



GIOVENZANA

INTERNATIONAL B.V.

GIOVENZANA INTERNATIONAL B.V.
Strawinskylaan, 1105
1077 XX Amsterdam, THE NETHERLANDS
Ph: +31 (0) 20.4413576
E-mail: giovenzana@giovenzana.com

G.T.R. LLC
Likhov lane, h.3, b.2, office 2-9
127051, Moscow, RUSSIAN FEDERATION
Ph: +7.499.9228548
E-mail: gtr@giovenzana.com

GIOVENZANA CONTROLS INDIA Pvt. Ltd.
A-102, Knox Plaza, Chincholi, Off Link Road
Near Mindspace, Malad West
400064 Mumbai, INDIA
Phone: +91.22.42640071
E-mail: ggindia@giovenzana.com

GIOVENZANA CONNECTING BRASIL LTDA
Rua Dante Razeira, 102 Cep. 92700-090
Guaíba, Rio Grande do Sul, BRASIL
Ph: (+55) 51 3055 1033
E-mail: gcb@giovenzana.com

GIOVENZANA INTERNATIONAL B.V. - Dubai Branch
Jafza 15, Jebel Ali Free Zone
P.O. Box 262146 Dubai, U.A.E.
Ph: +971.4.8870788
E-mail: uae@giovenzana.com



www.giovenzana.com




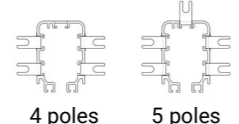
ENERGY TRANSMISSION SYSTEM
BUSBAR - MULTIPOLE - FESTOON




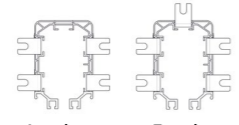
PRODUCTS INDEX

4/25 BUSBAR SYSTEM


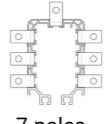
- 6/7 Line construction
- 8 Technical Data - Busbar and Multipole System

		LINE TYPE / AMPERAGE COVERAGE								
		40A	50A	60A	70A	100A	140A	160A	200A	320A
TR60										
10/11	Continuous conductors Max 5 Poles  Max 5 conductors slot	40A		60A						
12/13	Pre-mounted conductors Max 5 Poles  4 poles 5 poles	40A		60A						

TR85H5P

		40A	50A	60A	70A	100A	140A	160A	200A	320A
14/15	Continuous conductors Max 5 Poles  Max 5 conductors slot	40A			70A	100A	140A			
16/17	Pre-mounted conductors Max 5 Poles  4 poles 5 poles	40A			70A	100A	140A			

TR85H7P

		40A	50A	60A	70A	100A	140A	160A	200A	320A
18/19	Continuous conductors Max 7 Poles  Max 7 conductors slot		50A			100A		160A	200A *	320A *
20/21	Pre-mounted conductors Max 7 Poles  7 poles		50A			100A		160A	200A *	320A *

* Only 4 poles with parallel connections

- 22/23 Accessories
- 24/25 Survey

26/29 MULTIPOLE SYSTEM


		LINE TYPE / AMPERAGE COVERAGE									
		40A	50A	60A	70A	100A	140A	160A	200A	320A	

MP04P										
28/29	Pre-Mounted Conductors 4 Poles  4 Poles			60A		100A	140A			


30/41 FESTOON SYSTEM

- 32 Line construction

LINE 30

34/35	Standard (also available for HAZARDOUS LOCATIONS)** 
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LINE 41

36/37	Standard (also available for HAZARDOUS LOCATIONS)** 
36/37	Stainless Steel

LINE WIRE-ROP

38	Standard 
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LINE I-BEAM

38	Light Series 
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FLAT AND ROUND CABLES

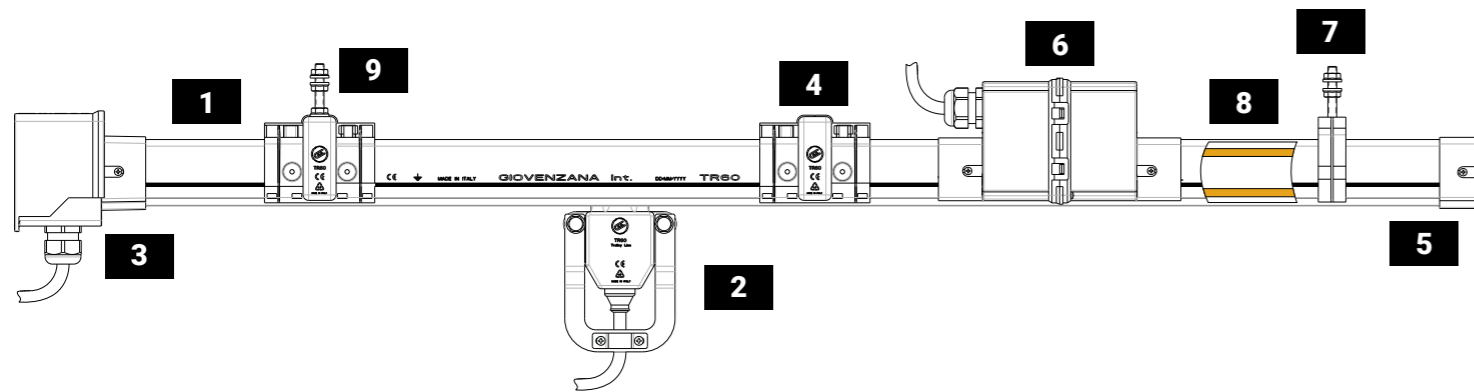
- 40 Flat cables and round cables with dual strain relief cords

41/43 NEWS: GIOVENZANA VERTICAL BUSBAR

BUSBAR SYSTEM

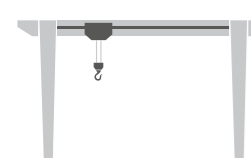
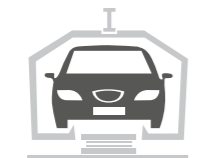

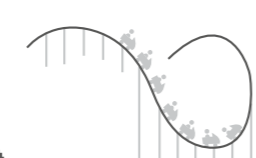


The **Conductor Busbar System** is a modern and safe power transmission system for various types of equipment, such as cranes, overhead cranes, conveyor belts, chain conveyors, etc...
The busbar system complies with relevant international standards, ensuring operator safety, ease of installation and reliability. The "H" honeycomb profile of the TR85H line ensures greater strength and light weight.

TYPICAL LAYOUT



1	BUSBAR	PVC Housing
2	TROLLEY CURRENT COLLECTOR	Transmits the energy from the conductor to the machine
3	HEAD FEED BOX	Connects power supply to the conductor
4	JOINT BOX	Links two busbars
5	END CAP	Closes and protects the busbar end
6	IN-LINE FEED BOX	Connects power supply from centre to avoid the voltage drop
7	HANGER CLAMP	Connects the busbar to the brackets
8	COPPER STRIP	Transmits the energy from the power supply to the current collector
9	FIXED POINT	Creates a fixed point

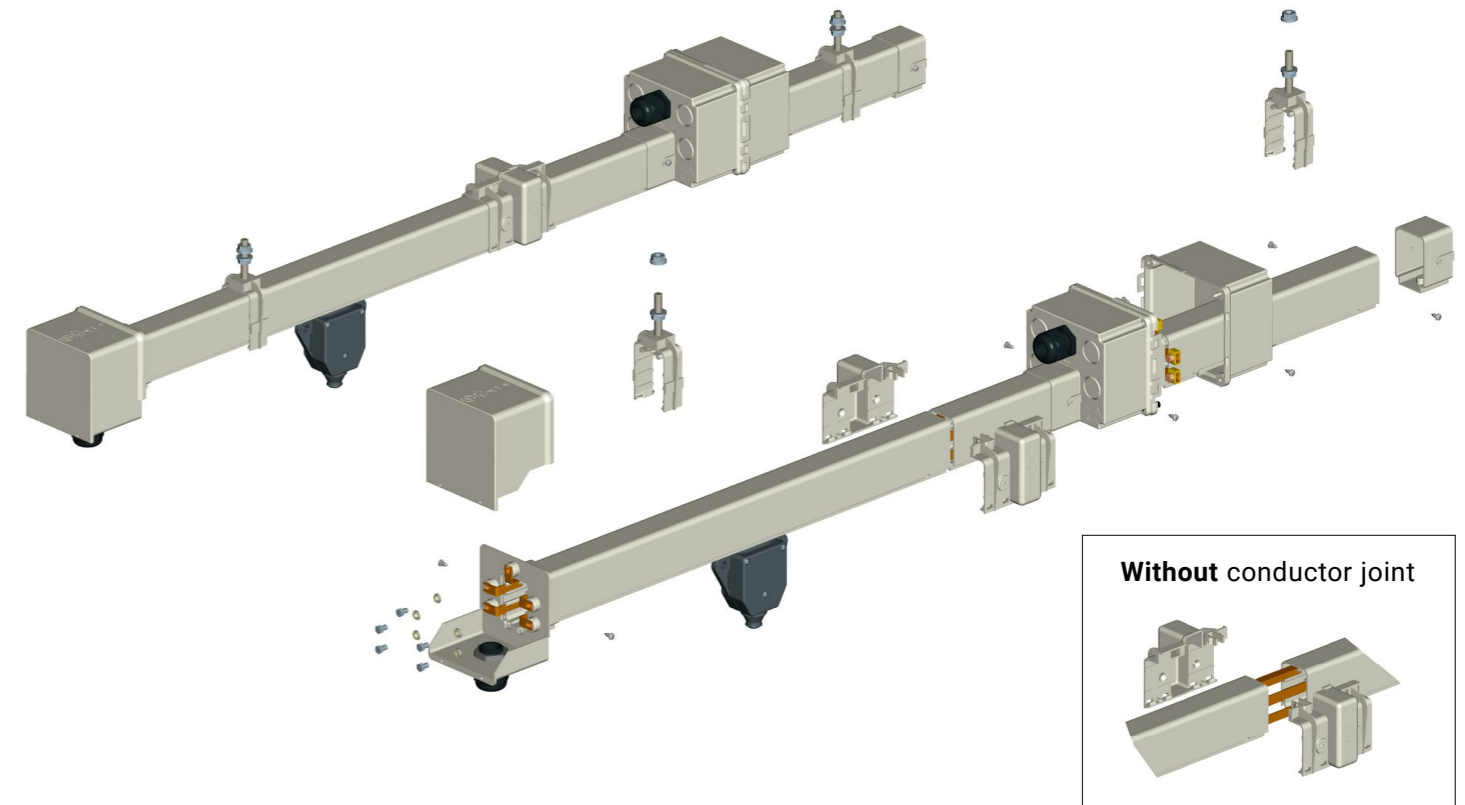
TYPICAL APPLICATIONS

					
CRANE TECHNOLOGY	PRODUCTION AUTOMATION	BMU	PEOPLE MOVER SYSTEM	STORAGE	TEXTILE
Cranes and Hoists Recycling plants Galvanized plants	Electric systems Automated conveyors	Building Maintenance Units Airport and terminal stations Skyscrapers Cleanroom technology	People movers Vertical elevators Inclined elevators	High-bay warehouses Automated storage	AIRCRAFT HANGAR DOORS

