Electrostatic Cable Coater
ECC301

Manual P/N 464 886 B
– English –

NORDSON ENGINEERING GMBH ● LÜNEBURG ● GERMANY

Note
This manual applies to the entire series.

Order number
P/N = Order number for Nordson products

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Safety

WARNING: Observe and follow all safety instructions, the general safety instructions included as a separate document, as well as the specific safety instructions in all other related documentation.

Description

1. Intended Use

Cable coaters in the series *ECC 301* – hereafter also referred to as *system* – may be used only to coat cables or similar substrates with talcum (ECC301 **V**) or other nonflammable super absorbent powder (ECC301 **T**). The model (ECC301 **C**) is intended for coating with abrasive materials.

Any other use is considered to be unintended. Nordson will not be liable for personal injury or property damage resulting from unintended use.

Intended use includes the observance of Nordson safety regulations. Nordson recommends obtaining detailed information on the materials to be used.

Area of Use (EMC)

The system is intended to be used in industrial areas.

Operating restrictions

When using in residential, business or industrial areas, the system may cause interference with other units, e.g. radios.

Unintended Use – Examples –

The system may not be used under the following conditions:

- For application of unsuitable materials, particularly flammable materials and stearates
- In defective condition
- When changes or modifications have been made by the customer
- In an atmosphere in which the maximum ppm concentration permitted is exceeded
- In a potentially explosive atmosphere
- When the values stated under *Specifications* are not complied with.

2. Residual Risks

In the design of the unit, all precautions were taken to protect personnel from potential danger. But some residual risks can not be avoided. Personnel should be aware of the following:

- Emission of material particles into the atmosphere when filling the hopper, disconnecting pneumatic lines and material hoses and opening the spray chamber
- Inhalation of potentially hazardous material particles.

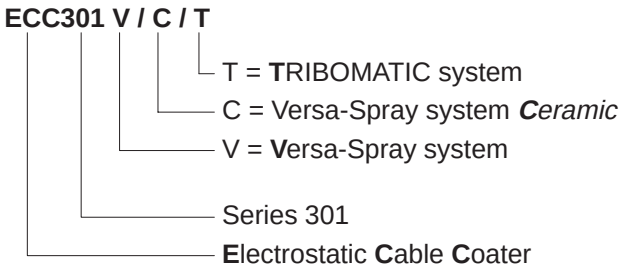
3. Note on Manual

- This manual applies to the entire series.
- This manual is valid only in conjunction with all other parts of the system documentation.

4. Series Overview

The various systems in the series *ECC 301* basically differ from one another in the model of the spray chamber, the guns and the control units used.

Type Designation



System Components

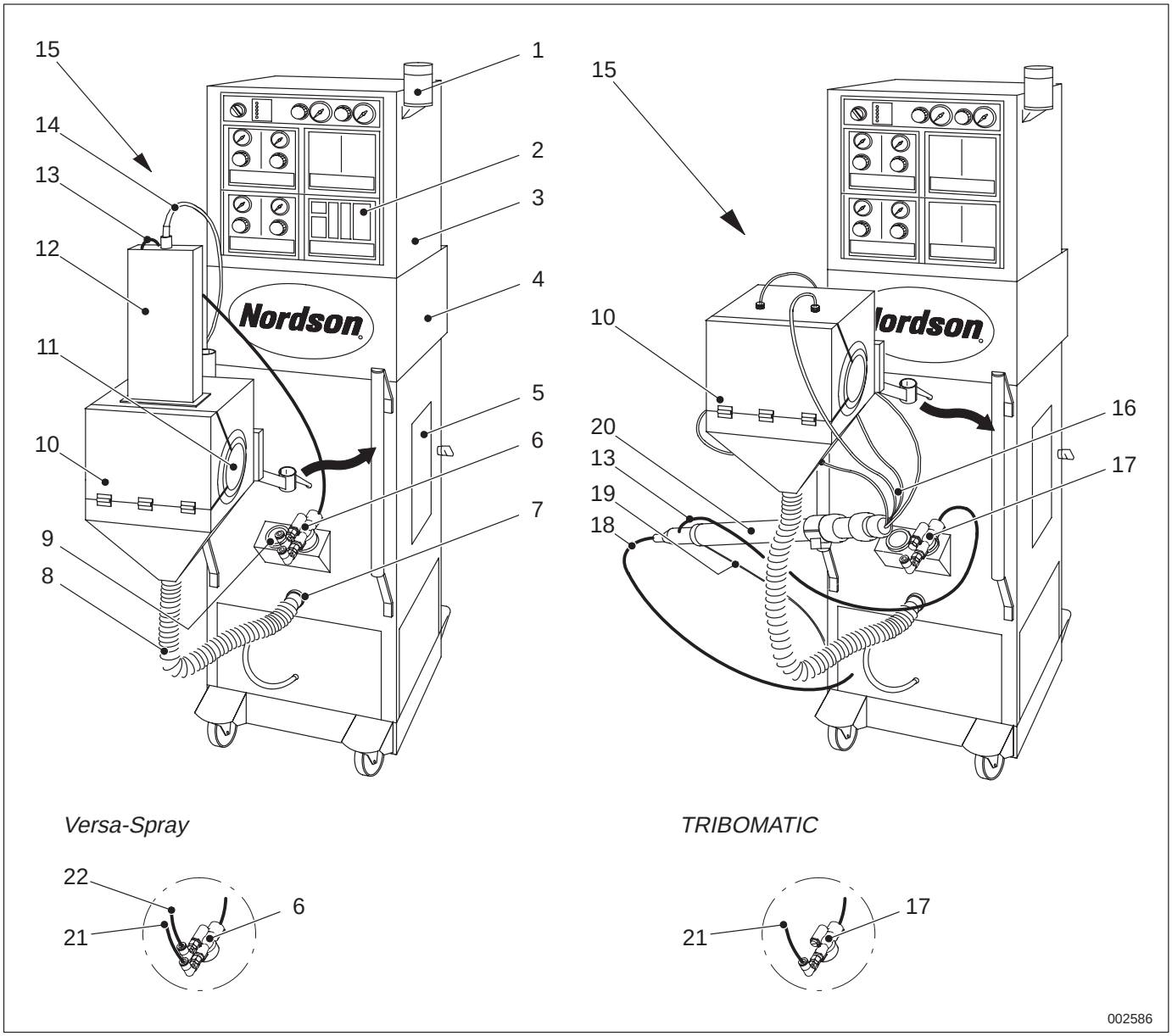


Fig. 1 Principle drawing

1 Warning light / Alarm
2 Control units*
3 Rack for control units
4 Basic unit
5 Door to powder hopper
6 Powder pump (Versa-Spray)*
7 Pump *powder recovery*
8 Powder recovery hose
9 Second powder pump mount
10 Spray chamber
11 Rubber cover
12 Inside: Versa Spray powder gun*
13 Powder hose
14 Cable to powder gun
15 Air dryer with preliminary and after filters (accessory)*
16 Powder hoses (charged material)
17 Powder pump (TRIBOMATIC)*
18 Hose *atomizing air*
19 Charge measuring cable
20 TRIBOMATIC powder gun*
21 F: Hose *flow rate air*
22 A: Hose *atomizing air*
23 Not shown: Level sensor (on back of system)

Note: There are separate manuals available for components marked with an asterisk (*).

5. Functioning

The system functions on the principle of electrostatic charging of powdery materials. The charged powder particles seek the closest and best ground – the substrate itself. Cable is usually coated.

Versa-Spray

The powder is conveyed out of the hopper with a powder pump working on the Venturi principle. The pump (6, Fig. 1) has two compressed air connections: flow rate air (F) and atomizing air (A). The pressure of the flow rate air determines the quantity of powder sucked in. The powder/air mixture generated by the atomizing air is conveyed to the powder gun and charged there by a high voltage electrode. The charged powder particles find the grounded substrate and stick to it.

This procedure is referred to as the *Corona* procedure in Nordson literature.

In order to make the powder in the hopper capable of being conveyed, it is fluidized. The fluidized air is introduced from underneath, penetrating a plate that is air permeable but not solid permeable.

NOTE: With higher line speeds / powder quantities (high flow), two powder pumps are used.

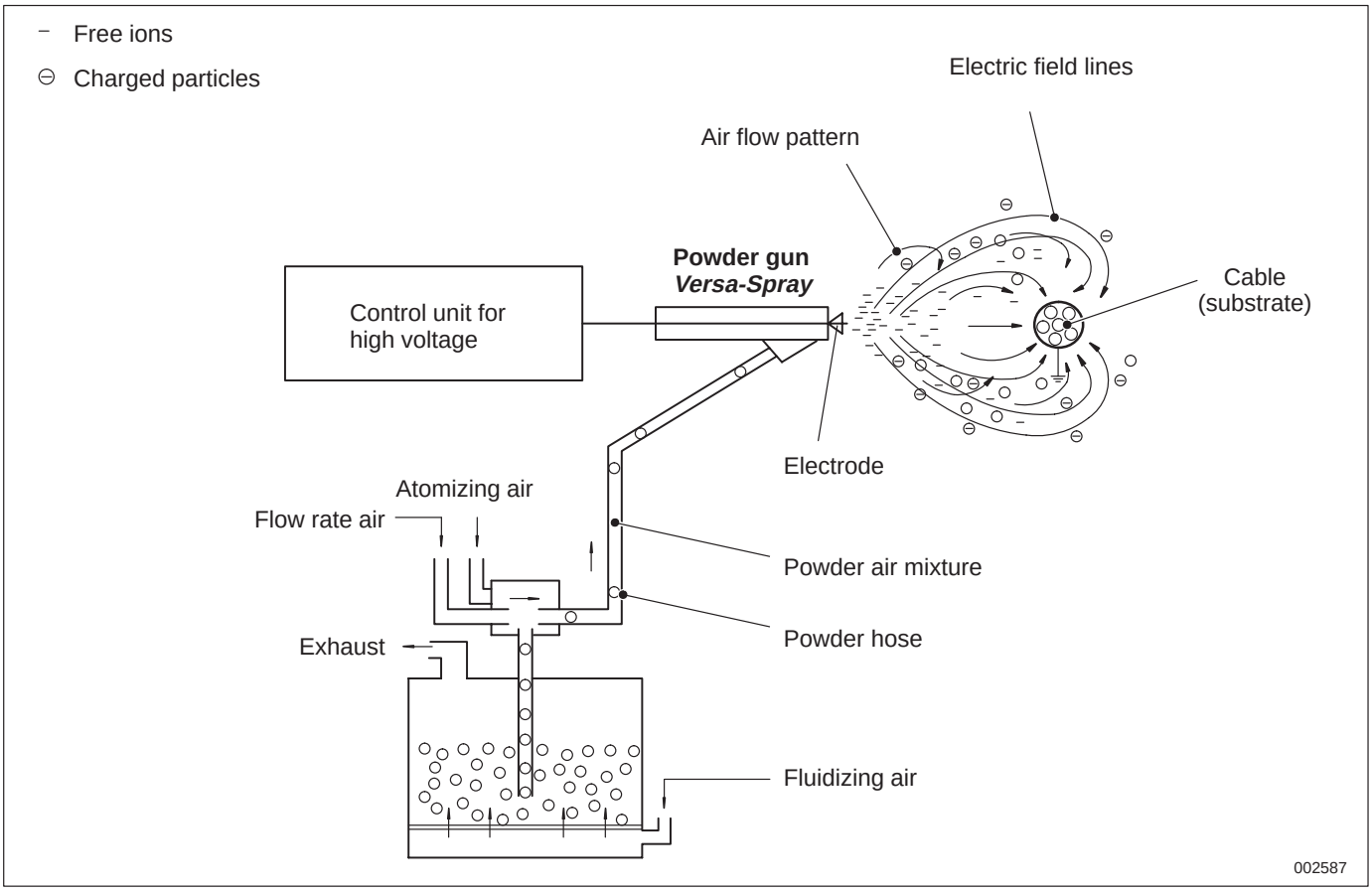


Fig. 2 Principle drawing with one powder gun

TRIBOMATIC

The powder (e.g.: Super Absorbent Powder) is conveyed out of the hopper with a powder pump working on the Venturi principle. The pump (17, Fig. 1) has a compressed air connection for the flow rate air (F). The pressure of the flow rate air determines the quantity of powder sucked in. The atomizing air and the powder come together at the diffuser of the TRIBOMATIC powder gun. The powder particles are charged by friction in the charge tube. The charged powder particles find the grounded substrate and stick to it.

