Documentation AR02 Rotating Axis

© Copyright 2006 Gema Switzerland GmbH
All rights reserved.

This publication is protected by copyright. Unauthorized copying is prohibited by law. No part of this publication may be reproduced, photocopied, translated, stored on a retrieval system or transmitted in any form or by any means for any purpose, neither as a whole nor partially, without the express written consent of Gema Switzerland GmbH.

MagicCompact, MagicCylinder, MagicPlus, MagicControl, OptiFlex, OptiControl, OptiGun, OptiSelect, OptiStar and SuperCorona are registered trademarks of Gema Switzerland GmbH.

OptiFlow, OptiCenter, OptiMove, OptiSpeeder, OptiFeed, OptiSpray, OptiSieve, OptiAir, OptiPlus, OptiMaster, MultiTronic, EquiFlow, Precise Charge Control (PCC), Smart Inline Technology (SIT) and Digital Valve Control (DVC) are trademarks of Gema Switzerland GmbH.

All other product names are trademarks or registered trademarks of their respective holders.

Reference is made in this manual to different trademarks or registered trademarks. Such references do not mean that the manufacturers concerned approve of or are bound in any form by this manual. We have endeavored to retain the preferred spelling of the trademarks, and registered trademarks of the copyright holders.

To the best of our knowledge and belief, the information contained in this publication was correct and valid on the date of publication. Gema Switzerland GmbH makes no representations or warranties with respect to the contents or use of this publication, and reserves the right to revise this publication and make changes to its content without prior notice.

For the latest information about Gema products, visit www.gemapowdercoating.com.

For information regarding patents, visit www.gemapowdercoating.com/patents or www.gemapowdercoating.us/patents.

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
# Table of contents

## General safety regulations
- Safety symbols (pictograms) ................................................................. 3
- Intended use ........................................................................................................ 3
- Product-specific safety measures ................................................................. 4
  - AR02 Rotating Axis .................................................................................... 4
  - Special safety regulations for AR02 rotating axis ........................................... 4

## About this manual
- General information ........................................................................................... 7

## Function description
- Field of application .......................................................................................... 9
- Design and function ......................................................................................... 9
  - Safety and monitoring devices ........................................................................ 9
  - Mechanical structure .................................................................................... 10
  - Function description ..................................................................................... 10

## Technical Data
- AR02 Rotating Axis ......................................................................................... 11
  - General specifications ................................................................................... 11
  - Electrical data .............................................................................................. 11
  - Dimensions ................................................................................................. 11
- Controller cabinet ........................................................................................... 12
  - General information ..................................................................................... 12
  - Electrical data .............................................................................................. 12
  - Dimensions ................................................................................................. 12

## Start-up
- Assembly and set-up ....................................................................................... 13
  - Electrical/pneumatic connections and cable connections ............................ 13
  - Place of installation and operation ............................................................... 14
- Preparation for start-up .................................................................................... 14
  - General information ..................................................................................... 14
  - Reference point ............................................................................................ 15
- Checkpoints before switching on .................................................................... 15
- Grounding / protection type ............................................................................ 15
- Hoses and cables ............................................................................................. 16
- Reference point and mechanical stops ............................................................. 16
- Setting values/parameters ............................................................................... 17
- Initial start-up .................................................................................................. 17

## Operation

## Maintenance
- Maintenance schedule ..................................................................................... 21
- Setting the guide and support rollers .............................................................. 22
Troubleshooting 23
  General information ........................................................................................................ 23

Spare parts list 25
  Ordering spare parts ........................................................................................................ 25
  Rotating Axis complete – spare parts list ........................................................................... 26
  Rotating Axis complete – spare parts ............................................................................... 27
  Controller cabinet – spare parts list ................................................................................. 28
  Pneumatic group – spare parts list .................................................................................... 29
General safety regulations

This chapter sets out the fundamental safety regulations that must be followed by the user and third parties using the AR02 rotating axis.

These safety regulations must be read and understood before the AR02 rotating axis is put into operation.

