

Operating Instructions and Spare Parts List

PH 50-D / 100-D / 150-D / 200-D Powder Hopper

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Spare Parts List

Ordering Spare Parts

When ordering spare parts for powder coating equipment, please indicate the following specifications:

1. Type, and serial number of your powder coating equipment
2. Order number, quantity, and description of *each* spare part

Example:

1. **Type** PH XXX-XX **Serial no:** XXXX XXXX
2. **Order no:** 340 901 1 piece, Filler cover

When ordering cable or hose material the length required must also be given. The spare part numbers of this yard/metre ware is always marked with an *.

The spare part number of yard/metre ware always begins with 1..

All wear parts are marked with a #.

All dimensions of plastic powder hoses are given as external and internal diameters :
e.g. \varnothing 8 / 6 mm = 8 mm outside diameter (o/d) / 6 mm inside diameter (i/d).

PH 50-2-D / 50-4-D / 100-D / 150-D / 200-D Powder Hoppers

	PH 50-2-D	PH50-4-D	PH 100-D	PH 150-D	PH 200-D
A	Hopper - complete (incl. Item A, 3 and 7)	370 983	371 106	370 991	371 009
	Bottom section - complete	367 095	367 095	367 109	367 117
1	Venting hose (without Airmover - ø 40 mm x 3 m.)	100 048	100 048	-----	-----
3	Hopper cover	See pages 4 and 5			
3.1	Inspection cover complete	371 033	371 033	371 033	371 033
4	Rubber seal (indicate powder hopper type)	103 837 (1.24 m)*	103 837 (1.24 m)*	103 837 (1.65 m)*	103 837 (1.96 m)*
5	Powder hopper body	367 087	367 087	367 052	367 060
6	Fluidizing plate (incl. Item 6.1)	340 820#	340 820#	341 037#	341 045#
6.1	Rubber seal	348 694	348 694	348 708	348 716
7	Clamp band	341 924	341 924	341 932	341 940
8	Fluidizing air chamber	340 898	340 898	341 002	341 010
9	Elbow joint	200 875	200 875	200 875	200 875
10	Aperture disk	301 329	301 329	-----	-----
11	Quick-release hose connector	200 859	200 859	239 275	239 275
12	Quick-release connection for fluidizing air hose	203 181	203 181	239 267	239 267
13	Fluidizing air hose	103 756*	103 756*	100 498*	100 498*
13.1	Hose clamp to Item 13	-----	-----	203 386	203 386
14	Suction tube - complete (incl. Items 14.1 and 15)	339 130	339 130	339 130	339 130
14.1	Suction tube	336 491	336 491	336 491	336 491
15	Injector support	336 483	336 483	336 483	336 483
16	Lock nut	234 869	234 869	234 869	234 869
17	Plug cap - Injector opening	238 333	238 333	238 333	238 333
19	Plug cap - Level sensor (ø 75 mm)	-----	-----	256 765	256 765
20	Plug cap - Powder recovery opening (ø 100 mm)	-----	-----	244 147	244 147
22	Inspection cover seal	103 837 (0.77 m)*	103 837 (0.77 m)*	103 837 (0.77 m)*	103 837 (0.77 m)*
28	Level Sensor Adapter plate (Proximity type)	-----	-----	368 210	368 210
29	Venting hose adapter - complete	361 410	361 410	-----	-----
30	Venting hose clamp band (ø 100 mm)	-----	-----	211 125	211 125
31	Venting hose (ø 100 mm)	-----	-----	104 434	104 434
32	Hopper cover (No holes)	367 010	367 010	367 028	367 036
33	Rubber seal (Not shown)	-----	-----	-----	103 438 (0.67 m)*
34	Airmover adapter	-----	-----	368 237	368 237

