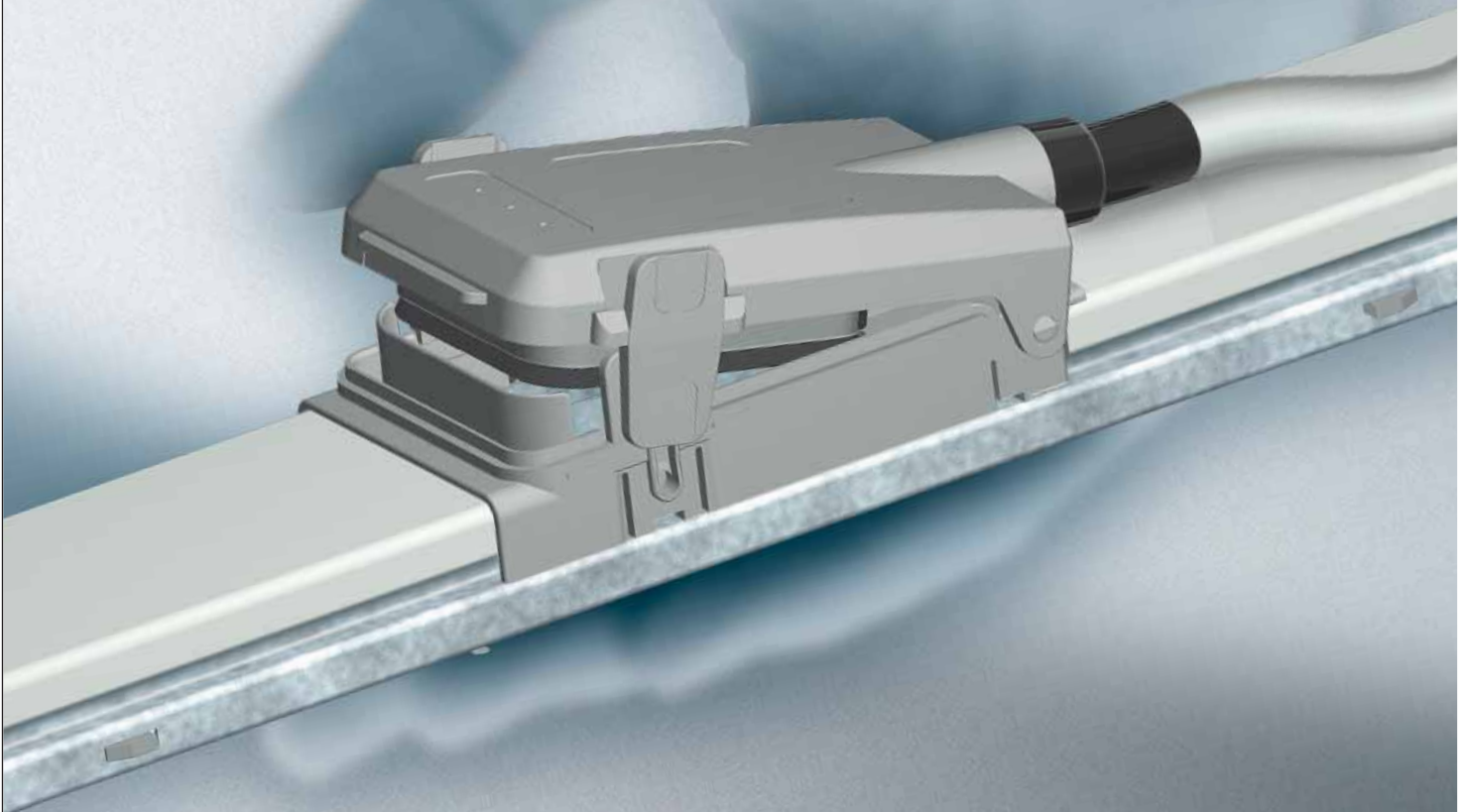


ZUCCHINI

EB - EASYBAR 25 - 40A

THE NEWS

A lot of energy in little space





SECTION CONTENTS

- 2 **General features**
- 4 **Advantages**
- 8 **The EASYBAR range**
- 10 **Straight elements and tap-off plugs**
- 11 **Installation accessories**
- 12 **General rules for installation**
- 166 **Technical information**
- 174 **Determination of the operating current of a busbar**

The innovative system for the distribution of energy

EASYBAR is the perfect solution for the distribution of energy within any service and industrial sector. Its **maximum height of only 50mm, the thinnest on the market**, makes it an exclusive and innovative product.

With EASYBAR, it is possible to distribute 25A or 40A currents, maintaining an IP55 degree of protection

when the installation is complete. The elements are available in 2m and 3m lengths.

EASYBAR can be positioned:

- under the raised floor
- On the wall to outfit work stations
- in the interspaces of the dry wall plasterboard
- in the false ceiling



■ **FLOOR INSTALLATION**

EASYBAR busbars, because of its reduced 50mm height (with accessories installed), can be positioned in particularly low raised floors. It is suitable for new installations as well as for renovations in which it is not possible to raise the floor.

By using **tap-off plugs**, which can be **positioned anywhere on the trunking**, it is also possible to connect Legrand fast-connection installation system products such as floor boxes, mini columns and multiple outlet extensions, which can be combined with the **Cablofil type wire mesh cable trays system** used for the data network distribution and safety circuits.



■ **CEILING INSTALLATION**

Thank to the innovative tap-off plugs, EASYBAR is well suited for distribution of energy for lighting in false ceilings. Specific tap-offs for each phase allow to distribute an even load and quickly connect the lighting fixtures.



Advantages

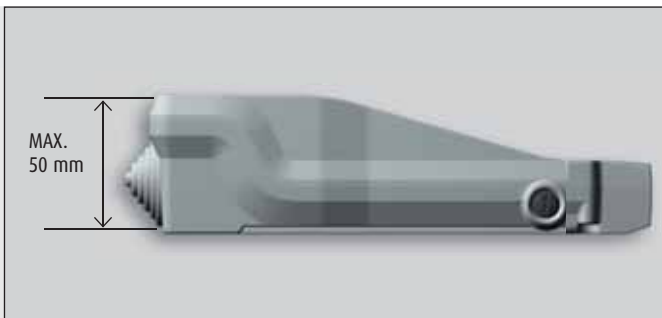
The EASYBAR system has been studied to make installation operations easier and quicker. When using EASYBAR, unlike a traditional energy distribution with trunking lines and cables, the installation time can be reduced by using the snap-on components and through the possibility of creating the lines in 2 ways:

1 - by first positioning the fixing clamping brackets onto the mounting surface, and then clipping in the straight element.

