



GIOVENZANA

INTERNATIONAL B.V.



HANDLING SYSTEM

Edition 2014 Rev. 03_2014

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GIOVENZANA
INTERNATIONAL B.V.

HANDLING SYSTEM

Company profile



THE PHILOSOPHY

Giovenzana's philosophy is based upon the basic principles of business management, dynamism and continuous research into the operator's needs in the field of man-machine interaction. These principles, thanks to the experience and professionalism of its staff, guarantees **Giovenzana's** development and growth.

THE HISTORY

With over 60 years experience in this field, coupled with excellent managerial skills, **Giovenzana** has maintained growth relying upon:

- Market research
- Product placement
- Manufacturing technology, and above all, team work



THE PRODUCTS

Giovenzana, leader in the industrial technology field, is the first choice for:

- Handling equipment
- Automation
- Lifting equipment
- Maintenance
- Command and control of moving parts

Development, design and production are combined to reach a common goal and cover most industrial applications.



QUALITY AS A WAY OF LIFE

The commercial success of a product does not happen by chance, but is the end result of the combined efforts of all human resources operating within an organizational structure that is devoted to quality.

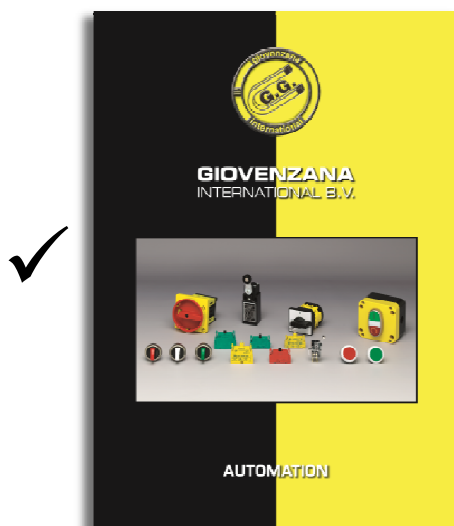
Giovenzana is a **UNI EN ISO 9001:2008** certified company. Today, **Giovenzana's** goal is not just "to manufacture a quality product", but also to ensure the protection of our cycle processes. **Giovenzana's** company is certified **UNI EN ISO 14001:2004**



THE PRODUCTION

The solutions offered by **Giovenzana** result from the company's extensive knowledge of the requirements of industrial electrical accessories, and are in line with all relevant international standards.

The solutions fall into three main sectors:



AUTOMATION

Automation includes Phoenix cam switches from 12 to 630 A and Regolus switch disconnectors from 25 to 160 A; Pegasus control auxiliaries with screw or spring cage terminal contacts blocks; limit switches with safety switches and either die cast or moulded casing; foot switches and micro switches.



LIFT

Throughout the years, continuous technological research and development has made Giovenzana the undisputed leader in its field.

The range includes: pit bottom push button stations, recall drive control units and inspection boxes.



HANDLING SYSTEM

Lifting equipment comprises of single and double row pendant stations up to 14 gang for control and direct switching, position and rotary gear limit switches, slip rings, warning horns, busbar conductor rails and festoon system.



Lifting equipment:

Pendant stations for small hoist application, in single / double row or direct power circuits switchings and tail lift controls .

Mounting example:

10

Page 11



Limit switches:

Rotary gear limit switches and control position limit switches

Mounting example:

1 3

Page 26



Slip ring:

20 A Slip ring from 3 up to 15 rings with IP51 protection case

Mounting example:

11

Page 43



Warning horn:

Single tone, Ø 75mm or 100 mm, available in AC 24/48/110/230 V and in DC 24/48 V

Mounting example:

4 5 6

Page 43



Energy and data transmission:

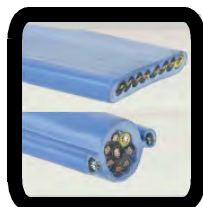
The busbar system TR60 - TR85 series conductor rail range available in pre-mounted conductors (blue line) and continuous conductors (yellow line).

The festoon system includes c-rail cable trolley line 30, 41; Wire rope cable trolleys; I-beam light series and heavy series cable trolley.

Mounting example:

2 9

Page 44



Conductors:

PVC flat cables and round cables with dual strain relief steel rope

Mounting example:

7 8

Page 80



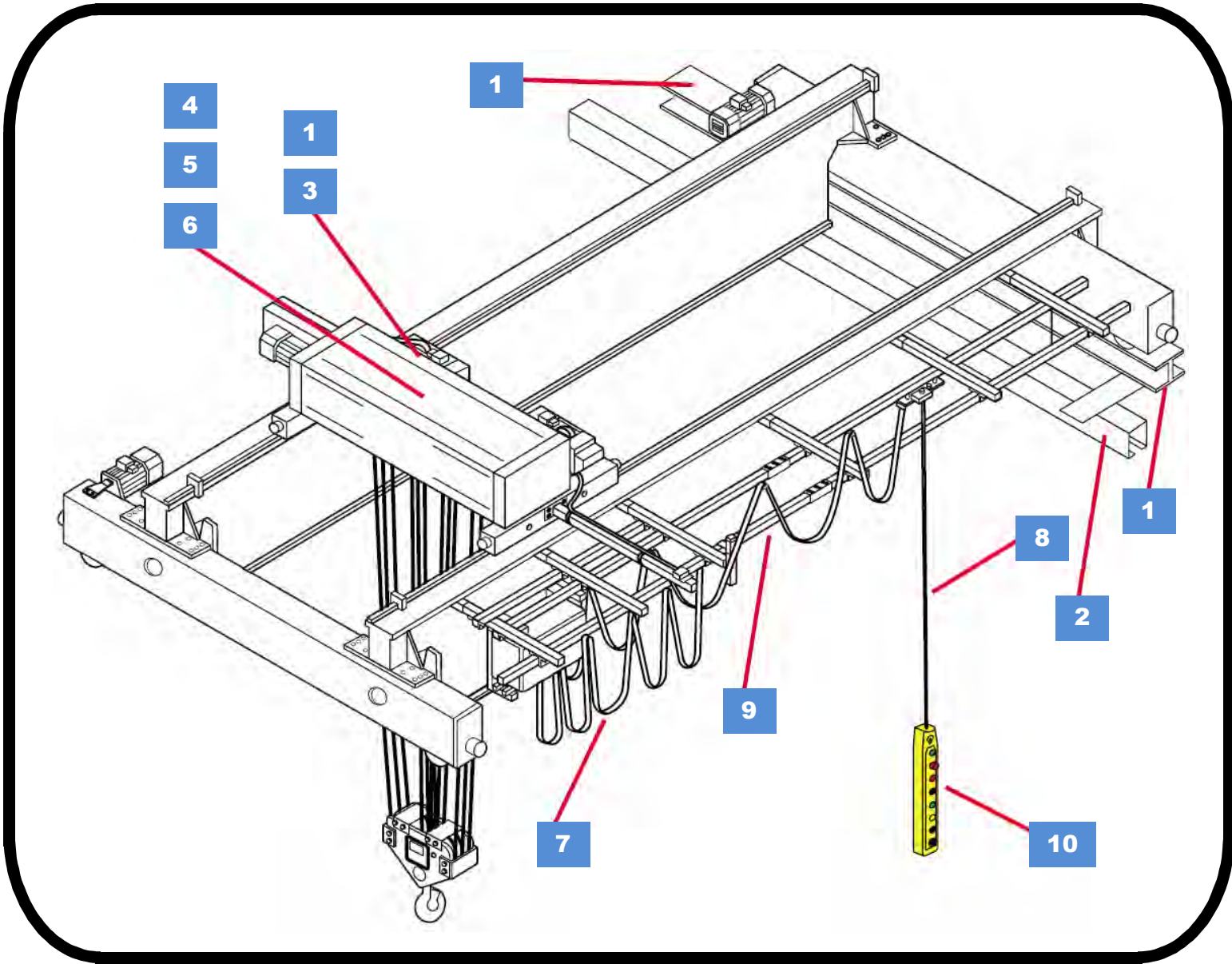
Complementary products:

Switch disconnectors

Mounting example:

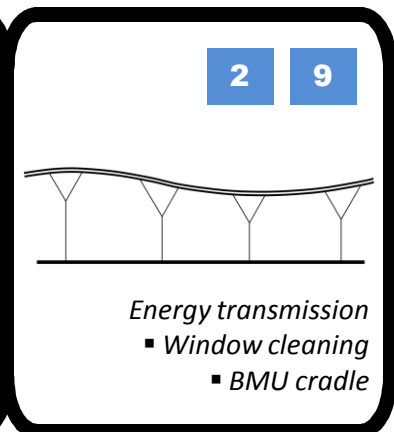
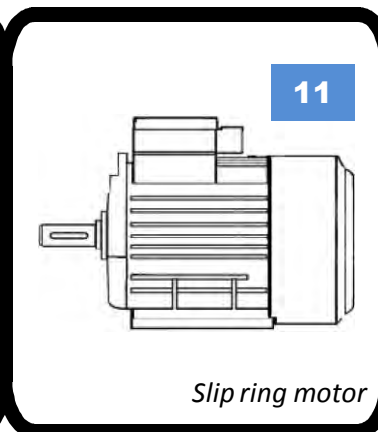
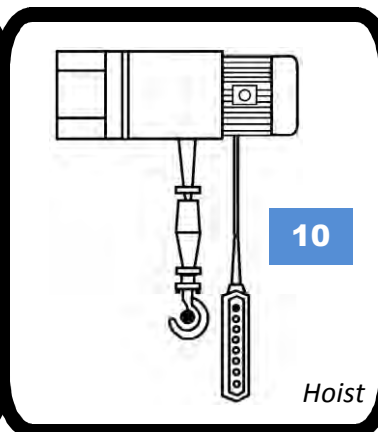
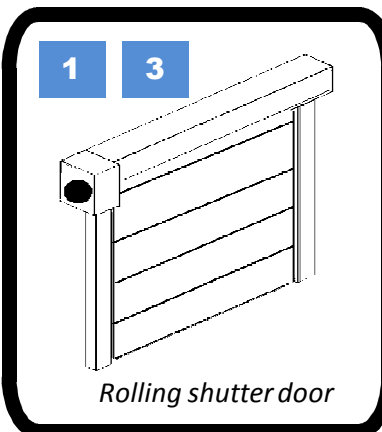
4 5 6

Page 82






Picture shows a typical overhead crane assembly

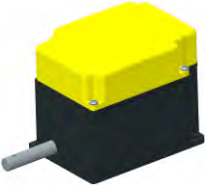


Other product applications:

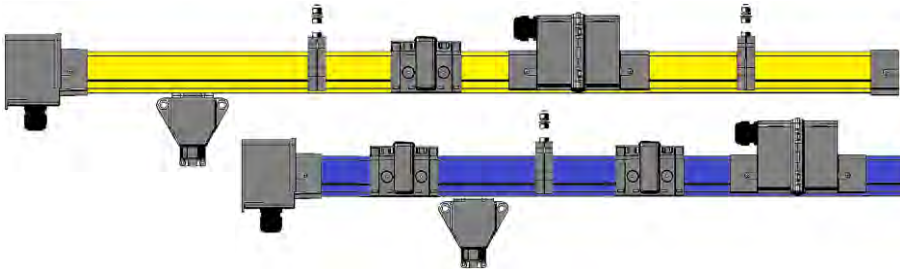
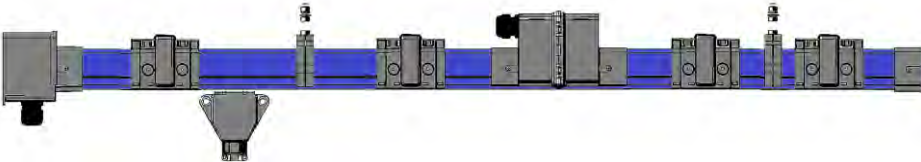


Product Overview











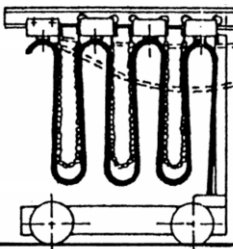
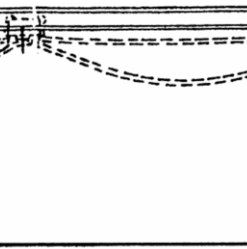
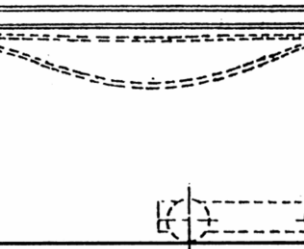

Line	P02	P03	HP03
Product type	pendant station	pendant station	pendant station
Picture			
Page	12	12	12-25 (safety NC contact)
Characteristics	shock proof - heat resistant two direction interlocked IP65 double insulation indelible laser engraved symbols	shock proof - heat resistant two direction interlocked IP65 double insulation indelible laser engraved symbols	shock proof - heat resistant two direction interlocked IP65 double insulation indelible laser engraved symbols ergonomic design

Line	FGR1	FGR2	FGR3
Product type	rotary gear limit switch	rotary gear limit switch	rotary gear limit switch
Picture			
Page	28	30	32
Characteristics	self extinguishing housing/cover ratio 012-033-050-075-100-150-200-400 IP65 flanged fixing /rear shaft version potentiometer available	aluminium housing/self ext. cover ratio 012-033-050-100-200 IP65 flanged fixing /rear shaft version	self extinguishing housing/cover ratio from 1:8 to 1:460 IP66 rear shaft version available encoder or potentiometer available

Line	TR60	TR85
Product type	busbar energy transmission	busbar energy transmission
Picture		
Page	52	54
Characteristics	height 60 mm – 40, 60 A pre-mounted conductors (blue line) conductors to be pulled (yellow line) easy and fast installation complies with the relevant international standards	height 85 mm – 40, 70, 100, 140, 200 A pre-mounted conductors (blue line) conductors to pulled (yellow line) easy and fast installation complies with the relevant international standards



Product Overview

DC30	PL	PLB	TLP
pendant station	pendant station	pendant station	fixed/pendant station
			
12	14	15	16
shock proof - heat resistant two direction interlocked IP65 double insulation indelible laser engraved symbols high power contact block 25 A	shock proof - heat resistant two direction interlocked IP65 double insulation indelible laser engraved symbols from 5 to 12 holes	shock proof - heat resistant two direction interlocked IP65 double insulation indelible laser engraved symbols from 4 to 14 holes	shock proof - heat resistant two direction interlocked IP65 double insulation indelible laser engraved symbols compact and modern design
FCR	FFH	FCP	SCUDO
position limit switch	position limit switch	position limit switch	slip ring
			
38	40	41	42
self extinguishing housing/cover lthe 16 A cam switch IP65 for single or double speed motor fully adjustable aluminium rods	self extinguishing housing/cover lthe 20 A cam switch IP65 double insulation rubber covering wheel fully adjustable metallic rod	self extinguishing housing/cover lthe 40 A cam switch IP65 reinforced mechanical stop	close PVC frame IP51 modularity from 3 up to 15 rings 80mm diameter rings rated operating current 20 A rated insulation voltage Ui 690 V
Line 30/41	Wire-Rope	I-Beam	G75/100
festoon energy transmission	festoon energy transmission	festoon energy transmission	warning horn
			
68	76	77	43
metallic "C" rail bar Line30: load capacity 100 kg/m Line 41 : load capacity 140 kg/m steel or plastic trolley ball bearing trolley	trolley load capacity 8 kg with one or two roller/s	light series trolley load capacity: 50 kg – IPE-IPN 80, 100 beam heavy series trolley load capacity: 200 kg – IPE-IPN 80, 100, 120 beam	G75: 50 Hz / G100: 300 to 350 Hz G75: 88dB / G100: 93.5 dB G75 IP30 / G100 IP65* *double insulation

Certifications



QUALITY

Giovenzana, leader in the elevator and lifting equipment field, has gained a prominent position in the automation sector with its launch of industrial control accessories into the market. For many years, all commercial and industrial operations have been integrated within the framework of the **UNI EN ISO 9001:2008**.

Ref.: quality system **CSQ certificate N 9105. GIOV.**

Giovenzana has fulfilled its commitment to the quality of its products since 1995. The quality system is the end user's guarantee that all production stages are maintained under strict control and adhere to the requirements set by the company, both in terms of customer expectations and compliance to the relevant international standards as proved by the various certificates **Giovenzana** holds for its products. With the certification **UNI EN ISO 14001:2004**, **Giovenzana** keeps up with new technologies in order to reduce the consumption of raw materials, energy and natural resources and to minimize refuse and emissions in hopes of progressively reducing negative impacts on the environment.

Giovenzana products are in conformity to directives Rohs, Pfos, Rae and Reach.

Ref.: certification **CSQ N 9191. GIBV.**

COMPLIANCE

All **Giovenzana** products are manufactured according to the relevant Cee directives. **Giovenzana** certifies this compliance with a declaration of conformity.

CERTIFICATIONS

In order to reach the high level of quality **Giovenzana's** products achieve, they are tested by multiple third parties. In order to obtain the UL mark, **Giovenzana** submits its products to be tested by Underwriter Laboratories Inc., one of the most prestigious independent certification companies in the world.



CEE DIRECTIVES

As of January 1, 1997 it is compulsory to CE mark all electro-mechanical products. This has been outlined by two important regulations:

72/23 CEE and 93/68 CEE Low Voltage Directives.

CE MARK

European directives, applied to all national regulations, set the minimum requirements in term of safety of all electrical material sold within the EU. The compliance to these requirements is certified to the manufacturer by the CE mark placed on the products.

STANDARDS

Giovenzana's products comply with both the European EN and the American UL standards. These regulations, such as the EN 60024 (covering the safety requirements of the electrical circuits on board industrial machinery), define the characteristics, performance and use of the products.

EN EUROPEAN STANDARDS

The EN European standards usually originate from IEC International and are the result of the collaboration between CENELEC (European Committee for Electrotechnical Standardization) member countries. These standards cover and eliminate existing national standards that may be contradictory or out of date.





Pendant stations for small hoist application, in single / double row or direct power circuits switchings and tail lift controls. page 12 to 25

Giovenzana International Company, leader in lifting equipment control, makes a wide range of standard products for all installation requirements, and all built to high quality specification and safety guidelines.

The Lift Equipment products series comply with: IEC 947-5-1, EN60947-5-1, UL508 and use: IEC 204-1, EN60204-1, EN ISO 13850, all achieved according to the needs and requirements of Cee 89/392.

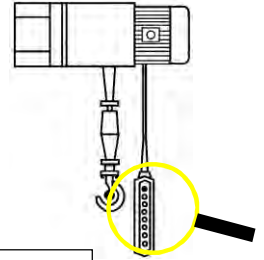
All operators are coloured and the laser-engraved, indelible legends comply with EN60204-1 and FEM 9.941. CERTIFICATIONS: The pendant stations P02, P03, HP03, PL series can be certificated cUL.

Use (recommended)	Line	Picture	Characteristic
<p>□ Hoist</p>	P02		Two push button pendant stations for small hoist : <ul style="list-style-type: none"> • single speed or two speed motor • direct motor control 1kW – 1speed • available in UL/CSA requirements
	page 12	<i>(item available in kit-form,; enclosure, contact block and operator available separately for customization)</i>	
	P03		Three push button pendant stations for small hoist: <ul style="list-style-type: none"> • single speed motor or two speed motor • direct motor control 1kW – 1speed • available in UL/CSA requirements
page 12	<i>(item available in kit-form,; enclosure, contact block and operator available separately for customization)</i>		
<p>□ Overhead crane</p>	HP03	 <i>Ergonomic! design</i>	Ergonomic pendant stations for small hoist : <ul style="list-style-type: none"> • single speed motor • two speed motor • available in UL/CSA requirements • <u>safety line available page 25</u>
	page 12	<i>(item available in kit-form,; enclosure, contact block and operator available separately for customization)</i>	
	DC30	 <i>High power!</i>	Pendant stations for high power hoist: <ul style="list-style-type: none"> • direct motor control single phase and three phase • lth 25A - 1phase/2poles 230...400V 2.2kW 3phase/3poles 230...400V 4kW
page 12	<i>(item available in kit-form,; enclosure, contact block and operator available separately for customization)</i>		
<p>□ Lifting platform □ Truck tails lift</p>	PL		SINGLE-row pendant stations for crane control circuits: <ul style="list-style-type: none"> • single speed motor or two-speed motor • available in different configuration with 5-7-8-10-12 holes • available in UL/CSA requirements
	page 14	<i>(item available in kit-form,; enclosure, contact block and operator available separately for customization)</i>	
	PLB		DOUBLE-row pendant stations for crane control circuits: <ul style="list-style-type: none"> • single speed motor • two speed motor • available in different configuration with 4-6-8-10-12-14 holes
page 15	<i>(item available in kit-form,; enclosure, contact block and operator available separately for customization)</i>		
	TLP	 <i>Compact! design</i>	Compact pendant stations for lifting platform and tails lift application (pendant or wall fixing)
	page 16	<i>(item available in kit-form,; enclosure, contact block and operator available separately for customization)</i>	

Pendant stations



Hoist control: **P02 P03 HP03 DC30**



LIFTING EQUIPMENT

Characteristics:

- Bi-directional, mechanically interlocked
- IP 65 double insulation IEC/EN60529
- General and electrical data page 23
- Laser engraved symbols comply with EN60204-1, FEM 9.941
- Shock proof and heat resistant



P02



P03



HP03



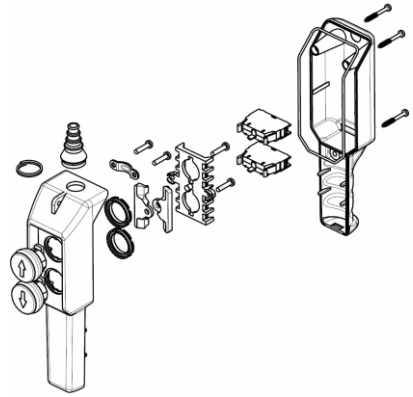
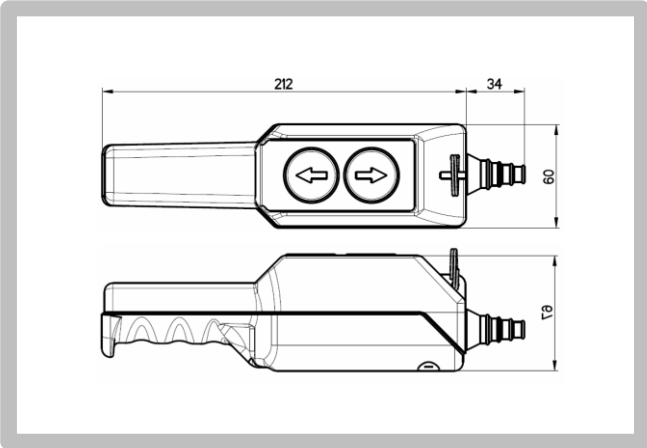
DC30

PICTURE	LAYOUT	CONFIGURATION	CODE	CONTACT TYPE	WEIGHT [gr]
		SINGLE SPEED (* TILTING BUTTON 16A – 250Vac ½ HP)	P02.RM		230
		SINGLE SPEED	P02.1		230
			P02.2		250
			P02.4		250
		(* HIGH POWER CONTACTS DIRECT MOTOR CONTROL 1Kw 1ph	P02.CD		230
	TWO SPEED	P02.D2		250	
		SINGLE SPEED	P03.1		440
			P03.2		450
			P03.3		460
			P03CD		460
		TWO SPEED	P03D2		460
		SINGLE SPEED	HP03		330
		TWO SPEED	HP03.D2		350
		SINGLE SPEED (* Ith 25A EXTRA HIGH POWER CONTACTS BLOCK FOR DIRECT MOTOR CONTROL : 2.2kW 1ph / 4kW 3ph	DC30		600
			DC30.RG		600
			DC30.GE		600
		TWO SPEED (* Ith 25A EXTRA HIGH POWER CONTACTS BLOCK FOR DIRECT MOTOR CONTROL : 2.2kW 1ph / 4kW 3ph	DC30D2		650

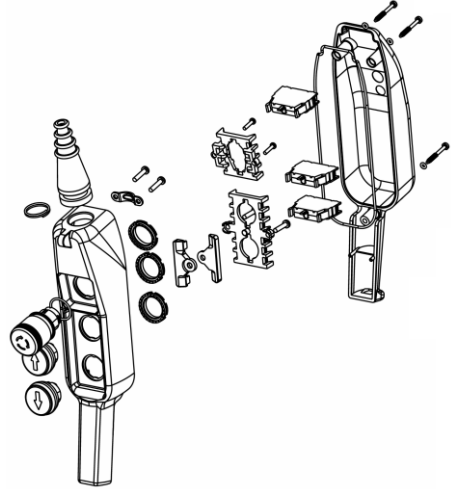
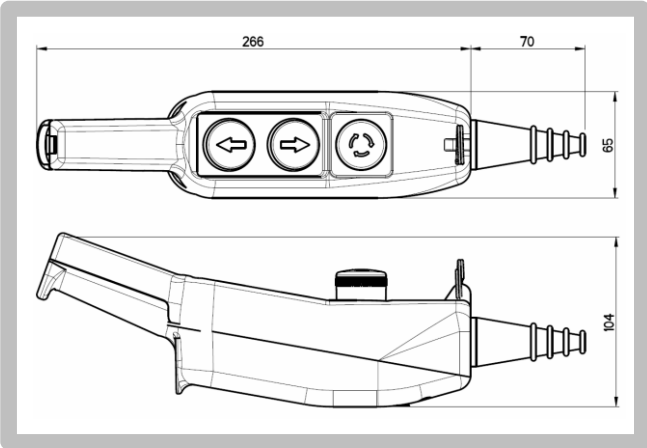


LIFTING EQUIPMENT

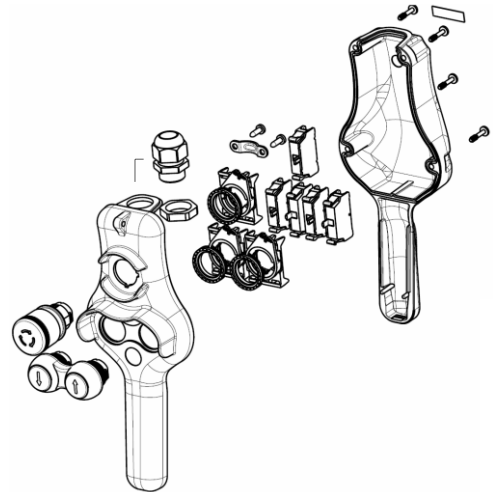
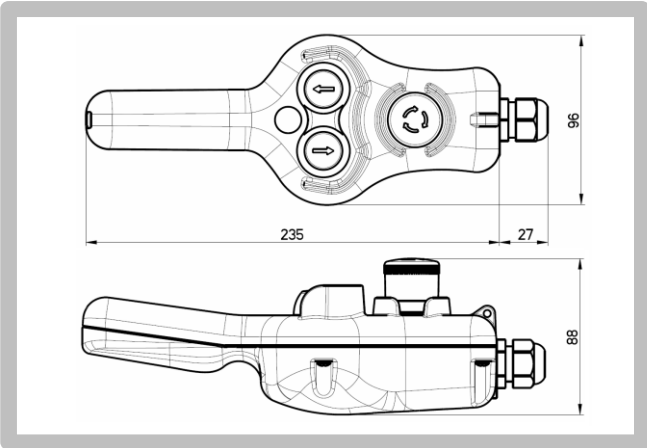
P02



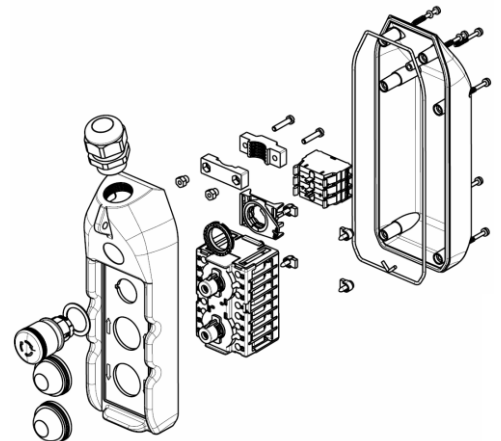
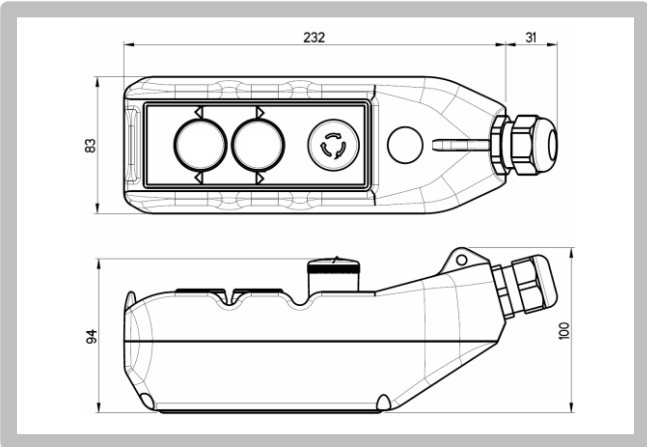
P03



HP03



DC30



Pendant Stations

cranes control circuits: **PL**



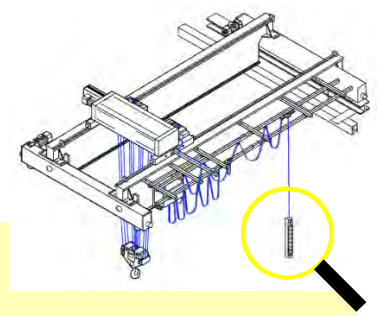
LIFTING EQUIPMENT



KIT Available See pg. 18
Available in UL/CSA req.

