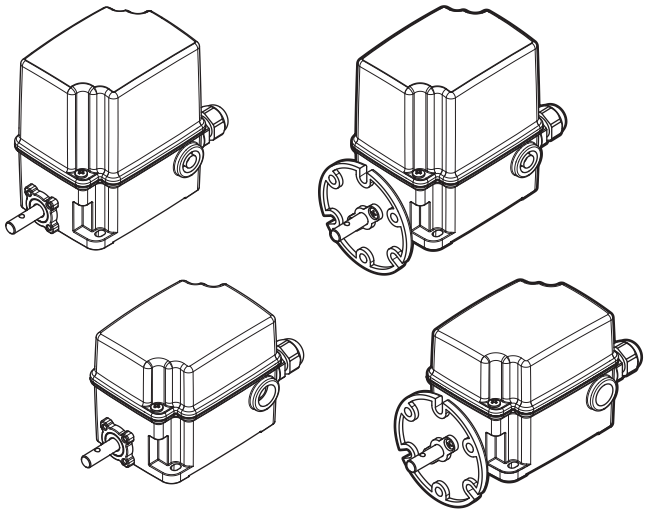
GIOVENZANA
INTERNATIONAL B.V.

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EN
instruction manual



FGR0

ROTARY GEAR LIMIT SWITCH

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Before use, read this booklet carefully to acquaint yourself with the features of the product. This booklet is an integral part of the product and therefore must be kept until the product is dismissed.

Giovenzana International B.V. reserves the right to change the features and data shown in this document at any time and without notice. This document cannot therefore be considered a contract with third parties.

Rotary gear limit switches FGR are designed and manufactured according to IEC international standard and EN European regulations.

Any improper installation or any tampering of the device may cause serious personnel injury or property damage, therefore, the installation and maintenance must be performed by specialized and authorized personnel.

The use of this device is not allowed in environment with a potentially explosive atmosphere or in presence of corrosive substances and in salt spray.

They are suitable for use in industrial environment with machinery monitoring and protection purpose.

Available in 3 variations:
- base fixing
- flanged fixing
- rear shaft

INTRODUCTION

The FGR rotary gear limit switch is a device used to control the number of turns or the rotation/direction angle of industrial and building machines.
A typical application is the rolling shutter door, overhead cranes or tackles etc. The unit, throught a gear system and cams transmission, controls 2 or more microswitches so, after a determined number of revolutions, it can prepare the motor to start or stop run.
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 system gear transmission allows you to choose different ratios with the main shaft.

Terms of use

The equipment must be installed only if it is completely intact and unbroken. The product must be installed according to the applicable code of practice, national regulations and laws and / or international standards as well as in compliance with the present instructions.
Do not change anything inside or outside the equipment.

Low mechanical risk
The equipment is suitable for resisting impact energies up to 4 J.
When impacts of energy are likely greater than 4 J, additional mechanical protection is required around the plastic case.

Potential electrostatic risk
The equipment is intended for fixed use and the user must not frequently touch the equipment in service (except for maintenance).
To avoid the potential electrostatic charge, it is necessary to perform the following instructions during the installation and service of the FGR:

- Do not install under direct air or other gas flow. If these requirements cannot be met, additional external direct flow protection is required.
- Install only when the relative humidity of the environment is greater than 30% (stable, always or for a long time) or in an environment with a humidity control system.
- The metal parts of the casing must be connected to the equipotential system in accordance with the instructions in paragraph “Connection of earthing or bonding conductors”.
- Do not rub the plastic cover insistently. If cleaning is required (e.g. to remove dust) only manual operations with wet materials are allowed.

Special conditions for a safe usage

Conditions

- The inner components (cam MFI micros, mounting brackets, etc.) are mounted in order to guarantee the type of protection.
- Any modification is forbidden.
- Do not remove any components or micro even if they are not used.

Types of protection

- Every screw shall be tightened with the tightening torque according to this document, to maintain the degree of protection IP.
- Additional holes and/or entries into enclosure are forbidden, the only entries in the enclosure shall be made by Giovenzana (see the information reported in clause 1 of this document).
- The type of protection and minimum degree of protection (IP code) of the entries into enclosure or cable glands shall be in accordance with the equipment marking.
- Any entry of the enclosure, the mounting of the entries into enclosure or cable glands shall be carried out to maintain the level of protection of the equipment.

TECHNICAL CHARACTERISTICS

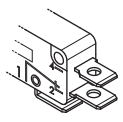
General technical data

Case	self-extinguishing thermoplastic material
Ratio	1:12 - 1:25 - 1:33 - 1:50 - 1:75 - 1:100 - 1:150 - 1:200 - 1:400
Direct ratio	1:25 - 1:50
Protection class	IP67
Shaft type	- stainless steel mounted on self-lubricating bush protected by sealing rings on both sides - double overhang shaft version available
Fixing type	base front (flanged version)
Microswitches	up to 4
Cam block	self-lubricating with transparent support for easier cam viewing
Cable entry	M16 + M16 knockout
Temperature	operating: -25 ... +70°C storage: -30 ... +70°C
Options	5 cam shape options

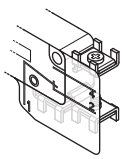
Microswitch technical data

Operating temperature			-25 ... +85°C
Minimum life expectancy	mechanical electrical		one million of cycles half million of cycles
Rated thermal current	Ith		8 A
Rated insulation voltage	Ui		250 V
Rated impulse withstand voltage	Uimp		1500 V
Rated operating current	Ie	resistive load inductive load	8 A - 250 V 3 A - 250 V
Pollution degree			2
Protection against electric shock			class II

Terminals
The microswitches installed can have one of the three types of terminals illustrated below:

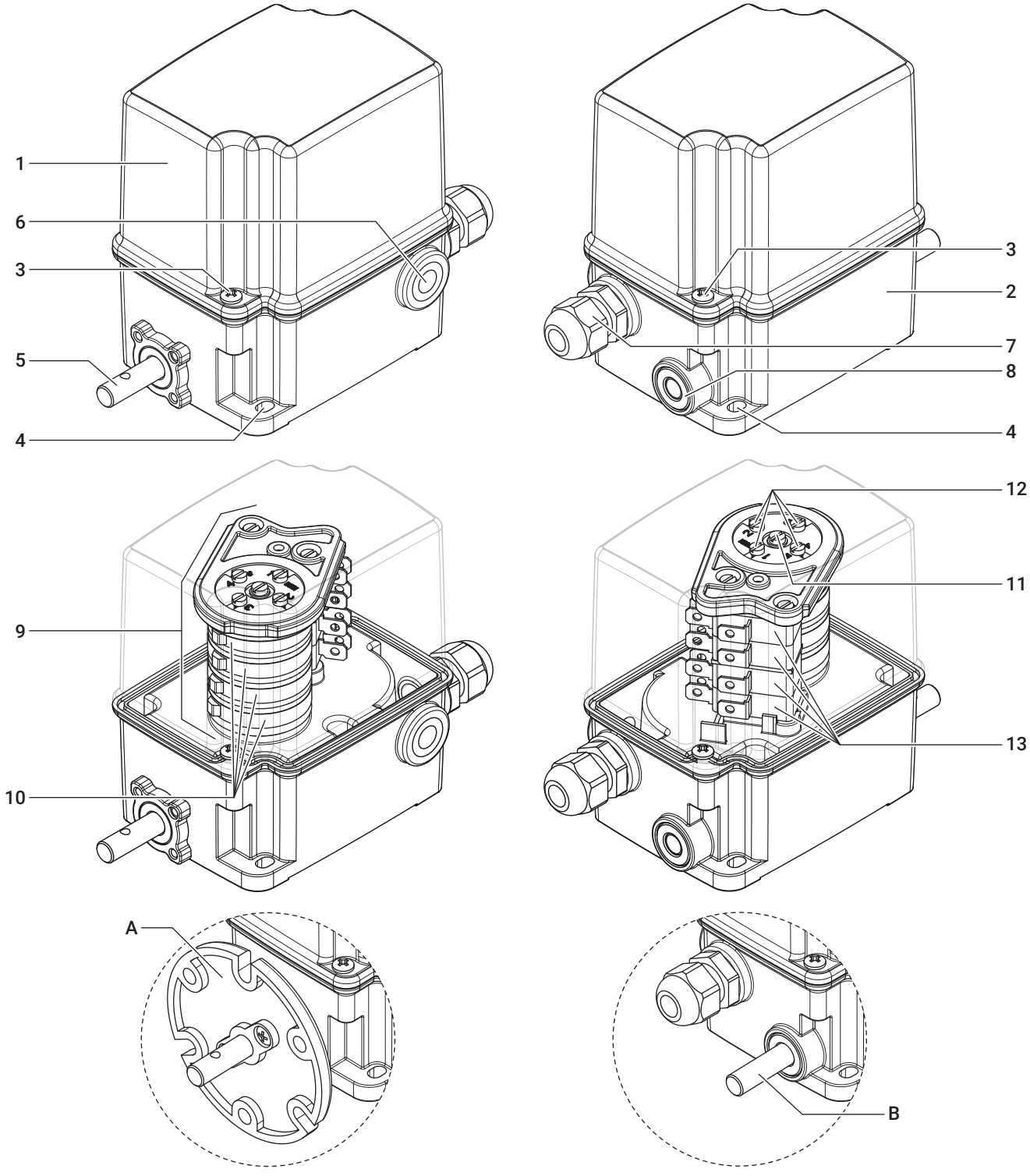


6.3×0.8 faston



screws M3 for wire 1.5 mm² with plate protection

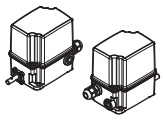
Main components



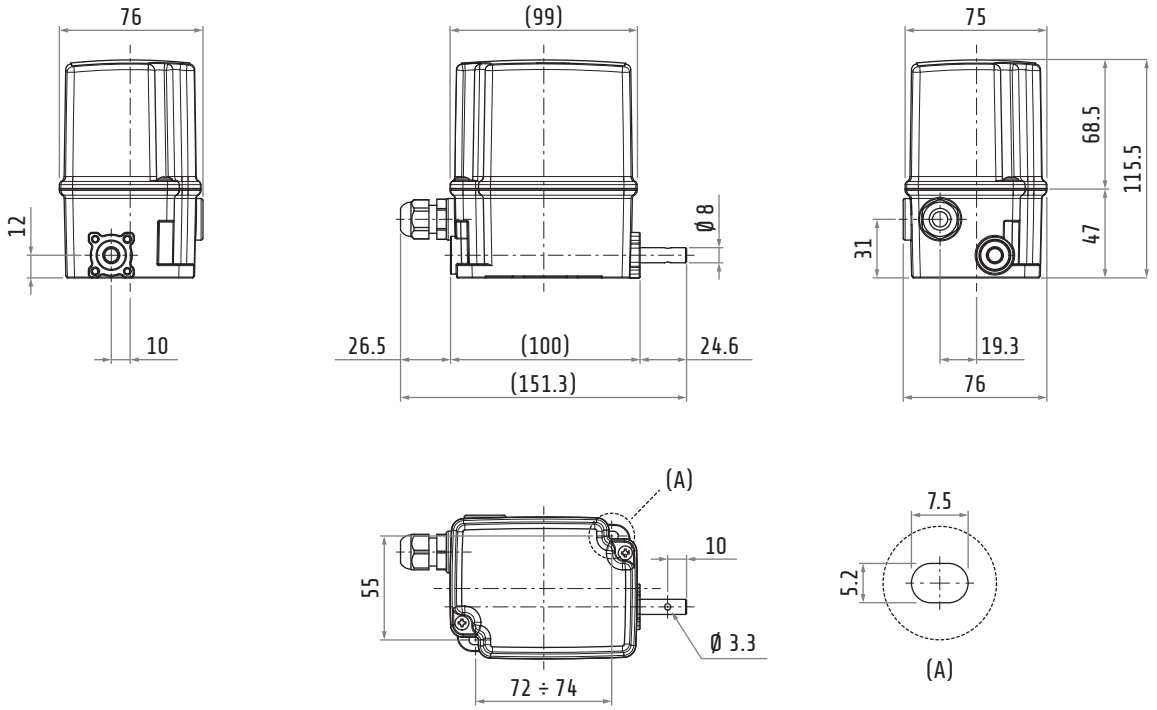
1	Cover
2	Base
3	Cover fixing screws
4	Holes for fixing the limit switch (M5)
5	Front shaft
6	M16 knockout
7	Cable gland M16
8	Sealing ring

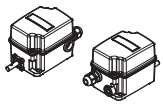
9	Cams unit
10	Cams
11	Cam adjustment locking screw
12	Cam adjustment screws
13	Microswitches
A	Flange for front fixing of the limit switch (where provided)
B	Double shaft (where provided)

