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GIOVENZANA
INTERNATIONAL B.V.

HANDLING SYSTEM

Company profile



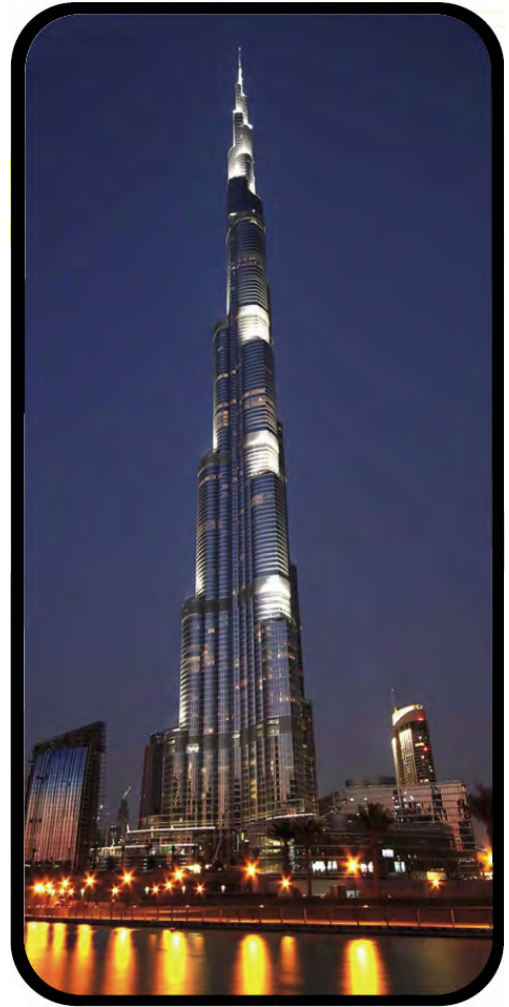
THE PHILOSOPHY

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

THE HISTORY

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

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



THE PRODUCTS

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

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

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



QUALITY AS A WAY OF LIFE

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

Giovenzana is 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.



HANDLING SYSTEM

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



Lifting equipment:

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

Mounting example: **10**

Page 11



Limit switches:

Rotary gear limit swicthes and control position limit switches

Mounting example: **1** **3**

Page 26



Slip ring:

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

Mounting example: **11**

Page 43



Warning horn:

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

Mounting example: **4** **5** **6**

Page 43



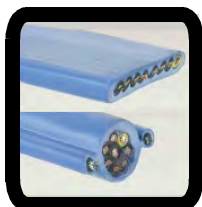
Energy and data transmission:

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

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

Mounting example: **2** **9**

Page 44



Conductors:

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

Mounting example: **7** **8**

Page 80

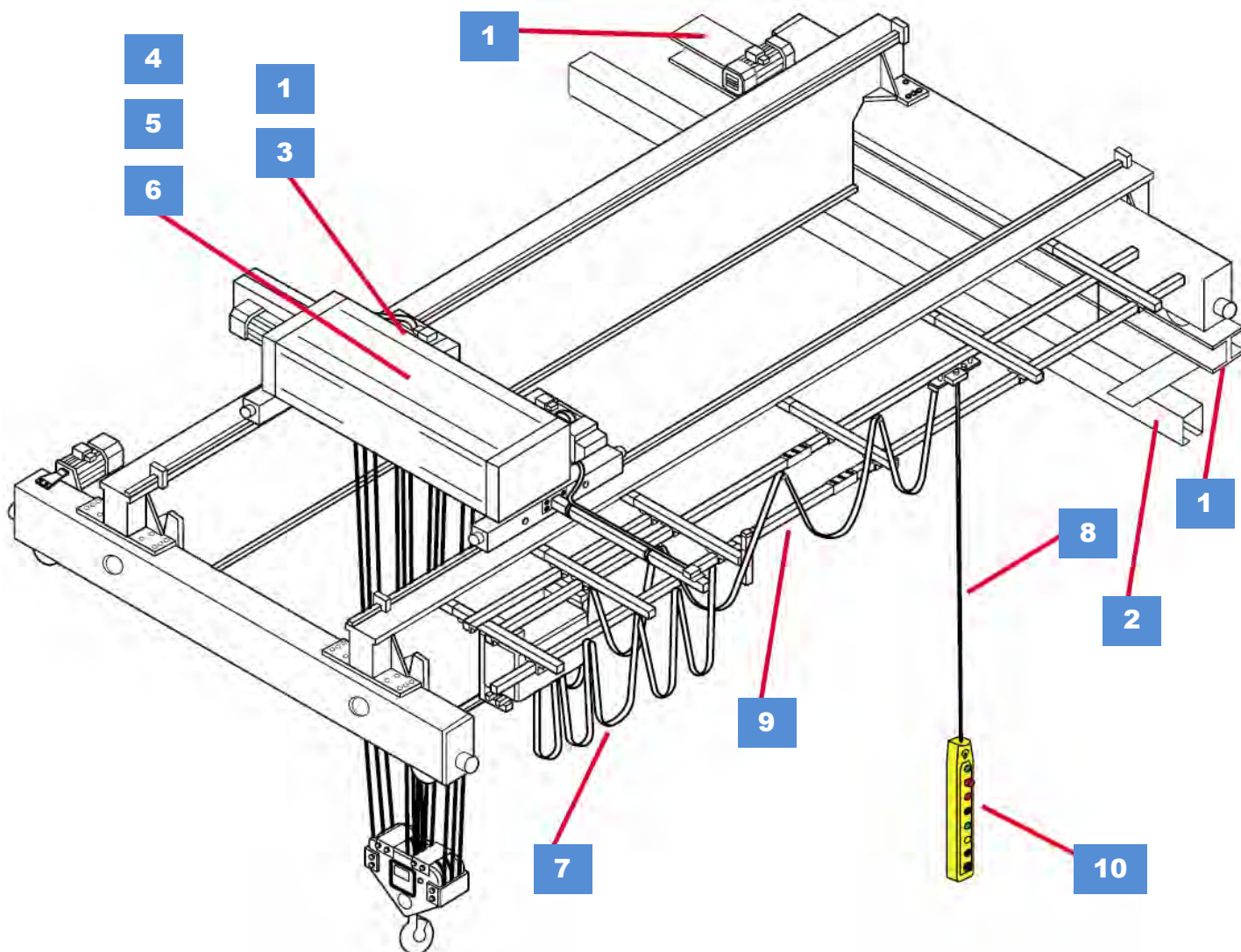


Complementary products:

Switch disconnectors

Mounting example: **4** **5** **6**

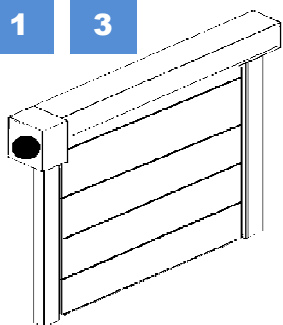
Page 82



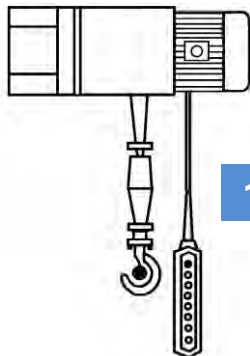
Picture shows a typical overhead crane assembly

Other product applications:

1 3



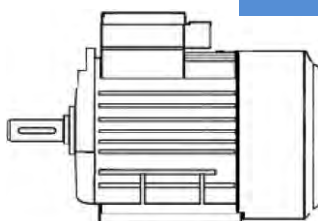
Rolling shutter door



10

Hoist

11



Slip ring motor

2 9



Energy transmission

- Window cleaning
- BMU cradle

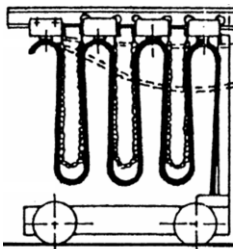
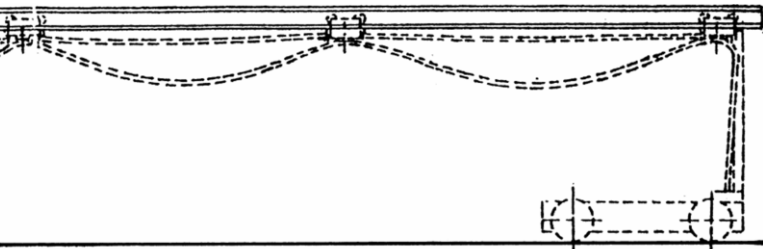
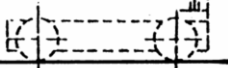
Product Overview



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



Product Overview

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



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

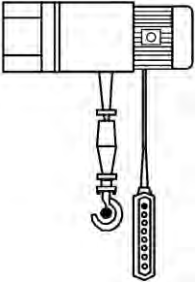
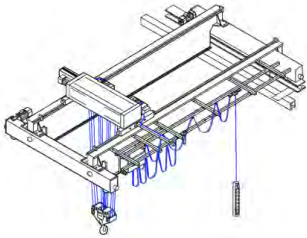
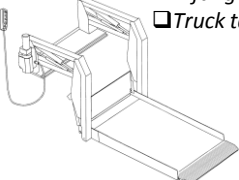
The EN European standards usually originate from IEC International and are the result of the collaboration between CENELEC (European Committee for Electrotechnical Standardization) member countries. These standards cover and eliminate existing national standards that may be contradictory or out of date.





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

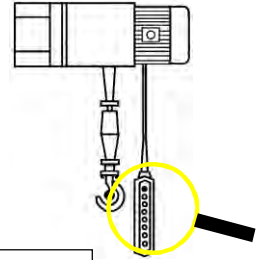
Giovenzana International Company, leader in lifting equipment control, makes a wide range of standard products for all installation requirements, and all built to high quality specification and safety guidelines. The Lift Equipment products series comply with: IEC 947-5-1, EN60947-5-1, UL508 and use: IEC 204-1, EN60204-1, EN ISO 13850, all achieved according to the needs and requirements of Cee 89/392. All operators are coloured and the laser-engraved, indelible legends comply with EN60204-1 and FEM 9.941. CERTIFICATIONS: The pendant stations P02, P03 , HP03, PL series can be certificated cUL.

Use (recommended)	Line	Picture	Characteristic
 □ Hoist	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)	
	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	 <i>Ergonomic! design</i>	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)	
 □ Overhead crane	DC30	 <i>High power!</i>	Pendant stations for high power hoist: • direct motor control single phase and three phase • lth 25A - 1phase/2poles 230...400V 2.2kW 3phase/3poles 230...400V 4kW
	page 12		
	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	 <i>Compact! design</i>	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)	



Characteristics:

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



P02



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

PICTURE	LAYOUT	CONFIGURATION	CODE	CONTACT TYPE	WEIGHT [gr]
		SINGLE SPEED (* TILTING BUTTON 16A – 250Vac ½ HP)	P02.RM		230
		SINGLE SPEED	P02.1		230
		SINGLE SPEED	P02.2		250
		SINGLE SPEED	P02.4		250
		(* HIGH POWER CONTACTS DIRECT MOTOR CONTROL 1Kw 1ph	P02.CD		230
		TWO SPEED	P02.D2		250

P03



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

		SINGLE SPEED	P03.1		440
		SINGLE SPEED	P03.2		450
		SINGLE SPEED	P03.3		460
		(* HIGH POWER CONTACTS DIRECT MOTOR CONTROL 1Kw 1ph	P03CD		460
		TWO SPEED	P03D2		460

HP03



Available in UL/CSA req.

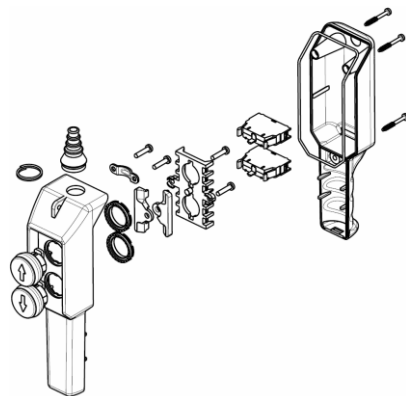
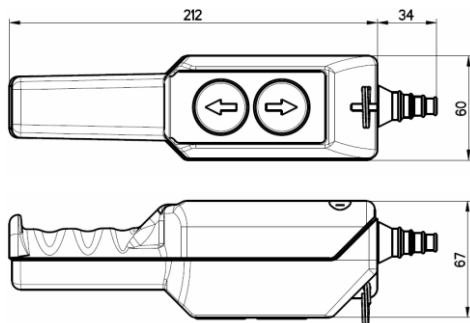
		SINGLE SPEED	HP03		330
		TWO SPEED	HP03.D2		350

DC30

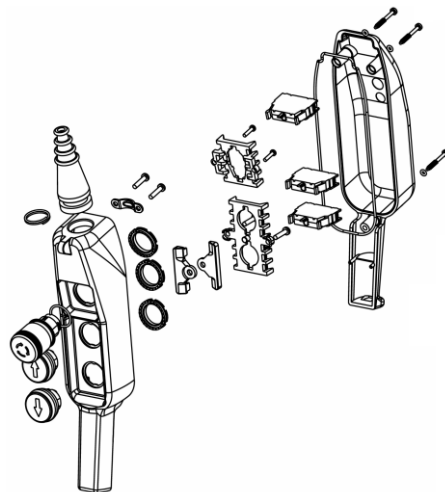
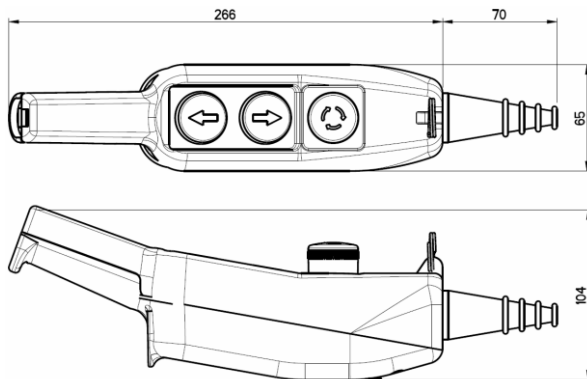


		SINGLE SPEED	DC30		600
		(* 1th 25A EXTRA HIGH POWER CONTACTS BLOCK FOR DIRECT MOTOR CONTROL : 2.2kW 1ph / 4kW 3ph	DC30.RG		600
		(* 1th 25A EXTRA HIGH POWER CONTACTS BLOCK FOR DIRECT MOTOR CONTROL : 2.2kW 1ph / 4kW 3ph	DC30.GE		600
		TWO SPEED (* 1th 25A EXTRA HIGH POWER CONTACTS BLOCK FOR DIRECT MOTOR CONTROL : 2.2kW 1ph / 4kW 3ph	DC30D2		650

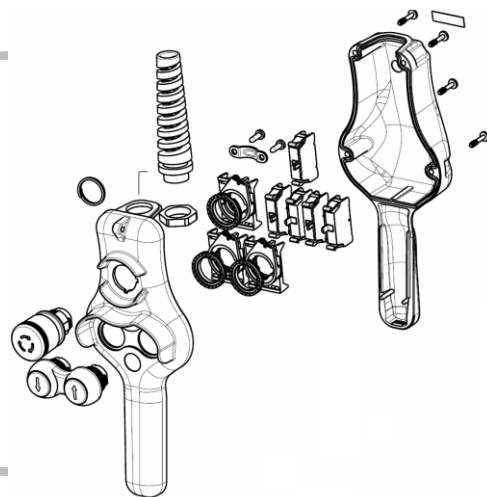
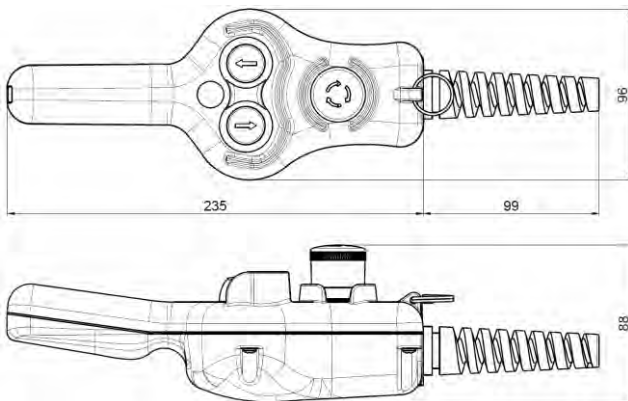
P02



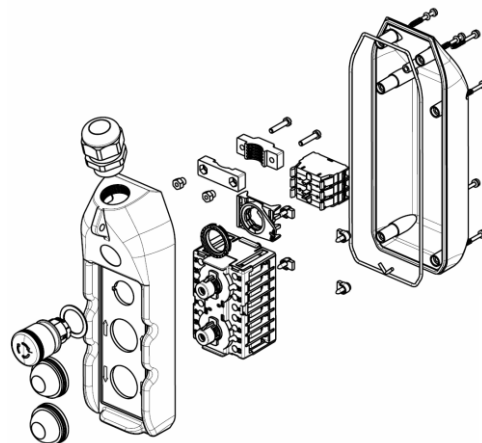
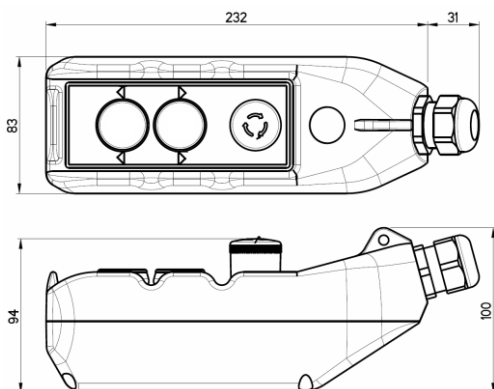
P03



HP03



DC30





LIFTING EQUIPMENT

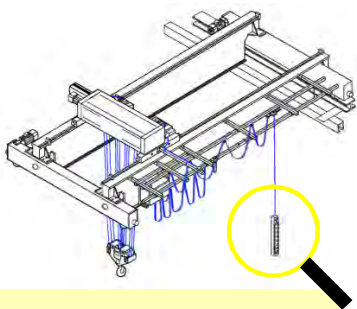


KT
Available
See pg. 18

Available in
UL/CSA req.