With this installation method, all brackets need to be put in the line roughly or with laser tools

2 - by positioning the brackets onto the busbars and then fixing the product.

The side fastening system gives you the advantage of having the brackets already aligned by the straight element.



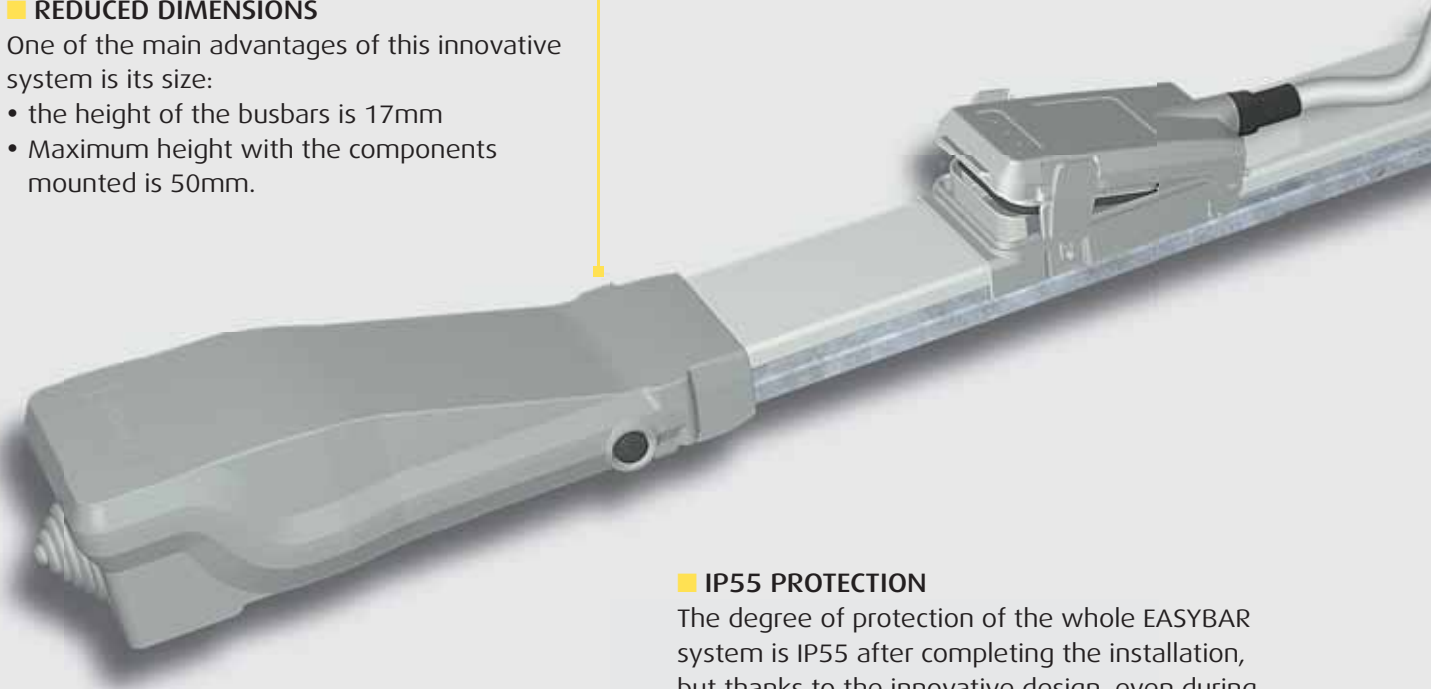
■ **REDUCED DIMENSIONS**

One of the main advantages of this innovative system is its size:

- the height of the busbars is 17mm
- Maximum height with the components mounted is 50mm.

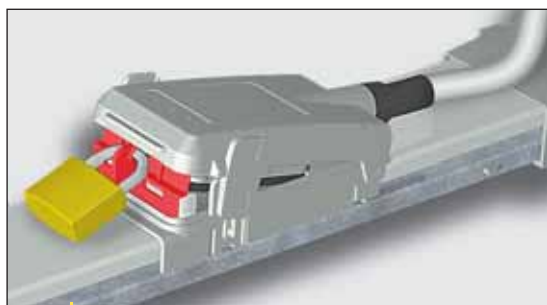
■ **ENERGY TAP-OFF WHEREVER YOU NEED IT**

The tap-off plugs have been designed to be positioned at any point on the busbar for complete modularity



■ **IP55 PROTECTION**

The degree of protection of the whole EASYBAR system is IP55 after completing the installation, but thanks to the innovative design, even during installation, if an end cover, joint or covering film is missing, an IP2X protection is always guaranteed against direct contact.

