

Operating Instructions and Spare Parts List

PI 3 Plug-in Injector

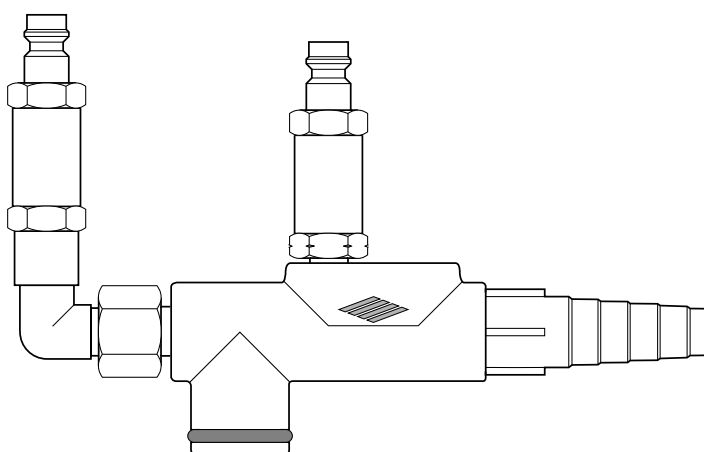


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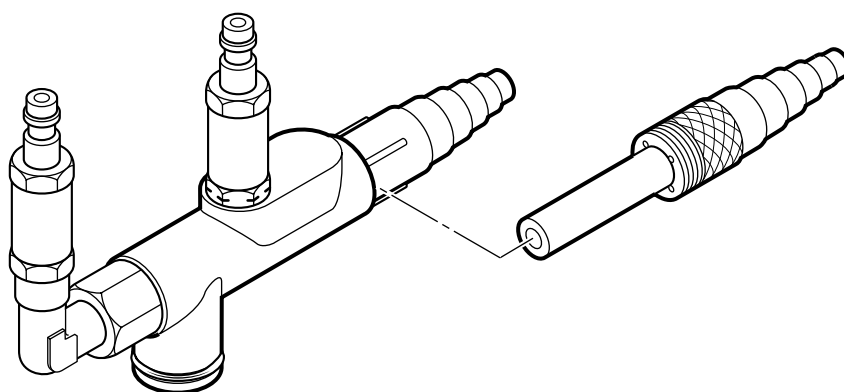
PI 3 plug-in injectors for organic powders

Fields of application

The PI 3 injector is used to convey normal organic powders between the powder hopper and the powder gun. The injector is supplied with a Tefzel powder hose fitting as standard. It is recommended to use a Teflon powder hose fitting for especially difficult to use powder. The Teflon powder hose fitting can be ordered separately (see also the Spare Parts List on pages 6 and 7).

The PI 3 "plug-in injector" allows fast cleaning and easy handling because it can be detached from the powder hopper without using any tools. All pneumatic connections are also easily detachable (Quick-release connectors). Depending on the application the pneumatic connections of the PI 3 can be selected either for vertical or for horizontal operation.

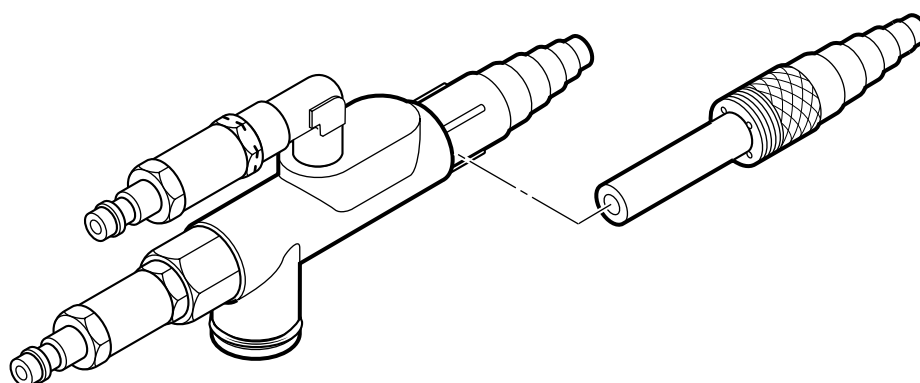
PI 3-V



PI 3-V "Vertical plug-in injector" with detachable pneumatic quick-release connections

Figure 1

PI 3-H



PI 3-H "Horizontal plug-in injector" with detachable pneumatic quick-release connections

Figure 2

This injector type is recommended when the curves of the hoses would be too small and could cause kinking in the hoses, thereby obstructing the air flow (Standard with MPS-L and MPS-S).

