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Operating instructions and spare parts list

OptiControl CM03 control unit

Translation of the original operating instructions

Gema

Documentation OptiControl CM03 control unit

Printed in Switzerland

Gema Switzerland GmbH
Mövenstrasse 17
9015 St. Gallen
Switzerland

Phone: +41-71-313 83 00
Fax.: +41-71-313 83 83

E-Mail: info@gema.eu.com
Homepage: www.gemapowdercoating.com

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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 OptiControl CM03 control unit.

These safety regulations must be read and understood before the OptiControl CM03 control unit is used.

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 operating instructions.

DANGER!
Danger due to live electricity 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

Conformity of use

1. The OptiControl CM03 control unit is built to the latest specification and conforms to the recognized technical safety regulations. It is designed for the normal application of powder coating.
2. Any other use is considered as non-conform. The manufacturer is not responsible for damage resulting from improper use of this equipment; the end-user alone is responsible. If the OptiControl CM03 control unit is to be used for other purposes or other substances outside of our guidelines then Gema Switzerland GmbH should be consulted.
3. Observance of the operating, service and maintenance instructions specified by the manufacturer is also part of conformity of

use. The OptiControl CM03 control unit 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 a particular operation) is forbidden until it has been established that the OptiControl CM03 control unit has been set up and wired according to the guidelines for machinery (98/37 EG). EN 60204-1 (machine safety) must also be observed.
5. Unauthorized modifications to OptiControl CM03 control unit exempts 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 must be observed.

Product specific security measures

OptiControl CM03 control unit

The OptiControl CM03 control unit is constituent part of the system and is thus integrated into the safety system of the plant.

For the use outside of the safety concept, corresponding measures must be taken!

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

About this manual

General information

This operating manual contains all the important information which you require for the working with the OptiControl CM03 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 function mode of the individual system components - reciprocators, booths, powder gun control units, powder guns etc. - should be referenced to their corresponding documents.

Function description

Field of application

The OptiControl CM03 control unit enables a semiautomatic operation in the OptiFlex A2 control system. The control unit assumes switching functions, monitors the powder hopper and alerts the operator when a powder shortage occurs. Various displays in the front door inform about the current operating status.

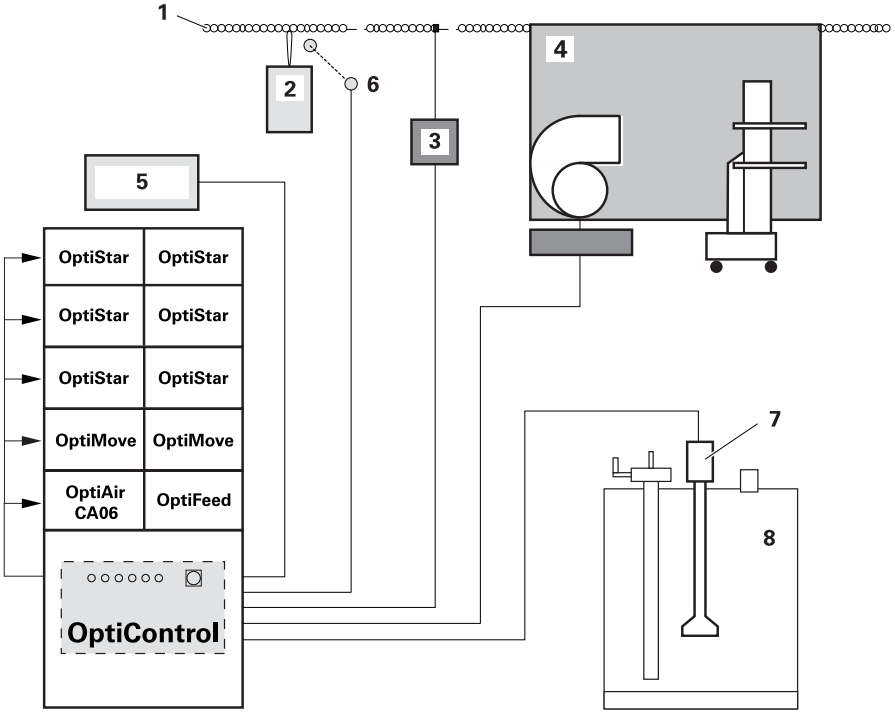
The OptiControl CM03 control unit is intended exclusively for controlling functions in electrostatic powder coating equipments. Any other use is considered as non-conform. The manufacturer is not responsible for any damage resulting from this - the risk for this is assumed by the user alone!

