



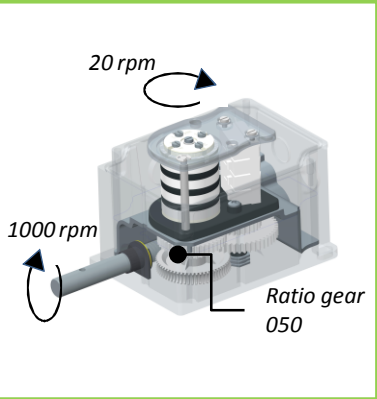
Rotary Gear Limit switches

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

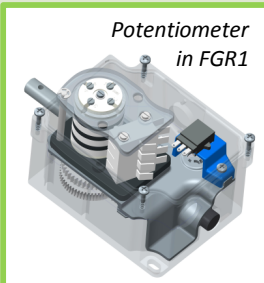
The Giovenzana's rotary gear limit switch are available in different transmission ratio. The ratio is the difference between the number of rotation of the main shaft and the number of rotation of the cams.



Potentiometer & Encoder

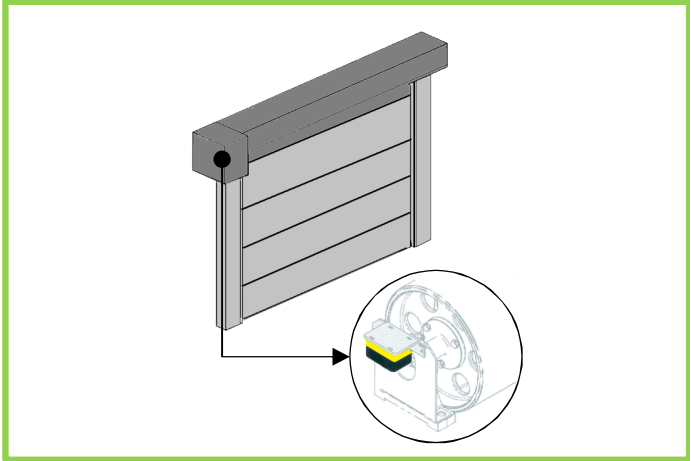
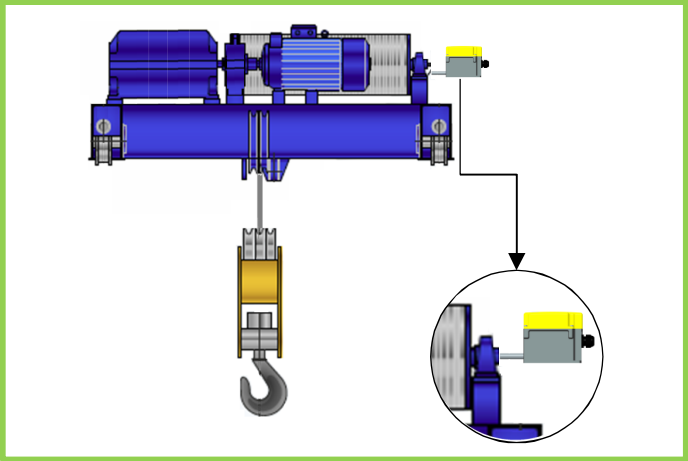
In addition to the microswitch :

- 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



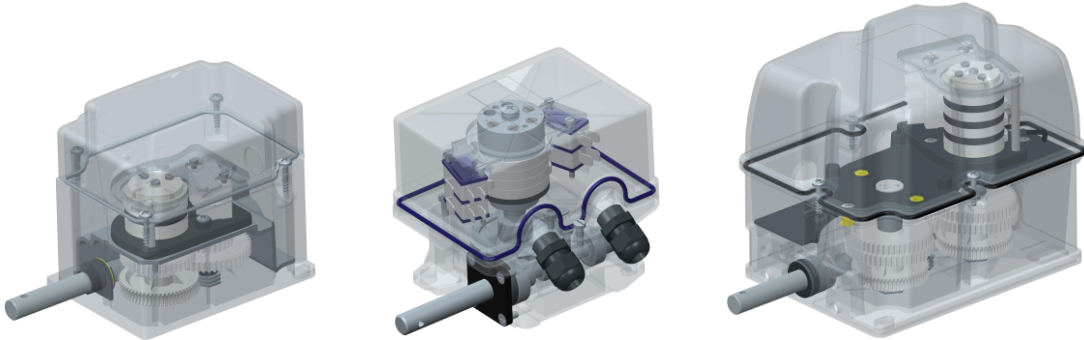


Line	FGR1	FGR2	FGR3
Page	28	30	32

Picture



X-ray view



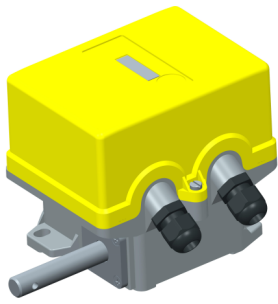
LIMIT SWITCHES

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)