Principle of the injector and the influence of supplementary air

When air flows through the nozzle into the cavity, a vacuum is created in the cavity, (see figure below). This vacuum causes powder to be drawn up the suction tube and into the cavity. A powder/air mixture is created. The forward air velocity at the nozzle conveys powder through to the powder hose and the gun.

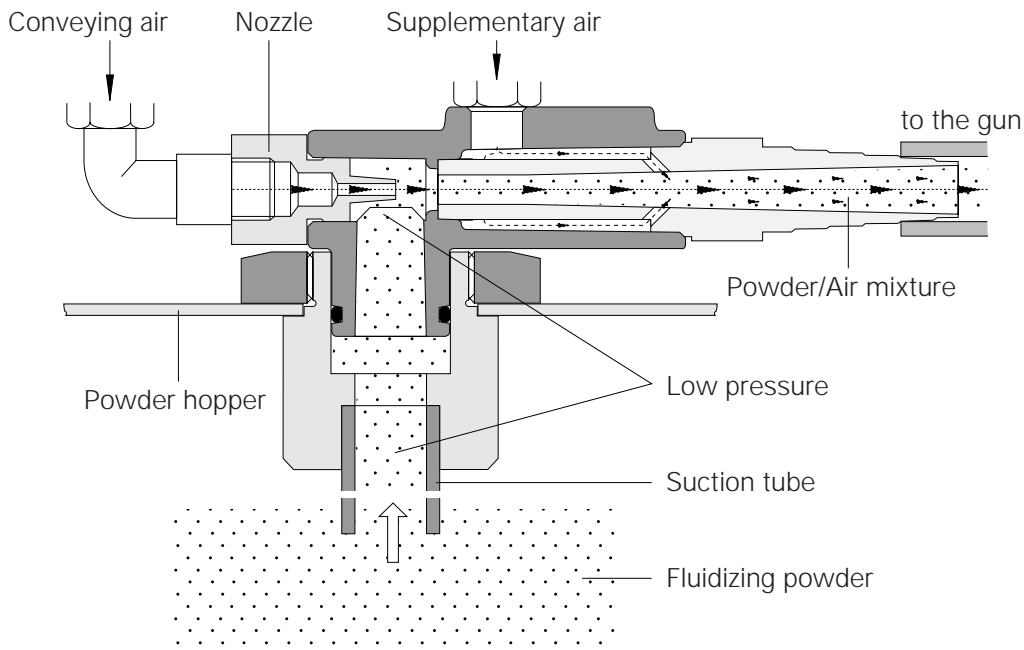


Figure 3

The concentration of the powder/air mixture, and with it, the powder output depends on the conveying air pressure and supplementary air pressure, the quality of the powder, the length of the powder hose, the diameter of the powder hose, the number of coils in the hose, the difference in the height between the gun and injector, and the type of nozzle.

Experience with pneumatic material handling technology shows that pneumatic transport of fine solid matter (powder) in the form of tubing (hose) the transporting medium requires a certain volume of air per unit of time. With an \varnothing 11 mm hose this value is approximately 4 m³/h. To decrease the powder output, the vacuum in the cavity has to be reduced. For that purpose the pressure of the conveying air is also reduced. With the reduction of the conveying air the volume of air in the powder hose sinks to below the optimum value of 4 m³/h. The powder transport becomes irregular, so-called "pumping" takes place. In order to prevent this from happening supplementary air is added until the volume of the air in the powder hose is 4-5 m³/h once more. As the flowmeter (4 - Fig. 4) measures the sum of the conveying air and supplementary air the ball in the flowmeter should therefore "float" within the green section of the scale.

