

# Operating manual for extrusion valve MKDD LV/KV



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

# 1 Introduction

The extrusion valves of series **MKDD** are very fast acting valves for continuous or intermitted use. They are suitable for the application of glues, adhesives, oils and sealing compounds.

With the long nozzles (LV) the valves can be sloped to each other such to achieve narrow nozzle distances. Also short nozzles (KV) are available. Depending on nozzle dimension and material pressure, fluids of different viscosities can be applied. Extrusion valves are precision tools. Always keep clean and observe minimum instructions to maintain a long useful 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 extrusion valve **MKDD** is a pneumatically controlled needle valve. It is suitable for application of fluids, especially glues and adhesives, continuously or intermittent use. They are not suitable for spraying aggressive fluids, like acids, alkaline solutions, cleaning agents, chemicals. When you are not sure, if your fluid is suitable for spraying 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 danger 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 Functional description

The extrusion valve **MKDD** is a pneumatically controlled valve for application of fluids as f.i. glues, adhesives, fats, colours, oils etc. The extreme short control air distance, reached through the directly mounted 3/2-way solenoid valve (15.0.0), gives this valve very fast and exact needle intermission cycles.

The needlepiston receives air pressure (= control air) by the 3/2-way solenoid valve to the larger surface of piston. This opens the needle. When the control air is switched off, the permanent air pressure (= control air) to the smaller surface of piston closes the needle. The spring (9.6.3) is during normal use out of operation, because the permanent control air to the smaller surface of needle piston press together the spring (9.6.3) by the piston (9.8.3). The spring (9.6.3) is only in operation, when air supply is defect or switched off. In this way no fluid can flow out from valve. The supply of fluid is to be obtained via pressure tank or pump. The MKDD LV/KV has an extrusion jet (without atomizing air).

The extrusion valves of series MKDD are very fast acting valves for continuous or intermitted use. Depending on application and quantity of needle intermission cycles the control air pressure has to be suited. From 5 intermission cycles per second, the control air pressure has to be at least 5 bar.

## 4 Installation and opening operations

The valve can be installed in any position. Vibrations of the valve caused by fast intermitting cycles require solid and massive installation. For solid attachment the valve body (4.1.0) is equipped with two drill-holes (M5 thread). Vibration of the equipped machine to the valve should be limited as far as possible.

### 4.1 Hose connection

Connect hoses (not included) for control air and material as follows:

1. Hose for control air to connection M5 (draw.-no.: 21.0.0)
2. Hose for material to connection 1/8" (22.2.0)

### 4.2 Operating instructions



#### CAUTION !

Never point the spray jet 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 pot and material data of fluid manufacturer must definitely be observed.

The extrusion valve **MKDD** is working with a control air pressure of 5-6 bar. If high material pressures are required, please observe in any case the safety regulations of the employee's compensation departments.

The valve can apply the fluid in contact as well as in non-contact to the surface. Intermittend use as well as continuous use is possible.

The travel of needle is giving way to fluid as adjusted by the 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 0,5 mm more or less stroke. Maximum stroke is 6 mm. 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 (9.1.3) in anticlockwise turn any further.



#### IMPORTANT !

To avoid damages to nozzle and needle, adjust decrease of fluid flow (turning regulating knob 9.1.3 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.

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 extrusion valves of series **MKDD** 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 fluids only. Control air should be slightly oiled.

### 5.1 Cleaning

To clean valve, spray solvent until pure solvent leaves the nozzle. Do not submerge entire valve in solvent. At longer working interruptions it is advisable to clean needle (7.0.0), retainer (6.1.0) and nozzle (2.1.0) by putting these parts only into solvent. If necessary use soft brush. Moving parts and threads should always be greased slightly. The valve should be cleaned using an appropriate thinner. To clean small drill holes, use our special nozzle cleaning needles.