Dimensions

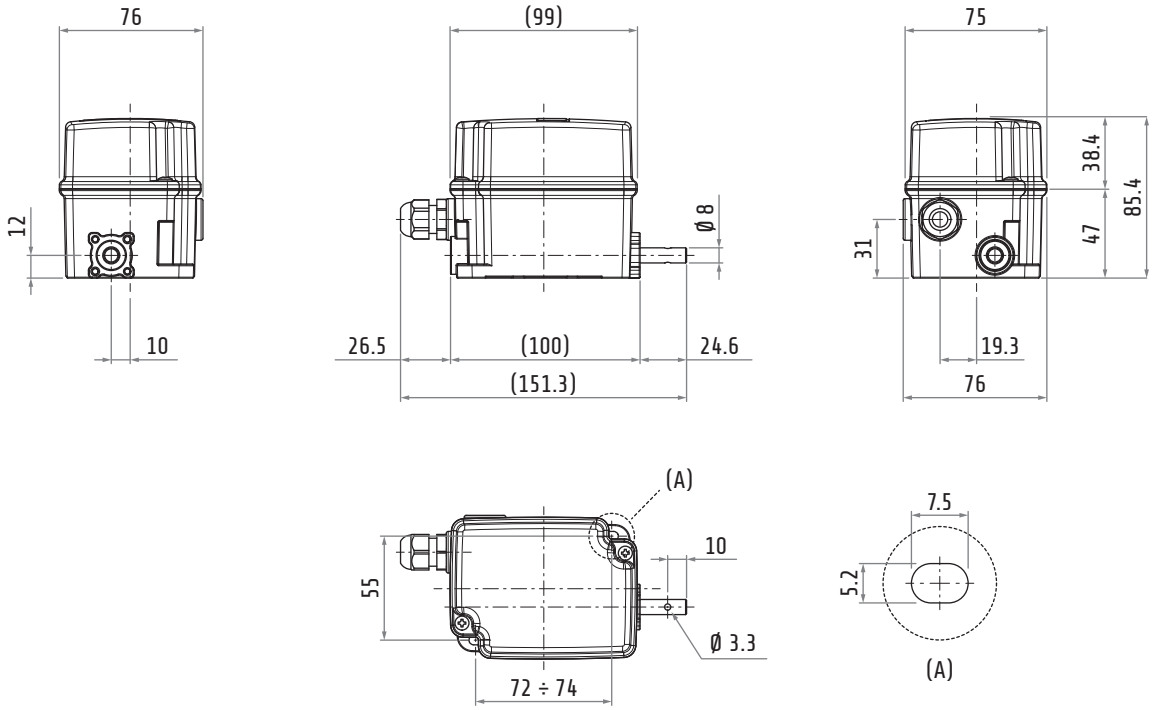


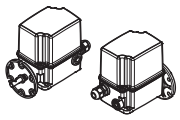
Base fixing - 4 microswitches



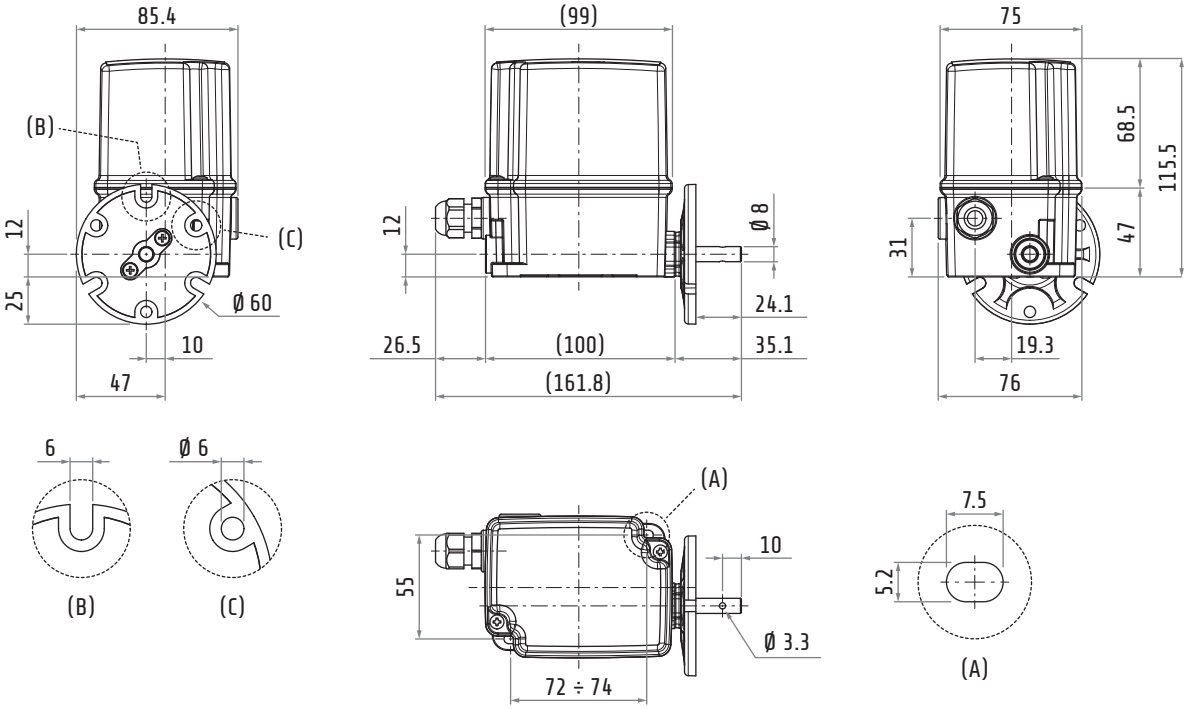


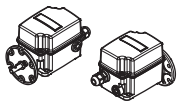
Base fixing - 2 microswitches



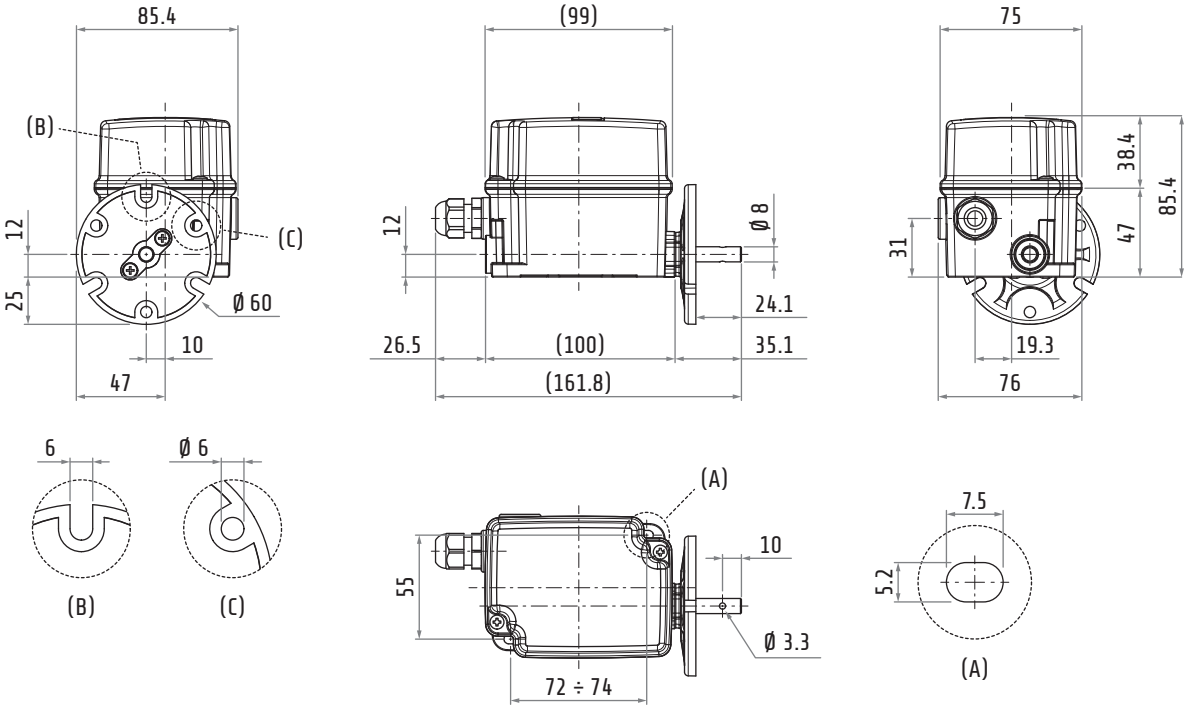


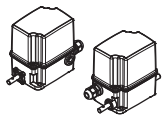
Flanged fixing - 4 microswitches



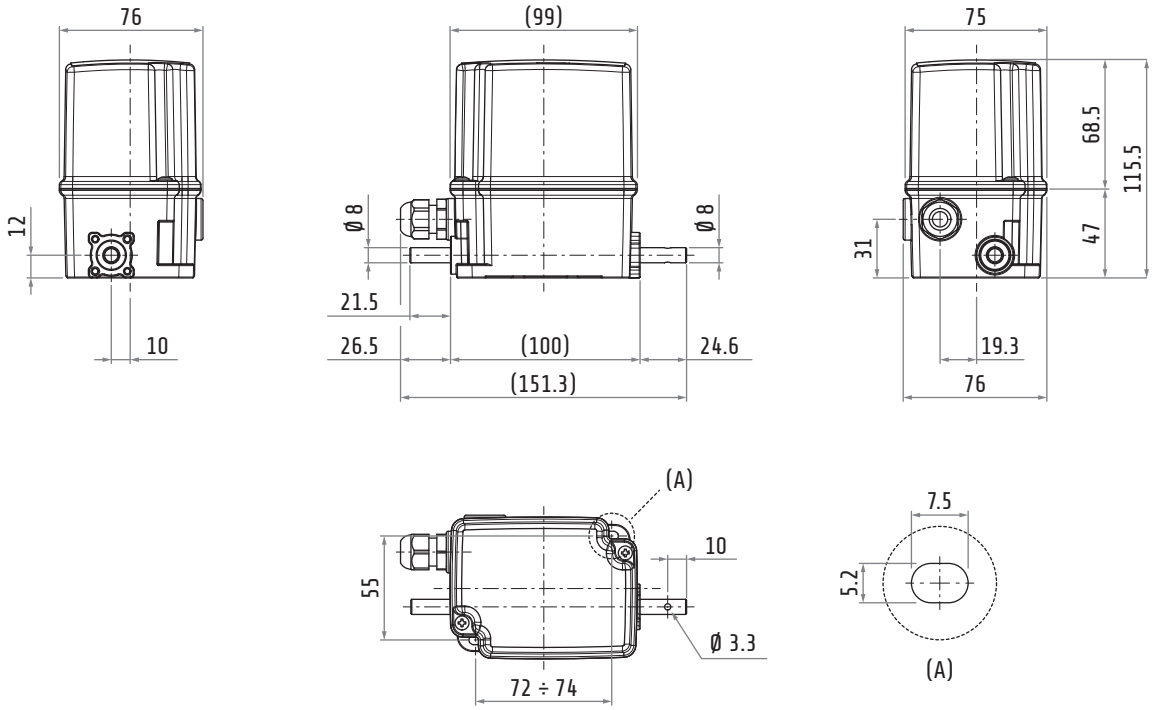


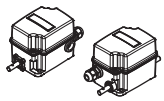
Flanged fixing - 2 microswitches



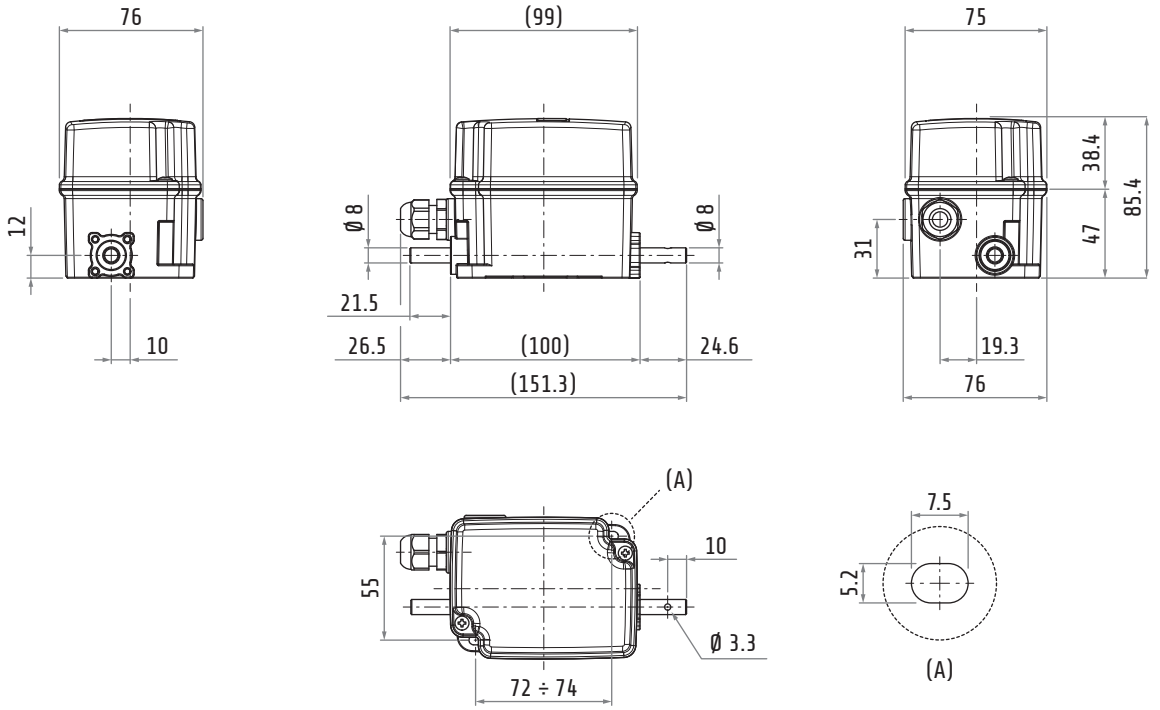


