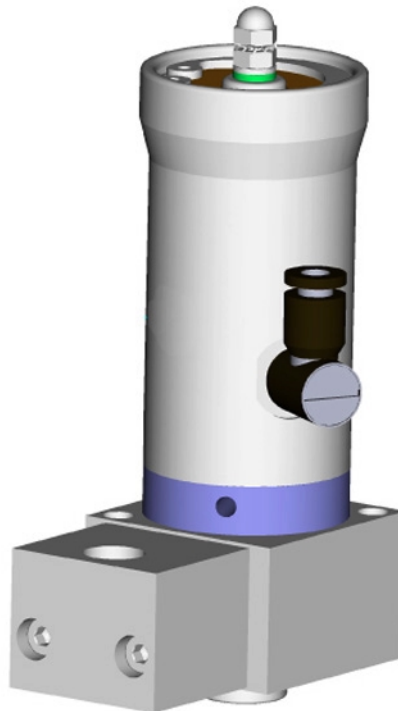




From February 1st, 2017 SAMES Technologies SAS becomes SAMES KREMLIN SAS
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SAMES  **KREMLIN**



DES01691

User manual

Stainless Steel "MINI" Pneumovalves

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Stainless Steel "MINI" Pneumovalves

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This manual contains links to the following user manuals:

- [see RT Nr 6021](#) for the microvalve.

1. Marking



BP 86 38243 Meylan Cedex France



II 2 G c T6

Dossier technique : PV mini
N° de SERIE:

DES04403

2. General

These pneumovalves are specially designed for rapid color changing. Product channels are direct, with no wells or contact with difficult-to-clean surfaces. Air and paint gaskets around the shaft are compressed by a spring and do not require adjustment or retightening. Materials in contact with the product withstand all pH levels in paints. These pneumovalves are always of the "normally closed" type, i.e. they are closed when the APPLICATION side is idle (no control air). The following variants exist:

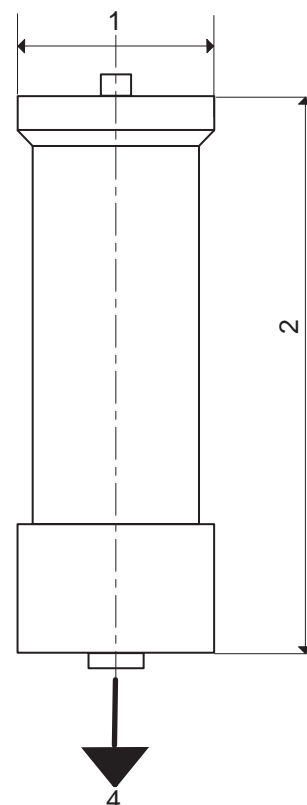
- **Mini G pneumovalve** : 2-way model for fitting in a color change manifold.
- **Mini RS pneumovalve** : 2- and 3-way models designed to be fitted directly on paint atomizers.

3. Characteristics

3.1. Pneumovalve Type "G"

1	dia. 32
2	85 mm
4	Product outlet for application

- Product channel diameter = 5 mm
- Weight (without union): 310 g
- Materials,
 - Body and housing
 - Needle: polyamide 6
 - Shaft: stainless steel AISI 303
 - Gasket (air or product):
 - Tapered seal: PTFE
- Utilization position: horizontal, vertical or other
- Products: air, water, solvent, paint
- Control air: filtered, dehumidified air at a pressure of 6 bar
- Total response time between energizing the control solenoid valve and full opening of the **Mini** pneumovalve (with air supply hose of dia. 2.7 x 4):
 - 50 ms with 0.5 m of hose
 - 300 ms with 15 m of hose
 - Approx. 1 s with 35 m of hose.

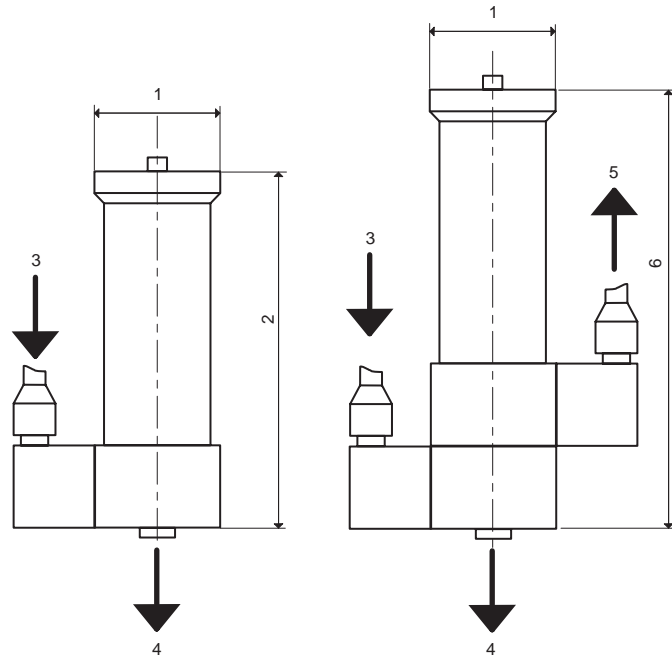


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3.2. Pneumovalve type “RS“

1	dia. 32
2	85 mm
3	Product inlet
4	Product outlet for application
5	Product return
6	106 mm

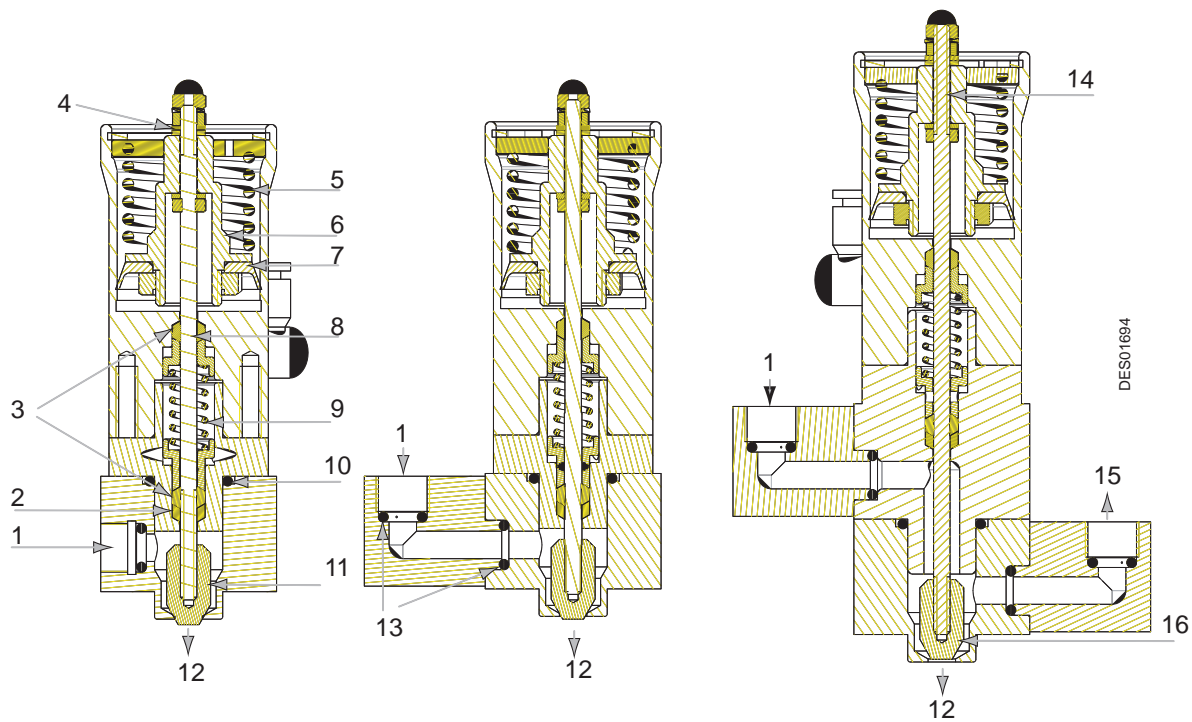
- Product channel diameter = 5 mm.
- Weight (without union):
 - **2-way mini RS** 440 g
 - **3-way mini RS** 640 g
- **Materials,**
 - Body and housing: stainless steel NSU
 - Needle: polyamide 6
 - Shaft: stainless steel AISI 303
 - Gasket (air or product): Graphite-loaded teflon
 - Tapered seal: PTFE
- Utilization position: horizontal, vertical or other
- Products: air, water, solvent, paint
- Control air: filtered and dehumidified air at a pressure of 6 bar.



DES01349

- Total response time between energizing the control solenoid valve and full opening of the **Mini** pneumovalve (with air supply hose of dia. 2.7 x 4):
 - 50 ms with 0.5 m of hose
 - 300 ms with 15 m of hose
 - Approx. 1 s with 35 m of hose.

4. Operation



- In idle mode the **Mini** pneumo valve is closed. The piston spring **5** pushes against the piston **6** secured to the shaft **8** (or **14**) which opens the needle **11** (or **16**) for outlet to the application **12**. Product arriving at **1** cannot flow to **12**.
- With the 3-way pneumo valve, the product flows via the return **15**.
- When the control air is pressurized, the piston **6** compresses the spring **5** driving the shaft **8** (or **14**) and the needle **11** (or **16**). The product can then flow to **12**.
- With the 3-way pneumo valve, the return **15** is closed by the rear end of the needle **16**.
- The shaft **8** (or **14**) is sealed from the air or product by gaskets **3** and a tapered seal **2**. The gaskets are compressed by the stuffing box spring **9**.
- A venting hole between these gaskets allows easy detection of a seal break so that mixing of the two fluids can be avoided.

