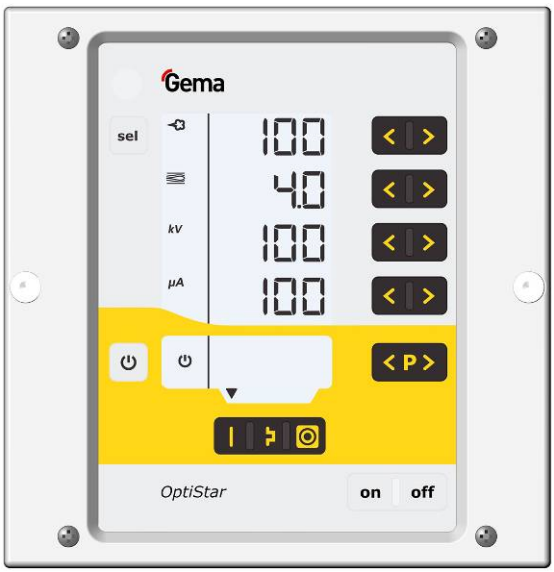
En

Operating instructions and spare parts list

OptiStar CG11-P
Gun control unit



Translation of the original operating instructions

Gema

Documentation OptiStar CG11-P

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General safety regulations

This chapter sets out the fundamental safety regulations that must be followed by the user and third parties using the OptiStar CG11-P.

These safety regulations must be read and understood before the OptiStar CG11-P is put into operation.

Safety symbols (pictograms)

The following warnings with their meanings can be found in the Gema Switzerland operating instructions. The general safety precautions must also be followed as well as the regulations in the operating instructions.

DANGER!
Danger due to electrically live or moving parts. Possible consequences: death or serious injury

WARNING!
Improper use of the equipment could damage the machine or cause it to malfunction. Possible consequences: minor injuries or damage to equipment

INFORMATION!
Useful tips and other information

Proper use

1. The OptiStar CG11-P is built to the latest specification and conforms to the recognized technical safety regulations and is designed for the normal application of powder coating.
2. 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. Gema Switzerland GmbH must be consulted prior to any use of the OptiStar CG11-P for any purposes or substances other than those indicated in our guidelines.
3. Observance of the operating, service and maintenance instructions specified by the manufacturer is also part of conformity of use. The OptiStar CG11-P should only be used,

maintained and started up by trained personnel, who are informed about and are familiar with the possible hazards involved.

4. Start-up (i.e. the execution of intended operational tasks) is forbidden until it has been established that the OptiStar CG11-P has been set up and wired according to the guidelines for machinery (2006/42 EC). EN 60204-1 (machine safety) must also be observed.
5. Unauthorized modifications to the OptiStar CG11-P exempt the manufacturer from any liability from resulting damage.
6. The relevant accident prevention regulations, as well as other generally recognized safety regulations, occupational health and structural regulations are to be observed.
7. Furthermore, the country-specific safety regulations also must be observed.

Product-specific safety measures

- Installation work performed by the customer must be carried out according to local regulations.
- All components must be grounded according to the local regulations before start-up.

OptiStar CG11-P Gun control unit

The OptiStar CG11-P Gun control unit is a constituent part of the system and is thus integrated into the safety system of the plant.

If it is to be used in a manner outside the scope of the safety concept, then corresponding measures must be taken.

Note:
For further security information, see the more detailed Gema safety regulations!

About this manual

General information

This operating manual contains all the important information you require for the working with the OptiStar CG11-P Gun control unit. 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 - booth, gun and application pump - should be referenced in the respective enclosed documents.

DANGER:

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 "Safety regulations".

► Work should only be carried out in accordance with the instructions of the relevant documents.

► Always work with the complete original document.

Software version

This document describes the operation of the OptiStar CG11-P Gun control unit with software version starting from 1.99 (see also "Software version request")!

Product description

Field of application

The OptiStar CG11-P Gun control unit is designed exclusively for controlling the Gema powder coating guns and the OptiSpray AP01 application pump (see also in chapter "Technical data").

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!

For a better understanding of the interrelationships in powder coating, it is recommended that the operating instructions for all other components be read as well, so as to be familiar with their functions too!

OptiStar CG11-P Gun control unit

Reasonably foreseeable misuse

- Operation without the proper training
- Use with insufficient compressed air quality and grounding
- Use in connection with unauthorized coating devices or components

Technical data

Connectable guns

CG11-P	connectable
OptiSelect GM03	yes, with diffuser

Warning:
The OptiStar CG11-P manual gun control unit may only be used with the specified gun types!

Electrical data

CG11-P	
Nominal input voltage	100-240 VAC
Frequency	50-60 Hz
Nominal output voltage (to the gun)	eff.10 V
Nominal output current (to the gun)	max. 1.2 A
Protection type	IP54
Temperature range	0 °C - +40 °C (+32 °F - +104 °F)
Max. surface temperature	85 °C (+185 °F)
Approvals	CE 0102 Ex II 3 (2) D PTB11 ATEX 5007-2

Pneumatic data

CG11-P	
Compressed air connection (on control unit)	8 mm
Input pressure (control of unit during operation)	6 bar / 87 psi
Max. water vapor content of the compressed air	1.3 g/m³
Max. oil vapor content of the compressed air	0.1 mg/m³

Powder output (guide values)

General conditions for AP01 Application pump

Powder type	Epoxy/polyester
Powder hose length (**m**)	14
Powder hose Ø (**mm**)	7
Power hose type	POE with guide strips
Input pressure (**bar**)	6
Correction value C0	Default = Powder output zeroing adjustment

Air flow rates

The total air consists of transport air and supplementary air, in relation to the selected powder quantity (in %). As a result the total air volume is maintained constant.

CG11-P	Range	Factory setting
Electrode rinsing air flow rate	0-5,0 Nm³/h	0,1 Nm³/h
Flow rate total air (at 6 bar)	1,8-6,5 Nm³/h	

Note:
The total air consumption for the device is determined based on the configured air values.
These values apply for an internal control pressure of 6 bar!

Compatibility and interactions

The OptiStar CG11-P gun control unit is used for the following manual equipment from the OptiFlex line:

- OptiFlex F (with fluidized powder hopper)