In order to make the powder in the hopper capable of being conveyed, it is fluidized. The fluidized air is introduced from underneath, penetrating a plate that is air permeable but not solid permeable.

NOTE: When the line speed / powder quantity is low (low flow), a gun with 4 nozzles is used; with medium line speed / powder quantity the gun has 8 nozzles. When the line speed / powder quantity is high (high flow), the system is equipped with 2 guns with 4 nozzles each.

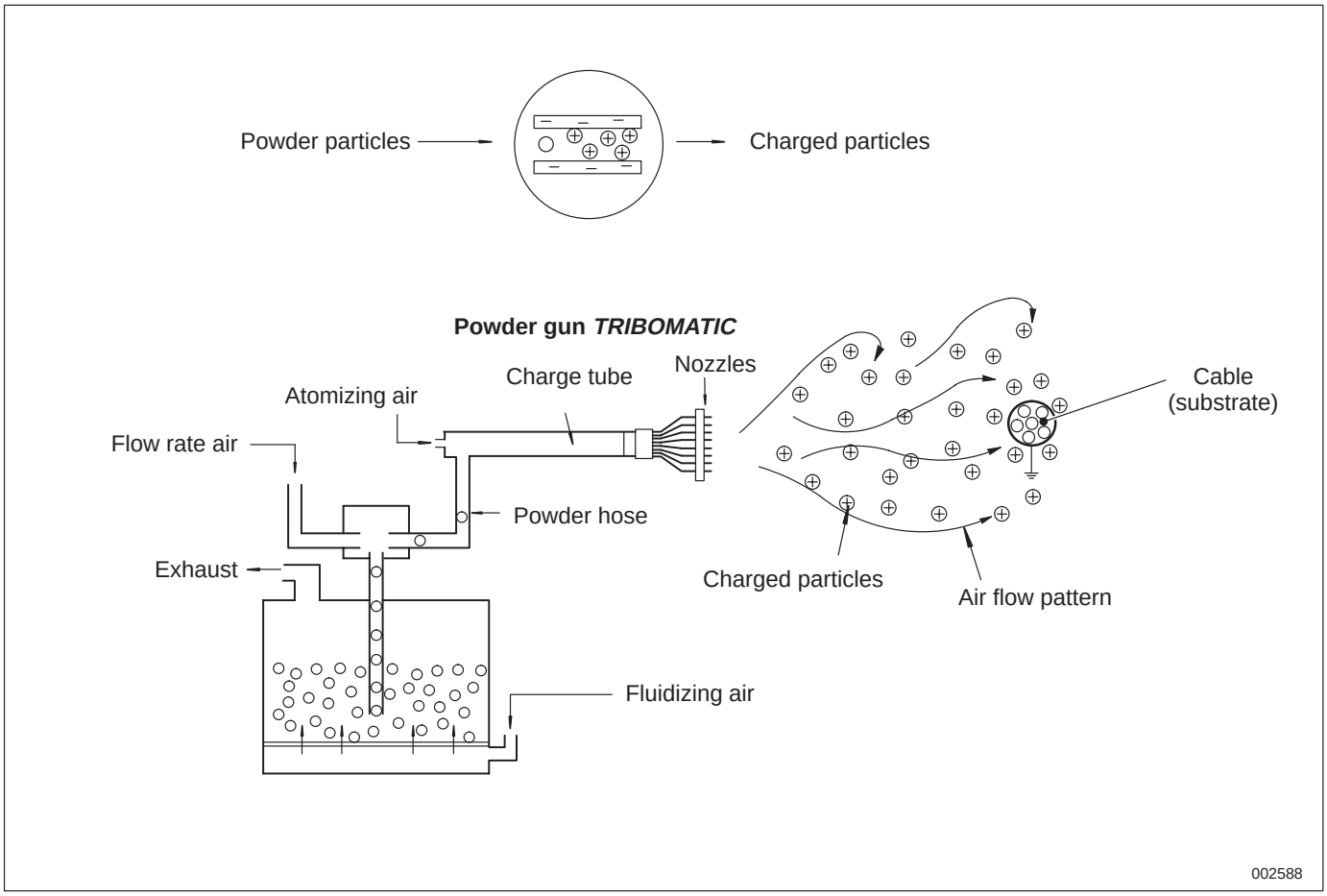


Fig. 3 Principle drawing with one powder gun (middle flow)

Contact Switch

When the spray chamber (10, Fig. 1) is opened during operation, the contact switch on the spray chamber causes the powder flow to stop and, with Versa-Spray, the high voltage supply to the powder gun to be interrupted.

When the door to the powder hopper (5, Fig. 1) is opened during operation, the contact switch on the door causes filter cleaning to be interrupted.

When the spray chamber / door is closed, the system automatically returns to the original operating state.

Warning Light / Alarm

The orange lamp lights up to indicate that the powder level is too low or there is too little powder (with option *PFC*). If desired, an acoustic warning signal can be emitted.

The acoustic signal can be switched on and off with the switch on the warning light.

6. ID Plate

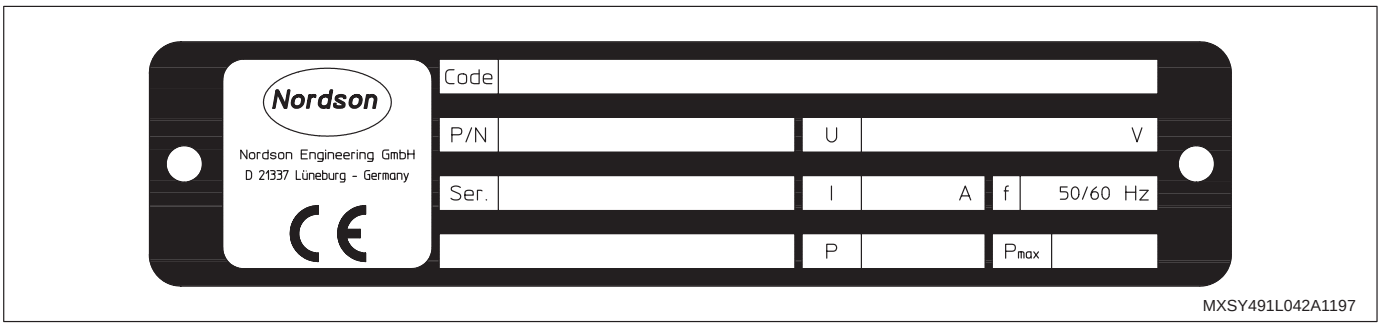


Fig. 4

Information	Explanation	Unit
Code	Unit designation and configuration code	–
P/N	Order number (part number)	–
Ser.	Serial number	–
U	Operating voltage	Volt
I	Fuse protection	Ampère
f	Line voltage frequency	Hertz
P	Power consumption of unit	Watt
P_{max}	Power consumption of unit and connected accessories	Watt

Installation

WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

1. Unpacking

Carefully unpack cable coater and components. Keep packaging material to reuse it, or dispose of properly according to local regulations.

Lifting (Unpacked System)

Refer to *Specifications* for weight. Use only suitable floor lifting equipment (lifting truck or fork lift).

2. Setting Up

Set up only in an environment that conforms with the stated Degree of Protection (Refer to *Specifications*). Do not set up in a potentially explosive atmosphere!

Ensure that there is enough space to fill powder (2) and for installation (1) and maintenance work.

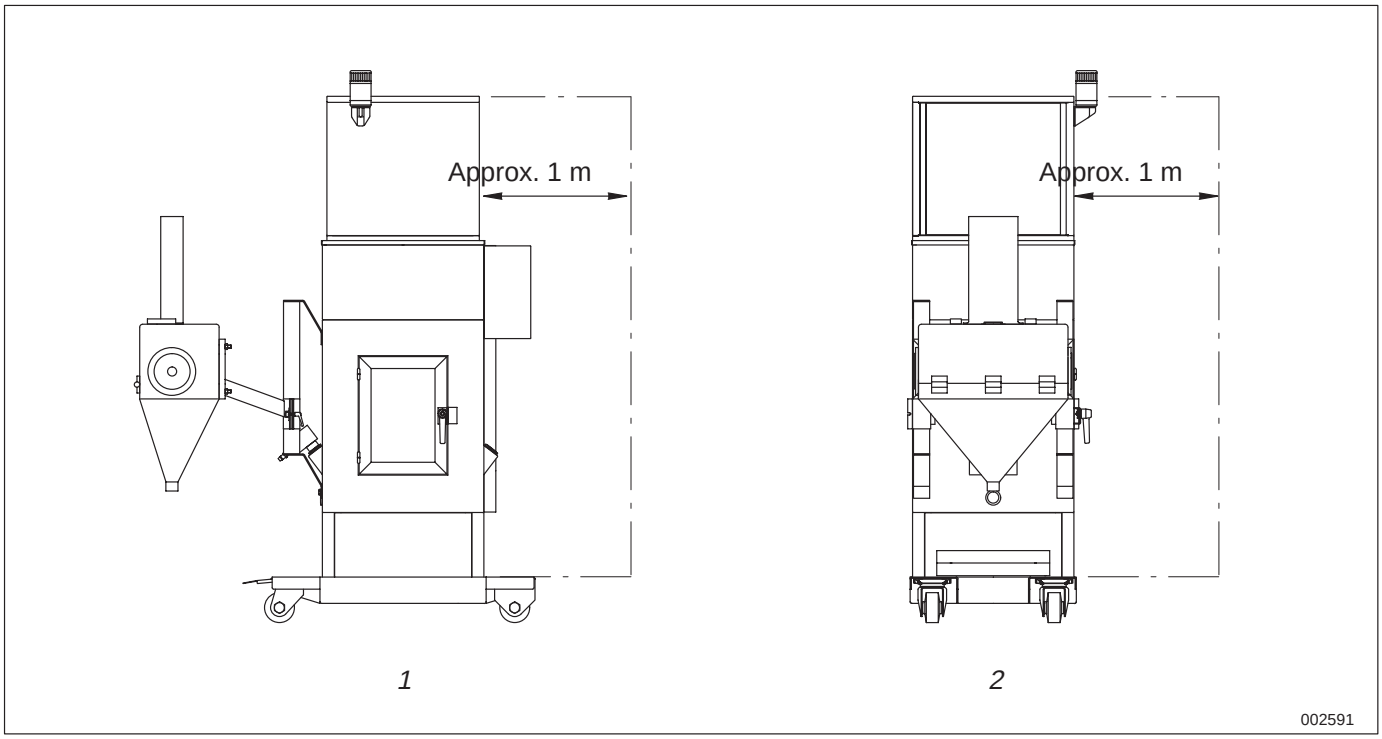


Fig. 5 Free space

3. Assembly

Also refer to separate manuals for powder guns.

