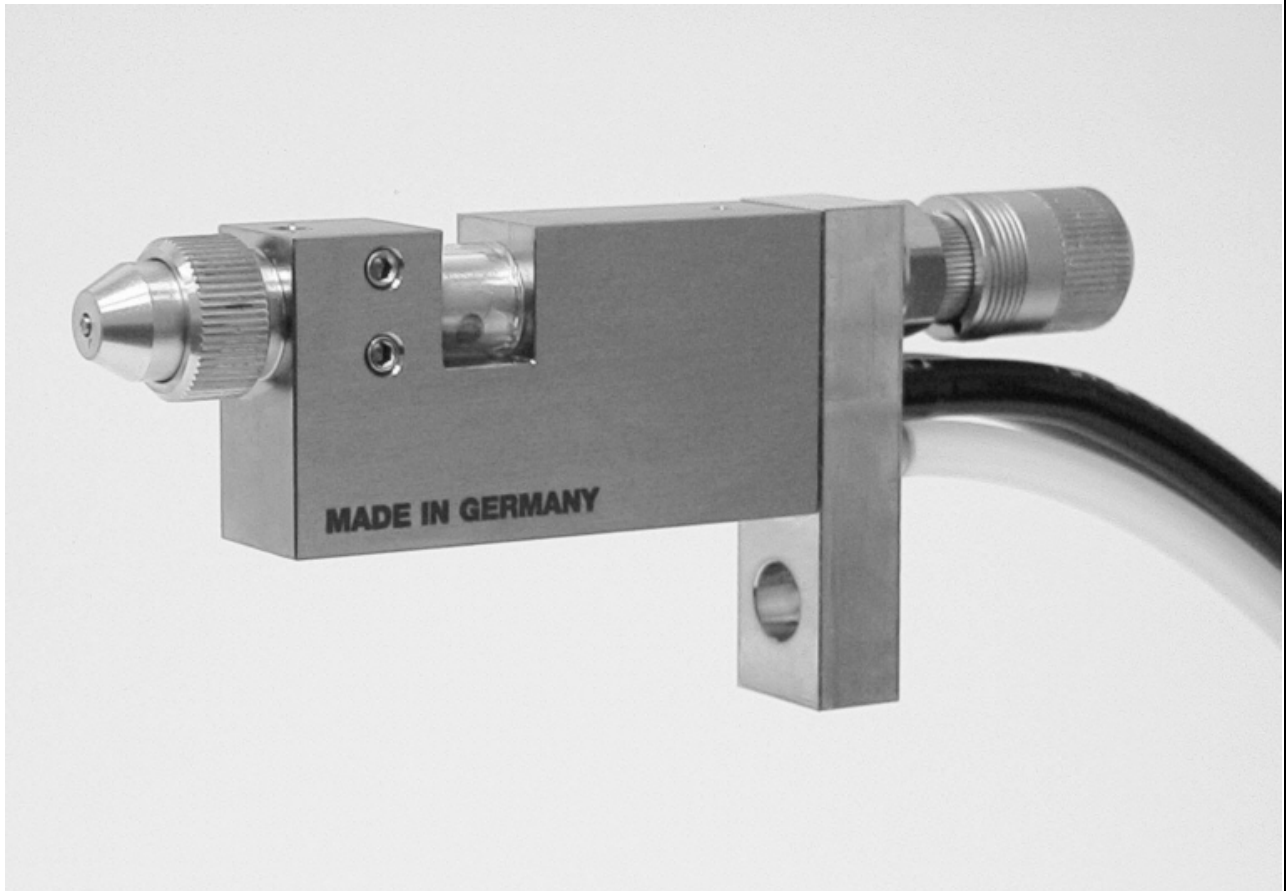


Operating manual for Mini-Automatic sprayvalve MMFS



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

1 Introduction

The Mini-Automatic sprayvalve **MMFS** is designed and constructed for application of thin materials f.i. release agents, colours or other fluids of low viscosity. This sprayvalve sprays in 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 valves.

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 Mini-Automatic sprayvalve **MMFS** is a pneumatically controlled sprayvalve. It is suitable for continuously or intermittent use. It is 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 Mini-Automatic sprayvalve **MMFS** is pneumatically controlled: air open; spring return.
The spraying material is to be fed to the valves via pressure tank or pump. The separate controlled atomizing air atomizes the material to a spray jet. This sprayvalve sprays in a very fine round spray jet.

