GIOVENZANA
INTERNATIONAL B.V.

HANDLING SYSTEM

Edition 2015 Rev. 02_2015

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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 happened 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 an **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 certificated **UNI EN ISO 140001:2004**

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

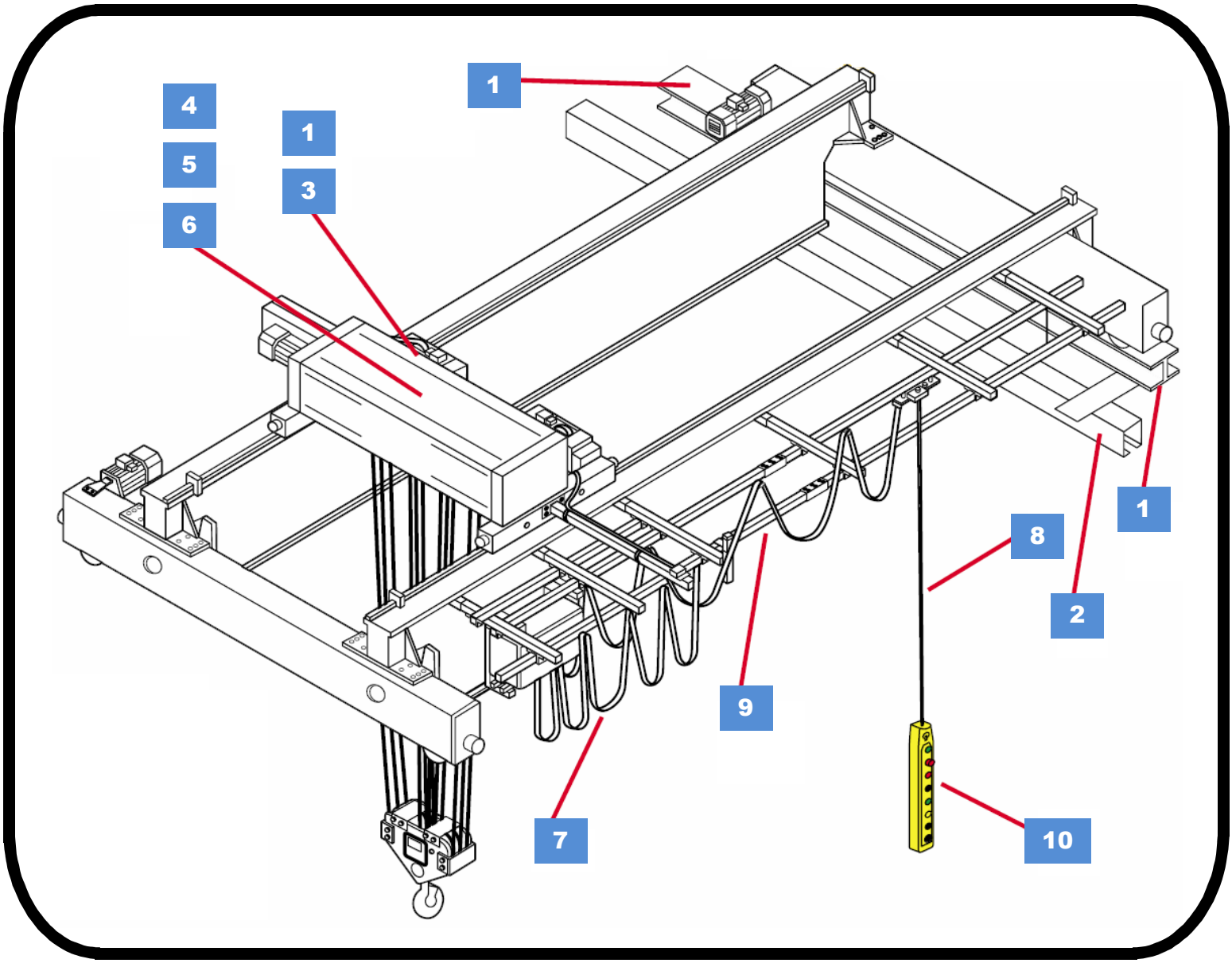
Throughout the years, continuous technological research and development has made Giovenzana the undisputed leader in its field.
The range includes: pit bottom push button stations, recall drive control units and inspection boxes.

YOU ARE HERE

HANDLING SYSTEM

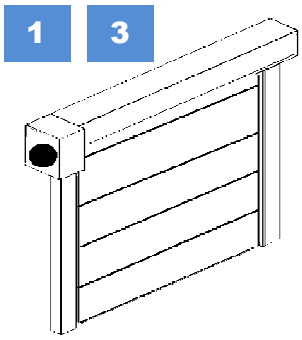
Lifting equipment comprises of single and double row pendant stations up to 14 gang for control and direct switching, position and rotary gear limit switches, slip rings, warning horns, busbar conductor rails and festoon system.

Catalogue contents

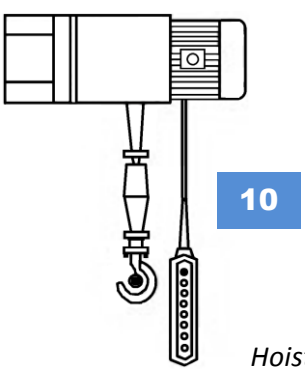


Picture shows a typical overhead crane assembly

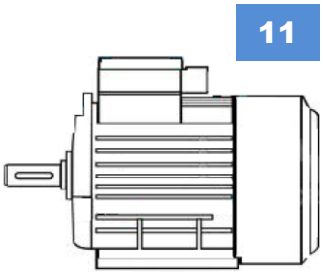
Other product applications:



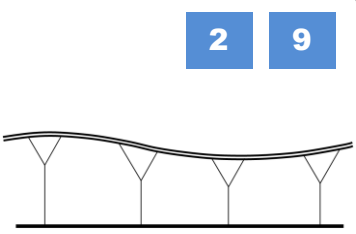
Rolling shutter door



Hoist



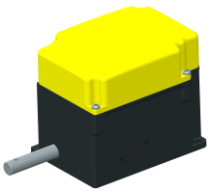
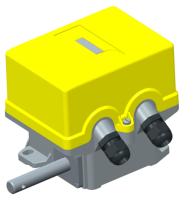
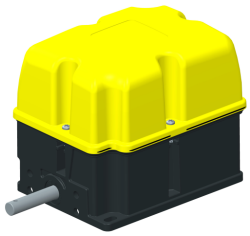
Slip ring motor

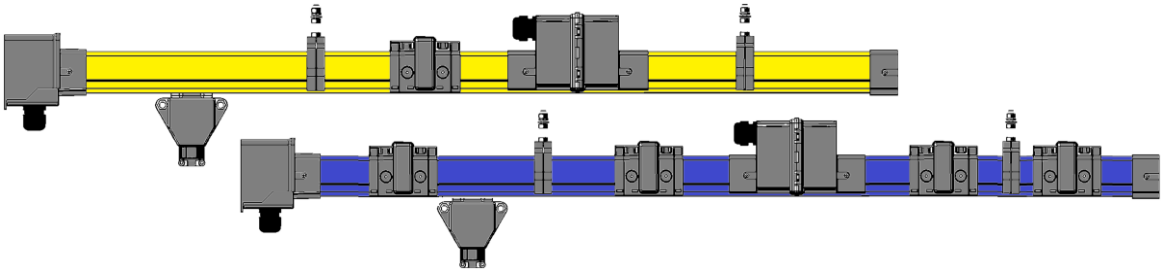


Energy transmission
- *Window cleaning*
- *BMU cradle*

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	thermoplastic 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	thermoplastic housing/cover ratio from 1:8 to 1:460 IP66 rear shaft version avaible 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

pendant station

12

shock proof - heat resistant
two direction interlocked
IP65 double insulation
indelible laser engraved symbols
high power contact block 25 A

PL

pendant station

14

shock proof - heat resistant
two direction interlocked
IP65 double insulation
indelible laser engraved symbols
from 5 to 12 holes

PLB

pendant station

15

shock proof - heat resistant
two direction interlocked
IP65 double insulation
indelible laser engraved symbols
from 4 to 14 holes

TLP

fixed/pendant station

16

shock proof - heat resistant
two direction interlocked
IP65 double insulation
indelible laser engraved symbols
compact and modern design

FCR

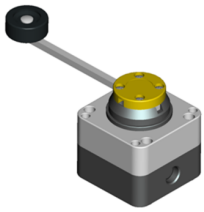
position limit switch

38

self extinguishing housing/cover
Ithe 16 A cam switch
IP65
for single or double speed motor
fully adjustable aluminium rods

FFH

position limit switch

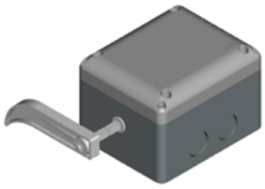


40

self extinguishing housing/cover
Ithe 20 A cam switch
IP65 double insulation
rubber covering wheel
fully adjustable metallic rod

FCP

position limit switch



41

self extinguishing housing/cover
Ithe 40 A cam switch
IP65
reinforced mechanical stop

SCUDO

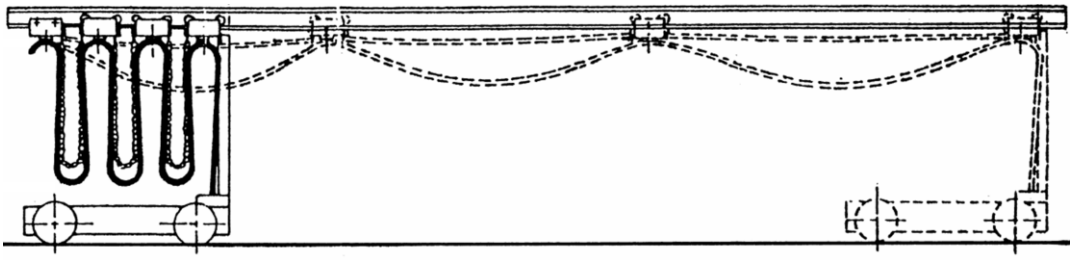
slip ring

42

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

festoon energy transmission



68

metallic “C” rail bar
Line30: load capacity 100 kg/m
Line 41 : load capacity 140 kg/m
steel or plastic trolley
ball bearing trolley

Wire-Rope

festoon energy transmission

76

trolley load capacity 8 kg
with one or two roller/s

I-Beam

festoon energy transmission

77

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

G75/100

warning horn

43

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, Raee 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

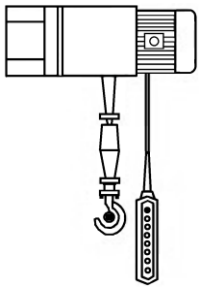
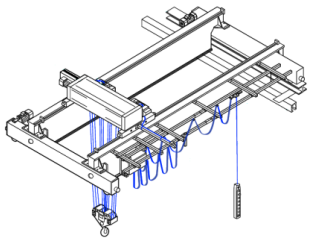
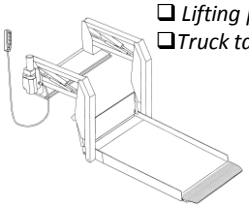
Giovenzana's products comply with both the European EN and the American UL standards. These regulations, such as the EN 60024 (covering the safety requirements of the electrical circuits on board industrial machinery), define the characteristics, performance and use of the products.

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 biult 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.

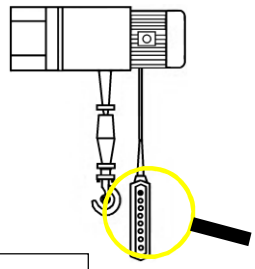
Use (recommended)	**Line**	**Picture**	**Characteristic**
	P02		Two push button pendant stations for small hoist : • single speed or two speed motor • direct motor control 1kW – 1speed • available in UL/CSA requirements
	page 12	*(item available in kit-form,: enclosure, contact block and operator available separately for customization)*	
❑ *Hoist* 	**P03**		Three push button pendant stations for small hoist: • single speed motor or two speed motor • direct motor control 1kW – 1speed • available in UL/CSA requirements
	page 12	*(item available in kit-form,: enclosure, contact block and operator available separately for customization)*	
	HP03	 *Ergonomic! design*	Ergonomic pendant stations for small hoist : • single speed motor • two speed motor • available in UL/CSA requirements • safety line available page 25
	page 12	*(item available in kit-form,: enclosure, contact block and operator available separately for customization)*	
	DC30	 *High power!*	Pendant stations for high power hoist: • direct motor control single phase and three phase • Ith 25A - 1phase/2poles 230…400V 2.2kW 3phase/3poles 230…400V 4kW
	page 12		
❑ *Overhead crane* 	**PL**		SINGLE-row pendant stations for crane control circuits: • 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	*(item available in kit-form,: enclosure, contact block and operator available separately for customization)*	
	PLB		DOUBLE-row pendant stations for crane control circuits: • single speed motor • two speed motor • available in different configuration with 4-6-8-10-12-14 holes
	page 15	*(item available in kit-form,: enclosure, contact block and operator available separately for customization)*	
❑ *Lifting platform* ❑*Truck tails lift* 	**TLP**	 *Compact! design*	Compact pendant stations for lifting platform and tails lift application (pendant or wall fixing)
	page 16	*(item available in kit-form,: enclosure, contact block and operator available separately for customization)*	

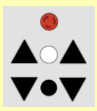
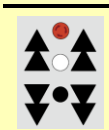
Pendant stations

Hoist control: **P02 P03 HP03 DC30**

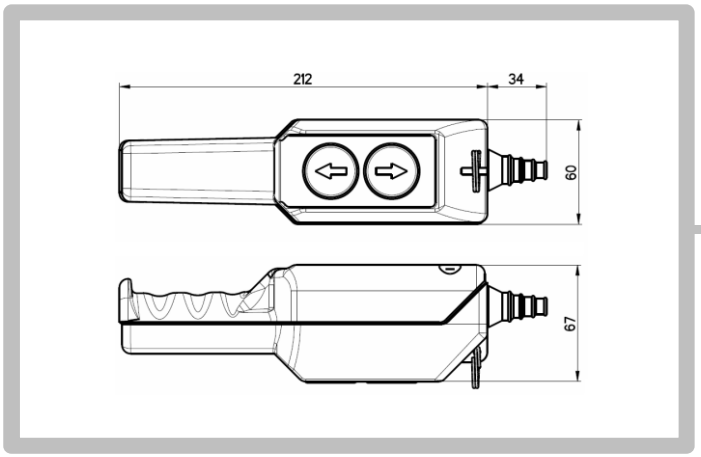
Characteristics:

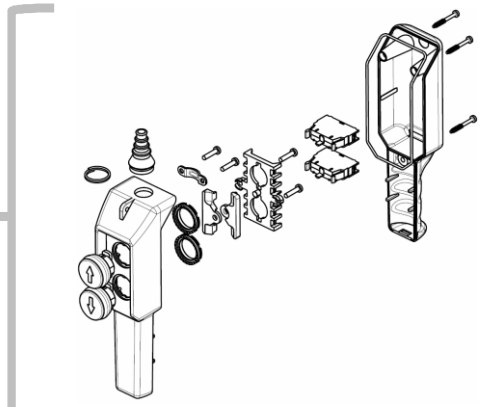
- ❑ Bi-directional, mechanically interlocked
- ❑ IP 65 double insulation IEC/EN60529 □
- ❑ General and electrical data page 23
- ❑ Laser engraved symbols comply with EN60204-1, FEM 9.941
- ❑ Shock proof and heat resistant



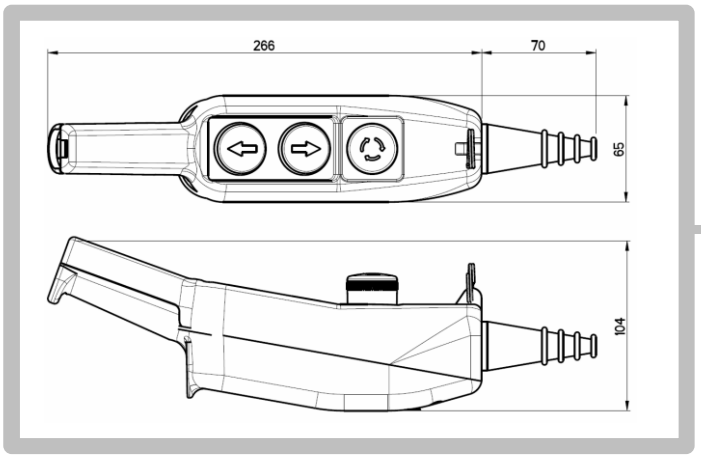
PICTURE	LAYOUT	CONFIGURATION	CODE	CONTACT TYPE	WEIGHT [gr]
 **P02**		SINGLE SPEED (* TILTING BUTTON 16A – 250Vac ½ HP)	**P02.RM**	NC · 1 NO* · 1 NO*	230
		SINGLE SPEED	**P02.1**	NO · NO	230
			P02.2	NO NO / NO NO	250
			P02.4	NC NC / NO NO	250
		(*) HIGH POWER CONTACTS DIRECT MOTOR CONTROL 1Kw 1ph	**P02.CD**	NC(*) NC(*) / NO(*) NO(*) / NO(*) NO(*)	230
		TWO SPEED	**P02.D2**	I^ NO NO NO NO / II^ NO NO NO NO	250
 **P03**		SINGLE SPEED	**P03.1**	NC · NO · NO	440
			P03.2	NC · NO NO · NO NO	450
			P03.3	NC · NO NO NO · NO NO NO	460
		(*) HIGH POWER CONTACTS DIRECT MOTOR CONTROL 1Kw 1ph	**P03CD**	NC(*) NC(*) NC(*) / NC(*) NO(*) NO(*) / NO(*) NO(*) NO(*)	460
		TWO SPEED	**P03D2**	NC · I^ NO NO NO NO / II^	460
 **HP03**		SINGLE SPEED	**HP03**	NC · NO · NO	330
		TWO SPEED	**HP03.D2**	NC · I^ NO NO NO NO / II^	350
 **DC30**		SINGLE SPEED	**DC30**	NC NC NC · 3 NO 1 NC · 3 NO 1 NC (*)	600
			DC30.RG	NC NC NC · 4 NO · 4 NO (*)	600
		(*) Ith 25A EXTRA HIGH POWER CONTACTS BLOCK FOR DIRECT MOTOR CONTROL : 2.2kW 1ph / 4kW 3ph	**DC30.GE**	NC NO · 3 NO 1 NC · 3 NO 1 NC (*)	600
		TWO SPEED (*) Ith 25A EXTRA HIGH POWER CONTACTS BLOCK FOR DIRECT MOTOR CONTROL : 2.2kW 1ph / 4kW 3ph	**DC30D2**	NC NC NC · (*) 2 NO 2 NC · 2 NO 2 NC	650

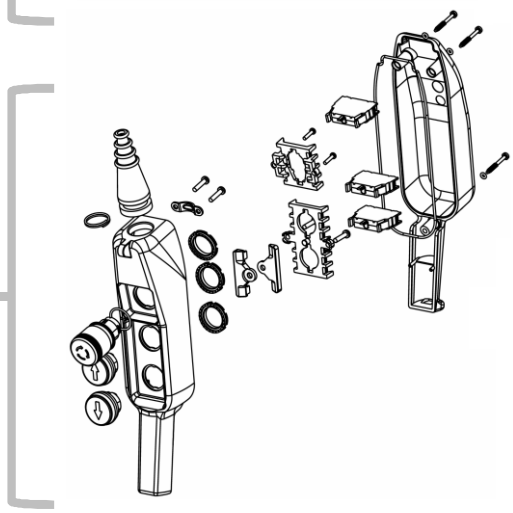
P02



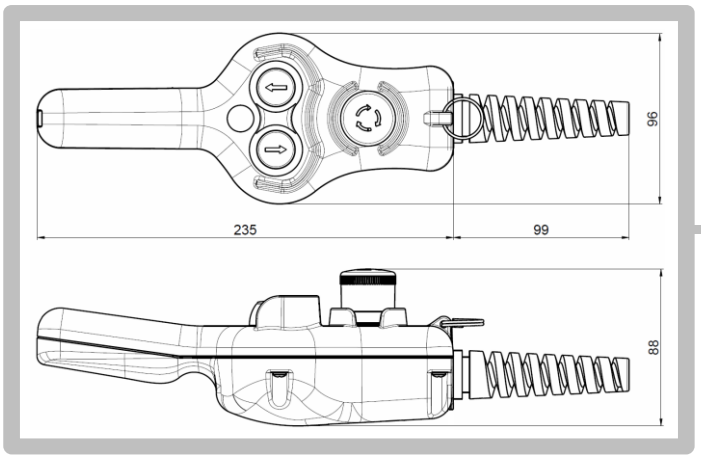


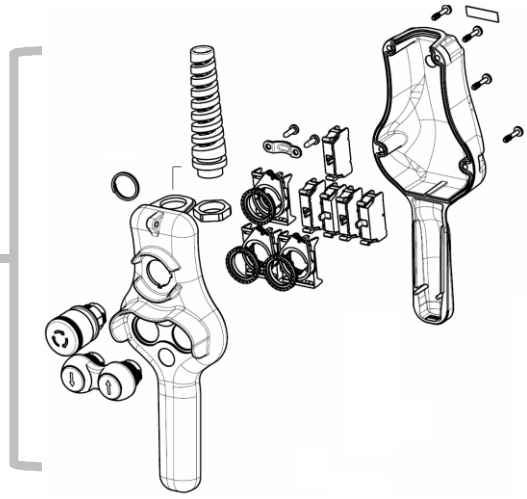
P03



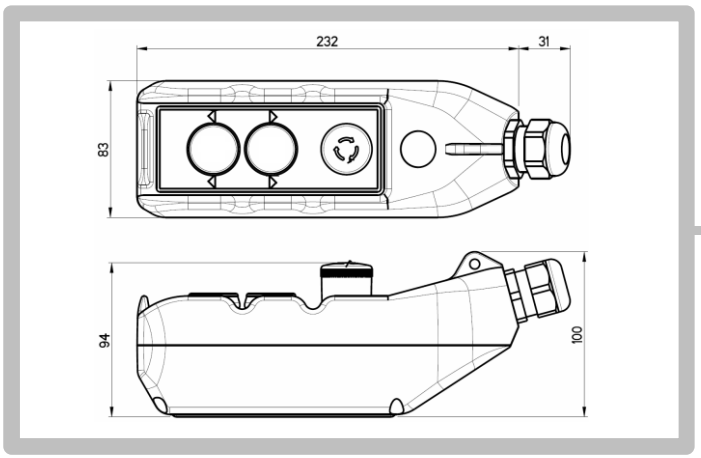


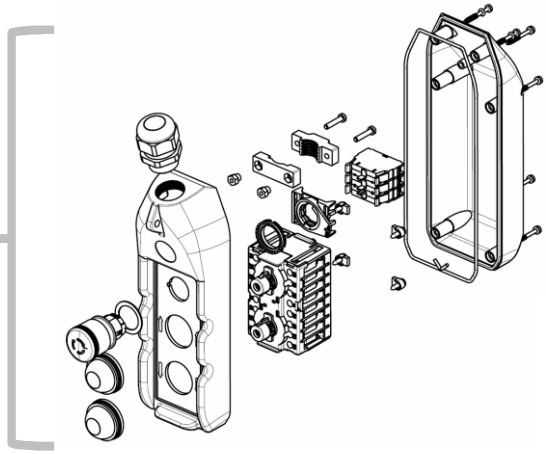
HP03

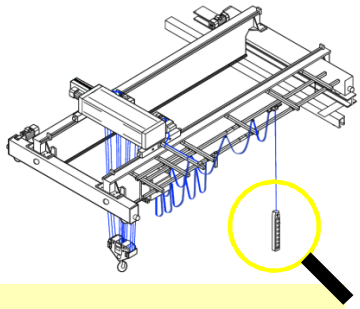




DC30





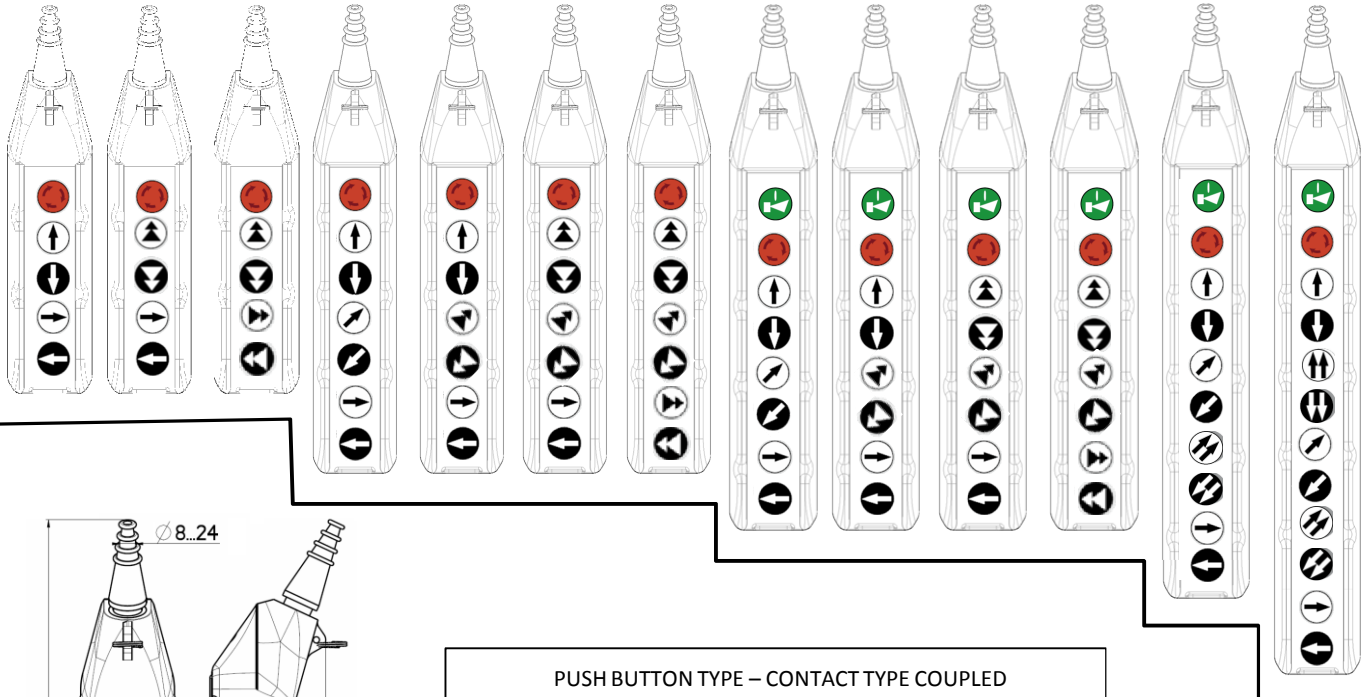


Characteristics:

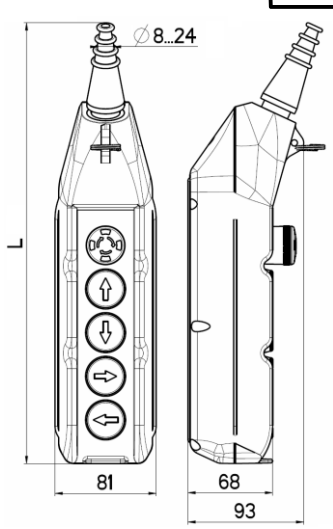
- ❑ Bi-directional, mechanically interlocked
- ❑ IP 65 double insulation IEC/EN60529 □
- ❑ General and electrical data page 23
- ❑ Laser engraved symbols comply with EN60204-1, FEM 9.941
- ❑ Shock proof and heat resistant
- ❑ Available in UL/CSA requirements

CODE	PL05/E	PL05D2/E	PL05D4/E	PL07/E	PL07D2/E	PL07D4/E	PL07D6/E	PL08/E	PL08D2/E	PL08D4/E	PL08D6/E	PL10/E	PL12/E
weight [gr.]	600	625	655	800	830	855	880	890	915	945	970	1.105	1.290
N° push button	5	5	5	7	7	7	7	8	8	8	8	10	12
L lenght [mm]	345	345	345	495	495	495	495	530	530	530	530	640	710

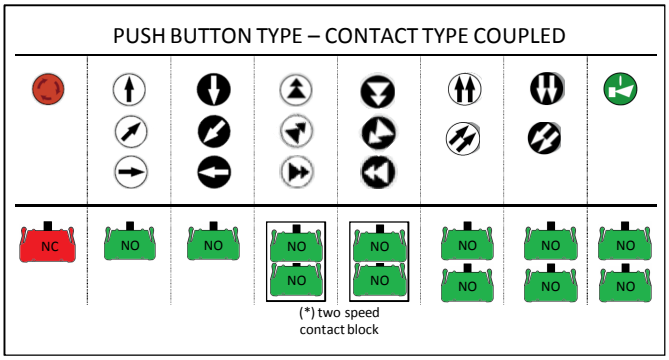
LAYOUT

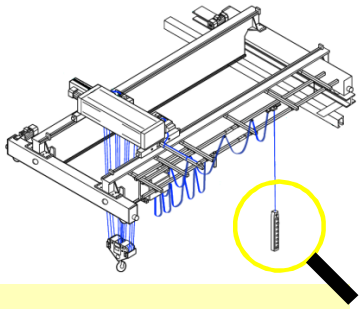


DIMENSIONS



PUSH BUTTON TYPE – CONTACT TYPE COUPLED



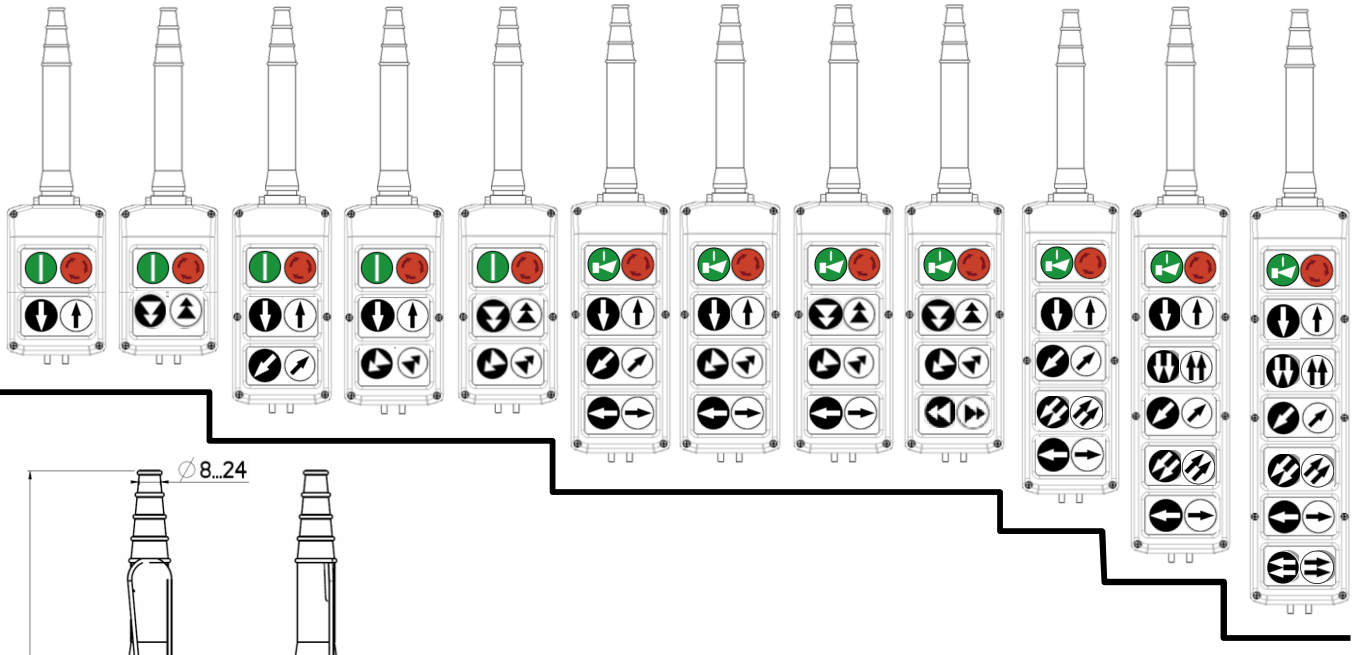


Characteristics:

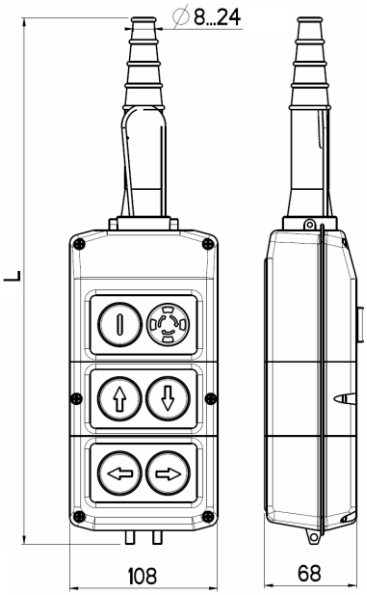
- ❑ Bi-directional, mechanically interlocked
- ❑ IP 65 double insulation IEC/EN60529 □
- ❑ General and electrical data page 23
- ❑ Laser engraved symbols comply with EN60204-1, FEM 9.941
- ❑ Shock proof and heat resistant

CODE	PLB04/E	PLB04D2/E	PLB06/E	PLB06D2/E	PLB06D4/E	PLB08/E	PLB08D2/E	PLB08D4/E	PLB08D6/E	PLB10/E	PLB12/E	PLB14/E
weight [gr.]	530	555	700	730	755	860	895	920	945	1.080	1.245	1.445
N° push button	4	4	6	6	6	8	8	8	8	10	12	14
L lenght [mm]	345	345	399	399	399	453	453	453	453	547	604	655

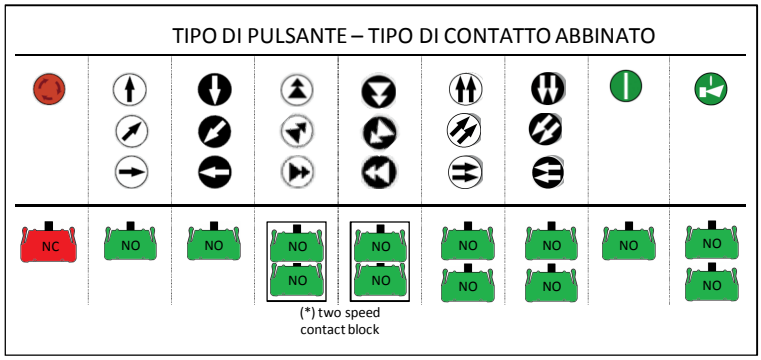
LAYOUT



DIMENSIONS

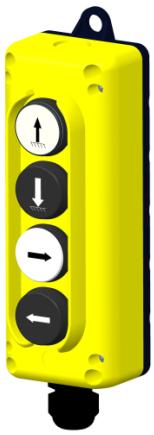


TIPO DI PULSANTE – TIPO DI CONTATTO ABBINATO

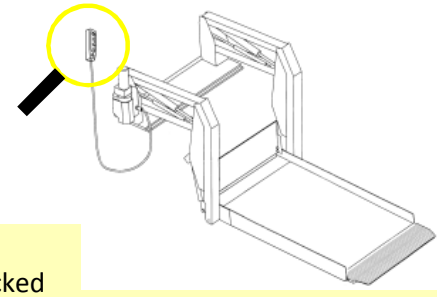


(*) two speed contact block

MOBILE-PENDANT FIXING
(with WALL BRACKET accessories)



WALL FIXING

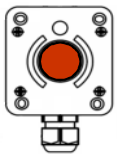


Characteristics:

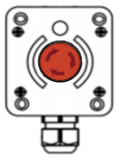
- ❑ Compact and modern design
- ❑ Bi-directional, mechanically interlocked
- ❑ IP 65 double insulation IEC/EN60529 □
- ❑ General and electrical data page 23
- ❑ Laser engraved symbols comply with EN60204-1, FEM 9.941
- ❑ Contact block with spring cage terminal
- ❑ Shock proof and heat resistant
- ❑ Mobile-Pendant (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 lenght [mm]	80	80	115	150	150	185	185

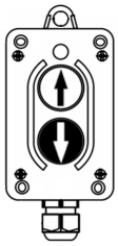
LAYOUT

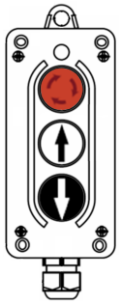


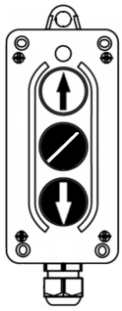
push pull



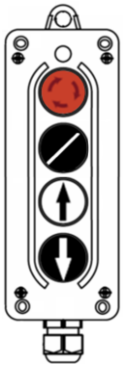
twist release



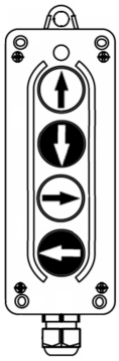




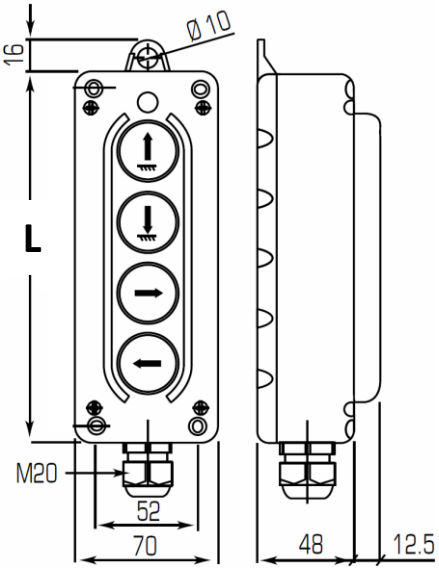
selector switch

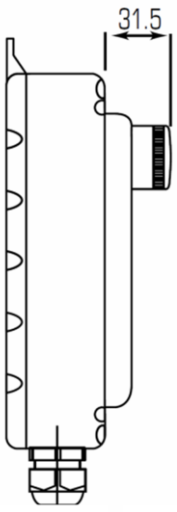


selector switch

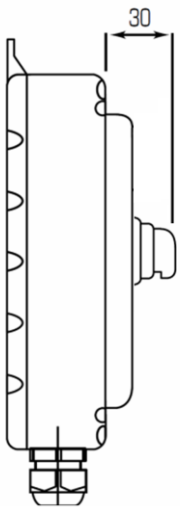


DIMENSIONS

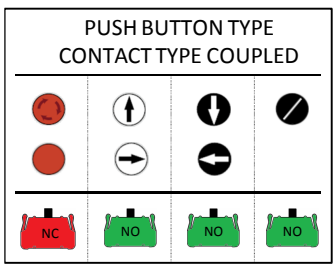




With
Emergency Stop



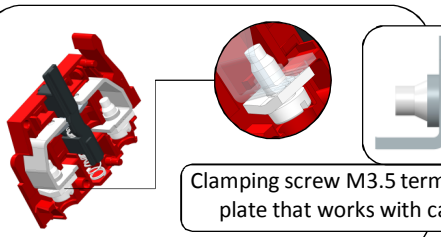
With
Selector Switch



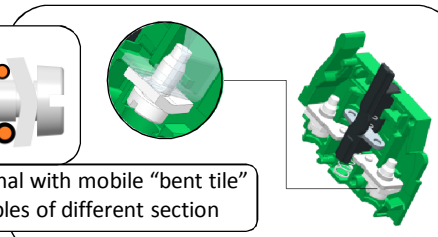
PL004 line

NC

PL004001



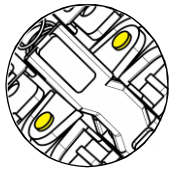
Clamping screw M3.5 terminal with mobile "bent tile" plate that works with cables of different section



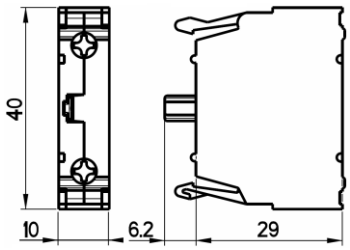
NO

PL004002

Simply Contact Point



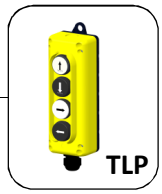
Dimensions

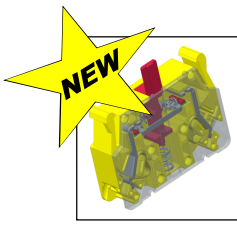


Markings

Technical data see page 23

PCW line





Safety contact block

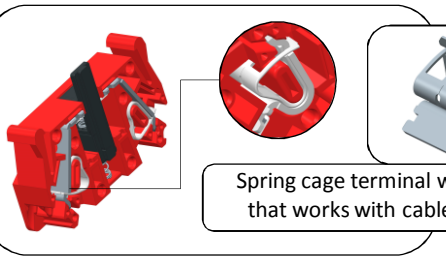
SAFETY FIRST

Code: PCW01FT (see page 24)

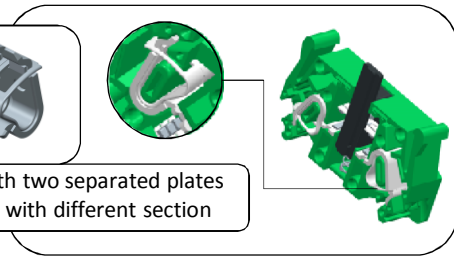
An important step in accident prevention!

NC

PCW01



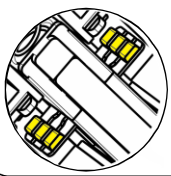
Spring cage terminal with two separated plates that works with cables with different section



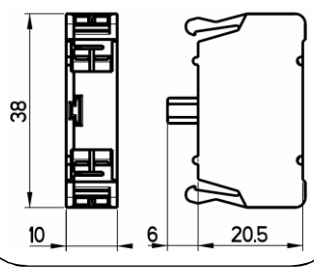
NO

PCW10

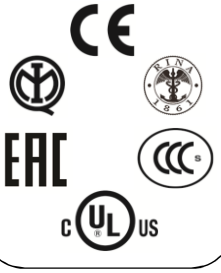
Three Contact Point
safe & durable energy transmission



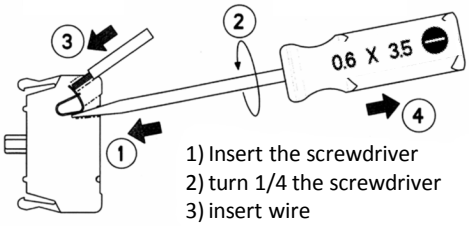
Dimensions



Markings



Spring cage terminal:



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

Pendant / Fixed Stations

KIT To be customized

Create your customized station in 4 steps

STEP 1
Choose station type

SMALL ← DIMENSIONS → BIG

		HOLES n°	CODE	WEIGHT [gr]
P02		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

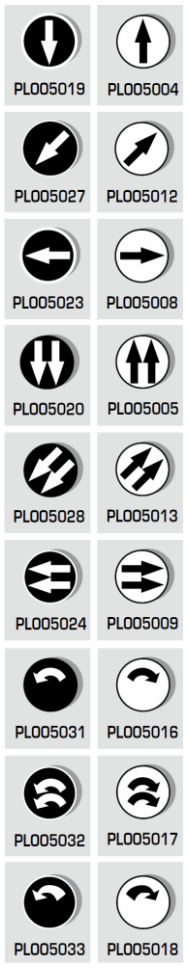
STEP 3
Choose CONTACT TYPE

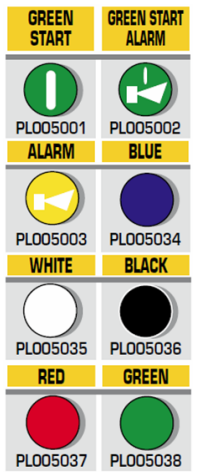
P02-P03-PL-PLB

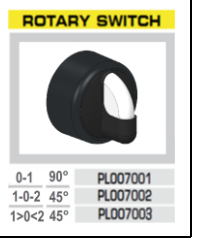
TLP

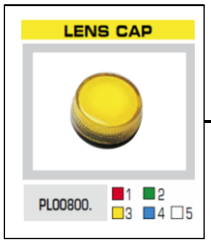
(*) Symbols according to FEM 9.941
Customized engraving available (min. quantity applies)

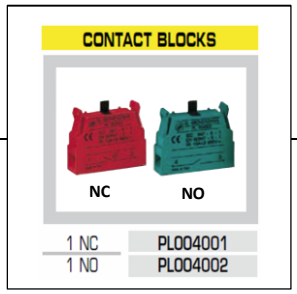
(*)

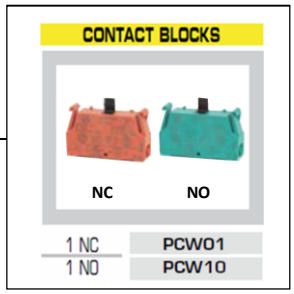


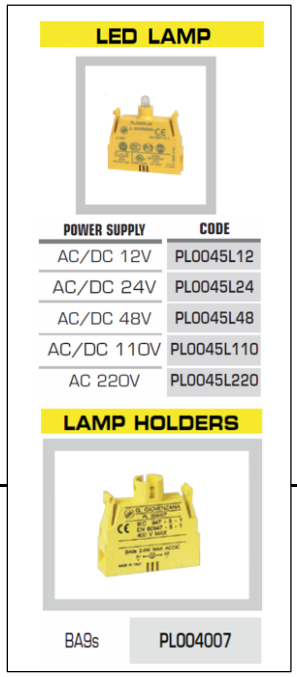


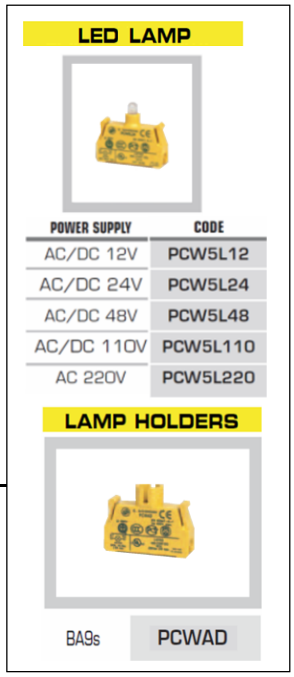




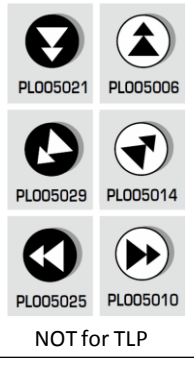




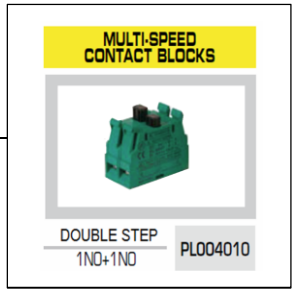


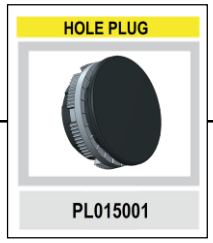


(*)

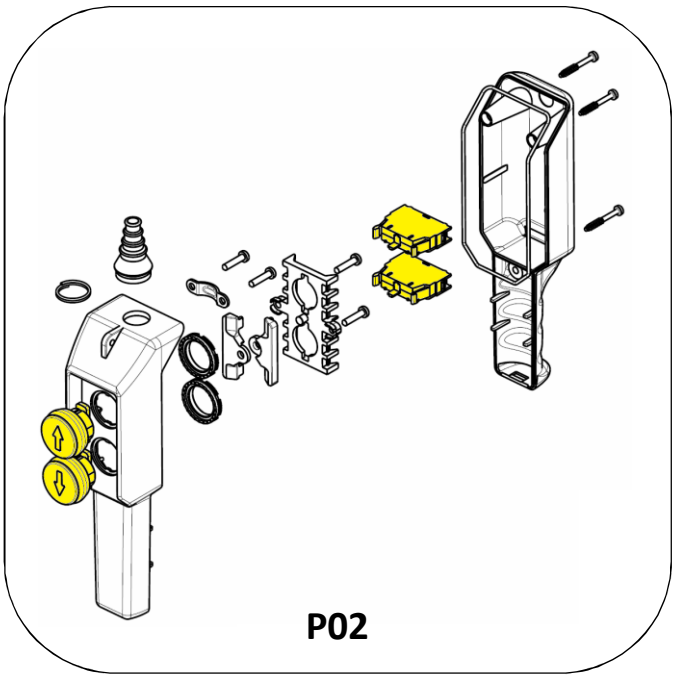


NOT for TLP

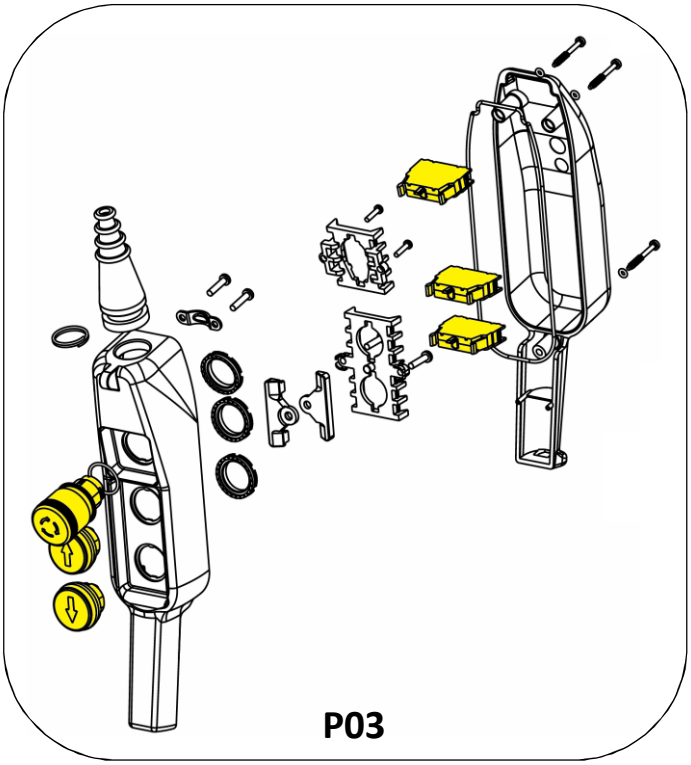




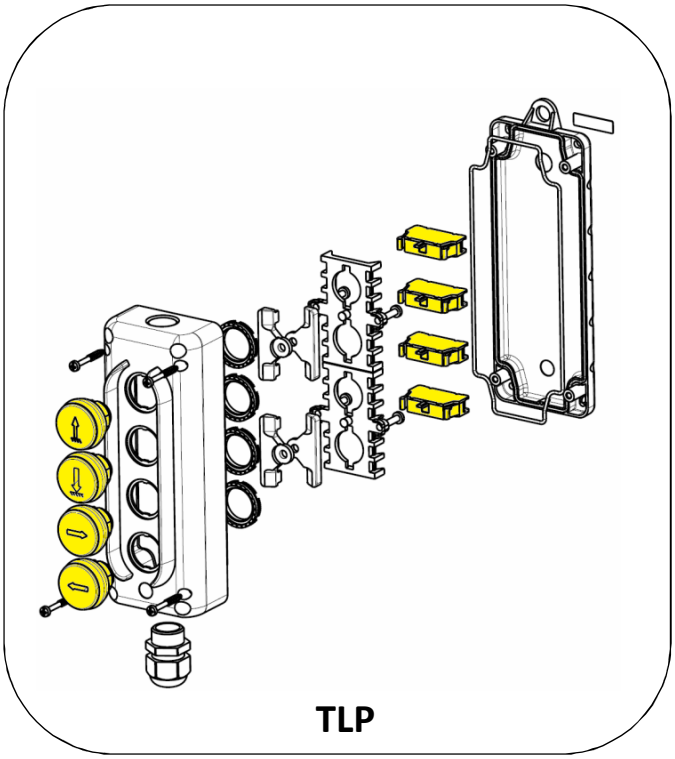
STEP 4
Mounting instructions



P02



P03



TLP

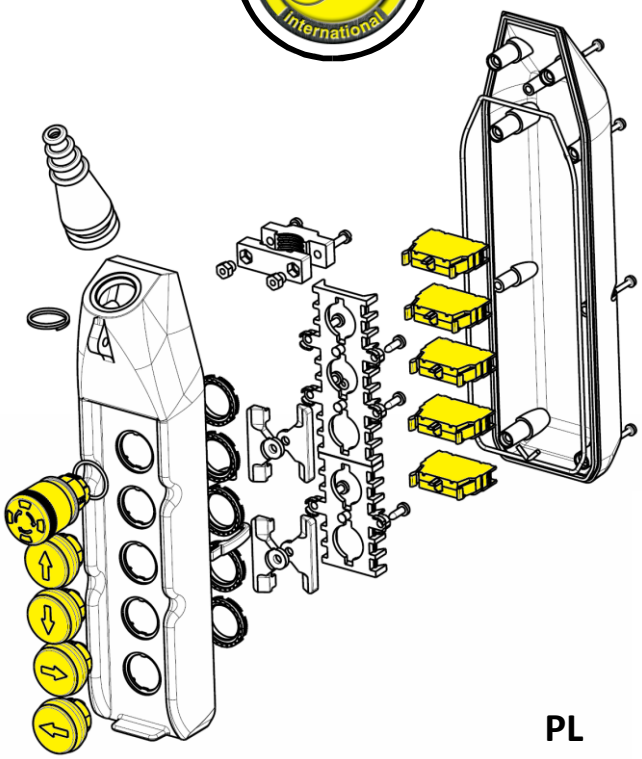
STEP 1
kit enclosures include

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

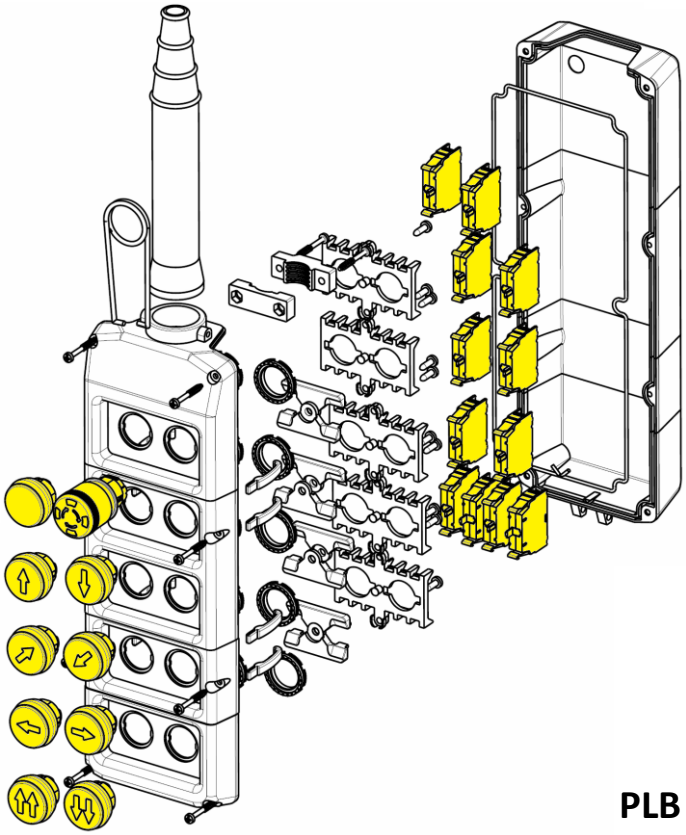
STEP 2-3
(item in yellow colour)

- Contact block
- Push buttons

must be choosen and purchased separately from the enclosure kit



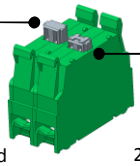
PL



PLB

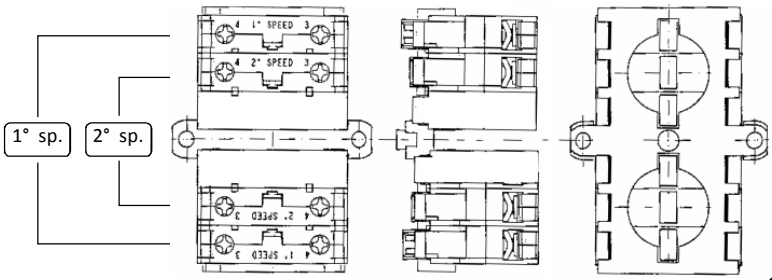
ASSEMBLY INSTRUCTION FOR 1ª - 2ª SPEED CONTACT BLOCKS

PL004010



1° speed "high" plunger

2° speed "low" plunger



SPARE PARTS:

P02 – P03 – PL – PLB – TLP

COUPLING PLATE

2 HOLES	PL003001
3 HOLES	PL003002

INTERLOCK

TOP	PL011001
BOTTOM	PL011002

CABLE CLAMP LEVER

PL012001

NOT for TLP

CABLE SLEEVE

VERSION	CODE
P02 cable Ø 7...14	12906011
P03 - PL05 cable Ø 7...18	12906006
PL07...PL12 PLB04-PLB06 cable Ø 9...21	12906004
PLB08-PLB14 cable Ø 12...24	12906005

NOT for TLP

❑ *Operators and contacts block codes please go to page 19*

DC30

CONTACT BLOCKS

mechanical interlock

FOR SINGLE SPEED - REVERSING MOTORS

	CODE	FOR
3NO+1NC	30205085	DC30 DC30.GE
4NO	30205087	DC30.RG

TWO-SPEED REVERSING MOTORS

	CODE	FOR
4NO (2NO+2NC progressive)	30205086	DC30D2

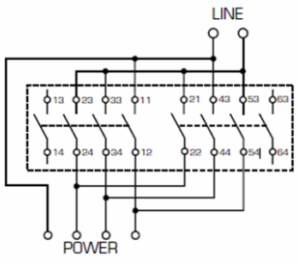
RUBBER BUTTON COVER

COLOUR	CODE
Black	11901044
White	11901046

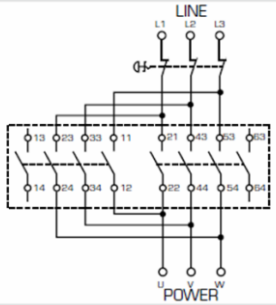
DRAWINGS EXAMPLES

POWER CIRCUITS

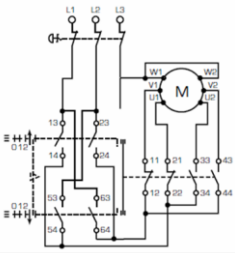
MONO-PHASE



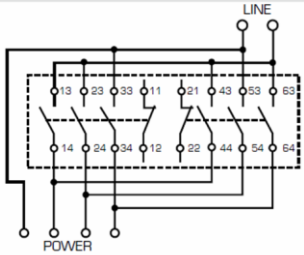
THREE-PHASE



For double speed, 2 reversing motor. Contact blocks



For single speed, 2 reversing motor. Contact block 3NO+1NC



TLP ACCESSORIES

WALL BRACKET

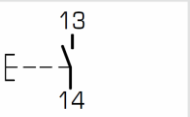
HOLES	CODE
1...3	16000061
4	16000062

SPIRAL CABLE GLAND

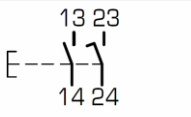
CODE
12901054

AUXILIARIES CIRCUIT

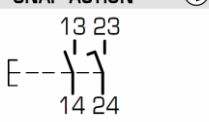
1 SPEED



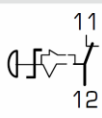
2 SPEED



SNAP ACTION



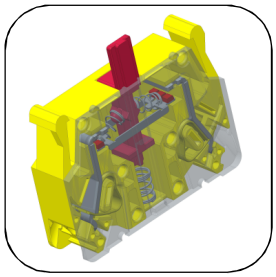
EMERGENCY



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

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		▪ P02 – P03: rubber cable sleeve Ø7…18mm ▪ PL – PLB: rubber cable sleeve Ø9…24mm ▪ HP03: spiral cable gland M20 – TLP: cable gland M20						cable gland M25

Electrical characteristics contact blocks		P02 – P03 – HP03 – PL – PLB – TLP									DC30
Markings		CE EAC cULus									CE EAC
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		(V)	24	60	110	240	400	440	500	690	
	type: PL004.. P02/P03/DC30 e-stop/PL/PLB	(A)	16	12	8	6	4	3.5	3	1	-
	type: PCW.. HP03-TLP	(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 capactity	type: PL004.. P02/P03/DC30 e-stop/PL/PLB	No. 1 or 2 flexible and solid conductor min 1 max 2.5 mm²									No. 1 or 2 flexible and solid conductor min 1 max 2.5 mm²
	type: PCW.. HP03-TLP	No. 1 or 2 flexible and solid conductor min 0.5 max 2.5 mm²									
UL508 characteristics											
General use	600V ac	16A									-
Designation code (HD) Heavy Duty		A600-Q600									-



Safety contact block

Code: PCW01FT

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

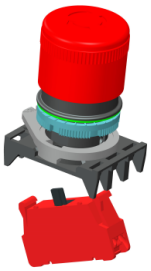
An important step in accident prevention!