* Indicate length required # Wear parts

PH 50-2-D / 50-4-D / 100-D / 150-D / 200-D Powder hoppers

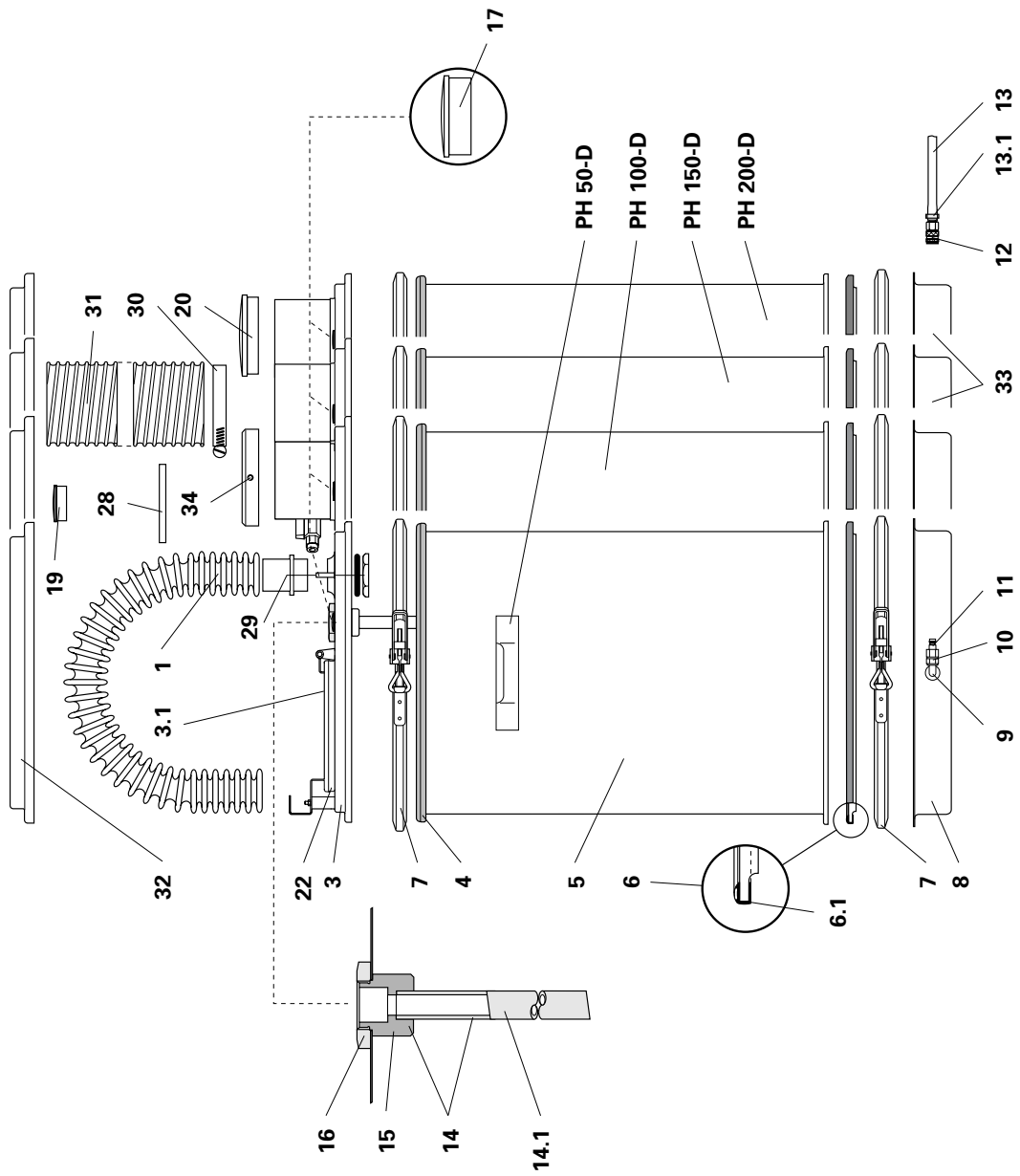


Figure 1.

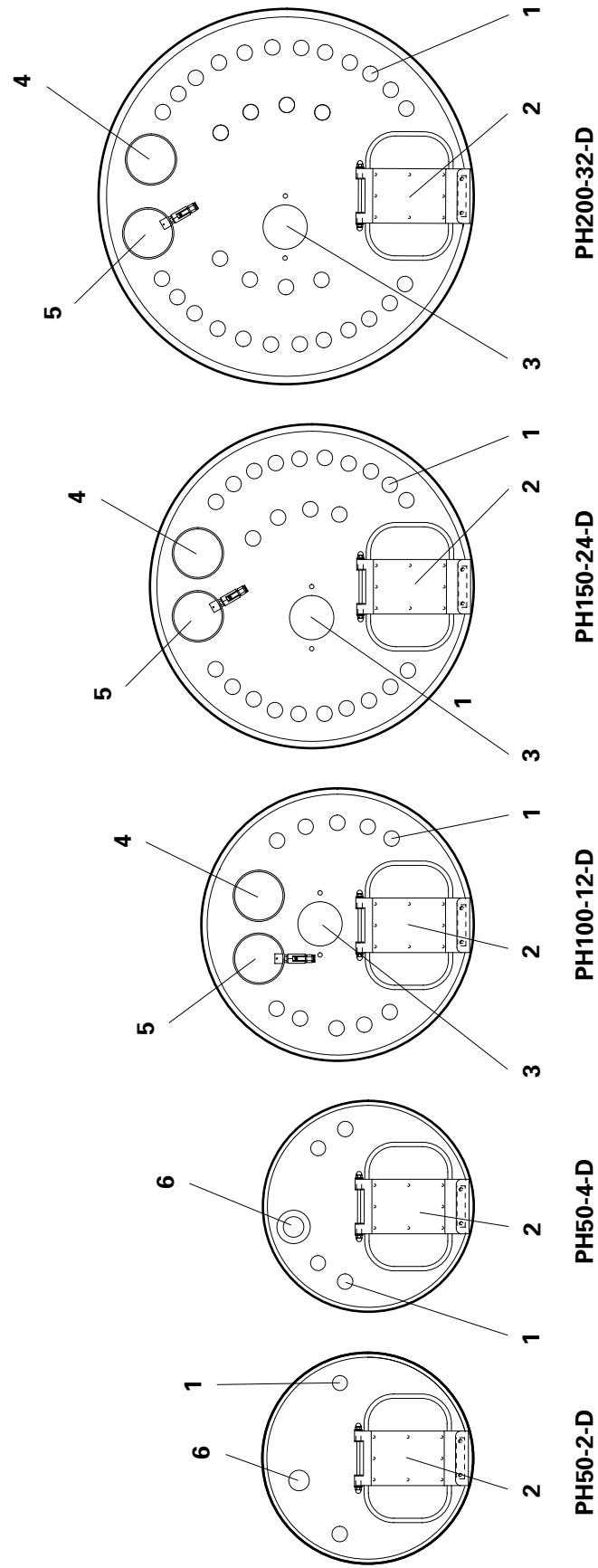
PH 50-2-D / 50-2-D / 100-D / 150-D / 200-D Powder Hopper covers