Characteristics:

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



CODE	PL05/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 length [mm]	345	345	345	495	495	495	495	530	530	530	530	640	710
LAYOUT													
DIMENSIONS													
PUSH BUTTON TYPE – CONTACT TYPE COUPLED													

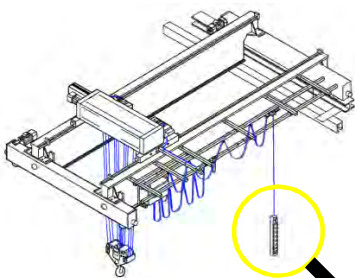


KIT
Available
See pg. 18



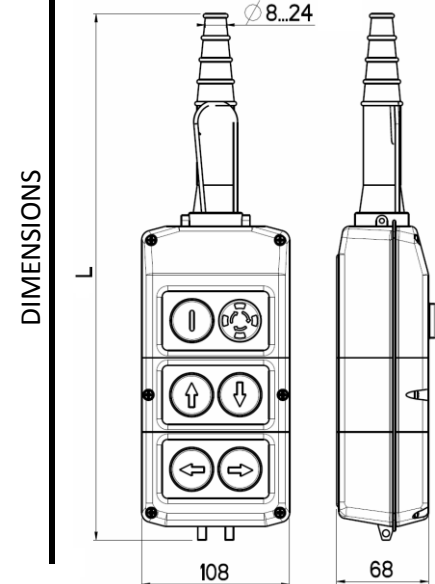
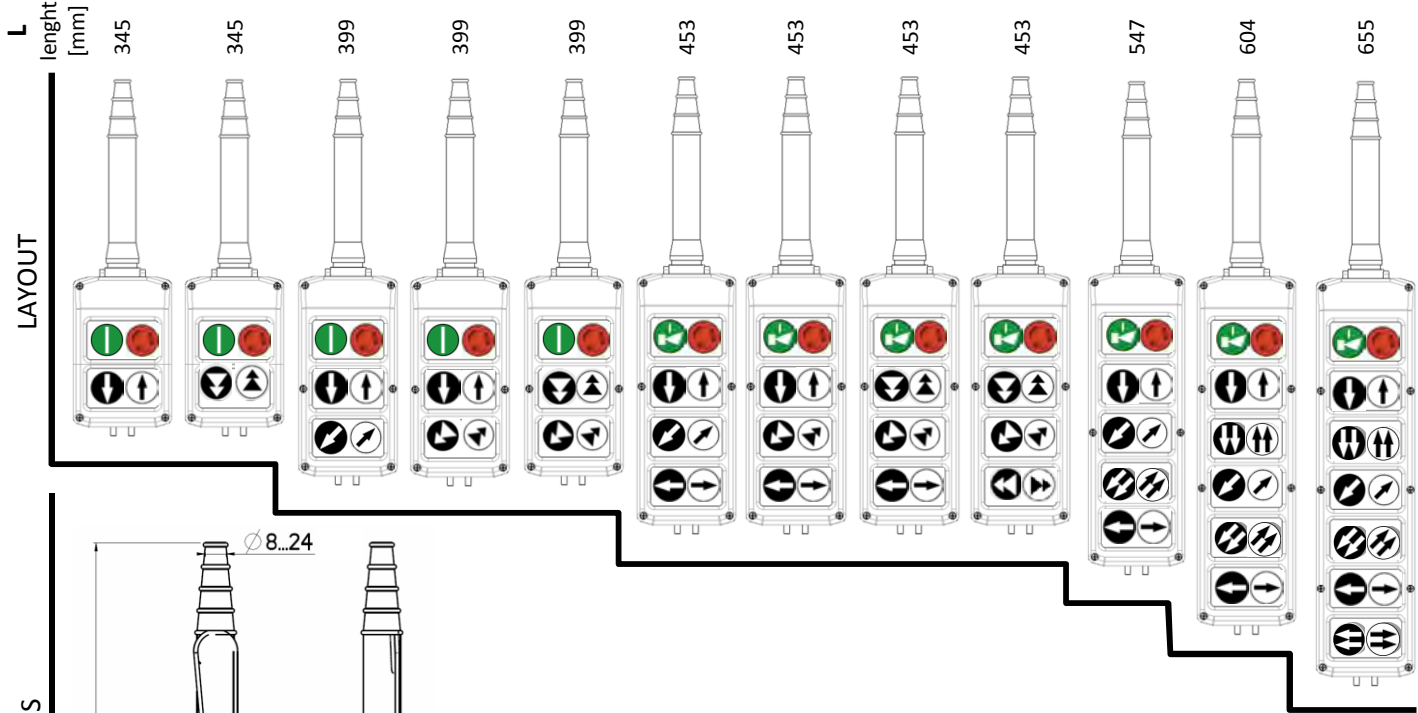
Characteristics:

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- ☐ General and electrical data page 23
- ☐ Laser engraved symbols comply with EN60204-1, FEM 9.941
- ☐ Shock proof and heat resistant



LIFTING EQUIPMENT

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



TIPO DI PULSANTE – TIPO DI CONTATTO ABBINATO								
(*) two speed contact block								



KT
Available
See pg. 18

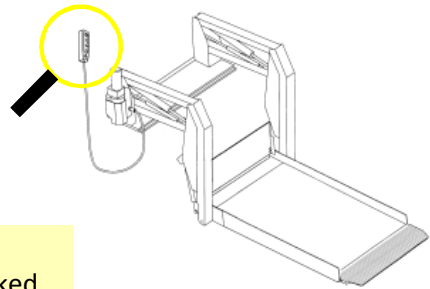


MOBILE-PENDANT FIXING (with WALL BRACKET accessories)



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



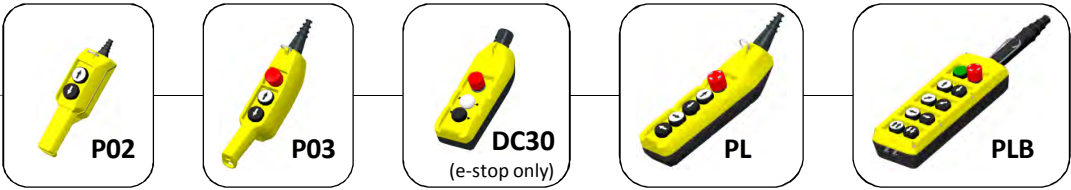
CODE	TLP1.EPP	TLP1.ESR	TLP2	TLP3.B	TLP3.D	TLP4.E	TLP4.C
weight [gr.]	120	120	200	255	255	314	314
N° push button	1	1	2	3	3	4	4
L lenght [mm]	80	80	115	150	150	185	185
LAYOUT	 push pull	 twist release					
DIMENSIONS							
			With Emergency Stop	With Selector Switch			

PUSH BUTTON TYPE
CONTACT TYPE COUPLED

NC	NO	NO	NO



PL004 line



NC

PL004001

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

N0

PL004002

Simply Contact Point

Dimensions

Markings

Technical data see page 23

PCW line



NC

PCW01

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

N0

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



LIFTING EQUIPMENT

STEP 1
Choose station type



P02



P03



PL



PLB



TLP



HOLES n°	CODE	WEIGHT [gr]
2	P02K	180
3	P03K	258
5	PL05K	410
7	PL07K	540
8	PL08K	600
10	PL10K	700
12	PL12K	800
4	PLB04K	410
6	PLB06K	510
8	PLB08K	610
10	PLB10K	710
12	PLB12K	810
14	PLB14K	910
1	TLP1K	100
2	TLP2K	130
3	TLP3K	160
4	TLP4K	200



STEP 2

Choose OPERATOR

STEP 3

Choose CONTACT TYPE

LIFTING EQUIPMENT

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

(*)

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

(*)

PL005021	PL005006
PL005029	PL005014
PL005025	PL005010

NOT for TLP

P02-P03-PL-PLB

TLP

CONTACT BLOCKS

NC NO

1 NC PL004001
1 NO PL004002

CONTACT BLOCKS

NC NO

1 NC PCW01
1 NO PCW10

LED LAMP

POWER SUPPLY **CODE**

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

LAMP HOLDERS

BA9s PL004007

LED LAMP

POWER SUPPLY **CODE**

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

LAMP HOLDERS

BA9s PCWAD

MULTI-SPEED CONTACT BLOCKS

DOUBLE STEP
1NO+1NO PL004010

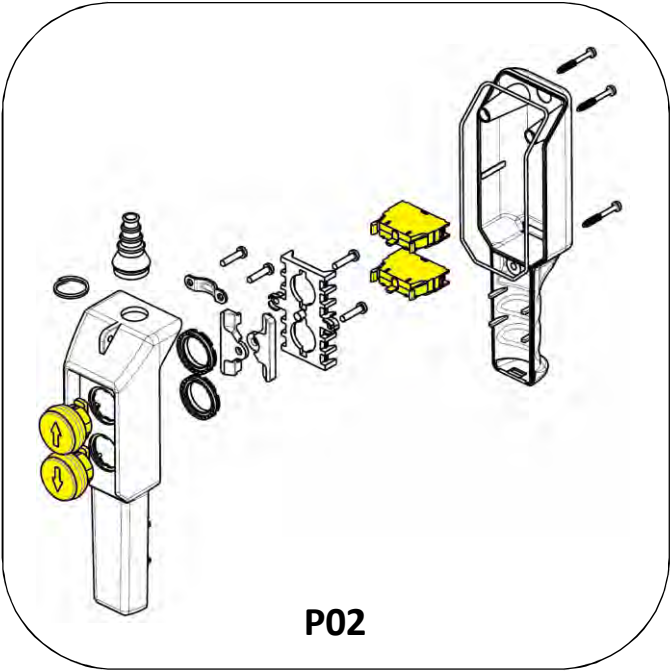
HOLE PLUG

PL015001

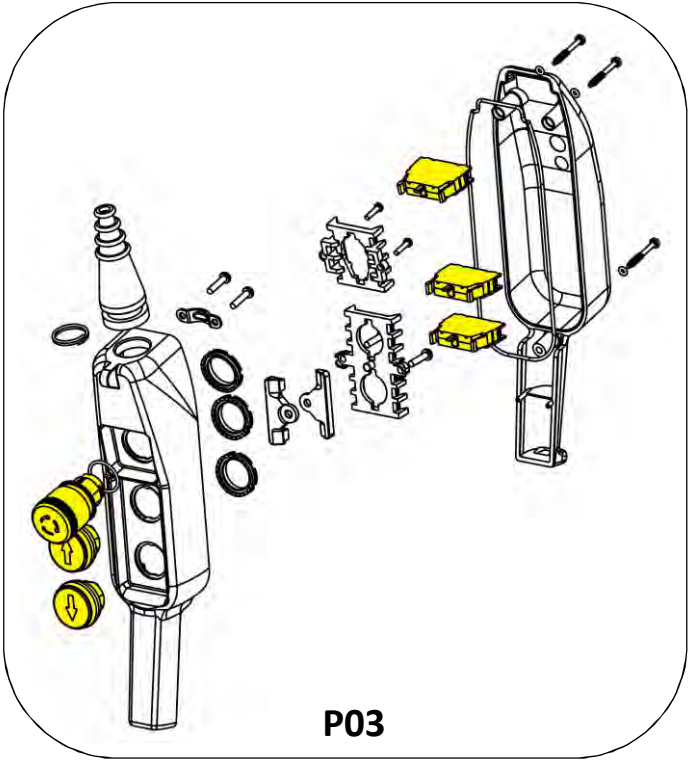


STEP 4

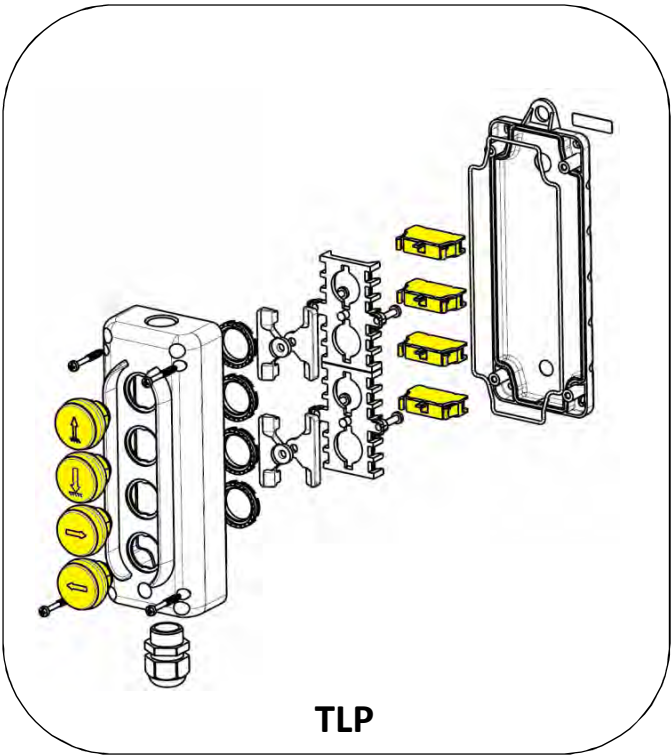
Mounting
instructions



P02



P03



TLP

STEP 1

kit enclosures include

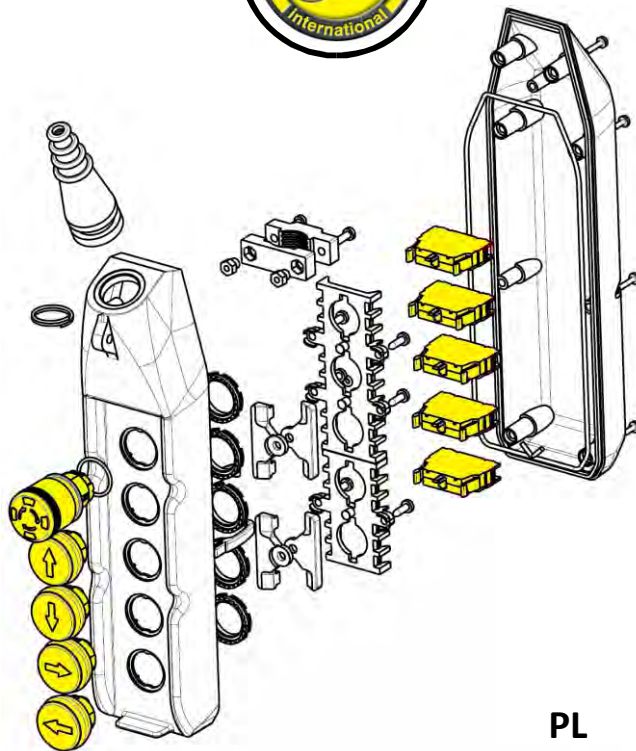
- Pendant stations (box, screws, gasket)
- Cable sleeve
- Cable clamp
- Suspension ring
- Push button interlock

STEP 2-3

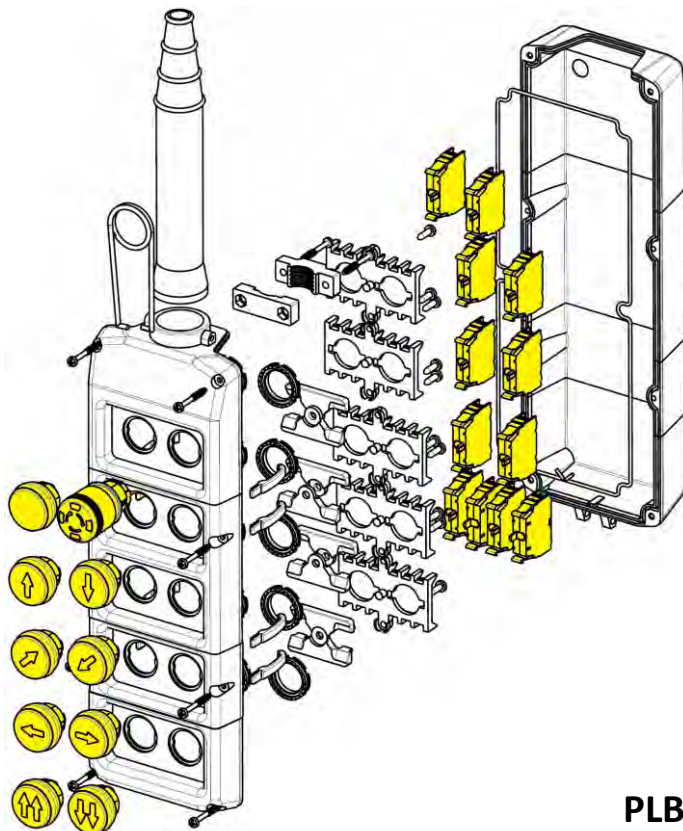
(item in yellow colour)

- Contact block
- Push buttons

must be choosen and purchased separately from
the enclosure kit



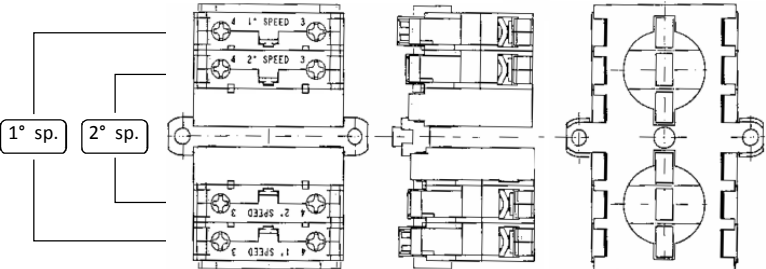
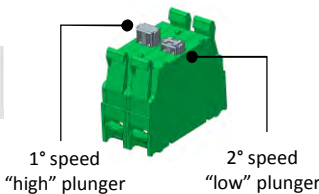
PL



PLB

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

PL004010





SPARE PARTS:

P02 – P03 – PL – PLB – TLP

COUPLING PLATE

2 HOLES
3 HOLES

PL003001
PL003002

INTERLOCK

TOP
BOTTOM

PL011001
PL011002

CABLE CLAMP LEVER

PL012001

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

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

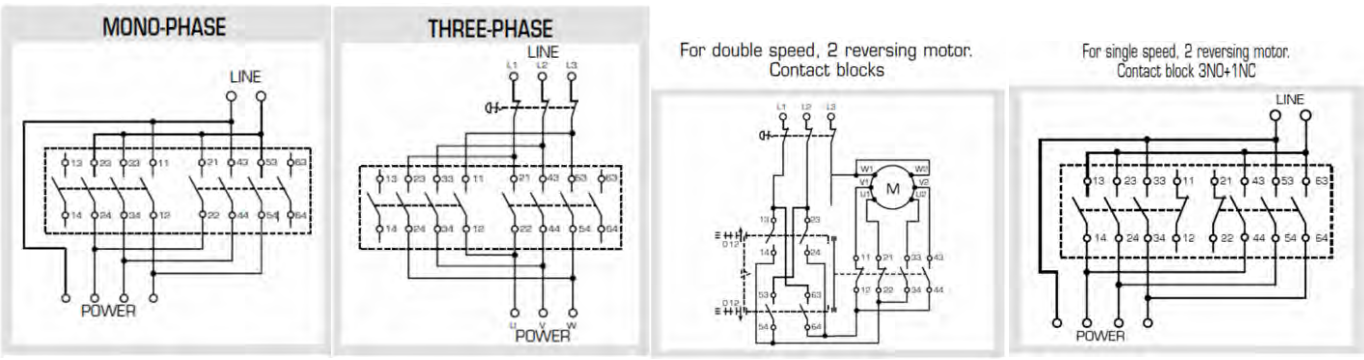
TWO-SPEED REVERSING MOTORS

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

RUBBER BUTTON COVER

COLOUR	CODE
Black	11901044
White	11901046

DRAWINGS EXAMPLES
POWER CIRCUITS



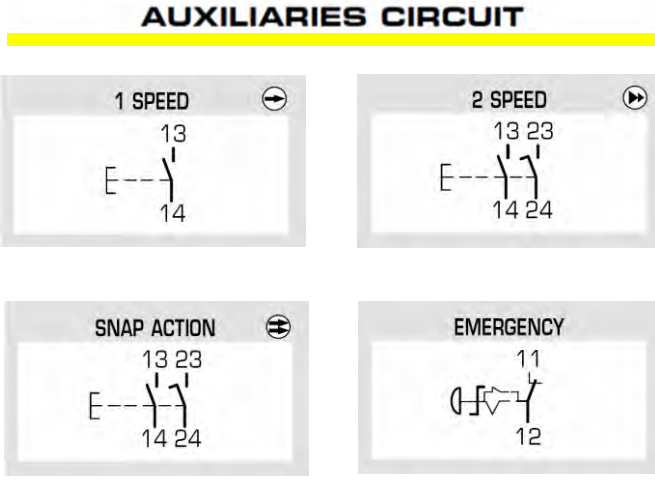
TLP ACCESSORIES

WALL BRACKET

HOLES	CODE
1...3	16000061
4	16000062

SPIRAL CABLE GLAND

CODE
12901054





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			    									 		
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 capacity	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									-		



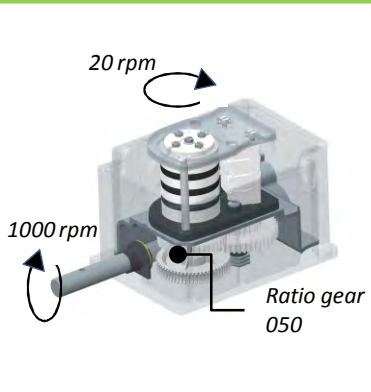
Rotary Gear Limit switches

page 26 to 35

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

Ratio

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



Potentiometer & Encoder

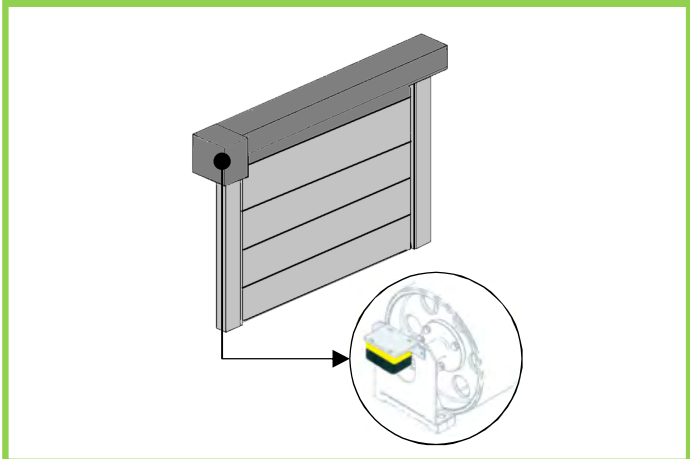
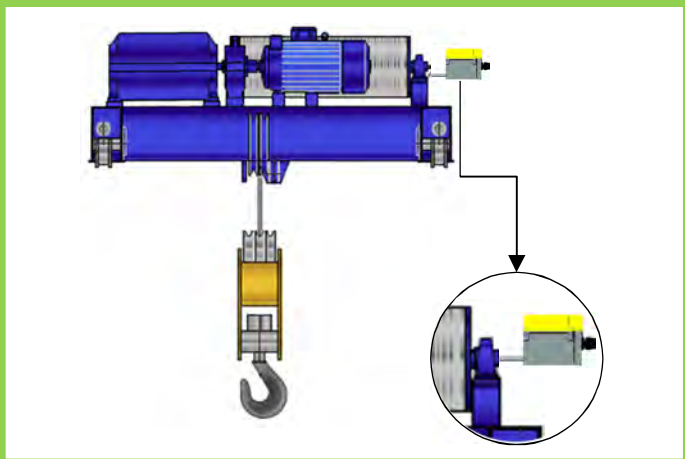
In addition to the microswitch :

