PMC 1  Powder Master Control
# Table of contents

## Safety rules

1. Description of the PMC 1 Powder Master Control ........................................... 1  
   PMC 1 Interlocking control for the APS series ........................................... 2  
   Control signals for PMC 1 ................................................................. 2  
   1.1 Options ................................................................................. 2  
      Rinsing on Conveyor Stop ......................................................... 2  
      Rinsing gaps ....................................................................... 2  
      Light barriers ..................................................................... 3  

2. Technical data of the PMC 1 Powder Master Control ......................................... 3  
   2.1 The number of PGC 1 Powder Gun Control units  
      which can be connected ......................................................... 3  

3. Setting the correct line voltage ................................................................. 4  

4. Starting up the PMC 1 Powder Master Control unit ..................................... 5  

5. Relays ....................................................................................... 6  

6. Fitting the cables to the terminal clamps .................................................... 8  

Spare parts list .................................................................................. 11  
   Ordering spare parts .................................................................... 11  
   PMC 1 Powder Master Control ....................................................... 12
PMC 1 Powder Master Control

1. Description of the PMC 1 Powder Master Control

PMC Interlocking control for the APS series

In order to control the operation of electrostatic powder coating plant it is absolutely necessary to have interlocking functions. The PMC 1 controls all the interlocking functions: Control and non-potential contact permit individual adaptation to all plant specific requirements.

- The PMC 1 is specially suitable for controlling the prefluidization, and fluidization of the powder hopper (See 1.1 Options).
- The PMC 1 controls up to 32 PGC 1 Powder gun units, divided into four equal groups of eight (See also 2.1 The number of PMC 1 Powder Master Control units which can be connected)
Interlocking signals from the PMC 1

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

All APS components, including the PRC, can be switched on or off with the key switch of the PMC 1 control unit (Operating main switch).

_It is not permitted to switch off the power with the PMC 1 key switch for maintenance purposes. The power must be switched off with the Mains switch on the APS control cabinet (The red handle on a yellow base, which should normally be locked with a small padlock)._ 

Control signals of the PMC 1

- Clears the PGC 1 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 (Option).
- Clears for rinsing at a gap in the workpieces on the conveyor (Option).

1.1 Options

Rinsing on Conveyor Stop (Option)

When the PMC 1 detects a Conveyor Stop, the guns are rinsed with air (when an HRC Hose Rinising control and a PI 2 injector are fitted).

The duration of rinsing is set with Relay K4.

Additional equipment requirement: Relay K4

Rinsing at gaps between workpieces (Option)

The time interval of the gaps between two workpieces being coated are detected using an object recognition unit (Light barrier).

When the time interval of the gap exceeds the set control time the powder hoses are rinsed and the powder spray command is locked until the next workpiece is detected.

The time interval of the gap is set with Relay K2.
The rinsing time is set with Relay K4.

Additional equipment required: Relay K2.

Relay K4.
Light barrier (See next page).
Light barriers (In addition to the rinsing on Conveyor Stop option)

One-way system:
Transmitter and receiver are separate.

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.

2. Technical data of the PMC 1 Powder Master Control:

Electrical data:
- Selectable voltage: 100 V, 110 V, 120 V, 200 V, 220 V, 230 V or 240 V
- Tolerance: ±10 %

Voltage selection is made inside of the electrical unit by resoldering the tag of the transformer. The equipment is delivered for operation at the voltage required from the factory.

- Frequency: 50 / 60 Hz
- Rated output of the solenoid valve: 24VAC
- Fuse F1: 1,25 AT
- Type of protection: IP 54
- Temperature range: +10 °C to +40 °C

Dimensions
- Width: 435 mm
- Depth: 300 mm
- Height: 96 mm
- Weight: 9.5 kg

2.1 Number of PGC 1 Powder Gun Control units which can be connected

With a voltage setting other than 220 / 240 V the number of PGC 1 units which can be connected is reduced as follows:

- for 200 V: Maximum 31 PGC 1 control units
- for 120 V: Maximum 18 PGC 1 control units
- for 110 V: Maximum 16 PGC 1 control units
- for 100 V: Maximum 15 PGC 1 control units
3. Setting the correct line voltage

The factory always sets the voltage to 220 V (See Fig. 3). If the local line voltage is not 220 V, the voltage setting of the transformer must be changed by a qualified specialist.

**ATTENTION:** 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 eight quick-release screws holding the cover plate of the control unit. Carefully remove the cover plate.
3. Unsolder the connecting wire from the 220 V terminal post on the transformer and re-solder onto the desired voltage terminal post.
   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</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 eight quick-release screws.
5. Push the module back into the housing until it locks back into place.
4. Starting up the PMC 1 Powder Master Control unit

The cable inputs/outputs are found on the rear panel of the PMC 1. The lead-through fittings are prepared for cables of ø 5-8 mm. Some fittings have a single hole (2) and the remaining fittings have a double hole (3). **Cable fittings which are not used must be sealed completely.** The number of fittings can vary according to customer requirements.

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 fuseholder - F1 is the Mains fuse and is rated at 1.25 AT (for 200 - 240 V).
The fuseholder - F2 is by-passed.
In countries where primary fuses are required the bridge must be removed (See wiring diagram).

The fuseholder - F3 is for the low voltage supply (24 V) for operating the PMC 1 unit and is rated at 4 AT.
5. Relays (see also corresponding Wiring diagram)

It is not permitted to switch off the power with the PMC 1 key switch for maintenance purposes. The power must be switched off with the Mains switch on the APS control cabinet (The red handle on a yellow base, which should normally be locked with a small padlock).