	Injector opening (ø 29.5 mm)	Inspection opening (235 x 155 mm)	Airmover opening (ø 42 mm)	Level sensor (Float type) (ø 75 mm)	Powder recovery (ø 100 mm)	Venting opening (ø 100 mm)	Order number
PH 50-2-D	2	1	1	-	-	-	370 940
PH 50-4-D	4	1	1	-	-	-	371 084
PH 100-12-D	12	1	-	1	1	1	370 959
PH 150-24-D	24	1	-	1	1	1	370 967
PH 200-32-D	32	1	-	1	1	1	370 975

Key to Figure 2:

- 1 Injector opening (ø 29.5 mm)
- 2 Inspection opening (235 x 155 mm)
- 3 Level sensor opening (ø 75 mm)
- 4 Powder recovery opening (ø 100 mm)
- 5 Venting opening (ø 100 mm)
- 6 Airmover / Venting opening (ø 42 mm) - **PH 50-D only**

PH 50-2-D / 50-4-D / 100-4-D / 150-D / 200-D Powder hopper covers



(For operation with manual equipment only)

Figure 2.

Level Sensor

(The bold numbers in brackets refer to Fig. 7, page 11)

Safety Regulations

Installation

All work to be done by the customer must be carried out according to local regulations.

Grounding

The cover must be grounded. The grounding connection must be done by the customer.

Repairs

Repairs should only be carried out by trained personnel.

Description of function

The level sensor functions according to the buoyancy principle. A green LED in the socket body indicates when the level sensor is ready for operation. A proximity switch and a steel ball are built into a plastic holder in the cap of the brown float. When the powder level in the powder hopper is higher than the float, the float is displaced sideways and „swims“ upwards. As soon as the float is above the horizontal the steel ball moves towards the proximity switch and releases a level signal. This signal is indicated on the red LED. Due to the „floating“ movement, this signal is sometimes indicated only for a very short time. The output signal from the level sensor is retarded by approximately 3 seconds by an internal delay circuit. As soon as the level signal is present for longer than approximately 3 seconds the orange LED is switched on and the switching signal is present at the level sensor socket.

If the powder level in the powder hopper sinks so that the float is below the horizontal position the level signal is switched off with a 3 second delay.

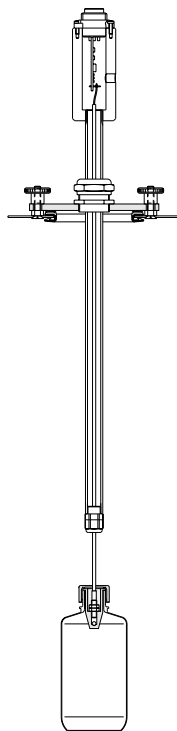


Figure 3.

Setting the Level Sensor Height

1. Connect the 7 pole plug from the corresponding control unit to the flange socket **(3)** of the level sensor.
2. Switch on the control unit.
The green LED in the display window **(2)** illuminates. The level sensor is ready to operate
3. Switch on the powder fluidizing.
4. Fill the powder hopper with powder up to the required level (manually or automatically, according to the configuration)
5. Loosen the lead-through nut **(16)** and move the tube upwards **(4)**, until the "float" is no longer in the powder.
6. Slowly lower the "float" until it just oversteps the horizontal position.
The red LED in the display window **(2)** illuminates (see also Fig. 4 - page 9, the "float" switching position, dotted line).
7. Wait 3 seconds, until the orange LED ("delayed signal") illuminates.
The red LED must not go out during the 3 seconds .
If the red LED starts to blink, then the sensor must be set deeper.
8. Tighten the lead-through nut **(16)**.