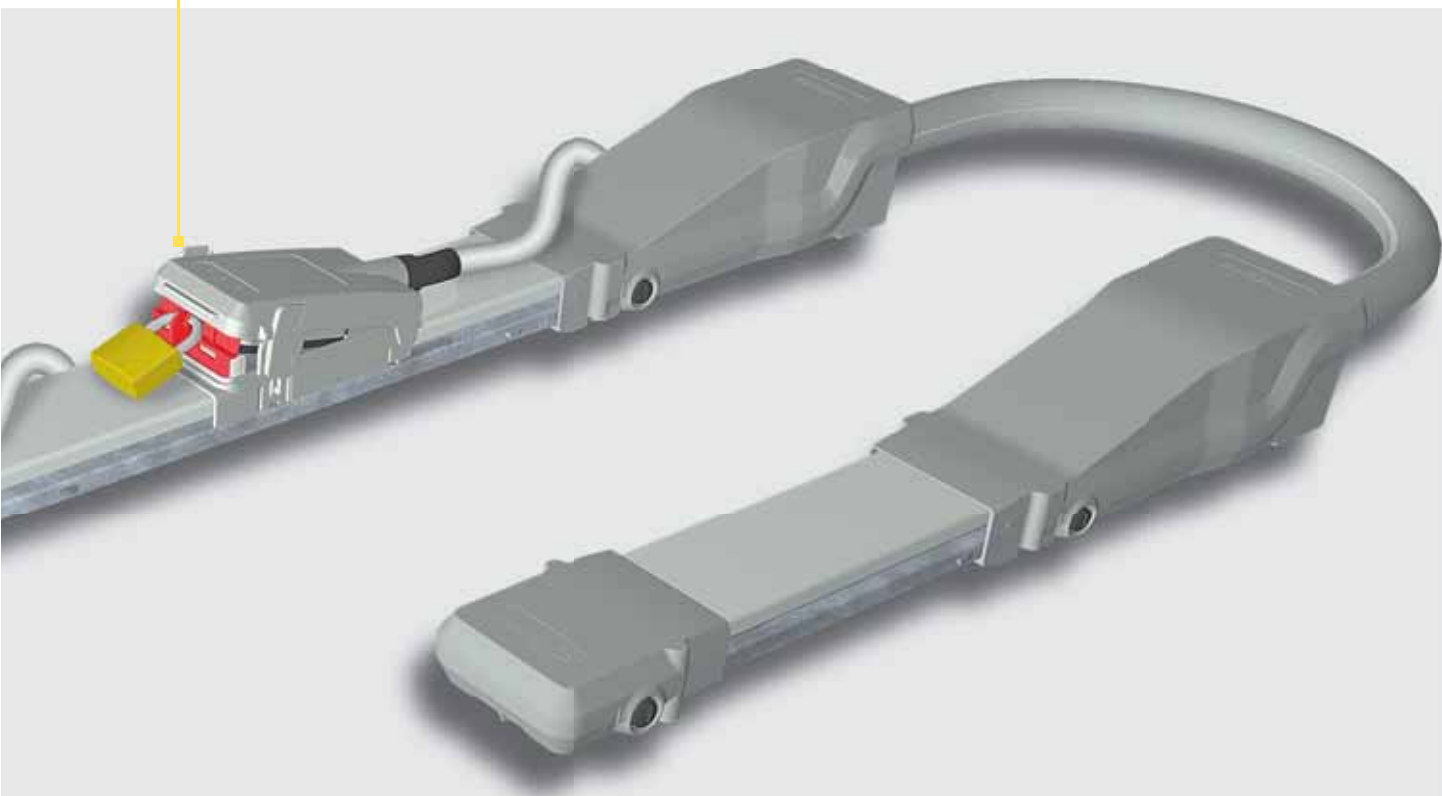


■ **UP TO 7 TAP-OFFS PER METRE**

Possibility to install up to 7 tap-off plugs per metre, thus allowing a complete utilisation as well as a widespread distribution of energy for different configurations.

■ **EASY AND QUICK INSTALLATION**

The snap-on system reduces the installation time considerably.



■ **CONVENIENT IN EVERY WAY**

Only one element and few installation accessories that guarantee an easy, fast and inexpensive distribution of energy.

■ **RESISTANCE AND SAFETY**

EASYBAR is particularly resistant; in fact the straight elements can be stepped on without damaging them. EASYBAR gives you the possibility of a good, safe installation when worksite jobs are being started. With the safety lock system, even under load, a worker can isolate a line to work in complete security. Thus even during installation or modifications, potential accidents are avoided with EASYBAR.

Installation SOLUTION: traditional or EASYBAR?

A traditional energy distribution system requires the use of trunking systems as well as multiple cables. There are various installation operations which are carried at different times, thus prolonging the installation and testing time and hence with increases in cost.

By using the innovative EASYBAR system, the installation time is greatly reduced, thus facilitating reliable project management and planning. Furthermore, EASYBAR is easily integrated both with the Cablofil cable tray system and with Legrand products for distribution in offices and all commercial applications.

The busbar can be simply clipped onto the same wire mesh cable tray used for the data VDI structured cabling system.

The worksite is an extremely severe environment during the installation stage, with all trades coming and going continuously, so EASYBAR was conceived as a very resistant product: it can even be stepped on, allowing the installation without waiting for the floor – this factor shall be taken into consideration as many types of underfloor trunking systems do not have this level of robustness.

The following table illustrates the cost effective solution of EASYBAR compared to traditional distribution.

INSTALLATION STAGES

Description	Traditional	EASYBAR	The advantages of using EASYBAR
System planning	√	No	It is not necessary to know in advance how many work stations there will be
Derivation points	√	No	If it is necessary to add new stations, all you need to do is install the tap-off plugs on the straight element
Material order	√	√	Limited only to the straight elements, plugs, brackets and to the power lock
Trunking installation	√	No	The snap-on system allows busbar ducts to be installed easily and quickly
Wiring devices	√	No	No need for derivation boxes and terminal strips to be cabled each time, just plug in where the derivation is needed
Cable insertion	√	No	When using Legrand fast connection plugs it is possible to connect EASYBAR tap-off plugs to the Legrand Fast Connection distribution system easily and quickly
System testing	√	√	There is no risk of having disconnections due to cable failure
Flexibility	No	√	
Possibility of being stepped on	No	√	EASYBAR can be stepped on and has a degree of protection IP55 after completing the installation



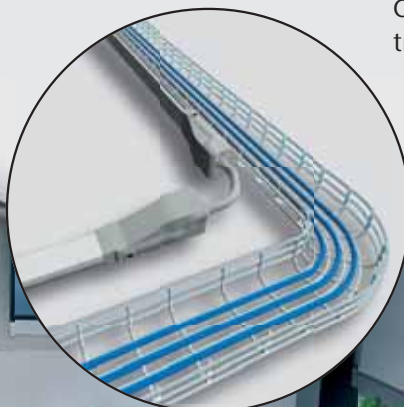
■ **TRADITIONAL SOLUTION**

- complex
- little flexibility
- long installation time requirements

■ **EASYBAR SOLUTION**

- neat
- fast
- flexible and integrated

Integration with the Cablofil wire cable tray



The EASYBAR range

■ STRAIGHT ELEMENTS

Straight elements are available with four 25A or 40A conductors with lengths of 3m, 2m and a 1.8m length which can be cut to measure at the worksite. The main features are:

- derivation from any point of the straight element
- structure made of galvanized steel
- degree of protection IP55, for the completed installation



■ TAP-OFF PLUGS

Tap-off are used for distributing energy in different points and are available with 10A or 16A rated currents, with or without fuse. The main features are:

- default phase selection or three-phase version
- plugs made of self-extinguishing-insulation material
- plugs that can be installed at any point of the straight element
- snap-on connection
- large available surface for clear identification marking



■ FEED UNIT

Once wired from the main power network, the feed unit is snapped into place onto the EASYBAR element without using any tools.



■ FLEXIBLE JOINT

The flexible joint is used to connect two busbar ducts with a bending angle of up to 180°.

The flexible joint is also useful for changing levels between ducts.