Remarks: For the operation of the pneumovalves (P/N # 910007742, 910008070), [see RT Nr 6021](#)

5. Installation

5.1. MINI Pneumo Valve G (2-way)

This pneumo valve is secured by 2 screws to a base plate (for 2 or 3 pneumovalves) or a manifold (for 5, 8 or X pneumovalves).

For special use it can be secured to base plates with **RS** outlets (see below).

5.2. RS MINI Pneumo Valves (2- or 3-way)

This pneumo valve is secured to the front of the atomizer via an RS outlet base plate, in axial, lateral or offset configuration (see figure) by means of 2 screws.

5.3. Control Air Circuit

The control solenoid valve must be 3-way to allow pneumovalve venting in idle mode. A dia.-2.7 x 4 Rilsan hose must be used to connect the control solenoid valve to the **Mini** pneumovalve. The 1/8 tapered x dia.-4 elbow union required for the **Mini** pneumovalve is always delivered with the product. To reduce the response time of the assembly, place the control solenoid valve as close as possible to the pneumovalve.

5.4. Product Circuit

5.4.1. 2-Way Mini Pneumovalve G

The product is supplied to the pneumovalve via a 1/8" BSP tapered union (not supplied with the pneumovalve).

5.4.2. 2- or 3- Way Mini Pneumovalve RS

The product is supplied to the pneumovalve (and the return if fitted) via special SAMES unions. Unless indicated otherwise, the pneumovalve is delivered with unions for dia. 6 x 8 Rilsan hoses. Unions for dia. 4 x 6 Rilsan or dia. 4 x 16 and dia. 8 x 20 polyethylene hoses can be delivered as options. For hoses of other diameters and materials, please contact our technical services.

6. Servicing

6.1. Maintenance

Maintenance is limited to changing the needle or gaskets if sealing is no longer efficient and a seal cartridge for the isocyanate pneumovalves .

6.2. Disassembly

6.2.1. Disassembly of the pneumovalves all types excepted the pneumovalves isocyanate

- 1 Remove the pneumovalve from its base plate or manifold.
- 2 If necessary remove the control air and product hoses.
- 3 Remove the 2 screws counter-sunk into the metal on the APPLICATION side "12".
- 4 Unscrew the needle **11** (or **16**).
- 5 The central part can then be separated. It contains the paint seal assembly comprising a tapered seal **2** and two gaskets **3**.
- 6 To remove the shaft **8** (or **14**):
 - Remove the circlip at the other end of the pneumovalve.
 - Remove the plug and piston spring **5** then the piston **6** and shaft.
 - This is only necessary on exceptional occasions to reach the piston seal **7** and the air seal assembly containing the air gasket **3**.

6.2.2. Disassembly of the isocyanate pneumovalves

Removal of the needle:

- **Step 1:** Tighten the needle with a vice in order to ovalize it, turn of 90° and to start again to tighten.
- **Step 2:** Make lever with a grip to extract it from the axis.



WARNING : Remain straight in order not to fold the part "fir tree".

- **Step 3:** On a small chuck of drilling machine vertically positioned (not to twist the axis) to block the part "fir tree" to prevent that the axis turns at the time of the unscrewing of the nuts of the piston.
- **Step 4:** Unscrew the cap nut (ref.: X4KEHB003), remove the red plate (Ref.:1410082), the external circlip (ref.: X4KQNT117), the lock washer (ref.: 900000571), the spring (Ref.:449089), and the nut M3 (Ref.:X4KEHU003).
- **Step 5:** Remove the pneumovalve from the chuck, remove the flat washer (Ref.:X4KDZU003) and the sealing ring (ref.: J4BRND032) (fold it with a grip and unscrew).
- **Step 6:** Disunite the axis of the piston, the piston is stuck on the axis by the joint-sealing product, to separate them, install the pneumovalve on the block support (ref.: 1315253) and give a blow of mallet on the axis.
- **Step 7:** Extract the piston unit, the sealing ring (ref.: J4BRND032) (fold it with a grip and unscrew), the washer (Ref.:1412147), if necessary install the axis on the chuck to unscrew the nut M3 (ref.: X4KEHU003).
- **Step 8:** Remove the axis, extract the two screws milled (Ref.:X4EVSF123) to remove the stuffing box from the body, leave the spring bushing (ref.: 449093) and the drain washer (ref.:749985), the spring (ref.: 449095), the equipped seal cartridge (ref.: 749987), the ring Teflon (ref.: 749986) and biconical sealing ring (ref.: 441117).
- **Step 9:** If necessary to replace the seal of piston (ref.: 449091), for that, to block the body of piston on a vice equipped with jaws with vertical V-shaped grooves or a standard grip "multi-grip" (to protect the nozzles not to stripe the part), unscrew the nut, remove the damage seal, clean the body of piston and the nut, to plate it well on the body of piston, put a drop of loctite "oléoétanche 542" on the bottom of the threading of the piston (with screwing, the nut will distribute the product on the seal), screw the nut side chamfer resting against the seal and tighten moderately from 1/4 to 1/2 turn (too much to tighten, the seal becomes deformed). Wipe the excess of product.
- **Step 10:** Clean all the reusable parts, pass the die M3 on the threading of the axis if this one is reusable (it should neither be striped, nor twisted).

6.3. Reassembly

6.3.1. Reassembly of the pneumovalves all types except the pneumovalves isocyanate

In reverse order, observing the following precautions:

- 1 Install in the stuffing box body: the conical seal, the seal cartridge and the metallic ring respecting their assembling order.
- 2 Compress the stuffing box spring **9** (by pushing the parts forming the pneumovalve body by hand) while screwing the needle **11** (or **16**).
- 3 Screw both assembly screws simultaneously and tighten them firmly.

Note 1: It is normal to find a regular, ring-shaped notch on the cone of the needle. This area of caulking is useful for providing a good seal. However, if it is irregular or has stripes cut into it, the needle may no longer be sealed and needs to be replaced.

Note 2: An oil-resistant cyanoacrylate sealant (Loctite) is used to produce the seal between the piston 6 and the shaft 8 (or 14). Only dismantle these parts if absolutely necessary, and renew this seal when refitting.

Note 3: Before replacing the gaskets 3 or the piston seal 7, soak the replacement parts with a few drops of pure vaseline oil.

Note 4: If the gaskets, piston seal or needle are changed, "break in" the refitted pneumovalve by carrying out 500 cycles without product so that:

- The needle is caulked,
- The gaskets are compacted and sit correctly,
- The piston seal is worn in.

6.3.2. Reassembly of the isocyanate pneumovalves

Assembling and Caulking of the biconical sealing ring (Ref.: 441117)

- **Step 1:** Soak the rings at least 30 minutes in vaseline oil, leave a ring vaseline oil and put it in the body of piston (ref.: 434987),
- **Step 2:** Put in place above the spring bushing (Ref.:449093) and to caulk slightly on the spring bushing (Ref.:449093) (in general a small blow is enough, if not a part of the ring will pass side piston.)



WARNING : The caulking of the ring will be made without the axis of piston in order to obtain a light tightening of the ring which will ensure the sealing on the axis.

- **Step 3:** In the body of stuffing box (Ref.:1312749), install the tapered seal (Ref.:749986) and the equipped seal cartridge (Ref.:749987) (take care to the direction of assembling of the equipped seal cartridge).
- **Step 4:** Put in place the drain washer (Ref.:749985) then the spring (Ref.:449095).
- **Step 5:** Secure the body of stuffing box on the body of pneumovanne with the two screws (F/90 HC 4x20 ref.: X4EVSF123).

Assembly of the axis of the piston in the body

- **Step 6:** Block the axis of piston side "fir tree" on a small chuck of drilling machine positioned vertically (not to twist the axis), introduce the pneumovalve side stuffing box, and screw it on the level of the sealing ring (ref.: 441117 (to avoid withdrawing it).
- **Step 7:** Push completely the pneumovalve until it stops on the chuck.
- **Step 8:** Clean the axis (threading recover a little trimming and vaseline).Screw and block the nut (ref.: X4KEHU003) completely.

Note: the axis should not turn in the chuck.

- **Step 9:** Install the washer (Ref.: 1412147) and the sealing ring (Ref.: J4BRND032).
- **Step 10:** Deposit and distribute a half drip of loctite "oléoétanche 542" between the sealing ring (ref.: J4BRND032) and the axis.
- **Step 11:** Assemble the piston unit, pay attention that the lip of the seal is not turned over, for that, to exert a rotational movement while entering the body.
- **Step 12:** Install the second sealing ring (ref.: J4BRND032), put in place the flat washer (ref.: X4KDZU003), screw and block the nut (ref.: X4KEHU003).



WARNING : Before installing the needle, it is necessary to carry out a pre control of sealing of the sealing ring (ref.: 441117) (to make sure that caulking is good) and also the seal of piston (ref.: 449091).

- **Step 13:** Remove the pneumo valve from the chuck, lubricate the interior of the body by depositing 3 to 4 vaseline oil drops.
- **Step 14:** Put the spring, install the lock washer (Ref.:900000571) (shoulder inside), close with the internal circlip (Ref.:X4KQNT117) (if possible, make the assembly on a press in order to compress the spring and to facilitate the assembly of the ring).
- **Step 15:** Pilot between 5 and 6 bar.

Result of the test:

- For the piston seal (ref.: 449091), not of audible leakage with approximately 30 to 50 centimetres of the ear.
- For the sealing ring (Ref.: 441117), put a water drop in the drain hole of the stuffing box body (Ref.:1312749), there should not be bubble.
- Switch off the air.
- **Step 16:** Assemble the plate of visualization (ref.: 1410082) (P7 marking must be visible).
- **Step 17:** Screw and block slightly the cap nut (Ref.:X4KEHB003)) if necessary lock the axis on the chuck

Assembly of the needle:

- Fix the needle which will be positioned until it stops against the shoulder of the axis.

