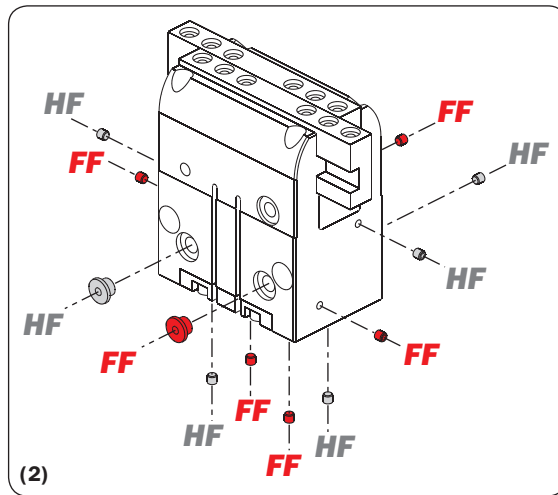
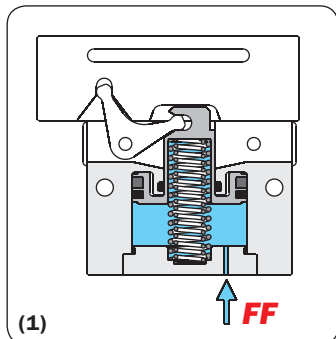


2-jaw self-centering pneumatic parallel gripper (series PQ)

- Robust guide.
- Long stroke.
- Integrated springs (1).
- Various fastening and air feeding options (2).
- Available upon request with food grease FDA-H1 and with high temperature (up to 100 °C.) seals.



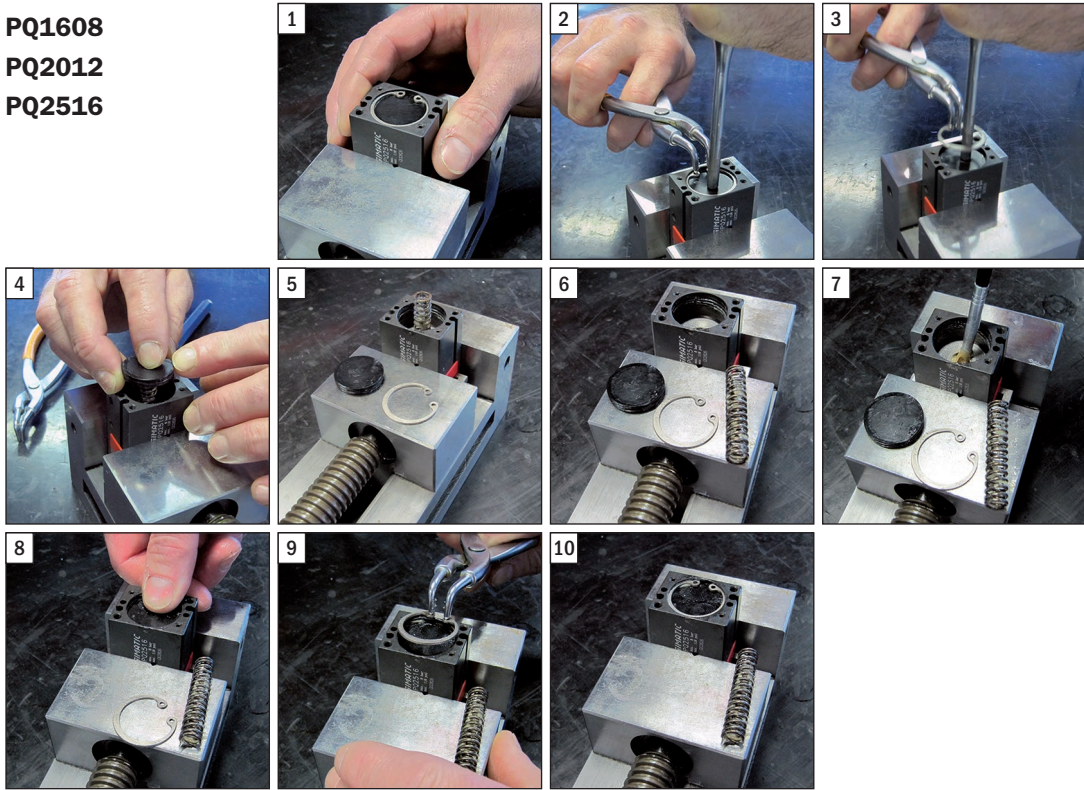
	PQ1608	PQ2012	PQ2516	PQ3015	PQ3523	PQ4533	PQ5047	PQ6063
Medium	Filtered, lubricated / non lubricated compressed air							
Operating pressure range	3.5 ÷ 8 bar							
Operating temperature range	5 ÷ 60 °C							
Gripping force on each jaw (6 bar in FF)	60 N	90 N	150 N	200 N	280 N	460 N	670 N	930 N
Total gripping force (6 bar in FF)	120 N	180 N	300 N	400 N	560 N	920 N	1340 N	1860 N
Total stroke (±0.5 mm)	8 mm	12 mm	16 mm	15 mm	23 mm	33 mm	47 mm	63 mm
Maximum working frequency	2 Hz	2 Hz	2 Hz	2 Hz	2 Hz	1 Hz	1 Hz	1 Hz
Cycle air consumption	2 cm ³	4 cm ³	8 cm ³	12 cm ³	23 cm ³	55 cm ³	114 cm ³	210 cm ³
Gripping time (air in FF)	20 ms	40 ms	40 ms	60 ms	60 ms	100 ms	140 ms	190 ms
Release time (air in HF)	20 ms	50 ms	50 ms	110 ms	110 ms	160 ms	230 ms	400 ms
Repetition accuracy	0.02 mm							
Weight	63 g	110 g	200 g	330 g	610 g	1270 g	2430 g	4900 g

Springs

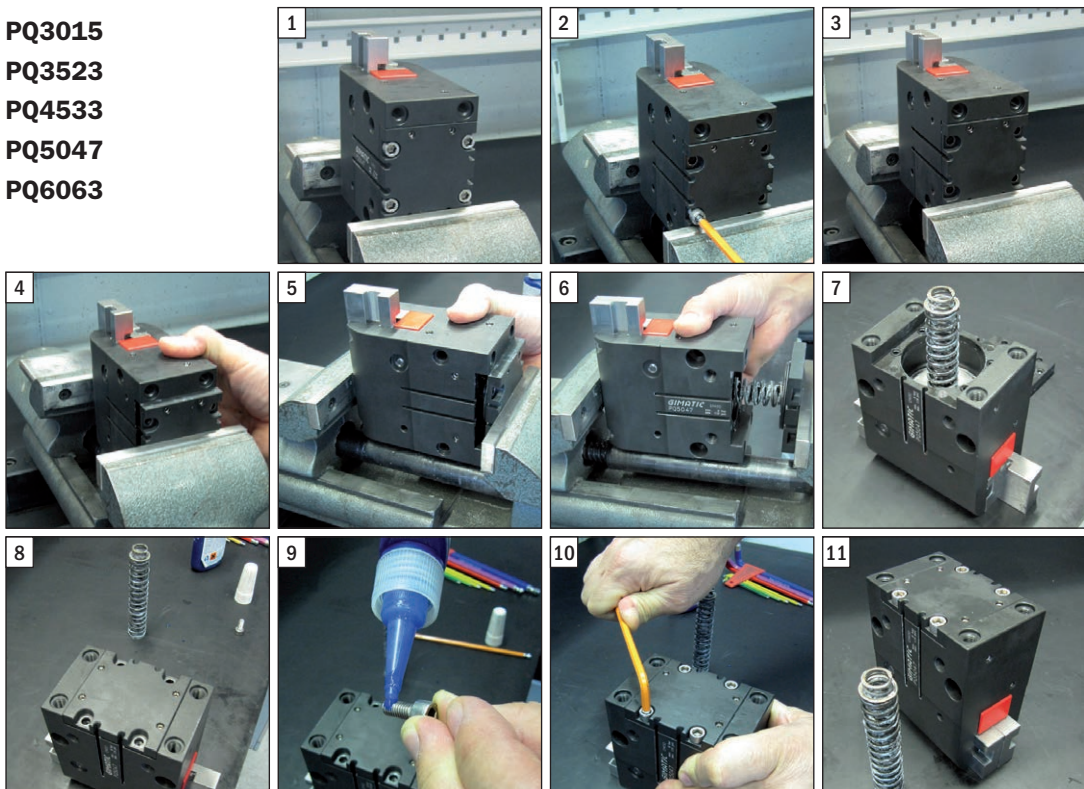
This gripper is provided with springs under the piston. For this reason and because of the piston rod, its maximum gripping force is achieved with compressed air in FF. The gripper can operate either in single-effect mode or double-effect mode. The springs can be removed, following the procedure illustrated in the photos. Without springs the resulting gripping force is:

- 18% lower with compressed air in FF;
- 37% lower with compressed air in HF.

