Electrostatic Cable Coater ECC 700

Manual P/N 213979G – English –

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Note This document applies to the entire series.

CE

Order number P/N = Order number for Nordson products

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Table of Contents

Safety	1
Introduction	1
Qualified Personnel	1
Intended Use	1
Regulations and Approvals	2
Personal Safety	2
Fire Safety	2
Grounding	3
Action in the Event of a Malfunction	4
Disposal	4
Description	_
	5
	5
Area of Use (EMC)	5
	5
Unintended Use – Examples –	5
	6
Note on Manual	6
Series Overview	7
	7
ID Plate	8
System Components	9
Rack for Control Units	10
Main Control Module	10
Control Units	10
PFC Control Unit (Option)	11
Light Tower / Alarm	11
Coarse Sieve	11
Level Sensor	11
Functioning	12
Versa and Ceramic	12
TRIBOMATIC	13
Powder Recovery	14
Filter Cleaning	14

Installation	15
Transport	15
Unpacking	15
Setting Up	15
Electrical Connections	16
Line Voltage	16
Laying Cable	16
Interface	16
Compressed Air Supply	17
Pressure Accumulator and Pressure Controller	17
Setting the Pressure Controller	17
Preparing Spray Chamber	18
Connecting Refilling Unit (Accessory)	18
Setting PLC Parameters	20
Choosing Settings	21
Optimizing Parameters for Filter Cleaning	21
Observe	21
Examples	21
Oneretion	00
	22
Starting Up	22
Optimizing Coating – Guidelines	23
	24
	25
Basic Settings	25
Setting PFC Control Unit (Uption)	20
	26
	26
	26
	26
Settings Record	27
Maintenance	28
General Information	28
Regular Maintenance	29
Filter Cartridges	30
Powder Pumps	30
Powder Recovery	31
Air Dryer Preliminary Filter	31
Draining Condensate	31
Changing Filter Elements	31
Air Dryer	31
Vibrator	31
Maintenance Record	32
Troublookesting	22
	33
	აა იი
	აა იი
City for TRIDOMATIC	00 04
For TRIDOMATIC and versa-spray	34
Technical Data	35
Dimensions	35
Pneumatics Diagram	3 E
	30

Safety

Introduction

Read and follow these safety instructions. Task- and equipment-specific warnings, cautions, and instructions are included in equipment documentation where appropriate.

Make sure all equipment documentation, including these instructions, is accessible to all persons operating or servicing equipment.

Qualified Personnel

Equipment owners are responsible for making sure that Nordson equipment is installed, operated, and serviced by qualified personnel. Qualified personnel are those employees or contractors who are trained to safely perform their assigned tasks. They are familiar with all relevant safety rules and regulations and are physically capable of performing their assigned tasks.

Intended Use

Use of Nordson equipment in ways other than those described in the documentation supplied with the equipment may result in injury to persons or damage to property.

Some examples of unintended use of equipment include

- using incompatible materials
- making unauthorized modifications
- removing or bypassing safety guards or interlocks
- using incompatible or damaged parts
- using unapproved auxiliary equipment
- operating equipment in excess of maximum ratings

Regulations and Approvals

Make sure all equipment is rated and approved for the environment in which it is used. Any approvals obtained for Nordson equipment will be voided if instructions for installation, operation, and service are not followed.

All phases of equipment installation must comply with all federal, state, and local codes.

Personal Safety

To prevent injury follow these instructions.

- Do not operate or service equipment unless you are qualified.
- Do not operate equipment unless safety guards, doors, or covers are intact and automatic interlocks are operating properly. Do not bypass or disarm any safety devices.
- Keep clear of moving equipment. Before adjusting or servicing any moving equipment, shut off the power supply and wait until the equipment comes to a complete stop. Lock out power and secure the equipment to prevent unexpected movement.
- Relieve (bleed off) hydraulic and pneumatic pressure before adjusting or servicing pressurized systems or components. Disconnect, lock out, and tag switches before servicing electrical equipment.
- Obtain and read Material Safety Data Sheets (MSDS) for all materials used. Follow the manufacturer's instructions for safe handling and use of materials, and use recommended personal protection devices.
- To prevent injury, be aware of less-obvious dangers in the workplace that often cannot be completely eliminated, such as hot surfaces, sharp edges, energized electrical circuits, and moving parts that cannot be enclosed or otherwise guarded for practical reasons.

