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Safety Notes

1. All moving axes must be fenced off by the customer, before Start Up, and during operation (see local regulations).

2. The UA 01 Axis may only be switched on, and operated after these Operating Instructions have been carefully read. Incorrect operation of the UA 01 Axis, and its control unit can lead to damage to the axis and/or other parts.

3. The plug connections between the UA 01 Axis and the control unit may only be connected when the control unit is switched off.

4. The connection cable between the UA 01 Axis and the control unit must be laid out so that the axis cannot be damaged during operation movements. The movement sequence of the Z, and X / Y axes must also be taken into account.

5. The travel range must be adjusted to the rack fitted. If the travel range is set incorrectly, this can lead to damage to the UA 01 Axis.

6. When repairing the UA 01 Axis, the control unit, and the power unit must be disconnected from the Mains, according to local regulations.

7. Only original ITW Gema spare parts may be used. Damage caused by the use of foreign parts make any guarantee claims on ITW Gema invalid.

8. It must be ensured, that the UA 01 Axis, and the rack are grounded before Start Up.

9. Repairs may only be carried out by personnel who have received the corresponding training from ITW Gema.
Description of Function

The UA 01 Powder Gun Axis serves to move an automatic powder gun. The automatic powder guns, with the corresponding PRC 3 Control unit, can be positioned to the object corresponding to the coating requirements with the UA 01 Axis. The UA 01 Axis is designed for operation with horizontal movements. The stroke registration is made through an incremental pulse generator.

It must always be observed that the area of movement of the UA 01 Axis and its rack are fenced off, by the customer, according to local regulations.

When the UA 01 Powder Gun Axis is switched on, the rack, fitted with the automatic powder guns, travels to the Start position. This is normally defined as the guns standing in the Start position at the edge of the booth openings. The rack travels at a low speed to the Reference point, the switch plate at the end of the rack. From the Reference point the movement, and the travel range are regulated through the control unit.

Before the UA 01 Axis can be operated, the maximum travel distance must be set on the control unit (see Operating Instructions for the corresponding PRC Control unit).

Technical Data

<table>
<thead>
<tr>
<th>Maximum load</th>
<th>for max. 2 automatic powder guns fitted symmetrically</th>
</tr>
</thead>
<tbody>
<tr>
<td>Travel speed</td>
<td>0.05 - 0.6 m/sec</td>
</tr>
<tr>
<td>Acceleration</td>
<td>1.5 m/sec²</td>
</tr>
<tr>
<td>Drive</td>
<td>DC motor with Tachometer / Spur gear</td>
</tr>
<tr>
<td>Reference point</td>
<td>Proximity switch</td>
</tr>
<tr>
<td>Position detection</td>
<td>Incremental pulse generator</td>
</tr>
<tr>
<td>Type of protection</td>
<td>IP 54</td>
</tr>
<tr>
<td>Control unit</td>
<td>PRC 3</td>
</tr>
</tbody>
</table>
Setting values / Parameters

CAUTION

The setting and changing of the parameters may only be done by trained personnel. Incorrect settings can lead to damage to the control unit, the UA 01 Axis or the plant.

The following system parameters must be set on the control unit:

<table>
<thead>
<tr>
<th>SP1</th>
<th>Travel distance m</th>
<th>adapt to the existing rack (see Fig. 4)</th>
</tr>
</thead>
<tbody>
<tr>
<td>SP2</td>
<td>Position Reference point</td>
<td>0.050</td>
</tr>
<tr>
<td>SP3</td>
<td>Incremental pulse generator</td>
<td>1060</td>
</tr>
<tr>
<td>SP4</td>
<td>Max. speed m/sec</td>
<td>0.600</td>
</tr>
<tr>
<td>SP5</td>
<td>Minimum speed m/sec</td>
<td>0.050</td>
</tr>
<tr>
<td>SP6</td>
<td>Acceleration m/sec²</td>
<td>1.500</td>
</tr>
<tr>
<td>SP7</td>
<td>Circuit amplification</td>
<td>1000</td>
</tr>
<tr>
<td>SP8</td>
<td>Alarm input Off</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>On</td>
<td>1</td>
</tr>
<tr>
<td>SP9</td>
<td>Module address</td>
<td>1</td>
</tr>
</tbody>
</table>
Corresponding adjustments, compared to a vertical axis must also be undertaken in the power stage (see also “PRP 1 Operating Instructions”).

⚠️ NOTICE

Before beginning with the adjustments, the rack must be removed!
Preferably a voltmeter should be attached to the terminals of the Tachometer.