**PQ1608
PQ2012
PQ2516**



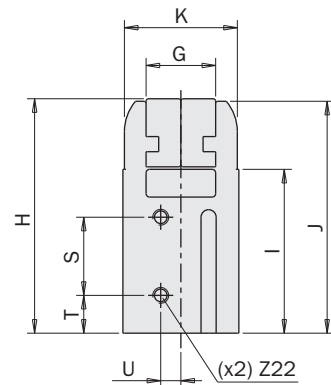
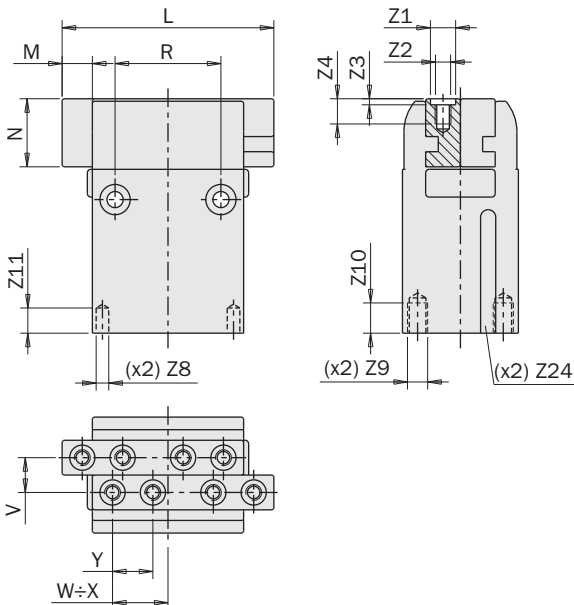
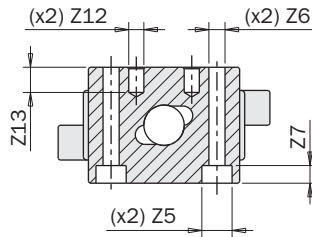
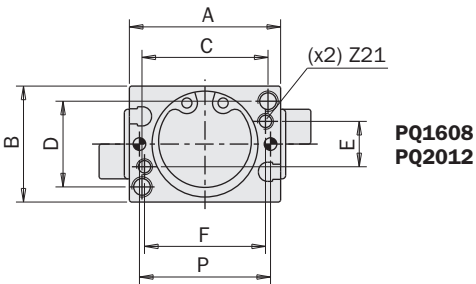
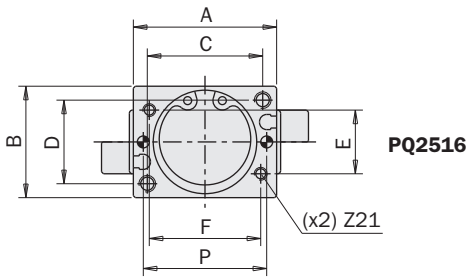
**PQ3015
PQ3523
PQ4533
PQ5047
PQ6063**



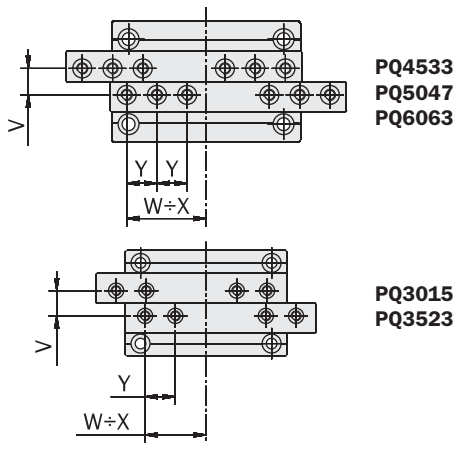
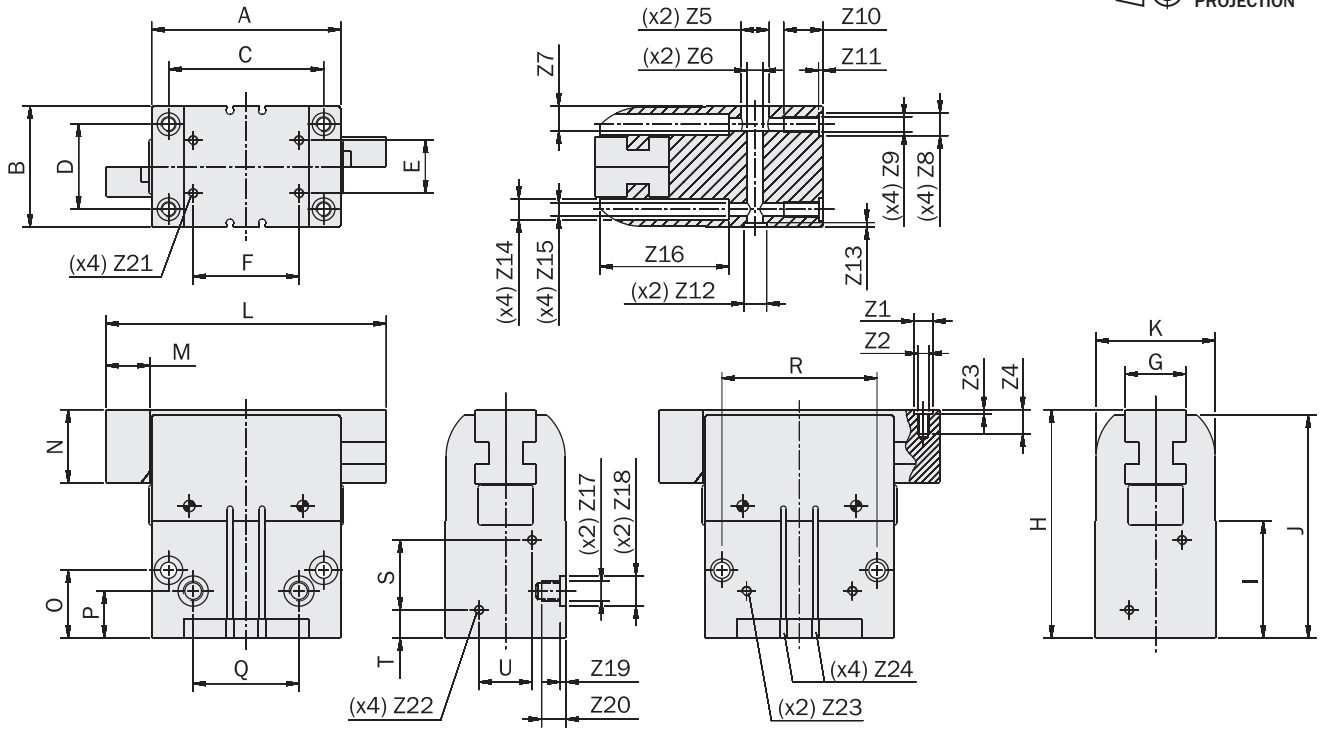
Dimensions (mm)

- Z1** Spot face for the centering sleeve of the gripping tool
- Z2** Threaded hole for the gripping tool fastening
- Z6** Through hole for the gripper side fastening
- Z9** Threaded hole for the gripper fastening on the bottom
- Z12** Spot face for the centering sleeve of the gripper body
- Z21** Ports for direct air supply from the bottom
- Z22** Air supply ports
- Z23** Air supply ports
- Z24** Magnetic sensor slots

	PQ1608	PQ2012	PQ2516
A	24	30	36
B	18	23	28
C ±0.02	20	25	29
D ±0.02	14	17	21
E	7	9	16
F	19.4	24	28
G	11	13.8	16
H	44	46.5	57
I	32.5	32.5	37.5
J	43.5	46	56
K	17.5	22.4	27
L	32	42	52
M	4	6	8
N	11	13.5	18
O ±0.02	26	26.5	28.5
P	21	26	31
Q	7.5	8.5	11
R ±0.02	17	21	24
S	13.5	15.3	16
T	7	7.5	8
U	3.7	4	8
V	5.5	6.9	8
W	13	17	21
X	9	11	13
Y ±0.02	6	8	9
Z1	Ø5 H8	Ø5 H8	Ø6 H8
Z2	M3	M3	M4
Z3	1.2	1.2	2.5
Z4	4	5	7.5
Z5	Ø5	Ø6	Ø6
Z6	Ø2.6	Ø3.2	Ø3.2
Z7	3	3.5	3.5
Z8	Ø2 H7	Ø2.5 H7	Ø3 H7
Z9	M3	M4	M4
Z10	5	6	6
Z11	3	5	5
Z12	Ø2.5 H7	Ø3 H7	Ø3 H7
Z13	3	5	5
Z21	M2.5	M3	M3
Z22	M3	M3	M5
Z23	M2.5	M3	M3



Dimensions (mm)