Fire Safety

To avoid a fire or explosion, follow these instructions.

- Do not smoke, weld, grind, or use open flames where flammable materials are being used or stored.
- Provide adequate ventilation to prevent dangerous concentrations of volatile materials or vapors. Refer to local codes or your material MSDS for guidance.
- Do not disconnect live electrical circuits while working with flammable materials. Shut off power at a disconnect switch first to prevent sparking.

- Know where emergency stop buttons, shutoff valves, and fire extinguishers are located. If a fire starts in a spray booth, immediately shut off the spray system and exhaust fans.
- Clean, maintain, test, and repair equipment according to the instructions in your equipment documentation.
- Use only replacement parts that are designed for use with original equipment. Contact your Nordson representative for parts information and advice.

Grounding



WARNING: Operating faulty electrostatic equipment is hazardous and can cause electrocution, fire, or explosion. Make resistance checks part of your periodic maintenance program. If you receive even a slight electrical shock or notice static sparking or arcing, shut down all electrical or electrostatic equipment immediately. Do not restart the equipment until the problem has been identified and corrected.

All work conducted inside the spray booth or within 1 m (3 ft) of booth openings is considered within a Class 2, Division 1 or 2 Hazardous location and must comply with NFPA 33, NFPA 70 (NEC articles 500, 502, and 516), and NFPA 77, latest conditions.

- All electrically conductive objects in the spray areas shall be electrically connected to ground with a resistance of not more than 1 megohm as measured with an instrument that applies at least 500 volts to the circuit being evaluated.
- Equipment to be grounded includes, but is not limited to, the floor of the spray area, operator platforms, hoppers, photoeye supports, and blow-off nozzles. Personnel working in the spray area must be grounded.
- There is a possible ignition potential from the charged human body. Personnel standing on a painted surface, such as an operator platform, or wearing non-conductive shoes, are not grounded. Personnel must wear shoes with conductive soles or use a ground strap to maintain a connection to ground when working with or around electrostatic equipment.
- Operators must maintain skin-to-handle contact between their hand and the gun handle to prevent shocks while operating manual electrostatic spray guns. If gloves must be worn, cut away the palm or fingers, wear electrically conductive gloves, or wear a grounding strap connected to the gun handle or other true earth ground.
- Shut off electrostatic power supplies and ground gun electrodes before making adjustments or cleaning powder spray guns.
- Connect all disconnected equipment, ground cables, and wires after servicing equipment.

Action in the Event of a Malfunction

If a system or any equipment in a system malfunctions, shut off the system immediately and perform the following steps:

- Disconnect and lock out electrical power. Close pneumatic shutoff valves and relieve pressures.
- Identify the reason for the malfunction and correct it before restarting the equipment.

Disposal

Dispose of equipment and materials used in operation and servicing according to local codes.

Description

Intended Use

Cable coaters in the series *ECC 700* – hereafter also referred to as *system* – may be used only to coat cables or similar substrates with talcum (model *Versa*, ECC 700 **V**) or non-flammable super absorbent powder (model *Tribomatic*, ECC 700 **T**). The model *Ceramic* (ECC 700 **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 instructions. Nordson recommends obtaining detailed information on the materials to be used.

Area of Use (EMC)

The system is designed for use 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:

- To apply unsuitable materials, particularly flammable substances
- 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 Technical Data are not complied with.

Residual Risks

In the design of the unit, every measure was taken to protect personnel from potential danger. However, 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.

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.

Series Overview

The various systems in the series *ECC 700* differ from one another in the model of the spray chamber, the guns and the control units used.

Configuration Code

The configuration code is engraved on the ID plate.

NOTE: An X indicates that the function or component was not ordered, meaning that it is unavailable. An S indicates that the model deviates from the configuration code. Such deviations are described in a supplement that is then added to this manual.

	Box	Code	Кеу	Note
	1	E	Series or unit designation	
	2	С		
ries	3	С		
Sei	4	7		
	5	0		
	6	0		
type	7	V	Versa	
lgun t		С	Ceramic	
Hanc		Т	Tribomatic	
ion	8	1	One gun installed	Up to four guns can be installed
In Irati		2	Two guns installed	
figu	9	Ν	Negative	Potential at gun, relevant only for Versa
con		Р	Positive	
ating age	10	A	400 VAC, 3 Ph Y	
Opera		В	230 VAC, 3 Ph D	Not possible with gun configuration N
Options	11	Р	PFC installed	PFC = Powder Flow Control; refer to section <i>Operation</i>
	12	S	Other special features	

NOTE: If large quantities of SAP (*Superabsorbent Powder*) are to be applied, Nordson recommends retrofitting the system with the *High Volume Kit*, P/N 398692.