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



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

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





Line	FGR1	FGR2	FGR3
Page	28	30	32

Picture



X-ray view



LIMIT SWITCHES

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     	8A - 250V – silver plated IEC/EN61058-1 / UL1054 1NC-1NO changeover fast trigger positive opening  markings     	8A – 250V – silver plated IEC/EN61058-1 / UL1054 1NC-1NO changeover fast trigger positive opening  markings     
Microswitch max n° / notes	max 4 - micrometric adjustment roller lever control (long life)	max 6 - micrometric adjustment	max 4 - micrometric adjustment roller lever control (long life)
Cam block	self-lubricating with transparent support for easier cam viewing	self-lubricating with transparent support for easier cam viewing	self-lubricating with transparent support for easier cam viewing
Cable entry	M20 or M16 (max 4)	M20 (max 2)	M20 (max 3)
Options	- N° 5 different cam shapes - potentiometer (direct ratio 1:1)	N° 3 different cam shapes	- N° 5 different cam shapes - potentiometer or encoder (direct ratio 1:1 or 1:X)

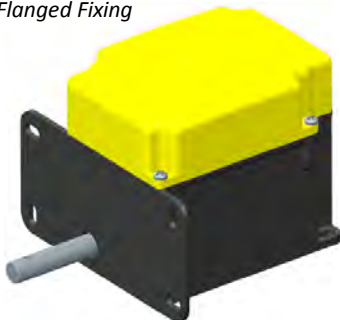


Version and options available

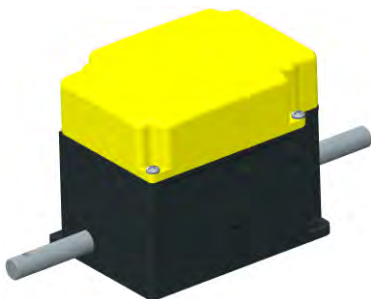
❑ Base Fixing



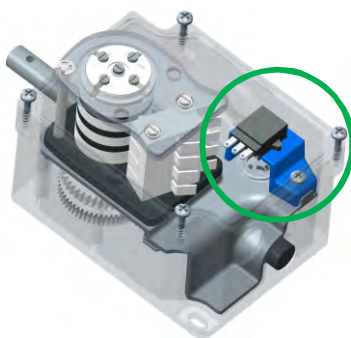
❑ Flanged Fixing



❑ Rear shaft



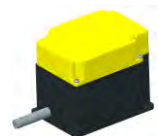
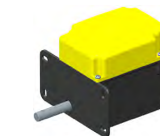
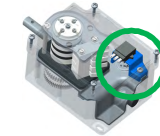
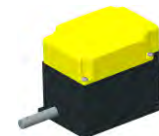
❑ With potentiometer



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  
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)

LIMIT SWITCHES

Ratio	Base Fixing	Flanged Fixing	N° of microswitches 2-3-4	Potentiometer 2.5 / 5 / 10 kΩ	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



E (10 tips)



D (opposite)



C (180°)



B (60°)



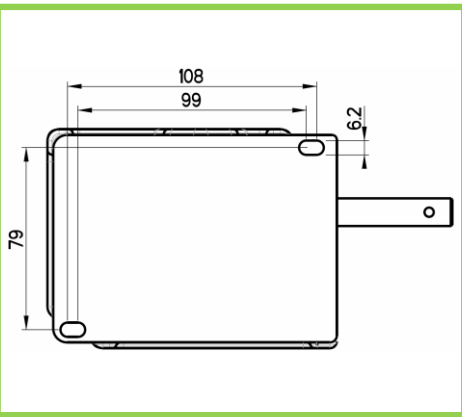
Standard A (10°)



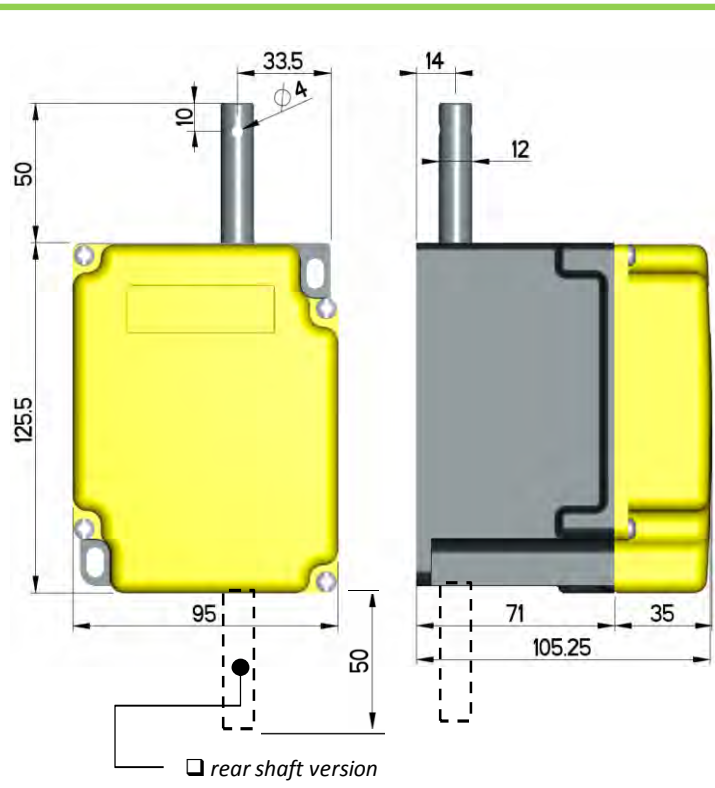
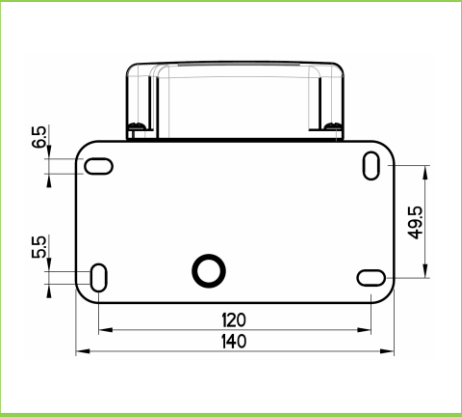
Fixing holes

Dimensions

Base fixing



Flanged fixing

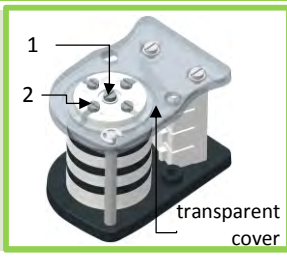


LIMIT SWITCHES

Microswitch system calibration guide

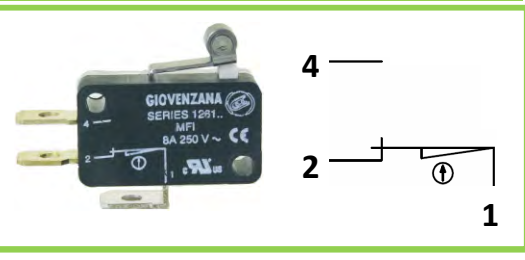
Spare parts

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

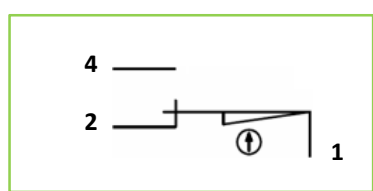
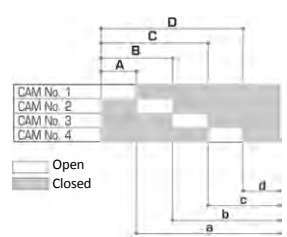
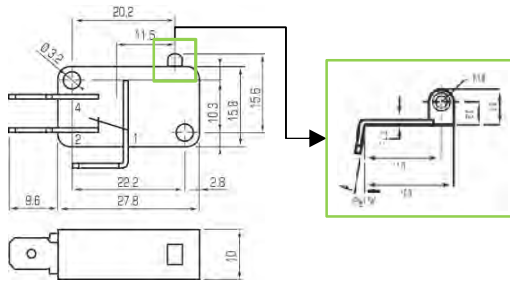


Microswitch

MFI.3



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



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

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



Version and options available

❑ Base Fixing



❑ Flanged Fixing
(with FLG accessories)



❑ Rear shaft



LIMIT SWITCHES

Characteristics

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

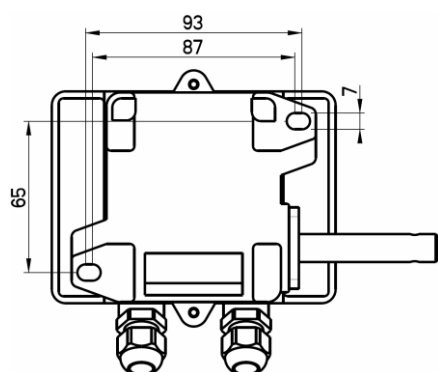


B (15°)

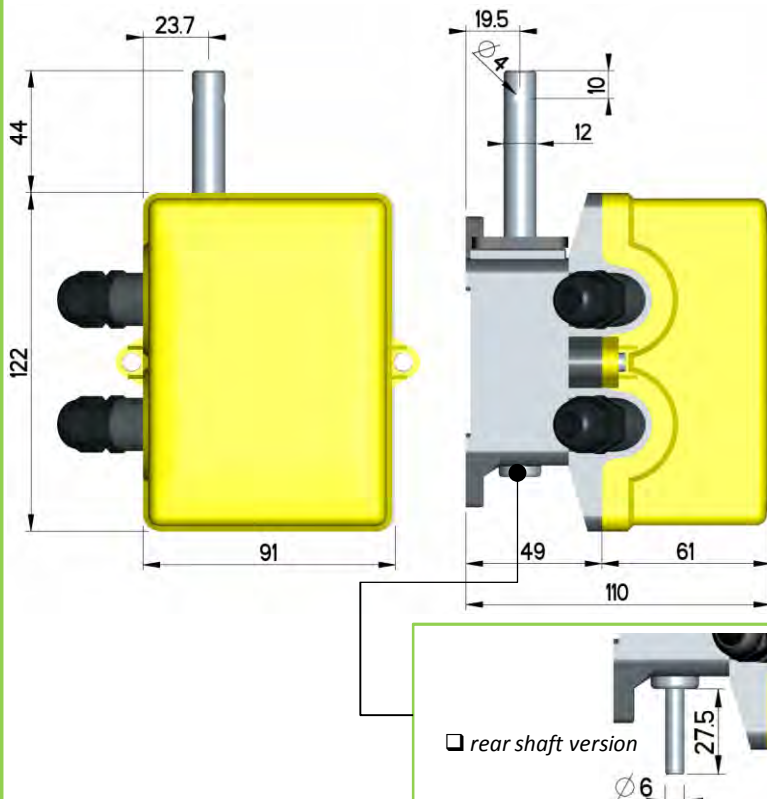
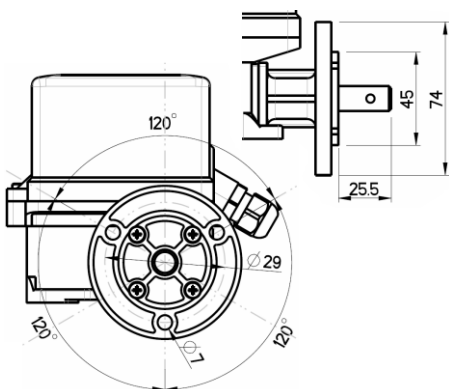


Standard A (30°)

Dimensions

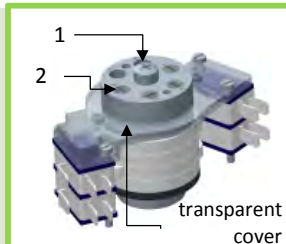


Flanged
fixing
(FLG)



Spare parts / Accessories

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

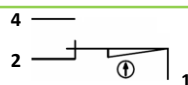


Microswitch

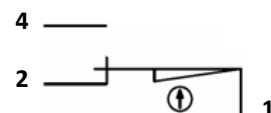
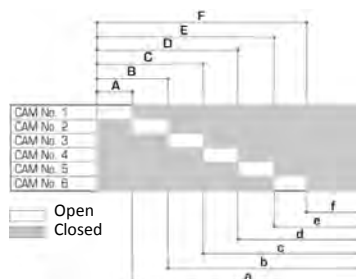
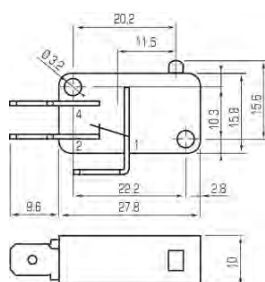


MFI

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.



Version and options available

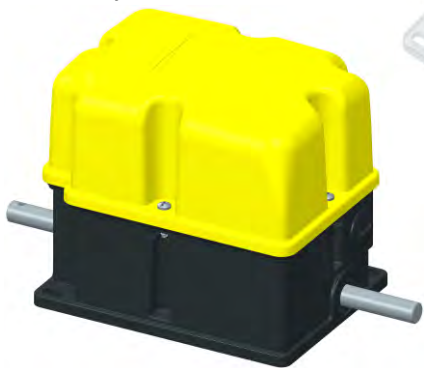
❑ Base Fixing



❑ With encoder



❑ Rear shaft



LIMIT SWITCHES

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



E (10 tips)



D (opposite)



C (180°)



B (60°)

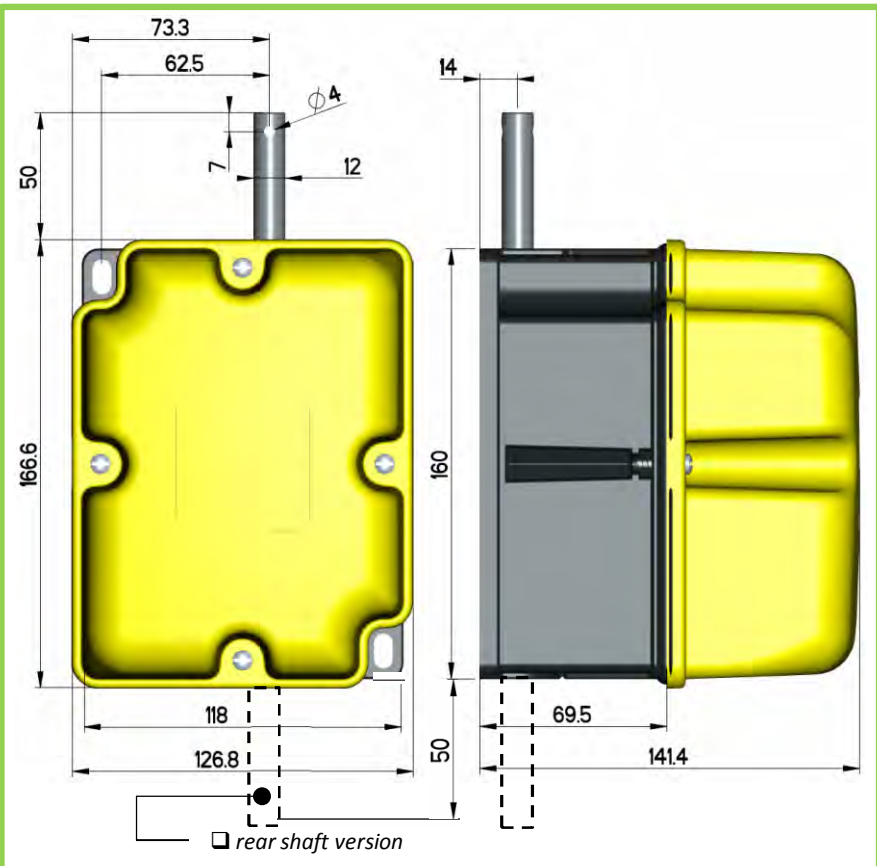
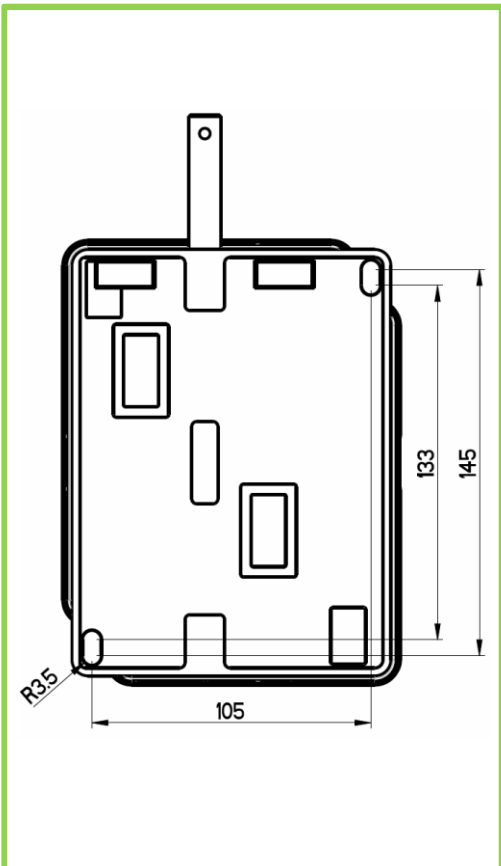


Standard A (10°)



Fixing holes

Dimensions

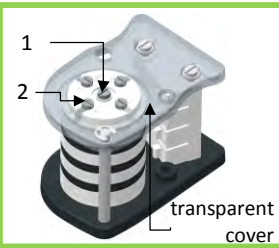


LIMIT SWITCHES

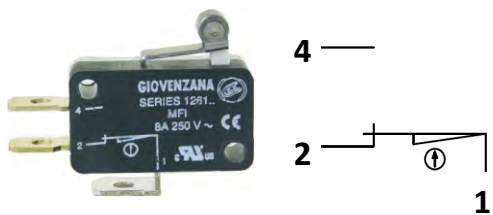
Microswitch system calibration guide

Spare parts

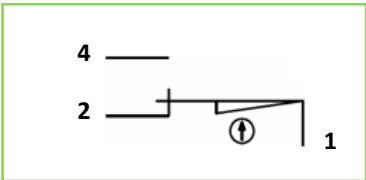
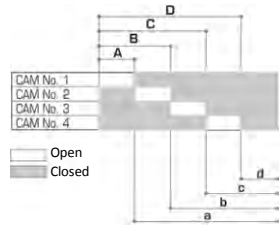
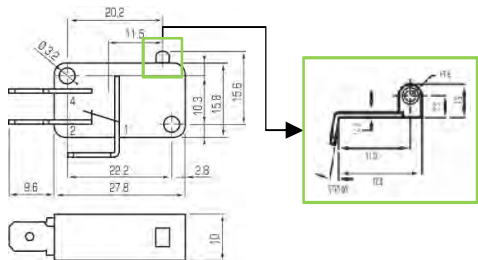
- I. Loosen the main screw (1)
- II. Adjust the screws (2)
- III. Tighten the main screw (1)



Microswitch MFI.3



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



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

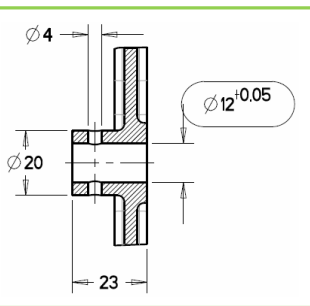
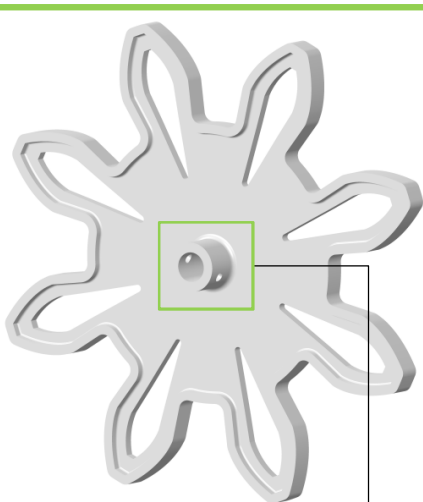
NOTE:
The movement refers to the action of the cam on contact 1-2 (NC).
The microswitch have all changeover contacts.



