
Operating instructions and spare parts list

NeoGun CA20

Automatic powder gun



Translation of the original operating instructions

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About this instructions

General information

This operating manual contains all the important information you require for the working with the NeoGun AC20 Automatic powder gun. It will safely guide you through the start-up process and give you references and tips for the optimal use of your new powder coating system.

Information about the functional mode of the individual system components should be referenced in the respective enclosed documents.

Keeping the manual

Please keep this Manual ready for later use or if there should be any queries.

Safety symbols (pictograms)

The following contains a list of warnings with their meanings found in the Neopro operating instructions. Apart from the regulations in the relevant operating instructions, the general safety precautions must also be followed .

DANGER

Indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury.

ATTENTION

Indicates a potentially harmful situation which, if not avoided, the equipment or something in its surrounding may be damaged.

ENVIRONMENT

Indicates a potentially harmful situation which, if not avoided, may have harmful consequences for the environment.



NOTE

Useful tips and other information.

Presentation of the contents

Figure references in the text

Figure references are used as cross references in the descriptive text.

Example:

"The high voltage (**H**) created in the gun cascade is guided through the center electrode.

Safety

General information

This chapter sets out the fundamental safety regulations, that must be followed by the user and third parties using the powder gun.

These safety regulations must be read and understood before the gun is put into operation.

WARNING

Working without operating instructions

Working without operating instructions or with individual pages from the operating instructions may result in damage to property and personal injury if relevant safety information is not observed.

- Before working with the device, organize the required documents and read the section on "Safety regulations".
- Work should only be carried out in accordance with the instructions in the relevant documents.
- Always work with the complete original document.

Intended use

- This product is built to the latest specification and conforms to the recognized technical safety regulations and is designed for the normal application of powder coating.
- Any other use is considered non-compliant. The manufacturer is not responsible for any incorrect use and the risks associated with such actions are assumed by the user alone. If this product is to be used for other purposes or other substances outside of our guidelines then Neopro Makine Ltd.Şti. should be consulted.
- Observance of the operating, service and maintenance instructions specified by the manufacturer is also part of conformity of use. This product should only be used, maintained and started up by trained personnel, who are informed about and are familiar with the possible hazards involved.
- Start-up (i.e. the execution of intended operational tasks) is forbidden until it has been established that this product has been set up and wired according to the guidelines for machinery. The standard "Machine safety" must also be observed.

- Unauthorized modifications to the product exempt the manufacturer from any liability from resulting damage.
- The relevant accident prevention regulations, as well as other generally recognized safety regulations, occupational health and structural regulations are to be observed.
- Furthermore, the country-specific safety regulations also must be observed.

Product specific safety information



- This product is a constituent part of the equipment and is therefore integrated in the system's safety concept.
- If it is to be used in a manner outside the scope of the safety concept, then corresponding measures must be taken.
- The installation work to be done by the customer must be carried out according to local regulations.
- It must be ensured, that all components are earthed according to the local regulations before start-up.



NOTE

For further security information, see the detailed Neopro safety .

Product description

Field of application

The NeoGun AC20 Automatic powder gun is built exclusively for the electrostatic coating with organic powders. Any other use is considered non-compliant. The manufacturer shall not be liable for damage resulting from such use; the user bears sole responsibility for such actions.



fig. 1: OptiGun GA03 automatic powder gun

Utilization


The Automatic gun type NeoGun AC20 is suited for the electrostatic coating of objects (in all shapes and geometries) that must be grounded.

