

GENERAL TECHNICAL DATA ROTARY ACTUATORS

DEVICES

The use of hydraulic decelerators means it is possible to increase absorbed power. Some models in the catalogue have built-in decelerators. For those without, the user can mount decelerators outside the actuator.
With horizontal axis rotation, if the masses are distributed asymmetrically it may be difficult to keep a constant rotation speed using flow regulators only. In this case it is advisable to use a decelerator.

CALCULATIONS

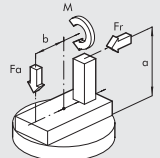
The following needs to be calculated:

- Absorbed kinetic energy
- Axial forces on the shaft or rotating flange
- Radial force on the shaft or rotating flange
- Overturning moment

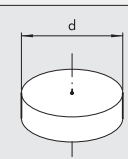
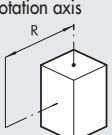
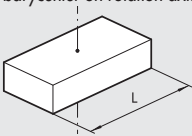
Then compare each of the 4 sizes with the admissible ones shown in the catalogue for each rotary actuator. Remember that the application of optional hydraulic decelerator, where envisaged, doubles the kinetic energy that can be absorbed by the actuator.

SIZING

HOW TO CALCULATE KINETIC ENERGY

Denomination	Unit of measurement	Formula	Example
			
α	Angle of rotation	rad $= \text{degrees} \cdot \frac{\pi}{180}$	$= 90^\circ = \frac{\pi}{2} \text{ rad.}$
t	Rotation time	s	2
J_{ta}	Moment of inertia of rotating masses N.B.: added those of the individual masses	kg m^2 $= \sum J_i$	$= 0.078 + 0.02 + 0.133 = 0.232$
E	Kinetic energy	Nm $= 1/2 J \omega^2 = 2J \cdot \left(\frac{\alpha}{t}\right)^2$	$= 2 \cdot 0.232 \cdot \left(\frac{\pi}{2}\right)^2 = 0.57$
F_r	Radial force (Remember to take into account centrifugal forces)	N $(F_c = M \cdot \omega^2 \cdot R)$	50
F_a	Axial force	N	10
M	Overturning moment	Nm $= M + F_r \cdot a + F_a \cdot b$	$= 50 \times 0.1 + 10 \times 0 = 5$

MOMENTS OF INERTIA FOR THE MOST COMMON SHAPES

Denomination	Unit of measurement	Formula	Example
		Disco 	
M	Disk mass	kg	7
d	Disk diameter	m	0.3
J	Moment of inertia of the disk	kg m^2 $= \frac{M d^2}{8}$	$= \frac{7 \cdot 0.3^2}{8} = 0.0787$
		Mass distant from rotation axis 	
M	Mass	kg	0.5
R	Distance between barycenter and rotation axis	m	0.2
J	Moment of inertia of the mass	kg m^2 $= M R^2$	$= 0.5 \times 0.2^2 = 0.02$
		Parallelepiped with barycenter on rotation axis 	
M	Mass	kg	10
L	Side of the parallelepiped	m	0.4
J	Moment of inertia of the mass	kg m^2 $= M \frac{L^2}{12}$	$= \frac{10 \cdot 0.4^2}{12} = 0.13$

ROTARY ACTUATOR SERIES R1

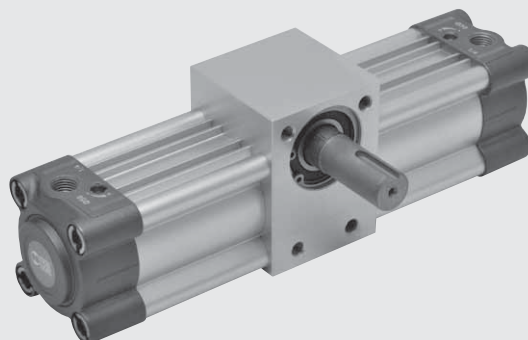
**METAL
WORK**[®]
P N E U M A T I C

Rack-type rotary actuators in various configurations:

- Configuration with standard magnet
- Version with male pinion or female hole
- Mechanical stroke adjustment
- Special configurations on request

The central body has ISO bore holes for wall fixing using ISO pin and/or flange fittings.

N.B.: We always suggest to use flow microregulators.
During the setup of the actuator, start with CLOSE flow microregulators,
and open gradually till the achievement of the required speed.



TECHNICAL DATA		Ø 32	Ø 40	Ø 50	Ø 63	Ø 80	Ø 100
Gaskets		NBR					
Operating pressure	bar	10					
	MPa	1					
	psi	145					
Temperature range	°C	- 10 to + 80					
Fluid		Filtered lubricated or unlubricated air. Lubrication, if used, must be continuous					
Rotation angle		90°; 180°; 270°; 360°					
Type of construction		Extruded profile					
Configuration		Magnetic standard cushioned					
Axial load	N	2500	2800	4500	5600	8500	12200
Max. moment (6 bar - 0.6 MPa)	Nm	4.5	12.5	16	32	70	120

N.B.: The product is supplied with negative end-of-stroke piston (in the proximity of head A).
The first cycle involves movement of the piston (towards head B) with consequent anti-clockwise rotation of the pinion.

ACTUAL ROTATION ANGLE

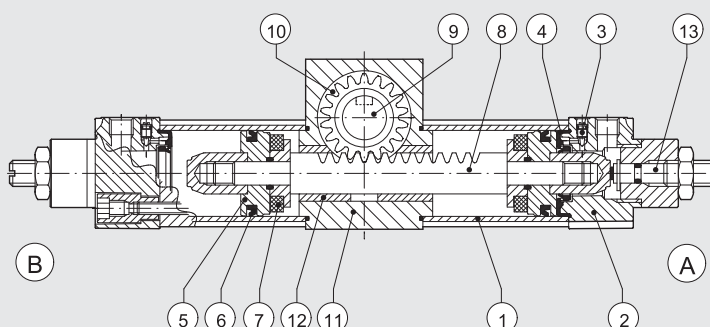
Actuators without regulation of the rotation angle: the manufacturing tolerance is $+ 4^\circ/0^\circ$ compared to the nominal value
Actuators with regulation of the rotation angle: the possible regulation ranges from $+ 2^\circ/- 20^\circ$.

WEIGHTS [kg]

