



GIOVENZANA

INTERNATIONAL B.V.

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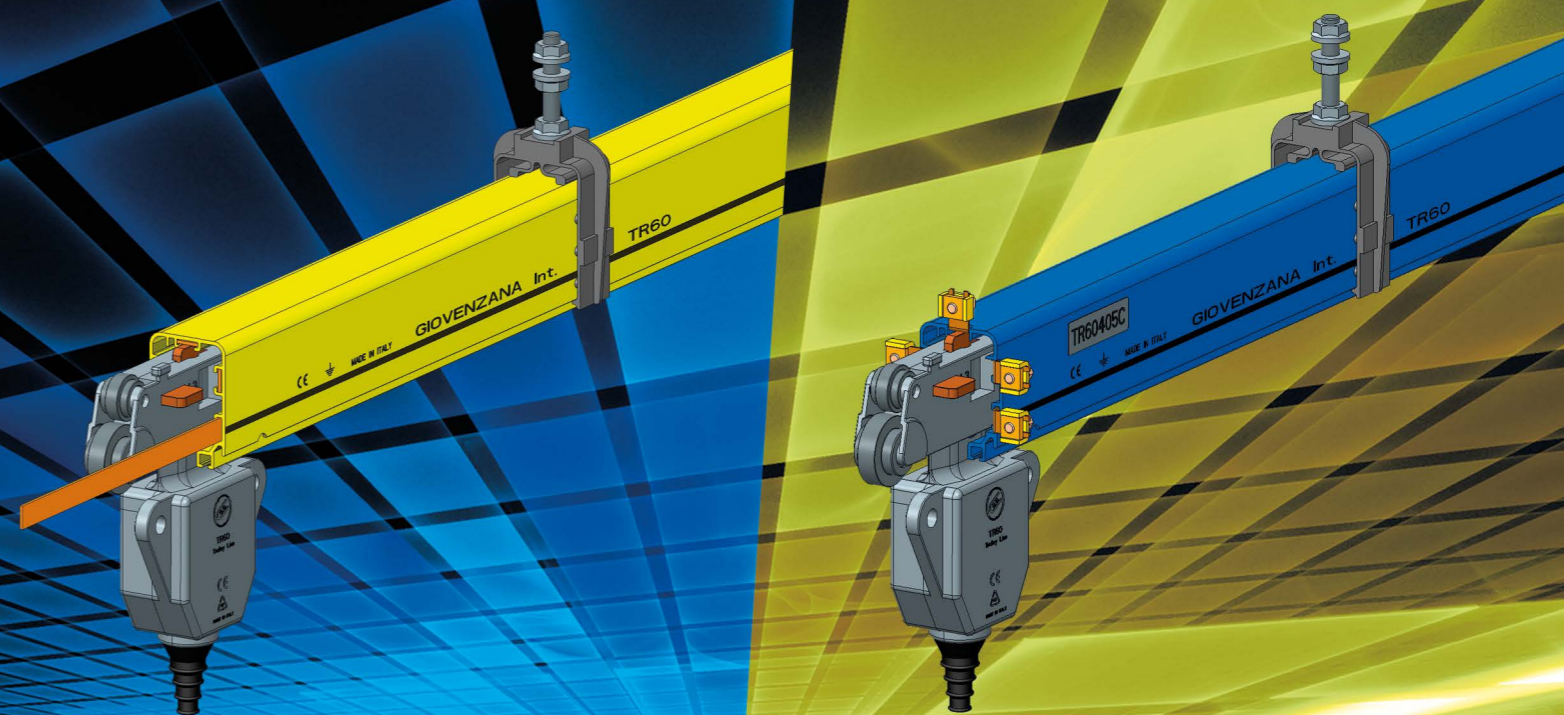
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www.giovenzana.com



BUSBAR TROLLEY LINE

TR60 · TR85H5P · TR85H7P

QUALITY AS A LIFE STYLE

www.giovenzana.com



GENERAL INDEX

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LINE TYPE / AMPERAGE COVERAGE

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11	TR85H5P											
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14	BLUE LINE Pre-Mounted Conductors Max 5 Poles	 4 Poles	 5 Poles									
17	TR85H7P											
18	YELLOW LINE Continuous Conductors Max 7 Poles	 Max 7 Conductors slot										Only 4 poles with parallel connections
20	BLUE LINE Pre-Mounted Conductors Max 7 Poles	 7 Poles										Only 4 poles with parallel connections