Reasonably foreseeable misuse

- Coating of non grounded objects
- Use of enameled powder
- Incorrectly configured values for powder conveyance
- Incorrectly configured values for electrode rinsing air
- Use of moist powder

Technical Data

Electrical data

NeoGun AC20	
Nominal input voltage	12 V
Frequency	18 kHz (average)
Nominal output voltage	100 kV
Polarity	negative
Max. output current	100 µA
Ignition protection	Type A acc. EN 50177 Ex 2 mJ T6
Temperature range	0 °C - +40 °C (+32 °F - +104 °F)
Max. surface temperature	85 °C (+185 °F) 
Protection type	IP64

Dimensions

NeoGun AC20	
Weight	600 g

Processible powders

NeoGun AC20	
Plastic powder	yes
Metallic powder	yes
Enamel powder	no

ATTENTION

The NeoGun AC20 Automatic powder gun may only be connected to the following control units:

- NeoGun PUC13,

Design and function

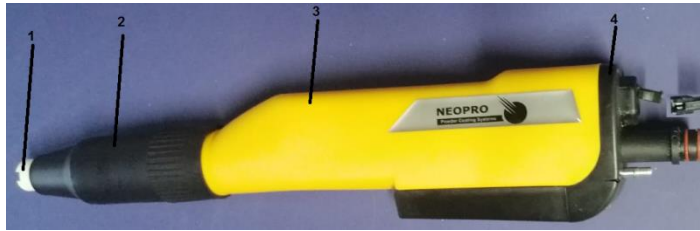


fig. 2: Structure

- 1 Spray nozzle
- 2 Threaded sleeve
- 3 Shaft with removable high voltage cascade
- 4 Gun fixture

Scope of delivery

- NeoGun AC20 Automatic powder gun with gun cable (20 m)*, negative polarity
- Electrode rinsing air hose (20 m)*
- Flat jet nozzle complete (incl. electrode holder)
- Cable tie with Velcro closure
- Gun cleaning brush
- Spare parts kit
- Operating manual

* standard

Available accessories

- Flat jet nozzle (for specific applications)
- Round jet nozzles
- Gun extension 150 and 300 mm
- Angled nozzles 45°, 60° and 90°
- Gun cable extensions
- Powder tube extensions (when using several powder hoses)

For more information, see spare parts list!

Principle of operation

High voltage generation

The control unit supplies a high-frequency low voltage signal of approx. 12 V eff. This voltage is fed through the gun cable (11) and the gun plug to the high voltage cascade (4) in the gun body.

In the high voltage cascade (2), the low voltage is high-transformed in a first step (c). This primary high voltage is subsequently rectified and multiplied in the high voltage cascade in a second step (d), until the required high voltage is obtained at the end (approx. 100 kV). The high voltage is now fed to the electrode (e) within the spray nozzle.

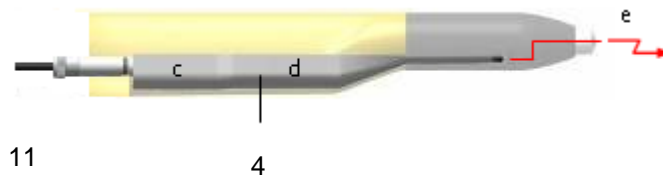


fig. 4: High voltage generation

Circuit

The NeoGun AC20 Automatic powder gun is switched on and off by the gun control module.

The control unit allows also the adjustment of low voltage, powder flow and electrode rinsing air to the gun.

Powder flow and electrode rinsing air

The electrode rinsing air is used by vented spray nozzles and is connected with its designated connection on the rear side of the gun control unit (see the operating manual of the gun control unit).

The functions of the spray nozzles are described in the following sections.

Spray nozzle

Flat jet nozzle with vented central electrode

The vented flat jet nozzle serves for the spraying and the charging of the powder. The powder is charged by the central electrode (E). The high voltage (H) created in the gun cascade is guided through the center electrode.

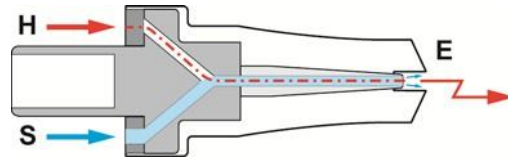


fig. 5: Flat jet nozzle with vented central electrode

In order to prevent powder from sintering on the electrode, compressed air is used during the spray process.

The electrode rinsing air (S) adjustment on the gun control unit is described in the corresponding operating manual.