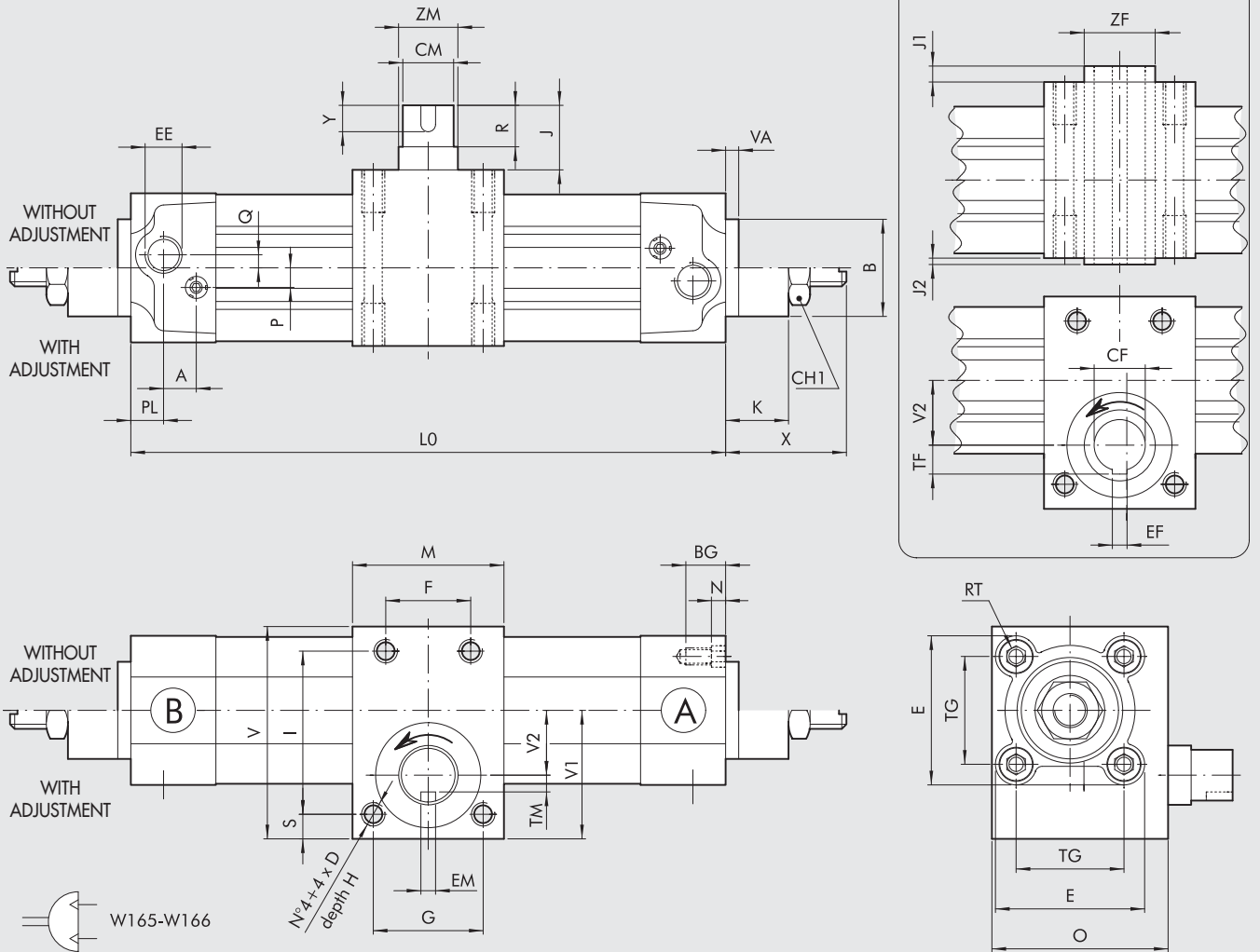
Ø	VERSION W165__1__				VERSION W165__2__				VERSION W166__1__				VERSION W166__2__			
	Rotation angle				Rotation angle				Rotation angle				Rotation angle			
	90°	180°	270°	360°	90°	180°	270°	360°	90°	180°	270°	360°	90°	180°	270°	360°
32	1.25	1.36	1.47	1.58	1.50	1.62	1.73	1.84	1.18	1.30	1.40	1.51	1.44	1.55	1.61	1.77
40	1.85	1.90	2.15	2.30	2.26	2.41	2.43	2.56	1.74	1.79	2.04	2.19	2.15	2.30	2.32	2.45
50	2.80	3.02	3.24	3.46	3.48	3.70	3.91	4.13	2.63	2.85	3.07	3.29	3.30	3.52	3.74	3.96
63	4.02	4.30	4.58	4.85	4.85	5.13	5.40	5.67	3.75	4.02	4.30	4.57	4.57	4.85	5.12	5.39
80	7.90	8.53	9.13	9.73	9.77	10.41	11.00	11.60	7.26	7.90	8.49	9.09	9.13	9.77	10.37	10.97
100	12.30	13.20	14.10	15.01	14.17	15.07	16.00	16.90	11.13	12.03	12.94	13.85	13.00	13.90	14.81	15.73

COMPONENTS

- ① BARREL: profiled anodised aluminium alloy
- ② HEAD: die cast aluminium
- ③ CUSHIONING NEEDLE: OT 58 with needle out movement safety system even when fully open
- ④ BUFFER + Static O-rings: NBR or FKM/FPM
- ⑤ PISTON: aluminium
- ⑥ PISTON GASKET: NBR
- ⑦ MAGNET: plastoferrite
- ⑧ RACK: AISI 304
- ⑨ PIGNON MALE/FEMALE: nitrided alloy steel
- ⑩ BALL BEARING
- ⑪ CENTRAL BODY: anodised aluminium
- ⑫ RACK GUIDE BUSH: self-lubricating sintered bronze
- ⑬ REGULATION SCREW: AISI 303



DIMENSIONS OF ROTARY ACTUATOR Ø 32 to 100



Note: with the key slot in the position specified, the piston is in contact with head (A)

Ø	LO ±1 for ROTATION ANGLE				Δ	A	B	BG	CM ^{g7}	CF ^{g7}	CH1	D	E	EE	EF ^{D10}	EM ^{H9}	F	G	H	I	J
	90°	180°	270°	360°																	
32	218.7	261.1	303.5	345.9	0.236	10	30	15.5	14	10	22	M6	46	G1/8	3	5	30	30	14	50	34.5
40	241.4	288.6	335.6	382.8	0.262	10	35	15.5	16	12	22	M6	54	G1/4	4	5	30	30	14	60	39.5
50	265.9	322.4	379.0	435.5	0.314	10	40	18.5	19	14	27	M8	64.5	G1/4	5	6	32	45	16	65	46.5
63	295.1	358.0	420.8	483.6	0.349	10	45	18.5	24	16	27	M10	75.5	G3/8	5	8	38	52	17	73	47.5
80	358.3	443.1	528.0	612.8	0.471	12	45	21.5	28	25	36	M12	94	G3/8	8	8	48	70	20	100	58.5
100	399.8	500.4	600.9	701.4	0.559	12	55	21.5	38	30	36	M14	111	G1/2	8	10	60	80	25	120	67

Ø	J1	J2	K	M	N	O	P	PL	Q	R	RT	S	TG	TF	TM	V	V1	V2	VA	X	Y	ZM	ZF
32	4.5	-	16	47	4.5	47	6	10	4	30	M6	9	32.5	6.4	4	68	44.5	19	4	32 - 35.5	20	15	15
40	5	2	20	52.5	4.5	54.5	6	12	4	35	M6	7	38	7.8	5	74	45	22	4	45.5 - 50	25	17	17
50	7	-	25	63	5.5	64	6	14	6	40	M8	10	46.5	9.3	6	85	51	25	4	48.5 - 53	25	20	20
63	2.5	-	25	75	5.5	75	6	16	6	45	M8	11	56.5	10.3	8	95	56	27.5	4	46.5 - 51	30	25	25
80	8.5	-	33	95	5.5	95	10	18	7	50	M10	12.5	72	15.8	10	125	76	39	4	61 - 67	35	35	35
100	7	-	38	108	5.5	110	10	20	7	60	M10	15	89	18.3	14	150	90.5	45.5	4	66.5 - 74.5	45	45	45

Δ = Linear displacement (mm) for each degree of rotation

KEY TO CODES

W165 TYPE		050 BORES	1 VERSION	090 ANGLE OF ROTATION •
W165	Rotary actuator with male pinion	032 040	1 Without adjustment of rotation angle	090 180
W166	Rotary actuator with female pinion	050 063 080 100	2 With adjustment of rotation angle	270 360

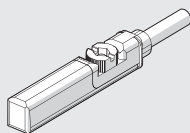
• expressed in sexagesimal degrees.

ACCESSORIES: MAGNETIC SENSORS

RETRACTABLE SENSOR

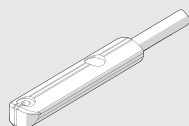
SENSOR, SQUARE TYPE

Latest generation,
secure fixing



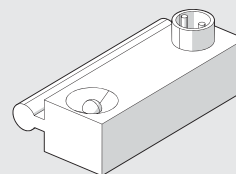
SENSOR, OVAL TYPE

Traditional



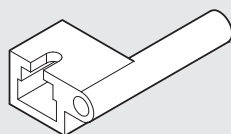
For codes and technical data, see **chapter A6**.

SENSOR SERIES DSM



For codes and technical data, see **chapter A6**.

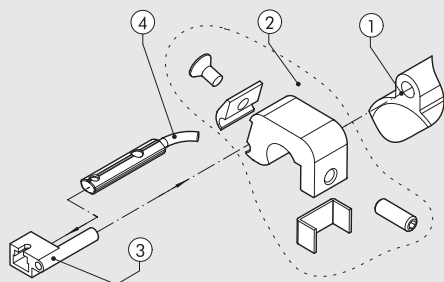
ADAPTER FOR OVAL TYPE RETRACTABLE SENSORS



Code	Description
W0950001001	Adaptor DSS005 for DST/ST brackets

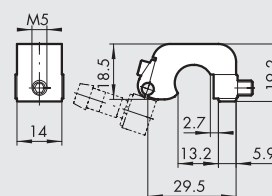
ASSEMBLY DIAGRAM

- ① Rotary actuator Serie R1
- ② Sensor bracket mod. DST (Ø 32 to 100)
- ③ Adaptor
- ④ Retractable sensor "oval type"



