Assembly Instructions

AUTOMATIC Spray Valve SMS-11

Article Number: S11-….

Figure: Spray Valve SMS-11 standard with flat-jet air-cap and raster needle lock

NOTE
Please read the Assembly Instructions carefully before first using the incomplete device and strictly adhere to the instructions!

The incomplete device may only be worked with and worked on by persons who are familiar with the assembly instructions and the current regulations for industrial safety and accident prevention.

Always keep a translated version of the *"Original Assembly Instructions"* at the incomplete device!
The instructions have to be available anytime!

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EC Declaration of Incorporation

in accordance with EU Machinery Directive 2006/42/EU, dated 17 May 2006, Appendix II B

We herewith confirm that the below mentioned incomplete device meets the basic requirements for safety and health as stated in EU Machinery Directive 2006/42/EU for its design and construction as well as for the configuration released by us on the market. This machine component will not be operated before it has been determined that the incomplete system where the machine component will be installed also meets the requirements of the Directive (2006/42/EG).

Manufacturer

Walther Systemtechnik GmbH
Hockenheimer Straße 3
D- 76726 Germersheim

Description

Spray Valve SMS-11, Article-No. S11-……

We also declare the conformity with other, product-relevant directives/guidelines:

Mach. Direct. 2006/42/EU App. I, Clause: 1.1.2, 1.1.3, 1.1.5, 1.1.6, 1.3.2, 1.3.3, 1.3.4, 1.5.8, 1.5.9
EMV Directive (2004/108/EU) dated 15 December 2004

Applied harmonized standards, in particular:

DIN EN ISO 12100	Safety of Machinery – General Design Principles – Risk Assessment and Risk Reduction (ISO 12100:2010)

In addition, we also confirm that the special documentation according to Appendix VII Part B has been prepared.

The manufacturer, respectively his authorized representative obligates himself to submit this documentation to the market surveillance authorities, if requested.

This EC Declaration of Incorporation becomes invalid if the incomplete device will be altered or changed without consent of Walther Systemtechnik GmbH.

Authorized representative for Technical Documentation:

Stefan Hirl, Hockenheimer Straße 3, D- 76726 Germersheim

Germersheim, 30 October 2015
(Place, Date) (Stefan Hirl, Management)

1 Introduction

1.1 Target Group of the Assembly Instructions

- Operating Personnel
- Maintenance Personnel

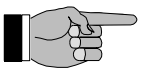
1.2 List of Signs and Symbols

The assembly instructions warn users of operations which may put their health at risk.
The warnings are indicated by combinations of text and symbols as follows:

DANGER
Describes a potentially dangerous situation.
Death, grievous bodily harm or severe material damage **WILL** occur if the respective measures of precaution have not been taken

WARNING
Describes a potentially dangerous situation.
Death, grievous bodily harm or severe material damage **MAY** occur if the respective measures of precaution have not been taken.

CAUTION
Describes a potentially dangerous situation.
Slight injuries CAN occur if the respective measures of precaution have not been taken. This signal word is also used to describe possible property damages.



IMPORTANT
Indicates tips for usage and other particularly useful information.
No dangerous situation.

2 Safety

2.1 General Information

The construction of this device is according to the latest technology and is absolutely reliable. The individual components as well as the complete device are continuously checked by our quality management.

2.2 Dangers from Residual Energy

Please instruct the operating personnel on the respective measures to be taken against the occurrence of mechanical, hydraulic, pneumatic and electric / electronic residual energies.

2.3 Warranty and Liability

According to the conditions laid down by the German Engineering Association (VDMA), Walther Systemtechnik GmbH has a guarantee of 12 months under normal European operating conditions on its own parts (spare parts are excluded); or according to the conditions of the manufacturer.
This guarantee can only be granted by Walther Systemtechnik GmbH, if:

- the user has thorough knowledge of the content of the assembly instructions;
- the user follows the instructions and notes contained in the assembly instructions;
- the user does not rebuild or make changes on parts of the device without prior consent of WST Systemtechnik GmbH.

2.4 Correct Use

This device is a needle valve and will be used for processing materials which can be sprayed in continuous or intermitting operation. Under no circumstances shall aggressive media such as acids, alkaline solutions, detergents, chemicals or others be sprayed. If you are not sure, please contact the manufacturer if a certain spray medium is suitable for this device.

2.5 Incorrect Use

- Operating the device with insufficient knowledge about the operation, maintenance and care of the device.
- Making changes, extensions or alterations on the device that may hamper its safety without the prior consent of Walther Systemtechnik GmbH.
- Operating the device with defective safety installations or not properly attached or malfunctioning safety devices.
- Using unsuitable materials.
- Handling the device while energized

2.6 Qualification of Personnel

Only trained and instructed personnel may conduct work on the equipment.
The responsibilities of the personnel for assembly work, operation, repair work or maintenance work must be clearly assigned to individuals!

Persons in training may work with the equipment only under supervision of an experienced person.

Personnel **Task**	**Instructed Personnel**	**Personnel with Technical Qualification**	**Specialist**	**Supervisor**
Packaging, Transport	**X**	**-**	**-**	**-**
Commissioning		**X**	**X**	**-**
Operation	**X**			**-**
Troubleshooting, general		**X**	**X**	**-**
Troubleshooting mechanical	**-**	**X**	**-**	**-**
Troubleshooting electrical	**-**	**-**	**X**	**-**
Setting up	**-**	**X**	**-**	**-**
Maintenance	**-**	**X**	**-**	**-**
Repair	**-**	**X**	**X**	**-**
Taking out of service, Storage	**-**	**X**	**X**	**-**

3 Transport

3.1 Packaging

The type of packaging depends on the individual mode of shipping. If not separately contracted, the packaging is in accordance with the rules and regulations of Walther Systemtechnik GmbH. This rule is in accordance with the Federal Association for Packaging HPE.

3.2 Tasks before Transport

The following has to be done before transport:

- Disconnect all power lines.

The actual transport of the incomplete device and its individual parts requires special care in order to prevent damages from external forceful impact or careless on- and off-loading. Depending on the mode of transportation, suitable transport and load securing has to be selected. The incomplete device will be aligned and leveled by appropriate fastening elements.

4 Description of Function

The AUTOMATIC **SMS-11** valve is a pneumatic device. It will be opened by control air and will be closed by a needle spring in case of failure or turn-off of the control air. The spray medium will be supplied into the valve from a pressured container or via a pump. The separately controlled spray air distributes the material into the actual spray jet. The discharge from the nozzle will be performed through the selected special air cap as flat or round jet. The function of the needle is: opening by air pressure / closing by spring pressure. The SMS-11 is optionally available with raster-needle sensor and material circulation.

4.1 Purpose of the Device

CAUTION
The use of other media can cause functional failures, damages or even the destruction of the device.