AVAILABLE VERSIONS

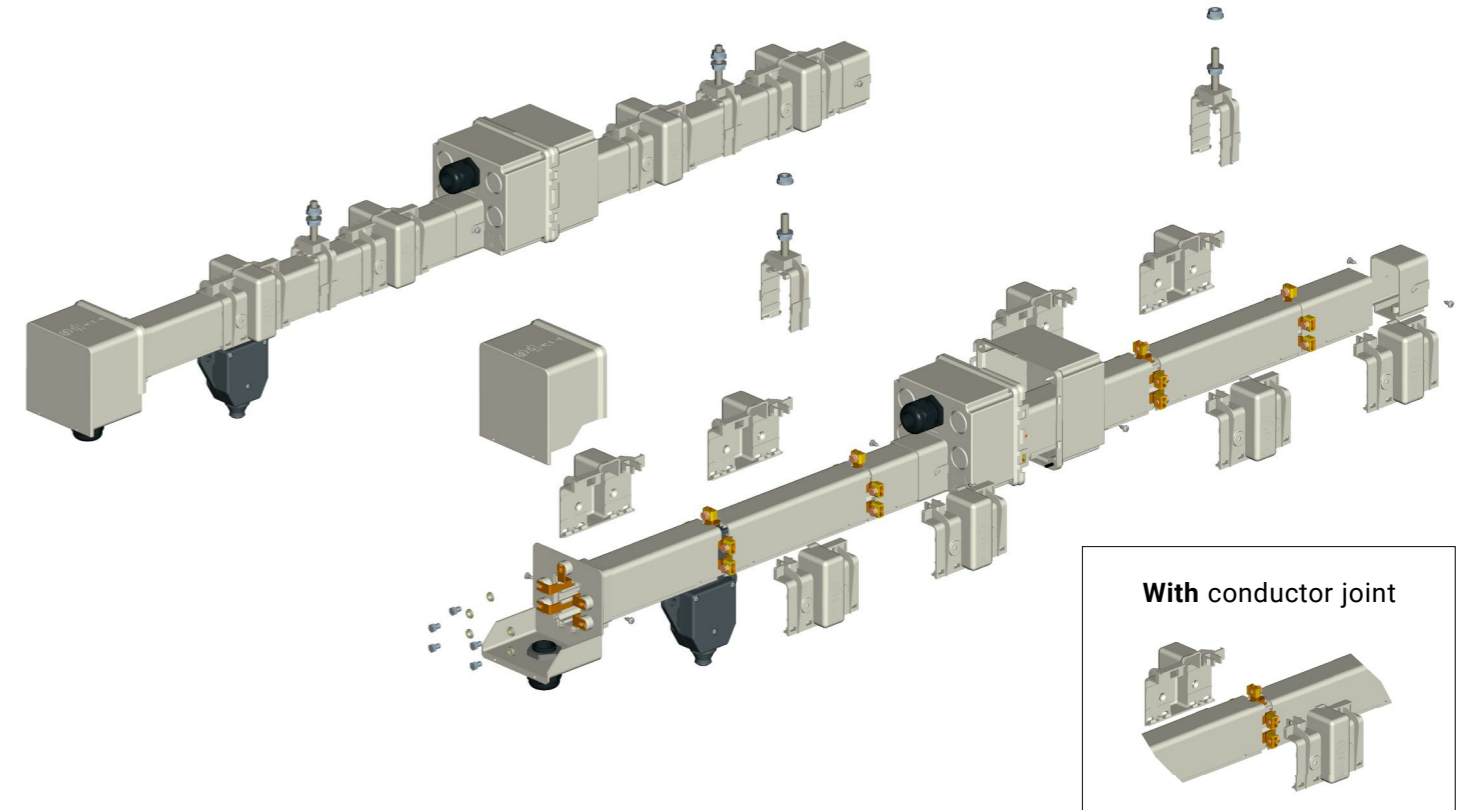
A. CONTINUOUS CONDUCTORS

The conductors are pulled from a coil without joints into the already installed casing.



B. PRE-MOUNTED CONDUCTORS

The conductors are already inserted in the plastic casing.



LINE CONSTRUCTION

When deciding on the size of the trolleys, it is necessary to consider:

- Maximum current in service;
- Devices (cage motors, slip-rings motors, resistors, electronic starters);
- Starting current of the devices;
- Maximum ambient temperature;
- The distance between device to the nearest power supply;
- Allowable voltage and voltage drop in continuous duty and starting;
- Type of current;
- Duty cycle of the devices (load factor).

CALCULATION OF THE VOLTAGE DROP

- The voltage drop must not exceed 5% of the rated voltage under normal operating conditions.

Three-phase alternating current:

$$\Delta u = \sqrt{3} \times I \times L_t \times Z$$

$$\Delta u\% = \frac{\Delta u \times 100}{U}$$

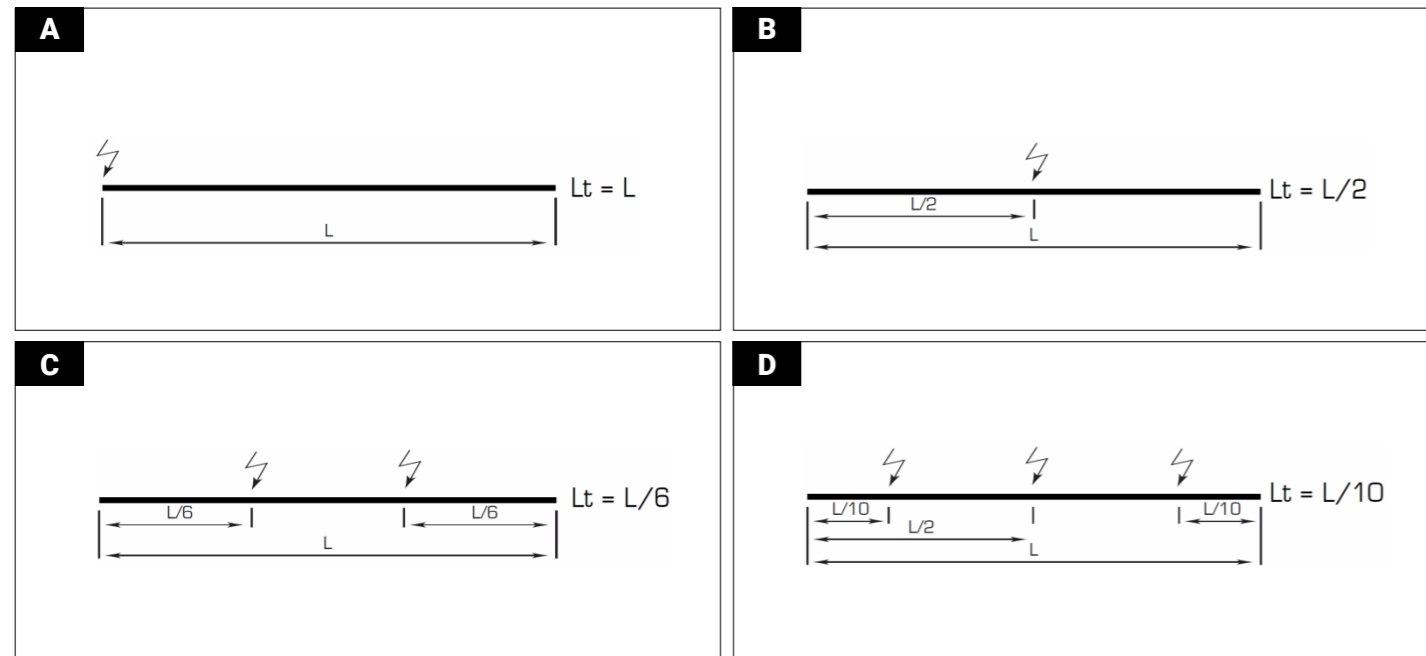
Keys:

Δu = Voltage drop [V]
 $\Delta u\%$ = Voltage drop [%]
 I = Current intensity [A]
 L_t = Length of section [m]
 Z = Impedence [Ω/m]
 U = Voltage [V]

POWER FEED: BUSBAR TRACK LENGHT

- Proper arrangement of power points minimizes voltage reduction.
 If "L" is the line length, "Lt" is the maximum track length to consider voltage reduction.