Round jet nozzle with vented deflector and vented central electrode

The vented deflector is used, to give the powder stream emerging from the gun, a cloud formation. The powder is charged by the central electrode (E). The high voltage (H) created in the gun cascade is guided through the center electrode.

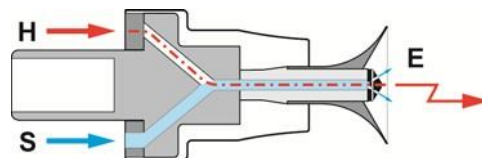


fig. 6: Round jet nozzle with vented deflector and vented central electrode

Since powder can accumulate on the baffle plate, it must be rinsed with compressed air.

The electrode rinsing air (S) adjustment on the gun control unit is described in the corresponding operating manual.

Typical characteristics – properties of the functions

- Continuous, tightly sealed gun body with separate channels for cascade and electrode rinsing air
- Powder tube coupling with quick-release fastener
- Covered hose and cable duct
- Simple conversion to a quick color change gun
- Easily dismountable by a few hand movements, therefore very easy to service
- Easily removable cascade, with integrated current limiting resistors

Powder hose quick release connection

- Quick and simple connection and disconnection from powder hose and application cup

Start-up

Preparation for start-up

Basic conditions

When starting up the NeoGun AC20 Automatic powder gun, the following general conditions impacting the coating results must be taken into consideration:

- Gun correctly connected
- Gun control unit correctly connected
- Corresponding power and compressed air supply available
- Powder preparation and powder quality

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Connect the NeoGun automatic powder gun

The NeoGun AC20 Automatic powder gun is delivered ready-to-use by the manufacturer. Just a few cables and hoses must be connected.



NOTE

The compressed air must be free of oil and water!

The gun is connected as follows:

1. Connect electrode rinsing air hose and powder hose to gun
2. Lay out gun cable, electrode rinsing air hose and powder hose and bind using Velcro strips (included)
3. Connect the gun cable plug to the socket **2.3** on the rear side of the control unit
4. Connect electrode rinsing air hose to coupling **1.4**
5. Connect powder hose to injector
6. Connect the gun plug to the gun control unit (see therefore the operating manual of the gun control unit)
7. Connect the electrode rinsing air hose of the control unit to the gun
8. Connect the powder hose from the gun to the injector

