
Operating instructions and spare parts list

Control unit OptiControl CM04



Translation of the original operating instructions

Documentation OptiControl CM04

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About this instructions

General information

This operating manual contains all important information you will need to work with the . It will safely guide you through the start-up process and provide you with references and tips for optimum use of your 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 warnings with their meanings can be found in the Gema operating instructions. The general safety precautions must also be followed as well as the regulations in the relevant operating instructions.

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.

**MANDATORY NOTE**

Information which must be observed.

**NOTE**

Useful information, tips, etc.

Structure of Safety Notes

Every note consists of 4 elements:

- Signal word
- Nature and source of the danger
- Possible consequences of the danger
- Prevention of the danger

 **SIGNAL WORD**

Nature and source of the hazard!

Possible consequences of the danger

- ▶ Prevention of the danger

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 electrode.

Basic safety instructions

- 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 not considered as intended use. The manufacturer shall not be liable for damage resulting from such use; the user bears sole responsibility for such actions. If this product is to be used for other purposes or other substances outside of our guidelines then Gema Switzerland GmbH should be consulted.
- 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 measures

- 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.
- 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.



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

WARNING

Working without instructions

Working without instructions or with individual pages from these 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.
-

Product description

Intended use

The OptiControl CM04 Control unit is intended exclusively for controlling functions in electrostatic powder coating equipments.

The Control unit is integrated in the control cabinet of the OptiFlex A1/OptiFlex A2 Control system and assumes the function of the gap control.

The Control unit starts and stops the powder guns and the axes, depending on the objects on the chain conveyor.

Observance of the operating, service and maintenance instructions specified by the manufacturer is also part of the intended 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.

Any other use is not considered as intended use. 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.

A summary of the directives and standards

This product was built according to the current state of the art. The product is subject to the European directives and complies with the following standards.

The product is suitable for the intended purpose and can be used in the appropriate areas.



For further information, also refer to the enclosed Declaration of Conformity.

European directives RL

EG-RL 2006/42/EU	Machinery
EG-RL 2014/34/EU	Equipment and Protective Systems in Potentially Explosive Atmospheres (ATEX)
EG-RL 2014/30/EU	Electromagnetic compatibility

EN European standards

EN 50177	Stationary electrostatic application equipment for ignitable liquid coating material - Safety requirements
EN 50050-2	Electrostatic equipment for areas where there is danger of explosion - electrostatic hand held equipment Part 2: Electrostatic hand-held spraying equipment
IEC/EN 60950	Safety of information technology equipment
UL 61010-2- 201	Industrial controls, section "Requirements for the place of installation"
DIN EN 60529	Degrees of protection provided by enclosures (IP Code)
NEMA 250- 2003	Enclosures for electrical equipment (1000 Volts maximum)
DIN EN 60898- 1:2006-03	Electrical accessories – Circuit-breakers for overcurrent protection for household and similar installations
EN 50178	Electronic equipment for use in power installations
IEC/EN 61131-2	Programmable controllers, Equipment requirements and tests
EN 12981	Coating plants – spray booths for application of organic powder coating material - Safety requirements

Recognized safety-related regulations

BGI 764 / DGUV Infor- mation 209- 052	Electrostatic coating Trade Union information concerning health and safety during work (BGI)
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Reasonably foreseeable misuse

- Operation without the proper training
- Use in connection with unauthorized coating equipment or components

Design and function

Overview

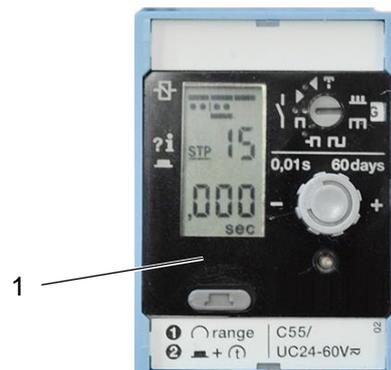


Fig. 1: OptiControl CM04 Control unit – overview

- 1 Time relay K1

Start-up

Preparation for start-up

Basic conditions

When starting up the plant control, the following general conditions impacting the coating results must be taken into consideration:

- Gun control units, axes and all other system components correctly connected
- Guns correctly connected
- Corresponding power and compressed air supply available
- Powder preparation and powder quality

General information

The plant control is pre-parameterized, configured and tested at the Gema factory. This allows faster commissioning, since fewer parameters need to be set on site.

The control can be subsequently adjusted and extended.



Changes of correction values may only be made by Gema trained personnel.

Operation

Operation



During the initial commissioning of the device, the functional check must be performed without powder!

Switching on

The control cabinet is switched on by the main switch (red on yellow base). The control unit in the cabinet are switched on, if the external interlocking device signals a ready operational condition.

Function

If a workpiece/object pass through the light barrier, the powder guns and the axes are started after a short delay. This duration is plant-specific and can be adjusted locally on the **K1** relay by setting the time **t1**.