■ END COVER

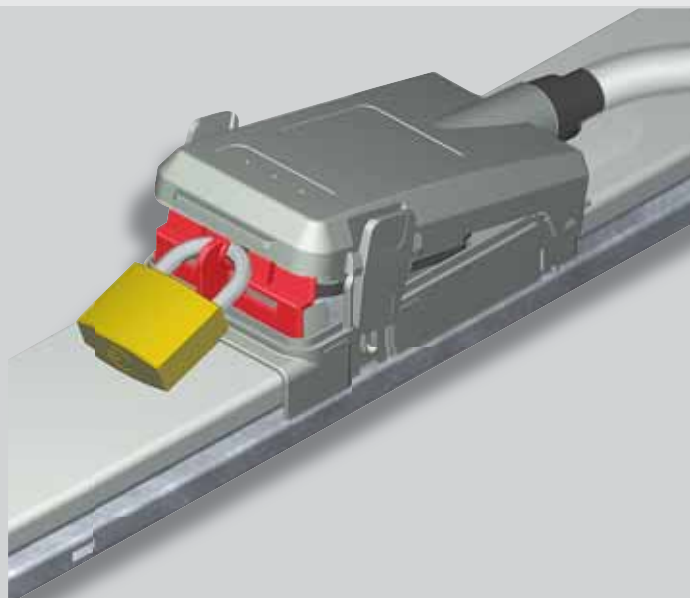
The end cover ensures the IP55 protection degree at the end of the line.



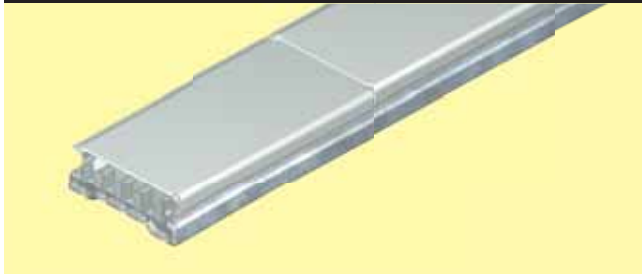
■ SAFETY BLOCK

To ensure maximum safety, the optional safety block maintains the plug in the open position and prevents unintentional closure.

This safety device can be installed very easily when the plug is open and can be guaranteed by means of a padlock to ensure the safest possible conditions to carry out safely all maintenance operations of the connected loads.



Straight elements and tap-off plugs



25A AND 40A STRAIGHT ELEMENTS

Straight elements with 4 copper conductors (3P+N). Supplied with a pre-cut, modular cover and a joining module (for clipping two straight lengths together). IP55

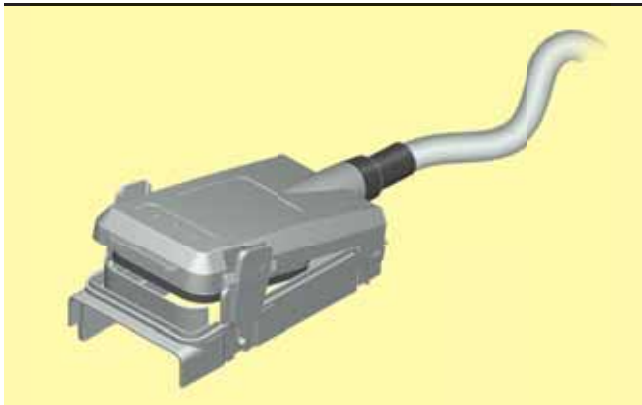
Item	Description
------	-------------

74160101	25A - 3 m
----------	-----------

74160102	25A - 2 m
----------	-----------

74180101	40A - 3 m
----------	-----------

74180102	40A - 2 m
----------	-----------



10A SINGLE-PHASE TAP-OFF PLUGS WITH A 1 m CABLE

Single-phase tap-off plugs without fuse protection with self-extinguishing insulating body, 3 X 1.5 mm² cable. IP55

Item	Description
------	-------------

74005011	L1+N
----------	------

74005012	L2+N
----------	------

74005013	L3+N
----------	------

74005014	L2+N2
----------	-------

Single-phase tap-off plugs protected with a 6.3A \varnothing 5x20 mm fuse with self-extinguishing insulating body, 3 X 1.5 mm² cable. IP55

Item	Description
------	-------------

74005111	L1+N
----------	------

74005112	L2+N
----------	------

74005113	L3+N
----------	------

74005114	L2+N2
----------	-------

16 A SINGLE-PHASE TAP-OFF PLUGS WITH A 3 m CABLE

Single-phase tap-off plugs without fuse protection with self-extinguishing insulating body. IP55

Item	Description
------	-------------

74005021	L1+N
----------	------

74005022	L2+N
----------	------

74005023	L3+N
----------	------

74005024	L2+N2
----------	-------

Single-phase tap-off plugs supplied with a \varnothing 8.5x31.5 fuse carrier with self-extinguishing insulating body. IP55

Item	Description
------	-------------

74005221	L1+N
----------	------

74005222	L2+N
----------	------

74005223	L3+N
----------	------

74005224	L2+N2
----------	-------

16 A SINGLE-PHASE TAP-OFF PLUGS WITH A 5 m CABLE

Single-phase tap-off plugs supplied with a \varnothing 8.5x31.5 mm fuse carrier with self-extinguishing insulating body. IP55

Item	Description
------	-------------

74005231	L1+N
----------	------

74005232	L2+N
----------	------

74005233	L3+N
----------	------

74005234	L2+N2
----------	-------

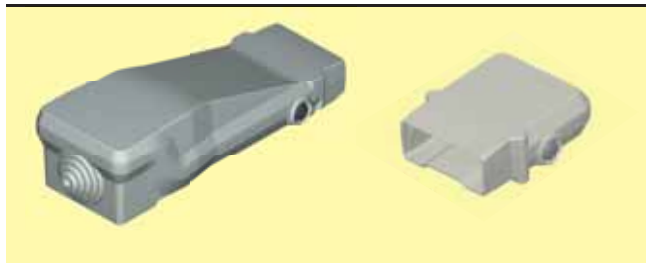
16 A THREE-PHASE TAP-OFF PLUGS WITH A 3 m CABLE

Three-phase tap-off plugs without fuse protection with self-extinguishing insulating body. IP55

Item	Description
------	-------------

74005025	L1+L2+L3+N (5x2.5mm ²)
----------	------------------------------------

Installation accessories



FEED UNIT WITH END COVER

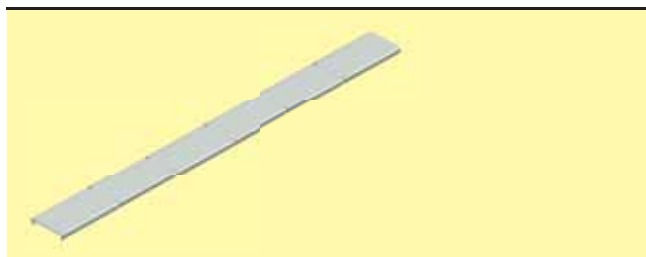
Feed unit with closing cap for 25/40A busbars. For special applications, the End Line feed unit can be used: when power feed is needed at both ends of a run, or whenever installation layout demands feed at opposite end. Foolproof mounting to avoid errors.