NOTE: Refer to Fig. 10 for a detailed illustration of the connecting panels.

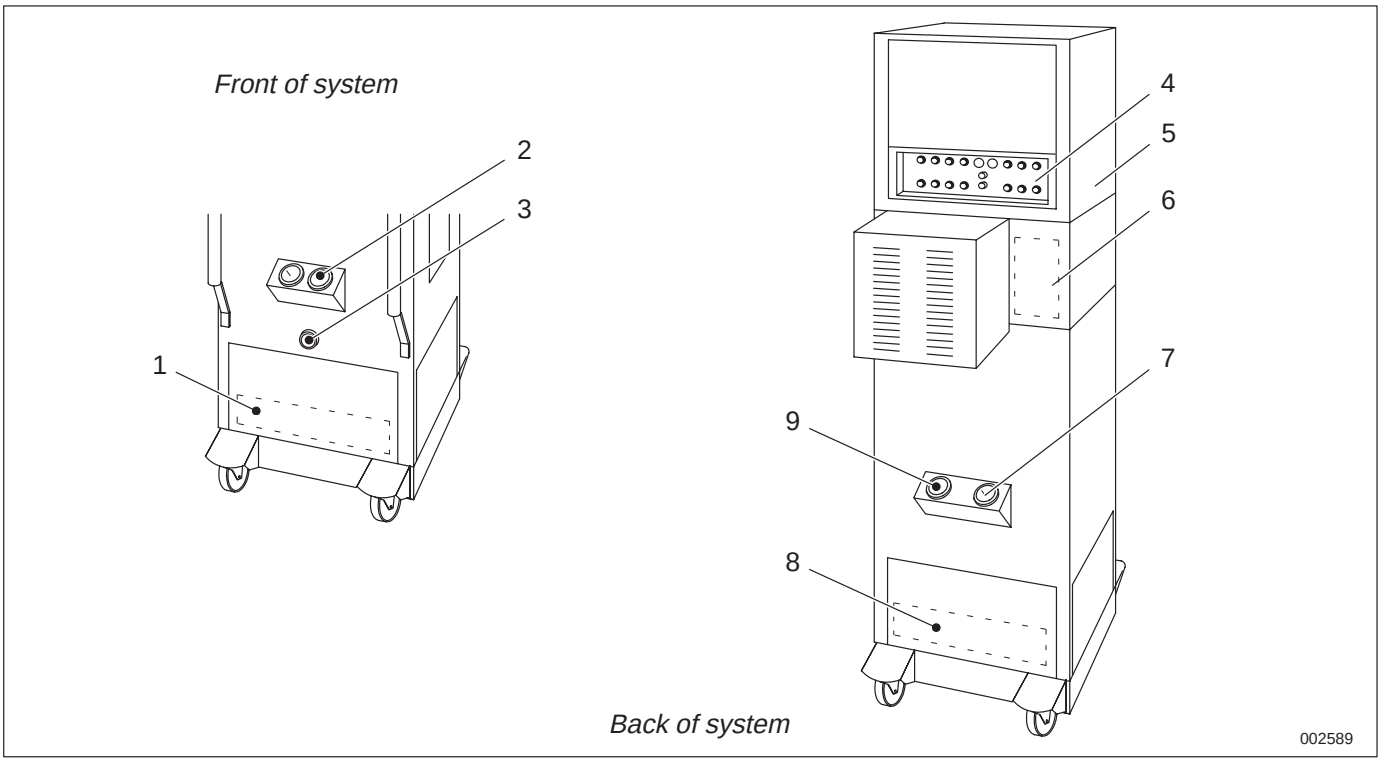


Fig. 6

1 Connecting panel 1
2 Connection for powder pump
3 Pump *powder recovery*
4 Connecting panel (rack)
Connecting panel 2
5 Rack for control units
6 Connecting panel 3
7 Connection for level sensor
8 Connecting panel 4
9 Connection for refill hopper

1. Remove transport protection (if present).
2. Attach spray chamber (10, Fig. 1) to the holders.
3. Attach powder recovery hose (8, Fig. 1) between the spray chamber and the pump *powder recovery* (3).

   NOTE: Make sure that this hose is of minimum length to avoid clogging of returning powder.

Attach Powder Gun(s)

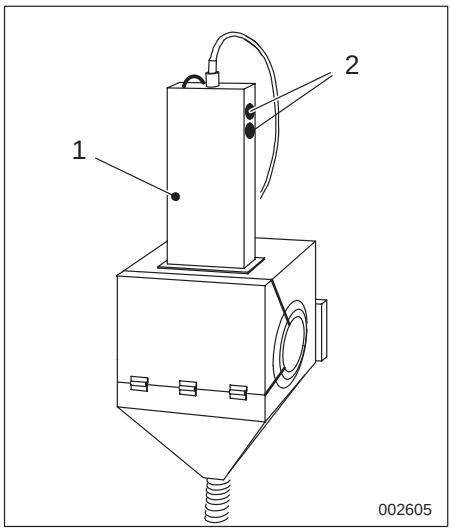


Fig. 7

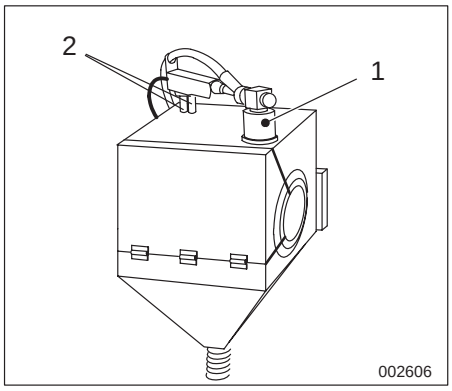


Fig. 8

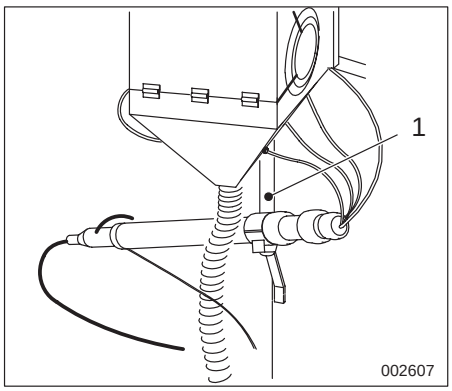


Fig. 9

Versa-Spray

1-gun version: Attaching to spray chamber

1. Screw holder (1) onto spray chamber.
2. Connect cables and hoses to the gun as described under *Pneumatic Connections / Electrical Connections*.
3. Guide gun into the holder from the top and then stick it into the connecting piece.
4. Screw the two gun spacers (2) onto the side of the holder.
5. Connect cables and hoses to the system as described under *Pneumatic Connections / Electrical Connections*.

2-gun version: Attaching to spray chamber and the back of the chamber.

1. Put gun in the connecting piece (1).
2. Screw the two gun spacers (2) onto the spray chamber.
3. Repeat steps for second gun on the back of the chamber.
4. Connect cables and hoses as described under *Pneumatic Connections / Electrical Connections*.

TRIBOMATIC

Attach to the holder (1) on the system.

Connect cables and hoses as described under *Pneumatic Connections / Electrical Connections*.

Pneumatic Connections

NOTE: *1*: 1st gun; *2:* 2nd gun (if present)

1. Connect powder pump and gun inlet with the powder hose.
2. ***TRIBOMATIC:*** Connect powder hoses (for charged material) to diffuser on end of charging tube and connect atomizing air also to diffuser.

   NOTE: The outlet *A1/2* (connecting panel 1) is connected to the gun inlet and used for atomizing air.

Electrical Connections

1. Electrically connect level sensor (*LEVEL PROBE*, connecting panel 2).
2. Electrically connect powder gun(s).

Versa-Spray: Connect cable to powder gun (14, Fig.1) to *GUN CONNECTOR 1/2* (connecting panel 2). To do this, guide the cable through the cable duct (connecting panel 1 and 4) and the cable channel on the back of the system.

TRIBOMATIC: Use charge measuring cable to connect gun and *PFC 1/2* (connecting panel 2). To do this, guide the cable through the cable duct (connecting panel 1 and 4) and the cable channel on the back of the system.

3. Connect spray chamber contact switch to the connection SPRAY CHAMBER INTERLOCK (connecting panel 2). To do this, guide the cable through the cable duct (connecting panel 1 and 4) and the cable channel on the back of the system.
4. Ground spray chamber holder. Do this by connecting the holder with terminal screw GND (connecting panel 3). To do this, guide the cable through the cable duct (connecting panel 1 and 4) and the cable channel on the back of the system.