Coaxial shaft - 4 microswitches



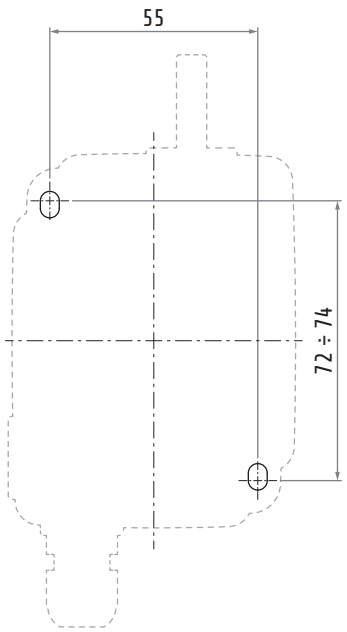


Coaxial shaft - 2 microswitches

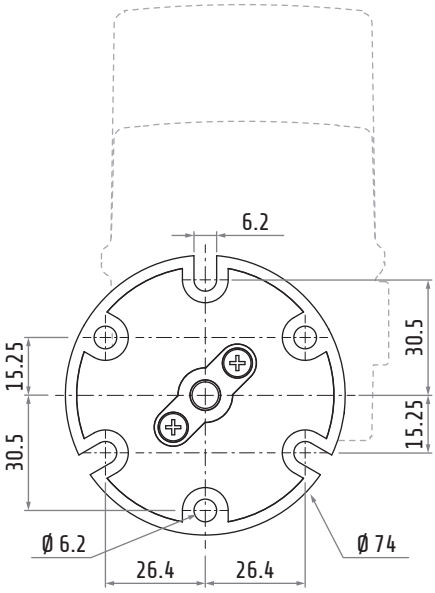


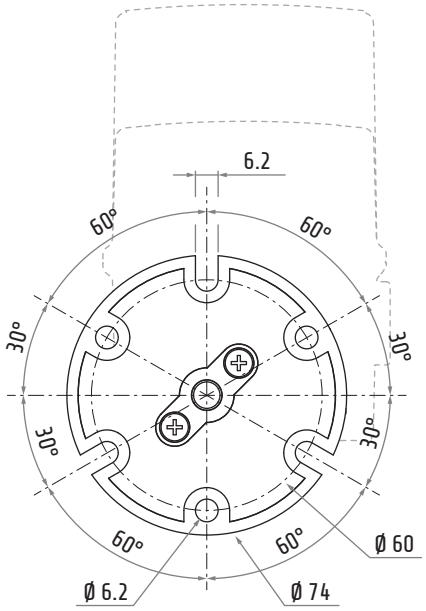
Limit switch installation

Fixing points for basic configuration

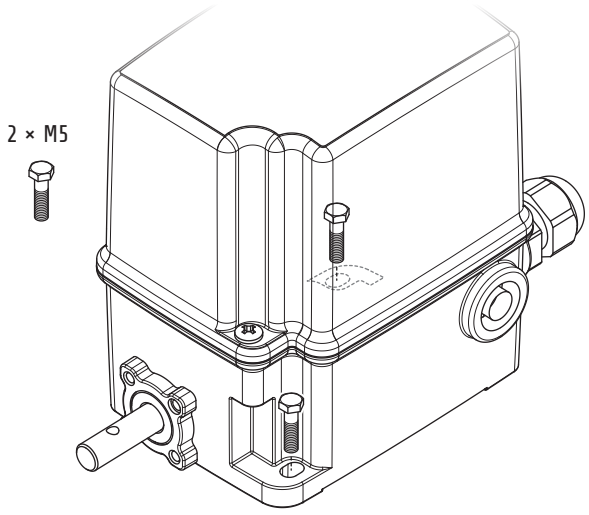


Fixing points for flanged configuration

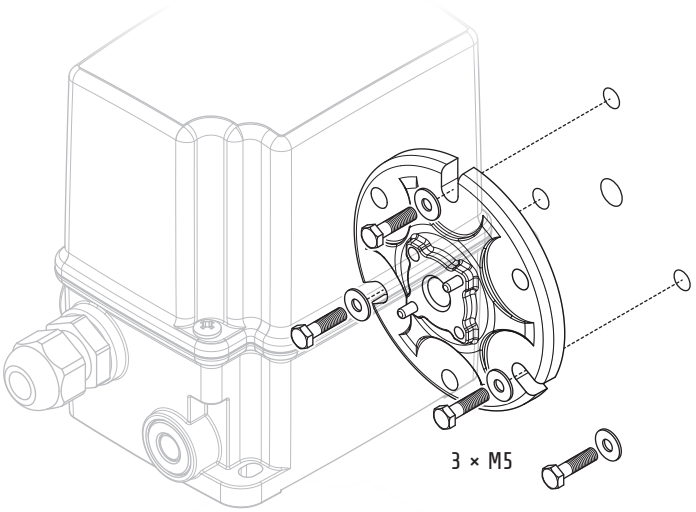


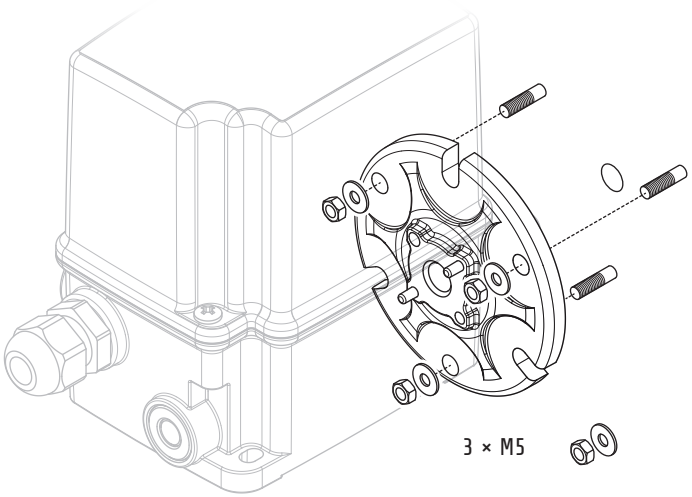


Base configuration fixing



Flanged configuration fixing

