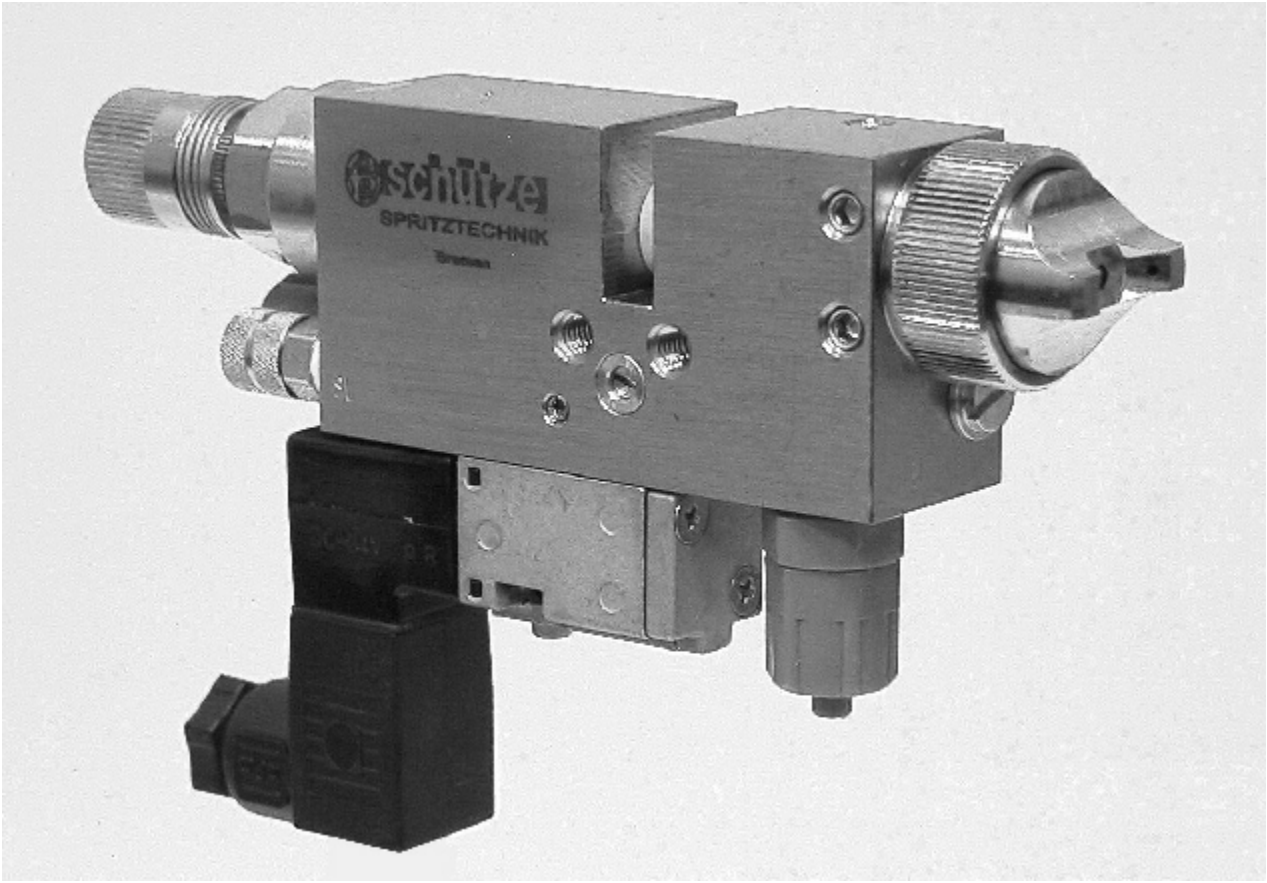
Operating Manual
for
sprayvalve MKDD-IS



Read this manual carefully before installing, operating or servicing this equipment.
Keep always handy for further use.