Relay K2: Gap rinsing (Option)

The duration of a gap between two workpieces being coated is determined by an object recognition unit (Light barrier). When the time delay between two workpieces set on the relay K2 is exceeded the spray operation is stopped and the powder hoses are rinsed with air (Spray time setting - Relay K4). The PGC 1 Powder Gun Control remains switched off until a workpiece is detected by the object recognition unit.

- The time delay of the gap is set with Relay K2.
- The spray time is set with Relay K4.
**Relay K3**: This relay is used to control the prefluidizing of the powder hopper (Fig. 5)

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 PMC 1 Powder Master Control is switched on the prefluidization is automatically switched on after the interlocking requirements (Booth, Powder recovery - "ON", etc) have been fulfilled.

In order to set a relay the three setting knobs t1, t2, and t3 should be set to the value 2 on the scale 1-10. These values can be corrected and adjusted to the fluidization characteristics of the powder later.

- **Potentiometer t1** - sets the air blast time between 0.15 and 0.7 seconds. (Compressed air blows into the fluidizing bed)
- **Potentiometer t2** - sets the pause duration (no air) between 0.2 and 0.8 seconds.
- **Potentiometer t3** - sets the total prefluidization time between 10 and 420 seconds.

**Relay K4**: (Option) This relay is used to set the powder hose rinsing duration. Depending on the length of the hose the rinsing time can be set between 3-30 seconds.
6. Fitting cables to the terminal clamps

If it is necessary to change or reconnect a cable to the central terminal block in the PMC 1 unit the following procedures should be followed:

To remove a cable:
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 (See Fig. 7).
3. Push the screwdriver blade down until the contact spring (3) rests on the stop (See Fig. 8).
4. Carefully remove the cable and then pull out the screwdriver (See Fig. 9).
To replace a cable:

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 (See Fig. 10).
4. Push the blade down until the contact spring (3) rests on the stop (see Fig. 11).
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 (See Fig. 12). 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:

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

Example:

1. Type PMC 1, Serial no: 8001 1496

2. Order no: 201 618, 5 pieces, fuse - 1.25 AT

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

The spare part number of yard/metre ware always begins with 1... .

All wear parts are marked with a #.

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

    e.g. ø 8 / 6 mm = 8 mm outside diameter (o/d) / 6 mm inside diameter (l/d).
# PMC 1 Powder Master Control

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Pulse relay</td>
<td>305 278</td>
</tr>
<tr>
<td>2</td>
<td>Timer relay - 24V AC</td>
<td>238 902</td>
</tr>
<tr>
<td>3</td>
<td>Timer relay</td>
<td>238 457</td>
</tr>
<tr>
<td></td>
<td>Relay socket - 11 pole</td>
<td>227 552</td>
</tr>
<tr>
<td>5</td>
<td>Bulbholder block</td>
<td>203 637</td>
</tr>
<tr>
<td>6</td>
<td>Pilot light cover (green)</td>
<td>203 564</td>
</tr>
<tr>
<td>6.1</td>
<td>Bulb - 24V/2W</td>
<td>201 278#</td>
</tr>
<tr>
<td>7</td>
<td>Key switch block</td>
<td>201 294</td>
</tr>
<tr>
<td>8</td>
<td>Key switch</td>
<td>203 521</td>
</tr>
<tr>
<td>9</td>
<td>Contact block</td>
<td>201 243</td>
</tr>
<tr>
<td>11</td>
<td>Screw plug</td>
<td>204 439</td>
</tr>
<tr>
<td>12</td>
<td>Lock nut</td>
<td>204 412</td>
</tr>
<tr>
<td>13</td>
<td>Grommet (1 hole)</td>
<td>204 366</td>
</tr>
<tr>
<td>15</td>
<td>Terminal plate</td>
<td>238 368</td>
</tr>
<tr>
<td>16</td>
<td>Resistor block</td>
<td>343 650</td>
</tr>
<tr>
<td>17</td>
<td>Grommet (2 holes)</td>
<td>204 374</td>
</tr>
<tr>
<td>18</td>
<td>Earthing terminal (green/yellow)</td>
<td>241 652</td>
</tr>
<tr>
<td>19</td>
<td>Transformer</td>
<td>238 899</td>
</tr>
<tr>
<td>20</td>
<td>Fuse holder</td>
<td>200 131</td>
</tr>
<tr>
<td>21</td>
<td>Fuse F1 - 1.25 AT</td>
<td>201 618#</td>
</tr>
<tr>
<td>22</td>
<td>Fuse F2 (not used)</td>
<td>200 182#</td>
</tr>
<tr>
<td>23</td>
<td>Fuse F3 - 4.0 A</td>
<td>241 806</td>
</tr>
<tr>
<td>24</td>
<td>Wire bridge</td>
<td>241 806</td>
</tr>
<tr>
<td>25</td>
<td>Contact bridge (single)</td>
<td>238 392</td>
</tr>
<tr>
<td>26</td>
<td>Contact bridge (double)</td>
<td>241 679</td>
</tr>
<tr>
<td>27</td>
<td>End plate</td>
<td>241 660</td>
</tr>
<tr>
<td>28</td>
<td>End plate</td>
<td>242 179</td>
</tr>
<tr>
<td>29</td>
<td>Contact plate</td>
<td>238 929</td>
</tr>
<tr>
<td>30</td>
<td>Contact plate (grey)</td>
<td>241 636</td>
</tr>
<tr>
<td>31</td>
<td>Cover plate</td>
<td>339 490</td>
</tr>
<tr>
<td>32</td>
<td>Quick-release screw</td>
<td>210 625</td>
</tr>
<tr>
<td>33</td>
<td>Sealing strip - 9 x 6 mm</td>
<td>100 269*</td>
</tr>
</tbody>
</table>

* Indicate length required
# Wear parts
Figure 13