The AUTOMATIC **SMS-11** spray valve is suitable for the application of greases, oils, release agents or colors. Depending on the selected air cap, a flat or a round jet can be generated. Depending on the viscosity of the medium to be applied, the application result can be individually adjusted through the nozzle size, the atomized air pressure or also the material supply pressure. Supply of spray air, control air and material is performed through three hoses. The AUTOMATIC **SMS-11** spray valve is a high-precision device which will be a long-term reliable tool if the following notes are observed

4.2 Technical Data

General Data

Dimensions [mm]	= ca. 50 x 30 x 72.5 (Standard) = ca. 50 x 45 x 72.5 (Standard with clamping device) = ca. 50 x 30 x 102 (with raster-needle sensor)
Weight [g]	= ca. 305
Air consumption, manual jet width adjustment	= ca. 111ltr./min. (at 3bar, 0.3mm nozzle, flat-jet cap and 2m hose length
Air consumption, remote jet width adjustment	= ca. 133ltr./min. (at 3bar, 0.3mm nozzle, flat-jet cap and 2m hose length

Energy Supply

Control air pressure [bar]	= min. 3.5 – max. 6
Spray air pressure [bar]	= should be adapted to the material pressure
Material pressure [bar]	= max. 10

4.3 Type Label

The type label has been etched into the casing. The serial number will be hammered into the type label.

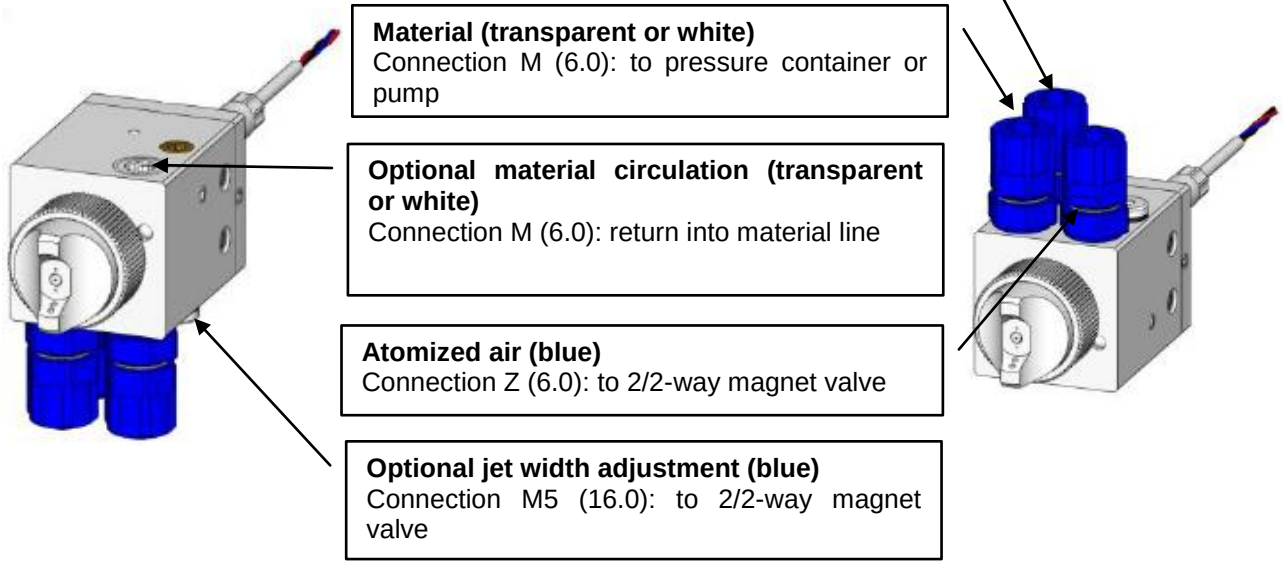
5 Mounting and Start-up

The valves can be installed in any position. A holder is available for a solid installation (optional, see drawing). The distance to the application area depends on the desired application width.

An intermitting working process of the device will create natural vibrations. Therefore the installation of the device has to be solid and firm. Try to avoid extreme natural vibrations (transfer from the machine onto the valve).

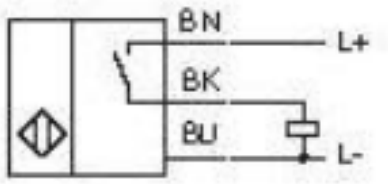
5.1 Hose Mounting

The three functional hoses will be installed as follows:

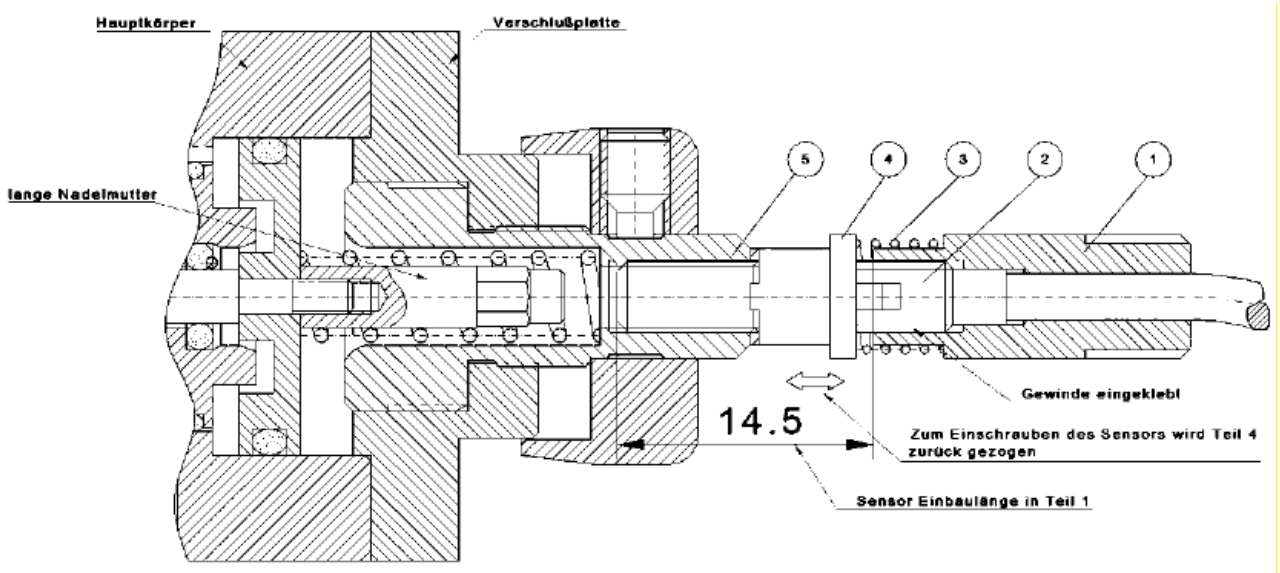


(In the standard version, the circulation connection is locked; however, it can be easily replaced by a different connection, if requested.)

5.2 Connecting the Sensor (Raster-Needle Sensor)



5.3 Adjusting the Sensor (Raster-Needle Sensor)



1. The screw-in sensor M4 x 0,5 (2) will be glued with a high-strength screw lock into the sensor holder over a length of 14.5mm (1). (see drawing)
2. Screw in the regulating spindle (5) until the needle is closed and no more material is discharged from the nozzle.
3. Connect the sensor to a control unit for adjusting.
4. Then slide the spring (3) and the spindle carrier (4) onto the sensor and together screw in into regulating spindle until you receive a signal.
5. Open (unscrew) the regulating spindle until the signal stops (up to max. 12 steps). If the signal of the sensor hasn't stopped by then, use the spindle carrier of the sensor for fine-adjustment until the signal stops.
6. The spindle carrier has to be pushed backed against the spring for fine-adjustment so the sensor can be turned in the regulating spindle until the signal stops.
7. Make sure that the spindle carrier locks again in the groove of the regulating spindle.

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6 Operation

6.1 General Information

This device may only be operated if the safety-related equipment is permanently effective and not suspended during operation or altered in its intended effectiveness.