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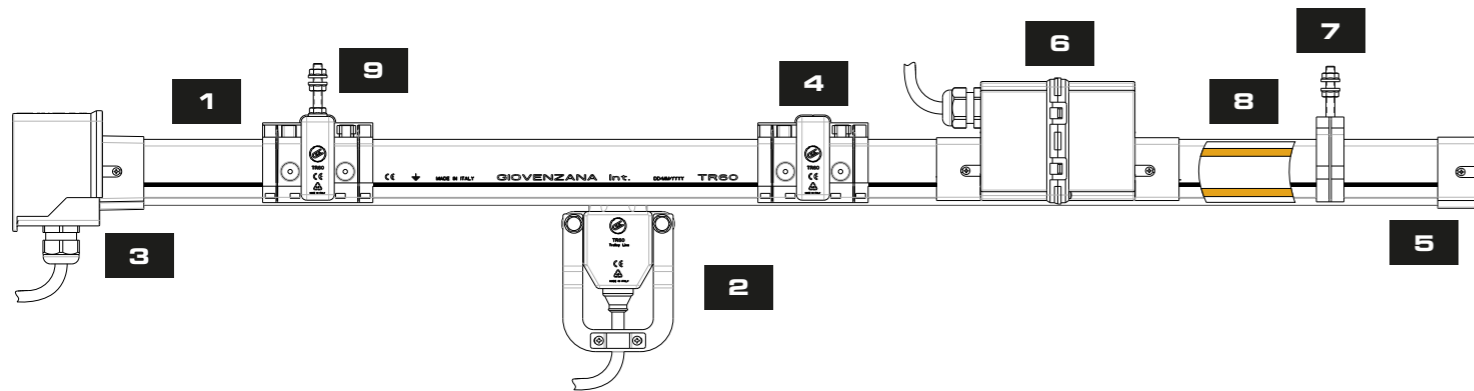
33 NOTES

PRODUCT DESCRIPTION

BUSBAR TROLLEY LINE

The “trolley system” series conductors rails is modern and safe system for energy transmission for various types of equipment, such as, cranes, bridge cranes, conveyour belts, chain conveyors, etc... The “trolley system” complies with the relevant international standards ensuring safety of the operator, easy installation and reliability. The new “H” honeycomb profile of the TR85H line guarantees extra endurance and lightness.

TYPICAL LAYOUT

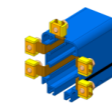


1	BUSBAR	PVC Housing
2	TROLLEY CURRENT COLLECTOR	Transmits the energy from the conductor to the machine
3	HEAD FEED BOX	Connects power supply to the conductors
4	JOINT BOX	Links two busbars
5	END CAP	Closes and protects the busbar end
6	IN-LINE FEED BOX	Connects power supply from centre to avoid the 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 LINE UTILIZATION

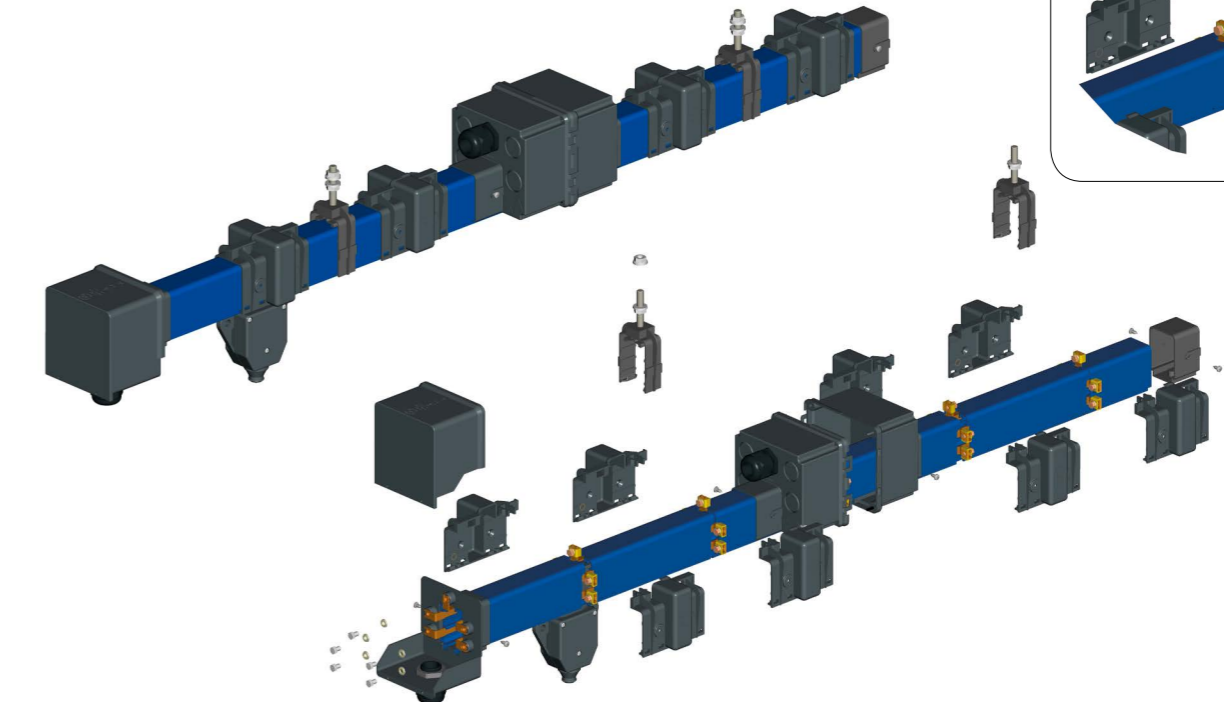
CRANE TECHNOLOGY	PRODUCTION AUTOMATION	BMU	PORT TECHNOLOGY	PEOPLE MOVER SYSTEM	STORAGE
Cranes and Hoists Recycling plants Galvanized plants	Electric systems Automated conveyors	Building Maintenance Units Airport and terminal stations Skyscrapers Cleanroom technology	RTG cranes STG cranes	People movers Vertical elevators Inclined elevators	High-bay warehouses Autometes storages