- A** $L_t = L$ - with ending/starting power feed
- B** $L_t = L/2$ - with in-line power feed
- C** $L_t = L/6$ - with power feed at 1/6 from each end
- D** $L_t = L/10$ - with three power feed at L/2 and L/10 from each end



CURRENT IN CONTINUOUS SERVICE

- Specify the number of devices working simultaneously to calculate the corresponding current:

$$I_n = I_1 + I_2 + I_3 + \dots$$

- The current can be determined by the power of the devices [W], which, for a three-phase system, is equal to:

$$I_n = \frac{P_u}{\sqrt{3} \times U \times \cos\phi \times \eta}$$

Keys:

I_n = Current consumption [A]
 P_u = Power devices [W]
 η = Devices performance
 U = Operating Voltage [V]
 $\cos\phi$ = Power factor

- In the absence of information on the operation of simultaneous devices, consider the following table:

N° OF IN-LINE LIFTING DEVICE	LIFTING EQUIPMENT IN USE			
	1 ST ENGINE	2 ND ENGINE	3 TH ENGINE	4 TH ENGINE
	max power engine*		decreasing power engine*	
1	x	x		
2	x	x	x	
3	x	x	x	
4	x	x	x	x
5	x	x	x	x
N° 2 lifting equipment operating simultaneously	x	x	x	x

* About η motors connected in parallel with rated current I_n' , consider $I_n = \eta \times I_n'$.

STARTING CURRENT

- Calculate the numbers of simultaneously started devices and the device already in service, then calculate the corresponding current. If the startup current is not known, proceed with the following approximation:

For a single user

$$I_a = K \times I_n \quad K = \frac{\text{Starting current (Ia)}}{\text{Nominal current (In)}}$$

As a general rule, consider:
 $K = 5$ to 6 for cage motors
 $K = 2$ for winding motors
 $K = 2$ for inverters (frequency converters)

- In the absence of information on the operation of simultaneous devices, consider the following table:

N° OF IN-LINE LIFTING DEVICE	LIFTING EQUIPMENT IN USE							
	1 ST ENGINE		2 ND ENGINE		3 TH ENGINE		4 TH ENGINE	
	I_a	I_n	I_a	I_n	I_a	I_n	I_a	I_n
1	x			x				
2	x			x		x		
3	x		x					
4	x		x			x		
5	x		x			x		x
N° 2 lifting equipment operating simultaneously	x		x			x		x

BUSBAR SYSTEM

TR60
CONTINUOUS CONDUCTORS

ITEM	PRODUCT	SPECIFICATION	40A	60A
BUSBAR		Standard length: 4 meters *. Material: PVC.	TR6000W	
CONDUCTOR SIZE		ETP copper.	CS40 10x1 - 10mm ²	CS60 10x1,5 - 15mm ²
JOINT BOX		Material: plastic. To connect two busbars.	TR6001W	
HANGER CLAMP		Material: plastic. Max support spacing: 1,33 m.	TR6002W	
		Material: steel. Max support spacing: 1,33 m.	TR6020	
END CAP		Material: plastic. Closes and protects the busbar end.	TR6006W	
FEED BOX		Material: plastic. To use to feed the line (at the head of the line).	TR6003W	
IN-LINE FEED		To use along the line in order to prevent voltage drop. Clamps or screws + nuts not included.	TR6008W Recommended use of dedicated accessories to page 23.	
TROLLEY CURRENT COLLECTOR (for straight and curved lines)		25A - 4 conductors.	TR6004	
		25A - 5 conductors.	TR6005	

ITEM	PRODUCT	SPECIFICATION	40A	60A
TOWING ARM		To use to move the trolley current collector.	TR8557	
TOWING ARM BRACKET		Alternative product of TR8557 (with TR8510).	TR6007	
TOWING ARM		To use with TR6007 or TR6013.	TR8510	
DOUBLE TROLLEY SUPPORT		For utilization with two trolleys in order to have ampacity of 50A.	TR6013	
FIXED POINT		Fix the line to control thermal expansion. One for each line.	TR6014W	
TRANSFER GUIDE			TR6034	
SPRING LOADED TOWING ARM		For transfer guide.	TR8538	
GASKET IP44			TR6012	
CONDUCTOR INSERTION TROLLEY		For insertion of copper conductor in the line.	TR6011	
DE-COIL UNIT			TR8513	

BUSBAR SYSTEM

TR60
PRE-MOUNTED CONDUCTORS

ITEM	PRODUCT	SPECIFICATION	40A	60A
BUSBAR		Standard lenght: 4 meters *. 4 conductors.	TR60404CW	TR60604CW
		Standard lenght: 4 meters *. 5 conductors.	TR60405CW	TR60605CW
		Conductor type.	Included in busbar code 10x1 - 10mm ²	Included in busbar code 10x1,5 - 15mm ²
JOINT BOX		Material: plastic. To connect two busbars.	TR6001W	
HANGER CLAMP		Material: plastic. Max support spacing: 1,33 m.	TR6002W	
		Material: steel. Max support spacing: 1,33 m.	TR6020	
END CAP		Material: plastic. Closes and protects the busbar end.	TR6006W	
FEED BOX		4 conductors.	TR6003A4W	
		5 conductors.	TR6003A5W	
IN-LINE FEED		4 conductors.	TR6008A4W	
		5 conductors.	TR6008A5W	
TROLLEY CURRENT COLLECTOR		25A - 4 conductors.	TR6004	
		25A - 5 conductors.	TR6005	

ITEM	PRODUCT	SPECIFICATION	40A	60A
TOWING ARM		To use to move the trolley current collector.		TR8557
TOWING ARM BRACKET		Alternative product of TR8557 (with TR8510).		TR6007
TOWING ARM		To use with TR6007 or TR6013.		TR8510
DOUBLE TROLLEY SUPPORT		For utilization with two trolleys in order to have ampacity of 50A.		TR6013
FIXED POINT		To fix the line to control thermal expansion. 1 for each line.		TR6014W
TRANSFER GUIDE		LEFT 4 conductors.		TR6034A4W
		LEFT 5 conductors.		TR6034A5W
		RIGHT 4 conductors.		TR6035A4W
		RIGHT 5 conductors.		TR6035A5W
SPRING LOADED TOWING ARM		For transfer guide.		TR8538
GASKET IP44				TR6012

BUSBAR SYSTEM
TR85H5P
 CONTINUOUS CONDUCTORS

ITEM	PRODUCT	SPECIFICATION	40A	70A	100A	140A
BUSBAR		Standard length: 4 meters *. Material: PVC.	TR85H5PW			
CONDUCTOR SIZE		ETP copper.	RM40 15,5x0,6 9,3mm ²	RM70 15,5x1 15,5mm ²	RM100 15,5x1,5 23,25mm ²	RM140 15,5x2 31mm ²
JOINT BOX		Material: plastic. To connect two busbars.	TR8501W			
		Material: steel. To connect two busbars.	TR8524			
HANGER CLAMP		Material: plastic. Max support spacing: 1,33 m.	TR8502W			
		Material: steel. Max support spacing: 1,33 m.	TR8525			
END CAP		Material: plastic. Closes and protects the busbar end.	TR8506W			
FEED BOX		Material: plastic. To use to feed the line (at the head of the line).	TR8503W			
IN-LINE FEED		To use along the line to prevent voltage drop. Clamps or screws + nuts not included.	TR8547W Recommended use of dedicated accessories to page 23.			
TROLLEY CURRENT COLLECTOR		35A - 4 conductors.	TR8511			
		35A - 5 conductors.	TR8512			
		70A - 4 conductors.	TR8518			
		70A - 5 conductors.	TR8519			
TROLLEY CURRENT COLLECTOR FOR CURVES		35A - 4 conductors.	TR8516			
		70A - 4 conductors.	TR8532			

ITEM	PRODUCT	SPECIFICATION	40A	70A	100A	140A
TOWING ARM		To use to move the trolley current collector.	TR8557			
TOWING ARM BRACKET		Alternative product of TR8557 (with TR8510).	TR6007			
TOWING ARM		To use with TR6007 or TR8523.	TR8510			
DOUBLE TROLLEY SUPPORT		For utilization with two trolleys in order to have ampacity of 140A.	TR8523			
FIXED POINT		To fix the line to control thermal expansion 1 for each line.	TR8527.1			
EXPANSION JOINT		To use to compensate thermal expansion.	TR85H5P07W			
INSPECTION JOINT		To use to extract the trolley from the line (when there are more than two trolleys).	TR85H5P28W			
SECTION JOINT		To use to section the line (double up the number of the trolleys).	TR85H5P45W			
TRANSFER GUIDE			TR85H5P34			
SPRING LOADED TOWING ARM		For transfer guide.	TR8538			
GASKET IP44			TR8505S			
CONDUCTOR INSERTION TROLLEY		For insertion of copper conductor in the line.	TR8514			
DE-COIL UNIT			TR8513			

BUSBAR SYSTEM

TR85H5P
PRE-MOUNTED CONDUCTORS

ITEM	PRODUCT	SPECIFICATION	40A	70A	100A	140A
BUSBAR		Standard lenght: 4 meters *. 4 conductors.	TR85H5P 404CW	TR85H5P 704CW	TR85H5P 1004CW	TR85H5P 1404CW
		Standard lenght: 4 meters *. 5 conductors.	TR85H5P 405CW	TR85H5P 705CW	TR85H5P 1005CW	TR85H5P 1405CW
		Conductor type.	15,5×0,6 9,3mm ²	15,5×1 15,5mm ²	15,5×1,5 23,25mm ²	15,5×2 31mm ²
Included in Busbar code						
JOINT BOX		Material: plastic. To connect two busbars.	TR8535W			
HANGER CLAMP		Material: plastic. Max support spacing: 1,33 m.	TR8502W			
		Material: steel. Max support spacing: 1,33 m.	TR8525			
END CAP		Material: plastic. Closes and protects the busbar end.	TR8506W			
FEED BOX		4 conductors.	TR85H5P03A4W			
		5 conductors.	TR85H5P03A5W			
IN-LINE FEED		To use along the line in order to prevent voltage drop.	TR8547W			
TROLLEY CURRENT COLLECTOR		35A 4 conductors.	TR8511			
		35A 5 conductors.	TR8512			
		70A 4 conductors.	TR8518			
		70A 5 conductors.	TR8519			
TROLLEY CURRENT COLLECTOR FOR CURVES		35A 4 conductors.	TR8516			
		70A 4 conductors.	TR8532			