Design and function

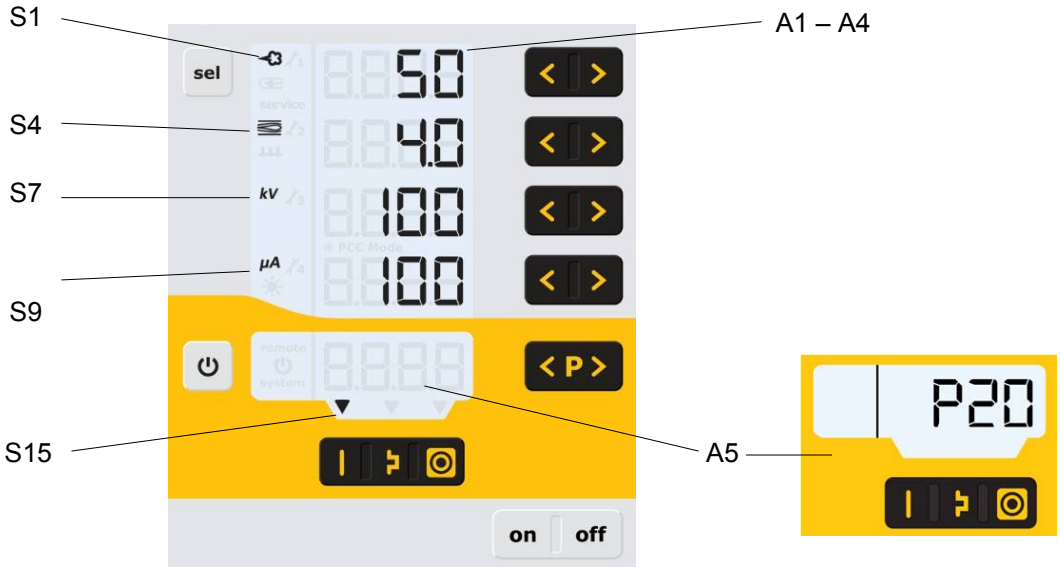
General view

1 Front plate with control and display elements
2 Enclosure
3 Back panel with interfaces

Operating elements

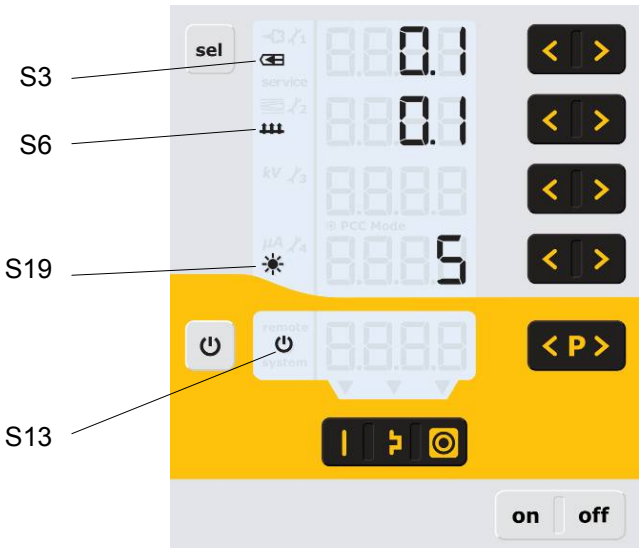
Display and input buttons

Note:
For easier operation of the control unit, the preset and actual values are distributed across several levels. The "sel" key is used to switch between the levels. If no controls are used within 6 s, the device automatically returns to level 1.



Displays, Level 1

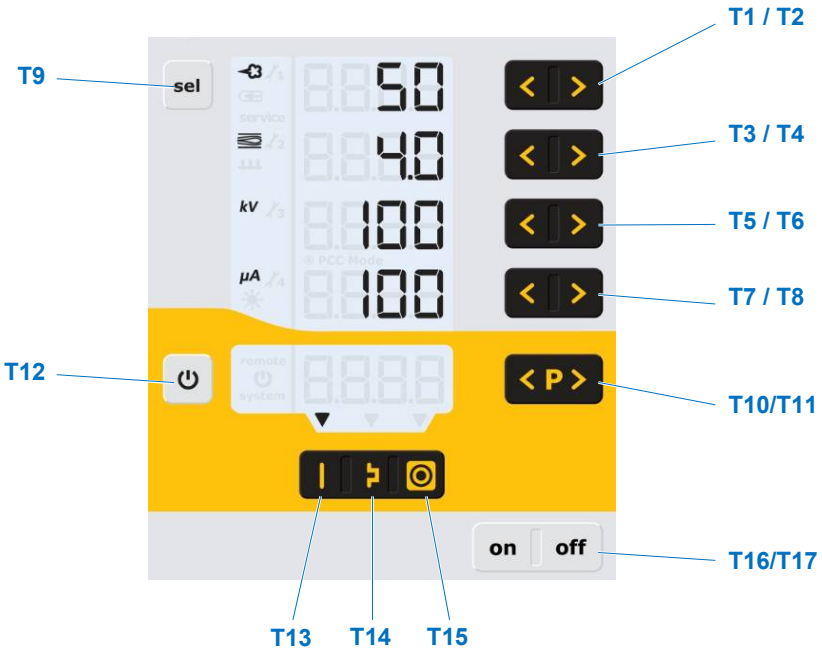
Designation	Function
A1-A4	Display of actual values, preset values and system parameters
A5	Display of program numbers, error diagnosis codes and status information
S1	Powder output (display in %)
S4	Total air volume (display in Nm³/h)
S7	High voltage (display in kV)
S9	Spraying current (display in µA)
S15	Display of predefined operating modes or display of cleaning mode during cleaning



Displays and LEDs, Level 2

Designation	Function
S3	Electrode rinsing air (display in Nm³/h)
S6	Fluidizing (display in Nm³/h)
S13	Activation of fluidization
S19	Display illumination (0-8)

Input keys and switches



Input keys and switches

Designation	Function
T1-T8	Input keys for preset values and system parameters
T9 (Select)	Switch between display levels
T10-T11	Program change
T12	Switching on and off the fluidization Switchover to system parameter mode (Press for at least 5 secs.)
T13	Preset mode for flat parts (fixed values)
T14	Preset mode for complex parts with depressions (fixed values)
T15	Preset mode for overcoating parts already coated (fixed values)
T16/T17	Power switch On/Off

Connections

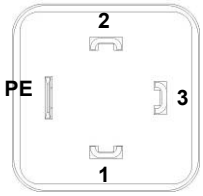
Compressed air hoses / cables

Connections – Compressed air hoses / cables

Connection	Description
1.1 Main air IN	Connection compressed air (6 bar / 87 PSI)
2.1 Power IN	Mains cable connection (100-240 VAC)
2.3 Gun	Gun cable connection
2.5 Ext.	AP01 Application pump connection
1.2	Transport air connection
1.3	Spraying air connection
1.4	Electrode rinsing air connection
1.5	Fluidizing air connection
1.6	Pinch valve air connection
	Grounding connection

Pin assignment

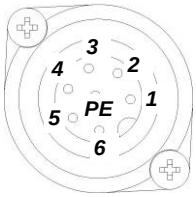
Power IN



Power IN connection

1	Neutral conductor (power supply)
2	Phase (100-240 VAC)
3	empty
PE	Grounding PE

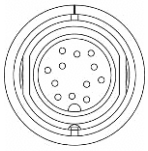
Gun



Gun connection

1	Ground
2	Remote control
3	Ground
4	Trigger
5	Remote control
6	Oscillator
PE	Grounding PE

Ext.



2.5

Application pump connection

A-J	Control signal valve 1-9
K	IDENT / Recognition
L	REQUEST / Request
M	GND / Ground
Enclosure	Shield

Scope of delivery

- Power cable (country-specific)
- Quick start instructions and operating manual

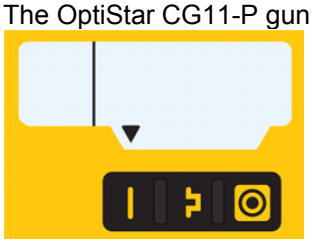
Typical properties - Characteristics of the functions

Operating modes

The OptiStar CG11-P gun control unit has two operating modes.

Predefined operating mode (Preset mode)

The OptiStar CG11-P gun control unit has three preset application modes:



- **Application mode for flat parts** 

  This application mode is suitable for the coating of simple, flat workpieces without larger cavities.

- **Application mode for complex parts** 

  This application mode is suitable for the coating of three-dimensional workpieces with complex shapes (e.g. profiles).

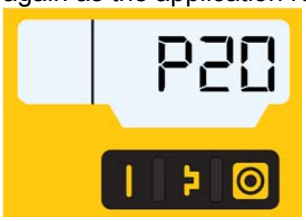
- **Application mode for recoating parts already coated**

  This application mode is suitable for the overcoating of workpieces which are already coated.

In this operating modes, current (**µA**) and high voltage (**kV**) are preset, while powder and air volumes can be set and stored for each application mode.

Adjustable operating mode (Program mode)

In this operating mode, 20 individually definable programs (P01-P20) are available. These programs are automatically saved and can be recalled again as the application requires.