Pinion type

☐ PA66 material

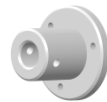
16020051	M20 - Z12	☐
16020052	M14 - Z17	☐
16020053	M22 - Z10	☐
16020054	M18 - Z12	☐
16020055	M16 - Z13	☐
16020056	M10 - Z17	☐
16020057	M6 - Z13	☐
16020058	M20 - Z8	o
16020059	M16 - Z10	o
16020060	M12 - Z12	o
16020061	M14 - Z10	o
16020062	M12 - Z10	o
16020063	M8 - Z12	o
16020065	M6 - Z11	o
16020066	M5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



Note:



"Water jet cut"
with metal flange

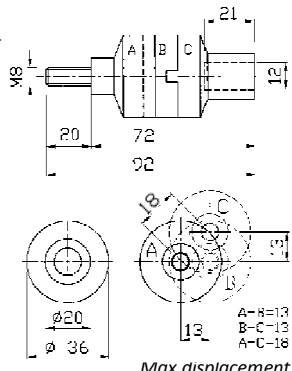


Moulded

FGR1/2/3: Oldham coupling

FGH

Drill and pin to the
limit switch's shaft

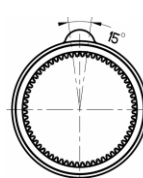
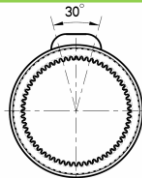
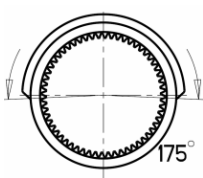
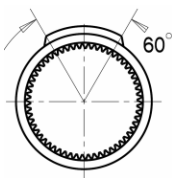
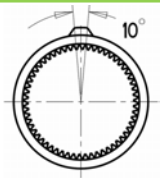


Max displacement

Cam shapes

FGR1 – FGR3

FGR2



Standard "A" (10°)

"B" (60°)

"C" (180°)

Standard "A" (30°)

"B" (15°)

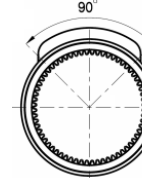
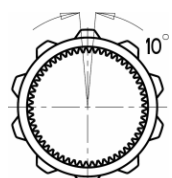
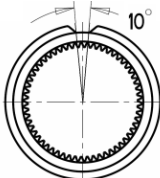
16020081

16020097

16020094

11703015

11703019



"D" (opposite)

"E" (10 tips)

"C" (90°)

16020095

16020093

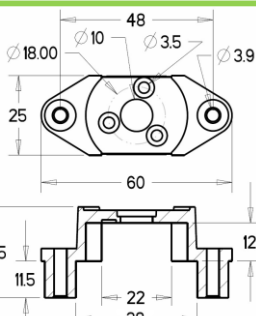
11703013

➤ on request available
other versions

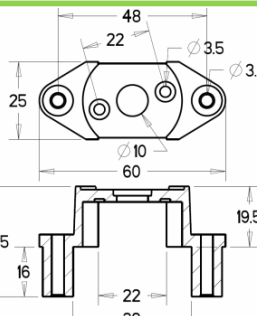
➤ on request available
other versions

FGR1/3: Potentiometer / Encoder support versions

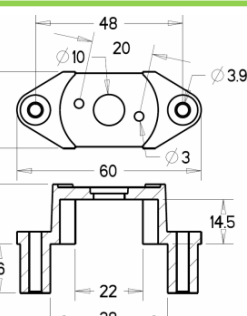
16020015



16020016



16020017





LIMIT SWITCHES

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 cRU [®] US EAC	CE cRU [®] US EAC	CE cRU [®] US EAC
Rated insulation voltage [Ui]		250V	250V	250V
Rated thermal current [Ith]		8A	8A	8A
Rated operating current	Resistive load	8A - 250Vac	8A - 250Vac	8A - 250Vac
	Inductive load	3A - 250Vac	3A - 250Vac	3A - 250Vac
Positive opening contacts		▶	▶	▶
Contact block	function	1NC+1NO changeover fast trigger	1NC+1NO changeover fast trigger	1NC+1NO changeover fast trigger
	contact	silver plated / self cleaning	silver plated / self cleaning	silver plated / self cleaning
	connections	fast-on 0.8x6.3mm	fast-on 0.8x6.3mm	fast-on 0.8x6.3mm

Options		FGR1	FGR2	FGR3
Rear shaft		available	available	available
Potentiometer		2.5 / 5 / 10kΩ (*)	-	according customer request
Encoder		-	-	according customer request
Cam's shape / Pinion available		5 / 15	3 / 15	5 / 15

(*) Standard potentiometers: available other versions on request



Position Limit switches

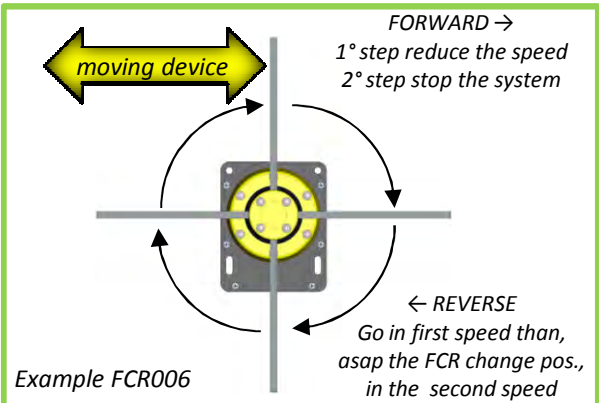
page 36 to 42

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

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

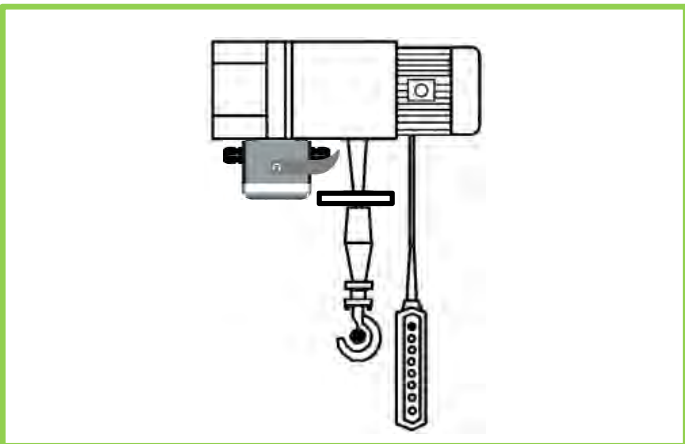
How it works?

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



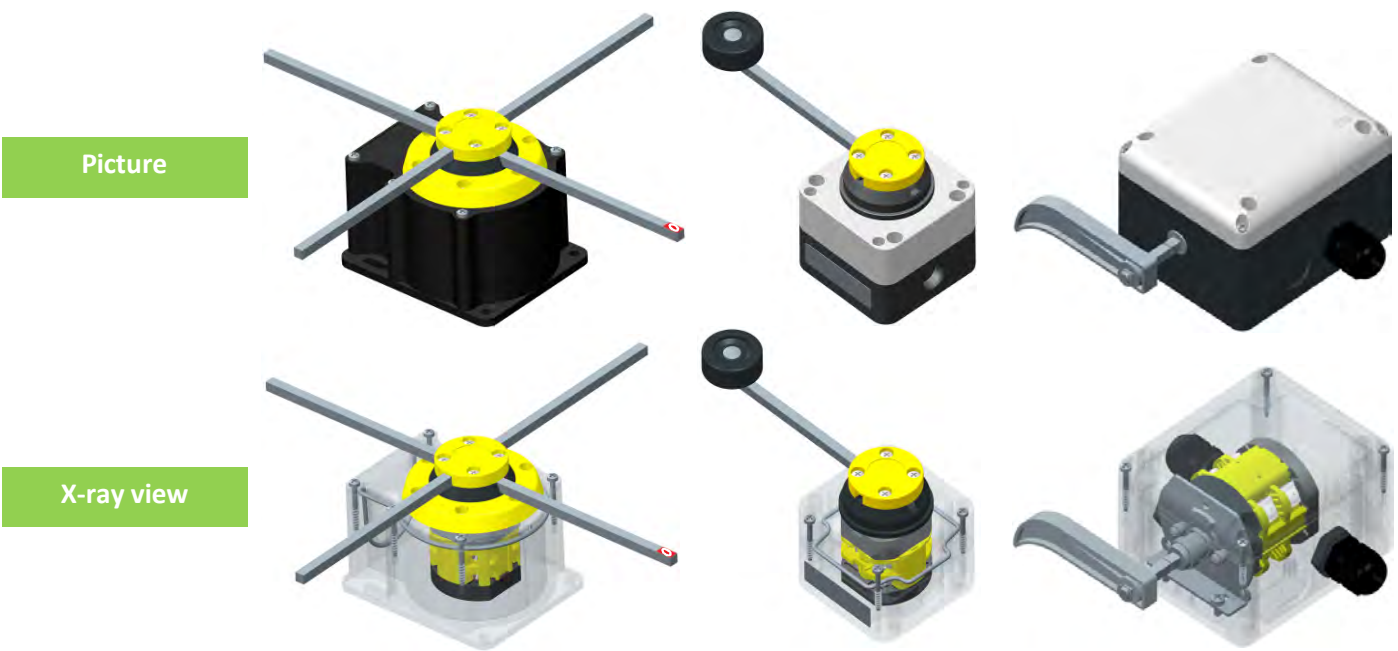
Picture shows a FCR working on a crane system

Picture shows a FCP working on a hoist





Line	FCR	FFH	FCP
Page	38	40	41



LIMIT SWITCHES

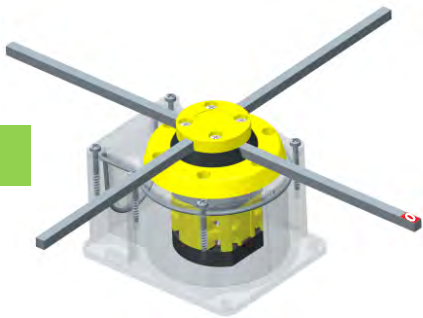
Characteristics				
Standards		IEC/EN 60947/3	IEC/EN 60947/3	IEC/EN 60947/3, EN81-1
Case		self extinguishing housing V0 UL94	self extinguishing cover V0 UL94	self extinguishing housing V0 UL94
Protection class IEC/EN 60529		IP65	IP65	IP65
Cam switch	enclosed thermal current [Ithe]	16A	20A	40A
	rated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



Picture



X-ray view



☐ contact open
☒ contact close

Versions

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

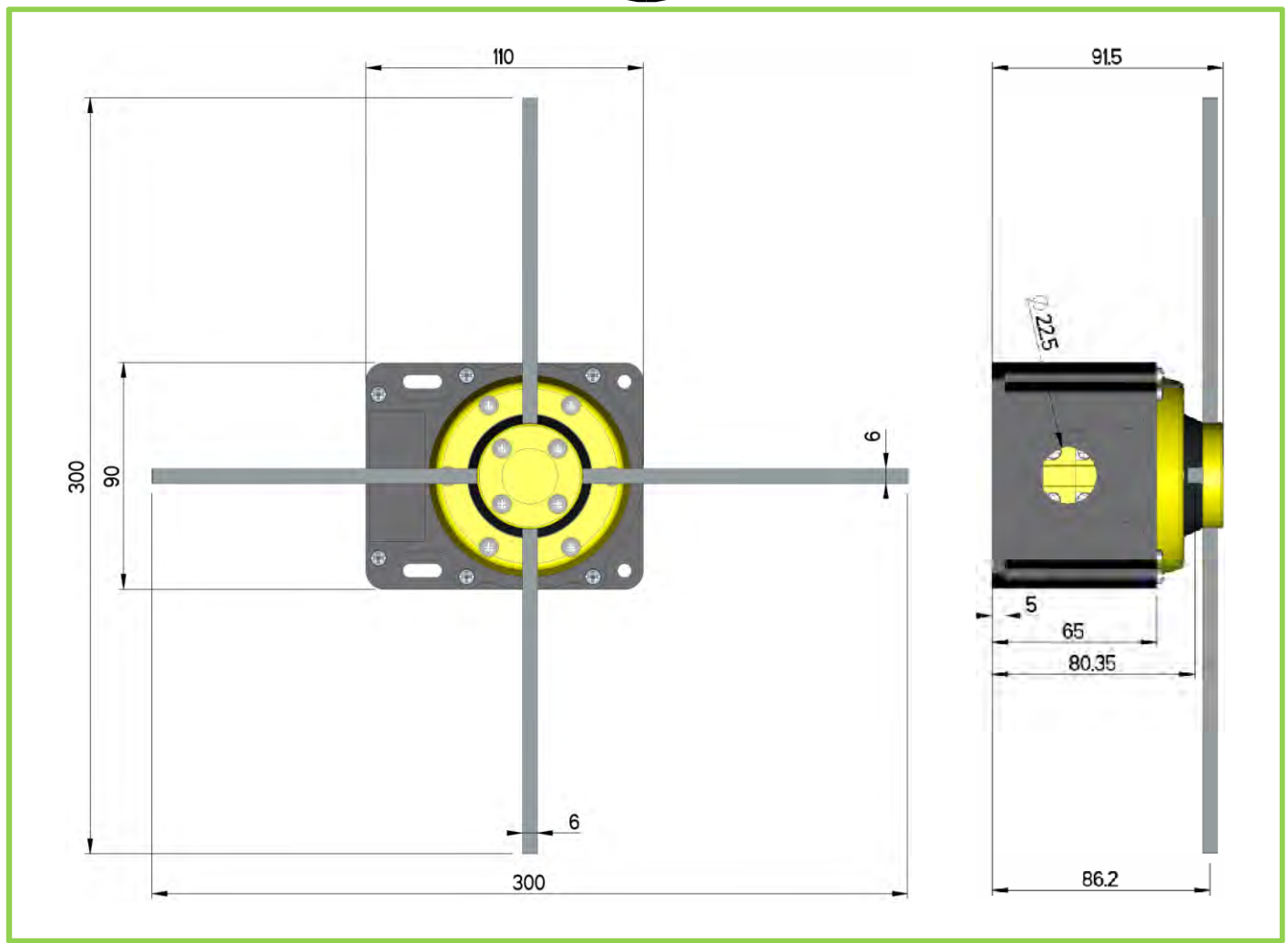
Characteristics

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

Other versions available on request →

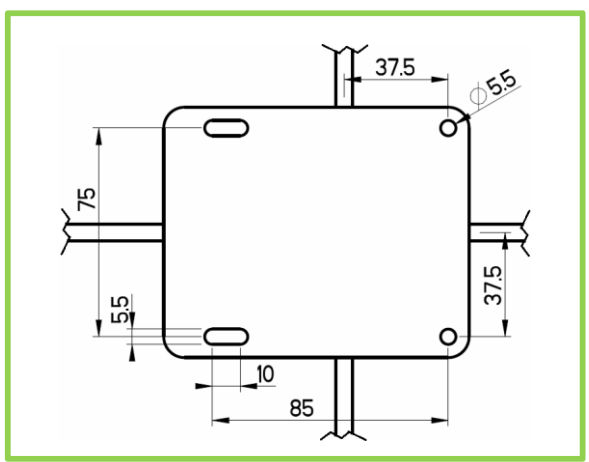


Dimensions

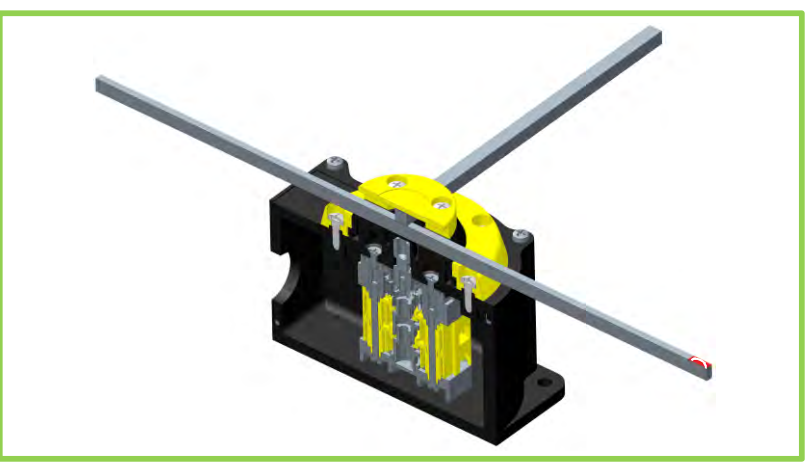


LIMIT SWITCHES

Fixing holes

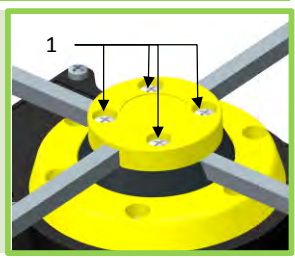


Section view

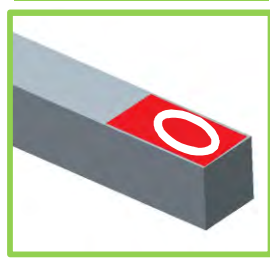


Rods adjusting guide

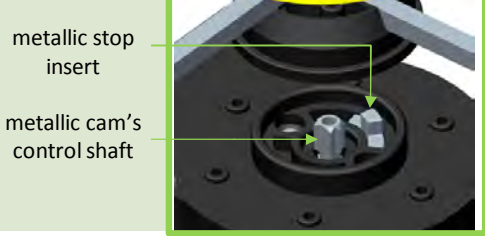
- I. Loosen the four screws (1)
- II. Adjust the rods
- III. Tighten the four screws (1)