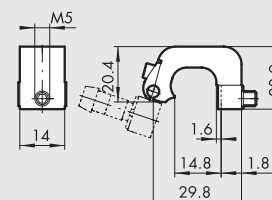
SENSOR SUPPORT BRACKETS FOR SENSORS DSM

Ø 32 to 40



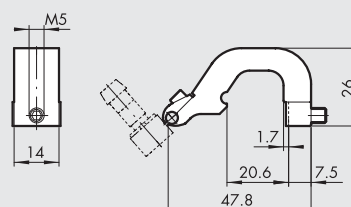
Code	Description
W0950000711	Bracket D.32-40 DST 80

Ø 50 to 63



Code	Description
W0950000712	Bracket D.50-63 DST 81

Ø 80 to 100

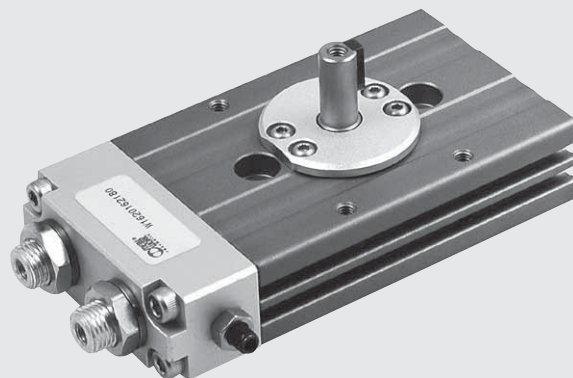


Code	Description
W0950000713	Bracket D.80-100-125 DST 82

ROTARY ACTUATOR SERIES R2

Actuator with double rack and play take-up.
Four sizes – 12, 16, 20 and 25. Two angles of rotation – 90° and 180°.
Stroke adjustment system for all sizes. Pneumatic cushioning for all sizes except the smallest. There are slots in the body to house a magnetic proximity sensor. Air supply, stroke adjustment and cushioning adjustment are all on the same side.

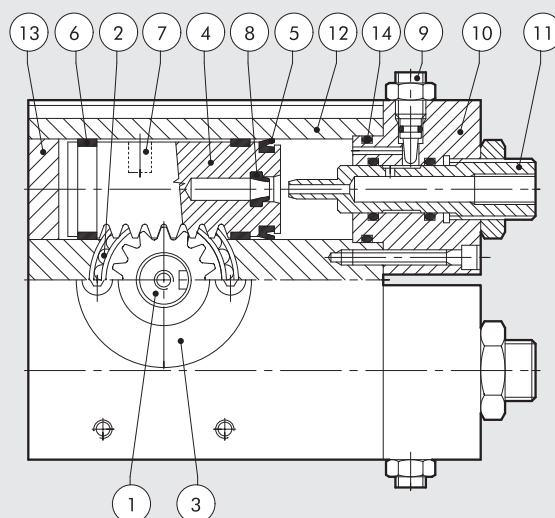
N.B.: We always suggest to use flow microregulators.
During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievement of the required speed.



TECHNICAL DATA		R2-12	R2-16	R2-20	R2-25
Operating pressure	bar	1.5 to 7			
	MPa	0.15 to 0.7			
	psi	22 to 101			
Temperature range	°C	-10 to +80			
Angle adjustment	degrees	35° (about +10° -25°)			
Fluid		20 µm filtered, lubricated or unlubricated air; lubrication if used, it must be continuous			
Versions		90°/180° rotation			
Ports		Both at the front			
Sizes	mm	12	16	20	25
Theoretical torque (ΔP = pressure in bar)	Nm	0.065 x P	0.11 x P	0.21 x P	0.48 x P
Max. axial load	N	8	14	40	80
Max. radial load	N	8	14	40	80
Weight with 90° rotation	kg	0.18	0.26	0.63	0.8
Weight with 180° rotation	kg	0.21	0.31	0.72	1
Rotation time without load:					
• 90° angle	s	0.2	0.2	0.2	0.2
• 180° angle	s	0.3	0.3	0.3	0.3

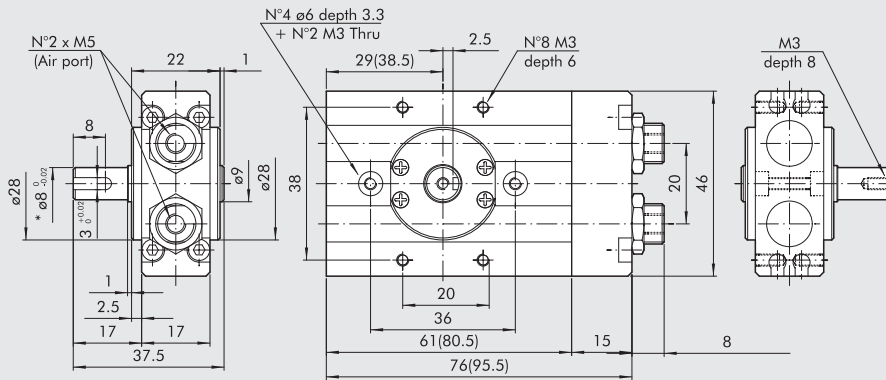
COMPONENTS

- ① ROTARY SHAFT / PINION: hardened and tempered steel
- ② BALL BEARING
- ③ FLANGE: anodised aluminium
- ④ PISTON / RACK: hardened and tempered steel
- ⑤ PISTON GASKET: NBR
- ⑥ GUIDE PAD: PTFE
- ⑦ MAGNET: neodymium
- ⑧ CUSHIONING GASKET: NBR
- ⑨ CUSHIONING PIN: zinc-plated steel
- ⑩ HEAD: anodised aluminium
- ⑪ PNEUMATIC CONNECTION / STROKE ADJUSTMENT: steel
- ⑫ BARREL: anodised aluminium
- ⑬ BASE: anodised aluminium
- ⑭ SEAL: NBR



ROTARY ACTUATOR R2-12 90°/180°

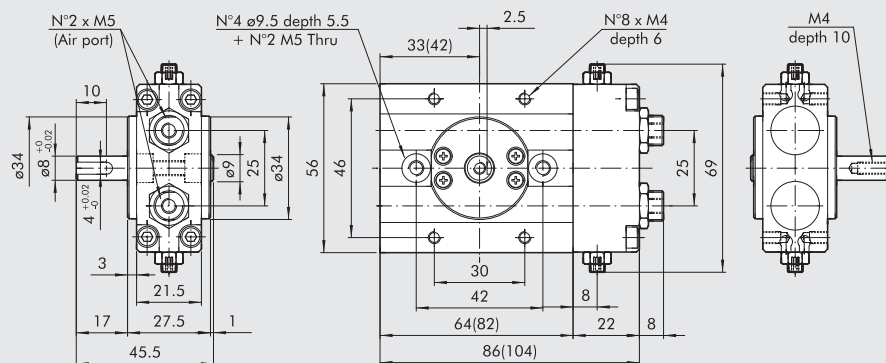
Code	Description
W1620122090	Rotary actuator R2-12-90°
W1620122180	Rotary actuator R2-12-180°



* For the version R2-12-90° it was $\phi 6$ mm; spare actuators code W1620122091 can be still supplied
Dimensions for 180° rotation are given in brackets

ROTARY ACTUATOR R2-16 90°/180°

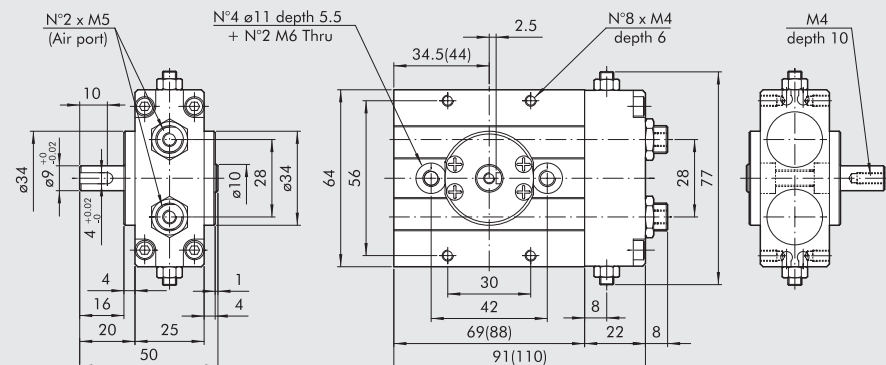
Code	Description
W1620162090	Rotary actuator R2-16-90°
W1620162180	Rotary actuator R2-16-180°