6.2 Operating Information / Operating Conditions

CAUTION
Never point the jet at people. The wearing of eye protection is strongly recommended. The spraying process can create noise depending on the air and fluid pressures used. Ear protection should be worn, if required.

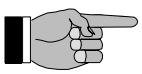
WARNING
Danger caused by flammable, harmful fluid. Always follow the safety instructions on the container or the safety data sheet for the fluid.

The valves of the **SMS-11** AUTOMATIC series generally operate with a control air pressure of 3 - 6 bar. Atomized air pressure and material pressure should be closely correlated.

IMPORTANT
Accident prevention directions will be **strictly** followed when applying high material pressures. Please strictly follow the following instructions when planning and constructing application systems!

- Each spraying valve must be equipped with its own pressure regulator for atomizing air.
- In case several spraying valves are supplied by one and the same material pressure tank, these valves must not spray simultaneously.
- The supply route for the material between material pressure tank and spraying valve must not exceed 2 m.
- If the pause time is a multiple of the spray time, the valve must be sprayed free in a separate location or the spray valve should be operated several times to optimize the application.
- After standstills of 15 min. and more, the valve must be sprayed free by pressing the switch 3 to 5 times.
- For longer standstills, the material can remain in the valve, if it remains under pressure (no contact to outside air).

The atomizing air pressure should be controlled in such a way that it starts before the opening of the needle and stops after the closing of the nozzle (guarantees broadest maintenance-free operation). The valves can be controlled for intermittent or continuous use. According to the individual application, the control air must be adjusted to the operating cycles and to the higher or lower material pressures. 30 tacts per second can be reached under appropriate operating conditions (material pressure, control air pressure, needle stroke, and short conductions).



IMPORTANT
The quantity of the spray medium can be adjusted to the individual requirements by turning the adjustment screw (13.0).

- Right turn: Reducing quantity of the spray medium
- Left turn: Increasing quantity of the spray medium

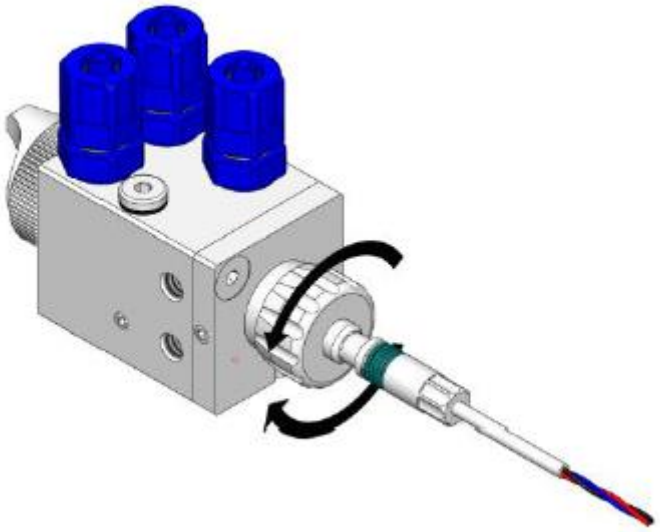
Nozzle and needle can be damaged by wrong handling. Only decrease the material flow (by a right turn of the regulating knob) if material spills out. Do not turn the regulating knob further to the right after the nozzle is closed!

For longer standstills, the material can remain in the valve, if it remains under pressure (no contact to outside air).

6.3 Function: Adjusting the Jet Width

The throttling screw (7.0) is used for adjusting the jet width.

- Right turn : reduce the jet width
- Left turn : increase the jet width



If the adjustment of the jet width will be remote-controlled (OPTION), the throttling screw (7.0) has to be completely turned off (right turn). You can then pneumatically adjust the jet width via a pressure regulator through screw-joint M5 (16.0). It works as follows:

- Lowering the pressure : reducing the jet width
- Increasing the pressure : increasing the jet width

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7 Taking out of Service

7.1 Short Interruption

A short interruption (15 min or more) has to be followed by a fine spraying.

IMPORTANT
Please follow the Operating Manual

7.2 Long-term Interruption

The following has to be observed for a long-term interruption of the device/machine:

- Depressurize material supply lines
- Take off air cap (2) and clean nozzle (3) with a special thinner and a soft cloth. Make sure that no cloth fibers are left on the nozzle tip.

NOTE
Please observe the maintenance instructions!

7.3 Final Shutdown of the Device

The following is important for a shutdown of the machine / device:

- Clean-spray valve with a special thinner.

NOTE
Please observe the maintenance instructions!

8 Maintenance and Repair

8.1 General Information

The spray valves of the **SMS-11** series are high-quality precision devices which will not fail if treated correctly and will operate almost maintenance-free. Always keep clean and observe minimum instructions to maintain a long life of the valve. We recommend lubricating moveable parts regularly and greasing threads, especially the nozzle threads, when replacing or cleaning the nozzle. Always use clean and filtered material only. The control air must also be clean and should be slightly oiled, if necessary. Maintenance also depends on the individual operating conditions and the type of media used.

CAUTION
Before starting any maintenance or repair work, ensure that all air-operated tools are depressurized and disconnected from the air supply.
Before opening the spray valve it must be disconnected from the air and fluid supply. Otherwise, ejected components can cause injuries.

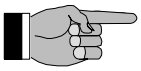
Particularly when employing the spray valve as color-marking device, the spray cap should be taken off before a longer standstill. The spray nozzle will be cleaned with a special thinner and a soft cloth. Make sure that there are no cloth fibers on the nozzle tip. After that the valve has to be sprayed clean by a longer spraying using the manual operator at the SPS or the manual operator at the 3/2-way valve (green button).

8.2 Cleaning

Wash equipment thoroughly after use to remove residues and dirt, especially if nozzle needle (Pos.9.0), needle sealing (8.1/8.4) or nozzle (Pos.3.0) are to be exchanged.

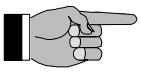
IMPORTANT
Only use soft brushes for outside cleaning of the nozzle tips. Never use metal tools with sharp edges!
During all repair and replacement tasks, take care that the working station as well as the device for repair will be kept in uttermost cleanliness.
We recommend removing the devices from the machines instead of leaving them installed during major repair works. (Disconnect the supply lines from pressure!).

8.3 Spare Parts



IMPORTANT
Only use original spare parts from the manufacturer!
Wrong or defective spare parts from other manufacturers can damage the device. If other than original spare parts of the manufacturer will be used, all obligations from the manufacturer or his sales partners, such as guarantees, service contracts etc will be **forfeited** without further notice

8.4 Inserting new Gasket Elements (Standard)



IMPORTANT
Gaskets and gasket holders can be damaged.
Do not use any sharp or pointed metallic implements for inserting the sealings!

After unscrewing the sealing bush, all O-rings and gaskets (8.1/8.2/8.4/8.5) can be easily replaced. The O-ring (9.1) can be easily replaced on the removed piston.

