

ROTARY GEAR LIMIT SWITCHES

For more than 65 years, **Giovenzana International B.V.** has been designing and producing rotary gear limit switches, offering now four different series.

Rotary gear limit switches are used to control the movement of industrial machinery when it's necessary to measure movement based on the rotation angle and/or the number of shaft revolutions, providing upper, lower and/or intermediate limits for moving machinery and mechanisms.

Usually connected to the motor shaft, the rotary gear limit switch uses a series of gears and cams to activate a microswitch when the appropriate number of rotations is reached. This is generally used to stop the motor when a moving load has reached the desired position or final positions.

The device, through a gear transmission, controls a cam system operating on 2, 4 or more microswitches that after a certain number of revolutions predispose the motor or the equipment to the start or stop.

Each cam is equipped with a "micrometric" adjustable register screw that operates in an independent way, so it is possible to calibrate the opening and closing of each microswitch according to the necessary requirements.

The gear transmission system allows to choose different ratios and can be supplied in a bi-protruding shaft version or with linear control (potentiometer or encoder).

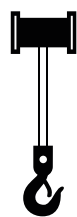
Each series of rotary limit switch has specific features which reduce time and costs for installation and maintenance.

Giovenzana International B.V. offers rotary gear limit switches with standard input ratios from 1:12 to 1:400 (custom input ratios are available on request up to 1:1482). They can be configured with maximum 6 contacts and combined with encoders and potentiometers to reach your own needs. We can offer snap action switches and different cam type to meet customers requirements.

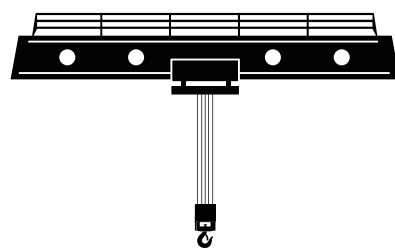
The wide range of the input ratios (standards and customized) available in our series, make every customers and applications needs satisfied.

APPLICATIONS

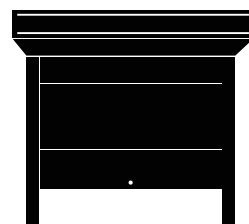
Giovenzana rotary limit switches are suitable for several applications: from lifting machinery to industrial overhead doors and boat lifts, from theatre lighting hoists to renewable energy systems, like wind turbines.



HOIST



CRANE



INDUSTRIAL DOORS



WIND TURBINES

SERIES



FGR0



FGR1



FGR2



FGR3

FEATURES

- The revolutions of the shaft are transmitted to a cam switch mechanism, through which mechanical switching contacts are actuated.
- Different ratios (also direct ratios) are available for the rotary gear limit switches of the FGR series.
- The switch can be equipped with a maximum of 8 switching contacts.
- Positive opening NC contacts for safety functions.
- Each cam can be individually adjusted to the desired position and thus enables flexible definition of end positions and reference points. More accurate adjustment of cams by means of screws.
- To reduce abrasion and rust, the transmission and guide shafts of the gears are made of stainless steel.
- The circumferential rubber gasket provides great protection against dust and water, allowing IP66 protection to be easily achieved for the entire products range.
- The optimised interior allows quick and easy cabling.

BENEFITS






- › High protection class degree
- › Extreme temperature resistance: -30°C to +70°C
- › Easy use, resistance and durability
- › Guaranteed safety

Coding system

The FGR2 coding system is very clear: each block of digits identifies a specific function. The code provides all the informations that can be used to specify each customization.