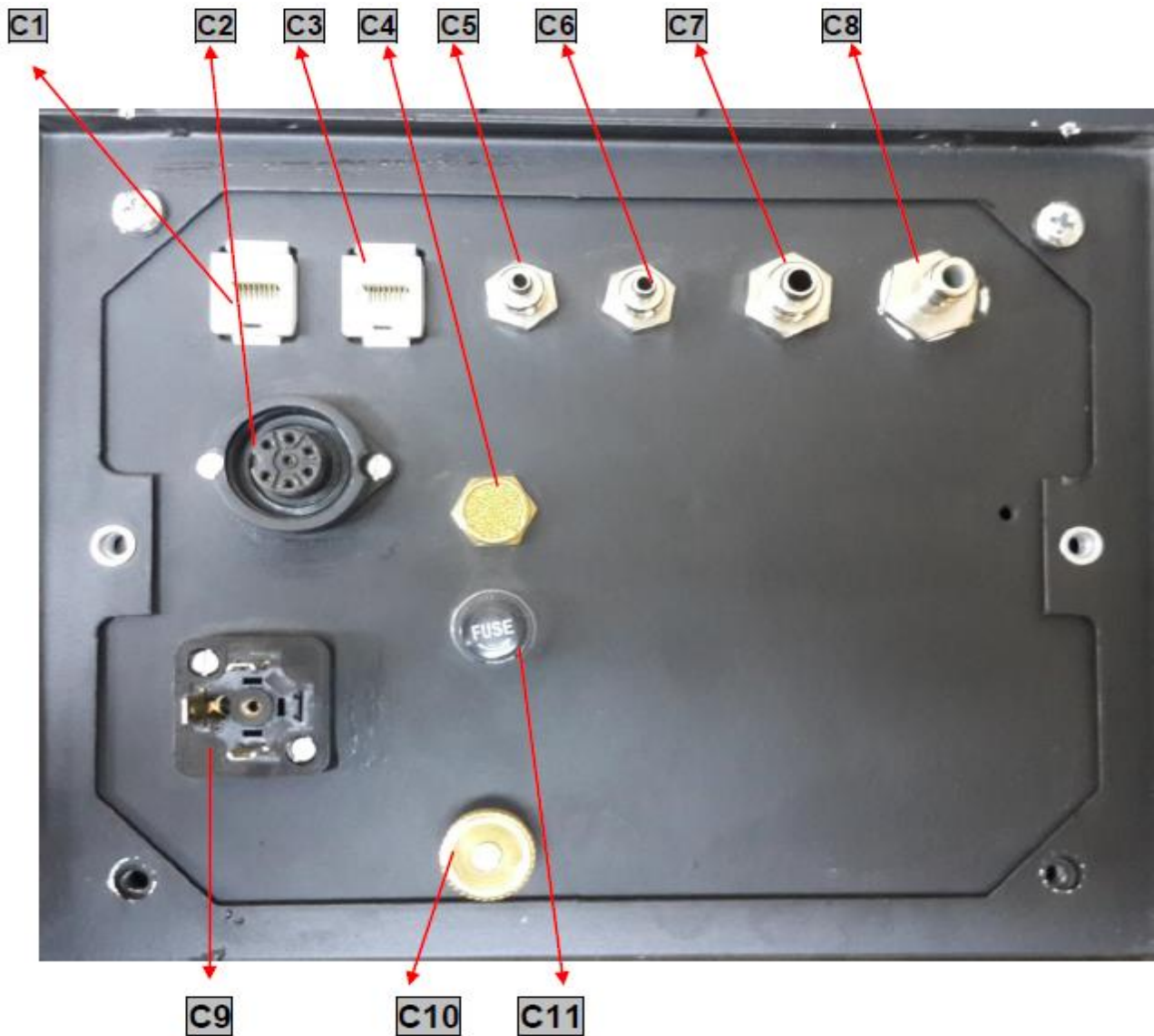


fig. 7: Connecting guide – overview

Connect	Explanation
C1	Communication
C2	Gun Cable
C3	Communication
C4	Air Purge
C5	Vortex Pneumatic output (the gun)
C6	Injector Auxiliary Air
C7	Injector Main Air
C8	Air Supply
C9	Power Supply
C10	Ground
C11	Fuse

Initial start-up



NOTE

If a malfunction occurs, see the troubleshooting guide, as well as the gun control unit operating manual!

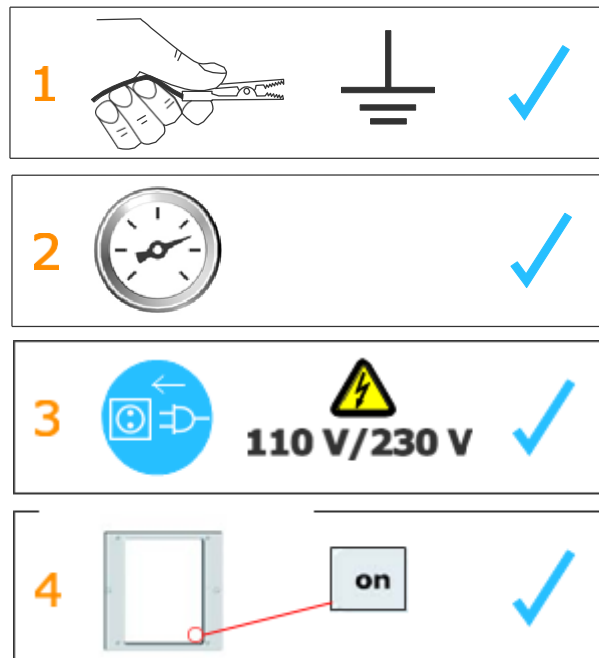


fig. 8:



NOTE

The remainder of the start-up procedure for the NeoGun AC20 gun is explicitly described in the operating instructions for the Neopro gun control unit (chapter "Initial start-up" and "Daily start-up")!

