GRIPPERS, ROTARY ACTUATORS, SLIDES SUMMARY

GRIPPERS

- GENERAL TECHNICAL DATA GRIPPERS — A2.4

- GRIPPER WITH TWO PARALLEL JAWS, SERIES P1 — A2.8
- GRIPPER WITH TWO PARALLEL JAWS, SERIES P1K — A3.156

- GRIPPER WITH TWO PARALLEL JAWS, SERIES P2 — A2.10
- GRIPPER WITH TWO PARALLEL JAWS, SERIES P2K — A3.161

- GRIPPER WITH TWO PARALLEL JAWS, SERIES P3 — A2.13
- GRIPPER WITH TWO PARALLEL JAWS, SERIES P3K — A3.165

- GRIPPER WITH TWO PARALLEL LONG-STROKE JAWS, SERIES P4 — A2.19
- GRIPPER WITH TWO PARALLEL LONG-STROKE JAWS, SERIES P4K — A3.171

- GRIPPER WITH TWO HINGED JAWS, SERIES P7 — A2.22
- GRIPPER WITH TWO HINGED JAWS, SERIES P7K — A3.180

- TECHNOPOLYMER HINGED GRIPPER, SERIES P8 — A2.24

- GRIPPER 180° WITH TWO HINGED JAWS SERIES P9 — A2.26
- GRIPPER 180° WITH TWO HINGED JAWS SERIES P9K — A3.185

- GRIPPER WITH THREE PARALLEL JAWS, SERIES P12 — A2.28
- GRIPPER WITH THREE PARALLEL JAWS, SERIES P12K — A3.190

- GRIPPER WITH TWO PARALLEL LONG-STROKE JAWS, SERIES GPLK — A3.175

ROTARY ACTUATORS

- GENERAL TECHNICAL DATA ROTARY ACTUATORS — A2.33

- ROTARY ACTUATOR SERIES R1 — A2.34

- ROTARY ACTUATOR SERIES R2 — A2.38

- ROTARY ACTUATOR SERIES R3 — A2.41
- ROTARY ACTUATOR SERIES R3K — A3.124

- ROTARY ACTUATOR SERIES R3 WITH EXTERNAL SHOCK ABSORBERS — A2.46
- ROTARY ACTUATOR SERIES R3K WITH EXTERNAL SHOCK ABSORBERS — A3.130

- ROTARY ACTUATOR SERIES R4 — B3.33

- VANE ROTARY ACTUATOR SERIES R5 — A2.52

- ROTARY ACTUATOR SERIES DAPK — A3.136

METAL WORK PNEUMATIC

SLIDES

- GENERAL TECHNICAL DATA SLIDES — A2.58


- TWIN CYLINDER SERIES S10 — A2.59


- TWIN CYLNDER SLIDE WITH FIXED BODY SERIES S11 — A2.63


- TWIN CYLNDER SLIDE WITH FIXED PLATES SERIES S12 — A2.69


- PRECISION SLIDE SERIES S13 — A2.75


- ELECTRIC SLIDE SERIES ELEKTRO CS — A5.156


- COMPACT PRECISION SLIDE - SERIES S14K — A3.47

OTHER GUIDE UNITS AND SLIDE


- GDS, GDH AND GDM GUIDE UNITS FOR ISO 6432 — A1.23
- GDHK, GDMK GUIDE UNITS FOR ISO 6432 — A3.79


- GDS, GDH AND GDM GUIDE UNITS FOR ISO 15552 — A1.57
- GDHK, GDMK GUIDE UNITS FOR ISO 15552 — A3.79


- SHORT-STROKE ANTI-ROTATION CYLINDER — A1.145

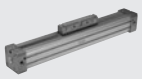

- COMPACT ANTI-ROTATION CYLINDER SERIES CMPC — A1.107


- ISO 21287 ANTI-ROTATION CYLINDER SERIES LINER — A1.96


- TWIN-ROD CYLINDER SERIES TWNC — A1.70


- COMPACT GUIDED CYLINDER SERIES MULTIFIX — A1.152


- COMPACT GUIDES CYLINDER SERIES CMPG — A1.162

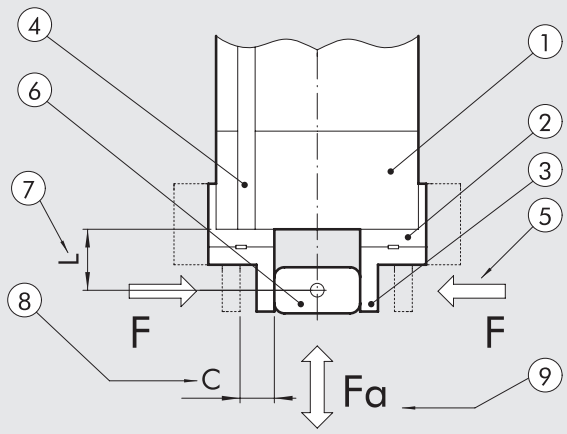

- RODLESS CYLINDER STD — A1.176
- RODLESS CYLINDER WITH BALL RECIRCULATING GUIDE SERIES V-Lock — A3.37

GENERAL TECHNICAL DATA GRIPPERS

NOMENCLATURE

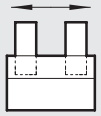
① Pneumatic gripper
② Jaws
③ Clamping finger
④ Sensor slot
⑤ F = clamping force of one jaw only
If a gripper has three jaws, with
F = 25 N, so the total clamping force is 25 x 3 = 75 N
⑥ Load
⑦ L = distance between the barycentre of the load
and the reference surface
⑧ C = stroke of a single jaw
⑨ Fa = maximum axial force applied to the grippers

FIG. 1.1



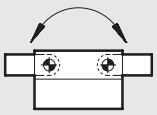
TYPES

Parallel gripper: the jaws move in a straight line. There may be two, three or even four jaws.

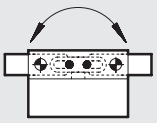


Hinged gripper: the jaws are hinged and move along the arc of a circle. It is generally cheaper than a parallel gripper but there are some limitations (see fig. 1.5):
- If the part has varying dimensions, the contact area changes (see fig. 1.6)
- If the part is cylindrical with varying dimensions, the position of the axis of the clamped part varies (see fig. 1.7)

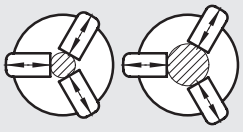
Gripper with retracting jaws: the jaws have an opening angle of about 90°. The clamping fingers can retract fully from the work top, and so, in certain cases, it is possible to avoid one linear retraction motion (see fig. 1.5).



Toggle gripper: a hinged gripper with a toggle-action mechanism to achieve high clamping forces. Clamping is irreversible even when there is no pressure, so the part cannot be released accidentally. The opening angle is 90° so it acts as retracting gripper. The clamping force is high within a limited angle only.



Number of jaws: two-jaw grippers are used for prism-shaped parts or cylindrical ones with a single diameter. Three-jaw grippers can be used for cylindrical parts with different diameters.



METAL WORK PNEUMATIC

CLAMPING FINGERS

The clamping fingers must be as light and short as possible to keep inertia to a minimum.
The longer the clamping fingers, the less force is available (see fig. 1.2).
Wider fingers are only heavier, they do not increase friction (see fig. 1.3).

FIG. 1.2

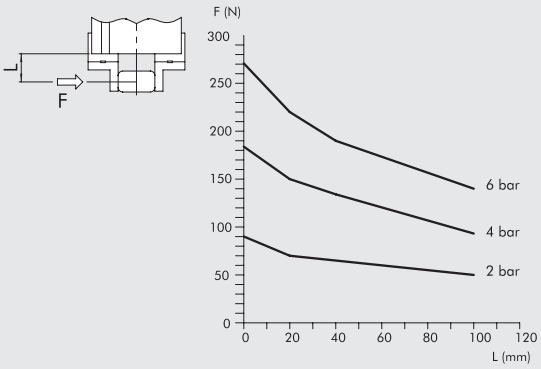
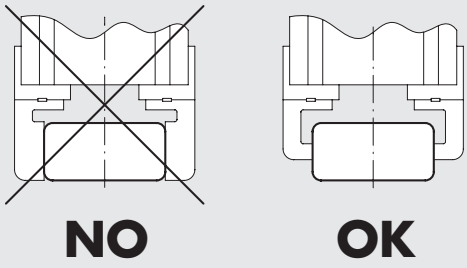
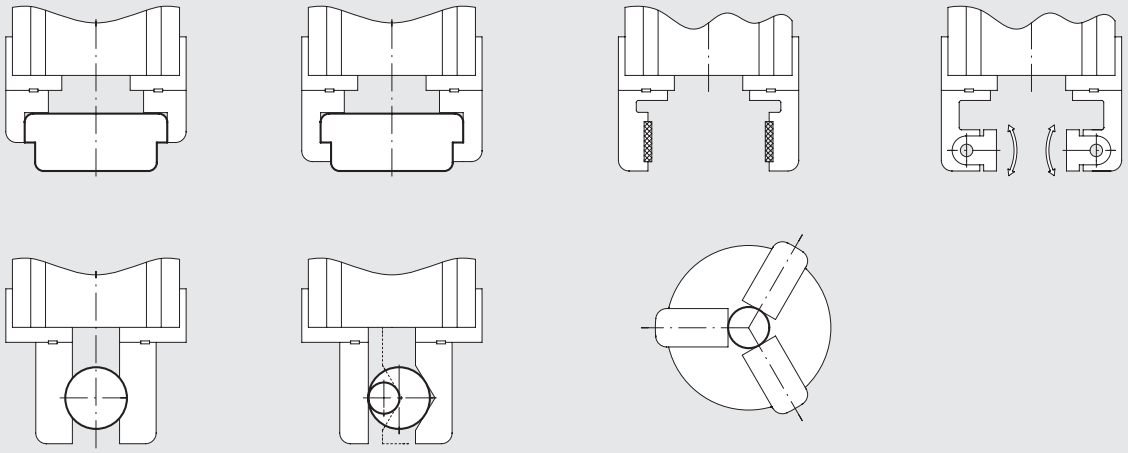


FIG. 1.3



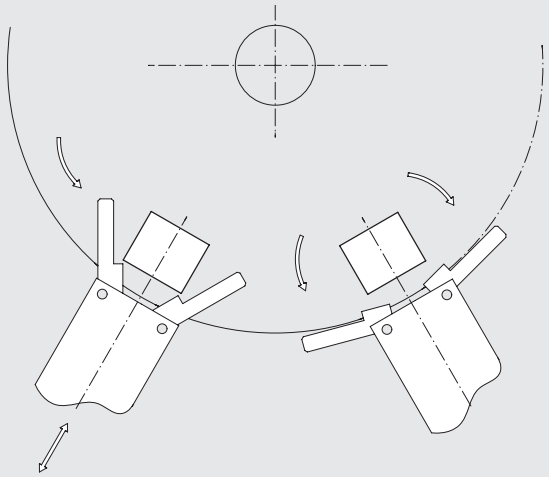
EXAMPLE OF CLAMPING FINGERS

FIG. 1.4



EXAMPLE OF RETRACTING HINGED GRIPPERS

FIG. 1.5



EXAMPLE OF USE LIMITATIONS OF HINGED GRIPPERS

FIG. 1.6

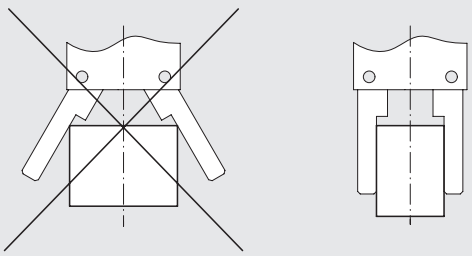
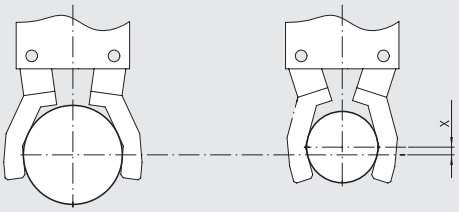


FIG. 1.7

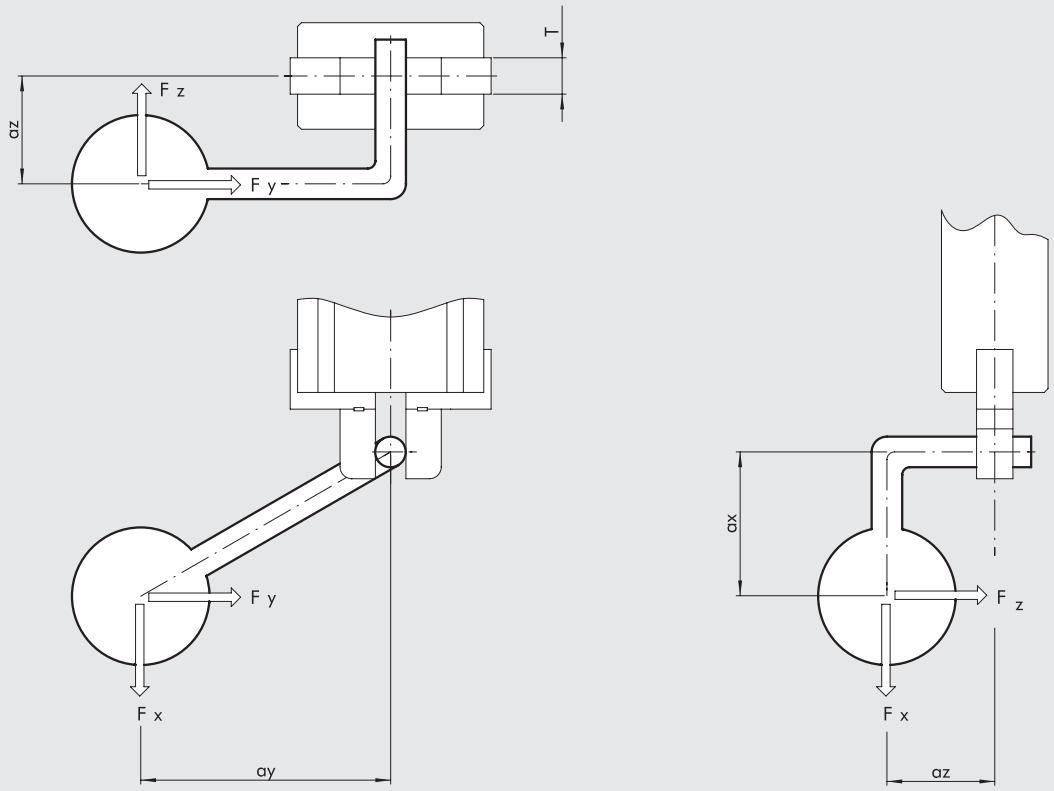


CALCULATIONS

First of all, determine the necessary clamping force.
Then decide which type of gripper can ensure this force with required pressure and clamping distance.
To help designers calculate the clamping force, we propose two levels of calculation.

DRAWING TO CALCULATE GRIPPER CLAMPING FORCE

FIG. 1.8



APPROXIMATION METHOD

Clamping force of each jaw [N] ≥ 200 x weight of part [kg] / number of jaws.

	Data	Unit of measurement	Formula	Example
M	Mass of part	kg		1.2
n	Number of jaws	–		3
F	Clamping force of each jaw	N	≥ 200 x M/n	≥ 200 x 1.2/3 = 80

METAL WORK PNEUMATIC

PRECISION COMPUTING METHOD

	Data	Unit of measur.	Formula	Example
M	Mass of part	kg		1.2
a	Acceleration	m/s^2		5 in direction Y
Ω	Angle speed	rad/s		0
T	Width of clamping finger	mm		8
d	Clamping diameter of part	mm		16
ax	Distance along X of the barycentre from clamping centre	mm		0
ay	Distance along Y of the barycentre from clamping centre	mm		0
az	Distance along Z of the barycentre from clamping centre	mm		25
μ	Finger/part friction coefficient			0.2
	Some examples:			
	Smooth steel on smooth metal		μ = 0.1	
	Rough steel on smooth metal		μ = 0.2 - 0.3	
	Soft material, e.g. Vulkolan		μ = 0.4	
	Coupled shape (vedi fig. 1.4)		μ = 1	
	Forces applied to barycentre of part. **When determining the forces, assess for each direction:**			
	Force x weight	N	M x 9.81	
	Force of inertia x linear acceleration	N	M x a	
	Force of inertia x angular velocity	N	$M \times \Omega^2 \times r$	
Fx	Force along gripper axis	N		Fx = weight 1.2 x 9.81 = 11.8 N
Fy	Force perpendicular to jaw	N		Fy = F. of inertia = 1.2 x 5 = 6 N
Fz	Force tangent to jaw	N		Fz = O
	Force equivalent to clamping centre:			
Ft eq	Equivalent tangential force	N	$\sqrt{\left[Fx \cdot \left(\frac{az+\frac{T}{2}}{T}+\frac{ay+\frac{d}{2}}{d}\right)+Fz \cdot \frac{ax}{T}+Fy \cdot \frac{ax}{d}\right]^2+Fz^2}$	$\sqrt{\left[11.8 \cdot \left(\frac{25+\frac{8}{2}}{8}+\frac{1}{2}\right)+O\right]^2} = 48.6\,N$
Fy eq	Equivalent perpendicular force	N	$Fy \cdot \frac{az+\frac{T}{2}}{T}+Fz \cdot \frac{ay}{T}$	$= 6 \cdot \frac{\left(25+\frac{8}{2}\right)}{8} = 75\,N$
Fs teo	Theoretical clamping force	N	Greater of (Fteq/2μ) and (Fyeq)	Greater of (42.8/2 · 0.2) and 75 = 107 N
F	Clamping force	N	FsTeo · 1.5 (safety coefficient)	= 107 · 1.5 = 160 N

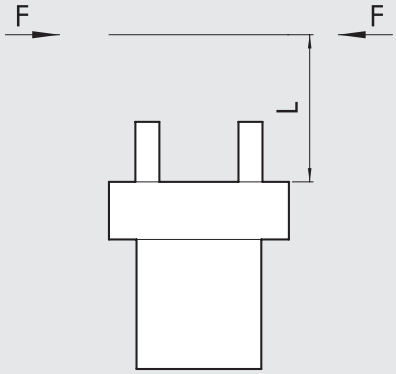
NOTES

GRIPPER WITH TWO PARALLEL JAWS SERIES P1

- Dual-acting parallel gripper for internal and external clamping.
- Anodized aluminium alloy body and tempered steel jaws.
- Bottom or side fixing.
- All sizes come with magnets and sensor slots.

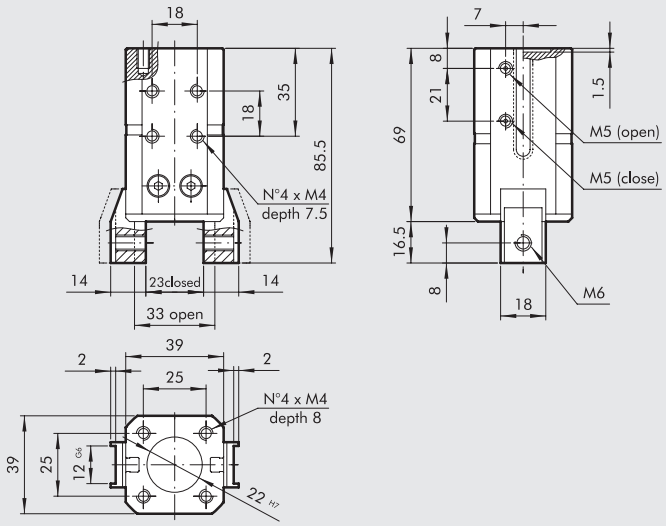
TECHNICAL DATA		P1-20	P1-32
Operating pressure	bar	2 to 8	
	MPa	0.2 to 0.8	
	psi	29 to 116	
Temperature range	°C	5 to 70	
Fluid		20 µm filtered, lubricated or unlubricated air; lubrification if used, it must be continuous	
Bores	mm	20	32
Clamping force at 6.3 bar 20 mm from the top surface	N	70	170
during opening and closing			
Single jaw stroke	mm	5	5
Weight	kg	0.50	0.70

TABLE OF CLAMPING FORCES FOR VARIOUS POINTS OF APPLICATION

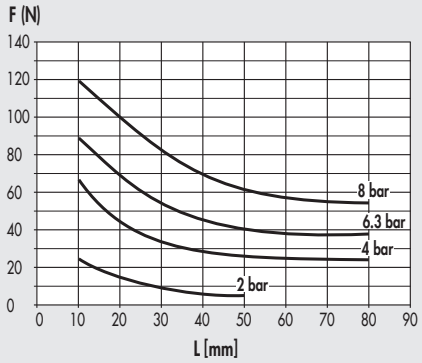


METAL WORK PNEUMATIC

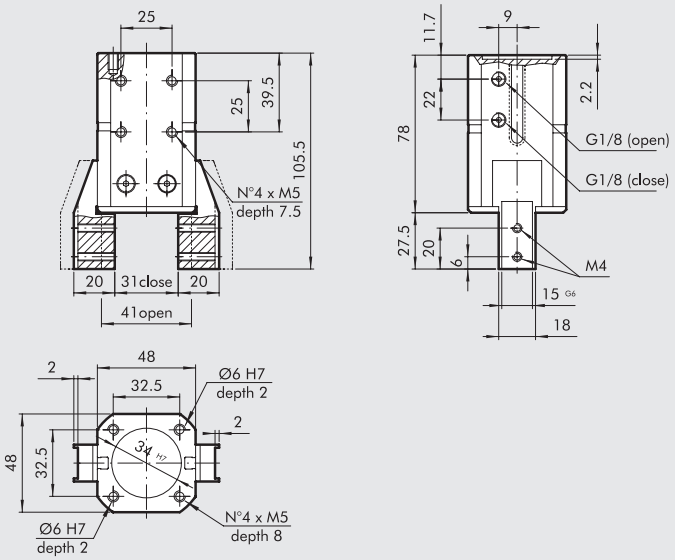
DIMENSIONS OF GRIPPER P1-20



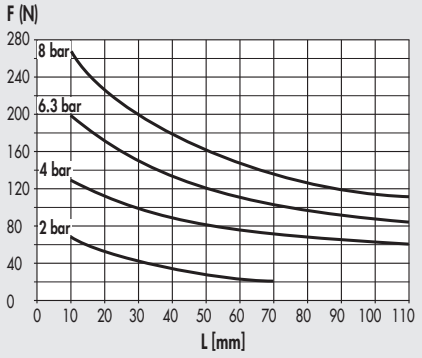
Code	Description
W1550200001	Gripper with 2 parallel jaws P1-20



DIMENSIONS OF GRIPPER P1-32



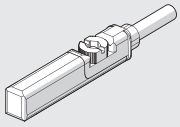
Code	Description
W1550320001	Gripper with 2 parallel jaws P1-32



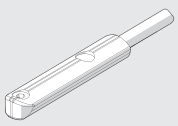
ACCESSORIES

RETRACTABLE SENSOR

SENSOR, SQUARE TYPE
Latest generation,
secure fixing



SENSOR, OVAL TYPE
Traditional



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

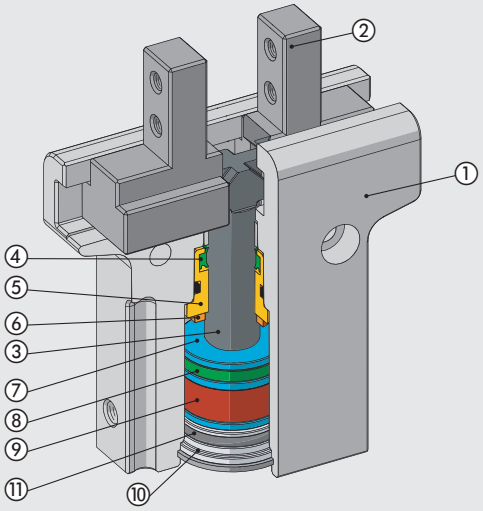
GRIPPER WITH TWO PARALLEL JAWS SERIES P2

Parallel double-acting two-jaw gripper, with either internal or external clamping, with sliding of the jaws on inclined planes.
Aluminum alloy body coated with surface hardening treatment, jaws made of wear-resistant coated steel.
The jaw-guiding system and precision in coupling with the body make the gripper extremely stable.
The ceramic-coated body reduces friction and wear, and enhances the movement of the jaws on the body.
All sizes are equipped with a magnet and sensor grooves.

TECHNICAL DATA		P2 -16	P2-20	P2- 25
Operating pressure	bar		2 to 8	
	MPa		0.2 to 0.8	
	psi		29 to 116	
Operating temperature	°C		-10 to 80	
Fluid		Fluid 20 µm filtered air, lubricated or unlubricated. If lubricated air is used, lubrication must be continuous		
Bore	mm	16	20	25
Clamping force of a single jaw	N	45	100	135
at 6.3 bar, 20 mm from the upper surface, on opening and closing				
Stroke of each jaw	mm	4	5	7
Minimum opening/closing time	s		0.01/0.02	
Repeatability	mm		± 0.01	
Moment of inertia around the piston axis Jy	kg cm²	0.19	0.83	2.33
Max. admissible static loads:				
- Fa	N	225	300	545
- Mx	Nm	3	4	7
- My	Nm	1.5	2	3
- Mz	Nm	3.5	5	8
Weight	kg	0.13	0.27	0.51

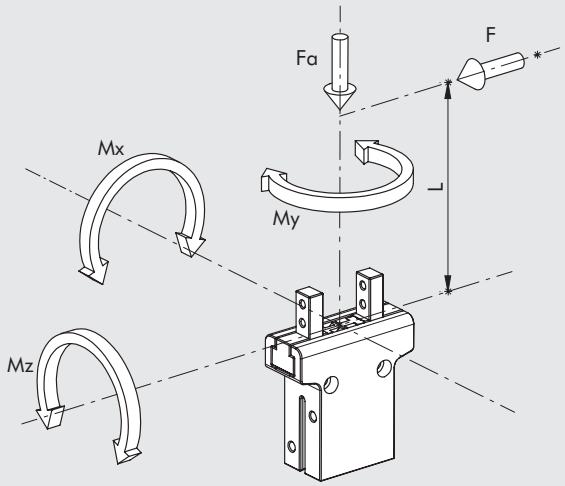
COMPONENTS

① BODY: hard-anodized aluminium
② JAWS: nitrided steel
③ PISTON ROD + GUIDE: nitrided steel
④ PISTON ROD GASKET: polyurethane
⑤ BUSHING: bronze
⑥ BUFFER: polyurethane
⑦ PISTON: aluminium alloy
⑧ PISTON GASKET: NBR
⑨ MAGNET: plastoferrite
⑩ REAR BASE: anodized aluminium alloy
⑪ GASKET: NBR



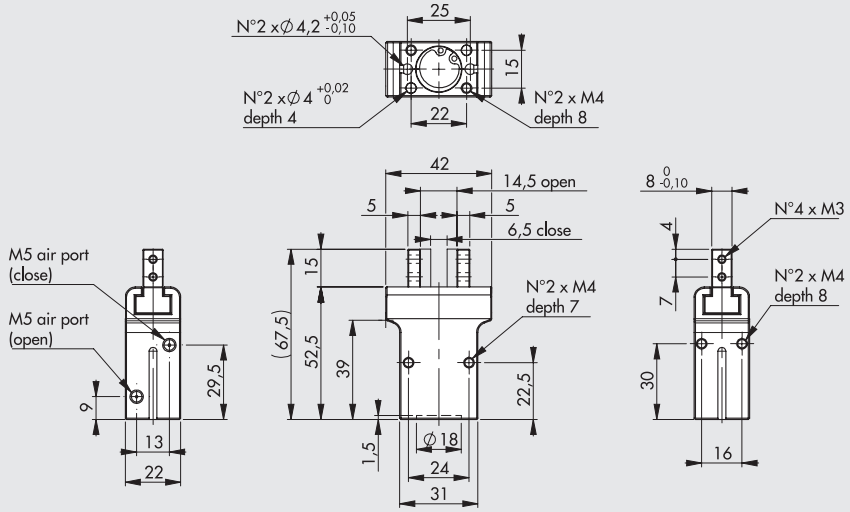
METAL WORK PNEUMATIC

DIAGRAM OF FORCES AND MOMENTS

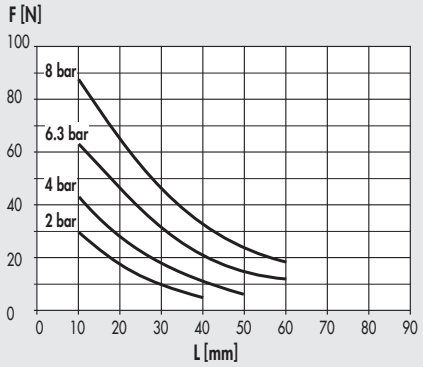


F	Clamping force for each jaw
Fa	Maximum static axial force
Mx, My, Mz	Maximum static moments

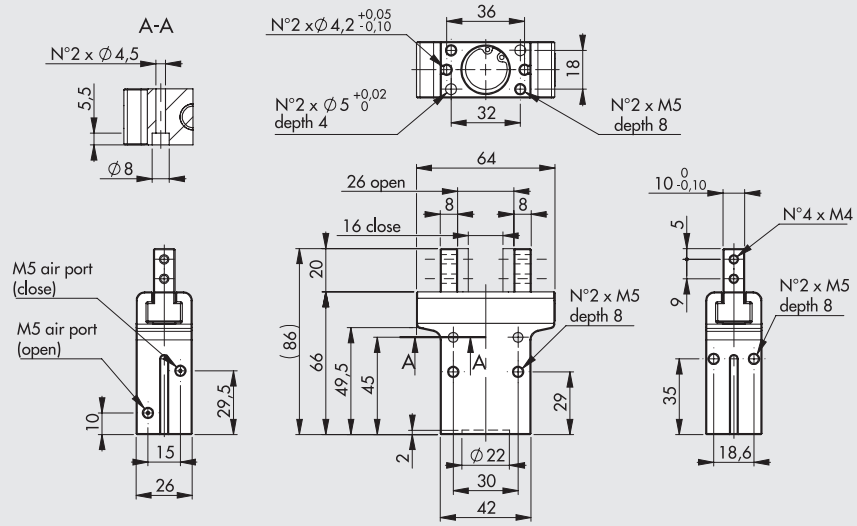
DIMENSIONS OF GRIPPER P2-16



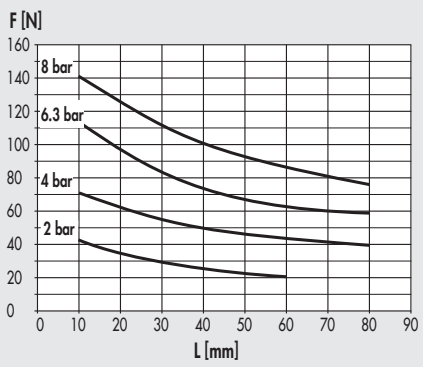
Code	Description
W1570160200	Gripper with 2 parallel jaws P2-16



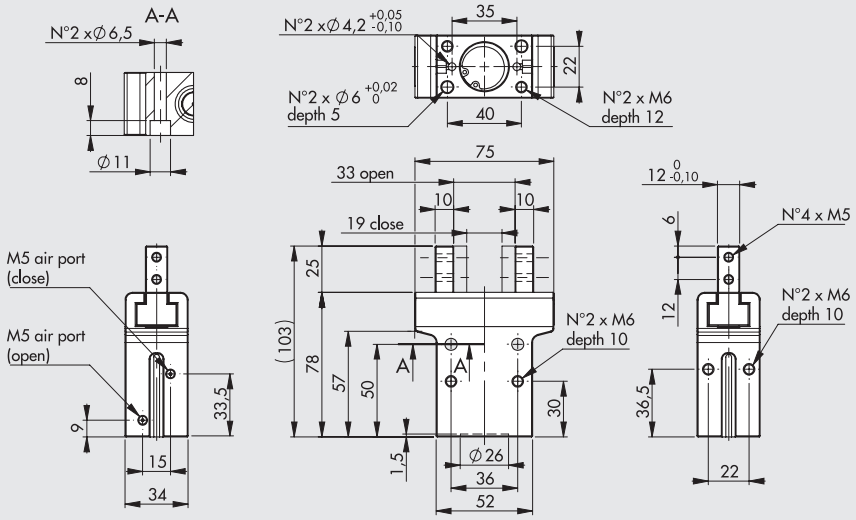
DIMENSIONS OF GRIPPER P2-20



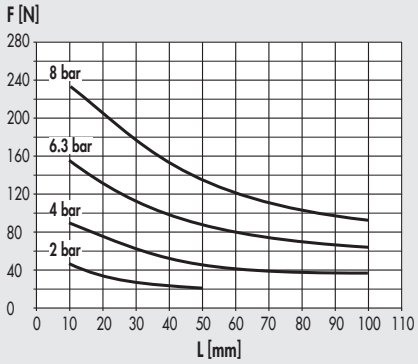
Code	Description
W1570200200	Gripper with 2 parallel jaws P2-20



DIMENSIONS OF GRIPPER P2-25

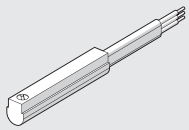


Code	Description
W1570250200	Gripper with 2 parallel jaws P2-25



ACCESSORIES

SENSOR Ø 4



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

NOTES

GRIPPER WITH TWO PARALLEL JAWS, SERIES P3

Parallel double-acting two-jaw gripper, with either internal or external clamping.
Aluminum alloy body coated with surface hardening treatment; jaws made of wear-resistant coated steel.
The jaw-guiding system and precision in coupling with the body make the gripper extremely stable.
The ceramic-coated body reduces friction and wear, and enhances the movement of the jaws on the body.
All sizes are available in the version with standard stroke and clamping force, while only some in the version with reduced stroke but with higher clamping torque.
The gripper is equipped with a magnet and grooves for sensors.
A version designed to house inductive sensors is also available (**the inductive sensors are not supplied by Metal Work**).
Pneumatic supply is available on both sides.