ITEM	PRODUCT	SPECIFICATION	40A	70A	100A	140A
TOWING ARM		To use to move the trolley current collector.	TR8557			
TOWING ARM BRACKET		Alternative product of TR8557 (with TR8510).	TR6007			
TOWING ARM		To use with TR6007 or TR8523.	TR8510			
DOUBLE TROLLEY SUPPORT		For utilization with two trolleys in order to have ampacity of 140A.	TR8523			
FIXED POINT		To fix the line to control thermal expansion. 1 for each line.	TR8527.1			
SECTION JOINT		To use to section the line (double up the number of the trolleys).	TR85H5P45W			
TRANSFER GUIDE		LEFT 4 conductors.	TR85H5P34A4W			
		LEFT 5 conductors.	TR85H5P34A5W			
		RIGHT 4 conductors.	TR85H5P35A4W			
TRANSFER GUIDE		RIGHT 5 conductors.	TR85H5P35A5W			
			TR85H5P35A5W			
SPRING LOADED TOWING ARM		For transfer guide.	TR8538			
GASKET IP44			TR8505S			

BUSBAR SYSTEM
TR85H7P
 CONTINUOUS CONDUCTORS

ITEM	PRODUCT	SPECIFICATION	50A	100/200A*	160/320A*
BUSBAR		Standard length: 4 meters.	TR85H7PW		
CONDUCTOR SIZE		ETP copper.	CSH750 12,5x0,8 10mm ²	CSH7100 12,5x1,8 22,5mm ²	CSH7160 12,5x2,5 31,25mm ²
JOINT BOX		Material: plastic. To connect two busbars.	TR8501W		
		Material: steel. To connect two busbars.	TR8524		
HANGER CLAMP		Material: plastic. Max support spacing: 1 m.	TR8502W		
		Material: steel. Max support spacing: 1 m.	TR8525		
END CAP		Material: plastic. Closes and protects the busbar end.	TR8506W		
FEED BOX		Only for 7 poles till 100A.	TR85H7P005W	-	
IN-LINE FEED		Clamps or screws + nuts not included.	TR85H7P03W Recommended use of dedicated accessories to page 23.		
TRANSITION BOX		For parallel connections 200A or 320A.	-	TR8564	
FIXED POINT		To fix the line to control thermal expansion. 1 for each line.	TR8527.1		
TROLLEY CURRENT COLLECTOR		35A - single.	TR85H7P001		
		70A - double.	TR85H7P002		
		105A - triple.	TR85H7P010		

ITEM	PRODUCT	SPECIFICATION	50A	100/200A*	160/320A*
TOWING ARM		Single.	TR8557		
		Double.	TR8558		
		Triple.	TR8559		
4 POLES TROLLEY CONNECTION CLAMP		Single (3ph 70A-PE 35A).	TR8561		
		Double (3ph 140A-PE 70A).	TR8562		
		Triple (3ph 210A-PE 105A).			
EXPANSION JOINT		To use to compensate thermal expansion.	TR85H7P07W		
INSPECTION JOINT		To use to extract the trolley from the line (when there are more than two trolleys).	TR85H7P28W		
SECTION JOINT		To use to section the line (double up the number of the trolleys).	TR85H7P45W		
GASKET IP44			TR8505S		
CONDUCTOR INSERTION TROLLEY		For insertion of copper conductor in the line.	TR85H7P14		
DE-COIL UNIT			TR8513		

BUSBAR SYSTEM
TR85H7P
 PRE-MOUNTED CONDUCTORS

ITEM	PRODUCT	SPECIFICATION	50A	100A	160A	200A*	320A*
BUSBAR		Standard lenght: 4 meters *. 4 conductors.	-	-	-	TR85H7P 1007CW	TR85H7P 1607CW
		Standard lenght: 4 meters. 7 conductors.	TR85H7P 507CW	TR85H7P 1007CW	TR85H7P 1607CW	-	-
		Conductor type.	Included in busbar code				
			12,5x0,8 10mm ²	12,5x1,8 22,5mm ²	12,5x2,5 31,25mm ²	2X (12,5x1,8) 2x22,5mm ²	2X (12,5x2,5) 2x31,25mm ²
JOINT BOX		Material: plastic. To connect two busbars.	TR85H7P007W				
HANGER CLAMP		Material: plastic. Max support spacing: 1 m.	TR8502W				
		Material: steel. Max support spacing: 1 m.	TR8525				
END CAP		Material: plastic. Closes and protects the busbar end.	TR8506W				
FEED BOX		7 conductors.	TR85H7P005A7W				
IN-LINE FEED		7 conductors.	TR85H7P03A7W				
TRANSITION BOX		For parallel connections 200A or 320A.				TR8564	
FIXED POINT		To fix the line to control thermal expansion. 1 for each line.	TR8527.1				
TROLLEY CURRENT COLLECTOR		35A - single.	TR85H7P001				
		70A - double.	TR85H7P002				
		105A - triple.	TR85H7P010				

ITEM	PRODUCT	SPECIFICATION	50A	100A	160A	200A*	320A*
TOWING ARM		Single.	TR8557				
		Double.	TR8558				
		Triple.	TR8559				
4 POLES TROLLEY CONNECTION CLAMP		Single (3ph 70A - PE 35A).	TR8561				
		Double (3ph 140A - PE 70A).	TR8562				
		Triple (3ph 210A - PE 105A).	TR8562				
SECTION JOINT		To use to section the line (double up the nr of the trolleys).	TR85H7P45W				
GASKET IP44			TR8505S				

BUSBAR SYSTEM

BUSBAR ACCESSORIES

ITEM	PRODUCT	SPECIFICATION	CODE
SUPPORT BRACKET (RAIL Fixing)	<p>2 arm clips kit included. THK ≤ 10mm</p>	L=350mm	TR8550
	<p>Mounting Example</p>	L=500mm	TR8551
	<p>2 arm clips kit included. THK ≤ 10mm</p> <p>Mounting Example</p>	L=800mm	TR8552
SUPPORT BRACKET (Wall Fixing)		L=350mm	TR8555
	<p>Wall drilling plan</p>	L=500mm	TR8556
END CAP			30607015

ITEM	PRODUCT	SPECIFICATION	CODE
TR60 CONDUCTORS CONNECTION CLAMP		Brass material	TR6015
TR85H5P CONDUCTORS CONNECTION CLAMP		Brass material	TR8548
TR85H5P CONDUCTORS CONNECTION CLAMP (for IN-LINE FEED)		Brass material	TR8537
TR85H7P CONDUCTORS CONNECTION KIT		Flanged screw M6×12	11606075
		Flanged nut M6	11612013
TR85H5P BRUSH KIT REPLACEMENT		Only for: TR8518, TR8519, TR8532. One piece for each pole.	TR8520K
TR85H7P BRUSH KIT REPLACEMENT		1x TR85H7P001 2x TR85H7P002 3x TR85H7P010	TR85H7P020K
TR85H7P WHEELS KIT REPLACEMENT		Only for: TR85H7P001 TR85H7P002 TR85H7P010	TR85H7P021K



BUSBAR SYSTEM | CUSTOMIZATION FORM

BUSBAR
SURVEY

COMPANY NAME: CITY:
 COUNTRY: CONTACT:
 PHONE: MAIL:
 DATE: REFERENCE:

1 GENERAL DATA

1.1 TYPE OF INDUSTRY Crane BMU Storage Other
1.2 N° MACHINE FOR TRACK
1.3 N° OF TRACKS
1.4 TRACK LENGHT m
1.5 TRACK LAYOUT m straight - m curved
 (please include Layout Drawing on the next page)

2 ELECTRICAL DATA

2.1 POWER / CURRENT PER MACHINE Kw - Inom A - Istart A
2.2 MAX SIMULTANEOUS CURRENT PER TRACK A
2.3 POWER SUPPLY VOLTAGE V 50/60 Hz - n° phases PE N
2.4 CONTROL SIGNALS Specify number - Voltage
2.5 SWITCH FREQUENCY AND DUTY CYCLE OF THE MACHINERY per
 duty cycle 50% 60% 70% 80% 90% 100%

3 SYSTEM CONFIGURATION

3.1 FEED POINT(S) At beginning - At m from beginning - At m from each end
3.2 CENTRE DISTANCE HANGERS m

4 MACHINE PARAMETERS

4.1 TRAVEL SPEED m/min
4.2 BUILD DIMENSIONS Please list if there are any build dimensions to take in consideration (include drawing)

5 ENVIRONMENTAL DATA

5.1 INDOOR OR OUTDOOR Indoor Outdoor
5.2 MIN & MAX AMBIENT TEMP. °C min °C max
5.3 ENVIRONMENTAL DETAILS Normal Dusty Humid Corrosive Other

6 OPTIONS

6.1 TRANSFER GUIDES Yes No - Quantity
6.2 SECTION JOINT Yes No - Specify the position in the line
6.3 IP44 RUBBER GASKET Yes No