Preparation for Start-up

Before starting up the level sensor the following points must be observed:

- Observe the Safety Regulations
- The level height can be adjusted with the cable clamping on the fixing flange. The level should be first set provisionally and can then be corrected to the desired level during operation.
- The green LED must illuminate when the powder hopper is empty and the red, and the orange LEDs are switched off.

Maintenance

This level sensor does not require any maintenance. It is, however, necessary to check periodically for powder depositing on the float.

Functional checks

Functional checks on the level sensor can be done through the three LEDs .

Green LED - Power supply is present
- The level sensor is ready for operation

Red LED - indicates an unretarded level signal
- the LED must illuminate immediately when the float is lifted for a short time.
- the LED switches off immediately the float sinks below the horizontal

Orange LED - indicates a debounced level signal
- LED illuminates only after the float is lifted for approximately 3 seconds
- the LED switches off 3 seconds after the float sinks below the horizontal

Troubleshooting guide

If the LEDs do not operate according to the description in the section "Functional Checks" the complete level sensor must be sent to an authorized Gema service centre for repair.

Technical Data

Input voltage :	20-28 VDC
Current consumption :	200 mA
Output signal :	24 VDC / 20mA
Type of protection :	IP 54
Switching delay :	approximately 3 seconds
Weight of level sensor - complete :	0.7 kg
Minimum density :	200 g/dm ³
Maximum depth :	approximately 350 mm

Block diagram / Pin allocation

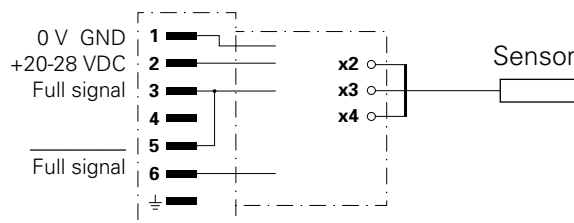
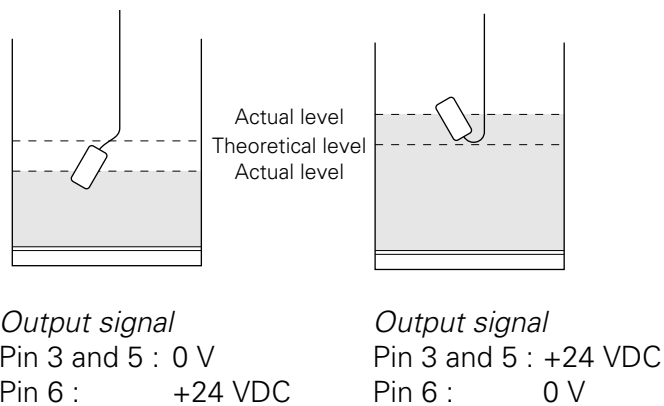


Figure 4 & 5.

Cover opening dimensions

Parts required for retrofitting a level sensor to existing powder hoppers:

2x - C/sk screws - M6 x 30 mm	237 035
2x - Nuts - M6	205 095
0.25 m Sealing strip	103 837
2x - Milled nuts - M6	248 711

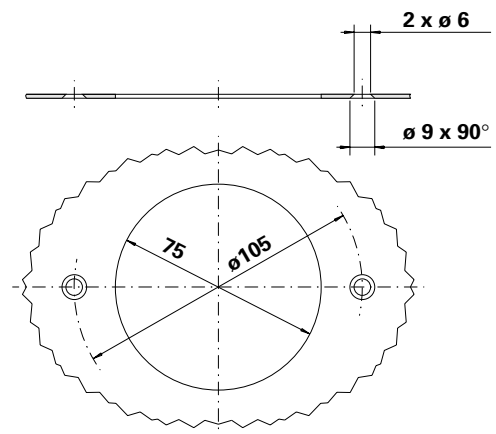


Figure 6.

Level Sensor - Spare Parts

	Level Sensor - complete	367 176
1	Level sensor housing	367 192
2	Display window	367 222
3	Flange socket - 7 pole (with printed circuit) - complete	364 258
4	Tube	367 184
5	Carrier plate	367 214
8	Float (with cable, and proximity switch) - complete	368 466
16	Lead-through - PG21	204 358
17	Lead-through - PG07	235 989
18	Milled nut - M 6	248 711
19	Sealing strip	103 837*