Dimensions for 180° rotation are given in brackets

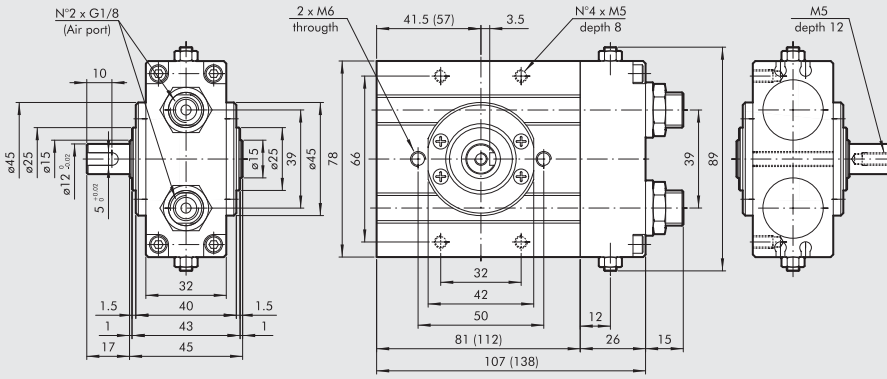
ROTARY ACTUATOR R2-20 90°/180°

Code	Description
W1620202090	Rotary actuator R2-20-90°
W1620202180	Rotary actuator R2-20-180°



Dimensions for 180° rotation are given in brackets

ROTARY ACTUATOR R2-25 90°/180°



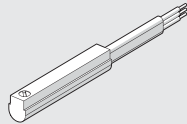
Code	Description
W1620252090	Rotary actuator R2-25-90°
W1620252180	Rotary actuator R2-25-180°

Dimensions for 180° rotation are given in brackets

ACCESSORIES

SENSOR Ø 4

For codes and technical data, see **chapter A6**.



NOTES

ROTARY ACTUATOR SERIES R3

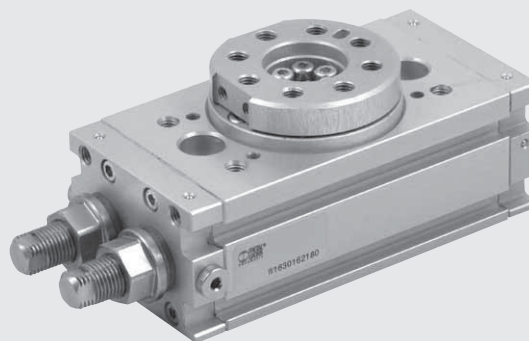
Actuator with double rack and play take-up. Angle of rotation adjustable from 0 to 180°. The R3 rotary actuator can come with a mechanical stop or hydraulic end-of-stroke cushioning.

There is a version with flange and one with shaft (for $\varnothing 16-20-25-30$).

There are slots in the body for retracting magnetic proximity sensors, two on each side. There is hole in the flange for air pipes or wires.

N.B.: We always suggest to use flow microregulators.

During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievement of the required speed.



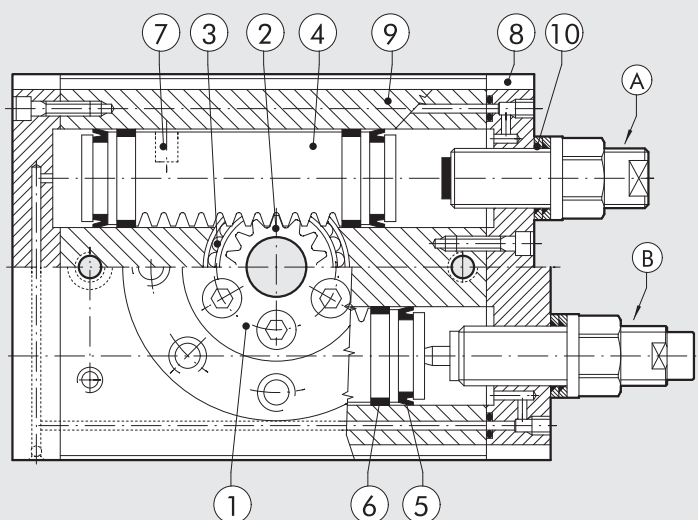
TECHNICAL DATA		R3-16	R3-20	R3-22	R3-25	R3-30	R3-40	
Operating pressure	bar						3 to 7	
	MPa						0.3 to 0.7	
	psi						43.5 to 101	
	°C						-10 to +80	
Temperature range	degrees						0° to 180°	
Angle adjustment								
Fluid		20 μ m filtered, lubricated or unlubricated air; lubrication if used, it must be continuous						
Versions		With mechanical stop / hydraulic decelerator						
Sizes		16	20	22	25	30	40	
Bores	mm	2 x 16	2 x 20	2 x 22	2 x 25	2 x 30	2 x 40	
Theoretical torque at 6 bar	Nm	0.9	1.8	2.7	4.6	9.3	22	
Max. axial load	N	74	135	195	300	340	360	
Max. radial load	N	78	137	360	450	490	560	
Weight	kg	0.53	0.99	1.29	2.08	3.9	6.7	
Rotation time without load	s	0.2	0.2	0.2	0.2	0.3	0.3	
Admissible kinetic energy	Joule							
WITH MECHANICAL STOP		0.007	0.025	0.049	0.082	0.090	0.150	
(with flange W1630__2180 and with shaft W1630__5180)								
WITH HYDRAULIC DECELERATOR		-	-	-	0.29	1.10	1.60	
(with flange W1630__2180 and with shaft W1630__5180)								

COMPONENTS

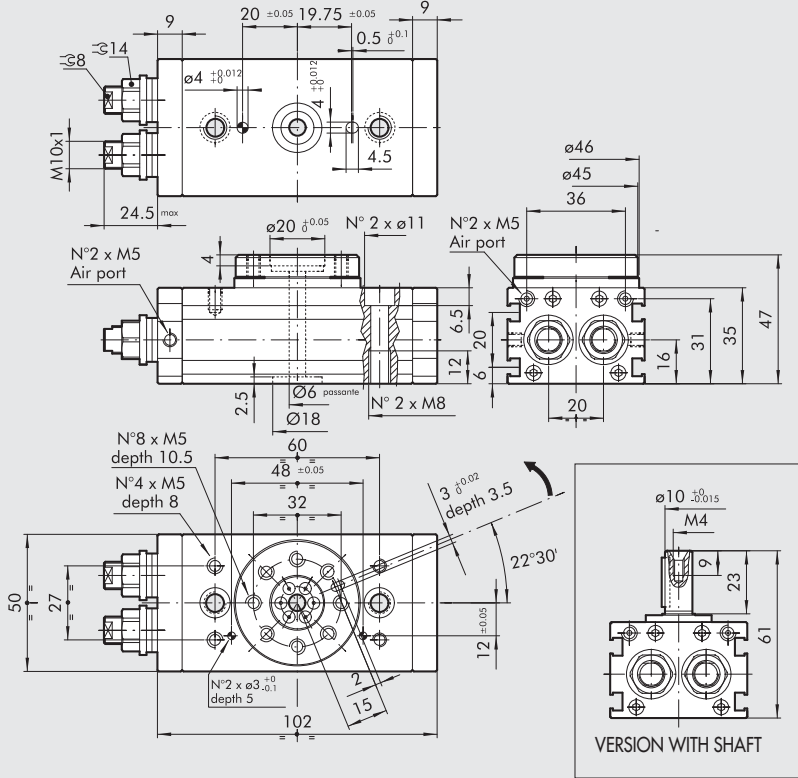
- ① ROTARY FLANGE: anodised aluminium
- ② PINION: hardened and tempered steel
- ③ BALL BEARING
- ④ PISTON / RACK: hardened and tempered steel
- ⑤ CUSHIONING GASKET: NBR
- ⑥ GUIDE PAD: PTFE
- ⑦ MAGNET: neodymium
- ⑧ HEAD: anodised aluminium
- ⑨ BARREL: anodised aluminium
- ⑩ SEAL: NBR

VERSIONS:

- A Stroke adjustment
- B Stroke adjustment with inside hydraulic shock absorbers (available from $\varnothing 25$)