ID Plate



Fig. 1

Information	Description	Unit
Code	Unit designation and configuration code	-
P/N	Part number	-
Ser.	Serial number	-
U	Operating voltage	Volt
I	Fuse protection	Ampère
f	Line voltage frequency	Hertz
Р	Power consumption of unit	Watt
P _{max}	Power consumption of unit and connected accessories	Watt



System Components

Example: ECC 700 with two guns (Versa) and refilling unit Fig. 1

- 1 Rack for control units*
- 4 Spray chamber
- 2 Membrane compressed air dryer (hidden)
- 3 Handgun*
- 5 Coarse sieve
- 6 Powder pump*

- 7 Light tower
- 8 Main switch
- 9 Powder transfer pump*
- 10 Refilling unit* (accessory)

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

Rack for Control Units



Fig. 2 Example: Rack for control units for two Versa guns, with PFC control units

- 1 Main control module*
- 3 Blind cover

5 PFC control unit (option)

- 2 Control unit* for first gun
- 4 Control unit for second gun

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

Main Control Module

The main 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 Units

Control Unit for 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.

PFC Control Unit (Option)

The PFC control unit (*Powder Flow Control*) is used to monitor the powder flow to the gun. The powder is guided through a sensor on the way to the gun; the signal from the sensor is evaluated by the control unit.

Light Tower / 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 light tower.

Coarse Sieve



A coarse sieve (1) is used to return excess powder to the spray chamber. Because a vacuum is created, hardly any excess powder can escape, even if the spray chamber is open.

Level Sensor



Refer to separate manual.

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 and Ceramic



The powder is conveyed out of the hopper with a powder pump working on the Venturi principle. The pump has two connections for compressed air: 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), up to four powder pumps are used.



Fig. 3 Principle drawing Versa

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 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 diffuser air and the powder come together at the inlet of the TRIBOMATIC powder gun. The powder particles are charged by friction in the gun charge module. 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. 4 Principle drawing *TRIBOMATIC*

Powder Recovery

A side channel blower (compressor, 1) generates a vacuum to suction excess powder from the spray chamber (5). The suction flow goes through two filter cartridges (3). The filters prevent the powder from escaping from the system. Instead it is returned to the hopper (4).

The fine filter (2) prevents powder from penetrating the side channel blower.



Filter Cleaning

Automatic cleaning occurs as follows:

- 1. The filter flap relieves the vacuum on the filter cartridge.
- 2. A nozzle rotates above the filter cartridge, blowing compressed air onto the filter cartridge blades.
- 3. A pneumatic cylinder knocks powder out of the filter.

The two filter cartridges are cleaned alternately; cleaning is controlled by a PLC.

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.

Transport



CAUTION: When transporting with a forklift, lift only from the door side. Otherwise the unit can tip!

Refer to *Technical Data* for weight. Lift only with a suitable floor conveyor (lift truck or fork lift).

Unpacking

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

Setting Up

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

Ensure sufficient clearance to fill powder and for installation and maintenance work.

Electrical Connections



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

Line Voltage



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

NOTE: Permitted deviation from nominal voltage is \pm 10%.

NOTE: The power cable cross-section must comply with the power consumption. Refer to *Technical Data*.

Laying Cable



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

Interface

Some models have an interface to a higher-order machine control unit. Refer to wiring diagram.

Compressed Air Supply



For applying powder, dry, non-lubricated and clean compressed air is imperative. The unit is equipped with a membrane compressed air dryer (*air dryer*, 2) for this purpose.

- 1. Connect compressed air supply (1).
- 2. Set pressure to 0.6 MPa (6 bar / 83 psi) (3).

Pressure Accumulator and Pressure Controller





NOTE: These components are standard beginning with serial number LU04C02610. Older systems can be retrofitted.

The pressure accumulator (1) and the pressure controllers (2 and 3) minimize pressure fluctuations in the diffuser air that occur when the filter is cleaned automatically.