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- Spritztechnik – Spraytechnology -

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1 Introduction

The spray valves of series **MKDD – IS** are spezial designed for the application of glues and adhesives. A spezial of this valve is the integrated atomizing air valve, which allows an independent regulation of purging air time (for cleaning the nozzle and needle point). Depending on air cap this spray valve sprays in flat- or roundspray. Depending on viscosity of fluid, the application can be adjusted individually via nozzle dimension, atomizing air pressure and material pressure. The supply of atomizing air, control air and material should be done via three hoses. Spray valves are precision tools. Always keep clean and observe minimum instructions to maintain a long usefull life of the valve.

2 Safety

2.1 Duties of the user

- The user must read this service manual carefully before performing any operations.
- Application and service operations should not be carried out if the user is not absolutely sure of the purpose and consequence of the operations.

2.2 Definitive Use

The automatic spray valves **MKDD – IS** are pneumatically controlled spray valves. They are suitable for continuously or intermittent use. They are not suitable for spraying aggressive fluids like acid, alkaline solutions, cleaning agents, chemicals etc.. In case of doubt, please contact the manufacturer.

2.3 Warning against danger

This operating manual warns users of operations which may put their health at risk. The warnings are indicated by combinations of text and symbols corresponding to the different danger classes.

WARNING!

Signs a possible dangerous situation.
If you don´t avoid, *death or severe injuries* can follow.

CAUTION!

Indicates a situation which may be dangerous.
Failure to heed the caution may result in *personal injury*. This indication is also used where material damage is possible.

IMPORTANT!

Indicates tips for usage and other helpful information.

3 Function Description

The automatic spray valves **MKDD – IS** are pneumatically controlled spray valves for application of fluids as f.i. glues, adhesives, fats, colours etc. The extreme short control air distance, reached throw the direct mounted 5/2-way solenoid valve (17.0.0), givesthese valves very fast and exact needle (7.0.0) intermission cycles. The needle piston receives to the larger piston surface air pressure from the 5/2-way solenoid valve. This opens the needle. When the air pressure to the larger piston is switched off, the constant air pressure on the smaller piston surface closes the needle
The spring (9.6.3) during the normal use of valve is not in function. Only when the air pressure supply is defective or switched off, this spring closes the needle. This guarantees, that no fluid comes out from the nozzle during working interruptions or when air supply should fail or any other reason.

To prevent fluid to form drops instead of being atomized, the MKDD – IS work with “pre-air” and “purging-air”. The time of “purging-air” can be regulated individually. Turning the adjusting screw (10.4.0) with a screwdriver, the time of “purging-air” will be regulated as under:

turning clockwise = longer „purging-air“
turning anticlockwise = shorter „purging-air“

Set working pressure of atomizing air and fluid pressure according to required droplet sizes. The spray jet can be intermittend or continouosly.

Controlled by the 5/2-way solenoid valve (17.0.0), the control air impulses (M5-connection, draw-no. 21.0.0) are led to the piston.
Set the control air according to the speed of intermittents. From 5 intermittents per second on, the control air has to be at least 5 bar.

4 Installation

The spray valve **MKDD – IS** can be installed in any position. The distance to the application surface depends on the width of application desired.
Vibrations of the valves caused by fast intermitting cycles require solid and massive installation. Vibrations of the equipped machine to the valves should be limited as far as possible.

4.1 Hose connection

The three hoses have to be assambled as under:

1. atomizing air (blue) to 1/8“-screw (21.1.0)
2. control air (black) to M5-screw (21.0.0)
3. material (transparent) to 1/8“-screw (21.2.0)

4.2 Operating instructions

CAUTION !
Never point the sprayjet against persons. Wearing eye protection is strongly recommended. Spraying procedures cause noises depending on the used pressure. If necessary, wearing of ear protection is recommend.

WARNING !
Danger caused by combustible and noxious spraying material. Safety instructions on fluid can and material data of fluid manufacturer must definitely be observed.

The spray valves MKDD – IS are working with a control air pressure of 5 – 6 bar. The atomizing air pressure must be less than the material pressure. This avoids flow back of material. If high material pressure are required, please observe in any case the safety regulations of the employee´s compensation departments.