The pressure gauge for conveying air is graduated in 1/10th bar and indicates the powder output accordingly. See "Setting table for the PI 3 injector" on the opposite page. The flowmeter for the sum of conveying and supplementary air is graduated in m³/h.

Setting table for the PI 3 injector

In order to set the conveying, and supplementary air correctly on the PGC and therefore the powder output, the amount of powder to be deposited must be determined first.

The conveying air pressure setting for the pressure gauge (2) is found in the table below through the desired amount of powder to be deposited, in grams per minute.

If the conveying air pressure is increased, through the control knob (1), then the powder output increases correspondingly. If the ball in the flowmeter (4) does not "float" in the green sector of the scale then the supplementary air must be adjusted either up or down, on the setting knob (3). Should the conveying air be set to over 2.5 bar then the supplementary air is no longer required and the setting knob (3) can be turned completely to the left-hand stop.

ATTENTION ! After every setting of the conveying air the ball in the flowmeter (4) should "float" in the green sector of the scale (4-5 m³/h). If the conveying air pressure is set above 3 bar for certain applications, then the volume of air, without supplementary air, increases to over 5 m³/h. The supplementary air is only required for rinsing the check valve. The setting knob (3) should not be fully closed (See also "Principle of the injector and the influence of supplementary air").

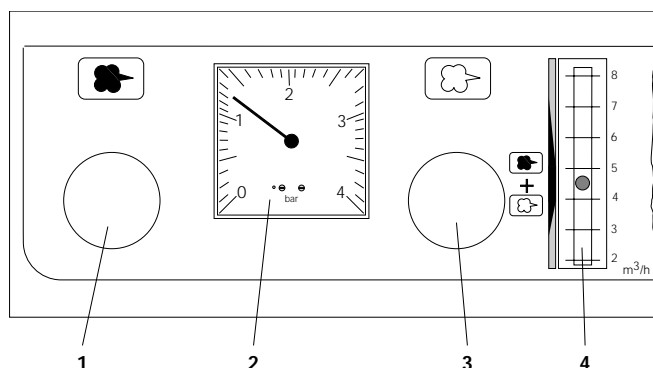


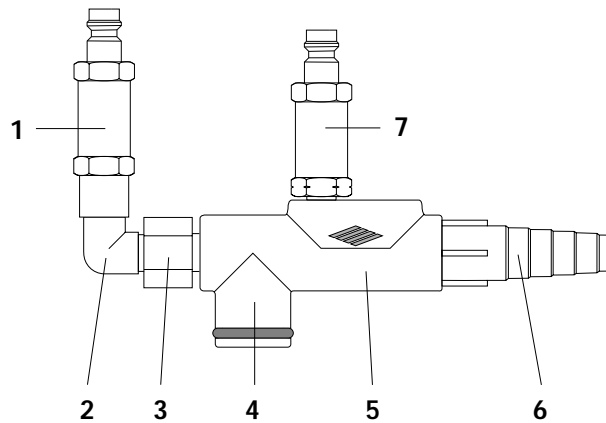
Figure 4

Values in the table below are approximate and only serve as a guideline for the various settings as conditions in different workshops can vary greatly.

Specification :	Powder hose :	ø 11 mm - 6 m. and 12 m. long.			
	Powder:	PES 31.9010 S			
	Constant volume of air :	4 m ³ /h (Conveying air + supplementary air).			
g/min.	<i>(6 m)</i> bar	<i>(12 m)</i> bar	g/min.	<i>(6 m)</i> bar	<i>(12 m)</i> bar
25	0.65	0.92	225	1.80	2.61
50	0.80	1.14	250	1.94	3.07
75	0.93	1.32	275	2.09	
100	1.10	1.52	300	2.24	
125	1.22	1.70	325	2.43	
150	1.38	1.90	350	2.75	
175	1.50	2.11	375	3.15	
200	1.65	2.32	400	3.50	

PI 3 Injector - Cleaning and Maintenance

a) Cleaning should be done daily before starting work or with a colour change



- | | | | |
|---|---------------------------|---|--------------------------|
| 1 | Conveying air check valve | 5 | Injector body |
| 2 | Elbow joint | 6 | Hose fitting |
| 3 | Injector nozzle | 7 | Rinsing air check valve* |
| 4 | Hopper fitting | | |

*The notch indicates the valve inside \varnothing : notch = \varnothing 1.4 mm.