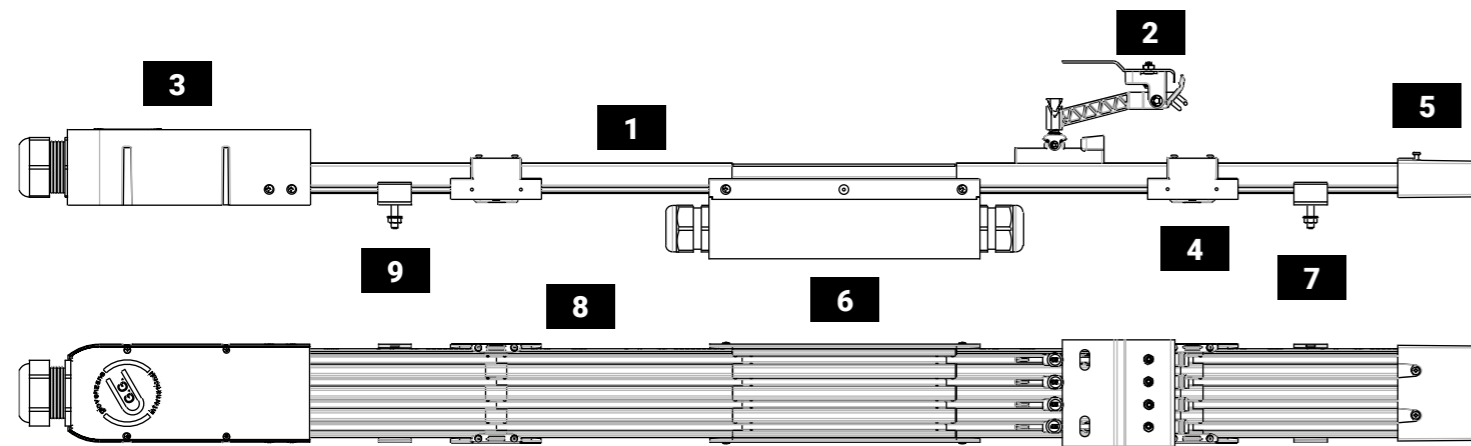
6.4 OTHER

1.5 LAYOUT DRAWING

MULTIPOLE SYSTEM

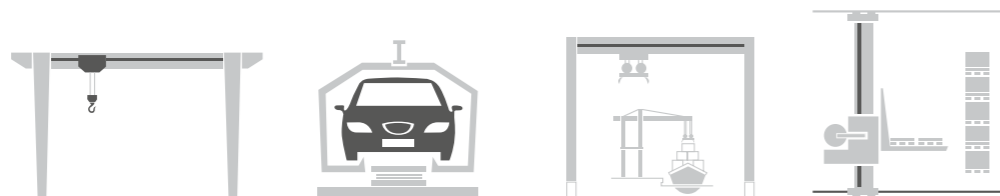
The **Multipole System** is one of the most used insulated system for transmission of power. The main applications of this system are for mobile power consumer: automatic warehouse, light cranes and packaging machinery. The honeycomb profile guarantees high rigidity and the design of the trolley allow to feed device that have high travel speed (up to 500 m/min).

TYPICAL LAYOUT



1	BUSBAR	PVC Housing
2	TROLLEY CURRENT COLLECTOR	Transmits the energy from the conductor to the machinery
3	HEAD FEED BOX	Connects power supply to the conductors
4	JOINT BOX	Links two busbars
5	END CAP	Closes and protects the busbar end
6	IN-LINE FEED BOX	Connects power supply from centre to the conductors
7	HANGER CLAMP	Connects the busbar to the support (posts, columns)
8	COPPER STRIP	Transmits the energy from the power supply to the current collector
9	FIXED POINT	Creates a fixed point to control thermal expansion

TYPICAL APPLICATIONS



CRANE TECHNOLOGY

Cranes and Hoists
Recycling plants
Galvanized plant

PRODUCTION AUTOMATION

Electric systems
Automated conveyors

PORT TECHNOLOGY

RTG cranes
STG cranes

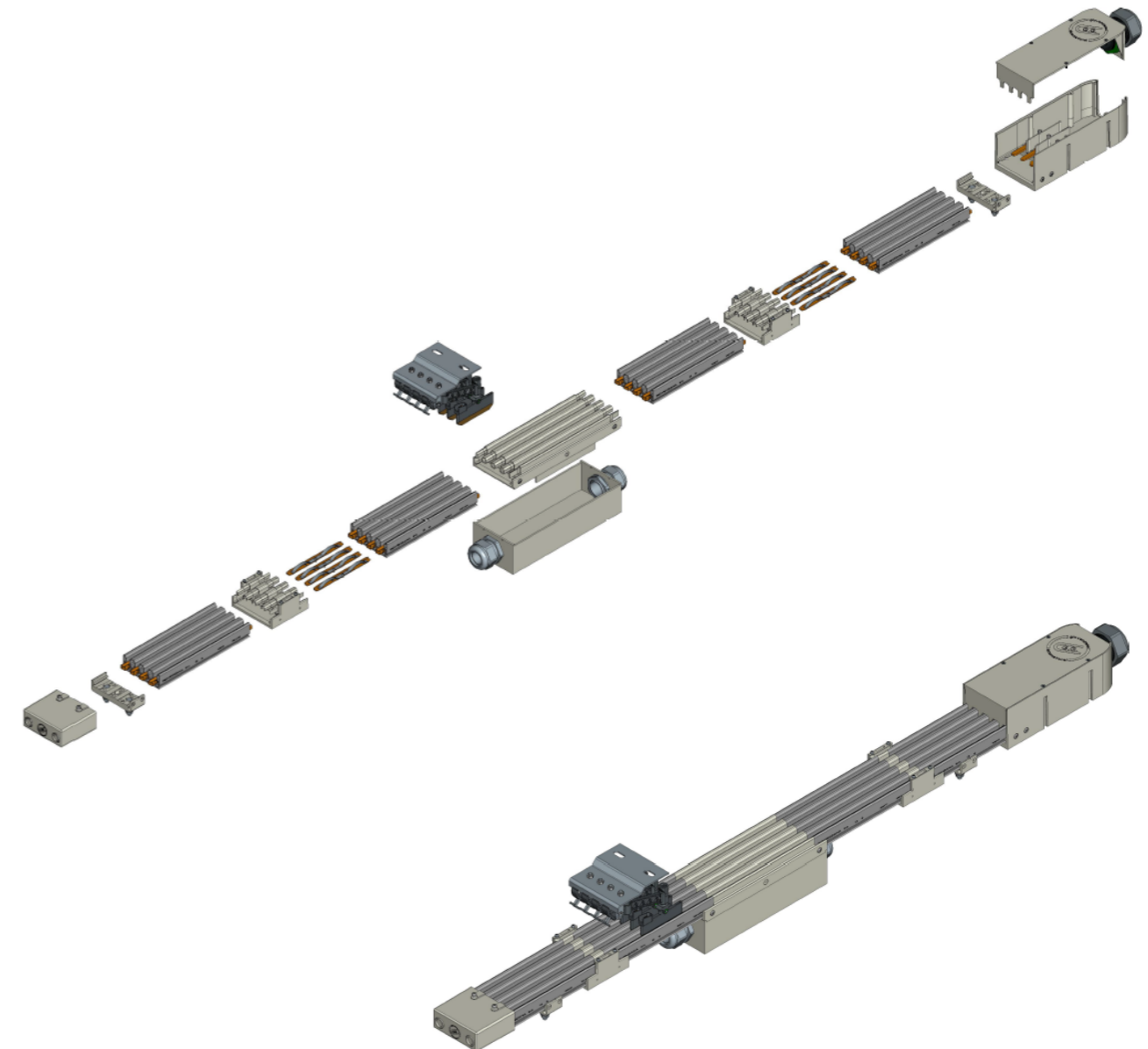
STORAGE

High-bay warehouses
Automated storages

AVAILABLE VERSION







PRE-MOUNTED CONDUCTORS

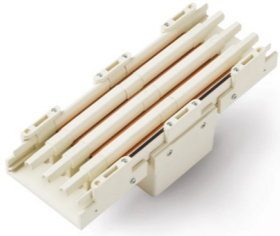

The conductors are already inserted in the plastic casing.



MULTIPOLE SYSTEM

MP04P
PRE-MOUNTED CONDUCTORS

ITEM	PRODUCT	SPECIFICATION	60A	100A	140A
BUSBAR		PVC busbar. ETP copper. Length of 4 meters. 4 poles.	MP04P060	MP04P100	MP04P140
JOINT UNIT		Material: nylon and copper. To use to connect two busbar.		MP04P001	
HANGER CLAMP		Material: nylon. 1 or 2 screws to fix. 1 piece each 1 meter.		MP04P002	
FIXED POINT HANGER		Material: nylon. 1 or 2 screws to fix. 1 piece each 1 line.		MP04P014	
END CAP		Material: nylon. To use at the end of the line.		MP04P006	
END FEEDER BOX		Material: nylon and copper. To use to feed the line. Mounted at the extremity of the line.		MP04P003	

ITEM	PRODUCT	SPECIFICATION	60A	100A	140A
IN-LINE FEED BOX		Material: nylon and copper. To provide intermediate feeding points to reduce voltage drop. Mounted along of the line.		MP04P008	
TROLLEY CURRENT COLLECTOR		50A. Compact. Max deflection: +15mm.		MP04P011	
		50A. Long. Max deflection: +30 mm.		MP04P012	

FESTOON SYSTEM

FESTOON SYSTEM

The **festoon system** is the traditional system for energy transmission using a cable. The main applications of this system are mobile power consumers like cranes, monorails, electric hoists, machine tools, car wash systems, plating lines, etc...

This feeding system has several advantages:

- Safety - the cables are flame resistant, the conductors are completely protected;
- Versatility - it can be used for straight rail as well as for curved rail, for indoor and outdoor applications;
- Easy to install;
- The maintenance of the line is extremely reduced.