Operation

⚠ WARNING

Touching the gun parts

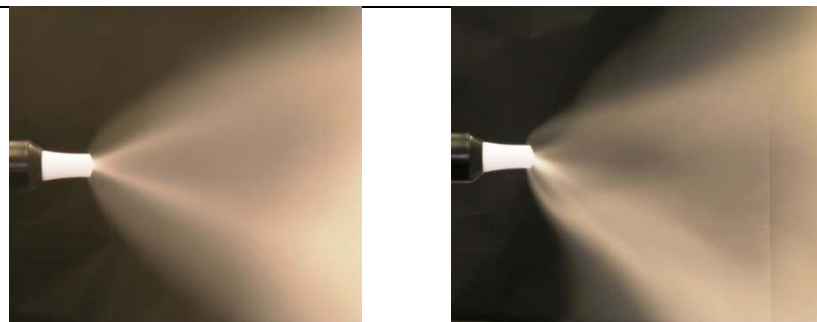
During the coating process, the gun can discharge along the body of the coater if touching it.

- Do not touch any parts of the gun!
-

Setting of total air

correct powder cloud

too little total air



NOTE

A total air volume of 4 Nm³/h and a 50% powder share are recommended as the base values.

The total air volume is depending on the powder hose length, the number of hose curvatures, the hose diameter, the conveying air pressure and the supplementary air. The operation mode of the injector and the effect of the supplementary air are described in the corresponding injector operating instructions.

NOTE

The adjusted value of the total air volume can be left as it is, as long as the same diameter powder hose is used. If the hose diameter changes, the total air volume must be reset.

Setting the powder quantity

The powder output volume is selected in reference to the desired layer thickness. The selection is done on the control unit. For the beginning, the standard adjustment of 1,5 bar is recommended. The total air volume is thereby kept constant automatically.

NOTE

The powder output depends on the powder type and the adjusted total air volume (see therefore the control unit operating manual)!

much powder

little powder

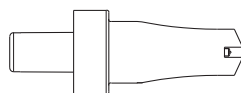


NOTE

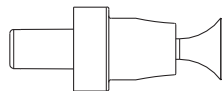
To achieve maximum efficiency, we recommend avoided an overly high powder volume where possible!

Setting the electrode rinsing air

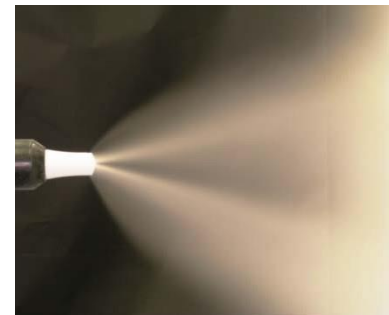
1. Select the correct electrode rinsing



≈ 0.1 Nm³/h



≈ 0.5 Nm³/h



too much electrode rinsing air

2. Adjust the powder cloud with a test object

If flat jet nozzles are used:

1. Unscrew the threaded sleeve approx. 45°, so that the flat jet nozzle (or its extension) can be moved slightly
2. Turn the flat jet nozzle to desired axis direction
3. Tighten the threaded sleeve firmly again

ATTENTION

Threaded sleeve not tightened well

If the spray nozzle is just fitted loosely, there is danger of a flash-over of the gun high voltage, which can damage the gun!

- Always tighten the threaded sleeve well!