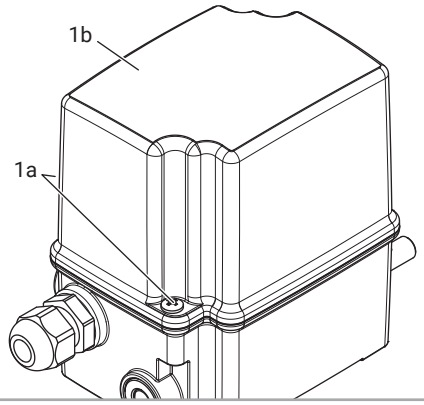




ATTENTION
TO CARRY OUT THE FOLLOWING OPERATIONS, THE LIMIT SWITCH COVER MUST BE REMOVED. ON THE COVER ARE PLACED VERY IMPORTANT INFORMATION CONCERNING THE LIMIT SWITCH YOU ARE INSTALLING. THE COVER MUST BE REASSEMBLED ON THE CORRESPONDING BODY. REASSEMBLING THE COVER ON A NON-CORRESPONDING BODY CAN LEAD TO AN INCORRECT INTERPRETATION OF THE LIMIT SWITCH OPERATION AND THEREFORE CAUSING SERIOUS DAMAGE TO THINGS AND PEOPLE DURING USE.

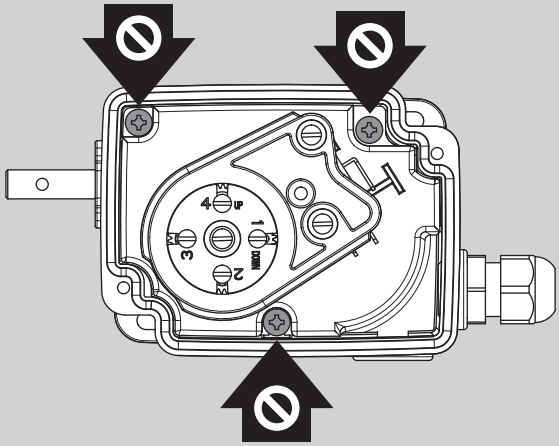