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

Note:
A perfect functioning of the axes/reciprocator control units and the gun control units requires the correct setting of the corresponding system parameters (see therefore the corresponding operating instructions)!

OptiControl CM03 control unit

Overview



OptiControl CM03 control unit - overview

1 Chain conveyor
2 Workpiece/object
3 Ext. control unit
4 Booth/recovery system
5 Fire protection
6 Start light barrier
7 Level sensor
8 Powder hopper

Possible configuration

A possible configuration of the OptiControl CM03 control unit with the subordinated components is shown in the following table:

OptiControl CM03 control unit	
Component:	**Function/release:**
OptiStar	Powder guns
OptiMove	Reciprocators
OptiFeed	Powder transport
OptiAir	Fluidizing and Airmover
Level sensor	Powder level in the powder hopper
Light barrier Start/Stop	Object recognition
Interlockings	Booth etc.
Main solenoid valve	Compressed air supply
Alarm	Powder shortage

Functions

- OptiMove/OptiStar control units release (switch on power supply)
- Main solenoid valve release
- Fluidization (controlled by fluidizing unit)
- Fresh powder requirement
- **Powder full** display
- **Powder empty** display
- Control of the alarm horn
- Reciprocators and powder guns signal Start/Stop

Note:
The OptiControl CM03 control unit functions are explicitly described in the chapter "Start-up"!

Interlocking signals

In order to control the operation of the electrostatic powder coating equipment, it is absolutely necessary to have some interlocking functions.

The OptiControl CM03 control unit assumes these interlocking functions:

- Chain conveyor
- Powder recovery equipment
- Fire protection
- Grounding check

Non-control and non-potential contacts permit an individual adaptation to all plant-specific requirements.

All OptiFlex components (incl. OptiMove) can be switched on and off with the key switch of the OptiControl CM03 control unit (main operation switch).

Attention:
It is not permitted to switch off the powder coating equipment with the OptiControl CM03 control unit key switch for maintenance purposes!
The whole powder coating equipment must be switched off with the main switch on the OptiFlex control cabinet (red on a yellow base), which should normally be locked with a small padlock!

Technical data

OptiControl CM03 control unit

General information

OptiControl CM03	
Max. number of OptiStar control units	14
Max. number of OptiMove control units	4

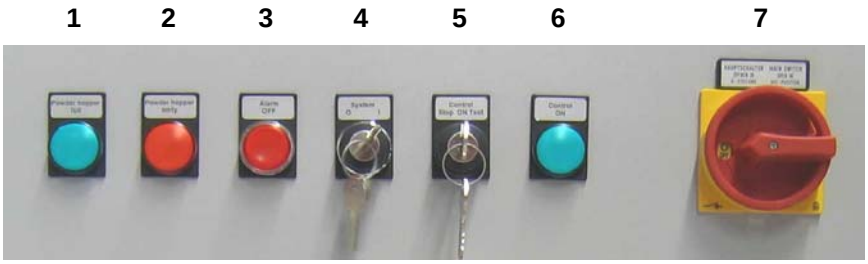
Electrical data

OptiControl CM03	
Nominal input voltage	100-240 VAC
Frequency	50/60 Hz
Control current circuit	24 VDC
Temperature range	0°C - +40°C (+32°F - +104°F)
Protection type	IP54
Approval	CE Ex II 3 D ATEX Zone 22