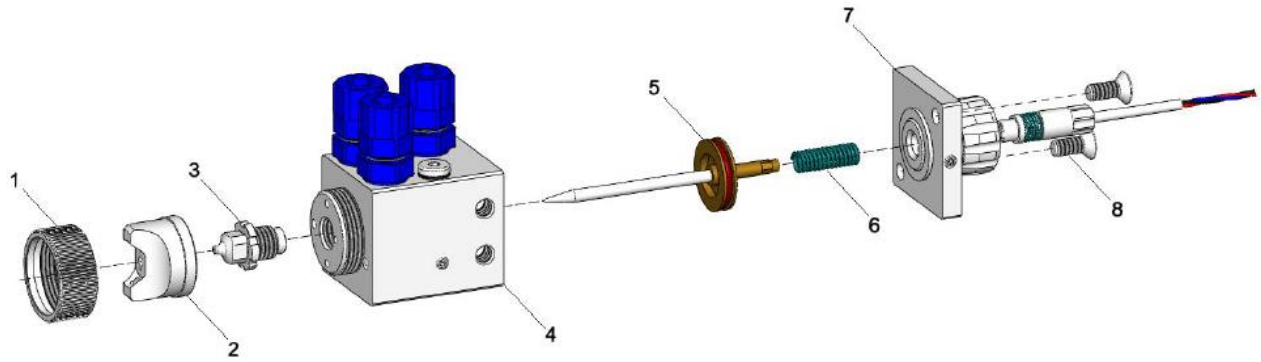
8.5 Replacing Nozzle Set (Standard)

CAUTION
Depressurize all connections.
.

Take off locking plate (14.0) by unscrewing fastening screws (12.0). Remove spring (10.0) and pull out needle (9.0). Unscrew retainer ring (1.0) and pull off air cap (2.0). Unfasten nozzle (3.0) with the open-end wrench SW 6 and screw out. Re-assemble in reverse order.

When re-using previous nozzles and needles the nozzle has to be thoroughly rinsed with an appropriate solvent so that no residues of the material remain in the nozzle. Also the shaft of the needle has to be cleaned of all rest particles. Needle shafts with hardened material residues can damage a replaced sealing element. Even inserting not completely clean needles through the needle gaskets (8.1/8.4) can also cause leakages.

8.6 Replacing Nozzle and Nozzle Needle (Raster-Needle Sensor)



1. Disconnect all connections from pressure and turn off energy and material supply!
2. Unfasten retaining ring (**1**) and remove air cap (**2**).
3. Unscrew countersunk screws (**8**) and remove cover plate (**7**).
   (Caution: the cover plate is under spring tension)
4. Make sure that you do not lose the pressure spring (**6**).
5. Pull out the nozzle needle (**5**) and unscrew the nozzle (**3**).
6. Slightly grease the new nozzle needle (**5**) and slide into main body (**4**); then remove grease residues from needle tip.
7. Screw new nozzle (**3**) into the main body (**4**).
8. After that screw cover plate (**7**) onto the main body (**4**). Make sure that the pressure spring, as described under step 4, is located in the correct position.
9. Then screw the air cap (**2**) together with the retaining ring (**1**) onto the main body (**4**) again.
10. Always perform a functional test after replacing nozzles and needles!

IMPORTANT
Always replace nozzle (**3**) and nozzle needle (**5**) at the same time.
Make sure that you thoroughly remove all sediments and material residues from nozzles and nozzle needles which have already been in use. Material residues in nozzles can cause leakages in the nozzle-needle-system; and nozzle needles with cured material residues can damage the sealing elements of the spray valve.

8.7 Replacing the Sealing Elements (Raster-Needle Sensor)

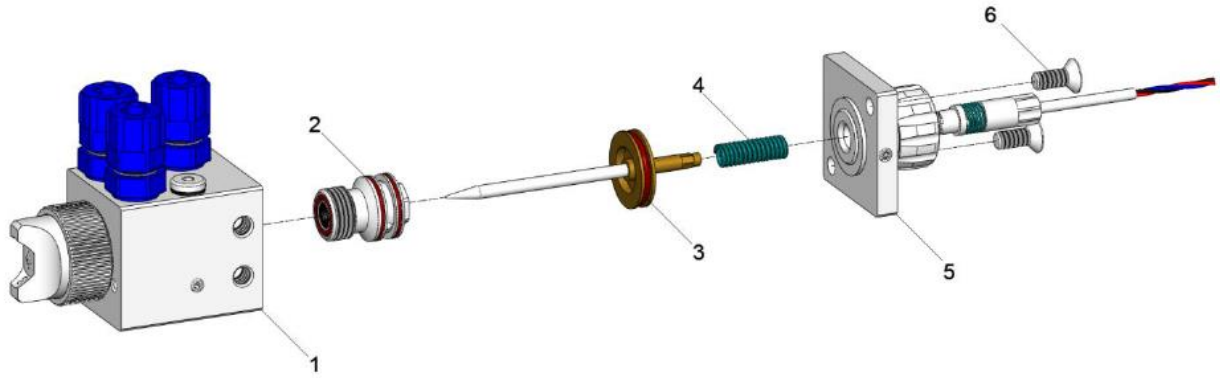


Fig. 1

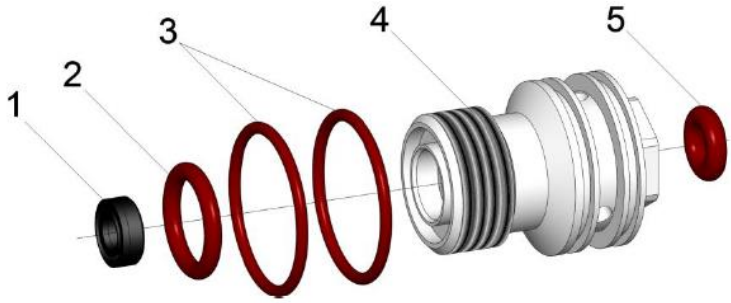


Fig. 2

Disconnect all connections from pressure and turn off energy and material supply!

Fig. 1

1. Unscrew cylinder screws (6) and remove cover plate (5). (Caution: the cover plate is unter spring tension)
2. Make sure that the pressure spring (4) does not get lost.
3. Pull out the nozzle needle (3).
4. Unscrew the sealing screw (2) with a socket wrench.

Fig. 2

5. Remove all O-rings (2. 3, 5) and the Variseal (1); mount new O-rings and Variseal and slightly grease (see Fig. 2).

   After replacing the sealing elements, re-assemble in reverse order (see Fig. 1).

IMPORTANT
Gaskets and seal seats can be damaged. Do not use any sharp-edged metal tools or objects when removing and inserting the gaskets!

8.8 Customer Service / Support

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9 Troubleshooting

9.1 General Information

IMPORTANT
First check all supply lines for connection and serviceability.

In case of serious problems that cannot be resolved, please contact the Walther Systemtechnik GmbH customer service.