Safety symbols (pictograms)

The following warnings with their meanings can be found in the Gema Switzerland 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

**ATTENTION!** improper use of the equipment could damage the machine or cause it to malfunction. Possible consequences: minor injuries or damage to equipment

**NOTE!** useful tips and other information

Intended use

- The AR02 rotating axis 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 considered non-compliant. The manufacturer is not responsible for any incorrect use and the risks associated with such actions are assumed by the user alone! Gema Switzerland GmbH must be consulted prior to any use of the AR02 rotating axis for any purposes or substances other than those indicated in our guidelines.

- Observance of the operating, service and maintenance instructions specified by the manufacturer is also part of the intended use. The AR02 rotating axis should only be used, maintained and started up by trained personnel, who are informed about and are familiar with the possible hazards involved.
– Start-up (i.e. the execution of a particular operation) is forbidden until it has been established that the AR02 rotating axis has been set up and wired according to the guidelines for machinery (2006/42 EG). EN 60204-1 (machine safety) must also be observed.

– Unauthorized modifications to the AR02 rotating axis 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

AR02 Rotating Axis

The AR02 rotating axis is a constituent part of the system and is thus integrated into the safety system of the plant.

If it is to be used in a manner outside the scope of the safety concept, then corresponding measures must be taken.

Only original Gema spare parts should be used! Any warranty claim for damage caused by the use of foreign parts is void.

Repairs on the rotating axis may only be carried out by Gema trained personnel!

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

Special safety regulations for AR02 rotating axis

– The installation work to be done by the customer must be carried out according to local regulations.

– It must be ensured, that all components are earthed according to the local regulations before start-up.

– The AR02 rotating axis may only be switched on and operated after careful reading of this manual. Incorrect operating of the axis and the corresponding control unit can lead to personal injuries as well as damage to the axis or other parts.

– All moving axes must be secured by the customer before start-up and during operation by providing fencing (see the local regulations)!

– Before start-up, check if the axis and the toothed rack are grounded!

– Safety devices may not be dismantled, bypassed or ignored! Open covers hide the danger of injury.

– Safety devices must be held in perfect functioning and may be not put out of operation.
- Maintenance works on the powder rotating axis may take place only when the plant is stopped. Switch off the plant, lock the main switch and remove the key!
About this manual

General information

This operating manual contains all the important information required for the working with the AR02 rotating axis. 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 – booth, gun control unit, manual gun or powder injector – should be referenced to their corresponding documents.

DANGER:

Working without operating instructions

Working without operating instructions or with individual pages from the operating 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.
Function description

Field of application

Die AR02 rotating axis serves to move an or two automatic powder guns. The axis can position the automatic powder gun in the corresponding position for the required coating condition to the object by the corresponding axis control unit. The rotating axis can only be used in combination with the UA03 gun axis. The rotating axis is installed in a horizontal position, other positions after consultation with Gema Switzerland GmbH only. The stroke registration is done by an encoder. It must also be observed that the movement area of the AR02 rotating axis and its rack are fenced off by the customer, according to the local regulations.

Design and function

Safety and monitoring devices

All moving axes must be secured by the customer before start-up and during operation by providing fencing (see the local regulations)!

To ensure that the axes cannot become a hazard during normal operation, the axes are shielded by a protective fence that is 2.3 m high. The fence has doors that are released by the control unit to allow authorized technical personnel access to the axes.
**Mechanical structure**

The AR02 rotating axis consists of the following parts:

![Structure of the AR02 rotating axis](image)

1. Drive unit
2. Toothed belt
3. Tube
4. Toothed rack
5. Rubber buffer
6. Extension tube

**Function description**

The rotating axis carries out a circular rotating motion, in order to adjust the gun position to the parts to be coated.

The position registration of the AR02 rotating axis takes place by an encoder built into the drive unit.