Characteristics:

- Bi-directional, mechanically interlocked
- IP 65 double insulation IEC/EN60529
- General and electrical data page 23
- Laser engraved symbols comply with EN60204-1, FEM 9.941
- Shock proof and heat resistant
- Available in UL/CSA requirements



CODE	PL05	PL05D2	PL05D4	PL07	PL07D2	PL07D4	PL07D6	PL08	PL08D2	PL08D4	PL08D6	PL10	PL12
weight [gr.]	560	590	620	740	770	800	830	830	860	890	920	990	1.140
N° push button	5	5	5	7	7	7	7	8	8	8	8	10	12

L length [mm]

LAYOUT

DIMENSIONS

PUSH BUTTON TYPE – CONTACT TYPE COUPLED

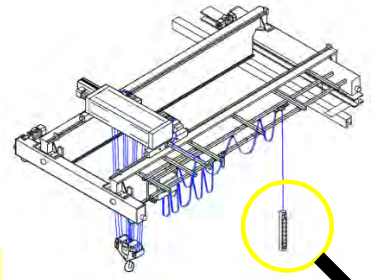
(*) two speed contact block

Pendant Stations

cranes control circuits: **PLB**



KIT Available See pg. 18

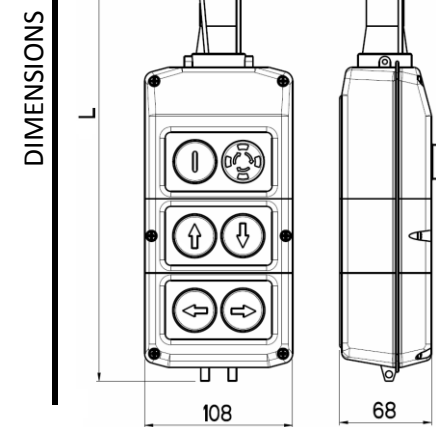
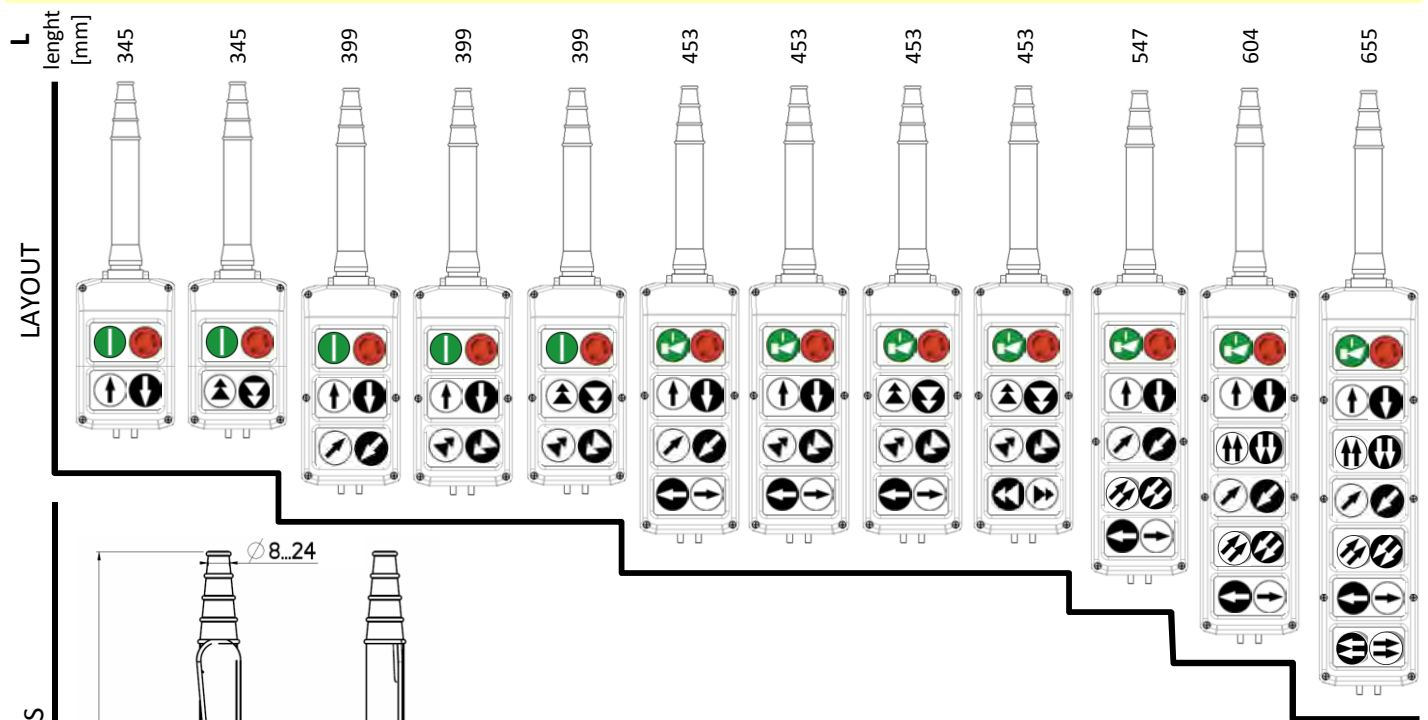


LIFTING EQUIPMENT

Characteristics:

- Bi-directional, mechanically interlocked
- IP 65 double insulation IEC/EN60529
- General and electrical data page 23
- Laser engraved symbols comply with EN60204-1, FEM 9.941
- Shock proof and heat resistant

CODE	PLB04	PLB04D2	PLB06	PLB06D2	PLB06D4	PLB08	PLB08D2	PLB08D4	PLB08D6	PLB10	PLB12	PLB14
weight [gr.]	560	590	620	770	800	830	830	860	890	920	990	1.140
N° push button	4	4	6	6	6	8	8	8	8	10	12	14



TIPO DI PULSANTE – TIPO DI CONTATTO ABBINATO

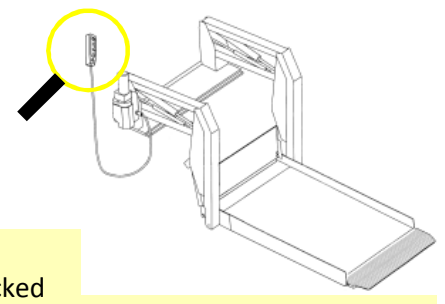


LIFTING EQUIPMENT

KIT Available See pg. 18



MOBILE-PENDANT FIXING (with WALL BRACKET accessories) WALL FIXING

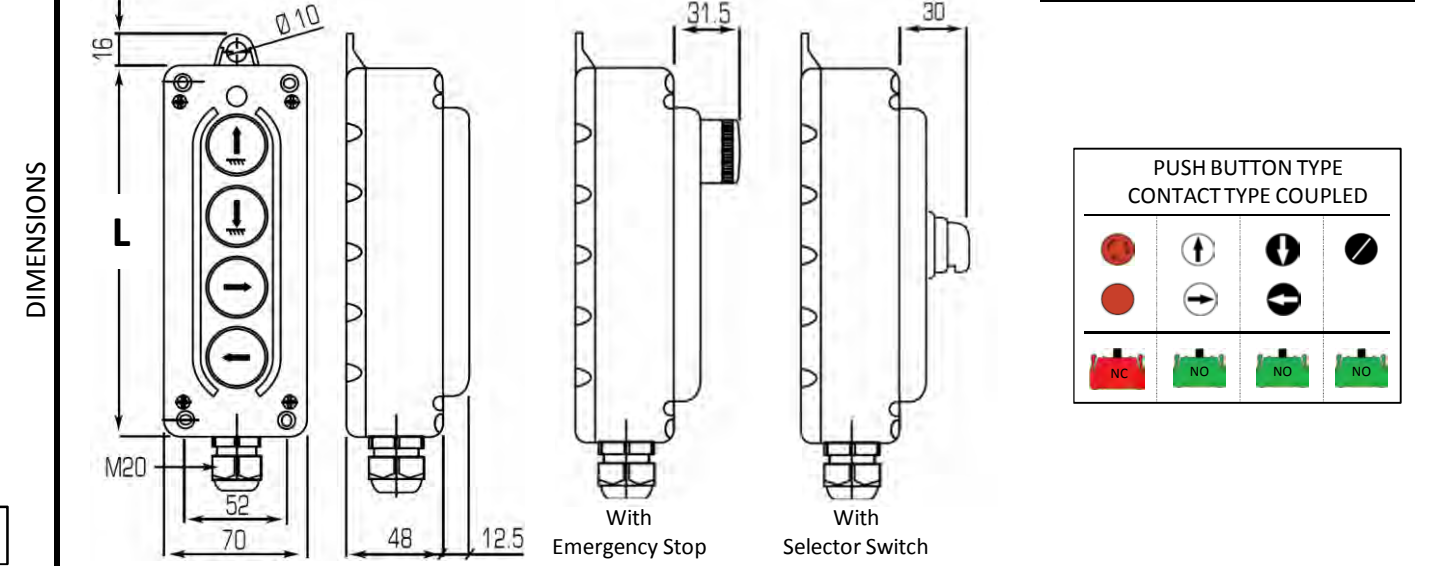
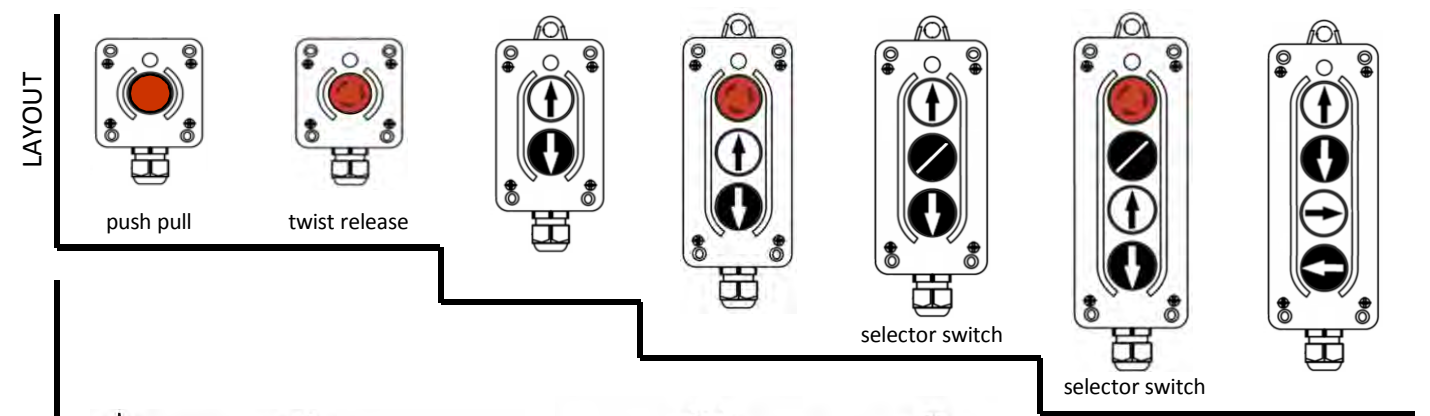


Characteristics:

- Compact and modern design
- Bi-directional, mechanically interlocked
- IP 65 double insulation IEC/EN60529
- General and electrical data page 23
- Laser engraved symbols comply with EN60204-1, FEM 9.941
- Contact block with spring cage terminal
- Shock proof and heat resistant
- Mobile-Pendant (with wall bracket accessories) or wall fixed mounting

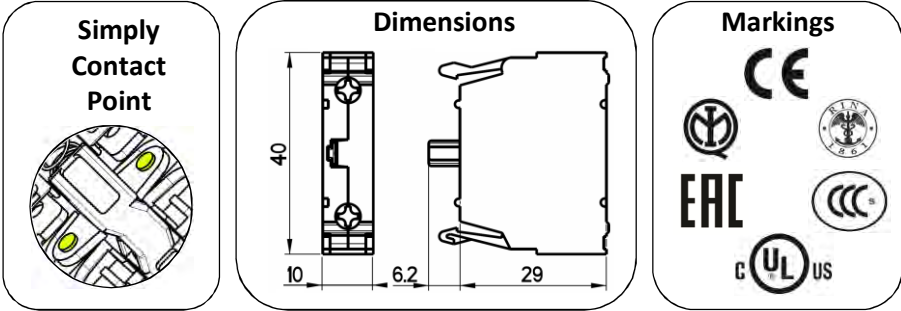
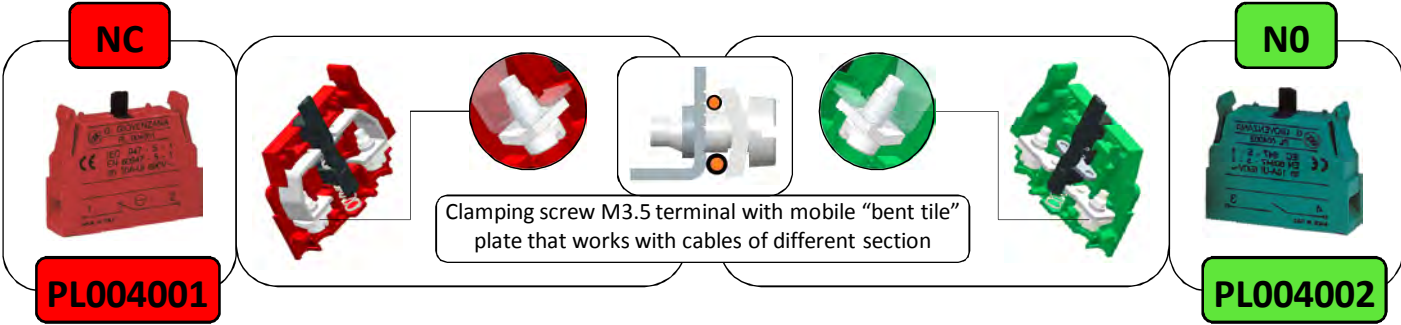
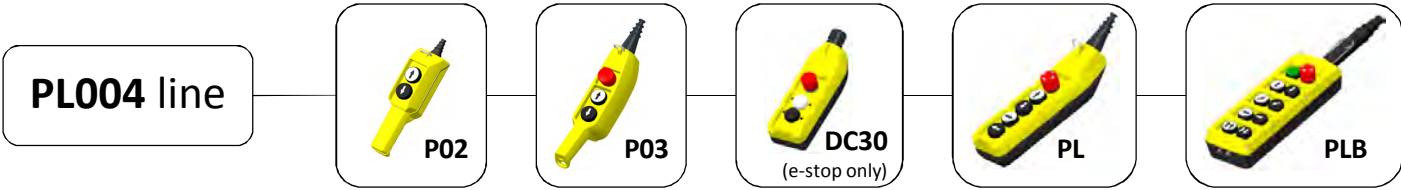
CODE	TLP1-EPP	TLP1-ESR	TLP2	TLP3-B	TLP3-D	TLP4-E	TLP4-C
------	----------	----------	------	--------	--------	--------	--------

weight [gr.]	120	120	200	255	255	314	314
N° push button	1	1	2	3	3	4	4
L length [mm]	80	80	115	150	150	185	185

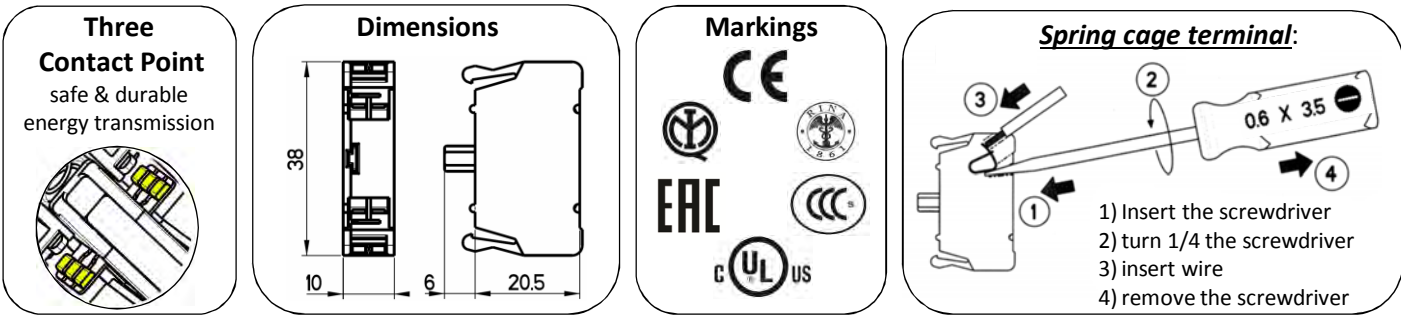
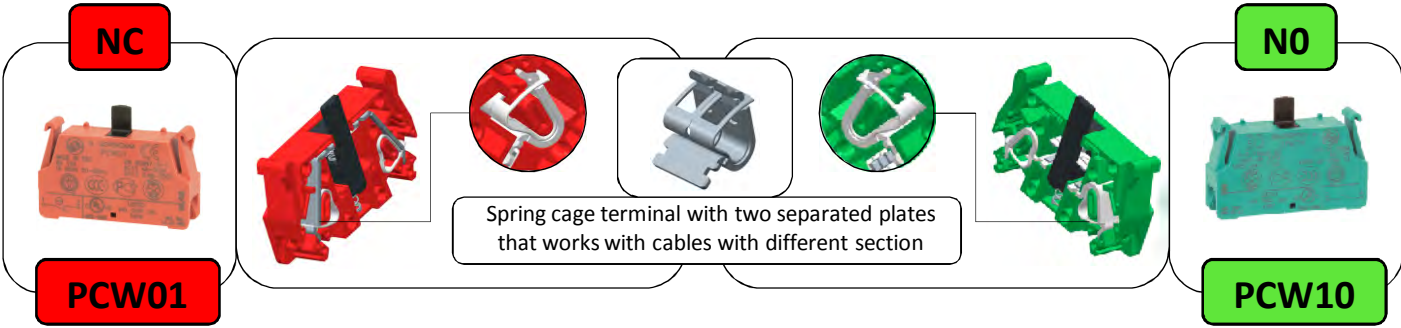




LIFTING EQUIPMENT



Technical data see page 23



Pendant / Fixed Stations



KIT To be customized
Create your customized station in 4 steps

LIFTING EQUIPMENT

STEP 1
Choose station type



P02



HOLES n°

CODE

WEIGHT [gr]

2

P02K

180

P03



3

P03K

258

PL



5

PL05K

410

7

PL07K

540

8

PL08K

600

10

PL10K

700

12

PL12K

800

PLB



4

PLB04K

410

6

PLB06K

510

8

PLB08K

610

10

PLB10K

710

12

PLB12K

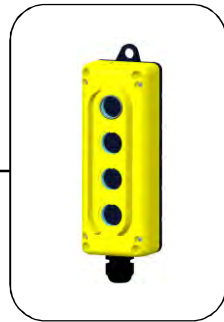
810

14

PLB14K

910

TLP



1

TLP1K

100

2

TLP2K

130

3

TLP3K

160

4

TLP4K

200



STEP 2 Choose OPERATOR

STEP 3 Choose CONTACT TYPE

LIFTING EQUIPMENT

(*) Symbols according to FEM 9.941
Customized engraving available (min. quantity applies)

P02-P03-PL-PLB

TLP

(*)

		GREEN START	GREEN START ALARM	MUSHROOM OPERATOR Ø 30 TURN TO RELEASE EN ISO 13850
PL005004	PL005019			
		PL005001	PL005002	WITH VISION STANDARD
		ALARM	BLUE	PL013001 PL013002
PL005023	PL005008			MUSHROOM OPERATOR Ø 40
		PL005003	PL005034	
		WHITE	BLACK	PL013003
PL005012	PL005027			MUSHROOM OPERATOR Ø 40 KEY RELEASE
		PL005035	PL005036	
PL005005	PL005020	RED	GREEN	PL013003
		PL005037	PL005038	MUSHROOM OPERATOR Ø 40 KEY RELEASE
PL005024	PL005009	KEY SWITCH		
				PPFN1C4NX
PL005013	PL005028			
		0-1 90° PL006001		
PL005031	PL005016	1-0-2 45° PL006002		
		0<1 45° PL006004		
		(key removable in "0")		
PL005032	PL005017	ROTARY SWITCH		
		0-1 90° PL007001		
PL005033	PL005018	1-0-2 45° PL007002		
		1>0<2 45° PL007003		

CONTACT BLOCKS

NC NO

1 NC PL004001
1 NO PL004002

CONTACT BLOCKS

NC NO

1 NC PCW01
1 NO PCW10

LED LAMP

POWER SUPPLY	CODE
AC/DC 12V	PL0045L12
AC/DC 24V	PL0045L24
AC/DC 48V	PL0045L48
AC/DC 110V	PL0045L110
AC 220V	PL0045L220

LAMP HOLDERS

BA9s PL004007

LED LAMP

POWER SUPPLY	CODE
AC/DC 12V	PCW5L12
AC/DC 24V	PCW5L24
AC/DC 48V	PCW5L48
AC/DC 110V	PCW5L110
AC 220V	PCW5L220

LAMP HOLDERS

BA9s PCWAD

(*)

PL005006	PL005021
PL005025	PL005010
PL005014	PL005029

NOT for TLP

MULTI-SPEED CONTACT BLOCKS

DOUBLE STEP
1NO+1NO PL004010

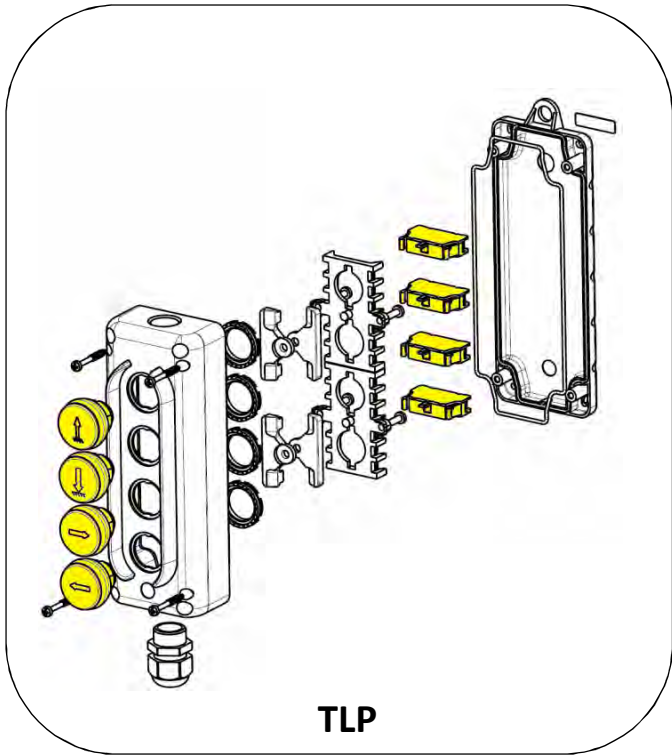
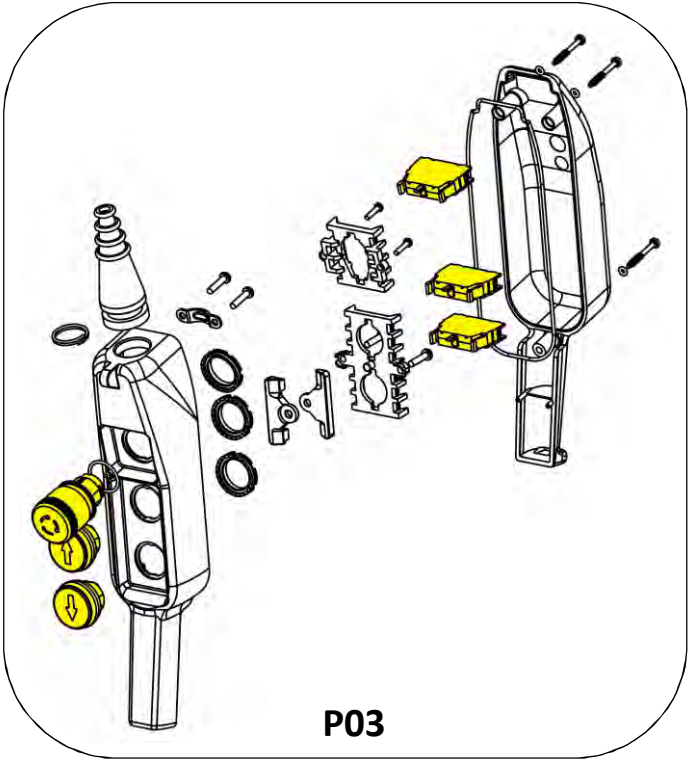
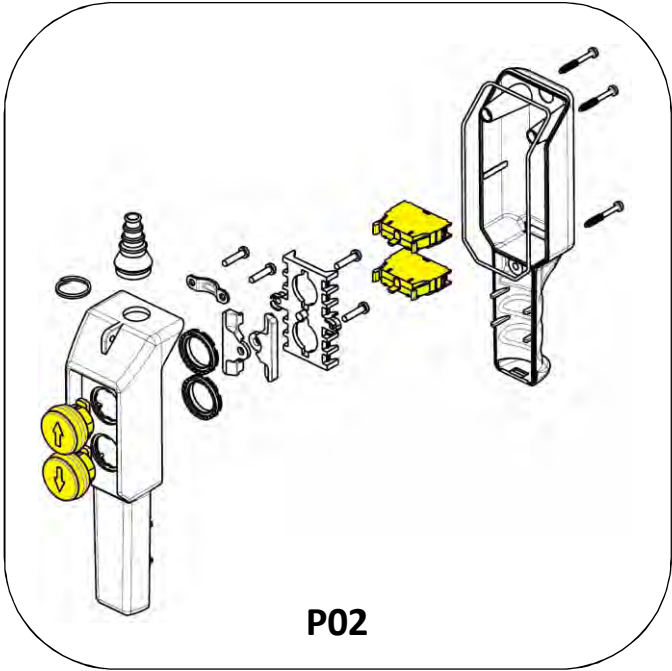
HOLE PLUG

PL015001



LIFTING EQUIPMENT

STEP 4
Mounting instructions



STEP 1

kit enclosures include

- Pendant stations (box, screws, gasket)
- Cable sleeve
- Cable clamp
- Suspension ring
- Push button interlock

STEP 2-3

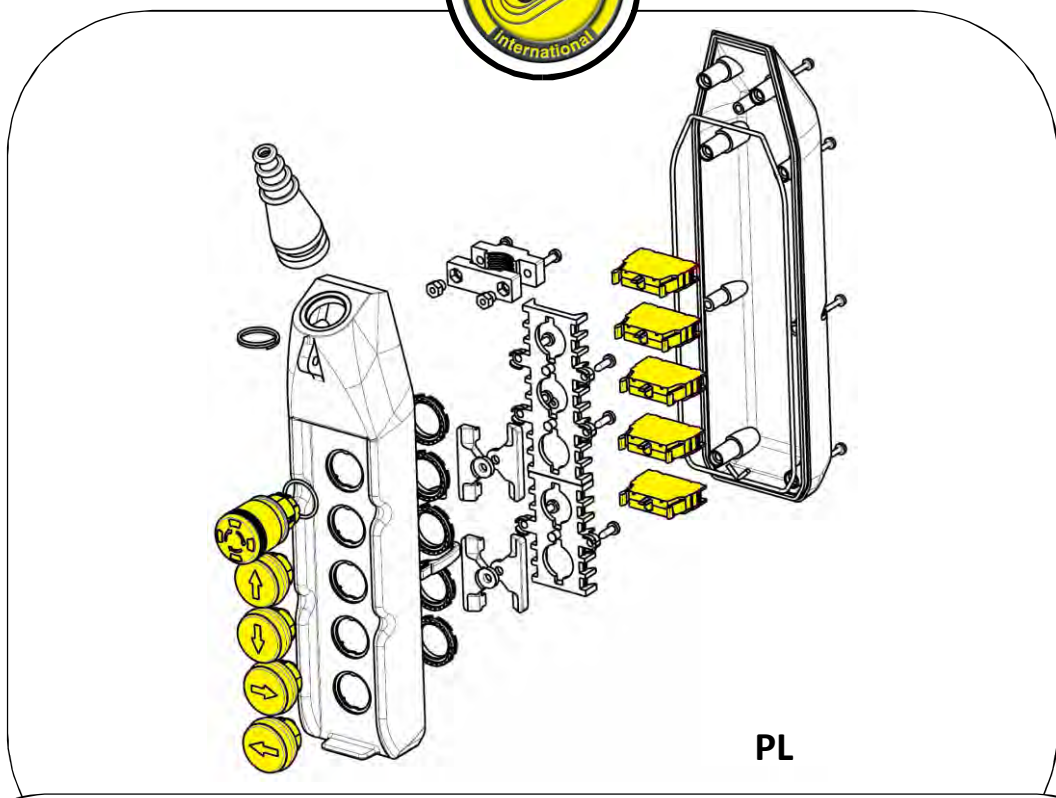
(item in yellow colour)

- Contact block
- Push buttons

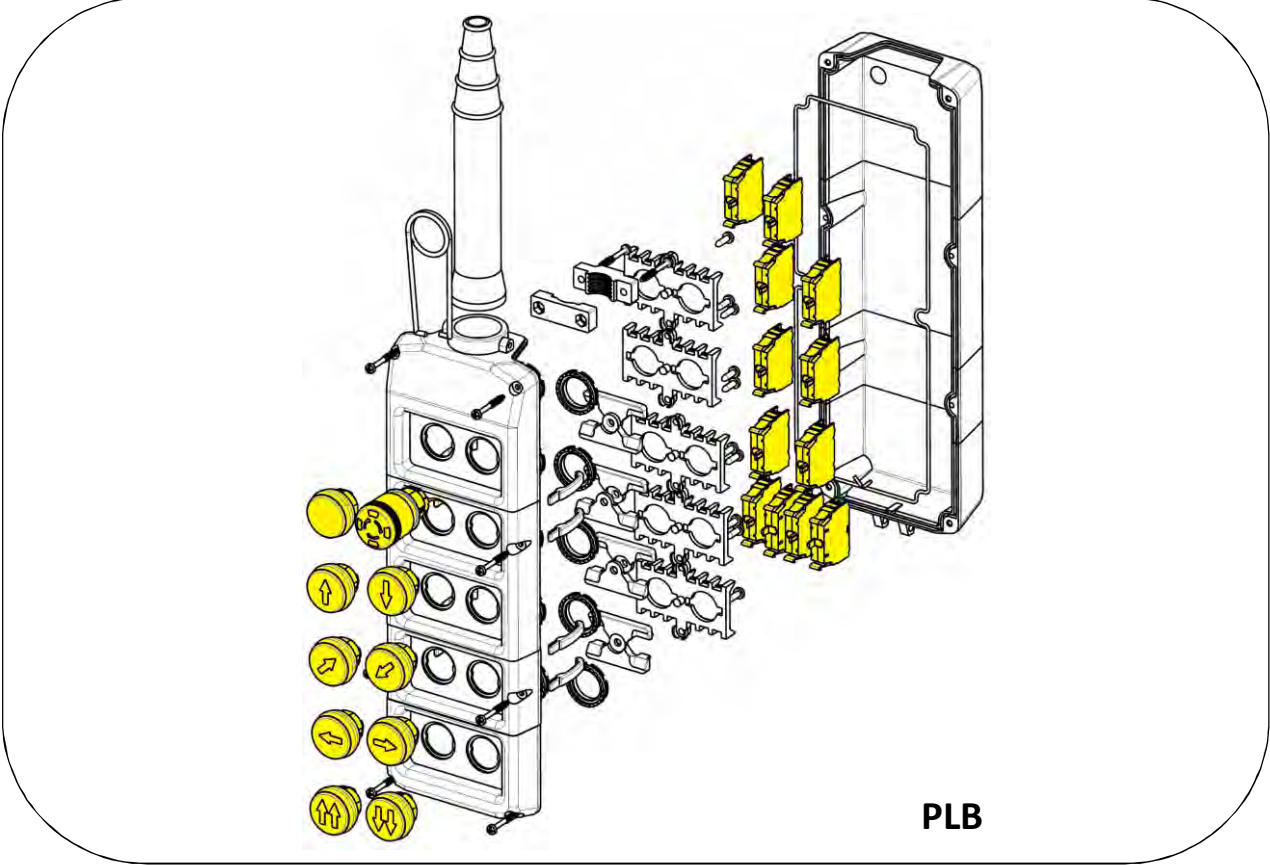
must be chosen and purchased separately from the enclosure kit



LIFTING EQUIPMENT



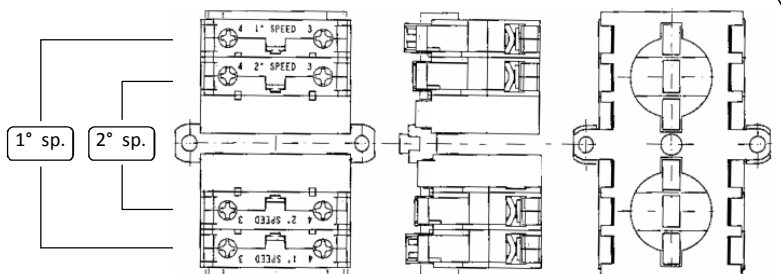
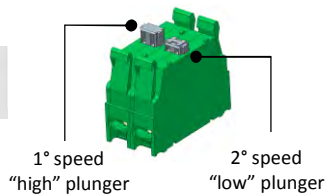
PL



PLB

**ASSEMBLY INSTRUCTION FOR
1^a - 2^a SPEED CONTACT BLOCKS**

PL004010





LIFTING EQUIPMENT

SPARE PARTS:

P02 – P03 – PL – PLB – TLP

COUPLING PLATE		INTERLOCK		CABLE CLAMP LEVER		CABLE SLEEVE	
2 HOLES	PL003001	TOP	PL011001	NOT for TLP		VERSION	CODE
3 HOLES	PL003002	BOTTOM	PL011002			P02 cable Ø 7...14	12906011
						P03 - PLO5 cable Ø 7...18	12906006
						PL07...PL12 PLB04-PLB06 cable Ø 9...21	12906004
						PLB08-PLB14 cable Ø 12...24	12906005

☐ Operators and contacts block codes please go to page 19

DC30

CONTACT BLOCKS			RUBBER BUTTON COVER	
	FOR SINGLE SPEED · REVERSING MOTORS		COLOUR	CODE
		CODE	FOR	
	3NO+1NC	30205085	DC30	
			DC30.GE	
	4NO	30205087	DC30.RG	
TWO-SPEED REVERSING MOTORS				
	CODE	FOR		
4NO	30205086	DC30D2		
(2NO+2NC progressive)				

DRAWINGS EXAMPLES
POWER CIRCUITS

MONO-PHASE	THREE-PHASE	For double speed, 2 reversing motor. Contact blocks	For single speed, 2 reversing motor. Contact block 3NO+1NC

TLP ACCESSORIES

WALL BRACKET		SPIRAL CABLE GLAND	
HOLES	CODE	CODE	
1...3	16000061	12901054	
4	16000062		

AUXILIARIES CIRCUIT	
1 SPEED	2 SPEED
SNAP ACTION	EMERGENCY



Note: P02 – P03 – HP03 – PL line available in UL/CSA requirements

LIFTING EQUIPMENT

General characteristics		P02 – P03 – HP03 – PL – PLB – TLP						DC30	
In conformity to standards		IEC / EN60947-5-1						IEC / EN60947-3	
Material		P02	P03	HP03	PL	PLB	TLP	ABS	
		PP	ABS	ABS	ABS	ABS	PP		
Material group		II						II	
Pollution class		3						3	
Climate temperature	operating	-25°C + 70°C						-25°C + 70°C	
	storage	-30°C + 70°C						-30°C + 70°C	
Climate resistance	IEC68 part 2-3	hot damp						hot damp	
	IEC68 part 2-30	unsettled hot damp						unsettled hot damp	
Cable entry		<ul style="list-style-type: none"> ▪ P02 – P03: rubber cable sleeve Ø7...18mm ▪ PL – PLB: rubber cable sleeve Ø9...24mm ▪ HP03 – TLP: cable gland M20 						cable gland M25	

Electrical characteristics contact blocks		P02 – P03 – HP03 – PL – PLB – TLP						DC30	
Markings									
Rated insulation voltage [Ui]		690V						500V	
Rated thermal current [Ith]		16A						25A	
Rated impulse withstand voltage [Uimp]		4kV						4kV	
Frequency		50Hz – 50/60 Hz type PCW (HP03-TLP)						50Hz	

Rated operating current [Ie]

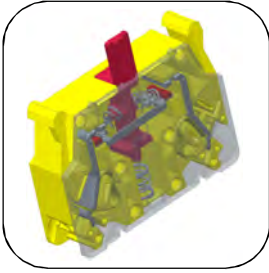
AC-15 alternate current	type: PL004.. P02/P03/DC30 e-stop/PL/PLB	(V)	24	60	110	240	400	440	500	690	
	type: PCW.. HP03-TLP	(A)	16	12	8	6	4	3.5	3	1	-
		(A)	10	8	6	5	4	4	4	2	-
DC-13 direct current		(V)	24	48	60	110	220	250			
	type: PL004.. P02/P03/DC30 e-stop/PL/PLB	(A)	2	1.2	0.85	0.4	0.25	-			-
	type: PCW.. HP03-TLP	(A)	2	2	1	0.4	-	0.4			-
AC-3 alternate current	1phase-2poles 230V-400V		-								2.2kW
	3phase-3poles 230V-400V		-								3kW
Conditional short circuit withstand current			1000A								1000A
Fuse rating			gG 10A - 500V								aM 12A - 500V
Contact insulation resistance			≤ 25mΩ								-
Switching mechanism	type: PL004.. P02/P03/DC30 e-stop/PL/PLB		slow break double gap contacts single pad								slow break double gap contacts single pad
	type: PCW.. HP03-TLP		slow break double gap contacts three pads								
Positive operation			NC contact block								-
Terminal type	type: PL004.. P02/P03/DC30 e-stop/PL/PLB		M3.5 screw								M3.5 screw
	type: PCW.. HP03-TLP		spring cage terminal								
Terminal capacity	type: PL004.. P02/P03/DC30 e-stop/PL/PLB		No. 1 or 2 flexible and solid conductor min 1 max 2.5 mm ²								No. 1 or 2 flexible and solid conductor min 1 max 2.5 mm ²
	type: PCW.. HP03-TLP		No. 1 or 2 flexible and solid conductor min 0.5 max 2.5 mm ²								

UL508 characteristics

General use	600V ac	16A	-
Designation code (HD) Heavy Duty		A600-Q600	-



LIFTING EQUIPMENT



Safety contact block

Code: PCW01FT

(Family line PCW: spring cage terminal – see page 17)

An important step in accident prevention!