	PQ3015	PQ3523	PQ4533	PQ5047	PQ6063
A	50	64	80	100	125
B	38	42	50	64	80
C ±0.02	42	52	66	82	100
D ±0.02	27	32	38	45	56
E	20	18	26	28	34
F	28	36	44	56	70
G	20	24	28	32	42
H	55	70	93	121	156
I	30	38	45	62	85
J	53	68	90	118	153
K	37.6	41.6	49	63	79
L	65.5	87.5	118.5	148.5	191.5
M	7.5	11.5	16.5	23.5	31.5
N	18	22	33	39	45
O ±0.02	25	22	34	36	55
P	17	25	24	25	40
Q	28	35	44	56	70
R ±0.02	42	52	66	82	100
S	-	-	-	37	44
T	-	-	-	15	24
U	-	-	-	28	34
V	8	10	12	14	16
W	24.8	35.7	52.2	65.6	79.8
X	17.3	24.2	35.7	42	48.3
Y ±0.02	10	12	14	16	20
Z1	Ø5 H8	Ø6 H8	Ø8 H8	Ø10 H8	Ø12 H8
Z2	M3	M4	M5	M6	M6
Z3	1.2	2.5	2.5	2.5	2.5
Z4	7.2	9.5	11.5	13	12.5
Z5	Ø6	Ø9	Ø11	Ø15	Ø15
Z6	Ø3.5	Ø5.2	Ø6.6	Ø8.5	Ø8.5
Z7	10	10	9	13.2	17
Z8	Ø6 H8	Ø8 H8	Ø10 H8	Ø12 H8	Ø12 H8
Z9	M4	M5	M6	M8	M8
Z10	10.5	14	18	21	22.5
Z11	2.5	2.5	2.5	2.5	2.5
Z12	Ø6 H8	Ø8 H8	Ø10 H8	Ø12 H8	Ø12 H8
Z13	2.5	2.5	2.5	2.5	2.5
Z14	Ø6	Ø7.5	Ø9	Ø11	Ø11
Z15	Ø3.3	Ø4.2	Ø5	Ø6.8	Ø6.8
Z16	22	38	45	68	82
Z17	M5	M5	M5	G1/8"	G1/8"
Z18	-	-	Ø10	Ø16	Ø18
Z19	-	-	2.5	3	3
Z20	5	5	9.3	13	16.3
Z21	M3	M4	M5	M5	M5
Z22	-	-	-	M5	M5
Z23	M5	M5	M5	M5	M5

- Z1** Spot face for the centering sleeve of the gripping tool
- Z2** Threaded hole for the gripping tool fastening
- Z6** Through hole for the gripper side fastening
- Z9** Threaded hole for the gripper fastening on the bottom
- Z12** Spot face for the centering sleeve of the gripper body
- Z15** Through hole for the gripper fastening on the bottom
- Z17** Main port for air fittings
- Z21** Ports for direct air supply from the bottom
- Z22** Air supply ports
- Z23** Air supply ports
- Z24** Magnetic sensor slots

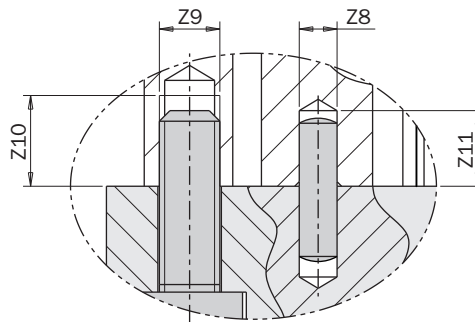
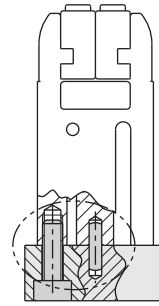
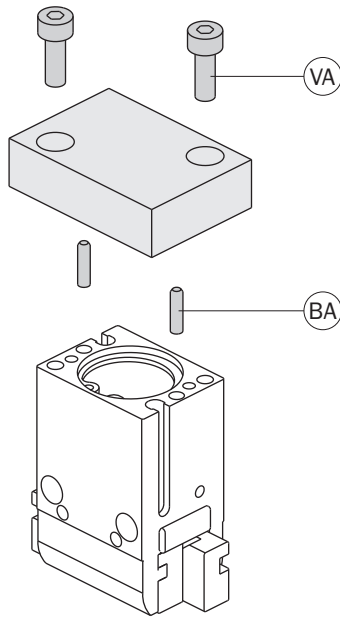
03/2015

Gripper fastening

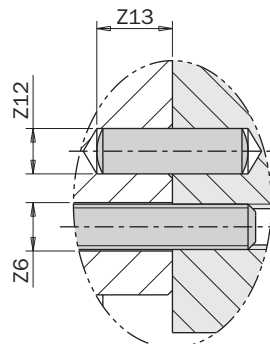
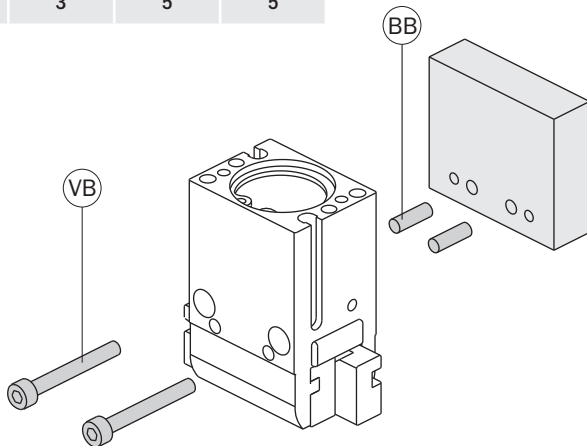
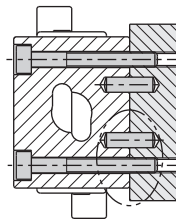
The gripper can be fastened to a static or moving part. When on a moving part, you must pay attention to the inertial force to which the gripper and its load are subjected.

The gripper can be mounted from the bottom using two screws (VA) and two dowel pins (BA).

It can also be mounted on the side using two screws (VB) and two dowel pins (BB).



	PQ1608	PQ2012	PQ2516
Z6	Ø2.6	Ø3.2	Ø3.2
Z8	Ø2 H7	Ø2.5 H7	Ø3 H7
Z9	M3	M4	M4
Z10	5	6	6
Z11	3	5	5
Z12	Ø2.5 H7	Ø3 H7	Ø3 H7
Z13	3	5	5



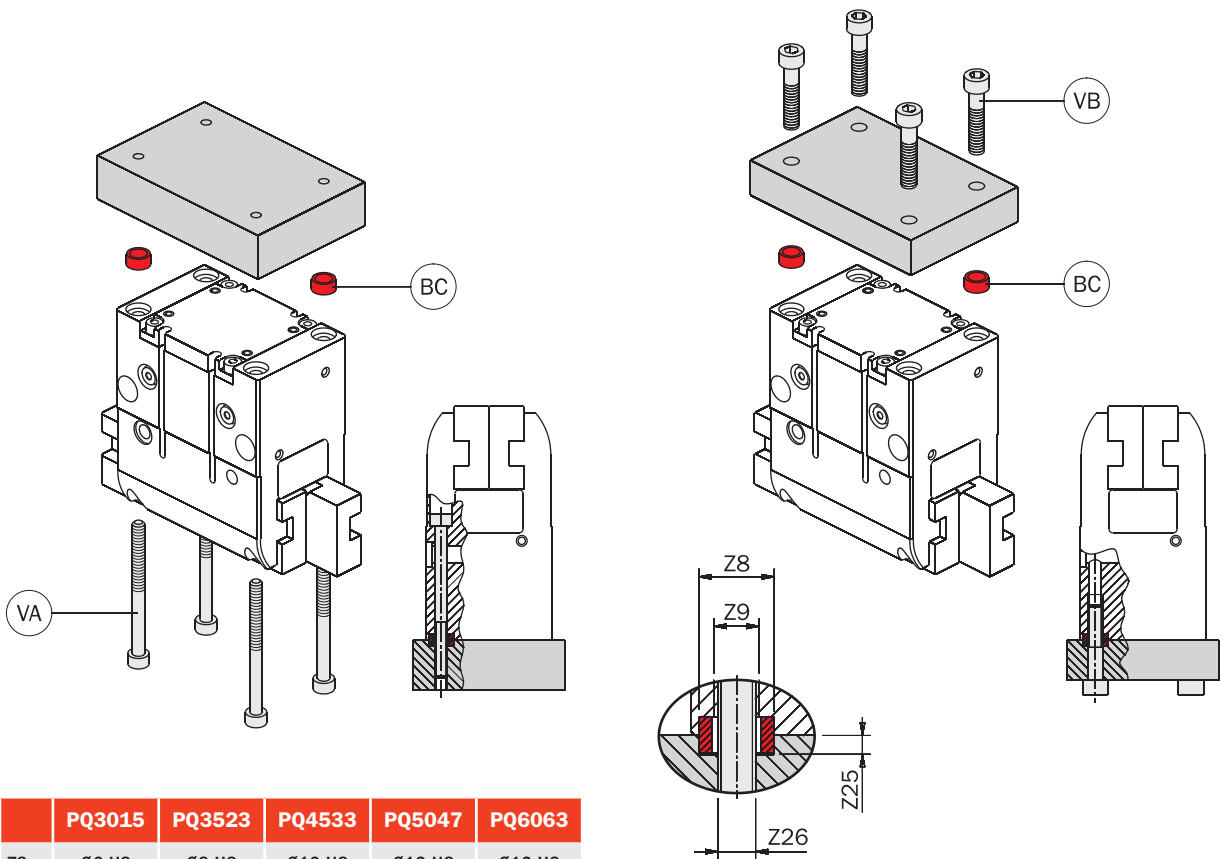
Gripper fastening

The gripper can be fastened to a static or moving part. When on a moving part, you must pay attention to the inertial force to which the gripper and its load are subjected.