### 5.2 Possible case of failure: Needle sticks

- 1) Check, if current on solenoid valve (slight click noise).
- 2) Check, if sufficient control air pressure is supplied (5 - 6 bar).
- 3) Check, if o-ring (6.2.0), o-ring (7.4.0) or o-rings (9.7.3) are defect.
- 4) Check, if needle (7.0.0) is stucked together within retainer (6.1.0).
- 5) Check, if minimum of travel of needle is set.

### 5.3 Changing needle (7.0.0) and nozzle (2.1.0)

Unscrew ratchet assembly (9.0.3). Unscrew nozzle (2.1.0). Pull out needle (7.0.0) on back side of needle piston by using a flat tong. Re-assemble new parts in reverse order slightly greased. It is not recommended to use old needles and nozzles because even slightly damaged needle shafts would immediately cause leakage in gasket (5.5.0).

### 5.4 Changing retainer (6.0.0)



### **IMPORTANT !**

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

Unscrew ratchet assembly (9.0.3). Unscrew nozzle (2.1.0). Pull out needle (7.0.0) on back side of needle piston by using a flat tong. Then using a screwdriver loosen retainer (6.0.0) till end of thread. As retainer can not go through the thread of valve body (4.1.0) 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 - 1,0 mm placed between gun body recess and retainer. After passing thread retainer is accessible for taking out of housing.