6.4. Sticking and adjustment of the "screwed" needles"

Material necessary:

Part number	Description
H2CPAL062	Glue DP460
W1SBPM083	Mixing nozzle
W1SPML084	Glue gun
W1SBPM095	Blue needle

- **Step 1:** Temporarily, maintain the stuffing box body on the body with two screws to leave free the threading of the axis.
- **Step 2:** Clean and degrease carefully the threaded part of the axis and the tapping of the needle with a solvent, wipe to dry the parts with a clean rag.
- **Step 3:** Deposit using the glue gun, a drop of glue inside the needle at the beginning of the tapping.
- **Step 4:** Screw the needle.
- **Step 5:** Check the dimension according to the table below between the back of the needle and the stuffing box body. Let dry the glue approximately 8 hours at the free air (or 3 hours under 40°C).
- **Step 6:** After drying, if necessary remove the pad of glue. Remove the two screws.

Nota : the pad guarantees that the glue is well distributed.

Adjustment of the needles:

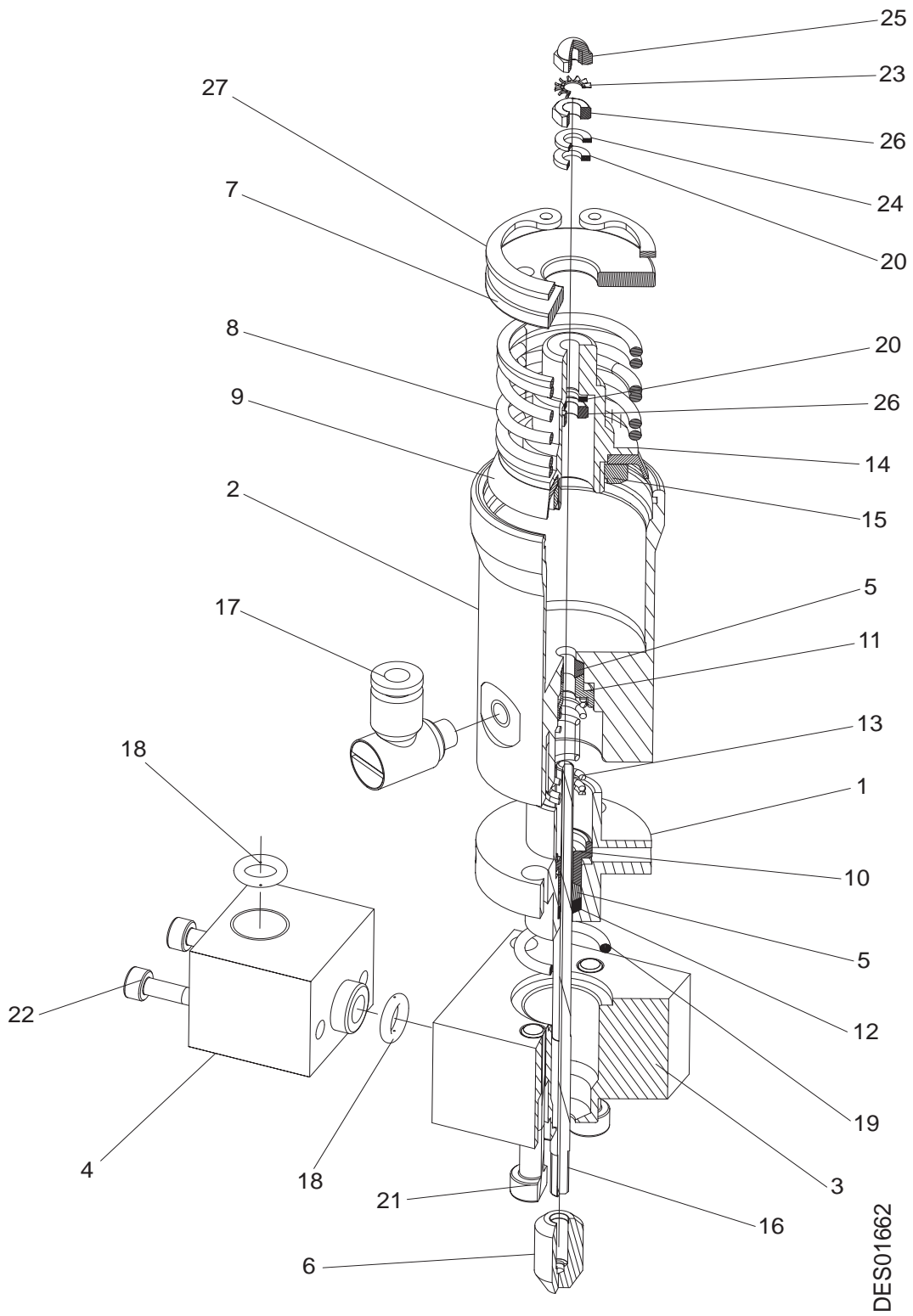
Part number of the Needles	Positioning dimensions of the needle
458804	4 mm
459159	4 mm
1516999	4 mm
458816	2 mm
1519550	2 mm
459153	18 mm between the end of the needle and the stuffing box body.
1521947	In stop against the axis
1521483	In stop against the axis

7. Problems, Troubleshooting.

Symptoms	Causes	Remedies
The pneumovalve does not open (the operating indicator does not remain in out position at the rear of the pneumovalve).	The control air does not arrive at the pneumovalve.	Check the control circuit (control hose folded or disconnected).
	The control pressure is less than 5 bar (72,5 Psi).	Increase the network pressure.
	The needle control rod is jammed. If there is a leak at the gaskets, the paint may dry if the gun is not used for some time preventing the needle rod from moving.	Check if any product has flowed through the venting hole. If this is the case, replace the pneumovalve.
	The piston seal is damaged. If this seal leaks, pressure cannot build up in the control chamber.	Remove the pneumovalve. Check that the needle can recede by pushing the end of it with a flat tool. If it does not operate correctly, replace the pneumovalve.
The pneumovalve does not close.	The control air circuit remains pressurized.	The control solenoid valve is not operating correctly. The air cannot be drained.
	The return spring is broken.	After disassembling the pneumovalve, exert a pressure on the end of the needle. Lack of resistance is a sign that the spring is worn. If so, replace the pneumovalve.
	The needle control rod is jammed.	Check that the indicator can move out by pressing on the end of it with a flat tool. If it does not operate correctly, replace the pneumovalve.
The pneumovalve no longer acts correctly as a valve.	If the pneumovalve cannot be closed, the needle does not exert enough pressure on its seat, resulting in product leakage.	See previous symptom.
	The needle is faulty.	Remove the pneumovalve. Check visually for scratches or faults on the needle. If faults can be seen, change the needle.
	Check for foreign matter on the needle bearing.	Clean as necessary.