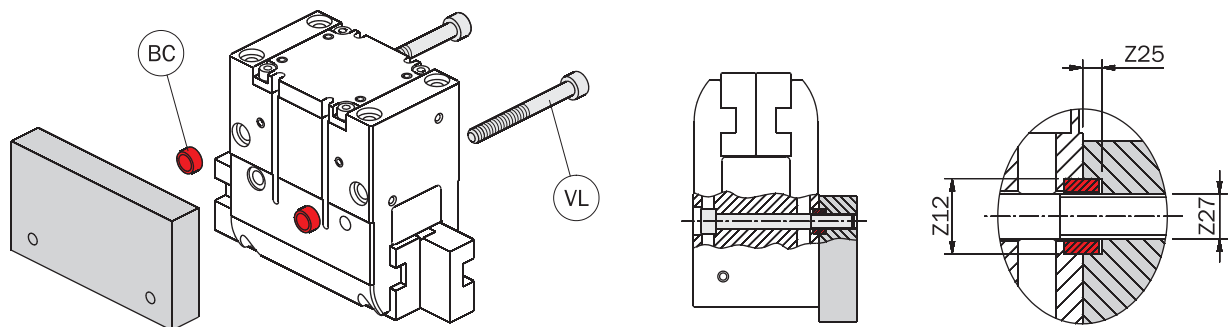
The gripper can be fastened either from the top or from the bottom.

4 centering sleeves for the gripping tools (BD) and 2 centering sleeves for the body (BC) are supplied in the package.

The gripper can also be fastened on one side by 2 screws (VL) and 2 centering sleeves (BC).



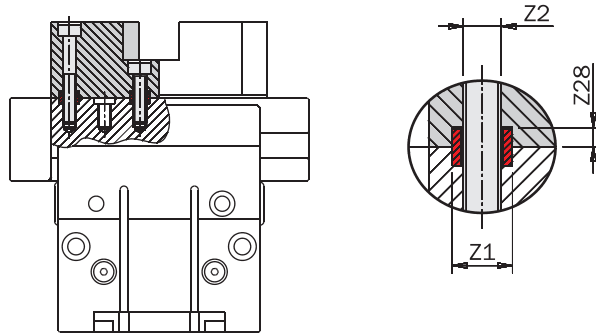
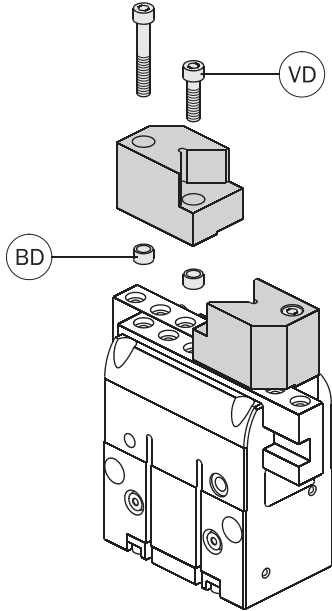
	PQ3015	PQ3523	PQ4533	PQ5047	PQ6063
Z8	Ø6 H8	Ø8 H8	Ø10 H8	Ø12 H8	Ø12 H8
Z9	M4	M5	M6	M8	M8
Z12	Ø6 H8	Ø8 H8	Ø10 H8	Ø12 H8	Ø12 H8
Z25	2.8	2.5	2.5	2.5	2.5
Z26	M3	M4	M5	M6	M6
Z27	M3	M5	M6	M8	M8



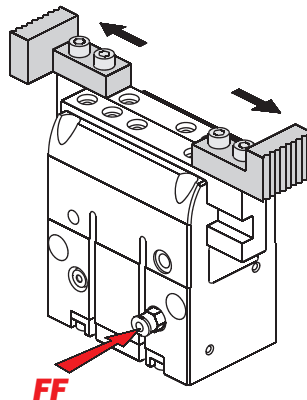
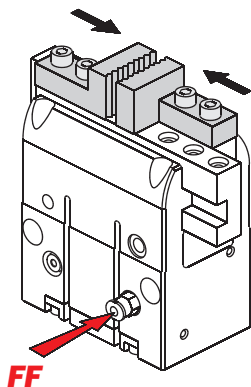
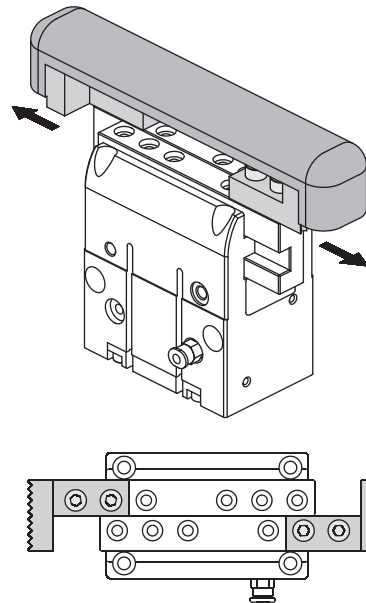
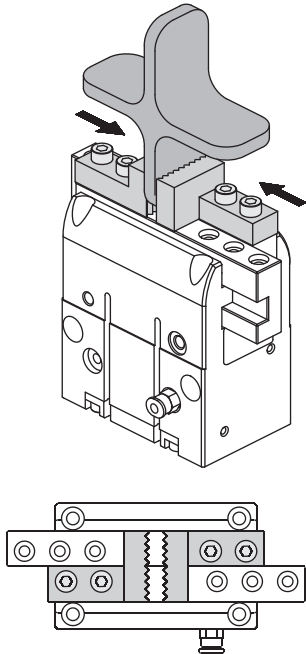
Fitting the gripping tools

The gripping tools must be as short and light as possible. They must be fastened by 2 screws (VD) and 2 centering sleeves (BD).

To achieve the maximum gripping force, the gripping tools should be fastened as shown in the pictures below, depending on whether the gripper is used for outside or inside gripping.



	PQ1608	PQ2012	PQ2516	PQ3015	PQ3523	PQ4533	PQ5047	PQ6063
Z1	Ø5 H8	Ø5 H8	Ø5 H8	Ø5 H8	Ø6 H8	Ø8 H8	Ø10 H8	Ø12 H8
Z2	M3	M3	M4	M3	M4	M5	M6	M6
Z28	1.2	1.2	2.5	1.2	2.8	2.5	2.5	2.5

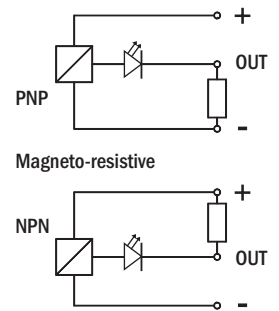


Sensors

The operating position is detected by magnetic proximity sensors (optional) through a magnet placed on the piston.
 The use of magnetic proximity sensors is to be avoided in the vicinity of large masses of ferromagnetic material or intense magnetic fields as this may cause detection problems.

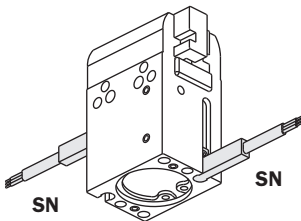
The sensors that can be used are:

			PQ16 PQ20 PQ25	PQ30	PQ35 PQ45 PQ50 PQ60
SN4N225-G	PNP	2.5m Cable	☑	☑	☑
SN4M225-G	NPN	2.5m Cable	☑	☑	☑
SN3N203-G	PNP	Snap M8 plug connector	☑	☑	☑
SN3M203-G	NPN	Snap M8 plug connector	☑	☑	☑
SS4N225-G	PNP	2.5m Cable	☐	☑ (1)	☑
SS4M225-G	NPN	2.5m Cable	☐	☑ (1)	☑
SS3N203-G	PNP	Snap M8 plug connector	☐	☑ (1)	☑
SS3M203-G	NPN	Snap M8 plug connector	☐	☑ (1)	☑

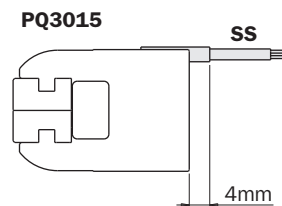
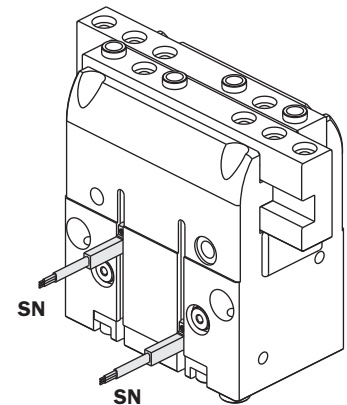
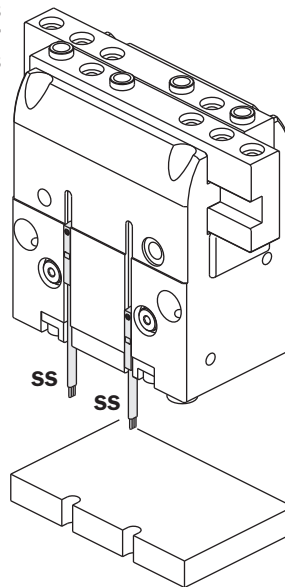


They are all provided with a 3-wire flat cable and a LED.