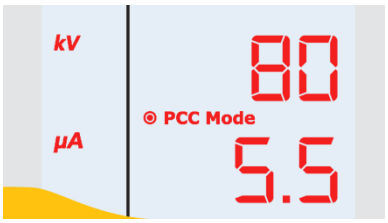


The values for current, high voltage, powder output, total air, electrode rinsing air and fluidizing air (if available) can be set as needed for a given application.

Note:
The settings defined in the 20 programs and 3 application modes are automatically stored, without confirmation!

Precise Control of spraying Current (PCC Mode)

For coating components with both complex and simple geometries, a spraying current of below 10 µA can be selected to prevent unintended overcoating on the simpler surfaces. This is especially important in combination with high loading powders (such as metallic). The controller automatically switches into "PCC mode". **This allows for very fast yet highly precise control. The high voltage and spray current values and their symbols are depicted in red:**



Rinsing mode

The Rinsing mode is used to blow powder accumulations and moisture out of the powder hose, application pump, and gun using compressed air.

Note:
The rinsing mode can only be activated from standby mode, namely by pressing the corresponding button on the gun remote control.

The rinsing mode is signalized by a circling LCD segment on the display:

The actual rinsing procedure is started and stopped by pressing the gun trigger.

Once the rinsing mode is quit, the unit automatically returns to the last program.

Remote control by gun

Various functions can be remotely controlled using the buttons on the rear side of the powder gun (GM03 gun type):

- Modify the powder output (press the **Λ** or **V** key on the gun) The powder output will be increased or decreased accordingly
- Change programs (press the **Λ** or **V** key on the gun) It is switching between programs P01-P20. This function must be activated first, in order to use it - see "Activate/deactivate the program change via remote control".)

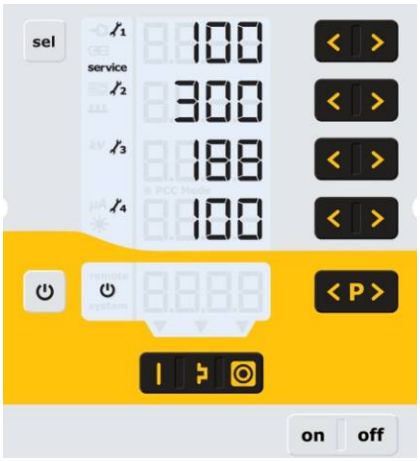
NOTE!
Pressing one of the keys calls up the preset values instead of the actual values!

- Switch to PowerClean mode (Press **P** button).

NOTE!
The remote control is blocked as long as the keyboard lock is activated or while in system parameterization mode.

Monitoring of wearing parts

Wearing parts have a limited service life. The OptiStar CG11-P gun controller offers functionality to monitor the service life of up to four wearing parts using a reverse counter:



Note:
The order of wearing parts to be monitored as well as the service life can be set as needed by the operator.

Example table:

No.	Wearing part
1	Filter element
2	Powder hose
3	Electrode holder
4	Pinch valve hose

To better explain this function, a few terms relevant to this process must first be explained:

Service life	Operating time after which wearing parts should be replaced (defined by the operator).
Minus hours	Number of hours past the selected service life that the wearing part has continued to be used.
Operating life	Effective time during which the wearing part was in operation = service life plus minus hours, if any
Remaining service life	displayed value (where not in the minus range)

- The service life monitoring can be activated/deactivated for each wearing part (see also "Initial start-up - Monitoring of wearing parts")
- By default all monitoring is deactivated and must be activated by the operator
- Query the remaining service life
- Reset the operating time
- Unit used for display of service life / operating time: 1 h

Keyboard lock

The OptiStar CG11-P gun control unit has a keyboard lock to prevent modification of individual parameter values kV, µA etc.) within the operating modes (Program and Preset). Following is not affected by the keyboard lock:

- Program selection
- Display of preset values of the current program
- Displaying the actual values
- Error acknowledgement

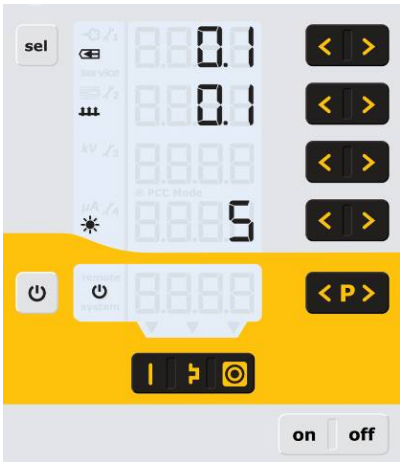
An active keyboard lock is indicated by a blinking of the **remote** display. (see also "Initial start-up - Activate/deactivate the keyboard lock")

The keyboard lock status remains stored, when switching the equipment off and on.

Background illumination

Brightness

8 different brightness settings are available for the display. The setting remains in place when the machine is switched on/off.



Auto Power Save mode

If no powder is being applied, then the background lighting turns off automatically 5 minutes after a button has been pressed last time.

Correction factor for the powder output C0

The OptiStar CG11-P gun control unit enables a zeroing out of the powder output. This allows for compensation to different powder hose lengths connecting to the pistol.

The correction factor C0 can be selected such that no powder is output when the powder share is reduced to 0%. (see also "Initial start-up - Correction values")

Commissioning

Preparation for start-up

Basic conditions

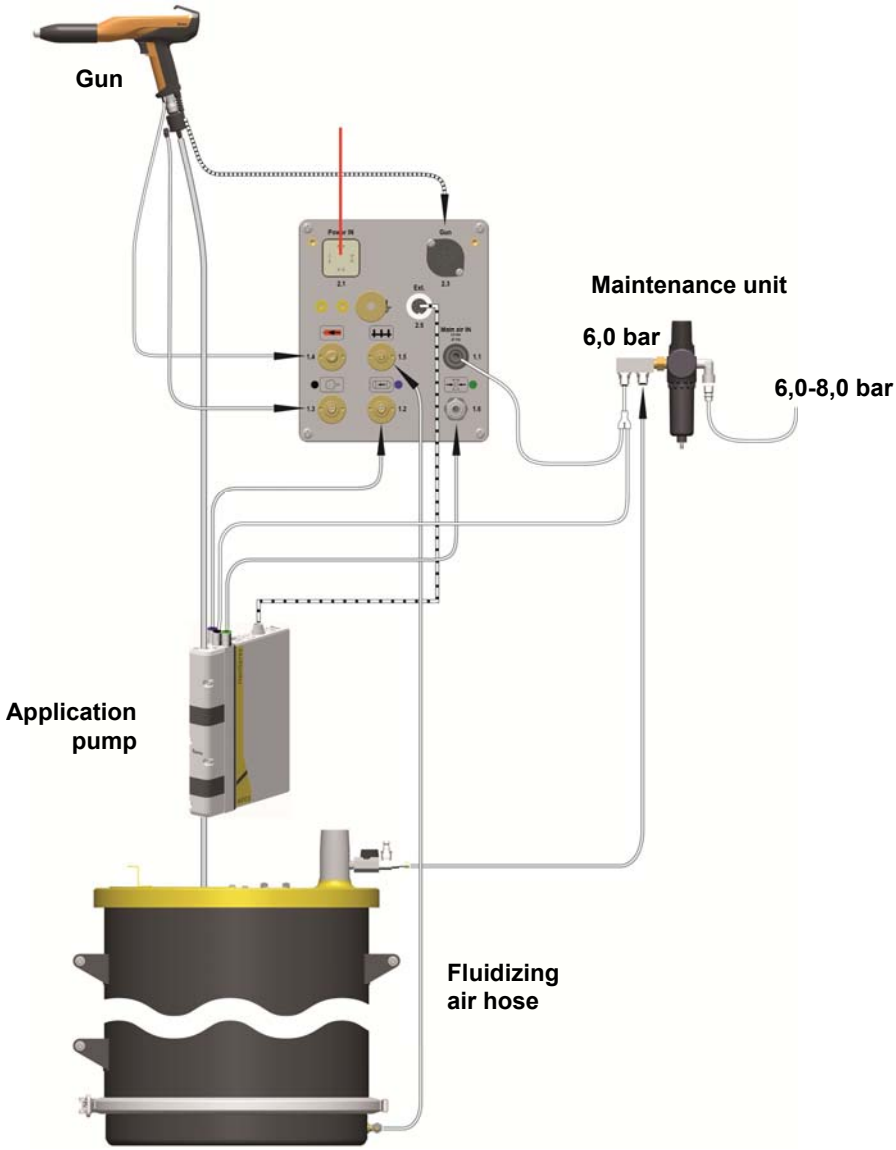
When starting up the OptiStar CG11-P gun control unit, the following general conditions impacting the coating results must be taken into consideration:

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

Mounting instructions

The OptiStar CG11-P gun controller is mounted into place using 2xM6 screws on the front side.