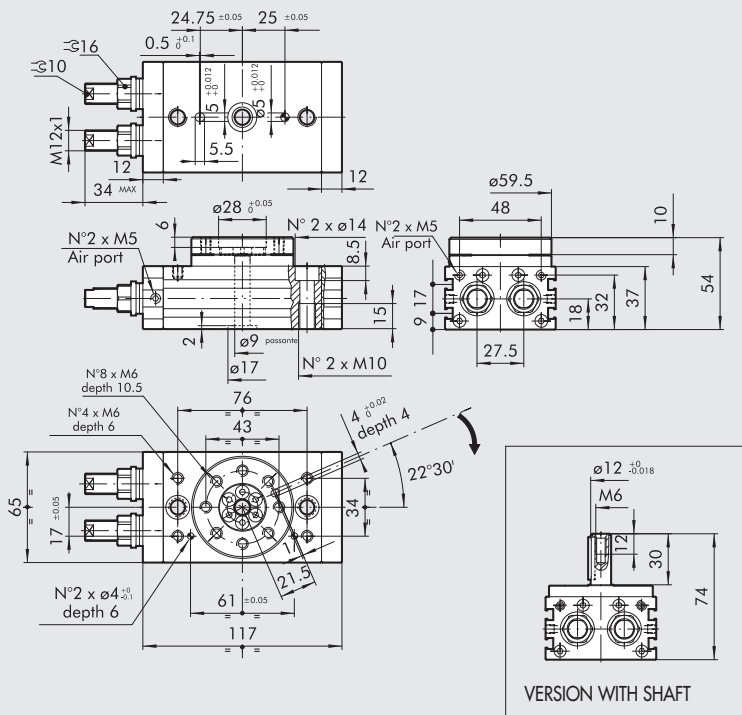


ROTARY ACTUATOR R3-16



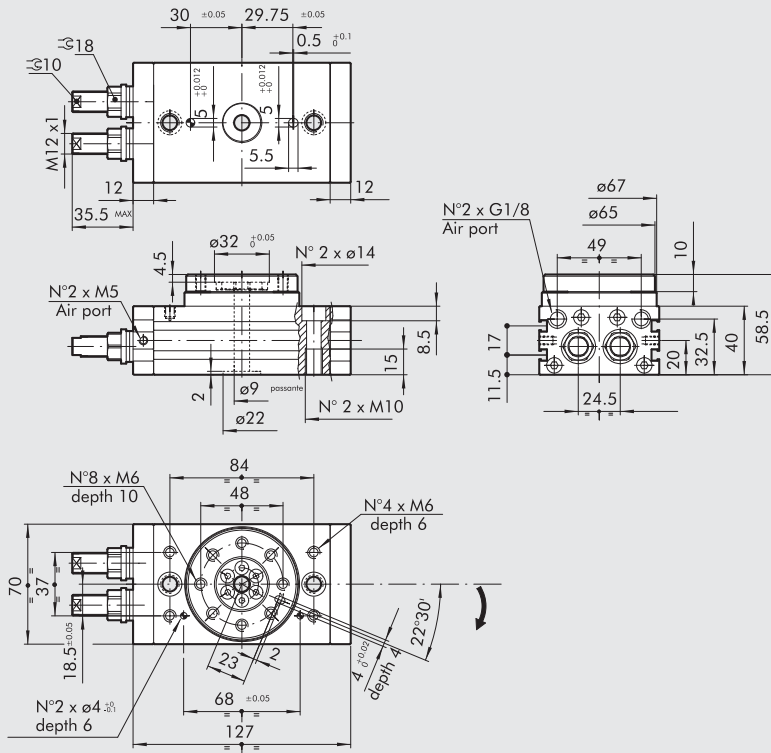
Code	Description
W1630162180	Rotary actuator with flange R3-16
W1630165180	Rotary actuator with shaft R3-16

ROTARY ACTUATOR R3-20



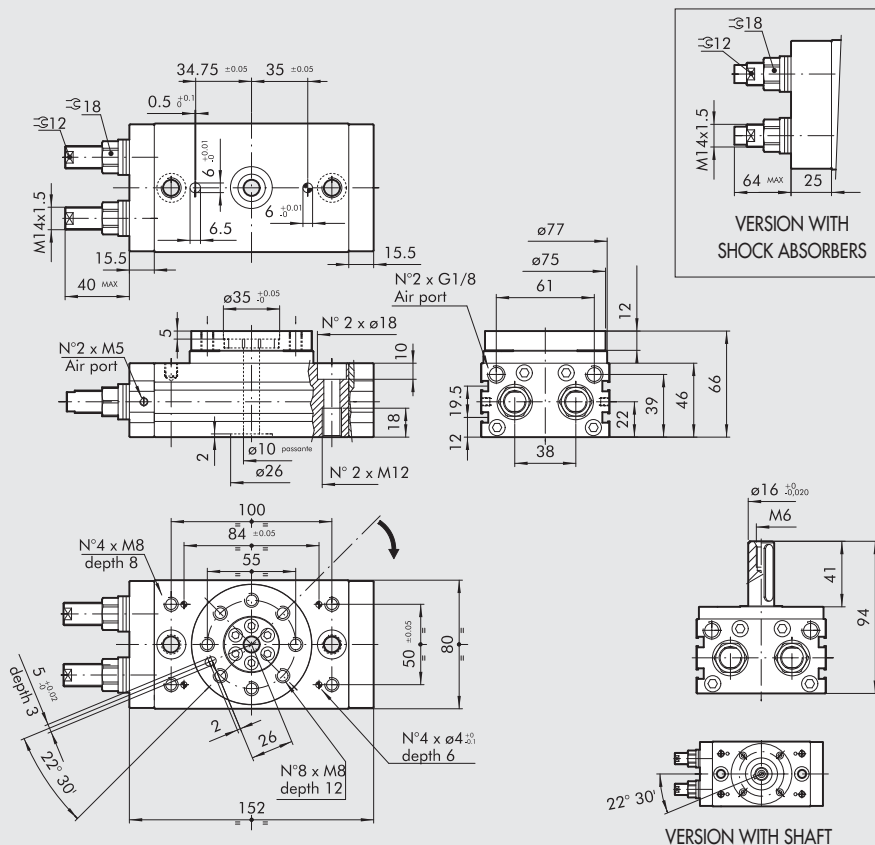
Code	Description
W1630202180	Rotary actuator with flange R3-20
W1630205180	Rotary actuator with shaft R3-20

ROTARY ACTUATOR R3-22



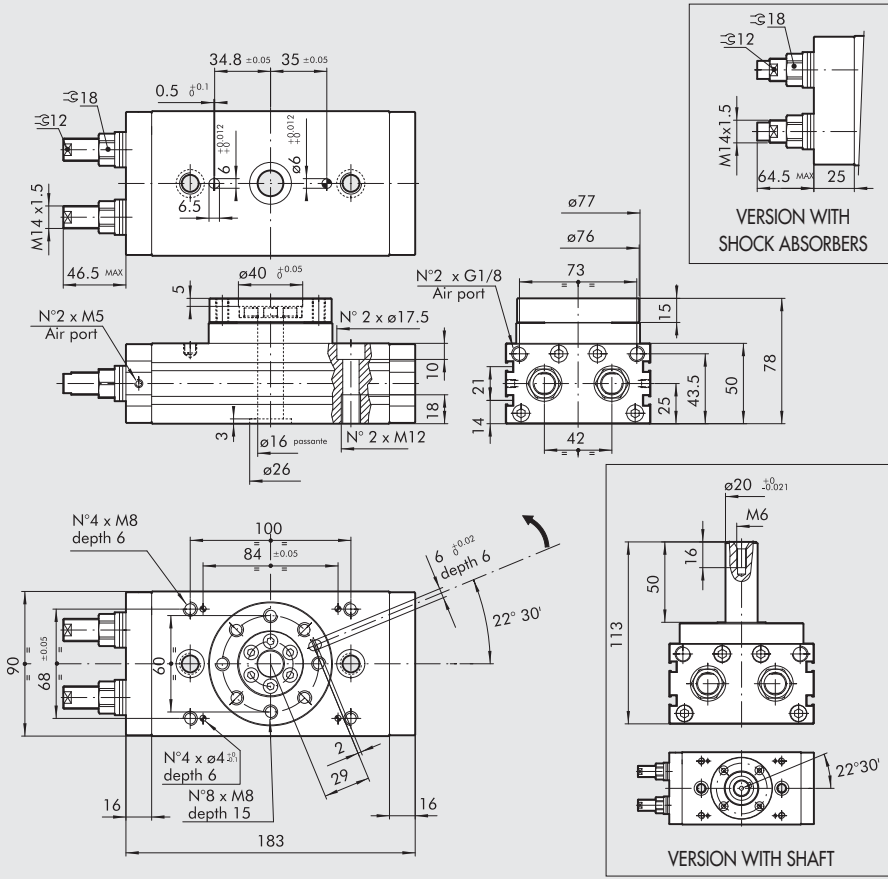
Code	Description
W1630222180	Rotary actuator with flange R3-22