1. Input the command “Travel to Reference point” on the PRC 3 Axis control (For more information, see “PRC 3 Operating Instructions”)
2. Keep pressing the DISPLAY UP key until DISPLAY TYPE “9” appears.
3. Check if the “ANALOG” display shows the value 1.0.
4. Make the following adjustments:

<table>
<thead>
<tr>
<th>Designation</th>
<th>displayed value</th>
<th>DISPLAY TYPE</th>
<th>setting with trim potentiometer No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tachometer voltage at Travel to Reference point</td>
<td>1.2 V</td>
<td>8</td>
<td>5 (Tachometer)</td>
</tr>
<tr>
<td>Proportional amplification</td>
<td>200</td>
<td>1</td>
<td>1 (Proportional)</td>
</tr>
<tr>
<td>Integral part</td>
<td>480</td>
<td>2</td>
<td>2 (Integral)</td>
</tr>
<tr>
<td>Maximum current $I_{\text{max}}$</td>
<td>10.8 A</td>
<td>4</td>
<td>3 (Max. current)</td>
</tr>
<tr>
<td>Effective current $I_{\text{RMS}}$</td>
<td>3.6 A</td>
<td>5</td>
<td>4 (RMS current)</td>
</tr>
</tbody>
</table>

Figure 1
Assembly notes

During assembly work the connection cables must not be connected between the drive unit, and the control unit. All assembly work must be checked by trained personnel.

When assembling the UA 01 Axis the following points must to be observed:

- The drive housing must be fitted in the position intended for it on a support, respectively, on a reciprocator.
- It must also be ensured, that the drive is fitted so that the Reference point switch (built into the drive housing) is facing the booth.
- The UA 01 Axis must be fitted horizontally.
- The rack must be positioned slowly in the drive housing, so that the drive wheels or the gears are not knocked.
- The rubber profile supplied must be fitted on the rack as buffers.
- When fitting the rack it must be observed that the rack can move freely through the whole travel range.

Preparation for Start up

The connecting cable between the drive unit, and the control unit must only be plugged in during the start up. The start up must be done by trained personnel.

Before the Start up the following points must be checked:

1. Check the firm seating of all screw connections
2. Play-free, easy running of the rack
3. Free movement for the rack over the whole travel range
4. Check the cable, and hose positions, so that no damage can be caused over the whole travel range
5. Check also the cable, and hose positions that no damage can be caused in the other movement sequences.
6. Area of movement around the rack must be fenced off, according local regulations, so that nobody is endangered
7. Check the parameters in the control unit.
Maintenance work

Before maintenance work is carried out, it must be ensured that the axis movement cannot be switched on by a third party.

The UA 01 Axis is designed to be maintenance-free and correspondingly, requires little maintenance work. The following work must, however, be carried out periodically:

1. The rack must be cleaned of deposited powder, and checked for wear.
2. Blow off the rack, and check for wear.
3. Check for play on the rack and, if necessary, set with the two screws (40) on top of the housing, which are secured by a plate (14).
4. Check the cable, and hose connections for firm seating and wear.

Figure 2
Troubleshooting

During Troubleshooting, and the correction of faults it must be ensured that the axes movements cannot be switched on by a third party.

<table>
<thead>
<tr>
<th>Error</th>
<th>Causes</th>
<th>Eliminate error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axis does not travel to the Reference point</td>
<td>• Rack clamps, running stiff • Reference plate on the rack missing • Reference point switch: Switching distance too great</td>
<td>– Fit Reference plate – Reset</td>
</tr>
<tr>
<td>Axis travels to the zero point on the stop</td>
<td>• Parameter SP2 “Position Reference point “ set incorrectly</td>
<td>– Adjust parameter</td>
</tr>
<tr>
<td>Axis travels with max. travel distance on the stop</td>
<td>• Parameter SP1 “Travel distance” set incorrectly</td>
<td>– Adjust parameter</td>
</tr>
<tr>
<td>Rack has vertical play</td>
<td>• Roller distance too great</td>
<td>– The roller spacing can be adjusted, with the hexagonal screws, when the safety plate on the top of the drive housing is removed.</td>
</tr>
<tr>
<td>Rack has side play</td>
<td>• Side guides worn</td>
<td>– Replace the side guides</td>
</tr>
<tr>
<td>Error “E21” or “E24” on the control unit</td>
<td>• No incremental pulse generator signals present</td>
<td>– Check the seating of the grubscrew in the gear axis. – Check the seating of the split collar of the incremental pulse generator – Check the connection cable</td>
</tr>
</tbody>
</table>
Connection assignment for Cable connection:

<table>
<thead>
<tr>
<th>Function</th>
<th>Contact</th>
<th>Braiding colour</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor</td>
<td>1</td>
<td>red</td>
</tr>
<tr>
<td>Motor</td>
<td>2</td>
<td>blue</td>
</tr>
<tr>
<td>Tacho -</td>
<td>3</td>
<td>white</td>
</tr>
<tr>
<td>Bridge to 12-13</td>
<td>4</td>
<td>orange</td>
</tr>
<tr>
<td>empty</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Incremental pulse generator</td>
<td>6</td>
<td>pink</td>
</tr>
<tr>
<td>Reference point switch</td>
<td>7</td>
<td>black</td>
</tr>
<tr>
<td>Reference point switch</td>
<td>8</td>
<td>blue</td>
</tr>
<tr>
<td>Incremental pulse generator</td>
<td>8</td>
<td>white</td>
</tr>
<tr>
<td>empty</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>empty</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Tacho +</td>
<td>11</td>
<td>brown</td>
</tr>
<tr>
<td>Bridge to 13-4</td>
<td>12</td>
<td>orange</td>
</tr>
<tr>
<td>Bridge to 12-4</td>
<td>13</td>
<td>orange</td>
</tr>
<tr>
<td>Incremental pulse generator</td>
<td>14</td>
<td>green</td>
</tr>
<tr>
<td>Incremental pulse generator</td>
<td>15</td>
<td>yellow</td>
</tr>
<tr>
<td>Reference point switch</td>
<td>16</td>
<td>brown</td>
</tr>
<tr>
<td>Incremental pulse generator</td>
<td>16</td>
<td>brown</td>
</tr>
<tr>
<td>Tacho</td>
<td></td>
<td>ground</td>
</tr>
<tr>
<td>Incremental pulse generator</td>
<td></td>
<td>ground</td>
</tr>
</tbody>
</table>

Figure 3

Remove the bridges when using the end switch
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:** U Axis    **Serial No.:** XXXX XXXX

2. **Order No.:** 204 412, 1 piece, Lock nut - PG16

When ordering cable and hose material the length required must also be given. The spare part number for this “yard/metre ware” is always marked with an * (in the spare parts list).

The spare part number for this “yard/metre ware” always begins with 1.. ....

All wear parts are marked with a # (in the spare parts list).
## UA 01 Axis complete

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Drive unit - complete</td>
<td>see page 12</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Square tube</td>
<td>according to the order</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Rack</td>
<td>according to the order</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Switch plate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Tube - ø 47 / 44 mm</td>
<td>103888*</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Clamp band</td>
<td>244856</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Rubber profile</td>
<td>212342</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Hex. Screw - M8 x 50 mm</td>
<td>213993</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Washer - M8</td>
<td>215813</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>Cylinder screw - M8 x 20 mm</td>
<td>216496</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Shake-proof screw - M8 x 16 mm</td>
<td>244457</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>Cylinder screw - M4 x 12 mm</td>
<td>220787</td>
<td></td>
</tr>
<tr>
<td>16</td>
<td>C/Sk screw - M4 x 16 mm</td>
<td>227706</td>
<td></td>
</tr>
<tr>
<td>17</td>
<td>Cap screw - M5 x 16 mm</td>
<td>216852</td>
<td></td>
</tr>
</tbody>
</table>