"ZERO" indicator



Reinforced mechanical stop insert





Picture



X-ray view

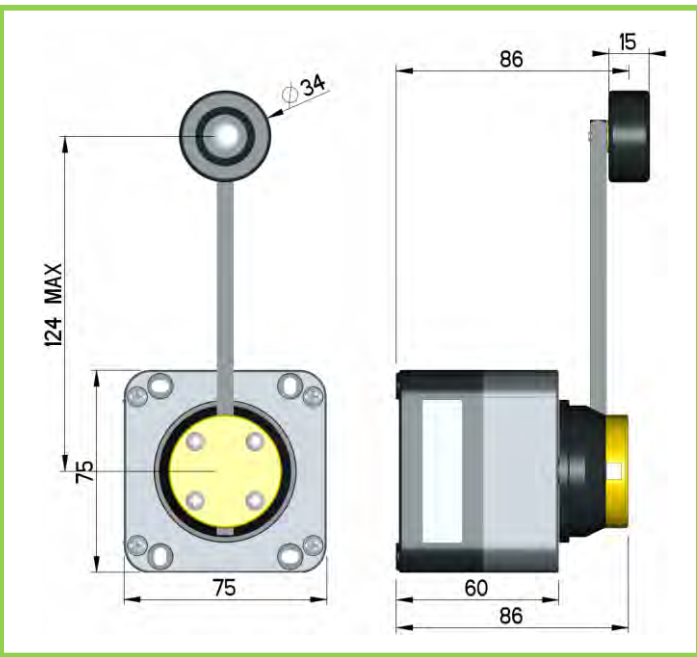
□ contact open
■ contact close

Versions

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

↑ Other versions available on request

Dimensions



Characteristics

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

Reinforced mechanical stop insert

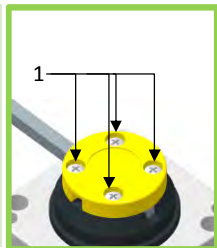


Section view

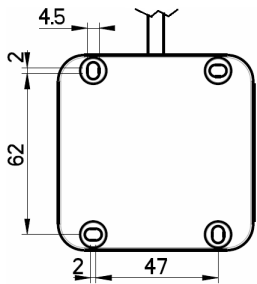


Rod adjusting guide

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

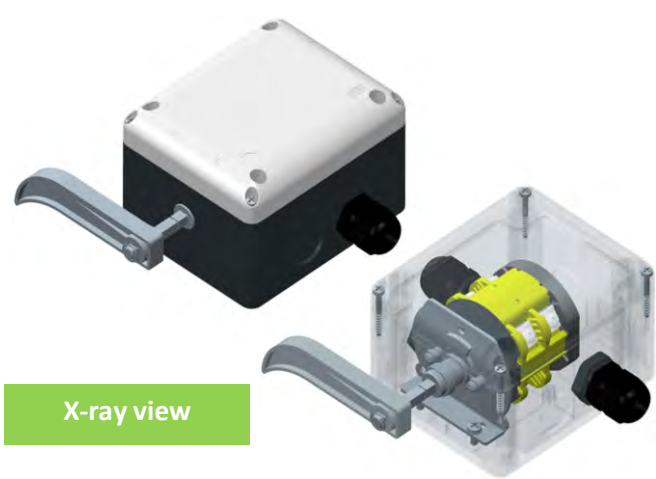


Fixing holes





Picture



X-ray view

contact open

contact close

Versions

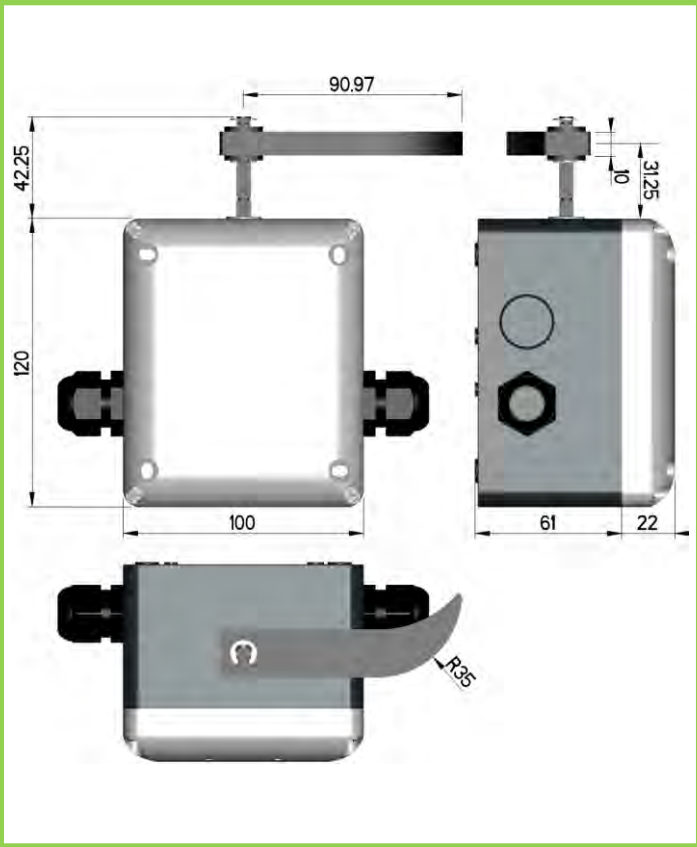
FCP245

single speed

3-4			
1-2			
Cont. Pos.	-50°	0	+50°

↑ Other versions available on request

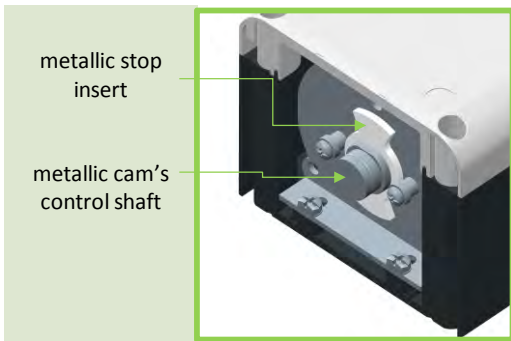
Dimensions



Characteristics

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

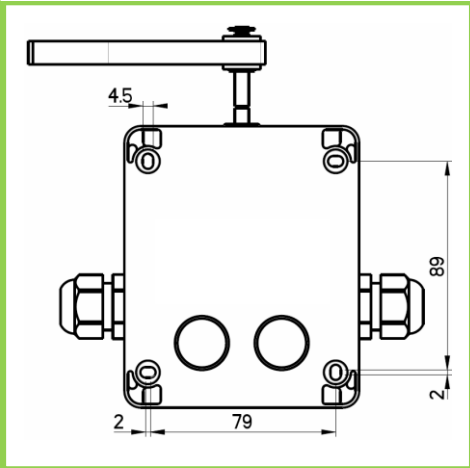
Reinforced mechanical stop insert



Section view



Fixing holes



LIMIT SWITCHES



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 cUL US EAC CCC	CE cUL US EAC CCC	CE cUL US EAC CCC
Enclosed thermal current [Ithe]		16A	20A	40A
Rated insulation voltage [Ui]		690V	690V	690V
Frequency		50/60 Hz	50/60 Hz	50/60 Hz
Rated operating current	AC21A-AC22A	16A - 690Vac	20A - 690Vac	40A - 690Vac
	AC23A 3ph 230V	13A - 4kW	16A - 5kW	35A - 11kW
	AC23A 3ph 400V	13A - 7.5kW	16A - 9kW	32A – 18.5kW
Rated short circuit withstand current (gG 20A - 690V)		5kA	5kA	10kA
Contacts		double gap positive opening ➡	double gap positive opening ➡	double gap positive opening ➡
Connections	caliber	A3 (EN60947-1)	A3 (EN60947-1)	A5 (EN60947-1)
	screw size	M3.5	M3.5	M4
	max torque	0.8 Nm (EN60947-1) 7.5 lb.in. (UL508)	0.8 Nm (EN60947-1) 7.5 lb.in. (UL508)	1.2 Nm (EN60947-1) 10.6 lb.in. (UL508)
Connectable section	flexible or solid min/MAX	1x0.75/4 – 2x0.75/2.5	1x0.75/4 – 2x0.75/2.5	2x2.5/10
	flexible or solid AWG	16-12	16-12	14-6



Slip rings

page 43

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

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

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

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

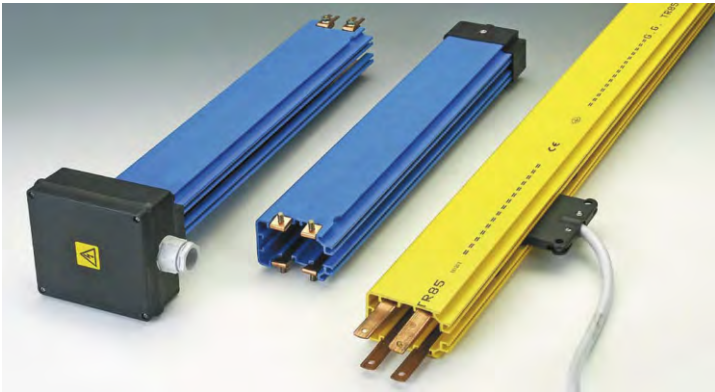
Warning horns					page 43	Technical data		Dimensions												
Picture	Line	Supply	Consumption	Code	✓Continuous operation ✓Frequency: G75: 50 Hz G100: 300÷350 Hz ✓Pressure (at 1 meter): G75: 88 dB (A) G100: 93.5 dB (A) ✓Wall mounted ✓Protection class IEC/EN 60529: G75: IP30 G100: IP65 double insulated ✓Terminal type: G75: 3 way terminal (2+T) G100: 2 way terminal			<table><tr><th></th><th>A</th><th>B</th><th>H</th></tr><tr><td>G75</td><td>Ø95.5</td><td>Ø76.5</td><td>56</td></tr><tr><td>G100</td><td>Ø120</td><td>Ø95.5</td><td>58</td></tr></table>		A	B	H	G75	Ø95.5	Ø76.5	56	G100	Ø120	Ø95.5	58
	A	B	H																	
G75	Ø95.5	Ø76.5	56																	
G100	Ø120	Ø95.5	58																	
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																
					Box															
					G 75	11710009														
					G 100	11710010														



Busbar system – trolley line TR60 and TR85 Giovenzana

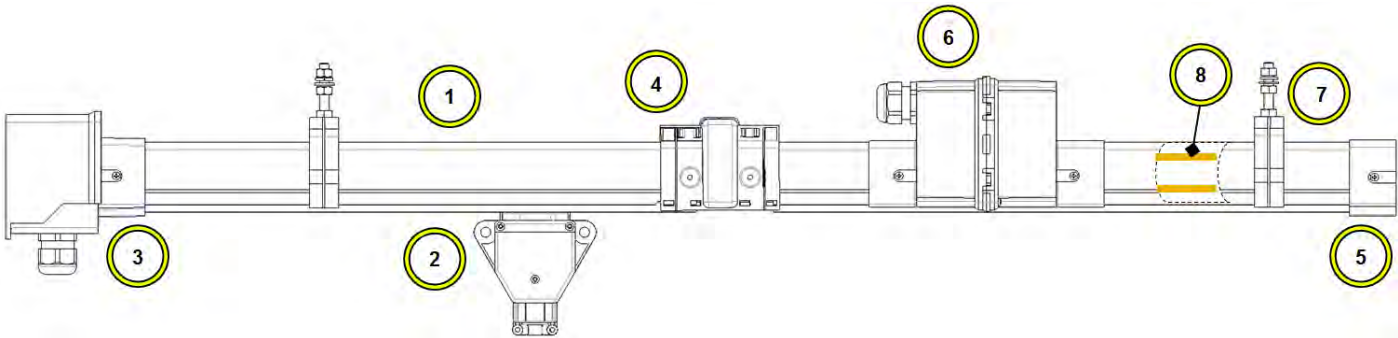
page 44 to 67

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

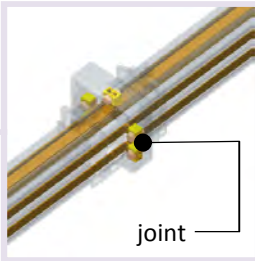
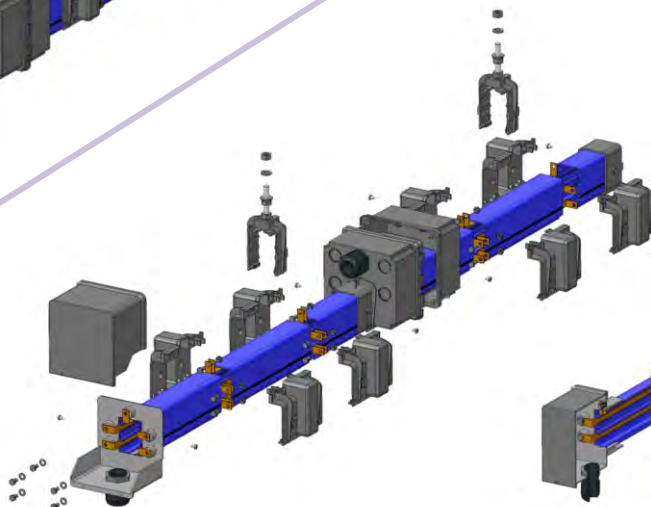
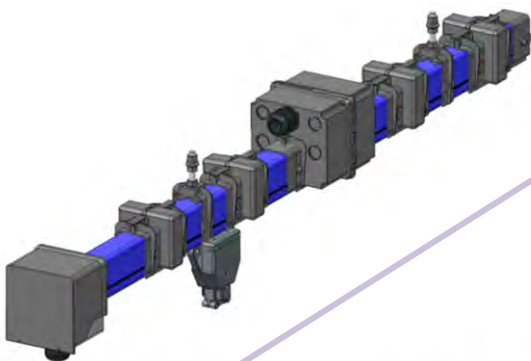
Straight :	3 or 4 meter module
90° curve	standard radius available or customized radius on request
Height drop	available on request



Versions

Blue colour

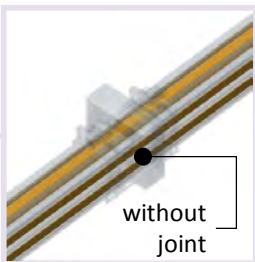
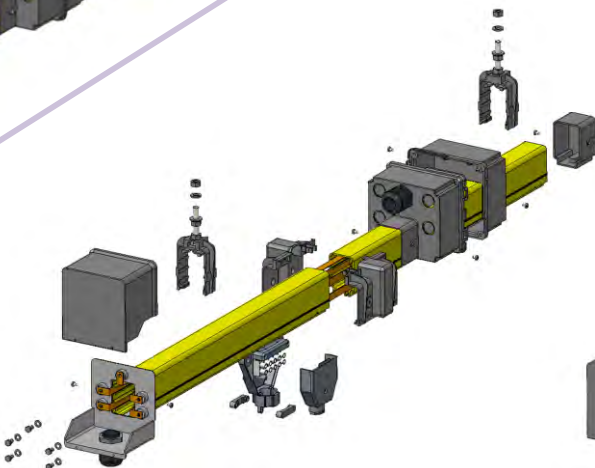
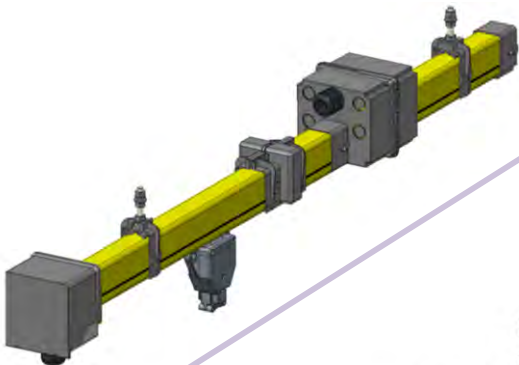
PRE-MOUNTED CONDUCTORS: the conductors are already inserted in the plastic casing.
very fast installation! Since the conductors are already inserted into the housing, it is only necessary to joint each section of the busbar.



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



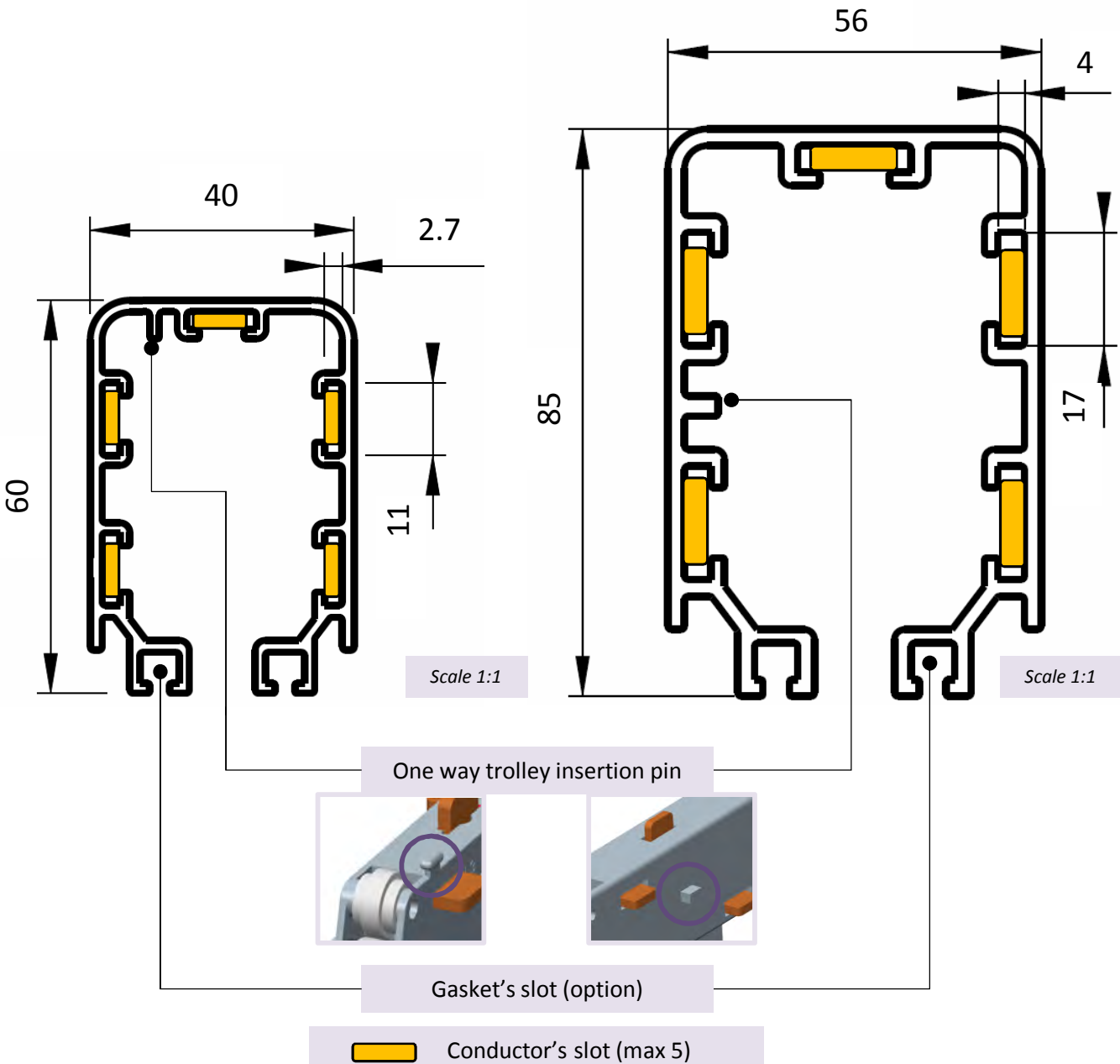
Size

TR60

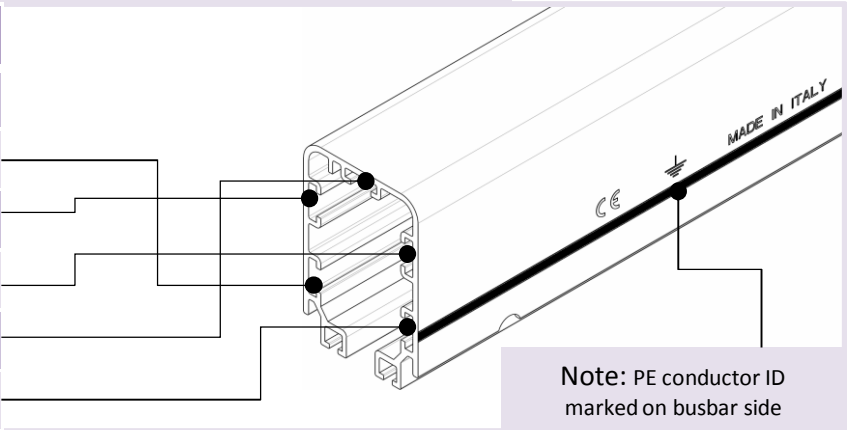
40 - 60 amp

TR85

40 - 70 - 100 - 140 - 200 amp



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





Line construction

- To decide the size of trolleys is necessary to consider:
- Maximum current in service
- Devices (cage motors, slip rings motors, resistors, electronic starters)
- Starting current of the devices
- Maximum ambient temperature
- The distance between device to the nearest power feed
- Voltage and admissible voltage drop in continuous and in starting service
- Type of current
- Devices cycle operations (load factor)

Calculation of the voltage drop

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

Three phase alternate current:

Legenda:

Delta U = sqrt(3) x I x Lt x Z
Delta U % = (Delta U x 100) / U

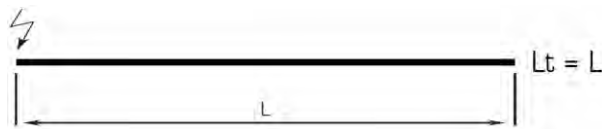
Table with 4 columns: Symbol, Operator, Description, Unit. Rows include Delta U, Delta U %, I, Lt, Z, and U.

Power feed: busbar track length

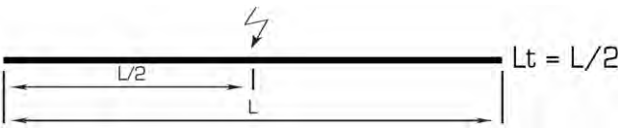
A proper disposal of power feed points minimize the voltage reduction.
If "L" is the lenght of the line, "Lt" is the track maximum length to consider the voltage reduction.

Table with 4 columns: Label, Lt, Operator, L, Description. Rows A, B, C, D show different power feed configurations and their corresponding track lengths.

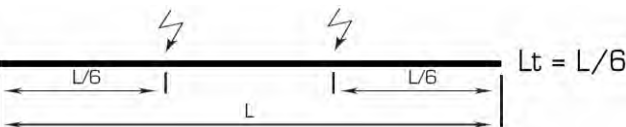
A



B



C



D





Current in continuous service

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

I_n = I_1 + I_2 + I_3 +

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

I_n = (P_u) / (sqrt(3) * U * cos phi * eta)

Legenda:

Table with 4 columns: Symbol, Definition, Unit. Rows: I_n (current consumption, [A]), P_u (power devices, [W]), eta (devices performance), U (operating voltage, [V]), cos phi (power factor).

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

Table with 5 columns: Numbers of in-line lifting device, 1st engine, 2nd engine, 3rd engine, 4th engine. Rows show engine configurations for 1 to 5 devices and for 2 simultaneous lifting equipment.