### 5.5 Replacing new gaskets



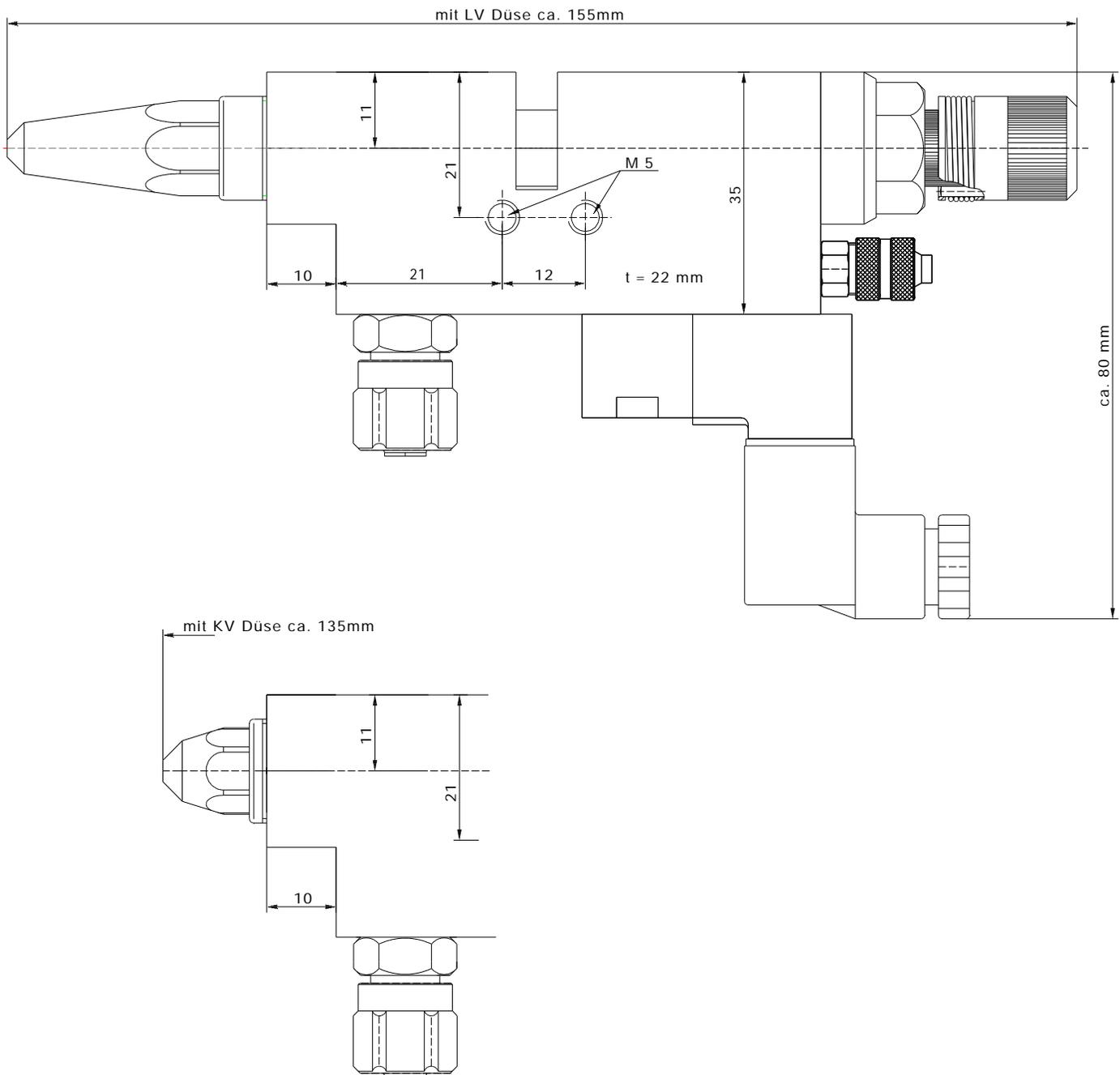
### **IMPORTANT !**

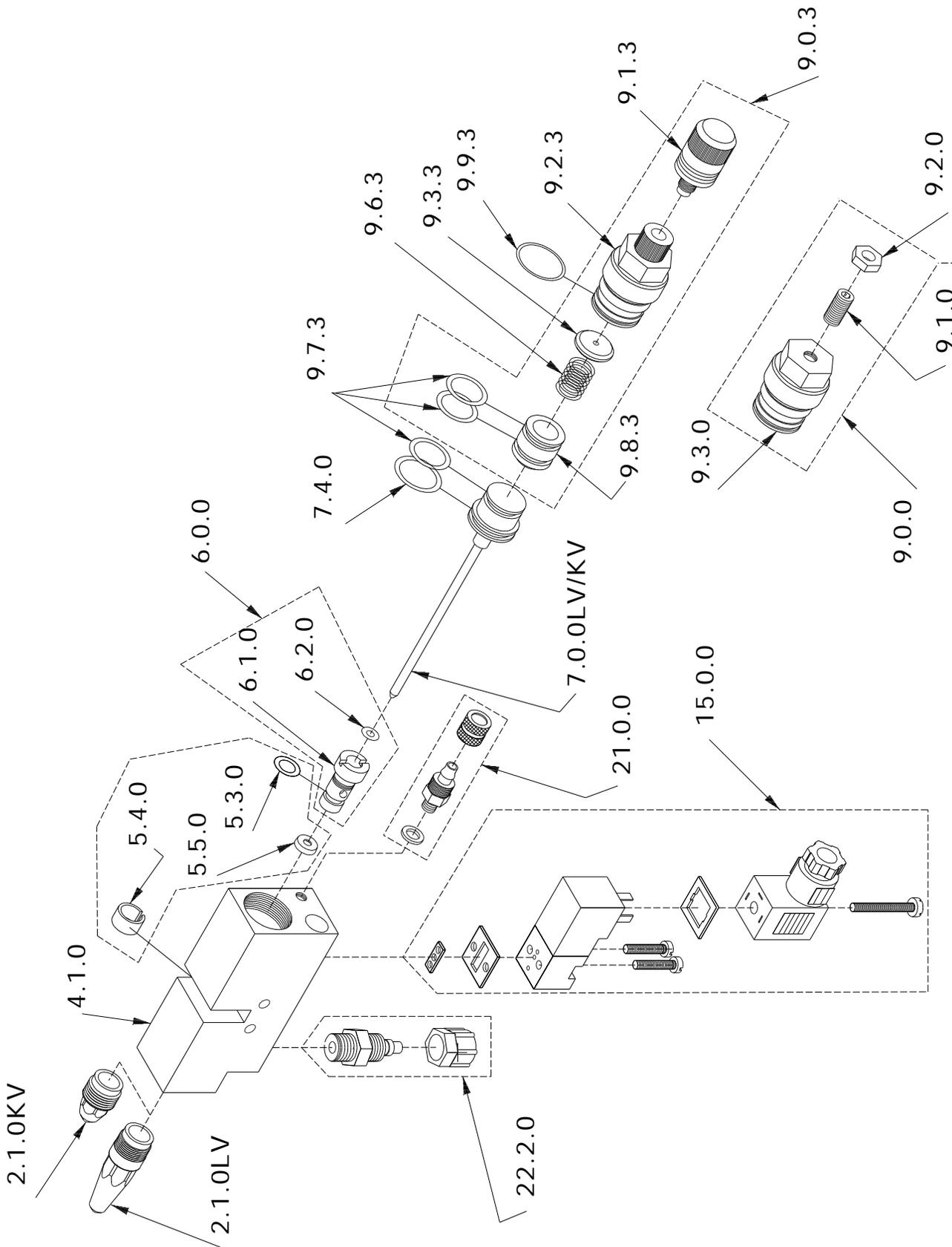
Do not use metallical aid to remove and insert gaskets and gasket seats !  
Gaskets and gaskets seats can be damaged.