Giovenzana International B.V. has developed a new technology in the field of industrial and lift automation. The product is designed to maximize the performance of the NC mushroom e-stop contact which results in a risk factor of zero.

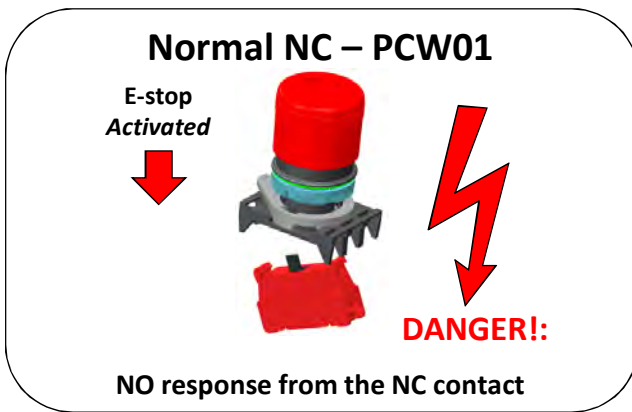
The NC contact will open in the event of accidental release of the contact block from the base.

In the unlikely event of mechanical failure or support breaking, the contact block is designed to intervene and open the circuit. This will block any further operation of the machine.

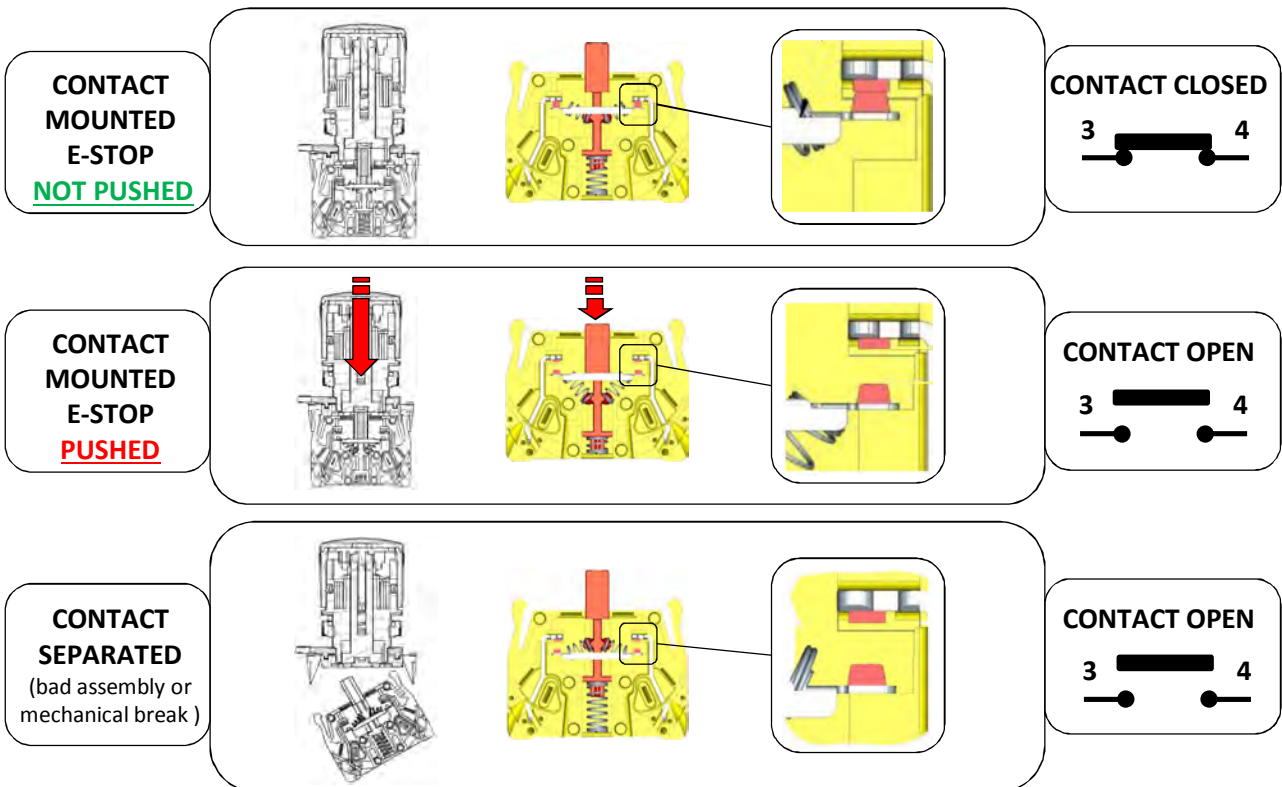
This is an important step ahead in accident prevention and emergency device intervention.

See following sequence with possible operating conditions.

***Detached contact due to a bad assembly or mechanical failure:
difference between a normal NC Vs a Safety NC contact:***



OPERATING SYSTEM





Stacking forbidden!
Do not fix the safety contact block under a contact block

Three Contact Point
safe & durable energy transmission

Dimensions

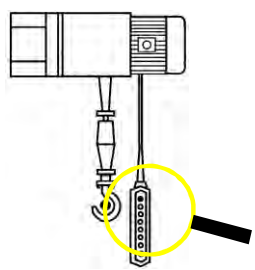
Markings

Spring cage terminal:

- 1) Insert the screwdriver
- 2) turn 1/4 the screwdriver
- 3) insert wire
- 4) remove the screwdriver

Pendant Stations with PCW01FT - Characteristics:

- Shock proof and heat resistant
- Bi-directional, mechanically interlocked
- IP 65 double insulation IEC/EN60529
- General and electrical data page 23
- Laser engraved symbols comply with EN60204-1, FEM 9.941



PICTURE	LAYOUT	CONFIGURATION	CODE	CONTACT TYPE	WEIGHT [gr]
<p>HP03</p>		SINGLE SPEED	HP03.SS		330

NOTE: available in UL/CSA requirements



Rotary Gear Limit switches

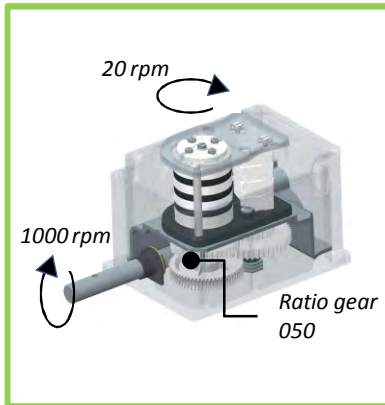
page 26 to 35

The Giovenzana's rotary gear limit switch is a device used to control the number of rotation or direction angle of industrial and building machines. A typical application is controlling the position of the rolling shutter door or overhead cranes etc... . The unit, through a gear system and cams transmission, controls 2, 4 or more microswitches so that after a defined number of revolutions, it can prepare the motor or the device to start or stop running. The microswitches have a calibration screw that operates independently on each cam; so it can calibrate the opening and closing of each micro according the functional requirements needed. The gear-based transmission system allows you to choose different ratios. It can also be supplied with rear shaft version or complete of linear detector (potentiometer or encoder) too.

LIMIT SWITCHES

Ratio

The Giovenzana's rotary gear limit switch are available in different transmission ratio. The ratio is the difference between the number of rotation of the main shaft and the number of rotation of the cams.



Potentiometer & Encoder

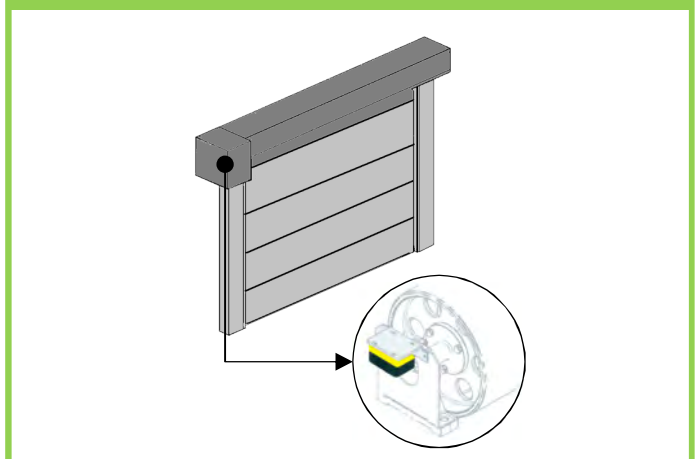
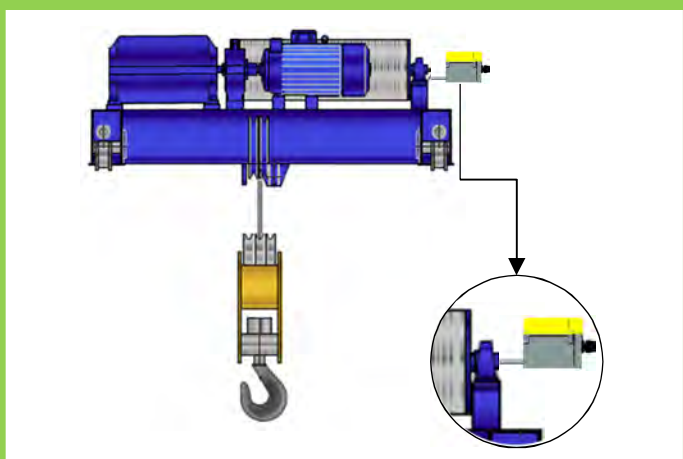
In addition to the microswitch :

- FGR1 line: available with potentiometer (direct ratio 1:1)
- FGR3 line : available with potentiometer or encoder having: direct ratio 1:1 or ratio 1:X (X=cam block ratio)



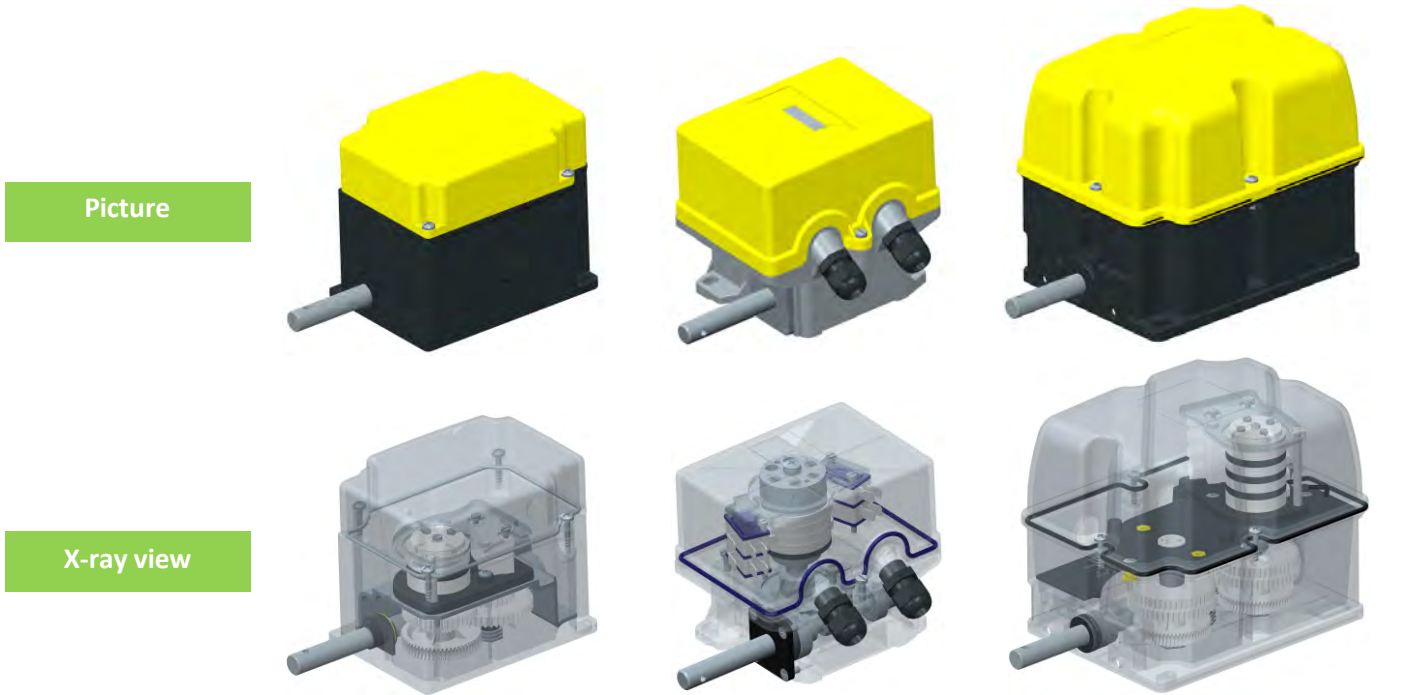
Picture shows a FGR1/2/3 working on a crane system

Picture shows a FGR1/2/3 working on a rolling shutter door





Line	FGR1	FGR2	FGR3
Page	28	30	32



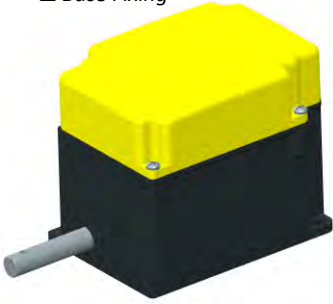
LIMIT SWITCHES

Characteristics			
Case	self extinguishing housing V0 UL94	aluminium housing self extinguishing cover V0 UL94	self extinguishing housing V0 UL94
Main / cam shaft ratio	012-033-050-075-100-150-200-400	012-033-050-100-200	1:8 to 1:460
Protection class	IP65	IP65	IP66
Shaft type	- steel - coaxial shaft version available	- steel mounted on ball bearing - coaxial shaft version available	- AISI 304 stainless steel mounted on ball bearing - coaxial shaft version available
Fixing type	- bottom - front (flanged version)	- bottom - front with FLG accessories	bottom (different metal plate available)
Microswitch	8A – 250V – silver plated IEC/EN61058-1 / UL1054 1NC-1NO changeover fast trigger positive opening markings	8A - 250V – silver plated IEC/EN61058-1 / UL1054 1NC-1NO changeover fast trigger positive opening markings	8A – 250V – silver plated IEC/EN61058-1 / UL1054 1NC-1NO changeover fast trigger positive opening markings
Microswitch max n° / notes	max 4 - micrometric adjustment roller lever control (long life)	max 6 - micrometric adjustment	max 4 - micrometric adjustment roller lever control (long life)
Cam block	self-lubricating with transparent support for easier cam viewing	self-lubricating with transparent support for easier cam viewing	self-lubricating with transparent support for easier cam viewing
Cable entry	M20 or M16 (max 4)	M20 (max 2)	M20 (max 3)
Options	- N° 5 different cam shapes - potentiometer (direct ratio 1:1)	N° 3 different cam shapes	- N° 5 different cam shapes - potentiometer or encoder (direct ratio 1:1 or 1:X)



Version and options available

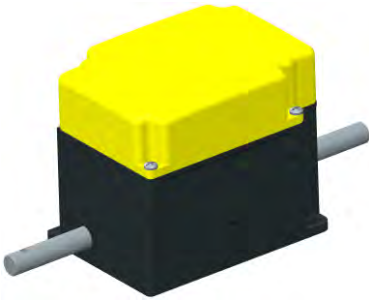
□ Base Fixing



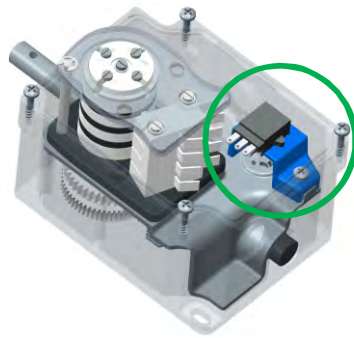
□ Flanged Fixing



□ Rear shaft



□ With potentiometer



LIMIT SWITCHES

Characteristics

Case	self extinguishing housing V0 UL94
Ratio	012-033-050-075-100-150-200-400
Protection class	IP65
Shaft type	- steel - coaxial shaft version available
Fixing type	- bottom - front (flanged version)
Microswitch	8A – 250V – silver plated contacts IEC/EN61058-1 / UL1054 1NC-1NO changeover fast trigger self cleaning positive opening markings
Microswitch max n° / notes	max 4 - micrometric adjustment roller lever control (long life)
Cam block	self-lubricating with transparent support for easier cam viewing
Cable entry	M20 or M16 (max 4)
Options (see page 34)	- 5 different cam shapes / 15 pinions - potentiometer (3 support version)

Ratio	Base Fixing	Flanged Fixing	N° of microswitches 2-3-4	Potentiometer 2.5 / 5 / 10 kΩ	Rear shaft	Microswitch cams
012	FGR100124	FGR100124F	4 silver plated	NO	NO	STANDARD
033	FGR100334	FGR100334F	4 silver plated	NO	NO	STANDARD
050	FGR100504	FGR100504F	4 silver plated	NO	NO	STANDARD
075	FGR100754	FGR100754F	4 silver plated	NO	NO	STANDARD
100	FGR101004	FGR101004F	4 silver plated	NO	NO	STANDARD
150	FGR101504	FGR101504F	4 silver plated	NO	NO	STANDARD
200	FGR102004	FGR102004F	4 silver plated	NO	NO	STANDARD
400	FGR104004	FGR104004F	4 silver plated	NO	NO	STANDARD

See page 34 for complete specifications

E (10 tips)

D (opposite)

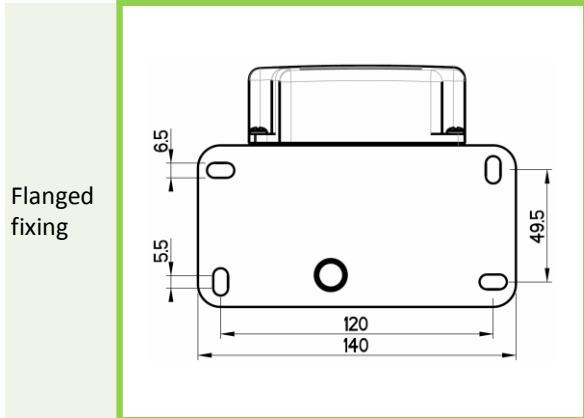
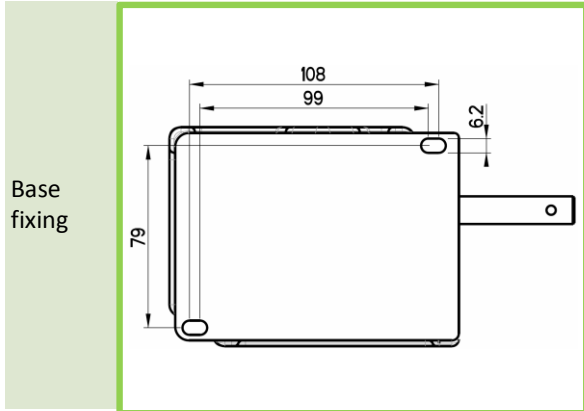
C (180°)

B (60°)

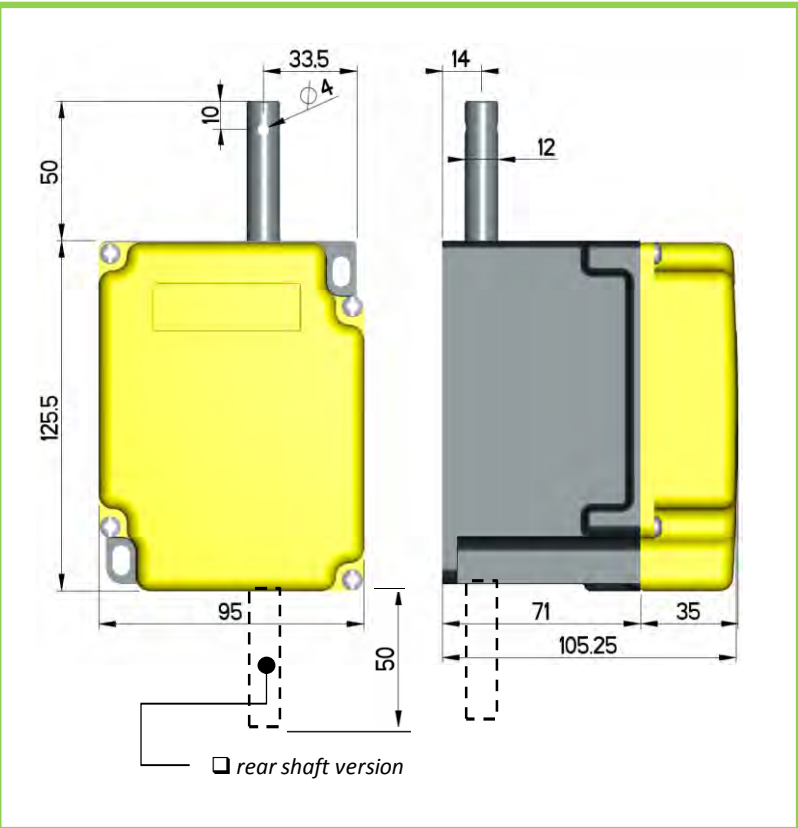
Standard A (10°)



Fixing holes



Dimensions



LIMIT SWITCHES

Microswitch system calibration guide

- I. Loosen the main screw (1)
- II. Adjust the screws (2)
- III. Tighten the main screw (1)

Spare parts

Microswitch **MFI.3**

Microswitch table activation (with the standard cam "A")

Ratio	Revolutions referred to the cam's activation							
	A	a	B	b	C	c	D	d
12	0.65	11.35	1.3	10.7	1.95	10.05	2.6	9.4
33	1.75	31.25	3.5	29.5	5.25	27.75	7	26
50	2.75	47.25	5.5	44.5	8.25	41.75	11	39
75	3.75	71.5	7.5	67.5	11.25	63.75	15	60
100	4.75	95.25	9.5	90.5	14.25	85.75	19	81
150	7.5	142.5	15	135	22.5	127.5	30	120
200	10.5	189.5	21	179	31.5	168.5	42	158
400	21	379	42	358	63	337	84	316

NOTE:
The movement refers to the action of the cam on contact 1-2 (NC).
The microswitch have all changeover contacts.



Version and options available

Base Fixing



Flanged Fixing
(with FLG accessories)



Rear shaft



Characteristics

Case	- aluminium housing - self extinguishing cover V0 UL94
Ratio	012-033-050-100-200
Protection class	IP65
Shaft type	- steel mounted on ball bearing - coaxial shaft version available
Fixing type	- bottom - front (flanged with FLG accessories)
Microswitch	8A – 250V – silver plated contacts IEC/EN61058-1 / UL1054 1NC-1NO changeover fast trigger self cleaning positive opening markings
Microswitch max n° / notes	max 6 - micrometric adjustment
Cam block	self-lubricating with transparent support for easier cam viewing
Cable entry	M20 (max 4) included
Options (see page 34)	- 3 different cam shapes - 15 pinions

LIMIT SWITCHES

Ratio	Single shaft		Rear shaft		Microswitch cams
	4 microswitches	6 microswitches	4 microswitches	6 microswitches	
012	FGR2006	FGR20066	FGR2006B	FGR2006B6	STANDARD
033	FGR2007	FGR20076	FGR2007B	FGR2007B6	STANDARD
050	FGR2008	FGR20086	FGR2008B	FGR2008B6	STANDARD
100	FGR2009	FGR20096	FGR2009B	FGR2009B6	STANDARD
200	FGR2010	FGR20106	FGR2010B	FGR2010B6	STANDARD

See page 34 for complete specifications



C (90°)



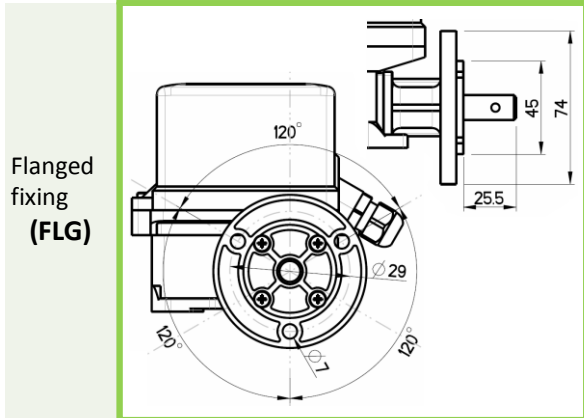
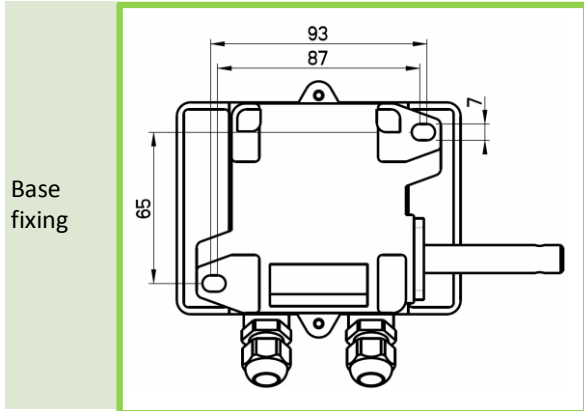
B (15°)



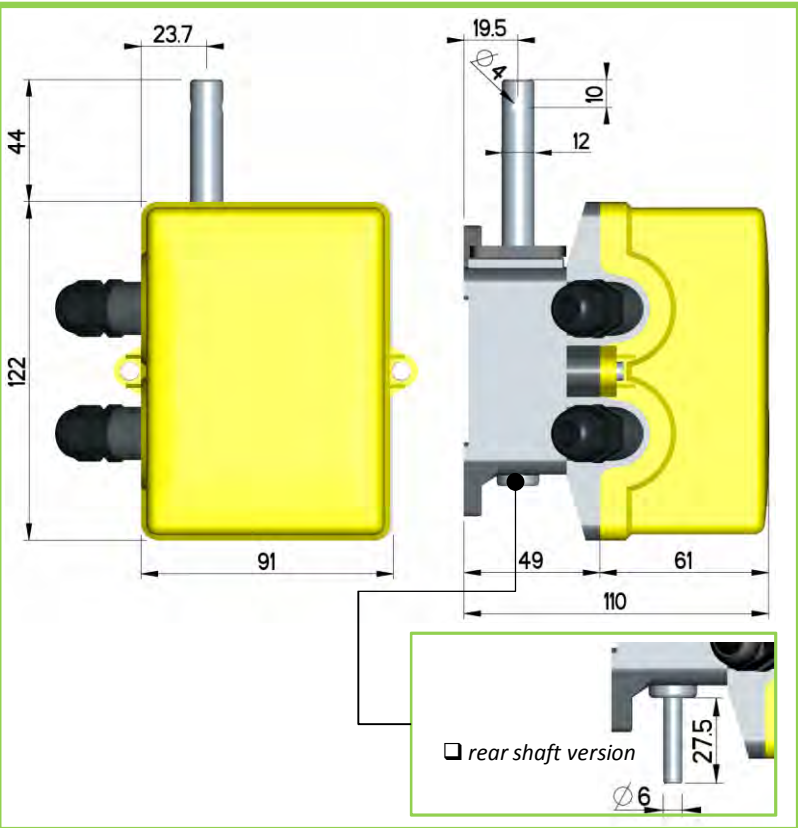
Standard A (30°)



Fixing holes



Dimensions



LIMIT SWITCHES

Microswitch system calibration guide

- I. Loosen the main screw (1)
- II. Adjust the screws (2)
- III. Tighten the main screw (1)

transparent cover

Spare parts / Accessories

Microswitch		Flange	
MFI		FLG	

Microswitch table activation (with the standard cam "A")

Ratio	Revolutions referred to the cam's activation											
	A	a	B	b	C	c	D	d	E	e	F	f
012	1.25	10.75	2.5	9.5	3.75	8.25	5	7	6.25	5.75	7.5	4.5
033	3.5	29.5	7	26	10.5	22.5	14	19	17.5	15.5	21	13
050	5	45	10	40	15	35	20	30	25	25	30	20
100	10	90	20	80	30	70	40	60	50	50	60	40
200	20	180	40	160	60	140	80	120	100	100	120	80

NOTE:
The movement refers to the action of the cam on contact 1-2 (NC). The microswitch have all changeover contacts.



