Operating instructions and spare parts list

OptiMaster CM02
Powder Master Control
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General safety regulations

Safety symbols (pictograms)

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

These safety regulations must be read and understood before the spraying paint equipment is used.

The following warnings with their meanings can be found in the ITW 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 stationary powder spraying equipment 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 powder spraying equipment is to be used for other purposes or other substances outside of our guidelines then ITW Gema AG should be consulted.
3. Observance of the operating, service and maintenance instructions specified by the manufacturer is also part of conformity of use. The stationary powder spraying equipment 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 powder spraying equipment 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 powder spraying equipment 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.

<table>
<thead>
<tr>
<th>Explosion protection</th>
<th>Type of protection</th>
<th>Temperature class</th>
</tr>
</thead>
<tbody>
<tr>
<td>0102</td>
<td>IP54</td>
<td>T6 (zone 21)</td>
</tr>
<tr>
<td>II (3) D</td>
<td></td>
<td>T4 (zone 22)</td>
</tr>
</tbody>
</table>

### Technical safety regulations for stationary electrostatic powder spraying equipment

#### General Faults

The powder spraying equipment from ITW Gema is designed with safety in mind and is built according to the latest technological specifications. This equipment can be dangerous if it is not used for its specified purpose. Consequently it should be noted that there exists a danger to life and limb of the user or third party, a danger of damage to the equipment and other machinery belonging to the user and a hazard to the efficient operation of the equipment.

1. The powder spraying equipment should only be started up and used once the operating instructions have been carefully studied. Improper use of the controlling device can lead to accidents, malfunction or damage to the control itself.

2. Before every start-up check the equipment for operational safety (regular servicing is essential)!

3. Safety regulations BGI 764 and VDE regulations DIN VDE 0147, Part 1, must be observed for safe operation.

4. Safety precautions specified by local legislation must be observed.

5. The plug must be disconnected before the machine is opened for repair.

6. The plug and socket connection between the powder spraying equipment and the mains network should only be taken out when the power is switched off.
7. The connecting cable between the controlling device and the spray gun must be set up so that it cannot be damaged during operation. Safety precautions specified by local legislation must be observed.

8. Only original ITW-Gema spare parts should be used, because the explosion protection will also be preserved that way. Damage caused by other parts is not covered by guarantee.

9. If ITW-Gema powder spraying equipment is used in conjunction with machinery from other manufacturers then their safety regulations must also be taken into account.

10. Before starting work familiarize yourself with all installations and operating elements, as well as with their functions! Familiarization during operation is too late!

11. Caution must be exercised when working with a powder/air mixture! A powder/air mixture in the right concentration is flammable! No smoking during powder coating!

12. As a general rule for all powder spraying installations, persons with pacemakers should never enter high voltage areas or areas with electromagnetic fields. Persons with pacemakers should not enter areas with powder spraying installations!

**WARNING!**

We emphasize that the customer himself is responsible for the safe operation of equipment. ITW-Gema is in no way responsible for any resulting damages!

**Safety conscious working**

Each person responsible for the assembly, start-up, operation, service and repair of powder spraying equipment must have read and understood the operating instructions and the “Safety regulations”-chapter. The operator must ensure that the user has had the appropriate training for powder spraying equipment and is aware of the possible sources of danger.

The control devices for the spray guns must only be set up and used in zone 22. Only the spray gun should be used in zone 21.

The powder spraying equipment should only be used by trained and authorized personnel. This applies to modifications to the electrical equipment, which should only be carried out by a specialist.

The shut-down procedures given in the operating instructions on all work concerning assembly, start-up, setting up, operation, modification of operating conditions and operating methods, maintenance, inspection and repair are to be observed as necessary.

The powder spray equipment can be turned off by using the main switch or failing that, the emergency shut-down. Individual components can be turned off during operation by using the appropriate switches.