ROTARY ACTUATOR R3-25



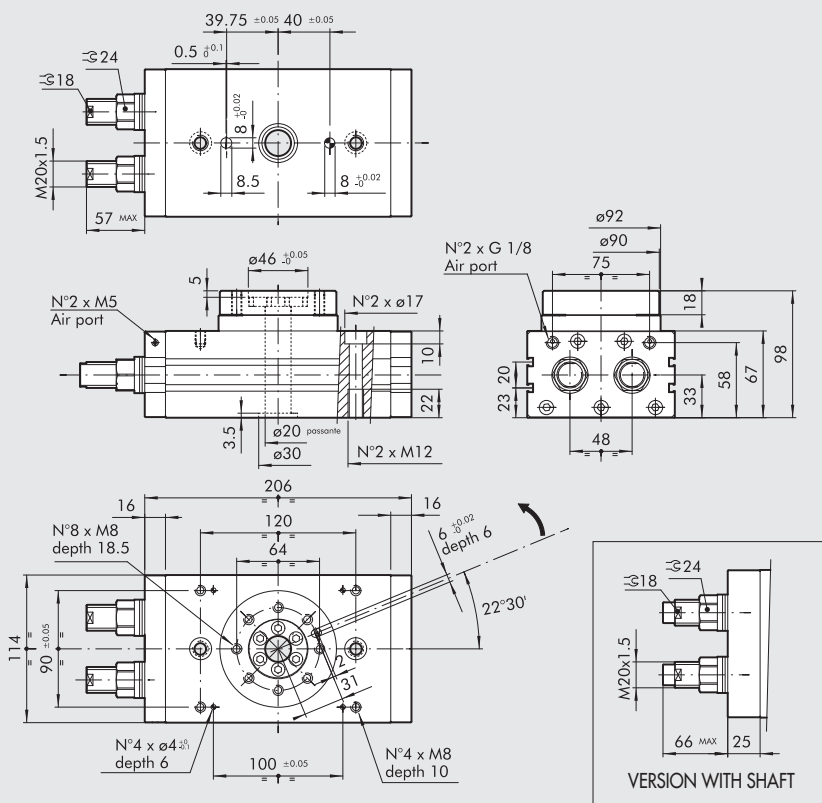
Code	Description
W1630252180	Rotary actuator with flange R3-25
W1630253180	Rotary actuator with flange + shock absorbers R3-25
W1630255180	Rotary actuator with shaft R3-25
W1630256180	Rotary actuator with shaft + shock absorbers R3-25

ROTARY ACTUATOR SERIES R3-30



Code	Description
W1630302180	Rotary actuator with flange R3-30
W1630303180	Rotary actuator with flange + shock absorbers R3-30
W1630305180	Rotary actuator with shaft R3-30
W1630306180	Rotary actuator with shaft + shock absorbers R3-30

ROTARY ACTUATOR SERIES R3-40



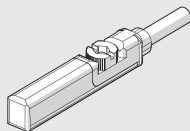
Code	Description
W1630402180	Rotary actuator with flange R3-40
W1630403180	Rotary actuator with flange + shock absorbers R3-40

ACCESSORIES

RETRACTABLE SENSOR

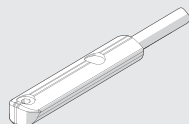
SENSOR, SQUARE TYPE

Latest generation,
secure fixing



SENSOR, OVAL TYPE

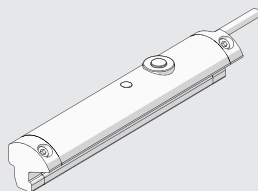
Traditional



For codes and technical data, see **chapter A6**.

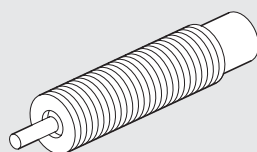
LTS POSITION SENSORS

For technical data and usage strokes see **chapter A6**.



SPARE PARTS

SHOCK ABSORBERS

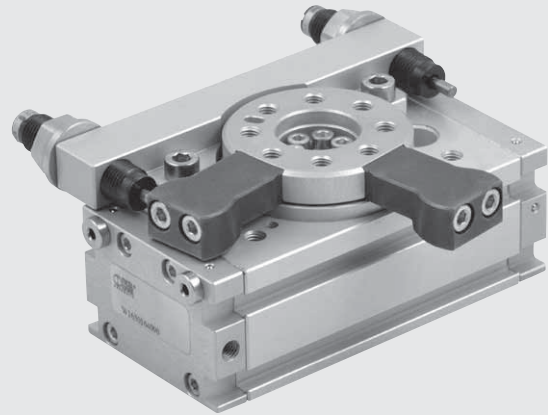


Code	Ø	Description
0950004015	Ø 25	Shock absorbers ECO S 25 MC2 short M14x1.5
0950004008	Ø 30	Shock absorbers ECO 25 MC4 M14x1.5
0950004005	Ø 40	Shock absorbers ECO 50 MC2 + nut M20x1.5

NOTES

ROTARY ACTUATOR SERIES R3 WITH EXTERNAL SHOCK ABSORBERS

Dual-rack actuator with automatic adjustment for wear. Hydraulic shock absorbers are arranged externally and operate at a distance from the axis of rotation which is considerably higher than for internal ones. This means that the absorbable kinetic energy is 4 to 8 times higher. It is reduced in length as there are no adjusting screws. A 90° and a 180° versions are available. Grooves are provided in the body to fix retractable magnetic proximity sensors, two on each side. A hole has been drilled in the flange for the passage of air pipes or power cables.

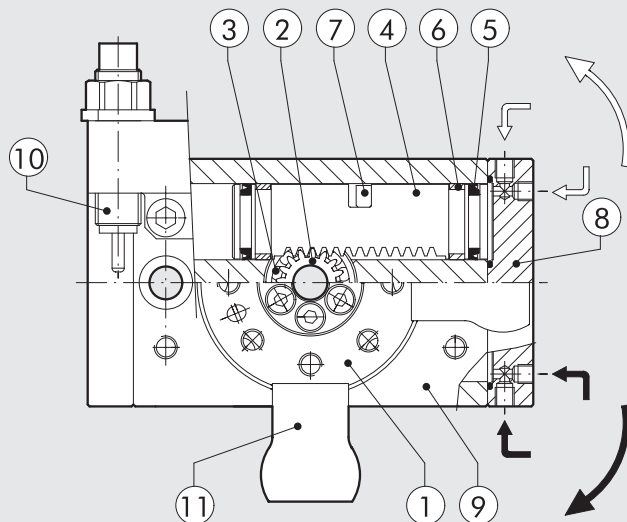


N.B.: We always suggest to use flow microregulators. During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievement of the required speed.

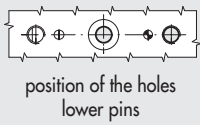
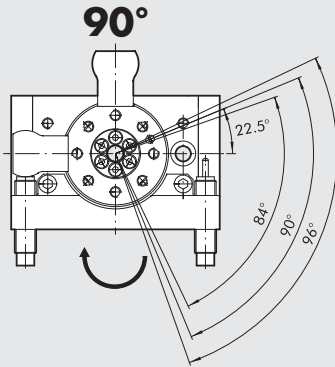
TECHNICAL DATA		R3-16	R3-20	R3-22	R3-25	R3-30	R3-40
Operating pressure	bar	3 to 7					
	MPa	0.3 to 0.7					
	psi	43.5 to 101					
Temperature range	°C	-10 to +80					
Angle adjustment	degrees	90° o 180° ± 3°					
Fluid		20 µm filtered, lubricated or unlubricated air; lubrication if used, it must be continuous					
Sizes	mm	16	20	22	25	30	40
Bore	mm	2 x 16	2 x 20	2 x 22	2 x 25	2 x 30	2 x 40
Theoretical torque at 6 bar	Nm	0.9	1.8	2.7	4.6	9.3	22
Max. axial load	N	74	135	195	300	340	360
Max. radial load	N	78	137	360	450	490	560
Max overturning moment	Nm	2.4	4	5.3	9.7	12	18
Admissible kinetic energy	J	0.16	0.55	0.85	1.40	1.85	3.35
Rotation time without load	s	0.2	0.2	0.2	0.2	0.3	0.3