Figure 5

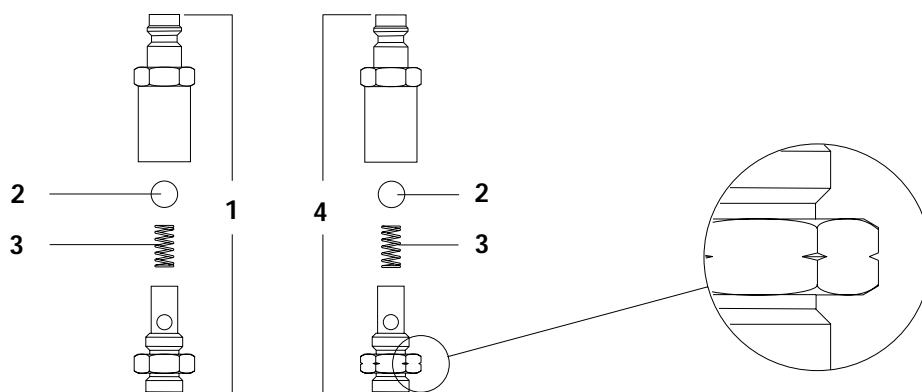
1. Remove the injector from powder hopper cover.
2. Pull hose off the hose fitting (6).
3. Remove the hose fitting (6) from the injector.
4. Clean the hose fitting (6) with the spiral gun brush, and with compressed air that is free of water and oil, check for wear.
5. Clean injector body (5) with compressed air that is free of water and oil. Any contamination can be seen through the opening of the hopper fitting (4).
6. Reassemble the injector and fit on the hopper cover.

Caution : **If the injector is severely fouled, it must be disassembled. Remove the check valves (1, and 7) and the injector nozzle (3) with the correct sized spanners. Clean the component parts with compressed air and, if necessary, dissolve sintered deposits with nitrothinners (after dismantling the check valve).**

Do not scrape. Do not use acetone!

b) Cleaning the check valves (1, and 4 - Fig. 6)

Care should be taken when disassembling the check valves, that the spring and/or the ball are not lost.



Attention : Do not place the ball in solvents !!!

- 1 Check valve (w/o notch)
- 2 Ball
- 3 Spring
- 4 Check valve (with notch)

Figure 6

The PI 3 injector should be cleaned at least once a day.

Normally, it can be disassembled as described on the previous page.

The injector should be totally disassembled **once a week or by heavy contamination**. See also Figure 7 or 8 - Spare parts drawing on the following pages.

Trouble shooting guide

If the gun does not spray powder although the PGC 1 Powder Gun Control is switched ON the injector could be contaminated :

<p>- Injector, injector nozzle, check valve, powder hose or gun are clogged and must be cleaned.</p>	<p>Clean the corresponding part(s)</p>
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Spare Parts List PI 3-V Injector

	Injector (complete)	345 318
1	Check valve - conveying air (complete-incl. Items 5, 6)	239 135
2	Check valve (with notch) - suppl. air (complete-incl. Items 5, 6)	239 143
3	Injector body	344 311
4	Elbow connection - 1/8"-1/8"	237 604
5	Ball	240 168
6	Spring	240 176
7	Hose fitting - Tefzel	344 338#
7.1	Hose fitting - Teflon	354 201#
8	Injector nozzle - \varnothing 1.6 mm (with notch)	365 912#
8.1	Injector nozzle - \varnothing 1.8 mm (without notch)	343 552#
9	O-ring - \varnothing 16 x 2 mm	231 517
10	Quick-release connector - \varnothing 8 / 6 mm	203 181
11	Conveying air hose - \varnothing 8 / 6 mm (red)	103 500*
12	Supplementary air hose - \varnothing 8 / 6 mm (black)	103 756*
13	Screw coupling for hose \varnothing 8 / 6 mm	201 316
	Powder hose - \varnothing 16 / 11 mm for PG 1 Manual gun	103 128*#
	Powder hose - \varnothing 16 / 11 mm for PG 1-A Automatic gun	103 012*#