If round jet nozzles with air rinsed deflectors are used:

4. Replace the deflector (Ø 16, 24 and 32 mm are supplied with the gun)

Functional check

General information

1. The installed gun must be pointed towards a grounded work piece in the coating booth. All connections must be attached!
2. Turn on the gun control unit (see also the control unit operating instructions) - the gun starts spraying
3. Adjust the desired coating parameters (powder volume, total air and high voltage) on the gun control unit (see also the control unit operating instructions)
4. Adjust the electrode rinsing air on the control unit dependent upon the nozzle used

If all tests have been completed positively, the gun is ready for operation. If malfunctions take place, the cause of the fault can be located by the corresponding troubleshooting guide.

Troubleshooting

If a malfunction occurs, see section "Troubleshooting". Please consider also the control unit operating instructions.

Start-up and powder coating

⚠ WARNING

Dangerous discharges.

If not grounded parts within 5 m of the coating booth are sufficient charged, this can cause dangerous discharges.

- All electrically conductive parts within 5 m of the coating booth must be grounded!

-
1. Check the powder fluidization
 2. The installed gun must be pointed towards a grounded work piece in the coating booth
 3. Switch on the gun control unit
 4. Adjust the coating parameters or select one of the programs. Check by observing the LED displays
 5. The workpieces can be coated now

Shut-down

1. Switch off the powder gun control unit. The adjustments for high voltage, powder output volume and electrode rinsing air remain stored.
2. If working interruptions take place, such as lunch time, night time etc. disconnect the main compressed air supply

Cleaning and maintenance

General information

ATTENTION

All unauthorized modifications to the gun are forbidden for safety reasons, and exempt the manufacturer from any liability from resulting damage!



NOTE

Regular, careful cleaning and maintenance extends the service life of the gun and ensures long-lasting, uniform coating quality!

- The parts to be replaced during maintenance work are available as spare parts. These parts can be found in the corresponding spare parts list!
-

Cleaning

Gun cleaning

ATTENTION

The following solvents may not be used to clean the gun:

- Ethylene chloride, acetone, ethyl acetate, methyl ethyl ketone, methylene chloride, premium gasoline, turpentine, tetrachloromethane, toluene, trichloroethylene, xylene!
-



NOTE

Only cleaning agents with a flash point of a least 5 Kelvin above the ambient temperature, or cleaning places with technical ventilation are allowed!



NOTE

Before cleaning the powder gun, switch off the control unit. The compressed air used for cleaning must be free of oil and water!

Daily

1. Blow off the outside of the gun and wipe, clean etc.

Weekly

2. Remove powder hose
3. Remove the spray nozzle from the gun and clean it with compressed air
4. Blow through the gun with compressed air, beginning from the connection in flow direction
5. Clean the integrated gun tube with the brush supplied, if necessary
6. Blow through the gun with compressed air again
7. Clean the powder hose
8. Reassemble the gun and connect it

Cleaning the spray nozzle

Daily or after every shift

- Clean the inside and outside of the spray nozzle with compressed air.
Never immerse the parts in solvents!
- Check the seating of the spray nozzles.

ATTENTION

Threaded sleeve not tightened well

If the spray nozzle is just fitted loosely, there is danger of a flash-over of the gun high voltage, which can damage the gun!

- Always tighten the threaded sleeve well!

Weekly:

- Remove the spray nozzle and clean on the inside with compressed air. If sinterings should have formed, then they have to be removed!

Monthly

- Check spray nozzle for wear

The flat jet nozzle is to be replaced, if:

- the spray pattern is no longer a regular oval
- deeper grooves are in the nozzle slot, or even the wall thickness is no longer recognizable
- the wedge of the electrode holder is worn

Nozzles with deflectors:

- if the wedge of the electrode holder is worn down, then the electrode holder is to be replaced

Maintenance

The gun is designed to require only a minimum amount of maintenance.

1. Clean the gun with dry cloth, see chapter "Maintenance"
2. Check connection points to powder house.
3. Replace the powder hoses, if necessary.

Replacing parts

Except for the replacement of possible defective parts, there are very few repairs to be made.



NOTE

The replacement of the cascade and the repair of the powder gun cable connection is only permitted by an authorized Neopro Service center!