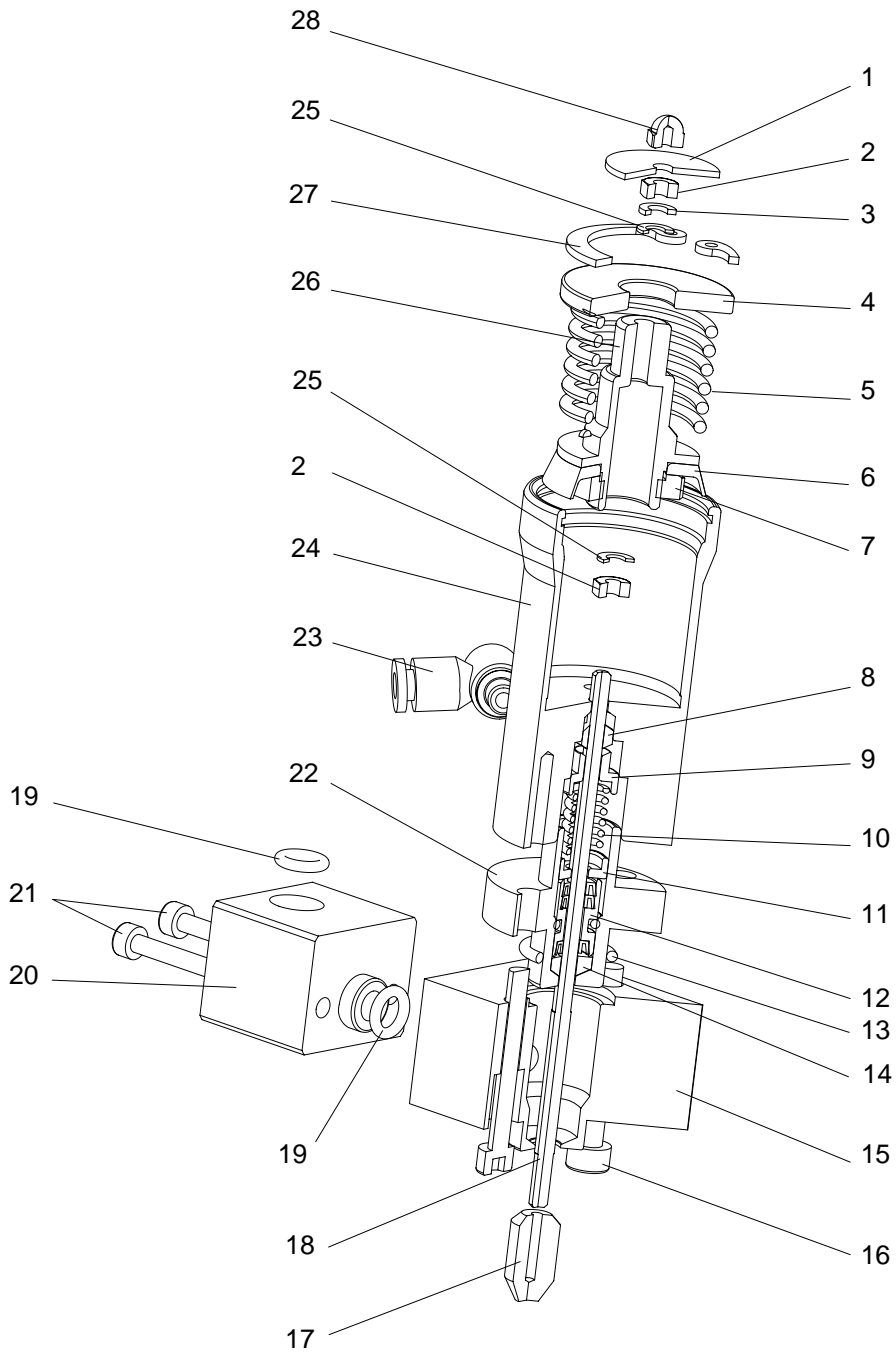
8. Spare Parts

8.1. MINI Pneumovalve RS (2-ways)



Item	Part number	Description	Qty	Unit of sale
	458804	2-way pneumovalve RS	1	1
1	434986	2-way stuffing box body	1	1
2	434987	Piston body, stainless steel M 5	1	1
3	437534	Block body, minivalve RS, stainless steel	1	1
4	438460	Mini die, stainless steel	1	1
5	441117	Biconical sealing ring	3	5
6	449085	2-way needle	1	1
7	900000571	Lock washer	1	1
8	449089	Piston spring	1	1
9	449091	Piston seal	1	1
10	449092	Drain washer	1	1
11	449093	Spring bushing	1	1
12	449094	Tapered seal	1	1
13	449095	Stuffing box spring	1	1
14	740392	Piston	1	1
15	740393	Nut	1	1
16	449084	2-way piston shaft	1	1
17	F6RLCS270	Male elbow	1	1
18	J3TTCN009	O ring	2	5
19	J3TTCN011	O ring	1	2
20	J4BRND032	Sealing ring	2	1
21	X4FVSY125	Screw, CHC M 4 x 30, s/s 316	4	1
22	X4FVSY073	Screw, CHC M 3 x 25, s/s 316	2	1
23	X4KDVX003	Fan washer, AZ 3 s/s 316	1	1
24	X4KDZU003	Flat washer, Z Ø 3 x 6 s/s 316	1	1
25	X4KEHB003	Cap nut, dia. M 3 s/s 316	1	1
26	X4KEHU003	H nut, dia. M 3 s/s 316	2	1
27	X4KQNT117	Internal circlip	1	1
-	455437	Repair kit	-	-

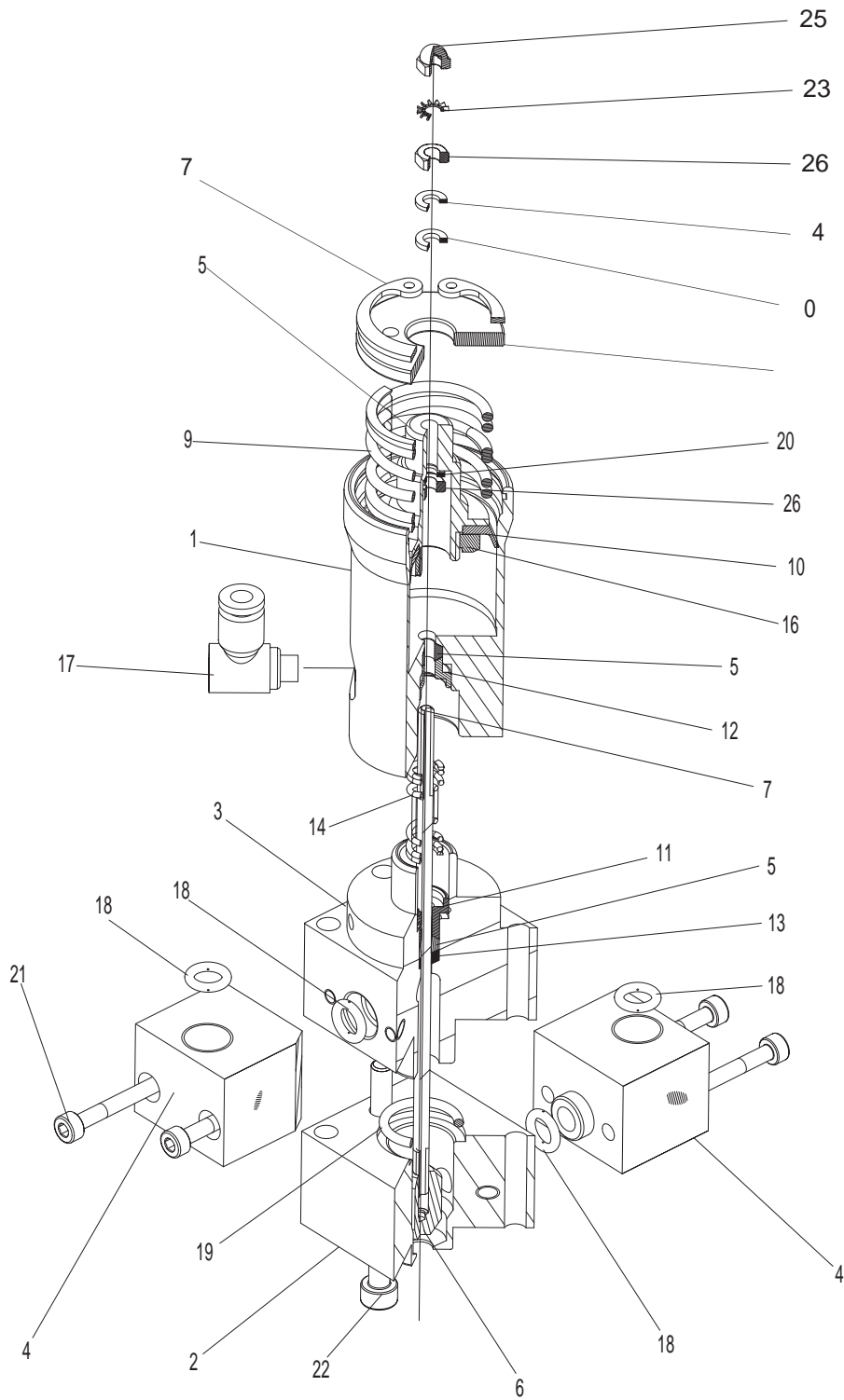
8.2. 2-way pneumovalve RS, isocyanate



DES04619

Item	Part number	Description	Qty	Unit of sale
	854493	2-way pneumovalve RS, isocyanate	1	1
1	640732	Plate, visualization	1	1
2	X4KEHU003	H nut, dia. M 3 s/s 316	2	1
3	X4KDZU003	Flat washer, Z Ø 3 x 6 s/s 316	1	1
4	900000571	Lock washer	1	1
5	449089	Piston spring	1	1
6	449091	Piston seal	1	1
7	740393	Nut	1	1
8	441117	Biconical sealing ring	1	5
9	449093	Spring bushing	1	1
10	449095	Stuffing box spring	1	1
11	749985	Drain washer	1	1
12	749987	Equipped seal cartridge	1	1
13	J3TTCN011	O ring	1	2
14	749986	Tapered seal	1	1
15	437534	Block body, minivalve RS, stainless steel	1	1
16	X4FVSY125	Screw, CHC M 4 x 30, s/s 316	2	1
17	449085	2-way needle	1	1
18	749983	2-way piston shaft	1	1
19	J3TTCN009	O ring	2	5
20	438460	Mini die, stainless steel	1	1
21	X4FVSY073	Screw, CHC M 3 x 25, s/s 316	2	1
22	732335	2-way stuffing box body	1	1
23	F6RLCS270	Male elbow	1	1
24	434987	Piston body, stainless steel M 5	1	1
25	J4BRND032	Sealing ring	2	1
26	740392	Piston	1	1
28	X4KEHB003	Cap nut, dia. M 3 s/s 316	1	1
27	X4KQNT117	Internal circlip	1	1

