

## **INJECTION UNITS**

*Type FA 89-1 and FA 89-2*



### **Testing device**

There is probably not one single moldmaker around who would not like to see immediately what the finished part looks like. To see whether there is burr or whether corrections will have to be made.

### **The low cost solution ...**

This can now be done very quickly. With the DME mold injection unit, you can inject into the cold mold even at the workplace and assess the injection-molded part. Any offset and any irregularity can be seen immediately without having to injection-mold the part first on the injection-molding machine.

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## Placing into operation :

the Injection Units FA 89-1 and FA 89-2 may be operated only by trained specialists! (Risk of accident!) The unit may be heated or filled only in vertical position, i.e. with the nozzle pointing downwards. The manufacturer offers a sturdy fixture for this purpose (see illustration, Injection Unit I).

It is essential to wear protective gloves when carrying out any work on the heated unit (risk of burns!).

During the injection process itself, it is advisable to wear a face protector owing to the risk of hot wax escaping if the mold's injection point and the nozzle on the unit do not coincide exactly.

Release from liability for inadequate use and improper operation.

## Operating instructions :

### Instructions for use :

Always wear protective gloves (risk of burns!). Position the unit vertically with the nozzle pointing downwards.

1. The unit must be preheated for approx. 10 minutes before opening each time to fill it (plug in the main plug).
2. Unscrew the handle No. 1(1) by turning it counterclockwise.
3. Wearing protective gloves, unscrew the screw cap No. 10 (1) by turning it counterclockwise and extract the piston No. 19 (17) using the chain (if the piston is difficult to move and there is a risk of breaking the chain, continue to heat the unit and repeat the procedure!).
4. Plug in the mains plug in order to heat the unit and fill the cylinder with wax.

### Important :

Use only wax recommended by the manufacturer. otherwise, we are unable to assume liability!

When filling the unit, crumble the wax into smaller pieces and use a funnel if necessary to fill the cylinder. (Avoid spilling wax in front of the cylinder opening or, if this cannot be avoided, remove the wax

before closing the unit, otherwise the unit will jam.) The wax must be entirely free of foreign matter (swarf and cleaning wool etc.) otherwise correct closure of the valve cannot be guaranteed!

### Important :

Note the maximum filling height approx. 35 mm from the upper edge of the cylinder (see marking)! If the unit is overfilled, hot wax may escape when injecting - risk of burns!

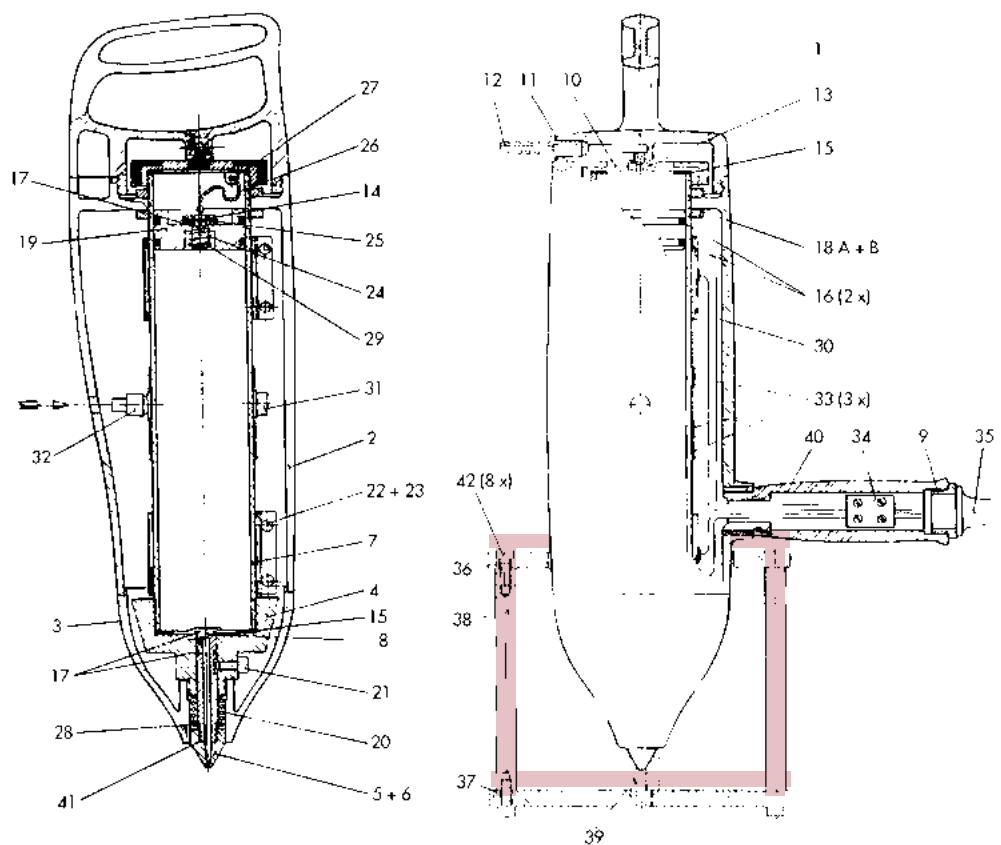
Allow the unit to heat up for approx. 30 minutes, depending on the filling quantity, until complete liquefaction of the wax can be seen through the cylinder opening.