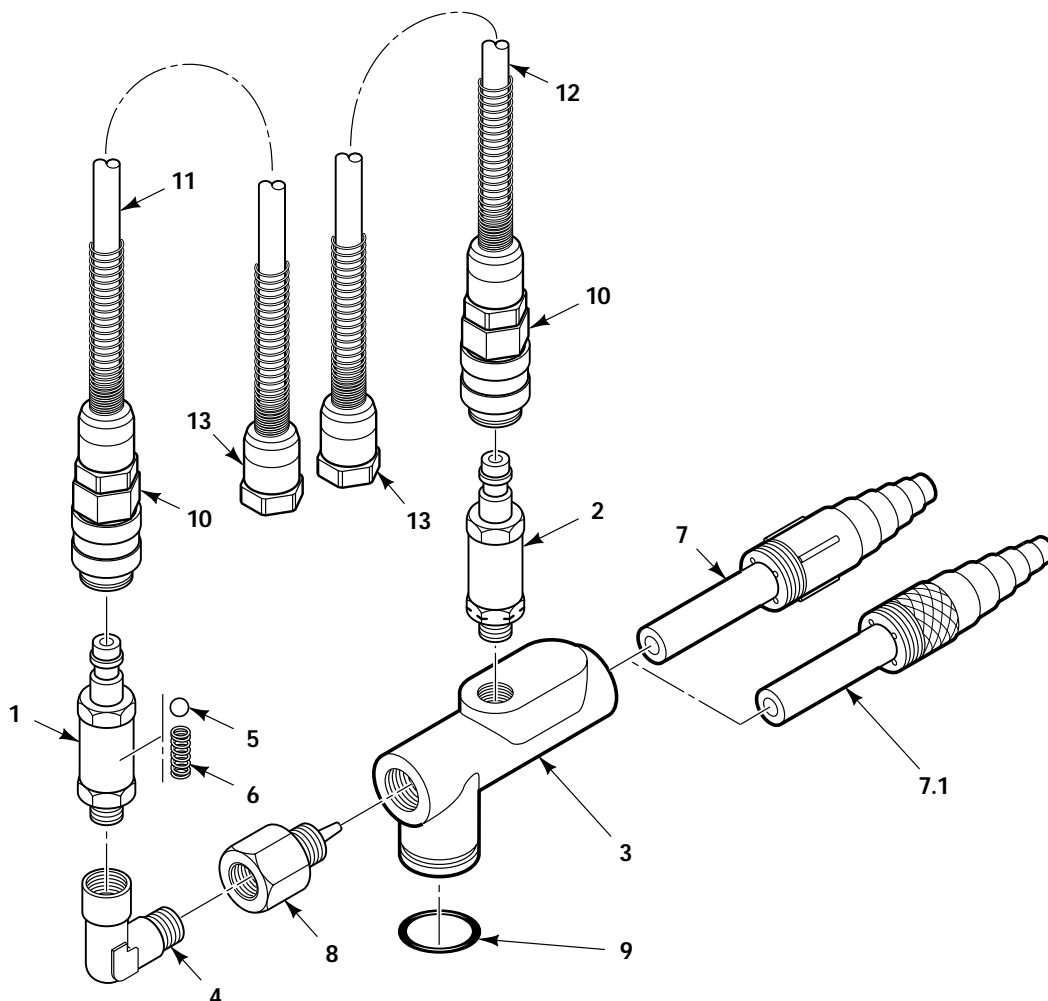