4 Installation

The **MMFS** can be installed in any position. Vibrations of the valve caused by fast intermitting cycles require solid and massive installation. For solid attachment the use of mounting (9.1.0) is recommend. Distance to spraying surface varies of application. Vibration of the equipped machine to the valve should be limited as far as possible.

4.1 Hose connection and assembly

Connect hoses for atomizing air and control air to separately control valves (pressure reducers and solenoids). Then fluid hose to material pressure tank or other means of feeding fluid as under:

- atomizing air (Z) (hose blue):
 - è to 2/2 way solenoid
- control air (S) (hose black):
 - è to 3/2 way solenoid
- fluid (M) (hose transparent):
 - è to feeding device

The three hoses are fixed by the mounting (9.1.0). To assembly new hoses to the spray valve, unscrew ratchet assembly (10.0.3). Then take off the mounting with hoses. Connect new hoses to the hose sockets (11.1.0) and put hose sockets into the valve body (4.1.0). Assemble mounting (9.1.0) with correct side to the valve body (4.1.0).



IMPORTANT !

Nozzle and needle can be damaged. Before adjusting ratchet assembly to the valve body, please turn (open) regulating knob (10.1.1) anti-clockwise.

Turn (open) regulating knob anti-clockwise and screw in the ratchet assembly (10.0.3). Connect fitting (13.0.0) for control air and fittings (13.0.1) for material and atomizing air to the hoses.

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 combustibile and noxious spraying material. Safety instructions on fluid can and material data of fluid manufacturer must definitely be observed.

The valve **MMFS** needs at least 5 bar control air pressure. The atomizing air should be 0,2 – 6 bar. The maximum material pressure in standard version is 4 bar. For higher material pressures or using long hose length the use of mounting ¼" (9.1.1) is needed. In any case, please observe the regulations of the professional/trade association having liability for industrial safety and insurance.

When you are certain, that fluid pressure stands up to the nozzle, actuate 2/2 way solenoid for atomizing air. After that actuate 3/2 way solenoid for control air. This way you receive socalled "pre-air" prior to opening fluid flow. After each cycle solenoids are to actuate in reverse order, so you will still have "purging-air" after needle has closed nozzle and fluid flow was stopped. This prevent fluid to form out drops instead of being atomized.

Set atomizing air pressure and fluid pressure according to required spray droplet sizes. Two separate pressure reducers must be available. Intermittend use as well as continuous use is possible.

Standard version of valve has round spray jet. Depending on viscosity of fluid, nozzle diameters are available in 0,3 / 0,5 / 0,8 / 1,0 / 1,2 / 1,5 / 2,0mm Ø. The travel of needle is giving way to fluid as adjusted by the regulating knob (10.1.1). Turning this knob in anti-clockwise turn = more fluid; clockwise turn = less fluid.

One revolution of regulating knob (10.1.1) gives 0,5mm more or less stroke. Do not over-tight the regulating knob.



IMPORTANT !

The maximum fluid outlet is already reached, when no further ratchets are noticeable. Do not turn the regulating knob (10.1.1) 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 extent that both parts could be damaged. This applies especially to valves where needle regulation is executed 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 Maintenance

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 definitely 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.

The spray valve is a high precision tool. 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 always be greased slightly. The spray valve should be cleaned using an appropriate thinner. To clean small drill holes, use our special nozzle cleaning needles.

5.2 Trouble shooting

- If drops form on the retainer (6.1.0), the packing set (5.0.0) is worn out. To exchange gaskets, remove needle (see "4.3 changing nozzle set"). Then unscrew retainer (6.1.0) and change packing set (5.0.0).
Re-assemble in reverse order. The o-rings (6.2.0) and (7.4.0) are to be renewed if uncontrolled air blow is noticeable.
- If drops form on the nozzle (2.1.0), either needle or nozzle is worn and should be replaced. Or needle is not closing properly f.i. because of particle residues within nozzle.
- If there is an uneven and not steady spray jet: Make sure that nozzle (2.1.0) is screwed in tight. Other reason could also be dirt residue within air cap (chapter "4.1 cleaning").