Item	Description
74181001	Standard feed unit for 25/40A busbars.
74181002	End line feed unit for 25/40A busbars. for special applications



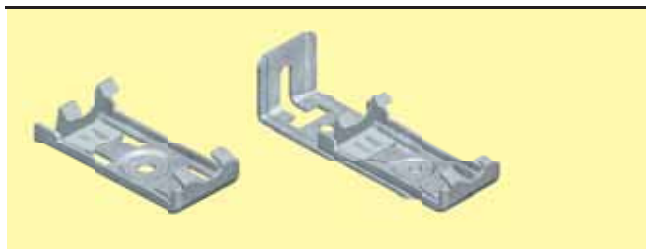
FLEXIBLE JOINT

Item	Description
74181200	flexible joint for 25/40A busbar with radius of action up to 180° for connecting 2 straight elements



MODULAR COVERS

Item	Description
74104001	box with five 0.6 m covers and 10 individual blanking plates. - The 0.6 metre covers have pre-cut modules which allow you to install plugs at any place without removing the whole cover. Snap-on installation - the 10 individual blanking plates allow to recreate the IP55 protection degree if the tap-off plugs are removed



CLAMPING BRACKETS

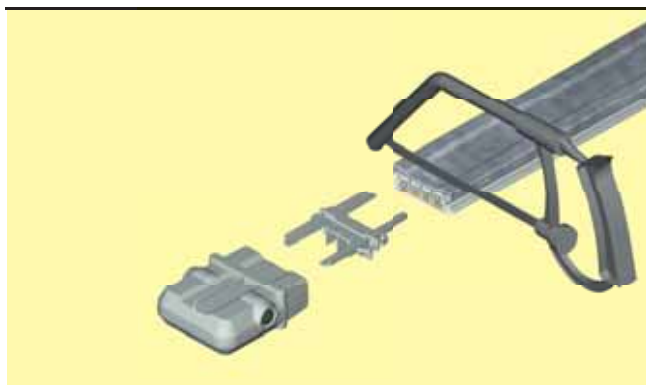
Brackets for fastening the straight elements in raised floors or in false ceilings. Can also be used to attach other material to the busbar

Item	Description
74003700	clamping bracket with centre installation hole
74003001	clamping bracket with side installation hole



SAFETY BLOCK

Item	Description
74003801	safety block to prevent unauthorised personnel from tampering with open plugs
74003800	ø6mm padlock



CUT TO MEASURE ELEMENT

Item	Description
74180300	straight element that can be cut on the jobsite, - possibility to cut every 20 cm - 1.8 m in length - including an additional accessory for resetting the correct insulation between components.

GENERAL RULES FOR INSTALLATION

The EASYBAR system is very easy and fast to install. In fact with few operations and with all the snap-on accessories it is possible to create a complete floor, ceiling and wall energy distribution system. The following pages describe the basic operations for the installation of the busbar and for the distribution of energy in different points. Remember that the EASYBAR distribution system

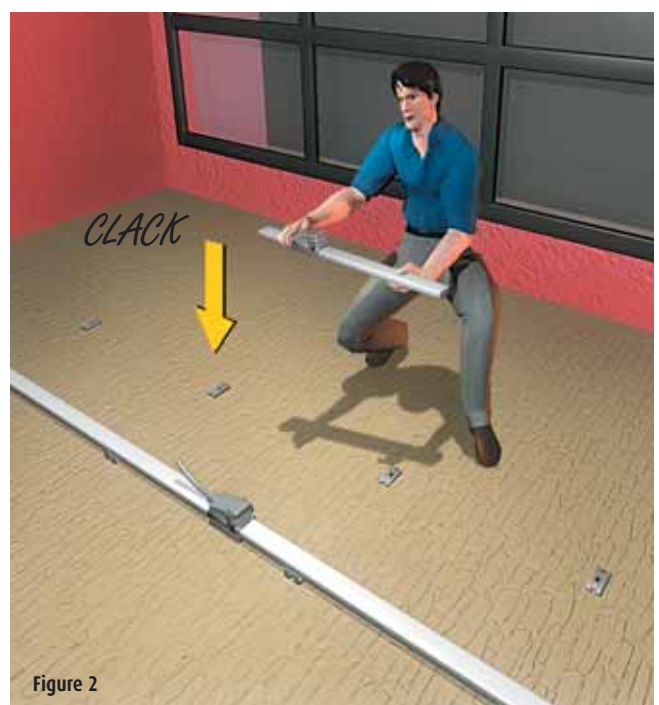
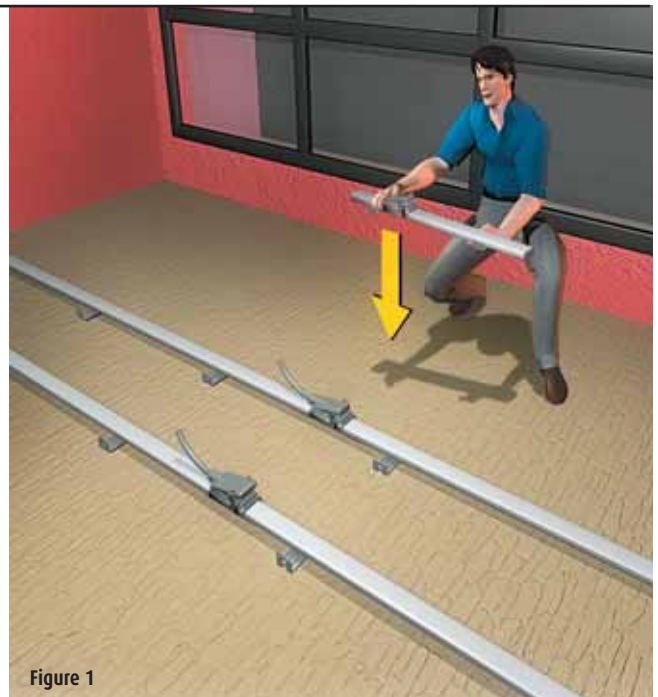
is part of the Legrand solution for the workstations: It is the integrated electrical backbone for the DLP columns, mini-columns and floor boxes alongside the Cablofil cable trays for the VDI structured cabling system. Remember that the maximum height of 50 mm (elements and plugs/feed units installed) allows EASYBAR to be used in even the most restrictive modern day installations.

INSTALLATION OF THE BUSBARS

For the electrical distribution, there is no need to follow the office layout of the furniture. Generally speaking, in order to guarantee the most complete and flexible distribution system under the raised floor or on the ceiling, parallel backbone distribution runs are used.