ATTENTION
The following procedures show an FGR limit switch with 4 microwsitches but remain valid for any other configuration.

Limit switch wiring

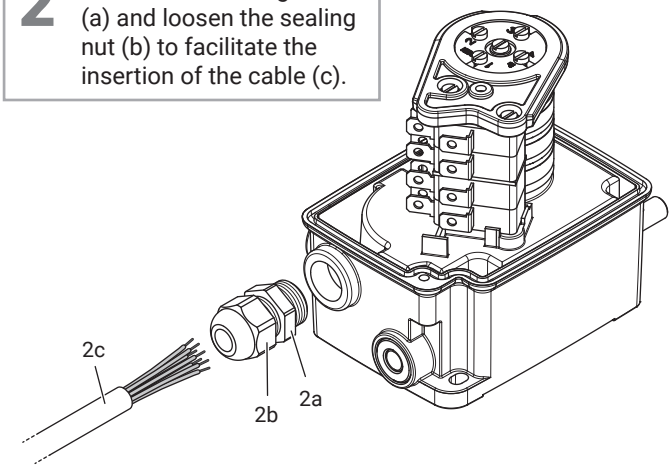


1 Unscrew the 2 screws (a) and remove the cover (b).

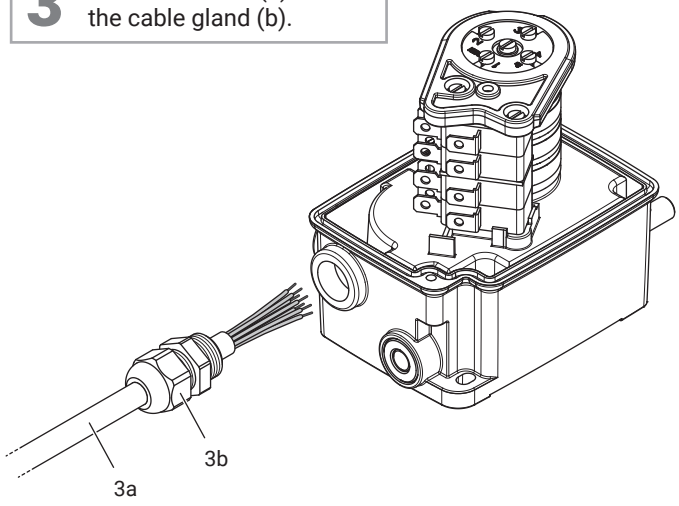
ATTENTION
It is strictly forbidden to unscrew the screws indicated in the figure. Their removal can compromise the operation of the limit switch and therefore cause serious damages to things and people during use.