Connection instructions



Connection instructions - overview

1. 

2. 

Note:
Use clamp to connect grounding cable to the cabin or the suspension arrangement. Check ground connections with Ohm meter and ensure 1 MOhm or less!

3. 

4. 

5. 

6. 

7. 

8. 

9. 

10. 

Note:
The compressed air must be free of oil and water!

Initial start-up

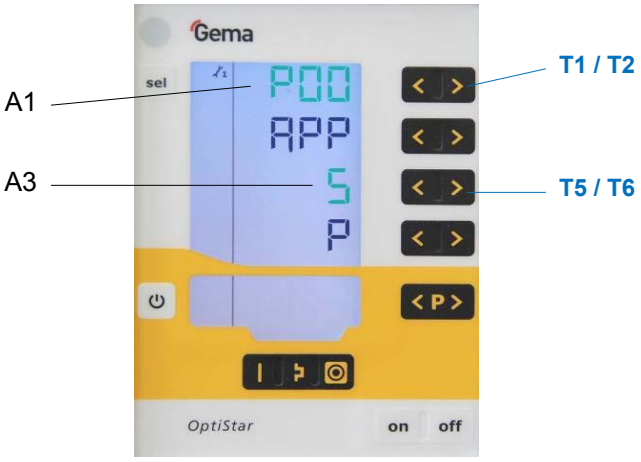
Note:
The gun control unit always starts up to the last configured settings.

System parameters

The OptiStar CG11-P Gun control unit is configured by using the system parameters. This configuration will be saved in the equipment memory.

Entering the system parameters

1. Turn on the gun control unit with the **ON** key
2. Hold key down for 5 seconds
   The display switches to the following level:



3. The system parameter number is shown in the display **A1** with a **P** placed in front
4. Set the corresponding system parameter value with the **T5 or T6** key. The value of the adjusted system parameter appears on corresponding display **A3**
5. Browse to the next or previous system parameter with the **T1 or T2** key
6. Select parameter values according to the following table

No.	Description	Values	Display
P0[1)]	Device type	**0**: CG09/13F 1: CG09/13B 2: CG09/13S 3: CG08/C 4: CG09/13SF 5: CG09P/CG11P 6: CG12CP	F B S A S Fd P CP
P3	Unit of measurement (air)	**0**: Nm³/h 1: scfm	
P10	Log level	0, 1, **2**, 3, 4, 5	LoG

[1)] is not overwritten, if a Memory Reset is performed

Default values are marked by **bold** print.

7. Press ⏻ key to quit the system parameter mode.
   The display switches to the standard level

System parameter P0

NOTE!

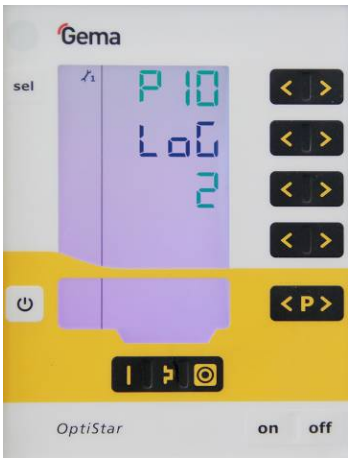
A wrong parameterization leads to various malfunctions!

► The system parameter P0 must be set to 5 (Application pump)!

System parameter P3

This parameter is used to determine the measuring unit for all airs. If the parameter is set to **1** (**scfm**), then all air values are shown in **blue**.

System parameter P10



The device can export log reports of the program run to an SD card for test purposes and for finding defects.

If an SD card is inserted during the switching on procedure, the log messages are also recorded onto the SD card. The data are record in the MESSAGES.LOG file in the root directory. Once this file reaches a size of 32 MB, it is renamed as MESSAGES.1 and a new MESSAGES.LOG file is then created.

Parameter value	Level of detail of reports
0	no messages
1	few details
...	
5	all messages

NOTE!

Real time timings can be impaired from a level of detail of 4.

Operation

Note:
During the initial commissioning of the device, it is recommended that the functional check be performed without powder!

Select predefined operating mode (Preset mode)

1. Turn on the gun control unit with the **ON** key
2. Press the corresponding application key
   the arrow above the pressed key is switched on

The pre-defined application modes have preset values for high voltage and spray current:

Application mode	Preset µA	Preset kV
(flat parts)	100	100
(complex parts)	22	100
(overcoated)	10	100

3. The air values for total air, powder output, electrode rinsing air and fluidizing air can be individually defined and are saved in the programs.

Starting the user-defined operating mode (Program mode)

1. Turn on the gun control unit with the **ON** key
2. Press  program key
3. Select desired program (01-20)

4. Change coating parameters as required

Note:
These programs can be modfied and are then automatically saved.

Setting powder output and powder cloud

The powder output depends on the selected powder output (in %) and the selected total air volume.

Setting the total air volume

1. 

Adjust the total air volume with the **T3/T4** keys (see also the manual gun / application pump operating manual)
   - Adjust the total air volume according to the corresponding coating requests

Setting the powder output

1. 

or 
Adjust the powder output volume (e.g. according to the desired coating thickness)
   - Factory default setting of 50% is recommended for initial operation. The total air volume is thereby kept constant automatically by the control unit.

Note:
As a factory default value, a powder rate of 50% and a total air volume of 4 Nm³/h are recommended.
By inserting values, which the equipment cannot execute, the operator is made aware by flashing of the appropriate display and a temporary out of range message!

2. Check fluidization of the powder in the powder container
3. Point the gun into the booth, press the gun trigger and visually check the powder output

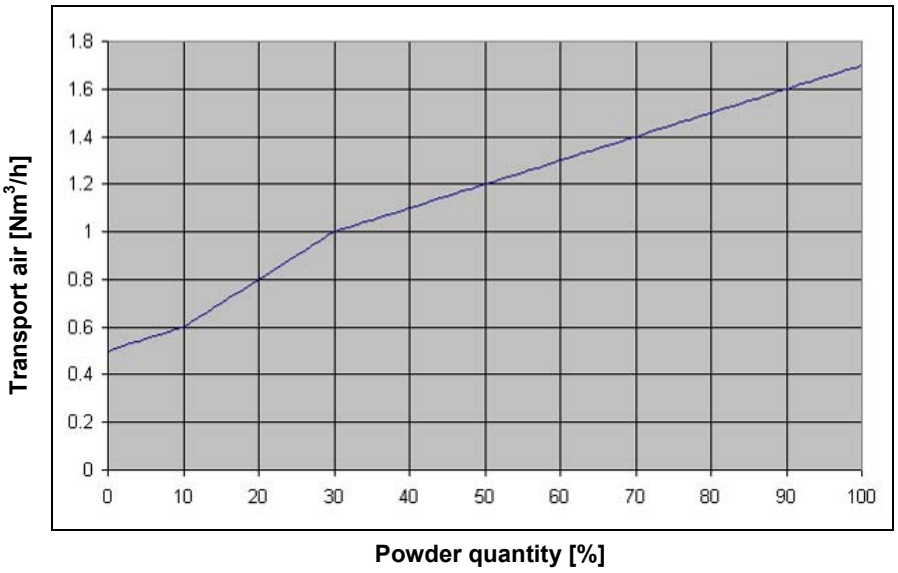
Technical explanations about automatic transport air/spraying air setting

Transport air

The transport air will be used for conveying the powder from the application pump to the powder gun. The transport air quantity will be set automatically by the device, based on the adjusted powder quantity and an adjustable correction factor (Transport air offset **C3**).