Connecting Panels 1 to 4

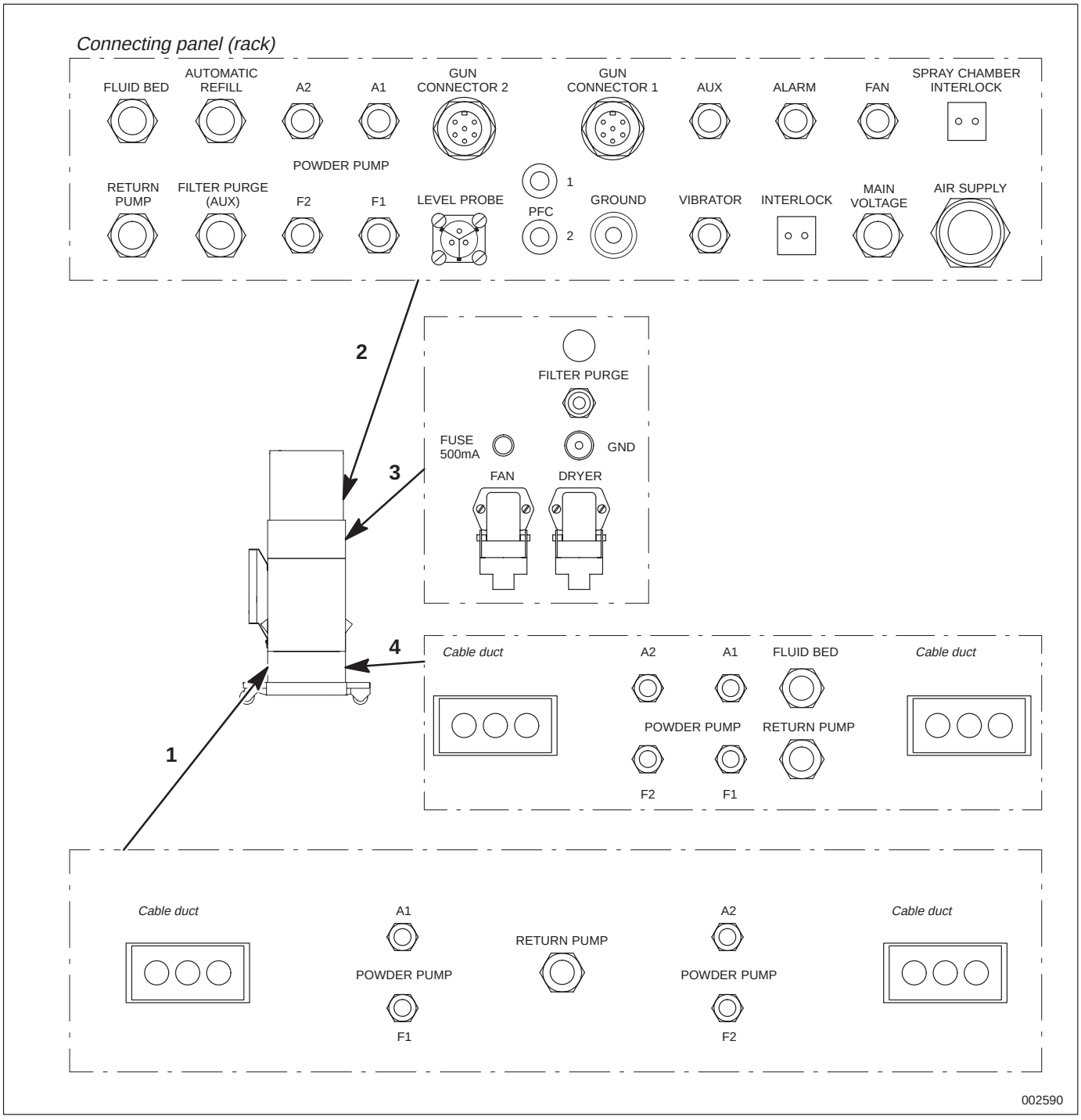


Fig. 10

Laying Power Cord

WARNING: In the working area around the unit, lay power cords such that they do not pose a risk of stumbling and such that they can not be damaged. Do not pinch power cords, and regularly check for damage. Replace damaged power cord immediately!

Line Voltage

WARNING: Operate only with the line voltage shown on the ID plate.

NOTE: Permitted deviation from nominal voltage is ± 10%.

NOTE: The power cord cross-section must comply with the power consumption. Refer to *Specifications*.

Electrical Connections (External)

WARNING: Risk of electrical shock. Failure to observe may result in personal injury, death, or equipment damage.

1. Connect cable coater to the customer's power supply with the power cord (*MAIN VOLTAGE*, connecting panel 2, Fig. 10).

2. Connect ground.

NOTE: The ground wire in the power cord is usually not sufficient for good grounding. The system should be independently connected to the best ground connection. Do this by laying a cable with a large cross-section from the terminal screw *GND* (connecting panel 3, Fig. 10) to good earth, e.g. a water pipe.

3. Connect *INTERLOCK* (connecting panel 2, Fig. 10). *INTERLOCK* is a potential-free connection that is used for coupling the system function with Start/Stop of the cable production line, for a PLC link or for an external control unit.

Compressed Air Supply

For applying powder, dry, non-lubricated and clean compressed air is imperative. The compressed air supply must be such that it can be dependably regulated in a range up to 600 kPA.

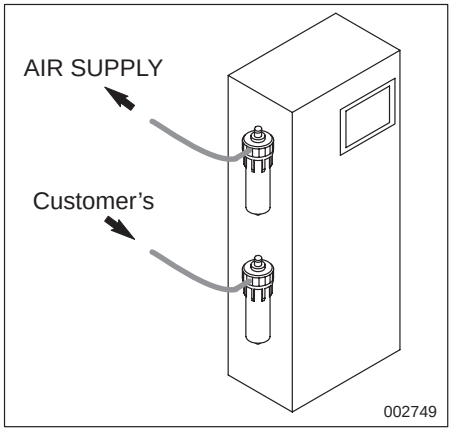


Fig. 11

Nordson recommends using the air dryer P/N 634 807 (Fig. 11).

If the air dryer is to retrofitted:

1. Attach the air dryer to the intended position on the coater.
2. Link air dryer and *AIR SUPPLY* (connecting panel 2, Fig. 10).
3. Connect compressed air supply to air dryer.
4. Electrically connect air dryer (*DRYER*, connecting panel 3).

Preparing Spray Chamber

Before the system can be started up, the spray chamber (10, Fig. 1) must be prepared as follows:

1. Set the height of the spray chamber such that the cable to be coated runs through the center of the spray chamber.
2. If necessary, run the cable over supporting rolls before it enters the chamber and after it exits the chamber to keep it from sagging.
3. Punch or cut holes in the rubber lid (11, Fig. 1) for chamber inlet and outlet.

NOTE: Approximately 12.5 mm (.50 in.) larger than cable outer diameter.

4. Fasten rubber lid to chamber inlet and outlet.

Operation

WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

1. Control Unit Rack Versa-Spray

Detailed descriptions of the control units can be found in separate manuals in the system documentation.

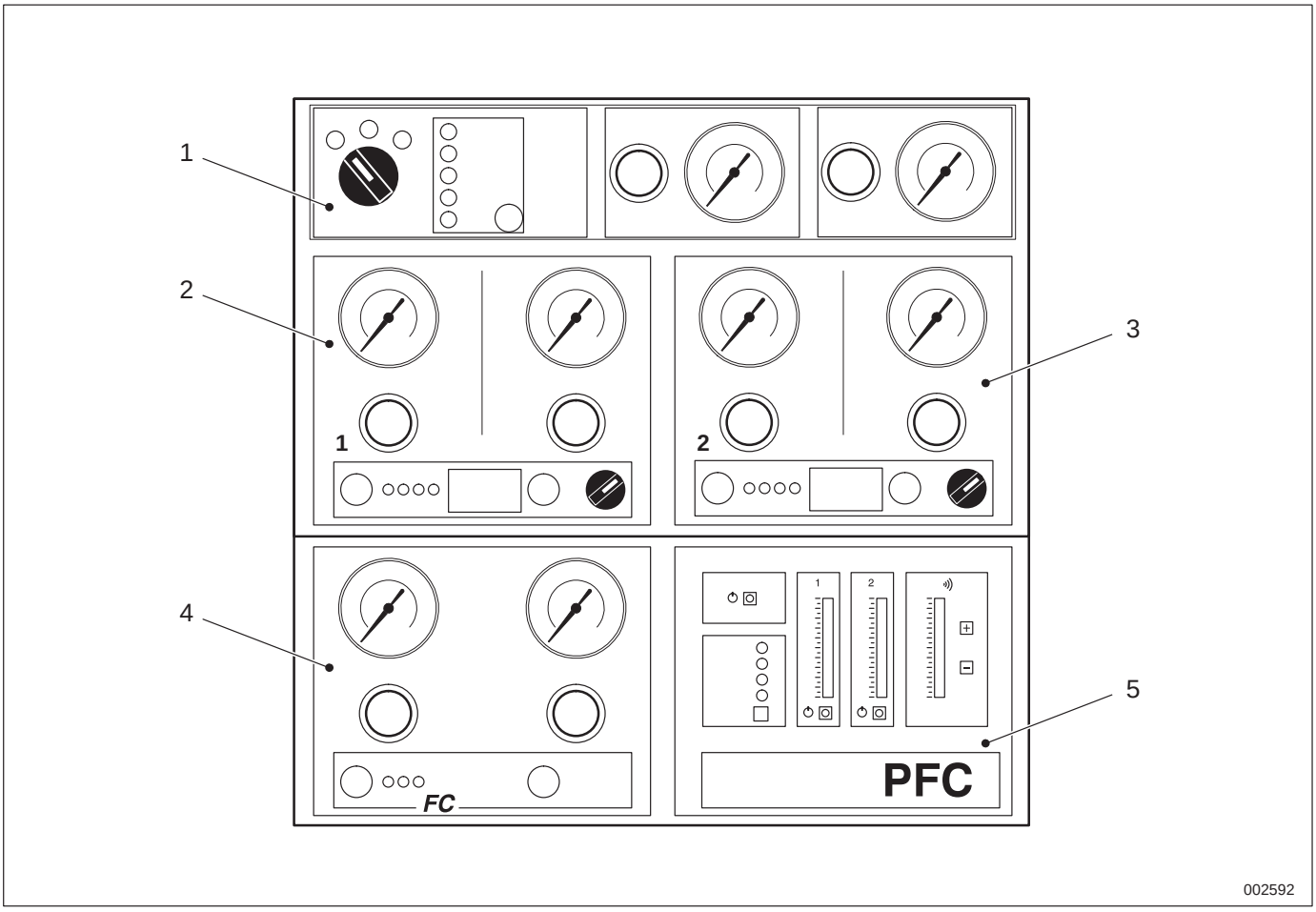


Fig. 12

1 Master control module
2 Control unit for 1st Versa-Spray gun
3 Control unit for 2nd Versa-Spray gun
4 FC control unit
5 PFC control unit (option)

2. Control Unit Rack TRIBOMATIC

Detailed descriptions of the control units can be found in separate manuals in the system documentation.