- Contact your Neopro representative for details!
-

Dismantling the gun

General information



NOTE

The gun should only be dismantled, if this is required because of a defect or pollution.

- Dismantle the gun only so far, as the desired part is accessible!
-

WARNING

Touching the gun parts

During work on the gun, the gun can discharge along the body of the coater if touching it.

- Before dismantling the gun, switch off the control unit and disconnect the gun plug!
-

Dismantling procedure

1.



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Assembling the powder gun

The assembling of the automatic gun is to be carried out in the reverse order to that shown above.

Repairing the powder gun

Apart from the replacement of possibly defective parts, hardly any repairs have to be made. The cascade can be replaced trouble-free. The repair of the gun cable connection, however, may only be made by an authorized Gema Service center.

Troubleshooting



NOTE

Additional error descriptions are to be found also in the control unit operating instructions!

Fault	Causes	Corrective action
Cascade failure	Gun not connected	Connect the gun
	Gun plug or gun cable defective	Contact local Neopro representative
	Remote control on powder gun defective	Contact local Neopro representative
The powder gun does not spray powder, although the powder gun control unit is switched on	Compressed air not present	Connect the equipment to the compressed air
	Injector, check valve or throttle on injector, powder hose or powder gun clogged	Clean or replace the corresponding part
	Insert sleeve in injector is worn	Replace
	Insert sleeve in the injector is clogged	Clean/replace
	Pressure valve in the control unit defective	Replace
	Solenoid valve in the control unit defective	Replace
	Electronic board in the control unit defective	Contact local Neopro representative
	No conveying air: - Throttle motor defective - Solenoid valve defective	Contact local Neopro representative

Fault	Causes	Corrective action
Powder gun sprays powder, but the powder does not adhere to work-piece	High voltage and current deactivated or too low	Check the high voltage and current setting
	Gun cable (gun plug or gun connection) defective	Test the gun cable on another control unit
	High voltage cascade defective	Contact local Neopro representative
	Electronic board in the OptiTronic defective	Send in for repair
Powder gun sprays powder, high voltage is available, powder does not adhere to work-piece	The objects are not properly grounded	Check the grounding
Gun achieving only poor spray profile	Total air incorrectly configured	Increase the powder quantity and/or total air volume on the control unit
	Bend or damage to air lines to injector	Check air lines to injector
	Insert sleeve in the injector worn or not inserted	Replace or insert it
	Fluidization not running	see above

Spare parts list

Ordering spare parts

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

- Type and serial number of your powder coating equipment
- Order number, quantity and description of each spare part

Example:

- **Type** NeoGun CA20 automatic powder gun,
Serial number 1234 5678
- **Order no.** AC100150, 1 piece,

When ordering cable or hose material, the required length must also be given. The spare part numbers of this bulk stock is always marked with an *.

All dimensions of plastic hoses are specified with the external and internal diameter:

Example:

Ø 8/6 mm, 8 mm outside diameter (o/d) / 6 mm inside diameter (i/d)