The transport air calculation depends furthermore on the correction factors **C1** and **C2**, which are also considered.

Transport air (TL) calculation



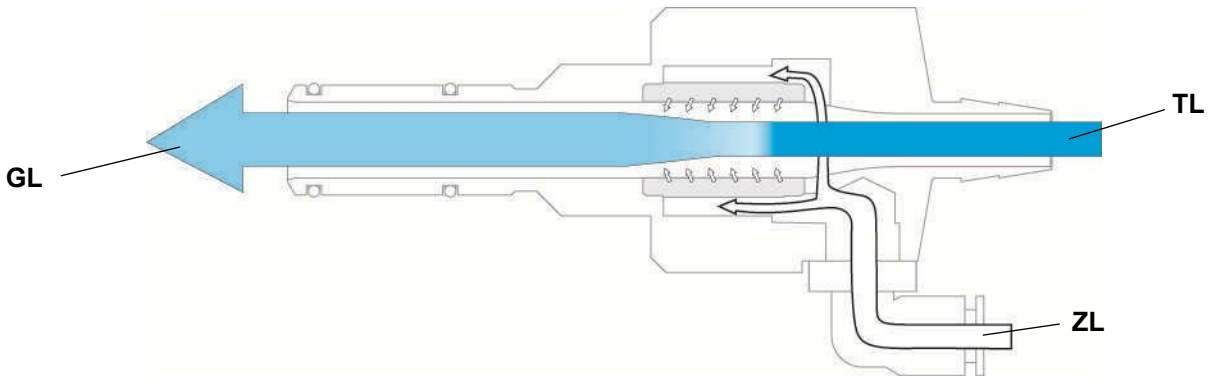
Characteristic curve of the transport air

Setting the spraying air

The spraying air (**ZL**) will be defined in accordance to the calculated transport air (**TL**) and the adjusted total air volume (**GL**).

Formula:

GL = ZL + TL



Air streams in the diffuser

Setting the electrode rinsing air

1. 

Press the key **T9** (**SELECT**)
The second display level will be shown

2. 
Adjust the correct electrode rinsing air according to the applied nozzles (deflector plate, flat jet nozzle)

Note:
By using flat jet nozzles, the factory default value is approx. 0.3 Nm³/h, by using round jet nozzles with air-rinsed deflector plates, the factory default value is approx. 0.5 Nm³/h!

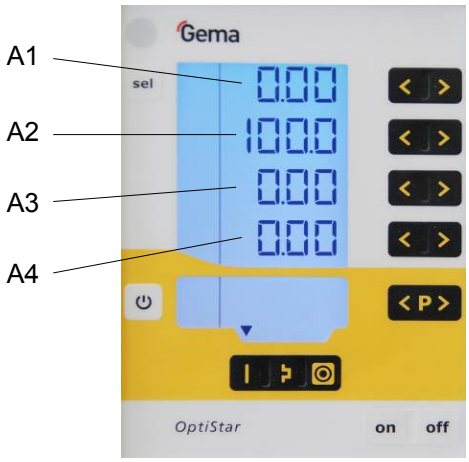
3. If in this display level is no operation for 3 seconds, the first display level is switched over independently

Pinch valves and filter elements monitoring display

1. Turn on the gun control unit with the **ON** key

2. Hold 

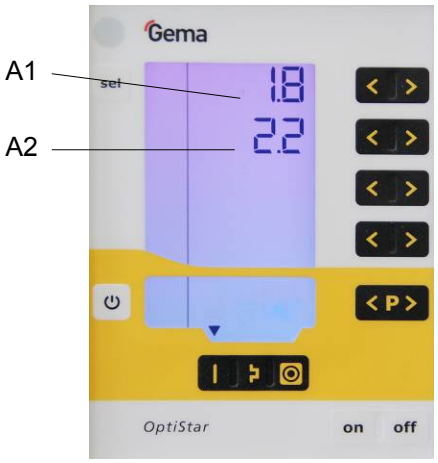
key down for 5 seconds
The display switches to the following level:



Display	Description	Unit
A1	Current pinch valves pressure	bar
A2	Opening time of control solenoid valve for pinch valves pressure	%
A3	Filter element 1 backpressure	bar
A4	Filter element 2 backpressure	bar

3. Press 

key 1x
The display switches to the following level:



Display	Description	Unit[1)]
A1	Current transport air	Nm³/h
A2	Current spraying air	Nm³/h

1) Depending on the unit set, airflows are displayed in Nm³/h or scfm.

4. Press sel key 2x
   The display switches to the main level

Cleaning mode

The cleaning mode enables the cleaning of the application pump and the powder hose. Three different rinsing programs are available to prepare the application pump for a color change.

Activating the cleaning function

1.  
   - The LCD segments begin to move on the display

NOTE!
The rinsing function can be stopped as required using the P key.

2. Press the corresponding application key
   The blue arrow above the pressed key is switched on

3.  = START

Cleaning programs

Powder chamber emptying combined with hose cleaning in both directions

In this cleaning program (key **T13**), some air is blown through the filter elements in the powder chambers. The cleaning process can be additionally supported by blowing compressed air into the suction hose.

NOTE!
The application pump may be cleaned with a pressure of max. 4 bar!

Cleaning the hose to the gun

In this cleaning program (key **T14**), the powder hose to the gun will be cleaned with several air blasts. During this time, the pinch valve on the suction side remains closed.

Cleaning the hose on the suction side

WARNING:

Large dust formation possible!

► The powder hose and the powder gun must be pointed into the booth during the cleaning procedure!

In this cleaning program (key **T15**), the powder hose on the inlet of the application pump will be cleaned with several air blasts. During this time, the pinch valve on the output to the gun remains closed.

The cleaning mode is terminated automatically.

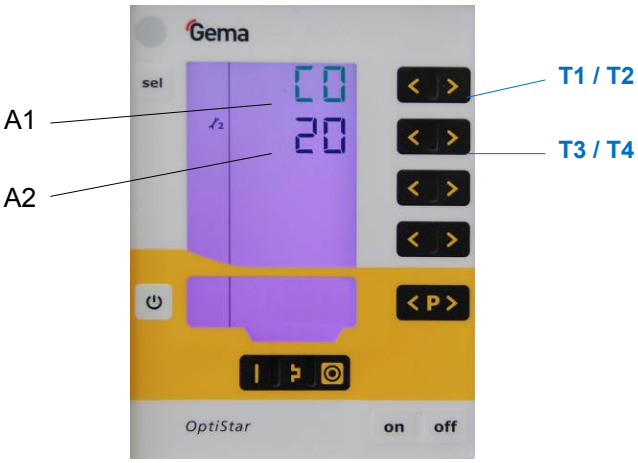
Correction values

The OptiStar CG11-P Gun control unit can be adapted with the correction values optimally to local conditions (e.g. the adjustment of different powder outputs in the plant).