Operating and display elements

OptiControl CM03 control unit

Front view



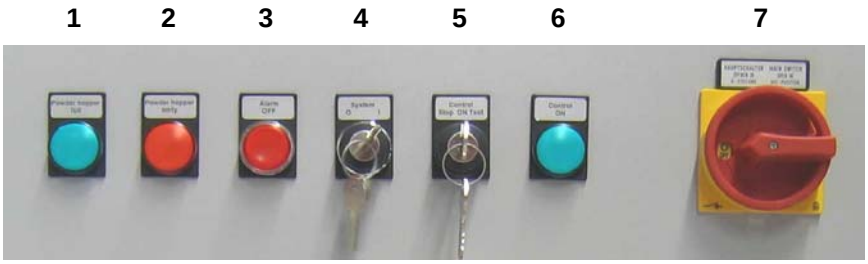
OptiControl CM03 - front view

1 Indicator lamp **Powder hopper full** (green)
2 Indicator lamp **Powder hopper empty** (red)
3 Push button/indicator lamp **Alarm OFF** (red)
4 Key switch for system release (**ON/OFF**)
5 Key switch for control voltage (**STOP/ON/Test**)
6 Indicator lamp **Control ON** (green)
7 Equipment main switch

Start-up

OptiControl CM03 control unit

Switching on



OptiControl CM03 - switching on

1. The OptiFlex A2 control cabinet is switched on by the main switch (**7**)
2. The OptiControl CM03 control unit is switched on by the key switch. The control voltage is OK when the indicator lamp (**6**) illuminates. The control units in the control cabinet (OptiStar, OptiMove etc.) are thereby put into operation too

Main solenoid valve, fluidization

The main solenoid valve will be switched on and the prefluidization started, when the three interlocking signals **Booth ready**, **Fire protection OK** and **Grounding control** are present on the control unit input.

Test mode

The test mode is started by turning the key switch (**5**) on **Test**. The powder guns and reciprocators are switched on immediately. The plant can be simply put into operation in this way, without external signals must be present on the control unit.

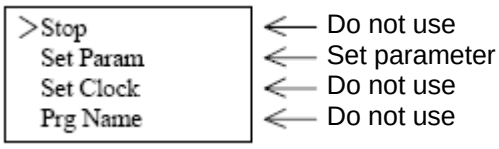
Attention:
If the plant is switched on manually, no persons may stand near the reciprocators or in the booth!

Parameterization

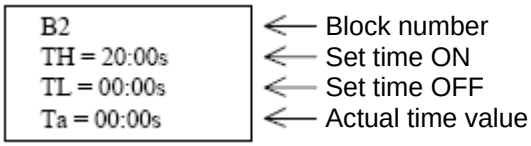
The various time sequences can be easily set and adapted to all plant-specific requirements by the aid of a simple menu control unit.

Note:
Read carefully this section, before access to a menu option!