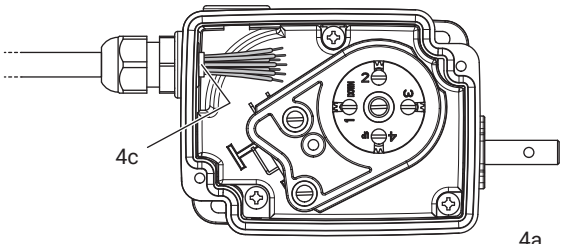


2 Remove the cable gland (a) and loosen the sealing nut (b) to facilitate the insertion of the cable (c).

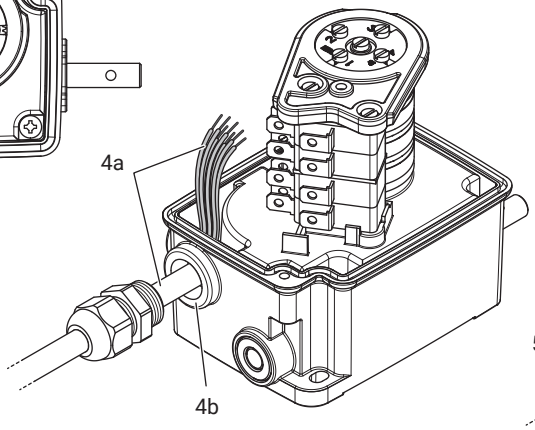


3 Insert the cable (a) into the cable gland (b).

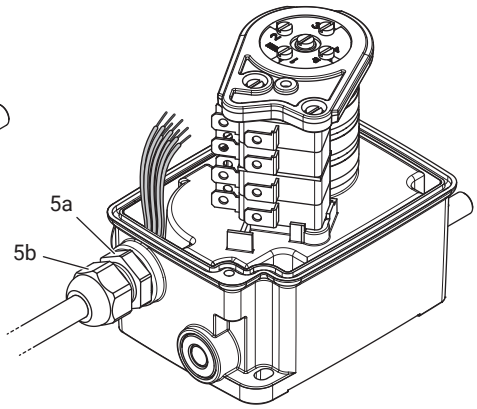




4 Insert the cable (a) in the limit switch (b) taking care not to let the cable sheath (c) protrude too much.

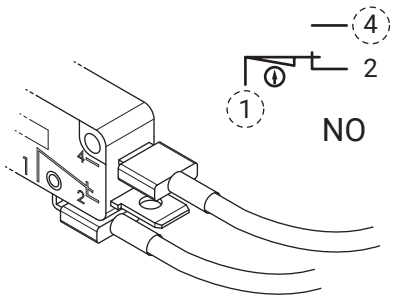
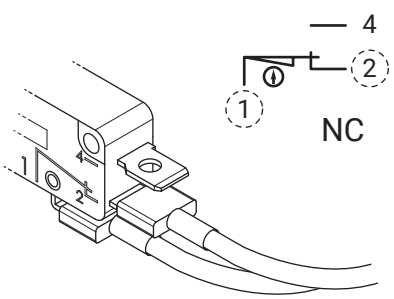
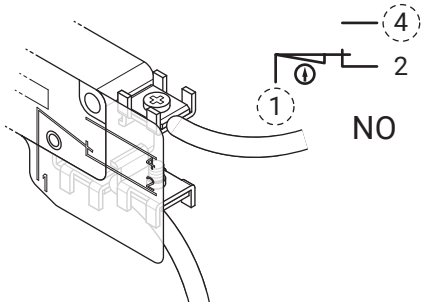
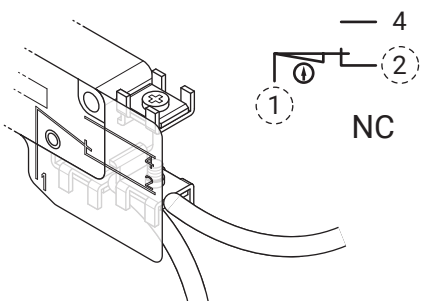


5 Fix the cable gland (a) and then tighten the sealing nut (b).



Microswitches wiring

The FGR rotary gear limit switch can be equipped with 2 or more microswitches among those shown below.
The wiring of the microswitches can be carried out to obtain an NO contact, an NC contact or both.

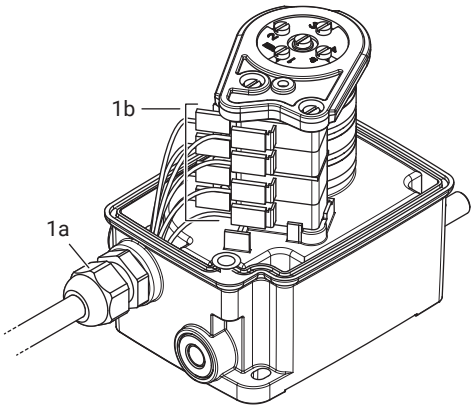
	NO	NC
To wire the microswitches it is necessary to use fastons suitable for a 6.3×0.8 mm contact.		
To wire the microswitches it is necessary to strip the end of the cable (1.5 mm²) and screw it into the terminal (M3 screws).		

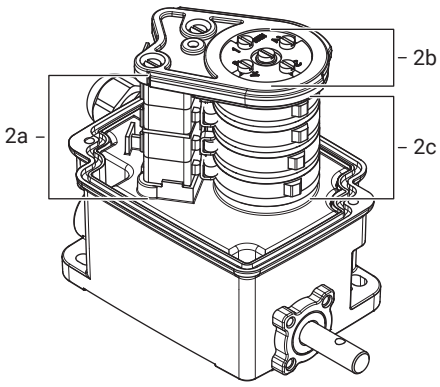
Cams adjustment

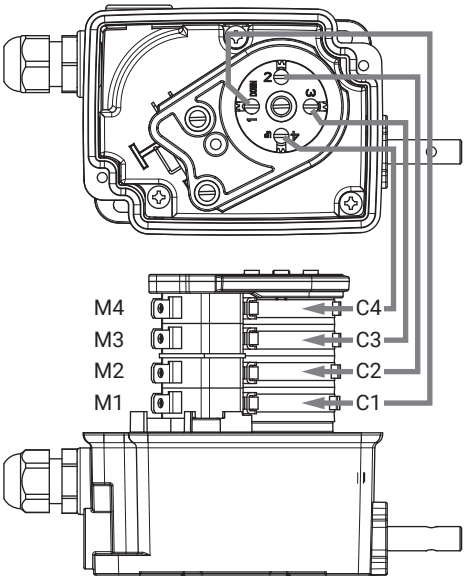
1 After having wired the limit switch (a) and connected the cables to the microswitches (b), proceed to adjust the cams as follows.

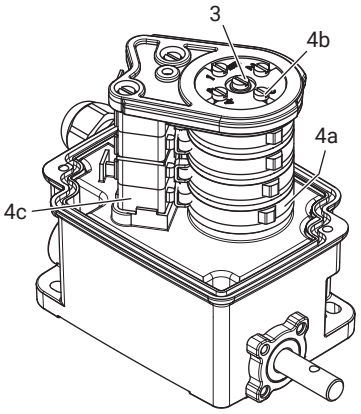
ATTENTION
The procedure implies that the FGR has already been coupled to the gearmotor of the system to be monitored.