**Individual safety regulations for the operating firm and/or operating personnel**

1. Any operating method which will negatively influence the technical safety of the powder spraying equipment is to be avoided.
2. The operator should see to it that no non-authorized personnel work on the powder spraying equipment (e.g. this also includes using the equipment for non-conform work).

3. The operator is under obligation to check the powder spraying equipment at least once every shift for signs of external damage, defects or changes (including the operating characteristics) which could influence safety and to report them immediately.

4. The operating enterprise has to ensure that GEMA electrostatic spraying equipment is only operated in perfect condition.

5. As far as is necessary, the operating firm must ensure that the operating personnel wear protective clothing (e.g. facemasks).

6. The operating firm must guarantee cleanliness and an overview of the workplace with suitable instructions and checks in and around the powder spraying equipment.

7. No safety devices should be dismantled or put out of operation. If the dismantling of a safety device for set-up, repair or servicing is necessary, reassembly of the safety devices must take place immediately after the maintenance or repair work is finished. The powder spraying device must be turned off while servicing is carried out. The operator must train and commit the responsible personnel to this.

8. Activities such as checking powder fluidization or checking the high-voltage spray gun etc. must be carried out with the powder spraying equipment switched on.

Notes on special types of hazard

**Power**

It is necessary to refer once more to the danger of life from high-voltage current if the shut-down procedures are not observed. High voltage equipment must not be opened - the plug must first be taken out - otherwise there is danger of electric shock.

**Powder**

Powder/air mixtures can be ignited by sparks. There must be sufficient ventilation in the powder coating booth. Powder lying on the floor around the powder spraying device is a potentially dangerous source of slipping.

**Static charges**

Static charges can have the following consequences: Charges to people, electric shocks, sparking. Charging of objects must be avoided – see "Earthing".

**Grounding**

All electricity conducting parts and machinery found in the workplace (according to DIN VDE 0745, part 102) must be earthed 1.5 meters either side and 2.5 meters around each booth opening. The earthing resistance must amount to \( \leq 1 \text{ MΩ} \). The resistance must be tested on a regular basis. The condition of the machinery surroundings as well as the suspension gear must ensure that the machinery remains earthed. If the earthing of the machinery includes the suspension arrangements, these must constantly be kept clean in order to guarantee the necessary
conductivity. The appropriate measuring devices must be kept ready in the workplace in order to check the earthing.

**Compressed air**

When there are longer pauses or stand-still times between working, the powder spraying equipment should be drained of compressed air. There is a danger of injury when pneumatic hoses are damaged and from the uncontrolled release and improper use of compressed air.

**Crushing and cutting**

During operation, moving parts may automatically start to move in the operating area. It must be ensured that only instructed and trained personnel go near these parts. The operator should ensure that barriers comply with the local security regulations.

**Access under exceptional circumstances**

The operating firm must ensure that local conditions are met when repairs are made to the electronic parts or when the equipment is restarted so that there are additional measures such as barriers to prevent unauthorized access.

**Prohibition of unauthorized conversions and modifications to machines**

All unauthorized conversions and modifications to electrostatic spraying equipment are forbidden for safety reasons.

The powder spraying equipment should not be used if damaged, the faulty part must be immediately replaced or repaired. Only original ITW-Gema replacement parts should be used. Damage caused by other parts is not covered by guarantee.

Repairs must only be carried out by specialists or in ITW-Gema workshops. Unauthorized conversions and modifications may lead to injury or damage to machinery. The ITW Gema AG guarantee would no longer be valid.

**Safety requirements for electrostatic powder coating**

1. This equipment is dangerous if the instructions in this operating manual are not followed.
2. All electrostatic conductive parts, in particular the machinery within 5 meters of the coating equipment, must be earthed.
3. The floor in the coating area must be electrically conductive (normal concrete is generally conductive).
4. The operating personnel must wear electricity conducting footwear (e.g. leather soles).
5. The operating personnel should hold the gun with bare hands. If gloves are worn, they must be electrically conductive.
6. The supplied earthing cable (green/ yellow) must be connected to the earthing screw of the electrostatic powder spraying hand appliance. The grounding cable must have a good metal to metal connection with the coating booth, recovery unit, and the workpiece conveyor system, especially with the workpiece suspension.
7. The electricity and powder supply to the hand guns must be set up so that they are fully protected against heat and chemical damage.