The creation of an EASYBAR layout can be carried out with two methods, making use of two fixing brackets (item 74003700 and item 74003001):

- the first method (traditional) is to make use of the fixing bracket item 74003700 where elements are placed on the floor, without the busbar, and set in line with laser indicators. The busbar will then be positioned accordingly. This is the most classical solution but it is also the most difficult because the installation needs to be carried out in two steps (figure 1),
- the second (the fastest) method can be carried out in one step, that is to make use of fixing brackets item 74003001. This accessory is first installed directly on the busbar and then positioned on the floor so that it can be fastened. This solution is possible because the bracket is fastened on one side, hence the hole is not obstructed by the busbar. By making use of this solution, the installation time will be reduced. The busbar will help you to line up all fixing brackets in line (see figure 2).

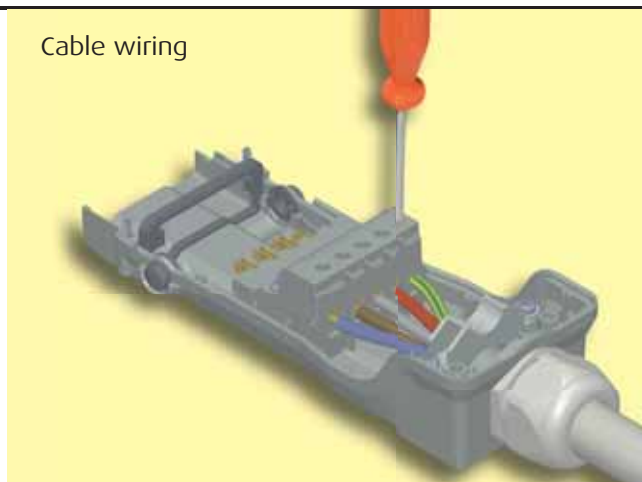


FEED UNIT

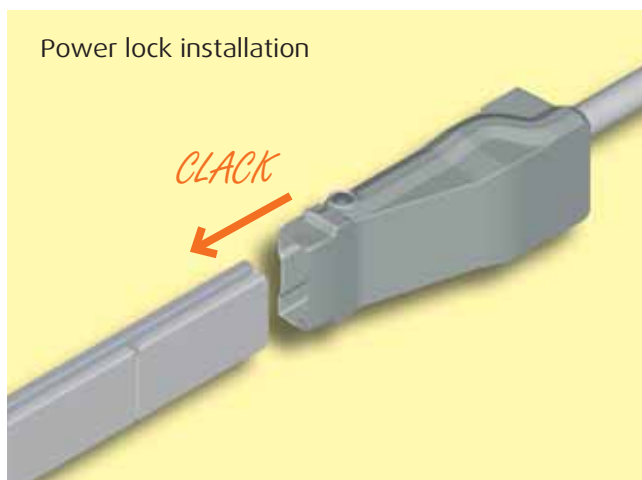
The feed units item 74181001 and item 74181002 can be wired in a few steps:

1. open the feed unit and wire the cables coming from the main line to the busbar by making use font
2. close the feed unit
3. slide it directly onto the straight element until it automatically clicks into place.
4. remove by a 90° rotation of the 2 screws located on the side of the feed unit and pull off.

Cable wiring



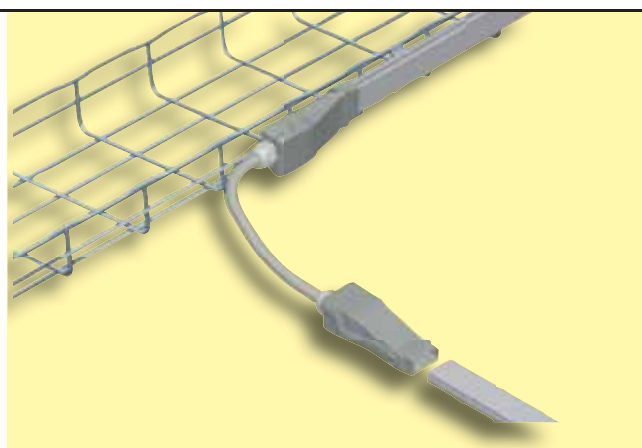
Power lock installation



FLEXIBLE JOINT CONNECTION

In order to make bends, it is necessary to use a flexible joint item 74181200. The installation of this accessory is very simple and can be carried out in a few steps:

1. remove the joining module from the straight element (if installed) by rotating the 2 side screws by 90°
2. slide the joint onto the busbar until locked into place



GENERAL RULES FOR INSTALLATION

TAP-OFF PLUG INSTALLATION

The installation of the tap-off plug is carried out as follows:

- set the plug to OFF position (open)
- snap the plug onto the busbar by placing it on the correct side (foolproof positioning)
- close the plug to the ON position to make the connection

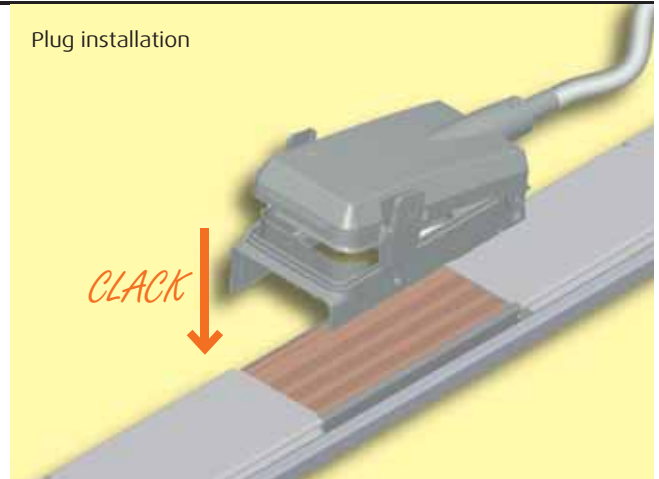
In order to ensure balanced phase distribution, there are also plugs available with a phase-differentiated connection; furthermore, there is an accessory which allows you to prevent unauthorised personnel from unintentionally inserting plugs.

This accessory item 74003801, combined with the padlock item 74003800, is positioned on the plug and prevents it from closing.