BUSBAR TROLLEY LINE'S VERSIONS

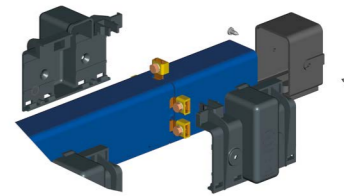


BLUE LINE > PRE-MOUNTED CONDUCTORS

The conductors are already inserted in the plastic casing

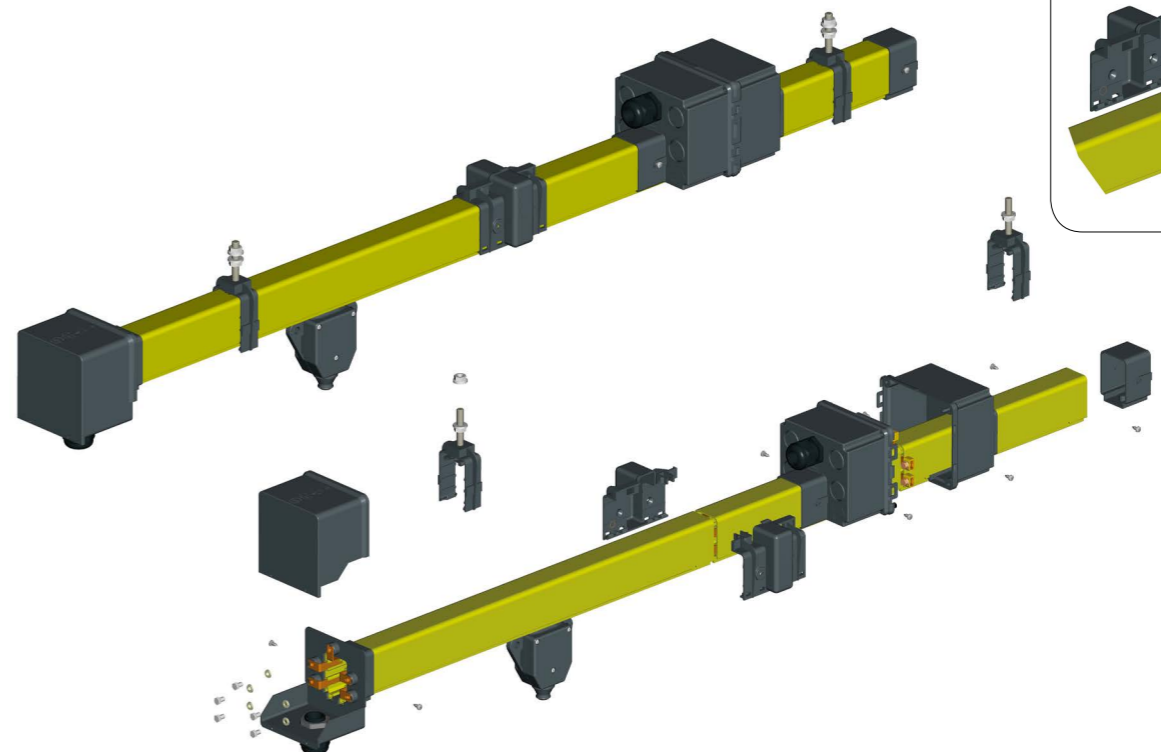


With conductor joint

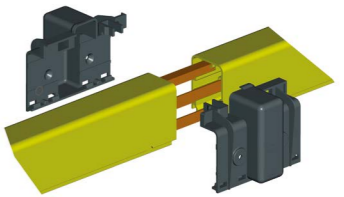


YELLOW LINE > CONTINUOUS CONDUCTORS

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



Without conductor joint





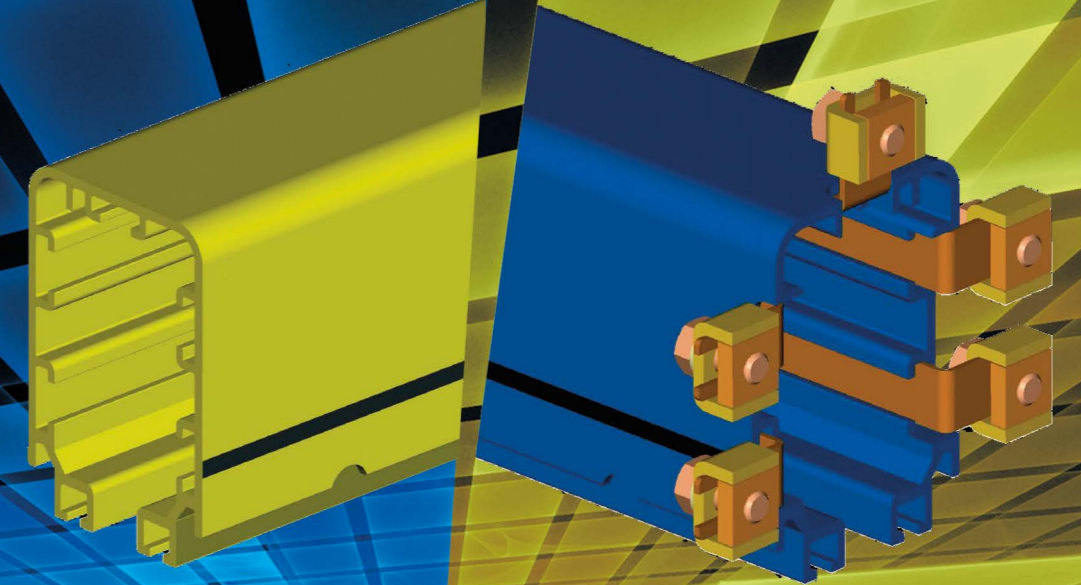
VERTICAL LINE

Special application on request with customized parts.
White RAL 1013 busbar customized for vertical installation.



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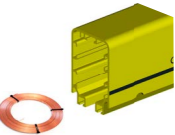
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TR60

YELLOW LINE
Continuous Conductors

BLUE LINE
Pre-Mounted Conductors



BUSBAR SYSTEM | TR60 | YELLOW LINE

BUSBAR SYSTEM | TR60 | YELLOW LINE

40A | 60A

			YELLOW LINE - Continuous Conductors	
ITEM	PRODUCT	SPECIFICATION	40A	60A
BUSBAR 4 meters (*)			TR6000	
CONDUCTOR SIZE		ETP Copper	CS40 10x1 - 10mm ²	CS60 10x1,5 - 15mm ²
JOINT BOX		Plastic	TR6001	
HANGER CLAMP		Plastic	TR6002	
		Steel	TR6020	
END CAP			TR6006	
FEED BOX			TR6003	
IN-LINE FEED		Clamps or screws + nuts not included	TR6008	
TROLLEY CURRENT COLLECTOR		35A - 4 Conductors	TR6004	
		35A - 5 Conductors	TR6005	

			YELLOW LINE - Continuous Conductors	