5.3 Changing the nozzle set

A nozzle set includes needle (7.0.0), nozzle (2.1.0) and air cap (1.1.0)

If nozzle size is to be changed, always change all three parts. Change the complete set also when only one of the parts is defect. Before starting maintenance or repair work, ensure that all air operated tools are disconnected from the air supply.

- Remove ratchet assembly (10.0.3)
- Remove mounting (9.1.0) and hoses
- Pull out needle spring (8.1.0)
- Pull out needle (7.0.0)
- Remove air cap (1.1.0) and unscrew nozzle (2.1.0)

Before unscrewing nozzle, please observe that needle never is under spring pressure.

RE-ASSAMBLE IN REVERSE ORDER.

Please observe chapter “3.1 hose connection”.

Needle nuts (7.2.0) must be counter-screwed in such a position where “pre- and purging-air” works according to chapter “3.2 operating instructions”.

5.4 Changing gaskets



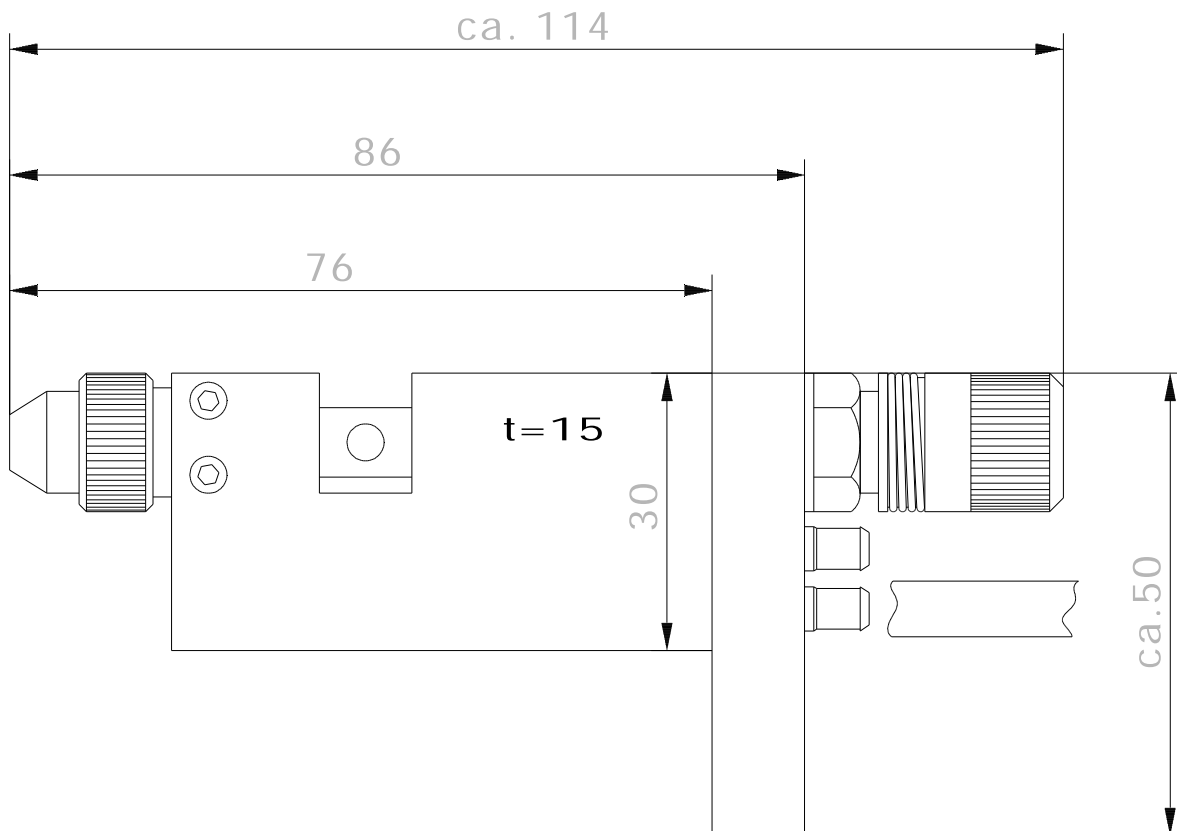
IMPORTANT !