8. The powder coating equipment should only be switched on after the booth is in operation. If the booth cuts out then the powder coating device must be switched off.

9. The earthing of all electricity conducting devices (e.g. hooks, conveyor chains) must be checked on a weekly basis. The earthing resistance must amount to $\leq 1 \Omega$.

10. The control device must be switched off if the hand gun is cleaned or the nozzle is changed.

11. When working with cleaning agents there may be a risk of hazardous fumes. The manufacturers instructions must be observed when using such cleaning agents.

12. The manufacturers instructions and the applicable environmental requirements must be observed when disposing of powder lacquer and cleaning agents.

13. If any part of the spray gun is damaged (broken parts, tears) or missing then it should not be used.

14. For your own safety, only use accessories and attachments listed in the operating instructions. The use of other parts can lead to risk of injury. Only original ITW-Gema replacement parts should be used.

15. Repairs must only be carried out by specialists and under no circumstances should they be carried out in the operating area. The former protection must not be reduced.

16. Conditions leading to dangerous levels of dust concentration in the powder spraying booths or in the powder spraying areas must be avoided. There must be sufficient technical ventilation available, to prevent a dust concentration of more than 50% of the lower explosion limit (UEG) (UEG = max. permissible powder/air concentration). If the UEG is not known then a value of 20 g/m³ should be used.

A summary of the rules and regulations

The following is a list of relevant rules and regulations which are to be observed:

**Guidelines and regulations, German professional association**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BGV A1</td>
<td>General Regulations</td>
</tr>
<tr>
<td>BGV A2</td>
<td>Electrical equipment and material.</td>
</tr>
<tr>
<td>BGI 764</td>
<td>Electrostatic coating</td>
</tr>
<tr>
<td>BGR 132</td>
<td>Guidelines for the avoidance of the dangers of ignition due to electrostatic charging (Guideline “Static Electricity”)</td>
</tr>
<tr>
<td>VDMA 24371</td>
<td>Guidelines for electrostatic coating with synthetic powder ¹</td>
</tr>
<tr>
<td></td>
<td>- Part 1 General requirements</td>
</tr>
<tr>
<td></td>
<td>- Part 2 Examples of use</td>
</tr>
</tbody>
</table>
### Leaflets

| ZH 1/310 | Leaflet for the use of tools in locations where there is danger of explosion 1) |

### EN European standards

| RL94/9/EG | The approximation of the laws of the Member States relating to apparatus and safety systems for their intended use in potentially explosive atmospheres 1) |
| EN 292-1 | Machine safety 2) |
| EN 292-2 | |
| EN 50 014 to EN 50 020, identical: DIN VDE 0170/0171 | Electrical equipment for locations where there is danger of explosion 3) |
| EN 50,050 | Electrical apparatus for potentially explosive atmospheres - Electrostatic hand-held spraying equipment 2) |
| EN 50 053 Teil 2 | Requirements for the selection, installation and use of electrostatic spraying equipment for flammable materials - Hand-held electrostatic powder spray guns 2) |
| EN 50 177 | Stationary electrostatic spraying equipment for flammable coating powder 3) |
| PR EN 12981 | Coating plants - Spray booths for application of organic powder coating material - Safety requirements |
| EN 60529, identical: DIN 40050 | IP-Type protection: contact, foreign bodies and water protection for electrical equipment 2) |
| EN 60 204, identical: DIN VDE 0113 | VDE regulations for the setting up of high-voltage electrical machine tools and processing machines with nominal voltages up to 1000 V 3) |
VDE (Association of German Engineers) Regulations

| DIN VDE 0100 | Regulations for setting-up high voltage equipment with nominal voltages up to 1000V 4) |
| DIN VDE 0105 | VDE regulations for the operation of high voltage equipment 4) |
| Part 1      | General regulations |
| Part 4      | Supplementary definitions for stationary electrical spraying equipment |
| DIN VDE 0147 | Setting up stationary electrostatic spraying equipment 4) |
| Part 1      | |
| DIN VDE 0165 | Setting up electrical equipment in locations in areas with danger of explosion 4) |