Setting the Pressure Controller

Pos.	Function	Recommended setting
2	Inlet pressure for gun control units	4 bar / 0.4 MPa / 58 psi
3	Blade cleaning	5 bar / 0.5 MPa / 72.5 psi
		At least 3 bar / 0.3 MPa / 43.5 psi

Preparing Spray Chamber

Before the system can be started up, the spray chamber 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.

Connecting Refilling Unit (Accessory)



- 1. Replace the blind fitting (2) with a screw fitting (P/N 448456), then connect the unit's air hose (1) and the powder transfer pump's air hose.
- 2. Screw the connecting piece (P/N 398448) with the blind fitting nut into the hopper (3) and connect the material hose from the refilling unit.

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Setting PLC Parameters



CAUTION: Operate the system initially with the factory settings. Then, if necessary, change the parameters in small steps to approach the optimal values.

The following parameters are stored in the PLC:

Code name	Parameters
Factory setting	
T1	Delay time alarm
2 min	When the level sensor has detected a lack of material in the hopper, this time begins. If after expiration of the delay time there is still not sufficient material, an alarm is indicated and the light tower blinks. The delay time prevents false alarms when a hopper performs automatic refilling.
T2	Follow-up time refilling unit
1.5 min	When the level sensor has detected a lack of material in the hopper, the refilling unit is switched on. When the level sensor detects material, this time begins. The refilling unit is switched off when this time has expired. The follow-up time ensures that enough material is provided. The longer the time, the more material is added.
Т3	Lead time nozzle
6 s	The lead time of the nozzle determines the time after which the tap units of the filter cleaning are switched on. The nozzle prepares for cleaning (filter flap closes, a slight vacuum is generated at four nozzles). The lead time should not be adjusted.
T4	Pulse frequency
10 ms	The pulse frequency determines the tab unit speed. The shorter the time, the better the cleaning. The pulse frequency should not be adjusted.
T5	Operating time filter 1 / filter 2
T7 12 s	The operation time determined the length of the entire cleaning process for each filter, including the lead time of the nozzle. Example: If operation time filter = 8 sec and lead time nozzle = 3 s, the vibrator time is 5 s.
	NOTE: Set the same operating time for both filters.
Т6	Pause time filter 1 / filter 2
T8 25 s	The pause time is the rest time between cleaning cycles. Both times should always be the same. The shorter the time, the better the cleaning.
	NOTE: Set the same pause time for both filters.

NOTE: Optimized values can save a substantial amount of air.

Choosing Settings

- 1. On control unit: Press OK to access setup mode.
- 2. Use the cursor key to select the menu item Parameter, then confirm with OK .
- 3. Use the cursor key to select the code name of the parameter, then confirm with OK.
- 4. Use the cursor key to select and set the individual numerals and to change the value.
- 5. Confirm value with OK.
- 6. Press OK again to return to display mode.

Optimizing Parameters for Filter Cleaning

Observe

- Operating times (T5/T7) and pause times (T6/T8) must be set such that filter cleaning is adequate for the degree of pollution resulting from each cycle. Otherwise the filters will become clogged after extensive operation or number of cycles.
- The cleaning capacity can be increased up to 500%. To keep the air consumption to a minimum, only the cleaning capacity actually needed should be set.
- Brand new filters should be used briefly (5 10 cycles) before settings are changed. The filter fleece must reach a certain degree of saturation before the actual cleaning that is required becomes apparent.

Examples

• Extend operating time T5/T7 from 8 s to 16 s.

The vibrator time is extended from 5 to 13 seconds, meaning cleaning capacity is increased 160%.

• Shorten pause times T6/T8 from 45 s to 25 s.

The time between cleaning procedures is cut almost in half, meaning cleaning capacity is increased nearly 100%.

If the two measures are combined, the cleaning capacity is approx. five times that of the factory setting.

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.



WARNING: High voltage at powder gun nozzles. Reaching into the spray chamber during operation can cause flashover voltage. Flashover voltage can pose a hazard to sensitive persons!

Starting Up

NOTE: Some of the following tasks are described in detail in the subsequent text.

- Effectively ground the end of the cable at the unwinder. 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.
- 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 0.6 MPa (6 bar / 83 psi).
- 5. Set dial on main system control module to the position to the right (system ON: *solenoid valves open*)
- 6. Add powder and allow the powder supply to fluidize for several minutes.
- 7. Start cable production line.
- 8. Switch on Versa-Spray or TRIBOMATIC control unit(s).
- 9. When using Versa-Spray guns, initiate production with maximum charging voltage.