Version and options available

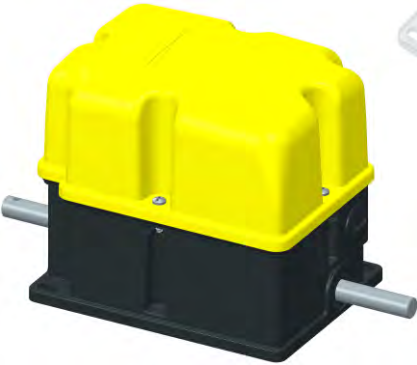
Base Fixing



With encoder



Rear shaft



LIMIT SWITCHES

Characteristics

Case	self extinguishing housing V0 UL94
Ratio	1:8 to 1:460
Protection class	IP66
Shaft type	- AISI 304 stainless steel mounted on ball bearing - coaxial shaft version available
Fixing type	- bottom (different metal plate available)
Microswitch	8A – 250V – silver plated contacts IEC/EN61058-1 / UL1054 1NC-1NO changeover fast trigger self cleaning positive opening markings
Max n° of microswitch	max 4 - micrometric adjustment roller lever control (long life)
Cam block	self-lubricating with transparent support for easier cam viewing
Cable entry	M20 (max 3)
Options (see page 34)	- 5 different cam shapes / 15 pinions - potentiometer or encoder (3 support version) direct ratio 1:1 or 1:X (X= cam's block ratio)

FGR3 coding system:

FGR3	0	060	4	1	51	-	XX
-------------	----------	------------	----------	----------	-----------	----------	-----------

Line ID	Optical reader	Ratio	N° of microswitch:	Shaft type	Pinion type:	Option
	0= NO (however the unit permits the future equipment) 1= Encoder 2= Potentiometer	008 to 460	2= two 4= four	0= single output 1= double output	the last two numbers of the Giovenzana's code table list on page 32	Suffix: define the code according customer's specifications like encoder, potentiometer, cams, shaft, etc etc type

Example:

FGR3	1	060	4	1	61	
------	---	-----	---	---	----	--

Limit switch FGR3 line with encoder, ratio 1:60 with 4 microswitches, single shaft output and complete of pinion M14-Z10 (code 16020061) equipped with standard cam type "A" (10°)

See page 34 for complete specifications



E (10 tips)



D (opposite)



C (180°)



B (60°)

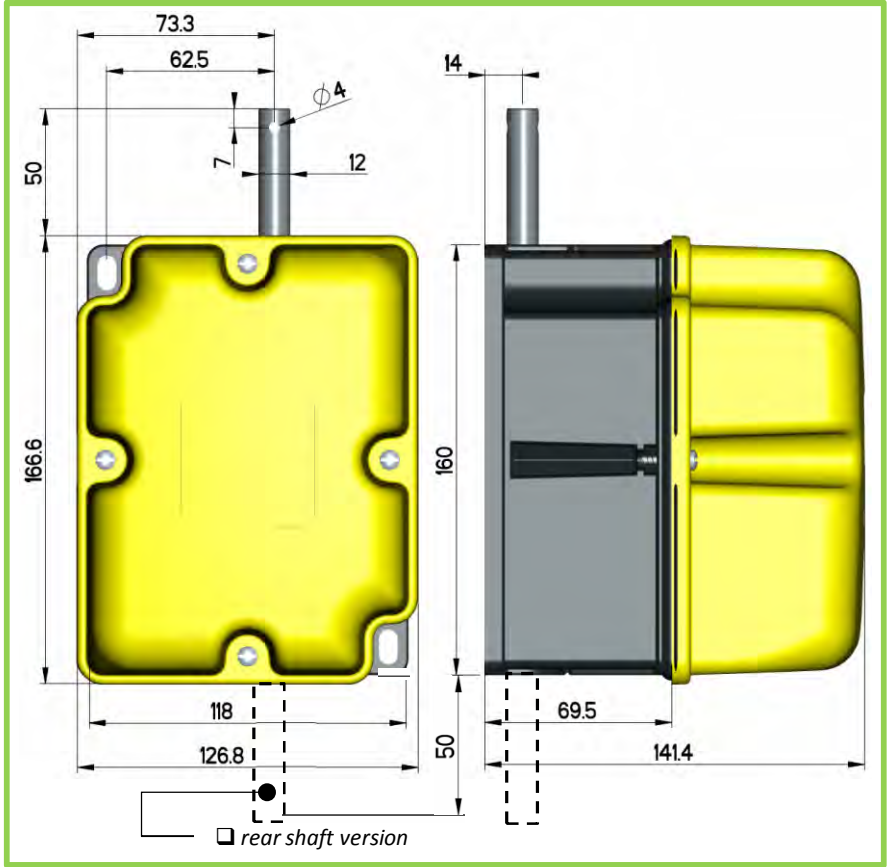
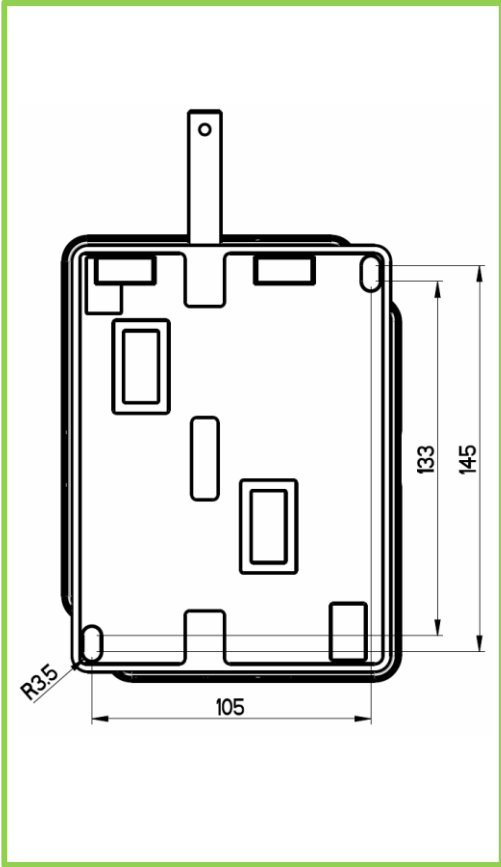


Standard A (10°)



Fixing holes

Dimensions

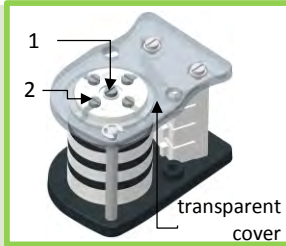


LIMIT SWITCHES

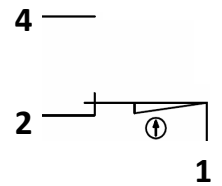
Microswitch system calibration guide

Spare parts

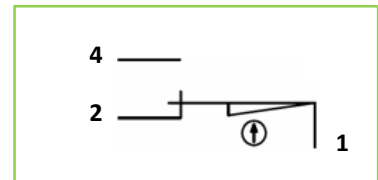
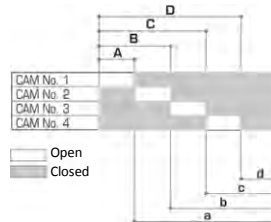
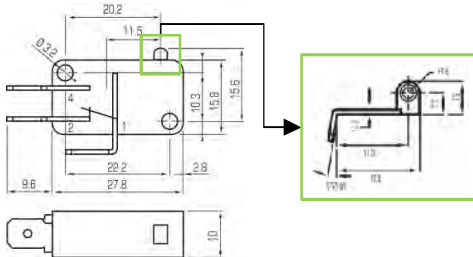
- I. Loosen the main screw (1)
- II. Adjust the screws (2)
- III. Tighten the main screw (1)



Microswitch **MFI.3**



Microswitch table activation (with the standard cam "A")



Ratio	Revolutions referred to the cam's activation							
	A	a	B	b	C	c	D	d
12	0.65	11.35	1.3	10.7	1.95	10.05	2.6	9.4
33	1.75	31.25	3.5	29.5	5.25	27.75	7	26
50	2.75	47.25	5.5	44.5	8.25	41.75	11	39
75	3.75	71.5	7.5	67.5	11.25	63.75	15	60
100	4.75	95.25	9.5	90.5	14.25	85.75	19	81
150	7.5	142.5	15	135	22.5	127.5	30	120
200	10.5	189.5	21	179	31.5	168.5	42	158
400	21	379	42	358	63	337	84	316

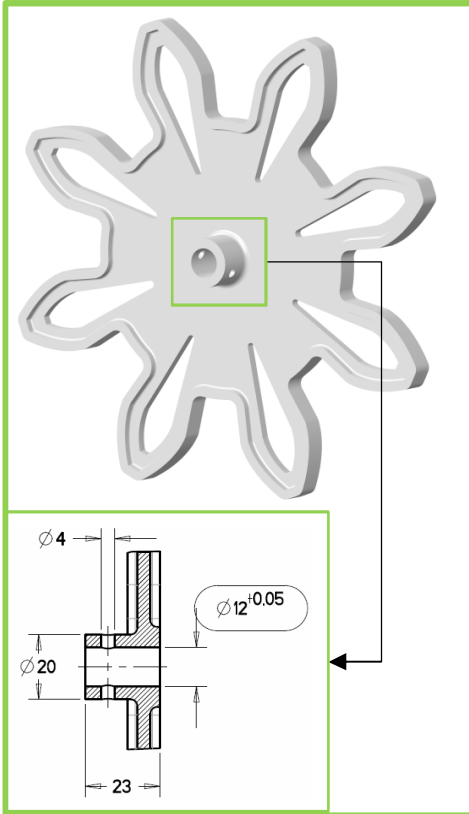
NOTE:
The movement refers to the action of the cam on contact 1-2 (NC). The microswitch have all changeover contacts.



LIMIT SWITCHES

Pinion type
 PA66 material

16020051	M20 - Z12	<input type="checkbox"/>
16020052	M14 - Z17	<input type="checkbox"/>
16020053	M22 - Z10	<input type="checkbox"/>
16020054	M18 - Z12	<input type="checkbox"/>
16020055	M16 - Z13	<input type="checkbox"/>
16020056	M10 - Z17	<input type="checkbox"/>
16020057	M6 - Z13	<input type="checkbox"/>
16020058	M20 - Z8	<input type="radio"/>
16020059	M16 - Z10	<input type="radio"/>
16020060	M12 - Z12	<input type="radio"/>
16020061	M14 - Z10	<input type="radio"/>
16020062	M12 - Z10	<input type="radio"/>
16020063	M8 - Z12	<input type="radio"/>
16020065	M6 - Z11	<input type="radio"/>
16020066	M5 - Z12	<input type="radio"/>



Note:

- "Water jet cut" with metal flange
- Moulded

FGR1/2/3: Oldham coupling

FGH

Drill and pin to the limit switch's shaft

Cam shapes

FGR1 - FGR3			FGR2	
Standard "A" (10°)	"B" (60°)	"C" (180°)	Standard "A" (10°)	"B" (15°)
16020081	16020097	16020094	11703015	11703019
		➤ on request available other versions		
"D" (opposite)	"E" (10 tips)			"C" (90°)
16020095	16020093			11703013

FGR1/3: Potentiometer / Encoder support versions

<p>16020015</p>	<p>16020016</p>	<p>16020017</p>
------------------------	------------------------	------------------------



General characteristics		FGR1	FGR2	FGR3
Markings		CE EAC	CE EAC	CE EAC
Case		self extinguishing V0 UL94	cast aluminium housing self extinguishing cover V0 UL94	self extinguishing V0 UL94
Ratio		012-033-050-075 100-150-200-400	012-033-050-100-200	1:8 to 1:460
Protection class IEC/EN 60529		IP65	IP65	IP66
Shaft type		steel	steel mounted on ball bearing	AISI 304 stainless steel mounted on ball bearing
Fixing type		base / flanged	base / flanged (FLG accessories)	base
Max n° of microswitch		4	6	4
Climate temperature	Operating	-25°C + 70°C	-25°C + 70°C	-40°C + 90°C
	Storage	-30°C + 70°C	-30°C + 70°C	-40°C + 90°C
Cable entry		M20 or M16 (max 4)	M20 (max 4 included)	M20 (max 3)
Microswitch cams		self-lubricating	self-lubricating	self-lubricating
Micrometric adjustment screw		zamak material	PA material	zamak material
Weight KG (approx)		0.75	1.1	1.5
Electrical characteristics		FGR1	FGR2	FGR3
Microswitch product ID		MFI.3 - Giovenzana line wheel drive control (long life)	MFI - Giovenzana line	MFI.3 - Giovenzana line wheel drive control (long life)
Standards		IEC/EN 61058-1, UL 1054	IEC/EN 61058-1, UL 1054	IEC/EN 61058-1, UL 1054
Markings		CE cRU[®] US EAC	CE cRU[®] US EAC	CE cRU[®] US EAC
Rated insulation voltage [Ui]		250V	250V	250V
Rated thermal current [Ith]		8A	8A	8A
Rated operating current	Resistive load	8A - 250Vac	8A - 250Vac	8A - 250Vac
	Inductive load	3A - 250Vac	3A - 250Vac	3A - 250Vac
Positive opening contacts				
Contact block	function	1NC+1NO changeover fast trigger	1NC+1NO changeover fast trigger	1NC+1NO changeover fast trigger
	contact	silver plated / self cleaning	silver plated / self cleaning	silver plated / self cleaning
	connections	fast-on 0.8x6.3mm	fast-on 0.8x6.3mm	fast-on 0.8x6.3mm
Options		FGR1	FGR2	FGR3
Rear shaft		available	available	available
Potentiometer		2.5 / 5 / 10kΩ (*)	-	according customer request
Encoder		-	-	according customer request
Cam's shape / Pinion available		5 / 15	3 / 15	5 / 15

(*) Standard potentiometers: available other versions on request



Position Limit switches

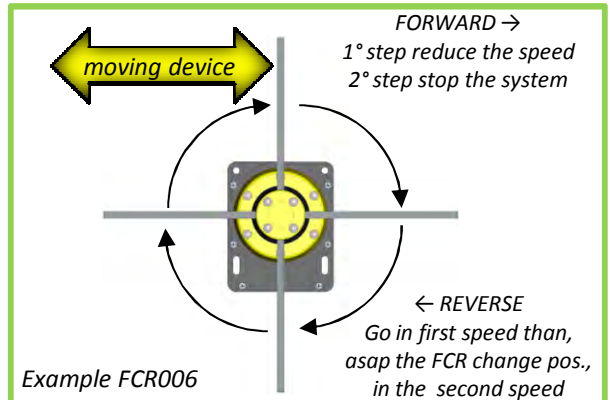
page 36 to 42

The position (rotary-angular) limit switch is used to control several handling system:

- sophisticated crane system:
the unit controls power operating system (ex. PLC) and allows the crane to slow-down and/or to stop running.
 - hoist:
the unit is used to stop the hoist running whenever it reaches a “limit” position
- Different combinations available for all standard system.
 - Customization available on request.

How it works?

As an example, an FCR006 is typically used on a sophisticated crane system. Its function is to control the crane as it approaches operational limits in the following sequence:
With the crane moving forward the end position, the FCR006 controls the crane’s speed reducing the speed (first step) then stopping the crane (second step) .
In this position the forward command is no longer enabled.
Only the reversing command is enabled for operation, in the first speed than in the second speed.

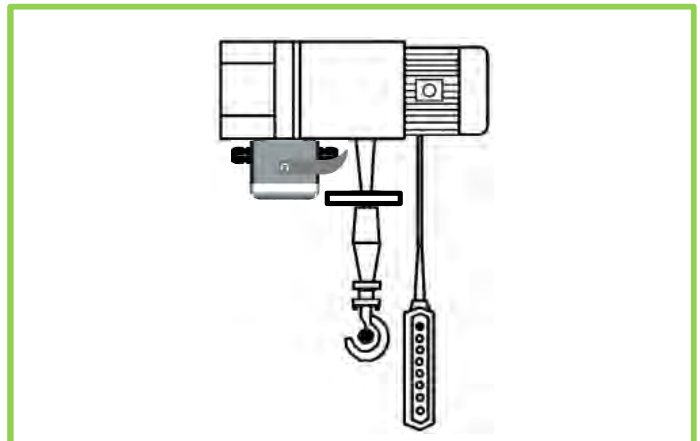


LIMIT SWITCHES



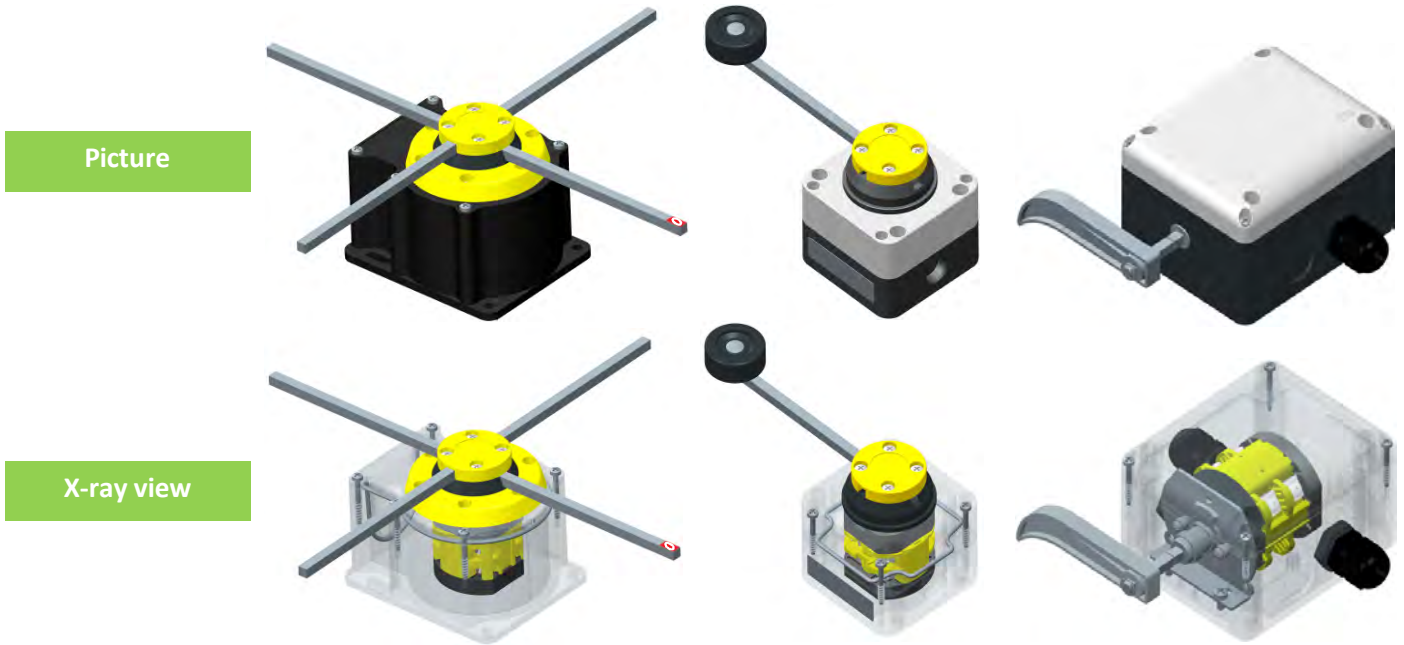
Picture shows a FCR working on a crane system

Picture shows a FCP working on a hoist





Line	FCR	FFH	FCP
Page	38	40	41



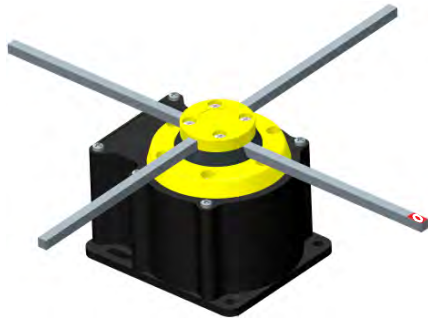
LIMIT SWITCHES

Characteristics

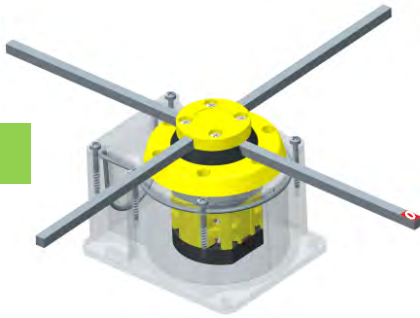
Standards	IEC/EN 60947/3	IEC/EN 60947/3	IEC/EN 60947/3, EN81-1	
Case	self extinguishing housing V0 UL94	self extinguishing cover V0 UL94	self extinguishing housing V0 UL94	
Protection class IEC/EN 60529	IP65	IP65	IP65	
Cam switch	enclosed thermal current [Ithe]	16A	20A	40A
	rated insulation voltage [Ui]	690V	690V	690V
	product ID	P016 Giovenzana line	PX20 Giovenzana line	CX40 Giovenzana line
	contacts	double gap positive opening	double gap positive opening	double gap positive opening
	markings			
Cable entry	N° 1 dia. 22.5mm	1xM20 + 1xM16	M20 (max 8)	
Versions	- single or double speed motor configuration - 3,4 or 4 with mechanical stop positions	single speed motor configuration (other configuration on request)	two pole on-off switch (other configuration on request)	
Notes	fully adjustable aluminium rods □ 6x300mm with "0" indicator - reinforced mechanical stop	- fully adjustable metallic rods □ 6x120mm - reinforced mechanical stop - rubber covering wheel	- reinforced mechanical stop	



Picture



X-ray view



contact open
 contact close

Versions

FCR001	single speed	<p>3 positions with mechanical interlock (•)</p>	<table border="1"> <tr><td>3-4</td><td></td><td></td><td></td></tr> <tr><td>1-2</td><td></td><td></td><td></td></tr> <tr><td>Cont. Pos.</td><td>-90°</td><td>0</td><td>+90°</td></tr> </table>	3-4				1-2				Cont. Pos.	-90°	0	+90°														
3-4																													
1-2																													
Cont. Pos.	-90°	0	+90°																										
FCR002	single speed	<p>3 positions with mechanical interlock (•)</p>	<table border="1"> <tr><td>7-8</td><td></td><td></td><td></td></tr> <tr><td>5-6</td><td></td><td></td><td></td></tr> <tr><td>3-4</td><td></td><td></td><td></td></tr> <tr><td>1-2</td><td></td><td></td><td></td></tr> <tr><td>Cont. Pos.</td><td>-90°</td><td>0</td><td>+90°</td></tr> </table>	7-8				5-6				3-4				1-2				Cont. Pos.	-90°	0	+90°						
7-8																													
5-6																													
3-4																													
1-2																													
Cont. Pos.	-90°	0	+90°																										
FCR003	single speed	<p>4 positions NO mechanical interlock</p>	<table border="1"> <tr><td>3-4</td><td></td><td></td><td></td><td></td></tr> <tr><td>1-2</td><td></td><td></td><td></td><td></td></tr> <tr><td>Cont. Pos.</td><td>0</td><td>90°</td><td>180°</td><td>270°</td></tr> </table>	3-4					1-2					Cont. Pos.	0	90°	180°	270°											
3-4																													
1-2																													
Cont. Pos.	0	90°	180°	270°																									
FCR004	single speed	<p>4 positions NO mechanical interlock</p>	<table border="1"> <tr><td>-</td><td>empty</td><td></td><td></td><td></td></tr> <tr><td>5-6</td><td></td><td></td><td></td><td></td></tr> <tr><td>-</td><td>empty</td><td></td><td></td><td></td></tr> <tr><td>1-2</td><td></td><td></td><td></td><td></td></tr> <tr><td>Cont. Pos.</td><td>0</td><td>90°</td><td>180°</td><td>270°</td></tr> </table>	-	empty				5-6					-	empty				1-2					Cont. Pos.	0	90°	180°	270°	
-	empty																												
5-6																													
-	empty																												
1-2																													
Cont. Pos.	0	90°	180°	270°																									
FCR005	single speed	<p>4 positions NO mechanical interlock</p>	<table border="1"> <tr><td>-</td><td>empty</td><td></td><td></td><td></td></tr> <tr><td>5-6</td><td></td><td></td><td></td><td></td></tr> <tr><td>-</td><td>empty</td><td></td><td></td><td></td></tr> <tr><td>1-2</td><td></td><td></td><td></td><td></td></tr> <tr><td>Cont. Pos.</td><td>0</td><td>90°</td><td>180°</td><td>270°</td></tr> </table>	-	empty				5-6					-	empty				1-2					Cont. Pos.	0	90°	180°	270°	
-	empty																												
5-6																													
-	empty																												
1-2																													
Cont. Pos.	0	90°	180°	270°																									
FCR006	two speeds	<p>4 positions with mechanical interlock (•)</p>	<table border="1"> <tr><td>7-8</td><td></td><td></td><td></td><td></td></tr> <tr><td>5-6</td><td></td><td></td><td></td><td></td></tr> <tr><td>3-4</td><td></td><td></td><td></td><td></td></tr> <tr><td>1-2</td><td></td><td></td><td></td><td></td></tr> <tr><td>Cont. Pos.</td><td>-180°</td><td>-90°</td><td>0</td><td>+90°</td><td>+180°</td></tr> </table>	7-8					5-6					3-4					1-2					Cont. Pos.	-180°	-90°	0	+90°	+180°
7-8																													
5-6																													
3-4																													
1-2																													
Cont. Pos.	-180°	-90°	0	+90°	+180°																								

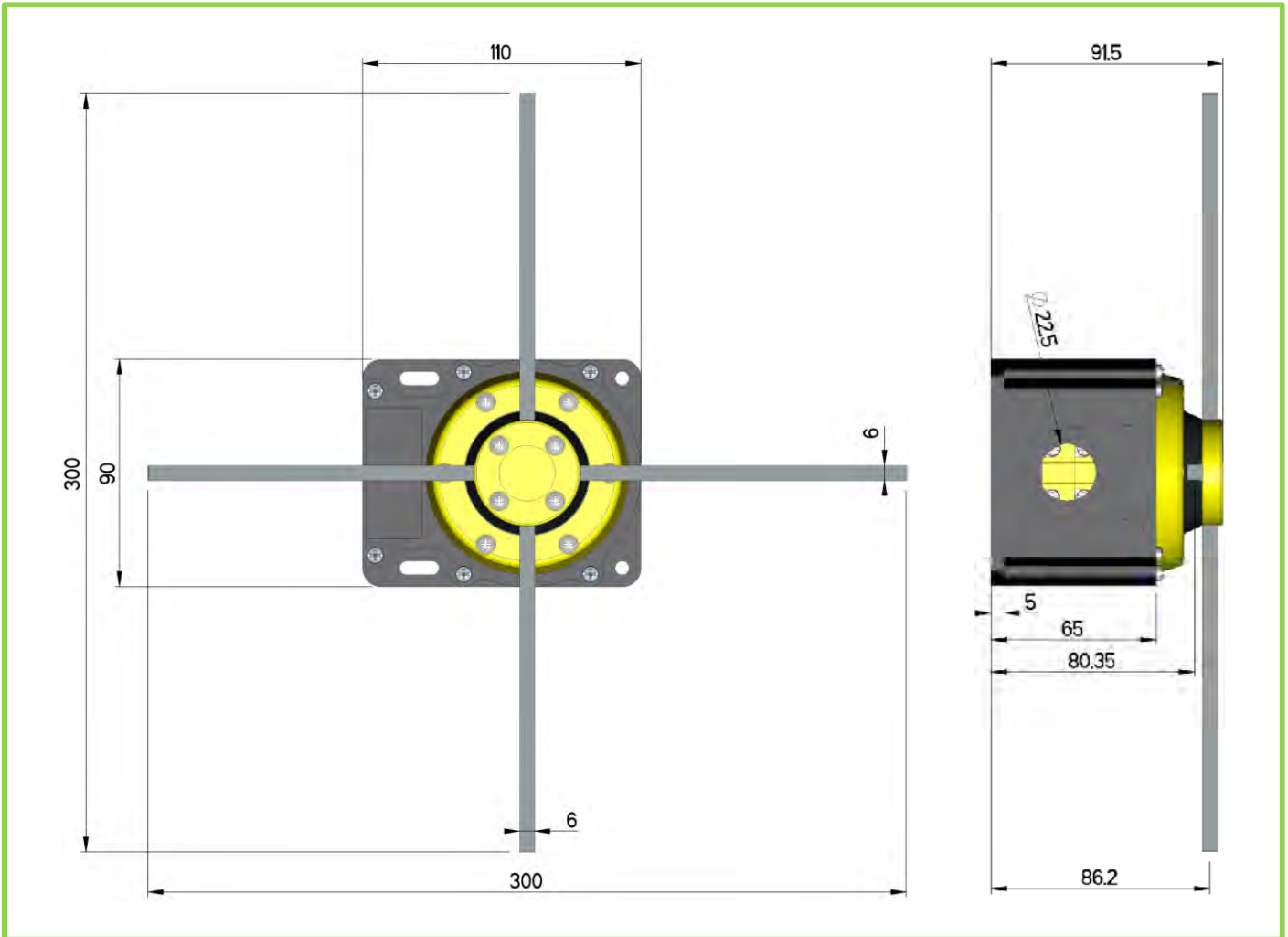
Characteristics

Standards	IEC/EN 60947/3	
Case	self extinguishing housing V0 UL94	
Protection class IEC/EN 60529	IP65 (double insulation)	
Cam switch	enclosed thermal current [I _{the}]	16A
	rated insulation voltage [U _i]	690V
	product ID	P016 Giovenzana line
	contacts	double gap positive opening
markings		
Cable entry	N° 1 dia. 22.5mm	
Versions	- single or double speed motor configuration - 3,4 or 4 with mechanical stop positions	
Notes	fully adjustable aluminium rods □ 6x300mm with "0" indicator - reinforced mechanical stop	

Other versions available on request →

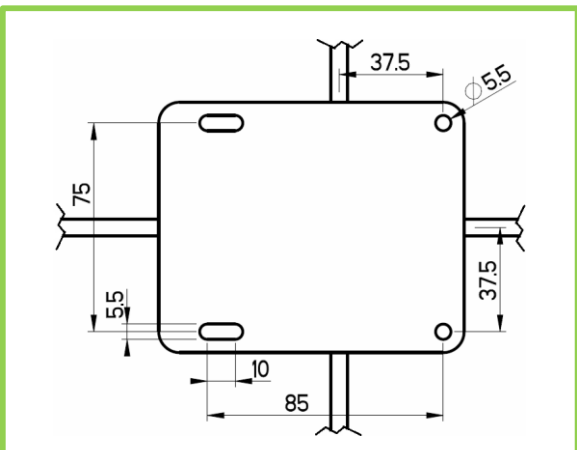


Dimensions



LIMIT SWITCHES

Fixing holes

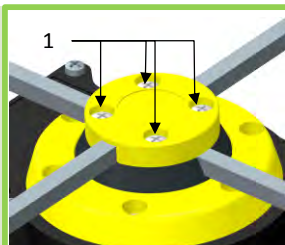


Section view

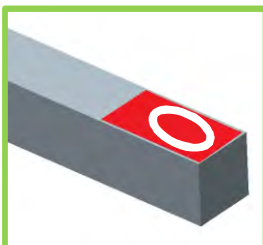


Rods adjusting guide

- I. Loosen the four screws (1)
- II. Adjust the rods
- III. Tighten the four screws (1)

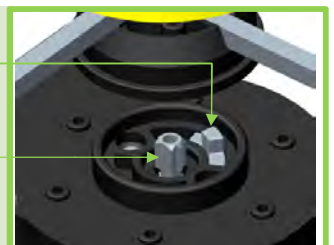


"ZERO" indicator



Reinforced mechanical stop insert

- metallic stop insert
- metallic cam's control shaft





Picture



X-ray view

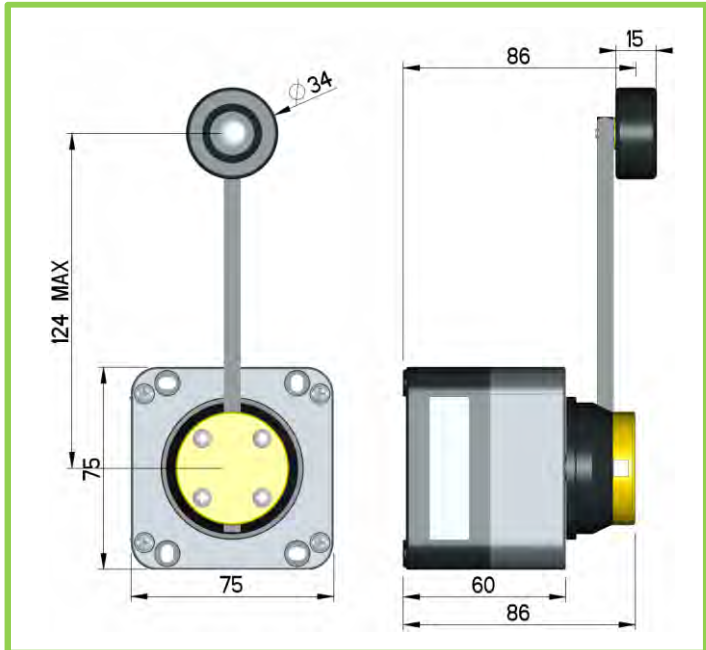
□ contact open
■ contact close

Versions

FFH2C	single speed	<p>3 positions automatic return to "0" with mechanical interlock (●)</p>	<table border="1"> <tr> <td>3-4</td> <td>□</td> <td>■</td> <td>□</td> </tr> <tr> <td>1-2</td> <td>□</td> <td>■</td> <td>□</td> </tr> <tr> <td>Cont. Pos.</td> <td>-65°</td> <td>0</td> <td>+65°</td> </tr> </table>	3-4	□	■	□	1-2	□	■	□	Cont. Pos.	-65°	0	+65°
3-4	□	■	□												
1-2	□	■	□												
Cont. Pos.	-65°	0	+65°												
FFH2C-1	single speed	<p>3 positions automatic return to "0" with mechanical interlock (●)</p>	<table border="1"> <tr> <td>3-4</td> <td>□</td> <td>■</td> <td>□</td> </tr> <tr> <td>1-2</td> <td>□</td> <td>■</td> <td>□</td> </tr> <tr> <td>Cont. Pos.</td> <td>-65°</td> <td>0</td> <td>+65°</td> </tr> </table>	3-4	□	■	□	1-2	□	■	□	Cont. Pos.	-65°	0	+65°
3-4	□	■	□												
1-2	□	■	□												
Cont. Pos.	-65°	0	+65°												

↑ Other versions available on request

Dimensions



Characteristics

Standards	IEC/EN 60947/3	
Case	self extinguishing housing V0 UL94	
Protection class IEC/EN 60529	IP65 (double insulation □)	
Cam switch	enclosed thermal current [Ithe]	20A
	rated insulation voltage [Ui]	690V
	product ID	PX20 Giovenzana line
	contacts	double gap positive opening ▶
	markings	
Cable entry	1xM20 + 1xM16	
Versions	single speed motor configuration (other configuration on request)	
Notes	-fully adjustable metallic rods □ 6x120mm - reinforced mechanical stop - rubber covering wheel	