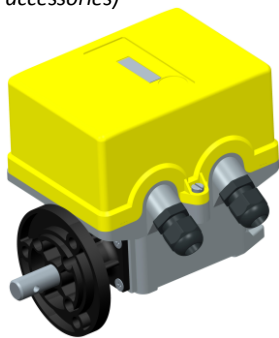


Version and options available

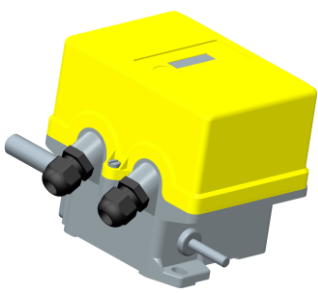
❑ Base Fixing



❑ Flanged Fixing  
(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°)

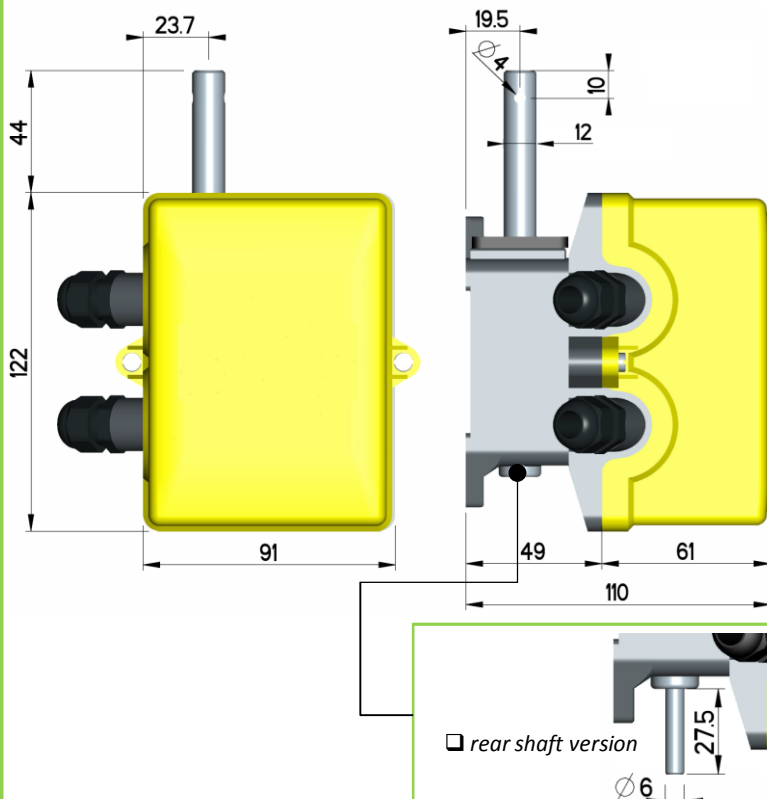
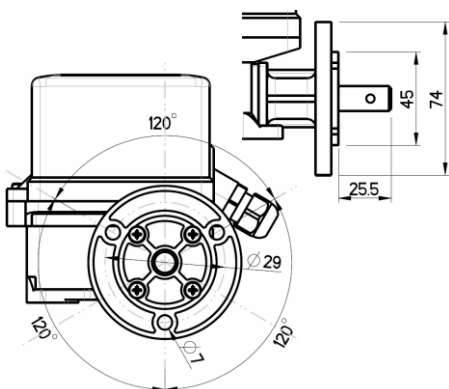
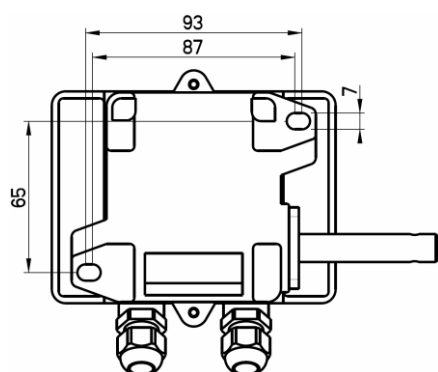


B (15°)



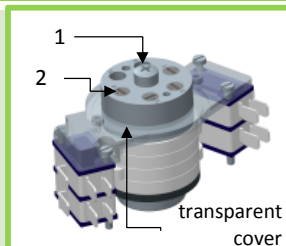
Standard A (30°)

## Dimensions



## Spare parts / Accessories

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



## Microswitch

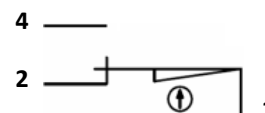
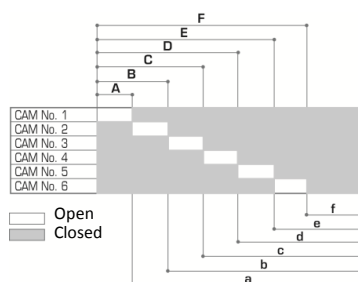
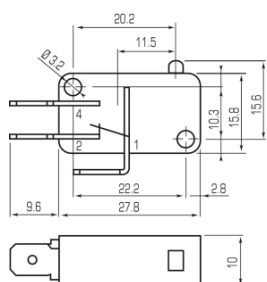