PQ1608
PQ2012
PQ2516



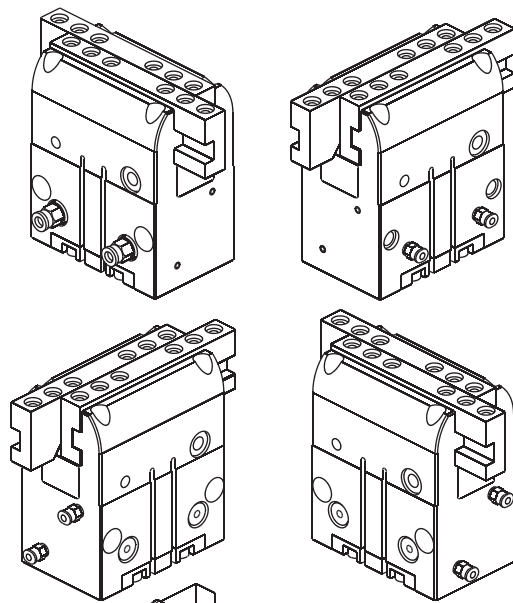
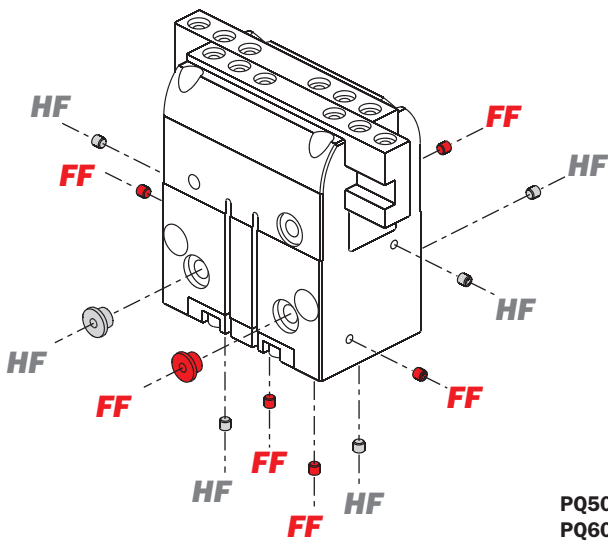
PQ3015
PQ3523
PQ4533
PQ5047
PQ6063



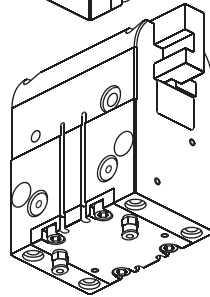
(1)
On the PQ3015 the SS sensors protude 4mm.

Compressed air feeding

This gripper has several options for air feeding. All ports are initially plugged. Only two plugs have to be removed. If the compressed air is supplied through one of the FF ports, the gripper will operate with its full force. If the gripper is used in the single-acting mode, fit a filter at the FF port to prevent suction of dirt from outside. Compressed air can be supplied through fittings or through the mounting plate and the O-rings shown (GG). Hoses, fittings, filters and O-Rings are not supplied. Compressed air must be supplied filtered (5+40 µm), not necessarily lubricated. The initial choice on air lubrication (lubricated or not) must be kept for the complete service life of the gripper. The pneumatic circuit must be pressurized progressively, to avoid uncontrolled movements.



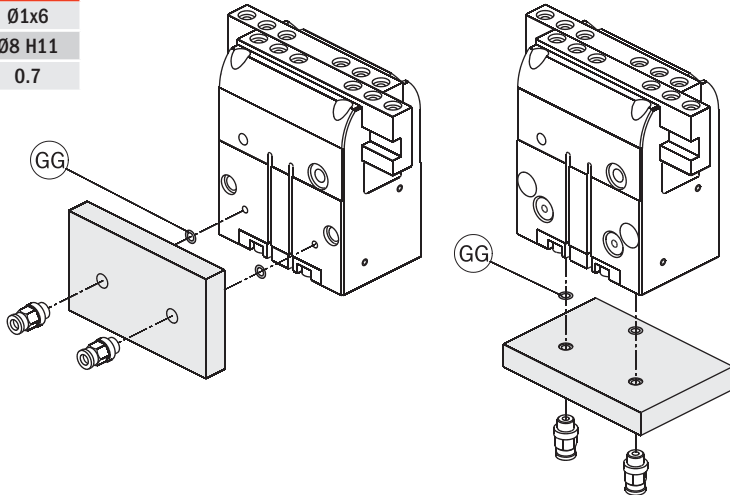
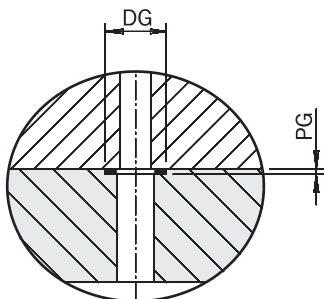
PQ5047
PQ6063



PQ4533
PQ5047
PQ6063

	PQ1608	PQ2012	PQ2516
GG	Ø1x2.5	Ø1x2.5	Ø1x3
DG	Ø4.5 H11	Ø4.5 H11	Ø5 H11
PG	0.7	0.7	0.7

	PQ3015	PQ3523	PQ4533	PQ5047	PQ6063
GG	Ø1x4	Ø1x5	Ø1x6	Ø1x6	Ø1x6
DG	Ø6 H11	Ø7 H11	Ø8 H11	Ø8 H11	Ø8 H11
PG	0.7	0.7	0.7	0.7	0.7



Pneumatic circuit

Possible problems on a compressed air supply circuit:

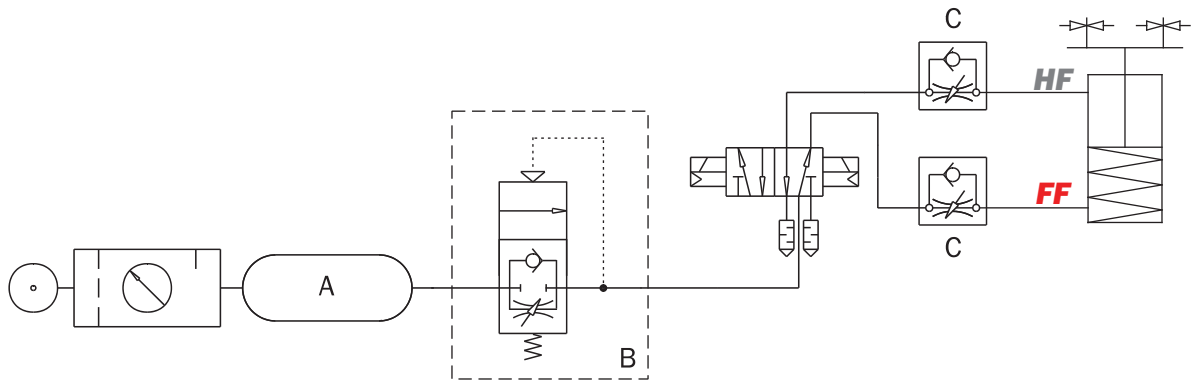
- 1- Pressure variation.
- 2- Pressurizing with empty gripper.
- 3- Excessive operating speed.

Possible solutions:

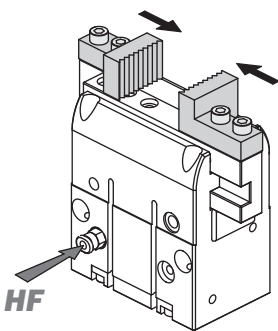
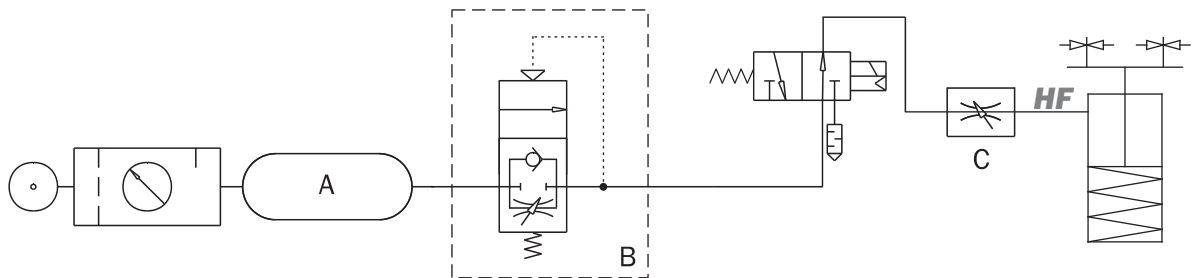
- 1- External air tank (A).
- 2- Start-up valve (B).
- 3- Flow controller (C).

The gripper can operate either in single-effect mode or double-effect mode.

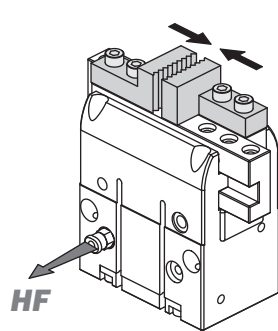
The double-effect mode (see circuit below, with 5/2 valve) is recommended when the highest gripping force is required.



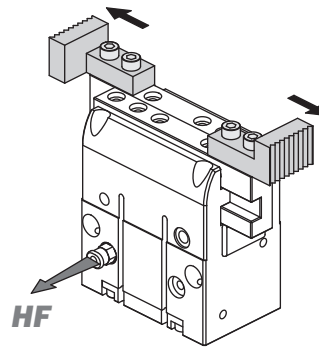
For single-effect operation with reset spring, the pneumatic circuit must be similar to that shown below, with a 3/2 valve.