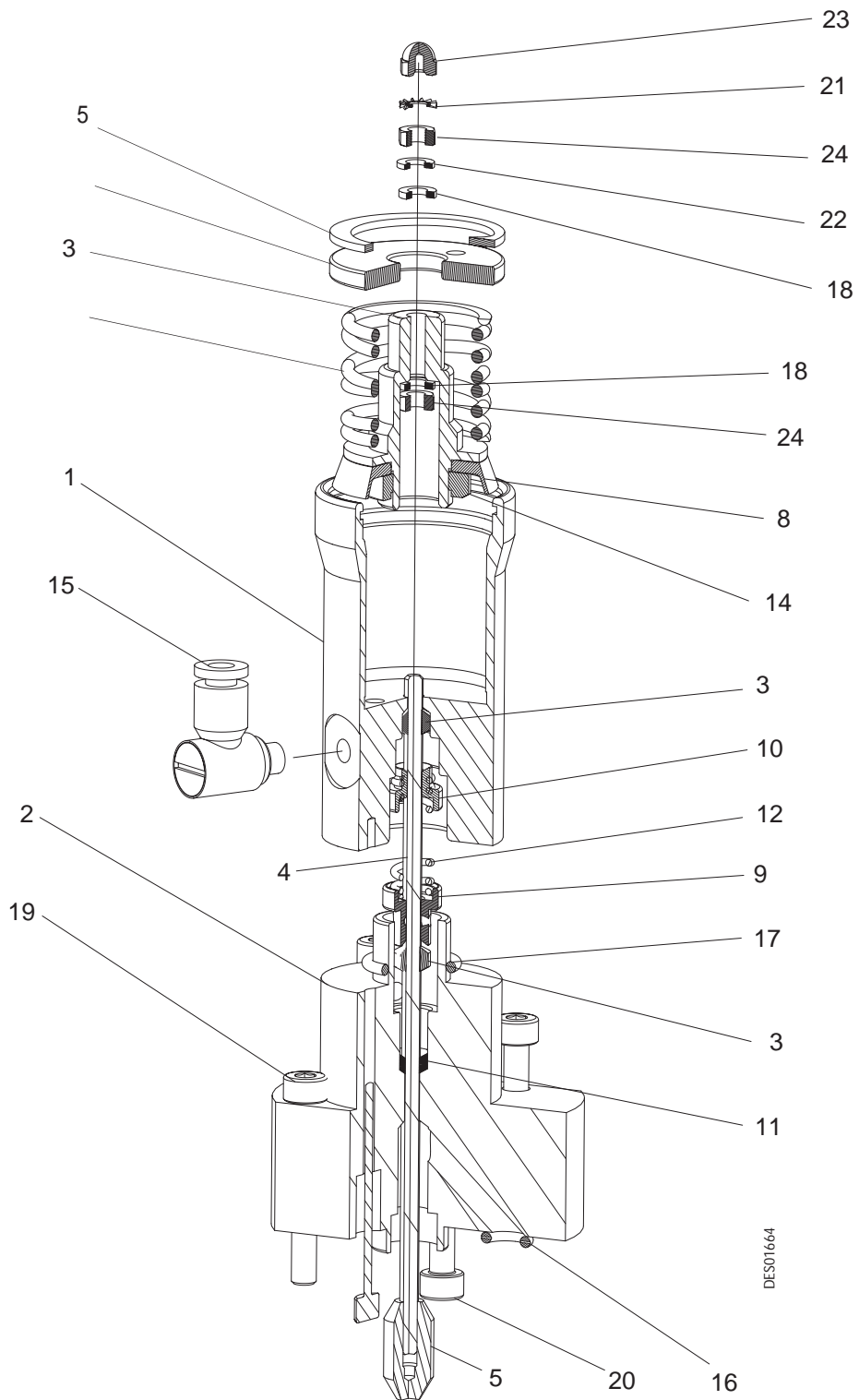
8.3. MINI Pneumovalve RS (3-ways)



DES01663

Item	Part number	Description	Qty	Unit of sale
	458816	3-way pneumovalve RS	1	1
1	434987	Piston body	1	1
2	437534	Block body, minivalve RS, stainless steel	1	1
3	438256	3-way stuffing box body	1	1
4	438460	Mini die, stainless steel	2	1
5	441117	Biconical sealing ring	3	5
6	449087	3-way needle	1	1
7	449086	3-way piston shaft	1	1
8	449088	Lock washer	1	1
9	449089	Piston spring	1	1
10	449091	Piston seal	1	1
11	449092	Drain washer	1	1
12	449093	Spring bushing	1	1
13	449094	Tapered seal	1	1
14	449095	Stuffing box spring	1	1
15	740392	Piston	1	1
16	740393	Nut, M 12	1	1
17	F6RLCS204	Male elbow	1	1
18	J3TTCN009	O ring	4	5
19	J3TTCN011	O ring	1	2
20	J4BRND032	Sealing ring	2	1
21	X4FVSY129	Screw, CHC M 4 x 50, s/s 316	4	1
22	X4FVSY073	Screw, CHC M 3 x 25, s/s 316	2	1
23	X4KDZX003	Fan washer, AZ 3 s/s 316	1	1
24	X4KDZU003	Flat washer, Z Ø 3 x 6 s/s 316	1	1
25	X4KEHB003	Cap nut, dia. M 3 s/s 316	1	1
26	X4KEHU003	H nut, dia. M 3 s/s 316	2	1
27	X4KQNT117	Internal circlip	1	1
-	455437	Repair kit	-	-

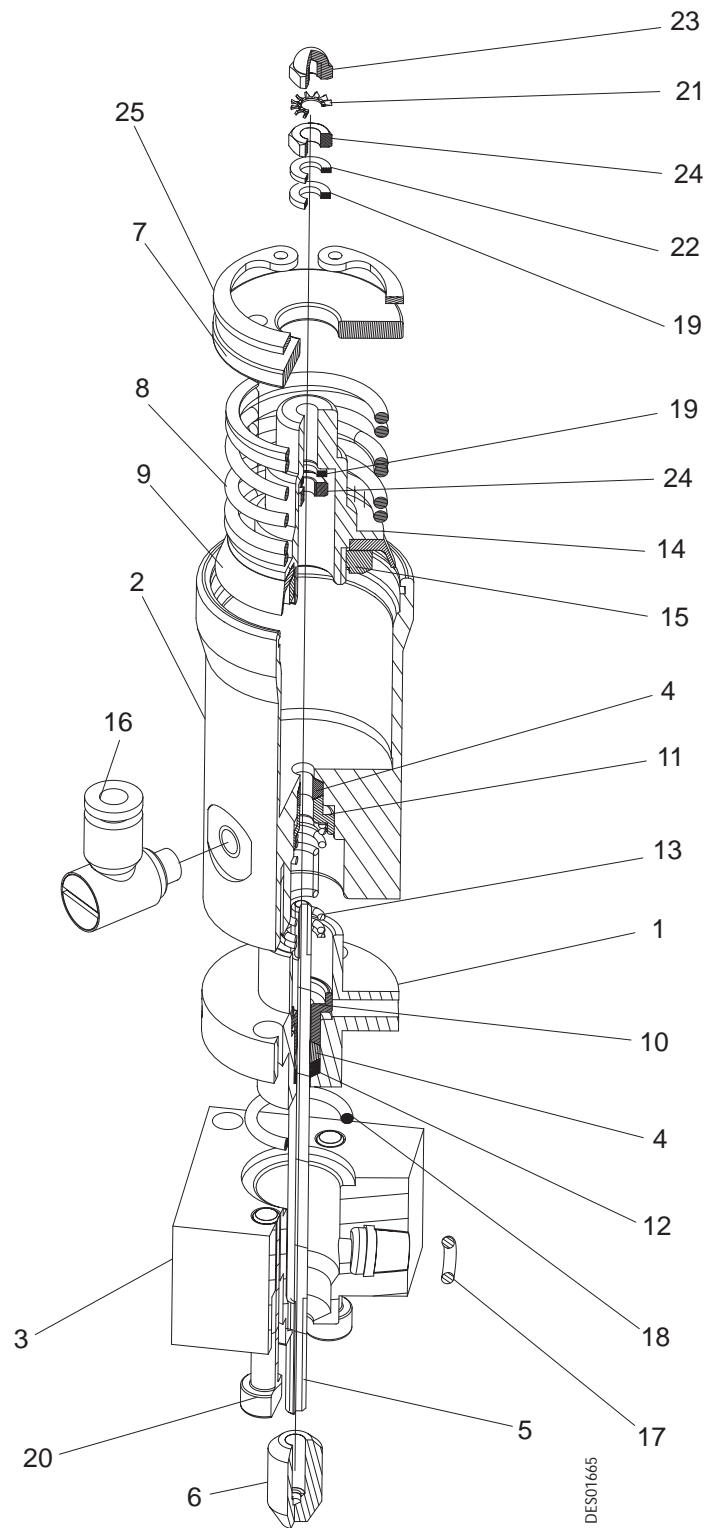
8.4. Pneumovalve (Flowmeter Bypass)



DES01664

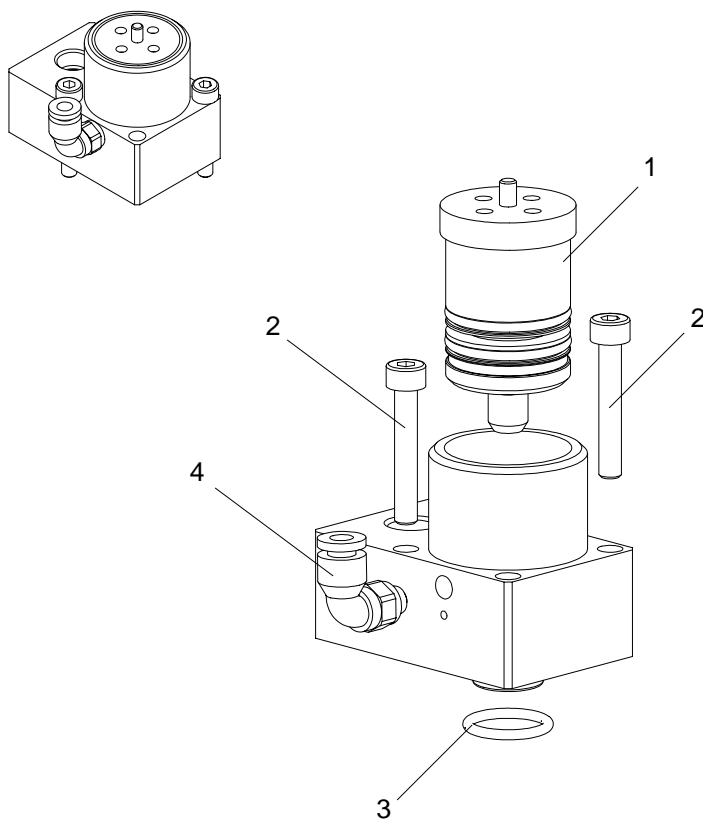
Item	Part number	Description	Qty	Unit of sale
	459153	Pneumovalve (flowmeter bypass)	1	1
1	434987	Piston body, stainless steel M 5	1	1
2	438781	Valve base plate, flowmeter bypass	1	1
3	441117	Biconical sealing ring	3	5
4	449086	3-way piston shaft	1	1
5	449087	3-way needle	1	1
6	449088	Lock washer	1	1
7	449089	Piston spring	1	1
8	449091	Piston seal	1	1
9	449092	Drain washer	1	1
10	449093	Spring bushing	1	1
11	449094	Tapered seal	1	1
12	449095	Stuffing box spring	1	1
13	740392	Piston	1	1
14	740393	Nut	1	1
15	F6RLCS204	Male elbow	1	1
16	J3TTCN009	O ring	1	5
17	J3TTCN011	O ring	1	2
18	J4BRND032	Sealing ring	2	10
19	X2BVCB125	Screw, CHC M4 X 30	4	1
20	X3AVSY126	Screw, CHC M4 X 35	2	1
21	X4KDVX003	Fan washer, AZ 3 s/s 316	1	1
22	X4KDZU003	Flat washer, Z Ø 3 x 6 s/s 316	1	1
23	X4KEHB003	Cap nut, dia. M 3 s/s 316	1	1
24	X4KEHU003	H nut, dia. M 3 s/s 316	2	1
25	X4KQNT117	Internal circlip	1	1
-	455437	Repair kit	-	-