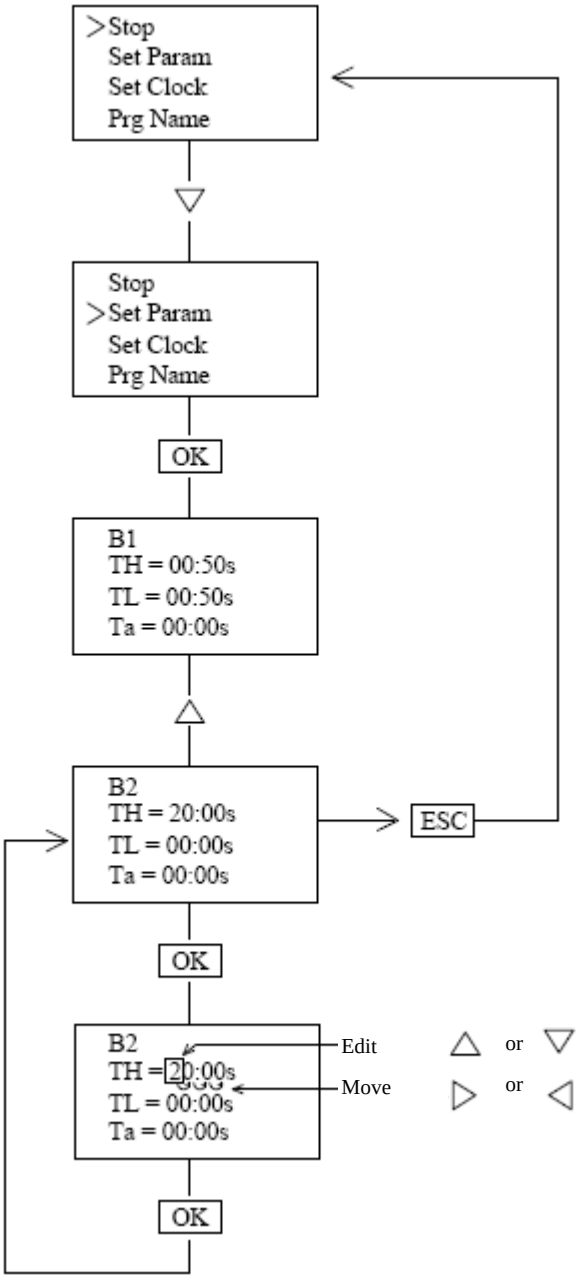
Standard display



Parameter input display



Selecting and editing a menu option



Select the Set Param menu with the ▽ key

Press **OK**. Block **B1** appears

Press the △ key, the block **B2** appears

Info:
Select Block **B2** until **B24** with the △ key

Quit the program mode with the **ESC** key and return to the normal display

Press **OK**

The values can now be selected and edited with the arrow keys

Press **OK**
The new values are saved. The editing mode will be quit

Note:
No other menu may be selected, otherwise the program becomes unusable for the control unit!

Attention!
The control unit continues to process the program in the "Parameterization" operating mode!

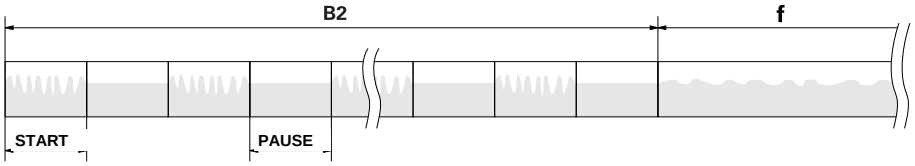
Working with the menus

Block no.	Designation	Default value	Set time
B2	Prefluidization	TH=20 secs.	T=
B9	Gap control	T=30 secs.	T=
B23	Debouncing level sensor	T=10 secs.	T=
B24	Powder hopper empty delay	T=3 min.	T=

Block functions

Block B2 - prefluidization

The prefluidization is started automatically. Thereby, a valve in the fluidizing unit switches alternately on and off for 0.5 sec. The prefluidization duration depends on the powder type, the air humidity and the ambient temperature. The default time is preset on 20 secs. After the elapse of this time, the fluidizing air can be set on the OptiAir fluidizing unit (see therefore the corresponding user manual).



B2 - prefluidization

Block B9 - gap control

The powder guns and reciprocators start with a light barrier signal on the booth entry. If no objects pass through the light barrier during a preset time, the powder guns and reciprocators will be stopped. The default time is preset on 30 secs. The plant will restart as soon as further objects pass through the light barrier.

If there is a chain conveyor stop, the guns and reciprocators are switched off. The elapsed time between two objects will be hold and keeps running by the next start.

Block B23 - debouncing the level sensor

The fluidized powder actuates many impulses on the level sensor. Therefore, a debouncing time is set, i.e. the level sensor must be covered or uncovered for a time, until the operating procedure will be continued. The debouncing time depends on the powder type, however, it should not be selected too short.

Block B24 - level control

The level control will be activated after the prefluidization. If the level sensor is covered, the **Powder hopper full** lamp (**1**) illuminates. If the level sensor is uncovered for more than 60 secs, the indicator lamp expires. The output **Fresh powder required** will be activated, and the alarm horn rings at the same time. The alarm horn can be acknowledged with the **Alarm OFF** (**3**) key, the horn switches off and the **Alarm OFF** (**3**) button illuminates. After the level sensor is covered with powder, the procedure can start again.

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 CM03 control unit,
  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 yard/meter ware is always marked with an *****.