Reinforced mechanical stop insert

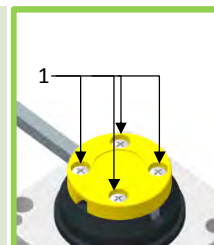


Section view

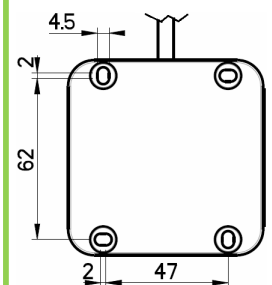


Rod adjusting guide

- I. Loosen the four screws (1)
- II. Adjust the rods
- III. Tighten the four screws (1)

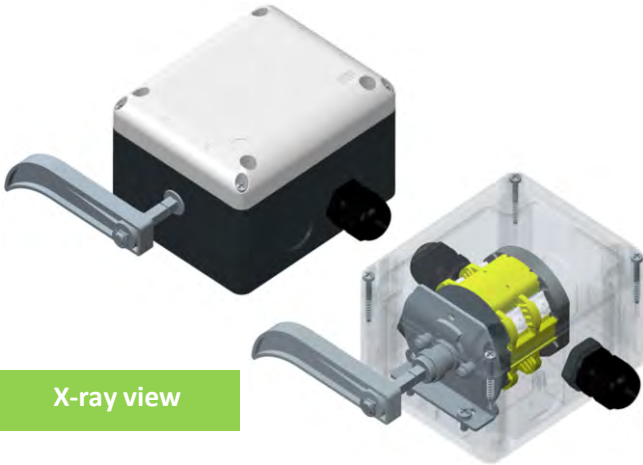


Fixing holes





Picture



contact open
 contact close

X-ray view

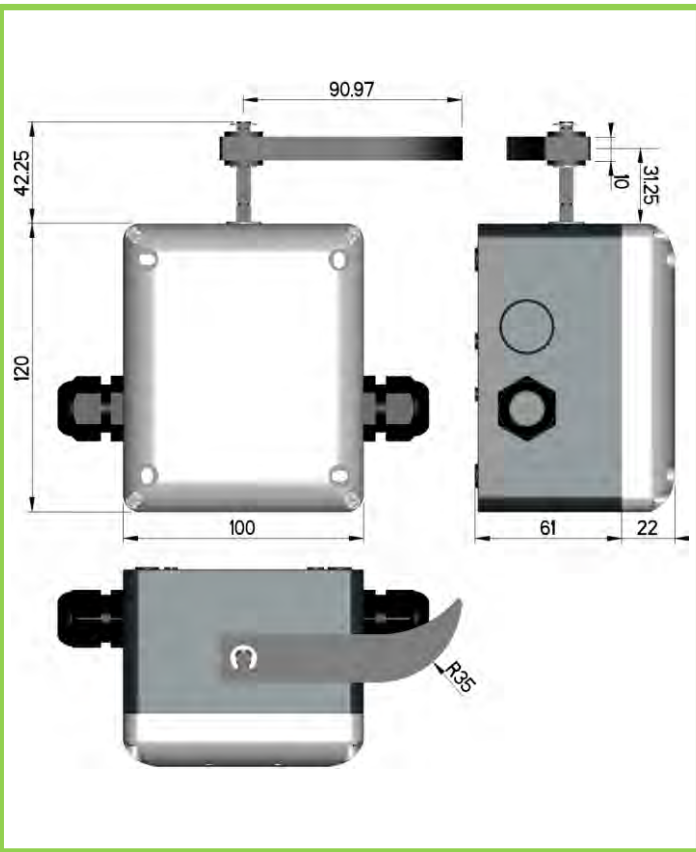
Versions

FCP245	single speed	<p>3 positions automatic return to "0" with mechanical interlock (●)</p>	<table border="1"> <tr> <td>3-4</td> <td><input checked="" type="checkbox"/></td> <td><input type="checkbox"/></td> </tr> <tr> <td>1-2</td> <td><input type="checkbox"/></td> <td><input checked="" type="checkbox"/></td> </tr> <tr> <td>Cont. Pos.</td> <td>-50°</td> <td>0</td> <td>+50°</td> </tr> </table>	3-4	<input checked="" type="checkbox"/>	<input type="checkbox"/>	1-2	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Cont. Pos.	-50°	0	+50°
			3-4	<input checked="" type="checkbox"/>	<input type="checkbox"/>								
1-2	<input type="checkbox"/>	<input checked="" type="checkbox"/>											
Cont. Pos.	-50°	0	+50°										
<p>↑ Other versions available on request</p>													

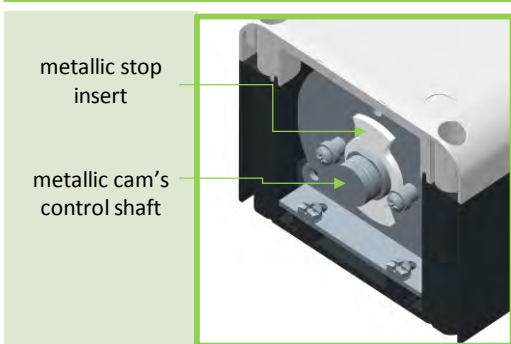
Characteristics

Standards	IEC/EN 60947/3	
Case	self extinguishing housing V0 UL94	
Protection class IEC/EN 60529	IP65 (double insulation)	
Cam switch	enclosed thermal current [I _{the}]	40A
	rated insulation voltage [U _i]	690V
	product ID	CX40 Giovanzana line
	contacts	double gap positive opening
	markings	
Cable entry	M20 (max 8)	
Versions	two pole on-off switch (other configuration on request)	
Notes	- reinforced mechanical stop	

Dimensions



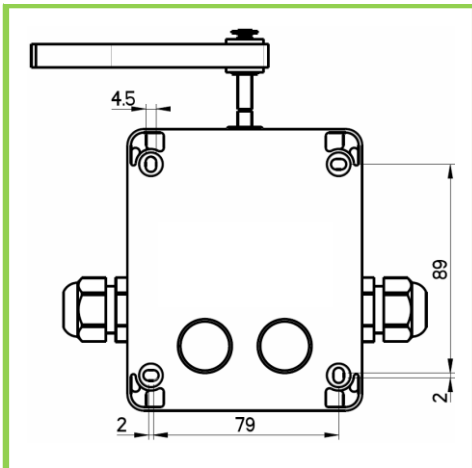
Reinforced mechanical stop insert



Section view



Fixing holes



LIMIT SWITCHES


LIMIT SWITCHES

General characteristics		FCR	FFH	FCP
Markings				
Standards		IEC/EN 60947/3	IEC/EN 60947/3	IEC/EN 60947/3
Case		self extinguishing housing V0 UL94	self extinguishing housing V0 UL94	self extinguishing housing V0 UL94
Protection class IEC/EN 60529		IP65 (double insulation)	IP65 (double insulation)	IP65 (double insulation)
Climate temperature	Operating	-25°C + 55°C		
	Storage	-30°C + 70°C		
Cable entry		N° 1 dia. 22.5mm	1xM20 + 1xM16	M20 (max 8)
Versions		- single or double speed motor configuration - 3,4 or 4 with mechanical stop positions	single speed motor configuration (other configuration on request)	two pole on-off switch (other configuration on request)
Notes		fully adjustable aluminium rods 6x300mm with "0" indicator - reinforced mechanical stop	- fully adjustable metallic rods 6x120mm - reinforced mechanical stop - rubber covering wheel	- reinforced mechanical stop
Weight KG (approx)		0.5	0.35	0.55
Electrical characteristics		FCR	FFH	FCP
Cam switch product ID		P016 Giovenzana line	PX20 Giovenzana line	CX40 Giovenzana line
Standards		IEC/EN 60947/3 – UL508	IEC/EN 60947/3 – UL508	IEC/EN 60947/3 – UL508
Markings				
Enclosed thermal current [Ithe]		16A	20A	40A
Rated insulation voltage [Ui]		690V	690V	690V
Frequency		50/60 Hz	50/60 Hz	50/60 Hz
Rated operating current	AC21A-AC22A	16A - 690Vac	20A - 690Vac	40A - 690Vac
	AC23A 3ph 230V	13A - 4kW	16A - 5kW	35A - 11kW
	AC23A 3ph 400V	13A - 7.5kW	16A - 9kW	32A – 18.5kW
Rated short circuit withstand current (gG 20A - 690V)		5kA	5kA	10kA
Contacts		double gap positive opening	double gap positive opening	double gap positive opening
Connections	caliber	A3 (EN60947-1)	A3 (EN60947-1)	A5 (EN60947-1)
	screw size	M3.5	M3.5	M4
	max torque	0.8 Nm (EN60947-1) 7.5 lb.in. (UL508)	0.8 Nm (EN60947-1) 7.5 lb.in. (UL508)	1.2 Nm (EN60947-1) 10.6 lb.in. (UL508)
Connectable section	flexible or solid min/MAX	1x0.75/4 – 2x0.75/2.5	1x0.75/4 – 2x0.75/2.5	2x2.5/10
	flexible or solid AWG	16-12	16-12	14-6



Slip rings page 43

Slip rings are used to transfer electrical signal and power energy between stator and a rotor or vice versa. They are comprised of 3 or more graphite or metal contacts, mounted on the steel shaft. The contact brushes are all replaceable and are in graphite on Prisma and Navale series in copper on Scudo series.

- OPERATING TIME:** The operating life of a slip ring depends on the rotation speed and the dynamic stability.
- CURRENT RATING:** Capacity can be increasing by connecting in series or parallel two or more slip rings.
- BRUSHES IN GRAPHITE (Prisma and Navale line):** They are mainly used on low-medium speed applications. They are most used when more circuits are required as they ensure a very good connection, as they are resistant to both low and high temperatures and aggressive environments with chemicals and/or humidity present.
- SPEED OPERATION:** Max rotation speed 20 turns 1'.

Picture	N° rings	Code	Dimensions	"A"	Technical data
	3	30402091		180	✓ Rated insulation voltage Ui 690V
	4	30402092		195	✓ Rated operating voltage Ue 500Vac
	5	30402093		210	✓ Rated operating current 20A Intermittent working 30A.
	6	30402094		225	✓ IP51 close frame version with protection rated IEC/EN60529
	7	30402095		240	✓ Modularity: from 3 up to 15 80 mm Ø rings
	8	30402096		255	✓ Copper brushes
	9	30402097		270	✓ 42 mm Ø shaft
	10	30402098		285	✓ Pvc Ø147 mm housing and terminals cover
	11	30402099		300	✓ Ambient temperature: +60°C/-30°C
	12	30402100		315	
	13	30402101		330	
	14	30402102		345	
	15	30402103		360	

available on request : Prisma line (open box), Navale line (aluminium housing) and spare parts (collectors, brushes etc etc..)

Warning horns page 43					Technical data	Dimensions	
Picture	Line	Supply	Consumption	Code	<ul style="list-style-type: none"> ✓ Continuous operation ✓ Frequency: G75: 50 Hz G100: 300÷350 Hz ✓ Pressure (at 1 meter): G75: 88 dB (A) G100: 93.5 dB (A) ✓ Wall mounted ✓ Protection class IEC/EN 60529: G75: IP30 G100: IP65 double insulated <input type="checkbox"/> ✓ Terminal type: G75: 3 way terminal (2+T) G100: 2 way terminal 		
	G75	24 AC	190 mA	G75.24			
	G75	48 AC	80 mA	G75.48			
	G75	110 AC	28 mA	G75.110			
	G75	230 AC	20 mA	G75.230			
	G75	24 DC	40 mA	G75.24DC			
	G75	48 DC	-	G75.48DC			
		G100	24 AC	415 mA			G100.24
G100		48 AC	210 mA	G100.48			
G100		110 AC	90 mA	G100.110			
G100		230 AC	42 mA	G100.230			
Box							
G 75			11710009				
G100			11710010				

SLIP RINGS

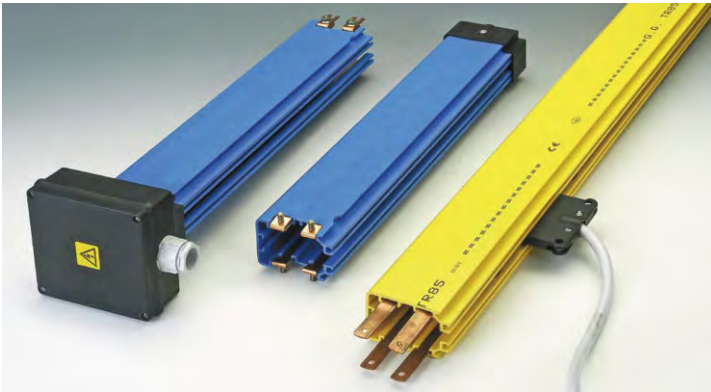
WARNING HORNS



Busbar system – trolley line TR60 and TR85 Giovenzana

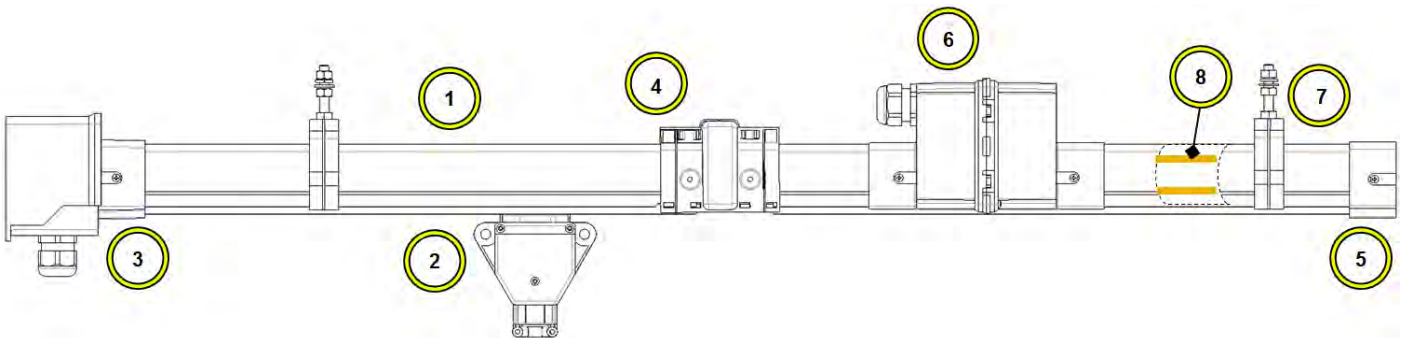
page 44 to 67

The “trolley system” series conductors rails are modern and safe system for energy and data 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 operator safety, easy of installation and reliability.



- ✓ **Worldwide installation:** complies with the relevant international standards.
- ✓ **Safety:** the conductors are protected and insulated by the busbar.
- ✓ **Extra quality materials:** self-extinguishing and high resistant strenght.
- ✓ **Easy & Fast installation:** only a simple “click” (NO tools required) is needed to mount almost all items.
- ✓ **Flexible:** indoor or outdoor installation, all components are designed to tolerate different climate status.
- ✓ **Expansion possibilities:** a lot of possibilities to expand or customize your line

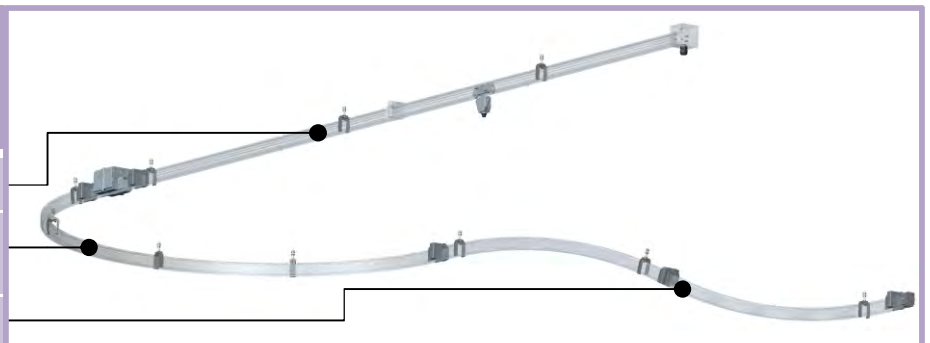
Typical line schematic



ID	Name	Function
①	Busbar	<i>PVC housing</i>
②	Trolley	<i>transmit the energy from the conductor to the load</i>
③	Feed	<i>connect power supply to the conductors</i>
④	Joint / Fixed point	<i>connect two busbars / create a fixed point</i>
⑤	End Cap	<i>close and protect the busbar end</i>
⑥	In-line feed	<i>avoid the voltage reduction</i>
⑦	Hanger clamp	<i>connect the busbar to the brackets</i>
⑧	Copper strip	<i>transmit the energy from the power supply to the trolley</i>

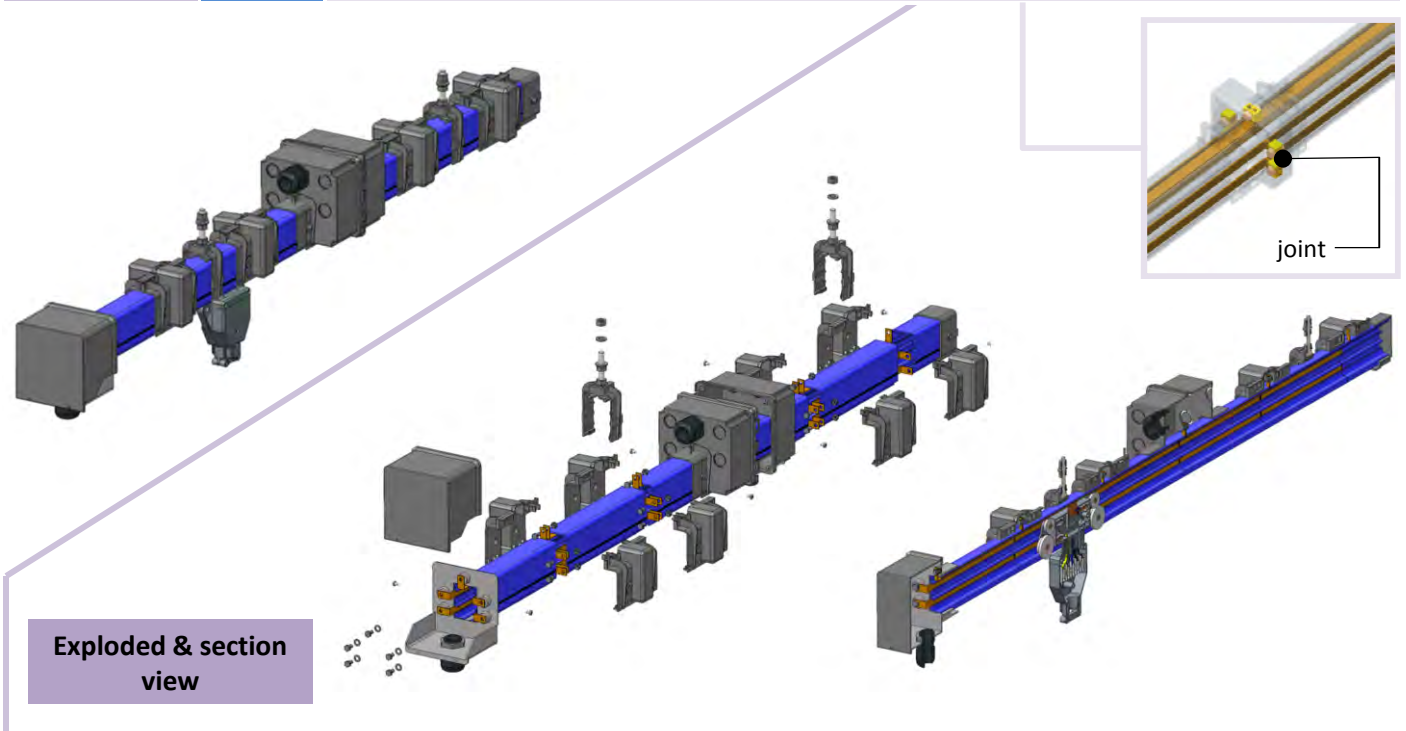
Busbar line example and module type

Straight :	3 or 4 meter module
90° curve	standard radius available or customized radius on request
Height drop	available on request



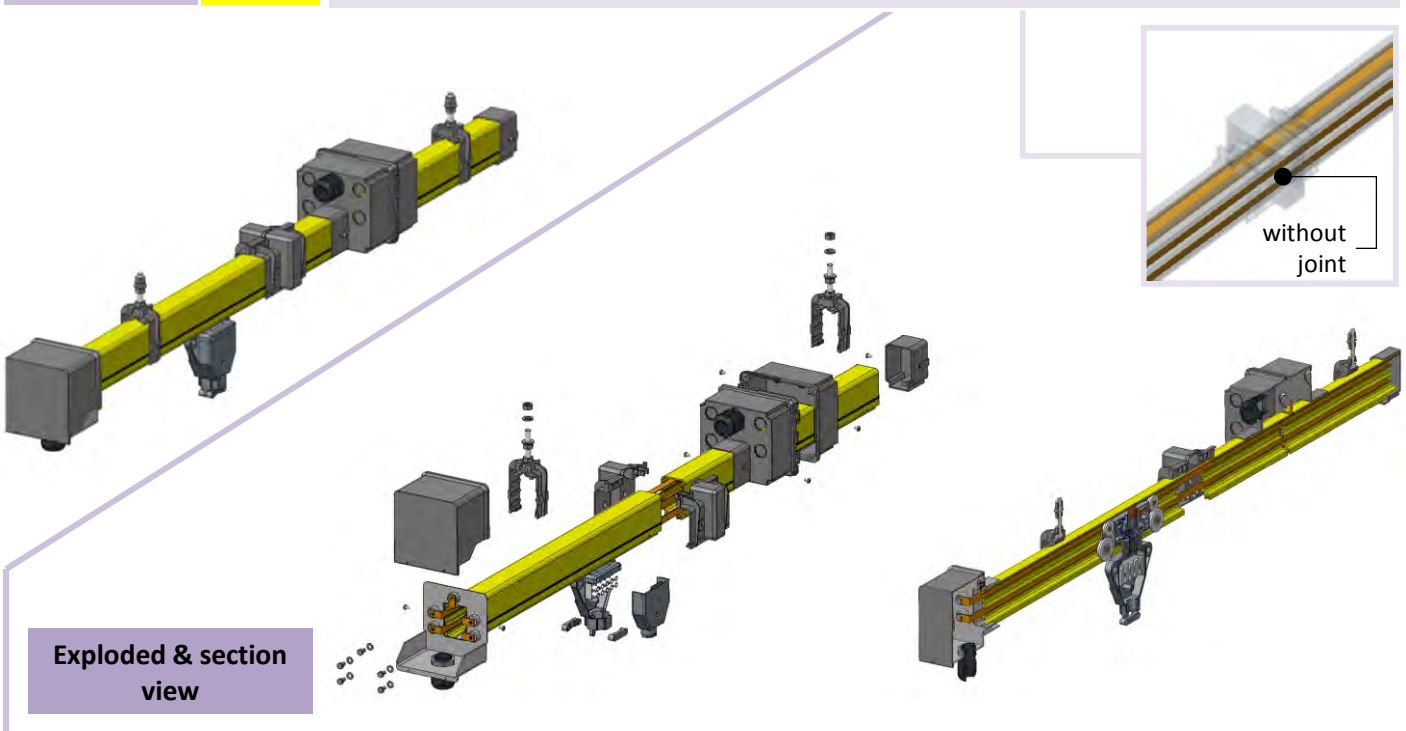
Versions

Blue colour **PRE-MOUNTED CONDUCTORS:** the conductors are already inserted in the plastic casing.
very fast installation! Since the conductors are already inserted into the housing, it is only necessary to joint each section of the busbar.



Exploded & section view

Yellow colour **CONTINUOUS CONDUCTORS:** the conductors strip are pulled from a coil without joints into the already installed casing.
long life, minimal and constant voltage reduction! The absence of joints between the conductors permits a long life brushes, plus minimal deposit and ohmic resistance.

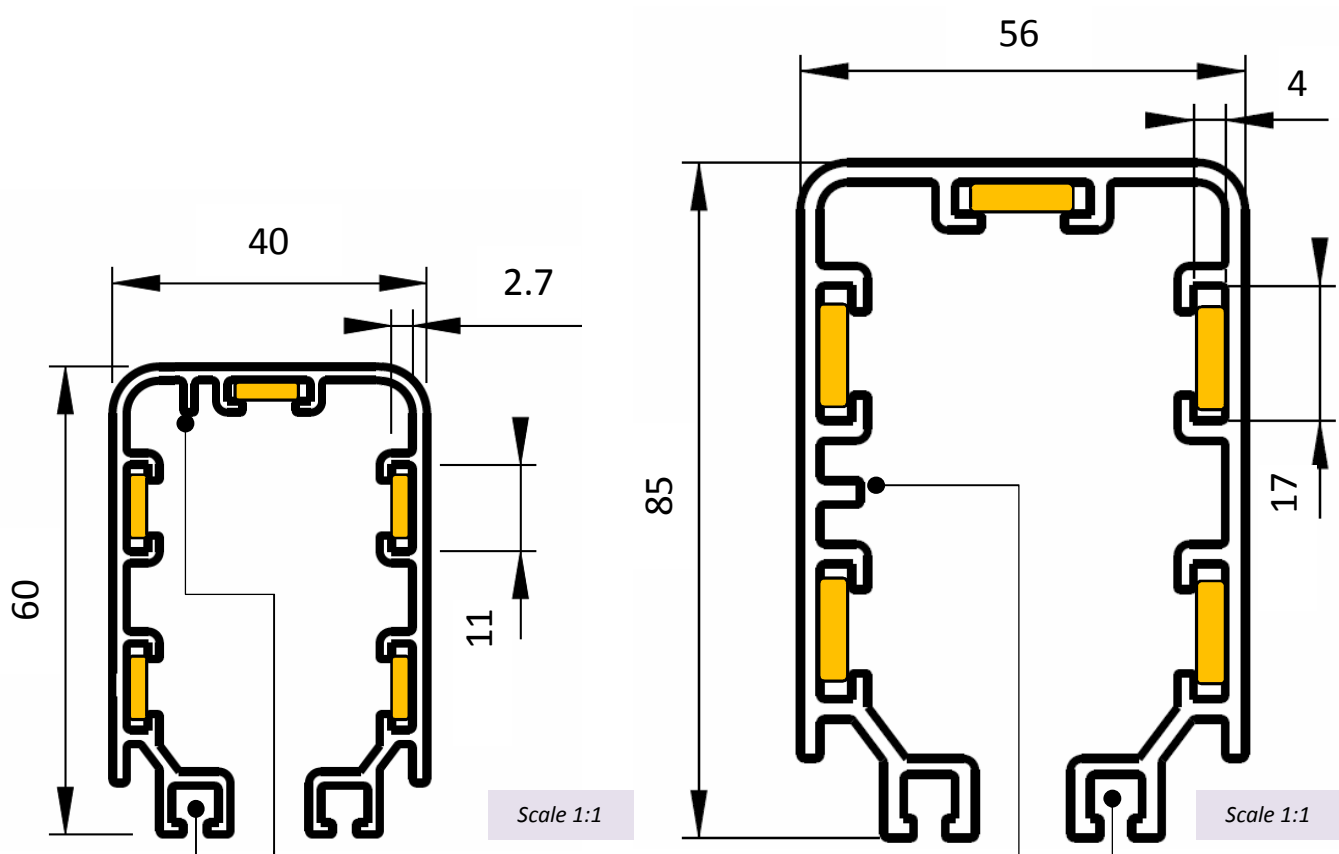


Exploded & section view



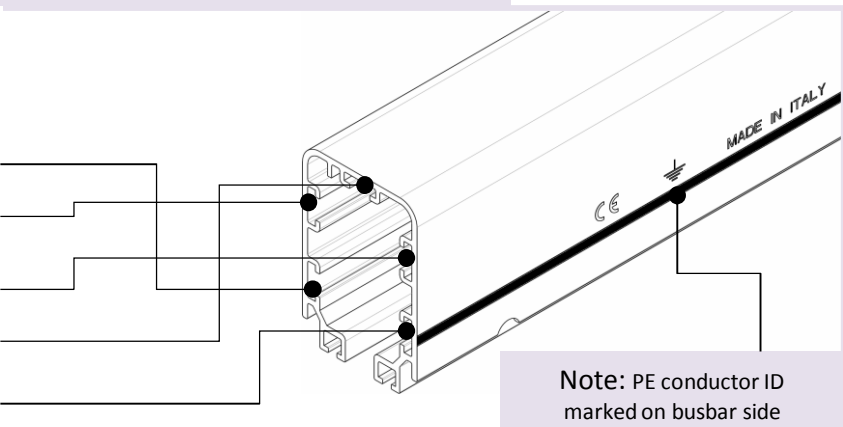
Size

<input type="checkbox"/> TR60	40 - 60 amp	<input type="checkbox"/> TR85	40 - 70 - 100 - 140 - 200 amp
--------------------------------------	-------------	--------------------------------------	-------------------------------



Conductor's slot (max 5)

Power supply	
Type	ID
Phase	R/L1
Phase	S/L2
Phase	T/L3
Neutral	N
Ground	PE



Note: PE conductor ID marked on busbar side



Line construction

- To decide the size of trolleys 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

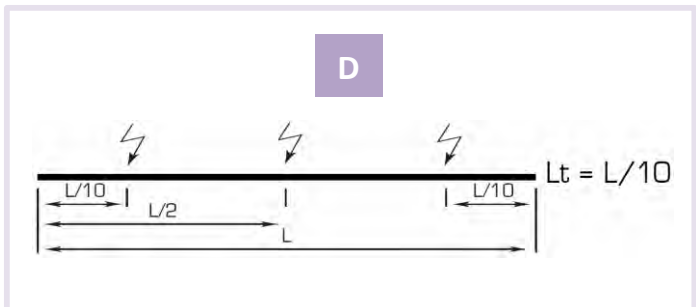
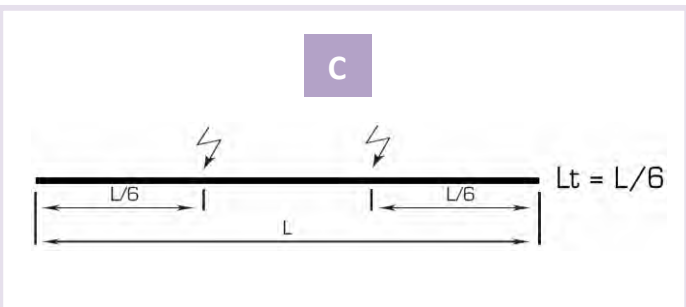
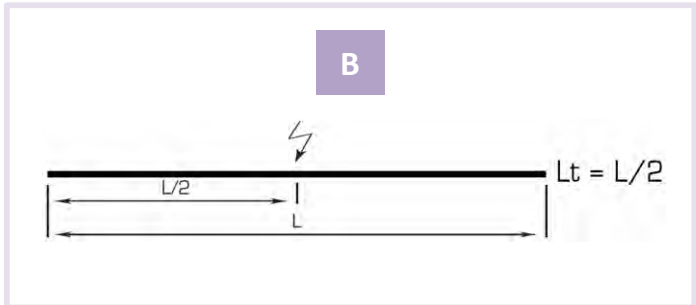
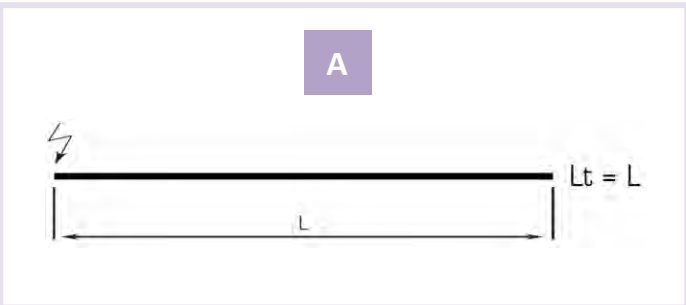
Voltage drop should not exceed 5% of rated voltage in normal operating service

Three phase alternate current:	Legenda:																								
$\Delta u = \sqrt{3} \times I \times L_t \times Z$ $\Delta u \% = \frac{\Delta u \times 100}{U}$	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 2px 5px;">Δu</td> <td style="padding: 2px 5px;">=</td> <td style="padding: 2px 5px;">voltage drop</td> <td style="padding: 2px 5px;">[V]</td> </tr> <tr> <td style="padding: 2px 5px;">$\Delta u\%$</td> <td style="padding: 2px 5px;">=</td> <td style="padding: 2px 5px;">voltage drop</td> <td style="padding: 2px 5px;">[%]</td> </tr> <tr> <td style="padding: 2px 5px;">I</td> <td style="padding: 2px 5px;">=</td> <td style="padding: 2px 5px;">current intensity</td> <td style="padding: 2px 5px;">[A]</td> </tr> <tr> <td style="padding: 2px 5px;">L_t</td> <td style="padding: 2px 5px;">=</td> <td style="padding: 2px 5px;">length of section</td> <td style="padding: 2px 5px;">[m]</td> </tr> <tr> <td style="padding: 2px 5px;">Z</td> <td style="padding: 2px 5px;">=</td> <td style="padding: 2px 5px;">impedence</td> <td style="padding: 2px 5px;">[Ω/m]</td> </tr> <tr> <td style="padding: 2px 5px;">U</td> <td style="padding: 2px 5px;">=</td> <td style="padding: 2px 5px;">voltage</td> <td style="padding: 2px 5px;">[V]</td> </tr> </table>	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]
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 length

A proper disposal of power feed points minimize the voltage reduction.
If "L" is the length of the line, "L_t" 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:

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

Legenda:

I_n	=	current consumption	[A]
P_u	=	power devices	[W]
η	=	devices performance	
U	=	operating voltage	[V]
cosφ	=	power factor	

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

Numbers of in-line lifting device	Lifting equipment in use			
	1st engine	2nd engine	3rd engine	4th engine
	max power engine (o)	decreasing power engine (o)		
1	X	X		
2	X	X	X	
3	X	X	X	
4	X	X	X	X
5	X	X	X	X
No. 2 lifting equipment operating simultaneously	X	X	X	X

(o) about η motors connected in parallel with rated current I_n', consider I_n = η • 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

$$I_a = K \cdot I_n$$

Starting current [I_a]
 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:

Numbers of in-line lifting device	Lifting equipment in use							
	1st engine		2nd engine		3rd engine		4th 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
No. 2 lifting equipment operating simultaneously	X		X			X		X



TR85 Blue line (pre-mounted conductors) 70 A – 4 conductors, order example:

To define line overall length is necessary to consider the standard modular length of the busbar, except the curves. These can be obtained with the 3 or 4 meters module.

