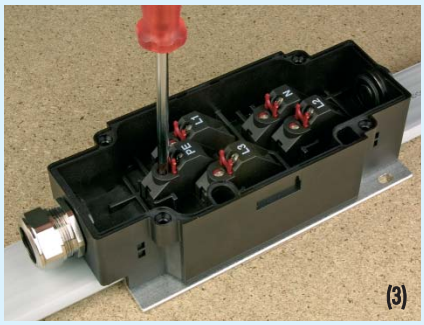
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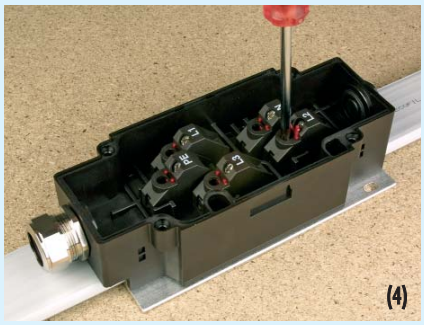
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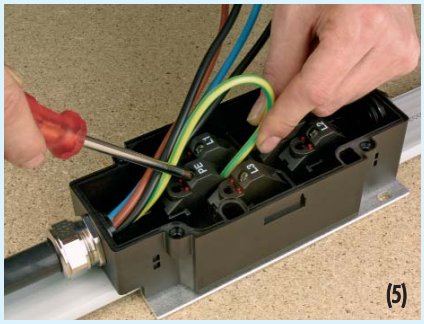
(5)


(6)

1. Open the folding baseplate and position the asymmetric flat cable between box and baseplate (no need to strip the insulation of the cable).
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.
6. Place the cover and tighten up the screws.

Quick connection technique ecofil i 5 x 16 mm²

Flat cable 5 x 16 mm²

The length of the installed cable has to guarantee the release of the overcurrent protection devices (circuit breakers) within 0.4 to 5 s. (contact voltage).
(Switzerland: see NIN "F2.8.4" "N4.3.4")

Environment: UV-protected area

Ambient temperature: from -15°C up to +40°C

Installation temperature: min. +10°C

Designation	Flat cable of PVC, oil resisting asymmetric 3L+N+PE	Flat cable halogen-free asymmetric 3L+N+PE
No.	49605	49606
	Technical data	Technical data
Sheath	PVC according to IEC 227, oil resisting	Polyolefines, halogen-free without corrosive gas acc. to IEC 60754-2
Colour of the sheath	light grey RAL 7035	light grey RAL 7035
Weight	1.3 kg/m	1.3 kg/m
Fire load	2.95 kWh/m	2.5 kWh/m
Fire behaviour	Flame retardant according to IEC 60332-1	Flame retardant acc. to DIN VDE 0207 Part 24 HM2 Low fire propagation acc. to IEC 60332-3 Low smoke development acc. to IEC 61034 Marking on the sheath FR/LSOH (Flame Retardant / Low Smoke / Zero Halogen)
No. of leads x cross-section	5 x 16 mm²	5 x 16 mm²
Copper conductors	bare, highly flexible acc. to CENELEC HD 383 S2 Class 6	bare, highly flexible acc. to CENELEC HD 383 S2 Class 6
Insulation of the leads	PVC according to IEC 227	Polyethylene Compound, halogen-free flame retardant acc. to CENELEC HD 22
Colour of the leads	brown, blue, green/yellow, black, grey	brown, blue, green/yellow, black, grey
Test voltage	4 kV, 50 Hz	4 kV, 50 Hz
Rated voltage	0.6/1kV	0.6/1kV
Current-carrying capacity	acc. to IEC 60364-5-523 and SEV NIN 42512.2	acc. to IEC 60364-5-523 and SEV NIN 42512.2

Accessories

Cable stripping tool
No. 49633

The cable has to be stripped at both ends for a distance of 25 mm so that the conductors of the flat cable can be inserted properly in the end pieces.
Use this tool to split up the sheath on the narrow sides of the cable. Then cut both sheath parts by means of the shears.

Packing unit: 1 pce.

Cable end piece
No. 49630

To be mounted at both ends of the flat cable, so that the specified creepage distance will be observed. The cable has to be stripped for a distance of 25 mm.

Of polycarbonate, halogen-free, transparent
Dimensions: 80 x 30 x 57 mm
Weight: 44 g
Fire load: 0.31 kWh

Packing unit: 10 pce.

Shears
No. 49929

For cutting neatly and easily every type of flat cables.

Packing unit: 1 pce.

Cable clamp
No. 49634

of galvanized steel.
Dimensions: 10 x 77 x 1 mm
Weight: 7 g

Packing unit: 100 pce.