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:

Normal NC – PCW01

E-stop
Activated

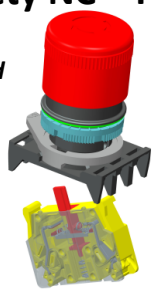


DANGER!:

NO response from the NC contact

Safety NC – PCW01FT

E-stop
Activated

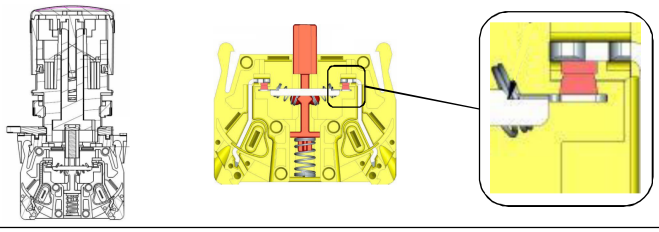


OK

If separated from the operator the safey
NC contact block switch in NO

OPERATING SYSTEM

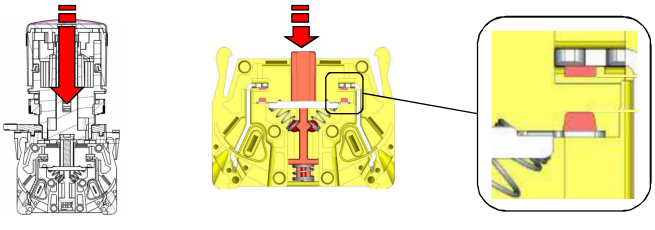
CONTACT MOUNTED E-STOP NOT PUSHED



CONTACT CLOSED

3 — 4

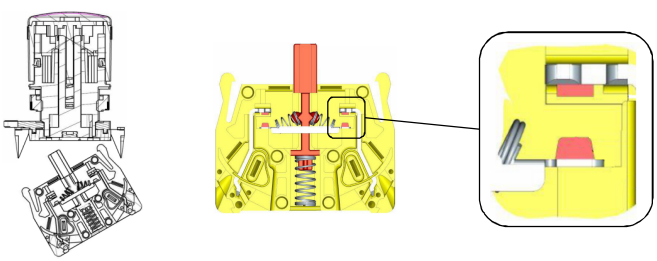
CONTACT MOUNTED E-STOP PUSHED



CONTACT OPEN

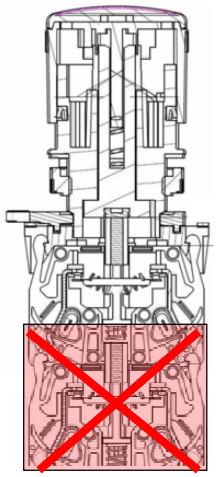
3 — 4

CONTACT SEPARATED
(bad assembly or mechanical break)



CONTACT OPEN

3 — 4

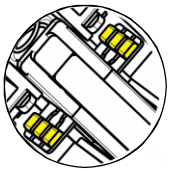


Stacking forbidden!

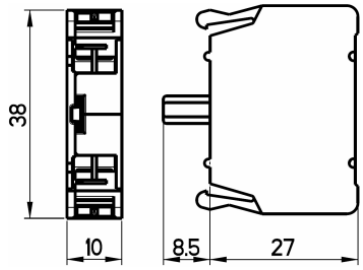
Do not fix the safety contact block under a contact block

Three Contact Point

safe & durable energy trasmission

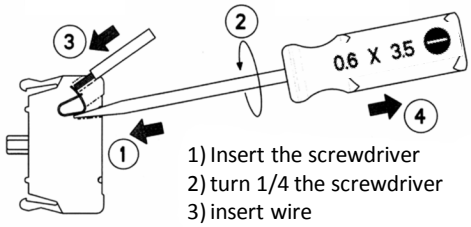


Dimensions



Markings

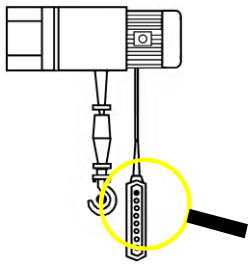
Spring cage terminal:



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]
HP03			SINGLE SPEED	HP03.SS	NC NO NO	330

NOTE: available in UL/CSA requirements

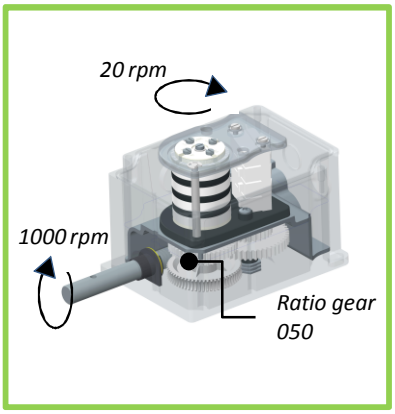
Rotary Gear Limit switches

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 definied 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.

Ratio

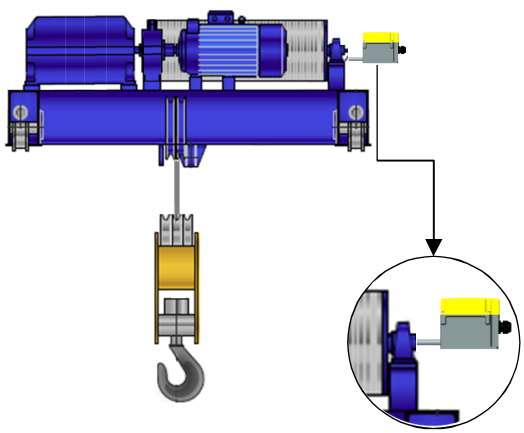
The Giovenana's rotary gear limit switch are available in different transmission ratio.
The ratio is the difference between the number of rotation of the main shaft and the number of rotation of the cams.



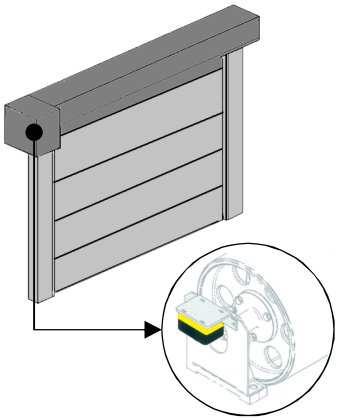
Potentiometer & Encoder

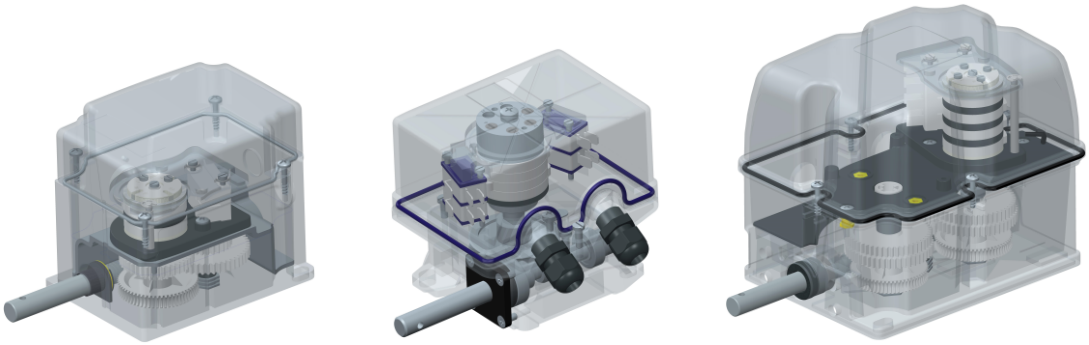
In addition to the microswitch :
- FGR1 line: available with potentiometer (direct ratio 1:1)
- FGR3 line: available with potentiometer or encoder having: direct ratio 1:1 or ratio 1:X (X=cam block ratio)

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



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



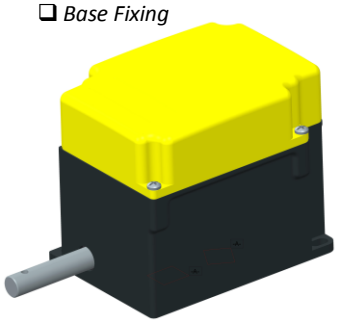
Line	FGR1	FGR2	FGR3
Page	28	30	32
Picture			
X-ray view			

Characteristics			
Case	thermoplastic glass fiber reinforced	aluminium housing self extinguishing cover V0 UL94	thermoplastic glass fiber reinforced
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 CE cULus EAC	8A - 250V – silver plated IEC/EN61058-1 / UL1054 1NC-1NO changeover fast trigger positive opening markings CE cULus EAC	8A – 250V – silver plated IEC/EN61058-1 / UL1054 1NC-1NO changeover fast trigger positive opening markings CE cULus EAC
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)

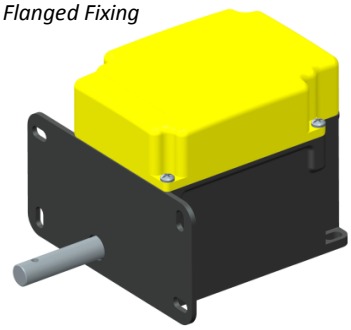
LIMIT SWITCHES

Version and options available

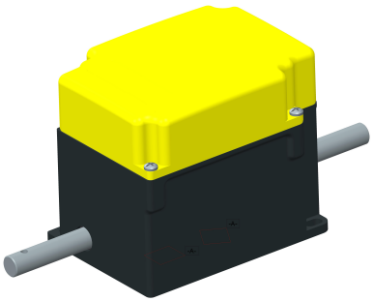
❑ *Base Fixing*



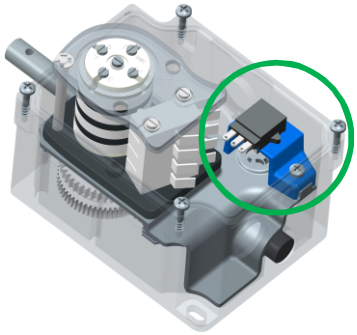
❑ *Flanged Fixing*



❑ *Rear shaft*

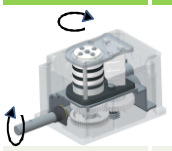
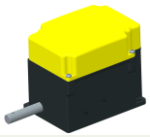
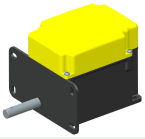
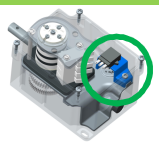
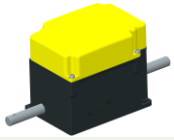


❑ *With potentiometer*

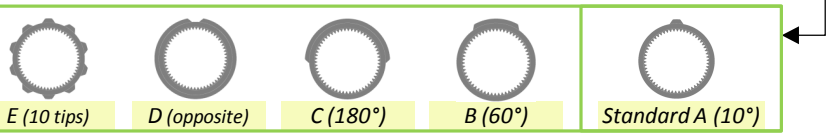


Characteristics

Case	thermoplastic glass fiber reinforced
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 CE cULus EAC
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)

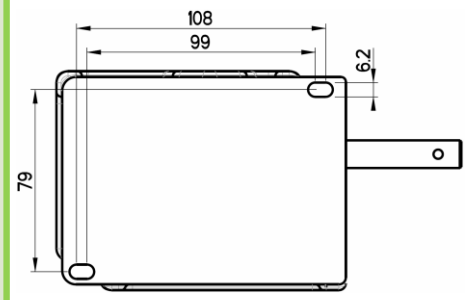
Ratio	Base Fixing	Flanged Fixing	N° of microswitches 2-3-4	Potentiometer 2.5 / 5 / 10kΩ	Rear shaft	Microswitch cams
			 *roller lever control (long life)*			
012	**FGR100124**	**FGR100124F**	4 silver plated	NO	NO	STANDARD
033	**FGR100334**	**FGR100334F**	4 silver plated	NO	NO	STANDARD
050	**FGR100504**	**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

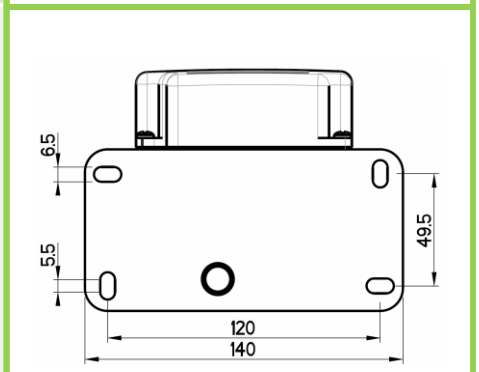


Fixing holes

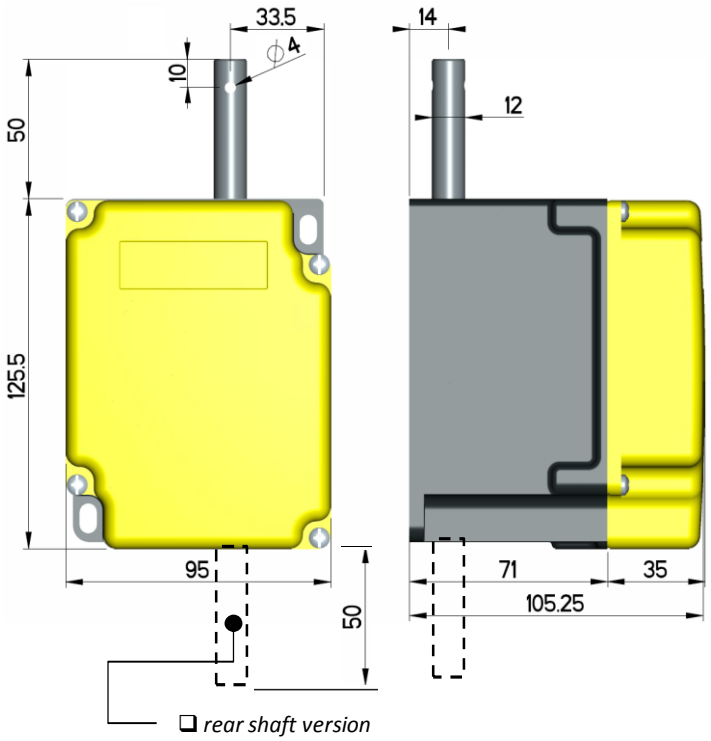
Base fixing



Flanged fixing



Dimensions

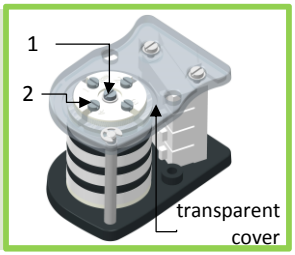


Microswitch system calibration guide

I. Loosen the main screw (1)

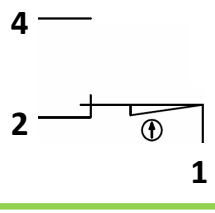
II. Adjust the screws (2)

III. Tighten the main screw (1)

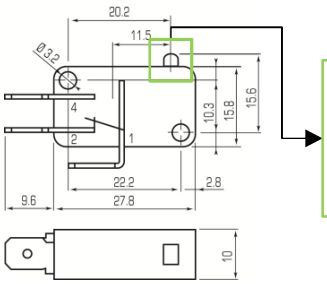


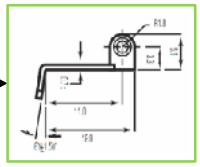
Spare parts

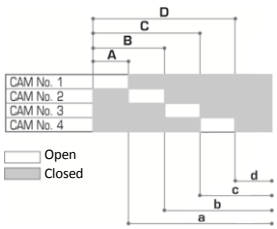
Microswitch	**MFI.3**

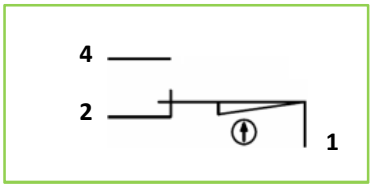


Microswitch table activation (with the standard cam"A")









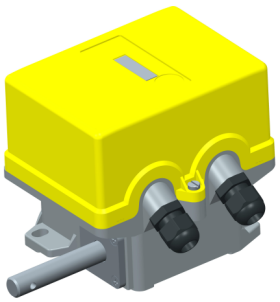
Ratio	Revolutions referred to the cam's activation							
	A	a	B	b	C	c	D	d
12	0.65	11.35	1.3	10.7	1.95	10.05	2.6	9.4
33	1.75	31.25	3.5	29.5	5.25	27.75	7	26
50	2.75	47.25	5.5	44.5	8.25	41.75	11	39
75	3.75	71.5	7.5	67.5	11.25	63.75	15	60
100	4.75	95.25	9.5	90.5	14.25	85.75	19	81
150	7.5	142.5	15	135	22.5	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.

LIMIT SWITCHES

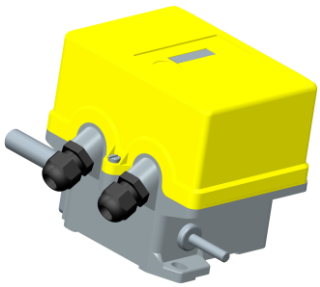
Version and options available

❑ *Base Fixing*



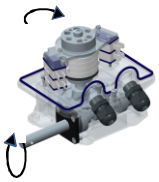
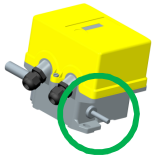
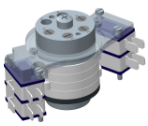
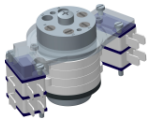
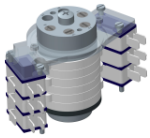
❑ *Flanged Fixing (with FLG accessories)*

❑ *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 CE cULus EAC
Microswitch max n° / notes	max 6 - micrometric adjustment
Cam block	self-lubricating with transparent support for easier cam viewing
Cable entry	M20 (max 2) included
Options (see page 34)	- 3 different cam shapes - 15 pinions

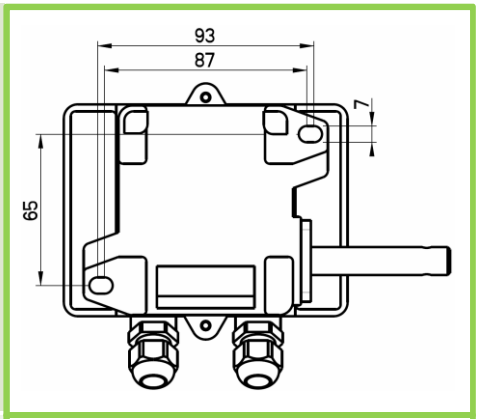
Ratio	Sigle shaft		Rear shaft		Microswitch cams
					
	4 microswitches	6 microswitches	4 microswitches	6 microswitches	
					
012	**FGR2006**	**FGR20066**	**FGR2006B**	**FGR2006B6**	STANDARD
033	**FGR2007**	**FGR20076**	**FGR2007B**	**FGR2007B6**	STANDARD
050	**FGR2008**	**FGR20086**	**FGR2008B**	**FGR2008B6**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

See page 34 for complete specifications

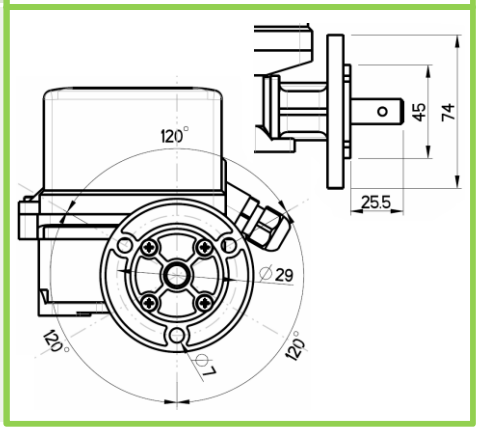
C (90°) *B (15°)* *Standard A (30°)*

Fixing holes

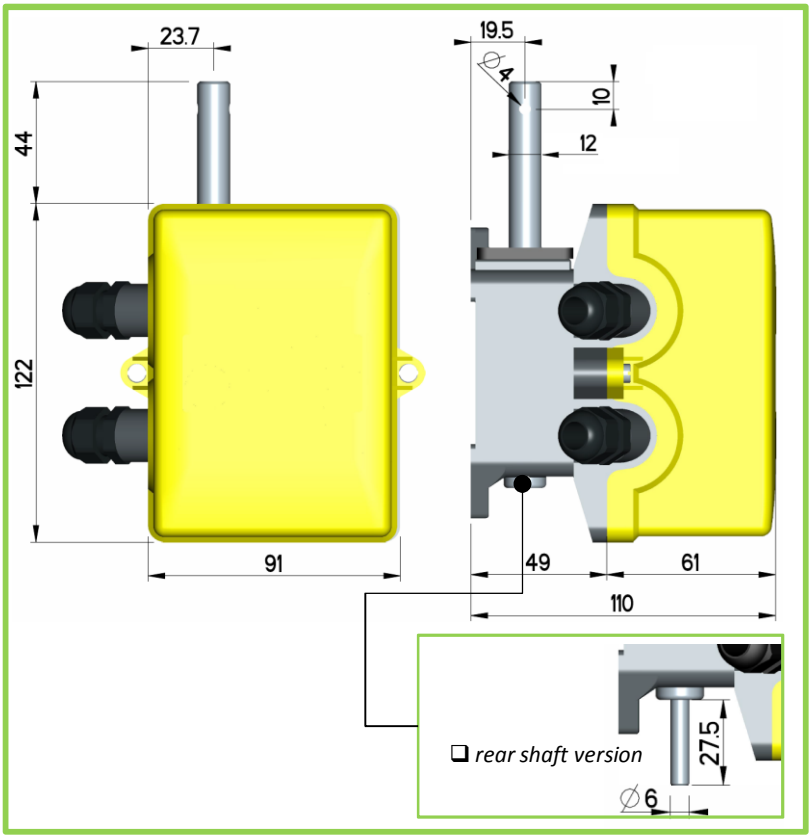
Base fixing



Flanged fixing **(FLG)**



Dimensions



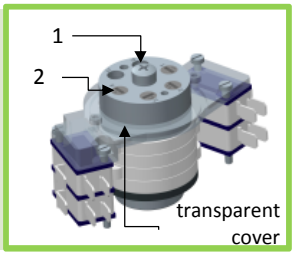
LIMIT SWITCHES

Microswitch system calibration guide

I. Loosen the main screw (1)

II. Adjust the screws (2)

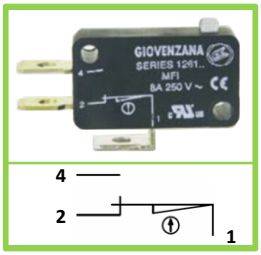
III. Tighten the main screw (1)



Spare parts / Accessories

Microswitch

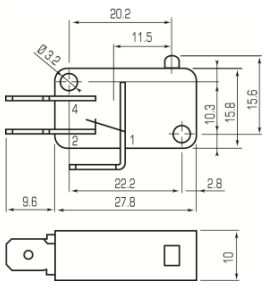
MFI

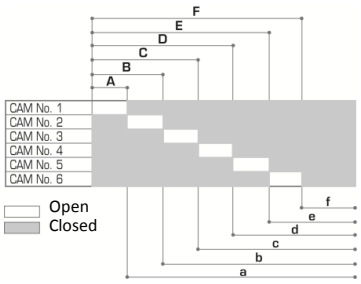


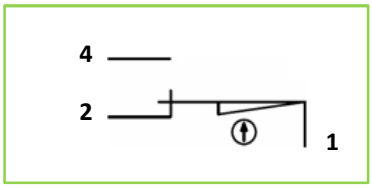
Flange

FLG

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







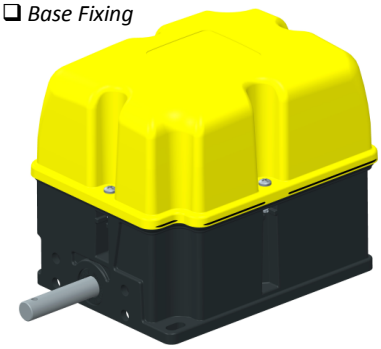
Ratio	Revolutions referred to the cam's activation											
	A	a	B	b	C	c	D	d	E	e	F	f
012	1.25	10.75	2.5	9.5	3.75	8.25	5	7	6.25	5.75	7.5	4.5
033	3.5	29.5	7	26	10.5	22.5	14	19	17.5	15.5	21	13
050	5	45	10	40	15	35	20	30	25	25	30	20
100	10	90	20	80	30	70	40	60	50	50	60	40
200	20	180	40	160	60	140	80	120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

LIMIT SWITCHES

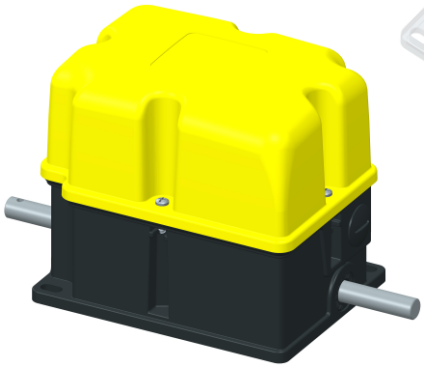
Version and options available

❑ *Base Fixing*



❑ *With encoder*

❑ *Rear shaft*



Characteristics

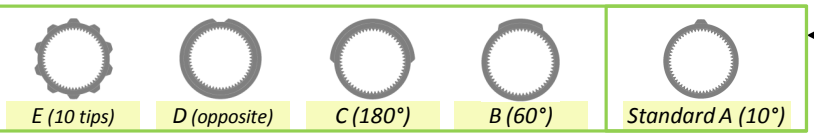
Case	thermoplastic glass fiber reinforced
Ratio	1:8 to 1:460
Protection class	IP66
Shaft type	- AISI 304 stainless steel mounted on ball bearing - coaxial shaft version available
Fixing type	- bottom (different metal plate available)
Microswitch	8A – 250V – silver plated contacts IEC/EN61058-1 / UL1054 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:

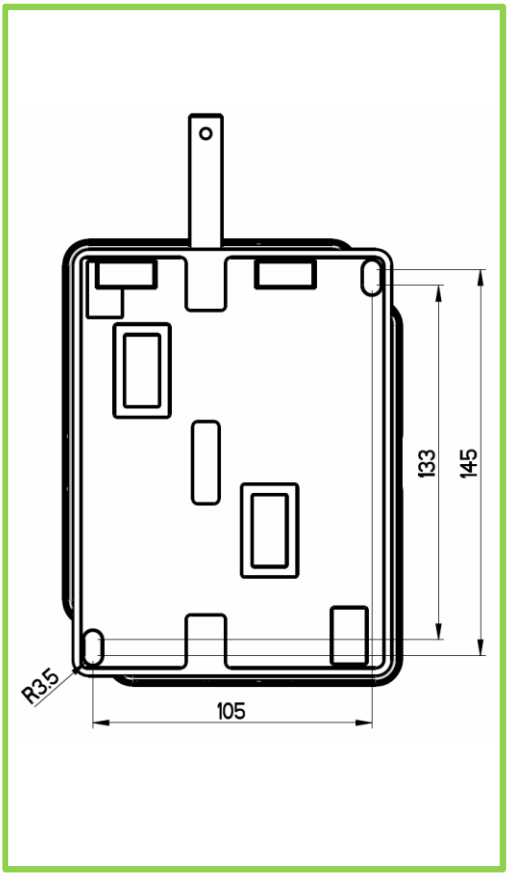
FGR3	0	060	4	1	51	-	XX
Line ID	**Optical reader**	**Ratio**	**N° of microswitch:**	**Shaft type**	**Pinion type:**		**Option**
	0= NO (however the unit permits the future equipment) 1= Encoder 2= Potentiometer	008 to 460	2= two 4= four	0= single output 1= double output	the last two numbers of the Giovenzana's 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°)

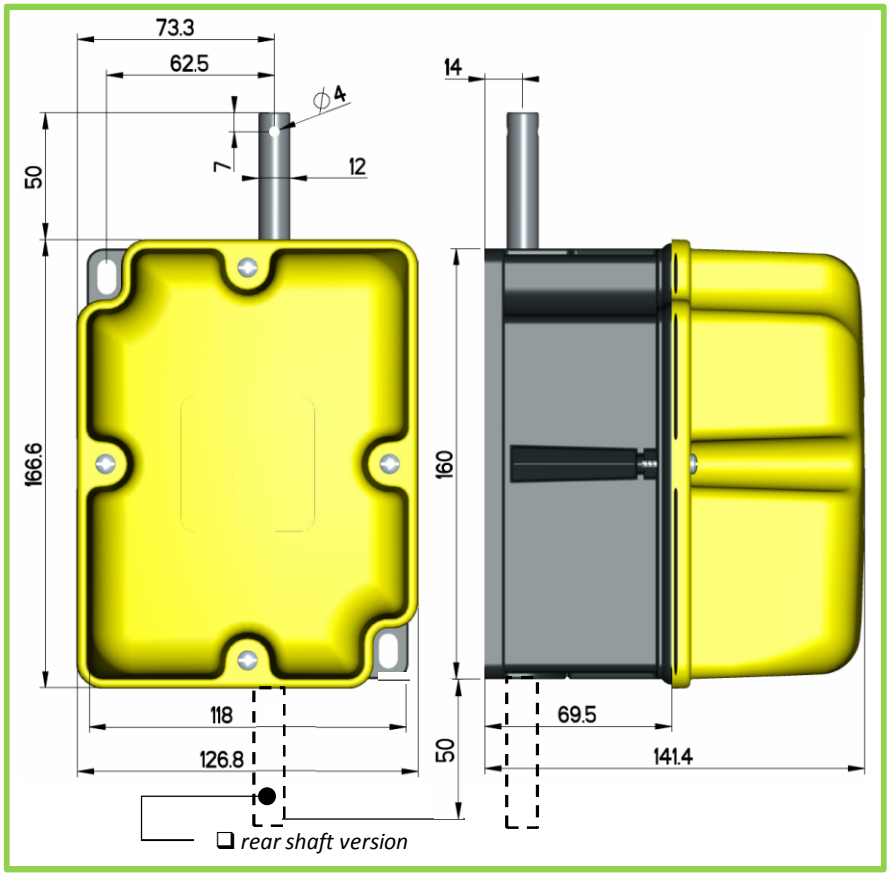
See page 34 for complete specifications



Fixing holes



Dimensions

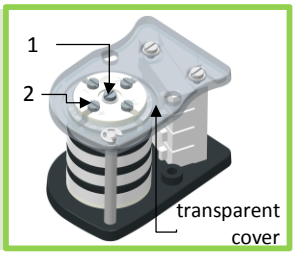


Microswitch system calibration guide

I. Loosen the main screw (1)

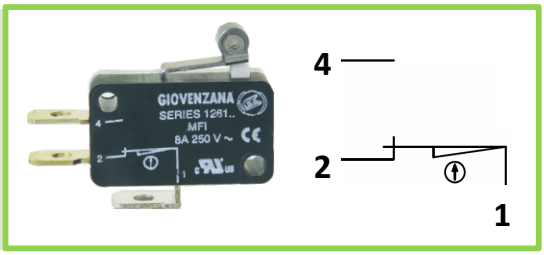
II. Adjust the screws (2)

III. Tighten the main screw (1)

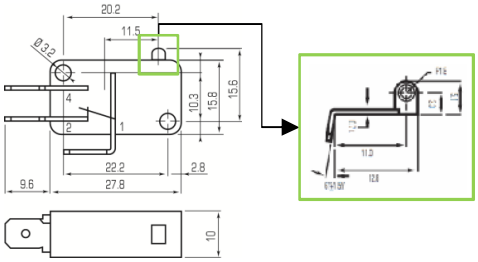


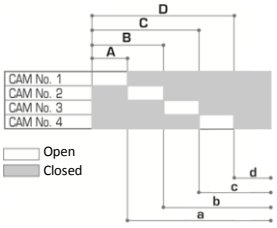
Spare parts

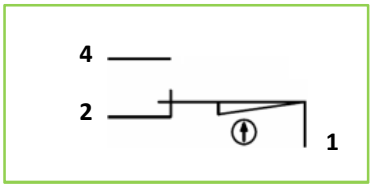
Microswitch	**MFI.3**



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





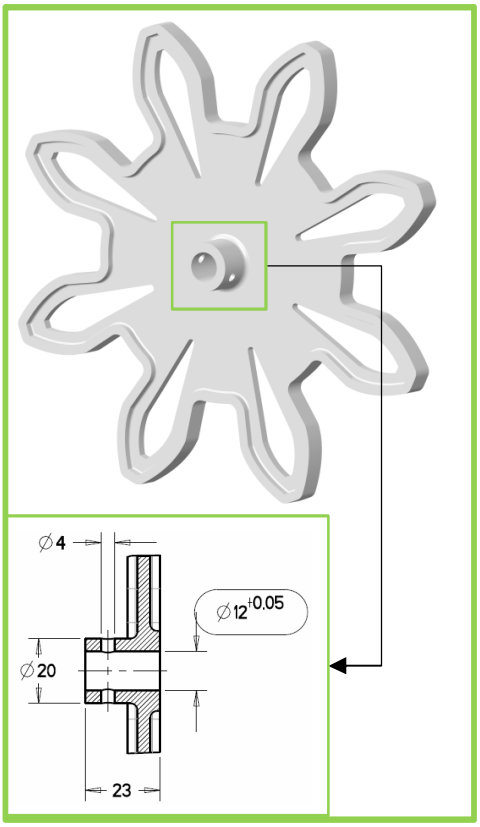


Ratio	Revolutions referred to the cam's activation							
	A	a	B	b	C	c	D	d
12	0.65	11.35	1.3	10.7	1.95	10.05	2.6	9.4
33	1.75	31.25	3.5	29.5	5.25	27.75	7	26
50	2.75	47.25	5.5	44.5	8.25	41.75	11	39
75	3.75	71.5	7.5	67.5	11.25	63.75	15	60
100	4.75	95.25	9.5	90.5	14.25	85.75	19	81
150	7.5	142.5	15	135	22.5	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.