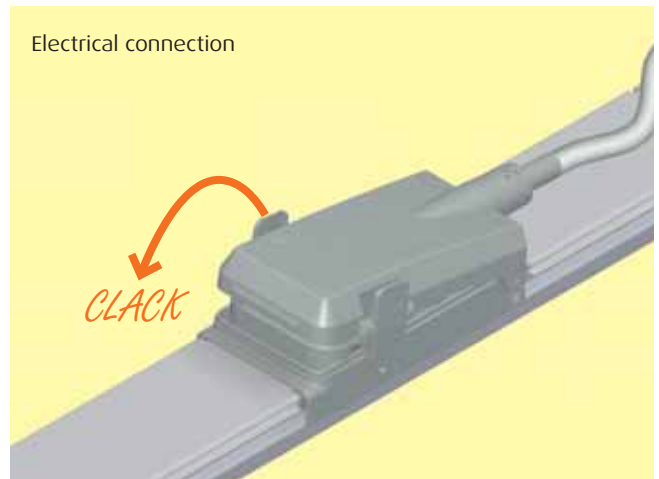
After completing the whole installation and after positioning the various covers, it is possible to change the position of the tap-off plugs whilst keeping the IP55 degree of protection. It is possible to carry out this operation with simple operations:

1. set the plug to OFF position
2. remove the plug from the busbar
3. replace the outlet cover (included in the package of covers item 74104001) with the plug; this will reset the IP55 degree
4. re-position the plug in the required position of the busbar. The dimensions of a plug are the same as the knockouts of the cover.

Plug installation



Electrical connection



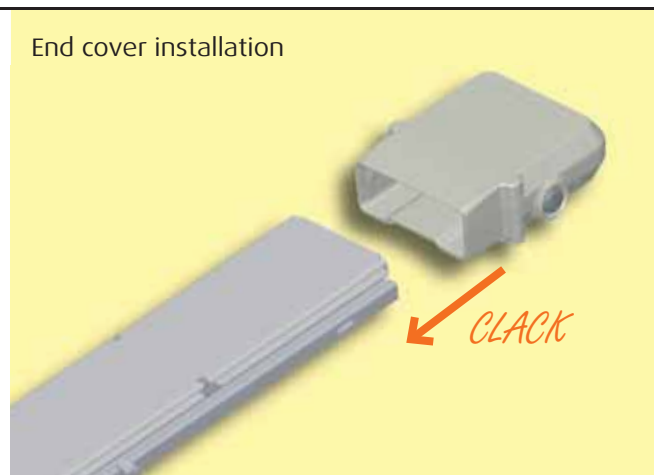
USING THE CUT TO MEASURE ELEMENT

This element is used when it is necessary to have elements cut to size to complete the installation. It is possible to cut this element every 20 cm; its maximum length is 1.8 m.

END COVER

The end cover are used to complete the installation and to guarantee an IP55 degree of protection. They are supplied with the feed units.

End cover installation



SYSTEM INTEGRATION

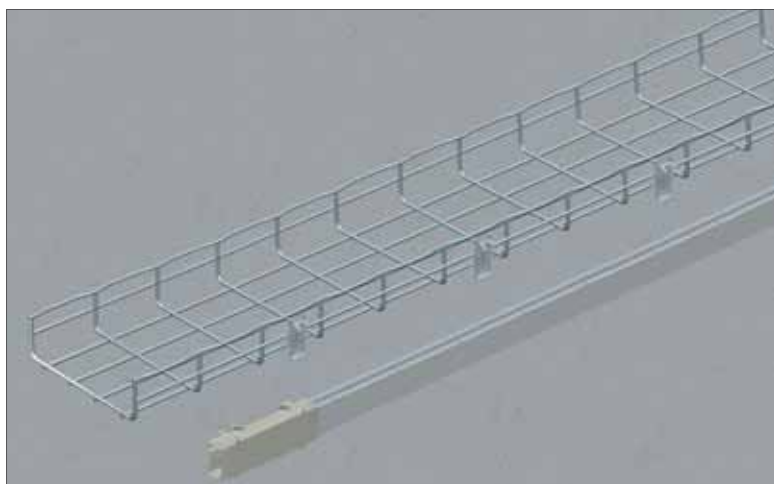
EASYBAR can be combined easily and quickly with the Legrand group cable management systems. Thanks to this integration it is possible to create a complete energy distribution system alongside the VDI structured cabling system with only one installation solution. The integration between the systems occurs as follows:

- the energy distribution occurs through EASYBAR, which can be fixed to the Cablofil wire cable tray trunking system with simple brackets. In this way, it is possible to distribute the data network inside the tray trunking system.

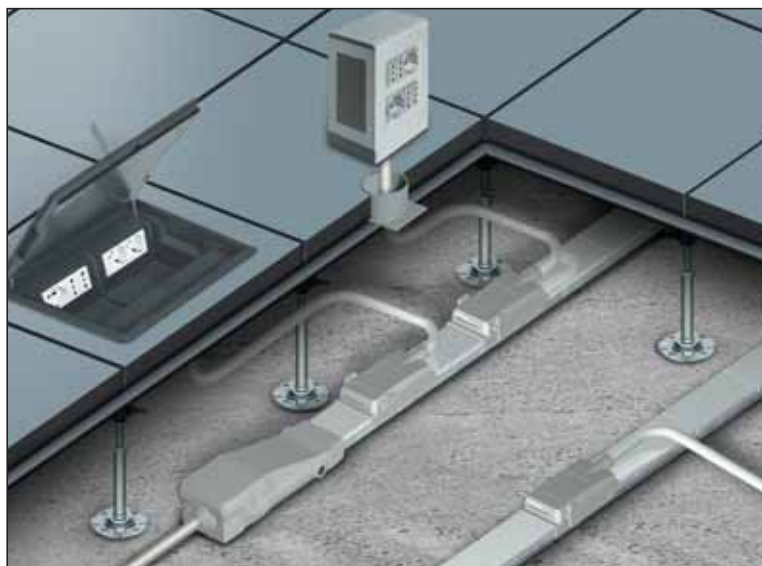
The connection to the workstation is achieved through the Legrand system products:

- from the EASYBAR tap-off plugs the energy is available wherever it is needed
- the Legrand quick-connection plugs connect the output tap-off plug cable to the fast connection junction boxes.
- the floor boxes provides local acces for power and data to the workstations
- distribute the power through the DLP columns and mini-columns

Whatever the need, all Legrand group products are integrated into one system for unlimited solutions to manage power and data.