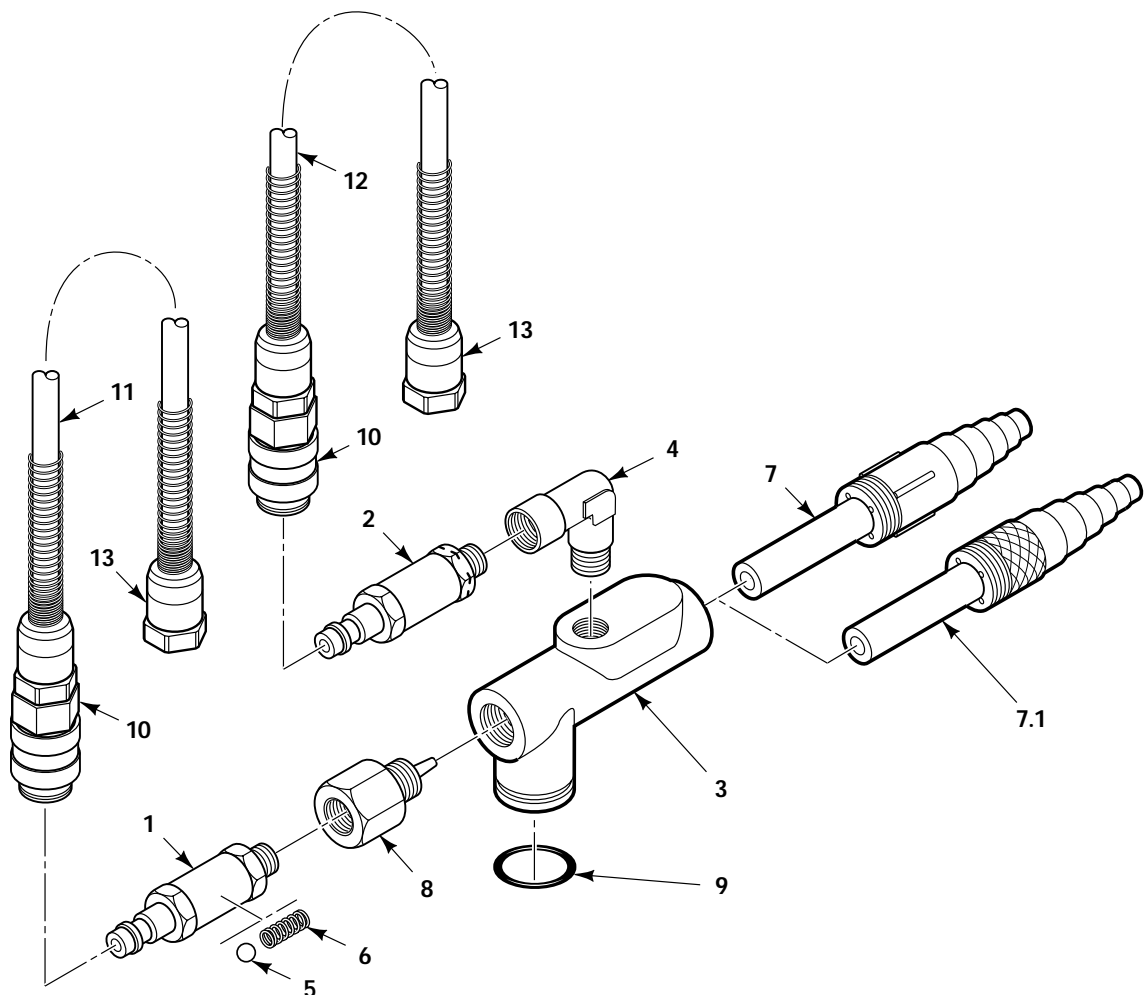


