

4/25 BUSBAR SYSTEM

6/7 Line construction Busbar System

8 Technical Data - Busbar & Multipole System

LINE TYPE / AMPERAGE COVERAGE

40A	50A	60A	70A	100A	140A	160A	200A	320A
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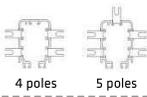
TR60

10/11 Continuous conductors
Max 5 Poles



40A	60A
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12/13 Pre-mounted conductors
Max 5 Poles



40A	60A
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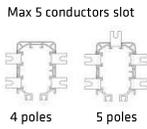
TR85H5P

14/15 Continuous conductors
Max 5 Poles



40A	70A	100A	140A
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16/17 Pre-mounted conductors
Max 5 Poles



40A	70A	100A	140A
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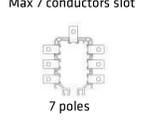
TR85H7P

18/19 Continuous conductors
Max 7 Poles



50A	100A	160A	200A*	320A*
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20/21 Pre-mounted conductors
Max 7 Poles



50A	100A	160A	200A*	320A*
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*Only 4 poles with parallel connections

22/23 Accessories Busbar System

24/25 Survey Busbar System

26/29 MULTIPOLE SYSTEM

LINE TYPE / AMPERAGE COVERAGE

40A	50A	60A	70A	100A	140A	160A	200A	320A
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MP04P

28/29 Pre-Mounted Conductors
4 Poles



60A	100A	140A
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30/41 FESTOON SYSTEM

32 Line construction Festoon System

LINE 30

34/35 Standard



LINE 41

36/37 Standard



36/37 Stainless Steel



LINE WIRE-ROP

38 Standard



LINE I-BEAM

39 Light Series



40 Flat cables - Festoon System

41 Round cables with dual strain relief cords - Festoon System

BUSBAR SYSTEM

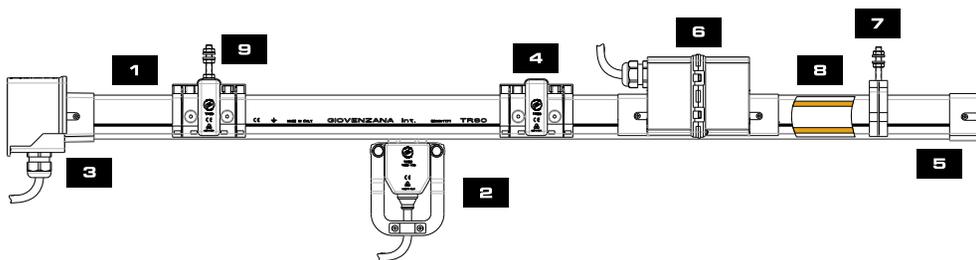
BUSBAR SYSTEM

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 UTILIZATIONS



CRANE TECHNOLOGY

Cranes and Hoists
Recycling plants
Galvanized plants



PRODUCTION AUTOMATION

Electric systems
Automated conveyors



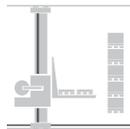
BMU

Building Maintenance Units
Airport and terminal stations
Skyscrapers
Cleanroom technology