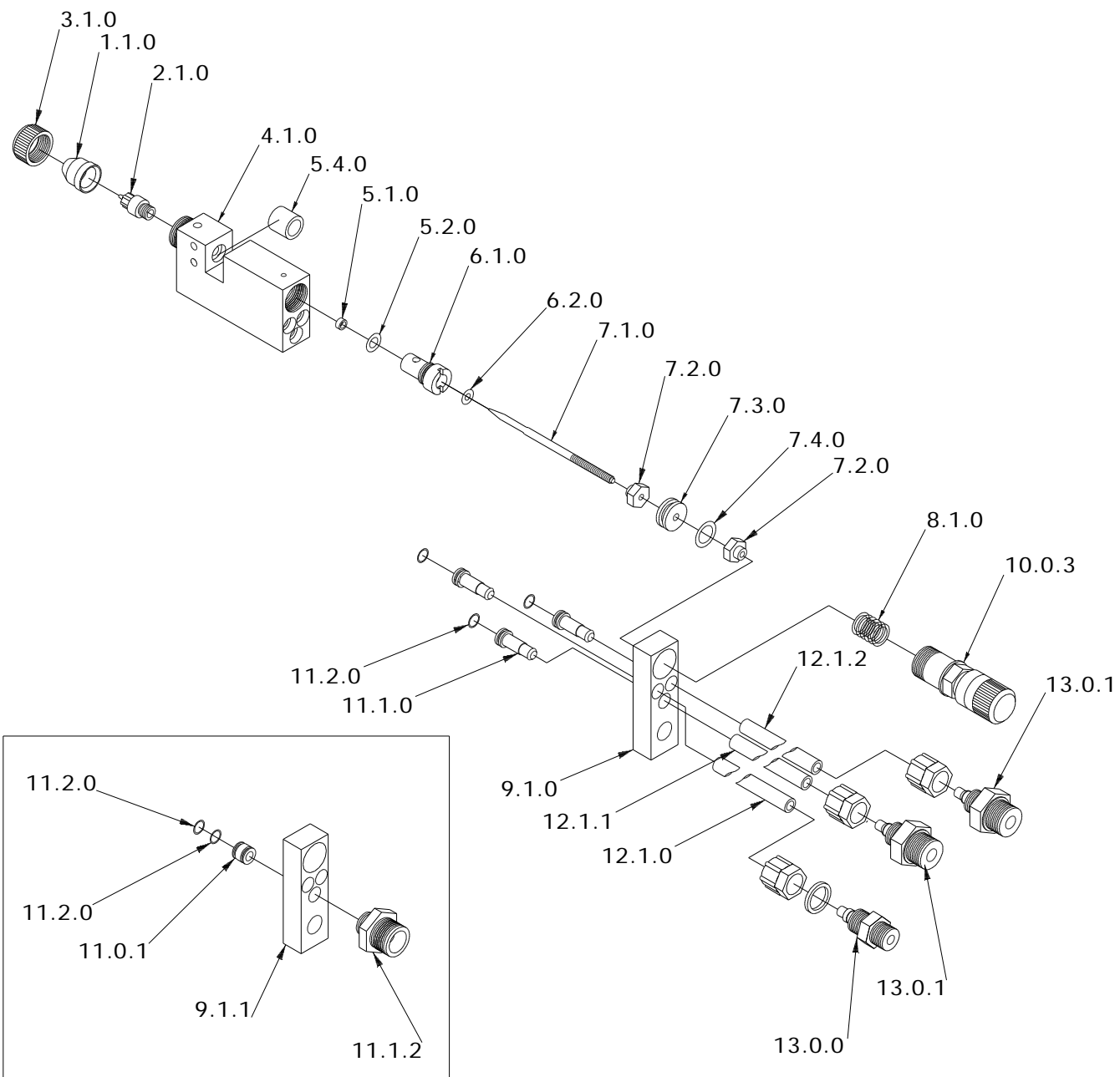
Do not use metalical aid to remove and insert gaskets and gasket seats !
Gaskets and gasket seats can be damaged.