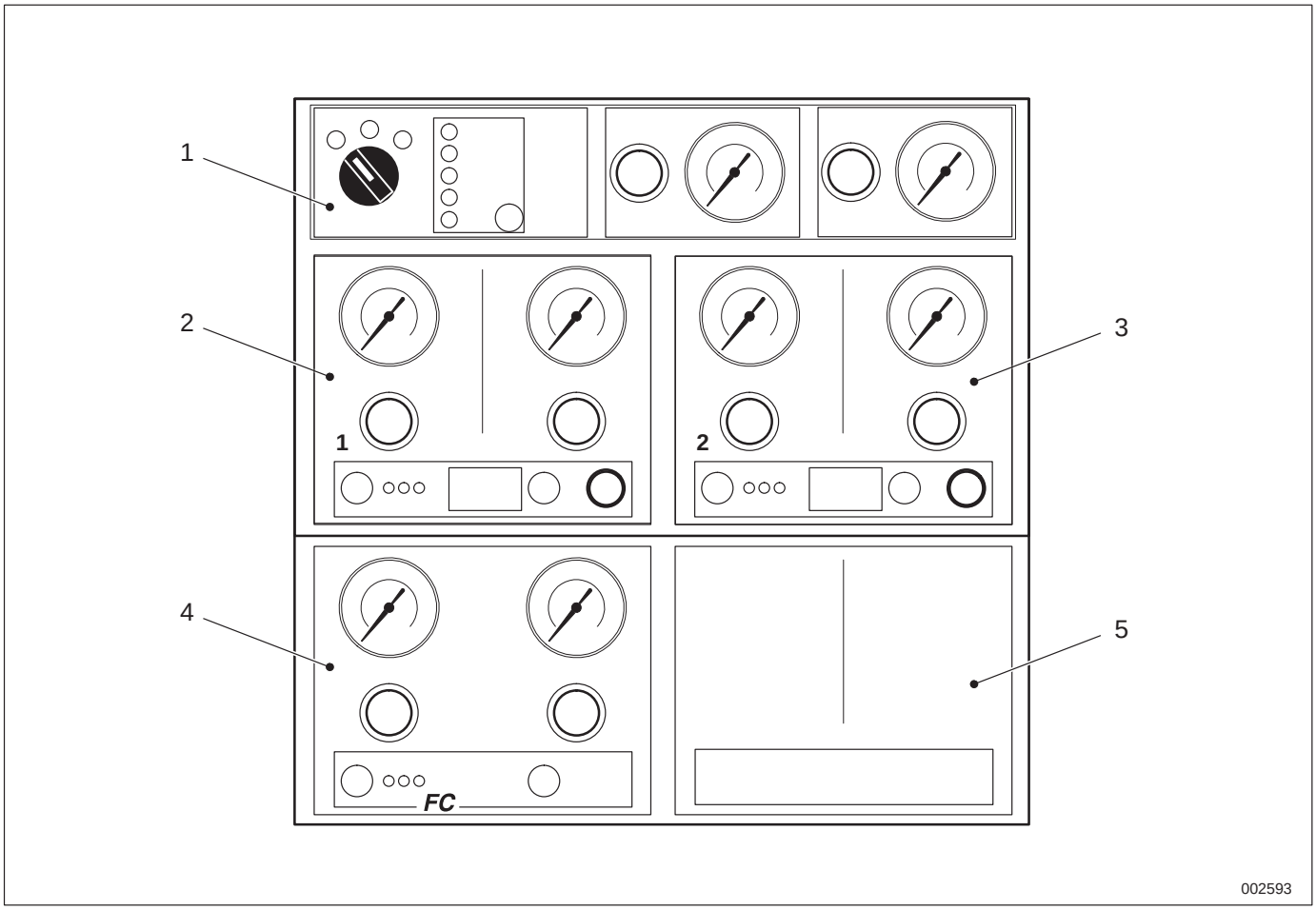


Fig. 13

1 Master control module
2 Control unit for 1st TRIBOMATIC gun
3 Control unit for 2nd TRIBOMATIC gun
4 FC control unit
5 Blind cover

Master Control Module

The master control module controls the gun control units. The module has two air pressure controllers and pressure measuring instruments for fluidization and powder recovery. LEDs show the selected functions and warnings.

Control Unit for 1st Versa-Spray Gun

The control unit contains the pneumatic and electrical control elements, the DC supply and monitoring functions for automatic powder guns, type IPS (Integral Power Supply).

Control Unit for TRIBOMATIC Gun

The automatic TRIBOMATIC II spray guns are controlled with the pneumatic and electrical control elements.

FC Control Unit

The control unit is used to pneumatically and electrically control the filling of powder hoppers and filter cleaning.

PFC Control Unit (Option)

The PFC control unit is used to make visible powder flow by showing the powder charge values. It is used only with Versa-Spray guns.

A measuring ring (1) is attached to the powder outlet on the pump(s).

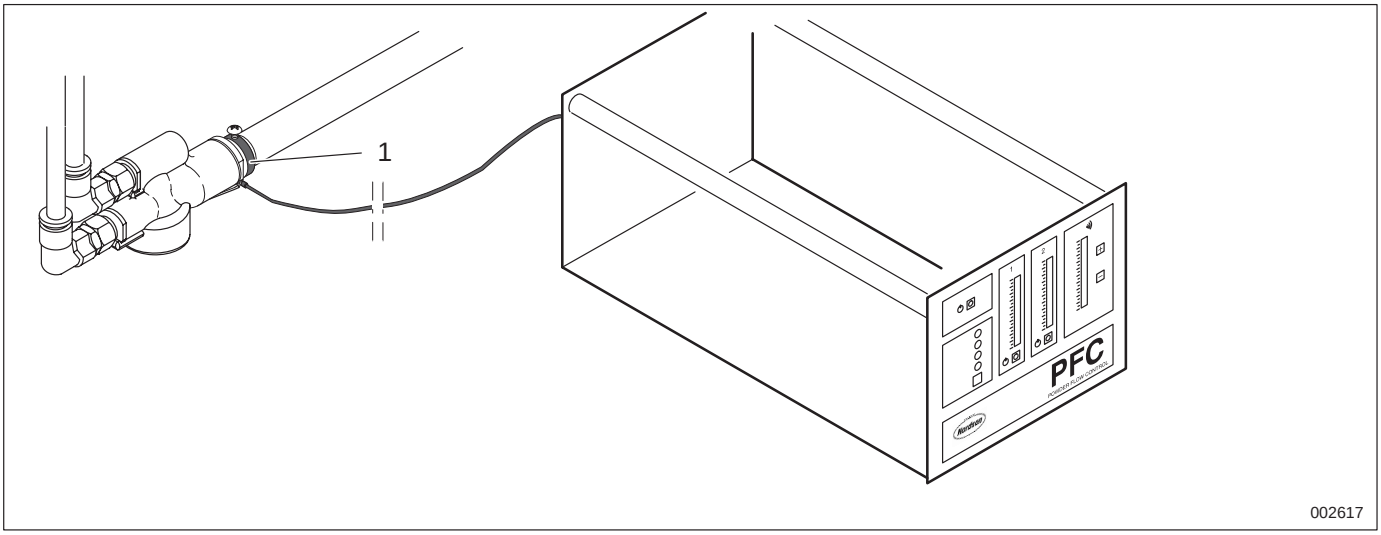


Fig. 14

3. Operation

Do not switch on the cable coater immediately. Particularly the compressed air supply must remain off.

Filling Powder

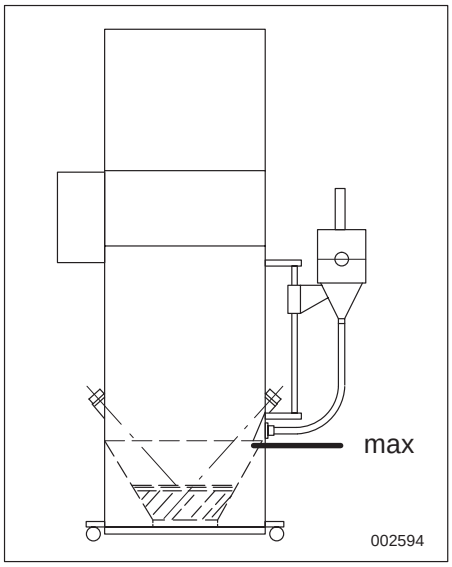


Fig. 15 Maximum powder level

WARNING: When the hopper is filled and the chamber is opened, material particles are emitted into the atmosphere. Keep emission to a minumum by handling drum carefully. Wear respiratory protection.

1. Open door to powder hopper (5, Fig. 1).
2. Carefully open powder drum.
3. Carefully pour approximately half (12.5 kg) of the standard powder drum (25 kg) into the hopper of the system.

NOTE: The powder level in the hopper must be significantly below the recovery connection piece (Fig. 15).

4. Firmly close door.
5. Store opened powder drum in a dry place.

Adding Powder During Operation

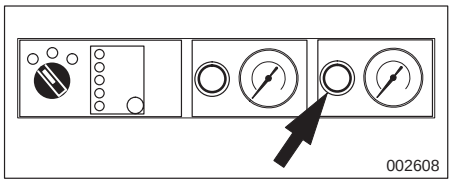


Fig. 16

When refilling powder during operation, observe the following points:

- Turn off powder recovery with the pressure regulator on the master control module (Fig. 16) by making pressure zero.
- Allow fluidization to run.
- Do not exceed maximum powder level.

Basic Settings

NOTE: When setting air pressures, the principle ”working from the bottom up” should be followed.

If, for example, the manometer shows 5 bar but only 3.5 bar is to be set, a value significantly below 3.5 should be used as the starting point (e.g. 1 bar). Then the pressure can be increased slowly from this low value up to the desired value of 3.5 bar.

Functioning		**Maximum value**	**Minimum value**	**Recommended value**	**Refer to**
Compressed air supply / operating air pressure		600 kPa/6.0 bar	500 kPa/5.0 bar	**600 kPa/6.0 bar**	*Installation, Compressed Air Supply*
Fluidization pressure		150 kPa/1.5 bar	50 kPa/0.5 bar	**100 kPa/1.0 bar**	Separate manual *Master Control Module*
Powder recovery		200 kPa/2.0 bar	150 kPa/1.5 bar	**150 kPa/1.5 bar**	
Powder flow rate		250 kPa/2.5 bar	40 kPa/0.4 bar	**120 kPa/1.2 bar**	Separate manual *Control Unit* for Versa-Spray or TRIBOMATIC guns
Atomizing / diffuser air		120 kPa/1.2 bar	100 kPa/1.0 bar	**120 kPa/1.2 bar**	
Powder refill air		350 kPa/3.5 bar	350 kPa/3.5 bar	**350 kPa/3.5 bar**	Separate manual *FC Control Unit*
Air blast cleaning of filters	**AUX**	300 kPa/3.0 bar	230 kPa/2.3 bar	**250 kPa/2.5 bar**	
PFC control unit		–	–	**Alarm level 20% Charge displays around 50%**	Separate manual *PFC Control Unit*

Startup

NOTE: Good electrostatic powder coating can occur only when – in addition to independent, sufficient grounding of the system – the substrate to be coated is effectively grounded.

1. Effectively ground the end of the cable at the unwinder.
2. Verify that the ON/OFF switch on the Versa-Spray- or TRIBOMATIC control units are still set to OFF.
3. Start compressed air supply.
4. Set operating air pressure to 600 kPa, 6 bar.
5. Switch on air dryer when present.
6. Set master switch on master system control module to the position to the right (system ON: *solenoid valves open*)
7. Set ON/OFF switch on FC control unit and – when present – on PFC control unit to ON.
8. Set air pressure values as recommended.
9. Allow the powder supply to fluidize for several minutes during startup.
10. Start cable production line.
11. Switch ON Versa-Spray or TRIBOMATIC control unit(s).
12. When using Versa-Spray guns, initiate production with maximum charging voltage.

NOTE: When using Versa-Spray nozzles, refer to *Nozzle Setting*.

13. Visually check the quality of the powder coating during production. If necessary, adjust pressure to optimize quality. Use the *Settings Record* for this purpose.

Optimizing Coating – Guidelines

There are no set rules for optimizing coating quality. Production parameters such as line speed (retention time of a section of cable in the spray chamber), material properties of cable surface and powder, ambient conditions, quality of grounding, etc. can vary significantly from customer to customer. But the following guidelines can generally be applied:

- Set the lowest possible powder output quantity, without impairing charge level, to avoid overspray
- Set charge voltage at 50 % of max.
- When using an optional PFC control unit: Select amplification range such that the charge level shows approx. 50%. Set alarm level to approx. 20%
- When a charge alarm occurs, check coating quality. If coating is insufficient and increasing the powder output quantity does not cause improvement, the powder pump as well as the Venturi inside pipe, the powder hoses and the powder guns must be thoroughly cleaned
- Set atomizing/diffuser air as low as possible without impairing the powder/air mixture
- Ensure that air blast cleaning of the filter cartridge is functioning regularly (6 x /min)
- Keep air current speed in the spray chamber as low as possible, by using smallest possible spray chamber openings.