PEOPLE MOVER SYSTEM

People movers
Vertical elevators
Inclined elevators



STORAGE

High-bay warehouses
Automated storage



AGRICULTURE



TEXTILE



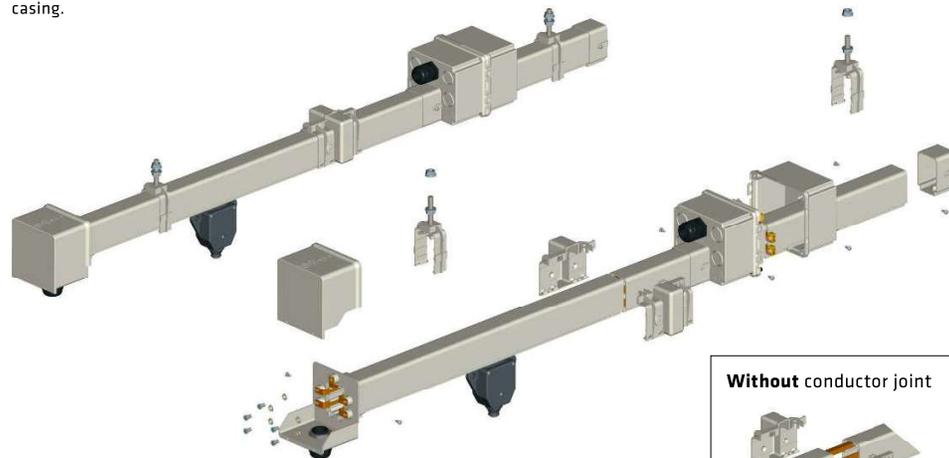
AIRCRAFT HANGAR DOORS

BUSBAR SYSTEM

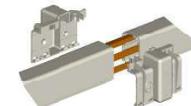
AVAILABLE VERSIONS

A. CONTINUOUS CONDUCTORS

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

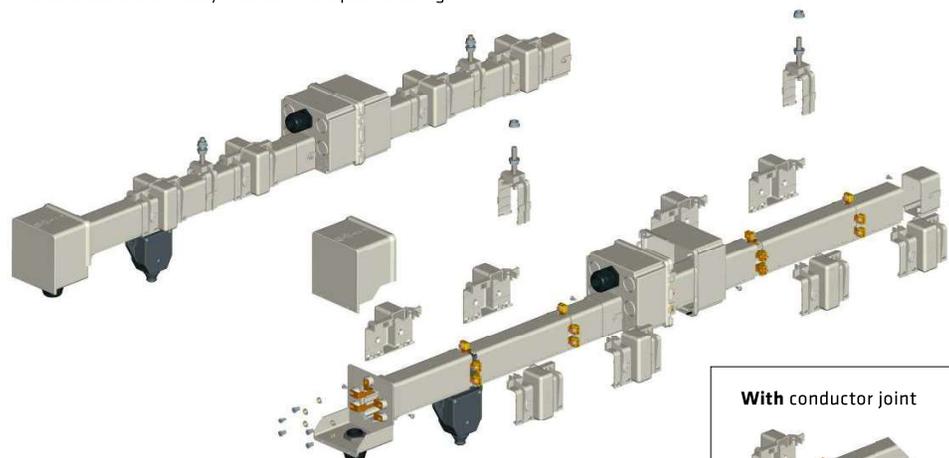


Without conductor joint

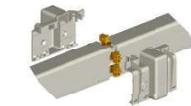


B. PRE-MOUNTED CONDUCTORS

The conductors are already inserted in the plastic casing.



With conductor joint



LINE CONSTRUCTION

To decide the size of trolleys it is necessary to consider:

- ➊ Maximum current in service
- ➋ Devices (cage motors, slip rings motors, resistors, electronic starters)
- ➌ Starting current of the devices
- ➍ Maximum ambient temperature
- ➎ The distance between device to the nearest power feed
- ➏ Voltage and admissible voltage drop in continuous and in starting service
- ➐ Type of current
- ➑ 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:

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

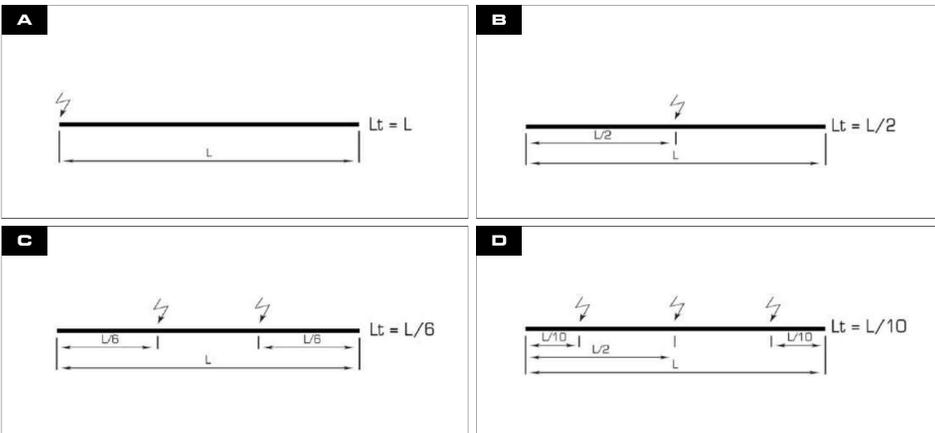
$$\Delta u\% = \frac{\Delta u \times 100}{U}$$

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:

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

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

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

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
TR60
 Continuous Conductors

ITEM	PRODUCT	SPECIFICATION	40A	60A
BUSBAR		- Standard length: 4 meters*. - Material: PVC.	TR6000W	
CONDUCTOR SIZE		ETP Copper	C540 10x1 - 10mm ²	C560 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 Coming soon	
GASKET IP44			TR6012	
CONDUCTOR INSERTION TROLLEY		- For insertion of copper conductor in the line.	TR6011	
DE-COIL UNIT			TR8513	

BUSBAR SYSTEM | TR85H5P | Continuous Conductors
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 in order 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.	TR85271			
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 Coming soon			
GASKET IP44			TR8505			
CONDUCTOR INSERTION TROLLEY		- For insertion of copper conductor in the line.	TR8514			
DE-COIL UNIT			TR8513			