Entering the correction values

1. Hold ⏻ key down for 5 seconds
   The display switches to the following level:

2. Press sel key
   The display switches to the following level:



3. The correction factor number is shown in the display **A1** with a **C** placed in front
4. Set the corresponding correction value with the **T3 or T4** key.
   The value of the adjusted correction factor appears on corresponding display **A2**
5. Browse to the next or previous correction factor with the **T1 or T2** key
6. Select correction values according to the following table

Corr.-value	Description	Range[2)]	Default value
C0	Minimum suction time (ms)	0-50	20[1)]
C1	Powder hose correction value (%)	40-100	100
C2	Daily correction value (%)	50-150	100
C3	Transport air offset (Nm³/h)	0-2.0	1.0[3)]
C4	Pump operating frequency (Hz)	1.0 – 10.0	6.0
C5	Pinch valves set pressure Conveying mode (bar)	1 .0 – 6.0	2.8
C6	Pinch valves set pressure Cleaning mode (bar)	1 .0 – 6.0	5.0

1) Any value correction is set to its default value if the default value changes when the P0 device type is changed.

2) A correction value is set to its default value if it is outside of the value range after the P0 device type has been changed.

3) Depending on the unit set, airflows are displayed and entered in Nm³/h or scfm.

7. Press  key
   Display returns to the first level display.

Powder output/powder hose correction

Powder output corrections are made at the first start-up, after a service work, after the solution of application problems, or by using different hose diameters!

It is recommended to create a table with input fields (see "Example table for powder output/powder hose correction"), so that, if a possible system reset takes place, an access to these data can take place.

Procedure (powder output correction)

1. Set the total air to **4.0** (Nm³/h) on the **A2** display. Set the powder output to **00** (%) on the **A1** display
2. To enter the system parameter mode, press the key **T12** longer than 5 seconds. The correction factor number is shown in the display **A1** with a **C** placed in front
3. Press sel key
   The display switches to the correction factors level:
4. Check the correction value for minimum powder output **C0** on the **A2** display, and set it to **20** (ms) with the keys **T3/T4**, if necessary.
5. Check the correction value for maximum powder output **C1** on the **A2** display, and set it to **100** (%), if necessary.

For the next steps a measuring bag is necessary, for weighing the powder output. Do not forget to note the dead weight of the measuring bag.

6. Put the measuring bag over the gun nozzle and fasten it. Switch on the gun for 60 seconds
7. After this time has elapsed, switch off the gun, remove the measuring bag and weigh it. The powder output should be between 10-15 gr
8. If no powder is expelled from the gun, return to the system parameter mode and increase the minimum powder output value **C0** (range **0-50** ms)
9. If too much powder is expelled from the gun, return to the system parameter mode and decrease the minimum powder output value **C0** (range **0-50** ms)
10. Repeat steps 5 and 6, until the powder output amounts to 10-15 g. Annotate the adjusted minimum powder output value **C0** in the table

Exit the system parameter mode by pressing the key **T12**.

Procedure (powder hose correction)

1. Set the powder output value to **80** (%) on the **A1** display
2. Put the measuring bag over the gun nozzle and fasten it. Switch on the gun for 60 seconds
3. Switch off the gun after 60 seconds, remove the measuring bag and weigh it
4. Annotate the powder output in **g/min** in the table

Calculate the powder output correction according to following formula:

$$\textbf{C1 (\%)} = \frac{\textbf{smallest powder output}}{\textbf{measured powder output}} \times 100$$

5. Annotate the calculated values (**C1**) for each individual gun in the table and enter the values to the control unit (therefore, repeat the steps 2 and 3)

Example table for powder output/powder hose correction

Gun	Powder output correction C0			
No.	before correction		after correction	
1	C0=20 ms	20 gr.	**C0=20 ms**	12 gr.
2	C0=20 ms	10 gr.	**C0=17 ms**	13 gr.
3	C0=20 ms	0 gr.	**C0=14 ms**	12 gr.
etc.				

Gun	Powder hose correction C1			
No.	before correction		after correction	
1	C1=100%	200 gr.	**C1=100%**	200 gr.
2	C1=100%	250 gr.	**C1=80%**	200 gr.
3	C1=100%	280 gr.	**C1=71%**	200 gr.
etc.				

Daily correction value C2

NOTE!

The daily correction value C2 can be used to allow higher or lower powder volumes!

Transport air offset C3

NOTE!

The transport air offset C3 can be used to correct the powder output if it is spitting or inconsistent!

Powder output	C3
50-100 g/min	ca. 0,8
100-200 g/min	ca. 1,0
200-300 g/min	ca. 1,2

Correction value C4

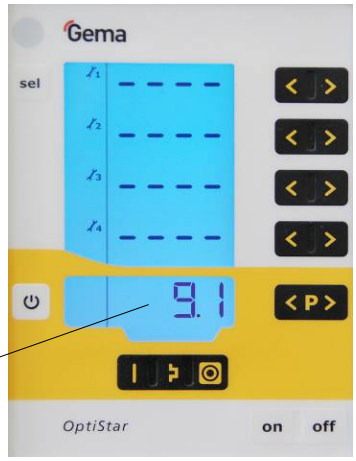
NOTE!

The C4 correction value can only be adjusted for analysis purposes during any repairs which may be carried out!

C4 must be re-set to 6.0 before being reused!

Monitoring of wearing parts and trigger counter

5. Press sel key 2x
   The display switches to the following level:



6. Press < and > at same time
   Monitoring is activated
   During the first activation a value of 1 is shown as the start value. If monitoring has already been activated at some earlier point, then the last stored value is displayed.

7. Set the desired service life for each wearing part using the < or >

8. The reverse counter is then activated and runs only during active coating

9. If the selected service life is exceeded, the **service** symbol appears on the display. The coating procedure is not affected by this.

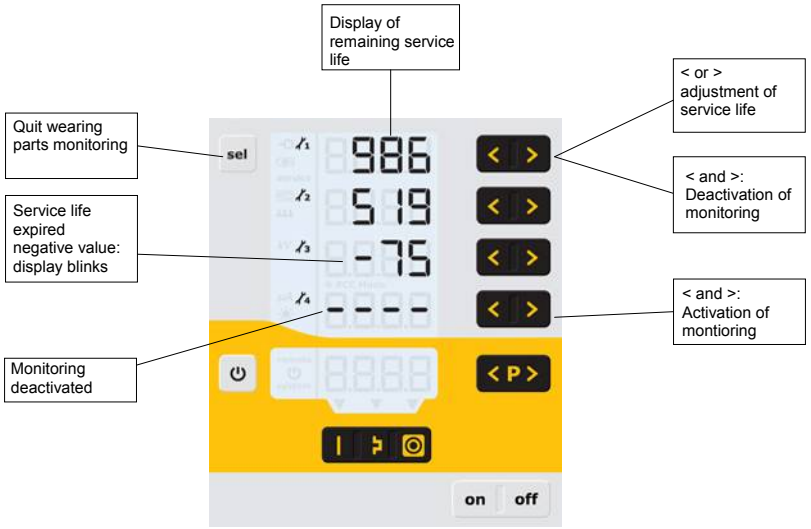
Trigger counter

The trigger counter (total time in days of trigger time) is shown in the display **A5**.

The trigger counter can't be reset!