9.2 Failures:

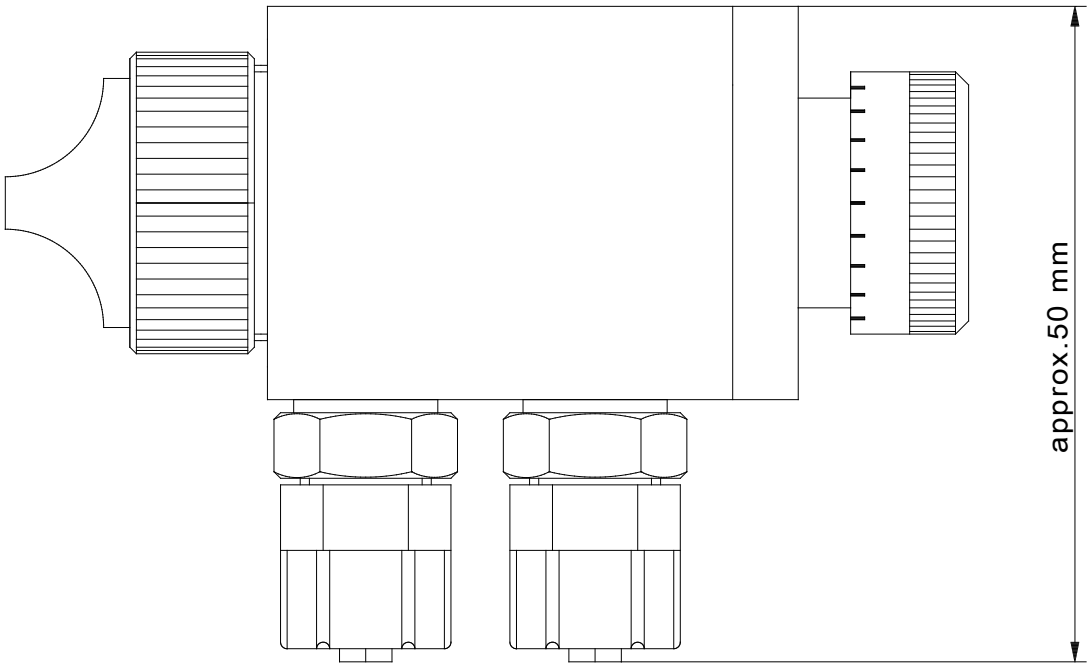
Fault	Possible Cause	Action
Nozzle needle does not open	Not enough control air supplied	Check if enough control air available (3 - 6 bar).
	Leakages	Check if O-Ring (9.1) is defective.
	Needle is sticky within the needle sealing (8.1 / 8.4).	Disassemble and clean.
	Needle stroke is set too low.	Check if needle stroke is correctly set.

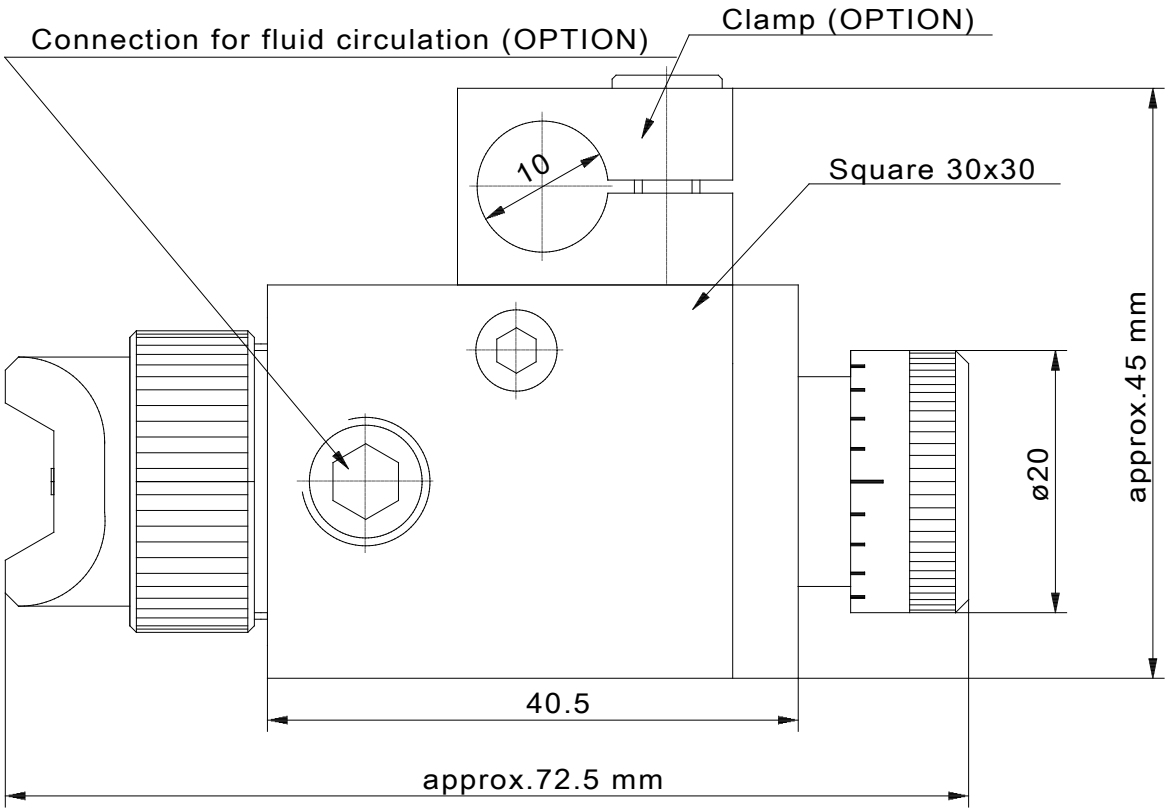
9.3 Spray Image/ Type of Defect

SPRAY IMAGE	PROBLEM	CAUSE	ACTION
	Normal Spray Image (Flat jet)		
	Normal Spray Image (Round jet)		
	Spray image shaped too much upwards and downwards	Soiled air cap Soiled nozzle	Clean nozzles
	Spray image too much left-sided or right-sided	Soiled air cap Soiled nozzle	Clean nozzles
	Heavy application in the middle of the spray image	Too much material Material too thick	Reduce material supply Dilute material
	Split spray image	Too little material Pressure flat jet too high	Increase material supply Increase pressure for round jet