5. Wearing protective gloves, carefully slide the piston No. 19 (17) into the cylinder, until you can feel resistance from the liquid wax. Then screw on the screw cap No. 10 (1) tightly and refit the handle No. 1. Keep the unit's heating system on after closing the injection unit until the injection process.

## Injection Unit FA 89-1

### Spare parts list

1	Handle
2	Housing
3	Protective cap
4	Valve body
5	Nozzle
6	Nozzle
7	Cylinder
8	Valve
9	Flange sleeve
10	Screw cap
11	Gasket 31 x 10 x 2 DIN 3750
12	Connection nipple
13	Silicone seal
14	Vent valve
15	Seal (2x)
16	O-ring RDR 54 x 3 DIN 3770 (2x)
17	O-ring RDR 8 x 2 DIN 3770 (3x)
18	Ring nut A + B
19	Piston
20	Compression spring
21	Shank screw made of M6 x 16 DIN 912
22	Cheese-head screw M6 x 16 DIN 912
23	Square-head nut
24	Compression spring
25	Parallel pin 2 m 6 x 20 DIN 6325
26	Chain
27	Chain wire
28	Circlip 12 x 1 DIN 471
29	Circlip 10 x 1 DIN 471
30	Strip heater
31	Temperature controller
32	Temperature limiter
33	Pipe clip 3 x
34	Cable clamp
35	Cable with plug
36	Plate
37	Plate
38	Rod
39	Centering pin
40	Handle
41	O-ring RDR 6 x 2 DIN 3770
42	Cheese-head screw M6 x 16 DIN 912 (8x)



## Injection procedure :

(Injection mold must have been prepared)

### Instructions for use :

- Wear protective gloves
- Wear face protector to protect against hot wax splashes
- Fully button up or zip up overalls

### When the unit has been heated up and the wax has liquified

1. Disconnect the mains plug.
2. Remove the unit from the heater.
3. Connect the compressed air supply to the unit via the connection nipple No. 12 (Quick-release coupling No. 5), 6 to max. 8 bar!
4. Fit nozzle No. 5 or 6 (45 or 46) to the mold's injection point and push the unit firmly against the mold. This triggers the injection process by means of a valve. If there are major differences between the shape of the injection point and the nozzle on the injection unit, it is advisable to insert a suitable seal (gasket, O-ring, etc.) in order to avoid wax splashes escaping.

5. The injection process takes approx. 5 to 10 seconds, depending upon the size of the mold.
6. Remove the unit from the injection point and place it vertically in the fixture in order to allow it to cool.