View remaining service life

1. Press sel key 2x
   The display switches to the wearing part monitoring level

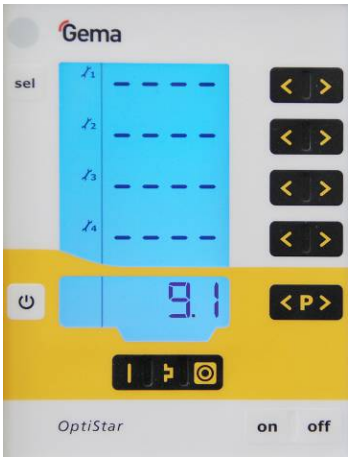


Display example

Read minus hours	-75 h
Selected service life	100 h
Operating life	175 h

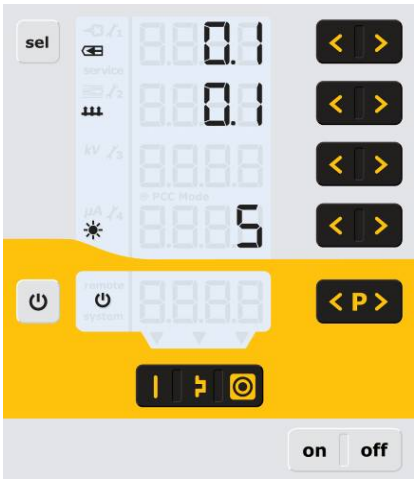
Deactivation of wearing part monitoring

1. Press < and > key simultaneously
   Monitoring is deactivated.



Setting the background illumination

1. Press sel key
   The display switches to the following level:



2. 
   Select the desired brightness

Activate/deactivate the program change via remote control

The remote control function has been set in the factory to change the powder output. If the operator prefers the possibility to switch between the programs P01-P20, this function is to be activated/deactivated on the control unit as follows:

1. Hold ⏻ key pressed
2. Press sel key
   The program change function is activated/deactivated

Activate/deactivate the keyboard lock

1. Hold ⏻ key pressed
2. 
   Press key
   The keyboard lock is activated. The **remote** display blinks.
3. The keyboard lock is cancelled by pressing the same key combination

Checking the software version

1. Press these two keys at the same time
2. 

The status display is shown as long as the keys are held.

Shutdown

1. Release gun trigger
2. Switch off the control unit

Note:
The adjustments for high voltage, powder output, electrode rinsing air and fluidizing remain stored!

If in disuse for several days

1. Separate from power mains
2. Clean the coating equipment (see the corresponding operating manual)
3. Turn off the compressed air main supply

Fault remedying

Error diagnosis of the software

General information

The correct function of the OptiStar CG11-P Gun control unit is constantly monitored. If the equipment software determines a fault, an error message is indicated with a help code. Following is monitored:

- High voltage technology
- Pneumatic system
- Power supply

Help codes

The error diagnosis codes (help codes) are shown in rot on the **A5** display.

The help codes are stored in an error list in the order of their appearance. Each error in the list must be individually acknowledged with the keys **T10** or **T11**.

The errors are displayed in the order of their appearance. The **T10** and **T11** keys cannot be used for other functions, as long as an error code is still shown.

Here is the complete listing of all help codes possible for the OptiStar CG11-P Gun control unit:

Code	Description	Criteria	Remedy
Pneumatics:			
H06	Trigger valve	Solenoid coil current lower than preset limiting value Valve defective, main board or cable defective	contact Gema Service

H07	Spraying air flow too high (Setting of spraying air on the display)	The preset value for spraying air is too high compared to the transport air setting	Lower spraying air value or increase value for transport air to equalize air volumes to the application pump, delete error code
H08	Transport air volume too high (setting of powder share on the display)	The preset value for transport air is too high compared to the spraying air setting	Lower transport air value or increase value for spraying air to equalize air volumes to the application pump, delete error code
H09	Powder output higher than 100%	The powder output multiplied by the powder hose length factor and daily correction value is greater than 100% Daily correction value too large	Reduce powder output Reduce daily correction value
H10	Transport air range lower deviation	The theoretical value for transport air falls below minimum Total air is smaller than minimum	Limit transport air to their minimum value
High voltage:			
H11	Gun error	No vibrations in the oscillator, cable break, oscillator or gun is defective	contact Gema Service
H14	Offset spray current measurement	Grounded current measurement	contact Gema Service
Power supply:			
H21	Supply undervoltage	Power pack defective or overloaded	contact Gema Service
EEPROM (equipment memory):			
H24	EEPROM content invalid	EEPROM error	contact Gema Service
H25	Timeout during EEPROM writing	EEPROM error	contact Gema Service
H26	Values not correctly stored in EEPROM during switching off	EEPROM error	contact Gema Service
H27	EEPROM verification erroneous	EEPROM error	contact Gema Service
Throttle motors:			
H60	Transport air reference position not found	Throttle motor or needle jammed, limit switch defective, error in motor throttle	contact Gema Service
H61	Spraying air reference position not found	Throttle motor or needle jammed, limit switch defective, error in motor throttle	contact Gema Service
H62	Electrode rinsing air reference position not found	Throttle motor or needle jammed, limit switch defective, error in motor throttle	contact Gema Service
H63	Fluidizing air reference position not found	Throttle motor or needle jammed, limit switch defective, error in motor throttle	contact Gema Service
H64	Transport air throttle does not move	Short circuit in limit switch, motor throttle defective	contact Gema Service
H65	Spraying air throttle does not move	Short circuit in limit switch, motor throttle defective	contact Gema Service
H66	Electrode rinsing air throttle does not move	Short circuit in limit switch, motor throttle defective	contact Gema Service

H67	Fluidizing air throttle does not move	Short circuit in limit switch, motor throttle defective	contact Gema Service
H68	Transport air position lost	Lost steps, limit switch defective, throttle motor defective	contact Gema Service
H69	Spraying air position lost	Lost steps, limit switch defective, throttle motor defective	contact Gema Service
H70	Electrode rinsing air position lost	Lost steps, limit switch defective, throttle motor defective	contact Gema Service
H71	Fluidizing air position lost	Lost steps, limit switch defective, throttle motor defective	contact Gema Service
Application pump			
H80	Pump not connected	The control unit is parameterized as pump control unit, but there is no pump connected.	Connect the pump
H81	Pump feedback	Application pump set the REQ signal to 5 V.	contact Gema Service
H82	(GLsoll – TL) < 0 (Total Air preset value – Transport Air) < 0	Total air is smaller than transport air which is resulting from powder output and daily correction value C2	Change the powder output correction value or daily correction value C2
H83	AP01 pressure control	Pressure falls 150 mbar below preset value longer than 5 s.	Check the compressed air supply, otherwise contact a Gema service center
H84	AP01 pressure measurement	A/D converter timeout. Possible cause: Hardware defective	contact Gema Service
H85	No AP01 interface	The unit is configured as pump control unit, but there is no pump interface	Check System parameter P0, otherwise contact a Gema service center

Help codes list

The last appeared four errors are stored in a list by the software. If an error appears, which is already in the list, he will not be listed again.

Appearance of errors

It is possible that an error is only displayed for a short time, but after the acknowledgement it will disappear. In this case, it's recommended to switch off the control unit and switch it on again (reset by restarting).

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** OptiStar CG11-P
  Serial number 1234 5678
- Order no. 203 386, 1 piece, Clamp - Ø 18/15 mm

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 *.

Wearing parts are always marked with a **#**.

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

Example:

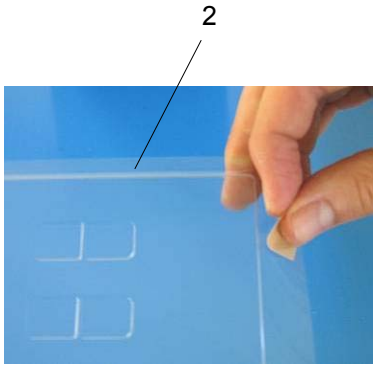
Ø 8/6 mm, 8 mm outside diameter (o/d) / 6 mm inside diameter (i/d)

WARNING!
Only original Gema spare parts should be used, because the explosion protection will also be preserved that way. The use of spare parts from other manufacturers will invalidate the Gema guarantee conditions!