*Sources:

1) Carl Heymanns Verlag KG, Luxemburger Strasse 449, 5000 Köln 41, or from the appropriate employers association

2) Beuth Verlag GmbH, Burgrafenstrasse 4, 1000 Berlin 30

3) General secretariat, Rue Bréderode 2, B-1000 Brüssel, or the appropriate national committee

4) VDE Verlag GmbH, Bismarckstrasse 33, 1000 Berlin 12

Special security measures

- The installation work, to be done by the customer, must be carried out according to local regulations
- It must be observed, that all components are grounded according to the local regulations, before start-up
About this manual

General information

These operating manual contains all important information which you require for the working with the OptiMaster CM02 Powder Master Control. 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 controls, powder guns etc. - you will find in the corresponding enclosed documentations.
Description of function

Field of application

The OptiMaster CM02 Powder Master Control is intended exclusively for the interlocking functions when controlling electrostatic powder coating plants. 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.

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

OptiMaster CM02 Powder Master Control

Design and functions

1. Display lamp "Plant in Operation" (green)
2. Display lamp "Powder hopper empty" (red)
3. Display lamp "Powder hopper full" (green)
4. Button/Display lamp "Alarm OFF" (green)
5. Key switch/Main switch

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

The OptiMaster-2 controls all the interlocking functions: Control and non-potential contact permit individual adaptation to all plant specific requirements.
OptiMaster CM02 Powder Master Control configuration

1. Conveyor
2. Workpiece/Object
3. Control
4. Booth
5. Fire protection
6. Key switch
7. Level sensor
8. Injector
9. Airmover
10. Powder container
11. Rinsing air
12. Fluidizing air

Interlocking signals from the OptiMaster-2

- Conveyor
- Powder recovery plant
- Fire protection
- Grounding control

All OptiMatic components, including the OptiMove, can be switched on or off with the key switch of the OptiMaster CM02 control unit (Operating main switch).

It is not permitted to switch off the power with the OptiMaster CM02 key switch for maintenance purposes. The power must be switched off with the Mains switch on the OptiMatic control cabinet (The red handle on a yellow base, which should normally be locked with a small padlock).
Control signals from the OptiMaster-2

- Clears the OptiTronic Powder gun control.
- Clears the main compressed air input.
- Clears the powder level monitoring.
- Clears the prefluidization / Fluidization.
- Clears the Airmover (Reserve connection possibility).
- Clears for rinsing at a conveyor stop
- Clears for rinsing at a gap in the workpieces on the conveyor.

Functions

- Release of OptiMove / EasyTronic control units for manual equipment (Switching on the power supply)
- Release Main solenoid valve
- Release OptiTronic control units for automatic equipment
- Guns rinsed through OptiPlus-C
- Fluidizing (OptiPlus-A controlled)
- ‘Powder hoper full’ display
- Request for fresh powder
- ‘Powder hopper empty’ display
- Horn control
- Axes controlled with OptiMove

Explanation of functions

The functions of the OptiMaster CM02 are described in more detail in the chapter "Definition of functions".
Technical Data

OptiMaster CM02 Powder Master Control

Electrical Data

<table>
<thead>
<tr>
<th>Description</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Selectable input voltage</td>
<td>100 V, 110 V, 120 V, 200 V, 220 V, 230 V, 240 V</td>
</tr>
<tr>
<td>Tolerance</td>
<td>+10% / -10%</td>
</tr>
<tr>
<td>Frequency</td>
<td>50/60 Hz</td>
</tr>
<tr>
<td>Rated output of the solenoid valve</td>
<td>24 VAC</td>
</tr>
<tr>
<td>Fuse F1</td>
<td>1,25 AT</td>
</tr>
<tr>
<td>Type of protection</td>
<td>IP 54</td>
</tr>
<tr>
<td>Temperature range</td>
<td>0°C to +40°C (+32 °F to +104 °F)</td>
</tr>
</tbody>
</table>

Voltage selection is made inside the electrical unit by resoldering the tag of the transformer.