Insulating tape
No. 49632

When connections are removed or displaced, the boxes have to be left in position. If it is not possible, the holes produced by the pointed screws have to be reinsulated correctly by means of the insulating tape trademark "Scotch VM", synthetic caoutchouc-based product, PVC coated black.
Weatherproof, self-fusing.
Dimensions: 50 mm x 1 m
Dielectric strength: max. 18 kV/mm
Temperature: max. +70°C
Packing unit: 1 m

Quick connection technique ecofil i 5 x 16 mm²

Connecting box for supply 5 x 16 mm²

CE

Environment:	UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +10°C
Degree of protection:	IP65

Designation — **Connecting box 5 x 16 mm² with 1 outlet M40x1.5 for 1 round cable 5 x 16 mm²**

No. — **49615**

Technical data

Weight	800 g
Fire load	3.30 kWh
Fire behaviour	UL 94-V0
Test specifications	IEC 60998-1, IEC 60998-2-1, IEC 60998-2-3 and IEC 60529
Plastic parts	black, halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 3.5 Nm, Phillips recessed head screw No. 2
Clamping screws	Tightening torque 2 Nm, Phillips recessed head screw No. 2
Nominal cross-section	16 mm²
Rated voltage	690 V
Test current	76 A
Packing unit	1 pce.

Beside each pointed screw there is a red indicator which follows the movement of the pointed screw. The red indicator is recessed when the corresponding pointed screw is turned in as far as possible.
It is thus easy to control if the pointed screws are correctly driven in.

Accessories

Cable gland
No. 49635

of plastic material, black
M40x1.5
Diameter of cables ∅ 20-26mm
Delivered with O-ring seal of NBR
Packing unit: 5 pce.

woertz

CE

Environment:	UV-protected area
Ambient temperature:	from -15°C up to +40°C
Installation temperature:	min. +10°C
Degree of protection:	IP65

Designation **Branching box 5 x 16 mm² with 2 outlets M25 x 1.5 for 2 round cables up to 5 x 6 mm²**

No. **49616**

Technical data

Weight	650 g
Fire load	2.97 kWh
Fire behaviour	UL 94-V0
Test specifications	IEC 60998-1, IEC 60998-2-1, IEC 60998-2-3 and IEC 60529
Plastic parts	black, halogen-free
Metal parts	corrosion-resistant
Pointed screws	Tightening torque 3.5 Nm, Phillips recessed head screw No. 2
Clamping screws	Tightening torque 2 Nm, Phillips recessed head screw No. 2
Nominal cross-section	6 mm²
Rated voltage	690 V
Test current	41 A
Packing unit	1 pce.

Place an usual safety cutout after the branching box.

Beside each pointed screw there is a red indicator which follows the movement of the pointed screw. The red indicator is recessed when the corresponding pointed screw is turned in as far as possible.
It is thus easy to control if the pointed screws are correctly driven in.

Accessories

Cable gland
No. 49628
of polyamide, grey
M25 x 1.5
diameter of cables ∅ 9-16 mm
delivered with O-ring seal of NBR, ∅ 22 x 2 mm
Packing unit: 5 pce.

Cable gland
No. 49629
of polyamide, grey
M25 x 1.5
diameter of cables ∅ 13-18 mm
delivered with O-ring seal of NBR, ∅ 22 x 2 mm
Packing unit: 5 pce.

Cable gland
No. 49637
of brass, nickel plated, M25x1.5
diameter of cables ∅ 11-20.5 mm
delivered with O-ring seal of NBR, ∅ 22 x 2 mm
Packing unit: 5 pce.

Blind plug
No. 49639
of plastic material, black
M25 x 1.5
delivered with O-ring seal of NBR
Packing unit: 5 pce.

Quick connection technique ecofil i 5 x 16 mm²

Branching boxes with distribution blocks
Equipment according to preference

Degree of protection: IP54

Distribution blocks can be equipped with any type of switching devices and sockets. The equipment determines the size of the distribution block.

Branching box
No. 49616

Branching box
No. 49616

Designation	Branching box No. 49616 with distribution block with safety cutouts	Branching box No. 49616 with distribution block with safety cutout and socket
No.	49618/...	49618/...
	Technical data	Technical data
Fire load Fire behaviour	according to equipment UL 94-V0	according to equipment UL 94-V0
Voltage Ui	400 V	400 V
Packing unit	1 pce.	1 pce.
Connecting box	branching box 5 x 6 mm² No. 49616 with 1 outlet on the front side obturated with a blind plug No. 49639 and 1 outlet on the other front side directly connected to a distribution block (plastic box dimensions 170 x 105 x 97 mm)	branching box 5 x 6 mm² No. 49616 with 1 outlet on the front side obturated with a blind plug No. 49639 and 1 outlet on the other front side directly connected to a distribution block (plastic box dimensions 200 x 120 x 90 mm)
Equipment of distribution block	1 mounting rail according to EN 60715 TH35 1 terminal 6 mm² No. 3452/6BL 1 earthing terminal 4 mm² No. 30544/4V cutouts according to preference	1 safety cutout 16 A 1 neutral disconnecting terminal 1 earthing terminal and also 1 socket 10 A completely wired

Example
Flat cable 5 x 16 mm² together with this type of branching box and distribution block have been installed for the lighting of a highway tunnel.

ORDER NUMBER INDEX

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