OptiStar CG11-P Gun control unit

1	OptiStar CG11-P Gun control unit - complete	1009 970
2	Cover	1008 301

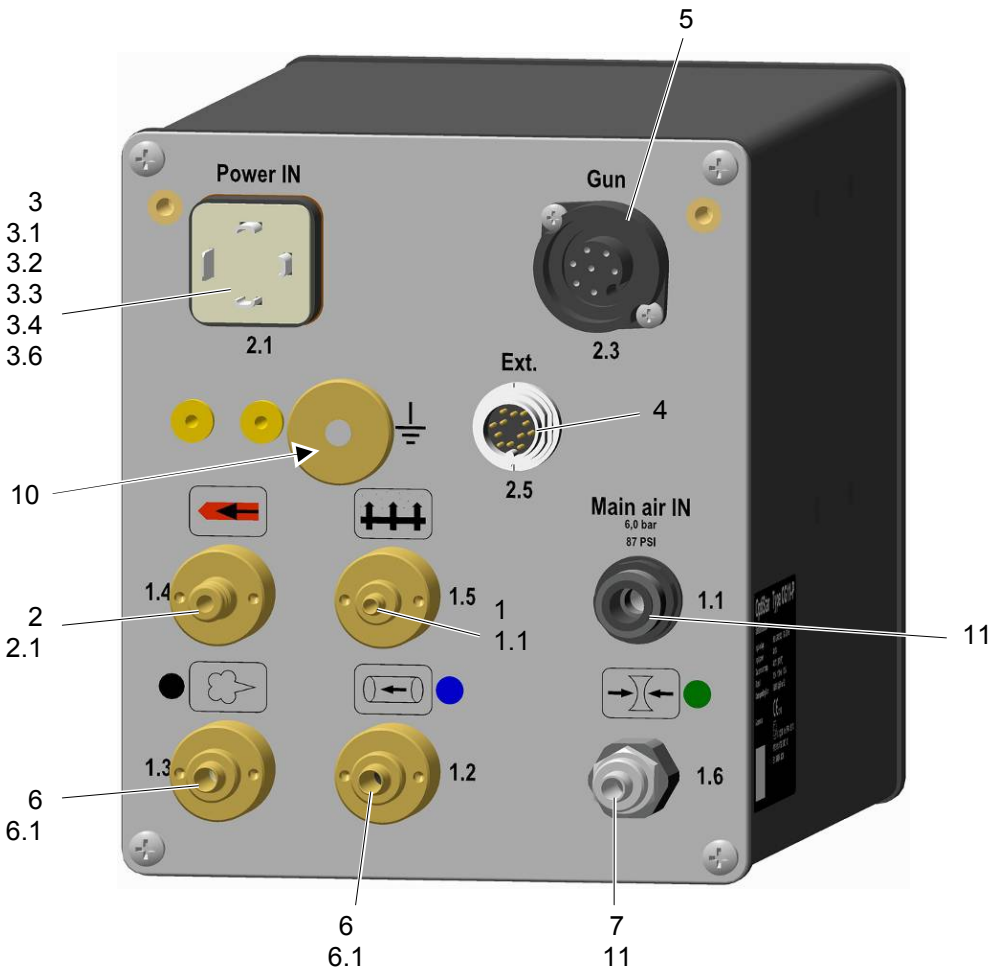
OptiStar CG11-P Gun control unit



OptiStar CG11-P – Connections

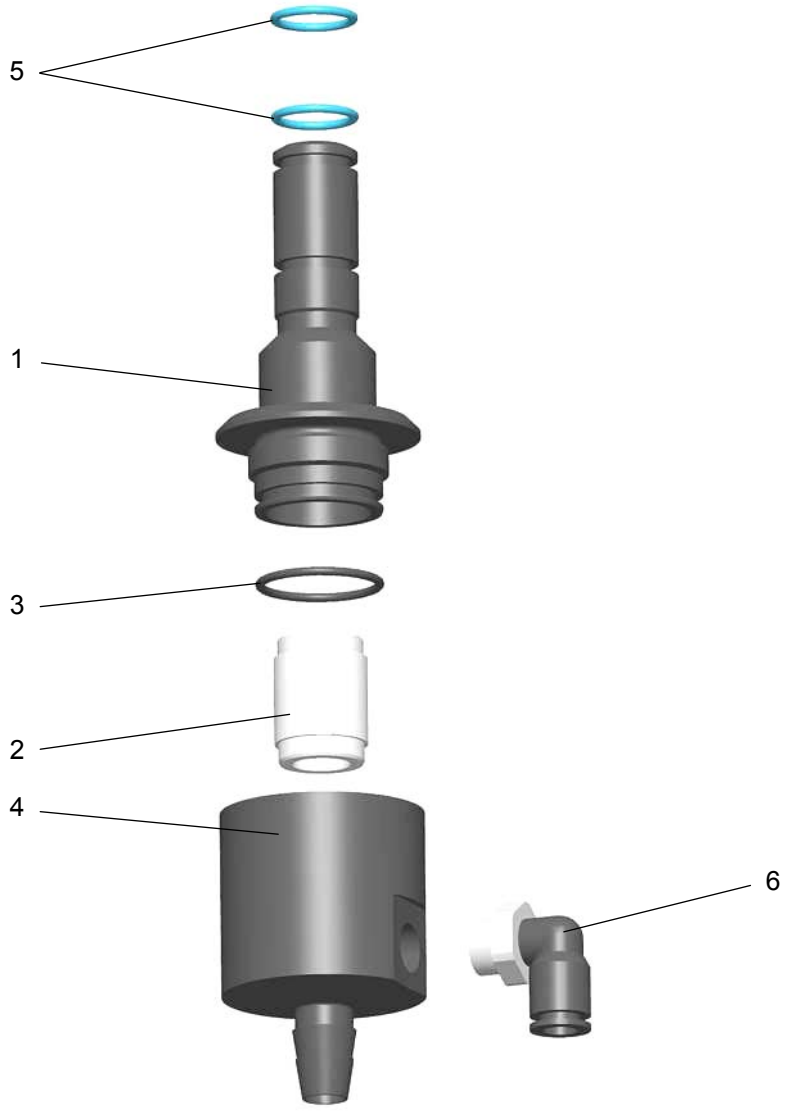
1	Hose connection - Ø 6/4 mm, complete	1004 184
1.1	Nut with kink protection – M10x1 mm, Ø 6 mm	201 308
2	Rectus quick release connection - complete	1004 181
2.1	Quick release connection - NW5, Ø 6 mm	200 840
3	Power supply connection	1009 852
3.1	Mains cable (CH)	382 493
3.2	Mains cable (Schuko)	382 485
3.3	Mains cable (USA)	382 507
3.4	Mains cable (GB)	382 515
3.5	Mains cable (AUS)	382 523
3.6	Mains cable (China)	1000 993
4	Application pump connection – complete	1009 854
5	Gun connection	1007 839
6	Hose connection – Ø 8/6 mm, complete	1004 183
6.1	Nut with kink protection – M12x1 mm, Ø 8 mm	201 316
7	Screw-in nipple - Ø 8 mm-1/4"a	225 479
10	Grounding cable - complete	301 140
11	Lead-through connection - Ø 8 mm-1/4"i	253 901

OptiStar CG11-P – Connections



Diffuser

	Diffuser - complete	1005 263
1	Adaptor piece	1005 260
2	Fluidizing tube	1005 262
3	O-ring - Ø 19x1.5 mm	1005 749
4	Connector	1005 261
5	O-ring - Ø 12x1.5 mm	1000 822
6	Elbow joint - 1/8"a, Ø 6 mm	254 061



Diffuser – Spare parts