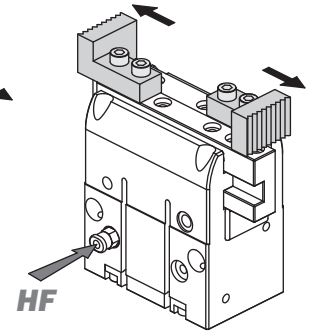
Normally open with outside gripping



Normally closed with outside gripping



Normally open with inside gripping

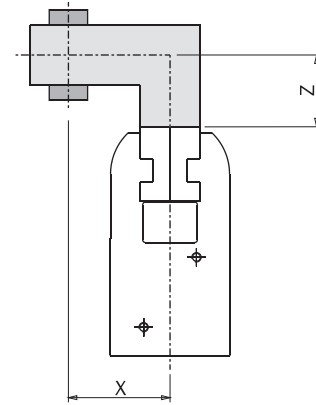
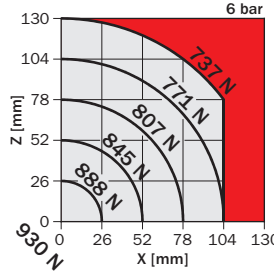
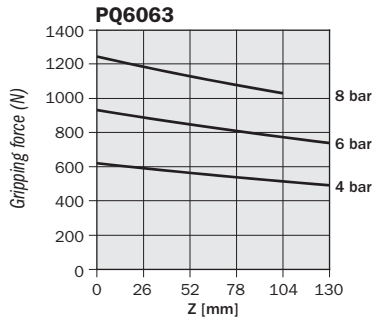
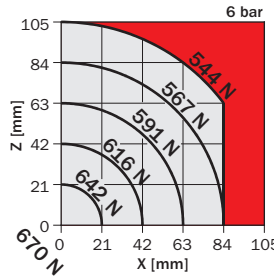
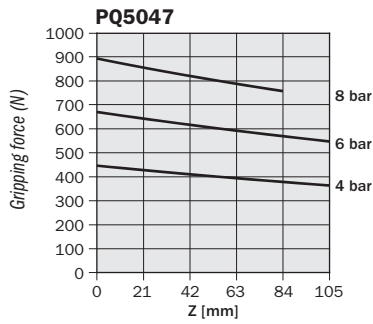
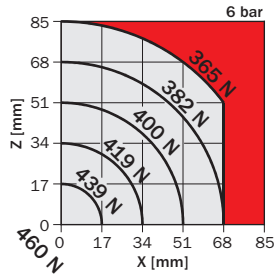
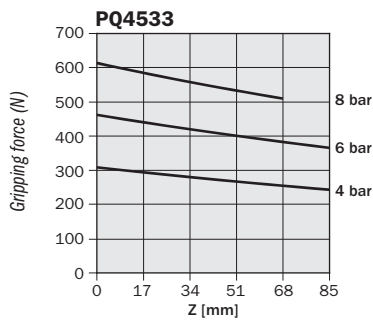
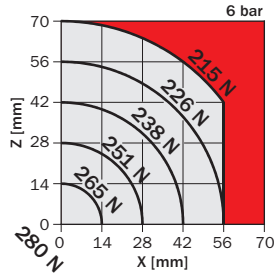
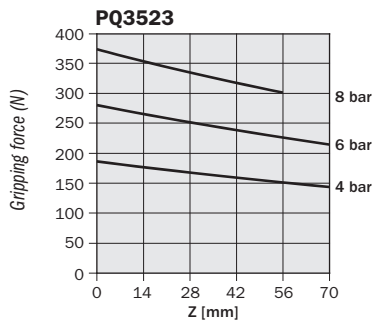
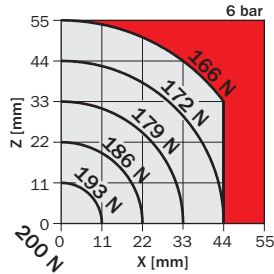
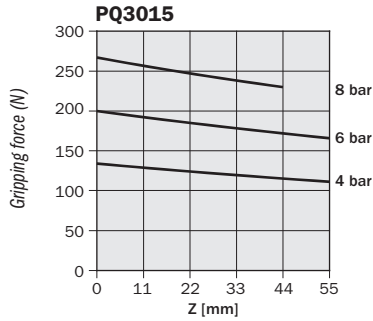


Normally closed with inside gripping

Gripping force

The graphs show the gripping force on each jaw, as a function of the operating pressure, the lever arm length Z and the misalignment of gripping point X, when compressed air is supplied to FF.

If compressed air is supplied to HF the gripping force is 50% lower.

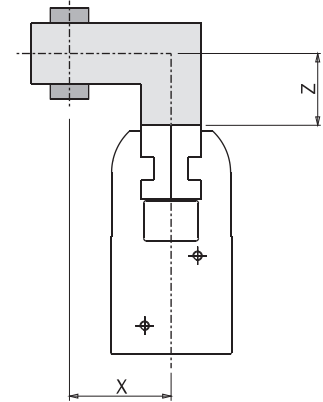
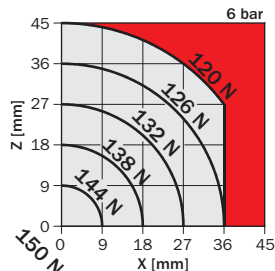
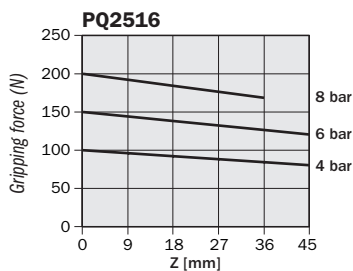
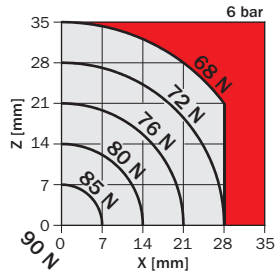
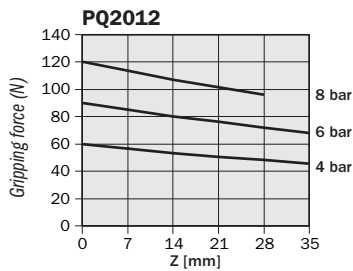
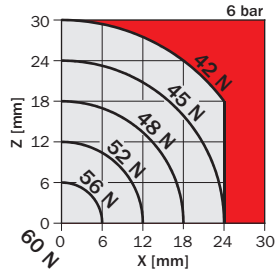
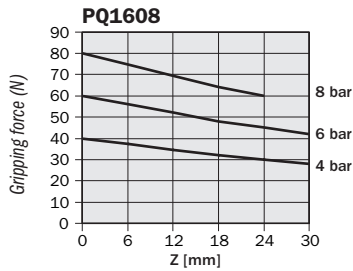


The force shown in these graphs refers to one jaw. The total force is double.

Gripping force

The graphs show the gripping force on each jaw, as a function of the operating pressure, the lever arm length Z and the misalignment of gripping point X, when compressed air is supplied to FF.

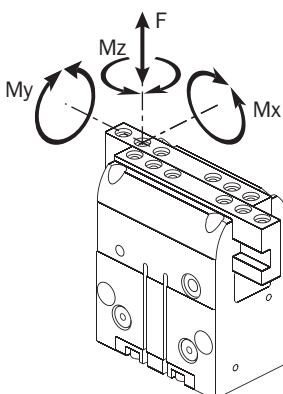
If compressed air is supplied to HF the gripping force is 50% lower.



The force shown in these graphs refers to one jaw. The total force is double.

Safety loads

Check the table for maximum permitted loads. Excessive forces or torques can damage the gripper, cause functioning troubles and endanger the safety of the operator. F_s , $M_x s$, $M_y s$, $M_z s$, are the maximum permitted static loads, that is when the jaws are still. F_d , $M_x d$, $M_y d$, $M_z d$, are the maximum permitted dynamic loads, that is when the jaws are operating. m is the maximum permitted weight of each gripping tool, when the gripper operates without speed adjustment. If the weight exceeds the permitted value, the jaw speed must be decreased by means of flow controllers (not supplied).



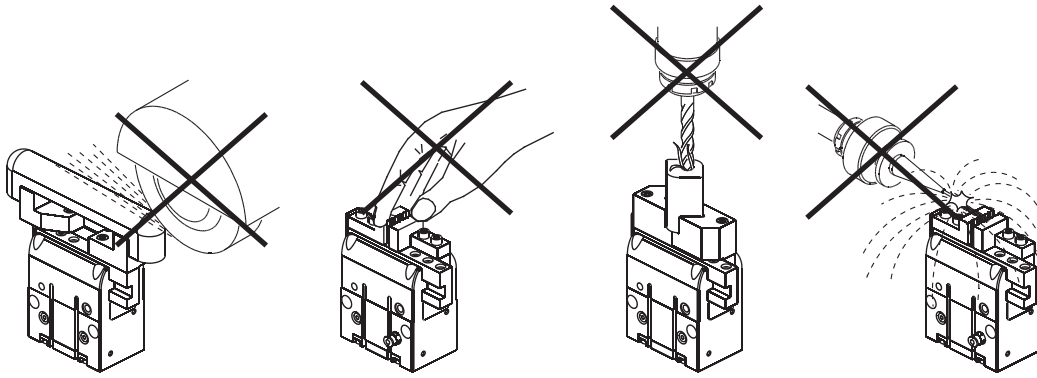
	PQ1608	PQ2012	PQ2516	PQ3015	PQ3523	PQ4533	PQ5047	PQ6063
F_s	50 N	120 N	250 N	400 N	800 N	1200 N	1600 N	2000 N
$M_x s$	1.5 Nm	2.5 Nm	6 Nm	10 Nm	17 Nm	35 Nm	64 Nm	105 Nm
$M_y s$	1.5 Nm	2.5 Nm	6 Nm	10 Nm	17 Nm	35 Nm	45 Nm	55 Nm
$M_z s$	1 Nm	2 Nm	5 Nm	8 Nm	14 Nm	28 Nm	50 Nm	85 Nm
F_d	0.5 N	1.2 N	2.5 N	4 N	8 N	12 N	18 N	25 N
$M_x d$	1 Ncm	2 Ncm	5 Ncm	8 Ncm	14 Ncm	28 Ncm	64 Ncm	145 Ncm
$M_y d$	1 Ncm	2 Ncm	5 Ncm	8 Ncm	14 Ncm	28 Ncm	64 Ncm	145 Ncm
$M_z d$	1 Ncm	2 Ncm	5 Ncm	8 Ncm	14 Ncm	28 Ncm	64 Ncm	145 Ncm
m	35 g	75 g	150 g	250 g	400 g	750 g	1400 g	2400 g

Cautions

Never let the gripper come into contact with corrosive substances or abrasive powders as they may damage the gripper.