ITEM	PRODUCT	SPECIFICATION	40A	60A
TOWING ARM BRACKET			TR6007	
TOWING ARM			TR8510	
FIXED POINT			TR6014	
DOUBLE TROLLEY SUPPORT			TR6013	
FUNNEL			TR6034	
SPRING LOADED TOWING ARM		For transfer guide	Coming soon	
GASKET IP44			TR6012	
CONDUCTOR INSERTION TROLLEY			TR6011	
DE-COIL UNIT			TR8513	

* Curved busbar available on request ONLY 4 conductors.

BUSBAR SYSTEM | TR60 | BLUE LINE

BUSBAR SYSTEM | TR60 | BLUE LINE

40A | 60A

ITEM	PRODUCT	SPECIFICATION	BLUE LINE - Pre-Mounted Conductors	
			40A	60A
BUSBAR 4 meters (*)		4 Conductors	TR60404C	TR60604C
		5 Conductors	TR60405C	TR60605C
		Conductor type	Included in busbar code 10x1 - 10mm ²	Included in busbar code 10x1,5 - 15mm ²
JOINT BOX			TR6001	
HANGER CLAMP		Plastic		TR6002
		Steel		TR6020
END CAP			TR6006	
FEED BOX		4 Conductors	TR6003A4	
		5 Conductors	TR6003A5	
IN-LINE FEED		4 Conductors	TR6008A4	
		5 Conductors	TR6008A5	
TROLLEY CURRENT COLLECTOR		35A - 4 Conductors	TR6004	
		35A - 5 Conductors	TR6005	

ITEM	PRODUCT	SPECIFICATION	BLUE LINE - Pre-Mounted Conductors	
			40A	60A
TOWING ARM BRACKET				TR6007
TOWING ARM				TR8510
FIXED POINT				TR6014
DOUBLE TROLLEY SUPPORT				TR6013
TRANSFER GUIDE		LEFT - 4 Conductors		TR6034A4
		LEFT - 5 Conductors		TR6034A5
		RIGHT - 4 Conductors		TR6035A4
		RIGHT - 5 Conductors		TR6035A5
SPRING LOADED TOWING ARM		For transfer guide		Coming soon
GASKET IP44				TR6012