8.5. MINI Pneumovalve G (2-ways)



Item	Part number	Description	Qty	Unit of sale
	459159	2-way pneumovalve G	1	1
1	434986	2-way stuffing box body	1	1
2	434987	Piston body, stainless steel M5	1	1
3	438824	Block body, minivalve RS, stainless steel	1	1
4	441117	Biconical sealing ring	3	5
5	449084	2-way piston shaft	1	1
6	449085	2-way needle	1	1
7	900000571	Lock washer	1	1
8	449089	Piston spring	1	1
9	449091	Piston seal	1	1
10	449092	Drain washer	1	1
11	449093	Spring bushing	1	1
12	449094	Tapered seal	1	1
13	449095	Stuffing box spring	1	1
14	740392	Piston	1	1
15	740393	Nut	1	1
16	F6RLCS204	Male elbow	1	1
17	J3TTCN009	O ring	1	5
18	J3TTCN011	O ring	1	2
19	J4BRND032	Sealing ring	2	10
20	X4FVSY125	Screw, CHC M 4 x 30, s/s 316	4	1
21	X4KDVB003	Fan washer, AZ 3 s/s 316	1	1
22	X4KDZU003	Flat washer, Z Ø 3 x 6 s/s 316	1	1
23	X4KEHB003	Cap nut, dia. M 3 s/s 316	1	1
24	X4KEHU003	H nut, dia. M 3 s/s 316	2	1
25	X4KQNT117	Internal circlip	1	1
-	455437	Repair kit	-	-

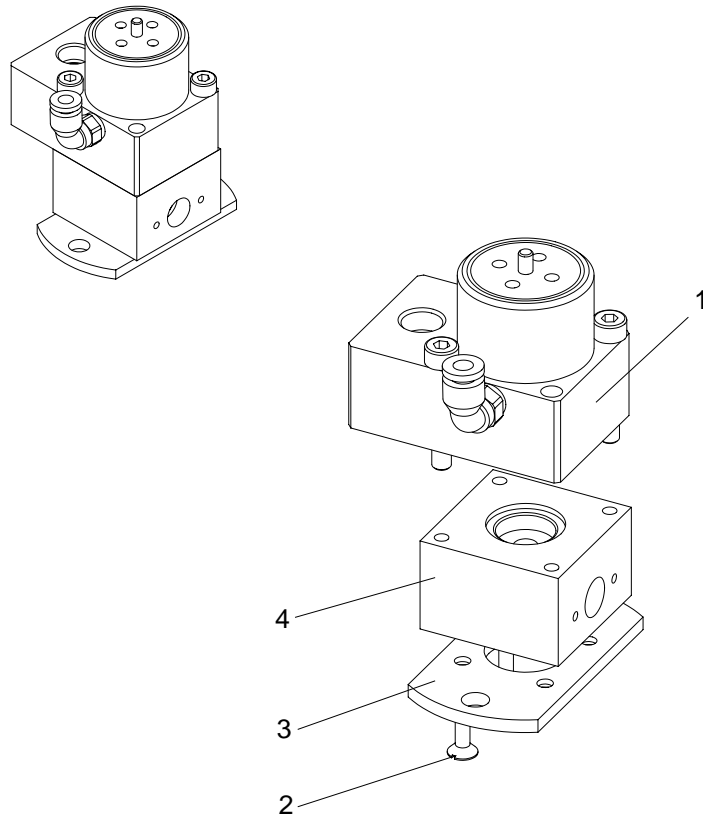
8.6. Safety pneumovalve



DES04759

Item	Part number	Description	Qty	Unit of sale
	910007742	Safety pneumovalve 2 ways, passage Dia: 6mm	1	1
1	1508516	Microvalve Dia: 7, orange indicator, chemically inert o-rings (see RT Nr 6021)	1	1
2	F6RLCS304	Elbow male fitting	1	1
3	J3TTCN011	O-ring - PTFE white	1	2
4	X4FVSY124	Screw Chc M 4x 25 stainless steel	2	1

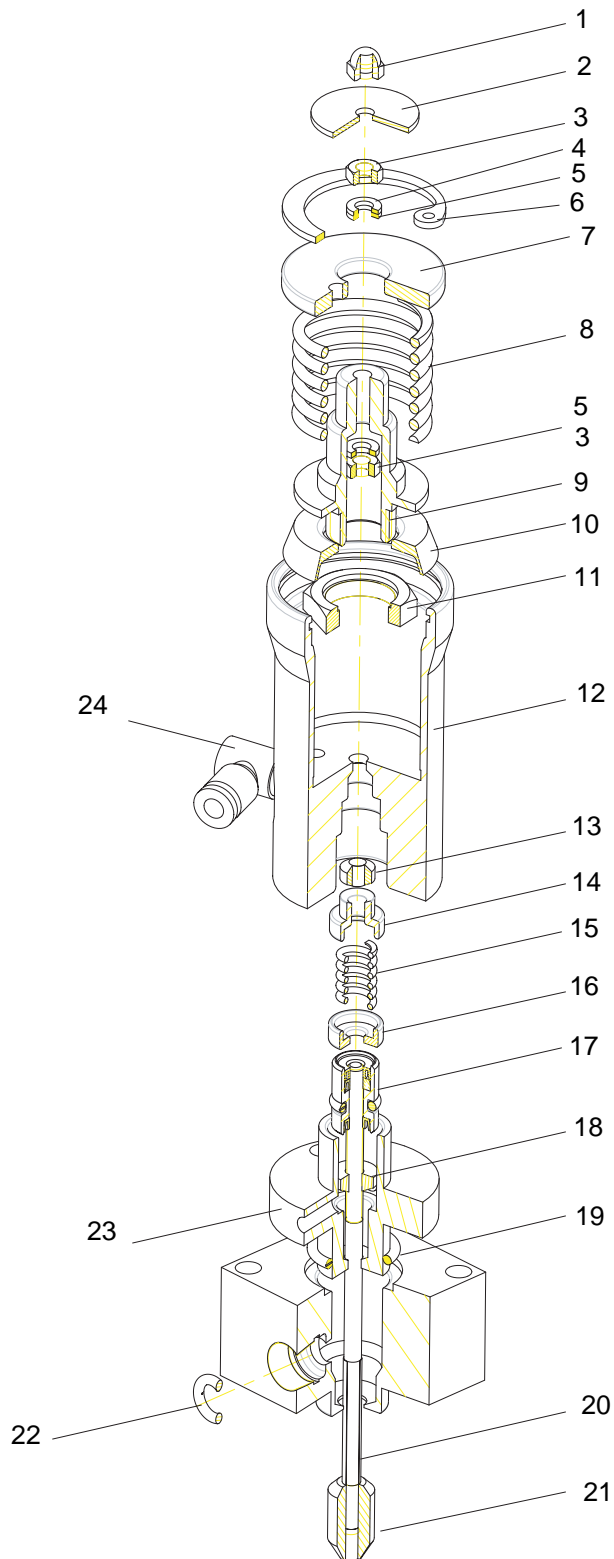
8.7. Shunt / safety pneumovalve



DES04760

Item	Part number	Description	Qty	Unit of sale
	910008070	Shunt / safety pneumovalve	1	1
1	910007742	Safety pneumovalve, 2 ways (see § 8.6 page 23)	1	1
2	X2BVFP068	Screw F/90 M 3x 12 steel 8/8 zinc coated	2	1
3	434992	Fixing plate	1	2
4	434995	Stainless steel base plate with shifted exit	1	1