Never let non-authorized persons or objects stand within the operating range of the gripper.

Never operate the gripper if the machine on which it is fitted does not comply with safety laws and standards of your country.

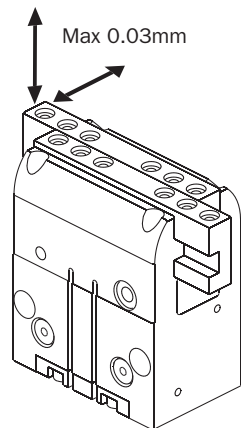


Maintenance

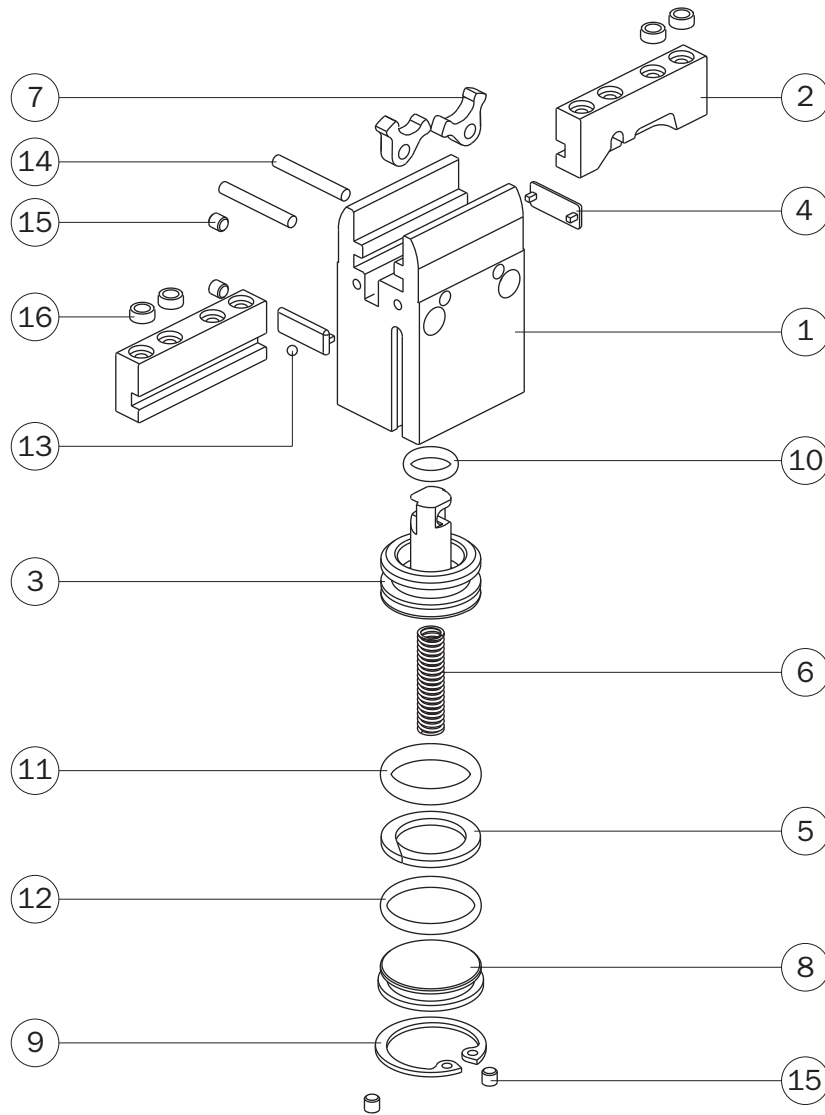
Grease the gripper after 10 million cycles with:

- BERULUB FG-H 2 EP
(Lubricant NSF H1 Registration No. 140486).

The figure below shows the jaw backlash.