The positioning motion is accomplished with a built-in drive unit (servo motor with planetary gears and a position encoder) and the toothed rack.
Technical Data

AR02 Rotating Axis

### General specifications

<table>
<thead>
<tr>
<th>AR02</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Drive unit</td>
<td>Servo motor</td>
</tr>
<tr>
<td>Max. load</td>
<td>max. 2 automatic powder guns, fitted symmetrically</td>
</tr>
<tr>
<td>Rotating speed</td>
<td>190°/s</td>
</tr>
<tr>
<td>Movement direction</td>
<td>Rotating movement</td>
</tr>
<tr>
<td>Position detection</td>
<td>encoder (integrated in the drive unit)</td>
</tr>
<tr>
<td>Temperature range</td>
<td>10 °C - +40 °C (+50 °F - +104 °F)</td>
</tr>
<tr>
<td>Max. surface temperature</td>
<td>135 °C (+275 °F)</td>
</tr>
<tr>
<td>Approvals</td>
<td>CE II 3 D</td>
</tr>
</tbody>
</table>

### Electrical data

<table>
<thead>
<tr>
<th>AR02</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Control unit</td>
<td>CM30</td>
</tr>
<tr>
<td>Nominal input voltage</td>
<td>24 VDC (from servo controller)</td>
</tr>
<tr>
<td>Connected load</td>
<td>220 W</td>
</tr>
<tr>
<td>Protection type</td>
<td>IP64</td>
</tr>
</tbody>
</table>

### Dimensions

<table>
<thead>
<tr>
<th>AR02</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>142 mm</td>
</tr>
<tr>
<td>Length</td>
<td>according to order</td>
</tr>
<tr>
<td>Height</td>
<td>300 mm</td>
</tr>
<tr>
<td>Angle of rotation</td>
<td>0-315°</td>
</tr>
<tr>
<td>Weight (axis with support)</td>
<td>7.5 kg plus 3.5 kg/m stroke</td>
</tr>
</tbody>
</table>
Controller cabinet

**General information**

<table>
<thead>
<tr>
<th>AR02</th>
<th></th>
</tr>
</thead>
</table>
| Temperature range | 10 °C - +40 °C  
(+50 °F - +104 °F) |
| Approvals    | unsuitable for zone 22               |

**Electrical data**

<table>
<thead>
<tr>
<th>AR02</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Nominal input voltage</td>
<td>230 VAC 50/60 Hz</td>
</tr>
<tr>
<td>Control signal</td>
<td>CANopen field bus</td>
</tr>
<tr>
<td>Protection type</td>
<td>IP54</td>
</tr>
</tbody>
</table>

**Dimensions**

<table>
<thead>
<tr>
<th>AR02</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Width</td>
<td>400 mm</td>
</tr>
<tr>
<td>Height</td>
<td>750 mm</td>
</tr>
<tr>
<td>Depth</td>
<td>260 mm</td>
</tr>
<tr>
<td>Weight</td>
<td>25 kg</td>
</tr>
</tbody>
</table>
Start-up

Assembly and set-up

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

When assembling the AR02 rotating axis, the following points are to be observed:

– The drive housing must be fitted in the position intended for it on a support, respectively on a reciprocator.

– The toothed rack must be positioned carefully in the drive housing, so that the drive wheels or the gears are not knocked.

– The supplied rubber profile must be fitted on the toothed rack as buffers.

– By fitting the toothed rack, it must be observed that the toothed rack can move freely on the whole travel range.

Electrical/pneumatic connections and cable connections

NOTE:
The electrical and pneumatic installations are to be done as indicated in the attached diagrams.
Place of installation and operation

The axis (1) is mounted primarily on the vertical axis ZA.. (2). The power supply is located in a separate control cabinet (3).

The control cabinet should be mounted as close to the axis as possible.

Preparation for start-up

ATTENTION:
Before connecting or switching on the rotating axis, read carefully these operating instructions!
► Before the rotating axis is put into operation, the upper stroke limit must be set on the reciprocator control unit!

(see the user manual of the axis control unit)

General information

DANGER:
Never stand too close to the moving axes during operation! Danger of accident!

ATTENTION:
Before start-up works are done, make certain that nobody can switch on the rotating axis!
► Switch off and lock the main switch!