Level Sensor

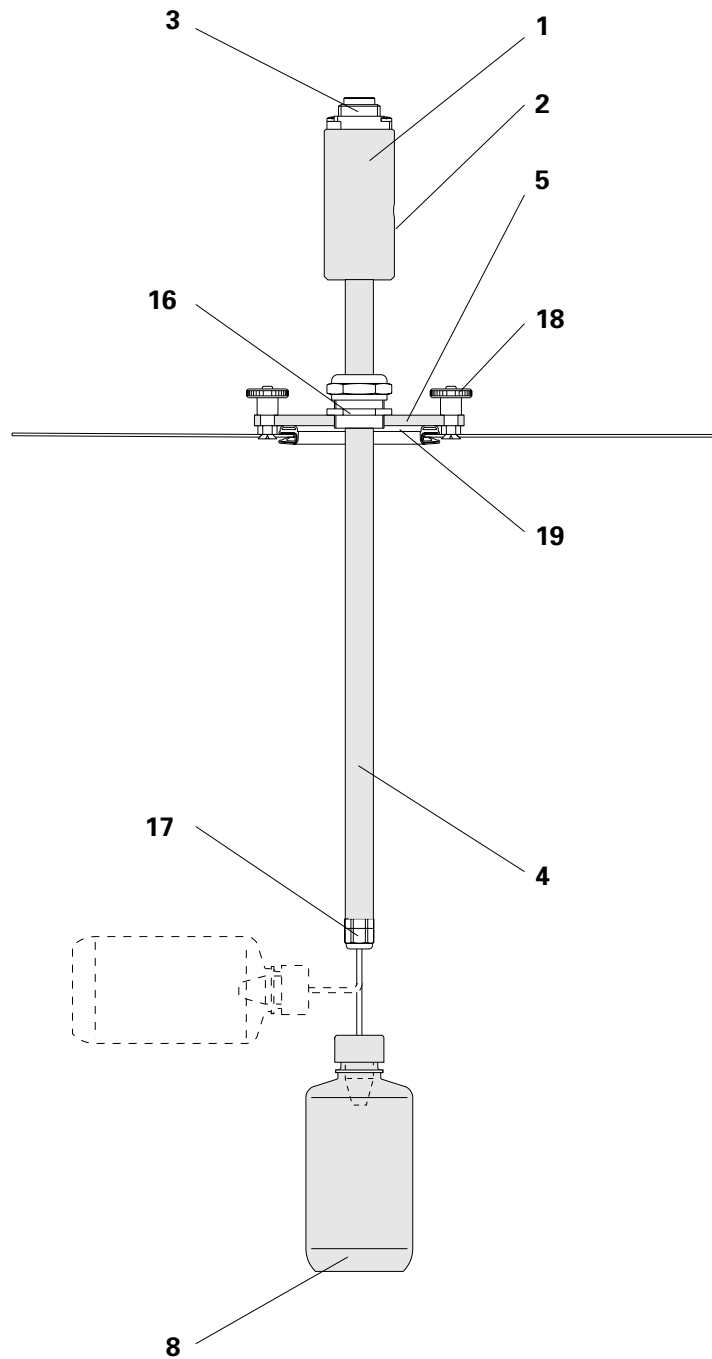


Figure 7.

Grounding of PH.--D Powder Hoppers

In order to guarantee operating safety, electrostatic powder coating hoppers must be grounded. On assembly a grounding cable (braided copper) must be passed through the fluidizing air hose and fixed with hose clamps at each end of the hose (see Fig. 3, below). The grounding cable can easily be passed through the hose by tying a knot in one end of the cable and then blowing it through the hose with compressed air.

NOTICE The braided cable must be unrolled to the full length of the powder hose required beforehand.

Powder hopper hose connections

1	Hose connection	203 173
2	Hose clamp	203 386
3	Solaflex hose	100 498
4	Braided copper wire	103 373
5	Quick-release connection	239 267
6	Locking nut	203 157
7	Hose connection	203 165