TECHNICAL DATA		P3-40	P3-64	P3-80		P3-100	
				Standard	Increased force	Standard	Increased force
Operating pressure	bar	2 to 8					
	MPa	0.2 to 0.8					
	psi	29 to 116					
Temperature range	°C	-10 to 80					
Fluid		20 µm filtered, lubricated or unlubricated air; lubrification if used, it must be continuous					
Clamping force of a single jaw	N	75	125	265	445	360	790
at 6.3 bar, 20 mm from the upper surface, on opening and closing							
Maximum movable weight	kg	0.65	1.3	2.5	5	3.5	7
Stroke of each jaw	mm	2.5	6	8	4	10	5
Minimum opening/closing time	s	0.05					
Repeatability	mm	0.01					
Moment of inertia as regards the piston axis	kg cm²	1.8	4	4.5		12	
Max. admissible static loads:							
- Fa	N	250	1100	1500		2000	
- Mx	Nm	12	60	90		115	
- My	Nm	5	40	55		70	
- Mz	Nm	10	40	55		80	
Weight	kg	0.12	0.35	0.5		0.9	

COMPONENTS

① BODY: hard-anodized aluminium
② JAWS: nitrided steel
③ PISTON ROD + GUIDE: nitrided steel
④ PISTON: hard-anodized aluminium
⑤ PISTON GASKET: NBR
⑥ PISTON ROD GASKET: NBR / polyurethane
⑦ BASE GASKET: reinforced SBR / NBR
⑧ MAGNET: neodymium

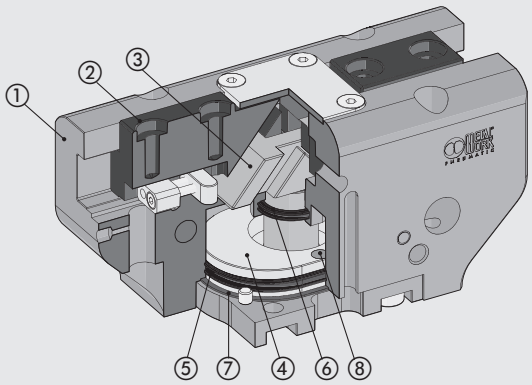
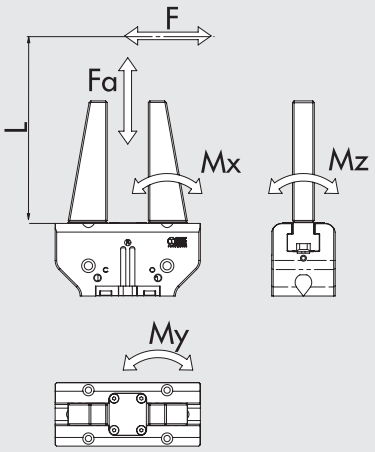
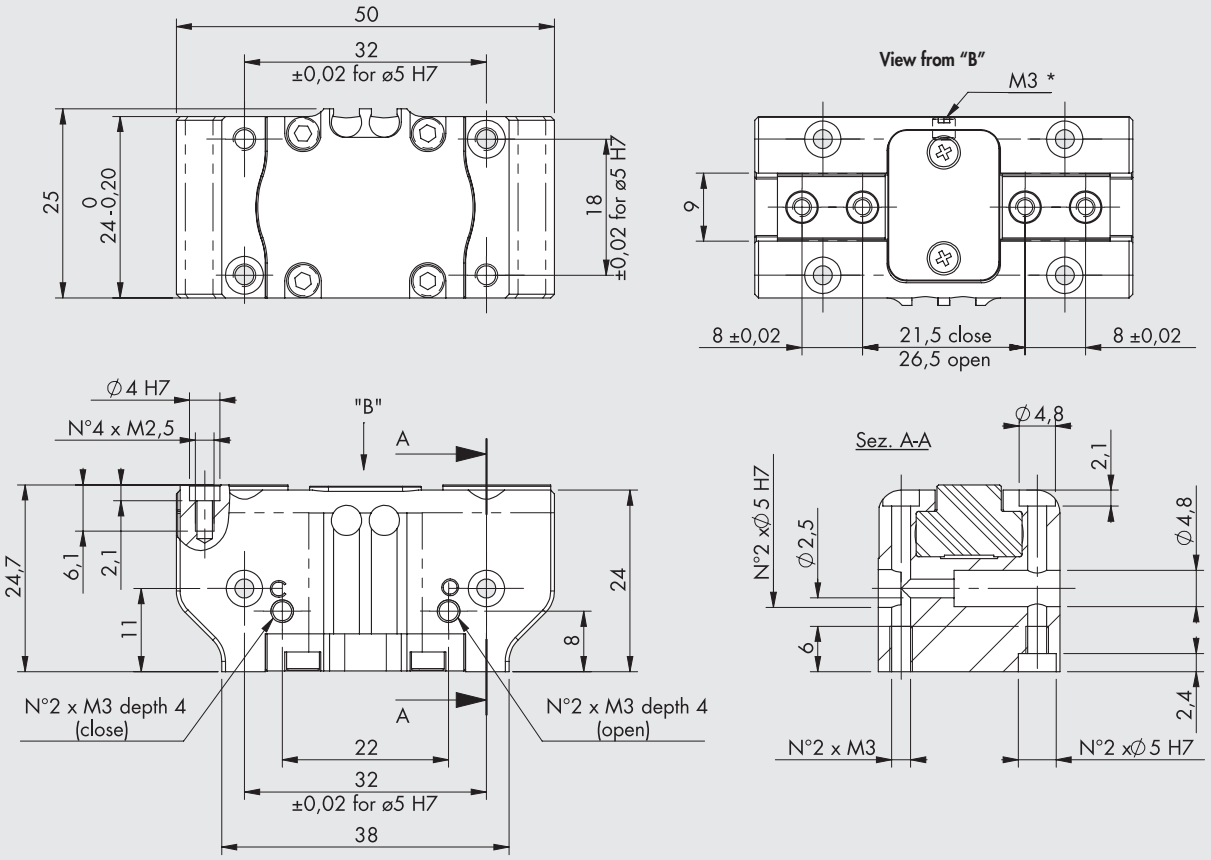


DIAGRAM OF FORCES AND MOMENTS



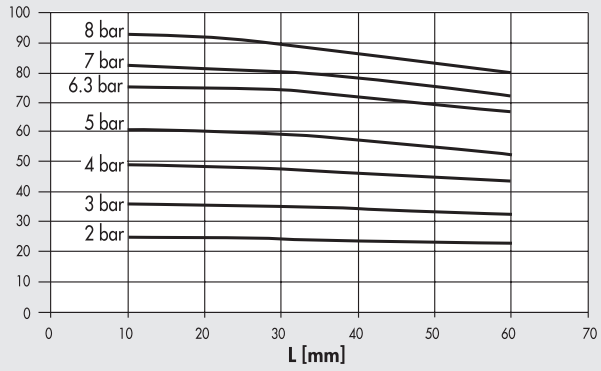
F	Clamping force for each jaw
Fa	Maximum static axial force
Mx, My, Mz	Maximum static moments

DIMENSIONS OF GRIPPER P3-40



* Discharge pressurization connection

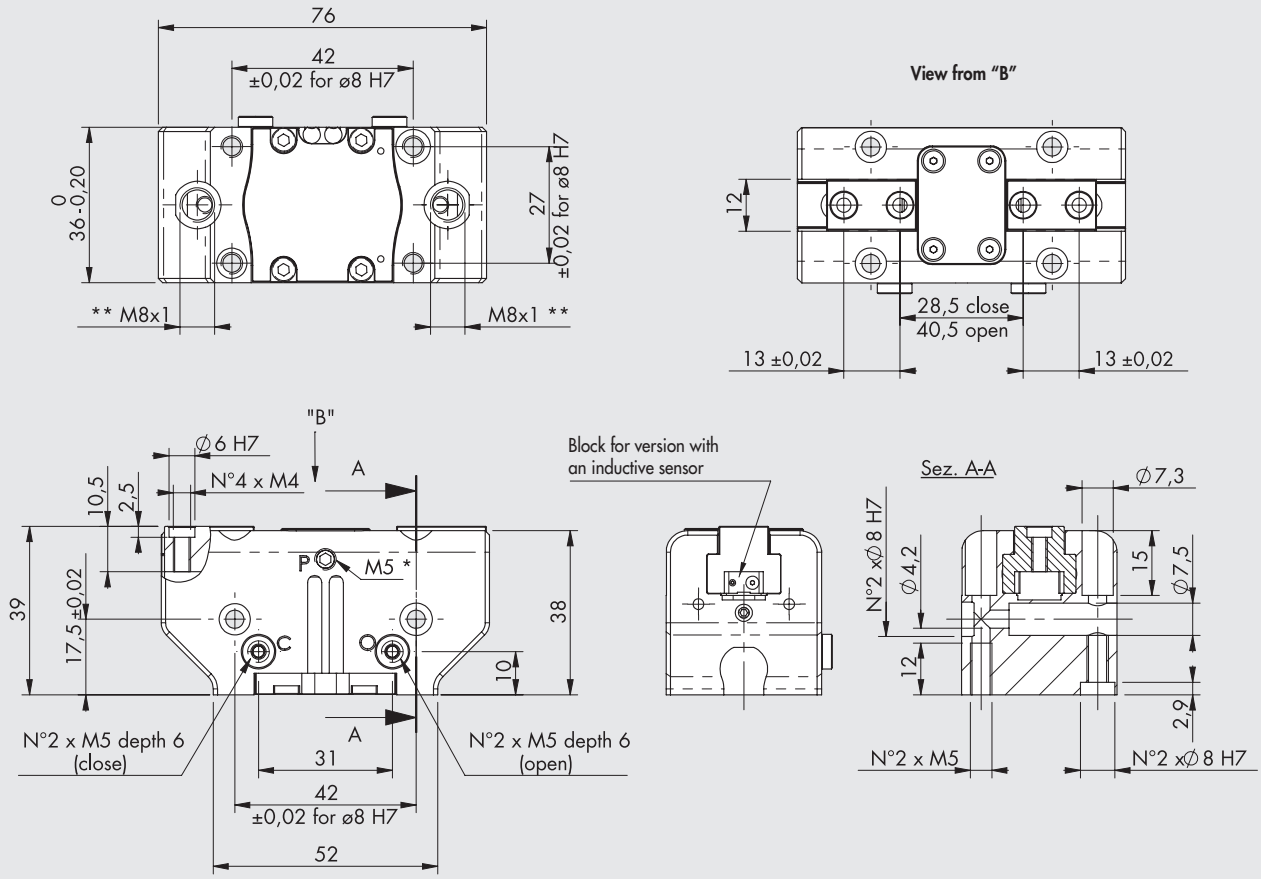
F [N]



Code	Description
W1560400200	Gripper with 2 parallel jaws P3-40

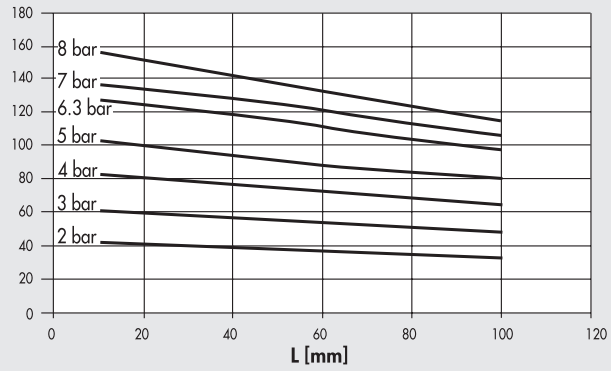
METAL WORK PNEUMATIC

DIMENSIONS OF GRIPPER P3-64



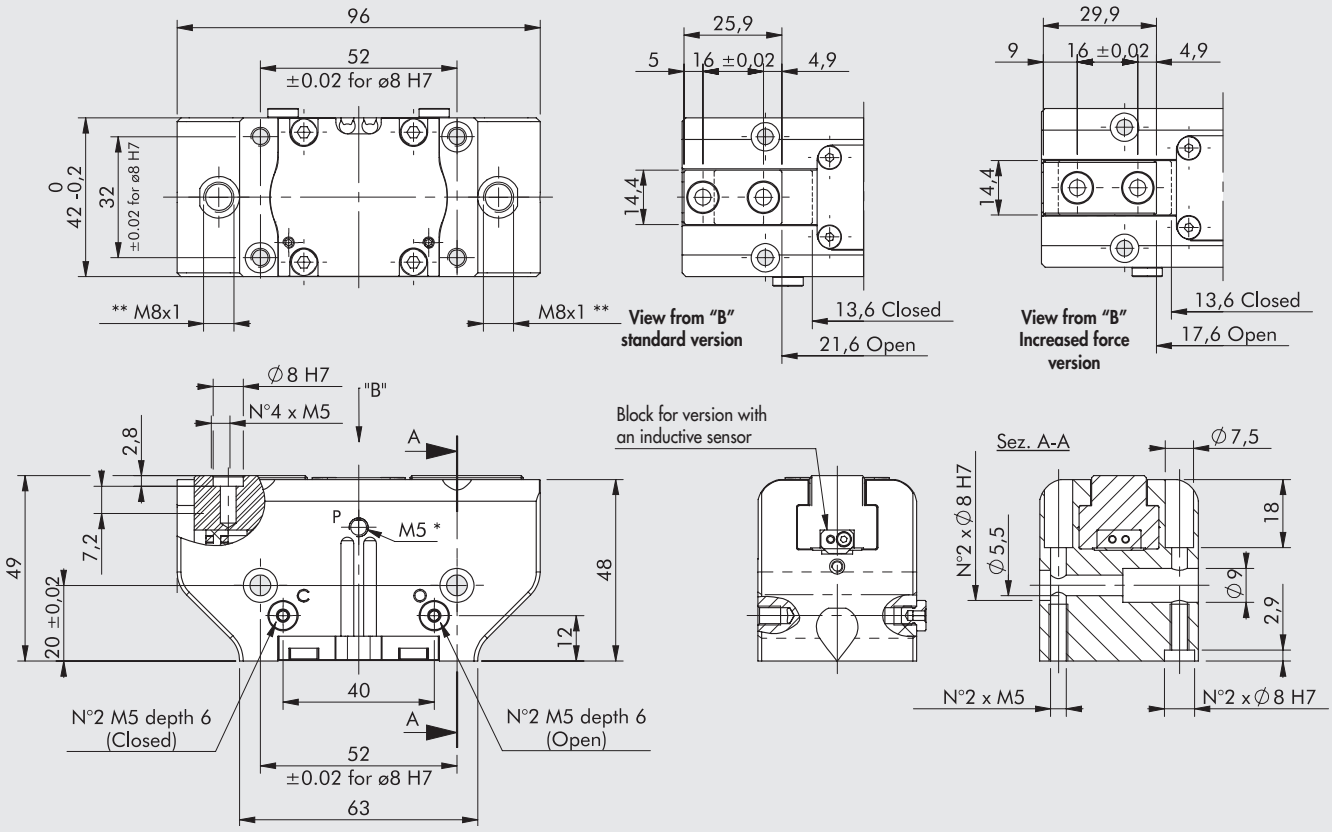
* Discharge pressurization connection, present on both sides
** Inductive sensor slot

F [N]



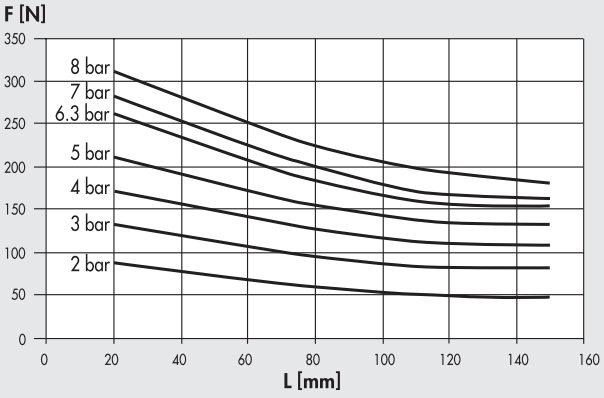
Code	Description
W1560640200	Gripper with 2 parallel jaws P3-64
W1560640201	Gripper with 2 parallel jaws P3-64 for inductive sensors

DIMENSIONS OF GRIPPER P3-80

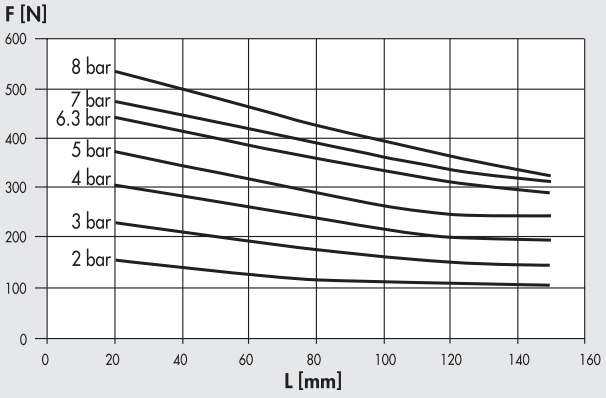


* Discharge pressurization connection, present on both sides
** Inductive sensor slot

Standard version



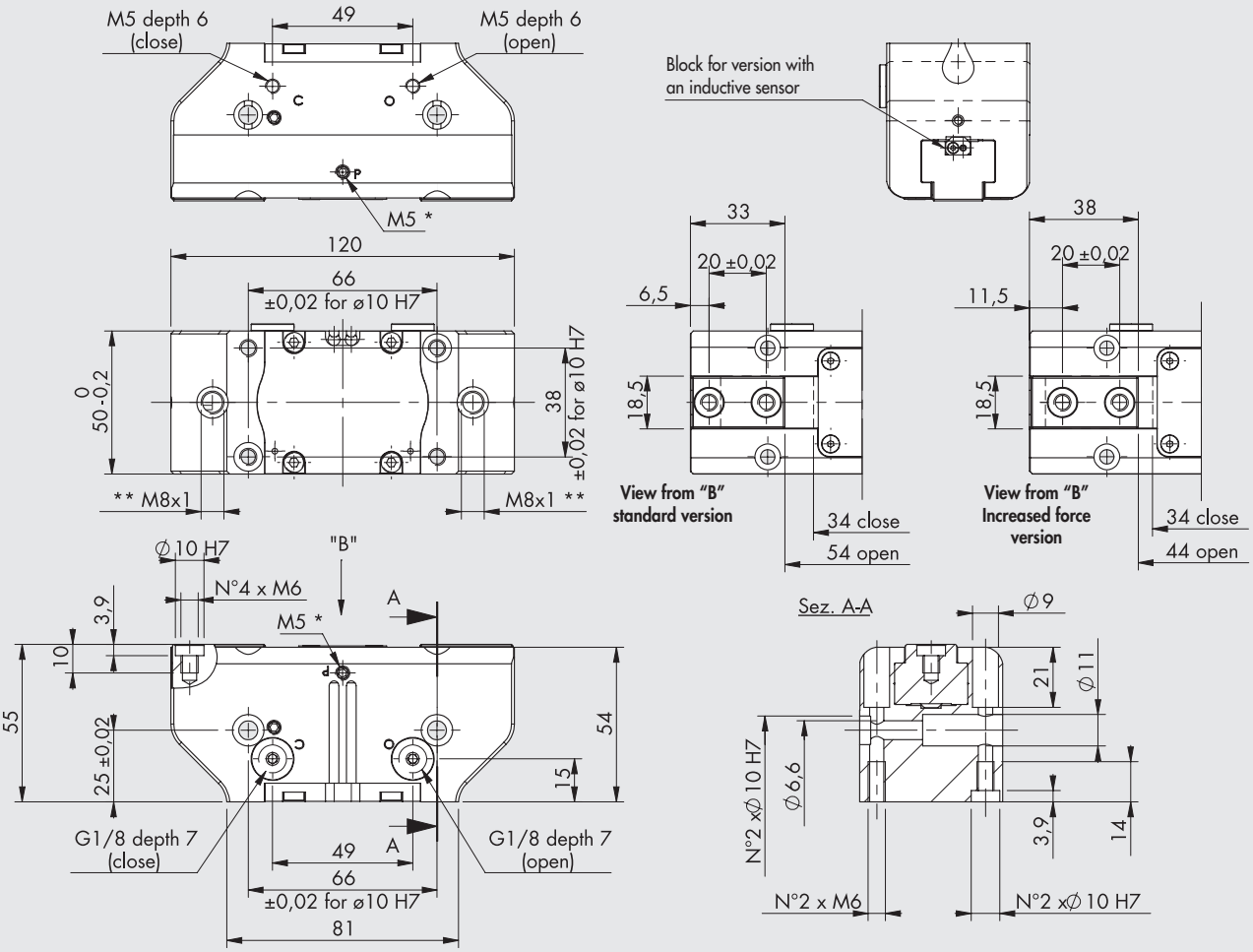
Increased force version



Code	Description
W1560800200	Gripper with 2 parallel jaws P3-80
W1560800201	Gripper with 2 parallel jaws P3-80 for inductive sensors
W1560800220	Gripper with 2 parallel jaws P3-80 increased force
W1560800221	Gripper with 2 parallel jaws P3-80 increased force for inductive sensors

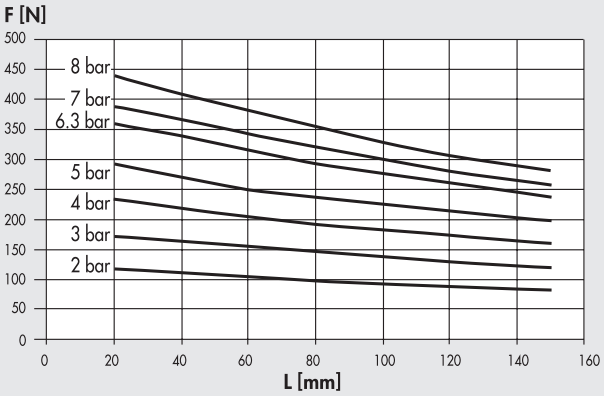
METAL WORK PNEUMATIC

DIMENSIONS OF GRIPPER P3-100

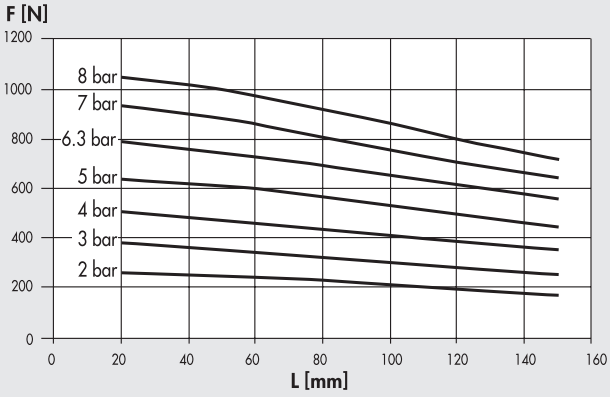


* Discharge pressurization connection, present on both sides
** Inductive sensor slot

Standard version



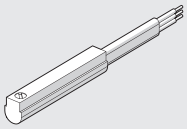
Increased force version



Code	Description
W1561000200	Gripper with 2 parallel jaws P3-100
W1561000201	Gripper with 2 parallel jaws P3-100 for inductive sensors
W1561000220	Gripper with 2 parallel jaws P3-100 increased force
W1561000221	Gripper with 2 parallel jaws P3-100 increased force for inductive sensors

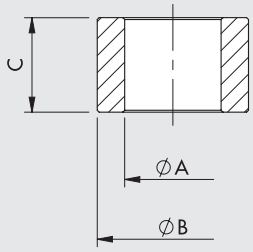
ACCESSORIES

SENSOR Ø 4



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

CENTRING RING



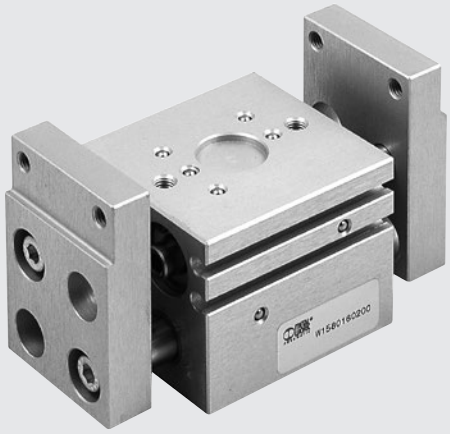
Code	Size	ØA	ØB f7	C
W1560409201	40	$3^{0}_{-0.1}$	4	$4^{0}_{-0.1}$
W1560649201	64	$4.5^{0}_{-0.1}$	6	$5^{0}_{-0.1}$
W1560809201	80	$5.1^{0}_{-0.1}$	8	$5^{0}_{-0.05}$
W1561009201	100	$6.2^{\pm 0.1}$	10	$6.9^{0}_{-0.1}$

Note: 2-pieces pack

NOTES

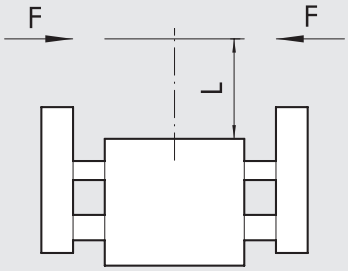
GRIPPER WITH TWO PARALLEL LONG-STROKE JAWS, SERIES P4

These are grippers with 2 parallel long-stroke jaws. The mechanical design makes them suitable for clamping bulky parts. All grippers, except for the smallest ones, can mount a retracting magnetic proximity sensor.

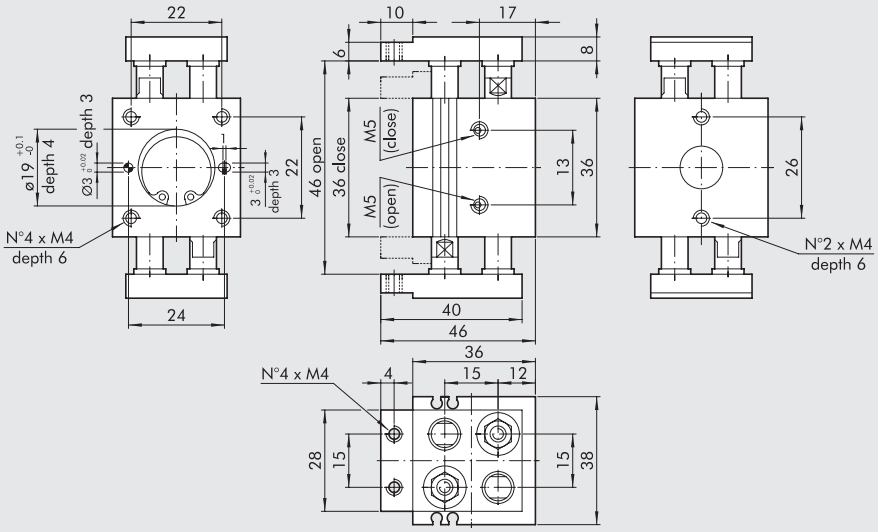


TECHNICAL DATA		P4-10	P4-12	P4-16	P4-25	P4-30
Operating pressure	bar	3 to 7				
	MPa	0.3 to 0.7				
	psi	43 to 101				
Operating temperature	°C	-10 to +80				
Maximum operating frequency	cycles/s	1				
Fluid		20 µm filtered, lubricated or unlubricated air; lubrification if used, it must be continuous				
Bore	mm	2 x 10	2 x 12	2 x 16	2 x 30	2 x 30
Single jaw stroke	mm	5	10	15	30	60
Clamping force at 6.3 bar 20 mm from the top surface during opening and closing	N	30	45	75	280	280
Weight	kg	0.18	0.3	0.5	2.95	3.7

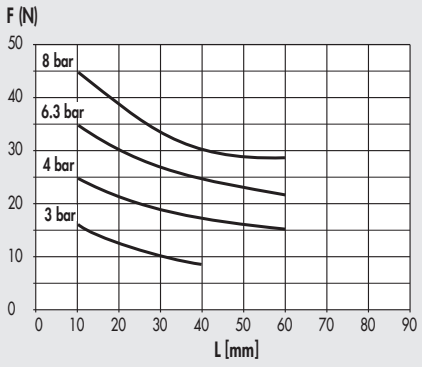
TABLE OF CLAMPING FORCES FOR VARIOUS POINTS OF APPLICATION



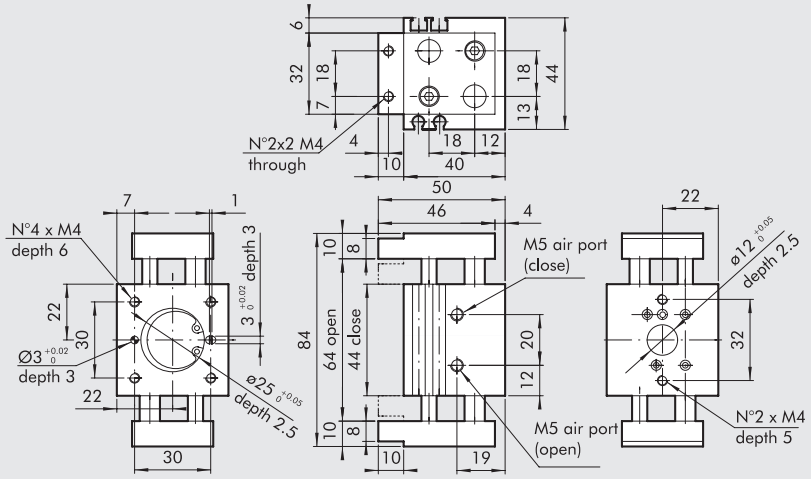
DIMENSIONS OF GRIPPER P4-10



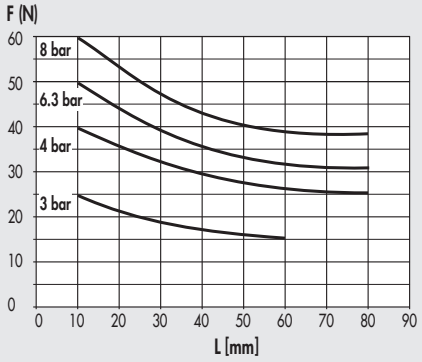
Code	Description
W1580100200	Gripper with 2 parallel long-stroke jaws P4-10



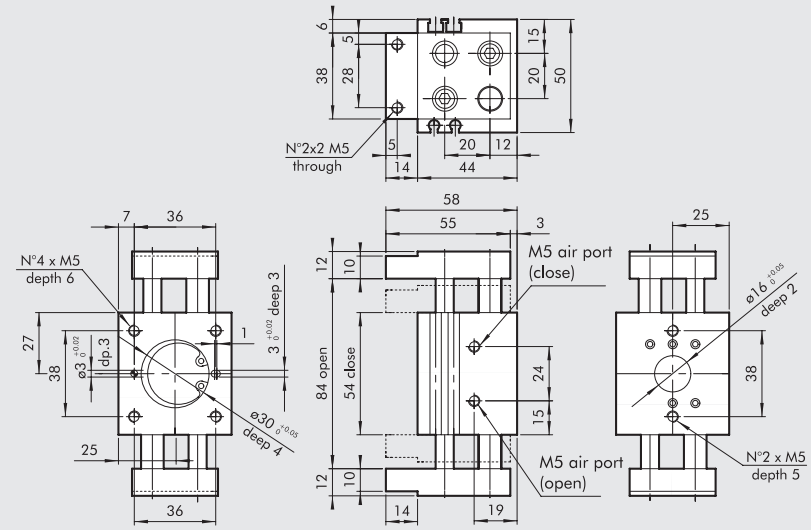
DIMENSIONS OF GRIPPER P4-12



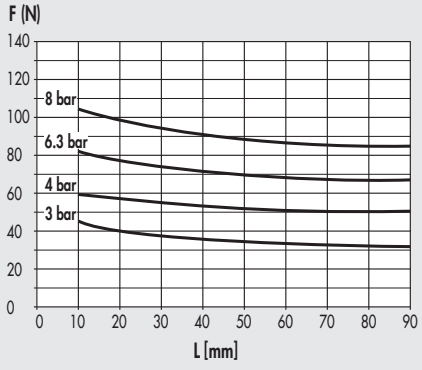
Code	Description
W1580120200	Gripper with 2 parallel long-stroke jaws P4-12



DIMENSIONS OF GRIPPER P4-16

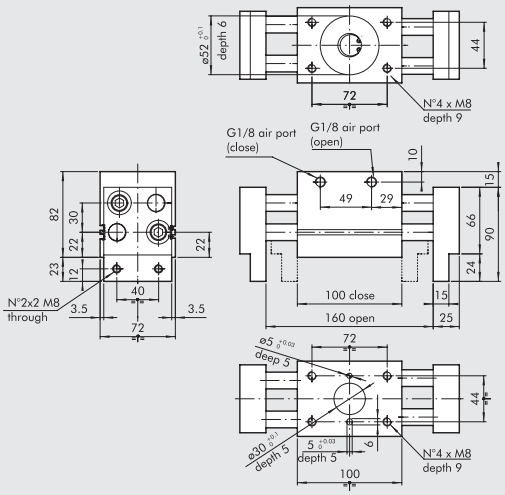


Code	Description
W1580160200	Gripper with 2 parallel long-stroke jaws P4-16

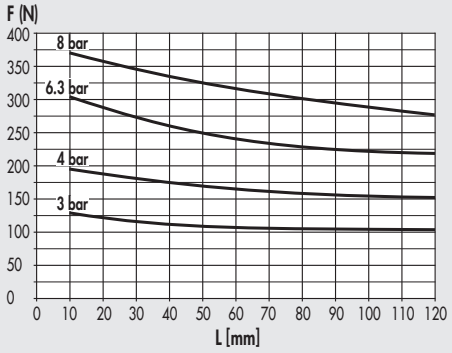


METAL WORK PNEUMATIC

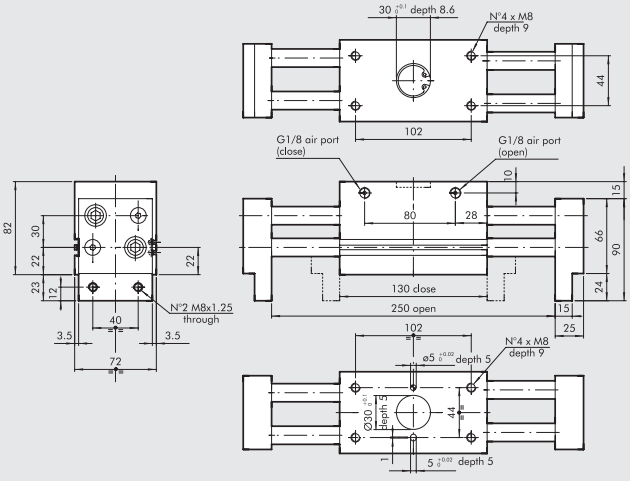
DIMENSIONS OF GRIPPER P4-25



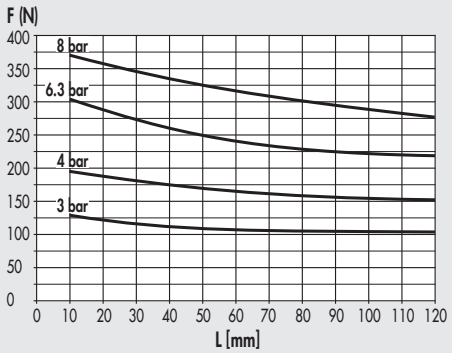
Code	Description
W1580250200	Gripper with 2 parallel long-stroke jaws P4-25



DIMENSIONS OF GRIPPER P4-30

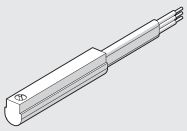


Code	Description
W1580300200	Gripper with 2 parallel long-stroke jaws P4-30



ACCESSORIES

SENSOR Ø 4 FOR P4 10-30

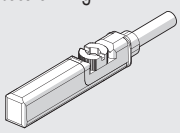


For codes and technical data, see **chapter A6**.