In case a new retainer (6.0.0) 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. Insert the gasket (5.5.0) into the front retainer bore. The gasket (5.5.0) 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”. Completed retainer (6.0.0) slightly greased then is put back into valve body (4.1.0) and without turning movement by means of a screw driver is to be carefully pushed through valve body thread observing outer o-ring (5.3.0). Lastly screw retainer into housing thread (tighten only slightly).

When inserting o-rings and gaskets, do not use any sharp or pointed metal implements. Mainly the gasket as a very precise and sensitive component is not able to stand impacts.

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Option, nicht im Lieferumfang enthalten

## 6. Sparepartslist

draw.-no.:	part-no.:	Qty.	description
2.1.0	*	1	nozzle, stainless steel
4.1.0	510038	1	valve body MKDD LV/KV, complete
5.0.0	640102	1	gasket set
5.3.0	640021	1	o-ring 6,07 x 1,78mm / Viton
5.4.0	640101	1	protecting cover, ø 10 x 6mm
5.5.0	640004	1	gasket (Variseal 2,65 x 2,0 x 2,8)
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, tungsten carbide
7.4.0	640007	1	o-ring 14,00 x 1,78mm
9.0.0	900011	1	hexagon key lock, ø 21,3x 32mm (option)
9.1.0	610025	1	screw DIN 913 M 6x12 (option)
9.2.0	410007	1	nut DIN 439 BM 6 (option)
9.3.0	220093	1	lock screw, wrench size 17 x 29mm (option)
9.0.3	900010	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	lock screw, wrench size 17 x 37mm
9.3.3	930000	1	Druckscheibe, Drm. 14,5 x 3mm
9.6.3	820024	1	spring 1,2 x 21,5mm
9.7.3	640005	3	o-ring 10,82 x 1,78mm / Viton
9.8.3	710005	1	piston, ø 14,5 x 14mm
9.9.3	640043	1	o-ring 15 x 1 / Viton
15.0.0	*	1	solenoid valve 3/2-ways
21.0.0	220089	1	pipe fitting, straight, wrench size 8 x 19mm
22.2.0	220022	1	pipe fitting with nut, wrench size 13 x 28mm / 1/8"

\* Please find part-numbers on next pages.

When ordering needles and nozzles, please specify dimension.