AVAILABLE VERSIONS

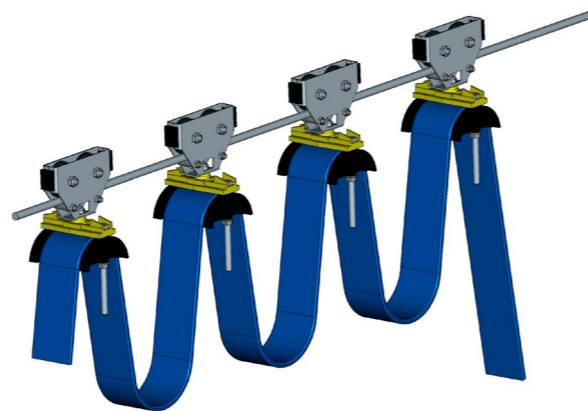
A. LINE 30

- **LOAD CAPACITY:** 100 kg/m
- **Bar size:** 30 × 32 mm
- **Bar length:** 4 m



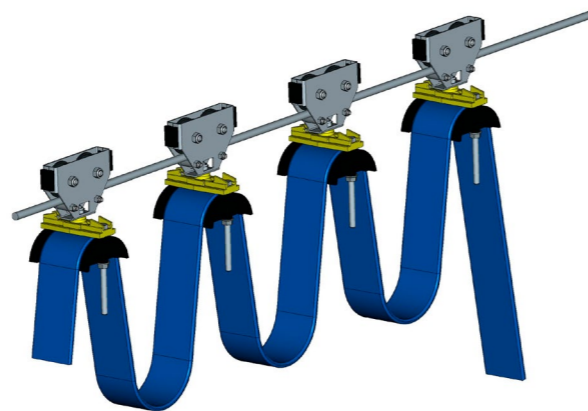
B. LINE 41

- **LOAD CAPACITY:** 140 kg/m
- **Bar size:** 39 × 56 mm
- **Bar length:** 4 m



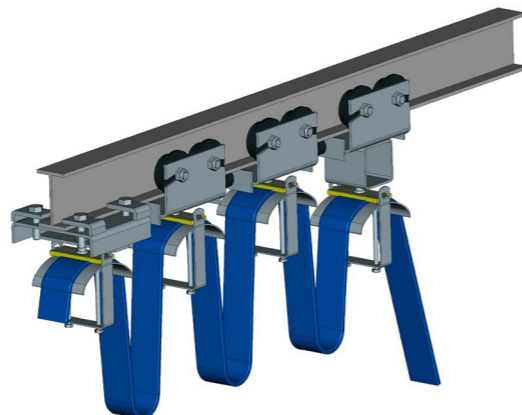
C. LINE 41 STAINLESS STEEL

- **LOAD CAPACITY:** 140 kg/m
- **Bar size:** 39 × 56 mm
- **Bar length:** 3 m



D. LINE WIRE-ROPE

- **TROLLEY LOAD CAPACITY:** 8 kg
- **Rope diameter:** 8 mm
- **Travel speed:** 40 m/min

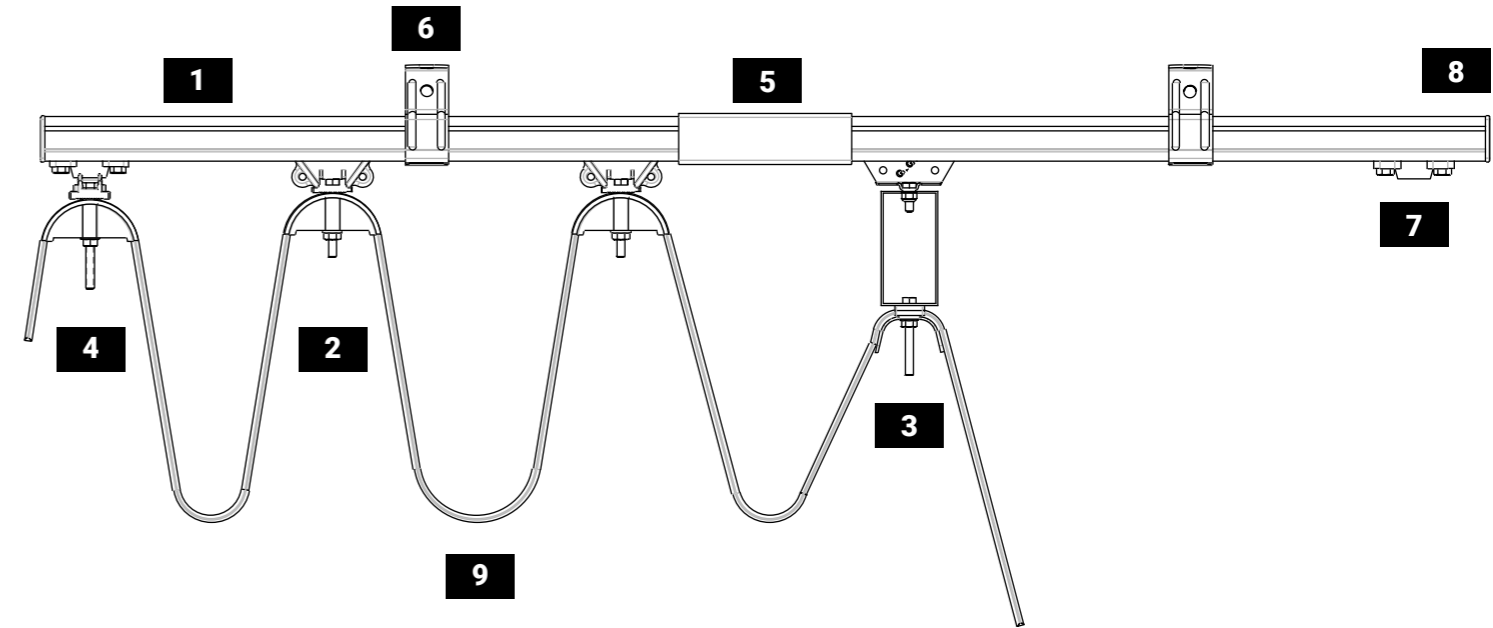


E. LINE I-BEAM Light Series

- **TROLLEY LOAD CAPACITY:** 50 kg
- **I-beam type:** IPE-IPN 80÷100
- **Travel speed:** 120 m/min
- **Max cable capacity:** 70 mm

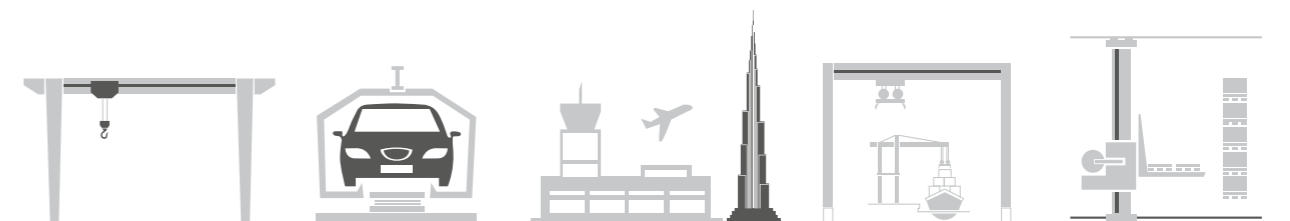


TYPICAL LAYOUT



1	C-RAIL BAR	Steel material
2	TROLLEY	Supports the cable
3	TOWING TROLLEY	Connects to the mobile device and allows the movement
4	HEAD CLAMP	Cable-supporting element without movement
5	JOINT	Connects two C-rail bars
6	SUPPORT	Holds the C-rail bar
7	END STOP	Prevents the exit of the trolley from the C-rail bar
8	END CAP	Closes and protects the C-rail bar
9	CABLE	Transmits the energy

TYPICAL APPLICATIONS



CRANE TECHNOLOGY

Cranes and Hoists
Recycling plants
Galvanized plants

PRODUCTION AUTOMATION

Electric systems
Automated conveyors

BMU

Building Maintenance Units
Airport and terminal stations
Skyscrapers
Cleanroom technology