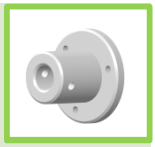
LIMIT SWITCHES

Pinion type ❑ PA66 material		
16020051	M20 - Z12	❑
16020052	M14 – Z17	❑
16020053	M22 – Z10	❑
16020054	M18 – Z12	❑
16020055	M16 – Z13	❑
16020056	M10 – Z17	❑
16020057	M6 – Z13	❑
16020058	M20 – Z8	o
16020059	M16 – Z10	o
16020060	M12 – Z12	o
16020061	M14 – Z10	o
16020062	M12 – Z10	o
16020063	M8 – Z12	o
16020065	M6 – Z11	o
16020066	M5 – Z12	o



Note:

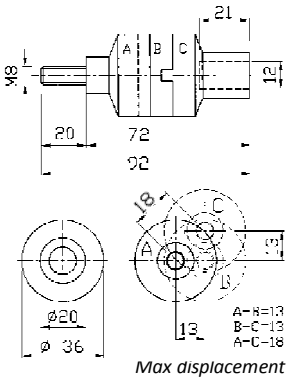
❑	"Water jet cut" with metal flange
o	Moulded



FGR1/2/3: Oldham coupling

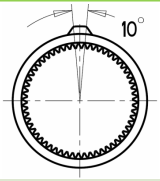
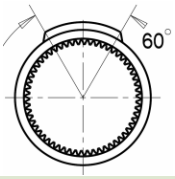
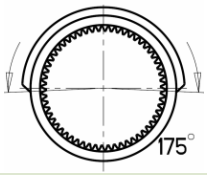
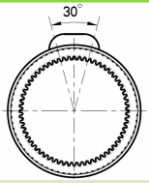
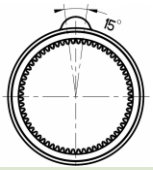
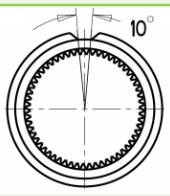
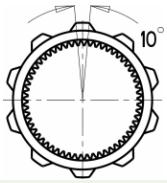
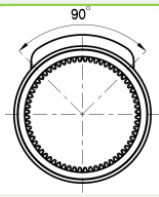
FGH

Drill and pin to the limit switch' s shaft



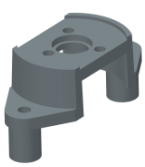
Max displacement

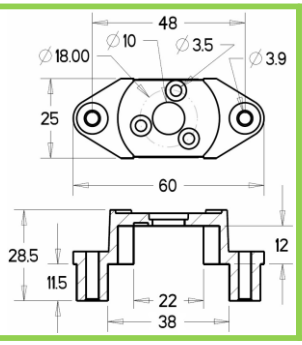
Cam shapes

FGR1 – FGR3			FGR2	
				
Standard "A" (10°)	"B" (60°)	"C" (180°)	**Standard "A" (30°)**	"B" (15°)
16020081	16020097	16020094	**11703015**	11703019
				
"D" (opposite)	"E" (10 tips)	➢ *on request available other versions*	"C" (90°)	➢ *on request available other versions*
16020095	16020093		11703013	

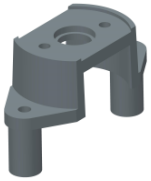
FGR1/3: Potentiometer / Encoder support versions

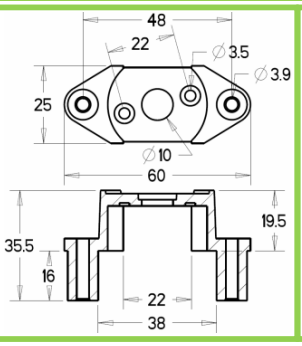
16020015





16020016





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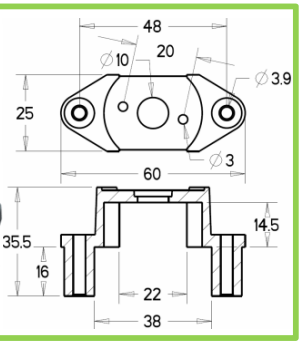


General characteristics		FGR1	FGR2	FGR3
Markings		CE EAC	CE EAC	CE EAC
Case		thermoplastic glass fiber reinforced	cast aluminium housing self extinguishing cover V0 UL94	thermoplastic glass fiber reinforced
Ratio		012-033-050-075 100-150-200-400	012-033-050-100-200	1:8 to 1:460
Protection class IEC/EN 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 cULus EAC	CE cULus EAC	CE cULus 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

LIMIT SWITCHES

Position Limit switches

page 36 to 42

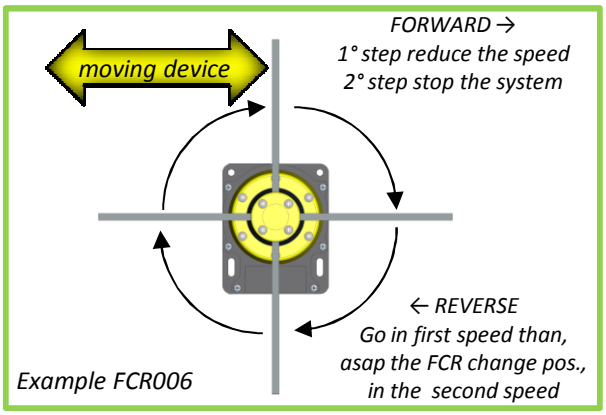
The position (rotary-angular) limit switch is used to control several handling system:

- 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.

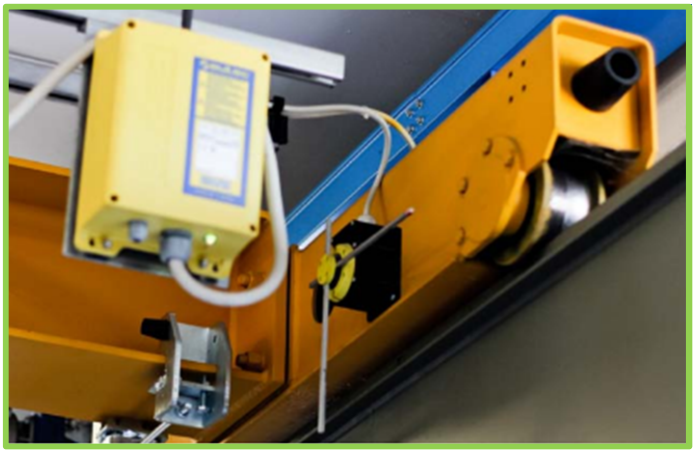
How it works?

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) than 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.

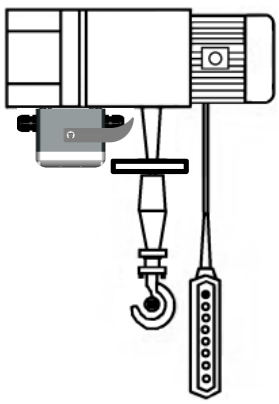


Example FCR006

Picture shows a FCR working on a crane system

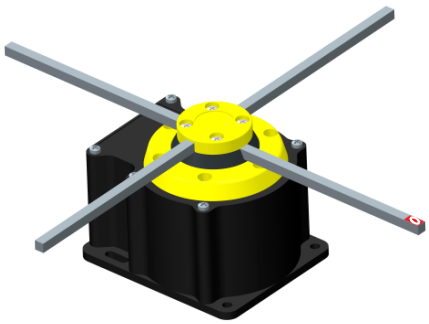
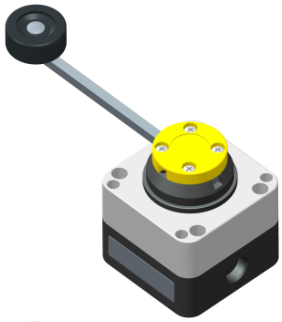
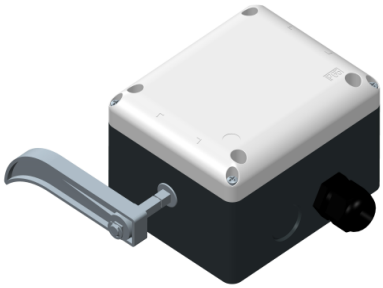


Picture shows a FCP working on a hoist

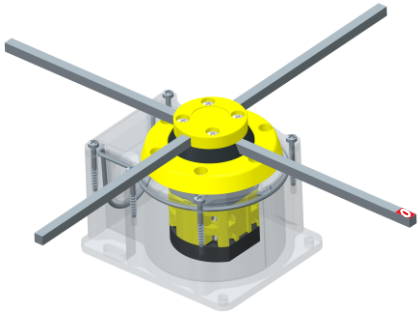
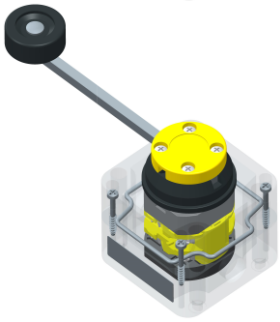
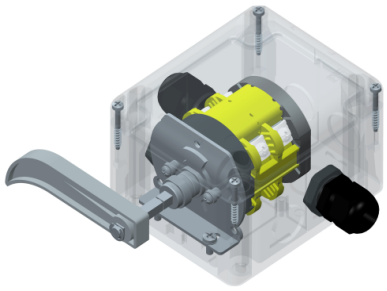


Line	FCR	FFH	FCP
Page	38	40	41

Picture

X-ray view

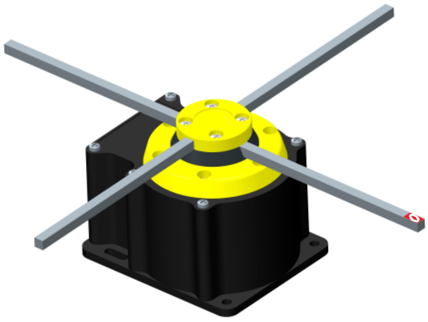




Characteristics

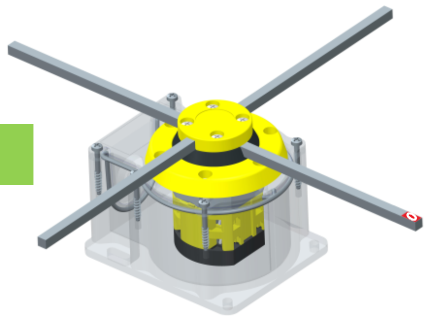
Standards		IEC/EN 60947/3	IEC/EN 60947/3	IEC/EN 60947/3, EN81-1
Case		self extinguishing housing V0 UL94	self extinguishing cover V0 UL94	self extinguishing housing V0 UL94
Protection class IEC/EN 60529		IP65	IP65	IP65
Cam switch	enclosed thermal current [Ithe]	16A	20A	40A
	rated insulation voltage [Ui]	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

□ contact open
■ contact close

Picture



X-ray view



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]	16A
	rated insulation voltage [Ui]	690V
	product ID	P016 Giovenzana line
	contacts	double gap positive opening ⊖
	markings	CE, UL, EAC, CCC
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 →

Versions

FCR001	single speed	0; - +; 90° 90° 3 positions with mechanical interlock (●)	see contact table FCR001
FCR002	single speed	0; - +; 90° 90° 3 positions with mechanical interlock (●)	see contact table FCR002
FCR003	single speed	0; 270° 90°; 180° 4 positions NO mechanical interlock	see contact table FCR003
FCR004	single speed	0; 270° 90°; 180° 4 positions NO mechanical interlock	see contact table FCR004
FCR005	single speed	0; 270° 90°; 180° 4 positions NO mechanical interlock	see contact table FCR005
FCR006	two speeds	0; - +; 90° 90°; - +; 180° 4 positions with mechanical interlock (●)	see contact table FCR006

FCR001

Cont. / Pos.	-90°	0	+90°
3-4	□	■	■
1-2	■	■	□

FCR002

Cont. / Pos.	-90°	0	+90°
7-8	□	■	■
5-6	■	■	□
3-4	□	■	■
1-2	■	■	□

FCR003

Cont. / Pos.	0	90°	180°	270°
3-4	■	□	■	□
1-2	■	□	■	□

FCR004

Cont. / Pos.	0	90°	180°	270°
-	empty			
5-6	■	■	□	■
-	empty			
1-2	■	□	□	□

FCR005

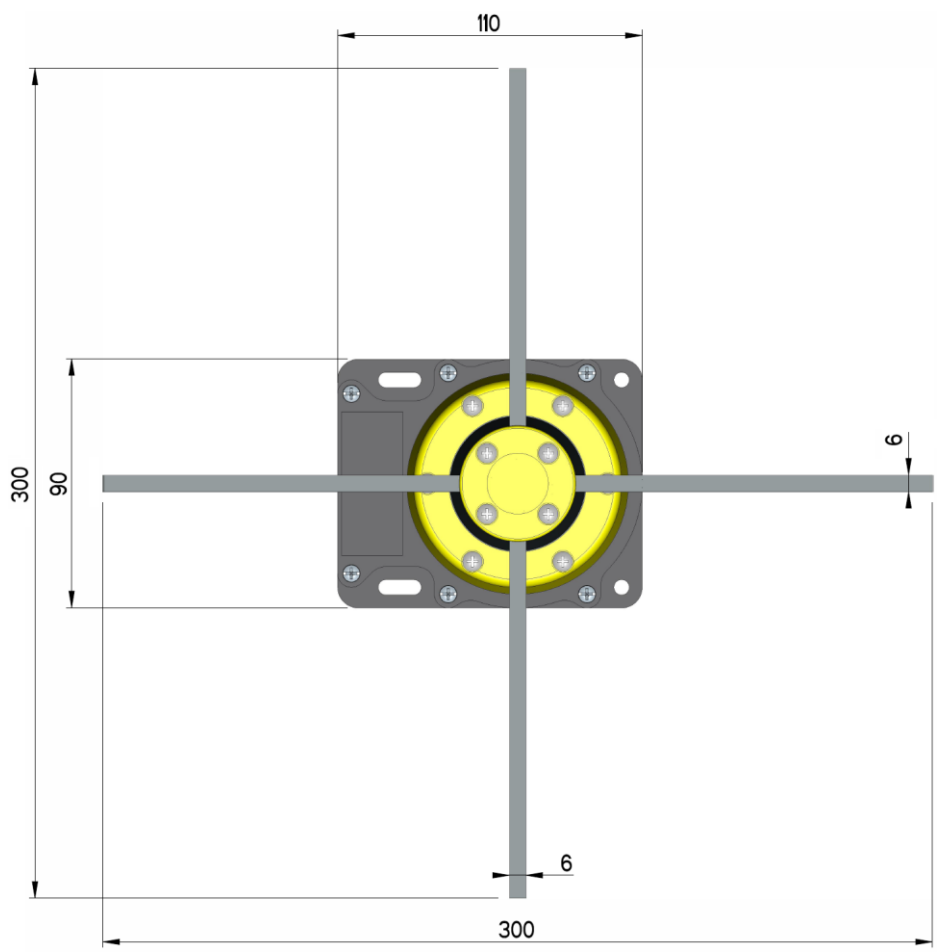
Cont. / Pos.	0	90°	180°	270°
-	empty			
5-6	■	□	□	■
-	empty			
1-2	■	■	□	□

FCR006

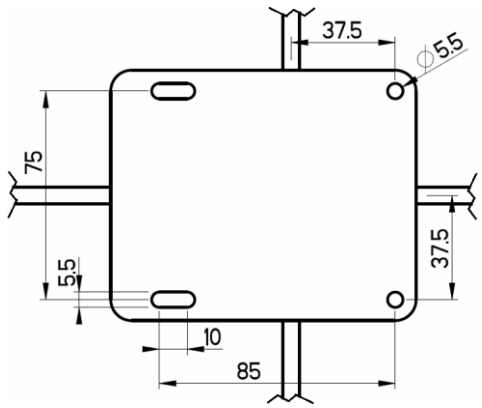
Cont. / Pos.	-180°	-90°	0	+90°	+180°
7-8	■	■	■	■	□
5-6	■	■	■	□	□
3-4	□	□	■	■	■
1-2	□	■	■	■	■

LIMIT SWITCHES

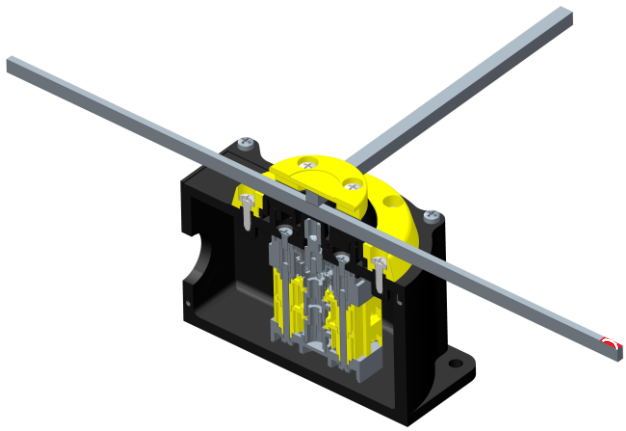
Dimensions



Fixing holes



Section view

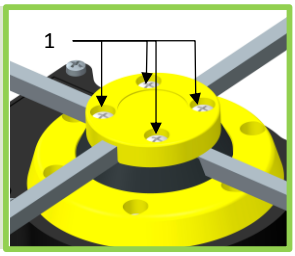


Rods adjusting guide

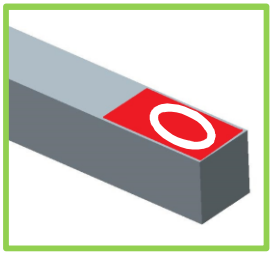
I. Loosen
the four scews (1)

II. Adjust the rods

III. Tighten
the four screws (1)



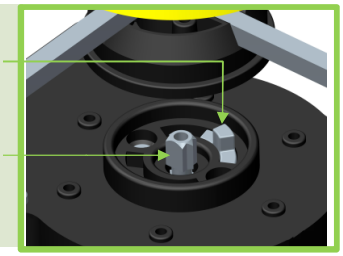
"ZERO" indicator



Reinforced mechanical stop insert

metallic stop insert

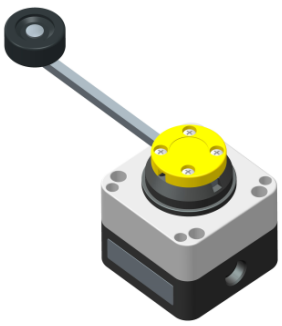
metallic cam's control shaft

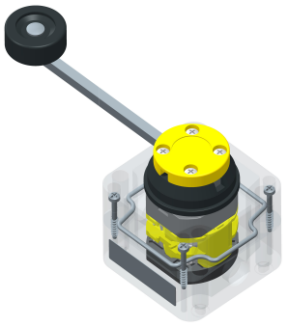


LIMIT SWITCHES

LIMIT SWITCHES

Picture





X-ray view

□ contact open
■ contact close

Versions

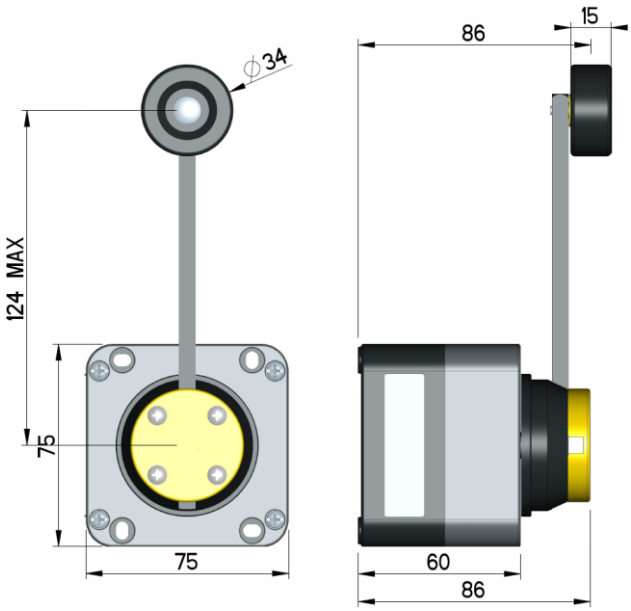
FFH2C	single speed	0 65° - + 65° 3 positions automatic return to "0" with mechanical interlock (●)	3-4 ■ 1-2 ■ Cont. Pos. -65° 0 +65°
FFH2C-1	single speed	0 65° - + 65° 3 positions automatic return to "0" with mechanical interlock (●)	3-4 ■ 1-2 ■ Cont. Pos. -65° 0 +65°

↑ *Other versions available on request*

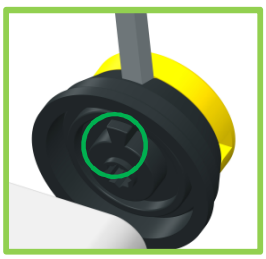
Characteristics

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	CE EAC
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

Dimensions



Reinforced mechanical stop insert



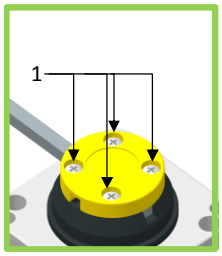
Section view

Rod adjusting guide

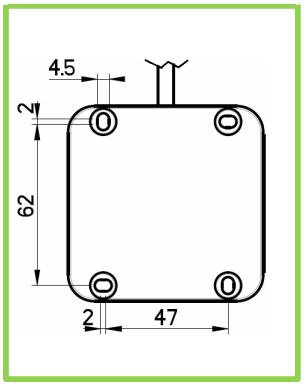
I. Loosen the four screws (1)

II. Adjust the rods

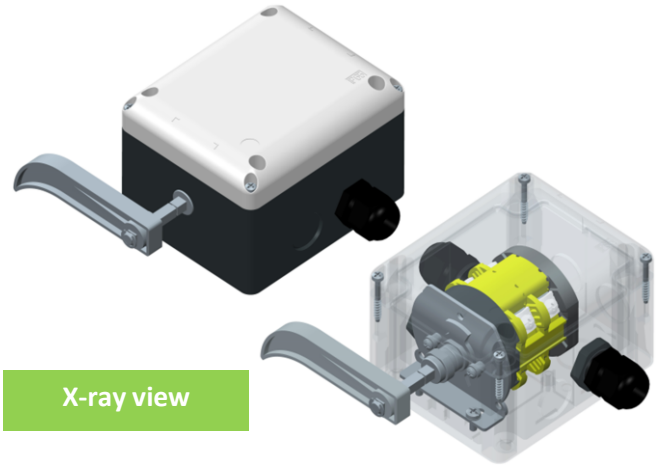
III. Tighten the four screws (1)



Fixing holes



Picture



X-ray view

□ contact open
■ contact close

Versions

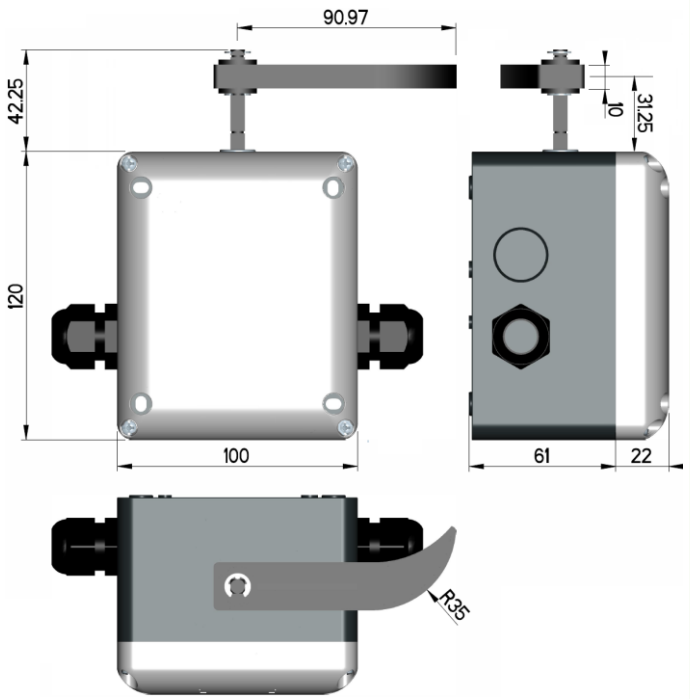
FCP245	single speed	0 / 50° - / + 50° 3 positions automatic return to "0" with mechanical interlock (●)	3-4 ■ 1-2 ■ Cont. Pos. -50° 0 +50°

↑ *Other versions available on request*

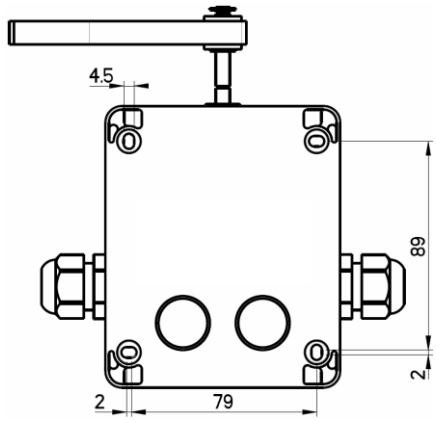
Characteristics

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]	40A
	rated insulation voltage [Ui]	690V
	product ID	CX40 Giovenzana line
	contacts	double gap positive opening
	markings	CE EAC
Cable entry		M20 (max 8)
Versions		two pole on-off switch (other configuration on request)
Notes		- reinforced mechanical stop

Dimensions



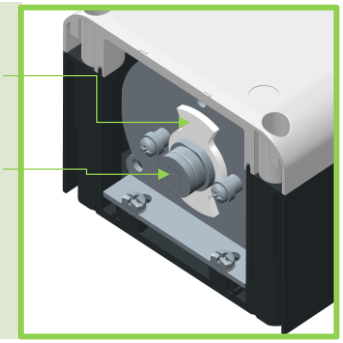
Fixing holes



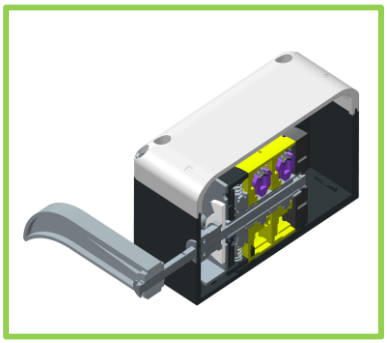
Reinforced mechanical stop insert

metallic stop insert

metallic cam's control shaft



Section view



LIMIT SWITCHES

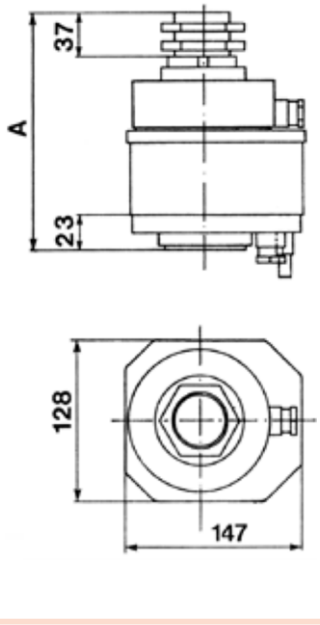
General characteristics		FCR	FFH	FCP
Markings		CE EAC	CE	CE
Standards		IEC/EN 60947/3	IEC/EN 60947/3	IEC/EN 60947/3
Case		self extinguishing housing V0 UL94	self extinguishing housing V0 UL94	self extinguishing housing V0 UL94
Protection class IEC/EN 60529		IP65 (double insulation ⧈)	IP65 (double insulation ⧈)	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		CE cULus EAC	CE cULus EAC	CE cULus EAC
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"
	3	30402091		180
	4	30402092		195
	5	30402093		210
	6	30402094		225
	7	30402095		240
	8	30402096		255
	9	30402097		270
	10	30402098		285
	11	30402099		300
	12	30402100		315
	13	30402101		330
	14	30402102		345
	15	30402103		360

Technical data

- ✓Rated insulation voltage Ui 690V
- ✓Rated operating voltage Ue 500Vac
- ✓Rated operating current 20A Intermittent working 30A.
- ✓IP51 close frame version with protection rated IEC/EN60529
- ✓Modularity: from 3 up to 15 80 mm Ø rings
- ✓Copper brushes
- ✓42 mm Ø shaft
- ✓Pvc Ø147 mm housing and terminals cover
- ✓Ambient temperature:+60°C/-30°C

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

Warning horns

page 43

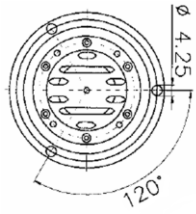
Picture	Line	Supply	Consumption	Code
G75 Ø 75mm 	G75	24 AC	190 mA	G75.24
	G75	48 AC	80 mA	G75.48
	G75	110 AC	28 mA	G75.110
	G75	230 AC	20 mA	G75.230
	G75	24 DC	40 mA	G75.24DC
	G75	48 DC	-	G75.48DC
G100 Ø100mm 	G100	24 AC	415 mA	G100.24
	G100	48 AC	210 mA	G100.48
	G100	110 AC	90 mA	G100.110
	G100	230 AC	42 mA	G100.230

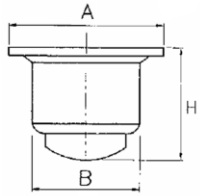
Technical data

- ✓Continuos 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 ☐
- ✓Terminal type:
  G75: 3 way terminal (2+T)
  G100: 2 way terminal

Box	
G 75	11710009
G100	11710010

Dimensions

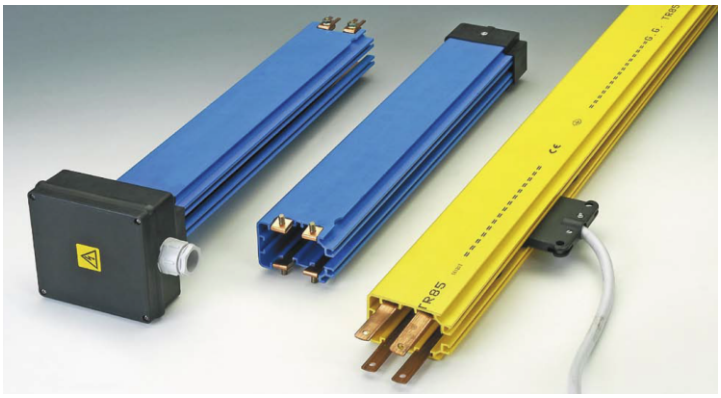




	A	B	H
G75	Ø95.5	Ø76.5	56
G100	Ø120	Ø95.5	58

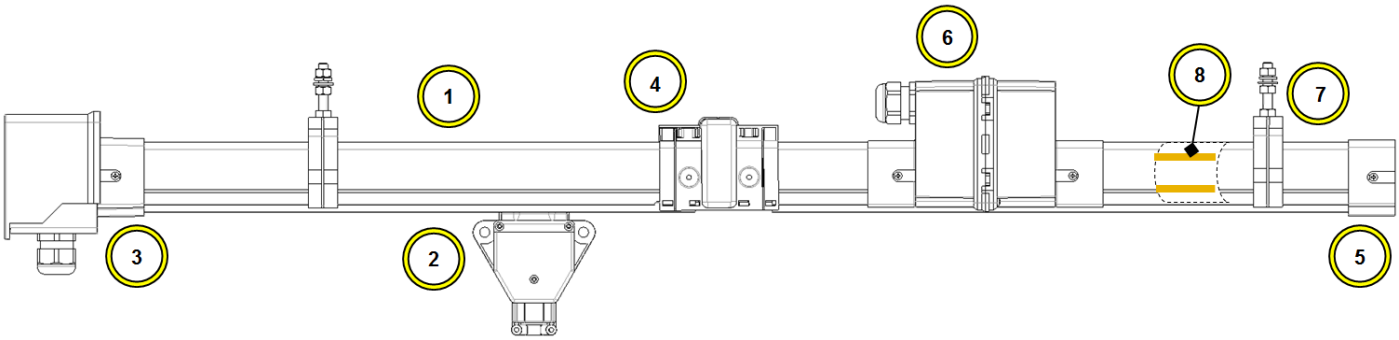
Busbar system – trolley line TR60 and TR85 Giovenzana page 44 to 67

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.