(o) about 17 motors connected in parallel with rated current I_n', consider I_n = 17 • I_n'

Starting current

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

I_a = K • I_n
for a single user
K = Starting current (I_a) / Nominal current (I_n)

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

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

Table with 9 columns: Numbers of in-line lifting device, 1st engine (Ia, In), 2nd engine (Ia, In), 3rd engine (Ia, In), 4th engine (Ia, In). Rows show engine configurations for 1 to 5 devices and for 2 simultaneous lifting equipment.



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

To define line overall length is necessary to consider the standard modular length of the busbar, except the curves. These can be obtained with the 3 or 4 meters module. The real length of the line will therefore be higher or lower than the theoretical length assumed or required.

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

① section 15,250m = 15.250mm

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

② section 8,750 = 8.750mm

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

③ section 7,0m = 7.000mm

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

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

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

Other items

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

Curve

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

ENERGY & DATA transmission

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					TR60				
					YELLOW line		BLUE line		
ID	Name	Function	Specifications		40 A	60 A	40 A	60 A	
①	Busbar	PVC housing	3 meters module		TR6000 (w/o conductors)		TR60404C3	TR60604C3	
			3 meters module				TR60405C3	TR60605C3	
			4 meters module				TR60404C	TR60604C	
			4 meters module				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			TR6004 (25 A)				
					TR6005 (25 A)				
③	Feed	connect power supply to the conductors			TR6003		TR6003A4		
							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			TR6008	TR6008A4			
						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

Blue line



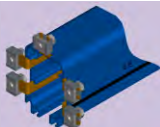
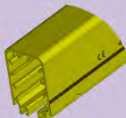
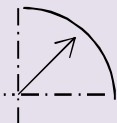
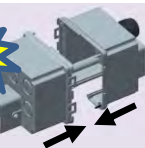
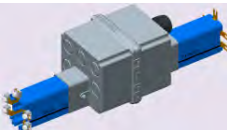
pre-mounted conductors

Yellow line



conductors to be pulled

min.
qty

Name	Specifications		N° conductors	40 A	60 A	40 A	60 A	
Straight busbar	☐ Self-extinguishing material ☐ One-way trolley insertion pin. $\longleftrightarrow$ L = length	L meters						3-4 meters
			4	TR60404C3	TR60604C3	-		
		3	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
			4	TR60404A90	TR60604A90	TR60A90		
		TR60404B90		TR60604B90	TR60B90			
		TR60404C90		TR60604C90	TR60C90			
		TR60404D90		TR60604D90	TR60D90			
Feed	 ☐ Fast assembly ☐ M25 cable gland equipped						1	
		4	TR6003A4		TR6003			
		5	TR6003A5					
In-line feed	 ☐ Fast assembly (+screw) ☐ M25 cable gland equipped						1	
		4	TR6008A4		TR6008			
		5	TR6008A5					
End cap	☐ Self tapping screw fix						1	
		4	TR6006A		TR6006			
		5						
Copper strip			-					(o)
						CS40 40 A /10mm ²	CS60 60 A /15mm ²	
			-					

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



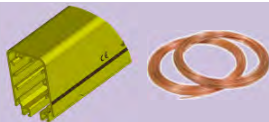
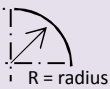
TR60 40 amp 60 amp
Code table list page 2/2

Dimensions see pag 58

Table with columns for Blue line (pre-mounted conductors) and Yellow line (conductors to be pulled), including sub-columns for 40 A and 60 A, and a min. qty column. Rows include various components like Trolley 25 A, Double trolley support, Hanger clamp, Joint, Fixed point, Towing arm, Towing arm bracket, Gasket IP23, Strip insertion trolley, and De-coil unit.

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



☐ TR85		40-70-100-140-200 amp				Dimensions see pag 62						
Code table list page 1/2		Blue line ☐ pre-mounted conductors						Yellow line ☐ conductors to be pulled			min. qty	
Name	Specifications	N° conductors	40 A	70 A	100 A	140 A	200 A	70 A	100 A	140 A		
Straight busbar	☐ Self-extinguishing material ☐ One-way trolley insertion pin. ↔ L = lenght	L meters									copper strip rolls already included in busbar code	
			4	TR85404C3	TR85704C3	TR851004C3	TR851404C3	TR852004C3	-			
		3	5	TR85405C3	TR85705C3	TR851005C3	TR851405C3	TR852005C3	-			
		4	4	TR85404C	TR85704C	TR851004C	TR851404C	TR852004C	TR85704	TR851004	TR851404	3-4 meters
			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	
			4	TR8529404A90	TR8529704A90	TR85291004A90	TR85291404A90	-	TR8529A90			
		1.2		TR8529404B90	TR8529704B90	TR85291004B90	TR85291404B90	-	TR8529B90			
		1.4		TR8529404C90	TR8529704C90	TR85291004C90	TR85291404C90	-	TR8529C90			
		1.8		TR8529404D90	TR8529704D90	TR85291004D90	TR85291404D90	-	TR8529D90			
Feed	☐ M40 cable gland equipped										1	
			4	TR8503A4			TR8533A4		TR8503			
			5	TR8503A5			TR8533A5					
In-line feed	☐ Pg29 cable gland equipped (not mounted)										1	
			TR8547									
End cap	☐ Self-tapping screw fixing										1	
			TR8506A					TR8506				
Joint												
			TR8504			TR8535		TR8501 (PA66) – TR8524 (steel)				
Section joint	☐ N°2 Pg29 cable gland equipped ☐ Insulating strip bars										TR8545	
			TR8545B									



TR85

40-70-100-140-200 amp

Dimensions see pag 62

Code table list page 2/2				Blue line pre-mounted conductors					Yellow line conductors to be pulled			min. qty
Name	Picture	Specifications	Note	40 A	70 A	100 A	140 A	200 A	70 A	100 A	140A	
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	 Click!	☐ 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 consider twice the length of the line)



Yellow line
(conductors to be pulled)



NEED HELP?
Ask to our technical service

1 Fix the support bars



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

2 Fix the hanger clamp



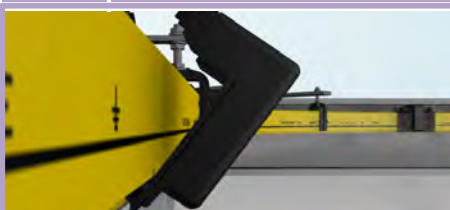
- Set vertical positions moving up and down the bolt and tighten well

3 Fix the busbar



- NO tools required

4 Apply all the joints



- TR60 no tools required
- TR85 fixed by screws

5 Fix the copper strip to the insertion trolley



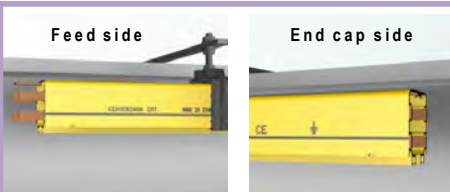
- Drill the copper strip if not already provided with holes and fix it to the insertion trolley

6 Pull the conductors



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

7 Cut the copper strip



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

8 Prepare the trolleys



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

9 Insert the trolley



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

10 Mount the feed

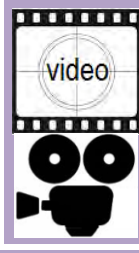


- Fix the case to the busbar
- Bend and drill (if not already drilled) the strips
- Cable the strips as shown/tight the cable gland

11 Mount the end cap



- Fix the end cap



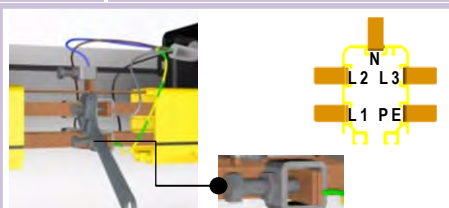
YouTube www.youtube.com/user/GiovenzanaInt

4a If needed mount the in-line feed



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

4b Cable the line



- Cable the strips as shown

4c Close & fix the cover



- Close and fix both cover
- Tighten the cable gland



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 cover

☐Close and fix both cover

☐Tight the cable gland



compatible with blue line
(pre-mounted conductors)

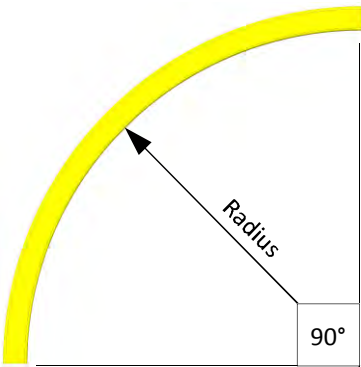


compatible with yellow line
(conductors to be pulled)

☐ **TR6000** TR60 line busbar



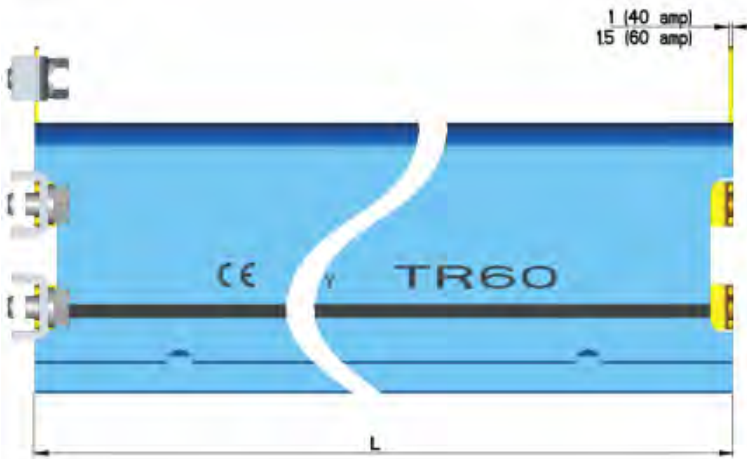
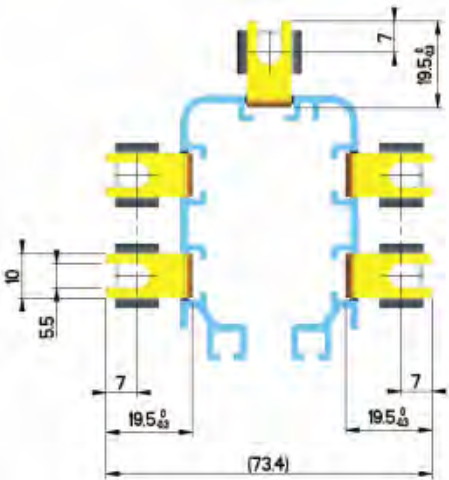
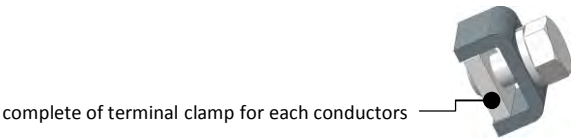
Radius [meters]	40 amp
1.2	☐ TR60A90
1.5	☐ TR60B90
1.8	☐ TR60C90
2.2	☐ TR60D90
4 conductors only can be pulled	



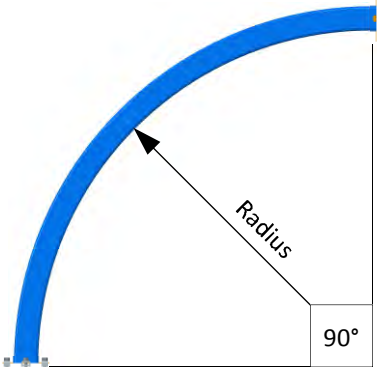
☐ **TR60404C3-TR60405C3-TR60404C-TR60405C**
☐ **TR60604C3-TR60605C3-TR60604C-TR60605C**

TR60 line pre-mounted busbar

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



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		





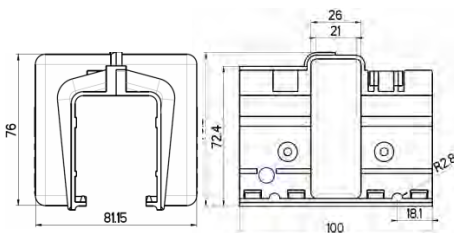
compatible with blue line
(pre-mounted conductors)



TR6001

TR60 line

joint



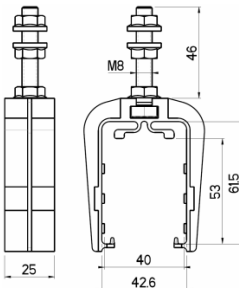
compatible with yellow line
(conductors to be pulled)



TR6002

TR60 line

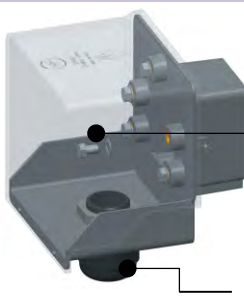
hanger clamp



TR6003

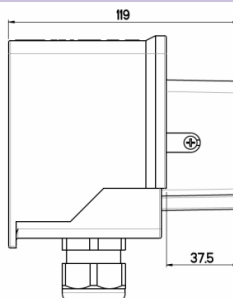
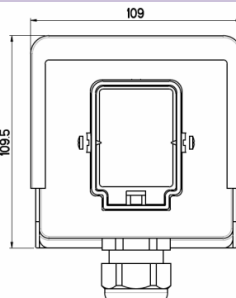
TR60 line

feed



5x M5x8

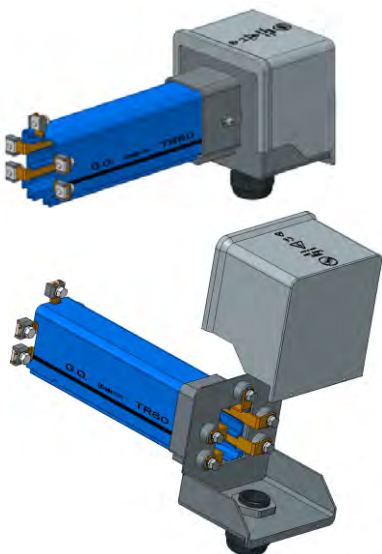
2x 3.5x9.5 self tapping
M25



TR6003A4-TR6003A5

TR60 line

pre-mounted feed

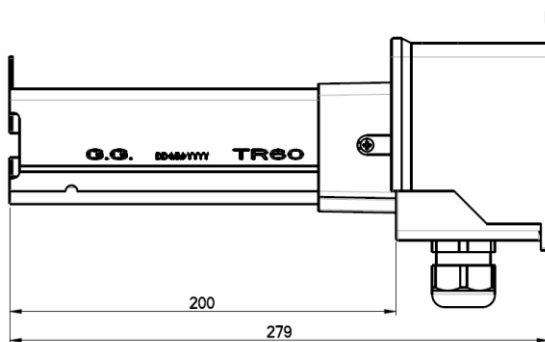


TR6003A4

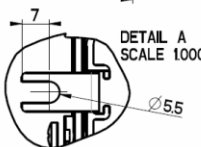
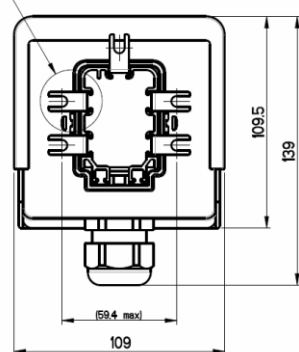
4 poles
L1-L2-L3-PE

TR6003A5

5 poles
L1-L2-L3-N-PE



DETAIL A



TR6004 - TR6005

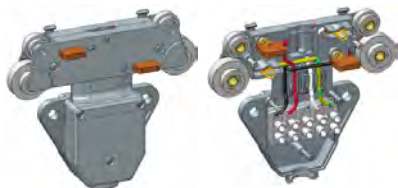
TR60 line

trolley



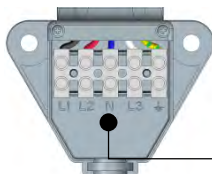
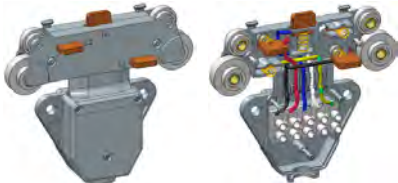
TR6004

4 poles
L1-L2-L3-PE

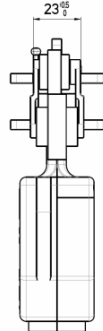
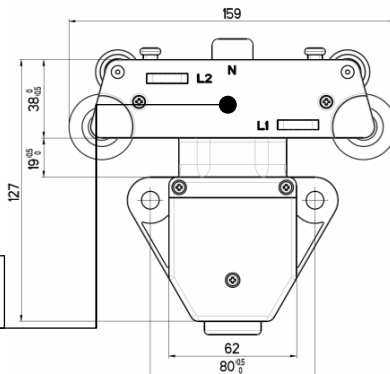


TR6005

5 poles
L1-L2-L3-N-PE



connection rif.
markings





compatible with blue line
(pre-mounted conductors)



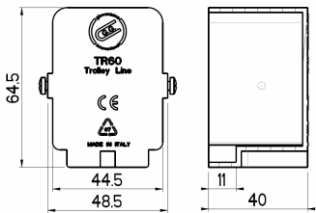
compatible with yellow line
(conductors to be pulled)



TR6006

TR60 line

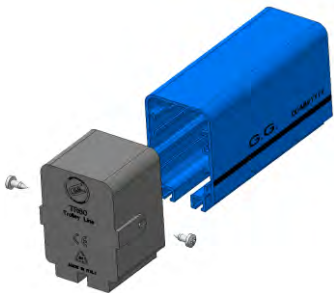
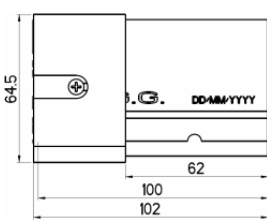
end cap



TR6006A

TR60 line

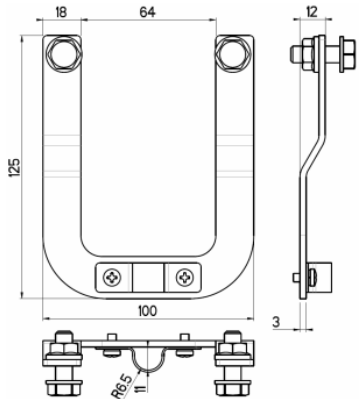
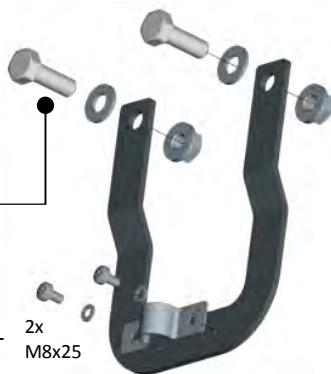
pre-mounted end cap



TR6007

TR60-85 line

towing arm bracket



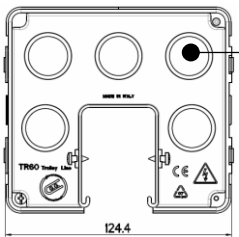
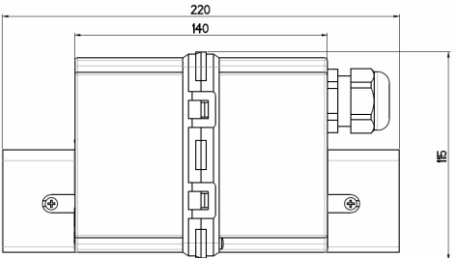
TR6008

TR60 line

in-line feed



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



TR6008A4-TR6008A5

TR60 line

pre-mounted in-line feed



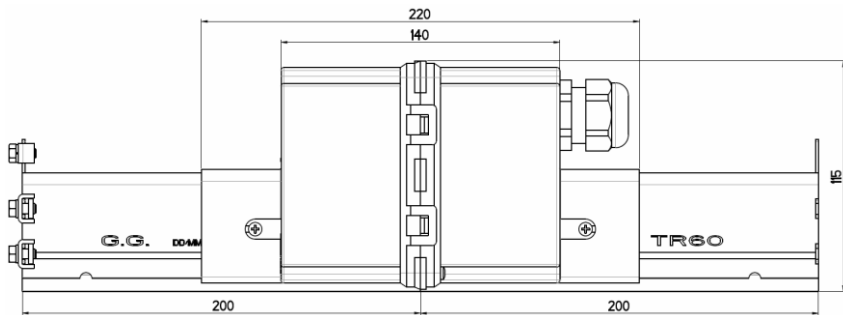
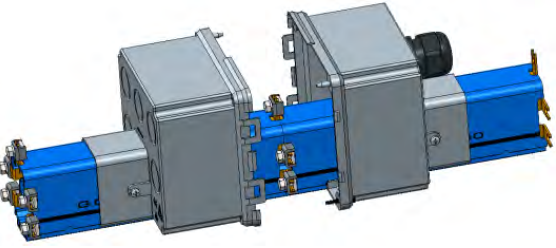
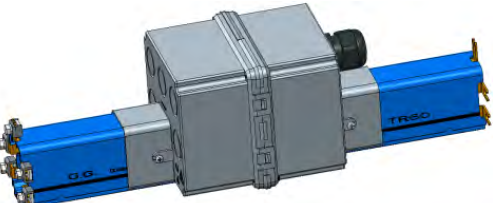
TR6008A4