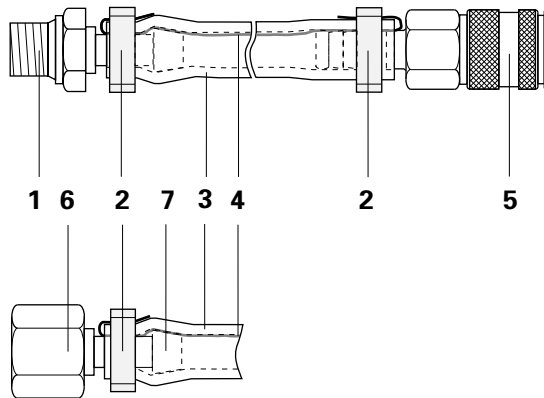


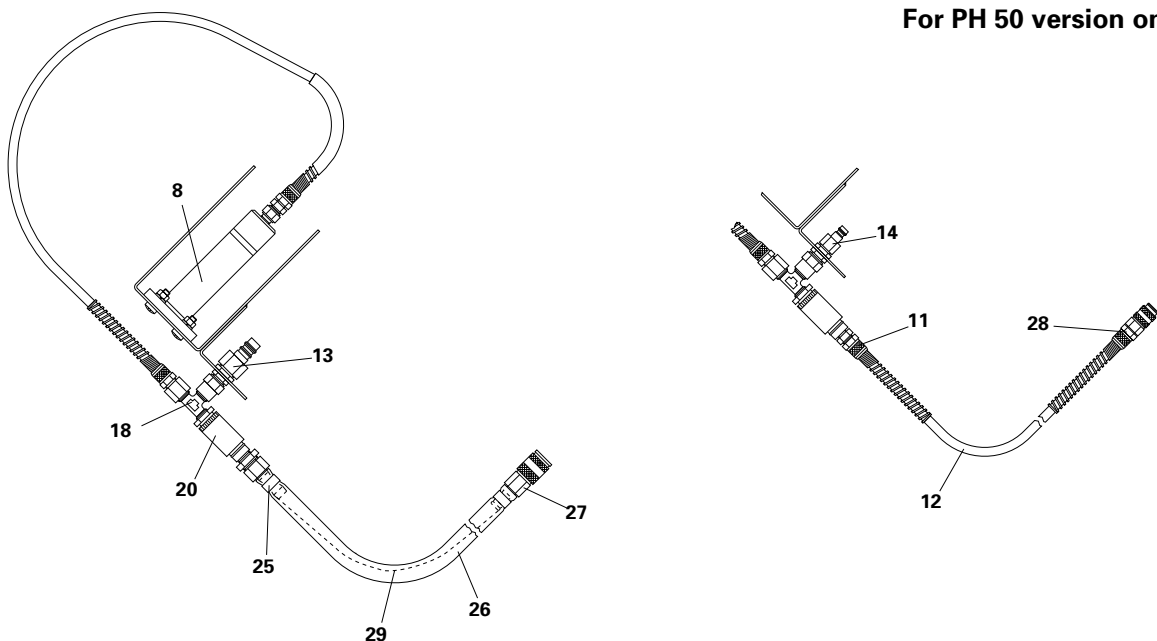
Figure 8.

Connecting the Vibrating base and setting the Fluidizing air on start-up

⚠ IMPORTANT

This procedure is only to be used on the initial start-up. Setting the fluidizing air later in operation (Adjustment for another type of powder) is to be done only on the ADU control unit.

1. Connect the main air input hose from the ADU (Air Distribution Unit) to the air input (**13** or **14** for **PH 50-D**) of the vibrating base.
2. Fit the quick-release connector (**27** or **28** for **PH 50**) to the fluidizing air connection of the powder hopper.
3. Screw the throttle check valve (**20**) closed (under the vibrating base).
4. Set the fluidizing air pressure on the ADU (**minimum 3 bar**). All the air is now being fed to the vibrator (**8**).
5. Slowly open the throttle check valve (**20**) to allow the powder in the hopper to fluidize. The vibration will decrease as the valve is opened.
6. If the vibrator stops vibrating before the powder "boils" properly, increase the fluidizing air pressure on the ADU, and then reset the throttle check valve (**20**) accordingly.
7. Repeat the above steps until the powder "boils" properly, and the hopper vibrates.
8. Tighten the milled locking ring on the throttle check valve (**20**) so that the setting cannot be changed by the vibration.



Vibrating/Fluidizing air connections - Viewed from below

Figure 9.

Vibrating Base - option

	Vibrating base PH 50-D - complete	352 020
	Vibrating base PH 100-D - complete	352 039
	Vibrating base PH 150-D / 200-D - complete	352 047
1	Vibration plate for PH 50-D / 100-D	351 997
	Vibration plate for PH 150-D / 200-D	352 055
2	Rubber mat for PH 50-D / 100-D	352 080
	Rubber mat for PH 150-D / 200-D	352 098
3	Beading	103 942*
4	Foot plate	352 012
5	Buffer support	342 378
6	Round buffer - \varnothing 50x45 mm-M10	239 232
7	Countersunk screw - M10x25 mm	214 566
8	Compressed air vibrator	245 232
9	Throttle - \varnothing 1.4 mm	301 329
10	Adapter - 1/8" (male)- \varnothing 8 mm	224 936
11	Connection nut - M12x1 mm (female) - \varnothing 8 mm	201 316
12	Hose - \varnothing 8 / 6 mm antistatic	103 756*
13	Quick-release hose connector - NW 7.4 mm-3/8" (female)	239 275
14	Quick-release hose connector - NW 5.2 mm-1/4" (female)	236 071
15	Lead-through - 3/8" (male)-1/4" (male)	237 817
16	Lead-through - \varnothing 8- \varnothing 8 mm	200 883
17	Adapter nut - 1/4" (female)-1/4" (female)	201 200
18	T-Connector - 1/4" (male) - 1/4" (male) - 1/4" (male)	201 600
19	Connection nut 1/4" (female)- \varnothing 8 mm	201 332
20	Throttle check valve - 1/4"	245 240
21	Adapter -1/4" (male)-3/8" (male)	223 239
22	Adapter -1/4" (male)- \varnothing 8 mm	225 479
23	Locking nut - 3/8" (female)	203 157
24	Hose connector - \varnothing 8 mm (female)	203 165
25	Hose clamp - 15-18 mm	203 386
26	Solaflex hose - \varnothing 16 / 10 mm	100 498*
27	Quick-release connection - NW* 7.4 mm- \varnothing 10 mm	239 267
28	Quick-release connection - NW* 5.2 mm- \varnothing 8 mm	203 181
29	Braided copper wire	103 373*
	Steel pin - M10x90 mm	245 216

* NW = Nominal diameter in mm.