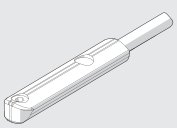
RETRACTABLE SENSOR FOR P4-12-30

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

SENSOR, SQUARE TYPE
Latest generation, secure fixing



SENSOR, OVAL TYPE
Traditional

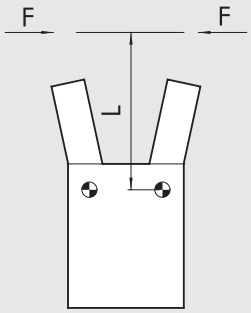


GRIPPER WITH TWO HINGED JAWS – SERIES P7

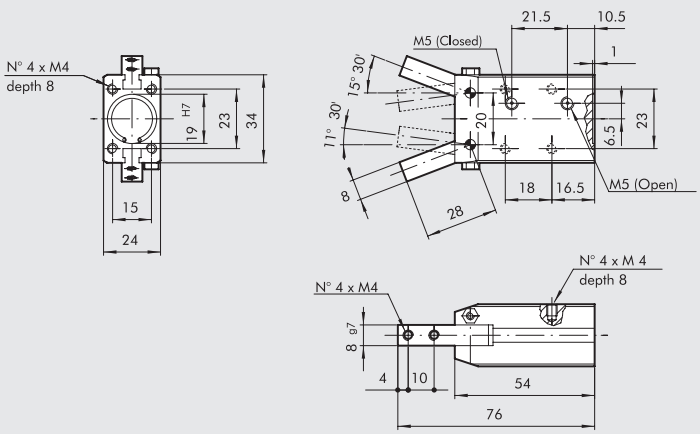
Bores 16, 20, 32 and 50 mm.
All grippers are magnetic with slots in the body with retracting sensors.

TECHNICAL DATA		P7-16	P7-20	P7-32	P7-50
Operating pressure	bar	2 to 10	2 to 10	2 to 10	2 to 10
	MPa	0.2 to 1	0.2 to 1	0.2 to 1	0.2 to 1
	psi	29 to 145	29 to 145	29 to 145	29 to 145
Fluid		20 µm filtered, lubricated or unlubricated air; lubrification if used, it must be continuous			
Temperature range	°C	-10 to +80			
Maximum opening angle of single jaw		15° 30′	16° 30′	16°	8° 30′
Clamping force at 6.3 bar 20 mm from the centre of rotation of the jaws, during opening and closing	N	27	50	120	380
Weight	kg	0.12	0.19	0.5	1.6

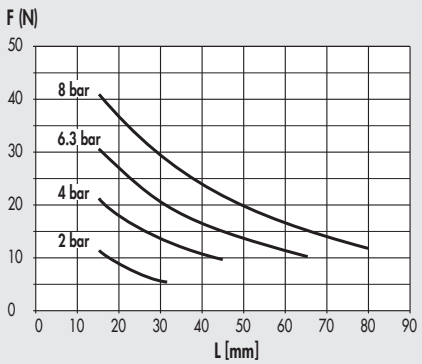
TABLE OF CLAMPING FORCES FOR VARIOUS POINTS OF APPLICATION



DIMENSIONS OF GRIPPER P7-16

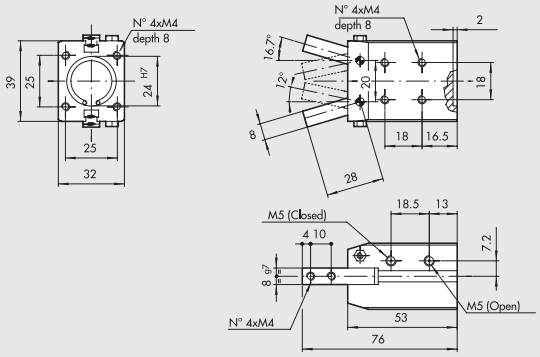


Code	Description
W1590160200	Gripper with 2 hinged jaws P7-16

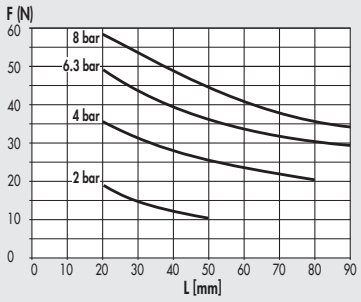


METAL WORK PNEUMATIC

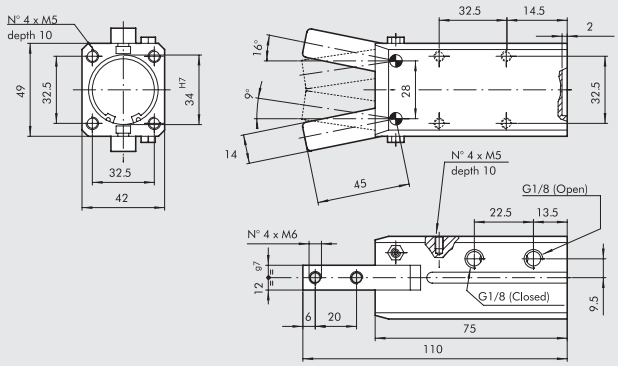
DIMENSIONS OF GRIPPER P7-20



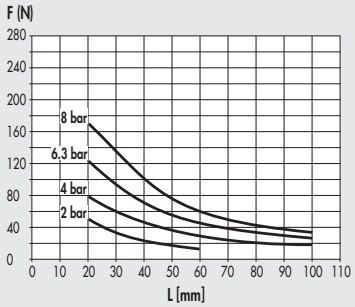
Code	Description
W1590200200	Gripper with 2 hinged jaws P7-20



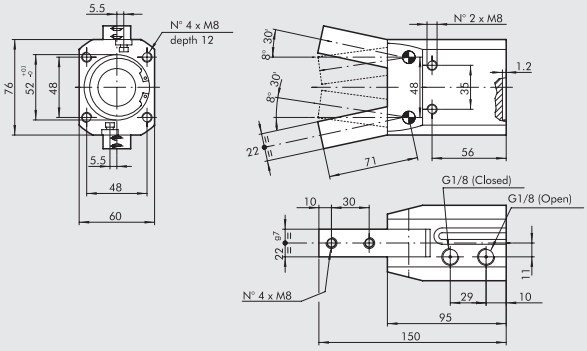
DIMENSIONS OF GRIPPER P7-32



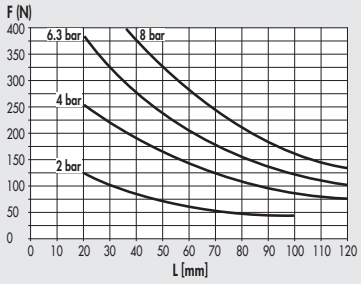
Code	Description
W1590320200	Gripper with 2 hinged jaws P7-32



DIMENSIONS OF GRIPPER P7-50



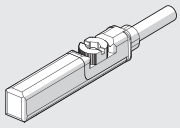
Code	Description
W1590500200	Gripper with 2 hinged jaws P7-50



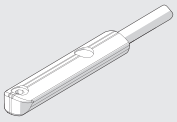
ACCESSORIES

RETRACTABLE SENSOR

SENSOR, SQUARE TYPE
Latest generation, secure fixing



SENSOR, OVAL TYPE
Traditional



For codes and technical data, see chapter A6.

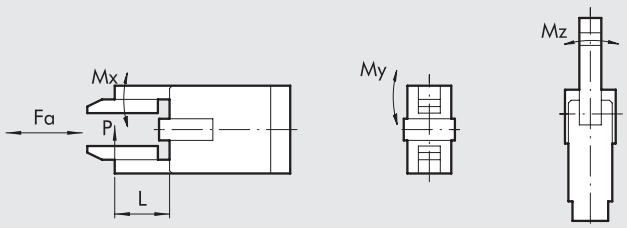
TECHNOPOLYMER HINGED GRIPPER SERIES P8

Single-acting hinged grippers, normally open, made entirely of technopolymer. Three sizes with clamping force 25-80 N at 6 bar. This solution makes the entire system lighter.
This gripper is corrosion-resistant and antimagnetic. It comes complete with spring-loaded bracket for pre-loading the piece (force 1.5-6 N) and sensor holders.

TECHNICAL DATA		P8-32	P8-40	P8-50
Operating pressure	bar		4 to 7	
	MPa		0.4 to 0.7	
	bar		58 to 101	
Operating temperature	°C		-10 to +60	
Fluid			20 µm filtered, lubricated or unlubricated air; lubrification if used, it must be continuous	
Life			Over 2 million cycles	
Jaw opening angle			8°	
Clamping force per jaw at 6 bar	N	22.5	48	80
Applicable weight (recommended)	kg	0.2	0.4	0.8
Air consumption per cycle	cm^3	0.5	1	1.8
Opening time	sec	0.04	0.05	0.05
Closing time	sec	0.06	0.08	0.08
Weight of grippers	g	36	45	60
Moment of inertia	kg cm^2	0.04	0.12	0.15
Repeatability	mm	0.1	0.1	0.1

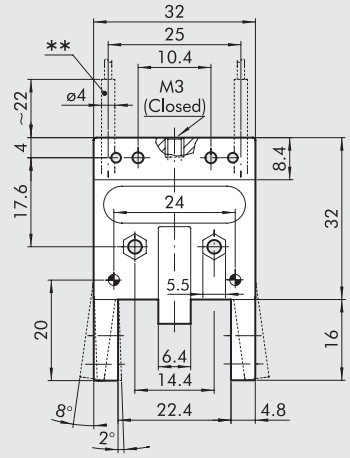
TABLE OF MOMENTS

Gripper	FA (N)	Mx (Ncm)	My (Ncm)	Mz (Ncm)	P (N)
P8 - 32	3	9	10	10	22.5
P8 - 40	5	23	20	20	47.5
P8 - 50	8	49	30	40	80

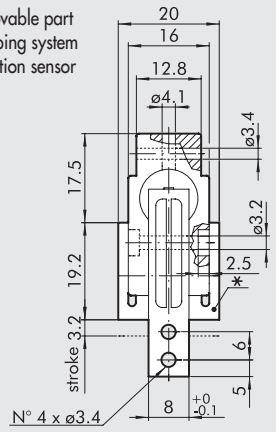


METAL WORK PNEUMATIC

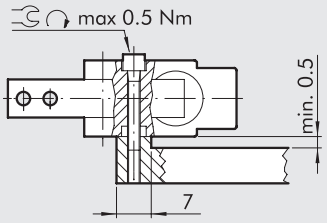
DIMENSIONS OF GRIPPER P8-32



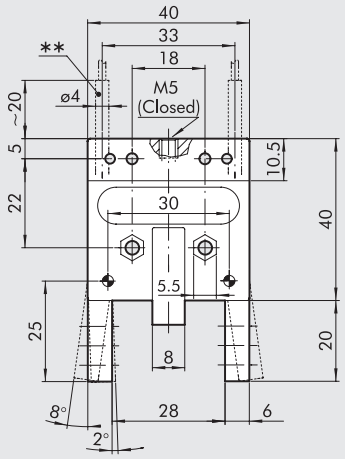
* Removable part clamping system
** Induction sensor



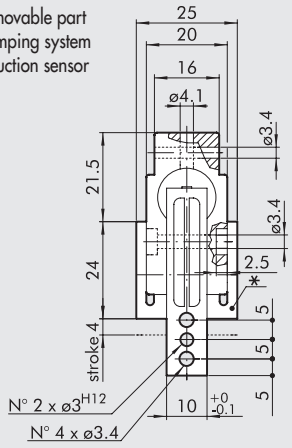
Code	Description
W0710010002	Tecnopolimer hinged grippers P8-32



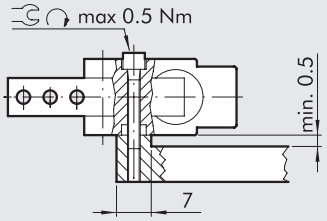
DIMENSIONS OF GRIPPER P8-40



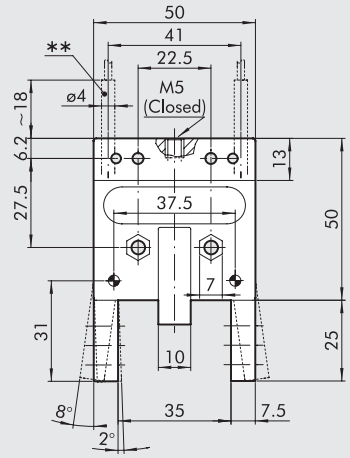
* Removable part clamping system
** Induction sensor



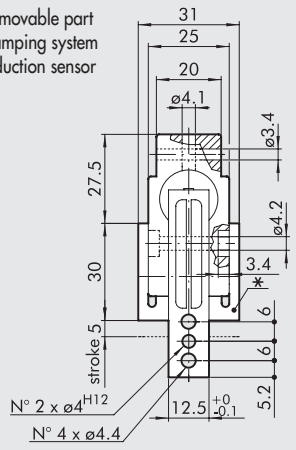
Code	Description
W0710010003	Tecnopolimer hinged grippers P8-40



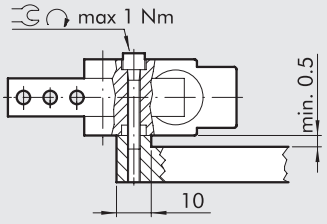
DIMENSIONS OF GRIPPER P8-50



* Removable part clamping system
** Induction sensor

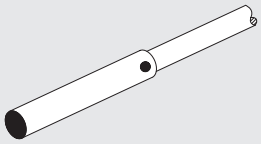


Code	Description
W0710010004	Tecnopolimer hinged grippers P8-50



ACCESSORIES

INDUCTION SENSOR



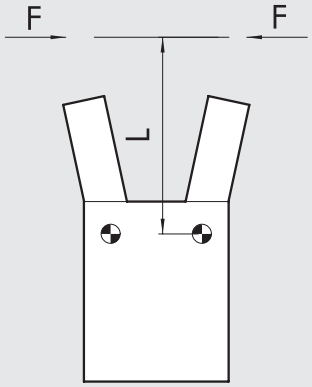
Code	Description
W0950037391	Induction sensor Ø 4 mm PNP-NO-2 m

GRIPPER 180° WITH TWO HINGED JAWS - SERIES P9

- Toggle-type pivoted grippers, with adjustable opening angle.
- High clamping forces.
- Body made of hard anodized aluminium, jaws and moving parts made of tempered steel.
- Bottom or side fixing.
- All sizes come with magnets and sensor slots.

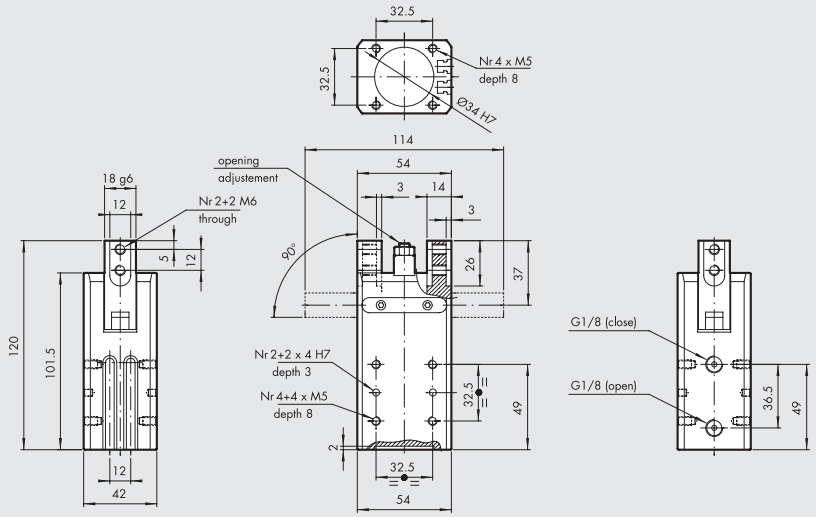
TECHNICAL DATA		P9-32	P9-40
Operating pressure	bar	2 to 8	
	MPa	0.2 to 0.8	
	psi	29 to 116	
Temperature range	°C	-10 to +80	
Fluid		Filtered, lubricated or unlubricated air; lubrification if used, it must be continuous	
Bores	mm	32	40
Jaw opening angle		Adjustable 180°	
Clamping force at 6.3 bar 40 mm from the jaw pivot during opening and closing	N	160	260
Weight	kg	0.85	1.5

TABLE OF CLAMPING FORCES FOR VARIOUS POINTS OF APPLICATION

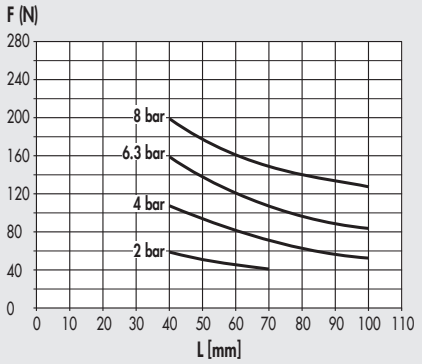


METAL WORK PNEUMATIC

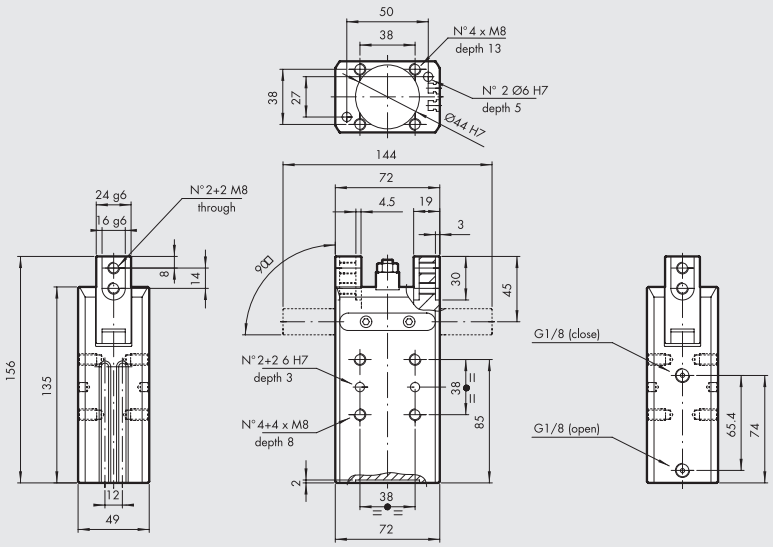
DIMENSIONS OF GRIPPER P9-32



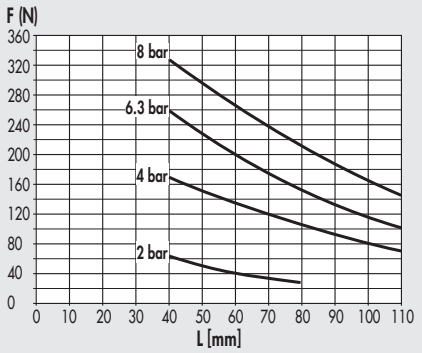
Code	Description
W1530320180	Hinged gripper P9-32



DIMENSIONS OF GRIPPER P9-40



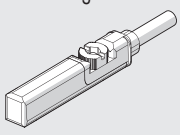
Code	Description
W1530400180	Hinged gripper P9-40



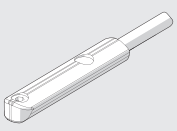
ACCESSORIES

RETRACTABLE SENSOR

SENSOR, SQUARE TYPE
Latest generation,
secure fixing



SENSOR, OVAL TYPE
Traditional



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

GRIPPER WITH THREE PARALLEL JAWS, SERIES P12

Parallel double-acting three-jaw gripper, with either internal or external clamping.
Aluminum alloy body coated with surface hardening treatment; jaws made of wear-resistant coated steel.
The jaw-guiding system and precision in coupling with the body make the gripper extremely stable.
The ceramic-coated body reduces friction and wear, and enhances the movement of the jaws on the body.
All sizes are available in the version with standard stroke and clamping force, while only some in the version with reduced stroke but with higher clamping torque.
The gripper is equipped with a magnet and grooves for sensors.
A version designed to house inductive sensors is also available (**the inductive sensors are not supplied by Metal Work**).

TECHNICAL DATA		P12-40	P12-64	P12-80		P12-100	
				Standard	Increased force	Standard	Increased force
Operating pressure	bar	2 to 8					
	MPa	0.2 to 0.8					
	psi	29 to 116					
Temperature range	°C	-10 to 80					
Fluid		20 µm filtered, lubricated or unlubricated air; lubrification if used, it must be continuous					
Clamping force of a single jaw at 6.3 bar,	N	130	310	435	860	840	1450
20 mm from the upper surface, on opening and closing							
Maximum movable weight	kg	1.3	2.9	4.5	9	9	20
Stroke of each jaw	mm	2.5	6	8	4	10	5
Minimum opening/closing time	s	0.05					
Repeatability	mm	0.01					
Moment of inertia as regards the piston axis	kg cm²	2.1	6	6.5		19	
Max. admissible static loads:							
- Fa	N	250	1100	1500		2000	
- Mx	Nm	12	60	90		115	
- My	Nm	5	40	55		70	
- Mz	Nm	10	40	55		80	
Weight	kg	0.2	0.7	0.75		1.4	

COMPONENTS

① BODY: hard-anodized aluminium
② JAWS: nitrided steel
③ PISTON ROD + GUIDE: nitrided steel
④ PISTON: hard-anodized aluminium
⑤ PISTON GASKET: NBR
⑥ PISTON ROD GASKET: NBR / polyurethane
⑦ BASE GASKET: reinforced SBR / NBR
⑧ MAGNET: neodymium

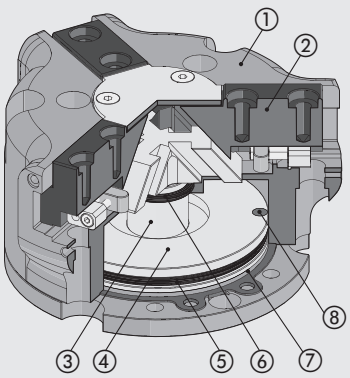
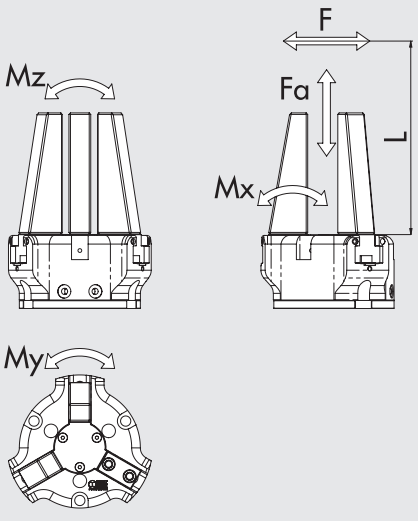


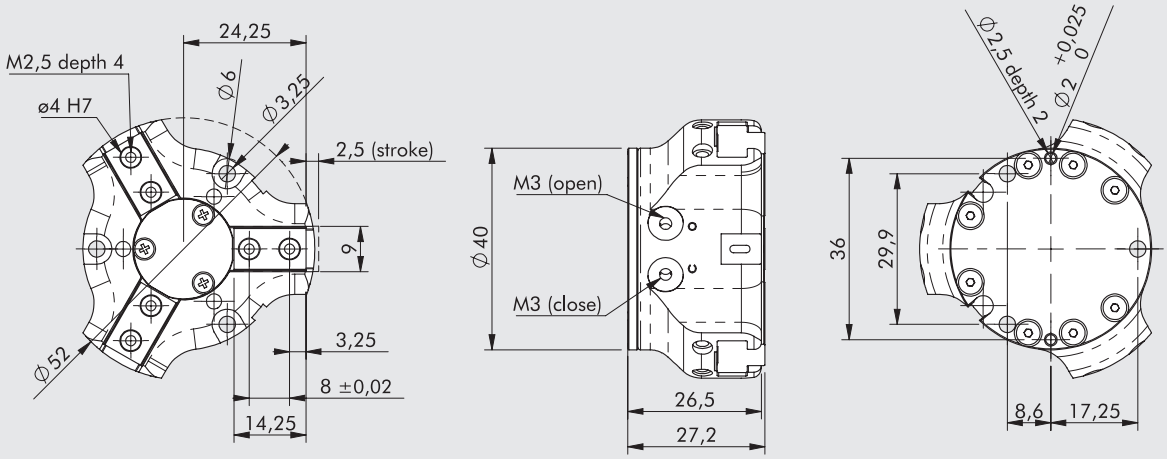
DIAGRAM OF FORCES AND MOMENTS



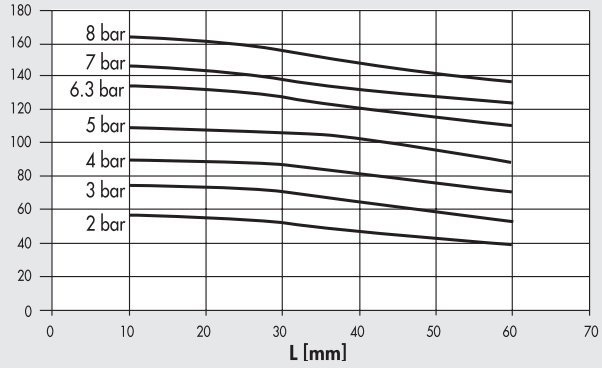
F	Clamping force for each jaw
Fa	Maximum static axial force
Mx, My, Mz	Maximum static moments

METAL WORK PNEUMATIC

DIMENSIONS OF GRIPPER P12-40

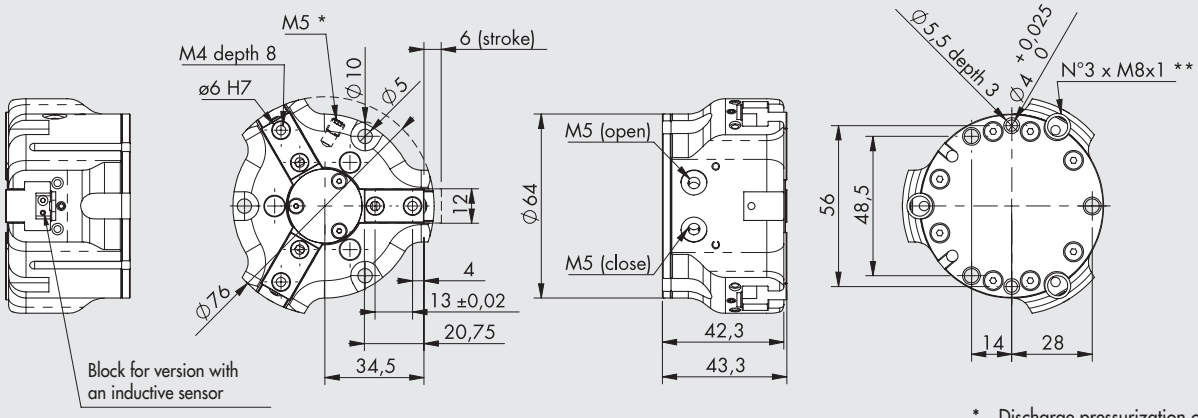


F [N]



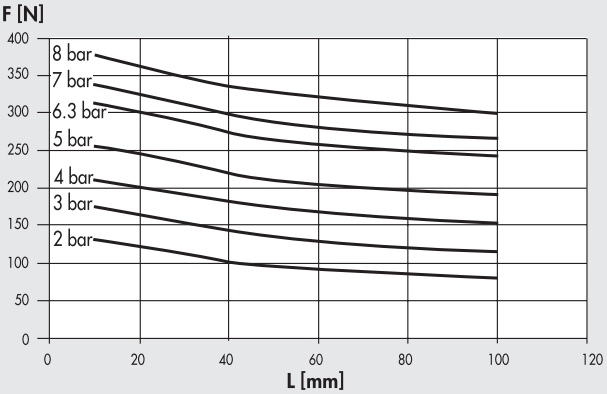
Code	Description
W1560400300	Gripper with 3 parallel jaws P12-40

DIMENSIONS OF GRIPPER P12-64



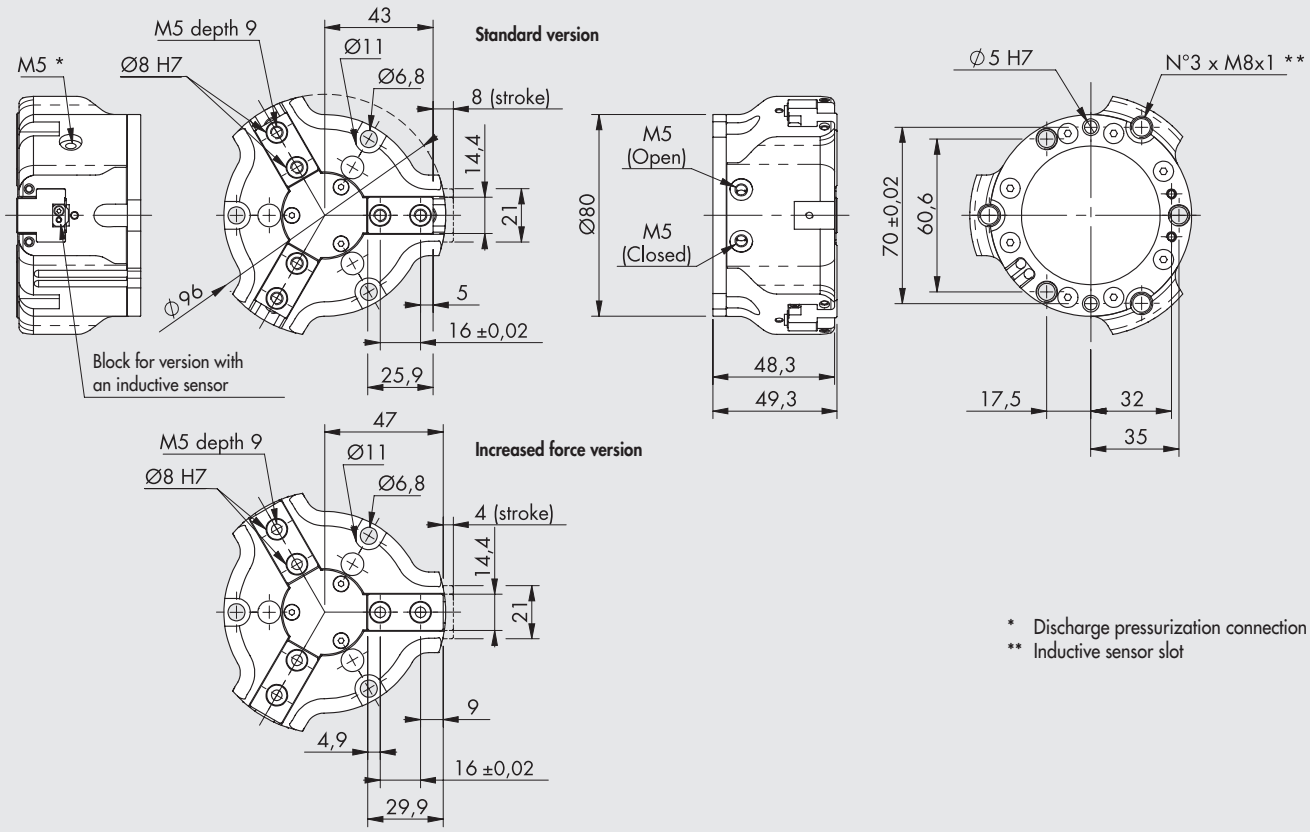
* Discharge pressurization connection
** Inductive sensor slot

F [N]



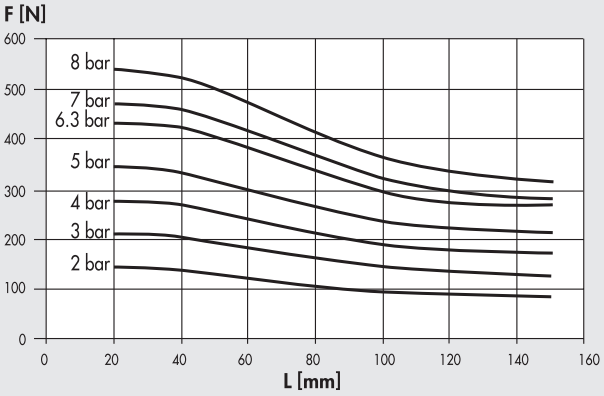
Code	Description
W1560640300	Gripper with 3 parallel jaws P12-64
W1560640301	Gripper with 3 parallel jaws P12-64 for inductive sensors