The travel of needle is giving way to fluid as adjusted by regulating knob (9.1.3). Turning this knob in:
anticlockwise turn : more fluid
clockwise turn : less fluid
One revolution of regulating knob (9.1.3) gives 0,5mm more stroke.

IMPORTANT !
The maximum fluid outlet is already reached, when no further ratchets are noticeable. Do not turn the regulating knob (9.1.3) in anti-clockwise turn any further.

IMPORTANT !

To avoid damages to nozzle and needle adjust decrease of fluid flow (turning regulating knob 10.1.1 clockwise) only when fluid is emitted from the nozzle. This is the only way to observe the steady reduction of fluid flow until an absolute stop of fluid. Going on to turn the regulating knob clockwise would at once push the needle into the nozzle to such an extant that both parts could be damages. This applies expecially to valves where needle regulation is execute by hexagon key (special design, not shown in sectional drawing).

It is harmless to leave fluid within the valve (no connection to outside air), if system stays under pressure.

5 Repair and Maintance

Before starting maintenance or repair work, ensure that all air operated tools are disconnected from the air supply.

WARNING !

Danger caused by combustible and noxious spraying material. Safety instructions on fluid can and material data of fluid manufacturer must definitly be observed.

WARNING !

Before opening the spray valve it has to be disconnected from the air and fluid supply.Otherwise ejected elements can cause danger.

These spray valves are high precision tools. Always keep clean and observe minimum instructions to maintain a long and useful life of valve. We recommend lubricating moveable parts regularly, and greasing threads, especially the nozzle threads, when replacing or cleaning the nozzle. It is recommended to use clean and filtered application fluid only. Also atomizing air should be clean. Control air should be slightly oiled.

5.1 Cleaning

To clean valve, spray solvent until pure solvent leaves nozzle. Do not submerge entire valve in solvent. At longer working interruptions it is advisable to clean air cap and nozzle by putting these parts only into solvent. If necessary use a soft brush. Moving parts and threads should alway be greased slightly. The spray valve should be cleaned using an appropiate thinner. To clean small drill holes, use our special nozzle cleaning needles.

5.2 Possible case of failure: Needle sticks

- Check, if current on solenoid valve (slight click noise)
- Check, if sufficient control / operating air is supplied (5 - 6 bar).
- Check, if o-ring (6.2.0), o-ring (7.4.0) or o-ring (7.5.0) are in propper order.
- Check, if needle (7.0.0) is dirted by f.i. glue residues or sticks within nozzle.
- Check, if minimum of travel of needle is set.

5.3 Replacing air valve (11.0.0)

Screw out lock screw (11.1.0). Take out spring (11.3.0) and remove piston (11.2.0). If necessary, change o-rings (11.1.1 + 11.2.1) Re-assemble new parts in reverse order slightly greased.

5.4 Replacing non return valve, complete (10.0.0)

Screw out adjusting screw (10.4.0). Screw out pin (10.6.0). Instead of the adjusting screw (10.4.0) a screw M 3 thread is to be used to pull out the base housing (10.1.0).If necessary, replace non return gasket (10.5.0) as well as o-rings (10.2.0 and 10.3.0). Re-assemble new parts in reverse order slightly greased.