## Cleaning :

The filling area should be cleaned in order to remove wax residue using a cleaning cloth in warm condition - area of the screw cap No. 10 (12) and bayonet catch in the housing No. 2 (23) and handle No. 1 (1). When doing this, remove any wax residue between the nozzle and protective cap No. 5 or 6 (45 or 46) and protective cap No. 3 (32).

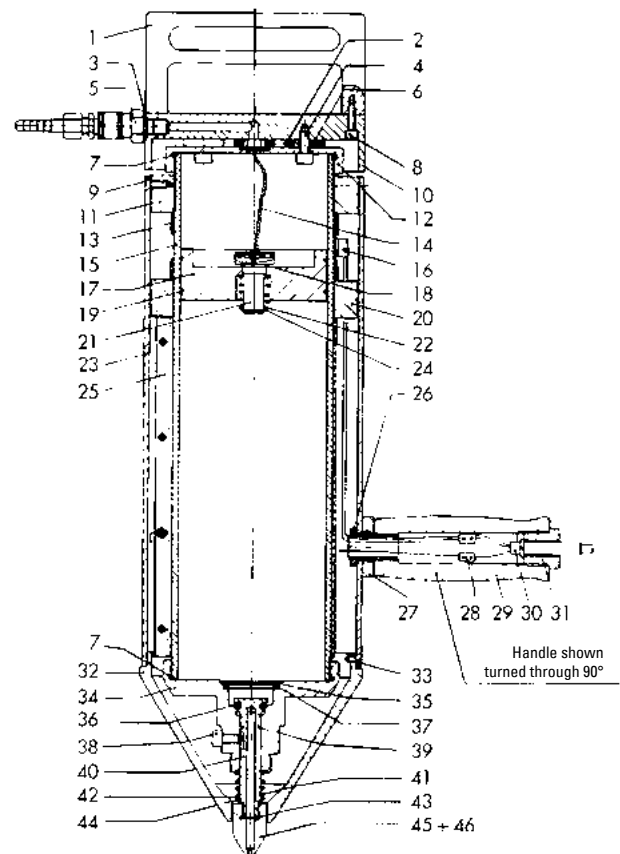
## Maintenance :

1. Inspect the unit visually each time before carrying out an injection operation.
2. The unit should be serviced after approx. 50 hours of operation or once per year.  
All seal elements of the injection unit must be inspected when doing this :  
FA 89-1 No. 11, 13, 15, 16, 17, 41  
FA-89-2 No. 2, 3, 7, 18, 19, 36, 39, 43  
Check the function and tightness of the valve No. 8 (40)  
Check that the valve body is tight in position. No. 4 (34).  
The unit should be returned to the manufacturer for a major inspection after approx. 150 hours of operation or after 3 years, depending on the frequency of use.
3. Carry out further maintenance in accordance with Points 1 + 2.

## Injection Unit FA 89-2

### Spare parts list

1	Top handle	25	Heater (assy.)
2	O-rings (4x)	26	Nut
3	Seal	27	Chain wire
4	Cheese-head screws (3x)	28	Cable clamps (2x)
5	Quick-release coupling (assy.)	29	Bottom handle
6	Spacer bushes (4x)	30	Cable with plug
7	O-rings (2x)	31	Cable gland
8	Cheese-head screws (4x)	32	Protective cap
9	Countersunk screw (4x)	33	Countersunk screws
10	Outer screw cap	34	Valve head
11	Threaded ring	35	Seeger circlip ring
12	Inner screw cap	36	O-ring
13	Pipe clips (2x)	37	Strainer
14	Chain, approx. 400 mm long	38	Stop screw
15	Cylinder	39	O-ring
16	Thermostat	40	Valve
17	Piston	41	Spring
18	O-ring	42	Disk (Brass)
19	O-rings (2x)	43	O-ring
20	Inner ring	44	Seeger circlip ring
21	Vent valve	45	Nozzle Ø 1,5 mm
22	Spring	46	Nozzle Ø 3 mm
23	Housing		
24	Seeger circlip ring		