FGR2	F	N	006/007/008/009/010	B	6
Series	Flange	Contact type	Identifyng number	Shaft type	Micro/cams
	Blank = Without F = With flange	MFI.7		Blank = Single shaft B = Double overhang shaft	Blank = Nr. 4 6 = Nr. 6
STANDARD ENCODING					

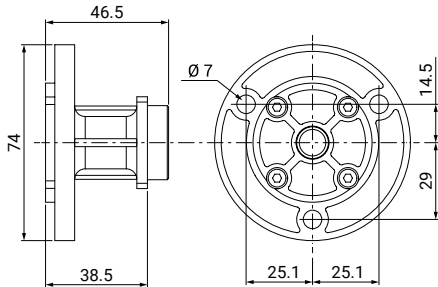
Available codes

Ratio	Base fixing 4 microswitches	Base fixing 6 microswitches	Double overhang shaft 4 microswitches	Double overhang shaft 6 microswitches
				
1:12	FGR2N006	FGR2N0066	FGR2N006B	FGR2N006B6
1:33	FGR2N007	FGR2N0076	FGR2N007B	FGR2N007B6
1:50	FGR2N008	FGR2N0086	FGR2N008B	FGR2N008B6
1:100	FGR2N009	FGR2N0096	FGR2N009B	FGR2N009B6
1:200	FGR2N010	FGR2N0106	FGR2N010B	FGR2N010B6

Front fixing + FLG
4 or 6 microswitches



FGR2 Base fixing + FLG

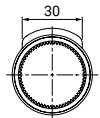


AVAILABLE CONTACT TYPES

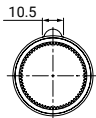


MFI.7

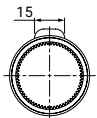
AVAILABLE CAM SHAPES



11703015
A (30°) - STANDARD



11703019
B (15°)



1173013
C (90°)

Rotary gear limit switch

The **FGR3** is a device used to control and measure the movement of industrial machines by measuring the rotation angle and/or counting the number of revolutions of a shaft. It is suitable for several applications like cranes and wind turbines.

Geneal features

- Different versions available:
 - base fixing;
 - with double overhang shaft;
 - front fixing (on request).
- IP66 protection class.
- Available in different ratios: from 1:8 to 1:3572 (according to the configuration).
- Microswitches:
 - device available potentially until 8 microswitches;
 - the working point is adjustable with a calibration screw;
 - each switch has 1NO + 1NC inside;
 - positive opening for NC contacts.

Compliance and certifications

- 2014/35/UE - 2014/33/UE - 2011/65/UE - 2015/863/UE
- EN 60947-1 (2007/A1 : 2011/A2 : 2014)
- 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)