5.5 Replacing needle (7.0.0) and nozzle (2.1.0)

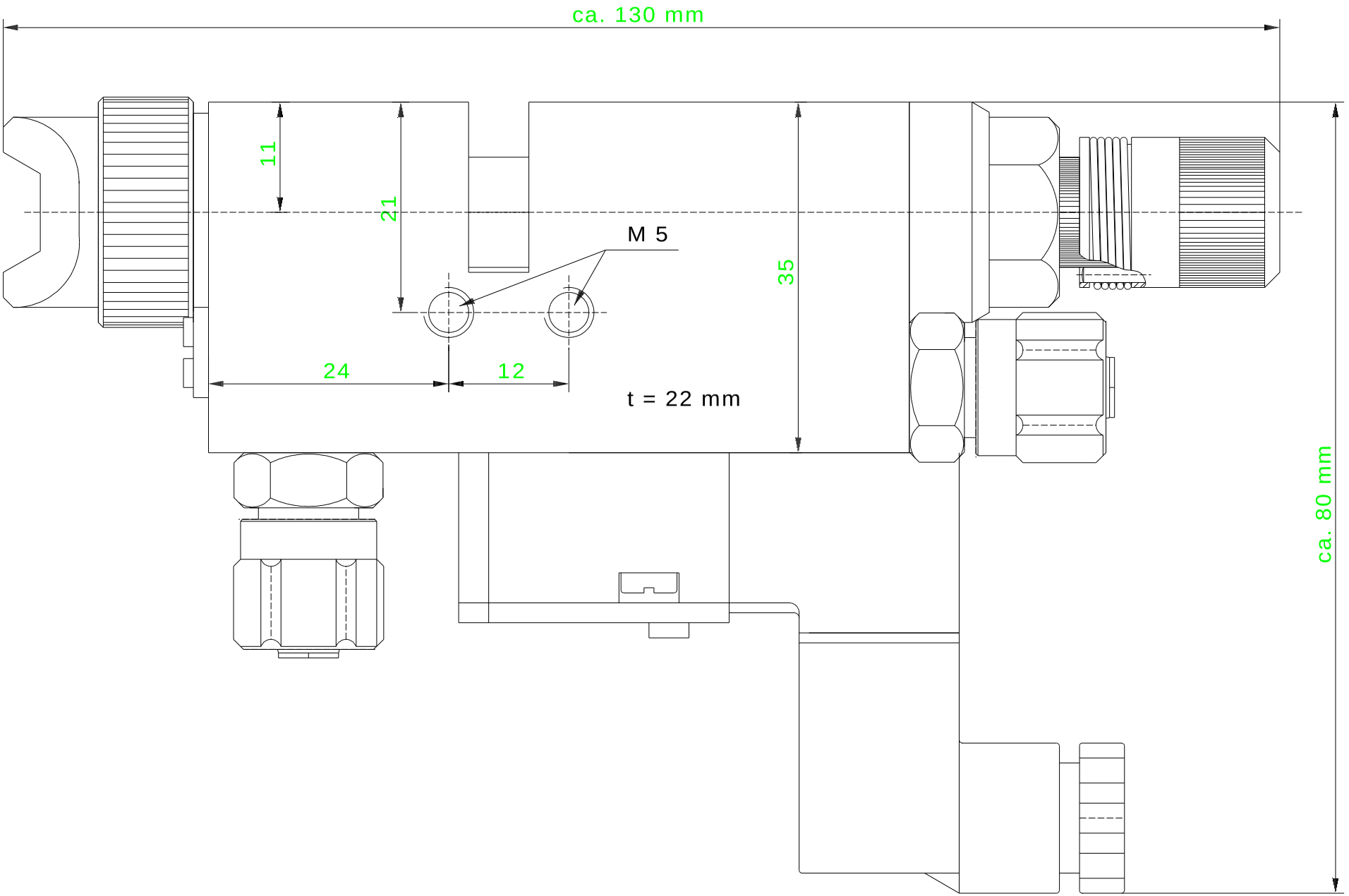
Screw out ratchet assembly, complete (9.0.3). Take off collar ring (3.1.0) and air cap (1.1.0). Screw out nozzle (2.1.0). Carefully push out needle (7.0.0) from the nozzle side to the rear. Re-assemble new parts in reverse order sightly greased. It is not recommended to use old needles because even slightly damaged needle shafts would immediatly cause leakage in shaped gasket (5.1.0)