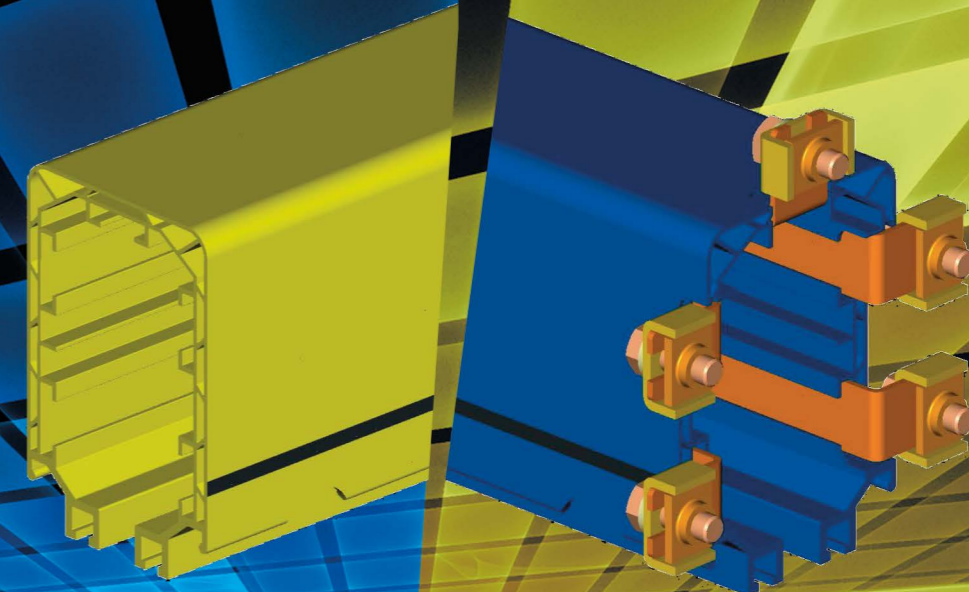
* Curved busbar available on request ONLY 4 conductors.



OBSERVATORY DOME



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TR85H5P

YELLOW LINE
Continuous Conductors

BLUE LINE
Pre-Mounted Conductors

BUSBAR SYSTEM | TR85H5P | YELLOW LINE
BUSBAR SYSTEM | TR85H5P | YELLOW LINE

 40A | 70A
 100A | 140A

			YELLOW LINE - Continuous Conductors			
ITEM	PRODUCT	SPECIFICATION	40A	70A	100A	140A
BUSBAR 4 meters (*)			TR85H5P			
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		Plastic	TR8501			
		Steel	TR8524			
HANGER CLAMP		Plastic	TR8502			
		Steel	TR8525			
END CAP			TR8506			
FEED BOX			TR8503			
IN-LINE FEED		Clamps or screws + nuts not included	TR8547			
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			

			YELLOW LINE - Continuous Conductors			
ITEM	PRODUCT	SPECIFICATION	40A	70A	100A	140A
TOWING ARM BRACKET			TR6007			
TOWING ARM			TR8510			
FIXED POINT			TR8527.1			
DOUBLE TROLLEY SUPPORT			TR6013			
EXPANSION JOINT			TR85H5P07			
INSPECTION JOINT			TR85H5P28			
SECTION JOINT			TR85H5P45			
FUNNELL			TR85H5P34			
SPRING LOADED TOWING ARM		For transfer guide	Coming soon			
GASKET IP44			TR8505			
CONDUCTOR INSERTION TROLLEY			TR8514			
DE-COIL UNIT			TR8513			

BUSBAR SYSTEM | TR85H5P | BLUE LINE

BUSBAR SYSTEM | TR85H5P | BLUE LINE

40A | 70A
100A | 140A

ITEM	PRODUCT	SPECIFICATION	BLUE LINE - Pre-Mounted Conductors			
			40A	70A	100A	140A
BUSBAR 4 meters (*)		4 Conductors	TR85H5P404C	TR85H5P704C	TR85H5P1004C	TR85H5P1404C
		5 Conductors	TR85H5P405C	TR85H5P705C	TR85H5P1005C	TR85H5P1405C
		Conductor Type	Included in Busbar code			
			15,5x0,6 9,3mm ²	15,5x1 15,5mm ²	15,5x1,5 23,25mm ²	15,5x2 31mm ²
JOINT BOX			TR8535			
HANGER CLAMP		Plastic	TR8502			
		Steel	TR8525			
END CAP			TR8506			
FEED BOX		4 Conductors	TR85H5P03A4			
		5 Conductors	TR85H5P03A5			
IN-LINE FEED			TR8547			
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	BLUE LINE - Pre-Mounted Conductors			
			40A	70A	100A	140A
TOWING ARM BRACKET			TR6007			
TOWING ARM			TR8510			
FIXED POINT			TR8527.1			
DOUBLE TROLLEY SUPPORT			TR6013			
SECTION JOINT			TR85H5P45B			
TRANSFER GUIDE		LEFT - 4 Conductors	TR85H5P34A4			
		LEFT - 5 Conductors	TR85H5P34A5			
		RIGHT - 4 Conductors	TR85H5P35A4			
		RIGHT - 5 Conductors	TR85H5P35A5			
SPRING LOADED TOWING ARM		For transfer guide	Coming soon			
GASKET IP44			TR8505			