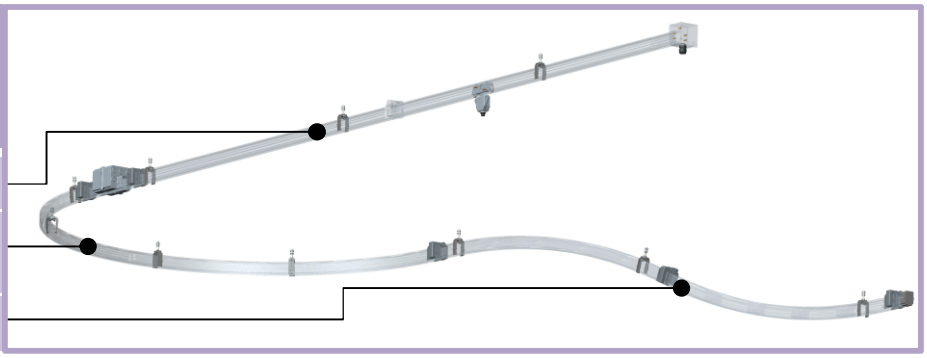
✓**Worldwide installation:** complies with the relevant international standards.
✓ **Safety**: the conductors are protected and insulated by the busbar.
✓ **Extra quality materials**: self-extinguishing and high resistant strenght.
✓ **Easy & Fast installation**: only a simple “click” (NO tools required) 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



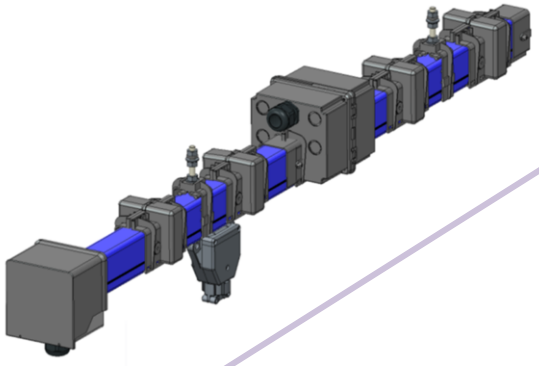
ID	Name	Function
①	Busbar	*PVC housing*
②	Trolley	*transmit the energy from the conductor to the load*
③	Feed	*connect power supply to the conductors*
④	Joint / Fixed point	*connect two busbars / create a fixed point*
⑤	End Cap	*close and protect the busbar end*
⑥	In-line feed	*avoid the voltage reduction*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

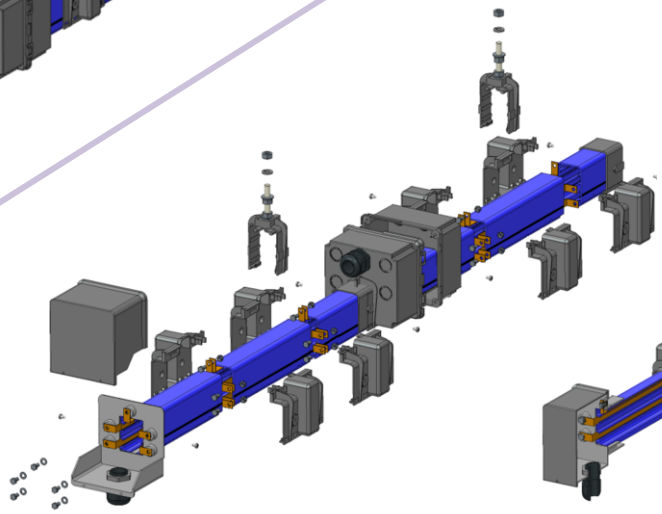
Busbar line example and module type	
Straight :	3 or 4 meter module
90° curve	standard radius available or customized radius on request
Height drop	available on request

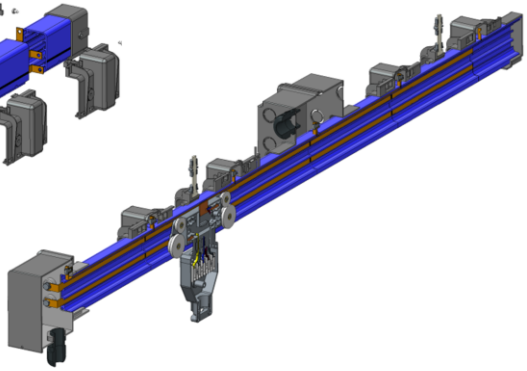


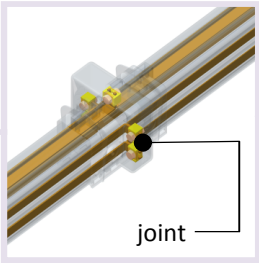
Versions

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.



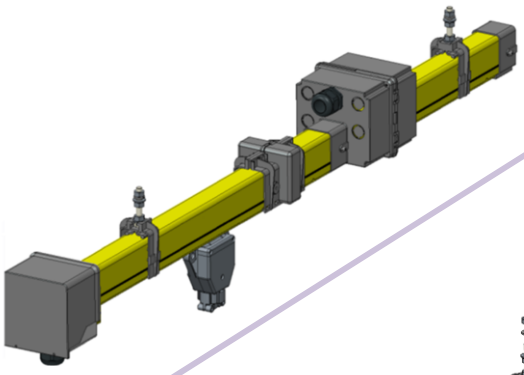


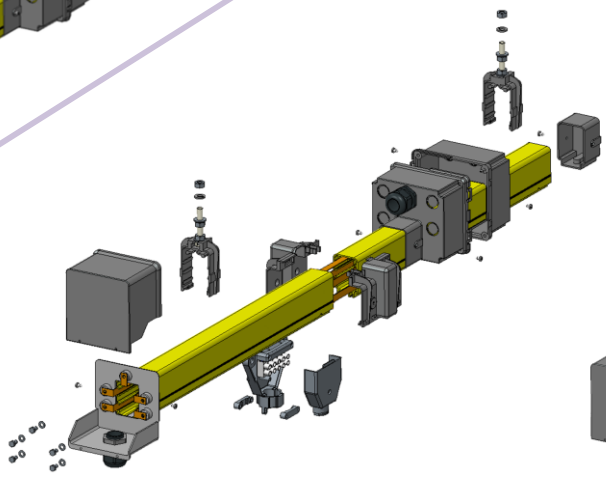


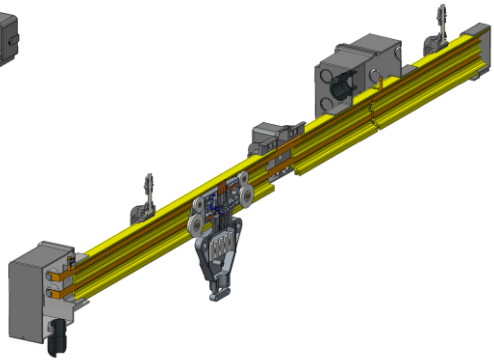


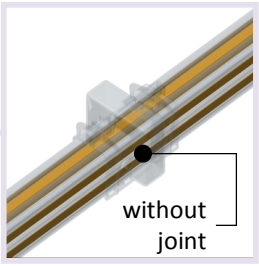
Exploded & section view

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 ohmmic resistance.



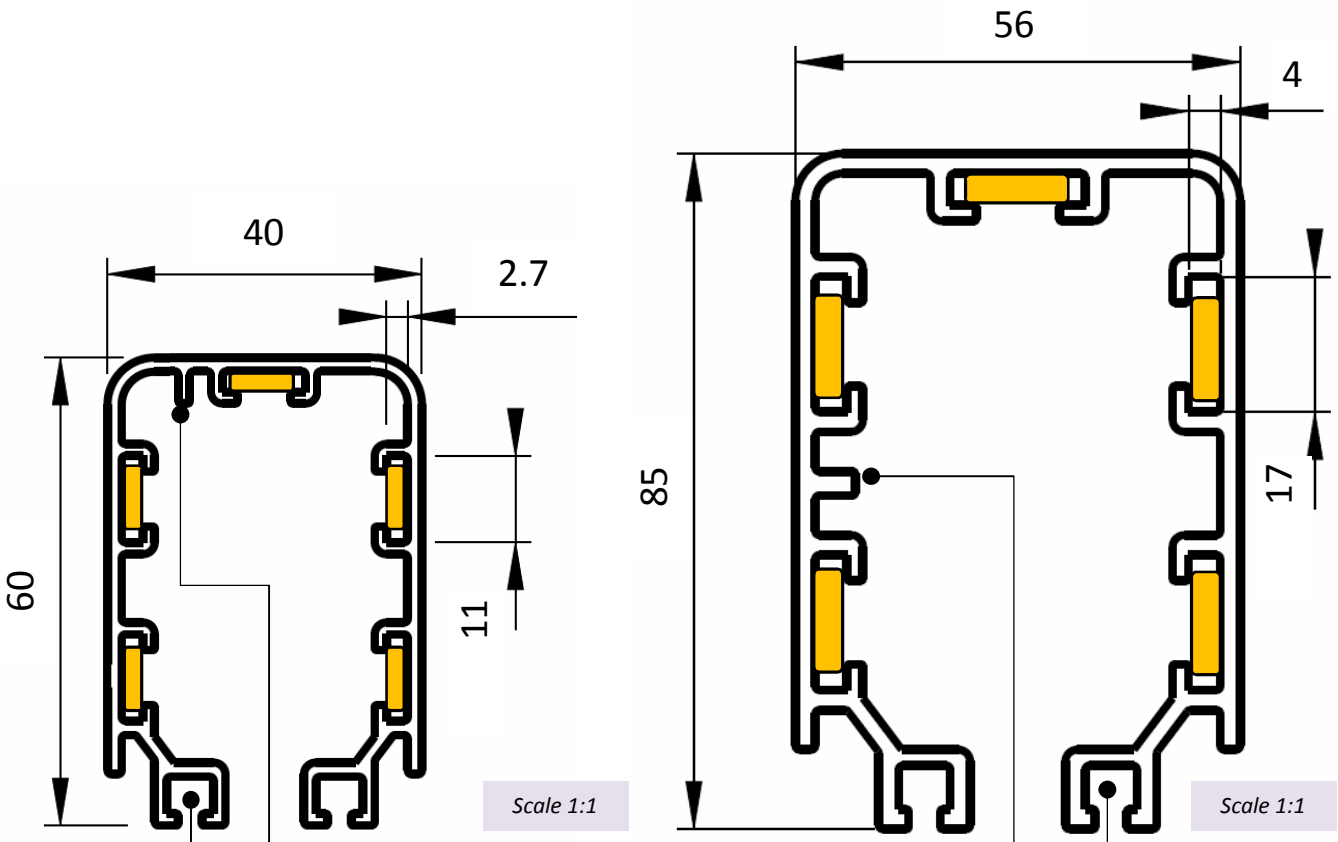




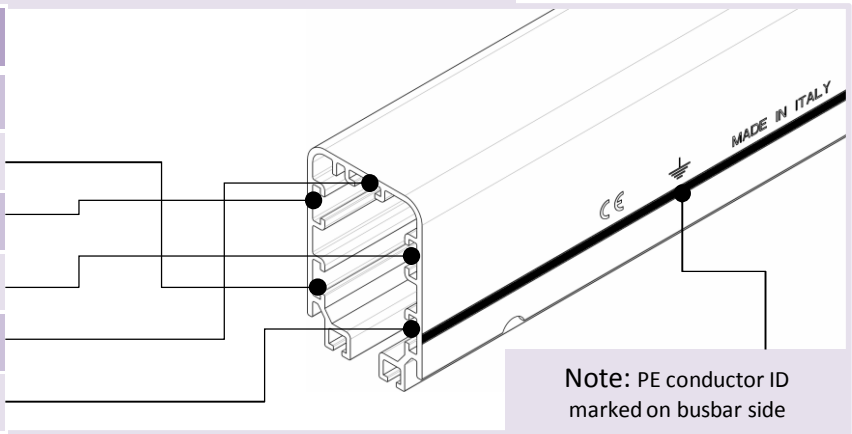


Exploded & section view

Size			
❑ **TR60**	40 - 60 amp	❑ **TR85**	40 – 70 – 100 – 140 - 200 amp



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:

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

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

Legenda:

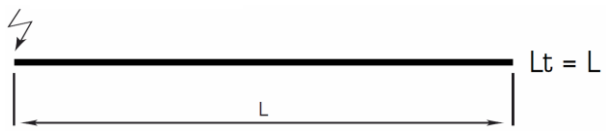
Δu	=	voltage drop	[V]
Δu%	=	voltage drop	[%]
I	=	current intensity	[A]
Lt	=	lenght of section	[m]
Z	=	impedence	[Ω/m]
U	=	voltage	[V]

Power feed: busbar track length

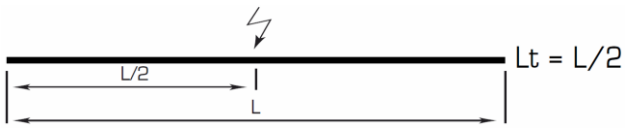
A proper disposal of power feed points minimize the voltage reduction.
If "L" is the lenght of the line, "Lt" is the track maximum length to consider the voltage reduction.

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

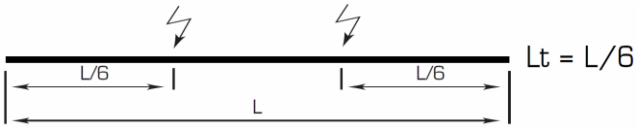
A



B



C



D

Current in continuous service

Specify the number of the devices which work simultaneously to calculate the corresponding current:

$$In = I_1 + I_2 + I_3 + ...$$

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

$$In = \frac{Pu}{\sqrt{3} \cdot U \cdot \cos\varphi \cdot \eta}$$

Legenda:

In	=	current consumption	[A]
Pu	=	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 (○)	decreasing power engine (○)		
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

(○) about Ƞ motors connected in parallel with rated current In', consider In = Ƞ ● In'

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:

$$Ia = K \cdot In$$

for a single user

$$K = \frac{\text{Starting current (Ia)}}{\text{Nominal current (In)}}$$

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

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

Numbers of in-line lifting device	Lifting equipment in use							
	1st engine		2nd engine		3rd engine		4th engine	
	Ia	In	Ia	In	Ia	In	Ia	In
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 highter 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)		

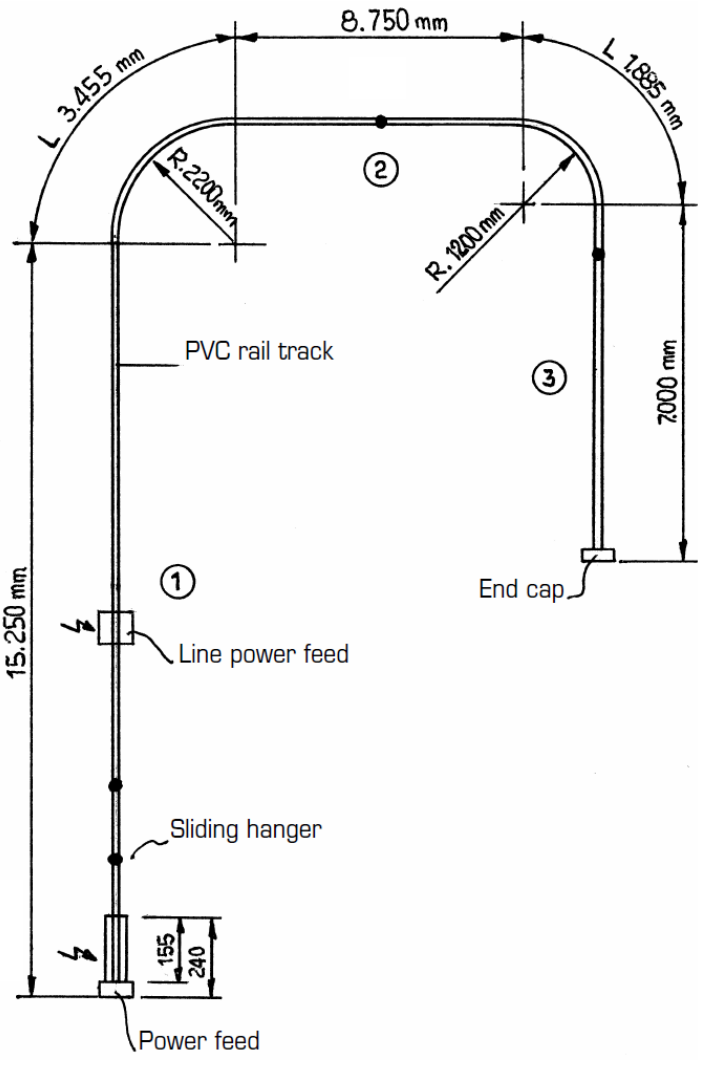
② section 8,750 = 8.750mm		
No. 3 busbar 3m = 9.000m	***TR85704C3***	**3**
9.000mm – 8.750mm = +250mm (excess)		

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 lenght: 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 (○)***	***17***
Hanger clamp from 40A to 140A steel material	***TR8525 (○)***	***17***
Joint from 40A to 200A plastic material (the quantity of the joints is equal to the quantity of the busbar +1)	***TR8504 (○)***	***10***
(○) 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	-		TR60404C3	TR60604C3
			3 meters module		5 conductors			TR60405C3	TR60605C3
			4 meters module		4 conductors	TR6000 (w/o 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

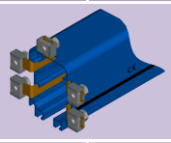
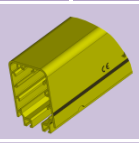
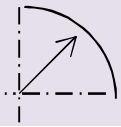
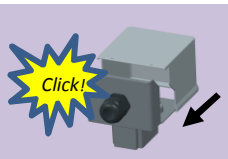
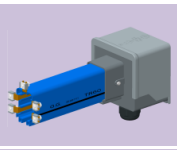
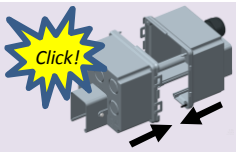
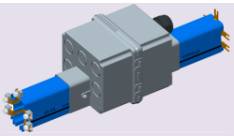
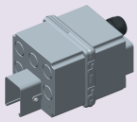
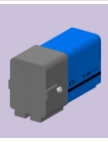
TR85								
YELLOW line			*BLUE line*					
70 A	*100 A*	*140 A*	*40 A*	*70 A*	*100 A*	*140 A*	*200 A*	
-	-	-	*TR85404C3*	*TR85704C3*	*TR851004C3*	*TR851404C3*	*TR852004C3*	
-	-	-	*TR85405C3*	*TR85705C3*	*TR851005C3*	*TR851405C3*	*TR852005C3*	
TR85704 (*)	*TR851004 (*)*	*TR851404 (*)*	*TR85404C*	*TR85704C*	*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*	
			TR8503A5				*TR8533A5*	
TR8501 (PA66) / TR8524 (steel)			*TR8504*					
TR8527.1								
TR8506			*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

Code table list page 1/2

Dimensions see pag 58

Name	Specifications		N° conductors	Blue line pre-mounted conductors 40 A	Blue line pre-mounted conductors 60 A	Yellow line conductors to be pulled 40 A	Yellow line conductors to be pulled 60 A	min. qty
Straight busbar	❑ Self-extinguishing material ❑ One-way trolley insertion pin. ↔ L = length	L meters						
		3	4	**TR60404C3**	**TR60604C3**	-		3-4 meters
			5	**TR60405C3**	**TR60605C3**			
		4	4	**TR60404C**	**TR60604C**	**TR6000**		
			5	**TR60405C**	**TR60605C**			
90° curved busbar	❑ Self-extinguishing material ❑ One-way trolley insertion pin. R = radius 	R meters						
		1.2	4	**TR60404A90**	**TR60604A90**	**TR60A90**		1
		1.5		**TR60404B90**	**TR60604B90**	**TR60B90**		
		1.8		**TR60404C90**	**TR60604C90**	**TR60C90**		
		2.2		**TR60404D90**	**TR60604D90**	**TR60D90**		
Feed	 ❑Fast assembly ❑M25 cable gland equipped							
			4	**TR6003A4**		**TR6003**		1
			5	**TR6003A5**				
In-line feed	 ❑Fast assembly (+screw) ❑M25 cable gland equipped							
			4	**TR6008A4**		**TR6008**		1
			5	**TR6008A5**				
End cap	❑Self tapping screw fix							
			4	**TR6006A**		**TR6006**		1
			5					
Copper strip				-				
				-		**CS40 40 A /10mm²**	**CS60 60 A /15mm²**	(o)

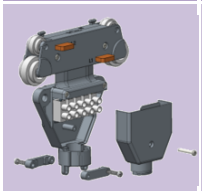
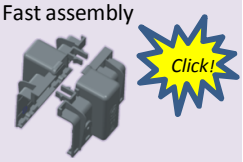
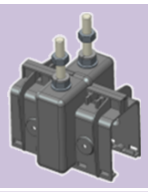
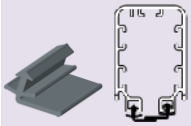
Note (o) "copper strip quantity": will be supplied the total meters according busbar quantity

❑ TR60

40 amp
60 amp

Code table list page 2/2

Dimensions see pag 58

Name	Picture	Specifications	note	Blue line pre-mounted conductors 40 A	Blue line pre-mounted conductors 60 A	Yellow line conductors to be pulled 40 A	Yellow line conductors to be pulled 60 A	min. qty
Trolley 25 A		❑ 25A load current ❑Self-extinguishing mat. ❑Fully insulated ❑Metal graphite brushes ❑One-way insertion pin ❑Easy cable wiring	4 conductors	**TR6004**				1
			5 conductors	**TR6005**				1
Double trolley support		❑Connects two trolleys in parallel to increase current rating		**TR6013**				1
Hanger clamp		❑Fast connection ❑Every 1.33 meters MAX 	PA66 material	**TR6002**				1
			Steel material	**TR6020**				1
Joint		❑Fast assembly 		**TR6001**				1
Fixed point		❑Fast assembly 		**TR6014**				1
Towing arm		Fixed to the mobile device permits to tow the trolley ❑Galvanized steel material		**TR8510**				1
Towing arm bracket		Fixed to the trolley permits to the mobile device to tow the trolley ❑Painted black steel material		**TR6007**				1
Gasket IP23		Additional prot. IP13>IP23 ❑PVC material ❑Resistance to cold -30° ❑Stretching 340% ❑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

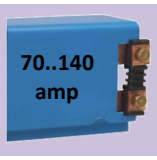
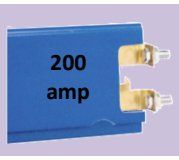
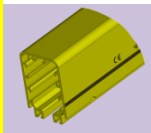
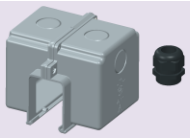
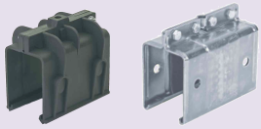
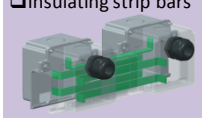
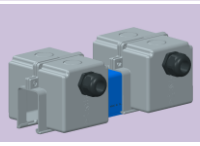
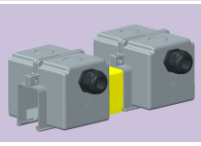
Note (●) "gasket IP23 quantity": (for order please consider twice the length of the line)

❑ TR85

40-70-100-140-200 amp

Dimensions see pag 62

Code table list page 1/2

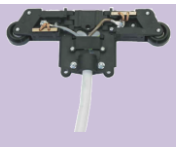
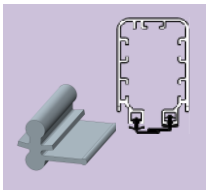
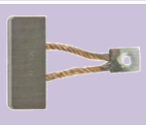
Name	Specifications		N° conductors	Blue line pre-mounted conductors 40 A	70 A	100 A	140 A	200 A	Yellow line conductors to be pulled 70 A	100 A	140 A	min. qty
Straight busbar	❑ Self-extinguishing material ❑ One-way trolley insertion pin. ←→ L = lenght	L meters		 70..140 amp		 200 amp			  copper strip rolls already included in busbar code			
		3	4	TR85404C3	TR85704C3	TR851004C3	TR851404C3	TR852004C3	-			3-4 meters
			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	❑Self-extinguishing material ❑ One-way trolley insertion pin. R = radius	R meters										
		1.2	4	TR8529404A90	TR8529704A90	TR85291004A90	TR85291404A90	-	TR8529A90			1
		1.4		TR8529404B90	TR8529704B90	TR85291004B90	TR85291404B90	-	TR8529B90			
		1.8		TR8529404C90	TR8529704C90	TR85291004C90	TR85291404C90	-	TR8529C90			
		2.2		TR8529404D90	TR8529704D90	TR85291004D90	TR85291404D90	-	TR8529D90			
Feed	❑M40 cable gland equipped											
			4	TR8503A4				TR8533A4	TR8503			1
			5	TR8503A5				TR8533A5				
In-line feed	❑Pg29 cable gland equipped (not mounted)											
				TR8547								1
End cap	❑Self-tapping screw fixing											
				TR8506A					TR8506			1
Joint												
				TR8504				TR8535	TR8501 (PA66) – TR8524 (steel)			
Section joint	❑N°2 Pg29 cable gland equipped ❑Insulating strip bars 											
				TR8545B					TR8545			

❑ TR85

40-70-100-140-200 amp

Dimensions see pag 62

Code table list page 2/2

Name	Picture	Specifications	Note	Blue line pre-mounted conductors: 40 A	70 A	100 A	140 A	200 A	Yellow line conductors to be pulled: 70 A	100 A	140A	min. qty
35 A trolley		❑ 35 or 70 A load current ❑Self-extinguishing material ❑Fully insulated ❑Metal graphite brushes ❑One-way insertion pin ❑Complete of 1.5m cable CEI 20-22 NPI	4 conductors	**TR8511**								1
			5 conductors	**TR8512**								
70 A trolley			4 conductors	**TR8518 – TR8532** *(articulated used for line with curved busbar)*								1
			5 conductors	**TR8519**								
Double trolley support		❑Connects two trolleys in parallel to increase current rating		**TR6013**								1
Hanger calmp		❑Fast connection ❑Every 2 meters MAX from 40 to 140 amp ❑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 ❑PVC material ❑Resistance to cold: -30° ❑Stretching 340% ❑Hardness shore A 81		**TR8505**								(●)
Towing arm		Fixed to the mobile device permits to tow the trolley ❑Galvanized steel material		**TR8510**								1
Towing arm bracket		Fixed to the trolley permits to the mobile device to tow the trolley ❑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 considertwice 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

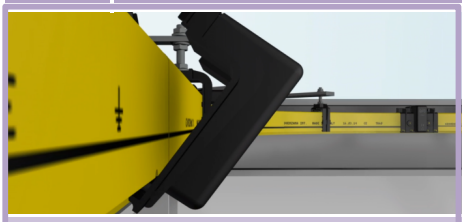
2 Fix the hanger clamp

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

3 Fix the busbar

- ❑NO tools required

4 Apply all the joints

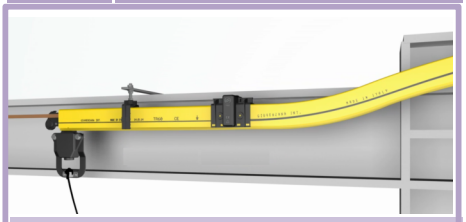


- ❑TR60 no tools required
- ❑TR85 fixed by screws

5 Fix the copper strip to the insertion trolley

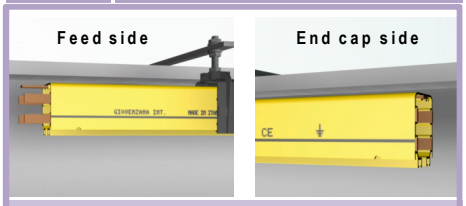
- ❑Drill the copper strip if not already provided with holes and fix it to the insertion trolley