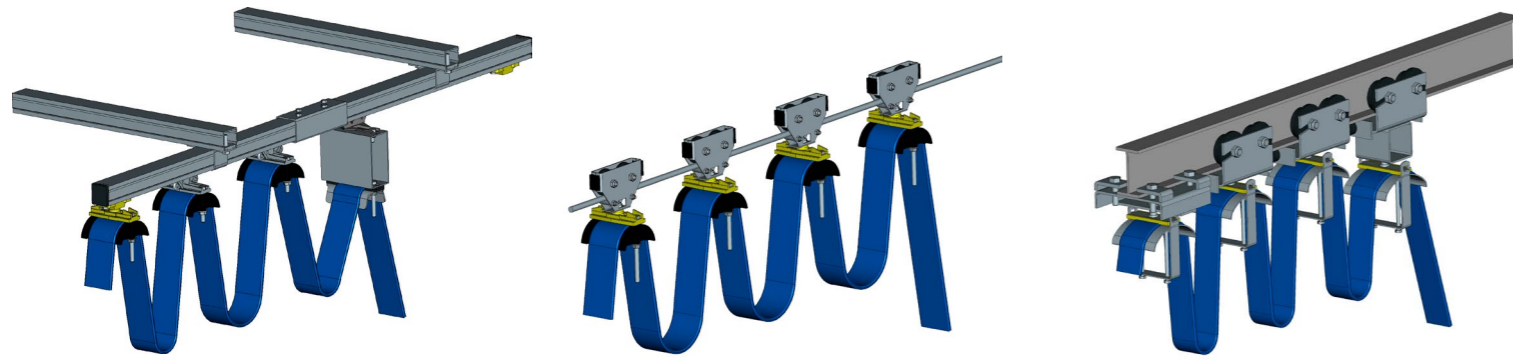
PORT TECHNOLOGY

RTG cranes
STG cranes

STORAGE

High-bay warehouses
Automated storage

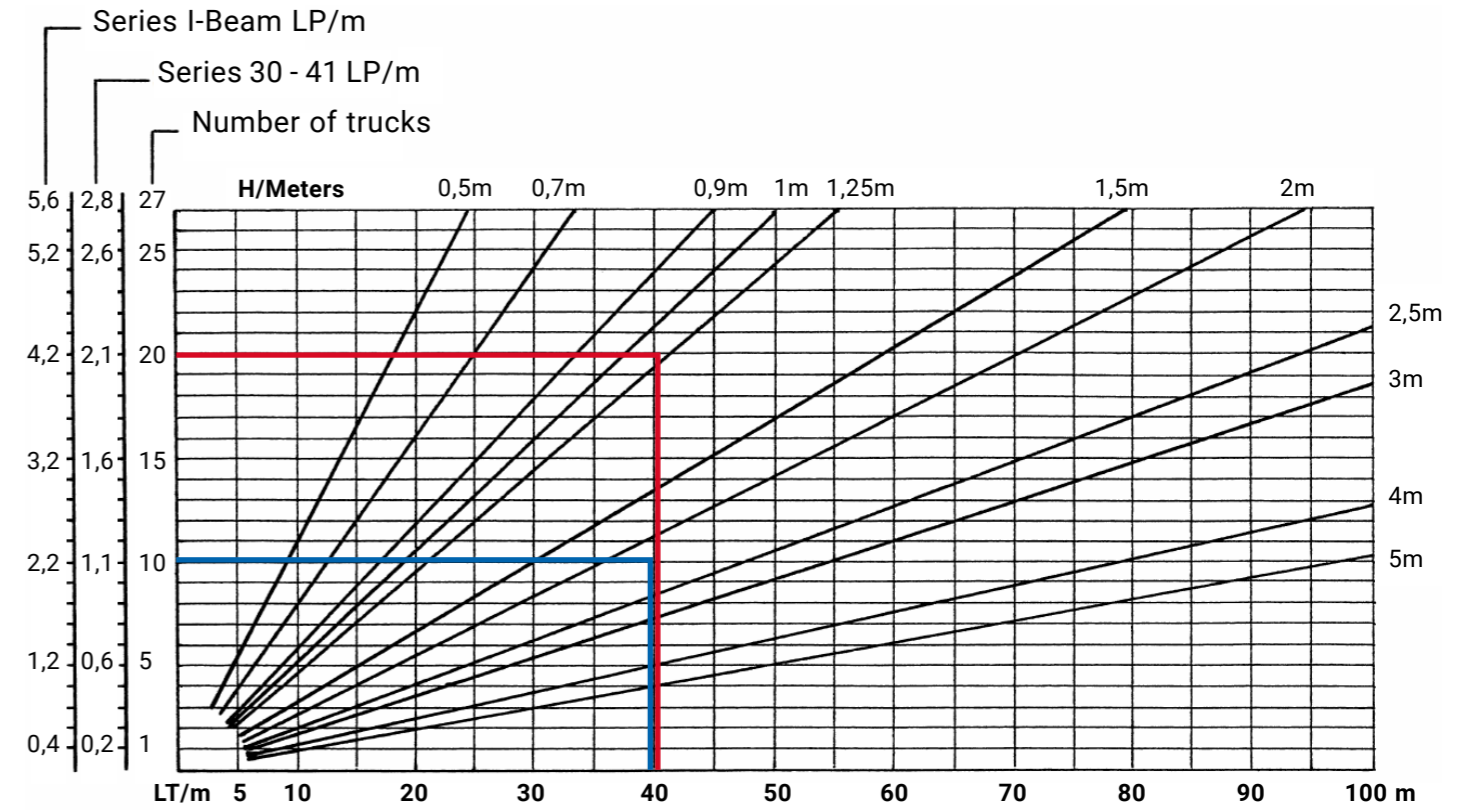
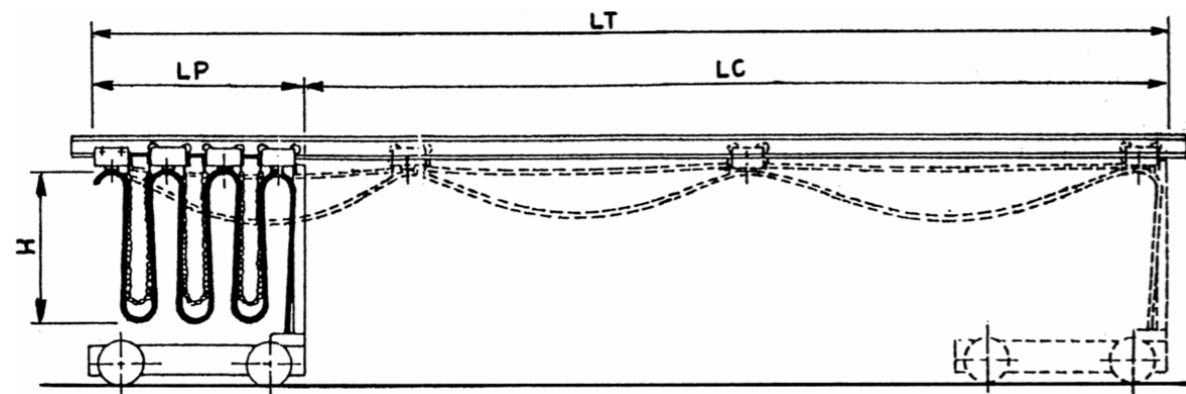
LINE DIAGRAMS



**LINE 30 / 41 /
41 Stainless Steel**

LINE WIRE-ROPE

LINE I-BEAM



LT = Total length LP = Parking zone length
H = Height LC = Race length

BLUE Example

Total line length "LT" = 40 m
Height "H" = 2 m
Number of trolley/trucks = 12 pcs
Parking zone length "LP" = 1,2 m
Race length "LC=LT-LP" = 38,8 m




RED Example








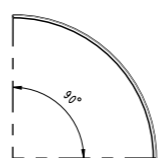
Total line length "LT" = 40 m
Height "H" = 1 m
Number of trolley/trucks = 21 pcs
Parking zone length "LP" = 2,2 m
Race length "LC=LT-LP" = 37,8 m

The diagram is used to determine the number of trolley necessary for the formation of the line, depending on its length.
The height of the loop determines how many trolley are needed and thus their parking area. Where the parking area is too long at the expense of running real user, it must increase the height of the loops, thus decreasing the number of trolleys required and therefore the parking area. To determine the cable length of a garland to increase by 10% the total length of the line and add enough to connect the two ends of the fixed and mobile users.

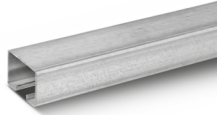
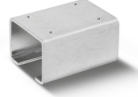



FESTOON SYSTEM







FESTOON
LINE 30

ITEM	PRODUCT	SPECIFICATION	LINE 30
C-RAIL BAR		Material: steel. Length: 4 m. Max load capacity: 100 kg/m.	30607001
JOINT		To connect 2 C-rail bars.	30607002
WALL SUPPORT BRACKET		Max support spacing: 1 m.	30607003
CEILING SUPPORT BRACKET			30607017
SHELF SUPPORT BRACKET			30607004
BRACKET		Length: 0,5 m.	30607001/050F
		Length: 0,8 m.	30607001/080F
SUPPORT ARM CLIPS		To fix bracket to I-beam. Two pieces each bracket.	30607012
HEAD CLAMP		Saddle: 55 mm. Excursion: 30 mm.	30607020
		Saddle: 76 mm. Excursion: 30 mm.	30607006
TROLLEY		Material: steel. Saddle: 68 mm. Excursion: 35 mm. Max load capacity: 30 kg. Max travel speed: 100 m/min.	30607010
			Material: plastic. Saddle: 55 mm. Excursion: 10 mm. Max load capacity: 15 kg. Max travel speed: 50 m/min.

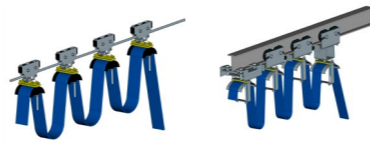
ITEM	PRODUCT	SPECIFICATION	LINE 30
ROUND CABLE TROLLEY		For round cable from 10 to 25 mm.	30607021
		For round cable from 26 to 40 mm.	30607022
EXPANSION FOR ROUND CABLE TROLLEY		For round cable from 10 to 25 mm.	30607025
		For round cable from 26 to 40 mm.	30607026
TOWING TROLLEY		Material: steel. Saddle: 68 mm. Excursion: 30 mm.	30607007
TROLLEY WITH SOCKET		16 poles' socket.	30607027
		24 poles' socket.	30607028
		Without socket.	30607029
END STOP			30607005
END CAP			30607015
END CAP			30607016
CURVED C-RAIL BAR		Curve radius 1200 mm.	30607031
		Curve radius 1500 mm.	30607030

FESTOON SYSTEM
FESTOON
 LINE 41 - 41 STAINLESS STEEL

ITEM	PRODUCT	SPECIFICATION	LINE 41	LINE 41 STAINLESS STEEL
C-RAIL BAR		41 Steel: 4 m. 41 Stainless steel: 3 m. Max load capacity: 140 kg/m.	30602001/4	30602061
JOINT		Single.	30602002	30602065
		Double. For track > 50 m.	30602034	30602062
WALL SUPPORT BRACKET		Galvanized steel. Max support spacing: 1 m.	30602003	30602063
CEILING SUPPORT BRACKET			30602004	-
HEAD CLAMP		Saddle: 55 mm. Excursion: 30 mm.	30602071	30602066
		Saddle: 76 mm. Excursion: 30 mm.	30602072	-
TROLLEY		Material: steel. Saddle: 68 mm. Excursion: 30 mm. Max load capacity: 35 kg. Max travel speed: 120 m/min.	30602086	-
		Material: plastic. Saddle: 55 mm. Excursion: 25 mm. Max load capacity: 20 kg. Max travel speed: 60 m/min.	30602069	30602064
		Material: plastic. Saddle: 76 mm. Excursion: 25 mm. Max load capacity: 20 kg. Max travel speed: 60 m/min.	30602070	-

ITEM	PRODUCT	SPECIFICATION	LINE 41	LINE 41 STAINLESS STEEL
ROUND CABLE TROLLEY		For round cable from 10 to 25 mm.	36602044	-
		For round cable from 26 to 40 mm.	30602045	-
EXPANSION FOR ROUND CABLE TROLLEY		For round cable from 10 to 25 mm.	30607025	-
		For round cable from 26 to 40 mm.	30607026	-
TOWING TROLLEY		Single. Saddle: 68 mm.	30602091	30602067
		Double. Saddle: 68 mm.	30602020	-
TROLLEY WITH SOCKET		16 poles' socket.	30602041	-
		24 poles' socket.	30602042	-
		Without socket.	30602043	-
END STOP			30602038	30602068
CURVED C-RAIL BAR		Curve radius 1500 mm.	30602054	-