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

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

Optimizing Coating – Guidelines



NOTE: When beginning optimization, close the admixed air opening (1) completely to achieve the maximum vacuum in the spray chamber. Always keep the door closed during operation. When optimization is complete, open the admixed air opening just far enough that no powder can escape from the spray chamber during operation.

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 charging voltage to 50% of the maximum
- 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 diffuser air as low as possible without impairing the powder/air mixture
- Keep air current speed in the spray chamber low with 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 Form 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 Form should be used.

Nozzle Setting Versa-Spray

The adjustable gun holders enable the gun to be adjusted. The spray chamber can be opened during system operation for visual inspection.



WARNING: High voltage at powder gun nozzles. Reaching into the spray chamber during operation can cause flashover voltage. Flashover voltage can pose a hazard to sensitive persons!



2 Versa-Spray nozzle, 2.5 mm slit, P/N 174223

alternative: 4 mm slit, P/N 174227

Filling Powder



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



- 1. Back of unit: Open hopper.
- 2. Carefully open powder drum.
- 3. Fill the hopper very carefully.
- 4. Close the hopper.
- 5. Store opened powder drum in a dry place.

NOTE: Powder can be added at any time - even during operation.

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.

Function		Maximum value	Minimum value	Factory setting	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 unit (supplies fluidizing plate and vibrator via a throttle)		250 kPa/2.5 bar	50 kPa/1.5 bar	200 kPa/2.0 bar	Separate manual <i>Main Control</i> <i>Module</i>
Powder recovery	→□	250 kPa/2.5 bar	150 kPa/1.5 bar	200 kPa/2.0 bar	
Powder feeding quantity	- C	250 kPa/2.5 bar	40 kPa/0.4 bar	120 kPa/1.2 bar	Separate manual <i>Control Unit</i> for Versa-Spray or
Atomizing air	\bigcirc	120 kPa/1.2 bar	100 kPa/1.0 bar	120 kPa/1.2 bar	TRIBOMATIC guns

Setting PFC Control Unit (Option)



The PFC control unit (*Powder Flow Control*) is used to monitor the powder flow to the gun. The powder is guided through a sensor on the way to the gun; the signal from the sensor is evaluated by the control unit.

- 1. Ensure that coating is optimized.
- 2. Switch off PFC control units of any guns not in use.
- During operation: Turn the potentiometer until two of the four green LEDs light up. The more powder that flows through the sensor, the more LEDs that light up.

Switching Off for Short Period of Time

Switch off powder gun control unit(s).

Daily Startup

- 1. Switch unit on with main switch.
- 2. Check powder level; refill if necessary.
- 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 Switchoff

- 1. Switch off powder gun control unit(s).
- 2. Allow system to run for 5 to 10 minutes to self-clean.
- 3. Set dial on main control module to left position, OFF.
- 4. Switch unit off with main switch.

Switching Off in an Emergency



WARNING: Immediately switch off the system in any emergency situation.

- 1. Stop cable production line.
- 2. Set main switch to 0 (Off).
- 3. After standstill and before switching the system back on, have the fault remedied by qualified personnel.

Settings Record

Production:					
Cable type					
Cable -Ø					
Machine					
Parameter	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 unit	200 kPa/2.0 bar				
Powder recovery	200 kPA/2.0 bar				
Powder feeding quantity	120 kPA/1.2 bar				
Atomizing air	120 kPA/1.2 bar				
Gun type					
Charge in kV or $\mu \textbf{A}$	50 % of maximum				
Powder pump type					
Alarm level					

Notes:

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.

General Information



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.

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 the unit may only be cleaned with compressed air, 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 minimum 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.