ATTENTION:
The power of the axis is much stronger than that of a human being!
► All axes must be secured against admittance during operation (see local regulations).
Before start-up the rotating axis, the following points must be observed:

- Check the maximum stroke length corresponding to the toothed rack applications (see Magic Control CM30 Operating instructions, chapter Axes parameters)
- All screw connections have to be firmly tightened
- Play-free, easy running of the rack
- Free movement for the rack over the whole travel range
- Check the cable, and hose positions, so that no damage can be caused over the whole travel range
- Check also the cable, and hose positions that no damage can be caused in the other movement sequences
- Area of movement around the rack must be fenced off, according local regulations, so that nobody is endangered

Reference point

Before the rotating axis is put into operation, the travel distance must be set on the axis control unit (see therefore the corresponding axis control unit operating manual)!

**ATTENTION:**

Incorrect setting of the travel distance can cause damages to the reciprocator, to the booth and/or to the applicators!

At every start-up after the mains have been interrupted, the reference point of the axis must be referred again (see "Reference point and mechanical stops"). After the reference point is reached, the axis begins to carry out the movements set on the axis control unit.

Checkpoints before switching on

Before switching on, the following checks should be done:

- Check if the cables and hoses are laid out correctly
- Check if the guns have a clear run and do not touch the booth slots
- Check the distance between the work pieces and the guns

**ATTENTION:**

Before connecting or switching on the rotating axis, read carefully these operating instructions!

Grounding / protection type

All metal parts of the rotating axis must be grounded according to the local safety regulations. The grounding screw is located at the rear of the rotating axis.

All electrical installations are implemented in accordance to VDE IP54 protection type regulations!
Hoses and cables

All movable hoses and cables must be laid out in such a way that they are neither subjected to any loads nor can hang on other parts. The electric cables of the reciprocators must be protected from mechanical damage.

Reference point and mechanical stops

The reference point serves as starting point for the axis control unit for calculating the reversing points as well as the maximum travel distance.

Each time the reciprocator is switched on, the control unit requests that the toothed rack travels to the reference point (zero point). The rack travels to the mechanical stop, which means onto the rubber buffer. The control unit notes this and gives the distance how far the carriage must travel from this position to decompress the rubber buffer. The standard value for the UA axis is 30, that means 30 mm away from the mechanical stop. For this reason, the Axis control unit must be programmed in such a way that the reference point is always 30 mm before the lowest mechanical stop (zero point).

ATTENTION:
In order to avoid damages to the booth, to the gun holders etc. the reference point must be set before the first start-up!

ATTENTION:
In order to avoid damages to the booth or the gun holders, the reference point must be checked before the first start-up and if necessary, reset!

► It must be noted that the axes in reference travel moves up to 30 mm behind the control’s zero point!

ATTENTION:
The reference point must be referenced before each start-up (at each switching on, after an interruption of the power supply etc.)!

Setting values/parameters

The exact setting of parameters is performed with the Magic Control CM30 control unit. (For more information, refer to the “Magic Control CM30 operating instructions”)

The pressure for the blow-off device should be approximately 3 bar.
Initial start-up

DANGER:
Never stand behind the rotating axis or under the carriage of the vertical axis when it is in operation! Danger of accident!

ATTENTION:
The power of the rotating axis is much stronger than that of a human being!
► All axes must be secured against admittance during operation (see local regulations).

Before start-up the rotating axis, the following points must be observed:
– The axis must be grounded! The grounding must be done by the customer
– Adapt the system parameters in the axes control unit (see the axes control unit operating instructions)

In addition, the following checks are necessary before the initial start-up:
– Travel distance
  Check it in accordance to the axes control operating manual
– Command
  Check the cable connections (correct connections, squeezed parts, cable lengths, cable movement etc.)
– Stability
  The rotating axis must be mounted so that it is stable.
Operation

The AR02 axis is operated exclusively by the Magic Control CM30 Axis control unit (see the corresponding operating instructions).

CM30 Control
ATTENTION:
Before maintenance works take place, it must be ensured that the moving axis cannot be switched on by a third party!

Maintenance schedule

The AR02 rotating axis is designed to be maintenance-free and therefore requires little maintenance work. The maintenance plan contains checking and maintenance notes for single shift operation of the axis. Wear checks, maintenance and repair must be adapted accordingly when operation conditions deviate.