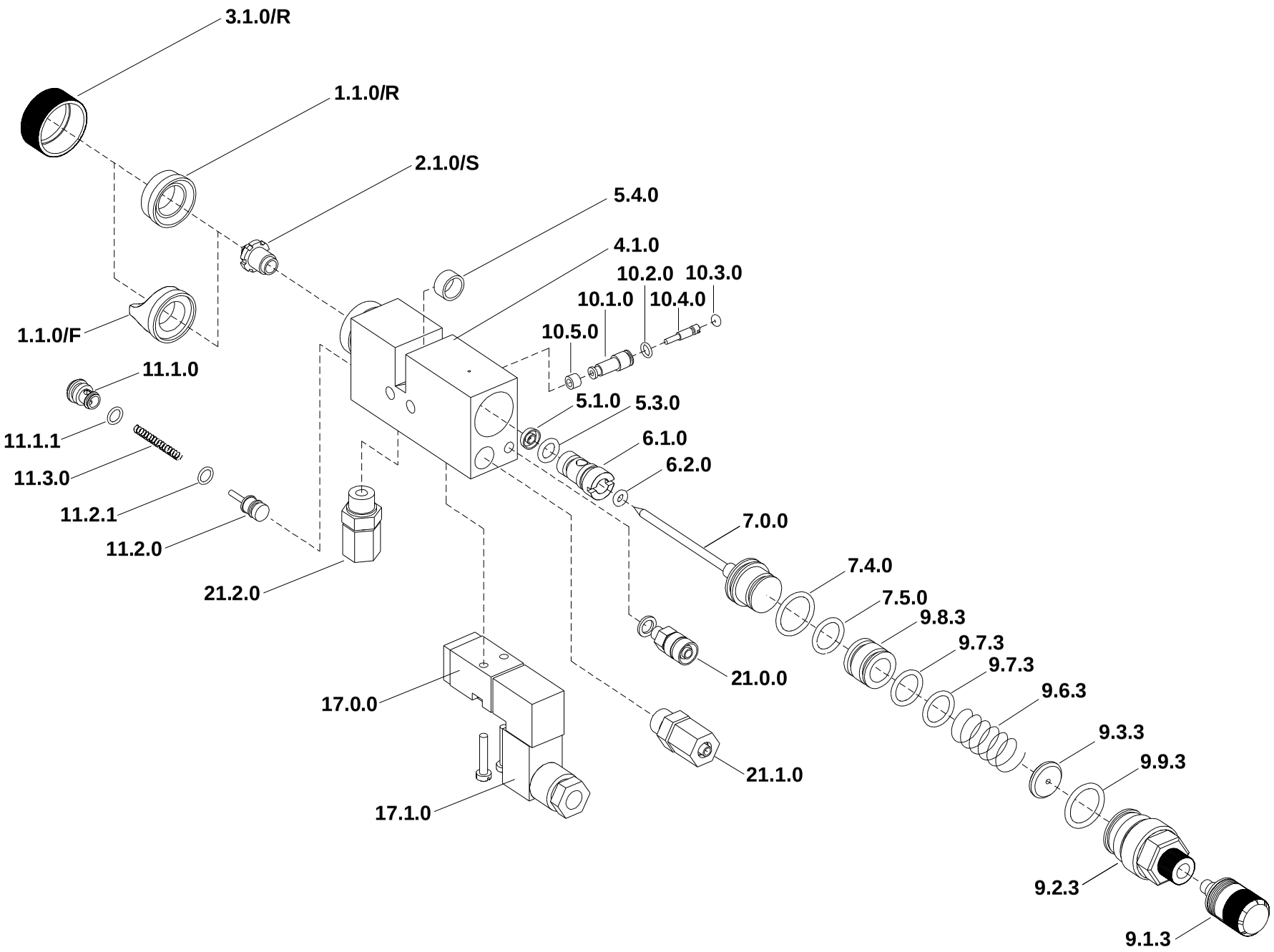
5.6 Replacing retainer set (6.0.0) complete with packing set (5.0.0)

Unscrew needle lock (9.2.3), take out spring (9.6.3) and pull out needle (7.0.0) by using flat nose plier (be carefull: needle in most cases is made of brittle tungsten carbide). Then usingn a screwdriver loosen retainer (6.1.0) till end of thread. As retainer can not go through the thread by itself because of o-ring (5.3.0), it has to be carefully pushed through be means of a thin metal sheet of 0,5 – 1,0mm placed between gun body recess and retainer. After passing thread retainer is accessible for taking out or housing.