ATTENTION

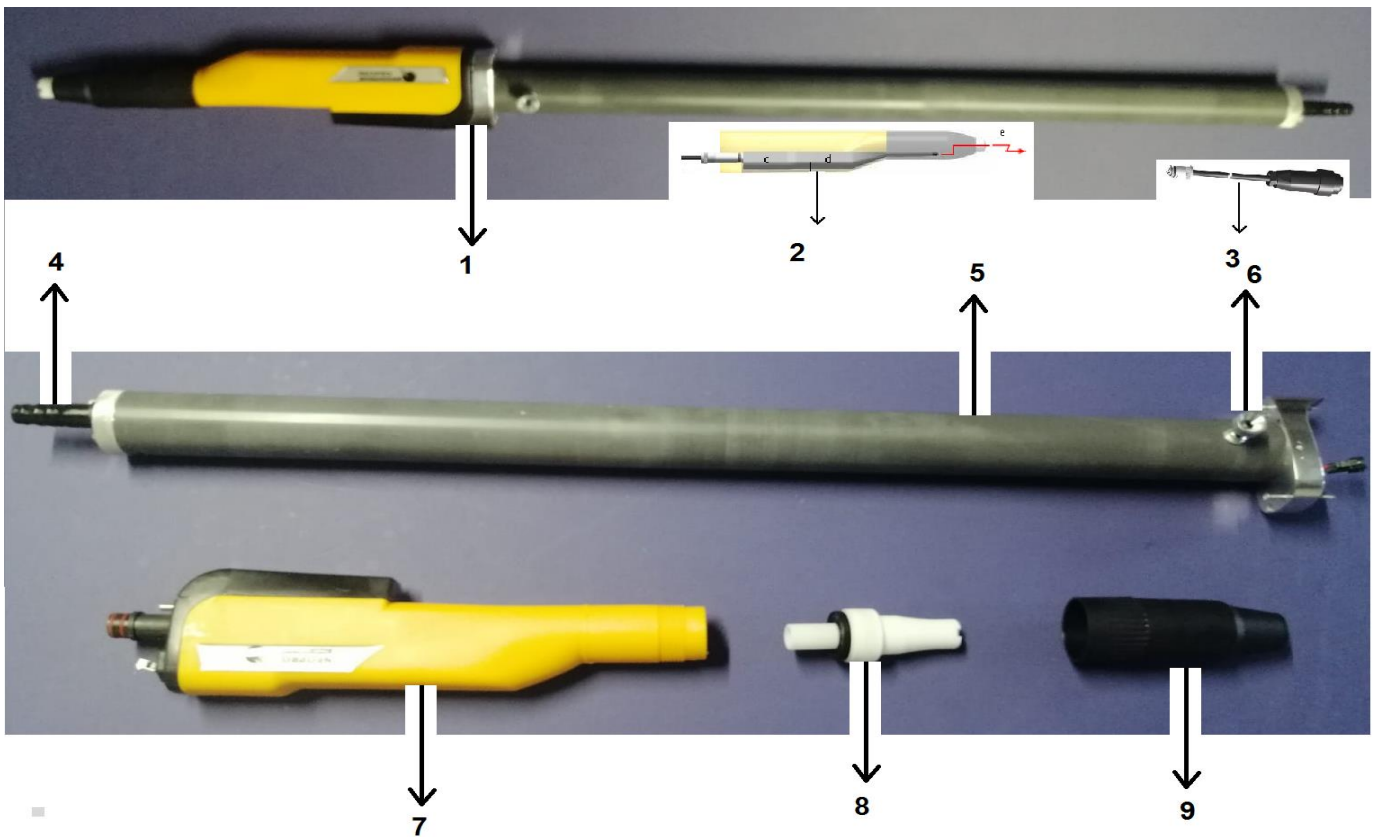
Use of non-original Neopro spare parts

When using the spare parts from other manufacturers the explosion protection is no longer guaranteed. **If any damage is caused by this use all guarantee claims become invalid!**

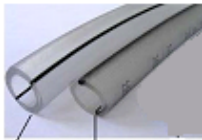
- Only original Neopro spare parts should be used!
-

NeoGun CA20 – complete

1	NeoGun CA20 Automatic powder gun – complete, polarity negative.V.2.0	AC100150
2	Cascade – complete, negative polarity	AC100152
3	Gun cable – complete, 20 m	AC100150/5
4	Hose holder	AC100150/1
5	Extension tube	AC100150/2
6	Grounding Nut	AC100151
7	NeoGun CA20 Gun Body Complete with Polarity Cascade	AC100151
7	NeoGun CA20 Saft	AC100150/4
8	Flat jet nozzle – complete	AC100260/1
9	Threaded sleeve	AC100150/3



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Powder hose (antistatic)	Application	Diameter	Parts No.*	Material	Type
	Fast color changes	Ø 9/12 mm	T 100 699	POE	T
	Fast color changes - low powder flow	Ø 11/14 mm	C 100 700	POE	C