DIMENSIONS OF GRIPPER P12-80

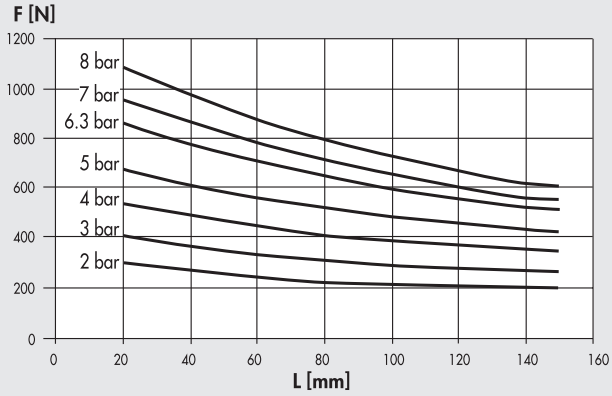


* Discharge pressurization connection
** Inductive sensor slot

Standard version



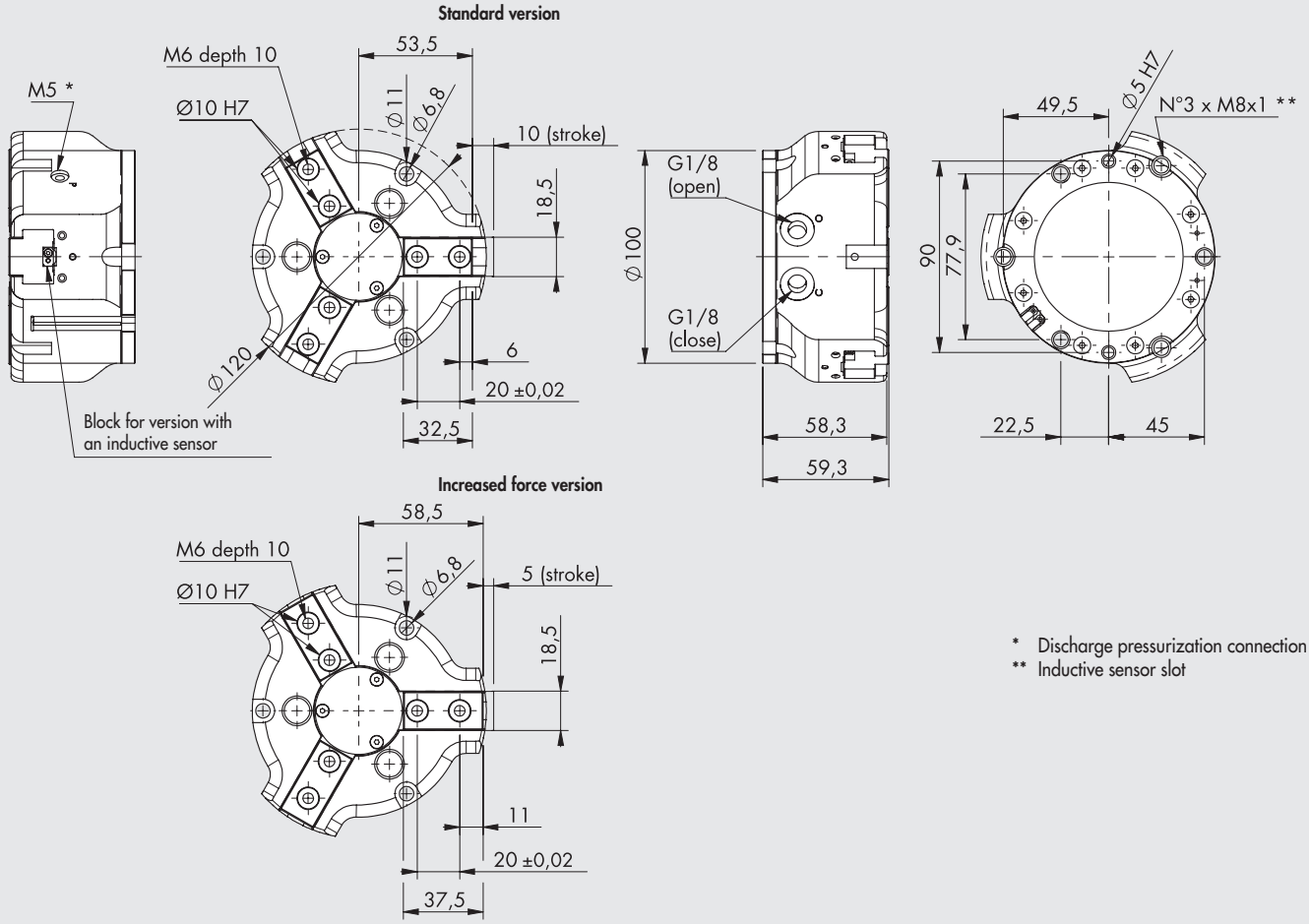
Increased force version



Code	Description
W1560800300	Gripper with 3 parallel jaws P12-80
W1560800301	Gripper with 3 parallel jaws P12-80 for inductive sensors
W1560800320	Gripper with 3 parallel jaws P12-80 increased force
W1560800321	Gripper with 3 parallel jaws P12-80 increased force for inductive sensors

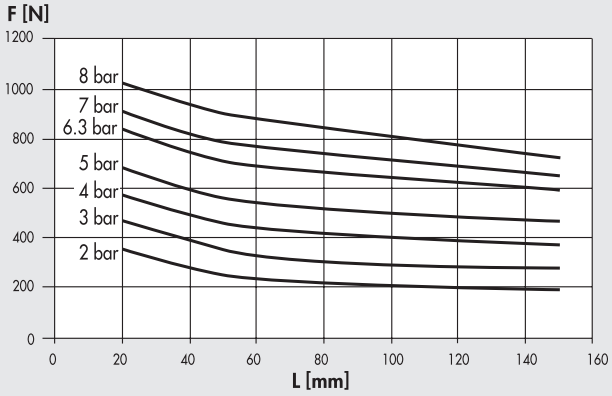
METAL WORK PNEUMATIC

DIMENSIONS OF GRIPPER P12-100

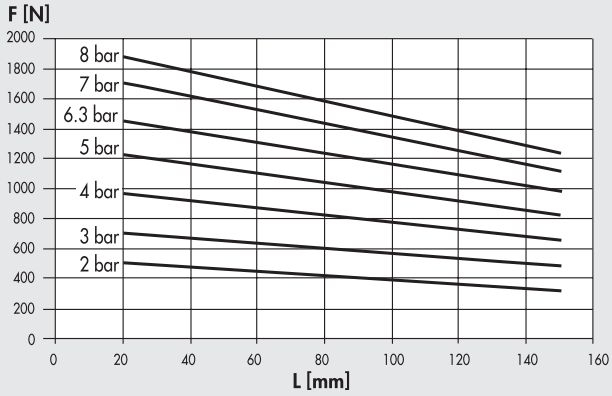


* Discharge pressurization connection
** Inductive sensor slot

Standard version



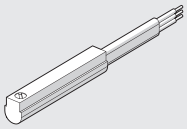
Increased force version



Code	Description
W1561000300	Gripper with 3 parallel jaws P12-100
W1561000301	Gripper with 3 parallel jaws P12-100 for inductive sensors
W1561000320	Gripper with 3 parallel jaws P12-100 increased force
W1561000321	Gripper with 3 parallel jaws P12-100 increased force for inductive sensors

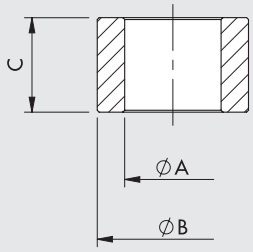
ACCESSORIES

SENSOR Ø 4



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

CENTRING RING



Code	Size	ØA	ØB f7	C
W1560409201	**40**	$3^{0}_{-0.1}$	4	$4^{0}_{-0.1}$
W1560649201	**64**	$4.5^{0}_{-0.1}$	6	$5^{0}_{-0.1}$
W1560809201	**80**	$5.1^{0}_{-0.1}$	8	$5^{0}_{-0.05}$
W1561009201	**100**	$6.2^{\pm 0.1}$	10	$6.9^{0}_{-0.1}$

Note: 2-pieces pack

NOTES

GENERAL TECHNICAL DATA ROTARY ACTUATORS

METAL WORK PNEUMATIC

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.

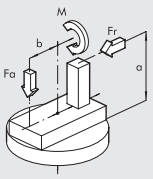
CALCULATIONS

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

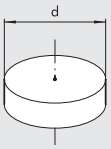
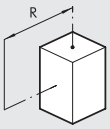
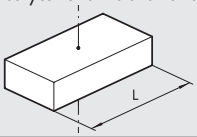
Then compare each of the 4 sizes with the admissible ones shown in the catalogue for each rotary actuator. Remember that the application of optional hydraulic decelerator, where envisaged, doubles the kinetic energy that can be absorbed by the actuator.

SIZING

HOW TO CALCULATE KINETIC ENERGY

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

MOMENTS OF INERTIA FOR THE MOST COMMON SHAPES

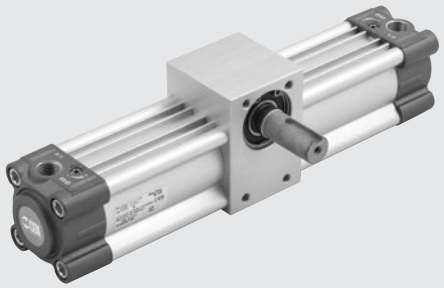
	Denomination	Unit of measurement	Formula	Example
			Disco 	
M	Disk mass	kg		7
d	Disk diameter	m		0.3
J	Moment of inertia of the disk	kg m^2	$= \frac{Md^2}{8}$	$= \frac{7 \cdot 0.3^2}{8} = 0.0787$
			Mass distant from rotation axis 	
M	Mass	kg		0.5
R	Distance between barycenter and rotation axis	m		0.2
J	Moment of inertia of the mass	kg m^2	$= MR^2$	= 0.5 x 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

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.

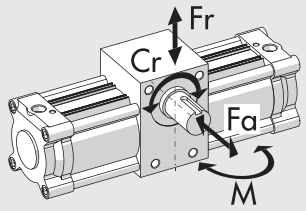
N.B.: We always suggest to use flow microregulators.
During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievment of the required speed.



TECHNICAL DATA		Ø 32	Ø 40	Ø 50	Ø63	Ø 80	Ø 100	Ø 125
Operating pressure		10 bar (1 MPa - 145 psi)						
Temperature range	°C	-10 to 80						
Fluid		Filtered lubricated or unlubricated air. Lubrication, if used, must be continuous						
Rotation angle		90°; 180°; 270°; 360°						
Configuration		Magnetic standard cushioned						
Actual rotation angle		See next page						
Admissible kinetic energy	Joule	1.8	3	5	12	28	40	66

DIMENSIONS - FORCES AND MOMENTS

Ø	Cr Theoretical torque at 6 bar [Nm]	Fa Max axial load [N]	Fr Max radial Load [N]	M Max overturning moment [Nm]
32	6	2500	570	18
40	11	2800	650	25
50	21	4500	1000	45
63	37	5600	1310	68
80	80	8500	2040	135
100	148	12200	2920	230
125	303	20000	4640	480

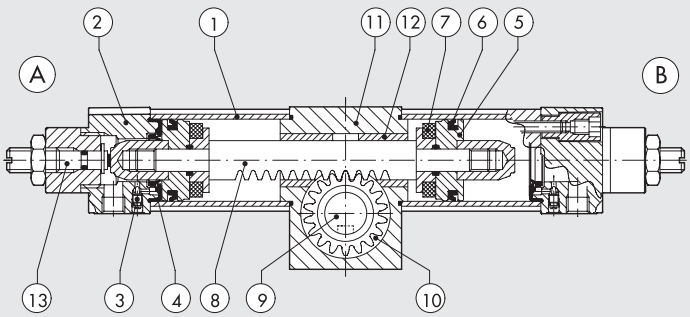


WEIGHTS [kg]

	VERSION W165_ _ _1 _ _ _				VERSION W165_ _ _2_ _ _				VERSION W166_ _ _1_ _ _				VERSION W166_ _ _2_ _ _			
	Rotation angle				Rotation angle				Rotation angle				Rotation angle			
Ø	90°	180°	270°	360°	90°	180°	270°	360°	90°	180°	270°	360°	90°	180°	270°	360°
32	1.15	1.25	1.36	1.47	1.25	1.36	1.47	1.58	1.00	1.20	1.30	1.40	1.20	1.30	1.40	1.50
40	1.65	1.80	1.90	2.00	1.80	1.95	2.05	2.15	1.55	1.65	1.75	1.85	1.60	1.75	1.90	2.05
50	2.50	2.70	2.90	3.05	2.27	2.90	3.07	3.25	2.35	2.50	2.70	2.85	2.50	2.75	2.90	3.07
63	3.60	3.80	4.05	4.25	3.85	4.05	4.30	4.50	3.35	3.55	3.80	4.00	3.50	3.80	4.00	4.20
80	7.40	7.90	8.30	8.80	7.80	8.30	8.80	9.30	6.80	7.30	7.80	8.30	7.20	7.70	8.20	8.70
100	11.60	12.40	13.20	13.90	12.20	12.90	13.60	14.40	10.50	11.20	12.00	12.70	11.00	11.70	12.50	13.30
125	20.00	21.70	23.30	25.00	20.60	22.30	23.90	25.60	18.80	20.50	22.10	23.80	19.40	21.10	22.70	24.40

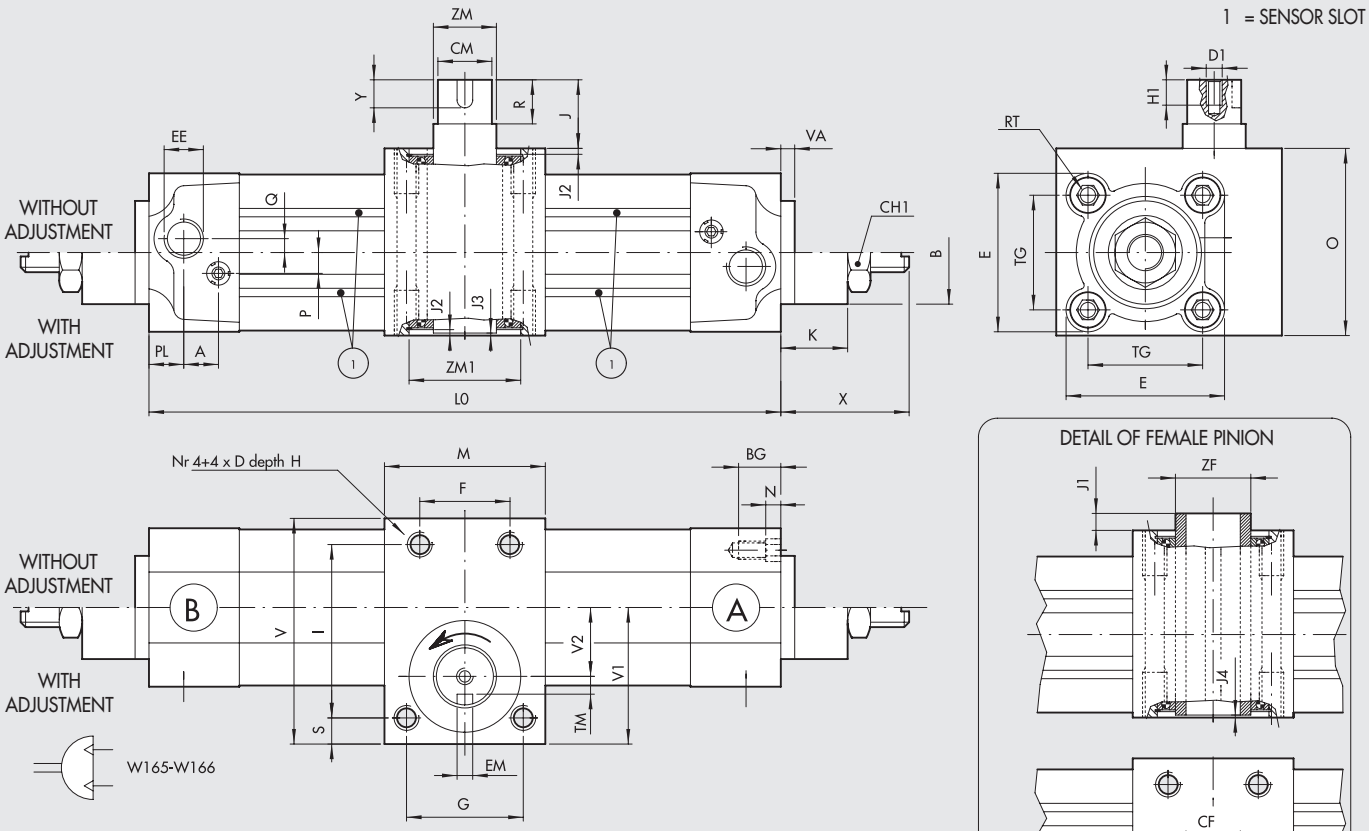
COMPONENTS

① BARREL: profiled anodized 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: nitrided steel
⑨ PIGNON MALE/FEMALE: nitrided alloy steel
⑩ BALL BEARING
⑪ CENTRAL BODY: anodized aluminium
⑫ RACK GUIDE BUSH: self-lubricating sintered bronze
⑬ REGULATION SCREW: anodized aluminium



METAL WORK PNEUMATIC

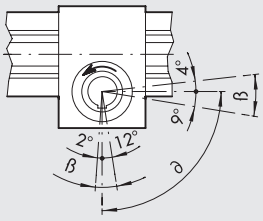
DIMENSIONS OF ROTARY ACTUATOR R1 Ø 32 to 125



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

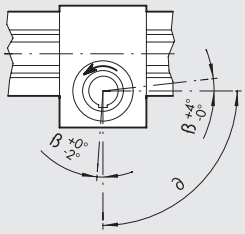
ACTUAL ROTATION ANGLE

VERSION WITH ADJUSTMENT



ß = Adjustment
∂ = Nominal rotation angle

VERSION WITHOUT ADJUSTMENT



ß = Manufactural tolerance
∂ = Nominal rotation angle

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.

Ø	L0 ±1 for ROTATION ANGLE 90°	180°	270°	360°	Δ	A	B	BG	CM g7	CF G7	CH1	D	D 1	E	EE	EF D10	EM H9	F	G	H	H 1	I	J	J1
32	204.2	248.0	289.0	331.6	0.236	10	30	15.5	14	10	22	M6	M5	46	G1/8	3	5	30	30	14	12.5	50	34.5	4.5
40	220.3	267.5	314.5	360.5	0.262	10	35	15.5	16	12	22	M6	M5	54	G1/4	4	5	30	30	14	12.5	60	39.5	5
50	250.6	307.0	362.6	419.2	0.314	10	40	18.5	19	14	27	M8	M6	64.5	G1/4	5	6	32	45	16	16	65	46.5	7
63	277.2	340.2	401.4	464.2	0.349	10	45	18.5	24	16	27	M10	M8	75.5	G3/8	5	8	38	52	17	19	73	47.5	2.5
80	350.0	434.0	517.0	603.6	0.471	12	45	21.5	28	25	36	M12	M8	94	G3/8	8	8	48	70	20	19	100	58.5	8.5
100	385.8	487.6	587.2	690.0	0.559	12	55	21.5	38	30	36	M14	M10	111	G1/2	8	10	60	80	25	22	120	67	7
125	462.0	594.0	726.0	858.0	0.733	10	60	23	38	30	36	M12	M10	134	G1/2	8	10	70	90	25	22	150	51	7

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

Ø	J2	J3	J4	K	M	N	O	P	PL	Q	R	RT	S	TG	TF	TM	V	V1	V2	VA	X	Y	ZM	ZM1	ZF
32	2.2	2.5	2.5	17	47	4.5	47	6	10	4	30	M6	9	32.5	6.4	4	68	44.5	19	4	29 - 32.5	20	15	32	15
40	1.7	0.5	0.5	17	52.5	4.5	54.5	6	12	4	35	M6	7	38	7.8	5	74	45	22	4	29 - 32.5	25	17	35	17
50	2.2	3	3	20	63	5.5	64	6	14	6	40	M8	10	46.5	9.3	6	85	51	25	4	32.5 - 37	25	20	42	20
63	3.7	2.5	2.5	20	75	5.5	75	6	16	6	45	M8	11	56.5	10.3	8	95	56	27.5	4	32.5 - 37	30	25	47	25
80	5.4	5.5	5.5	29	95	5.5	95	10	18	7	50	M10	12.5	72	15.8	10	125	76	39	4	42 - 50.5	35	35	62	35
100	4.4	5	5	29	108	5.5	110	10	20	7	60	M10	15	89	18.3	14	150	90.5	45.5	4	42 - 50.5	45	45	75	45
125	5.3	7	2	32.5	125	7	140	12	25	8	50	M12	15	110	18.3	14	188	118	58	6	45 - 54	45	60	95	60

KEY TO CODES

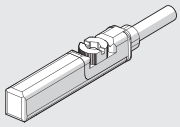
W165	050	1	090
TYPE	**BORES**	**VERSION**	**ANGLE OF ROTATION •**
W165 Rotary actuator with male pinion	032	**1** Without adjustment of rotation angle	090
W166 Rotary actuator with female pinion	040	**2** With adjustment of rotation angle	180
	050		270
	063		360
	080		
	100		
	125		

• Expressed in sexagesimal degrees.

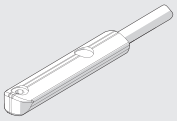
ACCESSORIES: MAGNETIC SENSORS

RETRACTABLE SENSOR

SENSOR, SQUARE TYPE
Latest generation, secure fixing



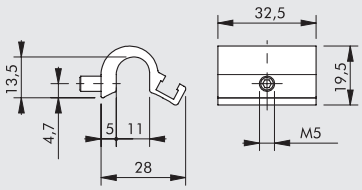
SENSOR, OVAL TYPE
Traditional



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

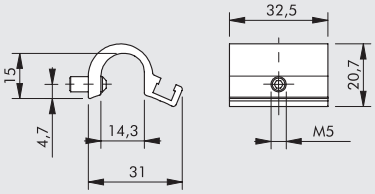
SENSOR SUPPORT BRACKETS FOR SENSORS SQUARE TYPE AND OVAL TYPE

Ø 32 to 40



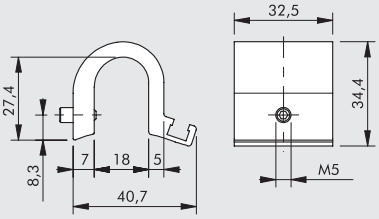
Code	Description
W0950001711	Bracket D.32-40

Ø 50 to 63



Code	Description
W0950001712	Bracket D.50-63

Ø 80 to 125

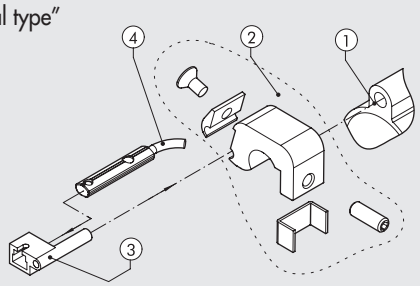


Code	Description
W0950001713	Bracket D.80-100-125

ADAPTER FOR OVAL TYPE RETRACTABLE SENSORS

ASSEMBLY DIAGRAM

① Rotary actuator Serie R1
② Sensor bracket mod. DST (Ø 32 to 125)
③ Adaptor
④ Retractable sensor "oval type"

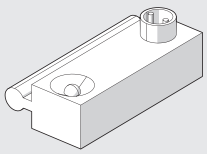


Code	Description
W0950001001	Adaptor DSS005 for DST/ST brackets

METAL WORK PNEUMATIC

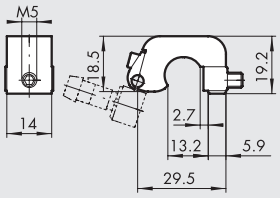
SENSOR SERIES DSM

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



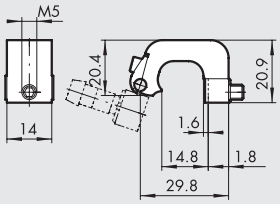
SENSOR SUPPORT BRACKETS FOR SENSORS DSM

Ø 32 to 40



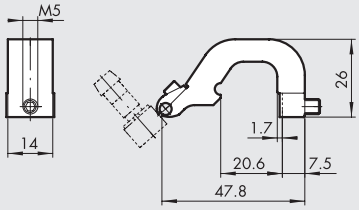
Code	Description
W0950000711	Bracket D.32-40 DST 80

Ø 50 to 63



Code	Description
W0950000712	Bracket D.50-63 DST 81

Ø 80 to 125



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

NOTES

ROTARY ACTUATOR SERIES R2

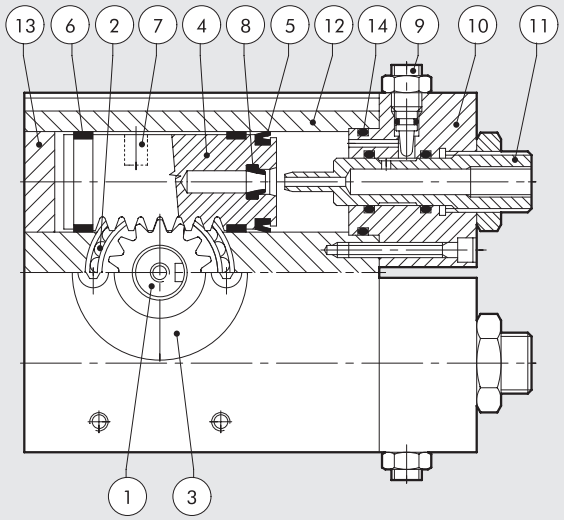
Actuator with double rack and play take-up.
Four sizes – 12, 16, 20 and 25. Two angles of rotation – 90° and 180°.
Stroke adjustment system for all sizes. Pneumatic cushioning for all sizes except the smallest. There are slots in the body to house a magnetic proximity sensor. Air supply, stroke adjustment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

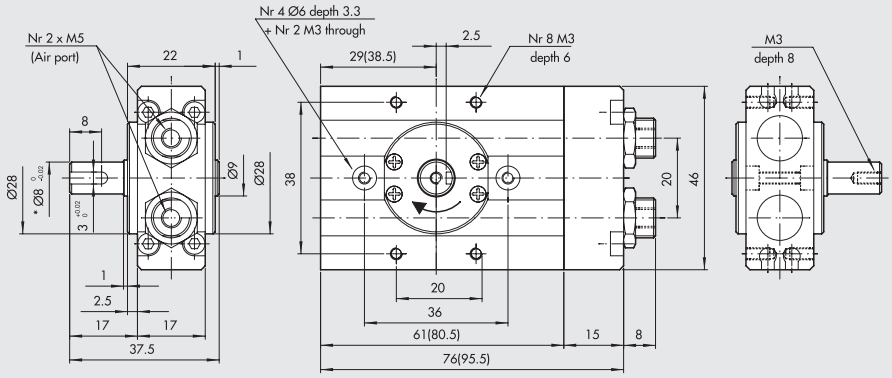
① ROTARY SHAFT / PINION: hardened and tempered steel
② BALL BEARING
③ FLANGE: anodized aluminium
④ PISTON / RACK: hardened and tempered steel
⑤ PISTON GASKET: NBR
⑥ GUIDE PAD: PTFE
⑦ MAGNET: neodymium
⑧ CUSHIONING GASKET: NBR
⑨ CUSHIONING PIN: zinc-plated steel
⑩ HEAD: anodized aluminium
⑪ PNEUMATIC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



METAL WORK PNEUMATIC

ROTARY ACTUATOR R2-12 90°/180°

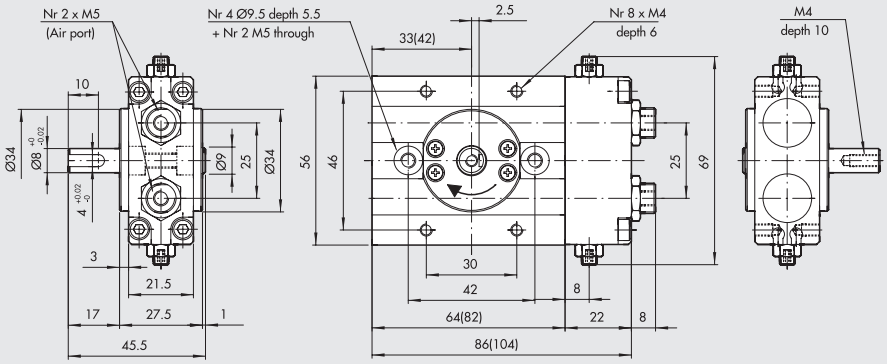
Code	Description
W1620122090	Rotary actuator R2-12-90°
W1620122180	Rotary actuator R2-12-180°



* For the version R2-12-90° it was Ø6 mm; spare actuators code W1620122091 can be still supplied
Dimensions for 180° rotation are given in brackets

ROTARY ACTUATOR R2-16 90°/180°

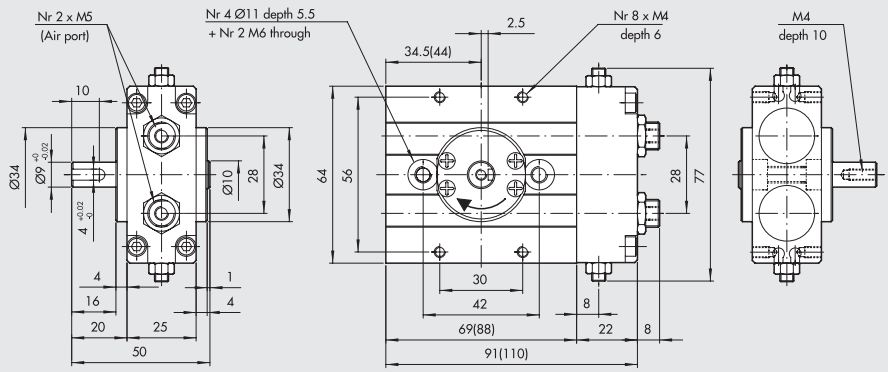
Code	Description
W1620162090	Rotary actuator R2-16-90°
W1620162180	Rotary actuator R2-16-180°



Dimensions for 180° rotation are given in brackets

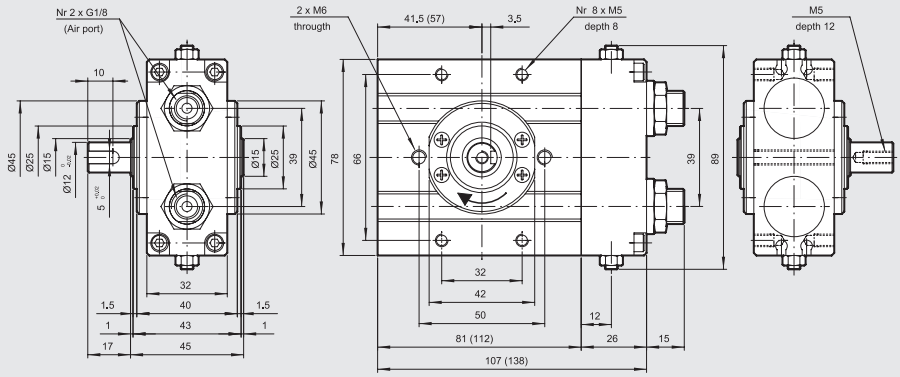
ROTARY ACTUATOR R2-20 90°/180°

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°

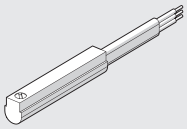


Code	Description
W1620252090	Rotary actuator R2-25-90°
W1620252180	Rotary actuator R2-25-180°

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 ø16-20-25-30).
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.

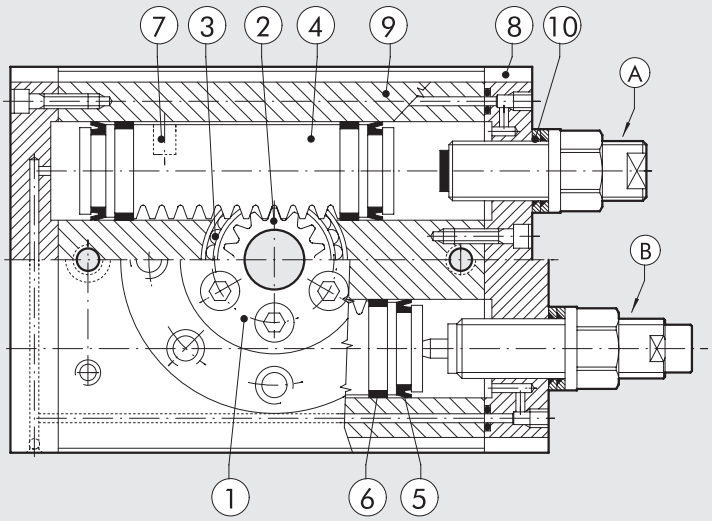
N.B.: We always suggest to use flow microregulators.
During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievment of the required speed.