The equipment is delivered for operation at the voltage required from the factory.

Dimensions

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>435 mm</td>
</tr>
<tr>
<td>Depth</td>
<td>300 mm</td>
</tr>
<tr>
<td>Height</td>
<td>96 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>9.5 kg</td>
</tr>
</tbody>
</table>

Number of OptiTronic powder gun control units which can be connected

With a voltage setting other than 230 V the number of OptiTronic units which can be connected is reduced as follows:

for 200 V: Maximum 31 OptiTronic control units
for 120 V: Maximum 18 OptiTronic control units
for 110 V: Maximum 16 OptiTronic control units
for 100 V: Maximum 15 OptiTronic control units
Start-up

OptiMaster CM02 Powder Master Control

1 Fuse holders
2 Cable lead-through

The cable inputs/outputs are found on the rear panel of the OptiMaster-2. The lead-through fittings are prepared for cables of ø 5-8 mm. The unused lead-through fittings are to be closed with blind grommets.

Also fitted on the rear panel (at the left-hand side) are three fuse holders, F1, F2, and F3 (1), one above the other. The fuse holder -F1 is the Mains fuse and is rated at 1.25 AT. The fuse holder -F2 is by-passed. In countries where primary fuses are required the bridge must be removed (See wiring diagram).

The fuse holder -F3 is for the low voltage supply (24 V) for operating the OptiMaster-2 unit and is rated at 4 AT.

Setting the correct line voltage

If the local line voltage is not the preset one, the voltage setting of the transformer must be changed by a qualified specialist.

If the incoming voltage is ±10% than the voltage selected damage may be done to internal components.
If the incoming voltage is 10% or more below the selected setting then the unit may operate erratically or not at all.

1. Pull out the control module from the control cabinet as far as it will go.
2. Open the quick-release screws holding the cover plate of the control unit, and carefully remove the cover plate.

3. Unsolder the connecting wire from the 230 V terminal post on the transformer and re-solder onto the desired voltage terminal post.

![Transformer diagram]

OptiMaster CM02 Powder Master Control - Transformer

The connections on the transformer are numbered as follows:

<table>
<thead>
<tr>
<th>Number</th>
<th>Voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>0 V</td>
</tr>
<tr>
<td>2</td>
<td>100 V</td>
</tr>
<tr>
<td>3</td>
<td>110 V</td>
</tr>
<tr>
<td>4</td>
<td>120 V</td>
</tr>
<tr>
<td>5</td>
<td>200 V</td>
</tr>
<tr>
<td>6</td>
<td>220 V</td>
</tr>
<tr>
<td>7</td>
<td>230 V</td>
</tr>
<tr>
<td>8</td>
<td>240 V</td>
</tr>
<tr>
<td>9</td>
<td>No connection</td>
</tr>
</tbody>
</table>

Do not unsolder the other wire (0) on the transformer.

4. Replace the cover plate and close the quick-release screws (take care to the sealing strip).

5. Push the module back into the housing until it locks back into place.

### Parametry

Various time sequences can be set and adapted to all plant specific requirements with the aid of a simple menu control. It is recommended to read the following section carefully, before a menu option is called up.