6 Pull the conductors



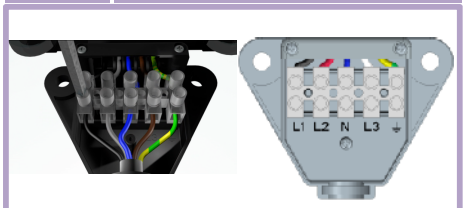
- ❑Drag the trolley using a rope
- ❑Repeat the operation for all the coductors
- ❑Drag one conductor one by one

7 Cut the copper strip



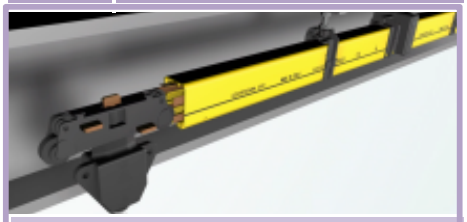
- ❑Cut the copper strip 50mm out from the busbar (line feed side)
- ❑Cut the copper strip flush with the busbar (end cap side)

8 Prepare the trolleys



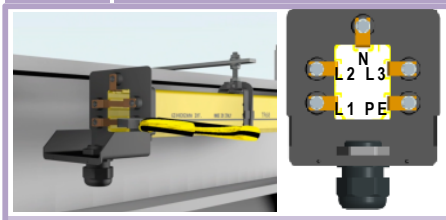
- ❑TR60: to be cabled: wire the trolley respecting the connections shown
- ❑TR85 Trolleys are already supplied with the wire

9 Insert the trolley



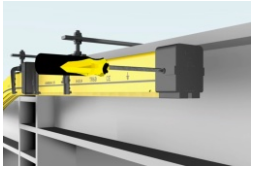
- ❑One way insertion pin / press in the brushes
- ❑PE brush corresponding to the continuous black line on the busbar side

10 Mount the feed

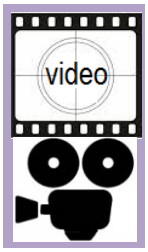


- ❑Fix the case to the busbar
- ❑Bend and drill (if not already drilled) the strips
- ❑Cable the strips as shown/tight the cable gland

11 Mount the end cap

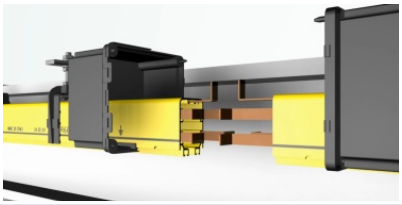


- ❑Fix the end cap



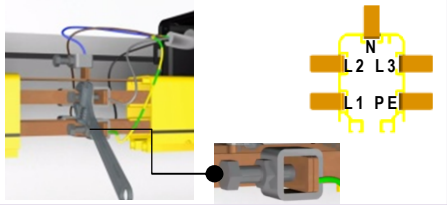
YouTube www.youtube.com/user/GiovenzanaInt

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

Blue line (pre-mounted conductors)

NEED HELP?
Ask to our technical service

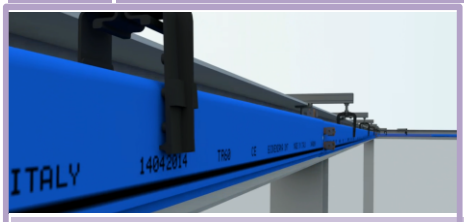
1 Fix the support bars

❑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

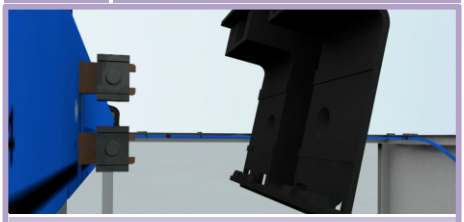


❑NO tools required

4 Fix each conductors strip

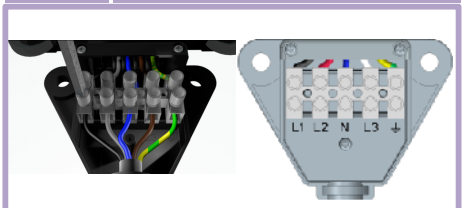
❑Fast connection using dedicated clamps

5 Apply all the joints



❑TR60 no tools required
❑TR85 fixed by screws

6 Prepare the trolleys

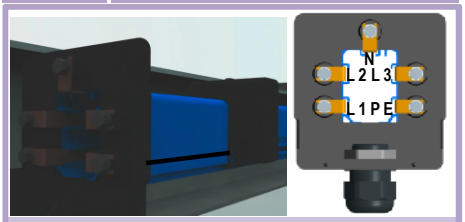


❑TR60: to be cabled: wire the trolley respecting the connections shown
❑TR85 Trolleys are already supplied with the wire

7 Insert the trolley

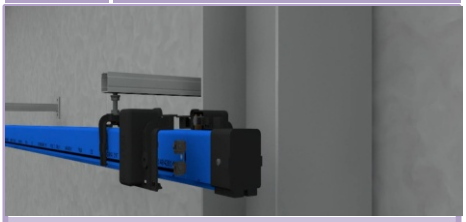
❑One way insertion pin / press in the brushes
❑PE brush corresponding to the continuous black line on the busbar side

8 Mount the feed

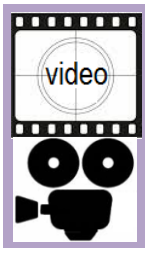


❑Fix the conductors of each legs
❑Apply joint / cable the strips as shown
❑tight the cable gland and close with the cover

9 Mount the end cap



❑Fix the end cap / apply joint

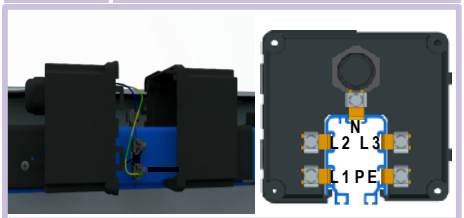


www.youtube.com/user/GiovenzanaInt

3a If needed mount the in-line feed

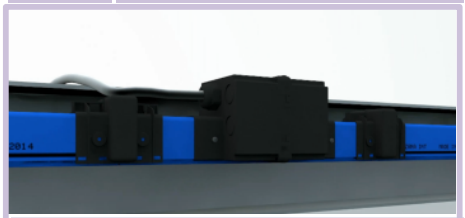
❑Fix the conductors of each side
❑Apply joint

3b Cable the line



❑Cable the strips as shown

3c Close & fix the conver

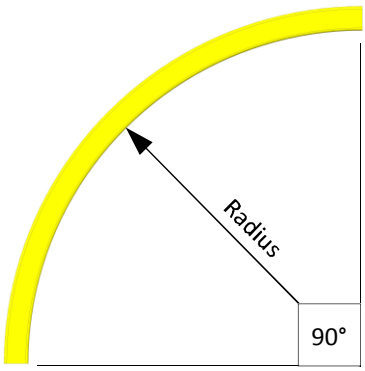


❑Close and fix both cover
❑Tight the cable gland

compatible with blue line (pre-mounted conductors)		compatible with yellow line (conductors to be pulled)

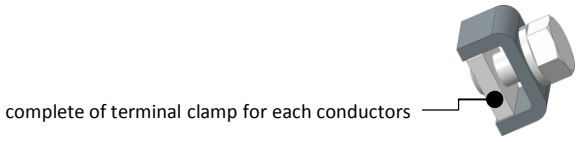
❑ TR6000 | TR60 line | busbar

Radius [meters]	40 amp
1.2	❑ TR60A90
1.5	❑TR60B90
1.8	❑ TR60C90
2.2	❑TR60D90
4 conductors only can be pulled	

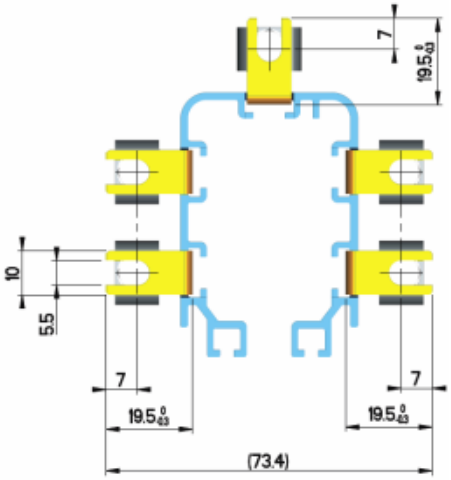


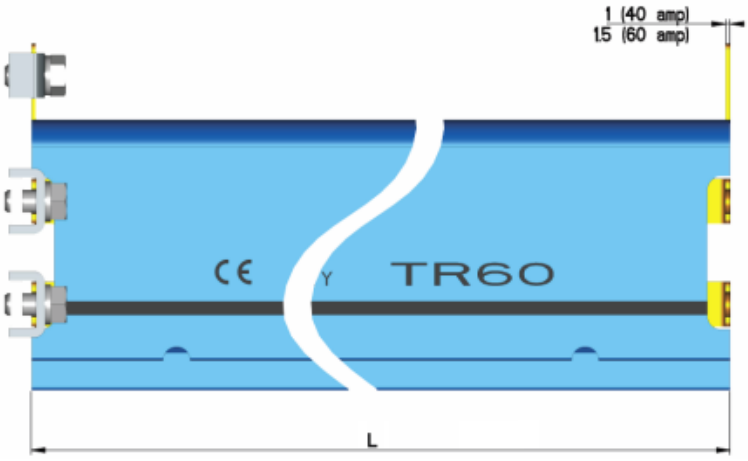
❑ TR60404C3-TR60405C3-TR60404C-TR60405C
❑ TR60604C3-TR60605C3-TR60604C-TR60605C | TR60 line | pre-mounted busbar

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

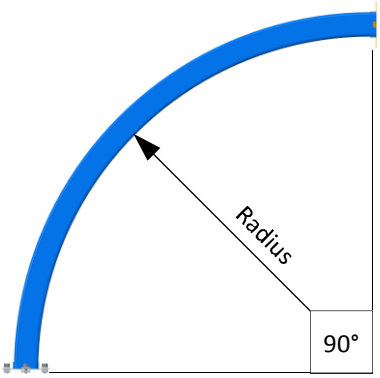


complete of terminal clamp for each conductors





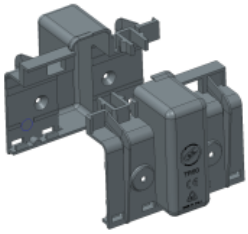
Radius [meters]	40 amp	60 amp
1.2	❑ TR60404A90	❑ TR60604A90
1.5	❑TR60404B90	❑TR60604B90
1.8	❑ TR60404C90	❑ TR60604C90
2.2	❑TR60404D90	❑TR60604D90
4 conductors only		

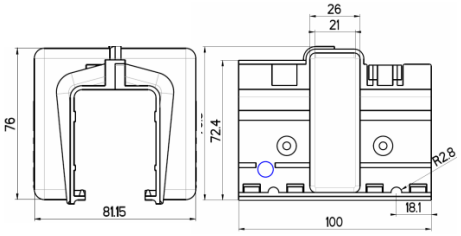


compatible with blue line (pre-mounted conductors)

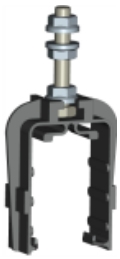
compatible with yellow line (conductors to be pulled)

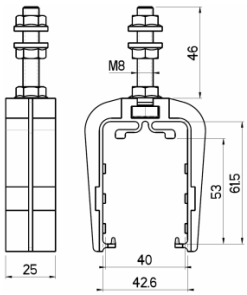
❑ TR6001 | TR60 line | joint



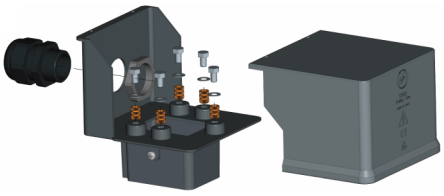


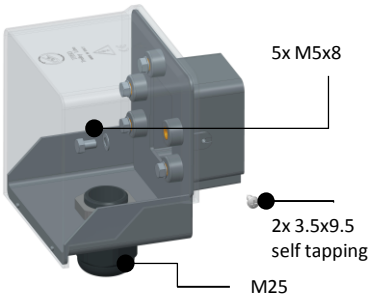
❑ TR6002 | TR60 line | hanger clamp

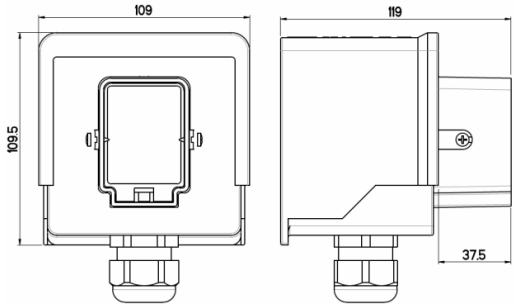




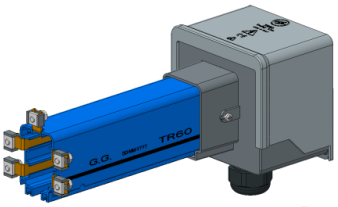
❑ TR6003 | TR60 line | feed

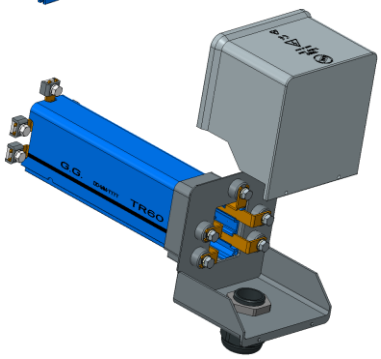






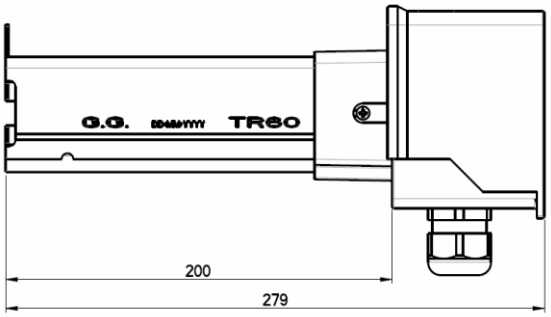
❑ TR6003A4-TR6003A5 | TR60 line | pre-mounted feed

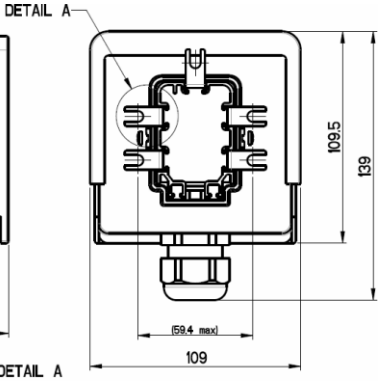


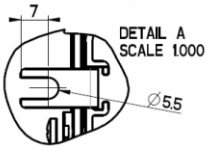


❑ **TR6003A4** — 4 poles L1-L2-L3-PE

❑ **TR6003A5** — 5 poles L1-L2-L3-N-PE







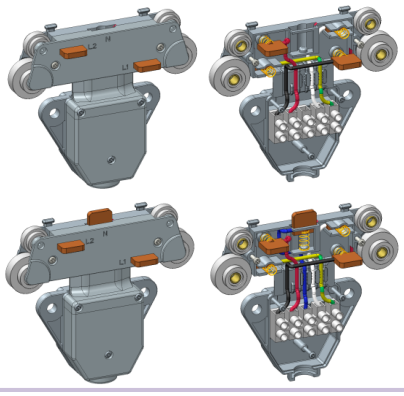
❑ TR6004 - TR6005 | TR60 line | trolley

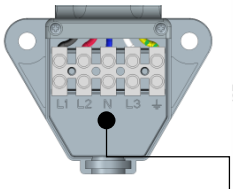
❑ **TR6004**

4 poles L1-L2-L3-PE

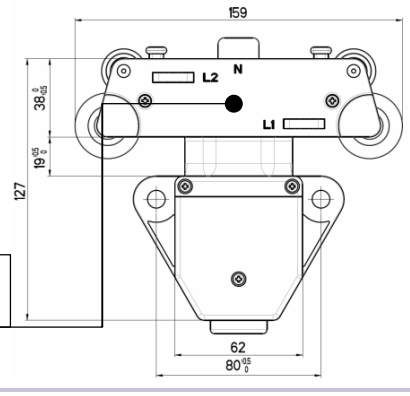
❑ **TR6005**

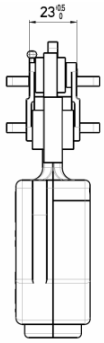
5 poles L1-L2-L3-N-PE





connection rif. markings

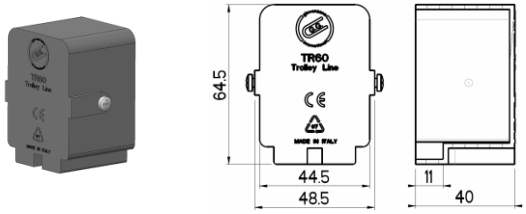




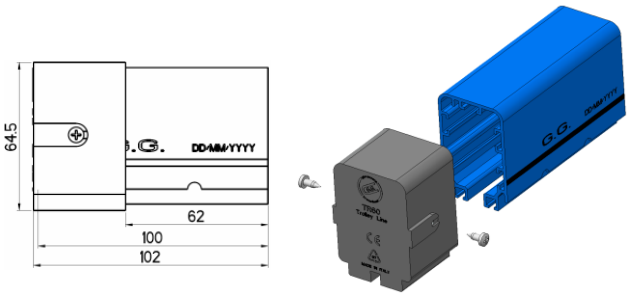
compatible with blue line (pre-mounted conductors)

compatible with yellow line (conductors to be pulled)

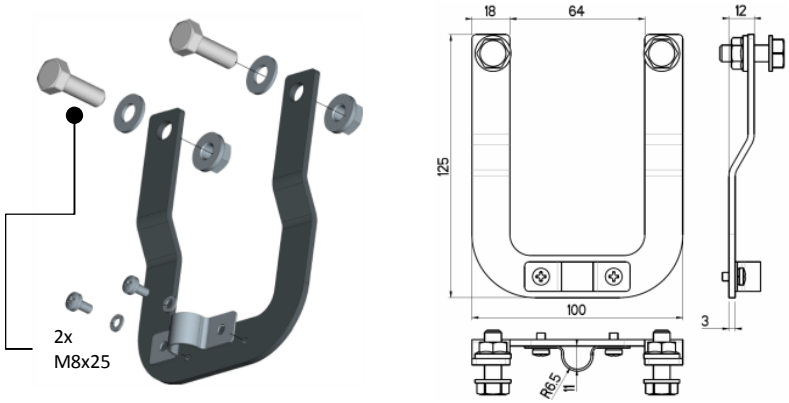
❑ TR6006 | TR60 line | end cap



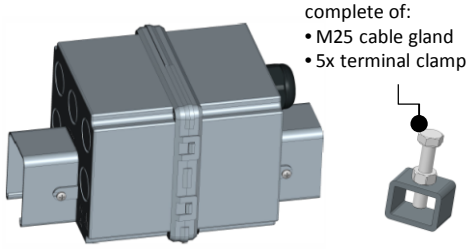
❑ TR6006A | TR60 line | pre-mounted end cap

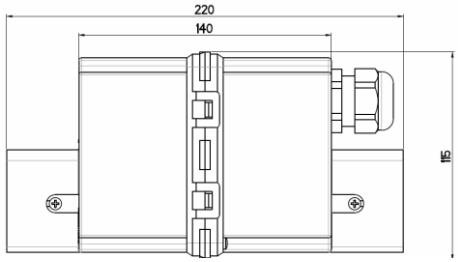


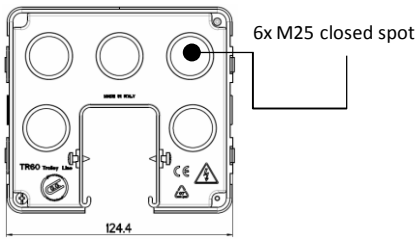
❑ TR6007 | TR60-85 line | towing arm bracket



❑ TR6008 | TR60 line | in-line feed

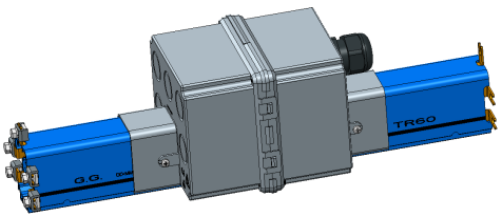


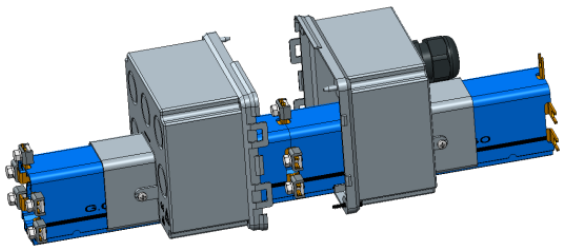




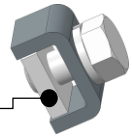
❑ TR6008A4-TR6008A5 | TR60 line | pre-mounted in-line feed

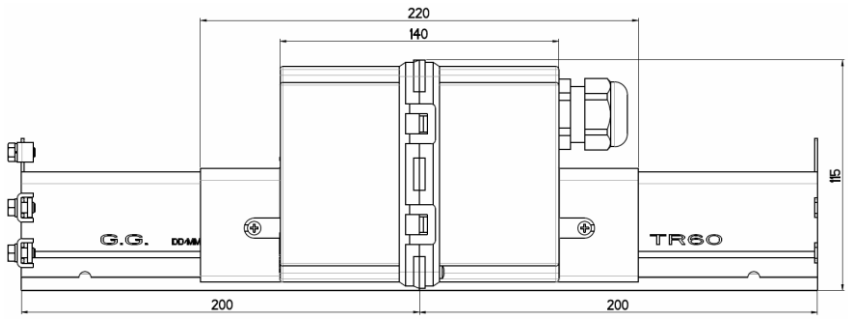
❑ TR6008A4	❑ TR6008A5
4 poles L1-L2-L3-PE	5 poles L1-L2-L3-N-PE



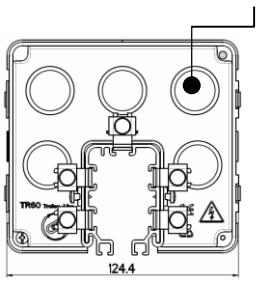


complete of terminal clamp for each conductors





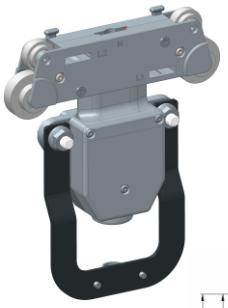
5x M25 closed spot

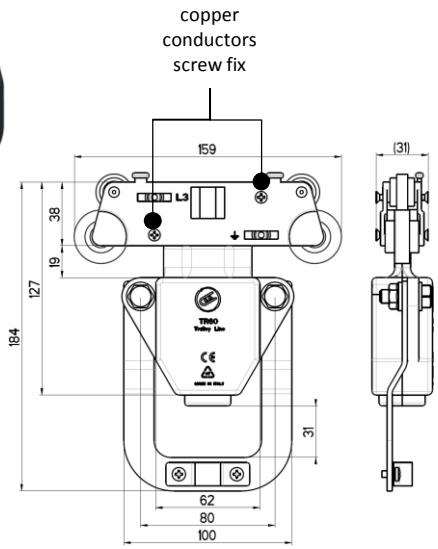


compatible with blue line (pre-mounted conductors)

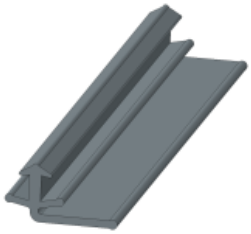
compatible with yellow line (conductors to be pulled)

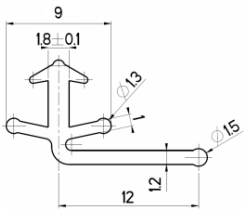
❑ TR6011 | TR60 line | strip insertion trolley

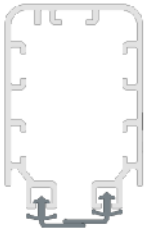




❑ TR6012 | TR60 line | gasket IP23

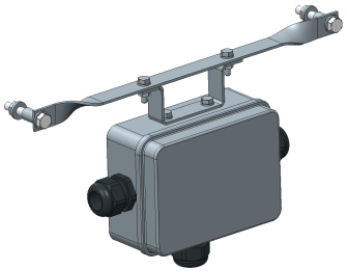


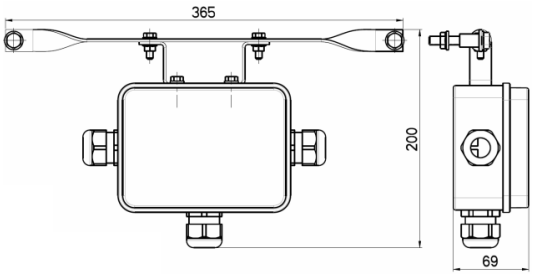


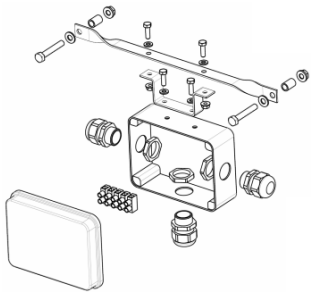


for order please consider twice the length of the line

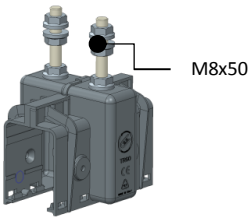
❑ TR6013 | TR60 line | double trolley support

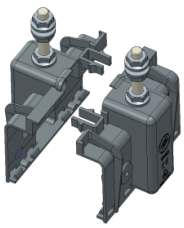


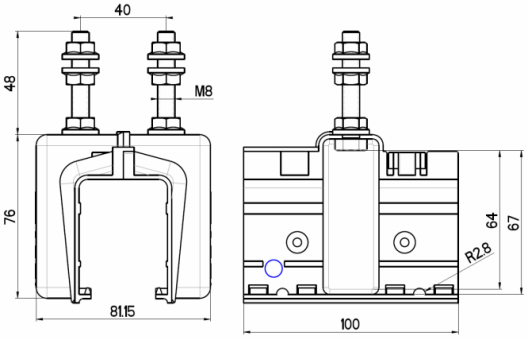




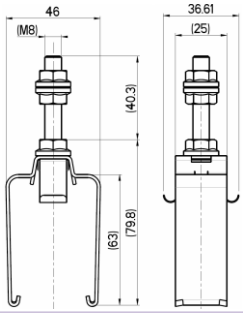
❑ TR6014 | TR60 line | fixed point





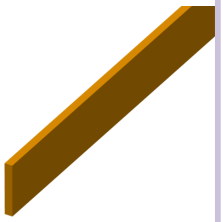


❑ TR6020 | TR60 line | hanger clamp (steel)



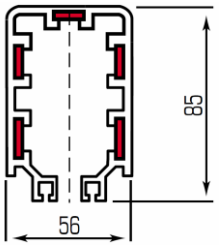
❑ CS40-CS60 | TR60 line | copper strip

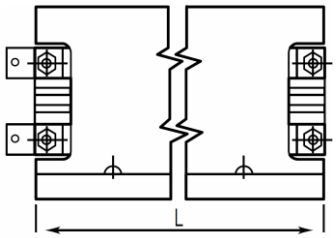
❑ CS40	❑ CS60
40 amp 10 mm² 1 x 10 mm²	60 amp 15mm² 1.5 x 10 mm²



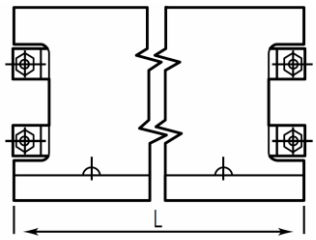
compatible with blue line (pre-mounted conductors)		compatible with yellow line (conductors to be pulled)

❑ **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	



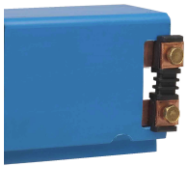


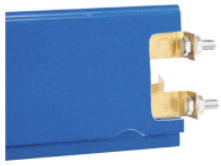
40A.....140A Series



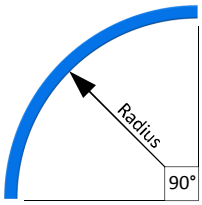
200A Series

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



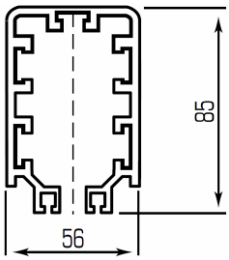


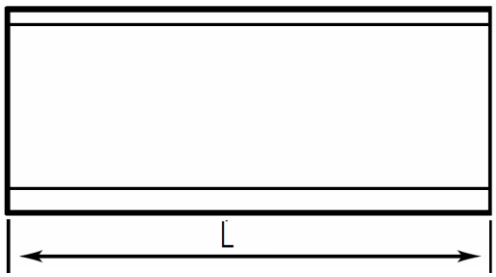
Radius [meters]	40 amp	70 amp	100 amp	140amp
1.2	❑ **TR8529404A90**	❑ **TR8529704A90**	❑ **TR85291004A90**	❑ **TR85291404A90**
1.4	❑ **TR8529404B90**	❑ **TR8529704B90**	❑ **TR85291004B90**	❑ **TR85291404B90**
1.8	❑ **TR8529404C90**	❑ **TR8529704C90**	❑ **TR85291004C90**	❑ **TR85291404C90**
2.2	❑ **TR8529404D90**	❑ **TR8529704D90**	❑ **TR85291004D90**	❑ **TR85291404D90**
4 conductors only				



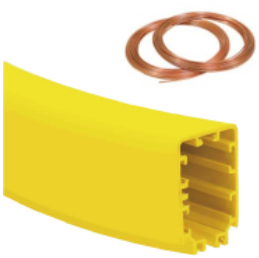
❑ **TR85704-TR85705** ❑ **TR851004-TR851005** ❑ **TR851404-TR851405**	TR85 line	busbar	

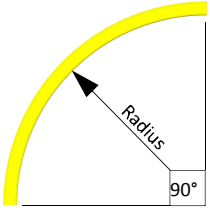
Line	Amp	N° conductors	Bar lenght "L"
TR85	**70**= 70 amp **100**= 100 amp **140**= 140 amp	**4C** = four **5C**= five	4meters