COMPONENTS

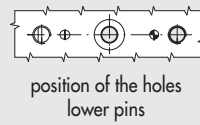
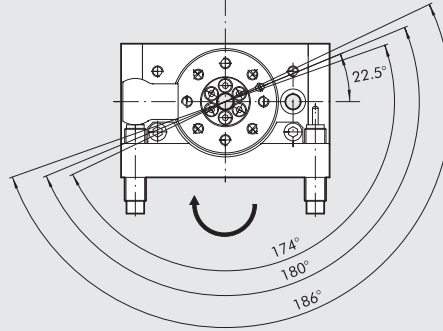
- ① ROTARY FLANGE: anodised aluminium
- ② PINION: hardened and tempered steel
- ③ BALL BEARING
- ④ PISTON / RACK: hardened and tempered steel
- ⑤ CUSHIONING GASKET: NBR
- ⑥ GUIDE PAD: PTFE
- ⑦ MAGNET: neodymium
- ⑧ HEAD: anodised aluminium
- ⑨ BARREL: anodised aluminium
- ⑩ STROKE REGULATOR WITH HYDRAULIC SHOCK ABSORBERS
- ⑪ Block for 90° version



ROTATION ANGLE



180°

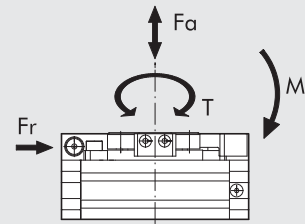


ADMISSIBLE KINETIC ENERGY Joule [J]

Bore Ø	With flange, 90° rotation°: W1630_4090	With flange, 180° rotation°: W1630_4180
16	0.16	
20	0.55	
22	0.85	
25	1.40	
30	1.85	
40	3.35	

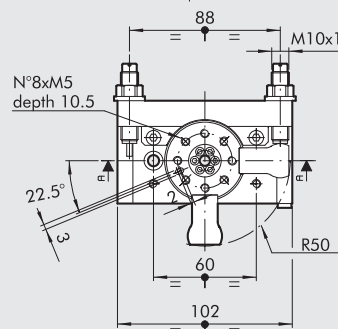
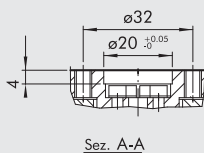
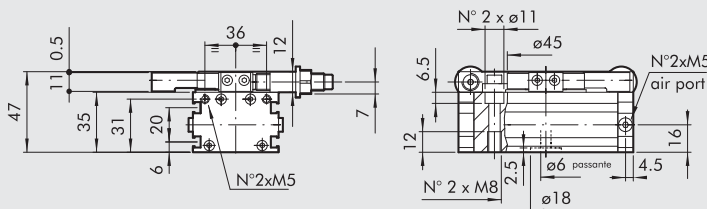
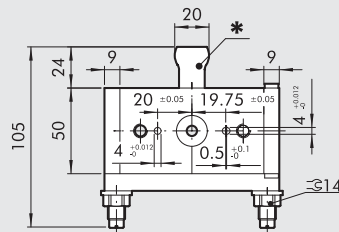
DIMENSIONES - FORCES AND MOMENTS

Bore Ø	T Theoretical torque at 6 bar [Nm]	FA Max. axial load [N]	FR Max. radial load [N]	M Averturing momnet [Nm]
16	0.9	74	78	2.4
20	1.8	135	137	4
22	2.7	195	360	5.3
25	4.6	300	450	9.7
30	9.3	340	490	12
40	22	360	560	18



ROTARY ACTUATOR SERIES R3-16 WITH EXTERNAL SHOCK ABSORBERS, 90/180°

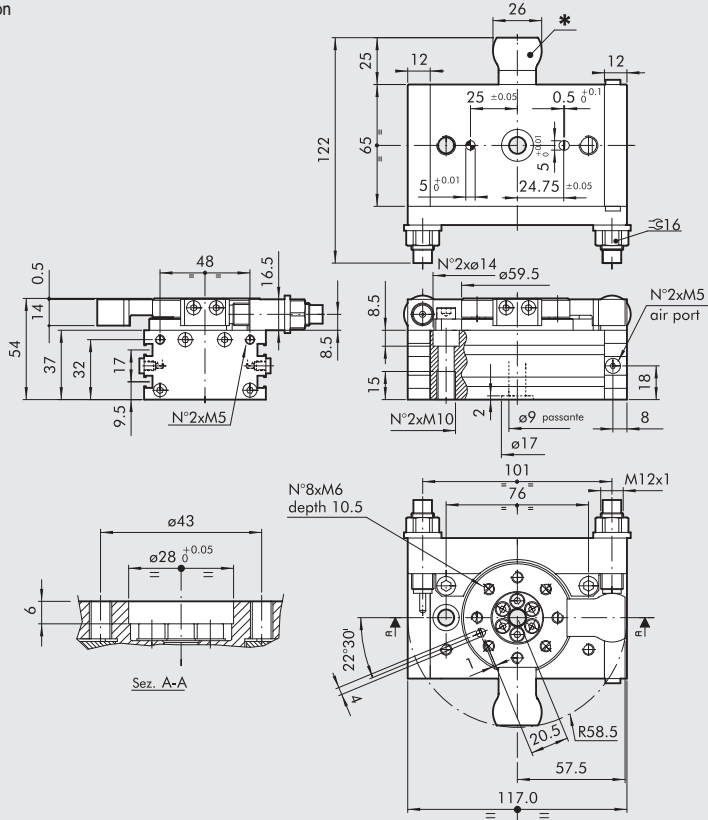
* Block for 90° version



Code	Description
W1630164090	Rotary actuator with flange + shock absorbers R3-16-90
W1630164180	Rotary actuator with flange + shock absorbers R3-16-180

ROTARY ACTUATOR SERIES R3-20 WITH EXTERNAL SHOCK ABSORBERS, 90/180°

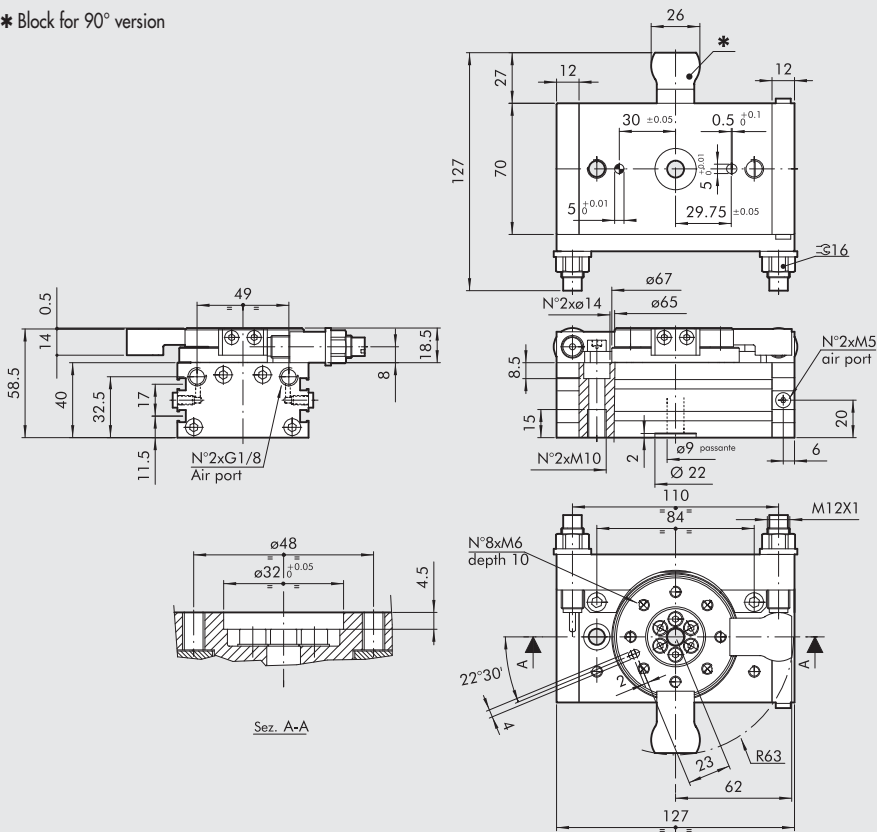
* Block for 90° version



Code	Description
W1630204090	Rotary actuator with flange + shock absorbers R3-20-90
W1630204180	Rotary actuator with flange + shock absorbers R3-20-180