5.7 Mounting gaskets and o-rings:

In case a new retainer set is not available to be replaced as a complete unit, the used retainer has to be cleaned thoroughly especially the o-ring groove and seats. These should also be greased slightly. O-ring (6.2.0) is to be placed first into ground of the rear retainer bore. O-ring (5.3.0) then into the outer groove. Mounting the gasket on the „fluid side“ first place o-ring (5.2.0) into the front retainer bore. After that insert gasket (5.1.0) into the center of o-ring. The shaped gasket (5.1.0) is not symetrical. The somewhat wider opening must be positioned to point to the front of spray valve i.e. after assembling retainer in direction fluid nozzle. When inserting o-rings and gaskets do not use any sharp or pointed metallic implements. Mainly the gasket as a very precise and sensitive component is not able to stand impacts. Completed retainer (6.0.0) slightly greased then is put back into housing an without turning movement by means of a screwdriver is to be carefully pushed through housing thread observing outer o-ring (5.3.0). Lastly screw retainer into housing thread (tighten only slightly). O-rings employed are of first class viton quality and by no means should be substituted by minor qualities.


ca. 130 mm
11
21
35
M 5
24
12
t = 22 mm
ca. 80 mm


3.1.0/R
1.1.0/R
2.1.0/S
5.4.0
4.1.0
10.2.0
10.3.0
10.1.0
10.4.0
10.5.0
1.1.0/F
11.1.0
5.1.0
5.3.0
11.1.1
6.1.0
6.2.0
11.3.0
11.2.1
7.0.0
11.2.0
7.4.0
21.2.0
7.5.0
9.8.3
9.7.3
9.7.3
21.0.0
9.6.3
17.0.0
9.3.3
9.9.3
21.1.0
17.1.0
9.2.3
9.1.3

6. Sparepartslist

draw no.	part no.	Qty	Description
1.1.0	*	1	air cap, flatspray, KLS, Ø 20 x 14,5mm
1.1.0	*	1	air cap, roundspray, KLS, Ø 20 x 11mm
2.1.0	*	1	nozzle, KLS, stainless steel, Ø 12 x 15,2mm
3.1.0	410028	1	collar ring, Ø 23 x 10mm
4.1.0	510030	1	gun body MKDD-IS, complete
5.0.0	640102	1	packing set
5.1.0	640004	1	shaped gasket 2,65 x 2,0 x 2,8
5.3.0	640021	1	o-ring 6,07 x 1,78mm / Viton
5.4.0	640101	1	plastic protection cover, Ø 10 x 6mm
6.0.0	810014	1	retainer, complete, 11 x 21mm
6.1.0	810013	1	retainer, 11 x 21mm
6.2.0	640026	1	o-ring 2,90 x 1,78mm
7.0.0	*	1	needle KLS, stainless steel, complete, Ø 4x73mm
7.4.0	640007	1	o-ring 14,00 x 1,78mm
7.5.0	640005	1	o-ring 10,82 x 1,78mm
9.0.3	900004	1	ratchet assembly, Ø 21,3 x 49mm
9.1.3	610092	1	regulating knob, Ø 15 x 29,5mm
9.2.3	220092	1	needle lock SW 17 x 37mm
9.3.3	930000	1	disc, 14,5 x 3mm
9.6.3	820020	1	spring 1,1 x 22mm
9.7.3	640005	2	o-ring 10,82 x 1,78mm / Viton
9.8.3	710005	1	pison, Ø 14,5 x 14mm
9.9.3	640043	1	o-ring 15 x 1 / Viton
10.0.0	800015	1	non-return valve, complete
10.1.0	320010	1	base housing IS
10.2.0	640003	1	o-ring 4 x 1 / Viton
10.3.0	640009	1	o-ring 1,5 x 1 / Viton
10.4.0	610040	1	adjusting screw IS
10.5.0	640083	1	non-return gasket Ø 6 x 3,5mm
10.6.0	610032	1	pin DIN 914 M3 x 6mm (not in drawing)
11.0.0	800016	1	air valve, complete
11.1.0	320094	1	lock screw, 9 x 12mm, M8 x 0,75
11.1.1	640364	1	o-ring 4,5 x 1 / Viton
11.2.0	710004	1	piston, Ø 6,8 x 18,3mm
11.2.1	640077	1	o-ring 5 x 1 / Viton
11.3.0	820013	1	spring 0,3 x 25mm
17.0.0	*	1	5/2-way solenoid valve
21.0.0	220089	1	screw M5, complete, SW 8 x 19mm
21.1.0	220022	1	screw 1/8" / SW 13 x 28mm
21.2.0	220022	1	screw 1/8" / SW 13 x 28mm