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	0° to 180°					
Fluid		20 µm filtered, lubricated or unlubricated air; lubrification 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 MECANICAL 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)							

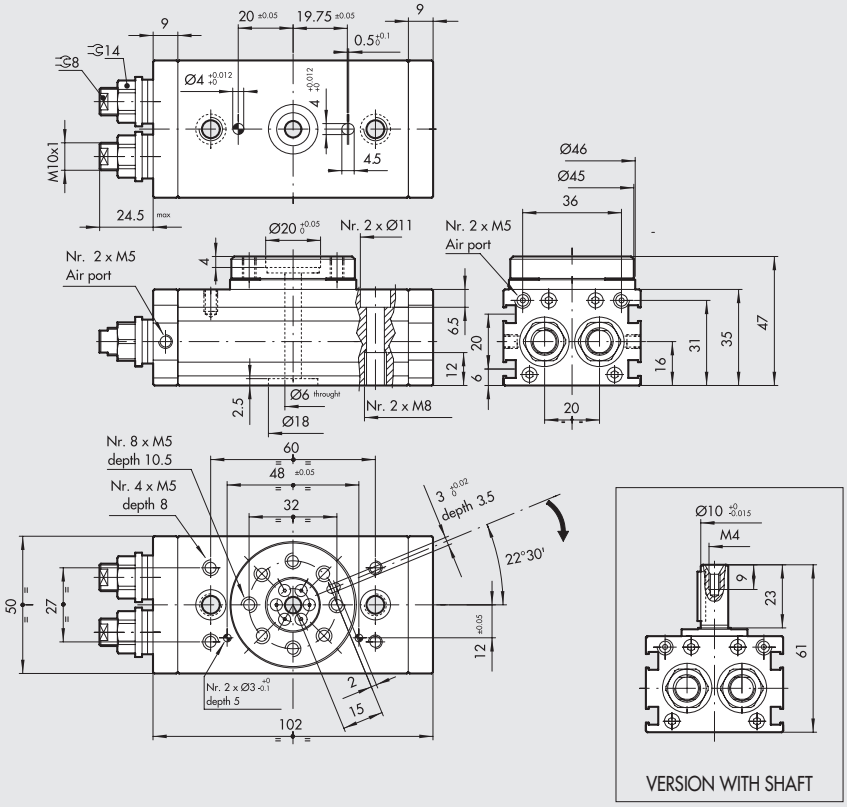
COMPONENTS

① ROTARY FLANGE: anodized 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: anodized aluminium
⑨ BARREL: anodized aluminium
⑩ SEAL: NBR

VERSIONS:
Ⓐ Stroke adjustment
Ⓑ Stroke adjustment with inside hydraulic shock absorbers (available from Ø 25)

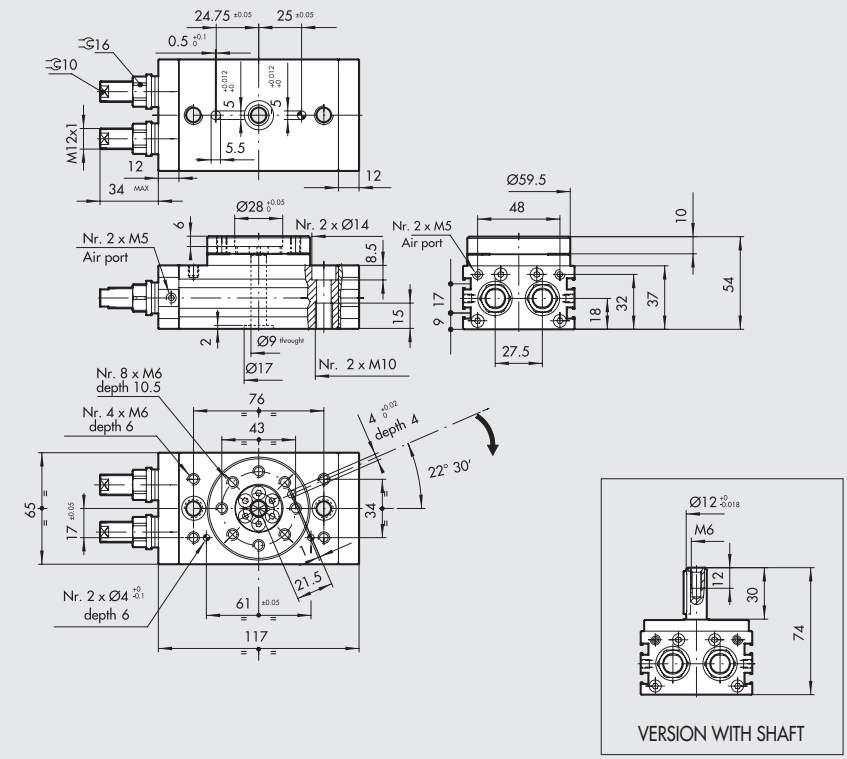


ROTARY ACTUATOR R3-16



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

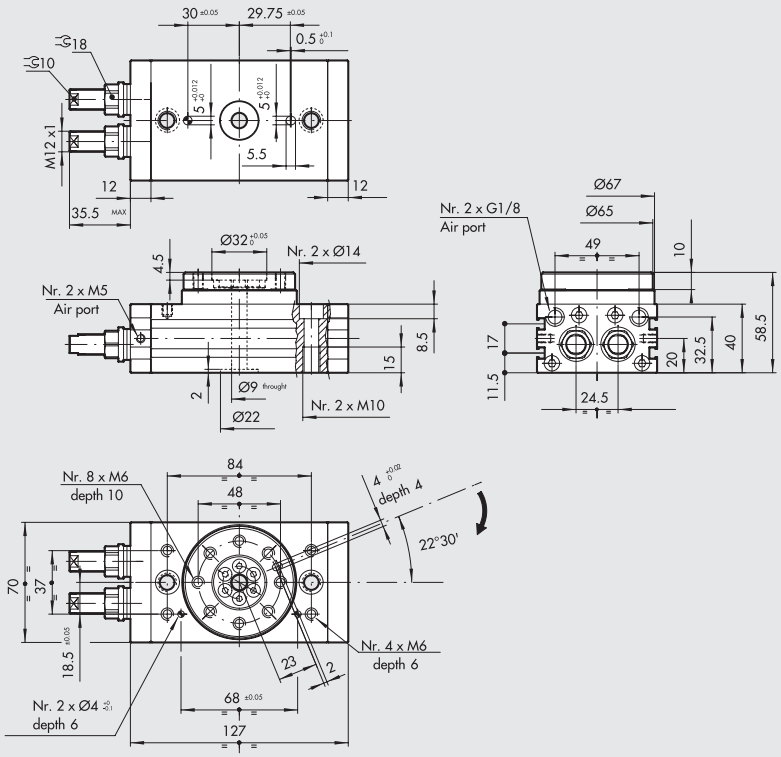
ROTARY ACTUATOR R3-20



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

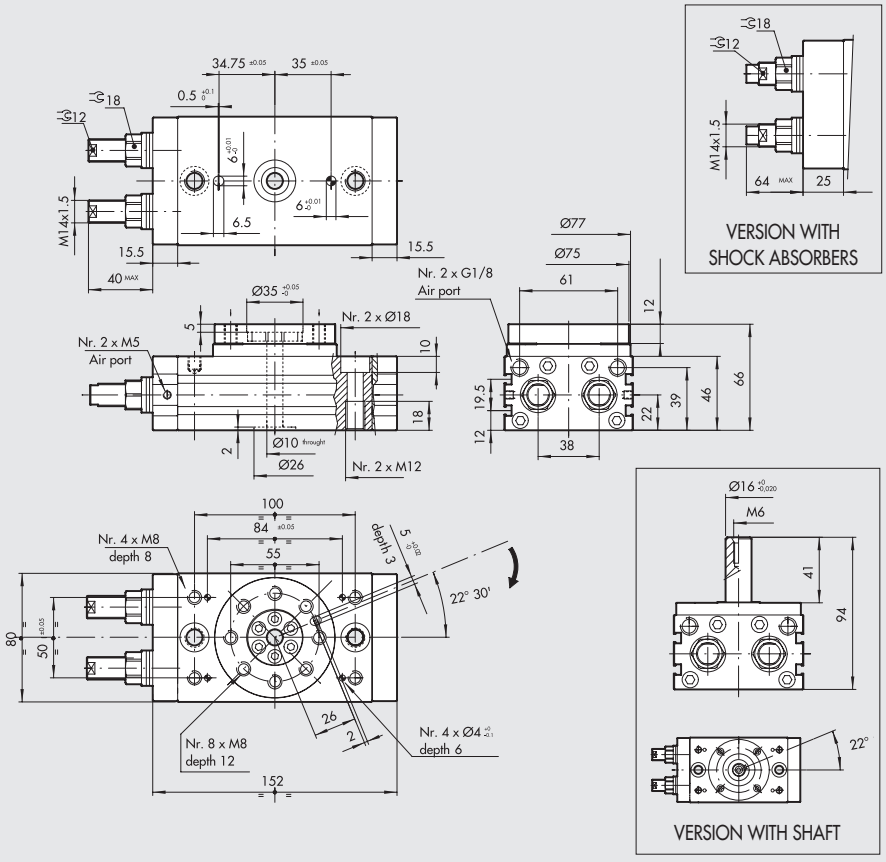
METAL WORK PNEUMATIC

ROTARY ACTUATOR R3-22



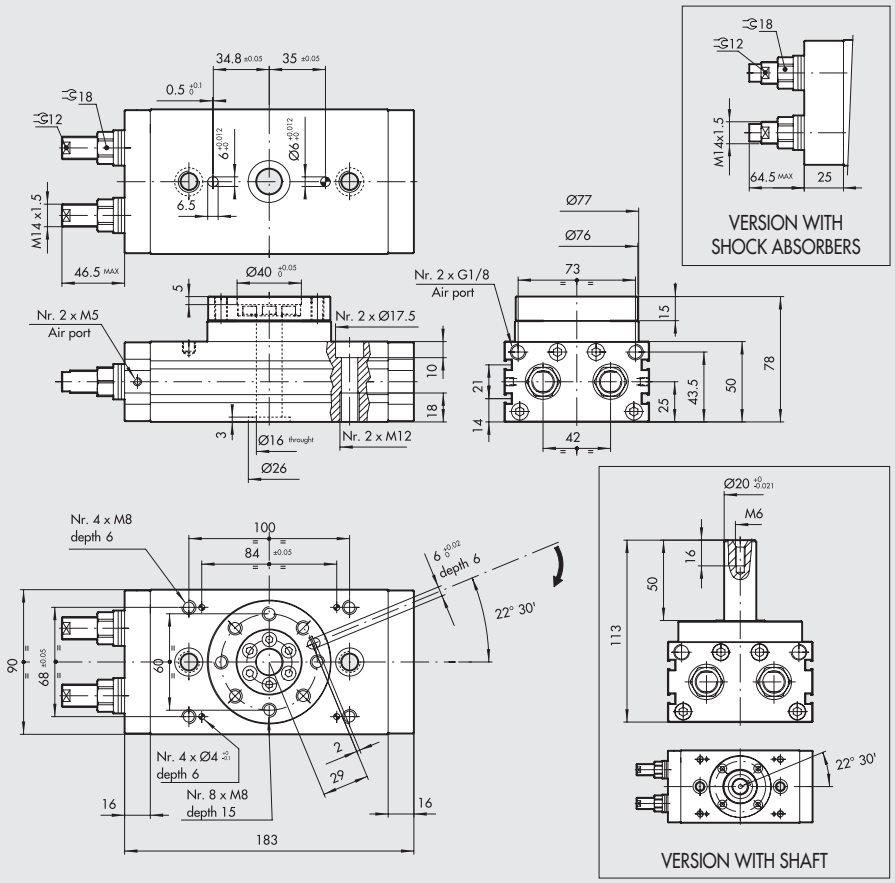
Code	Description
W1630222180	Rotary actuator with flange R3-22

ROTARY ACTUATOR R3-25



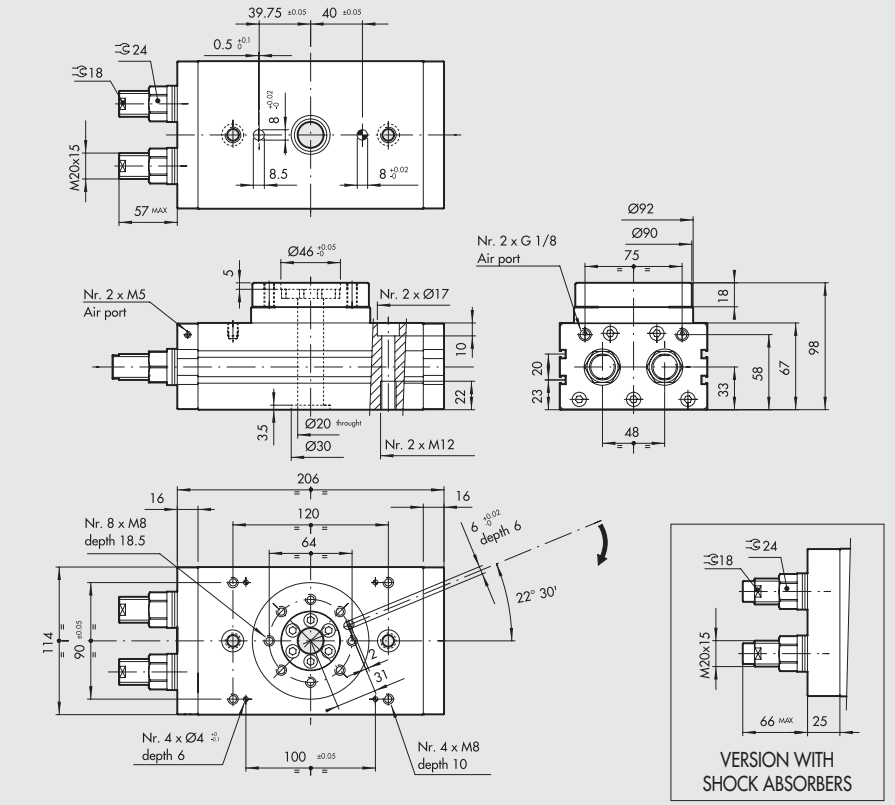
Code	Description
W1630252180	Rotary actuator with flange R3-25
W1630253180	Rotary actuator with flange + shock absorbers R3-25
W1630255180	Rotary actuator with shaft R3-25
W1630256180	Rotary actuator with shaft + shock absorbers R3-25

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

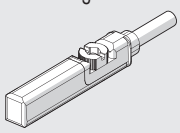


Code	Description
W1630402180	Rotary actuator with flange R3-40
W1630403180	Rotary actuator with flange + shock absorbers R3-40

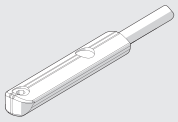
ACCESSORIES

RETRACTABLE SENSOR

SENSOR, SQUARE TYPE
Latest generation,
secure fixing



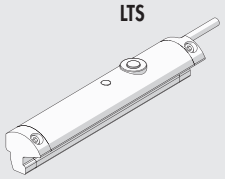
SENSOR, OVAL TYPE
Traditional



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

POSITION SENSORS

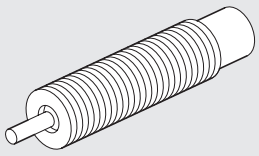
LTS



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

SPARE PARTS

SHOCK ABSORBERS



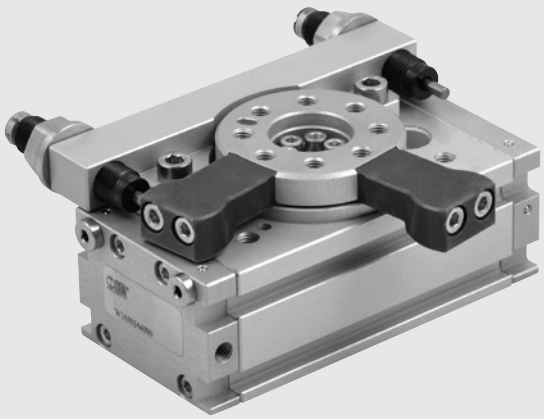
Code	Ø	Description
0950004015	25	Shock absorbers ECO S 25 MC2 short M14x1.5
0950004008	30	Shock absorbers ECO 25 MC4 M14x1.5
0950004005	40	Shock absorbers ECO 50 MC2 + nut M20x1.5

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.

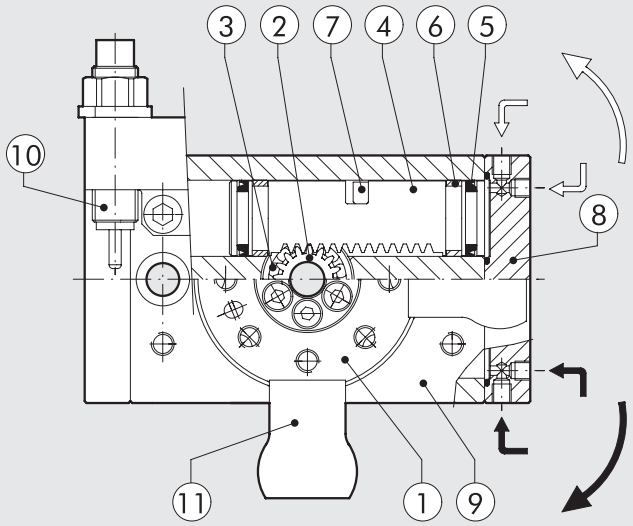
N.B.: We always suggest to use flow microregulators.
During the setup of the actuator, start with CLOSE flow microregulators, and open gradually till the achievment of the required speed.



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; lubrification 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

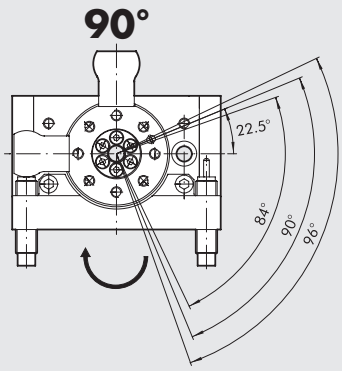
COMPONENTS

① ROTARY FLANGE: anodized 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: anodized aluminium
⑨ BARREL: anodized aluminium
⑩ STROKE REGULATOR WITH HYDRAULIC SHOCK ABSORBERS
⑪ Block for 90° version

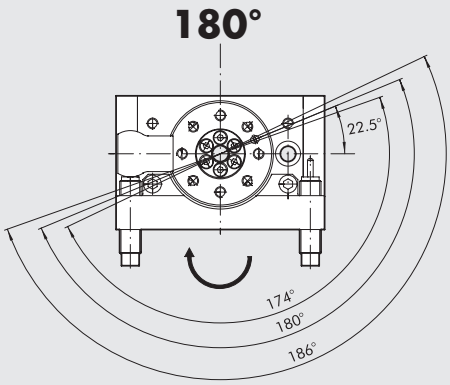


METAL WORK PNEUMATIC

ROTATION ANGLE



position of the holes
lower pins



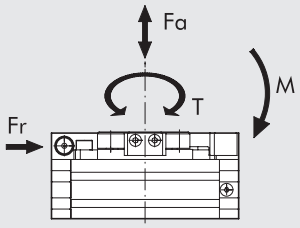
position of the holes
lower pins

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

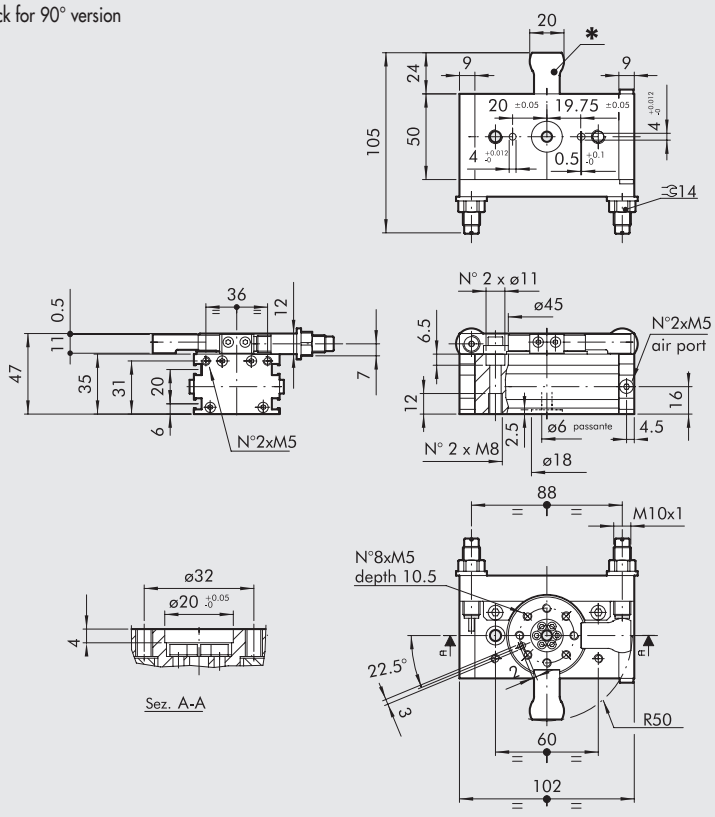
DIMENSIONES - FORCES AND MOMENTS

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°

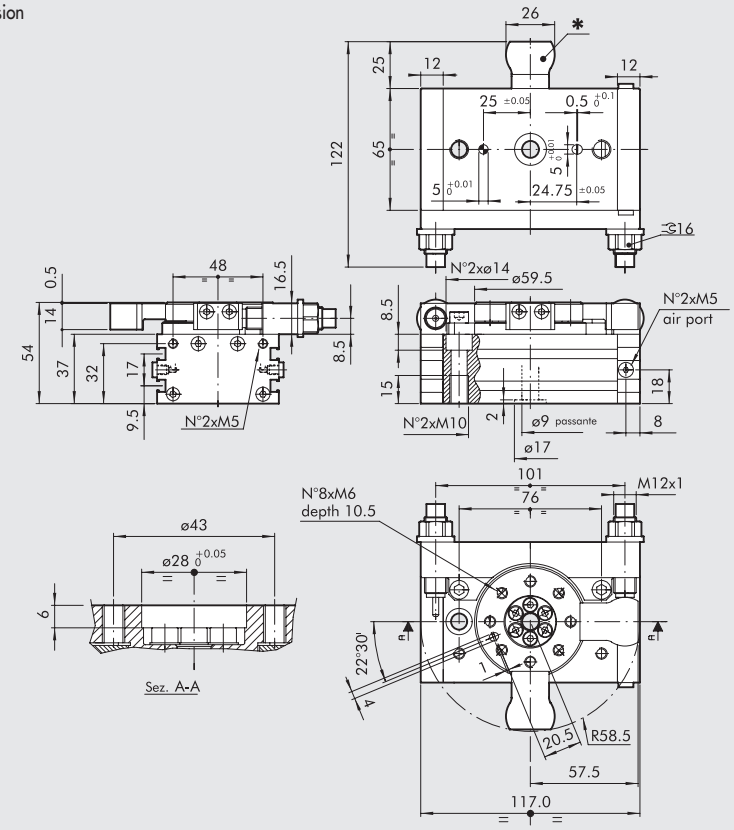
✱ Block for 90° version



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°

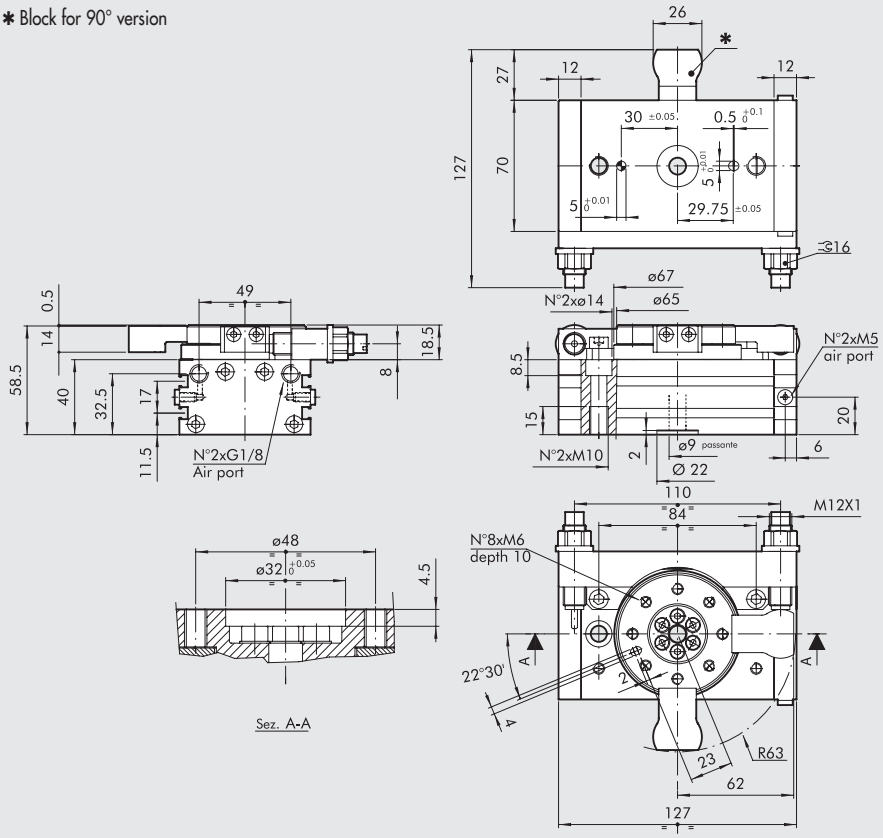
✱ Block for 90° version



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

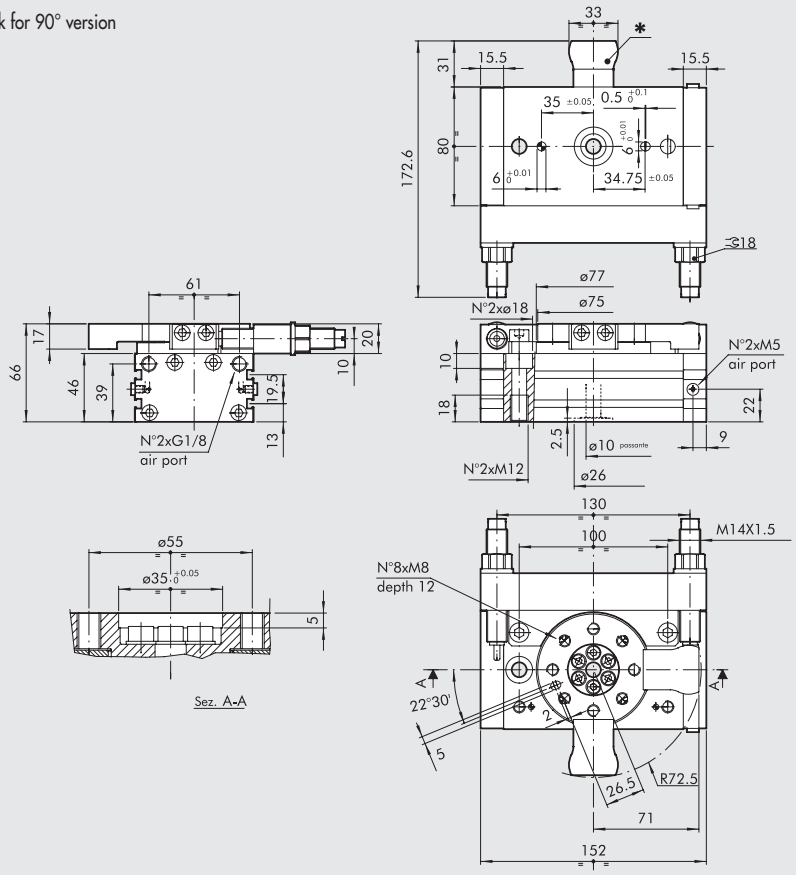


Code	Description
W1630224090	Rotary actuator with flange + shock absorbers R3-22-90
W1630224180	Rotary actuator with flange + shock absorbers R3-22-180

METAL WORK PNEUMATIC

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

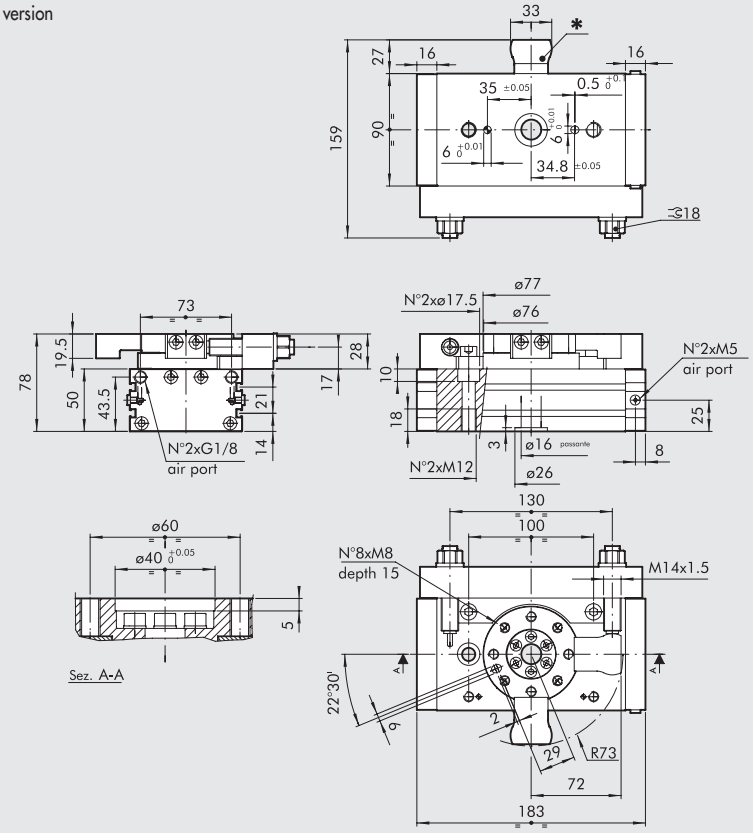
✱ Block for 90° version



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°

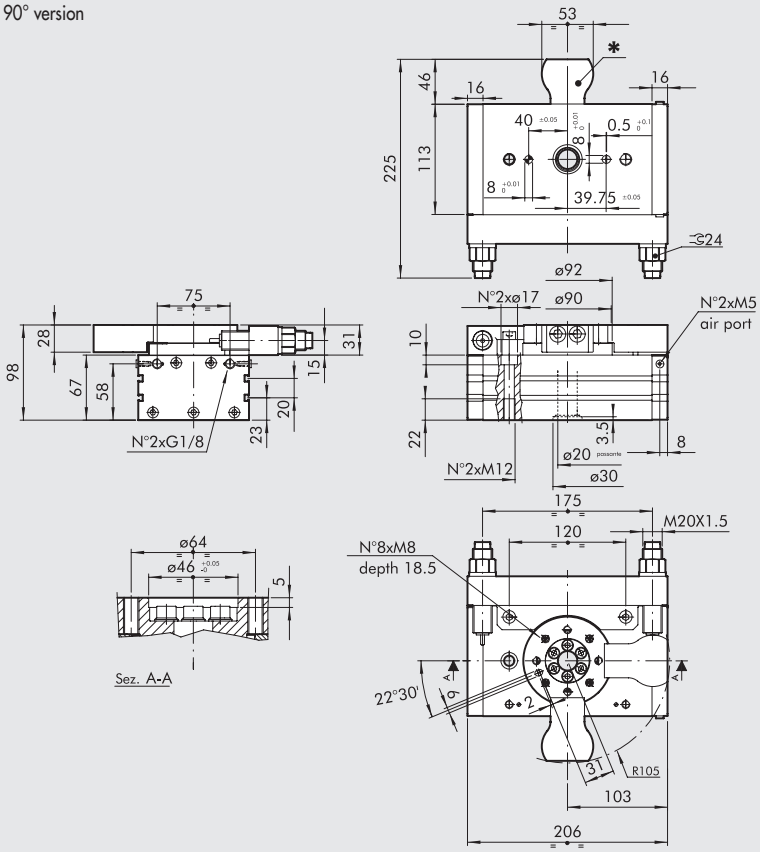
✱ Block for 90° version



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



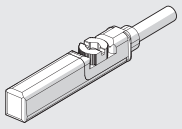
Code	Description
W1630404090	Rotary actuator with flange + shock absorbers R3-40-90
W1630404180	Rotary actuator with flange + shock absorbers R3-40-180

ACCESSORIES

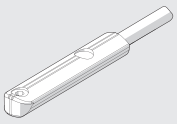
RETRACTABLE SENSOR

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

SENSOR, SQUARE TYPE
Latest generation, secure fixing



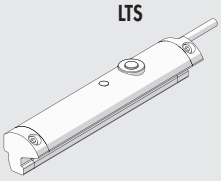
SENSOR, OVAL TYPE
Traditional



POSITION SENSORS

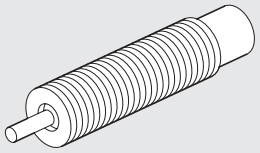
For technical data and usage strokes see **chapter A6**.

LTS



SPARE PARTS

SHOCK ABSORBERS



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

NOTES

VANE ROTARY ACTUATOR SERIES R5

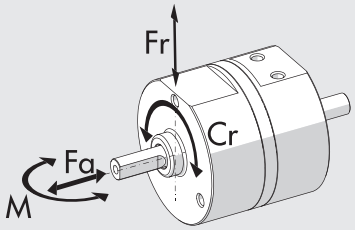
The R5 Series vane rotary actuator combines space-saving and compact design with low inertia of internal moving masses, which ensures particularly fast rotation.
The steel rotating shaft is supported by two bearings at the ends and comes with an over-moulded seal. The pressure difference in the two chambers of the anodized aluminium main body makes it to rotate clockwise or anticlockwise.
Three versions with a maximum rotation of 90°, 180° or 270° are available depending on the type of internal partition.
It can be either fixed directly to the wall, using the threads on the casing, or by means of an L-shaped bracket (foot), which can be fixed to the front or rear, or by means of a sturdy front fixing attachment.
An accessory for rotation angle adjustment can be mounted on the rear side on which special elastic stops and magnetic sensors for detecting end-of-stroke positions can also be mounted.

N.B.: The use of micro-flow regulators is always recommended.
When commissioning the actuator, start with a CLOSED micro regulator; open it gradually until the desired speed is reached.

TECHNICAL DATA		R5-16		
Operating pressure	bar	2 to 8		
	MPa	0.2 to 0.8		
	psi	29 to 116		
Operating temperature range	°C	0 to +60		
	°F	32 to 140		
Fluid		20 µm filtered, lubricated or unlubricated air; lubrification if used, it must be continuous		
End position stop shock-absorption		Elastic mechanical stop (if "Angle adjustment" accessory is used)		
End-position control		Magnetic sensors (if "Angle adjustment" accessory is used)		
Moment of inertia around the central axis	Kg m²	$2x10^{-6}$		
Theoretical torque at 6 bar	Nm	2.2		
Maximum overturning moment	Nm	1.4		
Maximal radial load	N	30		
Maximum axial load	N	25		
Admissible kinetic energy	Joule			
with elastic mechanical stop (if "Angle adjustment" accessory is used)		0.02		
without elastic mechanical stop		0.015		
Rotation angle	degrees	90°	180°	270°
Minimum rotation time without load	s	0.07	0.12	0.17
Weights	kg	0.33	0.33	0.31

DIMENSIONES - FORCES AND MOMENTS

Size	Cr Theoretical torque at 6 bar [Nm]	Fa Max. axial load [N]	Fr Max. radial load [N]	M Max. averturing momnet [Nm]
16	2.2	25 *	30	1.4

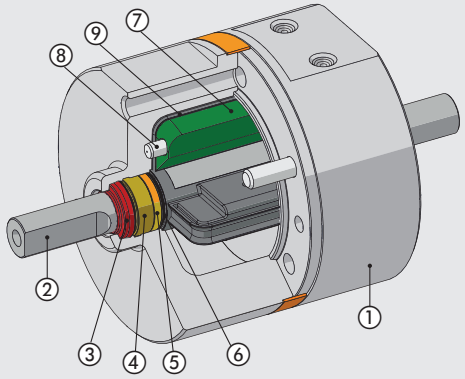


* The application of axial loads during the working sequence could reduce the life of the gaskets.