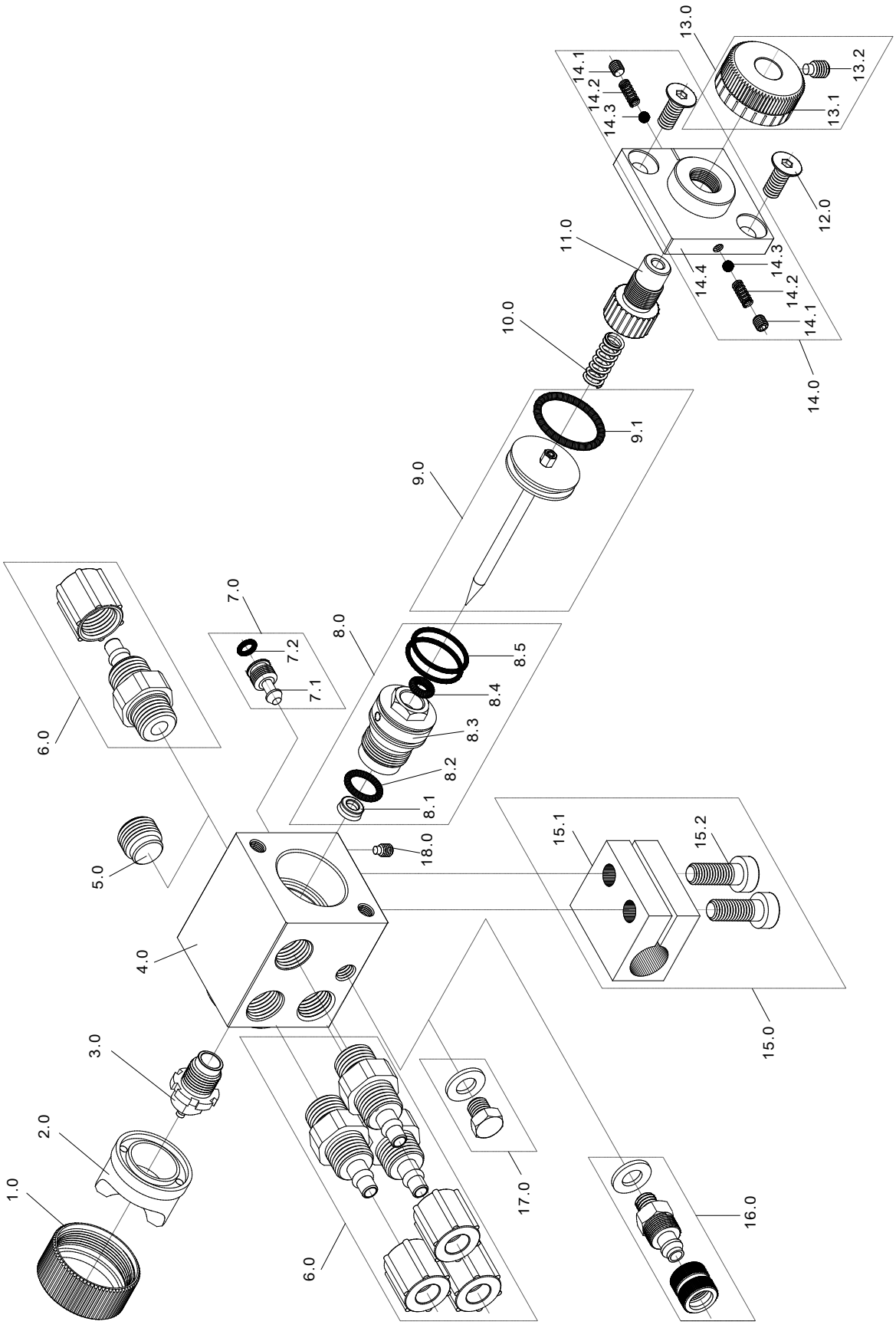
10 Appendix

10.1 Dimensioned Drawing for SMS-11 (Standard)





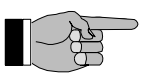
10.1.1 Spare Part Drawing for SMS-11 (Standard)



10.1.2 Spare Part List for SMS-11 (Standard)

Fig.-No.	Article-No.	Qty	Description
1.0	97410028	1	collar ring, ø 23 x 10mm
2.0	*	1	air cap, flat-spray, ø 20 x 14.5mm
2.1	*	1	air cap, round-spray, ø 20 x 11mm
3.0	*	1	nozzle, stainless steel, ø 12 x 18mm
4.0	97510345	1	valve body ASV, stainless steel, complete
5.0	97220300	1	screw, stainless steel, 1/8"
6.0	*	3/4	screw for material and air
7.0	97380032	1	regulating screw (round-/flatspray regulation), complete
7.1	97380033	1	regulating screw, M6x0.5 x 11mm
7.2	97640364	1	o-ring 4 x 1 / Viton
8.0	97810054	1	retainer, complete
8.1	97640155	1	shaped gasket 3.0 x 2.15 x 1.35
8.2	97640317	1	o-ring 7 x 1.5 / Viton
8.3	97810053	1	retainer, ø 14.94 x 19.5mm
8.4	97640026	1	o-ring 2.9 x 1.78 / Viton
8.5	97640316	2	o-ring 13 x 1 / Viton
9.0	*	1	needle, complete
9.1	97640007	1	o-ring 14 x 1.78 / Viton
10.0	97820076	1	spring 0.9 x 24mm
11.0	97320318	1	ratchet screw, ø 13 x 18.5mm
12.0	97610055	2	screw DIN 7991 M4 x 10
13.0	97320668	1	regulating knob, stainless steel, complete
13.1	97320609	1	regulating knob, ø 20 x 9mm, stainless steel
13.2	97610034	1	pin DIN 915 M4 x 6
14.0	97511021	1	closing plate, complete
14.1	97610017	2	pin DIN 913 M3 x 3
14.2	97820077	2	spring 0.4 x 5.5mm
14.3	97650004	2	ball, stainless steel, ø 2.5mm
14.4	97510346	1	closing plate, stainless steel, 30 x 30 x 10.5mm
15.0	97910015	1	clamp, complete (OPTION)
15.1	97910014	1	clamp, 21.5 x 25 x 15mm
15.2	97610042	2	screw DIN 6912 M5 x 14
16.0	97220089	1	screw M5, SW8 x 19mm, complete (OPTION)
17.0	97610063	1	screw M5, complete with seal
18.0	97610249	1	pin DIN 915 M3 x 3

* Article numbers can be found on the following pages.



IMPORTANT
Always indicate the inscribed serial numbers when ordering spare parts!