The real length of the line will therefore be higher or lower than the theoretical length assumed or required.

Example of order and composition of a line according to the diagram:

① section 15,250m = 15.250mm

15.250-85 (power feed) = 15.165mm No.3 busbar 4m = 12.000mm		
No.3 busbar 4m = 12.000mm	TR85704C	3
No.1 busbar 3m = 3.000mm	TR85704C3	1
12.000mm+3.000mm = 15.000mm-15.165 = -165mm (lack)		

② section 8,750 = 8.750mm

No. 3 busbar 3m = 9.000m	TR85704C3	3
9.000mm – 8.750mm = +250mm (excess)		

③ section 7,0m = 7.000mm

15.250-290 (end cap) = 14.960mm No.3 busbar 4m = 12.000mm		
No.1 busbar 4m = 4.000mm	TR85704C	1
No.1 busbar 3m = 3.000mm	TR85704C3	1
7.000mm – 7.000mm = 0		

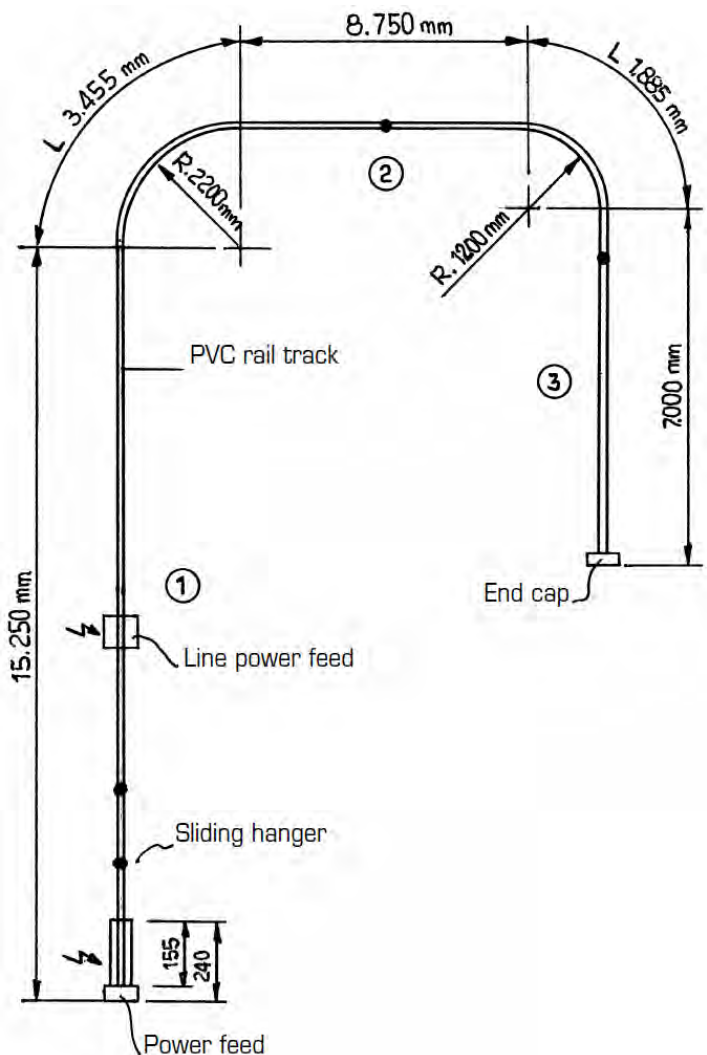
Total busbar length: ① + ② + ③ sector = 31m

Total busbar 4m module	TR85704C	4
Total busbar 3m module	TR85704C3	5

Curve		
Curve R.2.200mm = L 3.455mm	TR8529704D90	1
Curve R.1.200mm = L 1.885mm	TR8529704A90	1

Other items

Power feed from 40A to 140A	TR8503A4	1
End cap from 40A to 200A	TR8506A	1
Hanger clamp from 40A to 140A plastic material	TR8502 (o)	17
Hanger clamp from 40A to 140A steel material	TR8525 (o)	17
Joint from 40A to 200A plastic material (the quantity of the joints is equal to the quantity of the busbar +1)	TR8504 (o)	10
(o) add no. 2 hanger clamp for R.1200 to 1.800mm curve add no. 3 hanger clamp for R.2.200mm curve		





ID	Name	Function	Specifications		TR60				
					YELLOW line		BLUE line		
					40 A	60 A	40 A	60 A	
①	Busbar	PVC housing	3 meters module	4 conductors	TR6000 (w/o conductors)		TR60404C3	TR60604C3	
			3 meters module	5 conductors			TR60405C3	TR60605C3	
			4 meters module	4 conductors			TR60404C	TR60604C	
			4 meters module	5 conductors			TR60405C	TR60605C	
			Curved 90°	(□) R.1.2 meters 4 conductors			TR60A90	TR60404A90	TR60604A90
			Curved 90°	(□) R.1.5 meters 4 conductors			TR60B90	TR60404B90	TR60604B90
			Curved 90°	(□) R.1.8 meters 4 conductors			TR60C90	TR60404C90	TR60604C90
			Curved 90°	(□) R.2.2 meters 4 conductors			TR60D90	TR60404D90	TR60604D90
②	Trolley	transmit the energy from the conductor to the load		4 conductors	TR6004 (25 A)				
				5 conductors	TR6005 (25 A)				
③	Feed	connect power supply to the conductors		4 conductors	TR6003	TR6003A4			
				5 conductors		TR6003A5			
④	Joint / Fixed point	connect two busbars / create a fixed point	Joint		TR6001 (PA66)				
			Fixed point		TR6014				
⑤	End Cap	close the busbar end			TR6006	TR6006A			
⑥	In-line feed	avoid the voltage reduction		4 conductors	TR6008	TR6008A4			
				5 conductors		TR6008A5			
⑦	Hanger clamp	connect the busbar to the brackets	PA66 material		TR6002 (PA66) – TR6020 (steel) every 1.33 meter max				
⑧	Copper strip	transmit the energy from the power supply to the trolley			CS40	CS60	-(copper strip already inserted)		
-	Support bracket	support the line	Rail fixing	L 350mm	TR8550				
				L 500mm	TR8551				
				L700 mm	TR8552				
			Wall fixing	L 350mm	TR8555				
				L 500mm	TR8556				
-	Towing arm	fixed to the mobile device permits to tow the trolleys			TR8510				
-	Towing arm bracket	permits to the mobile device to tow the trolley			TR6007				
-	Double trolley support	connects two trolley in parallel to increase current rating			TR6013				
-	Gasket IP23	additional protection IP13>IP23			TR6012				
-	Copper strip trolley insertion	specific tool to insert easily the copper strip into the busbar			TR6011	-(copper strip already inserted)			
-	De-coil unit	unwind easily the copper rolls			TR8513	-(copper strip already inserted)			
-	Inspection joint	allow easy trolley's replacement			-	-			
-	Section joint	isolate two side track			-				
-	Brushes	spare parts			-	-	-	-	



(*) copper rolls already included in the busbar code
 (□) on request available other curve radius

TR85								
YELLOW line			BLUE line					
70 A	100 A	140 A	40 A	70 A	100 A	140 A	200 A	
-	-	-	TR85404C3	TR85704C3	TR851004C3	TR851404C3	TR852004C3	
-	-	-	TR85405C3	TR85705C3	TR851005C3	TR851405C3	TR852005C3	
TR85704 (*)	TR851004 (*)	TR851404 (*)	TR85404C	TR85704C	TR851004C	TR851404C	TR852004C	
TR85705 (*)	TR851005 (*)	TR851405 (*)	TR85405C	TR85705C	TR851005C	TR851405C	TR852005C	
TR8529A90			TR8529404A90	TR8529704A90	TR85291004A90	TR85291404A90	-	
TR8529B90 (R. 1400mm)			TR8529404B90 (R. 1400mm)	TR8529704B90 (R. 1400mm)	TR85291004B90 (R. 1400mm)	TR85291404B90 (R. 1400mm)	-	
TR8529C90			TR8529404C90	TR8529704C90	TR85291004C90	TR85291404C90	-	
TR8529D90			TR8529404D90	TR8529704D90	TR85291004D90	TR85291404D90	-	
TR8511 (35 A) / TR8518 (70 A) / TR8532 (70A articulated used for line with curved busbar)								
TR8512 (35 A) / TR8519 (70 A)								
TR8503			TR8503A4				TR8533A4	
TR8501 (PA66) / TR8524 (steel)			TR8503A5				TR8533A5	
TR8501 (PA66) / TR8524 (steel)			TR8504				TR8504	
TR8527.1								
TR8506			TR8506A				TR8506A	
TR8547								
TR8502 (PA66 not for 200 A) / TR8525 (steel) every 2meters max from 40 to 140 amp - every 1 meter max for 200 amp								
(*)	(*)	(*)	- (copper strip already inserted)	- (copper strip already inserted)	- (copper strip already inserted)	- (copper strip already inserted)	- (copper strip already inserted)	
TR8550								
TR8551								
TR8552								
TR8555								
TR8556								
TR8510								
TR6007								
TR8523								
TR8505								
TR8514			-				- (copper strip already inserted)	
TR8513			-				- (copper strip already inserted)	
TR8528			-				-	
TR8545			-				TR8545B	
TR8517 (35 A) / TR8520 (70 A)								


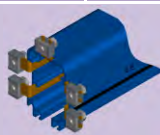
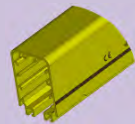
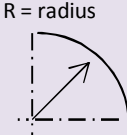








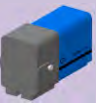




TR60

40 amp
60 amp

Dimensions see pag 58

Code table list page 1/2

Name	Specifications	N° conductors	Blue line <input type="checkbox"/> pre-mounted conductors		Yellow line <input type="checkbox"/> conductors to be pulled		min. qty	
			40 A	60 A	40 A	60 A		
Straight busbar	<input type="checkbox"/> Self-extinguishing material <input type="checkbox"/> One-way trolley insertion pin.  L = length	L meters					3-4 meters	
			3	4	TR60404C3	TR60604C3		-
		4	5	TR60405C3	TR60605C3	-		
			4	4	TR60404C	TR60604C		TR6000
90° curved busbar	<input type="checkbox"/> Self-extinguishing material <input type="checkbox"/> One-way trolley insertion pin.  R = radius	R meters					1	
			4	1.2	TR60404A90	TR60604A90		TR60A90
				1.5	TR60404B90	TR60604B90		TR60B90
				1.8	TR60404C90	TR60604C90		TR60C90
2.2	TR60404D90	TR60604D90		TR60D90				
Feed	 <input type="checkbox"/> Fast assembly <input type="checkbox"/> M25 cable gland equipped	4					1	
			5	TR6003A4		TR6003		
In-line feed	 <input type="checkbox"/> Fast assembly (+screw) <input type="checkbox"/> M25 cable gland equipped	4					1	
			5	TR6008A4		TR6008		
End cap	<input type="checkbox"/> Self tapping screw fix	4					1	
			5	TR6006A		TR6006		
Copper strip							(o)	
			CS40 40 A /10mm ²	CS60 60 A /15mm ²				

ENERGY & DATA transmission

Note (o) "copper strip quantity": will be supplied the total meters according busbar quantity



Dimensions see pag 58

TR60 40 amp
60 amp

Code table list page 2/2

Blue line
pre-mounted conductors

Yellow line
conductors to be pulled

min.
qty

Name	Picture	Specifications	note	Blue line		Yellow line		min. qty
				40 A	60 A	40 A	60 A	
Trolley 25 A		<input type="checkbox"/> 25A load current <input type="checkbox"/> Self-extinguishing mat. <input type="checkbox"/> Fully insulated <input type="checkbox"/> Metal graphite brushes <input type="checkbox"/> One-way insertion pin <input type="checkbox"/> Easy cable wiring	4 conductors			TR6004		1
			5 conductors			TR6005		1
Double trolley support		<input type="checkbox"/> Connects two trolleys in parallel to increase current rating				TR6013		1
Hanger clamp		<input type="checkbox"/> Fast connection <input type="checkbox"/> Every 1.33 meters MAX 	PA66 material			TR6002		1
			Steel material			TR6020		1
Joint		<input type="checkbox"/> Fast assembly 				TR6001		1
Fixed point		<input type="checkbox"/> Fast assembly 				TR6014		1
Towing arm		Fixed to the mobile device permits to tow the trolley <input type="checkbox"/> Galvanized steel material				TR8510		1
Towing arm bracket		Fixed to the trolley permits to the mobile device to tow the trolley <input type="checkbox"/> Painted black steel material				TR6007		1
Gasket IP23		Additional prot. IP13>IP23 <input type="checkbox"/> PVC material <input type="checkbox"/> Resistance to cold -30° <input type="checkbox"/> Stretching 340% <input type="checkbox"/> Hardness shore A 81				TR6012		(●)
Strip insertion trolley		Specific tool to easily insert the copper strip into the busbar			-		TR6011	1
De-coil unit		Specific tool to easily unwind the copper rolls			-		TR8513	1

Note (●) "gasket IP23 quantity": (for order please consider twice the length of the line)



TR85

40-70-100-140-200 amp

Dimensions see pag 62

Code table list
page 1/2

Blue line
pre-mounted conductors

Yellow line
conductors to be pulled

min.
qty

Name	Specifications	N° conductors	40 A	70 A	100 A	140 A	200 A	70 A	100 A	140 A			
Straight busbar	<input type="checkbox"/> Self-extinguishing material <input type="checkbox"/> One-way trolley insertion pin. <p>L = lenght</p>	L meters						<p>copper strip rolls already included in busbar code</p>			3-4 meters		
			3	4	TR85404C3	TR85704C3	TR851004C3	TR851404C3	TR852004C3	-			
				5	TR85405C3	TR85705C3	TR851005C3	TR851405C3	TR852005C3	-			
			4	4	TR85404C	TR85704C	TR851004C	TR851404C	TR852004C	TR85704		TR851004	TR851404
				5	TR85405C	TR85705C	TR851005C	TR851405C	TR852005C	TR85705		TR851005	TR851405
90° curved busbar	<input type="checkbox"/> Self-extinguishing material <input type="checkbox"/> One-way trolley insertion pin. <p>R = radius</p>	R meters									1		
			4	1.2	TR8529404A90	TR8529704A90	TR85291004A90	TR85291404A90	-	TR8529A90			
				1.4	TR8529404B90	TR8529704B90	TR85291004B90	TR85291404B90	-	TR8529B90			
				1.8	TR8529404C90	TR8529704C90	TR85291004C90	TR85291404C90	-	TR8529C90			
				2.2	TR8529404D90	TR8529704D90	TR85291004D90	TR85291404D90	-	TR8529D90			
Feed	<input type="checkbox"/> M40 cable gland equipped 									1			
			4	TR8503A4			TR8533A4	TR8503					
			5	TR8503A5			TR8533A5						
In-line feed	<input type="checkbox"/> Pg29 cable gland equipped (not mounted)										1		
End cap	<input type="checkbox"/> Self-tapping screw fixing									1			
			TR8506A				TR8506						
Joint													
			TR8504 (PA66)				TR8501 (PA66) – TR8524 (steel)						
Section joint	<input type="checkbox"/> N°2 Pg29 cable gland equipped <input type="checkbox"/> Insulating strip bars 									1			
			TR8545B				TR8545						



TR85

40-70-100-140-200 amp

Dimensions see pag 62

Code table list
page 2/2

Blue line
pre-mounted conductors

Yellow line
conductors to be pulled

min.
qty

Name	Picture	Specifications	Note	Blue line					Yellow line			min. qty	
				40 A	70 A	100 A	140 A	200 A	70 A	100 A	140A		
35 A trolley		<input type="checkbox"/> 35 or 70 A load current <input type="checkbox"/> Self-extinguishing material <input type="checkbox"/> Fully insulated	4 conductors	TR8511									1
				TR8512									
70 A trolley		<input type="checkbox"/> Metal graphite brushes <input type="checkbox"/> One-way insertion pin <input type="checkbox"/> Complete of 1.5m cable CEI 20-22 NPI	4 conductors	TR8518 – TR8532 (articulated used for line with curved busbar)									1
				5 conductors	TR8519								
Double trolley support		<input type="checkbox"/> Connects two trolleys in parallel to increase current rating			TR8523								
Hanger calmp		<input type="checkbox"/> Fast connection <input type="checkbox"/> Every 2 meters MAX from 40 to 140 amp <input type="checkbox"/> Every 1 meter MAX for 200A	Pa66 material	TR8502 (not for 200 A)									1
			Steel material	TR8525									
Fixed point				TR8527.1									1
Gasket IP23		Additional prot. IP13>IP23 <input type="checkbox"/> PVC material <input type="checkbox"/> Resistance to cold: -30° <input type="checkbox"/> Stretching 340% <input type="checkbox"/> Hardness shore A 81		TR8505									(●)
Towing arm		Fixed to the mobile device permits to tow the trolley <input type="checkbox"/> Galvanized steel material		TR8510									1
Towing arm bracket		Fixed to the trolley permits to the mobile device to tow the trolley <input type="checkbox"/> Painted black steel material		TR6007									1
Inspection joint		With multiple trolleys allows easy maintenance or replacement of trolleys										TR8528	1
Strip insertion trolley		Specific tool to insert easily the copper into the busbar										TR8514	1
De-coil unit		Specific tool to easily unwind the copper rolls										TR8513	1
Brushes		Spare parts	35 A	TR8517									1
			70 A	TR8520									

Note (●) "gasket IP23 quantity": (for order please consider twice the length of the line)



Yellow line (conductors to be pulled)



NEED HELP?
Ask to our technical service

1 Fix the support bars



- TR60 max 1.33 meters
- TR85 from 40 A to 140 A max 2 meters
- TR85 200 A max 1 meters

2 Fix the hanger clamp



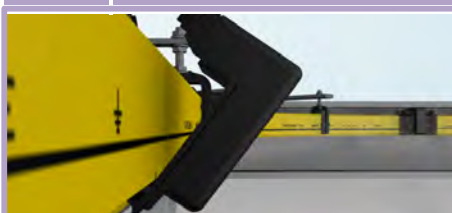
- set vertical positions moving up and down the bolt and tighten well

3 Fix the busbar



- NO tools required

4 Apply all the joints



- TR60 no tools required
- TR85 fixed by screws

5 Fix the copper strip to the insertion trolley



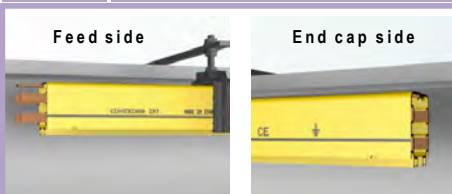
- Drill the copper strip if not already provided with holes and fix it to the insertion trolley

6 Pull the conductors



- Drag the trolley using a rope
- Repeat the operation for all the conductors
- Drag one conductor one by one

7 Cut the copper strip



- Cut the copper strip 50mm out from the busbar (line feed side)
- Cut the copper strip flush with the busbar (end cap side)

8 Prepare the trolleys



- TR60: to be cabled: wire the trolley respecting the connections shown
- TR85 Trolleys are already supplied with the wire

9 Insert the trolley



- One way insertion pin / press in the brushes
- PE brush corresponding to the continuous black line on the busbar side

10 Mount the feed

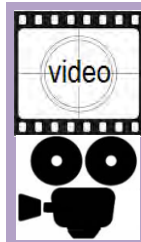


- Fix the case to the busbar
- Bend and drill (if not already drilled) the strips
- Cable the strips as shown/tight the cable gland

11 Mount the end cap



- Fix the end cap



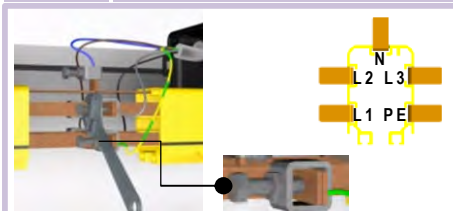
YouTube www.youtube.com/user/GiovenzanaInt

4a If needed mount the in-line feed



- Put both sides on the busbar
- Pull & bend the copper conductors
- Operation recommended to do before point 5

4b Cable the line



- Cable the strips as shown

4c Close & fix the cover



- Close and fix both cover
- Tighten the cable gland






NEED HELP?
 Ask to our technical service

Blue line (pre-mounted conductors)

1 Fix the support bars




- TR60 max 1.33 meters
- TR85 from 40 A to 140 A max 2 meters
- TR85 200 A max 1 meters

2 Fix the hanger clamp




- set vertical positions moving up and down the bolt and tighten well

3 Fix the busbar



- NO tools required

4 Fix each conductors strip




- Fast connection using dedicated clamps

5 Apply all the joints




- TR60 no tools required
- TR85 fixed by screws

6 Prepare the trolleys




- TR60: to be cabled: wire the trolley respecting the connections shown
- TR85 Trolleys are already supplied with the wire

7 Insert the trolley



- One way insertion pin / press in the brushes
- PE brush corresponding to the continuous black line on the busbar side

8 Mount the feed



- Fix the conductors of each legs
- Apply joint / cable the strips as shown
- tight the cable gland and close with the cover

9 Mount the end cap



- Fix the end cap / apply joint





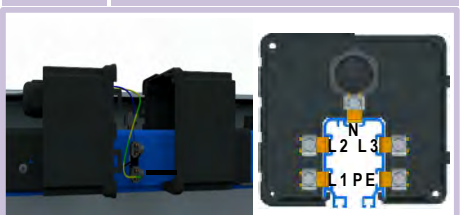
www.youtube.com/user/GiovenzanaInt

3a If needed mount the in-line feed




- Fix the conductors of each side
- Apply joint

3b Cable the line



- Cable the strips as shown

3c Close & fix the cover



- Close and fix both cover
- Tight the cable gland



compatible with blue line
(pre-mounted conductors)



compatible with yellow line
(conductors to be pulled)

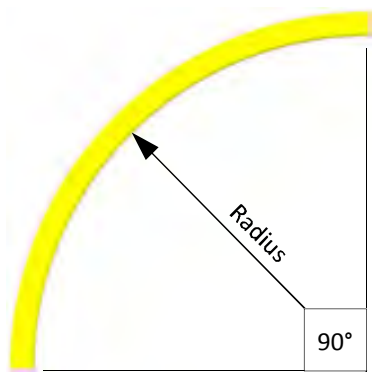


TR6000 TR60 line busbar



Radius [meters]	40 amp
1.2	<input type="checkbox"/> TR60A90
1.5	<input type="checkbox"/> TR60B90
1.8	<input type="checkbox"/> TR60C90
2.2	<input type="checkbox"/> TR60D90

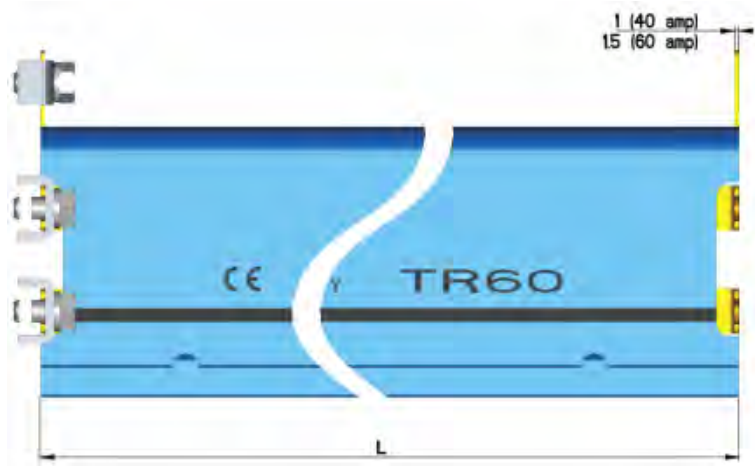
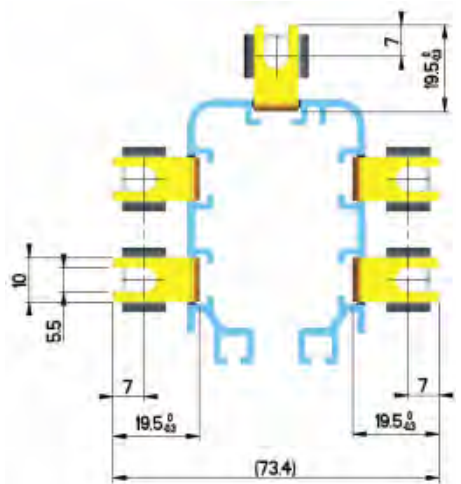
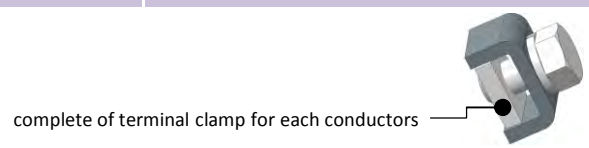
4 conductors only can be pulled



TR60404C3-TR60405C3-TR60404C-TR60405C TR60 line pre-mounted busbar

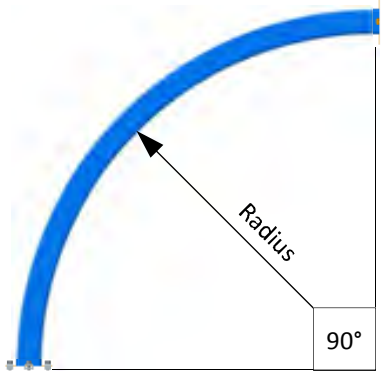
TR60604C3-TR60605C3-TR60604C-TR60605C

Line	Amp	N° conductors	Bar length "L"
TR60	40= 40 amp	4C= four	No extension = 4meters
	60= 60 amp	5C= five	3= three meters



Radius [meters]	40 amp	60 amp
1.2	<input type="checkbox"/> TR60404A90	<input type="checkbox"/> TR60604A90
1.5	<input type="checkbox"/> TR60404B90	<input type="checkbox"/> TR60604B90
1.8	<input type="checkbox"/> TR60404C90	<input type="checkbox"/> TR60604C90
2.2	<input type="checkbox"/> TR60404D90	<input type="checkbox"/> TR60604D90

4 conductors only





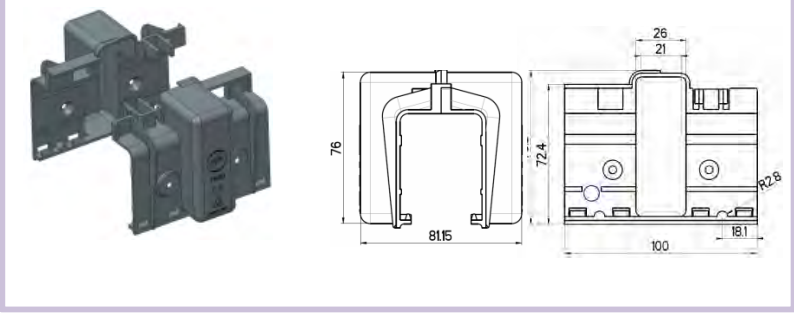
compatible with blue line
(pre-mounted conductors)



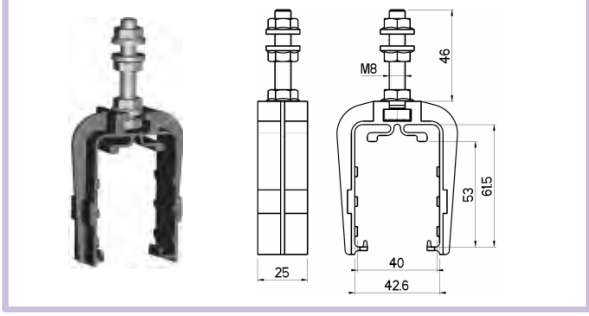
compatible with yellow line
(conductors to be pulled)



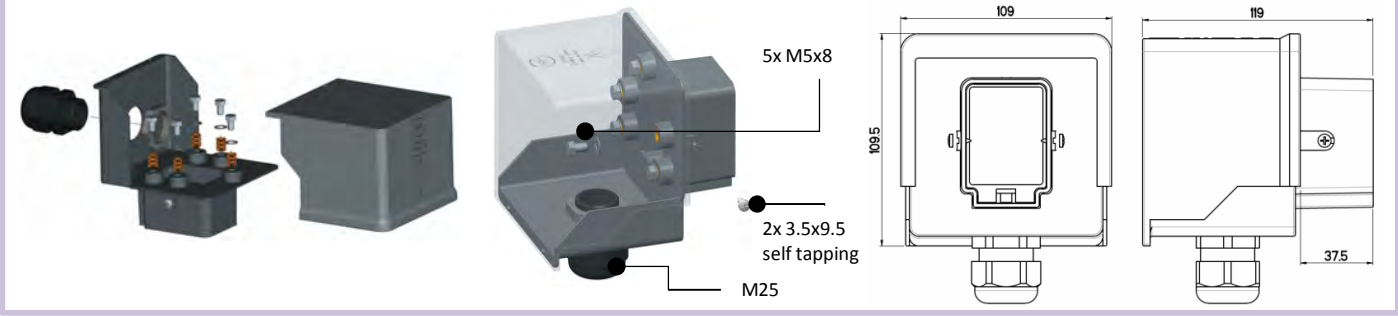
TR6001 TR60 line joint



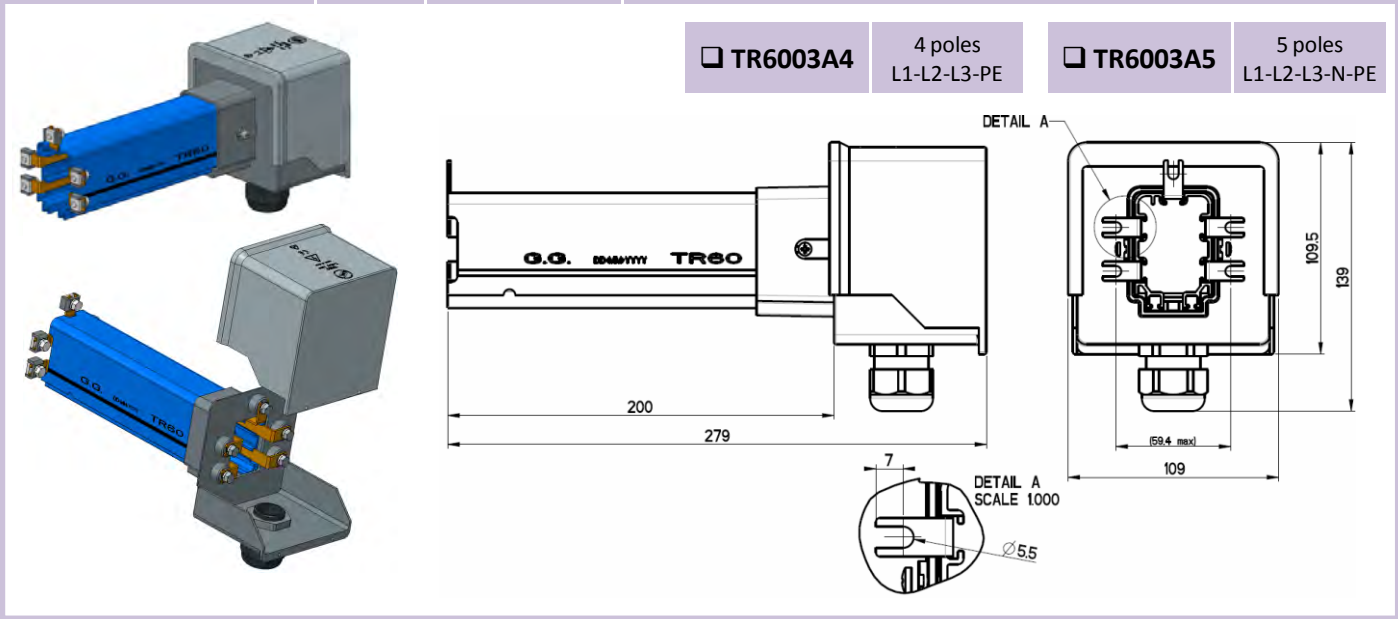
TR6002 TR60 line hanger clamp



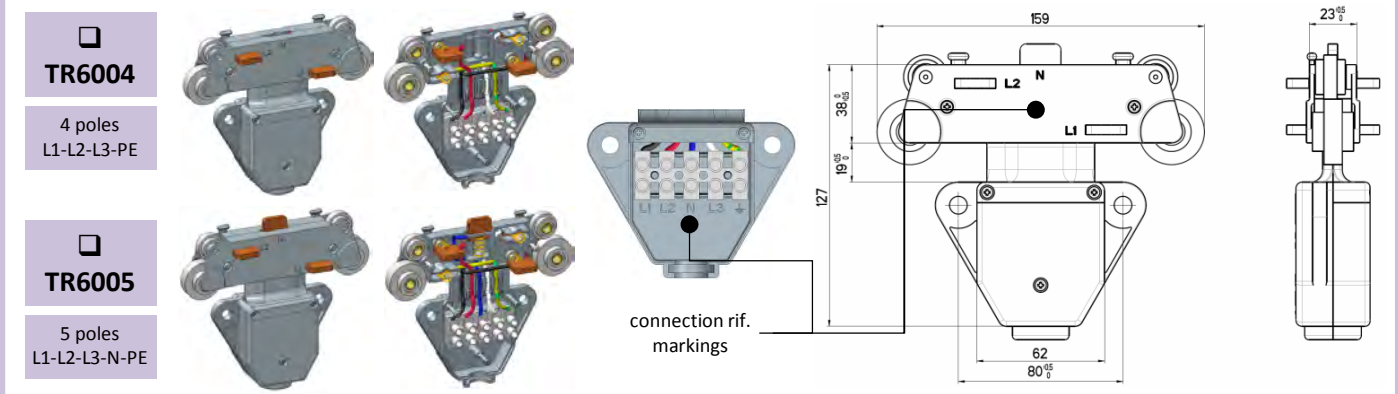
TR6003 TR60 line feed



TR6003A4-TR6003A5 TR60 line pre-mounted feed



TR6004 - TR6005 TR60 line trolley





compatible with blue line
(pre-mounted conductors)



compatible with yellow line
(conductors to be pulled)



TR6006 TR60 line end cap

Technical drawings showing dimensions: 64.5 (height), 44.5 (width), 48.5 (total width), 11 (flange thickness), 40 (base width).