Base Fixing versions

X-ray view

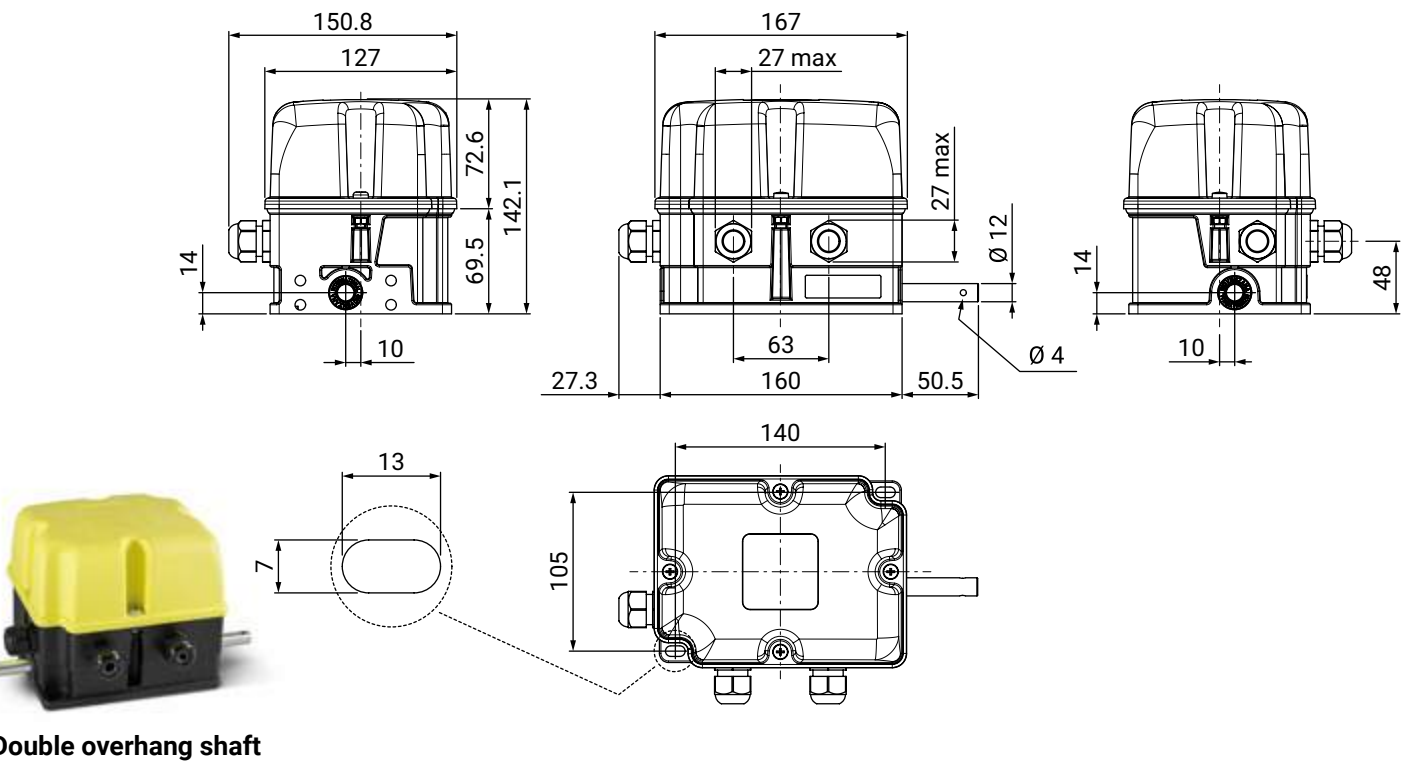
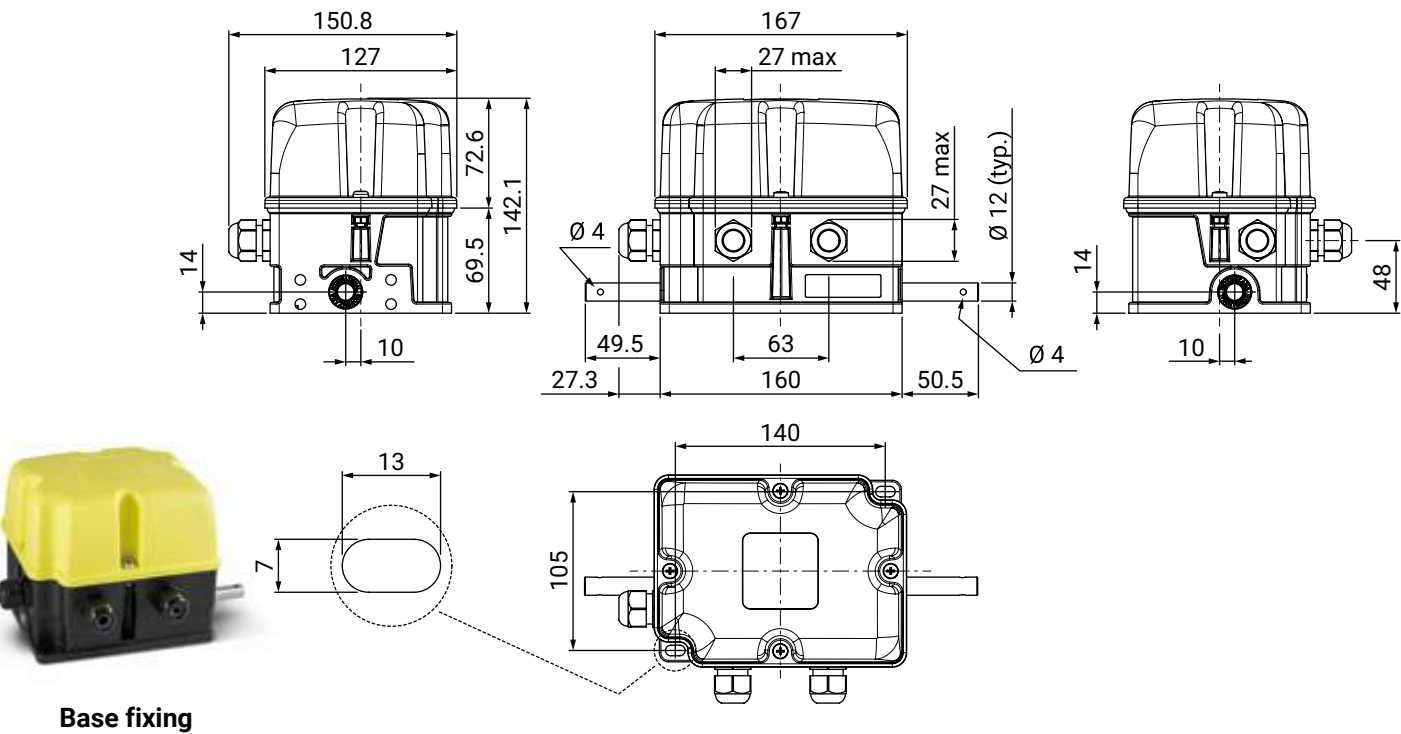