4 poles
L1-L2-L3-PE

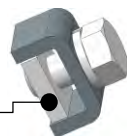


TR6008A5

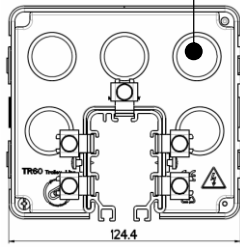
5 poles
L1-L2-L3-N-PE



complete of terminal clamp for each conductors



5x M25 closed spot





compatible with blue line
(pre-mounted conductors)



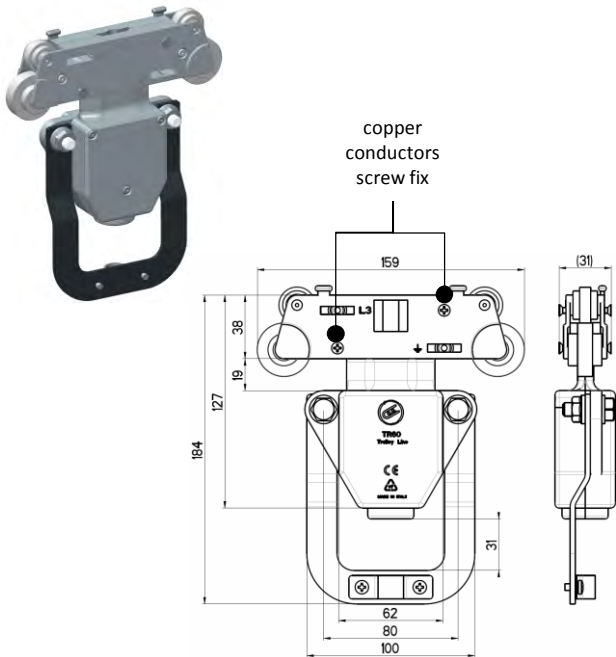
compatible with yellow line
(conductors to be pulled)



TR6011

TR60 line

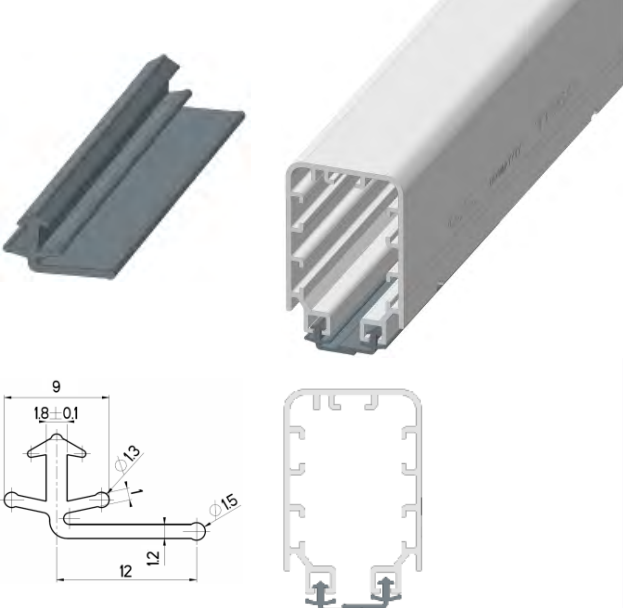
strip insertion trolley



TR6012

TR60 line

gasket IP23

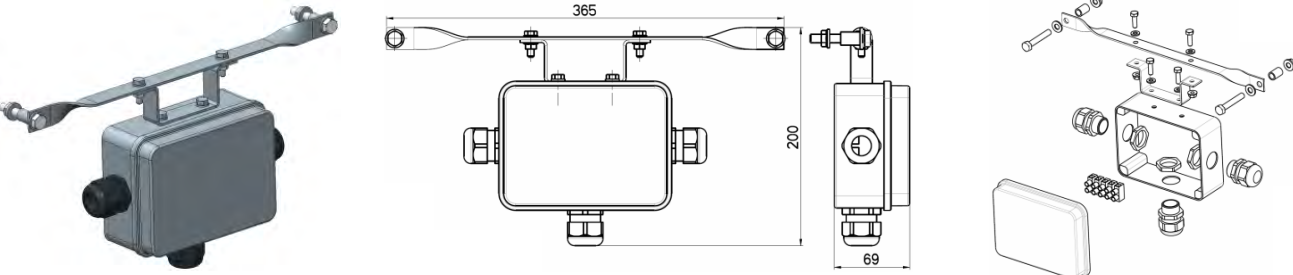


for order please consider twice the length of the line

TR6013

TR60 line

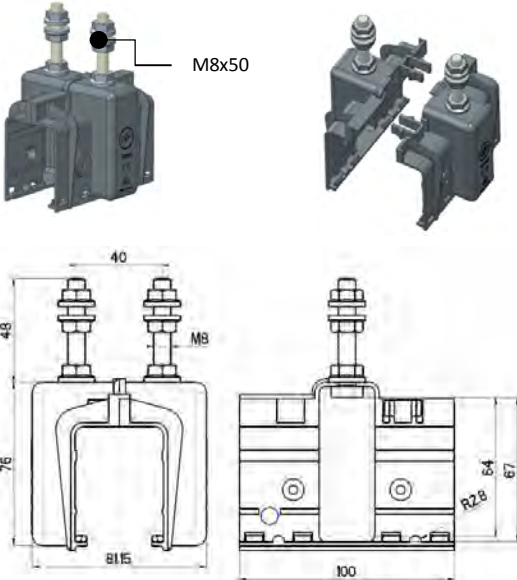
double trolley support



TR6014

TR60 line

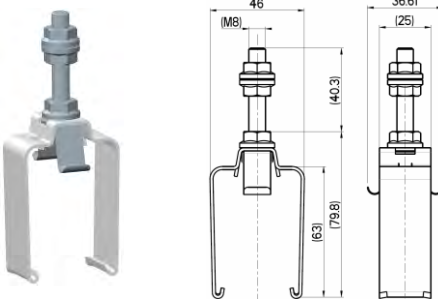
fixed point



TR6020

TR60 line

hanger clamp (steel)



CS40-CS60

TR60 line

copper strip



CS40

40 amp
10 mm²
1 x 10 mm²

CS60

60 amp
15mm²
1.5 x 10 mm²





Table with 4 columns: Compatibility (blue line/pre-mounted conductors), Color (blue square), G.G. International logo, Color (yellow square), Compatibility (yellow line/conductors to be pulled). The first two columns contain a list of TR85 series codes (e.g., TR85404C3, TR85405C3, etc.).

Technical drawings and specifications for the 40A.....140A Series and 200A Series busbars. Includes cross-sections showing dimensions (85mm height, 56mm width) and side views showing terminal spacing. Below the drawings is a table with columns: Line, Amp (40=40 amp, 70=70 amp, 100=100 amp, 140=140 amp, 200=200 amp), N° conductors (4C=four, 5C=five), and Length bar "L" (No extension=4meters, 3=three meters). To the right are 3D renderings of the blue busbars.

Table showing Radius [meters] vs Amp (40 amp, 70 amp, 100 amp, 140amp) for 4 conductors only. The table lists various TR85 series codes (e.g., TR8529404A90, TR8529704A90, etc.) for different radii (1.2, 1.4, 1.8, 2.2 meters). To the right is a diagram of a blue busbar with a 90° bend, labeled 'Radius'.

Table with 4 columns: Compatibility (yellow line/busbar), Color (yellow square), G.G. International logo, Color (yellow square). The first two columns contain a list of TR85 series codes (e.g., TR85704, TR85705, etc.).

Technical drawings and specifications for the TR85 series busbars. Includes cross-sections showing dimensions (85mm height, 56mm width) and side views showing terminal spacing. Below the drawings is a table with columns: Line, Amp (70=70 amp, 100=100 amp, 140=140 amp), N° conductors (4C=four, 5C=five), and Bar lenght "L" (4meters). To the right is a diagram of a yellow busbar with a 90° bend, labeled 'Radius'. Below the diagram are 3D renderings of the yellow busbars.



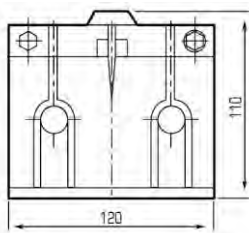
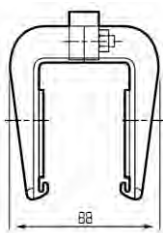
compatible with blue line
(pre-mounted conductors)



TR8501

TR85 line

joint



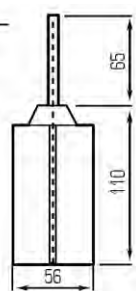
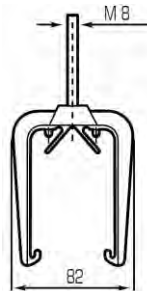
compatible with yellow line
(conductors to be pulled)



TR8502

TR85 line

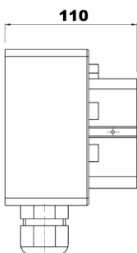
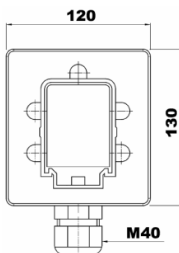
hanger clamp



TR8503

TR85 line

feed

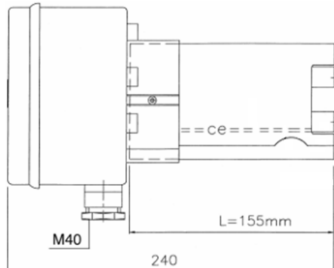


TR8503A4-TR6003A5

TR8533A4-TR8533A5

TR85 line

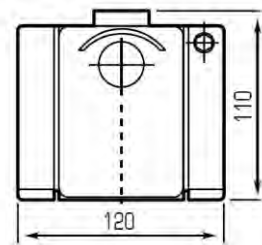
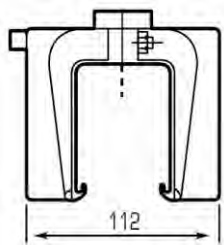
pre-mounted feed



TR8504-TR8535

TR85 line

joint



TR8503A4
(40...140amp)

4 poles
L1-L2-L3-PE

TR8533A4
(200amp)

TR8503A5
(40...140amp)

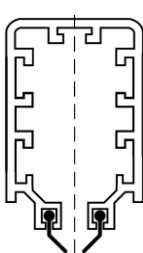
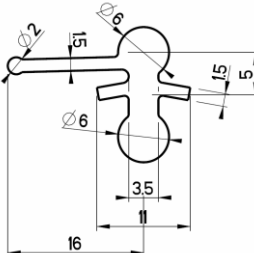
5 poles
L1-L2-L3-N-PE

TR8533A5
(200amp)

TR8505

TR85 line

gasket IP23

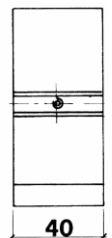
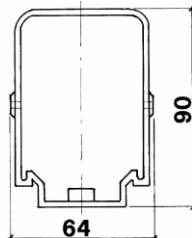


for order please consider twice the length of the line

TR8506

TR85 line

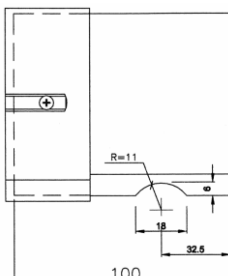
end cap



TR8506A

TR85 line

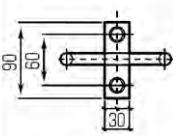
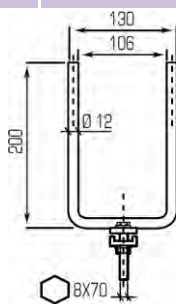
pre-mounted end cap



TR8510

TR60-85 line

towing arm





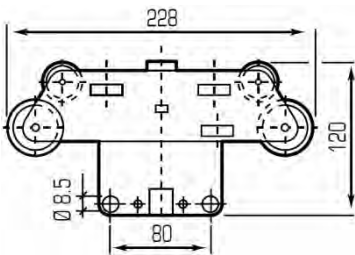
compatible with blue line
(pre-mounted conductors)



compatible with yellow line
(conductors to be pulled)



☐ **TR8511-TR8512** TR85 line 35 amp trolley  



☐ **TR8511**

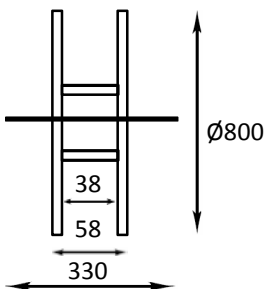
4 poles
L1-L2-L3-PE

☐ **TR8512**

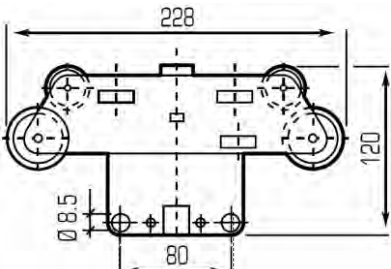
5 poles
L1-L2-L3-N-PE

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

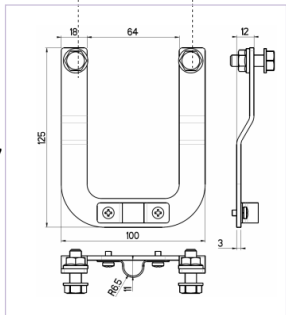
☐ **TR8513** TR60-85 line de-coil unit 



☐ **TR8514** TR85 line strip insertion trolley 



TR6007



☐ **TR8517-TR8520** TR85 line brush  



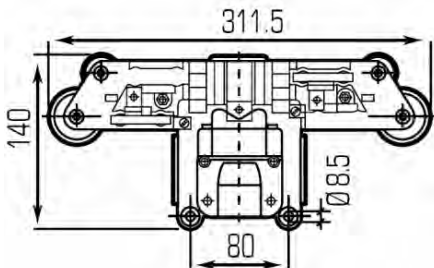
☐ **TR8517**

for 35 amp
trolley

☐ **TR8520**

for 70 amp
trolley

☐ **TR8518-TR8519-TR8532** TR85 line 70 amp trolley  



☐ **TR8518**

4 poles
L1-L2-L3-PE

☐ **TR8519**

5 poles
L1-L2-L3-N-PE

☐ **TR8532**

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

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



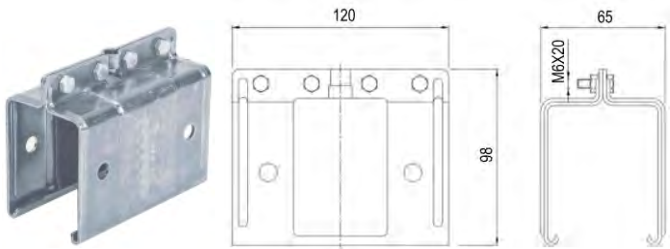
compatible with blue line
(pre-mounted conductors)



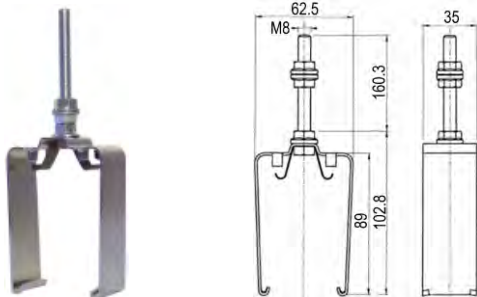
compatible with yellow line
(conductors to be pulled)



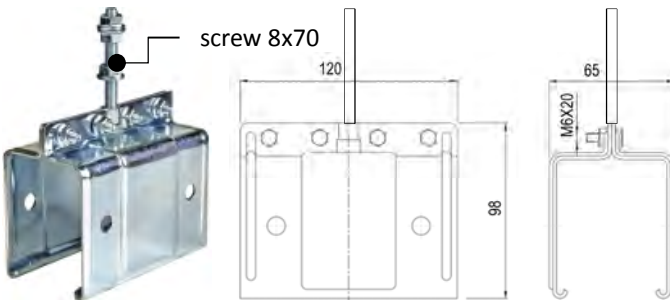
TR8524 TR85 line joint (steel)



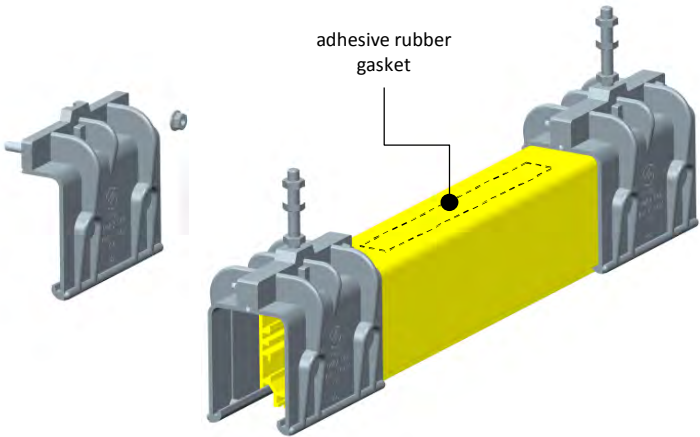
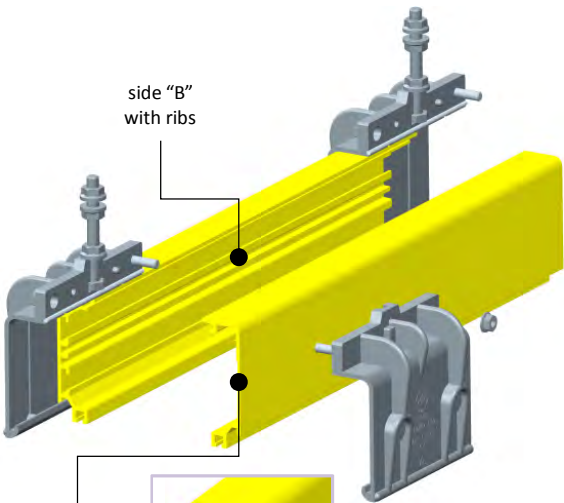
TR8525 TR85 line hanger clamp (steel)



TR8527.1 TR85 line fixed point



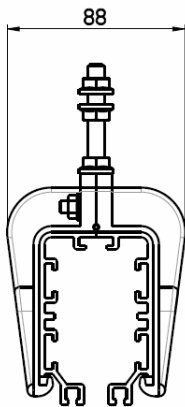
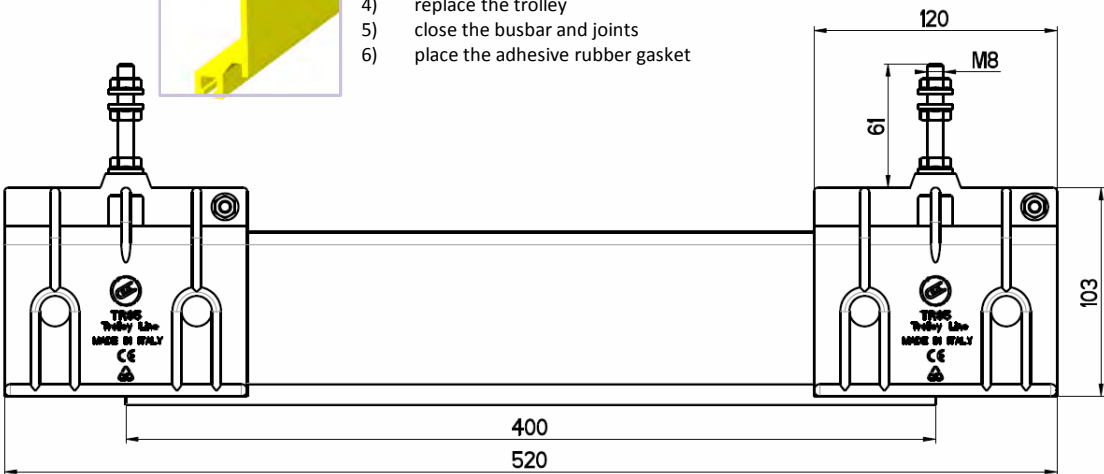
TR8528 TR85 line inspection joint



side "A"
without ribs

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

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





compatible with blue line
(pre-mounted conductors)



compatible with yellow line
(conductors to be pulled)