MFI

## 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

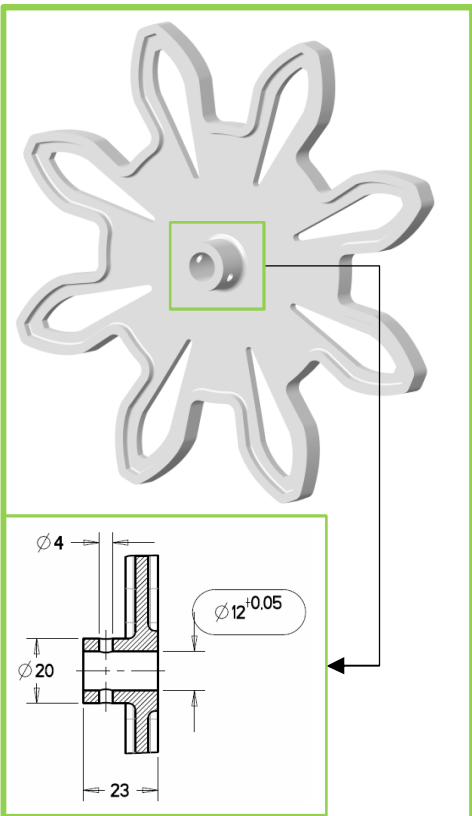
The movement refers to the action of the cam on contact 1-2 (NC). The microswitch have all changeover contacts.





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	○
16020059	M16 - Z10	○
16020060	M12 - Z12	○
16020061	M14 - Z10	○
16020062	M12 - Z10	○
16020063	M8 - Z12	○
16020065	M6 - Z11	○
16020066	M5 - Z12	○



Note:

□ "Water jet cut" with metal flange

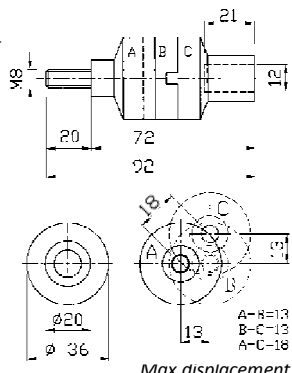


○ Moulded

FGR1/2/3: Oldham coupling

FGH

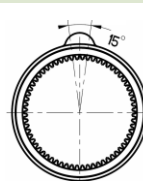
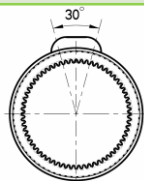
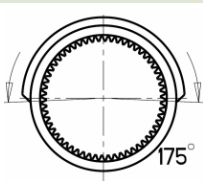
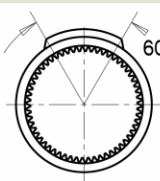
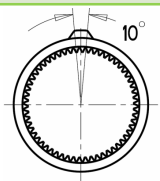
Drill and pin to the limit switch's shaft



Cam shapes

FGR1 - FGR3

FGR2



Standard "A" (10°)

"B" (60°)

"C" (180°)

Standard "A" (30°)

"B" (15°)

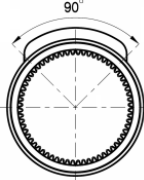
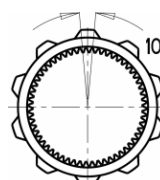
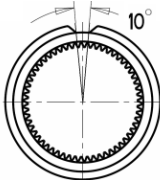
16020081

16020097

16020094

11703015

11703019



"D" (opposite)

"E" (10 tips)

"C" (90°)

16020095

16020093

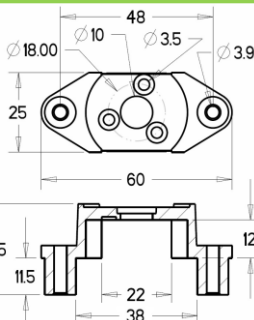
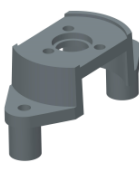
➤ on request available other versions

11703013

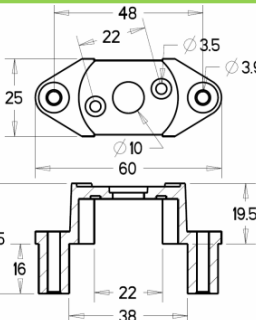
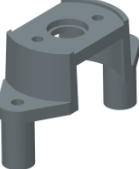
➤ on request available other versions

FGR1/3: Potentiometer / Encoder support versions

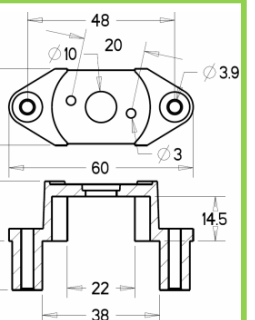
16020015



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 - Giovanzana line wheel drive control (long life)	MFI - Giovanzana line	MFI.3 - Giovanzana 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 <sup>us</sup> EAC	CE cRU <sup>us</sup> EAC	CE cRU <sup>us</sup> 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