6 microswitches



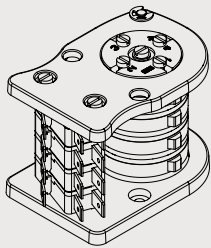
4 microswitches
with potentiometer

Available codes



FGR3
Internal cam pack
4 microswitches

MFI.7



Coding system

The **FGR3** coding system is very clear: each block of digits identifies a specific function. The code provides all the informations that can be used to specify each customization.

FGR3	0-8	001-999	0-2-3-4	1-2-3-4	51-73	-	00-99
Series	Encoder / Potentiometer	Nr. gear ratio	Micro/cams	Shaft type	Pinion type	-	Options
	0 = No sensors 1 = Incremental Encoder D22 2 = Potentiometer 2.5 K Ω 3 = Potentiometer 5 K Ω 4 = Potentiometer 10 K Ω 5 = Absolut Encoder D36 6 = Incremental Encoder P/P 5000 imp. 7 = Absolut/Incremental Encoder D36 8 = Absolut Encoder D58 A ... Z = Custom on request	Between: - shaft and cam pack output; - shaft and sensor output; - both.	0 = None 2 = Nr. 2 3 = Nr. 3 4 = Nr. 4 5 = Nr. 5	1 = Single shaft and reduction in cam output. 2 = Double overhang shaft and reduction in cam output. 3 = Single shaft and reduction in both cam and sensor output. 4 = Double overhang shaft and reduction both in cam output and in sensor output.	Last two numbers of the pinion code. (refers to pages 86-87).	-	Progressive versions

Available codes




Available options


- Can be supplied with front fixing. Available different typologies of flanged accessories, on request.
- Can be equipped with MFI.7 microswitches (standard version) or with MFI.7G micro switches (gold contact blocks - offshore use).
- Can be equipped with incremental or absolut encoder, available also with external encoder mounted.

The **FGR3** series is a totally customizable products.
Create your own devices using the FGR3 coding system!