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	Refer to
Filter cartridges	Replace	When dirty or clogged	Page 30
Fine preliminary filter	Disassemble and knock out	When replacing filter cartridges When the vacuum in the coating chamber decreases noticeably (powder escapes through cable inlets)	
Spray chamber	Vacuum, blow out with compressed air if necessary	Weekly	
Hopper	Vacuum, blow out with compressed air if necessary	Weekly	
Powder pump	Remove and blow out with compressed air, check Venturi inside pipe for wear, replace if necessary	Weekly	Page 30
Powder hoses	Remove and blow out with compressed air	Weekly	
Powder recovery	Extract coarse sieve and knock out	Weekly	
Powder gun	Detach and blow out with compressed air. WARNING: Ground first! Versa-Spray: Check nozzle/electrode (antenna) for wear	Weekly	Manuals for powder guns
Air dryer preliminary	Drain condensate	Weekly	Page 31
filter	Replace filter insert	When the pressure drop through the single filter reaches 1 bar (0.1 MPa / 14.5 psi); at least every two years	
Air dryer	Change insert	Every four years	Page 31
Vibrator	Tighten fixing screws	Every 500 hours of operation	Page 31
Complete coater,	Wipe with soft cloth	Daily	
external	Inspect for damage		

Filter Cartridges





The two filter cartridges have a very long operational lifetime due to the highly effective filter cleaning process during operation. There is no need to also clean manually. Instead, the filters must be replaced when they remain polluted or clogged.

NOTE: If the filter cartridges become clogged after only brief operation, the filter cleaning parameters must be optimized. Refer to *Installation, Setting PLC Parameters.*

- 1. Switch off the system.
- 2. Disconnect the system from the compressed air supply.
- 3. Back of unit: Open filter chamber door.
- 4. Release all three locks (1); fold back the front one.
- 5. Lift complete cover and extract filter cartridge (2).
- 6. Insert new filter cartridge and lock.

Powder Pumps





Fig. 6

Powder Recovery



- 1. Release locks and extract coarse filter (1).
- 2. Empty coarse filter and knock out.
- 3. Slide coarse filter back in again and lock.

Air Dryer Preliminary Filter



Draining Condensate

At microfilter (1) and submicrofilter (2): Press button on side of drain valve.

Changing Filter Elements

- 1. Disconnect the system from the compressed air supply.
- At microfilter (1) and submicrofilter (2): Unscrew condensate collector.
 NOTE: Depending on model: Release bayonet lock to unscrew condensate reservoir.
- 3. Replace filter element and screw condensate reservoir back on.

Air Dryer



- 1. Disconnect the system from the compressed air supply.
- 2. Release tube nut (1) and detach container from underneath.
- 3. Extract dryer module from reservoir and replace.
- 4. Screw holder with tube nut back on again.

Vibrator



1. Tighten fixing screws with 25 Nm every 500 hours of operation.

Maintenance Record

System part	Date / name	Date / name	Date / name
Filter and fine preliminary filter			
Spray chamber			
Hopper			
Powder pump			
Powder hoses			
Powder recovery (coarse			
Powder guns			
Vibrotor			
VIDIALOI			
Complete coater			

Troubleshooting

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

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 fuses been activated?

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 preliminary filter of air dryer, drain condensate, ensure that only clean, dry and non-lubricated compressed air is used	Maintenance/ air dryer preliminary filter
No charge, or charge value too	Insufficient ground?	Check plug connections for good contact, especially ground	Installation
low (microampère display)	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	Powder level in hopper too low	Fill powder	-
uneveniy	Powder is clogged in the Venturi pipe of the pump	Clean powder pump	Maintenance
	The conical powder inlet of the Venturi pipe is worn	Replace Venturi plug insert	Maintenance/ Powder pumps
Powder is not fluidized in the hopper	Compressed air is damp	Check preliminary filter of air filter; drain condensate	Maintenance/ air dryer preliminary filter
	Compressed air atomized with oil	Ensure that only non-lubricated air is used	_
	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	Adjusting	Separate manual

Technical Data

Permissible Ambient Temperature Range	0 to 40 °C	32 to 104 °F	
May be limited by type of powder			
Material Processing Capacity per Gun	Talcum: Approx. 40 to 300 g/min		
May be limited by type of powder	SAP: Approx. 40 to 100 g/min, with <i>High Volume Kit</i> : up to 250 g/min		
Voltage supply	Refer to ID plate		
Power consumption	Refer to ID plate		
Operating air pressure	600 kPa	6 bar	83 psi
Air consumption	Approx. 400 l/min		1
(when operating with one gun)			
Degree of protection	IP 54		
Weight	Approx. 330 kg		
Noise emission	81.3 dB(A)		
Filling volume	20		

Dimensions





Fig. 7 All dimensions in mm

Pneumatics Diagram