<table>
<thead>
<tr>
<th>Interval</th>
<th>Maintenance and inspection works</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weekly</td>
<td>Clean the toothed rack of powder and check for wear</td>
</tr>
<tr>
<td></td>
<td>Blow off the tooth profile of the rack and check for wear</td>
</tr>
<tr>
<td>Monthly</td>
<td>Check the toothed rack play and if necessary, readjust (see chapter „Setting the guide and support rollers“)</td>
</tr>
<tr>
<td></td>
<td>Check the cable and hose connections if they are firmly fitted and for wear</td>
</tr>
<tr>
<td></td>
<td>Remove the cover plate and perform a visual inspection of the drive unit (leaks in the gears)</td>
</tr>
</tbody>
</table>
Setting the guide and support rollers

1. Switch off the power supply.
2. Remove the sheet metal panels
3. Loosen the lock nut (1) on the grub screw (2)
4. Loosen the nut (3) of the running roller screw

**ATTENTION:**
Never loosen more than one roller at the same time!
► Adjust only one roller after another!

5. Adjust the pressure on the rollers with the grub screw, so that the rollers can be moved only slightly with manual pressure
6. Tighten the nut (3)
7. Check if the rollers can be moved slightly

**NOTE:**
Check if the toothed rack is blocked or runs rough!
► Adjust, if necessary!

8. Tighten the lock nut (1)
9. Fit the panels again and fasten them firmly

---

Setting the guide and support rollers
## Troubleshooting

### General information

**ATTENTION:**
Faults may only be eliminated by trained personnel, and it must be ensured that the moving axes can not be switched on by a third person.

<table>
<thead>
<tr>
<th>Failure</th>
<th>Causes</th>
<th>Troubleshooting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Axis does not move</td>
<td>Toothed rack is blocked, runs stiff</td>
<td>Check the guide and support rollers, and reset, if necessary (see section &quot;Setting the guide and support rollers&quot;)</td>
</tr>
<tr>
<td>During referencing, the axis moves in the wrong direction</td>
<td>The system parameter &quot;Change direction of movement&quot; is set incorrectly</td>
<td>Set the system parameter &quot;Change direction of movement&quot; (see Magic Control CM30 Operating instructions)</td>
</tr>
<tr>
<td>Axis travels onto the rubber buffer if max. travel distance is set</td>
<td>Parameter &quot;Travel distance&quot; incorrectly set</td>
<td>Adjust the parameter (see Magic Control CM30 Operating instructions)</td>
</tr>
<tr>
<td>Tooothed rack vibrates strongly or rollers not pressed tight on the rack</td>
<td>Roller distance too large</td>
<td>Reset the guide and support rollers (see section &quot;Setting the guide and support rollers&quot;)</td>
</tr>
<tr>
<td>Error displayed on the Magic Control CM30 control unit</td>
<td>Encoder signal not present</td>
<td>Check the connecting cable</td>
</tr>
</tbody>
</table>
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** AR02 Rotating Axis
- **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 *.

The wearing parts are always marked with a #. marked.

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)

**ATTENTION:**

Only original Gema spare parts should be used, because the explosion protection will also be preserved that way. The use of spare parts from other manufacturers will invalidate the Gema guarantee conditions!
# Rotating Axis complete – spare parts list