AVAILABLE CONTACT TYPES

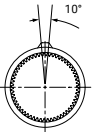


MFI.7

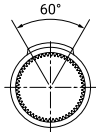


MFI.7G
On request
Offshore use

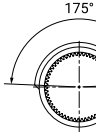
AVAILABLE CAM SHAPES



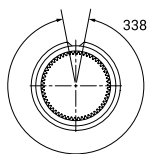
16020081
A (10°) - STANDARD



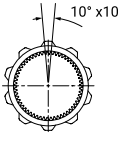
16020097
B (60°)



16020094
C (180°)



16020095
D (opposite)

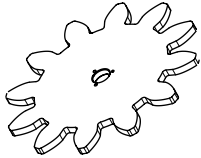
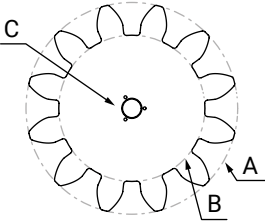
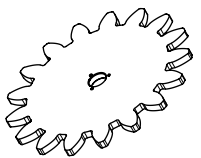
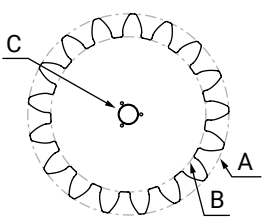
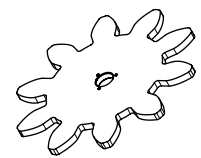
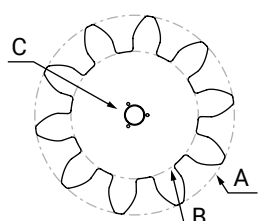
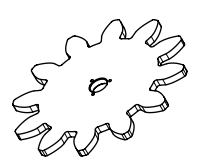
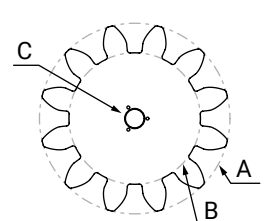
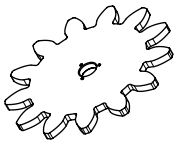
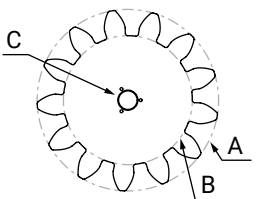
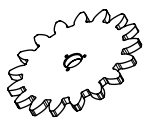
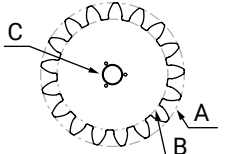

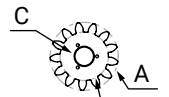
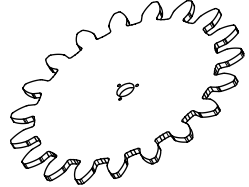
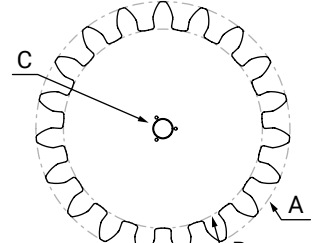


16020093
E (10° tips)



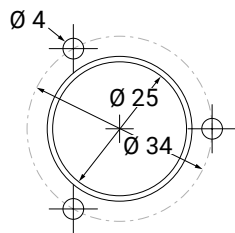
Water jet cut pinions

Our measuring pinions are specially manufactured for use with encoders and geared limit switches.
Pinions thickness = 10 mm.

 	 	 	 
16020051 M20 - Z12 A = Ø 280 / B = Ø 193.2	16020052 M14 - Z17 A = Ø 266 / B = Ø 205.24	16020053 M22 - Z10 A = Ø 264 / B = Ø 168.52	16020054 M18 - Z12 A = Ø 252 / B = Ø 173.88
 	 	 	 
16020055 M16 - Z13 A = Ø 240 / B = Ø 170.56	16020056 M10 - Z17 A = Ø 190 / B = Ø 146.6	16020057 M6 - Z13 A = Ø 90 / B = Ø 63.96	16020070 M16 - Z19 A = Ø 336 / B = Ø 263,2