* part-no. see the following pages.
When ordering nozzles, needles and air caps, please indicate nozzle dimension.
Available dimensions: 0,2 / 0,3 / 0,5 / 0,8 / 1,0 / 1,2 / 1,5 / 2,0 and 2,5mm ∅
In standard version all o-rings are made from viton.
Measurements of o-rings = inner diameter x thickness

6.1 Part-no. for needles, nozzles and air caps

*needle KLS, complete		
draw-no.	part no.	description
7.0.0	110187	0,2/0,3mm
7.0.0	110188	0,5mm
7.0.0	110189	0,8/1,0mm
7.0.0	110190	1,2mm
7.0.0	110191	1,5mm
7.0.0	110192	2,0mm

*nozzle KLS		
draw-no.	part no.	description
2.1.0	210119	0,2mm
2.1.0	210120	0,3mm
2.1.0	210121	0,5mm
2.1.0	210122	0,8mm
2.1.0	210123	1,0mm
2.1.0	210124	1,2mm
2.1.0	210125	1,5mm
2.1.0	210126	2,0mm

* air cap / flatspray 60° KLS (standard version)		
draw-no.	part no.	description
1.1.0	310081	for nozzle 0,2 - 1,0mm
1.1.0	310082	for nozzle 1,2 - 1,5mm
1.1.0	310083	for nozzle 2,0mm

* air cap / roundspray 15° KLS		
draw-no.	part no.	description
1.1.0	310084	for nozzle 0,2 - 1,0mm
1.1.0	310085	for nozzle 1,2 - 1,5mm
1.1.0	310086	for nozzle 2,0mm

* 5/2-way solenoid valve		
draw-no.	part no.	description
17.0.0	150015	solenoid valve 24V / DC / 1,8W with plug
17.0.0	150023	solenoid valve 24V / DC / 1,8W with LED-plug
17.0.0	150017	solenoid valve 110V / 50Hz / 1,8W with plug
17.0.0	150016	solenoid valve 220V / 50Hz / 1,5W with plug

7. Technical data

Measurements:
with air cap flatspray = 130mm x 22mm x 80mm
with air cap roundspray = 127mm x 22mm x 80mm

Weight = approx. 525g
Air consumption = approx. 150 l/min. (at 3 bar, nozzle 1,0mm and flatspray air cap)
Control air pressure = 5 – 6 bar
Atomizing air pressure = as required, but less then control air pressure
Material Pressure = max. 35 bar

Special designs on request. Technical alterations reserved. June 2001

8. Manufacturer declaration

The spray valves **MKDD – IS** were constructed and produced by
ALFRED SCHÜTZE Apparatebau GmbH, Hannoversche Straße 69-71, 28309 Bremen-Germany
in accordance with the guidelines and standards of DIN EN 292. This spray valve can be combined with other modules or machines, which comply to DIN EN 292, without limiting the conformity.

Place	Date	Signature of manufacturer
Bremen	29.06.2001