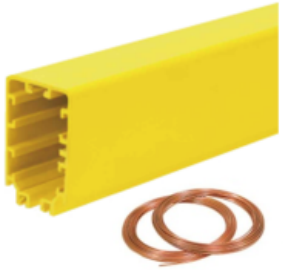




Radius [meters]	
1.2	❑ **TR8529A90**
1.4	❑**TR8529B90**
1.8	❑**TR8529C90**
2.2	❑**TR8529D90**
4 conductors only can be pulled	



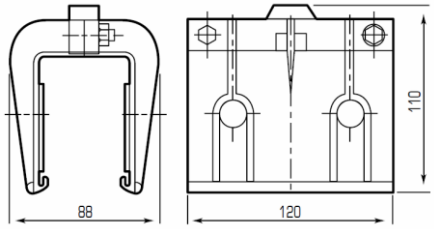




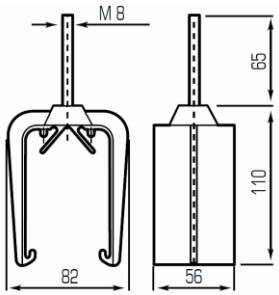
compatible with blue line (pre-mounted conductors)

compatible with yellow line (conductors to be pulled)

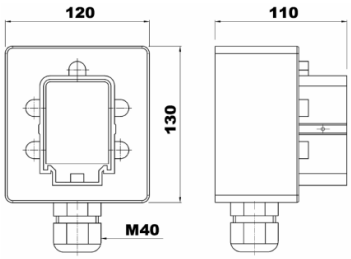
❑ TR8501 | TR85 line | joint



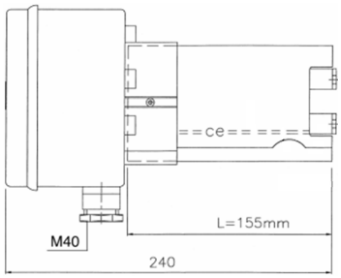
❑ TR8502 | TR85 line | hanger clamp



❑ TR8503 | TR85 line | feed

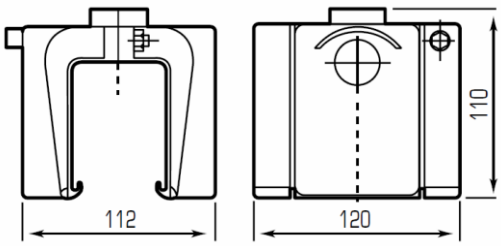


❑ TR8503A4-TR6003A5 ❑ TR8533A4-TR8533A5 | TR85 line | pre-mounted feed

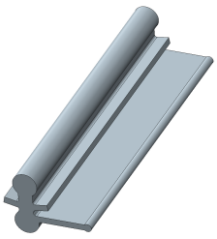


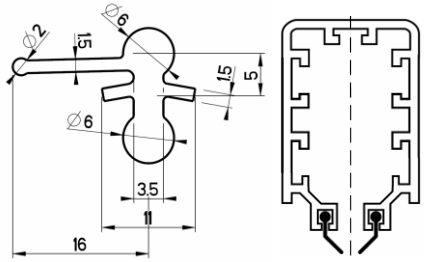
❑ **TR8503A4** (40…140amp) ❑**TR8533A4** (200amp)	4 poles L1-L2-L3-PE
❑ **TR8503A5** (40…140amp) ❑**TR8533A5** (200amp)	5 poles L1-L2-L3-N-PE

❑ TR8504-TR8535 | TR85 line | joint



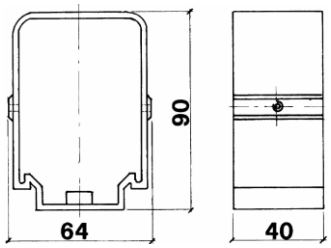
❑ TR8505 | TR85 line | gasket IP23



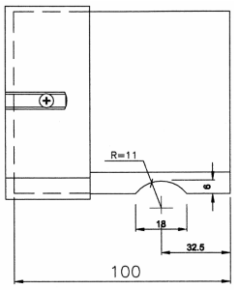


for order please consider twice the length of the line

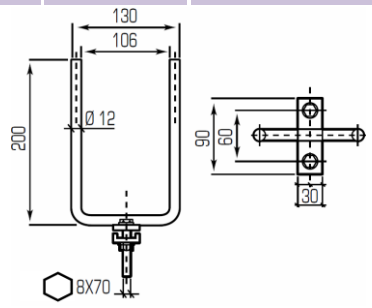
❑ TR8506 | TR85 line | end cap



❑ TR8506A | TR85 line | pre-mounted end cap

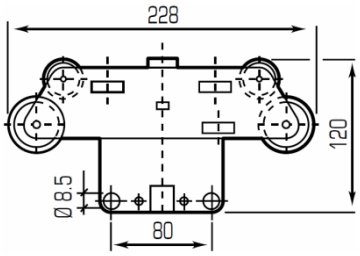


❑ TR8510 | TR60-85 line | towing arm



compatible with blue line (pre-mounted conductors)		compatible with yellow line (conductors to be pulled)

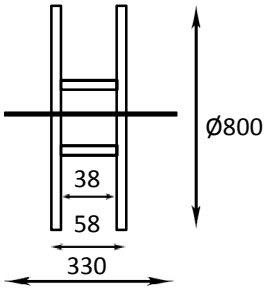
❑ TR8511-TR8512 | TR85 line | 35 amp trolley



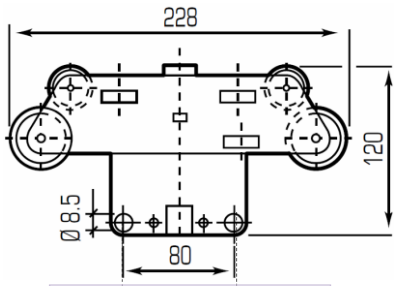
❑ TR8511	❑ TR8512
4 poles L1-L2-L3-PE	5 poles L1-L2-L3-N-PE

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

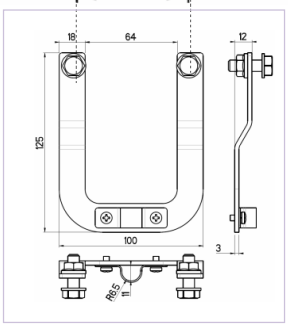
❑ TR8513 | TR60-85 line | de-coil unit



❑ TR8514 | TR85 line | strip insertion trolley



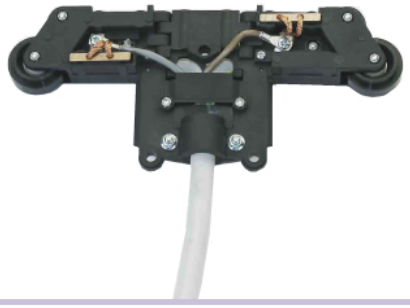
TR6007

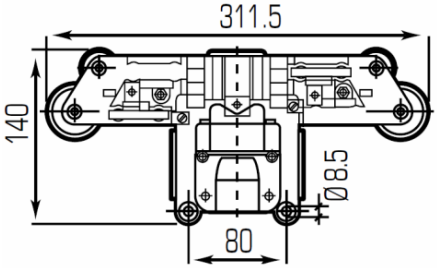


❑ TR8517-TR8520 | TR85 line | brush

❑ TR8517	❑ TR8520
for 35 amp trolley	for 70 amp trolley

❑ TR8518-TR8519-TR8532 | TR85 line | 70 amp trolley





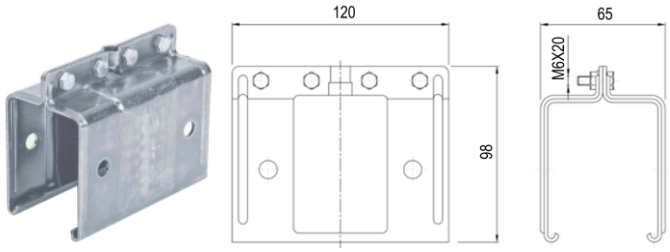
❑ TR8518	❑ TR8519	❑ TR8532
4 poles L1-L2-L3-PE	5 poles L1-L2-L3-N-PE	4 poles L1-L2-L3-PE articulated for curves

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

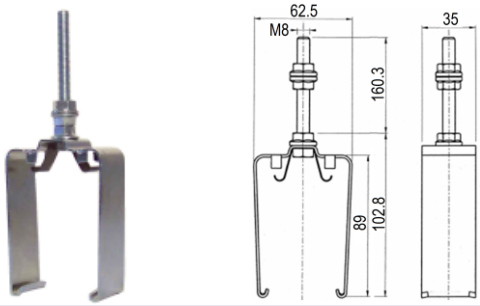
compatible with blue line (pre-mounted conductors)

compatible with yellow line (conductors to be pulled)

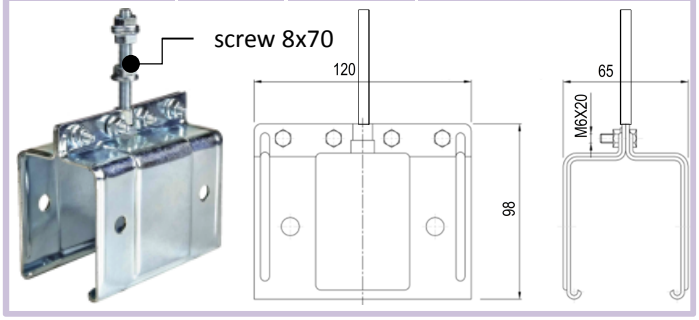
❑ TR8524 | TR85 line | joint (steel)



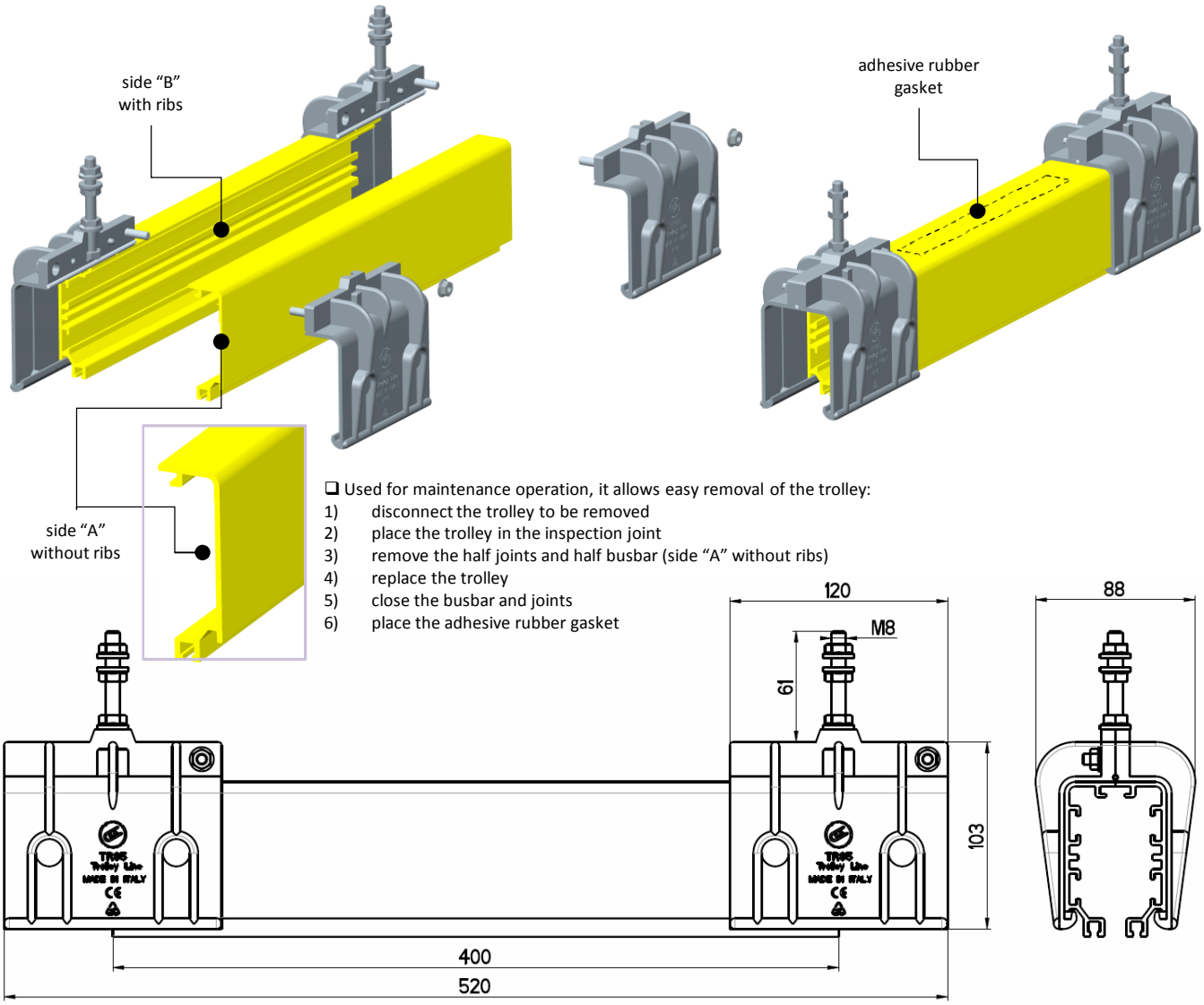
❑ TR8525 | TR85 line | hanger clamp (steel)



❑ TR8527.1 | TR85 line | fixed point



❑ TR8528 | TR85 line | inspection joint



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

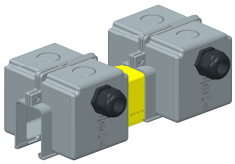
1) disconnect the trolley to be removed
2) place the trolley in the inspection joint
3) remove the half joints and half busbar (side "A" without ribs)
4) replace the trolley
5) close the busbar and joints
6) place the adhesive rubber gasket

compatible with blue line (pre-mounted conductors)

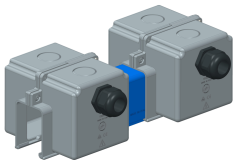
compatible with yellow line (conductors to be pulled)

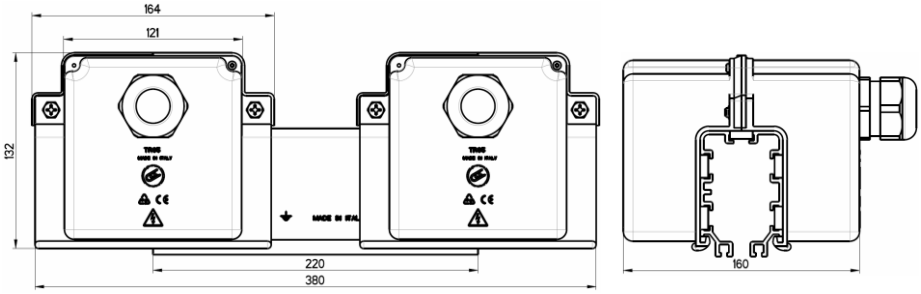
❑ TR8545-TR8545B | TR85 line | section joint

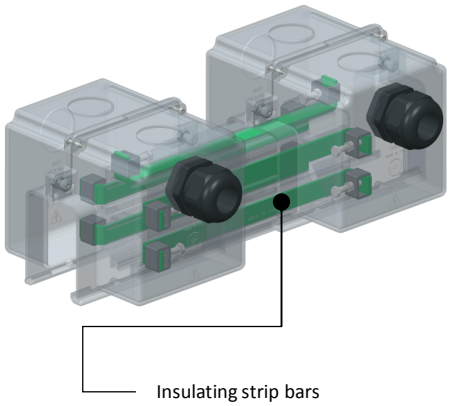
❑ **TR8545** — yellow



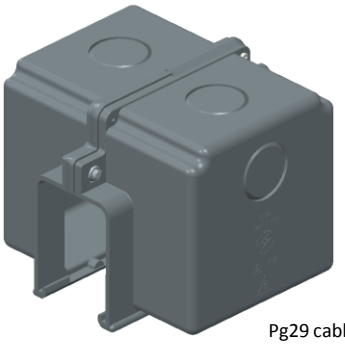
❑ **TR8545B** — blue

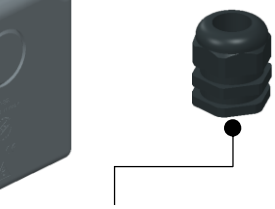




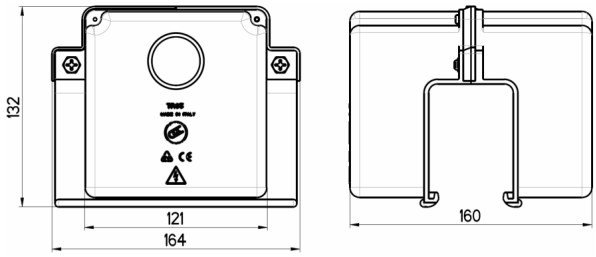


❑ TR8547 | TR85 line | in-line feed



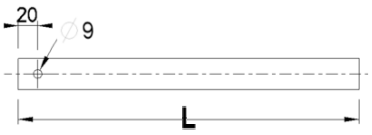


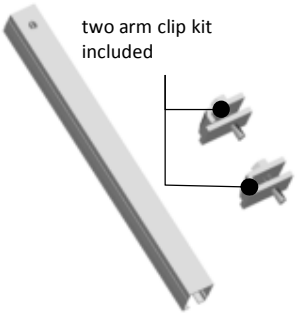
Pg29 cable gland included (not mounted)

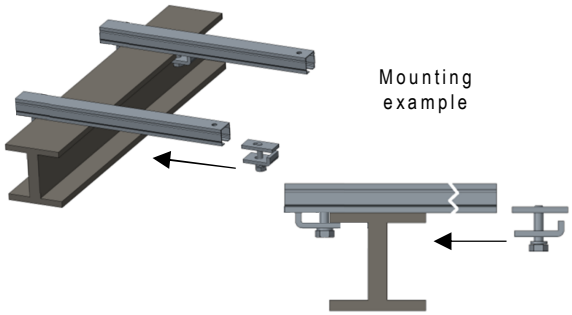


❑ TR8550-TR8551-TR8552 | TR60-85 line | support bracket (rail fixing)

❑ TR8550	❑ TR8551	❑ TR8552
L= 350mm	L= 500mm	L= 700mm

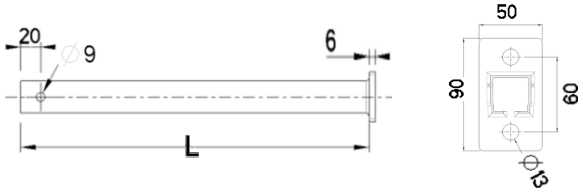






❑ TR8555-TR8556 | TR60-85 line | support bracket (wall fixing)

❑ TR8555	❑ TR8556
L= 350mm	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 [mm²]		10	15	9.3	15.5	23.25	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

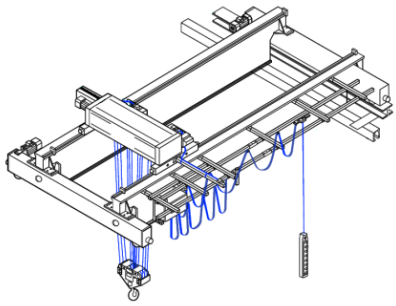
Material		rigid PVC
Self-extinguish	UL 94	V0
	DIN 4102	B2
	D.M.6/7/83	CI
Ultimate tensile strenght	ISO R527 23 °C	430 kg/cm³
Yield point	ISO R527 23 °C	460 kg/cm²
Modulus of elasticity	ISO R178 23 °C	30000 kg/cm²
Impact resistance	DIN 53453	unbroken
Dielectric strenght	ASTM 149	25 kV/mm
Softening temparature – 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

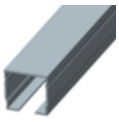
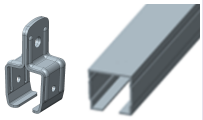
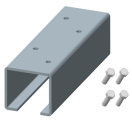
The festoon system is the traditional system for energy transmission for various type of handling equipment. One of the most popular is the overhead crane where the festoon lines transmit the signals to control the movement of the crane.
Line *30* and *41* Giovenzana are made of a "C"- rail bar fixed 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.

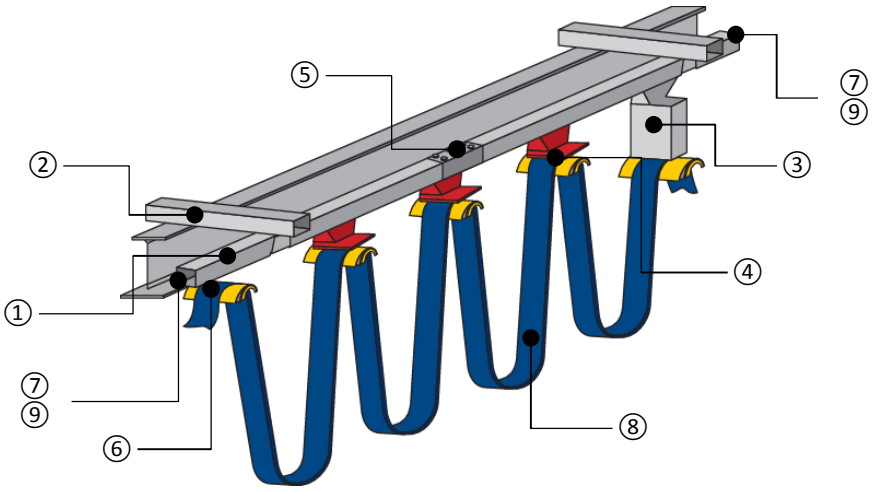


C- rail bar system

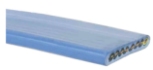
Line	Characteristic			Markings
30	❑ **Bar height: 30** mm	❑ **Load capacity**: 100 kg/m		CE EAC
41	❑ **Bar height: 41** mm	❑ **Load capacity** :140 kg/m		CE EAC
41 stainless steel	❑ **Bar height: 41** mm	❑ **Load capacity** :140 kg/m	❑ **Stainless steel material**	CE EAC

Typical line schematic:

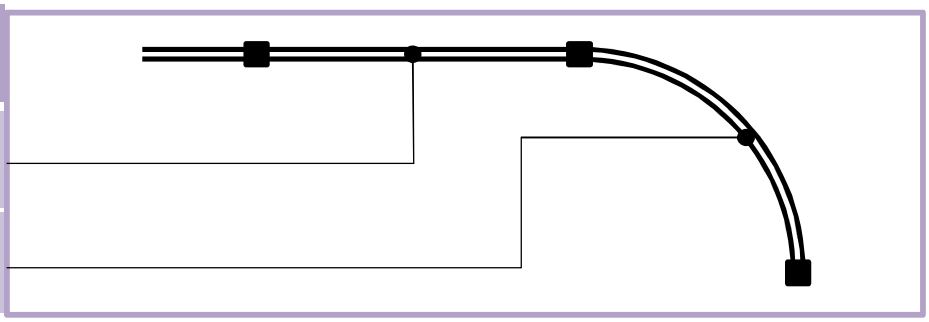
ID	Picture	Name
①		C-rail bar
②		Support arm and support bracket
③		Towing trolley
④		Trolley
⑤		Joint

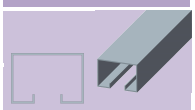
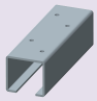
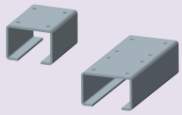
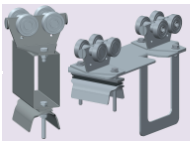
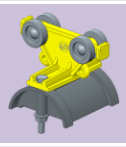
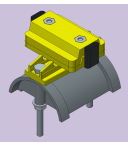


ID	Picture	Name
⑥		Head clamp
⑦		End Cap

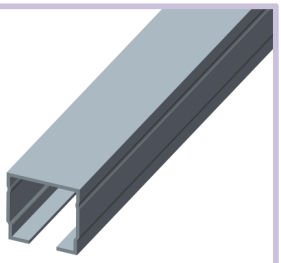
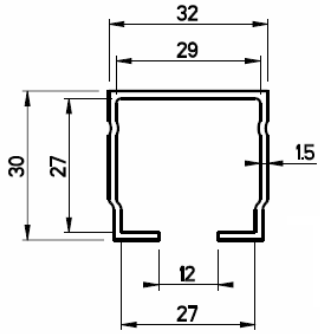
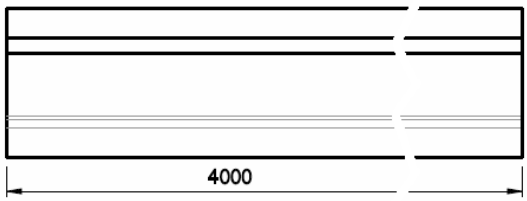
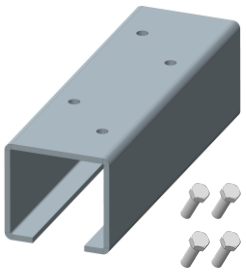
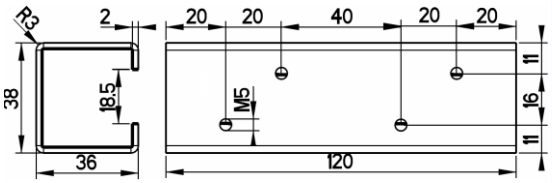
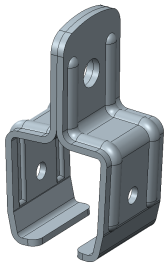
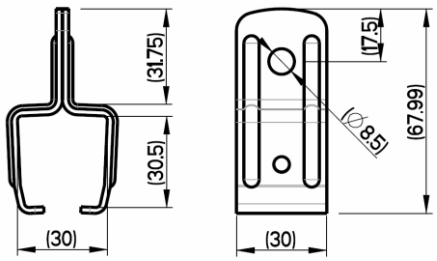
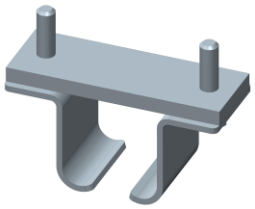
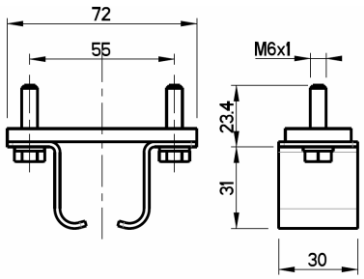
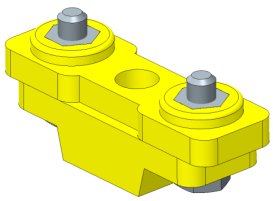
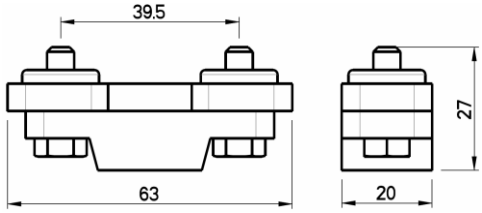
ID	Picture	Name
⑧		Cable
⑨		End stop

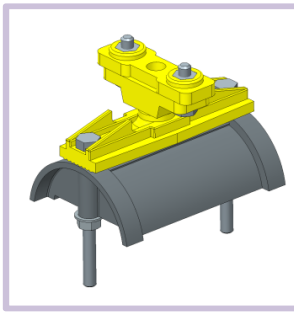
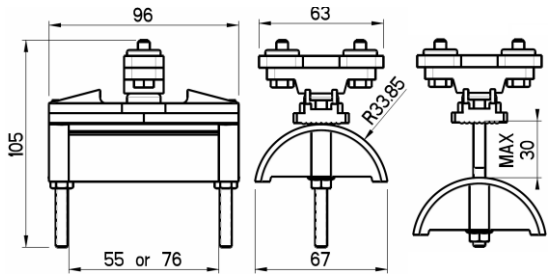
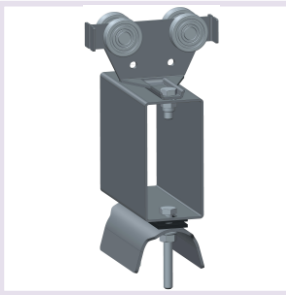
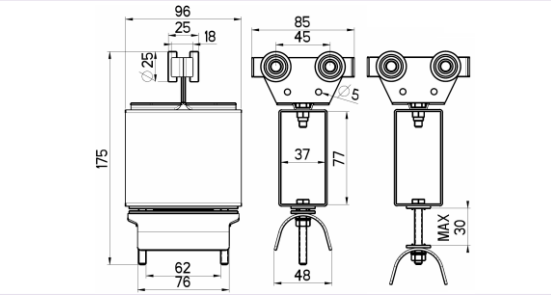
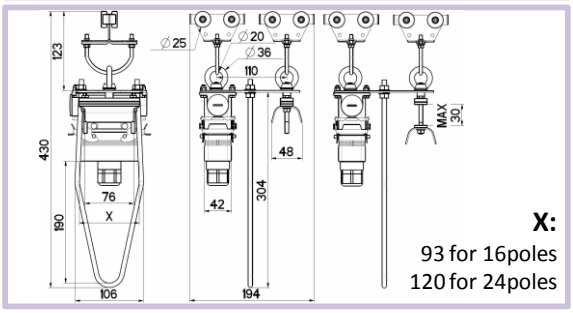
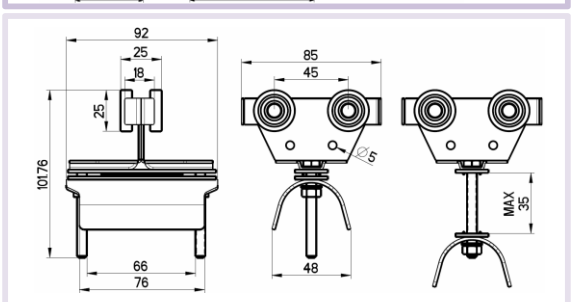
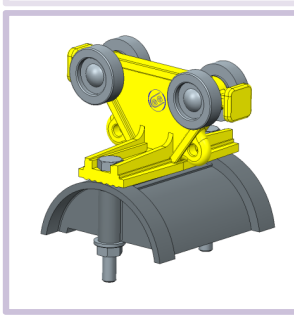
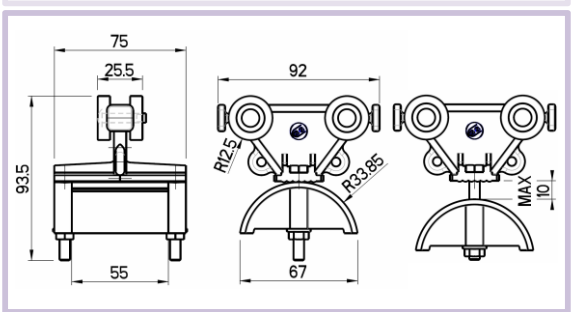
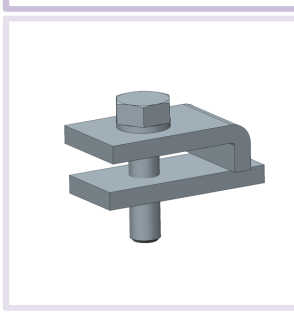
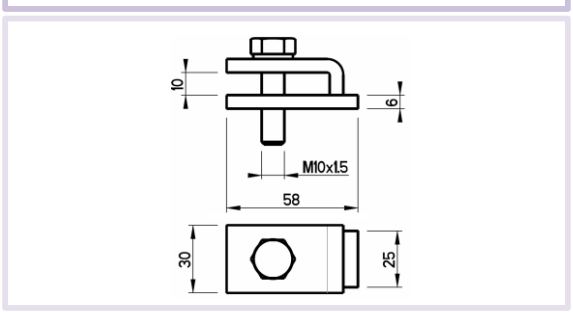
Festoon line module type	
Straight:	4 meters module (3 meters for stainless steel)
Curve:	90° curve radius 1.5 m (only line 41)