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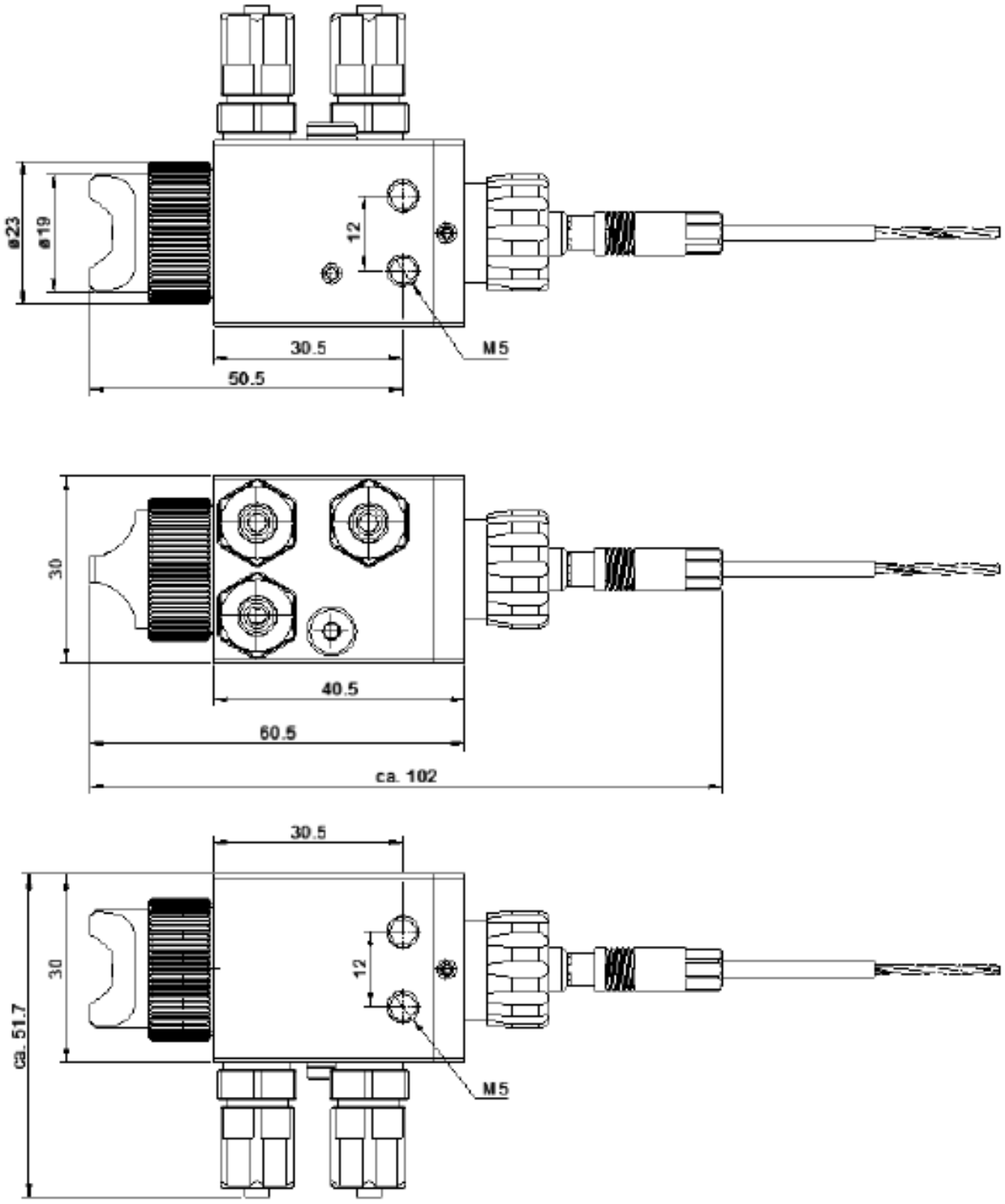
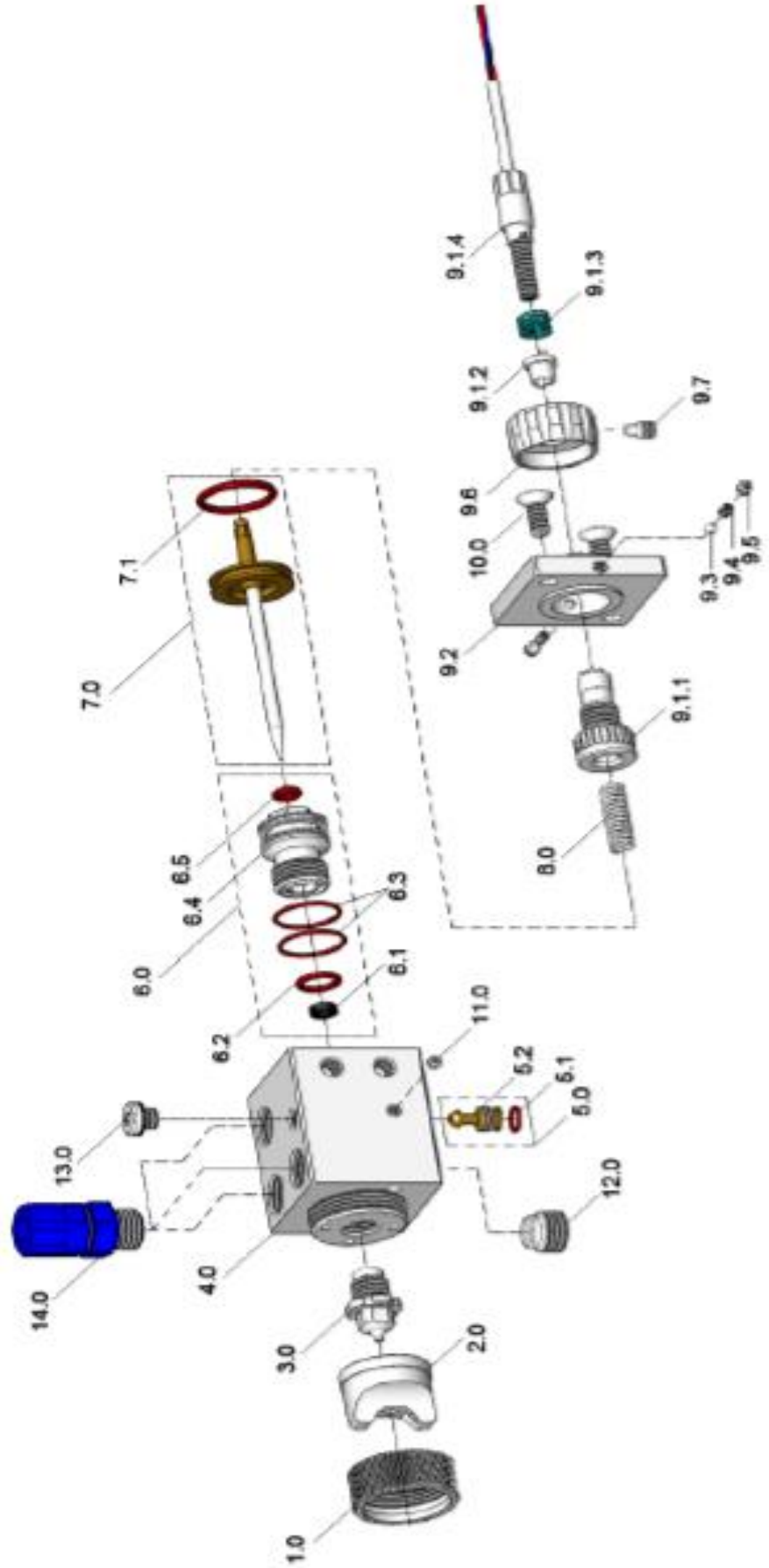
10.2 Dimensioned Drawing for SMS-11 (Raster-Needle Sensor)



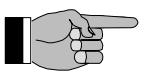
10.2.1 Spare Part Drawing for SMS-11 (Raster-Needle Sensor)



10.2.2 Spare Part List for SMS-11 (Raster-Needle Sensor)

Fig.-No.	Article No.	Qty	Description
1.0	97410028	1	Collar ring
2.0	*	1	Air cap, flat-spray, diam. 20 x 14.5mm
2.1	*	1	Air cap, round-jet, diam. 20 x 11mm
3.0	*	1	Nozzle, stainless steel, diam. 12 x 18mm
4.0	97510345	1	Main body SMS-11, stainless steel, complete
5.0	97380032	1	Throttling screw, complete
5.1	97640364	1	O-ring / Viton®
5.2	97380033	1	Throttling screw
6.0	97810054	1	Retainer, complete
6.1	97640155	1	Variseal
6.2	97640317	1	O-ring / Viton®
6.3	97640316	2	O-ring / Viton®
6.4	97810053	1	Retainer
6.5	97640026	1	O-ring / Viton®
7.0	*	1	Nozzle needle, complete
7.1	97640007	1	O-ring / Viton®
8.0	97820076	1	Pressure spring
9.0	97511494	1	Cover plate, complete
9.1	97320923	1	Sensor spindle, complete
9.1.1	97320820	1	Raster screw, diam. 13 x 23.5mm, stainless steel
9.1.2	97320317	1	Regulating spindle carrier, st.steel, 7 x 7.5mm
9.1.3	97820074	1	Pressure spring 0.60 x 6.70mm
9.1.4	97320670	1	Sensor holder, st.steel, 7 x 18mm, complete
9.2	97511020	1	Cover plate, 30 x 30 x 10.5mm
9.3	97650004	2	Ball, stainless steel
9.4	97820077	2	Pressure spring
9.5	97610017	2	Threaded pin DIN 913
9.6	97320821	1	Regulating knob, diam. 19 x 10mm, stainless steel
9.7	97610034	1	Threaded pin DIN 915
10.0	97610055	2	Countersunk screw DIN 7991
11.0	97610249	1	Threaded pin DIN 915
12.0	97220300	1	Locking screw, stainless steel, 1/8"
13.0	97610063	1	Locking screw M5, complete with sealing
14.0	97220022	3	Straight screw-in screw joint 1/8" - 6/4 KU

* Article numbers are indicated on the following pages.



IMPORTANT
Always indicate the inscribed serial numbers when ordering spare parts!