METAL WORK PNEUMATIC

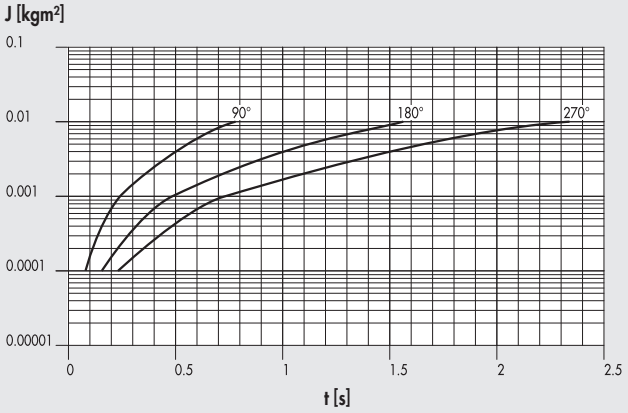
COMPONENTS

① BODY: anodized aluminium
② ROD SHAFT: rubber overmoulded steel
③ PISTON ROD GASKET: polyurethane
④ BALL BEARING
⑤ SPACER: brass
⑥ O-RING: NBR
⑦ SEPARATOR: anodized aluminium
⑧ PIN: stell
⑨ PARTITION SEAL: NBR

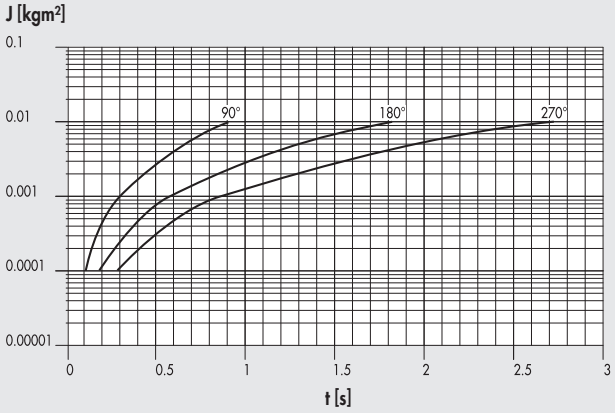


MOMENT OF INERTIA APPLICABLE ACCORDING TO ROTATION TIME

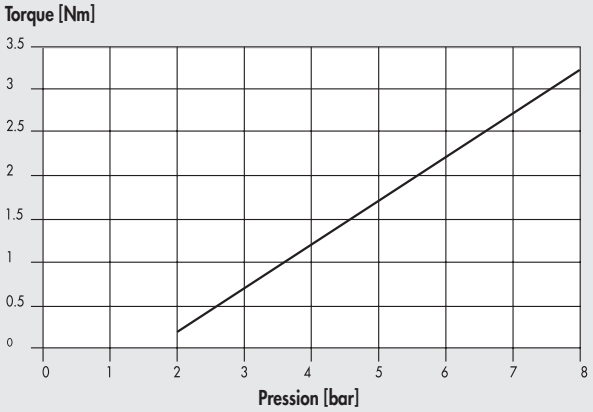
With angle adjustment accessory



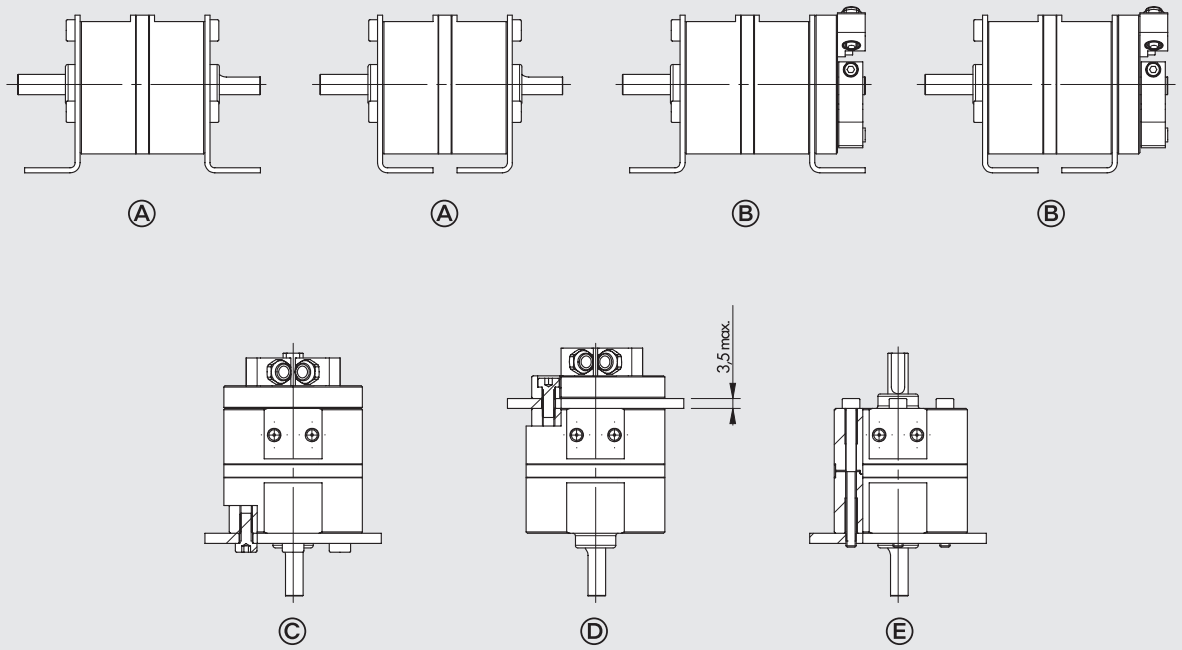
Without angle adjustment accessory



TORQUE OUTPUT ACCORDING TO INLET PRESSURE

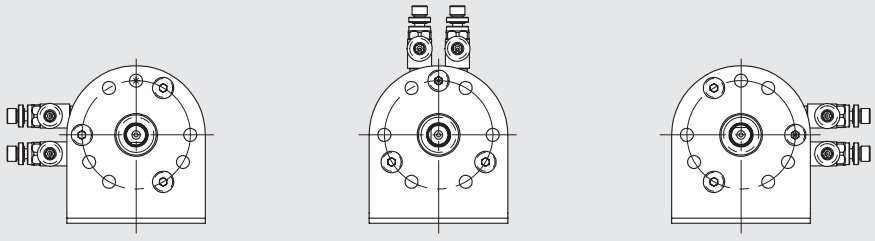


FIXING OPTIONS



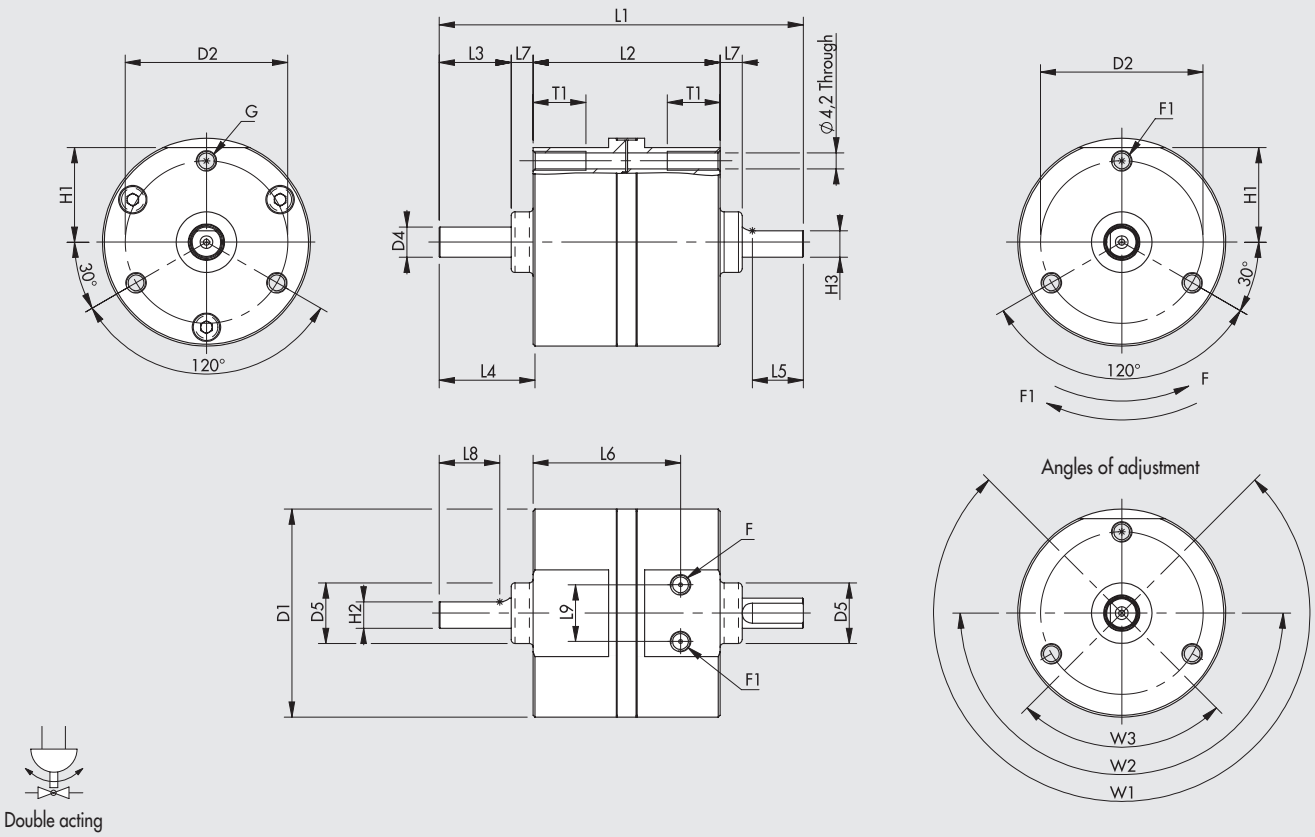
Ⓐ Fixing by means of feet without "Angle adjustment" accessory.
Ⓑ Fixing by means of feet with "Angle adjustment" accessory.
Ⓒ Fixing as pass-through sheet metal on front endcap.
Ⓓ Fixing as pass-through sheet metal on rear endcap.
Ⓔ Direct fixing from behind by means of long screws or tie rods. In this case, it is not possible to use the "Angle adjustment" accessory.

Possible attachment combinations using the "Foot" accessory and the corresponding power supply positions.



METAL WORK PNEUMATIC

DIMENSIONS



Double acting

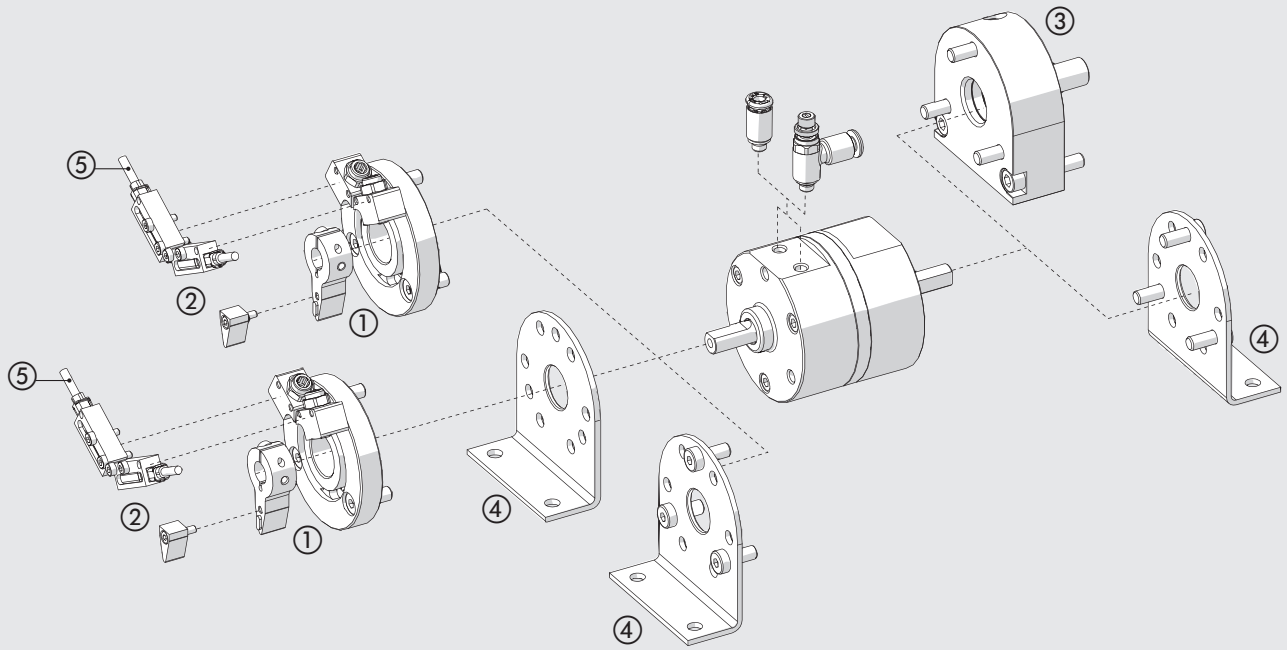
Size	D1	D2	D4	D5 (+0/-0.1)	F	F1	G	H1	H2	H3	L1	L2	L3	L4	L5	L6	L7	L8	L9	T1	W1	W2	W3
16	55	43	8	16	M5	M5	M5	25	7	7	96.3	49.5	19	23.8	13.5	39	5.8	16	15	14	270°	180°	90°

KEY TO CODES

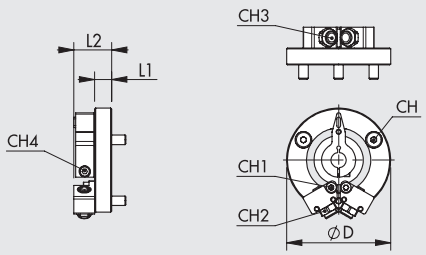
W167	016	0	270
TYPE	**SIZE**	**VERSION**	**ANGLE OF ROTATION •**
W167 Vane rotary actuator series R5	016	**0** Standard **1** With adjustment of rotation angle **2** With adjustment of rotation angle and provision for magnetic sensor	090 180 270

• Expressed in sexagesimal degrees.

ACCESSORIES

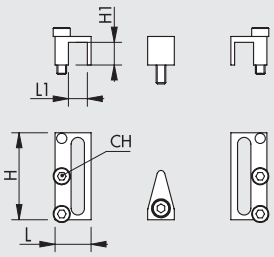


① ANGLE ADJUSTMENT



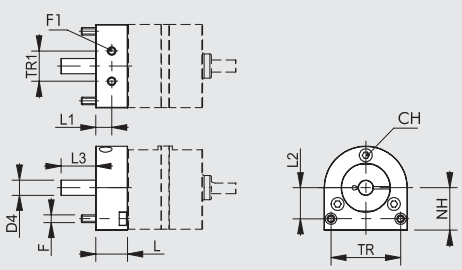
Code	Size	ØD	L1	L2	CH	CH1	CH2	CH3	CH4	Weight [g]
095016P001	16	55	9	20	3	2.5	9	4	2.5	73

② SENSOR SUPPORT



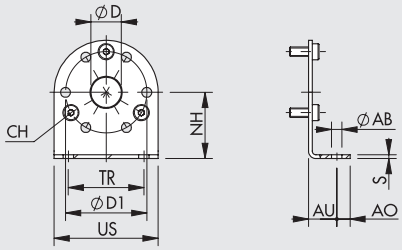
Code	Size	H	H1	L	L1	CH	Weight [g]
095016P002	16	23	6	9.5	5	2	8

③ FIXING ATTCHMENT



Code	Size	F	F1	D4	L	L1	L2	L3	NH	TR	TR1	CH	Weight [g]
095016P010	16	M5	M5	10	21	10.5	20.5	23	28	46	20	3	170

④ FOOT

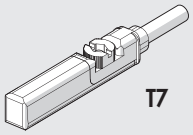


Code	Size	ØD	ØD1	TR	US	NH	CH	AB	S	Weight [g]
095016P020	**16**	16	43	40	55	35	3	5.5	2	62

Note: Individually packed with 3 screws

⑤ RETRACTING SENSOR T7

SENSOR, SQUARE TYPE
Latest generation, secure fixing



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

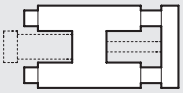
Note: Use T7 sensors only

NOTES

GENERAL TECHNICAL DATA SLIDES

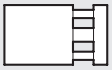
TYPES

The range of guide units and slides is very extensive.
Guides are grouped into families.

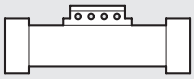


Guide units to couple with standard cylinders.
These are separate units to which an ISO 6432 or ISO 15552 cylinder is attached.

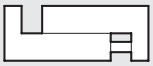
Twin pneumatic cylinder.
The barrel has two calibrated holes for housing two pistons and rods side by side. There are versions with a single piston rod, through piston rod and different power supplies depending on whether you wish to fix the barrel or the flanges to the ends of the piston rod.



Pneumatic single piston cylinders with supports at the end of the piston rod.
The common factor in all the various configurations is that, as well the calibrated hole for the piston in the cylinder body or front head, there are other slots housing bushes or guide bearings for additional piston rods.



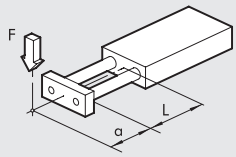
Rodless cylinders.
In these cylinders the piston rod is integral with a carriage on the outside of the barrel, so there is no piston rod.
We offer versions in which the barrel is open, with a C-shaped section, and piston and carriage linked mechanically.

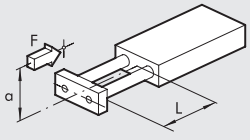


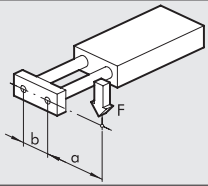
Guides with pneumatic actuator.
The main part of this actuators is the guiding section which determines the shape, applications, loads, maximum strokes and cost. The pneumatic part is housed in one of the bodies of the unit or it comes as a complete cylinder housed inside the guide.

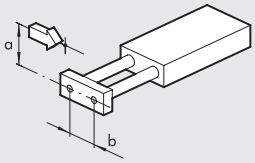
LOAD CONDITIONS

Admitted loads for each guide unit are shown in the catalogue.
If the load is not aligned with the moving plate, it is possible to determine the equivalent load or stroke with a good approximation.

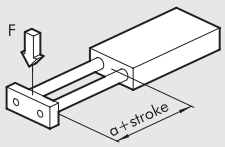




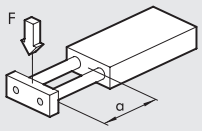




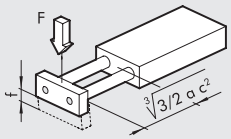
LOAD OR STROKE EQUIVALENCE

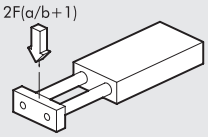


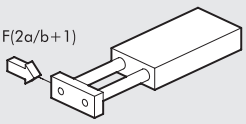
To check the admissible load



To check the arrow



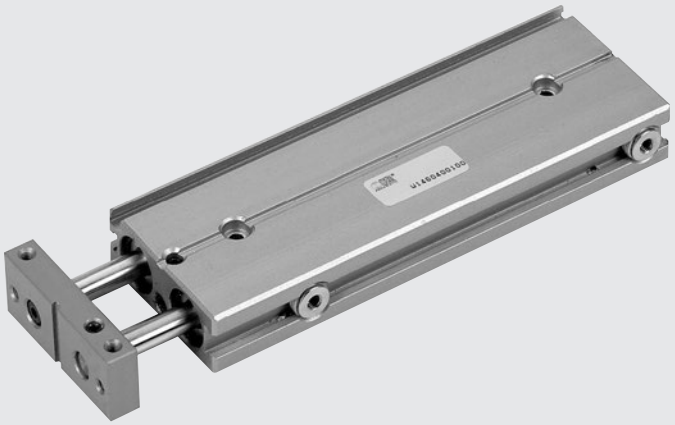




TWIN CYLINDER SERIES S10

METAL WORK PNEUMATIC

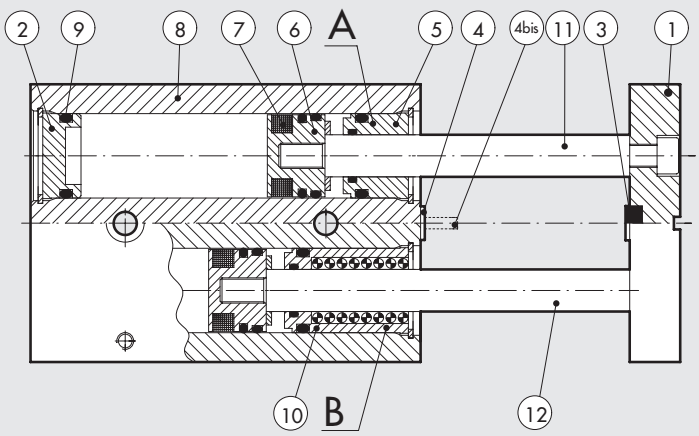
There are two sliding systems available:
• on bushes
• on ball recirculating bearings
The frame is made up of two paired cylinders with a common anodized aluminium body containing slots for retracting sensors.
There are 5 bores available:
2 x Ø 12, 2 x Ø 16, 2 x Ø 20, 2 x Ø 25 and 2 x Ø 30.



TECHNICAL DATA		S10-12	S10-16	S10-20	S10-25	S10-30
Pressure range	bar	3 to 7				
	MPa	0.3 to 0.7				
	psi	43.5 to 101				
Temperature range	°C	-10 to +80				
Fluid		20 µm dried or lubricated filtered air. Lubrication, if used, must be continuous.				
Piston speed	mm/s	30 to 100				
Versions		System with sliding bushes/System with ball bushes available with stop screw or hydraulic decelerator				
Sizes		12	16	20	25	30
Bores	mm	2 x 12	2 x 16	2 x 20	2 x 25	2 x 30
Piston rod diameter	mm	6	8	10	12	16
Strokes	mm	15	15	25	25	25
	mm	25	25	50	50	50
	mm	50	50	75	75	75
	mm	–	75	100	100	100
		–	–	–	125	125
Weight (C = stroke mm)						
Bushes version	kg	0.12 + (0.002 x C)	0.24 + (0.0025 x C)	0.51 + (0.005 x C)	0.76 + (0.006 x C)	1.3 + (0.009 x C)
Ball bearing version	kg	0.21 + (0.002 x C)	0.48 + (0.0025 x C)	0.77 + (0.005 x C)	0.18 + (0.006 x C)	1.92 + (0.009 x C)
Maximum impact energy	J	0.10	0.15	0.20	0.30	0.5
Theoretical thrust (P = relative pressure in bar)		(Multiply the value shown by the pressure in bar)				
Thrust force	da N	2.26 x P	4 x P	6.28 x P	9.8 x P	14.1 x P
Pull force	da N	1.69 x P	3 x P	4.11 x P	7.5 x P	10.1 x P
Max. loads		(The values shown refer to the min. and max. strokes)				
Bushes version	N	6 to 4	11 to 6	20 to 7	26 to 8	36 to 11
Ball bearing version	N	3 to 1.5	6 to 3	10 to 3.5	12 to 5.6	20 to 7

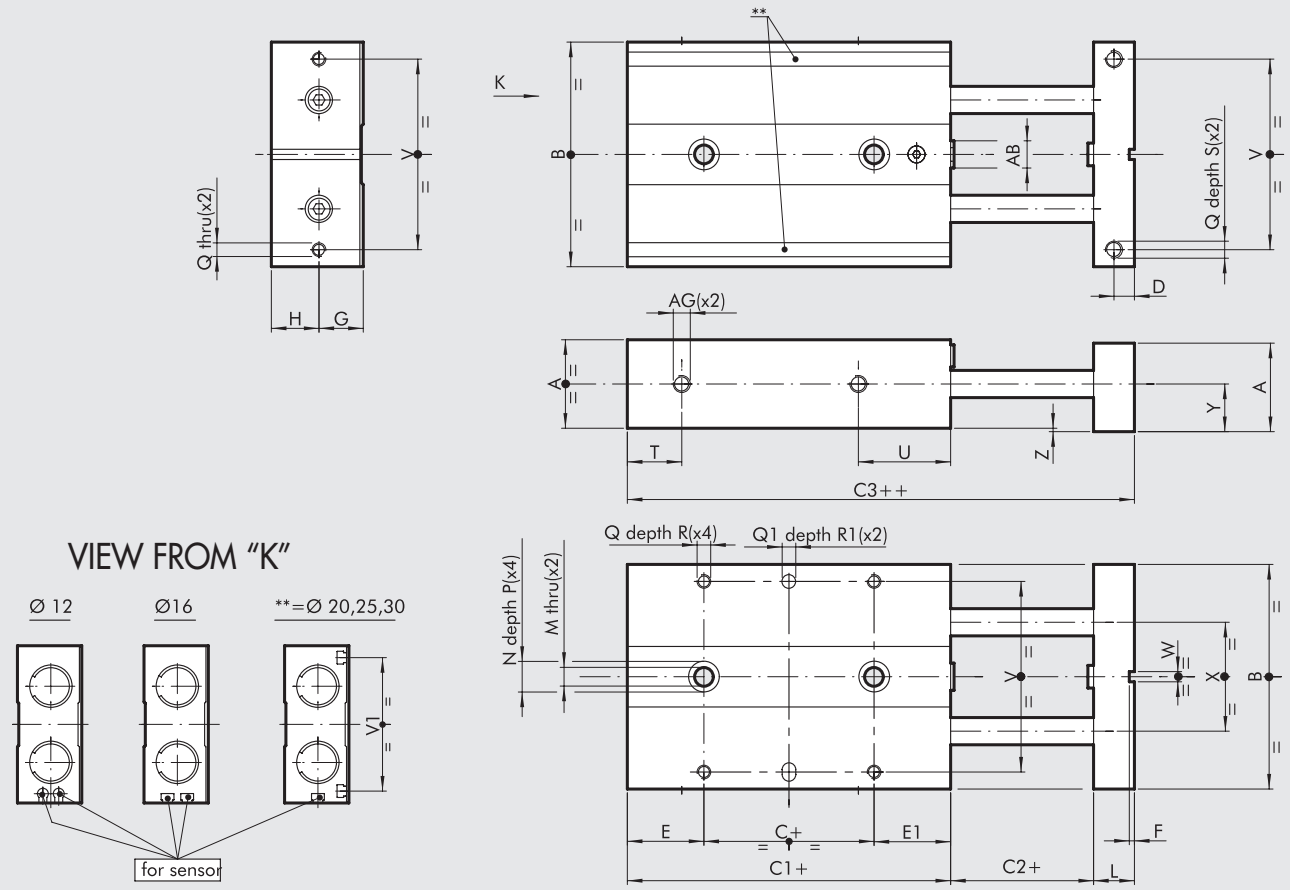
COMPONENTS

① FLANGE: anodized aluminium
② REAR BASE: anodized aluminium
③ BUFFER: rubber
④ ADJUSTABLE STRIKER PLATE. Zinc-plated steel
(4bis) HYDRAULIC DECELERATOR
⑤ FRONT BASE: brass
⑥ PISTON: brass
⑦ MAGNET: Plastoferrite
⑧ CYLINDER BODY: anodized aluminium
⑨ STATIC O-RING: NBR
⑩ BALL RE-CIRCULATION BUSH
⑪ PISTON ROD: grinded chromed stainless steel
⑫ PISTON ROD: tempered chrome stainless steel, grinded



VERSIONS:
Ⓐ With sliding bushes
Ⓑ With ball bushes

DIMENSIONS OF TWIN CYLINDER SERIES S10, ON BUSHES Ø 12 to 30 mm



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	D	E	E1	F	G	H	L	M	N	P	Q	Q1^{H7}	R	R1	S	T
W1440122...	**12**	18	46	10	50	2	60	4	20	20	1.5	9	10	8	4.3	8	4	M3	4	5	3	8	9
W1440162...	**16**	22	56	16	62	2	74	5	26	20	1.5	11	12	10	4.3	8	4	M4	4	6	3	8	10
W1440202...	**20**	26	66	10	68	2	82	6	29	29	1.5	13	14	12	5.5	9	5	M4	4	7	3	10	11
W1440252...	**25**	32	78	10	74	2	90	7	32.5	31.5	2.5	16	17	14	6.5	10.5	6	M5	4	7	3	12	11
W1440302...	**30**	36	98	10	87	2	105	8	37.5	39.5	2.5	18	19	16	8.5	14	8	M6	6	8	5	12	13

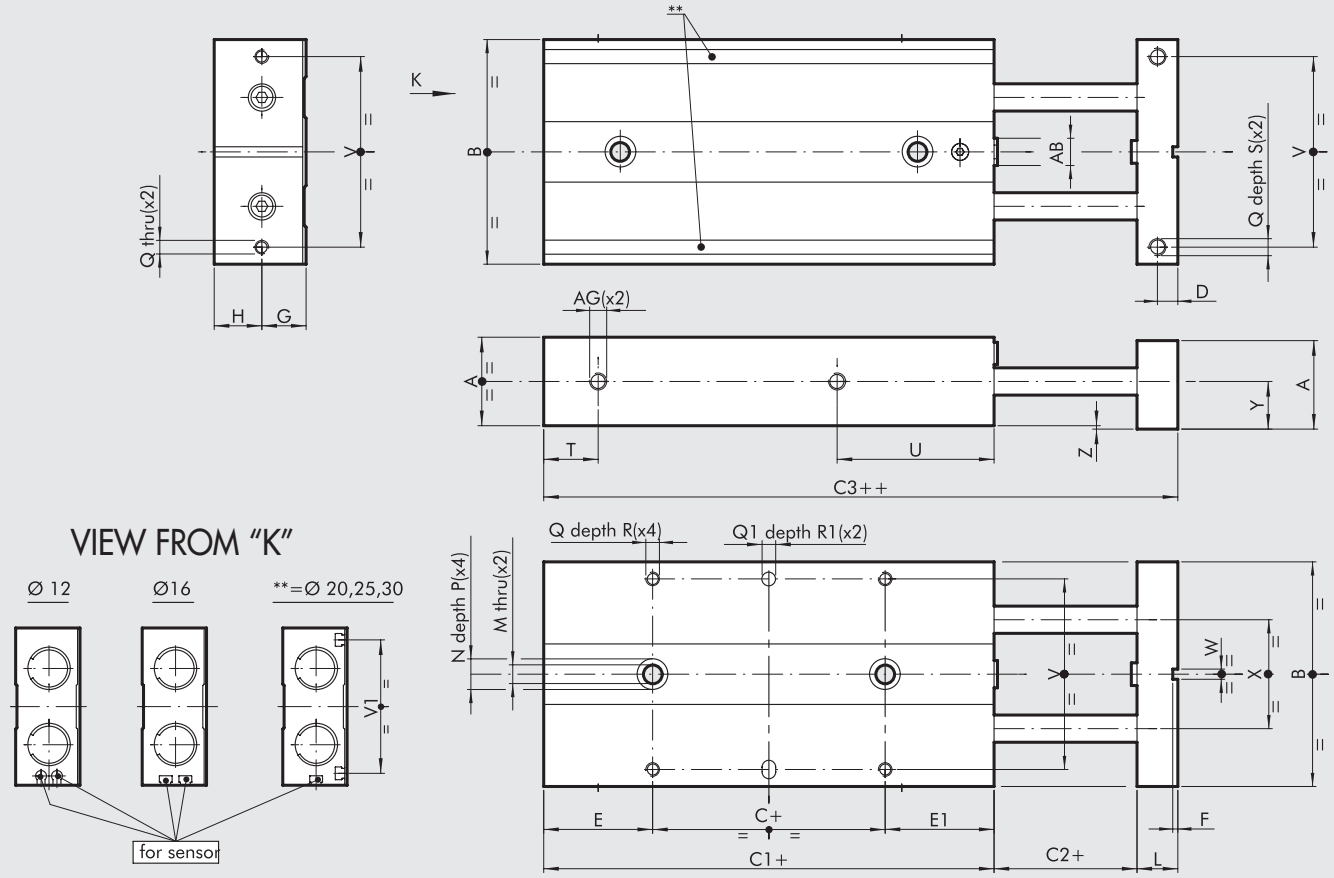
Ø	U	V	V1	W	X	Y	Z	AB	AG
12	28	38	–	3	20	10	1	M5	M5
16	33	46	–	3	26	12	1	M6	M5
20	40	56	54	3	30	14	1	M8	M5
25	42	66	64	5	39	17	1	M10	M5
30	51	86	82	5	52	19	1	M12	G 1/8"

...Enter the stroke in mm (e.g. Ø 12 stroke 50 = W1440122050)

Strokes for bore 12 mm	15; 25; 50;
Strokes for bore 16 mm	15; 25; 50; 75;
Strokes for bore 20 mm	25; 50; 75; 100;
Strokes for bore 25 mm	25; 50; 75; 100; 125;
Strokes for bore 30 mm	25; 50; 75; 100; 125;

METAL WORK PNEUMATIC

DIMENSIONS OF TWIN CYLINDER SERIES S10, ON BALL BEARINGS Ø 12 to 30 mm



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	D	E	E1	F	G	H	L	M	N	P	Q	Q1^{H7}	R	R1	S	T
W1440123...	**12**	18	46	10	69	2	79	4	29.5	29.5	1.5	9	10	8	4.3	8	4	M3	4	5	3	8	9
W1440163...	**16**	22	56	10	90	2	98	5	42	38	1.5	11	12	10	4.3	8	4	M4	4	6	3	8	10
W1440203...	**20**	26	66	10	100	2	111	6	46.5	43.5	1.5	13	14	12	5.5	9	5	M4	4	7	3	10	11
W1440253...	**25**	32	78	10	108	2	120	7	51.5	46.5	2.5	16	17	14	6.5	10.5	6	M5	4	7	3	12	11
W1440303...	**30**	36	98	10	124	2	142	8	56	58	2.5	18	19	16	8.5	14	8	M6	6	8	5	12	13

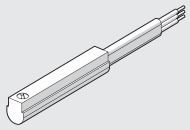
Ø	U	V	V1	W	X	Y	Z	AB	AG
12	47	38	–	3	20	10	1	M5	M5
16	57	46	–	3	26	12	1	M6	M5
20	69	56	54	3	30	14	1	M8	M5
25	72	66	64	5	39	17	1	M10	M5
30	88	86	82	5	52	19	1	M12	G 1/8"

...Enter the stroke in mm (e.g. Ø 12 stroke 50 = W1440123050)

Strokes for bore 12 mm	15; 25; 50;
Strokes for bore 16 mm	15; 25; 50; 75;
Strokes for bore 20 mm	25; 50; 75; 100;
Strokes for bore 25 mm	25; 50; 75; 100; 125;
Strokes for bore 30 mm	25; 50; 75; 100; 125;

ACCESSORIES

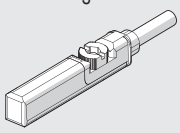
SENSOR Ø 4, FOR SLIDE S10 Ø 12



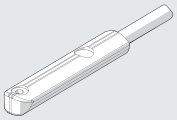
For codes and technical data, see **chapter A6**.

RETRACTABLE SENSOR, FOR SLIDE S10 Ø16 to 30

SENSOR, SQUARE TYPE
Latest generation,
secure fixing



SENSOR, OVAL TYPE
Traditional

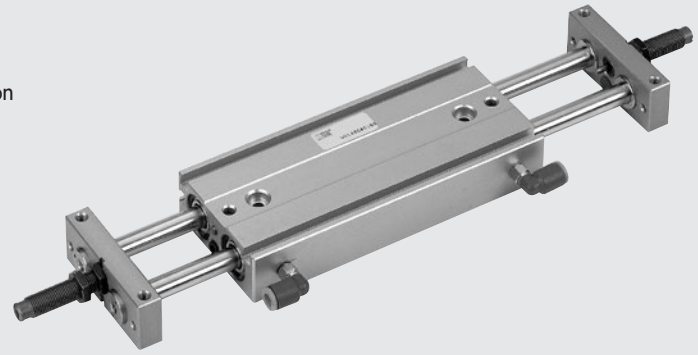


For codes and technical data, see **chapter A6**.

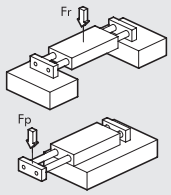
NOTES

TWIN CYLINDER SLIDE WITH FIXED BODY SERIES S11

There are two sliding systems available:
• on bushes
• on ball bearings
The frame is made up of two paired through-rod cylinders with a common anodized aluminium body containing slots for retracting sensors.
There are 5 bores available:
2 x Ø 12; 2 x Ø 16; 2 x Ø 20; 2 x Ø 25 and 2 x Ø 30.
The piston rods are united by means of a plate on which mechanical stops or hydraulic shock absorbers can be mounted.