TR6006A TR60 line pre-mounted end cap

Technical drawings showing dimensions: 64.5 (height), 62 (width), 100 (total width), 102 (total width including flange).

TR6007 TR60-85 line towing arm bracket

Technical drawings showing dimensions: 18 (hole offset), 64 (hole spacing), 125 (height), 100 (width), 12 (flange thickness), 3 (base thickness), 11 (flange offset), R6.5 (radius).

2x M8x25

TR6008 TR60 line in-line feed

Technical drawings showing dimensions: 220 (width), 140 (width), 115 (height), 124.4 (width).

complete of:
• M25 cable gland
• 5x terminal clamp

6x M25 closed spot

TR6008A4-TR6008A5 TR60 line pre-mounted in-line feed

TR6008A4

4 poles
L1-L2-L3-PE

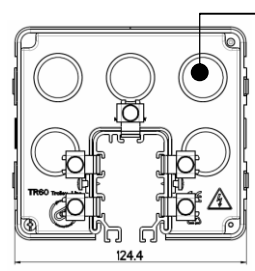
TR6008A5

5 poles
L1-L2-L3-N-PE

Technical drawings showing dimensions: 220 (width), 140 (width), 115 (height), 200 (width), 124.4 (width).

complete of terminal clamp for each conductors

5x M25 closed spot





compatible with blue line
(pre-mounted conductors)



compatible with yellow line
(conductors to be pulled)



TR6011 TR60 line strip insertion trolley

TR6012 TR60 line gasket IP23

for order please consider twice the length of the line

TR6013 TR60 line double trolley support

TR6014 TR60 line fixed point

TR6020 TR60 line hanger clamp (steel)

CS40-CS60 TR60 line copper strip

CS40	CS60
40 amp	60 amp
10 mm ²	15mm ²
1 x 10 mm ²	1.5 x 10 mm ²



compatible with blue line
(pre-mounted conductors)

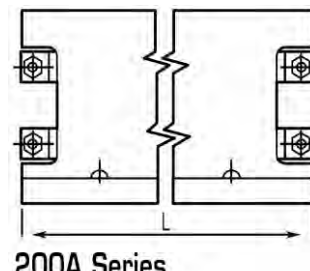
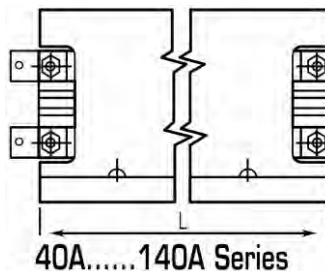
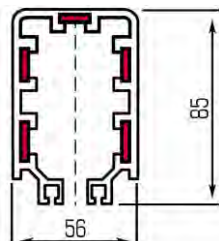


compatible with yellow line
(conductors to be pulled)



- TR85404C3-TR85405C3-TR85404C-TR85405C
- TR85704C3-TR85705C3-TR85704C-TR85705C
- TR851004C3-TR851005C3-TR851004C-TR851005C
- TR851404C3-TR851405C3-TR851404C-TR851405C
- TR852004C3-TR852005C3-TR852004C-TR852005C

TR85 line pre-mounted busbar

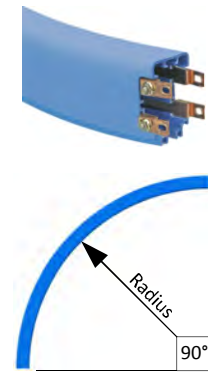


Line	Amp	N° conductors	Length bar "L"
TR85	40= 40 amp	4C = four 5C = five	No extension = 4meters 3= three meters
	70= 70 amp		
	100= 100 amp		
	140= 140 amp		
	200= 200 amp		



Radius [meters]	40 amp	70 amp	100 amp	140amp
1.2	<input type="checkbox"/> TR8529404A90	<input type="checkbox"/> TR8529704A90	<input type="checkbox"/> TR85291004A90	<input type="checkbox"/> TR85291404A90
1.4	<input type="checkbox"/> TR8529404B90	<input type="checkbox"/> TR8529704B90	<input type="checkbox"/> TR85291004B90	<input type="checkbox"/> TR85291404B90
1.8	<input type="checkbox"/> TR8529404C90	<input type="checkbox"/> TR8529704C90	<input type="checkbox"/> TR85291004C90	<input type="checkbox"/> TR85291404C90
2.2	<input type="checkbox"/> TR8529404D90	<input type="checkbox"/> TR8529704D90	<input type="checkbox"/> TR85291004D90	<input type="checkbox"/> TR85291404D90

4 conductors only

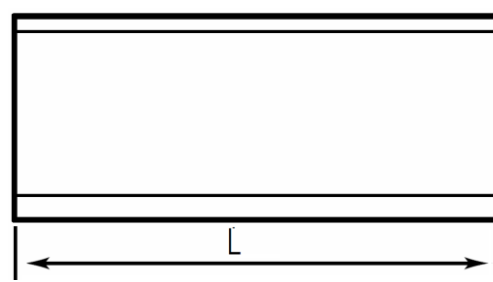
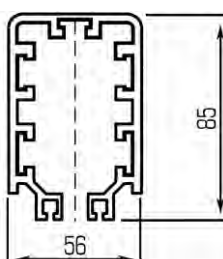


- TR85704-TR85705
- TR851004-TR851005
- TR851404-TR851405

TR85 line busbar

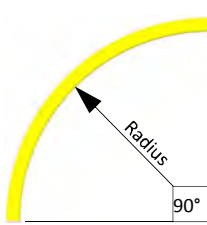


Line	Amp	N° conductors	Bar length "L"
TR85	70= 70 amp	4C = four 5C = five	4meters
	100= 100 amp		
	140= 140 amp		



Radius [meters]	40 amp
1.2	<input type="checkbox"/> TR8529A90
1.4	<input type="checkbox"/> TR8529B90
1.8	<input type="checkbox"/> TR8529C90
2.2	<input type="checkbox"/> TR8529D90

4 conductors only can be pulled





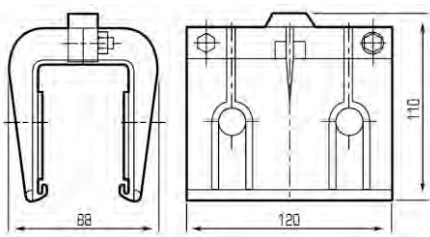
compatible with blue line
(pre-mounted conductors)



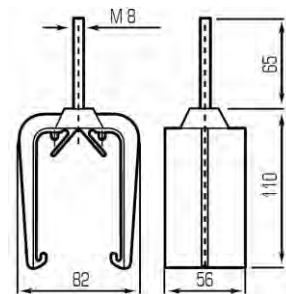
compatible with yellow line
(conductors to be pulled)



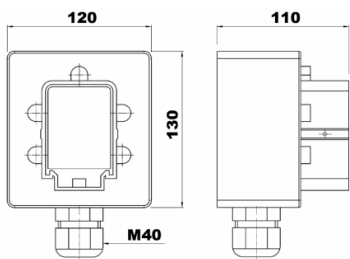
TR8501 TR85 line joint



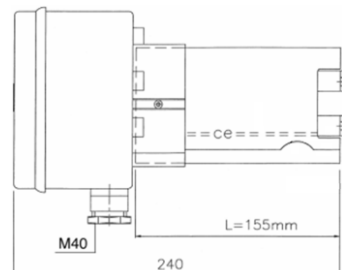
TR8502 TR85 line hanger clamp



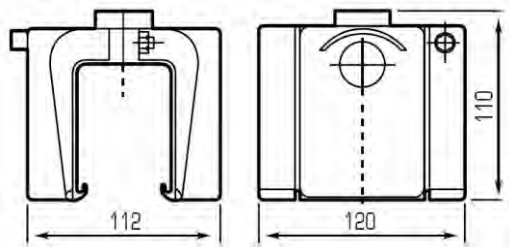
TR8503 TR85 line feed



TR8503A4-TR6003A5
 TR8533A4-TR8533A5 TR85 line pre-mounted feed



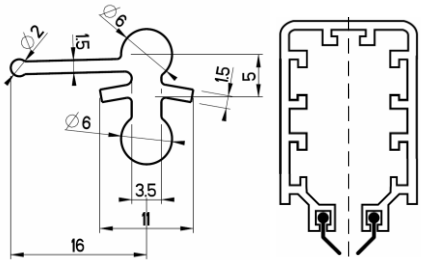
TR8504 TR85 line joint



TR8503A4 (40...140amp) 4 poles L1-L2-L3-PE
 TR8533A4 (200amp)

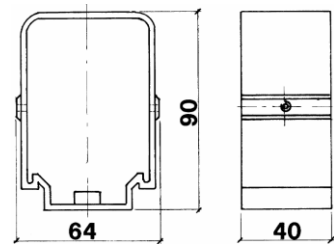
TR8503A5 (40...140amp) 5 poles L1-L2-L3-N-PE
 TR8533A5 (200amp)

TR8505 TR85 line gasket IP23

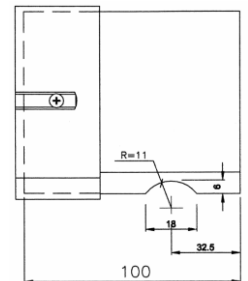


for order please consider twice the length of the line

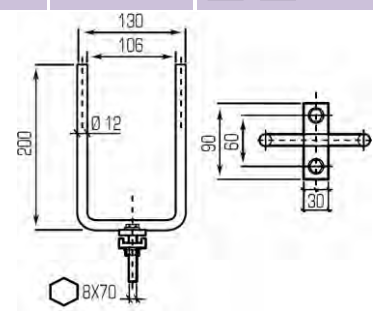
TR8506 TR85 line end cap



TR8506A TR85 line pre-mounted end cap



TR8510 TR60-85 line towing arm





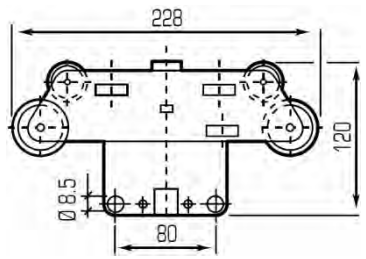
compatible with blue line
(pre-mounted conductors)



compatible with yellow line
(conductors to be pulled)



TR8511-TR8512 TR85 line 35 amp trolley



TR8511

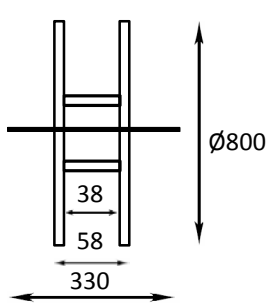
4 poles
L1-L2-L3-PE

TR8512

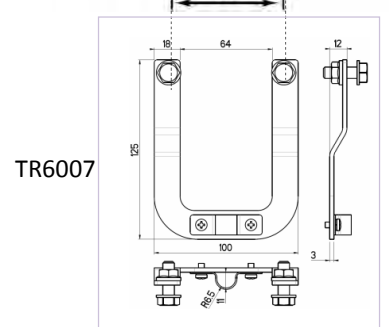
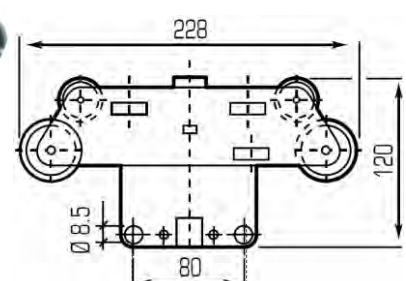
5 poles
L1-L2-L3-N-PE

- Ball bearing wheels
- Complete of L 1500mm CEI 20-22 NPI cable

TR8513 TR60-85 line de-coil unit



TR8514 TR85 line strip insertion trolley



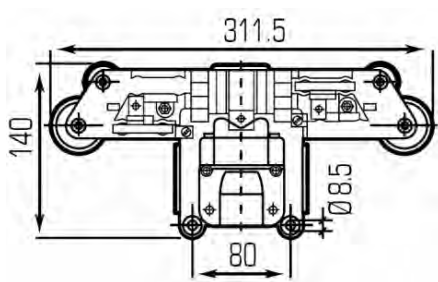
TR8517-TR8520 TR85 line brush



TR8517
for 35 amp trolley

TR8520
for 70 amp trolley

TR8505 TR85 line 70 amp trolley



TR8518

4 poles
L1-L2-L3-PE

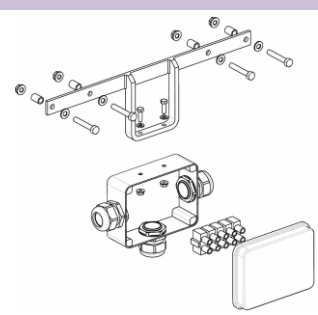
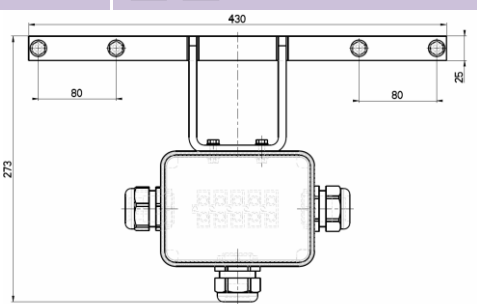
TR8519

5 poles
L1-L2-L3-N-PE

TR8532
4 poles
L1-L2-L3-PE
articulated
for curves

- Ball bearing wheels
- Complete of L 1500mm CEI 20-22 NPI cable

TR8523 TR85 line double trolley support





compatible with blue line
(pre-mounted conductors)



compatible with yellow line
(conductors to be pulled)



TR8524 TR85 line joint (steel)

TR8525 TR85 line hanger clamp (steel)

TR8527.1 TR85 line fixed point

screw 8x70

TR8528 TR85 line inspection joint

Used for maintenance operation, it allows easy removal of the trolley:

- 1) disconnect the trolley to be removed
- 2) place the trolley in the inspection joint
- 3) remove the half joints and half busbar (side "A" without ribs)
- 4) replace the trolley
- 5) close the busbar and joints
- 6) place the adhesive rubber gasket



compatible with blue line
(pre-mounted conductors)



compatible with yellow line
(conductors to be pulled)

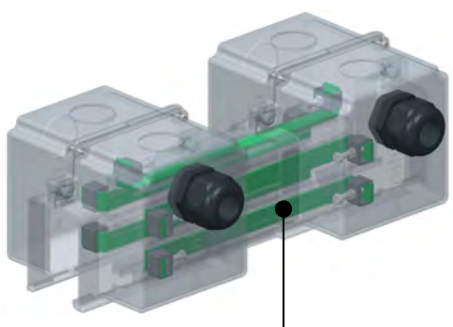


TR8545-TR8545B TR85 line section joint

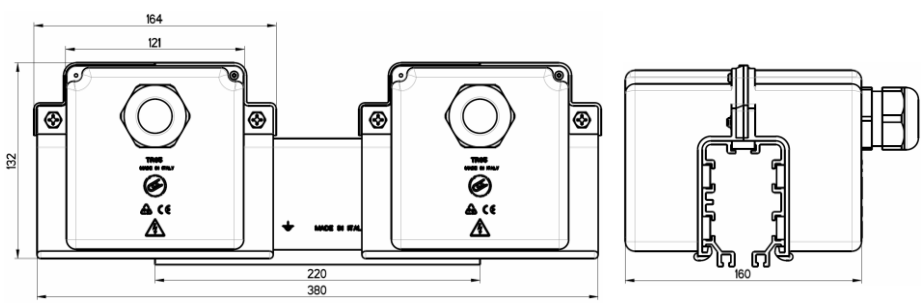
TR8545
yellow



TR8545B
blue



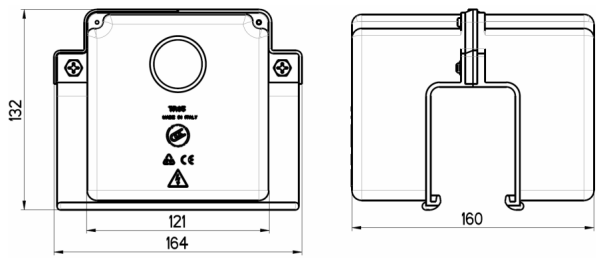
Insulating strip bars



TR8547 TR85 line in-line feed



Pg29 cable gland included
(not mounted)



TR8550-TR8551-TR8552 TR60-85 line support bracket (rail fixing)

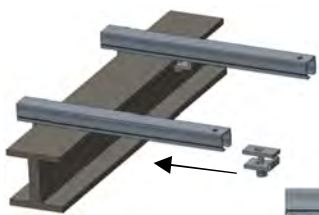
TR8550
L= 350mm

TR8551
L= 500mm

TR8552
L= 700mm



two arm clip kit included



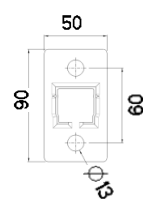
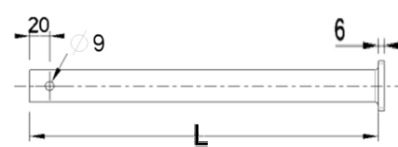
Mounting example



TR8555-TR8556 TR60-85 line support bracket (wall fixing)

TR8555
L= 350mm

TR8556
L= 500mm





General characteristics

Line / Size	TR60		TR85				
	40	60	40	70	100	140	200
Operating current 23°C	40A	60A	40A	70A	100A	140A	200A
Comply with standards	CEI EN 60439-1, CEI EN 60439-2, CEI EN 60695-2-1, CEI EN 60570						
Markings	CE EAC						
Rated operating voltage [Ue]	600 Vac						
Frequency	50 Hz						
Conditional rated short circuit withstand current	10 kA						
Fuse rating gG	40A	60A	40A	70A	100A	160A	200A
Protection class CEI EN 60529	IP13 (IP23 with gasket accessories)						
Flammability resistance	UL94	V0					
	Cei EN 60695-2-1 [°C]	960					
Ambient temperature	operating	-30 °C + 55 °C					
	storage	-30 °C + 70 °C					
Admissible trolley speed	200 m/min ¹						
Copper strip section [mm ²]	10	15	9.3	15.5	21.7	31	46.5
Resistance [Ω /m 10 ⁻⁴]	17	11.33	18.27	10.96	7.83	5.48	3.65
Impedence [Ω /m 10 ⁻⁴]	17.09	11.38	18.36	11.01	7.87	5.55	3.67

PVC busbar characteristics

Material	rigid PVC	
Self-extinguish	UL 94	V0
	DIN 4102	B2
	D.M.6/7/83	CI
Ultimate tensile strenght	ISO R527 23 °C	430 kg/cm ³
Yield point	ISO R527 23 °C	460 kg/cm ²
Modulus of elasticity	ISO R178 23 °C	30000 kg/cm ²
Impact resistance	DIN 53453	unbroken
Dielectric strenght	ASTM 149	25 kV/mm
Softening temperature – Vicat	ISO R306 49N	82 °C

Conductors bars weight table (complete of conductors)

Line / Size	TR60		TR85					
	40	60	40	70	100	140	200	
N° of conductors	4	1.035 kg/m	1.219 kg/m	1.680 kg/m	1.902 kg/m	2.122 kg/m	2.454 kg/m	3.010 kg/m
	5	1.127 kg/m	1.357 kg/m	1.764 kg/m	2.050 kg/m	2.305 kg/m	2.730 kg/m	3.423 kg/m



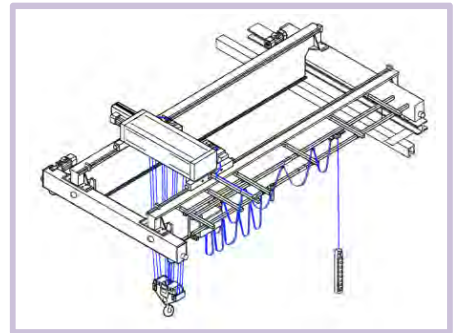
Festoon system – line 30 – 41 and 41 inox Giovenzana

page 68 to 79

The festoon system is the traditional system for energy transmission for various type of handling equipment. One of the most popular is the overhead crane where the festoon lines transmit the signals to control the movement of the crane.

Line 30 and 41 Giovenzana are made of a "C"- rail bar fixed along the crane's movement line. The signal cable is supported by the trolley that slides inside the "C"-rail bar.

Both lines 30 and 41 offer a complete selection of items and accessories to customize them according Customer needs.



C- rail bar system

Line	Characteristic			Markings
30	<input type="checkbox"/> Bar height: 30 mm	<input type="checkbox"/> Load capacity: 100 kg/m		CE EAC
41	<input type="checkbox"/> Bar height: 41 mm	<input type="checkbox"/> Load capacity :140 kg/m		CE EAC
41 stainless steel	<input type="checkbox"/> Bar height: 41 mm	<input type="checkbox"/> Load capacity :140 kg/m	<input type="checkbox"/> Stainless steel material	CE EAC



Typical line schematic:

ID	Picture	Name
①		C-rail bar
②		Support arm and support bracket
③		Towing trolley
④		Trolley
⑤		Joint
⑥		Head clamp
⑦		End Cap
⑧		Cable
⑨		End stop


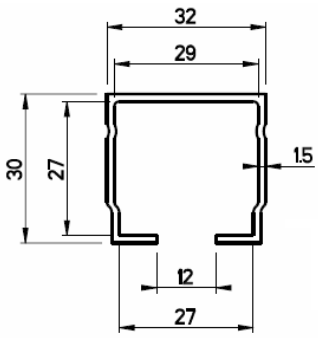

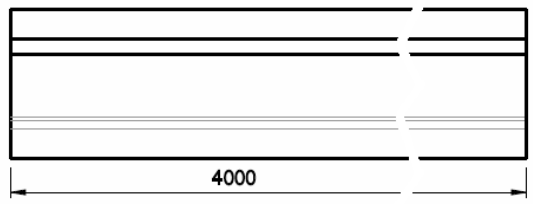

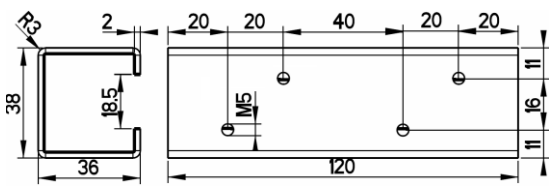

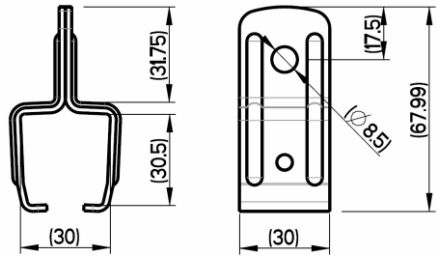

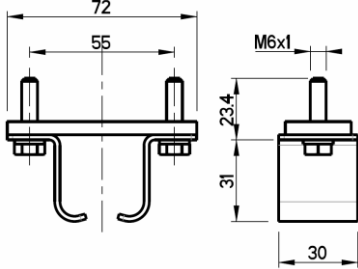
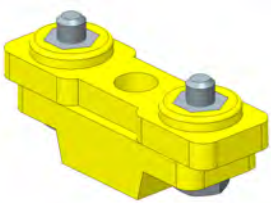
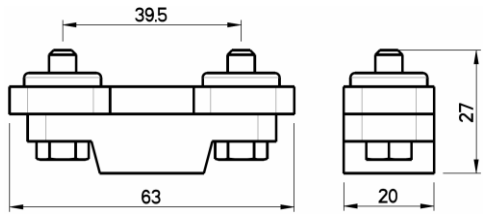
Festoon line module type


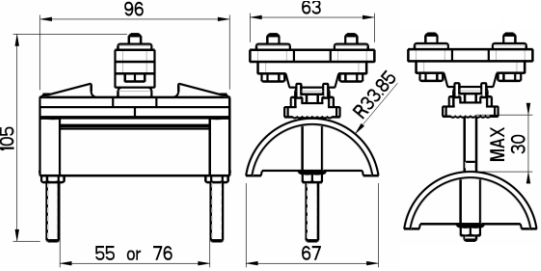

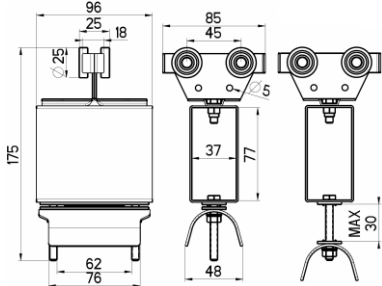

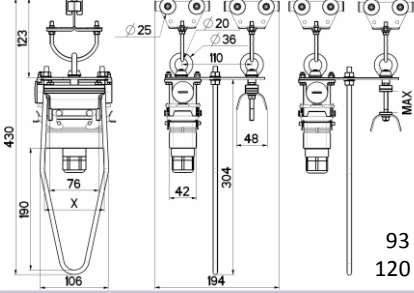

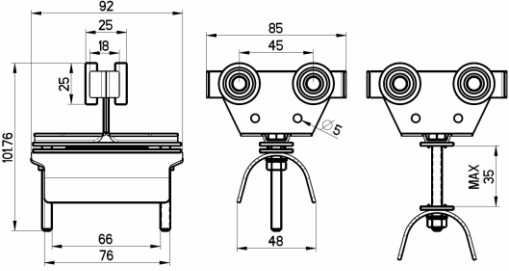

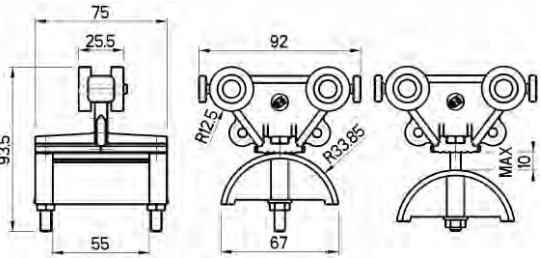
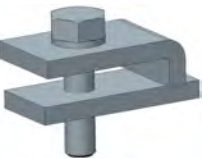
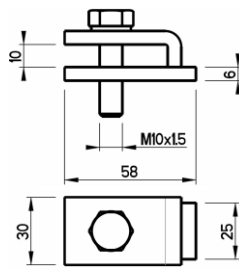
Straight:	4 meters module (3 meters for stainless steel)
Curve:	90° curve radius 1.5 m (only line 41)



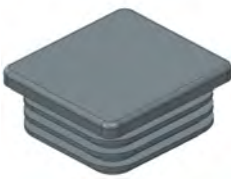
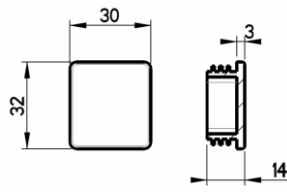

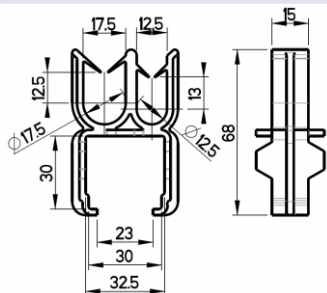

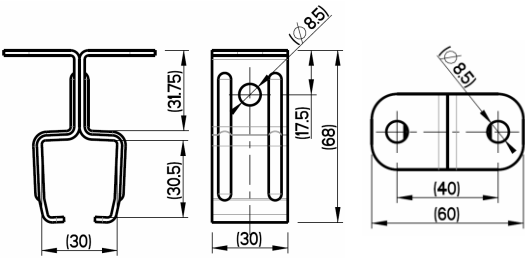

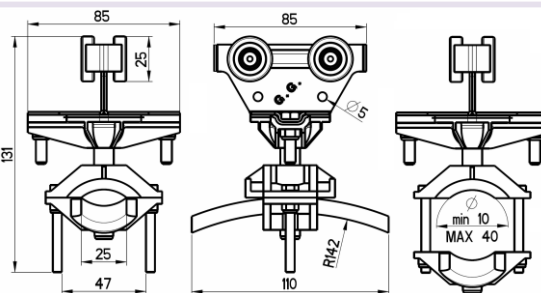
Description	note	Line 30 (load capacity 100 kg/m)		Line 41 (load capacity 140 kg/m)			Min. qty
		Code	Picture	Code standard	Code stainless steel	Picture	
C-Rail bar	straight 4m	30607001		30602001/4	30602061 (3m)		3-4 meters
	90° curved radius 1.5 m	-		30602054 (o)	-		
Track support bracket		30607017		30602004	-		1
Track support bracket		30607003		30602003	30602063		1
Joint	standard	30607002		30602002	30602065		1
	double for track >50m	-		30602034	30602062		
End stop		30607005		30602038	30602068		1
Towing trolley	single execution	30607007		30602091	30602067		1
	double execution	-		30602020	-		
Trolley with safety plug and socket connection	16 poles	30607008		30602036	-		1
	24 poles	30607019		30602040	-		
Trolley (steel)	ball bearing wheels	30607010		30602086	-		10
	PA wheels	30607009		-	-		
Trolley (PA)	55 mm saddle	30607011		30602069	30602064		10
	76 mm saddle	-		30602070	-		
Round cable trolley	PA/steel	30607021		-	-	-	10
Head clamp	55mm saddle	30607020		30602071	30602066		1
	76mm saddle	30607006		30602072	-		
Bracket	500 mm	30607001/05		-	-	-	1
	800 mm	30607001/08		-	-	-	
Support arm bracket (hanger)		30607004		-	-	-	1
Support arm clip (claw)		30607012		-	-	-	1
End cap		30607015		-	-	-	1
Cable clip		30607016		-	-	-	10

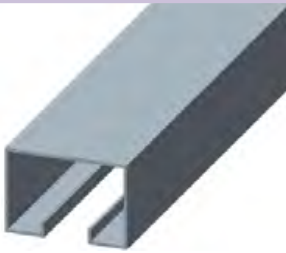
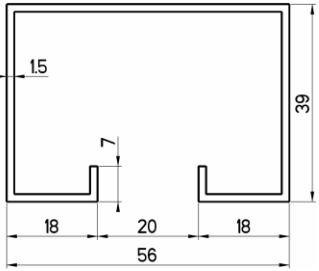
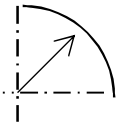
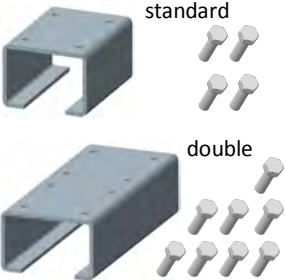
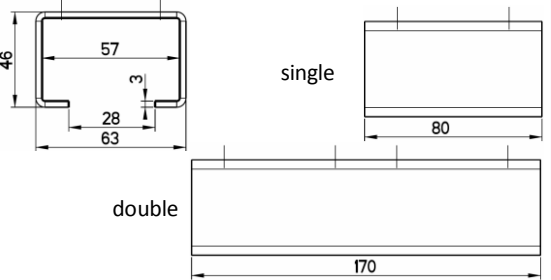