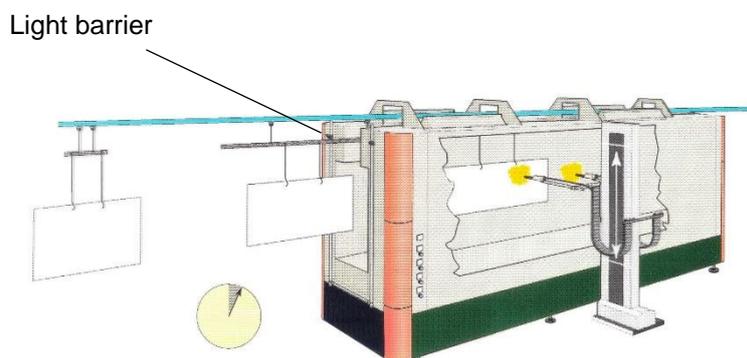


Fig. 2: Start of the powder guns and axes

When the last object passes through the light barrier, the powder guns and the axes are stopped after a short delay. This duration is plant-specific and can be adjusted locally on the **K1** relay by setting the time **t2** (spraying time).

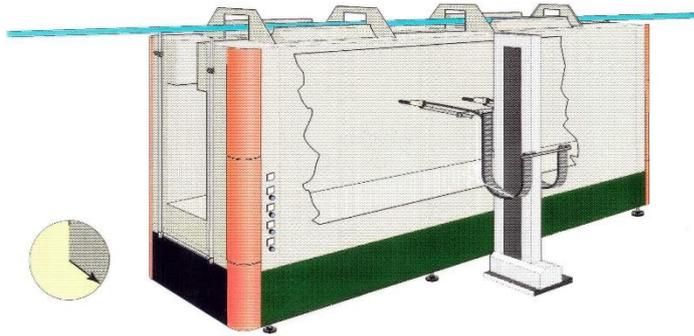


Fig. 3: Powder guns and axes are stopped

If the test mode is started with the key switch on the control cabinet, the powder guns and axes are switched on immediately.

If the conveyor is stopped, the times **t1** and **t2** are also stopped.

⚠ WARNING

If the plant is switched on manually, no persons may stand near the axes or in the booth!

⚠ WARNING

The powder coating equipment must be switched off for maintenance purposes with the main switch on the OptiFlex control cabinet (red on a yellow base), which should normally be locked with a small padlock!

Configuration of time relay K1

Display overview

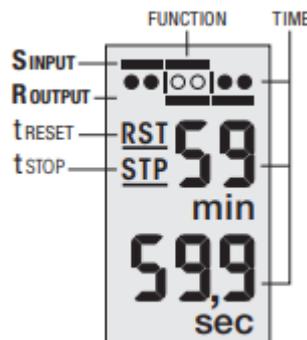


Fig. 4:

Configuration

- Object recognition switched off
 - Conveyor in stop
1. Switch on the power supply
 - Display switches on



2. Set function switch to G



Configure timer t1 (time from booth door to 1st gun)

1. Press the button  for more than 1 second
 - **Inf** (Information) is shown on the display
2. Release the  key
 - Indicator for **t1** flashes
 - Set time is displayed (5 s)



3. Within 5 s press the button  for more than 1 second
 - **Set** (Setup) is shown on the display
4. Release the  key
 - Set time flashes (indicator 1/100 s)
5. Turn the rotary knob to + until Seconds start to flash (Seconds indicator)
6. Press and hold the button  and turn the rotary knob, until 15 seconds is set

7. Release the  key
8. Wait until the Seconds display no longer flashes



- When the digits stop flashing, the new value is saved with mains failure protection

Configure timer t2 (coating time)

1. Press the button  for more than 1 second
 - **Inf** (Information) is shown on the display
 - **t1** is then displayed
2. Briefly press the  key again
 - Indicator for **t2** flashes
 - Set time is displayed (5 s)



3. Within 5 s press the button  for more than 1 second
 - **Set** (Setup) is shown on the display
4. Release the  key
 - Set time flashes (indicator 1/100 s)
5. Turn the rotary knob to + until Seconds start to flash (Seconds indicator)
6. Press and hold the button  and turn the rotary knob, until 30 seconds is set
7. Release the  key

8. Wait until the Seconds display no longer flashes



- When the digits stop flashing, the new value is saved with mains failure protection

Check configuration

Check timer t1

1. Switch on object recognition (set a bridge)
 - Display **t1** starts running.
2. Interrupt object recognition briefly, then switch it on again
 - Display **t1** stops, then continues to run
 - Indicator timer **t1** flashes
 - Timer **t1** runs



3. Timer **t1** expired
 - **30 s** is shown on the display
 - Indicator timer **t2** flashes
 - LED lights up yellow (contact C55 closed)



Check timer t2

1. Switch on "**Conveyor on**" (set a bridge)
 - Display **t2** starts running.
2. Interrupt conveyor movement briefly, then switch it on again
 - Display **t2** jumps back to **30 s**, then starts counting again
 - LED illuminates yellow



3. Timer **t2** expired
 - LED turns off as soon as **t2** (30 s) has expired
 - **t1** is shown on the display
 - Indicators **t1** and **t2** are static



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** OptiControl CM04^{SEP} **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

Use of non-original Gema 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 warranty claims become invalid!

- ▶ Only original Gema spare parts should be used!
-

OptiControl CM04 Control unit – spare parts list

1	Time relay	1024 864
1.1	Base for pos. 1 – 11 pins (not shown)	227 552



Fig. 5: OptiControl CM04 Control unit



Further information will be found in the plant-specific wiring diagram and in the corresponding parts list!