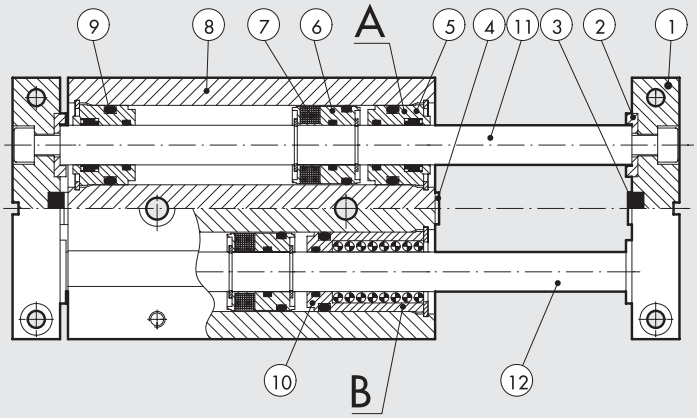


TECHNICAL DATA		S11-12	S11-16	S11-20	S11-25	S11-30
Fluid		20 µm filtered air				
Pressure range	bar	1.5 to 7				
	MPa	0.15 to 0.7				
	psi	43.5 to 101				
Temperature range	°C	-10 to +80				
Piston speed	mm/s	30 to 200				
Versions		With sliding bushes / With ball bearing bushes / With stop screw / With hydraulic shock absorbers				
Bores	mm	12	16	20	25	30
Piston rod diameter	mm	6	8	10	12	16
Strokes	mm	25	25	25	25	25
		50	50	50	50	50
		75	75	75	75	75
		–	100	100	100	100
		–	–	125	125	125
		–	–	–	150	150
Weight = X + (Y · C) where C = stroke	kg					
Bushes version		X = 0.14	X = 0.25	X = 0.5	X = 0.7	X = 1.24
		Y = 0.002	Y = 0.0035	Y = 0.045	Y = 0.007	Y = 0.01
Ball bearing version		X = 0.25	X = 0.37	X = 0.78	X = 1.04	X = 1.98
		Y = 0.002	Y = 0.0035	Y = 0.045	Y = 0.007	Y = 0.01
Maximum impact energy with buffers	J	0.10	0.15	0.20	0.30	0.5
Maximum impact energy with hydraulic decelerators	J	2	5	5	10	20
Theoretical thrust (P = relative pressure in bar)	N	16.9 x P	30 x P	47 x P	75 x P	101 x P
Max. loads		(The values shown refer to the min. and max. strokes)				
Bushes version	N	Fr: 13 to 5	Fr: 35 to 6.5	Fr: 58 to 7	Fr: 80 to 8	Fr: 130 to 18
		Fp: 6 to 3	Fp: 11 to 3	Fp: 18 to 5	Fp: 23 to 6	Fp: 50 to 8
Ball bearing version	N	Fr: 7 to 3	Fr: 20 to 4	Fr: 35 to 4.5	Fr: 50 to 5.4	Fr: 80 to 12
		Fp: 4 to 1.5	Fp: 4 to 1.5	Fp: 12 to 3	Fp: 15 to 3.5	Fp: 20 to 4.5



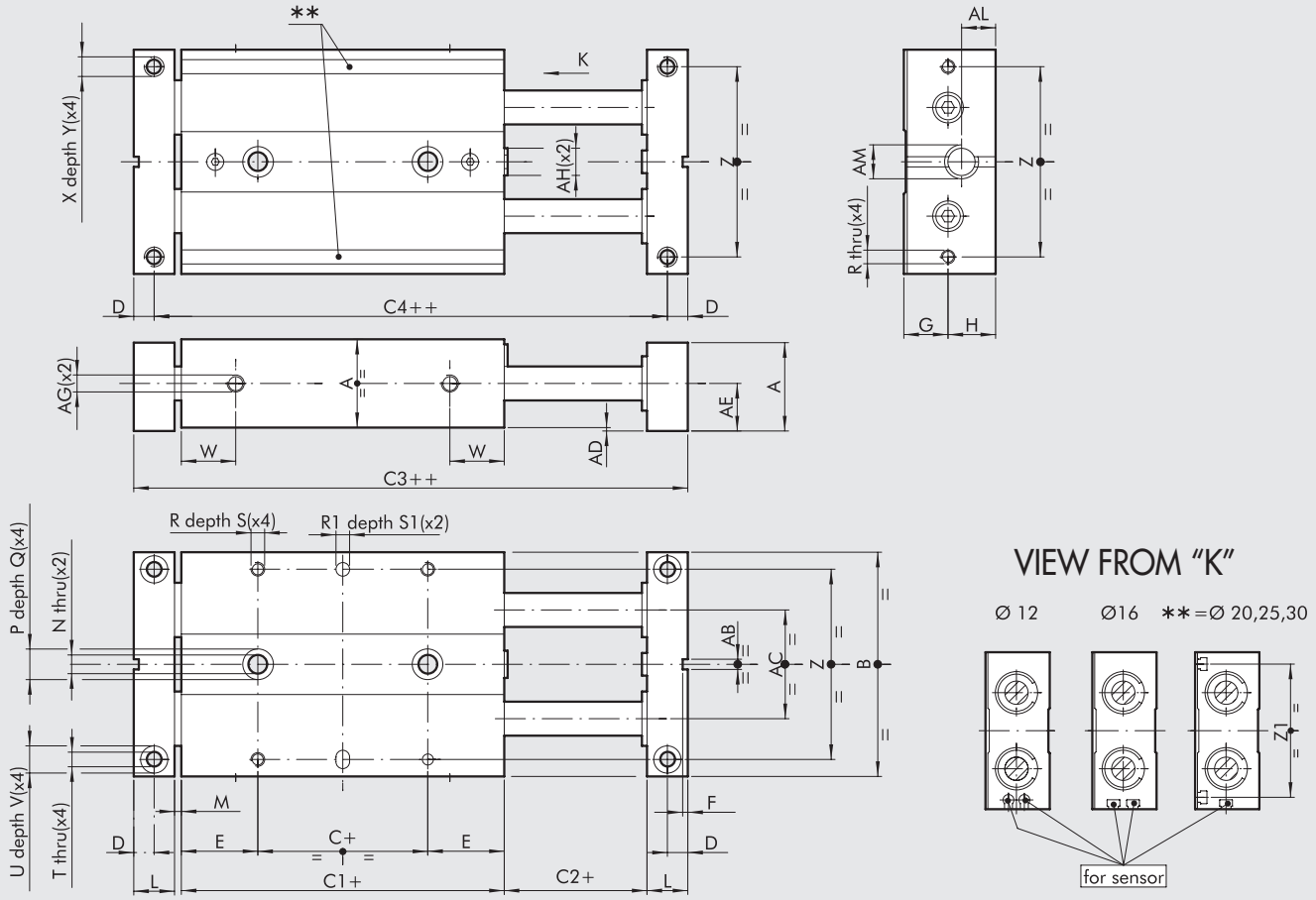
COMPONENTS

① FLANGE: anodized aluminium
② WASHER: steel
③ BUFFER: rubber
④ ADJUSTABEL STRIKER PLATE: Zinc-plated steel
⑤ BASE: brass
⑥ PISTON: brass
⑦ MAGNET: plastoferrite
⑧ CYLINDER BODY: anodized aluminium
⑨ STATIC O-RINGS: NBR
⑩ BUSH: ball bearing
⑪ PISTON ROD: grinded chromed stainless steel
⑫ PISTON ROD: tempered chrome stainless steel, grinded



VERSIONS:
Ⓐ With sliding bushes
Ⓑ With ball bearing bushes

DIMENSIONS OF TWIN-CYLINDER GUIDE UNITS SERIES S11, ON BUSHES Ø 12 to 30



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 H7	S	S1	T
W1450122...	**12**	18	46	5	45	2	65	57	4	20	1.5	9	10	8	2	4.3	8	4	M3	4	5	3	3.3
W1450162...	**16**	22	56	10	50	2	74	64	5	20	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1450202...	**20**	26	66	10	55	2	83	71	6	22.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1450252...	**25**	32	78	10	60	2	92	78	7	25	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1450302...	**30**	36	98	10	70	2	106	90	8	30	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

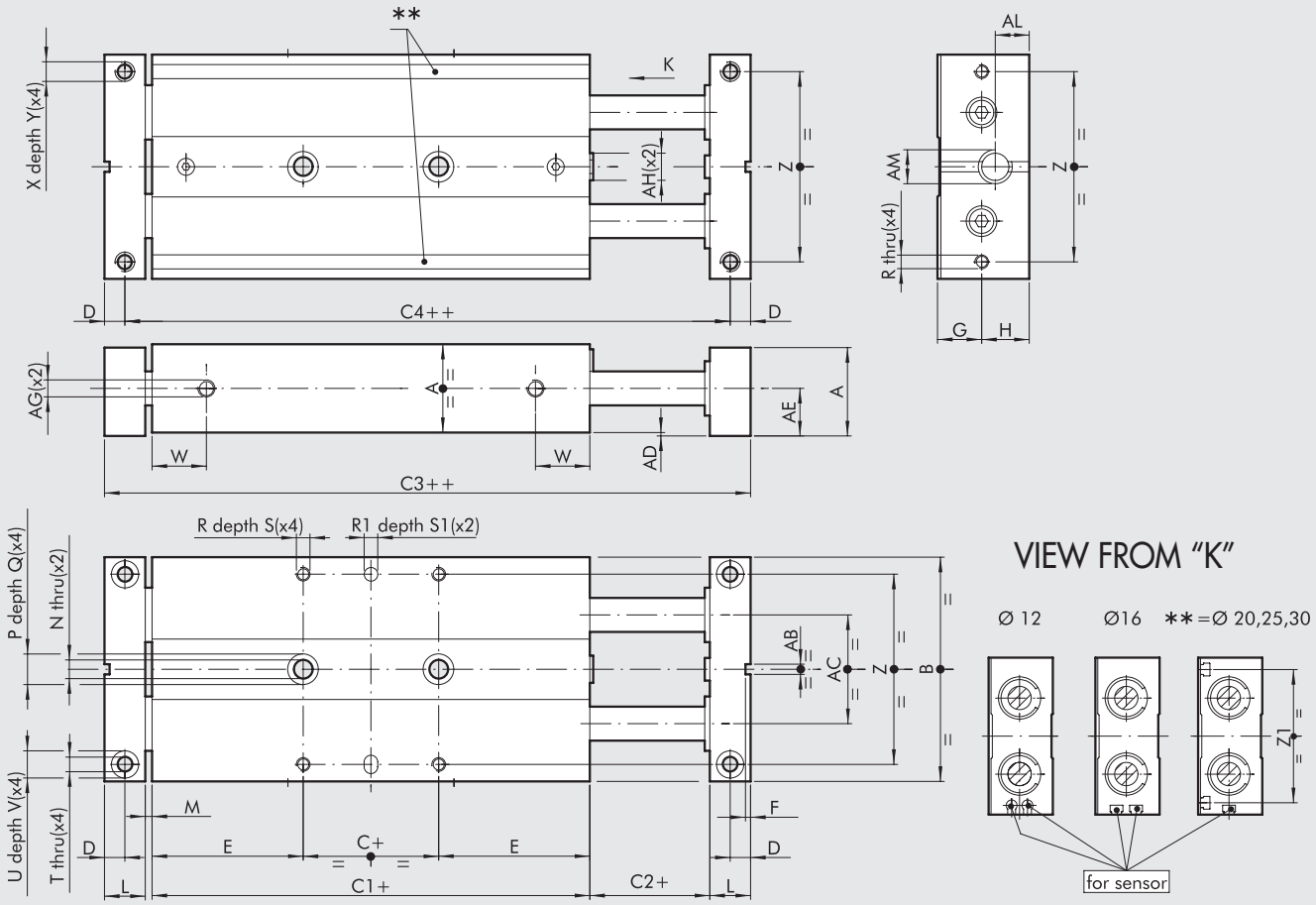
Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AM	AL
12	6	3	14	M4	6	38	–	3	20	1	10	4	M5	M8x1	7
16	8	4	15	M5	8	46	–	3	26	1	12	5	M5	M10x1	8.5
20	8	4	16	M5	10	56	54	3	30	1	14	5	M5	M10x1	9
25	9	5	19	M6	12	66	64	5	39	1	17	6	M5	M12x1	10
30	9	5	21	M6	12	86	82	5	52	1	19	6	G 1/8	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 12 stroke 50 = W1450122050)

Strokes for bore 12 mm	25; 50; 75
Strokes for bore 16 mm	25; 50; 75; 100
Strokes for bore 20 mm	25; 50; 75; 100; 125
Strokes for bore 25 mm	25; 50; 75; 100; 125; 150
Strokes for bore 30 mm	25; 50; 75; 100; 125; 150

METAL WORK PNEUMATIC

DIMENSIONS OF TWIN-CYLINDER GUIDE UNITS SERIES S11, ON BALL BEARINGS Ø 12 to 30



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

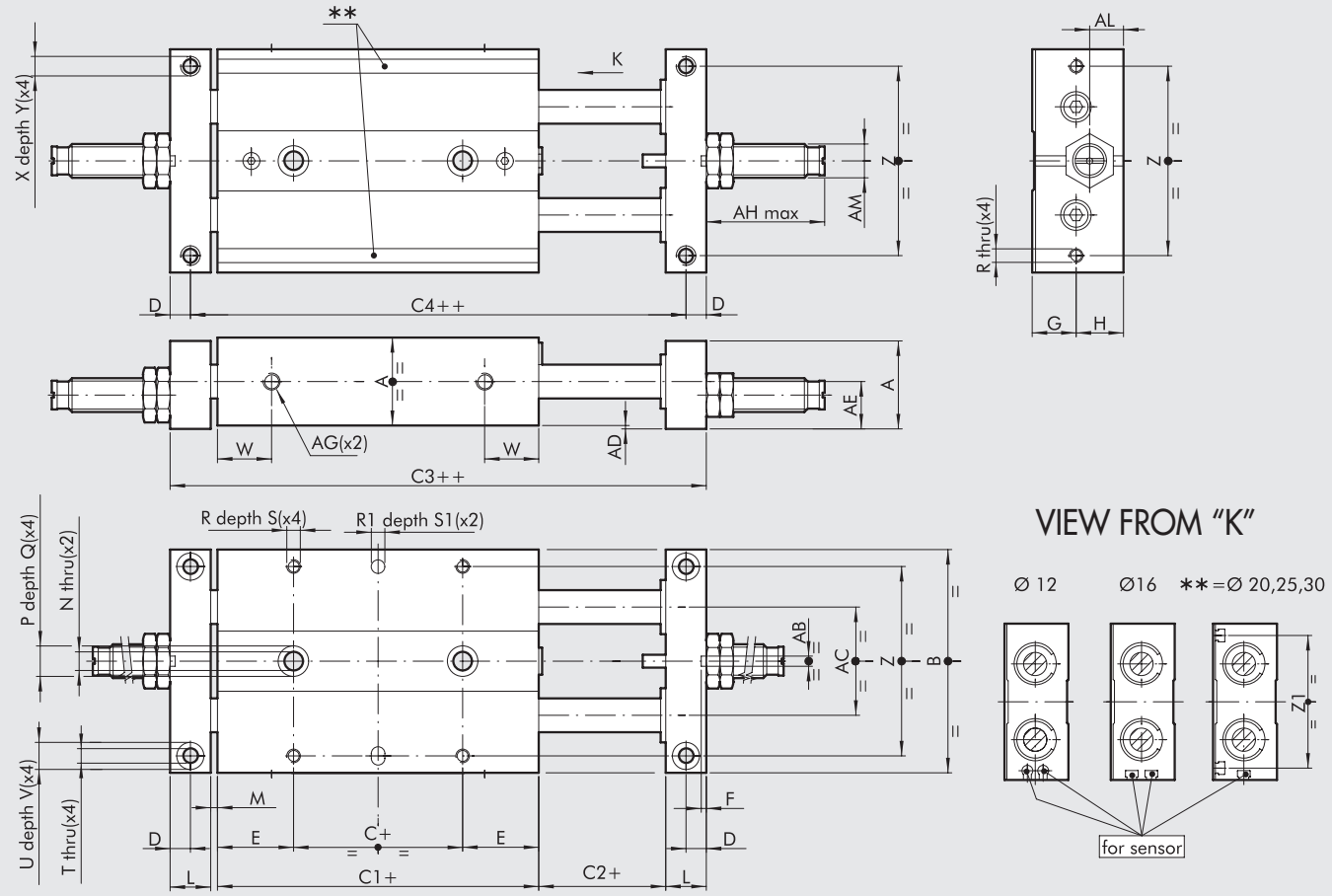
Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 H7	S	S1	T
W1450123...	**12**	18	46	5	71	2	91	83	4	33	1.5	9	10	8	2	4.3	8	4	M3	4	5	3	3.3
W1450163...	**16**	22	56	10	85	2	109	99	5	37.5	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1450203...	**20**	26	66	10	99	2	127	115	6	44.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1450253...	**25**	32	78	10	105	2	137	123	7	47.5	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1450303...	**30**	36	98	10	128	2	164	148	8	59	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
12	6	3	28	M4	6	38	–	3	20	1	10	4	M5	M5	M8x1	7
16	8	4	33	M5	8	46	–	3	26	1	12	5	M5	M6	M10x1	8.5
20	8	4	40	M5	10	56	54	3	30	1	14	5	M5	M8	M10x1	9
25	9	5	42	M6	6	66	64	5	39	1	17	6	M5	M10	M12x1	10
30	9	5	50	M6	12	86	82	5	52	1	19	6	G 1/8	M12	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 12 stroke 50 = W1450123050)

Strokes for bore 12 mm	25; 50; 75
Strokes for bore 16 mm	25; 50; 75; 100
Strokes for bore 20 mm	25; 50; 75; 100; 125
Strokes for bore 25 mm	25; 50; 75; 100; 125; 150
Strokes for bore 30 mm	25; 50; 75; 100; 125; 150

DIMENSIONS OF TWIN-CYLINDER GUIDE UNITS WITH SHOCK ABSORBERS SERIES S11, ON BUSHES Ø 12 to 30



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 H7	S	S1	T
W1450124...	**12**	18	46	5	45	2	65	57	4	20	1.5	9	10	8	2	4.3	8	4	M3	4	5	3	3.3
W1450164...	**16**	22	56	10	50	2	74	64	5	20	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1450204...	**20**	26	66	10	55	2	83	71	6	22.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1450254...	**25**	32	78	10	60	2	92	78	7	25	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1450304...	**30**	36	98	10	70	2	106	90	8	30	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

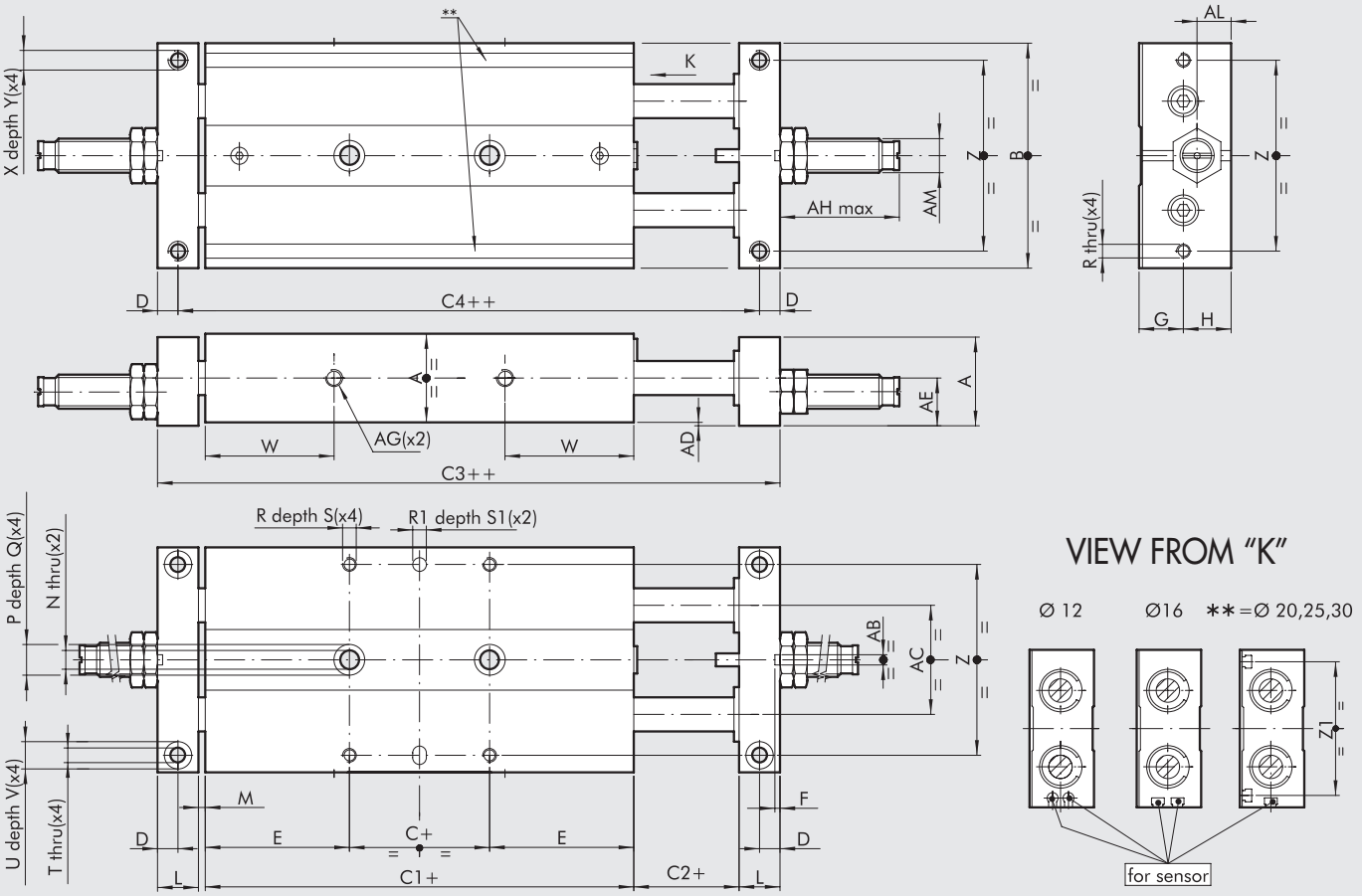
Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
12	6	3	14	M4	6	38	–	3	20	1	10	4	M5	30	M8x1	7
16	8	4	15	M5	8	46	–	3	26	1	12	5	M5	35	M10x1	8.5
20	8	4	16	M5	10	56	54	3	30	1	14	5	M5	35	M10x1	9
25	9	5	19	M6	12	66	69	5	39	1	17	6	M5	36	M12x1	10
30	9	5	21	M6	12	86	82	5	52	1	19	6	G 1/8	60	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 12 stroke 50 = W1450124050)

Strokes for bore 12 mm	25; 50; 75
Strokes for bore 16 mm	25; 50; 75; 100
Strokes for bore 20 mm	25; 50; 75; 100; 125
Strokes for bore 25 mm	25; 50; 75; 100; 125; 150
Strokes for bore 30 mm	25; 50; 75; 100; 125; 150

METAL WORK PNEUMATIC

DIMENSIONS OF TWIN-CYLINDER GUIDE UNITS WITH SHOCK ABSORBERS SERIES S11, ON BALL BEARING Ø 12 to 30



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 H7	S	S1	T
W1450125...	**12**	18	46	5	71	2	91	83	4	33	1.5	9	10	8	2	4.3	8	4	M3	4	5	3	3.3
W1450165...	**16**	22	56	10	85	2	109	99	5	37.5	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1450205...	**20**	26	66	10	99	2	127	115	6	44.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1450255...	**25**	32	78	10	105	2	137	123	7	47.5	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1450305...	**30**	36	98	10	128	2	164	148	8	59	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

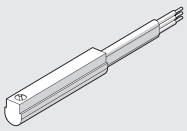
Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
12	6	3	28	M4	6	38	–	3	20	1	10	4	M5	30	M8x1	7
16	8	4	33	M5	8	46	–	3	26	1	12	5	M5	35	M10x1	8.5
20	8	4	40	M5	10	56	54	3	30	1	14	5	M5	35	M10x1	9
25	9	5	42	M6	6	66	64	5	39	1	17	6	M5	36	M12x1	10
30	9	5	50	M6	12	86	82	5	52	1	19	6	G 1/8	60	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 12 stroke 50 = W1450125050)

Strokes for bore 12 mm	25; 50; 75
Strokes for bore 16 mm	25; 50; 75; 100
Strokes for bore 20 mm	25; 50; 75; 100; 125
Strokes for bore 25 mm	25; 50; 75; 100; 125; 150
Strokes for bore 30 mm	25; 50; 75; 100; 125; 150

ACCESSORIES

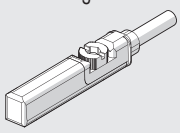
SENSOR Ø 4, FOR SLIDE S11 Ø 12



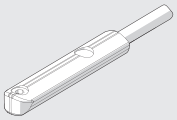
For codes and technical data, see **chapter A6**.

RETRACTABLE SENSOR, FOR SLIDE S11 Ø16 to 30

SENSOR, SQUARE TYPE
Latest generation,
secure fixing



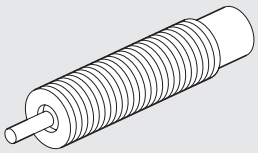
SENSOR, OVAL TYPE
Traditional



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

SPARE PARTS

SHOCK ABSORBERS



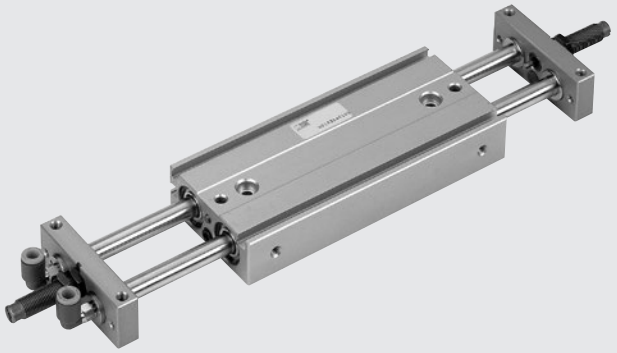
Code	Ø	Description
0950004001	12	Shock absorbers ECO 8 MC2 + nut M8x1
0950004002	16 - 20	Shock absorbers ECO 10 MF2 + nut M10x1
0950004003	25	Shock absorbers ECO 15 MF1 + nut M12x1
0950004004	30	Shock absorbers ECO 25 MC2 + nut M14x1.5

NOTES

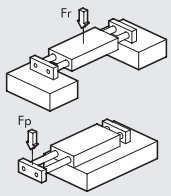
TWIN CYLINDER SLIDE WITH FIXED PLATES SERIES S12

Two sliding systems are available:
- on bushes
- on ball bearings

The structure is made up of two paired through-rod cylinders with a common anodized aluminium body with grooves for mounting the retractable sensor.
Five bores available: 2 x Ø 16; 2 x Ø 20; 2 x Ø 25; 2 x Ø 30.
The rods are joined together by means of a plate on which the mechanical limit switches or hydraulic shock absorbers can be mounted.
The compressed air ports are at the end of the piston rods.



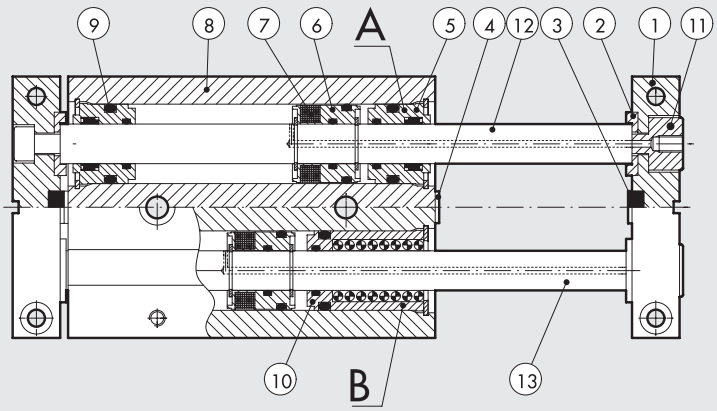
TECHNICAL DATA		S12-16	S12-20	S12-25	S12-30
Fluid		20 µm filtered air			
Pressure range	bar	1.5 to 7			
	MPa	0.15 to 0.7			
	psi	21.5 to 101			
Temperature range	°C	-10 to +80			
Piston speed	mm/s	30 to 200			
Versions		With sliding bushes / With ball bearing bushes / With stop screw / With hydraulic shock absorbers			
Bores	mm	16	20	25	30
Piston rod diameter	mm	8	10	12	16
Strokes	mm	25	25	25	25
		50	50	50	50
		75	75	75	75
		100	100	100	100
		–	125	125	125
		–	–	150	150
Weight = X + (Y · C) where C = stroke	kg				
Bushes version		X = 0.25	X = 0.5	X = 0.7	X = 1.24
		Y = 0.0035	Y = 0.045	Y = 0.007	Y = 0.01
Ball bearing version		X = 0.37	X = 0.78	X = 1.04	X = 1.98
		Y = 0.0035	Y = 0.045	Y = 0.007	Y = 0.01
Maximum impact energy with buffers	J	0.15	0.20	0.30	0.5
Maximum impact energy with hydraulic decelerators	J	5	5	10	20
Theoretical thrust (P = relative pressure in bar)	N	30 x P	47 x P	75 x P	101 x P
Max. loads		(The values shown refer to the min. and max. strokes)			
Bushes version	N	Fr: 35 to 6.5	Fr: 58 to 7	Fr: 80 to 8	Fr: 130 to 18
		Fp: 11 to 3	Fp: 18 to 5	Fp: 23 to 6	Fp: 50 to 8
Ball bearing version	N	Fr: 20 to 4	Fr: 35 to 4.5	Fr: 50 to 5.4	Fr: 80 to 12
		Fp: 4 to 1.5	Fp: 12 to 3	Fp: 15 to 3.5	Fp: 20 to 4.5



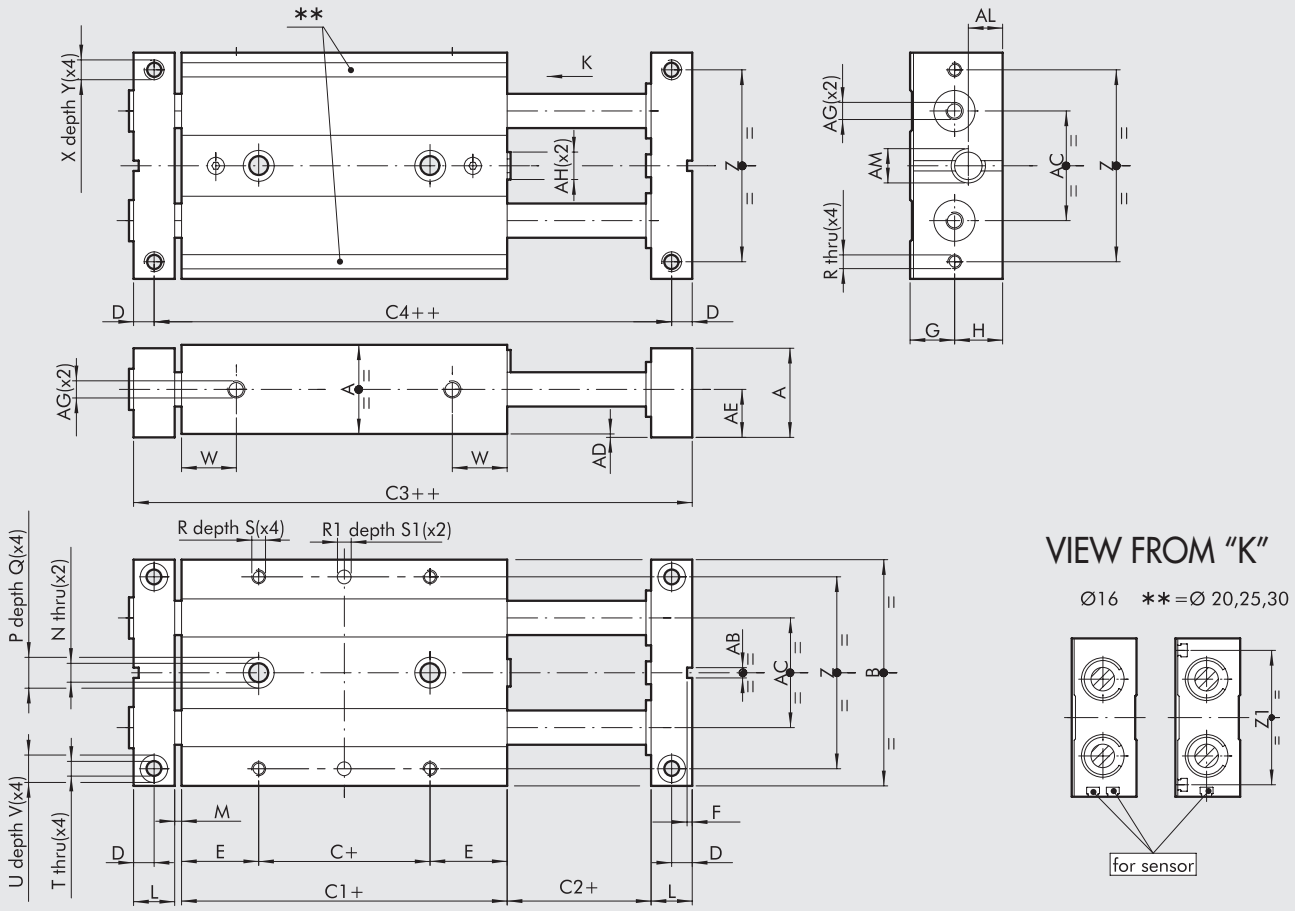
COMPONENTS

① FLANGE: anodized aluminium
② WASHER: steel
③ BUFFER: rubber
④ ADJUSTABLE STRIKER PLATE: Zinc-plated steel
⑤ BASE: brass
⑥ PISTON: brass
⑦ MAGNET: Plastoferrite
⑧ CYLINDER BODY: anodized aluminium
⑨ STATIC O-RINGS: NBR
⑩ BUSH: ball bearing
⑪ SCREW: pneumatically powered
⑫ PISTON ROD: grinded chromed stainless steel
⑬ PISTON ROD: tempered chrome stainless steel, grinded

VERSIONS:
Ⓐ With sliding bush
Ⓑ With ball bearing bush



DIMENSIONS OF TWIN-CYLINDER SLIDE SERIES S12, ON BUSHES Ø 16 to 30



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1^{H7}	S	S1	T
W1460162...	**16**	22	56	10	50	2	74	64	5	20	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1460202...	**20**	26	66	10	55	2	83	71	6	22.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1460252...	**25**	32	78	10	60	2	92	78	7	25	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1460302...	**30**	36	98	10	70	2	106	90	8	30	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