Available dimensions: 0,2 / 0,3 / 0,4 / 0,5 / 0,6 / 0,7 / 0,8 / 1,0 / 1,2 / 1,5 / 2,0 mm Ø

## 6.1 part-numbers for nozzles, needles and solenoid valves

<b>* nozzle, LV, stainless steel</b>		
draw.-no.	part-no.	description
2.1.0	210132	nozzle, LV, 0,2 mm, stainless steel
2.1.0	210133	nozzle, LV, 0,3 mm, stainless steel
2.1.0	210134	nozzle, LV, 0,4 mm, stainless steel
2.1.0	210102	nozzle, LV, 0,5 mm, stainless steel
2.1.0	210136	nozzle, LV, 0,6 mm, stainless steel
2.1.0	210137	nozzle, LV, 0,7 mm, stainless steel
2.1.0	210138	nozzle, LV, 0,8 mm, stainless steel
2.1.0	210139	nozzle, LV, 1,0 mm, stainless steel
2.1.0	210140	nozzle, LV, 1,2 mm, stainless steel
2.1.0	210141	nozzle, LV, 1,5 mm, stainless steel
2.1.0	210142	nozzle, LV, 2,0 mm, stainless steel

<b>*nozzle, KV, stainless steel</b>		
draw.-no.	part-no	description
2.1.0	210143	nozzle, KV, 0,2 mm, stainless steel
2.1.0	210144	nozzle, KV, 0,3 mm, stainless steel
2.1.0	210145	nozzle, KV, 0,4 mm, stainless steel
2.1.0	210146	nozzle, KV, 0,5 mm, stainless steel
2.1.0	210147	nozzle, KV, 0,6 mm, stainless steel
2.1.0	210148	nozzle, KV, 0,7 mm, stainless steel
2.1.0	210149	nozzle, KV, 0,8 mm, stainless steel
2.1.0	210150	nozzle, KV, 1,0 mm, stainless steel
2.1.0	210151	nozzle, KV, 1,2 mm, stainless steel
2.1.0	210152	nozzle, KV, 1,5 mm, stainless steel
2.1.0	210153	nozzle, KV, 2,0 mm, stainless steel

<b>*needle, LV, tungsten carbide</b>		
draw.-no.	part-no.	description
7.0.0	110240	needle, LV 0,2/0,3mm, complete
7.0.0	110241	needle, LV 0,4mm, complete
7.0.0	110242	needle, LV 0,5mm, complete
7.0.0	110243	needle, LV 0,6/0,7mm, complete
7.0.0	110244	needle, LV 0,8/1,0mm, complete
7.0.0	110245	needle, LV 1,2mm, complete
7.0.0	110246	needle, LV 1,5mm, complete
7.0.0	110247	needle, LV 2,0mm, complete

**\*needle, KV, tungsten carbide**

draw.-no.	part-no.	description
7.0.0	110248	needle, KV 0,2/0,3mm, complete
7.0.0	110249	needle, KV 0,4mm, complete
7.0.0	110250	needle, KV 0,5mm, complete
7.0.0	110251	needle, KV 0,6/0,7mm, complete
7.0.0	110252	needle, KV 0,8/1,0mm, complete
7.0.0	110253	needle, KV 1,2mm, complete
7.0.0	110254	needle, KV 1,5mm, complete
7.0.0	110255	needle, KV 2,03mm, complete

**\* solenoid valve 3/2-way**

draw.-no.	part-no.	description
15.0.0	150018	solenoid valve 24V / DC/ 2,5W, with plug
15.0.0	150043	solenoid valve 24V / DC/ 2,5W, with plug (hand operation)

**7. technical data**

measurements:

LV-version	= approx. 155mm x 22mm x 80mm
KV-version	= approx. 135mm x 22mm x 80mm
weight	= 523 g
control air pressure	= 5 - 6 bar
material pressure	= max. 35 bar
gaskets	= Viton

Special designs on request. Technical alterations reserved. January 2003.

**8. Manufacturer Declaration**

The extrusion valves **MKDD** are 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	04.02.2003	