NOTE: When optimizing the coating quality, only one setting should be changed at a time – e.g. powder output quantity – leaving the others unchanged. This way changes in results can be better interpreted. The *Settings Record* can be used for this purpose.

NOTE: In order to be able to reproduce at any time the optimal settings determined for production, the *Settings Record* should be used.

Nozzle Setting Versa-Spray

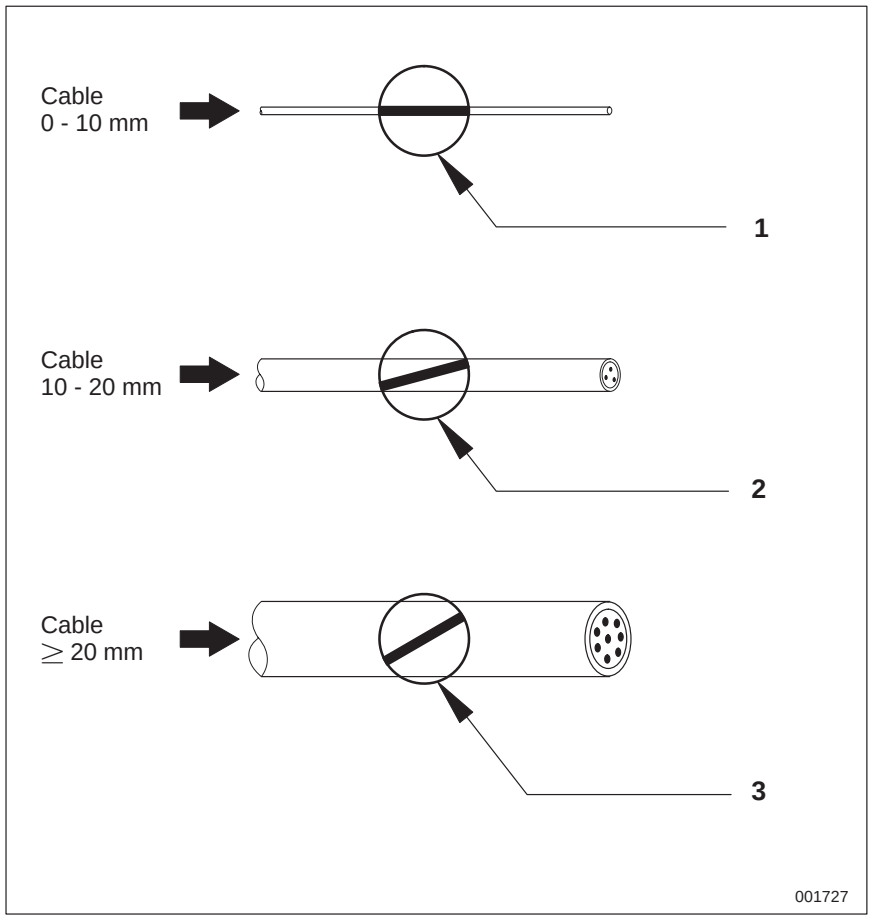


Fig. 17

1 Versa-Spray nozzle, 2.5 mm slit, P/N 174 223

2 Versa-Spray nozzle, 2.5 mm slit, P/N 174 223

3 Versa-Spray nozzle, 2.5 mm slit, P/N 174 223; alternative: 4 mm slit, P/N 174 227

Settings Record

Production:					
Cable type					
Cable ∅					
Machine					
Functioning	**Recommended basic setting**	**Test/ production set 1**	**Test/ production set 2**	**Test/ production set 3**	**Test/ production set 4**
Line speed					
Powder type					
Compressed Air Supply	600 kPA/6.0 bar				
Fluidization	100 kPa/1.0 bar				
Powder recovery	150 kPA/1.5 bar				
Powder flow rate	120 kPA/1.2 bar				
Atomizing / diffuser air	120 kPA/1.2 bar				
Powder refill air	350 kPA/3.5 bar				
Air blast cleaning of filters	250 kPA/2.5 bar				
Gun type					
Charge in kV or μA					
Powder pump type					
PFC amplification range					
Alarm level					

Notes:

Switching Off for Short Period of Time

Switch off control unit(s) for powder gun(s). Check powder level.

Daily Switch ON

1. Check powder level; refill if necessary.
2. Check that air dryer functions correctly.
3. Inspect all compressed air and powder hoses as well as electrical connections. Tighten loose connections and replace damaged parts.
4. Proceed as described under *Startup*.

Daily Switch OFF

1. Switch off control unit(s) for powder gun(s).
2. Allow system to run for 10 to 20 minutes for self-cleaning.
3. Set main switch on master control module to left position, *OFF*.

Switching Off in an Emergency

WARNING: When any type of emergency occurs, immediately switch off the system.

1. Stop cable production line.
2. Set main switch on master control module to left position, *OFF*.
3. After standstill and before switching the system back on, have the fault remedied by qualified personnel.

Maintenance

WARNING: Allow only qualified personnel to perform the following tasks. Observe and follow the safety instructions in this document and all other related documentation.

1. General

WARNING: Before doing any maintenance work, switch the system off completely (Refer to *Operation, Daily Switch OFF*) and secure such that it can not be unintentionally switched on.

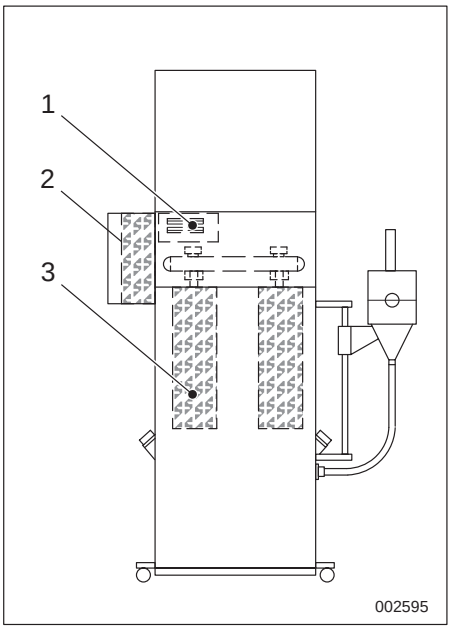


Fig. 18

Maintenance of the cable coating system is usually limited to cleaning. It is important that cleaning is thorough, because system functioning and coating quality are very much dependent on the cleanliness of all parts that come into contact with powder and compressed air.

The following points should always be observed when conducting maintenance tasks:

- If possible, clean all detachable components such as powder guns, powder hoses, pumps and filters in a separate, closed room equipped with an exhaust system.

WARNING: Since cleaning with compressed air is inevitable, extreme caution is imperative. Never direct air guns at yourself or others; compressed air can cause serious injury. When injuries occur or are suspected, immediately consult the first aid office!

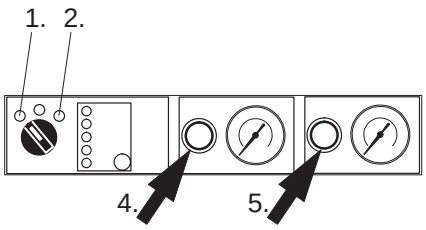
- When using compressed air to clean, ensure that the air is dry, clean and non-lubricated. Whenever cleaning with compressed air is the prescribed method, also use a vacuum cleaner or exhaust system.

- When cleaning powder guns with compressed air, ensure that they are securely grounded. Otherwise blowing compressed air could lead to charging and uncontrolled discharging, causing sparks. The resistance to ground may not exceed 1 Ω (one ohm).
- Never use sharp objects to scrape off powder deposits. Scratches on the surface can cause powder to collect, resulting in blockage.
- BLOWING OUT of unit parts and the complete coater may need to be conducted longer and possibly even more often than the stated interval.

WARNING: Emission of material particles into the atmosphere. Keep emissions to a minumum during all maintenance tasks and wear suitable respiratory protection. Ensure effective vacuuming of suspended powder particles.

WARNING: When damaged parts endanger the operating safety and/or the safety of personnel, switch off the system and have the damaged parts replaced by qualified personnel. Use only original Nordson spare parts.

Cleaning Reservoir Filter



Master control module

1. Vacuum out the reservoir when the system is switched off.
2. Switch on system.
3. Switch off control unit(s) for powder gun(s).
4. On the master control module, set the air pressure for fluidization to 0 bar.
5. On the FC control unit, set the air pressure for powder refilling to 0 bar.
6. On the FC control unit, set the air pressure for filter cleaning to 5 bar; on the master control module, also set the air pressure for powder recovery to 6 bar.
7. Allow system to run for 10 to 20 minutes for self-cleaning.
8. Switch off system.
9. Vacuum out reservoir.

2. Regular Maintenance

The stated maintenance intervals are only general values based on experience. Depending on production conditions – particularly with multiple shifts – other maintenance intervals may prove necessary.

System part	Activity	Interval	Note
Filter cartridges	Refer to *Cleaning Reservoir Filter*	Weekly	Pos. 3, Fig. 18; in separate room with exhaust, if possible
Final filter	Remove filter, knock out firmly, blow out with compressed air and vacuum	At least monthly; depending on type of powder and operating time, possibly every two weeks	Pos. 2, Fig. 18; in separate room with exhaust, if possible
Spray chamber	Vacuum, blow out with compressed air if necessary	Weekly	Pos. 10, Fig. 1
Hopper	Vacuum, blow out with compressed air if necessary	Weekly	Fig. 19
Powder pump	Remove and blow out with compressed air, check Venturi inside pipe for eccentric wear, replace if necessary	Weekly	Fig. 20; in separate room with exhaust, if possible
Powder hoses	Remove and blow out with compressed air	Weekly	Pos. 8, 13, 16, Fig. 1; in separate room with exhaust, if possible
Powder recovery equipment	Blow out with compressed air and vacuum	Weekly	Pos. 1, Fig. 18
Powder gun	Detach and blow out with compressed air. WARNING: Ground first! **Versa-Spray**: Check nozzle/electrode (antenna) for wear	Weekly	Refer to separate manuals for Versa-Spray or TRIBOMATIC powder guns; in separate room with exhaust, if possible
Complete coater, external	Wipe with soft cloth Visual inspection for damage	Daily	–
Air dryer	Refer to separate manual		