TR8545-TR8545B TR85 line section joint



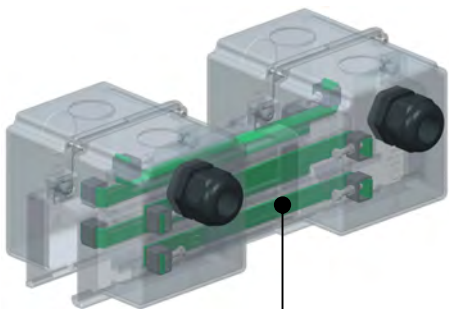
TR8545

yellow

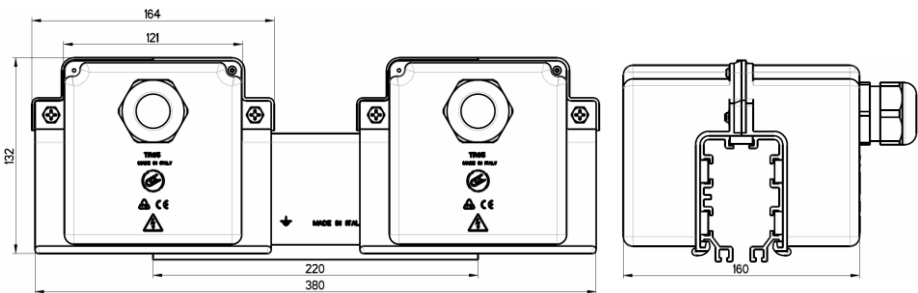


TR8545B

blue



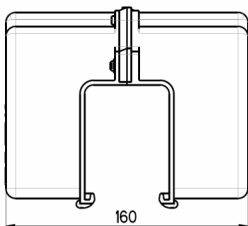
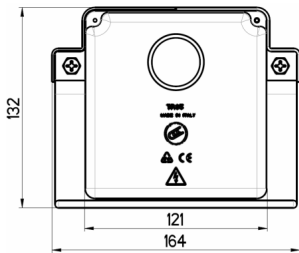
Insulating strip bars



TR8547 TR85 line in-line feed



Pg29 cable gland included
(not mounted)



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



TR8550

L= 350mm



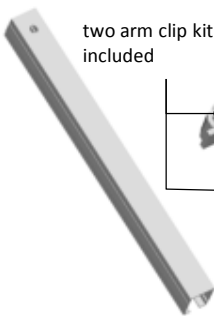
TR8551

L= 500mm

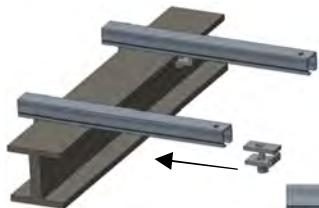


TR8552

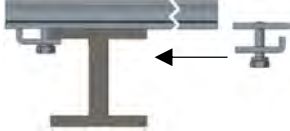
L= 700mm



two arm clip kit
included



Mounting
example



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



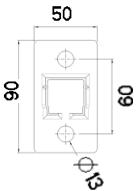
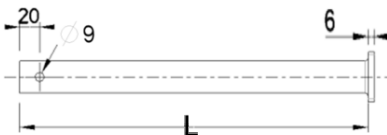
TR8555

L= 350mm



TR8556

L= 500mm





General characteristics							
Line / Size		TR60		TR85			
		40	60	40	70	100	140 200
Operating current 23°C		40A	60A	40A	70A	100A	140A 200A
Comply with standards		CEI EN 60439-1, CEI EN 60439-2, CEI EN 60695-2-1, CEI EN 60570					
Markings		CE ENEC					
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/min¹					
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 temperature – Vicat	ISO R306 49N	82 °C

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



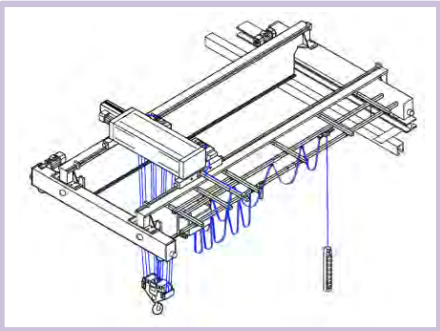
Festoon system – line 30 – 41 and 41 inox Giovenzana

page 68 to 79

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

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

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

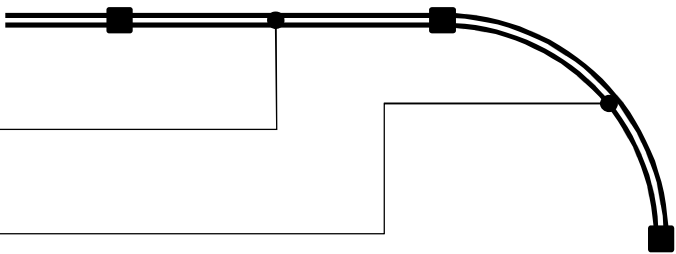


C- rail bar system				
Line	Characteristic			Markings
30	☐ Bar height: 30 mm	☐ Load capacity: 100 kg/m		CE EAC
41	☐ Bar height: 41 mm	☐ Load capacity :140 kg/m		CE EAC
41 stainless steel	☐ Bar height: 41 mm	☐ Load capacity :140 kg/m	☐ Stainless steel material	CE EAC

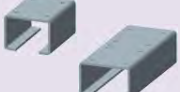
Typical line schematic:

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

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

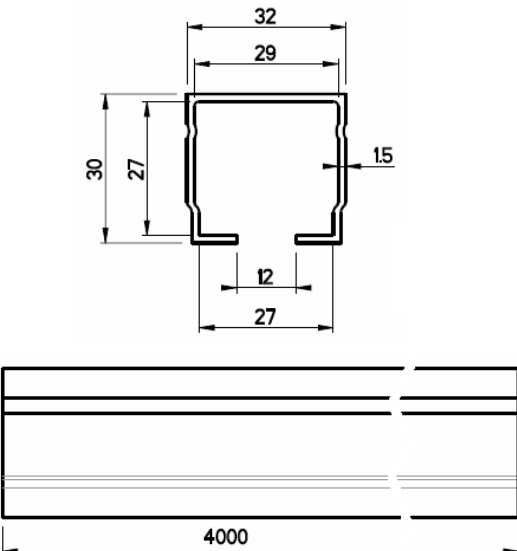
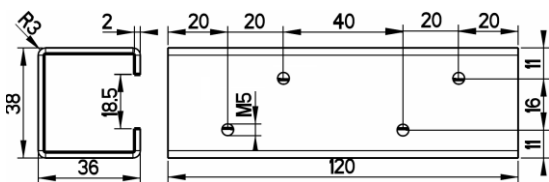
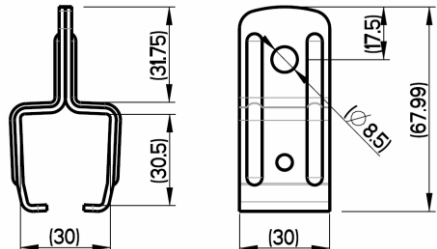
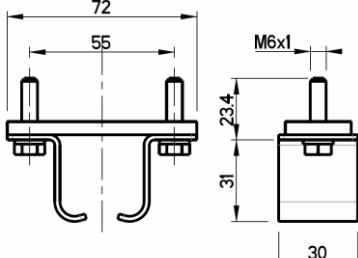
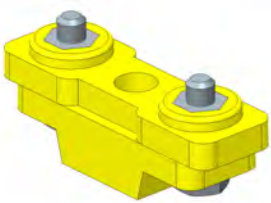
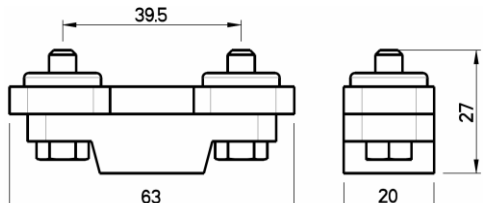




Description	note	Line 30 (load capacity 100 kg/m)		Line 41 (load capacity 140 kg/m)			Min. qty
		Code	Picture	Code standard	Code stainless steel	Picture	
C-Rail bar	straight 4m	30607001		30602001/4	30602061 (3m)		3-4 meters
	90° curved radius 1.5 m	-		30602054 (o)	-		
Track support bracket		30607017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

(o) may require mechanical adjustment during line assembly



Picture	Description	Code	Dimensions
	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)	
	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)	
	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: stainless 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

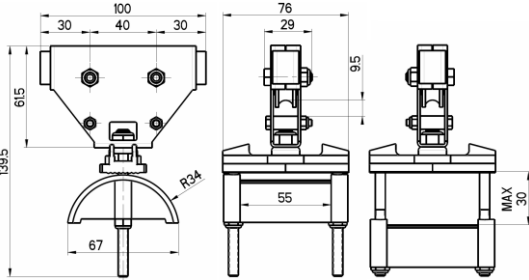
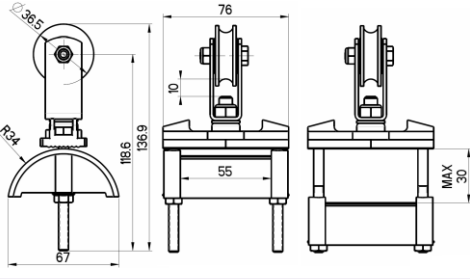
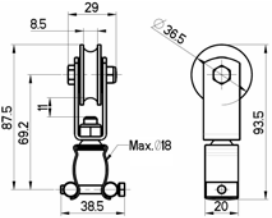
page 76

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

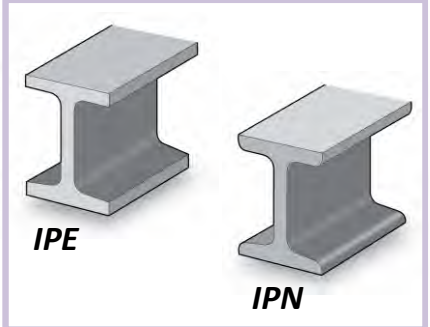
Line	Characteristic				Markings
Wire-rope	Rope diameter: 8 mm	Travel speed: 40 m/min.	Trolley type: for flat or round cable	Trolley load capacity: 8 kg	CE EAC

Picture	Description	Code	Min. qty	Dimensions
 <u>FLAT CABLE</u>	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	
 <u>FLAT CABLE</u>	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	
 <u>ROUND CABLE</u>	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 page 77 - 78

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



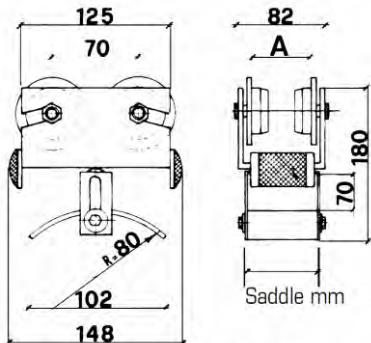
I-beam system					
Line	Characteristic				Markings
Light series	Beam type: IPE-IPN 80÷100	Travel speed: 120 m/min.	Trolley load capacity: 50 kg	Max cable capacity: 70 mm	CE EAC

I-beam type	I-beam size	Saddle [mm]	Rollers	Trolley	Towing trolley	Head clamp
IPE	80	55	PA	30606003	30606033	30606062
			steel	30606103	30606133	
		85	PA	30606005	30606035	30606063
			steel	30606105	30606135	
	100	55	PA	30606011	30606041	30606066
			steel	30606111	30606141	
		85	PA	30606013	30606043	30606067
			steel	30606113	30606143	
IPN	80	55	PA	30606004	30606034	30606062
			steel	30606104	30606134	
		85	PA	30606006	30606036	30606063
			steel	30606106	30606136	
	100	55	PA	30606012	30606042	30606066
			steel	30606112	30606142	
		85	PA	30606014	30606044	30606067
			steel	30606114	30606144	



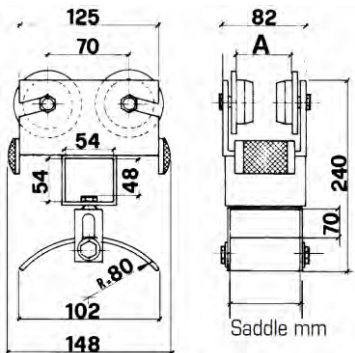
Light series

Trolley



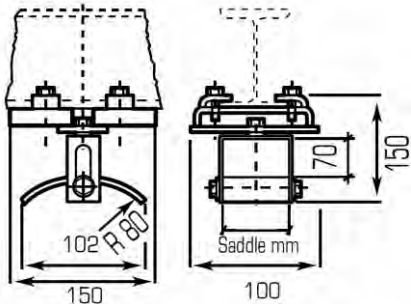
IPE 80 A=46+4
IPN 80 A=42+4
IPE 100 A=55+4
IPN 100 A=50+4

Towing trolley



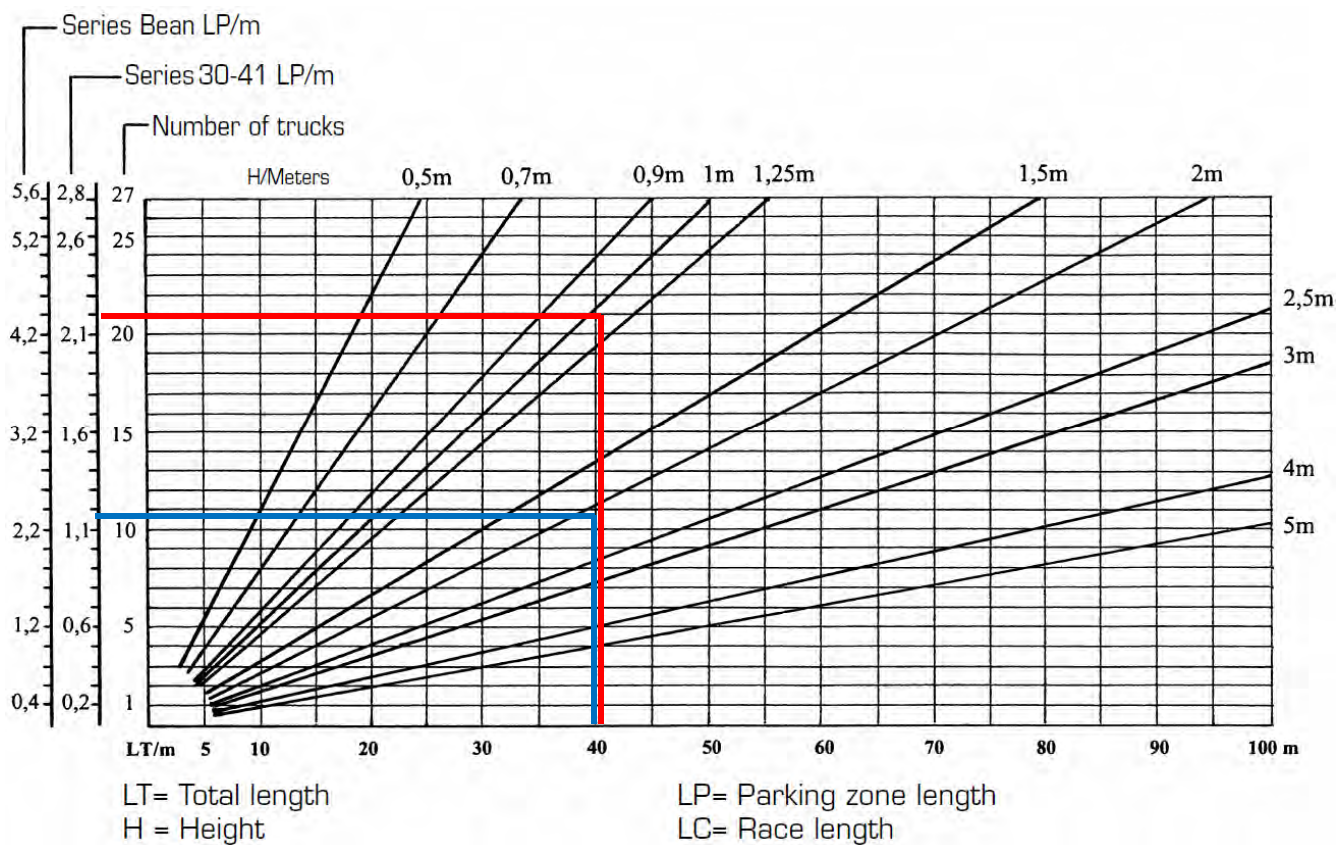
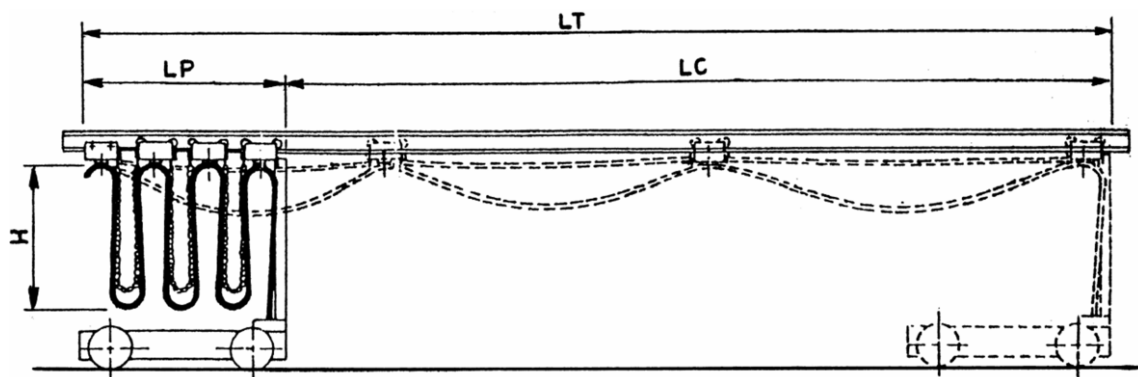
IPE 80 A=46+4
IPN 80 A=42+4
IPE 100 A=55+4
IPN 100 A=50+4

Head clamp





Line diagram



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 enough to connect the two ends of the fixed and mobile users.



PVC flat cable anti-aging H07VVH6-F

page 80

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

Characteristics

- Comply with: CEI 20-22 II (flame resistant)
- Rated operating voltage: 400V
- Max short circuit temperature: 160 °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)
- Insulation class: 2/3
- Rated insulation voltage: Uo/U 450/750V
- Operating temperature: -5 °C +70 °C



- 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 (o)	18X2.5	50X13		1050	45		15	10
CP2425AF (o)	24X2.5	54X13		1100	60		14	9
CP0404AF	4X4	21X7.5	56X0.30	330	16	4.95	35	30
CP0804AF	8X4	38X5		550	32	4.95	24	19
CP0406AF	4X6	24X8	84X0.30	440	24	3.30	46	40
CP0806AF	8X6	38.5X8		742	48	3.30	32	25
CP0410AF	4X10	35X11	7X12X0.40	800	40	1.91	57	46
CP0416AF	4X16	36.5X12	7X18X0.40	1200	64	1.21	76	62
CP04250AF	4X25	43X13	7X28X0.40	1700	100	0.78	96	80
CP0435AF	4X35	50X14	7X39X0.40	2050	140	0.55	119	99

(o) Minimum supply 500m.

Flat cable gland

Standard

ø 28.5 out

12903010

12903011



Round cable with dual strain relief steel ropes S05VVD7-F
page 81

Made for heavy duty applications, in particular for pendant push button stations and moving electromechanical components.
The two strain relief ropes avoid any stress on the cable; they are embedded, diametrically opposed to PVC sheath.

Characteristic table with 2 columns and 6 rows of specifications including compliance, voltage ratings, temperature limits, and breaking point.

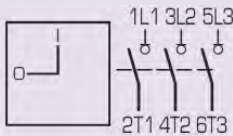


Main specification table with 10 columns: Code, N° conductors, Outer cable, Strain relief rope dimension, Strand, Weight, Total cross section, Electrical resistance, and Max current ambient temperature (Fixed and Moving place).

Body disconnecter switch base fixing

page 82

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

Characteristic								
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

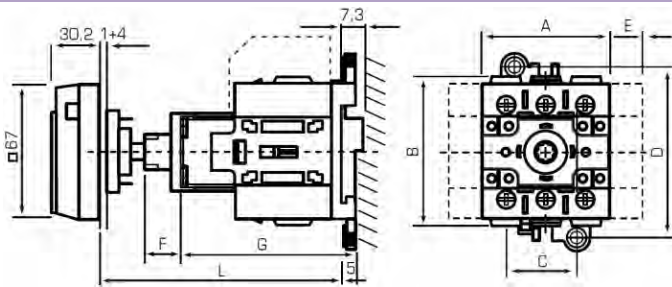
☐ Locking knob (max 3 locks)

☐ 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





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