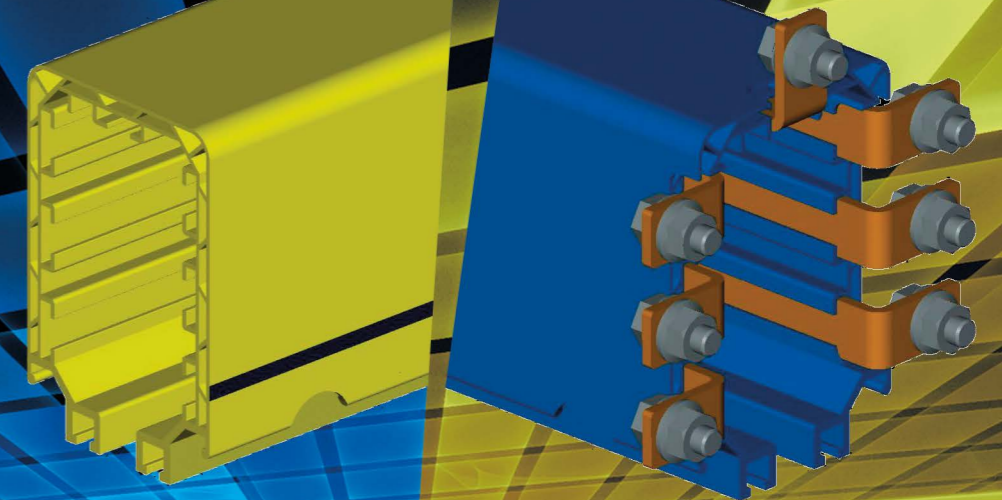
CRANE



ROUND HOIST



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TR85H7P

YELLOW LINE
Continuous Conductors

BLUE LINE
Pre-Mounted Conductors

BUSBAR SYSTEM | TR85H7P | YELLOW LINE
BUSBAR SYSTEM | TR85H7P | YELLOW LINE

 50A | 100A | 160A
 200A | 320A

ITEM	PRODUCT	SPECIFICATION	YELLOW LINE - Continuous Conductors		
			50A	100A 200A*	160A 320A*
BUSBAR 4 meters			TR85H7P		
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		Plastic	TR8501		
		Steel	TR8524		
HANGER CLAMP		Plastic	TR8502		
		Steel	TR8525		
END CAP			TR8506		
FEED BOX		Only for 7 poles till 100A	TR85H7P005		
IN-LINE FEED		Clamps or screws + nuts not included	TR85H7P03		
TRANSITION BOX		For parallel connections 200A or 320A	-	Coming soon	
FIXED POINT			TR8527.1		
TROLLEY CURRENT COLLECTOR FOR CURVES		35A - Single	TR85H7P001		
		70A - Double	TR85H7P002		
		105A - Triple	TR85H7P010		

ITEM	PRODUCT	SPECIFICATION	YELLOW LINE - Continuous Conductors		
			50A	100A 200A*	160A 320A*
TOWING ARM		Single	TR8557		
		Double	TR8558		
		Triple	TR8559		
4 POLES TROLLEY CONNECTION CLAMP		Single (3ph 70A - PE 35A)	Coming soon		
		Double - need 2x (3ph 140A - PE 70A)	Coming soon		
		Triple - need 3x (3ph 210A - PE 105A)	Coming soon		
EXPANSION JOINT			TR85H7P07		
INSPECTION JOINT			TR85H7P28		
SECTION JOINT			TR85H7P45		
FUNNELL			Coming soon		
SPRING LOADED TOWING ARM		For transfer guide	Coming soon		
GASKET IP44			TR8505		
CONDUCTOR INSERTION TROLLEY			TR85H7P14		
DE-COIL UNIT			TR8513		

* The 200A and the 320A are obtained by parallel configuration ONLY for 4 poles.