Access to Filters

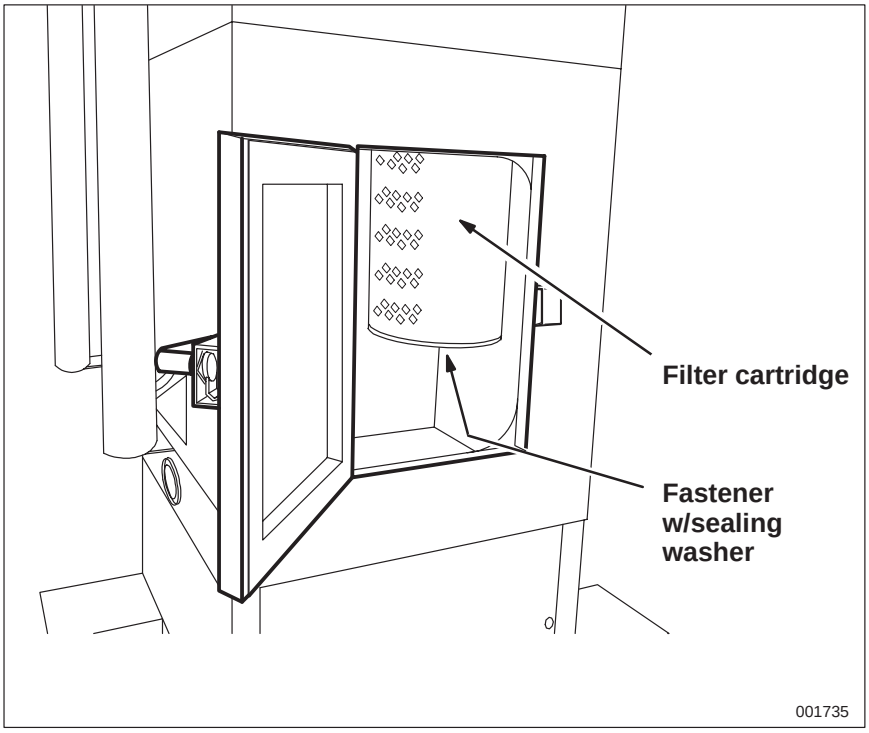


Fig. 19 Hopper with filters

Powder Pumps

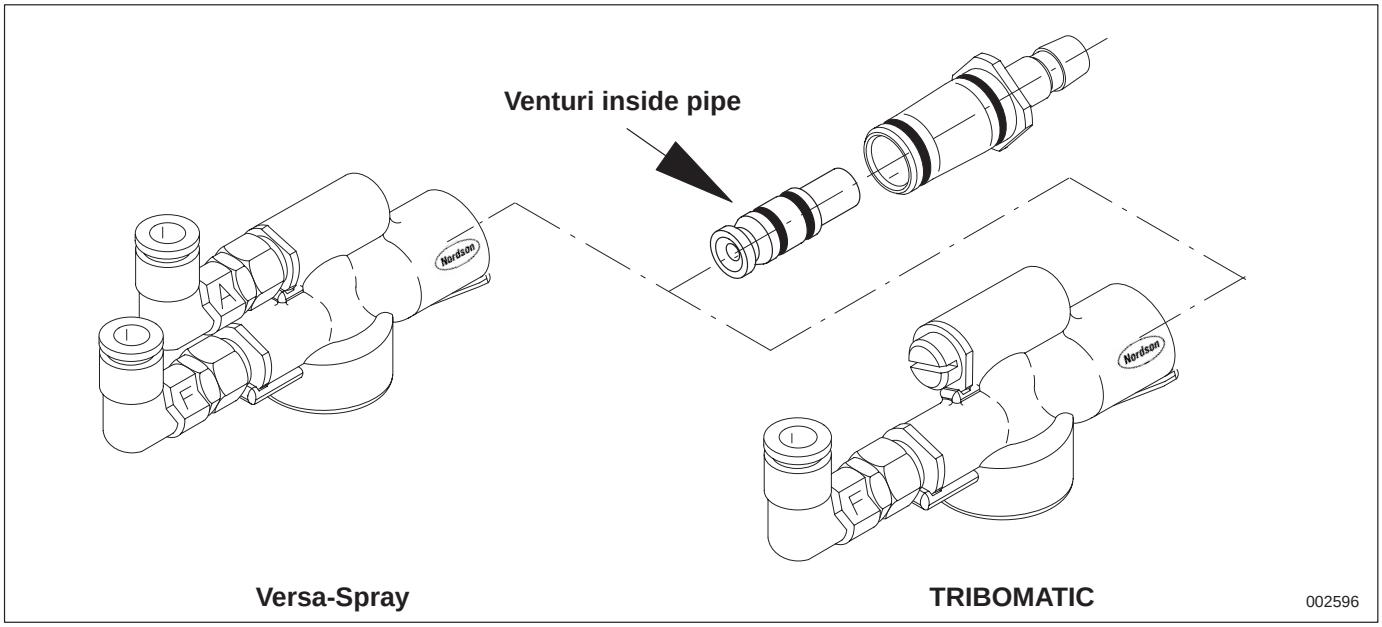


Fig. 20

3. Maintenance Record

System part	Date/name	Date/name	Date/name
Filter cartridges			
Final filter			
Spray chamber			
Hopper			
Powder pump			
Powder hoses			
Recovery equipment			
Powder guns			
Complete coater			

Troubleshooting

NOTE: When the system is used as intended, problems do not usually occur. Experience has shown that malfunctions are causes by either failure to clean or by foreign objects that accidentally land in the hopper when filling with powder.

1. General Checking

Before other troubleshooting, check the following:

- Are the pneumatic and electrical operating values set correctly (Refer to section *Operation / Basic Settings*)?
- Are all pneumatic connections and powder hoses intact?
- Do all electrical plug connections have correct contact?
- Have any fuses blown?

2. Troubleshooting Table

Only for TRIBOMATIC

Problem	Possible Cause	Corrective Action	Refer to
Different amounts of powder come out of the spray nozzles	Individual charge tubes or nozzles clogged?	Clean charge tubes / nozzles	*Maintenance*
No powder comes out of the spray nozzles	Blockage at Venturi pump, diffuser or in charge tubes due to damp compressed air or air atomized with oil	Check air conditioning unit, drain condensate, ensure that only clean, dry and non-lubricated compressed air is used	*Maintenance*
No charge, or charge value too low (microampère display)	Insufficient ground?	Check plug connections for good contact, especially ground	*Installation*
	Is the processed powder suitable for Tribomatic use (electrostatic charging capacity)	Consult powder manufacturer (or material safety data sheet)	
	Microampère display defective	Consult Nordson	

For TRIBOMATIC and Versa-Spray:

Problem	Possible Cause	Corrective Action	Refer to
Powder comes out unevenly	Powder level in hopper too low	Fill powder	–
	Powder is clogged in the Venturi pipe of the pump	Clean powder pump	*Maintenance*
	The conical powder inlet of the Venturi pipe is (eccentrically) worn	Replace Venturi plug insert	*Maintenance / Powder Pumps*
Powder is not fluidized in the hopper	Compressed air is damp	Empty condensate bowl of air conditioning unit; check that air conditioning unit is functioning correctly, if necessary	–
	Compressed air atomized with oil?	Ensure that only non-lubricated air is used	–
	Is fluidizing air connected?	Ensure that the air hose(s) is/are connected correctly to the back of the unit	*Installation*, Fig. 10
	Air pressure for fluidization too low	Increase air pressure	*Operation / Basic Settings*
Powder comes out irregularly or not at all	Nozzles clogged	Clean nozzles	*Maintenance*
Incorrect powder level indications	Level sensor set incorrectly	Calibrate	*Calibration of Level Sensor*

3. PFC: Incorrect Charge Display

In rare cases, the PFC control unit (option) may indicate an incorrect charge level. The display is close to zero, although other faults, e.g. loose plug connections, can be eliminated.

Then the PFC charge tube should be installed (Refer to *Specifications / Accessories)*

4. Calibrating Level Sensor

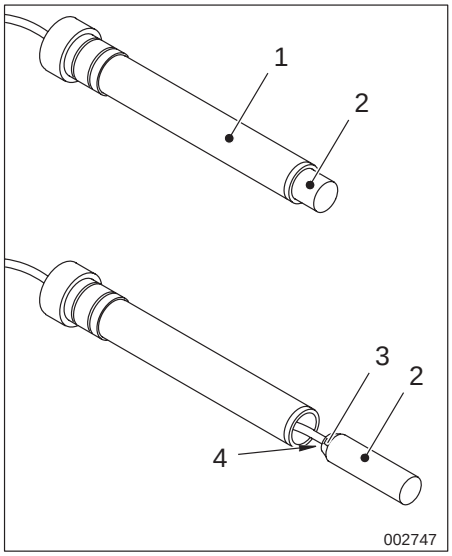


Fig. 21

1. Measure/note distance that the actual sensor (2) protrudes from the tube (1).
2. Extract sensor (2).
3. Turn the sunken screw (4) in the end until the sensor switches at the desired distance (diode (3) lights up) when submerged into the fluidized powder in the powder hopper.
4. Slide the sensor into the tube until the distance measured in 1. is correct.

NOTE: The error indication should be acknowledged by pressing Reset on the FC control unit.

Specifications

Voltage Supply	240 VAC, 50/60 Hz, 1 phase with neutral conductor, max. voltage tolerance ± 10%	
Power Consumption	Approx. 400 Watt	
Current Consumption		***/ Fuse Protection***
ECC system	1.5 A	/ 5 A fast
Control unit *Versa-Spray*	0.5 A	/ 1 A, 0.5 A fast
Control unit *TRIBOMATIC II*	0.1 A	/ 0.2 A slow
Master control module	0.3 A	/ 0.5 A ultra fast
Fan	0.2 A	/ via main control module
PFC control unit (Option)	0.45 A	/ 3 A fast
FC control unit	0.1 A	/ 0.2 A slow
Air blast cleaning of filters		/ 0.5 A slow (Refer to connecting panel 3, Fig. 10)
Material Processing Capacity per Gun	Talcum:	Approx. 40 to 300 g/min
	SAP:	Approx. 40 to 100 g/min
Degree of Protection (EN 60529)		
System	IP 65	
Noise Emission	< 72 dB (A)	
Weight of Entire System	Approx. 230 kg	
Max. Operating Air Pressure	600 kPa (6 bar, 87 psi)	
Min. Operating Air Pressure	500 kPa (5 bar, 73 psi)	
Max. Compressed Air Consumption	36 m^3 /h (600 l/min) (21.2 SCFM)	
Permissible Ambient Temperature Range	0 °C to 40 °C (32 °F to 104 °F) (system function), may be restricted by type of powder	

Dimensions

All dimensions in mm.