10.3 Article Numbers for Air Caps

2.0	***Air cap, Flat-jet, Standard, 60° (Ø20x14.5mm)***	
Article-No.	**Description**	
97310234	Air cap, Flat-jet, 0.2-1.0mm	
97310235	Air cap, Flat-jet, 1.2-1.5mm	
97310236	Air cap, Flat-jet, 1.8-2.0mm	
97310237	Air cap, Flat-jet, 2.5mm	

2.0	***Air cap, Flat-jet, Standard, 90° (Ø20x14.5mm)***	
Article-No.	**Description**	
97310238	Air cap, Flat-jet, 0.2-1.0mm	
97310239	Air cap, Flat-jet, 1.2-1.5mm	
97310240	Air cap, Flat-jet, 1.8-2.0mm	
97310241	Air cap, Flat-jet, 2.5mm	

2.0	***Air cap, Flat-jet, KLS, 60° (Ø20x14.5mm)***	
Article-No.	**Description**	
97310242	Air cap, Flat-jet, KLS 0.2-1.0mm	
97310243	Air cap, Flat-jet, KLS 1.2-1.5mm	
97310244	Air cap, Flat-jet, KLS 1.8-2.0mm	
97310245	Air cap, Flat-jet, KLS 2.5mm	

2.0	***Air cap, Flat-jet, KLS, 90° (Ø20x14.5mm)***	
Article-No.	**Description**	
97310246	Air cap, Flat-jet, KLS 0.2-1.0mm	
97310247	Air cap, Flat-jet, KLS 1.2-1.5mm	
97310248	Air cap, Flat-jet, KLS 1.8-2.0mm	
97310249	Air cap, Flat-jet, KLS 2.5mm	

2.1	***Air cap, Round-jet, Standard, 15° (Ø20x11mm)***	
Article-No.	**Description**	
97310034	Air cap, Round-jet, 0.2-1.0mm	
97310035	Air cap, Round-jet, 1.2mm-1.5mm	
97310080	Air cap, Round-jet, 1.8-2.0mm	
97310091	Air cap, Round-jet, 2.5mm	

2.1	***Air cap, Round-jet, KLS, 15° (Ø20x11mm)***	
Article-No.	**Description**	
97310084	Air cap, Round-jet, KLS 0.2-1.0mm	
97310085	Air cap, Round-jet, KLS 1.2-1.5mm	
97310086	Air cap, Round-jet, KLS 1.8-2.0mm	
97310250	Air cap, Round-jet, KLS 2.5mm	

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2.1	***Marking Air cap, Round jet 8° (Ø20x18mm)***	
Article-No.	**Description**	
97310578	Marking air cap, 0.2-0.5mm	
97310727	Marking air cap, 0.8-1.0mm	

2.1.	***Special spin air cap, round jet***	
Article No.	**Description**	
97310197	Special spin 0.2-2.0mm	

10.4 Article Numbers for Nozzles

3.0	***Nozzle, Standard, stainless steel (Ø12x18mm)***	
Article-No.	**Description**	
97210110	Nozzle, Standard, 0.2mm	
97210111	Nozzle, Standard, 0.3mm	
97210112	Nozzle, Standard, 0.5mm	
97210113	Nozzle, Standard, 0.8mm	
97210114	Nozzle, Standard, 1.0mm	
97210115	Nozzle, Standard, 1.2mm	
97210116	Nozzle, Standard, 1.5mm	
97210117	Nozzle, Standard, 2.0mm	
97210118	Nozzle, Standard, 2.5mm	

3.0	***Nozzle, KLS, stainless steel (Ø12x17.2mm)***	
Article-No.	**Description**	
97210119	Nozzle, KLS, 0.2mm	
97210120	Nozzle, KLS, 0.3mm	
97210121	Nozzle, KLS, 0.5mm	
97210122	Nozzle, KLS, 0.8mm	
97210123	Nozzle, KLS, 1.0mm	
97210124	Nozzle, KLS, 1.2mm	
97210125	Nozzle, KLS, 1.5mm	
97210126	Nozzle, KLS, 2.0mm	
97210564	Nozzle, KLS, 2.5mm	

3.0	***Marking nozzle, stainless steel 8°(Ø8x18mm)***	
Article-No.	**Description**	
97212056	Marking nozzle 0.2mm	
97211875	Marking nozzle 0.3mm	
97211461	Marking nozzle 0.5mm	
97212146	Marking nozzle 0.8mm	

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3.0	***Nozzle, special spin, stainless steel (Ø12x18mm)***	
Article No.	**Description**	
97210483	Nozzle, special spin, 0.2mm	
97210484	Nozzle, special spin, 0.3mm	
97210482	Nozzle, special spin, 0.5mm	
97210485	Nozzle, special spin, 0.8mm	
97211030	Nozzle, special spin, 1.0mm	
97212510	Nozzle, special spin, 1.5mm	
97212397	Nozzle, special spin, 2.0mm	

10.5 Article Numbers for Nozzle Needles

9.0	***Nozzle needle complete, standard and marking, Special spin, VITON***	
Article-No.	**Description**	
97110884	Nozzle needle, Standard, 0.2/0.3mm	
97110885	Nozzle needle, Standard, 0.5mm	
97110886	Nozzle needle, Standard, 0.8mm	
97110887	Nozzle needle, Standard, 1.0mm	
97110888	Nozzle needle, Standard, 1.2mm	
97110889	Nozzle needle, Standard, 1.5mm	
97110890	Nozzle needle, Standard, 2.0mm	
97110891	Nozzle needle, Standard, 2.5mm	

9.0	***Nozzle needle complete, KLS, VITON***	
Article-No.	**Description**	
97110900	Nozzle needle, KLS, 0.2/0.3mm	
97110901	Nozzle needle, KLS, 0.5mm	
97110902	Nozzle needle, KLS, 0.8mm	
97110903	Nozzle needle, KLS, 1.0mm	
97110904	Nozzle needle, KLS, 1.2mm	
97110905	Nozzle needle, KLS, 1.5mm	
97110906	Nozzle needle, KLS, 2.0mm	
97110907	Nozzle needle, KLS, 2.5mm	

10.6 Wear-and-Tear Parts

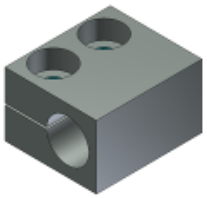
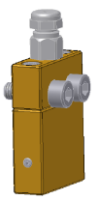
	Wear-and-Tear Parts Kit complete for SMS-11 (Standard)[1]
Article-No.	**Description**
97640319	Wear Parts Kit for SMS-11, VITON

[1] We recommend this wear-and-tear kit when exchanging nozzle needles and nozzle.

10.7 Screw-Joints

6.0	***Straight screwed joint for material and air***	
Article-No.	**Description**	
97220022	Straight screwed joint with nut SW 13x28mm /1/8-6/4 (Standard)	
97220243	Straight screwed joint with nut SW 13x28mm /1/8-8/6	

10.8 Accessories

Figure	Article Number	Description
	97xxxxxx	Nozzle extension (see Product Catalog ACCESSORIES)
	97410042	Retainer ring hexagonal
	97410059	Retainer ring stainless steel
	97910015	Clamp mounting (see Product Catalog ACCESSORIES)
	97910283	*Quick change adapter* (see Product Catalog ACCESSORIES)
	979565.004	Hot plate (see Product Catalog ACCESSORIES)
	979444	Cleaning set (see also Product catalog ACCESSORIES)

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