Figure 7

* Indicate length required
Wear parts

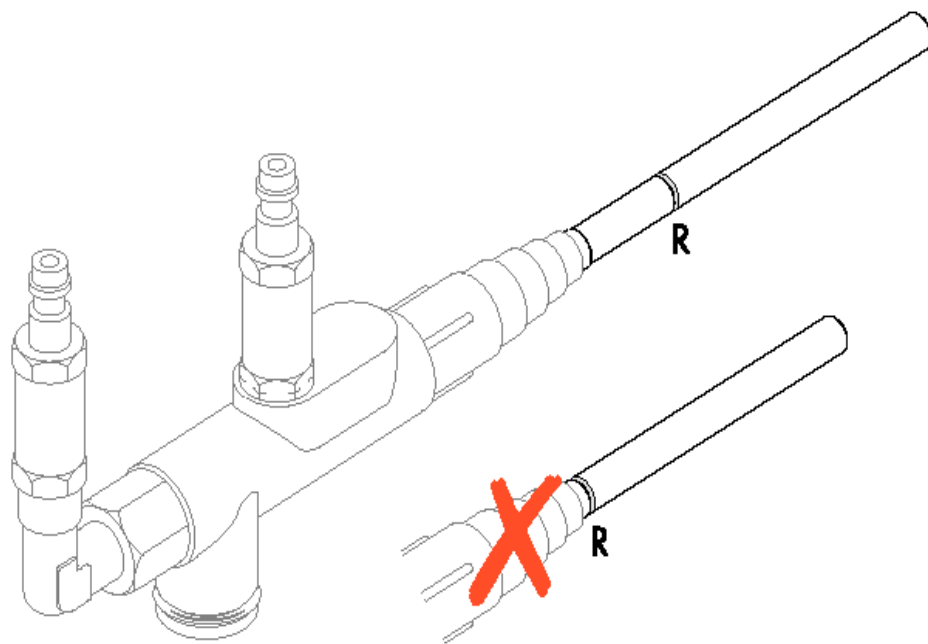
Spare Parts List PI 3-H Injector

	Injector (complete)	345 326
1	Check valve - conveying air (complete - incl. Items 5, 6)	239 135
2	Check valve (with notch) - suppl. air (complete - incl. Items 5, 6)	239 143
3	Injector body	344 311
4	Elbow connection - 1/8"-1/8"	237 604
5	Ball	240 168
6	Spring	240 176
7	Hose fitting - Tefzel	344 338#
7.1	Hose fitting - Teflon	354 201#
8	Injector nozzle - \varnothing 1.6 mm (with notch)	365 912#
8.1	Injector nozzle - \varnothing 1.8 mm (without notch)	343 552#
9	O-ring - \varnothing 16 x 2 mm	231 517
10	Quick-release connector - \varnothing 8 / 6 mm	203 181
11	Conveying air hose - \varnothing 8 / 6 mm (red)	103 500*
12	Supplementary air hose - \varnothing 8 / 6 mm (black)	103 756*
13	Screw coupling for hose - \varnothing 8 / 6 mm	201 316
	Powder hose - \varnothing 16 / 11 mm for PG 1 Manual gun	103 128*#
	Powder hose - \varnothing 16 / 11 mm for PG 1-A Automatic gun	103 012*#



* Indicate length required
Wear parts

Figure 8



Plug Gauge for Checking Wear in PI 3 Injector Hose Fittings

The influence of wear on the inside of the hose fitting (mixing cone) is very important. Worn hose fittings produce a much lower powder output than new hose fittings. Wear on the hose fitting occurs internally, is hardly visible from the outside, and the inlet diameter is not affected.

The condition of the hose fitting can be checked, with the hose fitting still mounted in the injector, with a special plug gauge (**Part No. 122421**), as follows:

1. Remove the powder hose.
2. Insert the tapered end of the plug gauge into the opening of the hose fitting (Tefcel or Teflon). If the shoulder on the plug gauge only enters a few millimeters, then the wear is within the tolerance. If, on the other hand, the gauge enters to the groove **(R)** or past the groove, then the wear is too great and the hose fitting must be replaced. When the groove on the plug gauge enters the hose fitting, the powder output can be as low as 50%, or lower than the powder output required.

Documentation PI 3 Powder Injector

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