Detail C


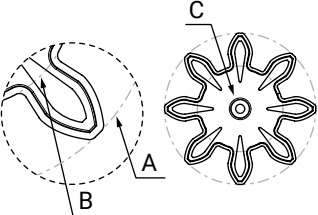
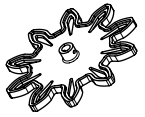
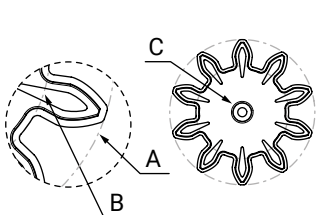

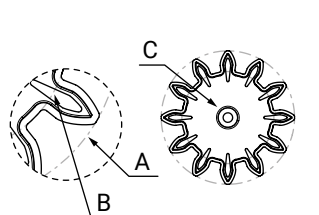
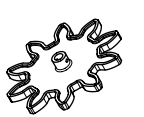
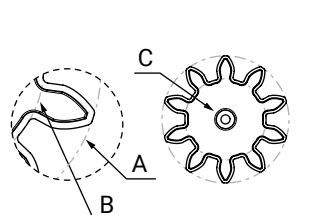

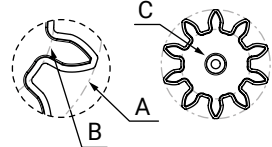

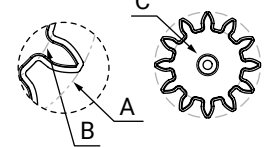

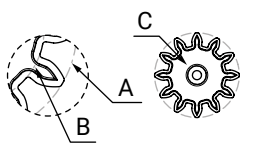

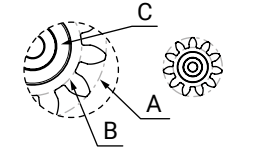

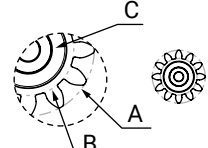

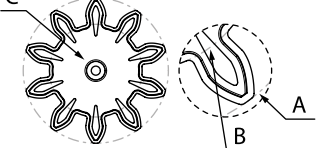



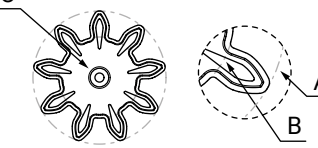
For all previous pinions.
Finished product measurements.



SPARE PARTS & ACCESSORIES

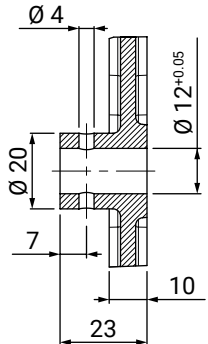
Rotary gear limit switch

Injection moulded pinions

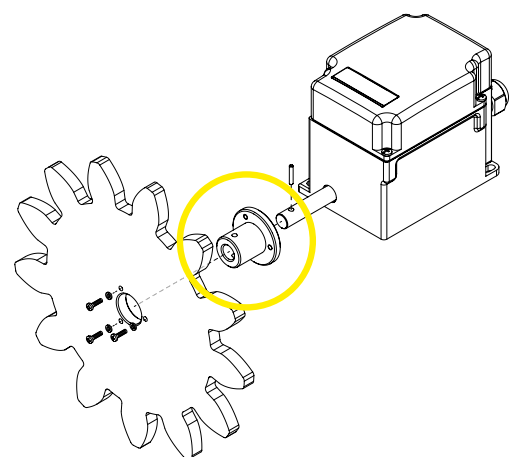
 	 	 	 
16020058 M20 - Z8 A = Ø 200 / B = Ø 113.2	16020059 M13 - Z10 A = Ø 192 / B = Ø 122.56	16020060 M12 - Z12 A = Ø 176.4 / B = Ø 121.716	16020061 M14 - Z10 A = Ø 168 / B = Ø 107.24
 	 	 	 
16020062 M12 - Z10 A = Ø 144 / B = Ø 91.92	16020063 M10 - Z12 A = Ø 140 / B = Ø 96.6	16020064 M8 - Z12 A = Ø 112 / B = Ø 77.28	16020065 M6 - Z11 A = Ø 78 / B = Ø 51.96
 	 	 	 