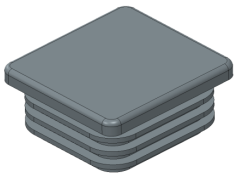
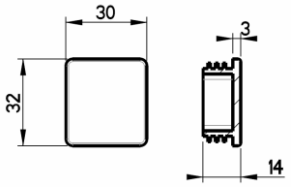
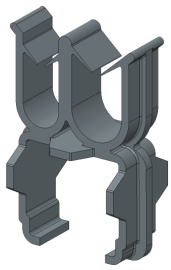
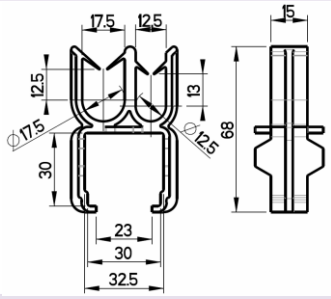
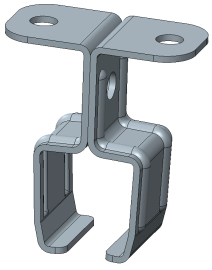
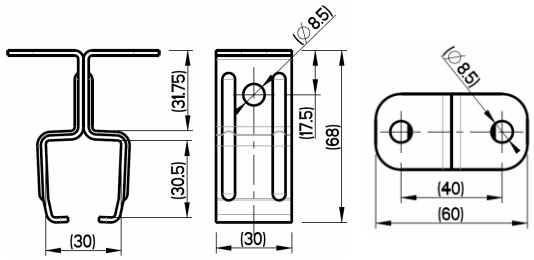
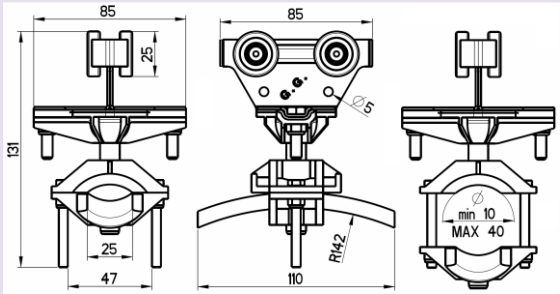


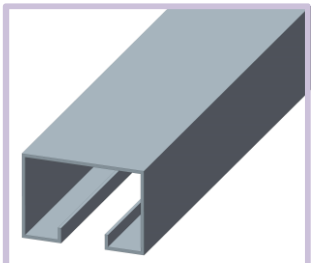
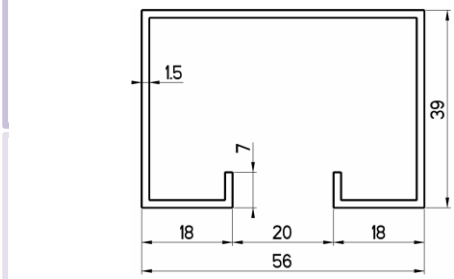
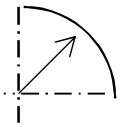
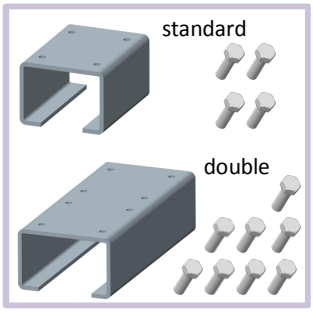
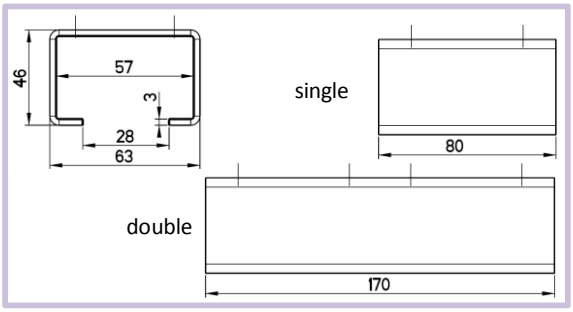
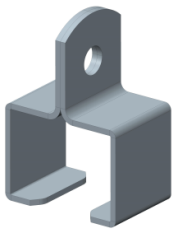
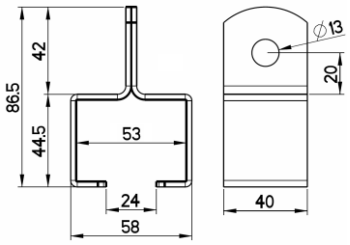
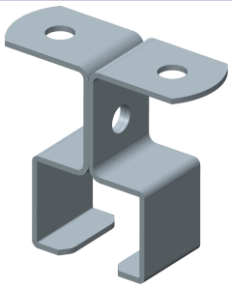
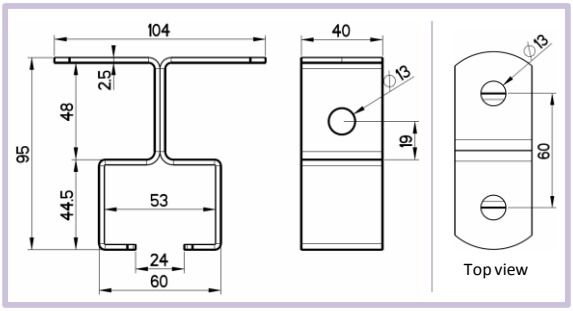
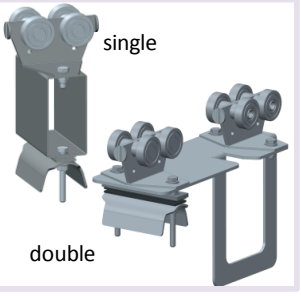
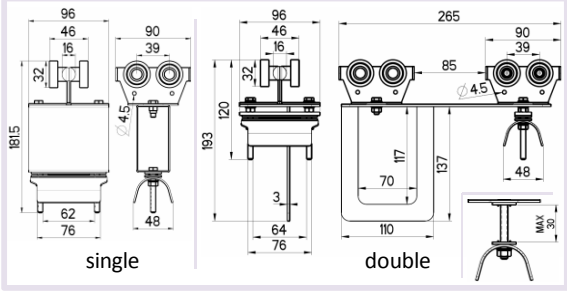
Description	note	Line 30 (load capacity 100 kg/m		Line 41 (load capacity 140 kg/m)			Min. qty
		Code	Picture	Code standard	Code stainless steel	Picture	
C-Rail bar	straight 4m	**30607001**		**30602001/4**	**30602061** (3m)		3-4 meters
	90° curved radius 1.5 m	-		**30602054** (o)	-		
Track support bracket		**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

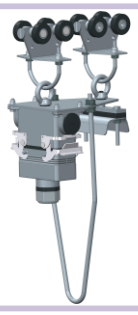
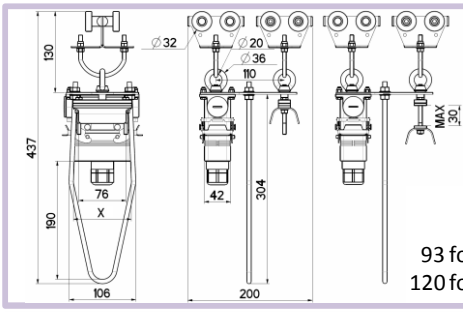
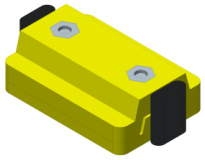
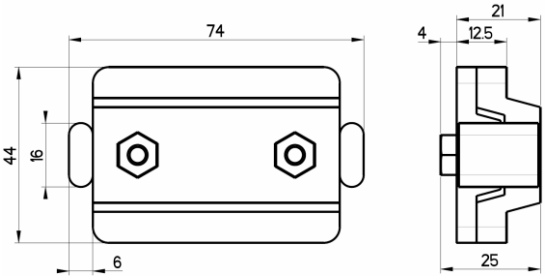
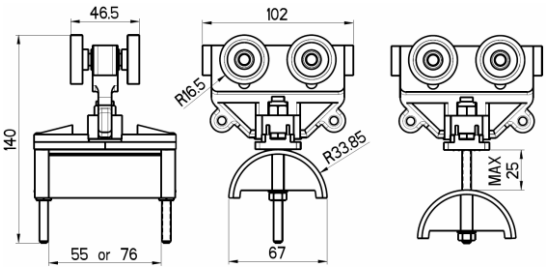
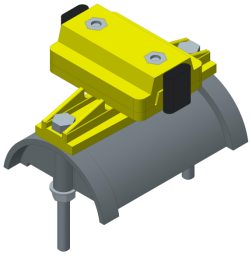
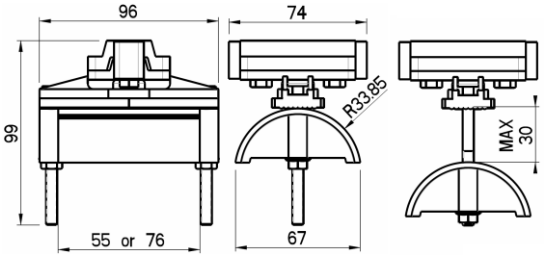
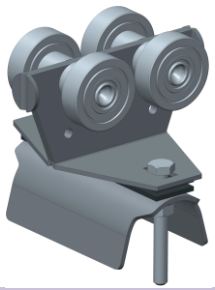
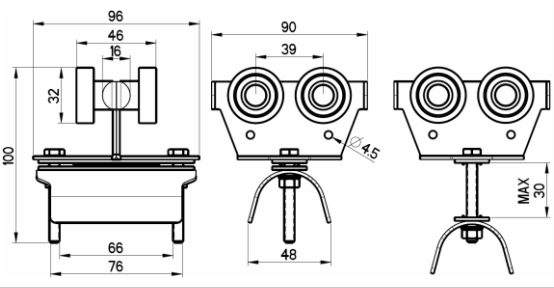
(o) may requiremechanical adjustment during line assembly

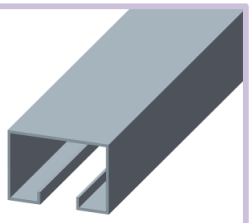
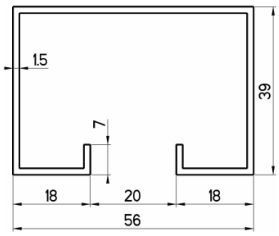
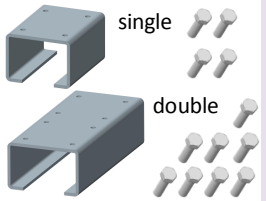
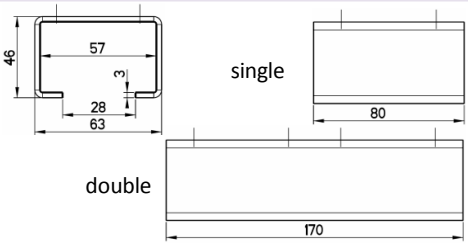
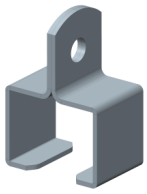
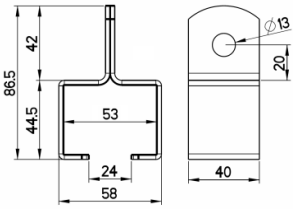
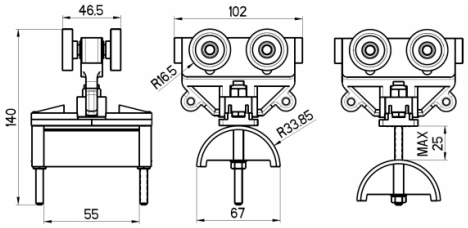
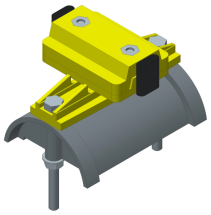
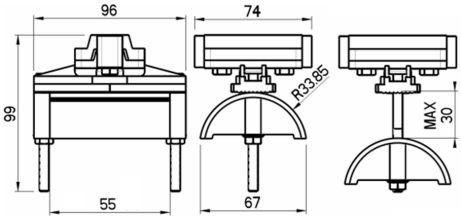
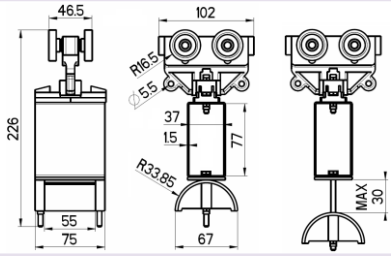
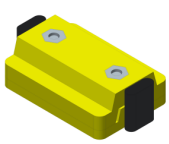
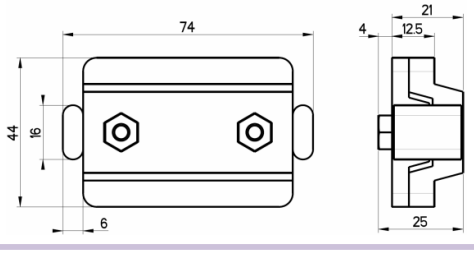
Picture	Description	Code	Dimensions
	**C-Rail bar** ❑Material: galvanized steel ❑Length: 4 m ❑Weight: 5 kg	**30607001**	
	**Bracket** ❑Material: galvanized steel	**30607001/05** (length 0.5 m) **30607001/08** (length 0.8 m)	
	**Joint** to connect a C-rail and suitable for supporting the track ❑Material: galvanized steel Screws M5x10 included	**30607002**	
	**Track support bracket** 2 pcs ❑Material: galvanized steel ❑Max support spacing: 1 m screws not included	**30607003**	
	**Support arm bracket (hanger)** ❑Material: galvanized steel ❑Max support spacing: 1 m	**30607004**	
	**End stop** ❑Material: PA6	**30607005**	

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

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

Picture	Description	Code	Dimensions
	**C-Rail bar** ❑Material: galvanized steel ❑Length: 4 m ❑Weight: 8 kg	**30602001/4**	
	**90° curved bar** ❑1.5 meters radius may require mechanical adjustment during line assembly	**30602054**	
	**Joint** to connect a C-rail and suitable for supporting the track ❑Material: galvanized steel Screws M5x10 included: No. 4 for single No. 8 for double Use double for track >50meters	**30602002** (standard) **30602034** (double)	
	**Track support bracket** 2 pcs ❑Material: galvanized steel ❑Max support spacing: 1 m screws not included	**30602003**	
	**Track support bracket** Ceiling fixing 2 pcs ❑Material: galvanized steel ❑Max support spacing: 1 m screws not included	**30602004**	
	**Towing trolley** ❑Material: galvanized steel ❑steel rollers with ball-bearing ❑68 mm steel saddle	**30602091** (single) **30602020** (double)	

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

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

Festoon system – line wire-rope Giovenzana

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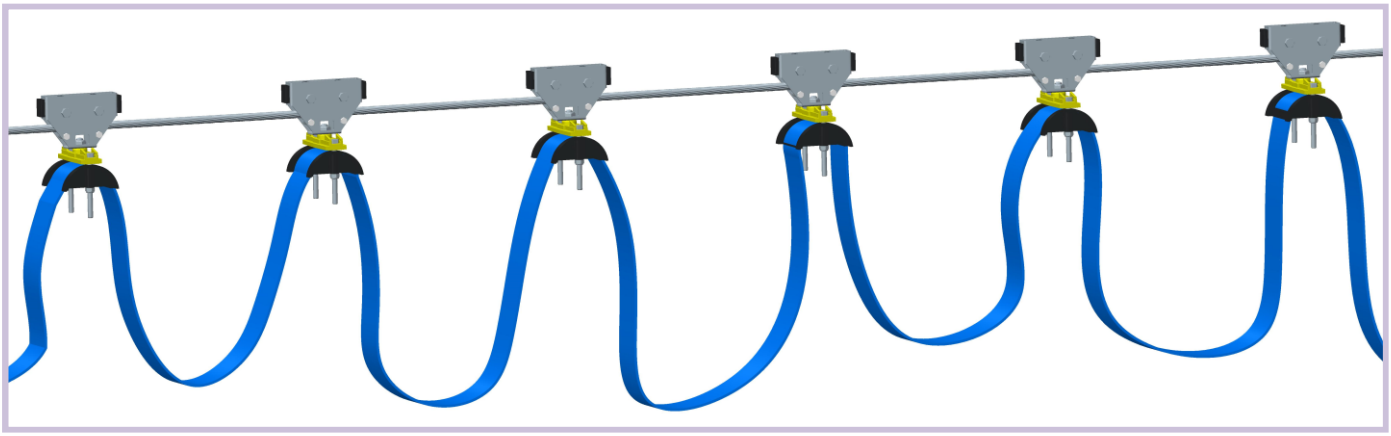
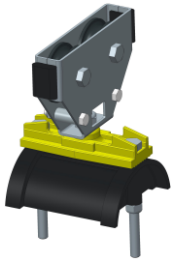
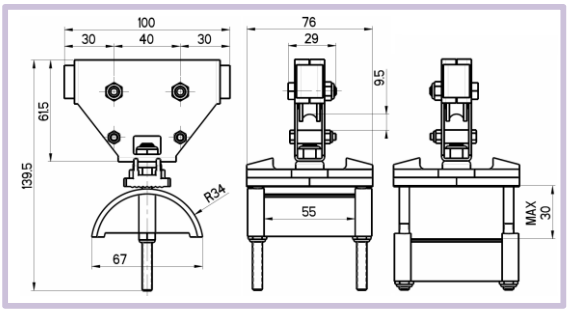
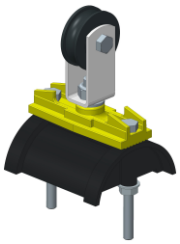
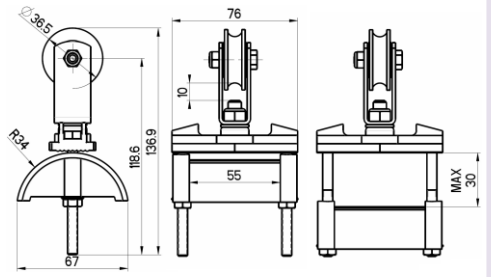
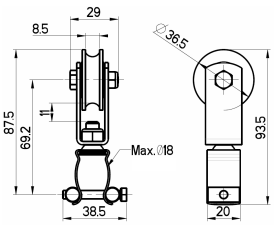
The festoon system is the traditional system for energy transmission for various type of handling equipment. Line *wire-rope* Giovenzana uses a rope to support the trolleys carrying the cable that supplies energy to the mobile device.



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
 ***FLAT CABLE***	**Twin roller trolley** ❑Material: PA6- galvanized steel ❑Type of roller: PA ❑Rotating 55 mm plastic saddle ❑Range 30 mm ❑Speed 40 m/min.	**30604003**	10	
 ***FLAT CABLE***	**One roller trolley** ❑Material: PA6- galvanized steel ❑Type of roller: PA ❑Rotating 55 mm plastic saddle ❑Range 30 mm ❑Speed 40 m/min.	**30604005**	10	
 ***ROUND CABLE***	**One roller trolley + metal cable clip** ❑Material: PA6- galvanized steel ❑Type of roller: PA ❑Cable Ø max: 18 mm ❑Speed 40 m/min.	**30604007**	10	

Festoon system – line I-beam Giovenzana

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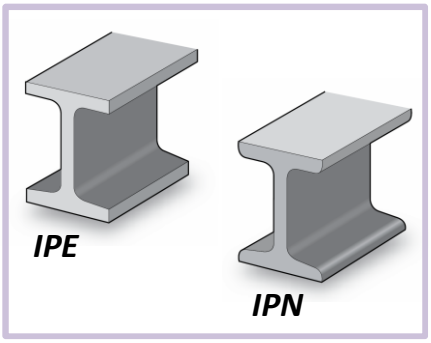
The festoon system is the traditional system for energy transmission for various types of handling equipments.
Line *I-beam* Giovenzana uses the beams of the mobile device to support the trolleys carrying the cable that supplies energy to the mobile device.
Line *I-beam* Giovenzana is suitable for installation 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… .



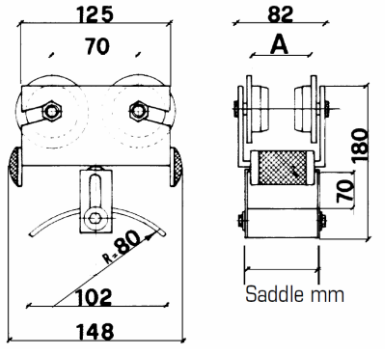
I-beam system

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	Seddle [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**	

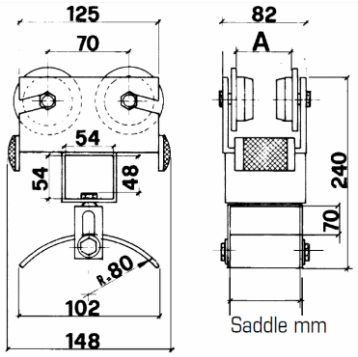
Light series

Trolley



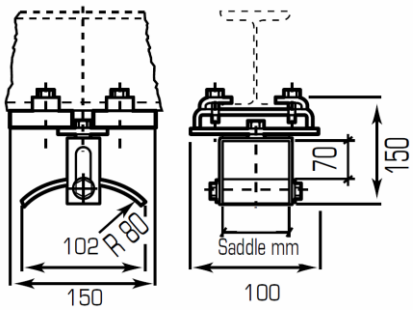
IPE 80 A=46+4
IPN 80 A=42+4
IPE 100 A=55+4
IPN 100 A=50+4

Towing trolley

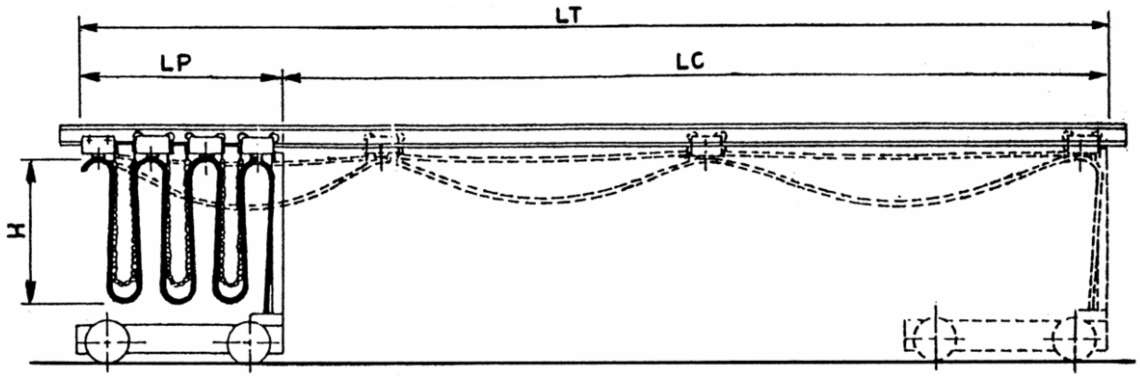


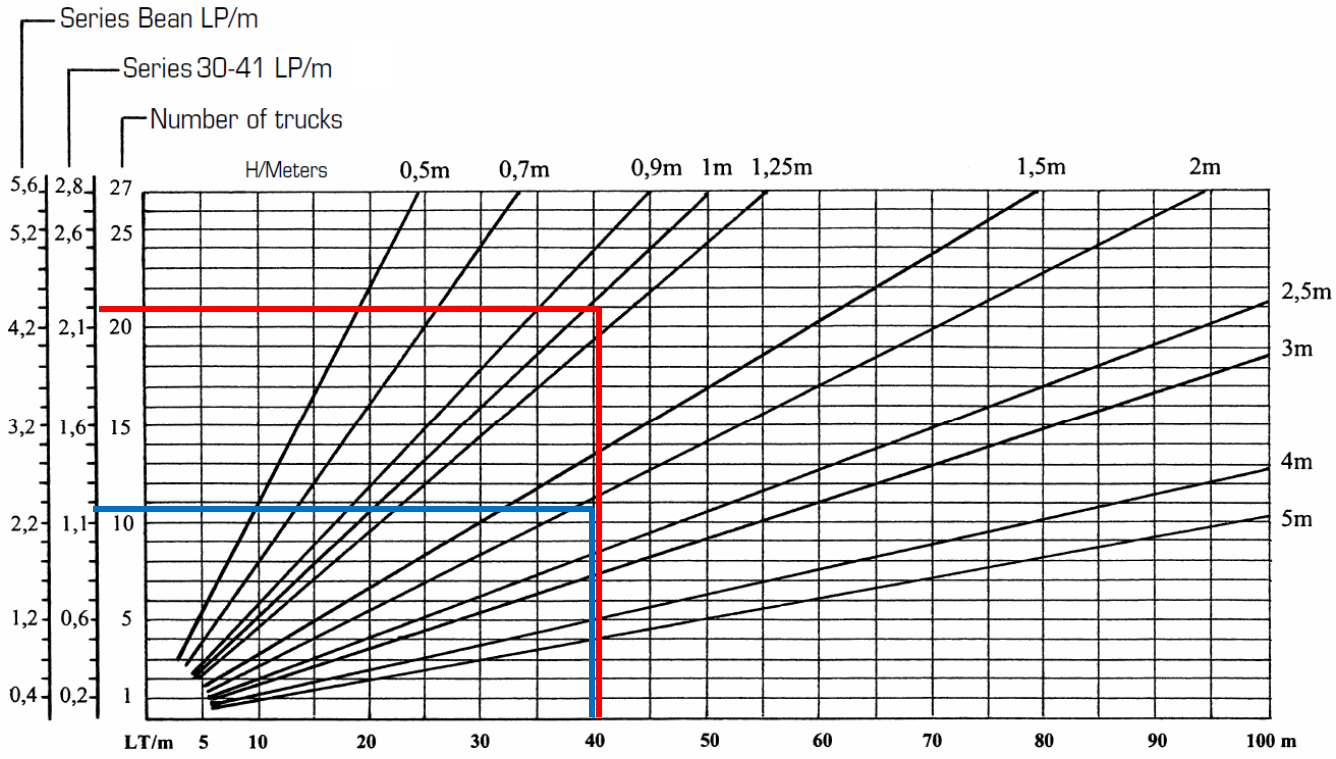
IPE 80 A=46+4
IPN 80 A=42+4
IPE 100 A=55+4
IPN 100 A=50+4

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 lenght. 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 lenght of a garland to increase by 10% the total lenght of the line and add enought to connect the two ends of the fixed and mobile users.

PVC flat cable anti-aging H07VVH6-F

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

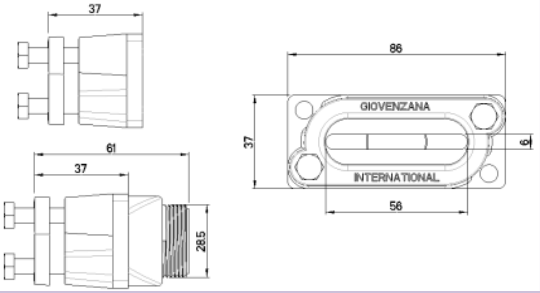
Characteristics

- ❑Comply with: CEI 20-22 II (flame resistant)
- ❑Insulation class: 2/3
- ❑Rated operating voltage: 400V
- ❑Rated insulation voltage: Uo/U 450/750V
- ❑Max short circuit temparature: 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)

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

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 [mm²]	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***	41X13		1000	40		16	11
CP1825AF ***(○)***	***18X2.5***	50X13		1050	45		15	10
CP2425AF ***(○)***	***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
CP04250AF	***4X25***	43X13	7X28X0.40	1700	100	0.78	96	80
CP0435AF	***4X35***	50X14	7X39X0.40	2050	140	0.55	119	99

(○) Minimum supply 500m.

Flat cable gland	Standard		**12903010**	
	Ø 28.5 out		**12903011**	

Round cable with dual strain relief steel ropes S05VVD7-F

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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

Characteristic

❑Comply with: CEI 20-22 II (flame resistant)	❑Insulation class: 2/3
❑Rated operating voltage: 230V	❑Rated insulation voltage: Uo/U 300/500V
❑Max short circuit temparature: 160 °C	❑Operating temperature: -5°C +70°C
❑Ø2mm steel strain relief ropes	❑Breaking point: 60kg/mm²

❑Internal conductors with flexible PVC scheath progressively numbered, plus earth conductor (yellow/green)

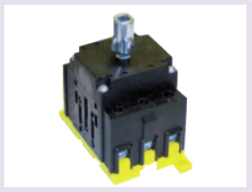
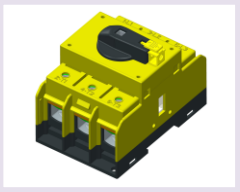
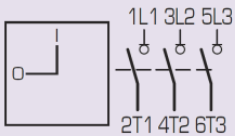
❑Blue colour sheath
❑Finalize the code with "N" for the black colour

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 [mm²]	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 disconnector 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

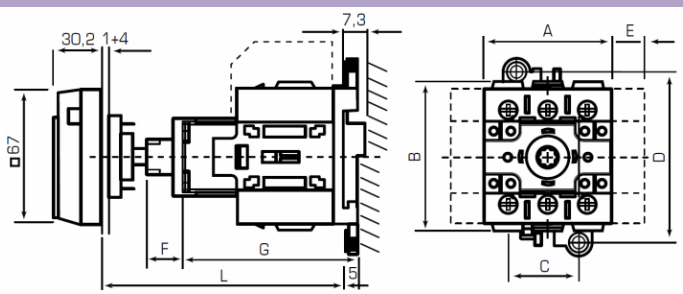
Code			SQ032003B	SQ063003B	SQ125003B
Product ID			SQ32 – Giovenzana Line	SQ63 – Giovenzana Line	SQ125 – Giovenzana Line
Picture					
Function			door interlock - 3 poles on-off – 90° switching angle (aux contact : neutral, protective earth “PE”, NC or NO available on request)		
Comply with standards			IEC 947-3, EN60947-3, UL508		
Rated insulation voltage [Ui]			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 mm²	6 - 25 mm²	10-70 mm²
		rigid cable	1.5-16 mm² / 12-6 AWG	10-35 mm² / 10-2 AWG	10-70 mm²
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:

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