### Wear parts

* Please indicate length required
UA 01 Axis complete

Figure 4
## UA 01 Axis Drive Unit - complete

<table>
<thead>
<tr>
<th>No.</th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Cover - UA 01</td>
<td>349283</td>
</tr>
<tr>
<td>5</td>
<td>Tachometer cover</td>
<td>357081</td>
</tr>
<tr>
<td>6</td>
<td>Lower roller</td>
<td>350443</td>
</tr>
<tr>
<td>7</td>
<td>Lower shaft</td>
<td>350427</td>
</tr>
<tr>
<td>8</td>
<td>Upper roller</td>
<td>350451</td>
</tr>
<tr>
<td>9</td>
<td>Upper shaft</td>
<td>350052</td>
</tr>
<tr>
<td>10</td>
<td>Side guide UA 01</td>
<td>349224#</td>
</tr>
<tr>
<td>11</td>
<td>Motor - Gear-Tacho unit</td>
<td>328480</td>
</tr>
<tr>
<td>12</td>
<td>Drive wheel</td>
<td>307580</td>
</tr>
<tr>
<td>13</td>
<td>Fixing bracket</td>
<td>350001</td>
</tr>
<tr>
<td>14</td>
<td>Safety plate</td>
<td>350010</td>
</tr>
<tr>
<td>15</td>
<td>Proximity switch holder UA 01</td>
<td>349216</td>
</tr>
<tr>
<td>16</td>
<td>Incremental pulse generator fixture</td>
<td>362344</td>
</tr>
<tr>
<td>17</td>
<td>Spacer holder</td>
<td>362352</td>
</tr>
<tr>
<td>18</td>
<td>Cable - 4 x 0.25 mm² - screened (plug / coupling)</td>
<td>344214</td>
</tr>
<tr>
<td></td>
<td>Cable - 4 x 0.25 mm² - screened (m / coupling)</td>
<td>366200</td>
</tr>
<tr>
<td>25</td>
<td>Deep groove ball bearing - ø 10 / 26 x 8 mm</td>
<td>230383</td>
</tr>
<tr>
<td>26</td>
<td>Safety ring I-26</td>
<td>230375</td>
</tr>
<tr>
<td>27</td>
<td>Tesamol tape - 9 x 6 mm</td>
<td>100269*</td>
</tr>
<tr>
<td>28</td>
<td>Protective profile</td>
<td>103896*</td>
</tr>
<tr>
<td>30</td>
<td>Incremental pulse generator</td>
<td>250350</td>
</tr>
<tr>
<td>31</td>
<td>Proximity switch</td>
<td>241458</td>
</tr>
<tr>
<td>32</td>
<td>Additional housing - 16 pin without interlocking</td>
<td>241385</td>
</tr>
<tr>
<td>33</td>
<td>Plug set -16 pin</td>
<td>221864</td>
</tr>
<tr>
<td>34</td>
<td>Adhesive base for cable binder</td>
<td>205184</td>
</tr>
<tr>
<td>35</td>
<td>Lead-through - PG07</td>
<td>235989</td>
</tr>
<tr>
<td>36</td>
<td>Lock nut - PG07</td>
<td>230537</td>
</tr>
<tr>
<td>40</td>
<td>Hex. Screw - M8 x 20 mm</td>
<td>213934</td>
</tr>
<tr>
<td>41</td>
<td>Cylinder screw - M6 x 65 mm</td>
<td>230340</td>
</tr>
<tr>
<td>42</td>
<td>Hex. Shake-proof screw - M6 x 20 mm</td>
<td>244414</td>
</tr>
<tr>
<td>43</td>
<td>Cap screw - M6 x 12 mm</td>
<td>238163</td>
</tr>
<tr>
<td>44</td>
<td>Cap screw - M5 x 12 mm</td>
<td>239941</td>
</tr>
<tr>
<td>45</td>
<td>Cap screw - M4 x 12 mm</td>
<td>239925</td>
</tr>
<tr>
<td>46</td>
<td>Cap screw - M4 x 12 mm</td>
<td>216798</td>
</tr>
<tr>
<td>47</td>
<td>Cap screw - M4 x 8 mm</td>
<td>216771</td>
</tr>
<tr>
<td>48</td>
<td>Cap sheet screw - ø 2.9 x 9.5 mm</td>
<td>227218</td>
</tr>
<tr>
<td>49</td>
<td>C/Sk screw - M6 x 12 mm</td>
<td>214680</td>
</tr>
<tr>
<td>50</td>
<td>Hex. Grubscrew - M5 x 8 mm</td>
<td>214825</td>
</tr>
<tr>
<td>51</td>
<td>Hex. Screw - M3 x 12 mm</td>
<td>243868</td>
</tr>
<tr>
<td>55</td>
<td>Spring washer 4x7.5 mm</td>
<td>230367</td>
</tr>
<tr>
<td>56</td>
<td>Spring washer M6 R</td>
<td>205117</td>
</tr>
<tr>
<td>57</td>
<td>Spring washer M4 R</td>
<td>205680</td>
</tr>
<tr>
<td>58</td>
<td>Washer - ø 6.4 / 12.5 x 1.6 mm</td>
<td>216020</td>
</tr>
<tr>
<td>60</td>
<td>Hex. Nut - M6</td>
<td>205095</td>
</tr>
</tbody>
</table>

# Wear part

* Please indicate length required
UA 01 Axis Drive Unit - complete

Section A–A

Figure 5