The wear parts are always marked with a #.

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

Example:

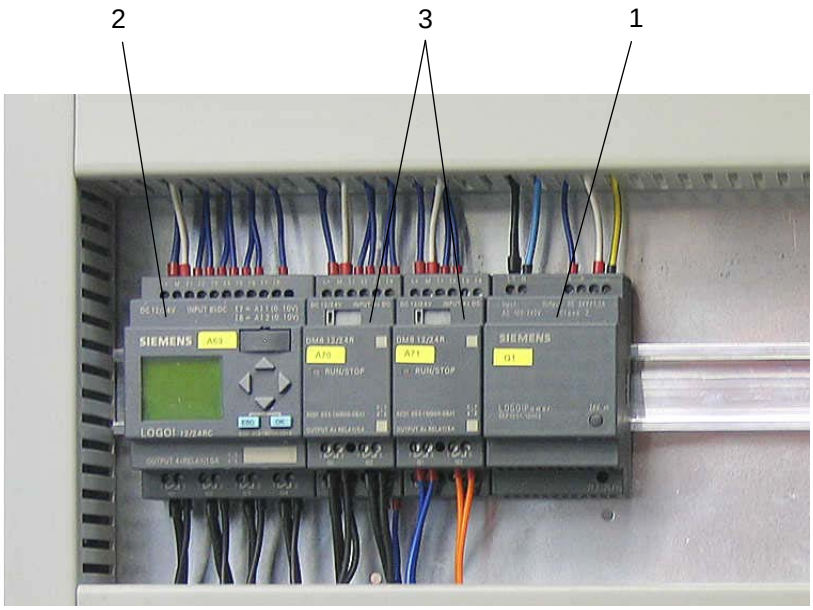
Ø 8/6 mm, 8 mm outside diameter (o/d) / 6 mm inside diameter (i/d)

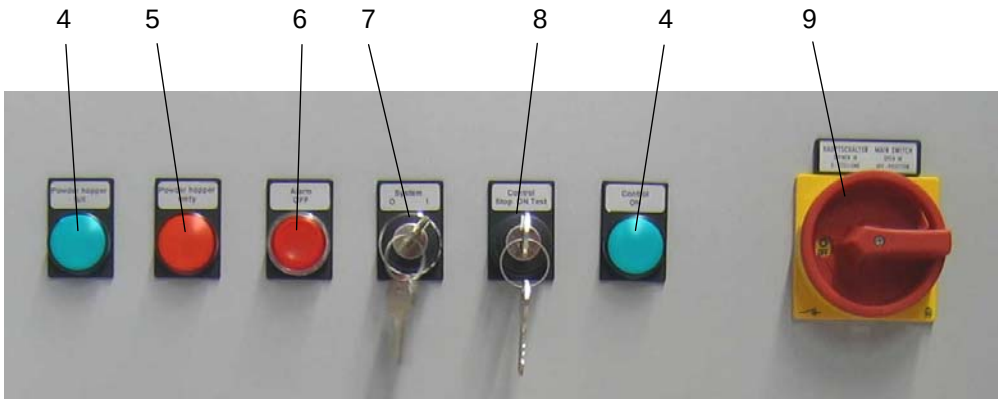
WARNING!
Only original Gema spare parts should be used, because the hazardous location approval will be preserved that way! The use of spare parts from other manufacturers will invalidate the Gema guarantee conditions!

OptiControl CM03 control unit - spare parts list

1	Power pack - Logo Power, 24 VDC, 1.3 A	263 915
2	Siemens relay - Logo 24RC, 8 IN/4 OUT	266 949
3	Siemens relay - Logo 24R, 4 IN/4 OUT (additional module)	266 957
4	Indicator lamp - green, 230 V	267 104
5	Indicator lamp - red, 230 V	267 090
6	Push button - red	267 880
7	Key switch - 2 raster	268 020
8	Key switch - 3 raster	264 440
9	Main switch - 25A	245 690

OptiControl CM03 control unit - spare parts





OptiControl CM03 - spare parts

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