16020066 M5 - Z12 A = Ø 70 / B = Ø 48.3	16020068 M16 - Z20 A = Ø 192 / B = Ø 122.56	16020069 M18 - Z11 A = Ø 234 / B = Ø 155.81	16020071 M16 - Z19 A = Ø 176 / B = Ø 107.285

Detail C

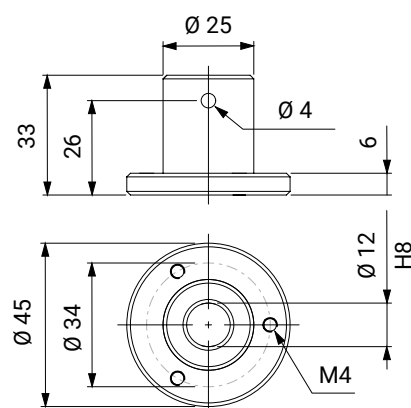
For all previous pinions.



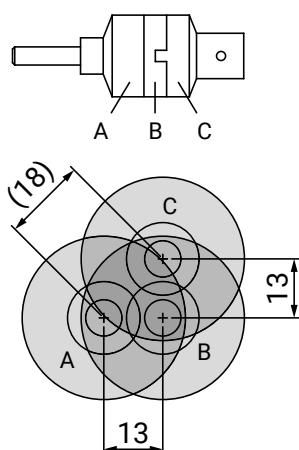
Metal sleeve for water jet cut pinions



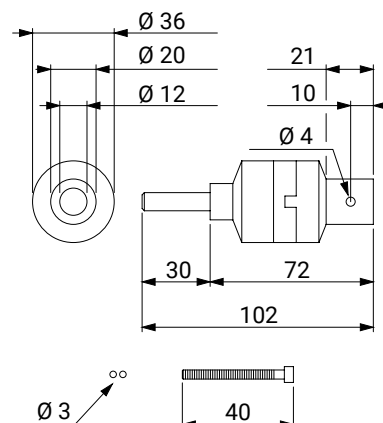
16020050



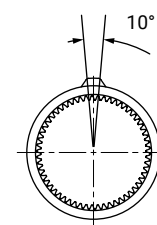
Oldham coupling



FGH

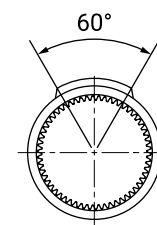


Cam shapes for FGR0, FGR1, FGR3



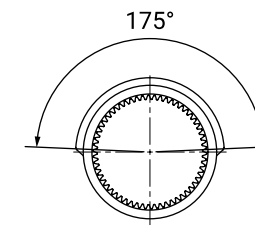
16020081

A (10°) - STANDARD



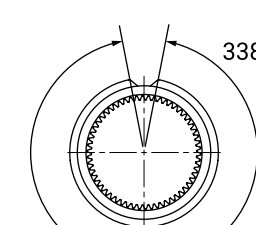
16020097

B (60°)



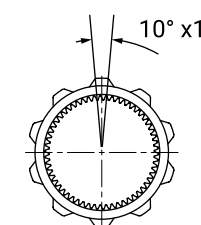
16020094

C (180°)



16020095

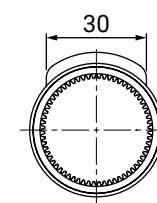
D (opposite)



16020093

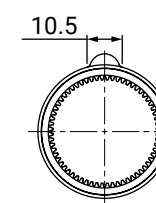
E (10 tips)

Cam shapes for FGR2



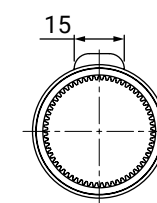
11703015

A (30°) - STANDARD



11703019

B (15°)



11703013

C (90°)

Available customised versions on request.