### Injection Unit FA 89-1 :

Filling capacity	600 cm <sup>3</sup>
Electrical connection	220 V / 240 W
Operating pressure	6-8 bar
Injection nozzle	1,5/3 mm
Weight	3,5 kg
Injection material used corresponding to polystyrene weight	900 g
Casting wax (solid hydrocarbons)	
Flash point	250° C
Congeaing point	84° C
Injection wax shrinkage	0,5 %

### Injection Unit FA 89-2 :

Filling capacity	1800 cm <sup>3</sup>
Electrical connection	220 V / 240 W
Operating pressure	6-8 bar
Injection nozzle	1,5/3 mm
Weight	8 kg
Injection material used corresponding to polystyrene weight	2700 g
Casting wax (solid hydrocarbons)	
Flash point	250° C
Congeaing point	84° C
Injection wax shrinkage	0,5 %

The material used is not a hazardous substance as defined by the German Hazardous Substances Ordinance.

**Important :** Ensure that the injection unit is not filled with the liquid injection material above the marking on the inside wall of the cylinder

### If malfunctions occur on the unit when heating or during injection, this may be attributable to the following causes :

1. **Wax escapes in the area of the screw cap. No 10 (12) and handle No. 1 (1).**  
Cause :
  - a) Screw cap not correctly fitted (possibly wax residue).
  - b) Max filling capacity has been exceeded
  - c) Seal ring No. 15 (7) defective
  - d) O-ring No 17 (18) defective
2. **Wax escapes in the area of the nozzle No. 5 + 6 (45 + 46) or between the protective cap No. 3 (32) and valve body No. 4 (34).**  
Cause :
  - a) Valve body not tightened
  - b) Foreign bodies between contact side valve No. 8 (40) and valve body No. 4 (34)
  - c) Seeger circlip ring No. 28 (44) missing or valve fractured
  - d) O-ring No. 17 (18) defective
  - e) Valve No. 8 (40) stiff
  - f) Nozzle No. 5 + 6 (45 + 46) in bore Protective cap No. 3 (32) stiff
  - g) O-ring No. 41 (43) defective
  - h) Seal ring No. 15 (7) defective
3. **Air bubbles in the wax mold.**  
Cause :
  - a) O-rings No. 16 (19) defective
  - b) O-ring No. 17 (18) defective
  - c) Unit not filled an heated vertically (air in the cylinder)
4. **Air escapes when connecting compressed air.**  
Cause :
  - a) Silicone seal No. 13 (2) defective
  - b) Connection nipple No. 12 (5) defective
  - c) Gasket No. 11 (3) defective
  - d) Handle No. 1 (1) leaking
5. **Unit does not reach its heating temperature or switches off owing to overheating.**  
Cause :
  - a) Temperature limiter has tripped owing to overheating :  
FA 89-1 : Push the temperature limiter No. 32 (see arrow) back in when cooling the unit, using a pencil or a soft implement. If the temperature limiter trips repeatedly, return the unit to the manufacturer.  
FA 89-2 : Return the unit to the manufacturer.
- b) Temperature controller No. 31 (16) defective
- c) Heater defective :  
The heater may be repaired only by a qualified specialist or the unit must be returned immediately to the manufacturer (risk of accident!)

### Absolute Safety Essentials:

**Unit becomes hot!  
Do not overfill the unit!  
Observe the safety precautions!**

#### Wax package

##### Features:

- Weight: 5 kg blue
- Inflammability point: 250°C
- Meltpoint: ~100°C
- Solidification temp.: 84°C
- Volume: 660 cm<sup>3</sup> = 1kg (1l=1,5kg)



#### FA 89 W

#### Stand for wax guns

##### Features:

- Only for FA 89 1



#### FA 89 S