**The standard display looks as follows:**

```
>Stop
Set Param
Set Clock
Prg Name
```

- do not edit
- set parameter
- do not edit
- do not edit
Display when inputting parameters:

<table>
<thead>
<tr>
<th>Block</th>
<th>TH</th>
<th>TL</th>
<th>Ta</th>
</tr>
</thead>
<tbody>
<tr>
<td>B2</td>
<td>20:00s</td>
<td>00:00s</td>
<td>00:00s</td>
</tr>
</tbody>
</table>

 Calling up and selecting a menu option

Select menu
Set Param by pressing ↓.

Important note: Do not select any other menu, since the control cannot use this program!

Press OK. The Block B1 appears.

The block B2 is entered by pressing ↑. Block B2 to B4 is selected by pressing ↑ or ↓.

Press OK. Move the cursor to the point at which you want to make the change.

Press OK. The values are applied, and the Block B2 is entered again.

The programming mode is exit by pressing ESC, and the Control shows the standard display.

**WARNING!**
In parameter assignment mode, the LOGO! continues execution of the circuit program!
### Menues

<table>
<thead>
<tr>
<th>Block no.</th>
<th>Designation</th>
<th>Default value</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>Prefluidization relay frequency</td>
<td>TH=0,5 sec. TL=0,5 sec.</td>
<td>This value should be changed by experienced plant manager only!</td>
</tr>
<tr>
<td>B2</td>
<td>Prefluidization time</td>
<td>TH=20 sec. TL=0 sec.</td>
<td></td>
</tr>
<tr>
<td>B9</td>
<td>Gap control</td>
<td>T=30 sec.</td>
<td></td>
</tr>
<tr>
<td>B14</td>
<td>Axis start delay</td>
<td>T=3 sec.</td>
<td></td>
</tr>
<tr>
<td>B19</td>
<td>Gun rinsing</td>
<td>TH=6 sec. TL=0 sec.</td>
<td></td>
</tr>
<tr>
<td>B23</td>
<td>debouncing the level sensor</td>
<td>T=10 sec.</td>
<td></td>
</tr>
<tr>
<td>B24</td>
<td>„Powder hopper empty” delay</td>
<td>T=3 min.</td>
<td></td>
</tr>
</tbody>
</table>

### Set parameters

<table>
<thead>
<tr>
<th>Block no.</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>B1</td>
<td>TH=0,5 sec. TL=0,5 sec.</td>
</tr>
<tr>
<td>B2</td>
<td>TH= TL=</td>
</tr>
<tr>
<td>B9</td>
<td>T=</td>
</tr>
<tr>
<td>B14</td>
<td>T=</td>
</tr>
<tr>
<td>B19</td>
<td>TH= TL=</td>
</tr>
<tr>
<td>B23</td>
<td>T=</td>
</tr>
<tr>
<td>B24</td>
<td>T=</td>
</tr>
</tbody>
</table>

### Definition of functions

**Prefluidization/Continuous fluidization (Parameter B1 / B2)**

When the Main solenoid valve is switched on, prefluidizing is started. The prefluidizing valve switches alternately on for 0.5 second and off for 0.5 second. The fluidization of the powder in the powder hopper depends on the characteristic of the powder, the humidity, and the ambient air temperature. For this reason the fluidization system comprises the prefluidization and the continuous fluidization.

When the OptiMaster-2 Powder Master Control is switched on the prefluidization is automatically switched on after the interlocking requirements (Booth, Powder recovery - "ON", etc) have been fulfilled.
Prefluidization/Continuous fluidization (Parameter B1 / B2)

Rinsing at gaps between workpieces

The time period of the gap between two objects to be coated is recognized with the help of an object recognition (light array). When the time interval of the gap exceeds the set control time the powder hoses are rinsed. The spraying process is interrupted, until an object is recorded by the object recognition. The time delay of the gap is set with the Parameter B9. For this purpose the Light array is required as an additional component.