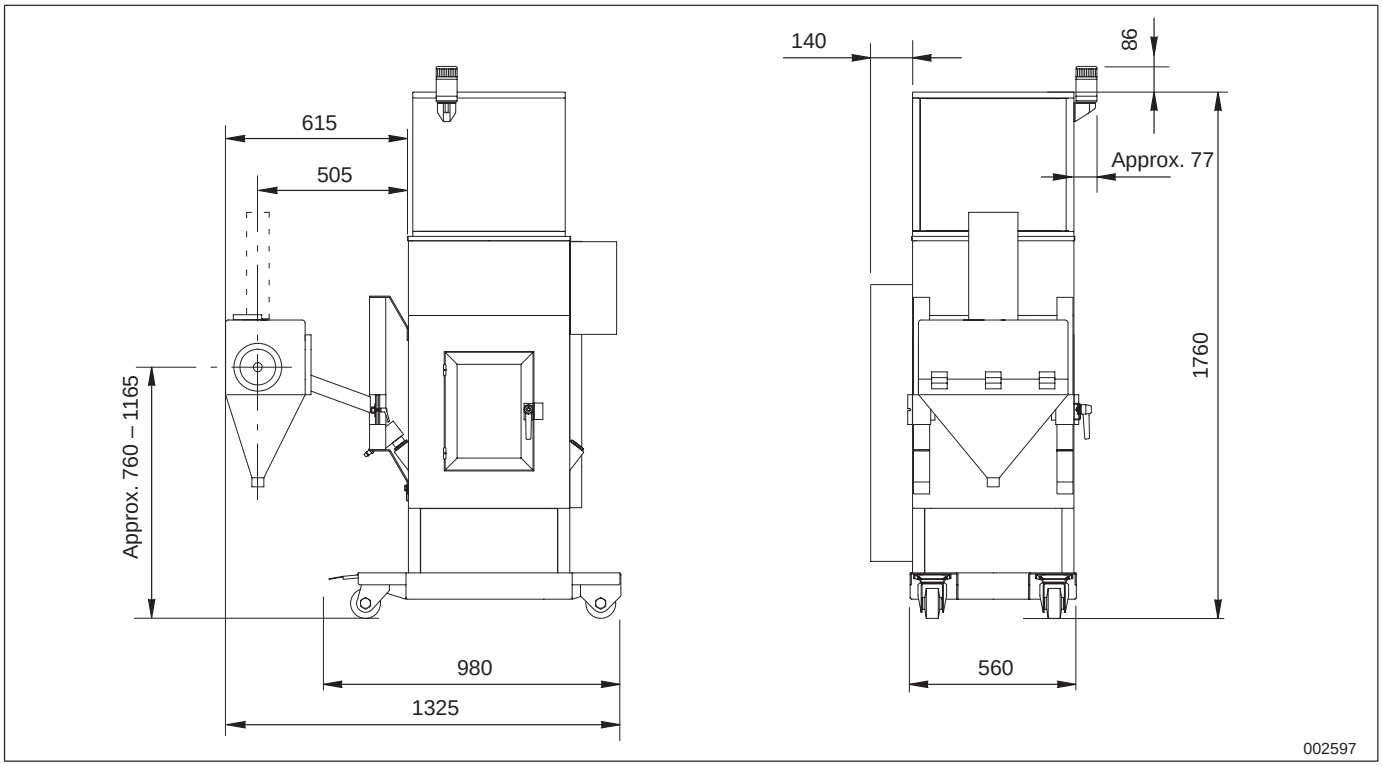


Fig. 22

Options

Designation	P/N
Air dryer with preliminary and after filters	634 807
PFC control unit	635 675

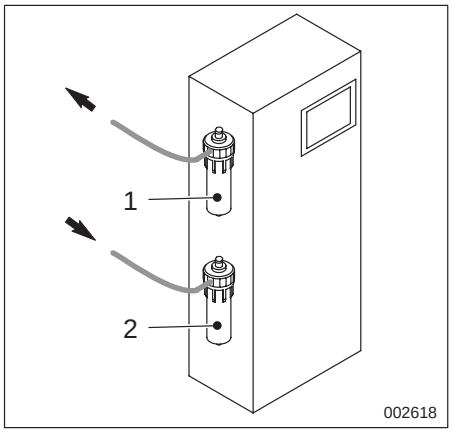


Fig. 23

Air dryer

Also refer to *Installation / Compressed Air Supply* and separate manual for air dryer.

Pos. 1: After filter HFD (P/N 464 355)
Pos. 2: Preliminary filter PFD (P/N 464 354)

Accessories

Designation	P/N
PFC charge tube	461 626
Refill hopper *PC 80*	783 307

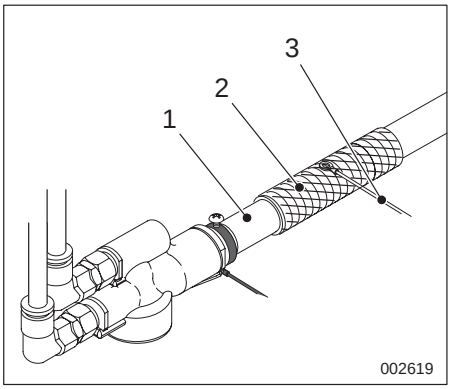


Fig. 24 Shown without shrink hose

Installation of PFC charge tube

1. Switch off control unit(s) for powder gun(s).
2. Cut open powder hose (1) just past the pump and insert the charge tube (2).
3. Connect grounding cable (3) of charge tube to *PFC 1/2* (connecting panel 2). Use the cable ducts (connecting panels 1 and 4, Fig.10).

Installation of refill hopper PC 80

NOTE: Unless indicated otherwise, the numbers in parentheses refer to Fig. 26.

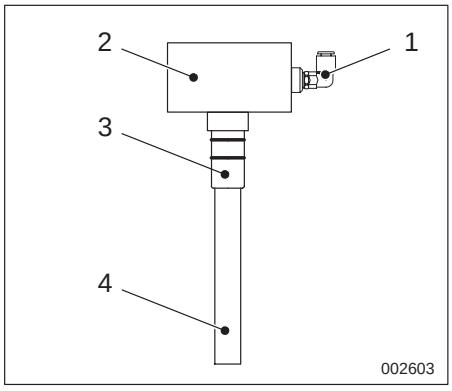


Fig. 25 Assembling feed pump

1. Assemble feed pump (5).
    1. Replace fitting (1, Fig. 25) with the included screwed air fitting.
    2. Insert adapter (3, Fig. 25 – P/N 460 952) into pump body (2, Fig. 25).
    3. Insert suction tube (4, Fig. 25) in adapter.
2. Insert end of suction tube in hopper connection piece.

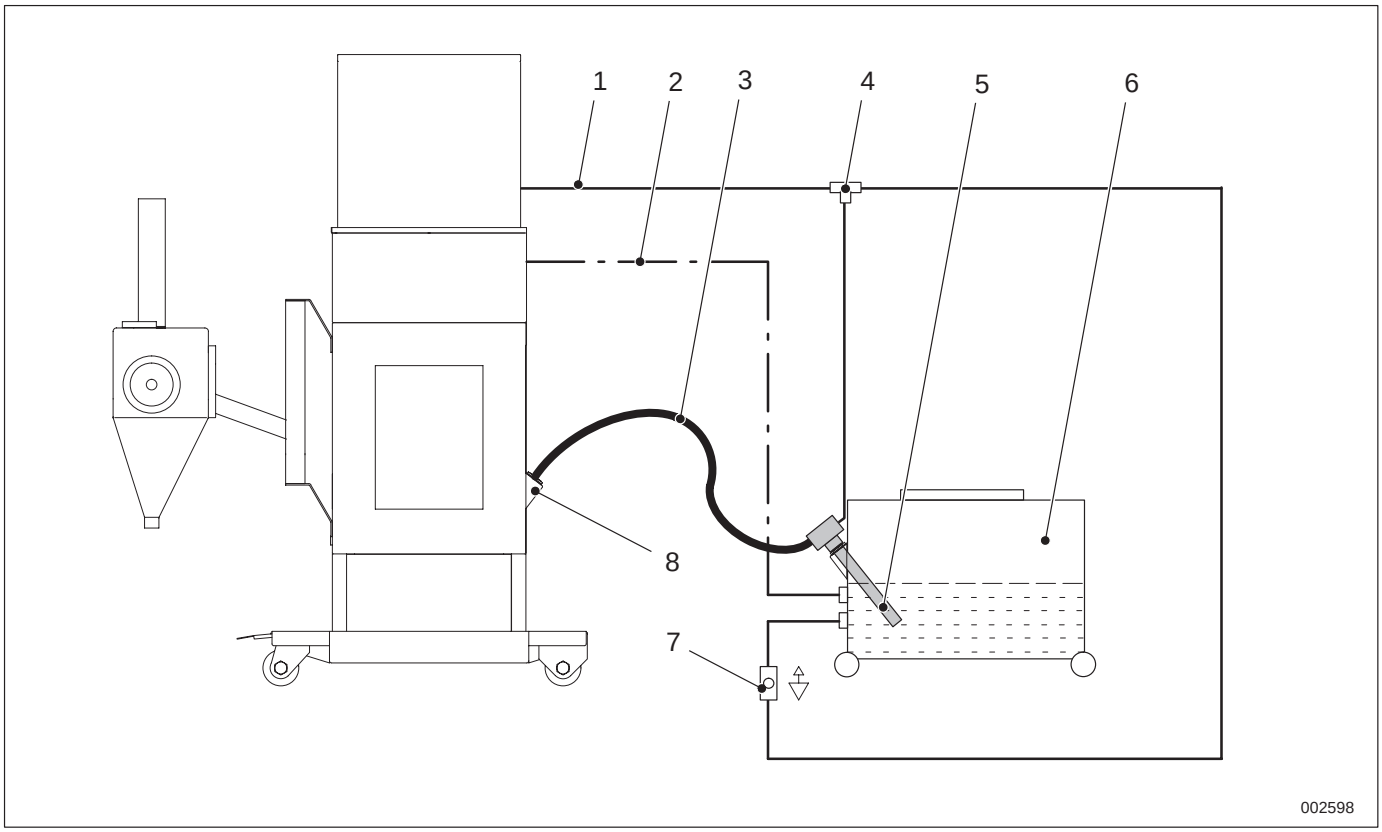


Fig. 26 ECC301 with refill hopper

1 Air tubing
2 Grounding cable
3 Powder hose
4 Union Tee
5 Transfer pump
6 Bulk feed hopper
7 Needle valve
8 Powder hose mount

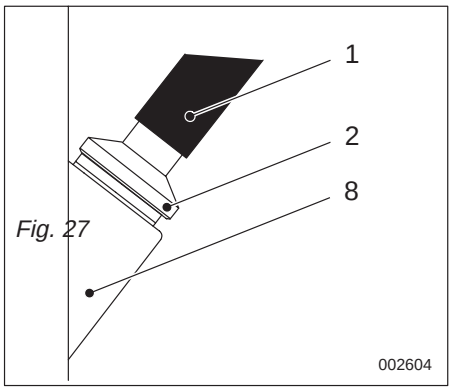


Fig. 27

3. Connect powder hose (3) onto pump (5).
4. Connect the other end of the powder hose (1, Fig. 27) to the adapter (2, Fig. 27 – P/N 460 953).
5. Insert the adapter into the powder hose mount (8) on the system.

Installation of refill hopper PC 80 *(contd.)*

6. Measure the distance from the pump air connections to the fluidized bed connection on the feed hopper.

7. Cut lengths of hose to connect pump, needle valve, and fluidizing bed to the union Tee.

NOTE: Ensure that the needle valve is installed correctly (as indicated by arrow).

8. Cut length of hose from *Automatic Refill* (connecting panel 2, Fig. 10) to length needed to reach the union Tee.

NOTE: The factory setting for *Powder Refill Air* is 350 kPa/3.5 bar (Refer to *Operation / Basic Settings*).

9. Ground refill hopper. Do this by linking *GROUND* on refill hopper and *GND* on system (connecting panel 3, Fig. 10) with grounding cable (2).