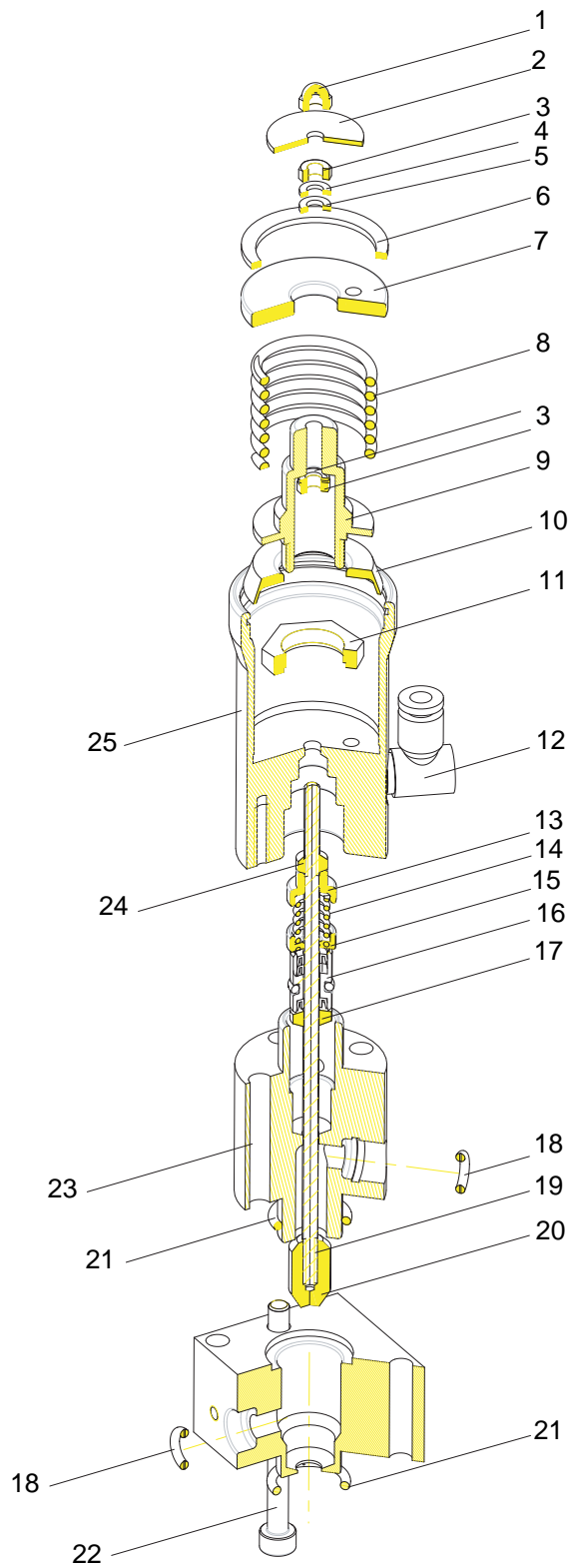
8.8. 2-way pneumovalve G - isocyanate



DES02176

Item	Part number	Description	Qty	Unit of sale
	1516999	2-way pneumovalve G - isocyanate	1	1
1	X4KEHB003	Cap nut, dia. M 3 s/s 316	1	1
2	640732	Plate, visualization	1	1
3	X4KEHU003	Nut M3	2	1
4	X4KDZU003	Flat washer	1	1
5	J4BRND032	Sealing ring	2	10
6	X4KQNT117	Internal circlip	1	1
7	900000571	Lock washer	1	1
8	449089	Spring	1	1
9	740392	Piston	1	1
10	449091	Piston seal	1	1
11	740393	Nut	1	1
12	434987	Piston body	1	1
13	441117	Biconical sealing ring	1	5
14	449093	Spring bushing	1	1
15	449095	Stuffing box spring	1	1
16	749985	Drain washer	1	1
17	749987	Equipped seal cartridge	1	1
18	749986	Tapered seal	1	1
19	J3TTCN011	O-ring	2	2
20	749983	2-way piston axle	1	1
21	449085	2-way needle	1	1
22	J3TTCN009	O-ring	1	5
23	732335	2-way stuffing box body	1	1
24	F6RLCS270	Male elbow	1	1
-	X4FVSY125	Screw, CHC M 4 x 30, s/s 316	4	1

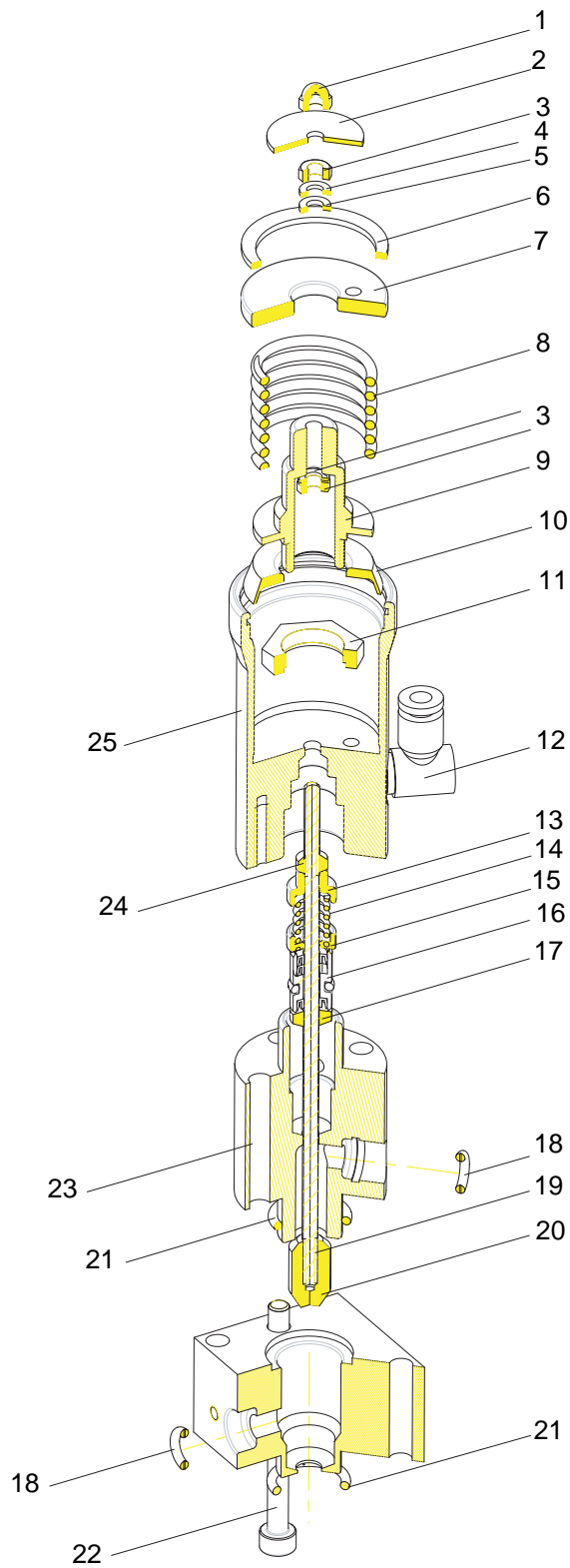
8.9. 3-way pneumovalve G - isocyanate



DES02177

Item	Part number	Description	Qty	Unit of sale
	1519550	3-way pneumovalve G - isocyanate	1	1
1	X4KEHB003	Cap nut, dia. M 3 s/s 316	1	1
2	640732	Plate, visualization	1	1
3	X4KEHU003	Nut M3	2	1
4	X4KDZU003	Flat washer	1	1
5	J4BRND032	Sealing ring	2	10
6	X4KQNT117	Internal circlip	1	1
7	449088	Lock washer	1	1
8	449089	Spring	1	1
9	740392	Piston	1	1
10	449091	Piston seal	1	1
11	740393	Nut	1	1
12	F6RLCS270	Male elbow	1	1
13	449093	Spring bushing	1	1
14	449095	Stuffing box spring	1	1
15	749985	Drain washer	1	1
16	749987	Equipped seal cartridge	1	1
17	749986	Tapered seal	1	1
18	J3TTCN009	O-ring	2	5
19	540045	3-way piston axle	1	1
20	449087	3-way needle	1	1
21	J3TTCN011	O-ring	2	2
22	X4FVSY129	Screw Chc M 4 x 50 stainless steel	4	1
23	1311632	3-way stuffing box body	1	1
24	441117	Biconical sealing ring	1	5
25	434987	Piston body	1	1