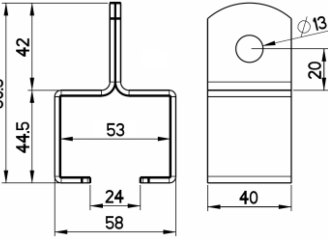

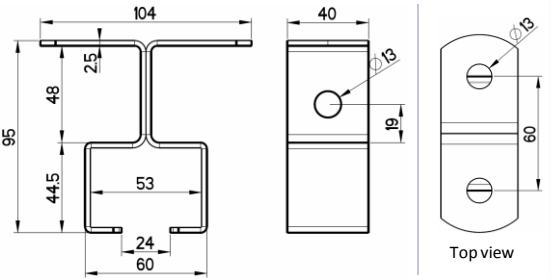
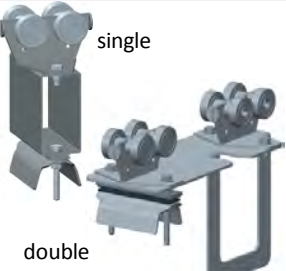
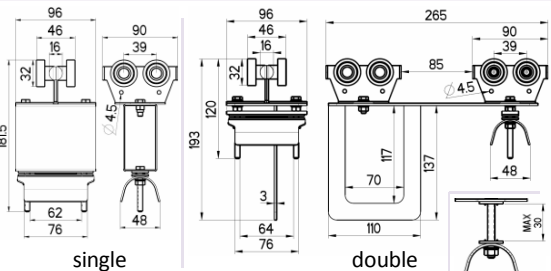
(o) may require mechanical adjustment during line assembly

Picture	Description	Code	Dimensions
	<p>C-Rail bar</p> <ul style="list-style-type: none"> <input type="checkbox"/> Material: galvanized steel <input type="checkbox"/> Length: 4 m <input type="checkbox"/> Weight: 5 kg 	30607001	
	<p>Bracket</p> <ul style="list-style-type: none"> <input type="checkbox"/> Material: galvanized steel 	<p>30607001/05 (length 0.5 m)</p> <p>30607001/08 (length 0.8 m)</p>	
	<p>Joint</p> <p>to connect a C-rail and suitable for supporting the track</p> <ul style="list-style-type: none"> <input type="checkbox"/> Material: galvanized steel <p>Screws M5x10 included</p>	30607002	
	<p>Track support bracket</p> <p>2 pcs</p> <ul style="list-style-type: none"> <input type="checkbox"/> Material: galvanized steel <input type="checkbox"/> Max support spacing: 1 m <p>screws not included</p>	30607003	
	<p>Support arm bracket (hanger)</p> <ul style="list-style-type: none"> <input type="checkbox"/> Material: galvanized steel 	30607004	
	<p>End stop</p> <ul style="list-style-type: none"> <input type="checkbox"/> Material: PA6 	30607005	


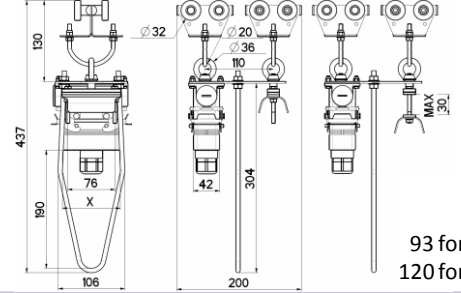

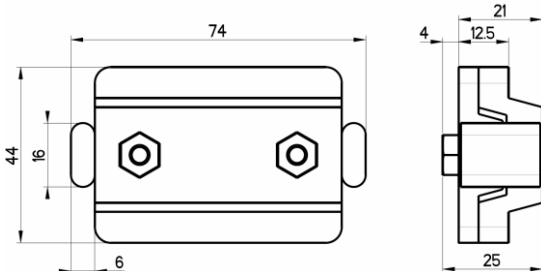

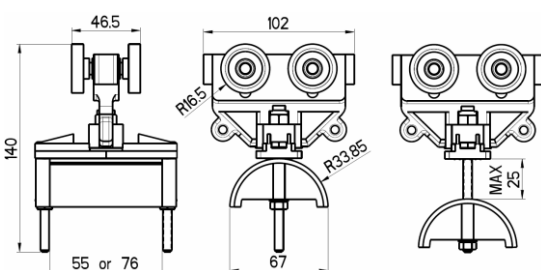

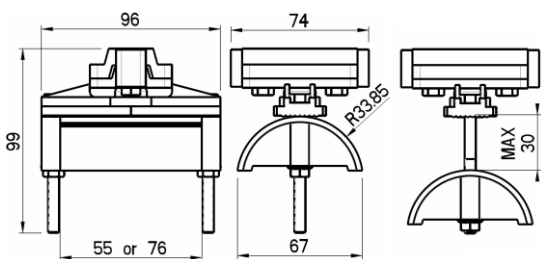

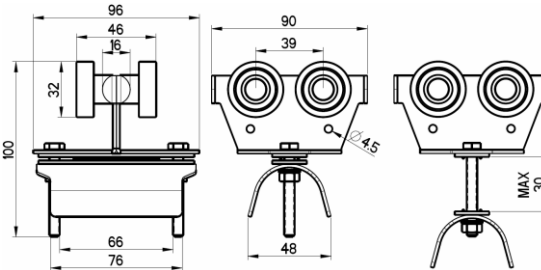
Picture	Description	Code	Dimensions
	Head clamp <input type="checkbox"/> Material: PA	30607020 (55 mm saddle) 30607006 (76 mm saddle)	
	Towing trolley <input type="checkbox"/> Material: galvanized steel <input type="checkbox"/> Steel rollers with ball-bearing <input type="checkbox"/> 68 mm steel saddle	30607007	
	Trolley with safety plug and socket connection To connect the festoon system to the pendant station <input type="checkbox"/> 68 mm saddle	30607008 (16 poles) 30607019 (24 poles)	 X: 93 for 16poles 120 for 24poles
	Trolley (steel) <input type="checkbox"/> Material: galvanized steel <input type="checkbox"/> 68 mm steel saddle	30607009 (PA wheels) 30607010 (ball-bearing wheels)	
	Trolley (PA) <input type="checkbox"/> Material: PA <input type="checkbox"/> PA rollers <input type="checkbox"/> 55 mm PA material saddle	30607011	
	Support arm clip (claw) <input type="checkbox"/> Material: galvanized steel (need n° 2 for every bracket)	30607012	

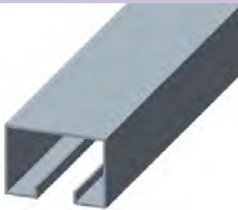
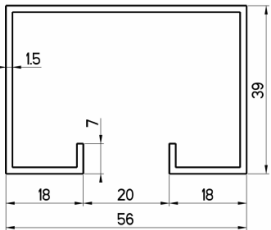
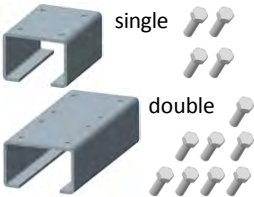
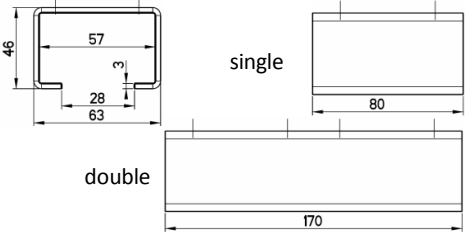

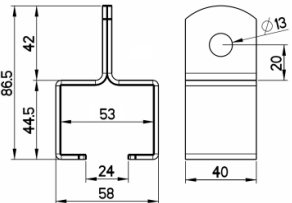

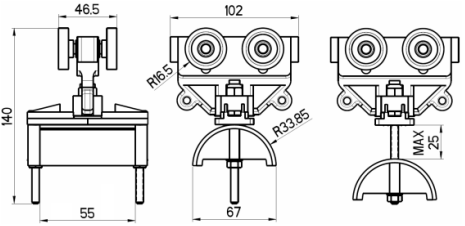

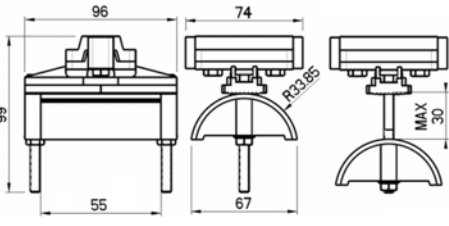

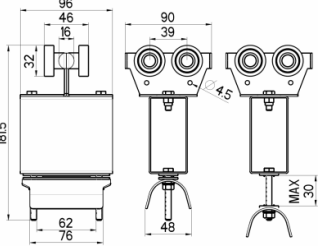

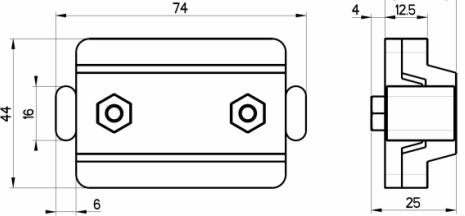


Picture	Description	Code	Dimensions
	<p>End cap</p>	<p>30607015</p>	
	<p>Cable clip</p>	<p>30607016</p>	
	<p>Track support bracket Ceiling fixing 2 pcs <input type="checkbox"/> Material: galvanized steel <input type="checkbox"/> Max support spacing: 1 m screws not included</p>	<p>30607017</p>	
	<p>Round cable trolley <input type="checkbox"/> Galvanized steel trolley upper body with PA saddle <input type="checkbox"/> Steel rollers with ball-bearing <input type="checkbox"/> Swinging & rotating saddle <input type="checkbox"/> Cable diameter: min 10 – MAX 40 mm</p>	<p>30607021</p>	

Picture	Description	Code	Dimensions
	<p>C-Rail bar</p> <ul style="list-style-type: none"> <input type="checkbox"/> Material: galvanized steel <input type="checkbox"/> Length: 4 m <input type="checkbox"/> Weight: 8 kg 	30602001/4	
	<p>90° curved bar</p> <ul style="list-style-type: none"> <input type="checkbox"/> 1.5 meters radius may require mechanical adjustment during line assembly 	30602054	
	<p>Joint</p> <p>to connect a C-rail and suitable for supporting the track</p> <ul style="list-style-type: none"> <input type="checkbox"/> Material: galvanized steel <p>Screws M5x10 included: No. 4 for single No. 8 for double Use double for track >50meters</p>	<p>30602002 (standard) 30602034 (double)</p>	
	<p>Track support bracket</p> <p>2 pcs</p> <ul style="list-style-type: none"> <input type="checkbox"/> Material: galvanized steel <input type="checkbox"/> Max support spacing: 1 m <p>screws not included</p>	30602003	
	<p>Track support bracket</p> <p>Ceiling fixing 2 pcs</p> <ul style="list-style-type: none"> <input type="checkbox"/> Material: galvanized steel <input type="checkbox"/> Max support spacing: 1 m <p>screws not included</p>	30602004	
	<p>Towing trolley</p> <ul style="list-style-type: none"> <input type="checkbox"/> Material: galvanized steel <input type="checkbox"/> steel rollers with ball-bearing <input type="checkbox"/> 68 mm steel saddle 	<p>30602091 (single) 30602020 (double)</p>	



Picture	Description	Code	Dimensions
	<p>Trolley with safety plug and socket connection To connect the festoon system to the pendant station <input type="checkbox"/> 68 mm steel saddle</p>	<p>30602036 (16poles) 30602040 (24poles)</p>	 <p>X: 93 for 16poles 120 for 24poles</p>
	<p>End stop <input type="checkbox"/> Material: PA6</p>	<p>30602038</p>	
	<p>Trolley (PA) <input type="checkbox"/> Material: PA <input type="checkbox"/> PA rollers <input type="checkbox"/> 55 or 76 mm PA saddle</p>	<p>30602069 (55 mm saddle) 30602070 (76 mm saddle)</p>	
	<p>Head clamp <input type="checkbox"/> Material: PA <input type="checkbox"/> 55 or 76 mm PA saddle</p>	<p>30602071 (55 mm saddle) 30602072 (76 mm saddle)</p>	
	<p>Trolley (steel) <input type="checkbox"/> Material: galvanized steel <input type="checkbox"/> 68 mm steel saddle</p>	<p>30602086</p>	

Picture	Description	Code	Dimensions
 <p>C-Rail bar <input type="checkbox"/> Material: stainless steel <input type="checkbox"/> Length: 3 m <input type="checkbox"/> Weight: 8 kg</p> <p>STAINLESS STEEL</p>		30602061	
 <p>Joint to connect a C-rail and suitable for supporting the track <input type="checkbox"/> Material: stainless steel stainless screws M5x10 included No. 4 for single No. 8 for double Use double for track >50meters</p> <p>STAINLESS STEEL</p>		30602065 (standard) 30602062 (double)	
 <p>Track support bracket 2 pcs <input type="checkbox"/> Material: stainless steel <input type="checkbox"/> Max support spacing: 1 m screws not included</p> <p>STAINLESS STEEL</p>		30602063	
 <p>Trolley (PA) <input type="checkbox"/> Material: PA <input type="checkbox"/> PA rollers <input type="checkbox"/> 55 mm PA material saddle</p> <p>STAINLESS STEEL</p>		30602064	
 <p>Head clamp <input type="checkbox"/> Material: PA – stainless steel <input type="checkbox"/> 55 mm PA material saddle</p> <p>STAINLESS STEEL</p>		30602066	
 <p>Towing trolley <input type="checkbox"/> Material: stainless steel <input type="checkbox"/> steel rollers with ball-bearing <input type="checkbox"/> 68 mm steel saddle</p> <p>STAINLESS STEEL</p>		30602067	
 <p>End stop <input type="checkbox"/> Material: PA6 – stainless steel screw</p> <p>STAINLESS STEEL</p>		30602068	


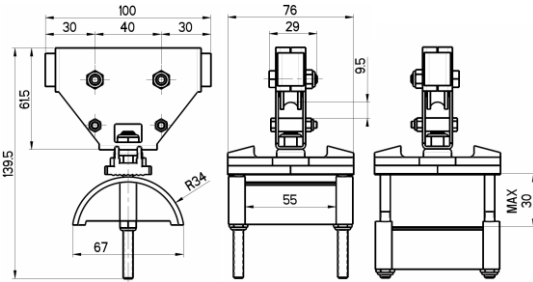

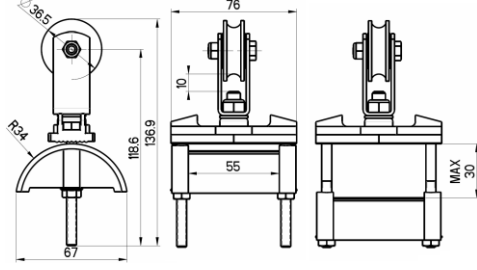

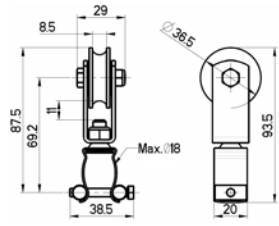
Festoon system – line wire-rope Giovenzana

The festoon system is the traditional system for energy transmission for various type of handling equipment. Line *wire-rope* Giovenzana uses a rope to support the trolleys carrying the cable that supplies energy to the mobile device.



Wire -rope system

Line	Characteristic				Markings
Wire-rope	Rope diameter: 8 mm	Travel speed: 40 m/min.	Trolley type: for flat or round cable	Trolley load capacity: 8 kg	CE EAC

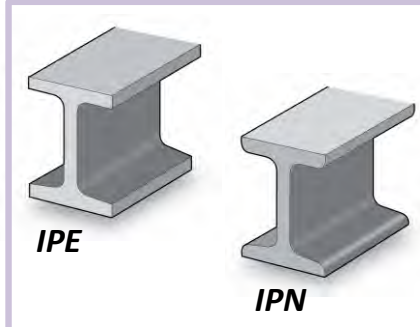
Picture	Description	Code	Min. qty	Dimensions
 <p>FLAT CABLE</p>	<p>Twin roller trolley</p> <ul style="list-style-type: none"> <input type="checkbox"/> Material: PA6- galvanized steel <input type="checkbox"/> Type of roller: PA <input type="checkbox"/> Rotating 55 mm plastic saddle <input type="checkbox"/> Range 30 mm <input type="checkbox"/> Speed 40 m/min. 	30604003	10	
 <p>FLAT CABLE</p>	<p>One roller trolley</p> <ul style="list-style-type: none"> <input type="checkbox"/> Material: PA6- galvanized steel <input type="checkbox"/> Type of roller: PA <input type="checkbox"/> Rotating 55 mm plastic saddle <input type="checkbox"/> Range 30 mm <input type="checkbox"/> Speed 40 m/min. 	30604005	10	
 <p>ROUND CABLE</p>	<p>One roller trolley + metal cable clip</p> <ul style="list-style-type: none"> <input type="checkbox"/> Material: PA6- galvanized steel <input type="checkbox"/> Type of roller: PA <input type="checkbox"/> Cable Ø max: 18 mm <input type="checkbox"/> Speed 40 m/min. 	30604007	10	



Festoon system – line I-beam Giovenzana

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The festoon system is the traditional system for energy transmission for various types of handling equipments.
Line *I-beam* Giovenzana uses the beams of the mobile device to support the trolleys carrying the cable that supplies energy to the mobile device.
Line *I-beam* Giovenzana is suitable for installation in industries where heavy duty capabilities are required.
For example it is used in:
powering mobile equipment in steel mills, cranes, rolling mills, foundries, storage containers, etc... .



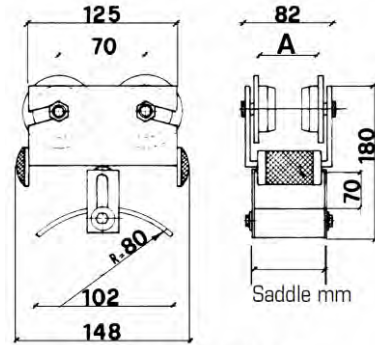
I-beam system

Line	Characteristic				Markings
Light series	Beam type: IPE-IPN 80÷100	Travel speed: 120 m/min.	Trolley load capacity: 50 kg	Max cable capacity: 70 mm	CE EAC

I-beam type	I-beam size	Saddle [mm]	Rollers	Trolley	Towing trolley	Head clamp
IPE	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	
IPN	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	

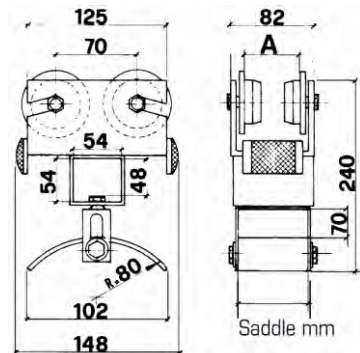
Light series

Trolley



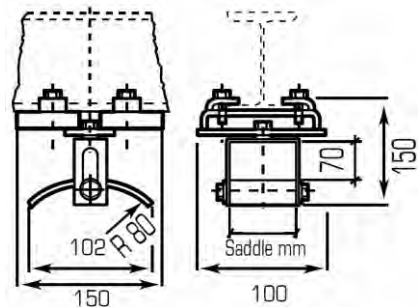
IPE 80 A=46+4
IPN 80 A=42+4
IPE 100 A=55+4
IPN 100 A=50+4

Towing trolley



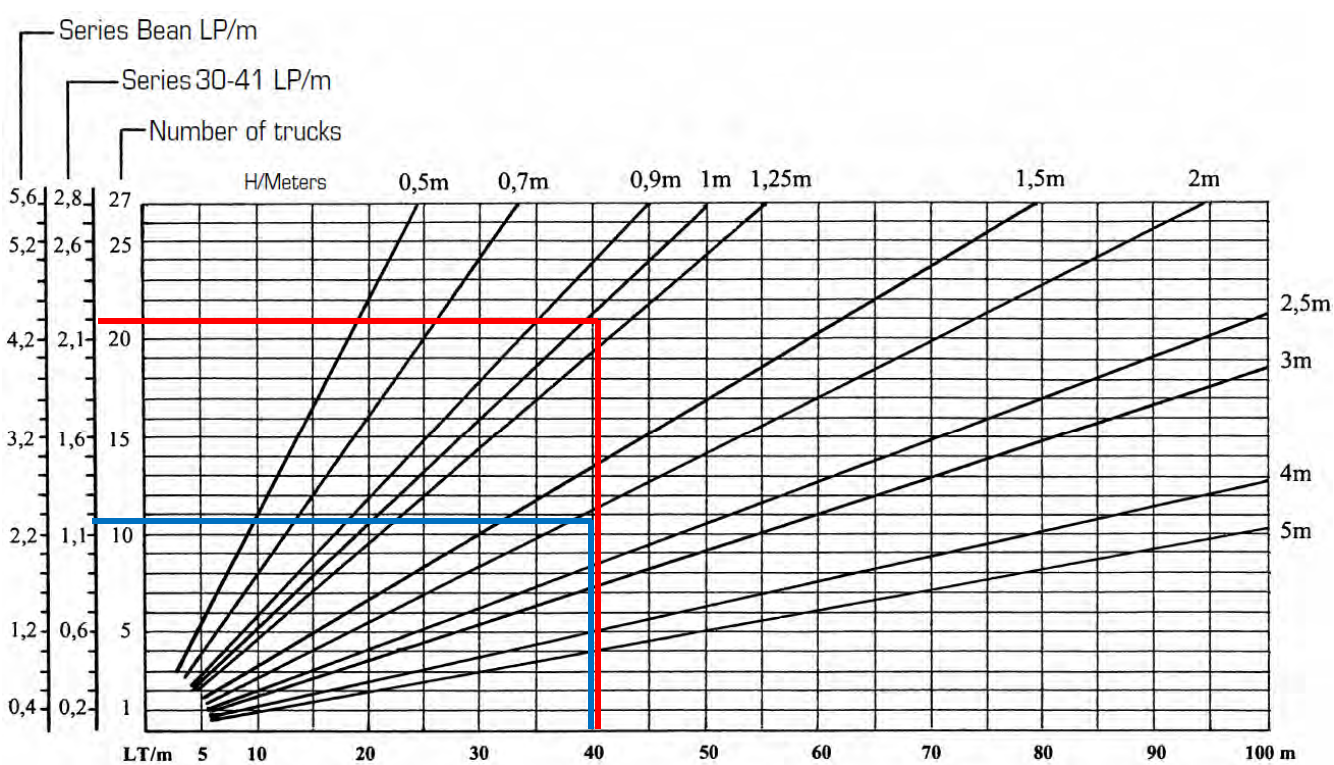
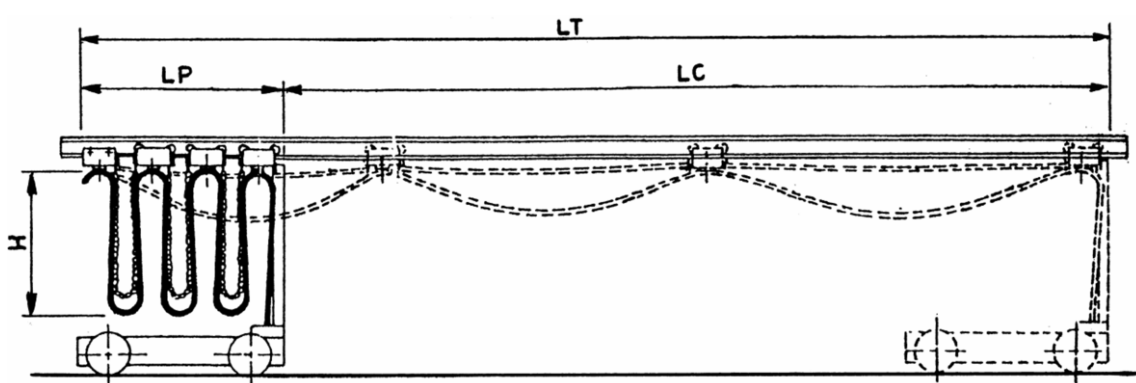
IPE 80 A=46+4
IPN 80 A=42+4
IPE 100 A=55+4
IPN 100 A=50+4

Head clamp





Line diagram



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

Example "1" (blue colour)
Total line length "LT" = 40 meters
Height "H" = 2 meters
Number of trolley/trucks = 12 pcs
Parking zone length "LP" = 1,2 meters
Race length "LC=LT-LP" = 38,8 meters

Example "2" (red colour)
Total line length "LT" = 40 meters
Height "H" = 1 meters
Number of trolley/trucks = 21 pcs
Parking zone length "LP" = 2,2 meters
Race length "LC=LT-LP" = 37,8 meters

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.

PVC flat cable anti-aging H07VVH6-F

Particularly suitable for supply and control circuits, lifting and handling equipment.



- Blue colour sheath
- Finish the order code with "N" for the black sheath

Characteristics

- Comply with: CEI 20-22 II (flame resistant)
- Insulation class: 2/3
- Rated operating voltage: 400V
- Rated insulation voltage: U₀/U 450/750V
- Max short circuit temperature: 160 °C
- 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)

Code (final "N" for black sheath)	N° conductors X cross section	Outer dimension [mm] approx	Strand [N°/mm]	Weight [gr/m] approx	Total cross section [mm ²]	Electrical resistance 20°C [ohm/km]	Max current ambient temperature 30°C [A]	
							Fixed place	Moving place
CP0415AF	4X1.5	15X5.2	30X0.25	150	6	13.30	19.5	17
CP0815AF	8X1.5	29X5.5		300	12		12	10
CP1215AF	12X1.5	41X5		420	18		11	9.5
CP1615AF	16X1.5	54X8		510	24		10	8.5
CP1815AF	18X1.5	43X11		700	27		9.5	8
CP2415AF	24X1.5	51X13		1000	36		9	7.5
CP0425AF	4X2.5	21X5.7	50X0.25	240	10	7.98	26	22.5
CP0825AF	8X2.5	33X6		420	20		18	13
CP1225AF	12X2.5	50X7		640	30		17	12
CP1625AF	16X2.5	66X7		1000	40		16	11
CP1825AF (o)	18X2.5	50X13		1050	45		15	10
CP2425AF (o)	24X2.5	54X13		1100	60		14	9
CP0404AF	4X4	21X7.5	56X0.30	330	16	4.95	35	30
CP0804AF	8X4	38X5		550	32	4.95	24	19
CP0406AF	4X6	24X8	84X0.30	440	24	3.30	46	40
CP0806AF	8X6	38.5X8		742	48	3.30	32	25
CP0410AF	4X10	35X11	7X12X0.40	800	40	1.91	57	46
CP0416AF	4X16	36.5X12	7X18X0.40	1200	64	1.21	76	62
CP0425AF	4X25	43X13	7X28X0.40	1700	100	0.78	96	80
CP0435AF	4X35	54X14	7X39X0.40	2050	140	0.55	119	99

(o) Minimum supply 500m.

**Flat
cable
gland**

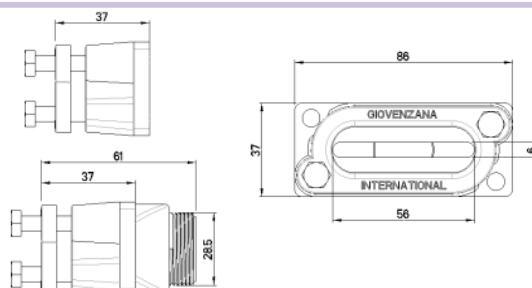
Standard

∅ 28.5 out



12903010

12903011



Round cable with dual strain relief steel ropes S05VVD7-F

page 81

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.



strain relief steel ropes

- Blue colour sheath
- Finalize the code with "N" for the black colour

Characteristic

- Comply with: CEI 20-22 II (flame resistant)
- Insulation class: 2/3
- Rated operating voltage: 230V
- Rated insulation voltage: U₀/U 300/500V
- Max short circuit temperature: 160 °C
- Operating temperature: -5°C +70°C
- Ø2mm steel strain relief ropes
- Breaking point: 60kg/mm²
- Internal conductors with flexible PVC sheath progressively numbered, plus earth conductor (yellow/green)

Code (final "N" for black sheath)	N° conductors X cross section	Outer cable [mm] approx	Strain relief rope dimension	Strand [N°/mm]	Weight [gr/m] approx	Total cross section [mm ²]	Electrical resistance 20°C [ohm/km]	Max current ambient temperature 30°C [A]	
								Fixed place	Moving place
CT0815AUAF	8X1.5	11.6	23.6	30X0.25	225	12	13.30	12	10
CT1215AUAF	12X1.5	14.4	26.4		315	18		11	9.5
CT1615AUAF	16X1.5	16	28		415	24		10	8.5
CT1815AUAF	18X1.5	17	29		470	27		9.5	8
CT2015AUAF	20X1.5	18	30		525	30		9	7.5
CT2415AUAF	24X1.5	21	33		620	36		8.5	7

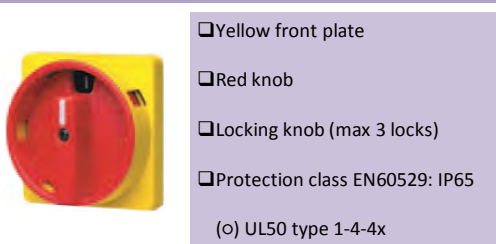
Body disconnecter switch base fixing

page 82

Used to disconnect the power supply for maintenance operations. The door-interlock actuator comes with a locking knob, which can work with 3 locks (max) in complete safety. It is available in different size according to line range.

Characteristic		SQ032003B	SQ063003B	SQ125003B	
Code		SQ032003B	SQ063003B	SQ125003B	
Product ID		SQ32 – Giovenzana Line	SQ63 – Giovenzana Line	SQ125 – Giovenzana Line	
Picture					
Function		door interlock - 3 poles on-off – 90° switching angle (aux contact : neutral, protective earth "PE", NC or NO available on request)			
Comply with standards		IEC 947-3, EN60947-3, UL508			
Rated insulation voltage [U]		690V			
Rated impulse withstand voltage [Uimp]		8kV			
Rated thermal current [Ith] / in enclosed [Ithe]		40A	80A	125A	
Frequency		50/60 Hz			
Rated operating current [Ie]	AC21A	690Vac	40A	80A	125A
	AC22A	690Vac	32A	80A	125A
	AC23A 3ph-3poles	230V	32A	75A	125A
		400/500V	32A	67A	125/100A
	690V	20A	32A	80A	
Rated breaking capacity (cosφ 0.45)	400V	256A	536A	1000A (cosφ 0.35)	
Conditional rated short circuit		10kA		10.5kA	
Fuse ratings gG	690V	40A	63A	125A	
Connectable section	flex cable	1.5 - 10 mm ²	6 - 25 mm ²	10-70 mm ²	
	rigid cable	1.5-16 mm ² / 12-6 AWG	10-35 mm ² / 10-2 AWG	10-70 mm ²	
General use UL 508	600Vac	40A	80A	-	
Terminal protection class		IP20 - (IP10 for SQ125)			
Fixing system		DIN-rail 50022-35 or with screws			

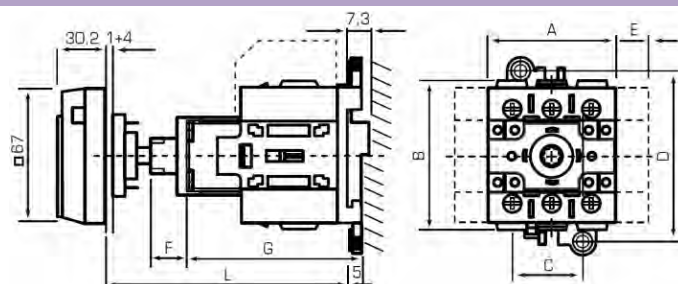
Door-interlock actuator



- Yellow front plate
 - Red knob
 - Locking knob (max 3 locks)
 - Protection class EN60529: IP65
- (o) UL50 type 1-4-4x

for series	code
SQ032	012/0001 (o)
SQ063	042/0001 (o)
SQ125	231/0001

Dimensions



Series	A	B	C	D	E	F	G	L
SQ032	45	52.6	22	60	12.5	13.5	60.3	80÷142 max
SQ063	52.5	72.5	43.5	82.5	17.5	23.5	57.8	112÷142 max
SQ125	65.2	92	51.2	102.2	22.5	16	64	127÷327 max



Annotations:

A large rectangular area with a black header bar containing the text 'Annotations:'. Below the header bar, the page is filled with a series of horizontal lines alternating between light gray and white, providing a template for writing annotations.



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