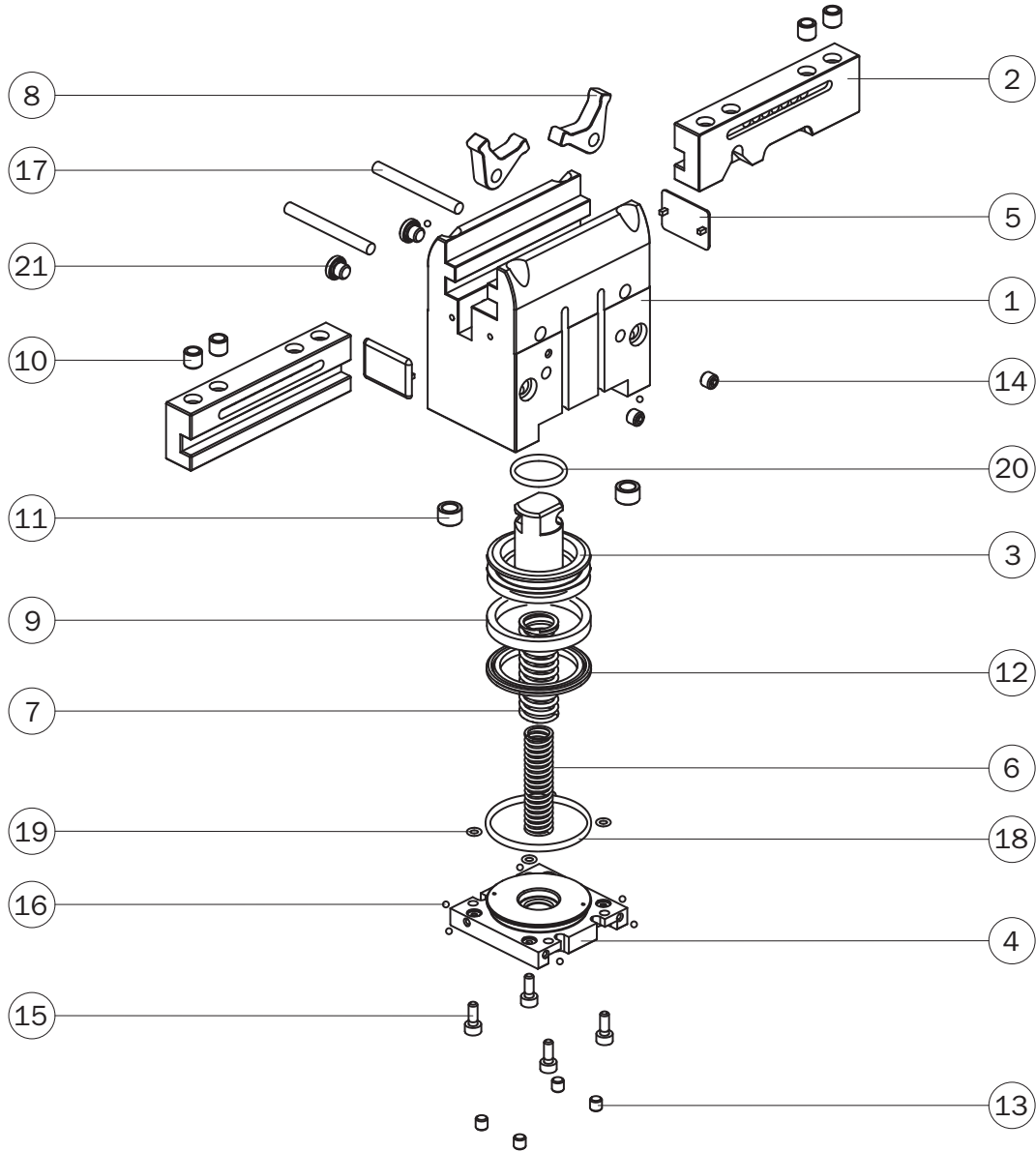


Part list



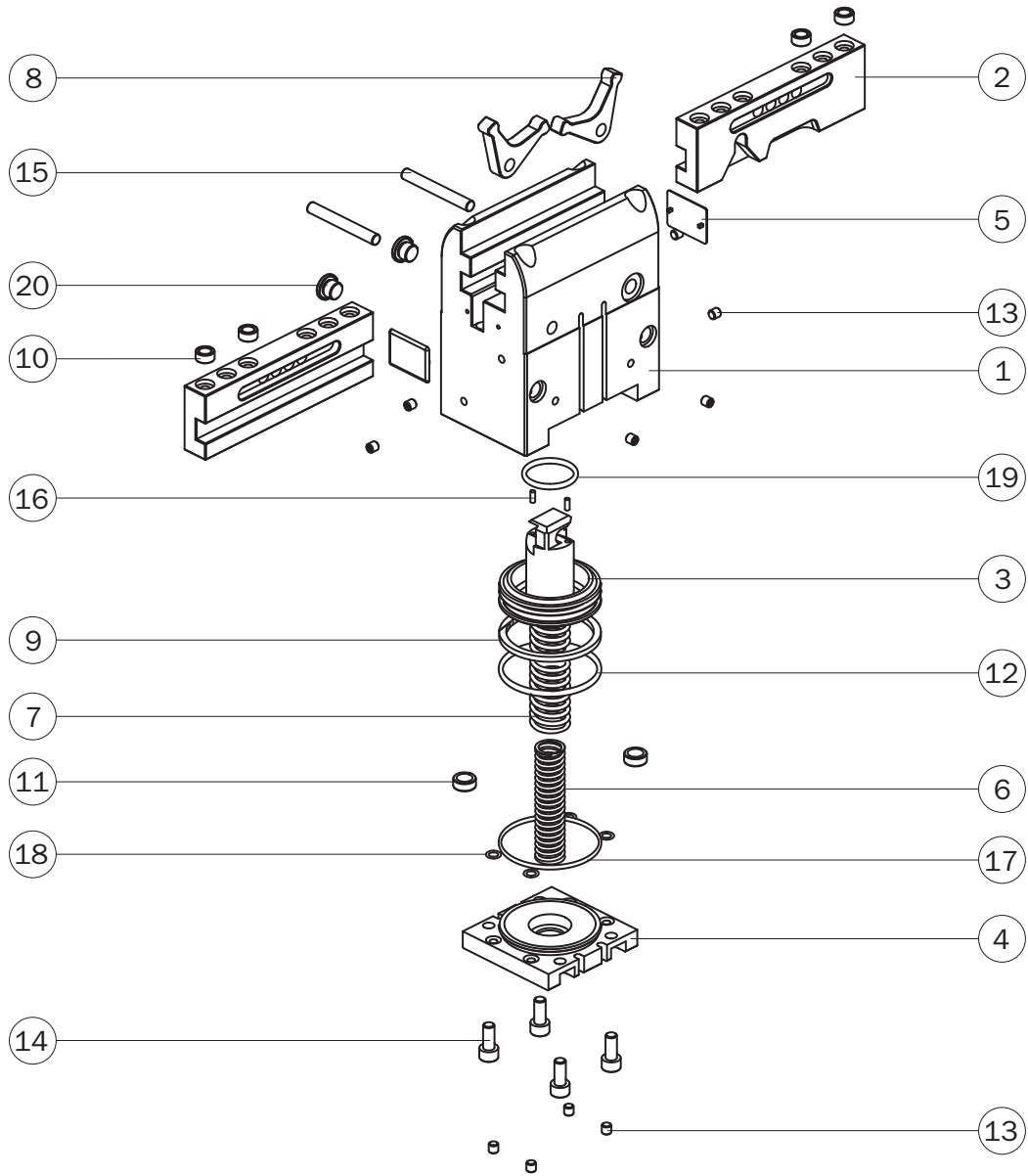
		PQ1608	PQ2012	PQ2516	
1	Gripper housing	PQ1608-01	PQ2012-01	PQ2516-01	1
2	Jaw	PQ1608-02	PQ2012-02	PQ2516-02	2
3	Piston	PQ1608-04	PQ2012-04	PQ2516-04	3
4	Protection	PQ1608-08	PQ2012-08	PQ2516-08	4
5	Magnet	PAR-16-10B	PQ2012-09	PAR-25-10B	5
6	Spring	PQ1608-20	PQ2012-20	PQ2516-11	6
7	Lever	PQ1608-03	DH2208-05	PQ2516-03	7
8	Back end plate	GS-16-06	GS-20-06	PQ2516-06	8
9	Retaining ring	SEEGER-016	SEEGER-005	SEEGER-001N	9
10	O-Ring	GUAR-039H (Ø1.78x6.07)	GUAR-045H (Ø1.78x7.66)	GUAR-037H (Ø1.78x11.11)	10
11	Dynamic gasket	GUAR-116H (Ø2.62x10.77)	GUAR-105H (Ø2.62x15.08)	GUAR-061H (Ø2.62x20.29)	11
12	O-Ring	GUAR-084 (Ø1x14)	GUAR-076 (Ø1.78x17.17)	GUAR-025 (Ø1.78x21.95)	12
13	Ball	SPINA-084 (Ø2 DIN5401A)	SPINA-084 (Ø2 DIN5401A)	SPINA-084 (Ø2 DIN5401A)	13
14	Dowel pin	SPINA-087 (Ø2x18 DIN6325)	SPINA-077 (Ø2.5x20 DIN6325)	SPINA-053 (Ø3x28 DIN6325)	14
15	Grub screw	VITE-414 (M2.5x3 DIN913)	VITE-229 (M3x3 DIN913)	VITE-179 (M3x4 DIN913)	15
16	Bush	ZBH-5	ZBH-5	SGP-32-09	16

Part list



		PQ3015	PQ3523	PQ4533	
1	Gripper housing	PQ3015-01	PQ3523-01	PQ4533-01	1
2	Jaw	PQ3015-02	PQ3523-02	PQ4533-02	2
3	Piston	PQ3015-04	PQ3523-04	PQ4533-04	3
4	Back end plate	PQ3015-05	PQ3523-05	PQ4533-05	4
5	Protection	SZ12-05	PQ3523-08	PQ4533-08	5
6	Spring	-	PQ3523-10	PQ4533-10	6
7	Spring	PQ3015-11	PQ3523-11	PQ4533-11	7
8	Lever	PAR-20-8C	PAR-25-8C	PQ4533-03	8
9	Magnet	T30-10	PAR-35-10B	PS-0045-P10	9
10	Bush	ZBH5	SGP-32-09	LP23-62	10
11	Bush	SGP-32-09	LP32-62	PQ5047-07	11
12	Dynamic gasket	GUAR-024P (30x21x3)	GUAR-005P (35x26x3)	GUAR-026P (45x36x3)	12
13	Grub screw	VITE-229 (M3x3 DIN913)	VITE-415 (M4x4 DIN913)	VITE-197 (M5x4 DIN913)	13
14	Grub screw	VITE-197 (M5x4 DIN913)	VITE-197 (M5x4 DIN913)	VITE-197 (M5x4 DIN913)	14
15	Screw	VITE-031 (M3x8 DIN912)	VITE-031 (M3x8 DIN912)	VITE-020 (M4x10 DIN912)	15
16	Ball	SPINA-084 (Ø2 DIN5401A)	SPINA-084 (Ø2 DIN5401A)	SPINA-092 (Ø3 DIN5401A)	16
17	Dowel pin	SPINA-073 (Ø4x36 DIN6325)	SPINA-132 (Ø4x40 DIN 6325)	SPINA-013 (Ø5x40 DIN6325)	17
18	O-Ring	GUAR-086 (Ø1x25)	GUAR-009 (Ø1.78x31.47)	GUAR-027 (Ø1.78x41)	18
19	O-Ring	GUAR-082 (Ø1x3)	GUAR-082 (Ø1x3)	GUAR-091 (Ø1x4)	19
20	O-Ring	GUAR-007H (Ø1.78x14)	GUAR-023H (Ø1.78x15.6)	GUAR-070H (Ø2.62x18.72)	20
21	M5 Plug	107-M5	107-M5	107-M5	21

Part list



		PQ5047	PQ6063	
1	Gripper housing	PQ5047-01	PQ6063-01	1
2	Jaw	PQ5047-02	PQ6063-02	2
3	Piston	PQ5047-04	PQ6063-04	3
4	Back end plate	PQ5047-05	PQ6063-05	4
5	Protection	SZ25-05	SZ40-05	5
6	Spring	PQ5047-10	PQ6063-10	6
7	Spring	PQ5047-11	PQ6063-11	7
8	Lever	PQ5047-03	PQ6063-03	8
9	Magnet	PQ5047-06	T63-10	9
10	Bush	PQ5047-07	ZBH-12	10
11	Bush	ZBH-12	ZBH-12	11
12	Dynamic gasket	GUAR-182H (Ø2.62x48.89)	GUAR-068 (63x51x4)	12
13	Grub screw	VITE-069 (M5x5 DIN913)	VITE-069 (M5x5 DIN913)	13
14	Screw	VITE-115 (M6x14 DIN912)	VITE-159 (M8x20 DIN912)	14
15	Dowel pin	SPINA-166 (Ø6x50 DIN6325)	SPINA-182 (Ø8x70 DIN6325)	15
16	Dowel pin	SPINA-055 (Ø2.5x7 DIN5402)	SPINA-149 (Ø2.5x9.8 DIN 5402)	16
17	O-Ring	GUAR-162 (Ø1.78x50.52)	GUAR-146 (Ø1.78x60.05)	17
18	O-Ring	GUAR-021 (Ø1x5)	GUAR-098 (Ø1x6)	18
19	O-Ring	GUAR-074H (Ø2.62x25.07)	GUAR-189H (Ø2.62x31.42)	19
20	G1/8 Plug	107-G1/8	107-G1/8	20