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BUSBAR SYSTEM | TR85H7P | BLUE LINE

BUSBAR SYSTEM | TR85H7P | BLUE LINE

50A | 100A | 160A
200A | 320A

ITEM	PRODUCT	SPECIFICATION	BLUE LINE - Pre-Mounted Conductors				
			50A	100A	160A	200A*	320A*
BUSBAR 4 meters		4 Conductors *	-	-	-	TR85H7P1007C	TR85H7P1607C
		7 Conductors *	TR85H7P507C	TR85H7P1007C	TR85H7P1607C	-	-
		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						TR85H7P007	
HANGER CLAMP		Plastic				TR8502	
		Steel				TR8525	
END CAP						TR8506	
FEED BOX		7 Conductors	TR85H7P005A7				
IN-LINE FEED		7 Conductors				TR85H7P03A7	
TRANSITION BOX		For parallel connections 200A or 320A					Coming soon
FIXED POINT						TR8527.1	
TROLLEY CURRENT COLLECTOR FOR CURVES		35A - Single				TR85H7P001	
		70A - Double				TR85H7P002	
		105A - Triple				TR85H7P010	

ITEM	PRODUCT	SPECIFICATION	BLUE LINE - Pre-Mounted Conductors				
			50A	100A	160A	200A*	320A*
TOWING ARM		Single					TR8557
		Double					TR8558
		Triple					TR8559
4 POLES TROLLEY CONNECTION CLAMP		Single (3ph 70A - PE 35A)					Coming soon
		Double - need 2x (3ph 140A - PE 70A)					Coming soon
		Triple - need 3x (3ph 210A - PE 105A)					Coming soon
SECTION JOINT						TR85H7P45B	
TRANSFER GUIDE		LEFT - 7 Conductors					Coming soon
		RIGHT - 7 Conductors					Coming soon
SPRING LOADED TOWING ARM		For transfer guide					Coming soon
GASKET IP44							TR8505

* The 200A and the 320A are obtained by parallel configuration ONLY for 4 poles.

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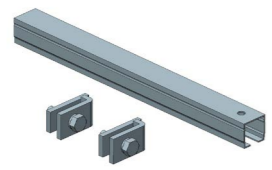
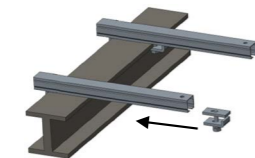
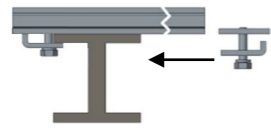
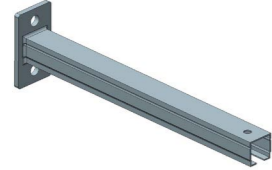
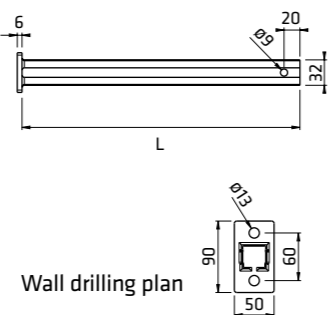
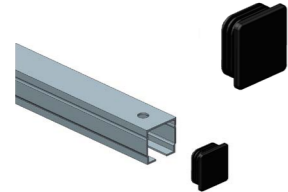
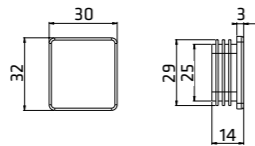
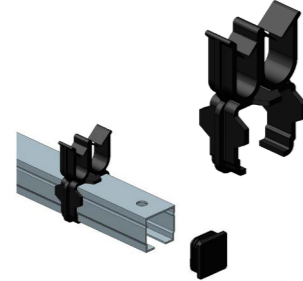
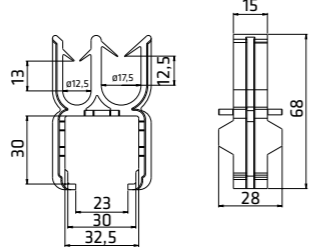


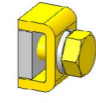
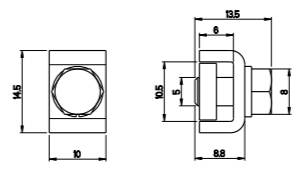
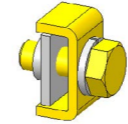
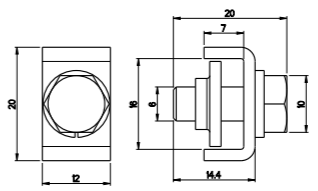
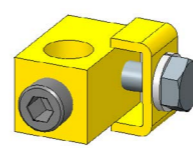
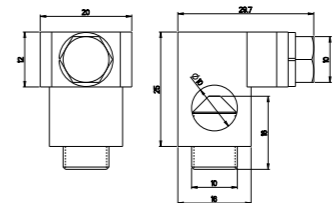



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**ACCESSORIES
SPARE PARTS**

BUSBAR SYSTEM | ACCESSORIES

BUSBAR SYSTEM | 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
		L=700mm	TR8552
SUPPORT BRACKET (Wall Fixing)		L=350mm	TR8555
	<p>Wall drilling plan</p> 	L=500mm	TR8556
END CAP			30607015
CABLE CLIP			30607016

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 M6x12	11606075
		Flanged nut M6	11612013
TR85H5P 70A TROLLEY BRUSH KIT REPLACEMENT	  <p>1x Brush 2x Springs</p>	Only for: TR8518 TR8519 TR8532	TR8520



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- 1. LINE CONSTRUCTION**
- 2. SURVEY**
- 3. TECHNICAL DATA**

BUSBAR SYSTEM | 1. LINE CONSTRUCTION

BUSBAR SYSTEM | 1. LINE CONSTRUCTION

LINE CONSTRUCTION

To decide the size of 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 feed
- ➔ Voltage and admissible voltage drop in continuous and in starting service
- ➔ Type of current
- ➔ Devices cycle operations (load factor)

CALCULATION OF THE VOLTAGE DROP

Voltage drop should not exceed 5% of rated voltage in normal operating service.