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

- Remove ratchet assembly (10.0.3)
- Remove mounting (9.1.0) and hoses
- Pull out needle spring (8.1.0)
- Pull out needle (7.0.0)
- Unscrew retainer (6.1.0)

Pull out gaskets. New gaskets should be greased slightly. O-Ring (6.2.0) is to be placed into the retainer (6.1.0). O-ring (5.2.0) is to be placed into the seat of the retainer. After that insert shaped gasket (5.1.0) into the center of o-ring (5.2.0). The shaped gasket (5.1.0) is not symmetrical. The somewhat wider opening must be positioned to point to the front of spray valve i.e. after assembling retainer in direction “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 valve body (4.1.0). **RE-ASSAMBLE IN REVERSE ORDER.**





Sonderausführung Materialanschluß R 1/4"

6. Spareparts

draw-no.	part-no.	Qty.	Description
1.1.0	*	1	air cap, round spray (part-no. see overleaf)
2.1.0	*	1	nozzle, stainless steel (part-no. see overleaf)
3.1.0	410040	1	collar ring
4.1.0	510032	1	valve body
5.0.0	640105	1	packing set
5.1.0	640103	1	shaped gasket
5.2.0	640027	1	o-ring
5.4.0	640104	1	plastic protection cover
6.0.0	810016	1	retainer, complete
6.1.0	810015	1	retainer
6.2.0	640026	1	o-ring
7.0.0	*	1	needle, complete (part-no. see overleaf)
7.1.0	*	1	needle, stainless steel (part-no. see overleaf)
7.2.0	410041	2	needle nut
7.3.0	710007	1	piston
7.4.0	640001	1	o-ring
8.1.0	820020	1	needle spring
9.1.0	910016	1	mounting
9.1.1	910017	1	mounting 1/4"
10.0.3	900006	1	ratchet assembly, complete
10.1.1	610088	1	regulating knob with spring and pin
10.2.1	640106	1	lock
11.0.0	220096	3	hose socket, complete
11.1.0	220094	3	hose socket
11.2.0	640077	3	o-ring
11.0.1	320097	1	hose socket, complete
11.1.1	320096	1	hose socket
11.2.0	640077	2	o-ring
11.1.2	610064	1	double nipple 1/4" - 1/8"
12.1.0	340006	1m	hose, black (control air)
12.1.1	340007	1m	hose, translucent (fluid)
12.1.2	340005	1m	hose, blue (atomizing air)
13.0.0	220034	1	fitting 1/8"
13.0.1	220023	2	fitting 1/4"

* part-no. see next page.

When ordering nozzles, needles and air caps, please indicate nozzle dimension.

Available dimensions: 0,3 / 0,5 / 0,8 / 1,0 / 1,2 / 1,5 and 2,0mm Ø other dimensions on request.

In standard version all o-rings are made from viton.

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

*needle, complete		
draw-no.	part-no.	Description
7.0.0	110200	0,3mm
7.0.0	110201	0,5mm
7.0.0	110202	0,8mm
7.0.0	110203	1,0mm
7.0.0	110204	1,2mm
7.0.0	110205	1,5mm
7.0.0	110206	2,0mm

*needle		
draw-no.	part-no.	Description
7.1.0	110193	0,3mm
7.1.0	110194	0,5mm
7.1.0	110195	0,8mm
7.1.0	110196	1,0mm
7.1.0	110197	1,2mm
7.1.0	110198	1,5mm
7.1.0	110199	2,0mm

*nozzle		
draw-no.	part-no.	Description
2.1.0	210057	0,3mm
2.1.0	210058	0,5mm
2.1.0	210059	0,8mm
2.1.0	210060	1,0mm
2.1.0	210061	1,2mm
2.1.0	210062	1,5mm
2.1.0	210127	2,0mm

* air cap, round spray 15°		
draw-no.	part-no.	Description
1.1.0	310092	for nozzle 0,3 - 0,5mm
1.1.0	310093	for nozzle 0,8 - 1,0mm
1.1.0	310094	for nozzle 1,2 - 1,5mm
1.1.0	310095	for nozzle 2,0mm

7. Technical data

measurements with mounting	= 115mm x 15mm x 50mm
measurements without mounting	= 115mm x 15mm x 30mm
weight	= ca. 275g (without hoses)
air consumption	= ca. 38,3 ltr. (at 3 bar and 1,0mm nozzle)
pressure for control air	= 5 – 6 bar
pressure for atomizing air	= 0,2 – 8 bar
pressure for material	= max. 4 bar (for higher pressure special design available)

Special designs on request. Technical alterations reserved. December 2000