Powder Level control (B24)

After prefluidizing the Level control becomes active. When the level sensor is covered the LED 'Powder full' illuminates. If the upper sensor is uncovered for more than 60 seconds the display goes out and the output 'Fresh powder required' is activated, and simultaneously the alarm horn rings. The Alarm horn is acknowledged with the button 'Horn off', the Horn switches off and the 'Horn off' illuminates. This process cannot be reversed. The powder sensor must be covered with powder, then the procedure can be restarted.

The control of the 'Powder hopper full' display is not interlocked with the 'Powder hopper empty' display.

Rinsing on Conveyor Stop (B19)

When the OptiMaster-2 detects a Conveyor Stop, the guns are rinsed with air (when an OptiPlus-C Hose Rinsing control and corresponding injectors with rinsing air connection are fitted) The rinsing time is set in parameter B19.

Light barriers in addition to the "Rinsing on Conveyor Stop"

This one-way system (transmitter and receiver are separate) is specially suitable for:

- detecting opaque, and reflecting objects.
- bad environmental conditions (dust, rain, contamination, etc).
- the accurate positioning, and detection of small objects.

Limitations:

- requires accurate setting.
- not suitable for detecting transparent objects.

The optical axes of the equipment facing each other must be aligned exactly (the transmitter and receiver must be fitted to stable structures).
Debouncing the level sensor (B23)

The powder level detecting range releases many impulses caused by fluidized powder. In order to not analyze all of the switching impulses, a debouncing time of several seconds must be set. This time is dependent on the type of powder, and powder consumption, and should not be set too short.

Release of OptiTronic control units for Automatic guns, and OptiMove

When the Mains switch is switched on the power supply for the OptiTronic control units for Manual guns and OptiMove are switched on.

If the Start light barrier is activated then the signals "OptiTronic Release" and "OptiMove Start" are set simultaneously. When the Start light barrier is free again, a set time (0 -15 min) is started. After the elapse of this time the guns, and the axes are switched off, and the guns are rinsed for 5 seconds.

If a chain conveyor stop is released during coating the guns are switched off and the axes travel to the lower reversing point. When the axes have stopped in the lower reversing point the guns are rinsed. As soon as the chain conveyor runs again, the guns are immediately switched on. After a 3 second delay the axes are switched on. When the chain conveyor stops, the set time is stopped so that when the conveyor is restarted, the time on the Gap control has not already expired.

Main solenoid valve

When the three interlocking signals “Booth ready”, “Fire protection -O.K”, and “Grounding control - O.K” are on, the Main solenoid valve is switched on.

Test operation

If the OptiMaster-2 is switched to Test operation all functions are retained. The guns, however, are controlled independent of the Start light barrier, and the 'Conveyor running' signal.
Fitting cables

Terminal clamp

To remove a cable

If it is necessary to change or reconnect a cable to the central terminal block in the OptiMaster-2 unit the following procedures should be followed:

1. Make a note of the contact numbers (at each end of the cable) to be removed to avoid connecting a cable to the wrong contact. Contact is only made with the contact on the opposite side of the terminal element.

2. Place a small screwdriver with a strong, tapered blade (maximum Ø 3 mm) into the square hole (1) in the terminal element.

3. Push the screwdriver blade down until the contact spring (3) rests on the stop.

4. Carefully remove the cable and then pull out the screwdriver.
Fitting cables to the terminal clamps

1. Make sure that the cable has 4-6 mm of the insulating material stripped from the end to be connected. Twist the wires neatly together if they are frayed out.

2. Before continuing, check that the cable will be connected to the correct contact. Contact is only made with the contact on the opposite side of the terminal element.

3. Place a small screwdriver with a strong, tapered blade (maximum Ø 3 mm) into the square hole (1) in the terminal element.

4. Push the screwdriver blade down until the contact spring (3) rests on the stop.

5. Insert the cable into the round hole (2), making sure that the cable is seated in the hole of the contact spring. Carefully remove the screwdriver from the square hole. Check that the wire is securely clamped.

Only one cable should be fitted per hole.