EASYBAR installation on Cablofil wire cable tray



EB technical information

Model		25	40
Number of live conductors	No.	4	4
Casing overall dimensions	A x B [mm]	51.4x18	51.4x18
Rated current	I _n [A]	25	40
Cross-section of protective conductor eq. Cu	S _{PE} [mm ²]	6.1	6.1
Operating voltage	U _e [V]	400	400
Insulation voltage	U _i [V]	500	500
Rated frequency	f [Hz]	50-60	50-60
Rated short-time current (0.1 s)	I _{CW} [kA]rms	2.2	2.7
Allowable peak current	I _{pk} [kA]	10	10
Thermal limit	I ² t [A ² s x 10 ⁶]	0.48	0.73
Phase resistance	R ₂₀ [mΩ/m]	4.75	2.99
Phase reactance (50Hz)	X [mΩ/m]	1.279	0.77
Phase impedance	Z [mΩ/m]	4.919	3.088
Resistance of the protective conductor	R _{PE} [mΩ/m]	2.99	2.99
Reactance of the protective conductor (50Hz)	X _{PE} [mΩ/m]	1.07	1.07
Resistance of the fault loop	R _o [mΩ/m]	8.34	6.36
Reactance of the fault loop (50Hz)	X _o [mΩ/m]	2.349	1.84
Impedance of the fault loop	Z _o [mΩ/m]	8.66	6.62
$\Delta V_{1f} = \frac{1}{2} (2 R_{20} \cos \varphi + 2 X \sin \varphi)$	ΔV [V/m/A]10 ⁻³ cosφ = 0.70	4.24	2.64
	ΔV [V/m/A]10 ⁻³ cosφ = 0.75	4.21	2.62
	ΔV [V/m/A]10 ⁻³ cosφ = 0.80	5.73	4.26
Voltage drop with distributed load (k)	ΔV [V/m/A]10 ⁻³ cosφ = 0.85	3.11	3.11
	ΔV [V/m/A]10 ⁻³ cosφ = 0.90	4.60	3.73
	ΔV [V/m/A]10 ⁻³ cosφ = 0.95	8.66	6.61
$\Delta V_{3f} = \frac{\sqrt{3}}{2} (R_{20} \cos \varphi + X \sin \varphi)$	ΔV [V/m/A]10 ⁻³ cosφ = 1.00	2.35	1.84
Straight element weight	p [kg/m]	0.78	0.93
Fire load	[kWh/m]	0.82	0.82
Degree of protection	IP	55	55
Joule effect losses at rated current	P [W/m]	8.91	14.35
Ambient temperature min./MAX.	t [°C]	-5/+50	-5/+50

Determination of the operating current of a busbar

In order to determine the current whereby it is necessary to choose the busbar, the following planning data must be known:

- type of load inputs: three-phase or single-phase;
- type of circuit input: from one end, from both ends, central input, etc.;
- nominal input voltage;
- number, power and $\cos\varphi$ of loads which are to be fed by the busbar;
- load diversity factor;
- load use nominal factor;
- assumed short circuit current at the input point;
- room temperature;
- type of busbar installation (edgewise, flat, vertical).

When using a three-phase power supply, the operating current is determined by the following formula:

$$I_b = \frac{P_{TOT} \cdot \alpha \cdot \beta \cdot d}{\sqrt{3} \cdot U_e \cdot \cos\varphi_{medium}} \quad [A]$$

where:

- I_b operating current [A];
- α load diversity factor [..];
- β load use factor [..];
- d feed factor [..];
- P_{TOT} sum of the total active power of installed loads [W];
- U_e operating voltage [V];
- $\cos\varphi_{medium}$ average load power factor [..];

The "d" input factor has a value of 1 when the busbar is fed from one end only. The value is 1/2 if fed from the centre or if it is fed from each end.

Once the operating current has been determined, choose the busbar with a rated current immediately higher than the one calculated.

All Zucchini products have been designed and tested for an average room temperature of 40°C; should they be installed in rooms with average daily temperatures different from 40 °C the rated current of the busbar should be multiplied by a k_1 factor that is greater than the unit for temperatures lower than 40°C and lower than the unit if the room temperature is higher than 40°C.

Room temperature [°C]	15	20	25	30	35	40	45	50	55	60
k_1 thermal correction factor [..]	1.15	1.12	1.08	1.05	1.025	1	0.975	0.95	0.93	0.89

Finally, the following should be considered for the most appropriate busbar choice:

$$I_{nt} \geq I_b \quad \Rightarrow \quad I_{nt} = k_1 \cdot I_n$$

where I_{nt} represents the maximum current loaded by a busbar for an indefinite time at the specified room temperature.

JOULE EFFECT LOSSES

Losses due to the Joule effect are essentially caused by the electrical resistance of the busbar. Lost energy is transformed into heat and contributes to the heating of the conduit.

Three-phase rating

$$P = 3 \cdot R_t \cdot I_b^2 \cdot 10^{-3} [W/m]$$

Single phase rating

$$P = 2 \cdot R_t \cdot I_b^2 \cdot 10^{-3} [W/m]$$

VOLTAGE DROP

If the length of the line is particularly long (>100m) it is necessary to check the voltage drop (hereinafter specified as v.d.). If the installation is a three phase system and the power factor is not lower than $\cos\varphi = 0.7$ the v.d. may be calculated with the coefficients of the voltage drop specified in the technical data table.

$$\Delta v\% = b \cdot \frac{k \cdot I_b \cdot L}{V_n} \cdot 100$$

defined

- I_b = the current that supplies the busbar [A]
- V_n = the voltage power supply of the busbar [V]
- L = the length of the busbar [m]
- $\Delta v\%$ = the voltage drop percentage
- b = the distribution factor of the current [..]
- k = corresponding voltage drop factor a $\cos\varphi$ [V/m/A] (see technical data table)

The current distribution factor "b" depends on how the circuit is fed and on the distribution of the electric loads along the busbar:

$b=2$	supplies at one end and load at the end of the line	
$b=1$	supplies at one end and with load evenly distributed	
$b=0.5$	supplies at both ends and with load evenly distributed	
$b=0.5$	central supply with loads at both ends	
$b=0.25$	central supply with load distributed evenly	

ex: MR 160

$I_b = 80A$ operating current

$b=1$ supply from one end

$k=0.608$ see technical data table

$\cos\varphi = 0.85$

$L = 100m$ line length

$V_n = 400V$ operating voltage

$$\Delta v\% = b \cdot \frac{k \cdot I_b \cdot L}{V_n \cdot 10^3} \cdot 100 =$$

$$\frac{0.608 \cdot 80 \cdot 100}{400 \cdot 10^3} \cdot 100 = 1.22\%$$

SHORT-CIRCUIT CURRENT

The short circuit current value I_{cw} that can be supported by our busbar trunking systems allows for both electrodynamic stress and thermal energy dissipated during the fault. The busbars must be able to sustain the short circuit current for the entire duration of the fault - i.e. for the time required for the protective device (circ. breaker) to start operating, cutting off the metal continuity and extinguishing the electric arc.