* Indicate length required

Vibrating Base - option

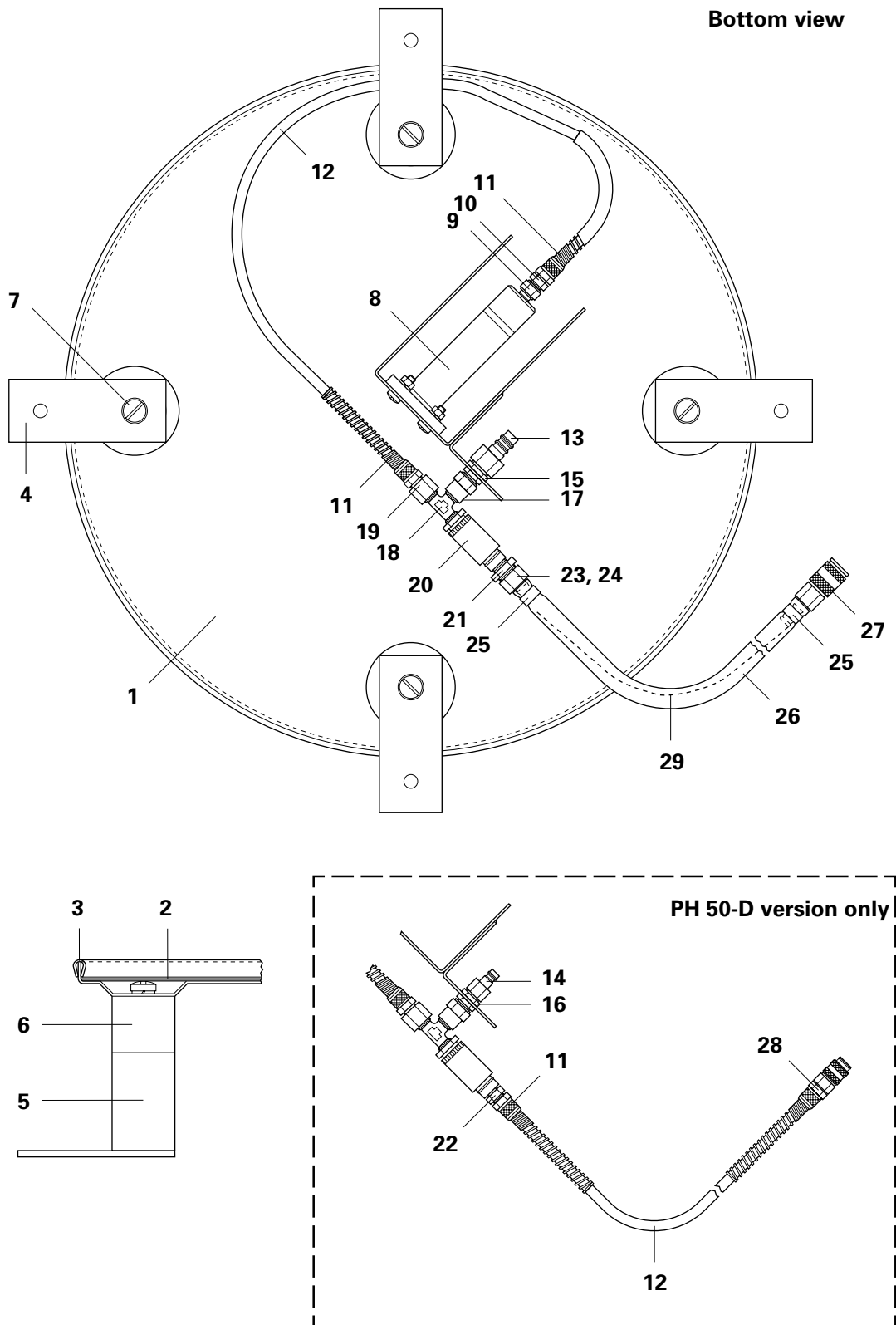


Figure 10.