ROTARY ACTUATOR SERIES R3-22 WITH EXTERNAL SHOCK ABSORBERS, 90/180°

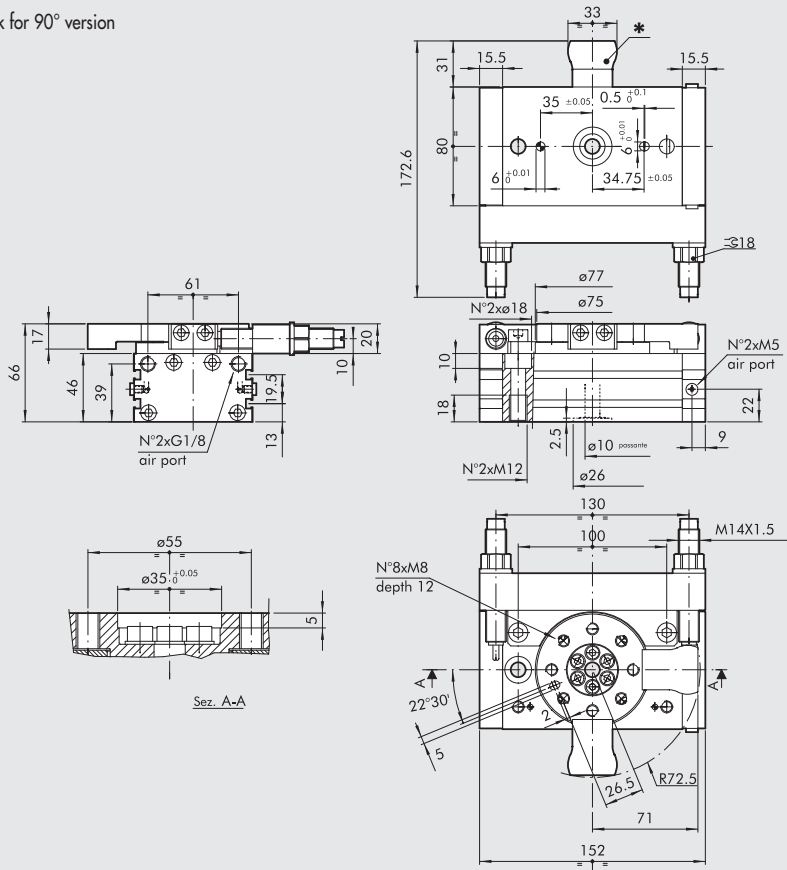
* Block for 90° version



Code	Description
W1630224090	Rotary actuator with flange + shock absorbers R3-22-90
W1630224180	Rotary actuator with flange + shock absorbers R3-22-180

ROTARY ACTUATOR SERIES R3-25 WITH EXTERNAL SHOCK ABSORBERS, 90/180°

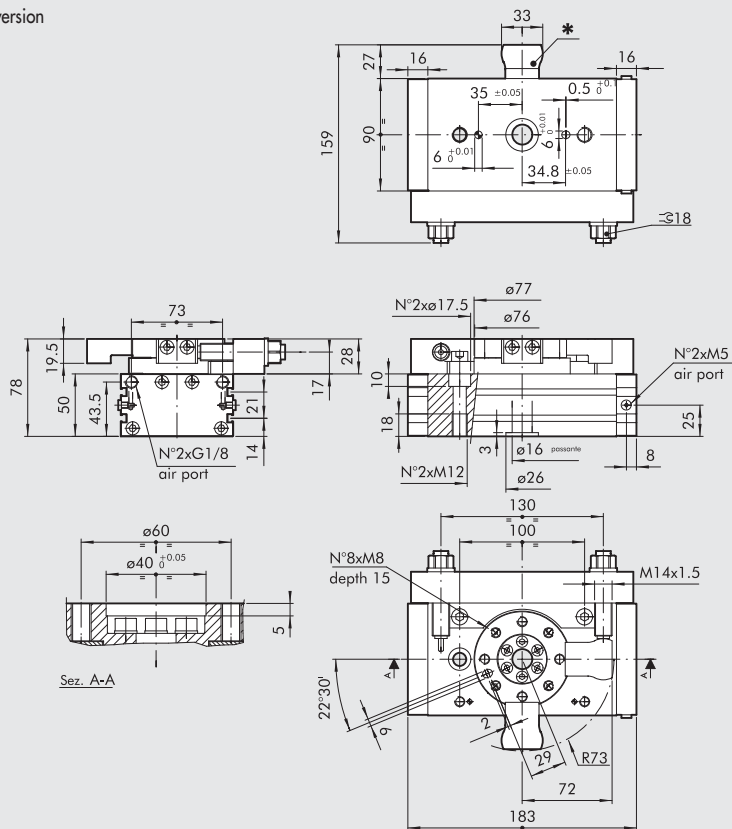
* Block for 90° version



Code	Description
W1630254090	Rotary actuator with flange + shock absorbers R3-25-90
W1630254180	Rotary actuator with flange + shock absorbers R3-25-180

ROTARY ACTUATOR SERIES R3-30 WITH EXTERNAL SHOCK ABSORBERS, 90/180°

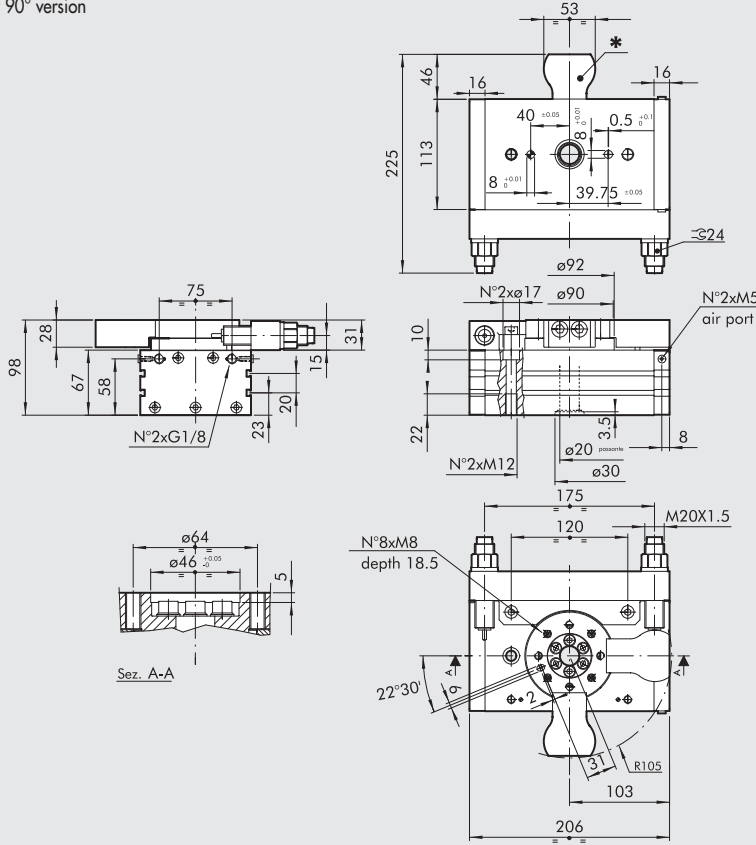
* Block for 90° version



Code	Description
W1630304090	Rotary actuator with flange + shock absorbers R3-30-90
W1630304180	Rotary actuator with flange + shock absorbers R3-30-180

ROTARY ACTUATOR SERIES R3-40 WITH EXTERNAL SHOCK ABSORBERS, 90/180°

* Block for 90° version



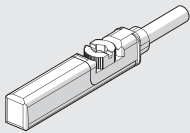
Code	Description
W1630404090	Rotary actuator with flange + shock absorbers R3-40-90
W1630404180	Rotary actuator with flange + shock absorbers R3-40-180

ACCESSORIES

RETRACTABLE SENSOR

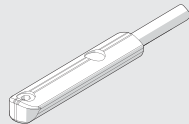
SENSOR, SQUARE TYPE

Latest generation, secure fixing



SENSOR, OVAL TYPE

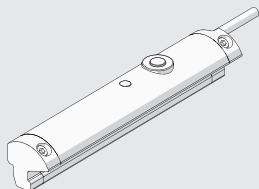
Traditional



For codes and technical data, see chapter A6.

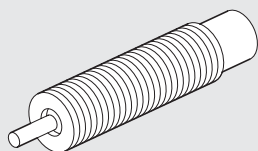
LTS POSITION SENSORS

For technical data and usage strokes see chapter A6.



SPARE PARTS

SHOCK ABSORBERS



Code	Ø	Description
0950004009	Ø 16	Shock absorbers ECO 10 MF3 M10x1
0950004010	Ø 22	Shock absorbers ECO 15 MF4 M12x1
0950004015	Ø 25 - 30	Shock absorbers ECO S 25 MC2 M14x1.5
0950004005	Ø 40	Shock absorbers ECO MC2 + nut M20x1.5

NOTES