The above-mentioned procedures are valid only for the central terminal contact block, the other contacts are conventional screw type clamps!
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 OptiMaster CM02 Powder Master Control, serial no. 1234 5678
- Order no. 203 386, 1 piece, Clamp - Ø 18/15 mm

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

All wear parts are marked with a #.

All dimensions of plastic hoses are given as external and internal diameters:

Example:

Ø 8/6 mm, 8 mm outside diameter (o/d) / 6 mm inside diameter (i/d)
<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Mounting plate - complete (items 30-39)</td>
<td>359 939</td>
</tr>
<tr>
<td>3</td>
<td>Cover plate</td>
<td>339 490</td>
</tr>
<tr>
<td>7</td>
<td>Button/Display PCB TP 1 complete</td>
<td>360 104</td>
</tr>
<tr>
<td>12</td>
<td>Lead-through - PG16 / D8-15</td>
<td>204 366</td>
</tr>
<tr>
<td>13</td>
<td>Fuse holder</td>
<td>200 131</td>
</tr>
<tr>
<td>14</td>
<td>Fuse - F01,25AT</td>
<td>201 618</td>
</tr>
<tr>
<td>15</td>
<td>Fuse - F04,00AT</td>
<td>200 182</td>
</tr>
<tr>
<td>16</td>
<td>Cable lead-through - PG16/2</td>
<td>204 374</td>
</tr>
<tr>
<td>17</td>
<td>Counter nut - PG16</td>
<td>204 412</td>
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<tr>
<td>18</td>
<td>Key switch 3 x positions</td>
<td>264 440</td>
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<tr>
<td>19</td>
<td>Fixing flange</td>
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<tr>
<td>20</td>
<td>Standard auxiliary switch 1NO</td>
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<tr>
<td>21</td>
<td>Standard auxiliary switch 1NC</td>
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<td>22</td>
<td>Screw - M4x12 mm</td>
<td>216 798</td>
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<tr>
<td>24</td>
<td>Washer - Ø 3.7/8.0 x 0.5 mm</td>
<td>248 096</td>
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<tr>
<td>26</td>
<td>Spacer sleeve - Ø 4.3/8.0 x 7.5 mm, plastic</td>
<td>238 120</td>
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<tr>
<td>27</td>
<td>Adhesive sealing strip - 9 x 2 mm</td>
<td>100 250*</td>
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<td>30</td>
<td>Transformer - 100 VAP, 100-240 S24</td>
<td>238 899</td>
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<tr>
<td>31</td>
<td>Contact plate - 2,5 mm², P</td>
<td>251 062</td>
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<tr>
<td>32</td>
<td>Contact plate - 2,5 mm², N</td>
<td>251 070</td>
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<td>33</td>
<td>Contact plate - 2,5 mm², PE</td>
<td>251 089</td>
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<td>34</td>
<td>End plate 3-contact</td>
<td>251 143</td>
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<td>35</td>
<td>Contact bridge - 1 to 2</td>
<td>238 392</td>
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<tr>
<td>36</td>
<td>Contact bridge - 1 to 3</td>
<td>241 679</td>
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<td>37</td>
<td>Bridging piece - 1 to 4</td>
<td>250 481</td>
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<td>38</td>
<td>Terminal plate - 10 mm</td>
<td>238 368</td>
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<tr>
<td>39</td>
<td>Wire bridge - 60 mm</td>
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<td>42</td>
<td>Logo Power - 24VDC/1.3a</td>
<td>263 915</td>
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<td>43</td>
<td>Logo - 24RC Siemens-Relais 8i/4o</td>
<td>266 949</td>
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<tr>
<td>44</td>
<td>Logo - 24R Siemens-Relais 4i/4o</td>
<td>266 957</td>
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<tr>
<td>52</td>
<td>Light barrier pair (Transmitter, and Receiver)</td>
<td>252 166</td>
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<tr>
<td>53</td>
<td>Cable with connector for Item 52 (L = 5 m)</td>
<td>252 158</td>
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* Please indicate length