2 The cam pack shown in this procedure is equipped with 4 microswitches (a). The correspondence between calibration screws (b), cams (c) and microswitches (a) is shown in the diagram.





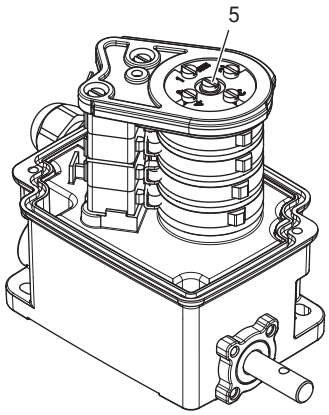




3 Loosen the main screw to release the calibration mechanism.

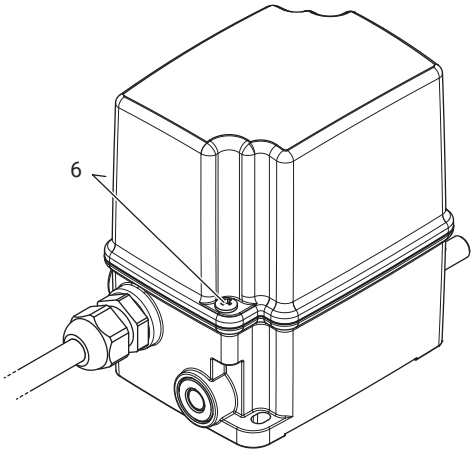
4 Adjust each cam (a) with the calibration screws (b). The cam must rotate until the microswitch trips (c).

ATTENTION
The direction of rotation of the calibration screw corresponds to direction of rotation of the cam.



5 At the end of the operation, tighten the main screw to lock the calibration mechanism.

TIGHTENING TORQUE
1.8-2.2 N×m
16-19.5 lb×in

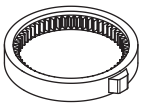
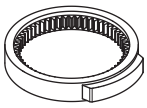
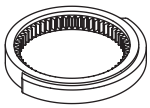
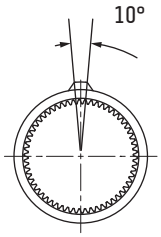
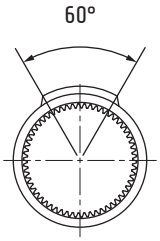
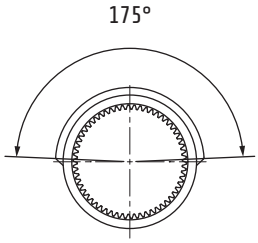
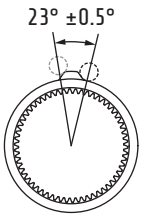
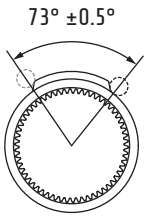
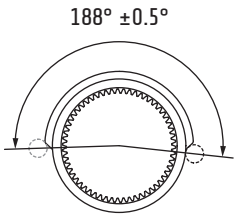


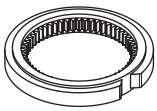
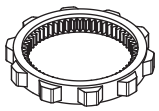
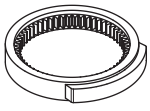
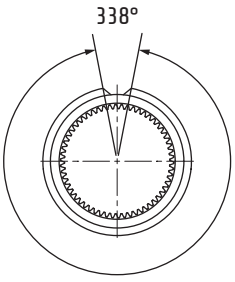
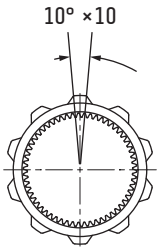
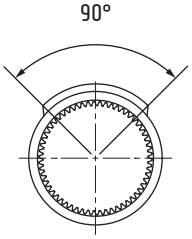
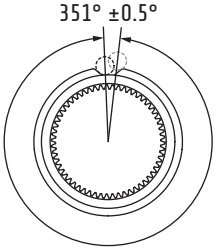
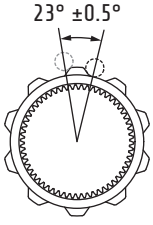
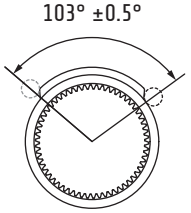
6 Close the limit switch cover by tightening the screws.

TIGHTENING TORQUE
1.6-1.8 N×m
14.2-15.9 lb×in

Camshapes

Material PA66

Standard “A” (10°)	“B” (60°)	“C” (180°)
16020081	16020097	16020094
		
		
		

“D” (opposite)	“E” (10 tips)	“F” (90°)
16020095	16020093	16020089
		
		
		

MAINTENANCE AND REPAIR TERMS AND CONDITIONS

Maintenance

Maintenance is required to guarantee the level of protection provided by the types of protection of this equipment. Periodical verifications are required. The following operations shall be carried out with the frequency indicated in the table.

Operation required	Frequency	Action
Check that the screws are in place, free of corrosion.	Each time the enclosure is opened and then closed	In case of fault contact manufacturer for substitution
Check that the screws are tightened with a correct torque.	Annually and each time the enclosure is opened and then closed	Tight with the torque according to this document.
Check the condition of the enclosure: (enclosure is not damaged).	- Each time the enclosure is opened and then closed. - Annually. - In case of impact.	In case of fault contact manufacturer for substitution.
Check that the gaskets - are not damaged. - are placed correctly. - the thickness is not compromised by compression.	Each time the enclosure is opened and then closed.	In case of fault contact manufacturer for substitution.
Check if a dust layer is present on upper and plane surfaces.	Depending on the frequency of dust deposits.	Clean the surfaces periodically and remove the dust layer. In case of frequent deposit limiting the thickness of the layer less than 5 mm.
Control the correct work of mircos.	Annually if the usage is not continuous (quarterly under continuous use conditions h24).	To verify that the ratio of the rotations set originally during installation are maintained.

CERTIFICATIONS

Worm screw limit switches FGR series are in conformity with the following standards or other normative documents:

EN 60947-1	2007/A1 : 2011/A2 : 2017
EN 60947-5-1	2004/A1 : 2009/AC : 2004/AC : 2005
EN 60204-1	2006/A1 : 2009
EN 60529	1991/A1 : 2000/A2 : 2013
EN 50581	2012
IEC 63000	2016

and therefore follow the provision of the Directives:

2014/35/UE
2014/33/UE
2011/65/UE
2015/863/UE

Markings: CE, CCC, EAC, UKCA