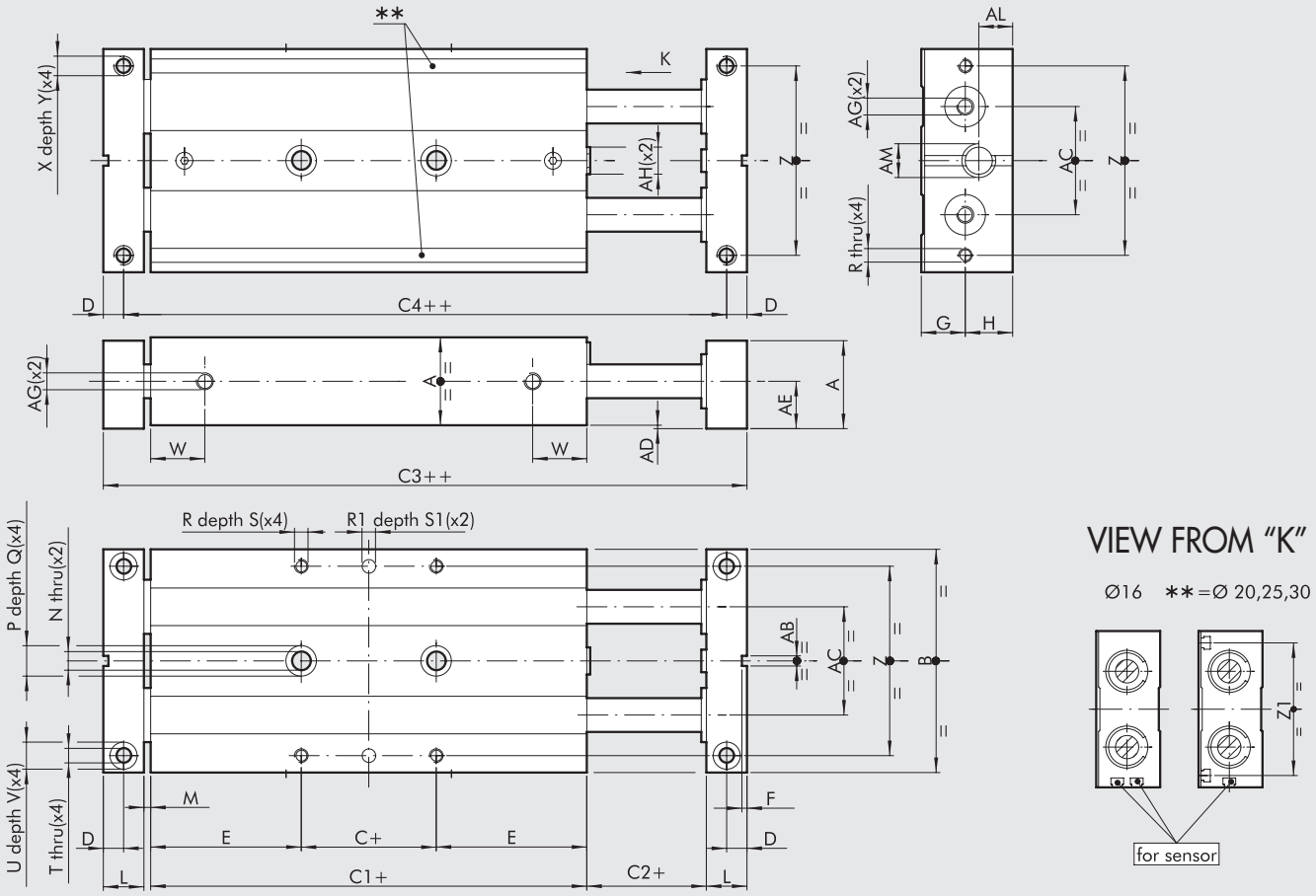
Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
16	8	4	15	M5	8	46	–	3	26	1	12	5	M5	M6	M10x1	8.5
20	8	4	16	M5	10	56	54	3	30	1	14	5	M5	M8	M10x1	9
25	9	5	19	M6	12	66	64	5	39	1	17	6	M5	M10	M12x1	10
30	9	5	21	M6	12	86	82	5	52	1	19	6	G 1/8	M12	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 16 stroke 50 = W1450162050)

Strokes for bore 16 mm	25; 50; 75; 100
Strokes for bore 20 mm	25; 50; 75; 100; 125
Strokes for bore 25 mm	25; 50; 75; 100; 125; 150
Strokes for bore 30 mm	25; 50; 75; 100; 125; 150

METAL WORK PNEUMATIC

DIMENSIONS OF TWIN-CYLINDER SLIDE SERIES S12, ON BALL BEARINGS Ø 16 to 30



\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

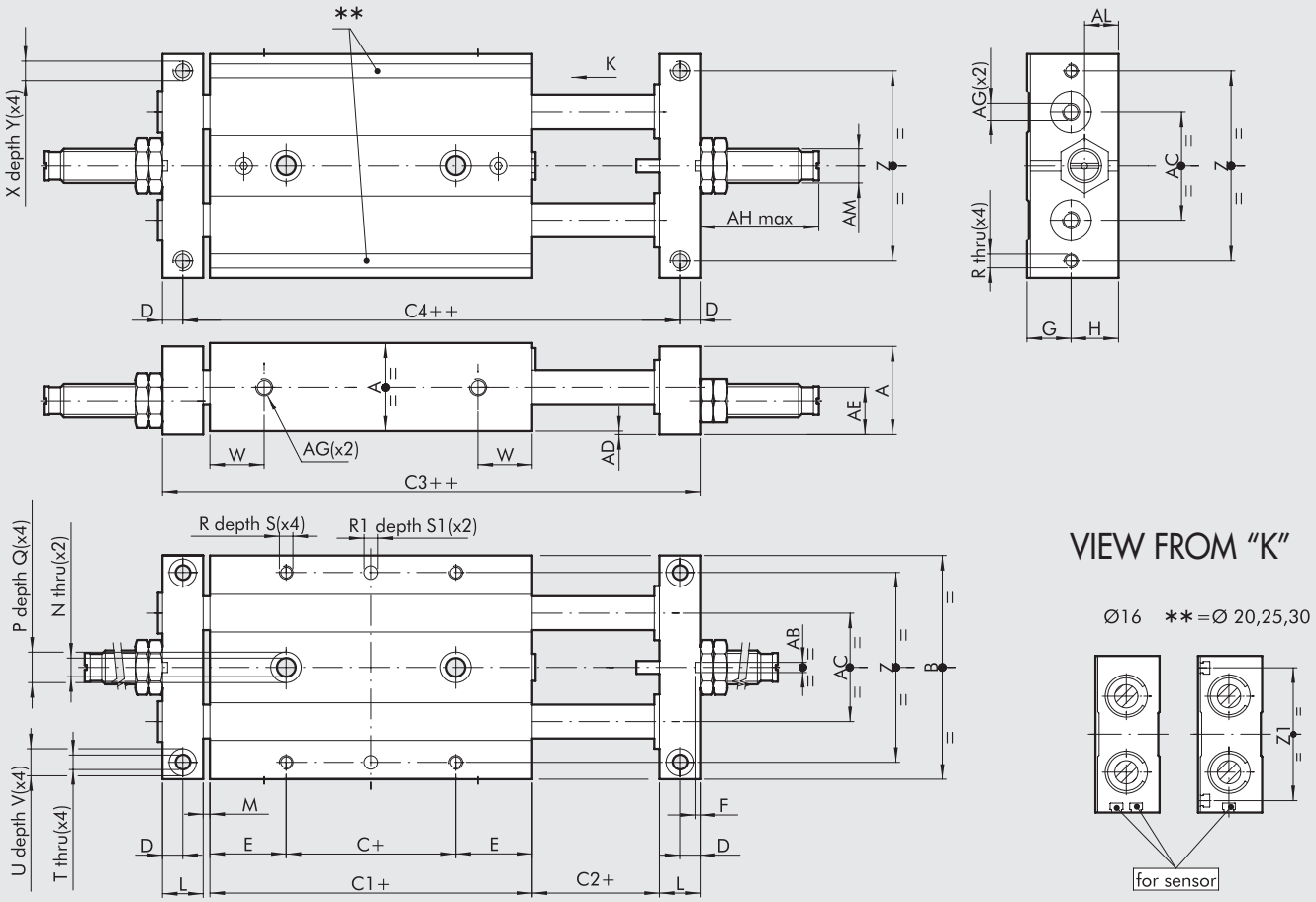
Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 H7	S	S1	T
W1460163...	**16**	22	56	10	85	2	109	99	5	37.5	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1460203...	**20**	26	66	10	99	2	127	115	6	44.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1460253...	**25**	32	78	10	105	2	137	123	7	47.5	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1460303...	**30**	36	98	10	128	2	164	148	8	59	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
16	8	4	33	M5	8	46	–	3	26	1	12	5	M5	M6	M10x1	8.5
20	8	4	40	M5	10	56	54	3	30	1	14	5	M5	M8	M10x1	9
25	9	5	42	M6	6	66	64	5	39	1	17	6	M5	M10	M12x1	10
30	9	5	50	M6	12	86	82	5	52	1	19	6	G 1/8	M12	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 16 stroke 50 = W1450163050)

Strokes for bore 16 mm	25; 50; 75; 100
Strokes for bore 20 mm	25; 50; 75; 100; 125
Strokes for bore 25 mm	25; 50; 75; 100; 125; 150
Strokes for bore 30 mm	25; 50; 75; 100; 125; 150

DIMENSIONS OF TWIN-CYLINDER SLIDE WITH SHOCK ABSORBERS SERIES S12, ON BUSHES Ø 16 to 30



VIEW FROM "K"

Ø16 **=Ø 20,25,30

\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 H7	S	S1	T
W1460164...	**16**	22	56	10	50	2	74	64	5	20	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1460204...	**20**	26	66	10	55	2	83	71	6	22.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1460254...	**25**	32	78	10	60	2	92	78	7	25	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1460304...	**30**	36	98	10	70	2	106	90	8	30	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

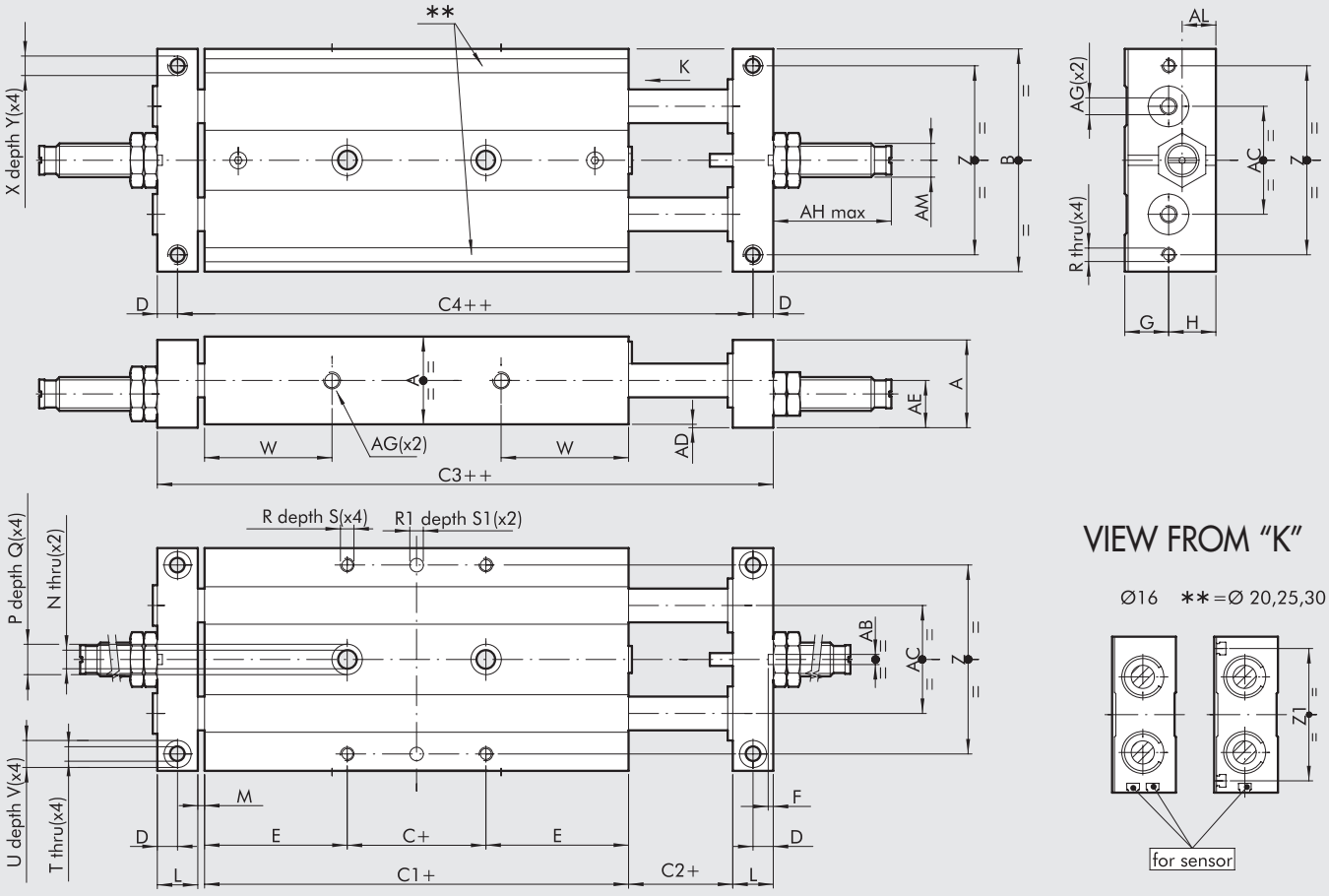
Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
16	8	4	15	M5	8	46	–	3	26	1	12	5	M5	35	M10x1	8.5
20	8	4	16	M5	10	56	54	3	30	1	14	5	M5	35	M10x1	9
25	9	5	19	M6	12	66	64	5	39	1	17	6	M5	36	M12x1	10
30	9	5	21	M6	12	86	82	5	52	1	19	6	G 1/8	60	M14x1.5	12

...Enter the stroke in mm (e.g. Ø 16 stroke 50 = W1450164050)

Strokes for bore 16 mm	25; 50; 75; 100
Strokes for bore 20 mm	25; 50; 75; 100; 125
Strokes for bore 25 mm	25; 50; 75; 100; 125; 150
Strokes for bore 30 mm	25; 50; 75; 100; 125; 150

METAL WORK PNEUMATIC

DIMENSIONS OF TWIN-CYLINDER SLIDE WITH SHOCK ABSORBERS SERIES S12, ON BALL BEARING Ø 16 to 30



VIEW FROM "K"

Ø16 **=Ø 20,25,30

\+ = ADD THE STROKE
++ = ADD TWICE THE STROKE

Code	Ø	A	B	C	C1	C2	C3	C4	D	E	F	G	H	L	M	N	P	Q	R	R1 H7	S	S1	T
W1460165...	16	22	56	10	85	2	109	99	5	37.5	1.5	11	12	10	2	4.3	8	4	M4	4	6	3	4.3
W1460205...	20	26	66	10	99	2	127	115	6	44.5	1.5	13	14	12	2	5.5	9	5	M4	4	7	3	4.3
W1460255...	25	32	78	10	105	2	137	123	7	47.5	2.5	16	17	14	2	6.5	10.5	6	M5	4	7	3	5.2
W1460305...	30	36	98	10	128	2	164	148	8	59	2.5	18	19	16	2	8.5	14	8	M6	6	8	5	5.2

Ø	U	V	W	X	Y	Z	Z1	AB	AC	AD	AE	AF	AG	AH	AM	AL
16	8	4	33	M5	8	46	–	3	26	1	12	5	M5	35	M10x1	8.5
20	8	4	40	M5	10	56	54	3	30	1	14	5	M5	35	M10x1	9
25	9	5	42	M6	6	66	64	5	39	1	17	6	M5	36	M12x1	10
30	9	5	50	M6	12	86	82	5	52	1	19	6	G 1/8	60	M14x1	12

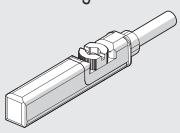
...Enter the stroke in mm (e.g. Ø 16 stroke 50 = W1450165050)

Strokes for bore 16 mm	25; 50; 75; 100
Strokes for bore 20 mm	25; 50; 75; 100; 125
Strokes for bore 25 mm	25; 50; 75; 100; 125; 150
Strokes for bore 30 mm	25; 50; 75; 100; 125; 150

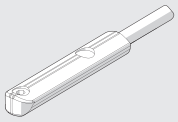
ACCESSORIES

RETRACTABLE SENSOR

SENSOR, SQUARE TYPE
Latest generation,
secure fixing



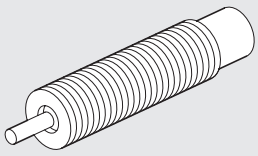
SENSOR, OVAL TYPE
Traditional



For codes and technical data, see chapter A6.

SPARES

SHOCK ABSORBERS

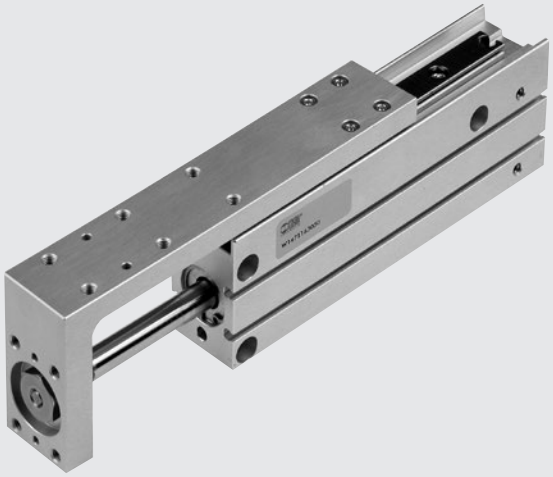


Code	Ø	Description
0950004002	16 - 20	Shock absorbers ECO 10 MF2 + nut M10x1
0950004003	25	Shock absorbers ECO 15 MF1 + nut M12x1
0950004004	30	Shock absorbers ECO 25 MC2 + nut M14x1.5

NOTES

PRECISION SLIDE SERIES S13

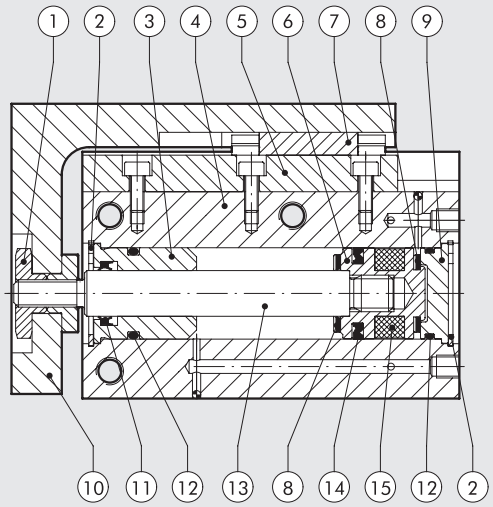
Series S13 precision slides feature a dual-acting pneumatic cylinder that has the sole purpose of pushing and pulling the load, a ground steel guide that is integral with the body, and a ball recirculation pad that is fixed onto the moving table and is designed to withstand all the loads and movements applied. This ensures accurate movement with virtually no play, and the piston rods do not suffer wear as there are no lateral loads.
All the slides are equipped with sensor magnets.
The body can be secured on many sides. The load side can be fixed onto the table from the top or the front. The compressed air supply can be connected on three sides. The retractable sensors can be fitted on the right or on the left. All these possibilities make the application extremely flexible. The width is extremely reduced to allow installation in small spaces and the combination of several reduced-pitch slides.



TECHNICAL DATA		Ø 6	Ø 10	Ø 16	Ø 20
Operating pressure	bar	2 to 8			
	MPa	0.2 to 0.8			
	psi	29 to 116			
Operating temperature	°C	-10 to +80			
Fluid		Lubricated and unlubricated compressed air at 20 µm, must be uninterrupted when lubricated			
Minimum and maximum speed	mm/s	30 to 500			
Pneumatic fittings		M5			
Type of guide		Ball recirculation			
Versions		Magnetic dual-acting with rubber buffer			
Strokes	mm	10	10	10	10
		25	25	25	25
		---	---	50	50
Theoretical thrust force, at 6 bar	N	17	47	120	188
Theoretical pull force, at 6 bar	N	13	40	104	158
Admitted loads		See **next page**			
Admitted kinetic energy	Joule	0.012	0.025	0.050	0.100
Stroke tolerance	mm	0 / +1.0			
Assembly position		Any (horizontal and vertical)			
Weight	kg	See **next page**			

COMPONENTS

① NUT: stainless steel
② SNAP RING: zinc-plated steel
③ FRONT BASE: bronze
④ BODY: anodized aluminium
⑤ GUIDE: tempered stainless steel
⑥ PISTON: aluminium
⑦ BALL RECIRCULATION PAD: stainless steel
⑧ BUFFER: NBR
⑨ REAR BASE: anodized aluminium
⑩ PLATE: anodized aluminium
⑪ PISTON ROD GASKET: type EM, NBR
⑫ O-RING: NBR
⑬ PISTON ROD: stainless steel
⑭ PISTON GASKET: type PZ, NBR
⑮ MAGNET: neodymium (Ø 6 and Ø 10)
plastoferrite (Ø 16 and Ø 20)



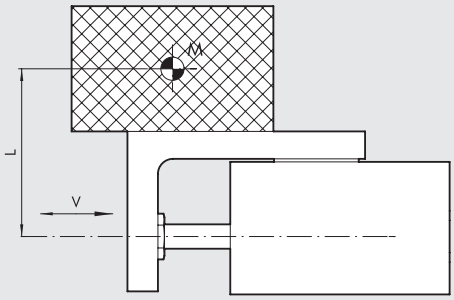
WEIGHTS

WEIGHT [gr]				
Stroke	Bore			
	6	8	16	20
10	68	125	230	455
25	90	160	280	550
50	---	---	350	660

WEIGHT OF MOVING PART [gr]				
Stroke	Bore			
	6	8	16	20
10	30	50	100	180
25	40	68	125	220
50	---	---	167	290

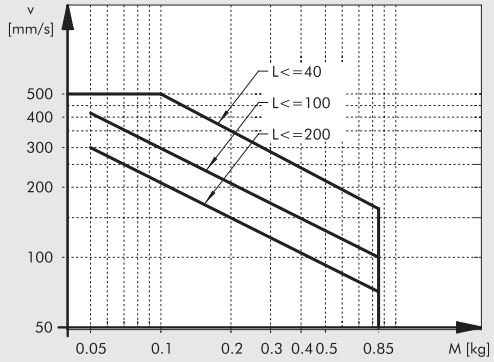
MASS/VELOCITY DIAGRAM

M (kg) = Mass applied
L (mm) = Distance between the axis of the piston rod and the barycentre of the mass
v (mm/s) = Velocity of the slide
vert = Limit with vertical movement

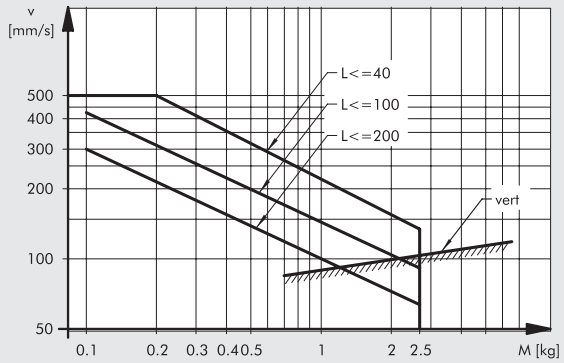


ADMITTED LOADS DIAGRAM

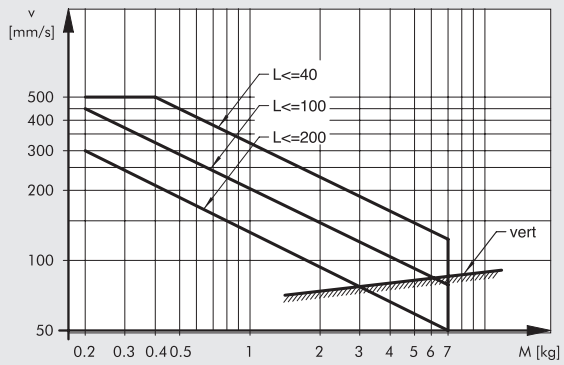
S13-6



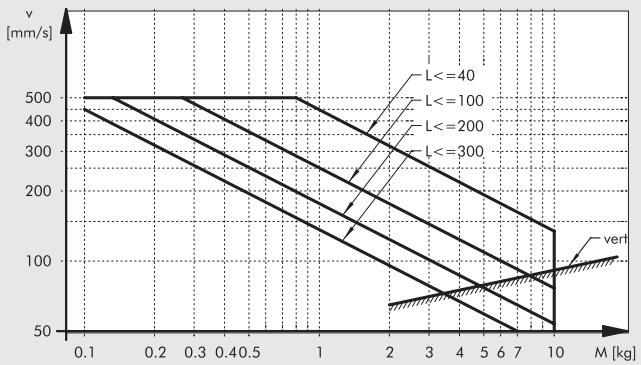
S13-10



S13-16



S13-20



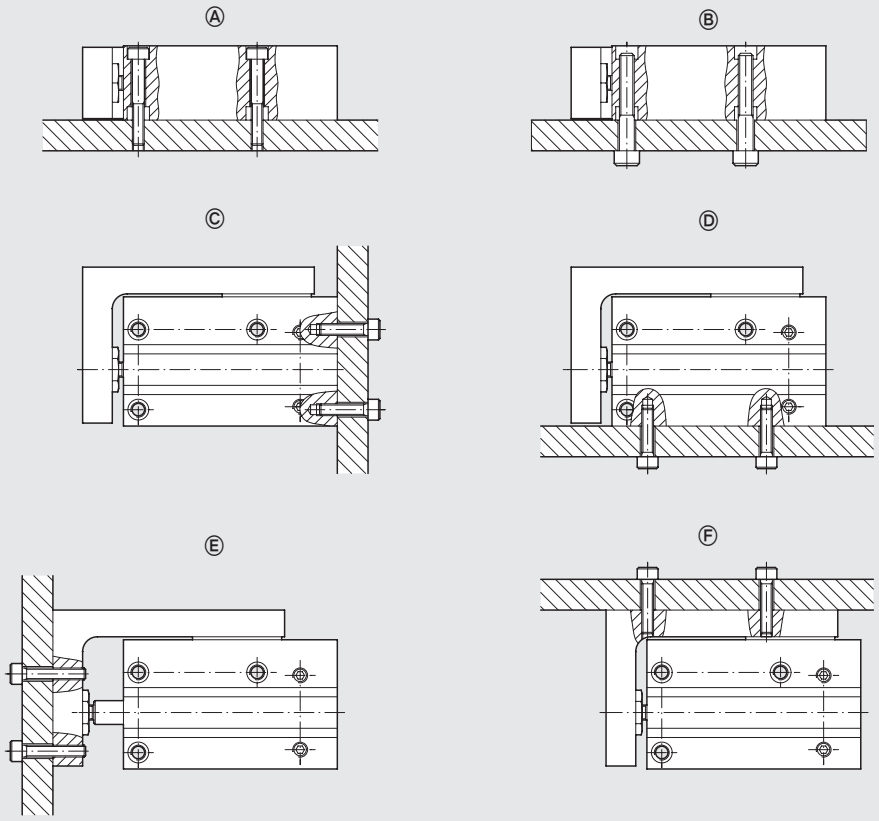
METAL WORK PNEUMATIC

FIXING OPTIONS

FIXING THE BODY
Ⓐ Lateral, via the through holes
Ⓑ Lateral, on the hole threads
Ⓒ Rear, on the threaded holes
Ⓓ Vertical, on the threaded holes

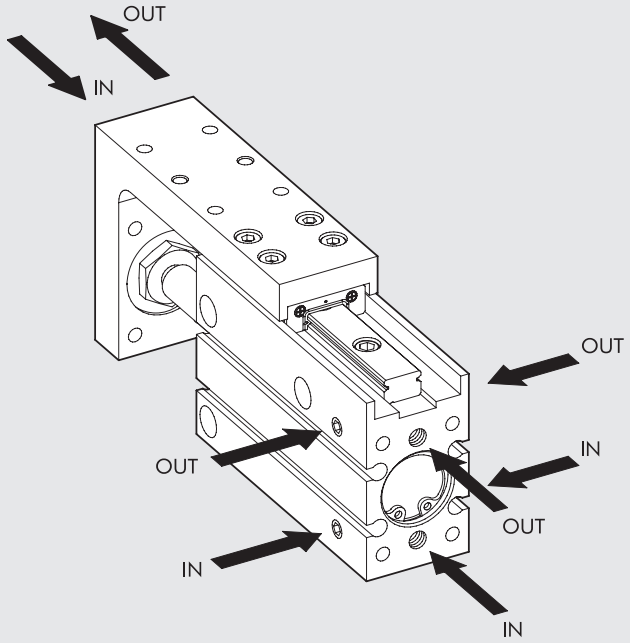
FIXING THE MOVING TABLE
Ⓔ Front, on the threaded holes
Ⓕ Top, on the threaded holes

N.B. Since the table is supported by a ball guide/pad, avoid applying excessive torques or forces. When securing the screws, hold the table, not the body, so that the torque discharges through the ball pad.

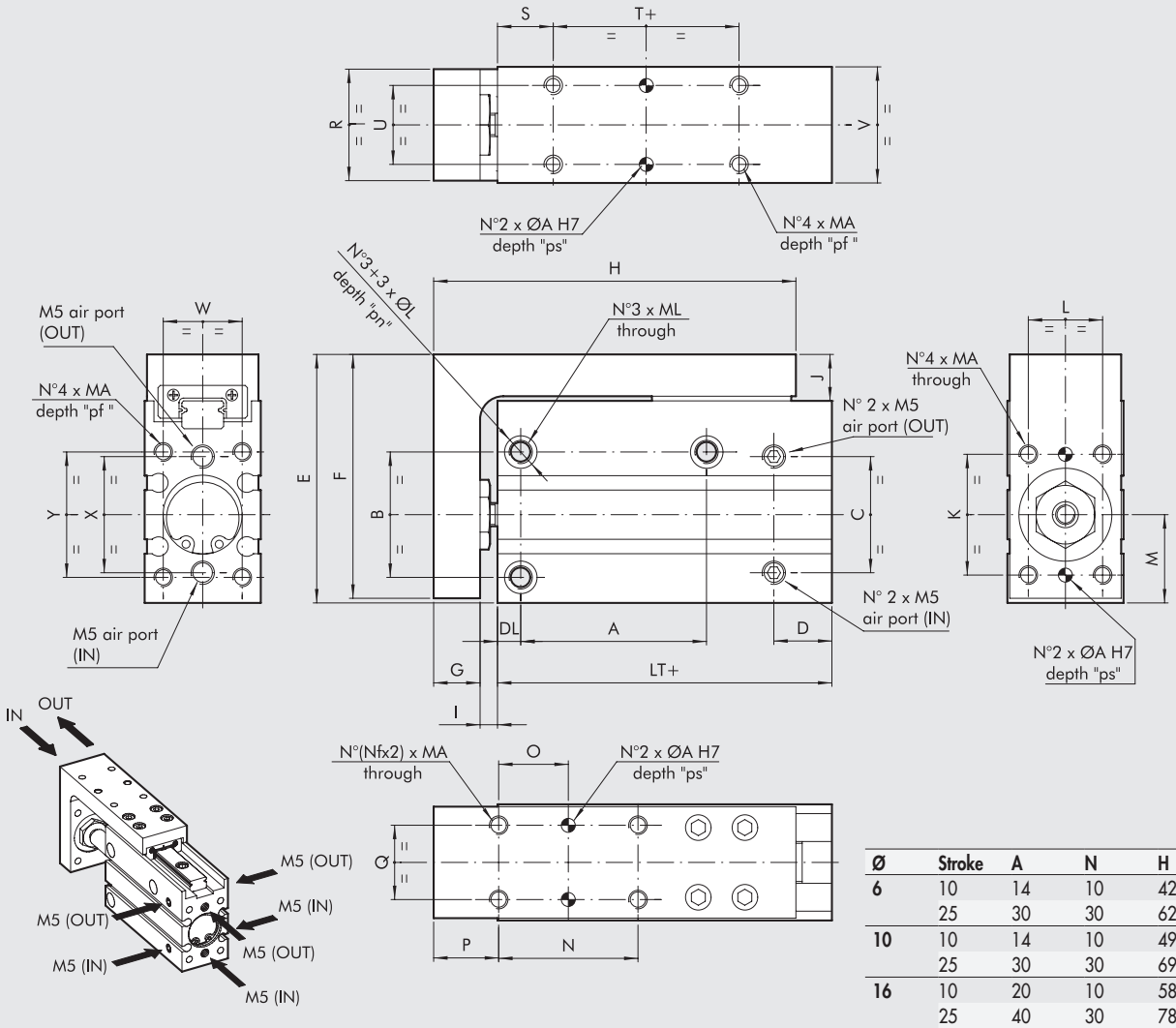


COMPRESSED-AIR SUPPLY

The compressed air supply can be from the back, from the left or from the right.
The slide comes with holes on the left and right that are plugged with screws and O-ring seals.
If you wish to use the holes, remove the screws and O-rings and fix them in the holes in the back, applying a drop of adhesive to the screw thread.



DIMENSIONS



Ø	Stroke	A	N	H	NF
6	10	14	10	42	2
	25	30	30	62	2
10	10	14	10	49	2
	25	30	30	69	2
16	10	20	10	58	2
	25	40	30	78	2
	50	60	25	98	3
20	10	20	10	64	2
	25	40	30	84	2
	50	70	25	104	3

\+ = ADD THE STROKE

Code	Ø	LT	B	C	D	E	F	G	I	J	K	MA	pf	ØA	ps	L	M	O	P	Q	R	S
W1471063...*	**6**	31	19	18	10	39	38	5.5	2.9	7.5	15	M3	5	2	4.5	9	14.5	N/2	8	9	15	10
W1471103...*	**10**	35	23	20	12.5	47	46	7.5	4	9	18	M4	6	2	4.5	11	15.5	N/2	11	11	19	12
W1471163...*	**16**	42	27	25	12.5	53.5	52.5	10	3.75	10	26	M4	7	3	7.5	16	19	N/2	14	16	24	12
W1471203...*	**20**	52.5	34	32	15	64.5	63.5	11	4.5	10.5	34	M5	9	3	7.5	20	23	N/2	14	20	31	15

Ø	T	U	V	W	X	Y	ØL	pn	ML	DL
6	5	9	16	10.5	18	19	6	3.5	M4	4
10	5	13	20	13	20	23	7.5	4.5	M5	5
16	10	17	25	17	25	27	7.5	4.5	M5	5
20	10	20	32	20	32	34	9.5	7.5	M6	6

* Enter the stroke in mm (e.g. Ø 6 stroke 10=W1471063010)

Standard strokes:

Bore Ø 6 -> 10; 25 mm

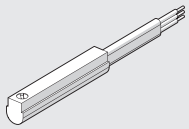
Bore Ø 10 -> 10; 25 mm

Bore Ø 16 -> 10; 25; 50 mm

Bore Ø 20 -> 10; 25; 50 mm

ACCESSORIES

SENSOR Ø 4



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

NOTES