Three phase alternate current:

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

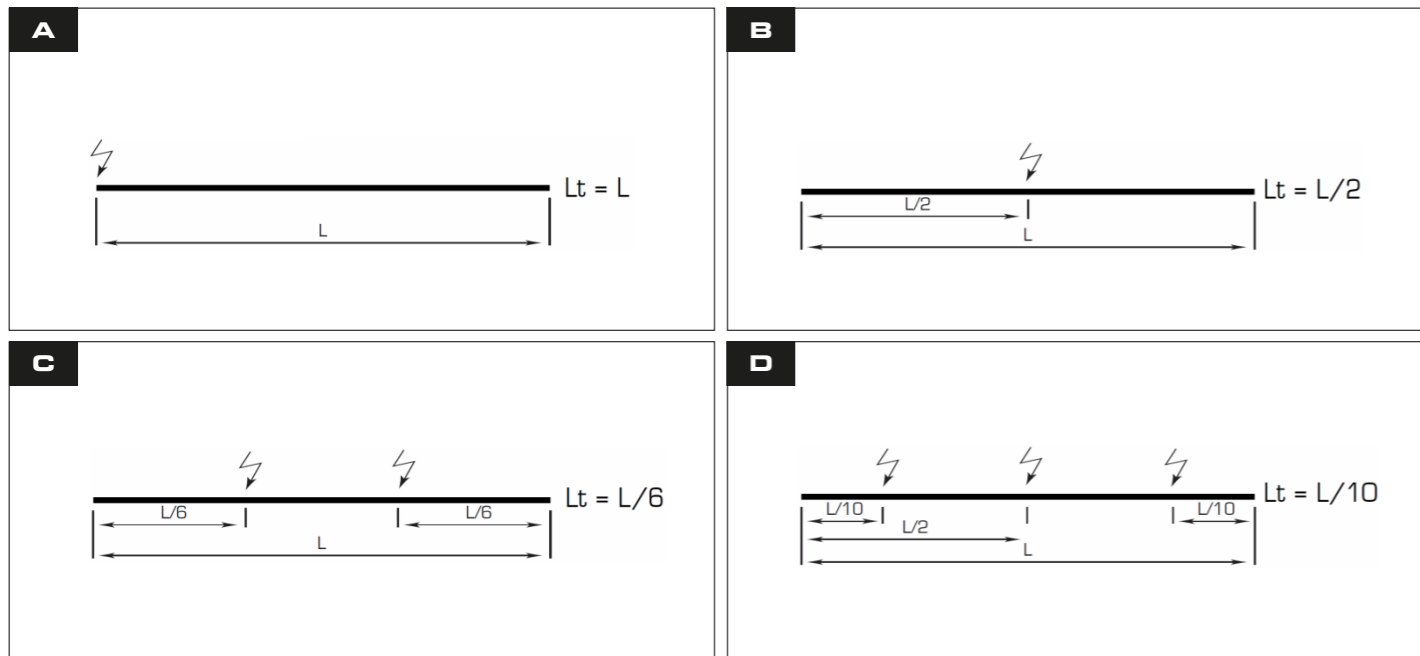
$$\Delta u\% = \frac{\Delta u \times 100}{U}$$

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

A proper disposal of power feed points minimize the voltage reduction.
 If "L" is the lenght of the line, "Lt" is the track maximum length to consider the 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 the devices which work simultaneously to calculate the corresponding current:

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

The current can be determined from the devices power [W] that for a three phase system is:

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

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 the devices started simultaneously and the device already in service, then calculate the corresponding current. If the starting current is unknown, proceed with the following approximation:

For a single user

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

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 | 2. SURVEY

BUSBAR SYSTEM | 2. 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 mt
 1.5 TRACK LAYOUT mt straight - mt 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 mt from beginning - At mt from each end
 3.2 CENTRE DISTANCE HANGERS mt

4 MACHINE PARAMETERS

3.1 TRAVEL SPEED mt/min
 3.2 BUILD DIMENSIONS Please list if there are any build dimensions to take in consideration (include drawing)

5 ENVIRONMENTAL DATA

1.1 INDOOR OR OUTDOOR Indoor outdoor
 1.2 MIN & MAX AMBIENT TEMP. °C min °C max
 1.3 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
 6.3 OTHER

1.5 LAYOUT DRAWING