Airmover (Option - for PH 50-D only)

A	Airmover - complete (option) - without Item 8	342 351
	Airmover - complete (option) - <i>for Enamel</i>	403 822
1	Powder hopper cover	367 011
2	Venting hose - \varnothing 32 mm	102 059*
3	Airmover	342 335
	Airmover - <i>for Enamel</i>	403 849
4	O-ring - \varnothing 38 x 4 mm	239 151
5	Clamp nut	342 343
6	Elbow joint - 1/8"-1/4"	202 894
7	Quick-release coupling - 1/8"	200 859
8	Ring - <i>for Enamel only</i>	403 830

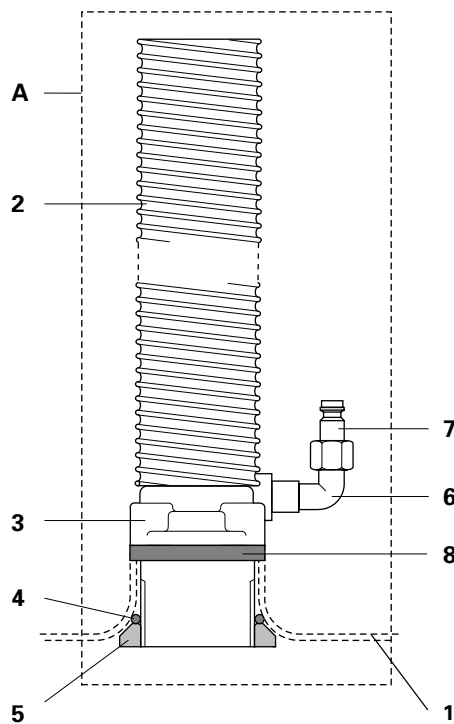
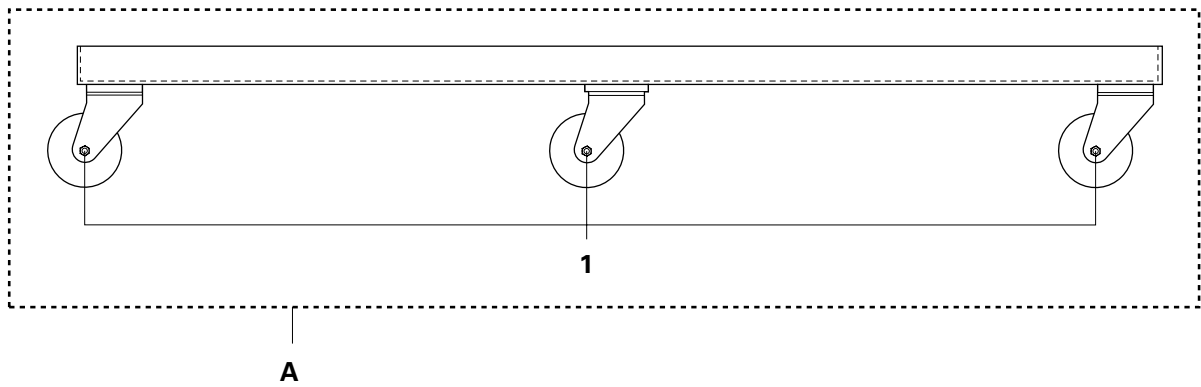


Figure 11.

* Indicate length required

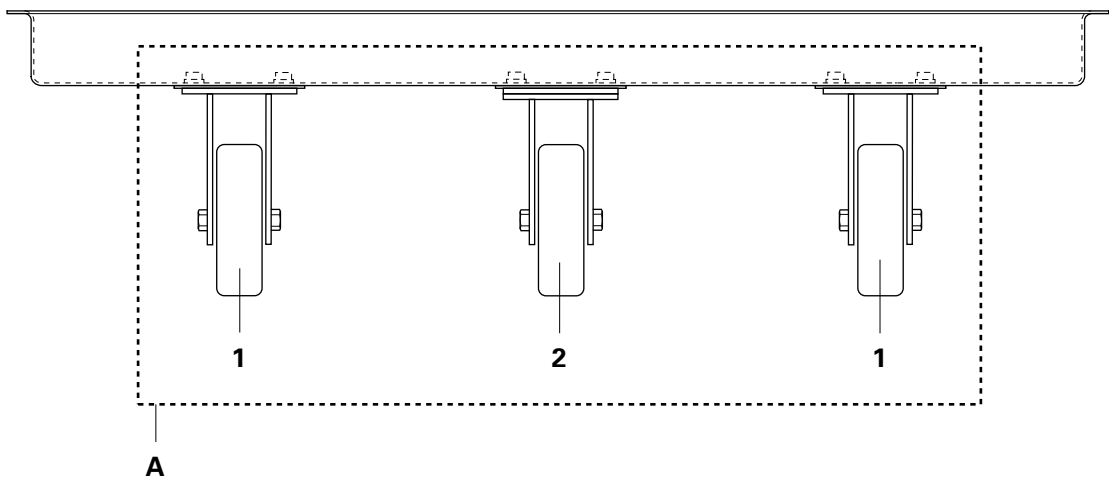
Powder Hopper Trolley (for PH 50-D only)



A	Trolley - complete	345 628
1	Swivel roller - ø 75 mm	217 581

Figure 12.

Mobile Powder Hopper (option) for PH 100-D / 150-D / 200-D



A	Rollers - complete (option - without Fluidizing air chamber)	342 432
1	Fixed roller - ø 75 mm	239 178
2	Swivel roller - ø 75 mm	239 186

Figure 13.

Documentation PH 50-D / 100-D / 150-D / 200-D Powder Hopper

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