FESTOON SYSTEM

FESTOON
LINE WIRE-ROPE AND I-BEAM

ITEM	PRODUCT	SPECIFICATION	MIN. Q.TY	LINE WIRE ROPE
TWIN ROLLER TROLLEY		For flat cable. Saddle: 55 mm. Excursion: 30 mm.	10	30604003
ONE ROLLER TROLLEY		For flat cable. Saddle: 55 mm. Excursion: 30 mm.	10	30604005
ONE ROLLER TROLLEY + METAL CABLE CLIP		For round cable. Max diameter 18 mm.	10	30604007

I-BEAM TYPE	I-BEAM SIZE	SADDLE (mm)	WHEELS	TROLLEY	TOWING TROLLEY	HEAD CLAMP	
	80	55	PA	30606003	30606033	30606062	
			steel	30606103	30606133		
		85	PA	30606005	30606035	30606063	
			steel	30606105	30606135		
		100	55	PA	30606011	30606041	30606066
				steel	30606111	30606141	
85	PA		30606013	30606043	30606067		
	steel		30606113	30606143			
	80	55	PA	30606004	30606034	30606062	
			steel	30606104	30606134		
		85	PA	30606006	30606036	30606063	
			steel	30606106	30606136		
		100	55	PA	30606012	30606042	30606066
				steel	30606112	30606142	
85	PA	30606014	30606044	30606067			
	steel	30606114	30606144				

FESTOON SYSTEM

FESTOON
CABLES

PVC FLAT CABLE ANTI-AGING H07VVH6-F



- Particularly suitable for supply and control circuits, lifting and handling equipment.
- Comply with: CEI 20-22 II (flame resistant).
- Rated operating voltage: 400V.
- Max short circuit temperature: 160°C.
- Insulation class: 2/3.
- Rated insulation voltage: U₀/U 450/750V.
- Operating temperature: -5°C ... +70°C.
- Internal conductors with flexible PVC sheath progressively numbered, plus earth conductor (yellow/green).
- On request the cables can be supplied with a tinned red copper shield heat resistant up to 105° C (minimum requirement is 2000 m).
- Blue colour sheath. Finish the order code with "N" for the black sheath.

CODE	N° COND. X CROSS SECTION	OUTER SIZES (mm)	STRAND (N°/mm)	WEIGHT (gr/m)	TOTAL CROSS SECTION (mm ²)	ELECTRICAL RESISTANCE 20°C (ohm/km)	MAX CURRENT AMBIENT TEMPERATURE 30°C (A)	
							FIXED	MOVED
CP0415AF	4 × 1,5	15 × 5,2	30 × 0,25	150	6	13,30	19,5	17
CP0815AF	8 × 1,5	29 × 5,5		300	12		12	10
CP1215AF	12 × 1,5	41 × 5		420	18		11	9,5
CP1615AF	16 × 1,5	54 × 8		510	24		10	8,5
CP1815AF	18 × 1,5	43 × 11		700	27		9,5	8
CP2415AF	24 × 1,5	51 × 13		1000	36		9	7,5
CP0425AF	4 × 2,5	21 × 5,7	50 × 0,25	240	10	7,98	26	22,5
CP0825AF	8 × 2,5	33 × 6		420	20		18	13
CP1225AF	12 × 2,5	50 × 7		640	30		17	12
CP1625AF	16 × 2,5	41 × 13		1000	40		16	11
CP1825AF	18 × 2,5	50 × 13		1050	45		15	10
CP2425AF	24 × 2,5	54 × 13		1100	60		14	9
CP0404AF	4 × 4	21 × 7,5	56 × 0,30	330	16	4,95	35	30
CP0804AF	8 × 4	38 × 5		550	32		24	19
CP0406AF	4 × 6	24 × 8	84 × 0,30	440	24	3,30	46	40
CP0806AF	8 × 6	38,5 × 8		742	48		32	25
CP0410AF	4 × 10	35 × 11	7 × 12 × 0,40	800	40	1,91	57	46
CP0416AF	4 × 16	36,5 × 12	7 × 18 × 0,40	1200	64	1,21	76	62
CP04250AF	4 × 25	43 × 13	7 × 28 × 0,40	1700	100	0,78	96	80
CP0435AF	4 × 35	50 × 14	7 × 39 × 0,40	2050	140	0,55	119	99

12903010	Standard		FLAT CABLE GLAND		
12903011	ø28.5 out				



FESTOON SYSTEM

FESTOON
CABLES

ROUND CABLE WITH DUAL STRAIN RELIEF STEEL ROPES S05VVD7-F



- Made for heavy duty applications, in particular for pendant push button stations and moving electromechanical components.
- The two strain relief ropes avoid any stress on the cable; they are embedded, diametrically opposed to PVC sheath.
- Comply with: CEI 20-22 II (flame resistant).
- Rated operating voltage: 230V.
- Max short circuit temperature: 160°C.
- Ø2mm steel strain relief ropes.
- Insulation class: 2/3.
- Rated insulation voltage: Uo/U 300/500V.
- Operating temperature: -5°C +70°C.
- Breaking point: 60kg/mm².
- Internal conductors with flexible PVC sheath progressively numbered, plus earth conductor (yellow/green).
- Blue colour sheath. Finish the order code with "N" for the black sheath.

CODE	N° COND. X CROSS SECTION	OUTER CABLE Ø (mm) approx	STRAIN RELIEF ROPE	STRAND (N°/mm)	WEIGHT (gr/m)	TOTAL CROSS SECTION (mm ²)	ELECTRICAL RESISTANCE 20°C (ohm/km)	MAX CURRENT AMBIENT TEMPERATURE 30°C (A)	
								FIXED	MOVED
CT0815AUAF	8 × 1,5	11,6	23,6	30 × 0,25	225	12	13,30	12	10
CT1215AUAF	12 × 1,5	14,4	26,4		315	18		11	9,5
CT1615AUAF	16 × 1,5	16	28		415	24		10	8,5
CT1815AUAF	18 × 1,5	17	29		470	27		9,5	8
CT2015AUAF	20 × 1,5	18	30		525	30		9	7,5
CT2415AUAF	24 × 1,5	21	33		620	36		8,5	7

BREAKING NEWS
2023

VERTICAL
BUSBAR



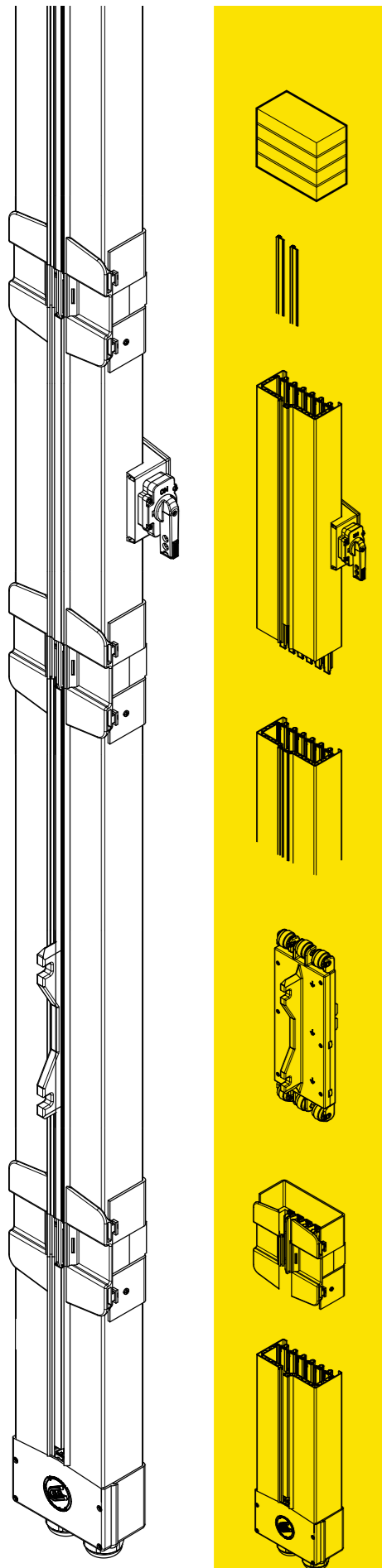
TRV VERTICAL BUSBAR

Designed for lifting tasks in Material Handling Systems and Outdoor and Construction Site Lift Technology

Ask more to giovenzana@giovenzana.com

**VERTICAL BUSBAR SYSTEM
WITH 6 PRE-MOUNTED CONDUCTORS**

Energy transmission system fitted with 6 conductors with joints.
Operating current: 50, 100 or 160 A, depending on the busbar.
Vertical layout suitable for construction site lifts.



TRV06P006

End cap: Close and protect the end of the busbar.

TR6012

Gasket: In high-performance elastic PVC.

TRVS06P160

Switch disconnect: The switch allows to interrupt current within a TRV line to allow the line to be extended in length without having to intervene on the main switch.
On request.

TRV06P...

Insulated bar 50A / 100A / 150A: Rigid PVC housing with 6 enclosed copper conductors.
At each extremities, the copper strip has connector for electrical and mechanical connection with next bar.

TRV06P011

Trolley current collector: To provide power to construction hoist. Carbon brushes with springs guarantee uniform electrical contact.

TRV06P001

Connection box: Composed by a joint box, baseplate with connectors and two joint covers. Connectors are mounted on a baseplate. The phases on busbar are engaged to it guarantee both mechanical and electrical continuity.

TRV06P003

Feeding box: Composed by insulated bar, it provides connection between system and cable inside the relevant box.

**SMART SOLUTION AVOID THE CONVENTIONAL
CABLE DISTRIBUTION SYSTEM!**

Optimization of space.

The compact design of the cable-free bar allows optimization of installation and use space.

It is the safety response to a problem that has never been solved.

It can solve the problem of conductor interruption in the power cable currently used to power construction site elevators. There is no problem of damage or wear on the cable.

Provides easier and faster installation.

The interlocking modularity of the individual components means that no tools are needed for installation and less construction work means less expensive installation.

Flexibility of use.

Compatible with any type of structure and any configuration.

It is a unique solution, an excellent alternative to cable replacement.