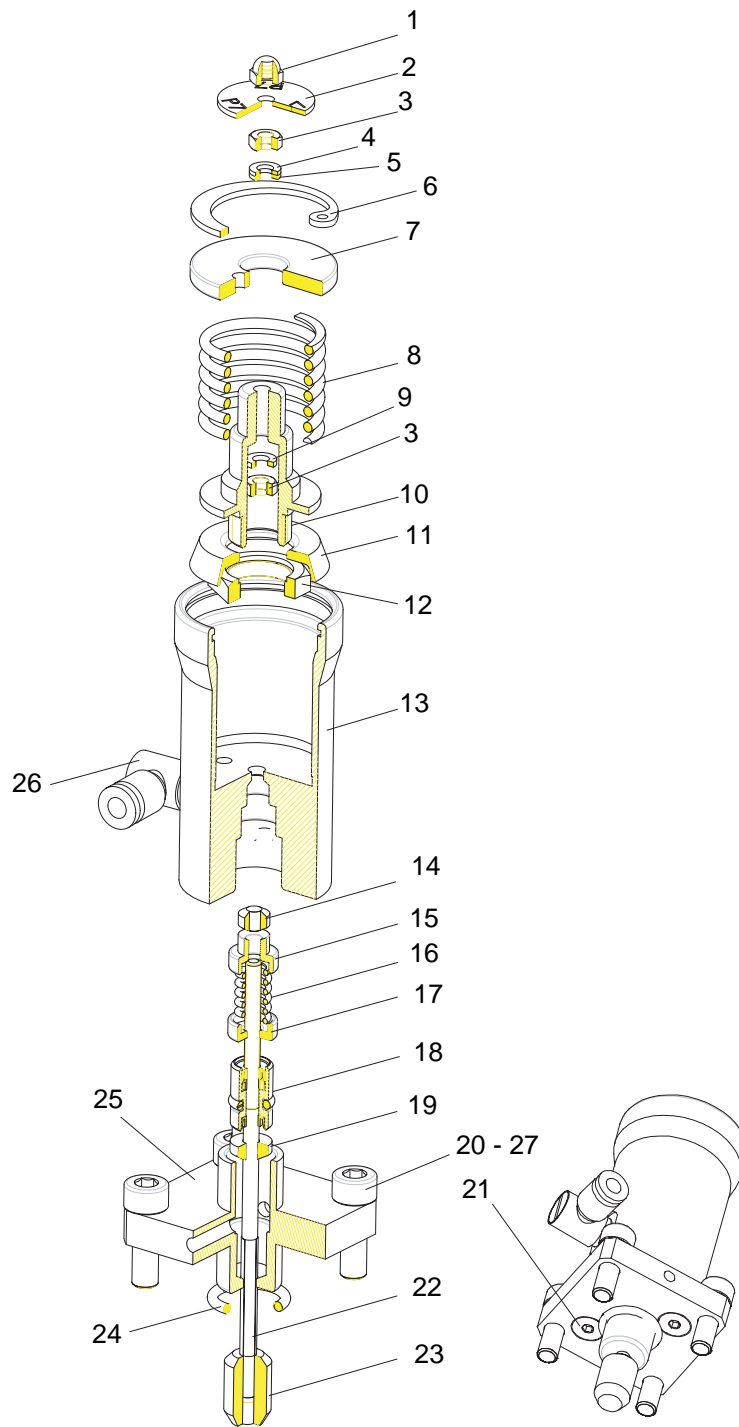
8.10. 4-way pneumovalve G - isocyanate



DES02177

Item	Part number	Description	Qty	Unit of sale
	1526962	4-way pneumovalve G - isocyanate	1	1
1	X4KEHB003	Cap nut, dia. M 3 s/s 316	1	1
2	640732	Plate, visualization	1	1
3	X4KEHU003	Nut M3	2	1
4	X4KDZU003	Flat washer	1	1
5	J4BRND032	Sealing ring	2	10
6	X4KQNT117	Internal circlip	1	1
7	449088	Lock washer	1	1
8	449089	Spring	1	1
9	740392	Piston	1	1
10	449091	Piston seal	1	1
11	740393	Nut	1	1
12	F6RLCS270	Male elbow	1	1
13	449093	Spring bushing	1	1
14	449095	Stuffing box spring	1	1
15	749985	Drain washer	1	1
16	749987	Equipped seal cartridge	1	1
17	749986	Tapered seal	1	1
18	J3TTCN009	O-ring	4	5
19	540045	3-way piston axle	1	1
20	449087	3-way needle	1	1
21	J3TTCN011	O-ring	1	2
22	X4FVSY165	Screw, CHC M 4 x 65, s/s 316	2	1
23	1315452	4-way stuffing box body	1	1
24	441117	Biconical sealing ring	1	5
25	434987	Piston body	1	1

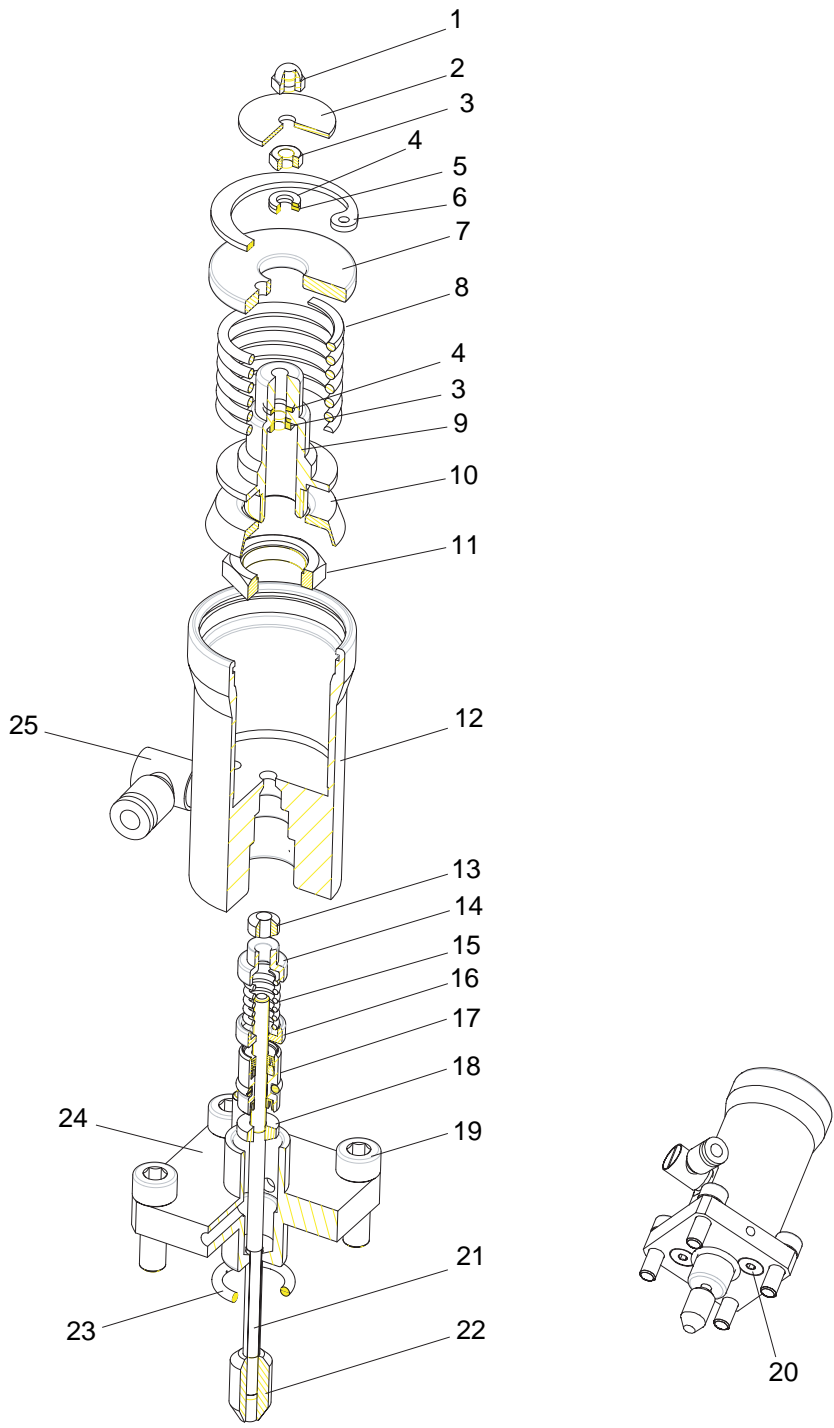
8.11. 2-way pneumovalve D: 7- isocyanate



DES02175

Item	Part number	Description	Qty	Unit of sale
	1521947	2-way pneumovalve - D: 7 - isocyanate	1	1
1	X4KEHB003	Cap nut, dia. M 3 s/s 316	1	1
2	1410082	Plate, visualization	1	1
3	X4KEHU003	Nut M3	2	1
4	X4KDZU003	Flat washer Z M3	1	1
5	J4BRND032	Sealing ring	1	10
6	X4KQNT117	Internal circlip	1	1
7	900000571	Lock washer	1	1
8	449089	Spring	1	1
9	1412147	Washer	1	1
10	740392	Piston	1	1
11	449091	Piston seal	1	1
12	740393	Nut	1	1
13	434987	Piston body	1	1
14	441117	Biconical sealing ring	1	5
15	449093	Spring bushing	1	1
16	449095	Stuffing box spring	1	1
17	749985	Drain washer	1	1
18	749987	Equipped seal cartridge	1	1
19	749986	Tapered seal	1	1
20	X3AVSY184	Screw Chc M 5 x 16 zinc plated steel	4	1
21	X4EVSF123	Screw F/ 90 HC M 4 x 20	2	1
22	1410310	2-way piston axle	1	1
23	1410635	2-way quick release needle D: 9	1	1
24	J3TTCN011	O-ring	1	2
25	1312749	2-way stuffing box body	1	1
26	F6RLCS270	Male elbow	1	1
27	X2BDZU005	Washer	4	1

8.12. 2-way pneumovalve for block - isocyanate



DES02174

Item	Part number	Description	Qty	Unit of sale
	1521483	2-way pneumovalve for block - isocyanate	1	1
1	X4KEHB003	Cap nut, dia. M 3 s/s 316	1	1
2	1410941	Plate, visualization	1	1
3	X4KEHU003	Nut M3	2	1
4	X4KDZU003	Flat washer Z M3	2	1
5	J4BRND032	Sealing ring	1	10
6	X4KQNT117	Internal circlip	1	1
7	449088	Lock washer	1	1
8	449089	Spring	1	1
9	740392	Piston	1	1
10	449091	Piston seal	1	1
11	740393	Nut	1	1
12	434987	Piston body	1	1
13	441117	Biconical sealing ring	1	5
14	449093	Spring bushing	1	1
15	449095	Stuffing box spring	1	1
16	749985	Drain washer	1	1
17	749987	Equipped seal cartridge	1	1
18	749986	Tapered seal	1	1
19	X3AVSY183	Screw Chc M 5 x 16 zinc plated steel	4	1
20	X4FVSY121	Screw Chc M 4 x 16 steel	2	1
21	1410310	2-way quick release piston axle	1	1
22	1410309	2-way needle	1	1
23	J3TTCN011	O-ring - chemically inert	1	1
24	1312749	2-way stuffing box body	1	1
25	F6RLCS270	Male elbow	1	1