<table>
<thead>
<tr>
<th></th>
<th>Item Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Bearing cover</td>
<td>1000 321</td>
</tr>
<tr>
<td>2</td>
<td>Bearing bush</td>
<td>1000 323</td>
</tr>
<tr>
<td>3</td>
<td>Bearing cover</td>
<td>1000 319</td>
</tr>
<tr>
<td>4</td>
<td>Spacer ring</td>
<td>1000 325</td>
</tr>
<tr>
<td>5</td>
<td>Angular contact ball bearing – Ø 62/30x23.8 mm</td>
<td>1001 247</td>
</tr>
<tr>
<td>6</td>
<td>Sealing bush</td>
<td>1000 324</td>
</tr>
<tr>
<td>7</td>
<td>Rubber buffer – Ø 35x40 mm, M8</td>
<td>211 664</td>
</tr>
<tr>
<td>8</td>
<td>Toothed belt T5 – Z=82 B=16</td>
<td>1007 605#</td>
</tr>
<tr>
<td>10</td>
<td>Deep groove ball bearing – Ø 35/62x14 mm</td>
<td>1001 248</td>
</tr>
<tr>
<td>11</td>
<td>Snap ring – A-35 mm</td>
<td>1001 245</td>
</tr>
<tr>
<td>12</td>
<td>Cylinder ribbed Allen screw – M6x20 mm</td>
<td>261 840</td>
</tr>
<tr>
<td>13</td>
<td>Cylinder Allen screw – M6x20 mm</td>
<td>216 429</td>
</tr>
<tr>
<td>14</td>
<td>Ribbed washer – M6</td>
<td>264 849</td>
</tr>
<tr>
<td>15</td>
<td>Snap ring – A-30 mm</td>
<td>1001 246</td>
</tr>
<tr>
<td>16</td>
<td>Allen grub screw – M6x16 mm</td>
<td>256 234</td>
</tr>
<tr>
<td>17</td>
<td>Shaft seal – Ø 35/50x7 mm</td>
<td>1001 243</td>
</tr>
<tr>
<td>18</td>
<td>Rubber seal</td>
<td>1000 397</td>
</tr>
<tr>
<td>19</td>
<td>Washer – Ø 6.4/16x1.6 mm</td>
<td>215 805</td>
</tr>
<tr>
<td>20</td>
<td>Countersunk Allen screw – M5x10 mm</td>
<td>262 480</td>
</tr>
<tr>
<td>21</td>
<td>Gear motor</td>
<td>1007 604</td>
</tr>
<tr>
<td>22</td>
<td>Upper belt pulley</td>
<td>1001 270</td>
</tr>
<tr>
<td>23</td>
<td>Lower belt pulley (incl. pos. 24)</td>
<td>1000 341</td>
</tr>
<tr>
<td>24</td>
<td>Allen set screw – M6x10 mm</td>
<td>214 841</td>
</tr>
<tr>
<td>25</td>
<td>Urelast spring – Ø 16/6.5x12 mm</td>
<td>1001 244</td>
</tr>
<tr>
<td>26</td>
<td>Spacing ring</td>
<td>1000 338</td>
</tr>
<tr>
<td>27</td>
<td>Extension tube</td>
<td>1001 770</td>
</tr>
<tr>
<td>28</td>
<td>Countersunk Allen screw – M4x6 mm</td>
<td>1010 979</td>
</tr>
<tr>
<td>29</td>
<td>Stop lever</td>
<td>1000 337</td>
</tr>
<tr>
<td>30</td>
<td>Kink protection</td>
<td>1013 361</td>
</tr>
<tr>
<td>31</td>
<td>Countersunk Allen screw – M6x25 mm</td>
<td>241 598</td>
</tr>
<tr>
<td>32</td>
<td>Cylinder Allen screw – M6x25 mm</td>
<td>216 437</td>
</tr>
</tbody>
</table>

# Wearing part

* Please indicate length
Rotating Axis complete – spare parts
# Controller cabinet – spare parts list

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Code</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Position controller CDF-AR02</td>
<td>1007 613</td>
</tr>
<tr>
<td>2</td>
<td>Switching power supply 24 VDC, 20 W</td>
<td>1007 615</td>
</tr>
<tr>
<td>3</td>
<td>Can-Hub – V3.0, complete</td>
<td>1001 787</td>
</tr>
<tr>
<td>4</td>
<td>Peltier cooler – 24 VDC, 30 W</td>
<td>1005 583</td>
</tr>
<tr>
<td>5</td>
<td>Axial flow fan – 24 VDC</td>
<td>1007 614</td>
</tr>
<tr>
<td>6</td>
<td>Clamping profile SS</td>
<td>386 820</td>
</tr>
<tr>
<td>7</td>
<td>Cable bush – 2+2</td>
<td>386 847</td>
</tr>
<tr>
<td>8</td>
<td>Clamping profile GS</td>
<td>386 839</td>
</tr>
<tr>
<td>9</td>
<td>Gasket</td>
<td>386 855</td>
</tr>
<tr>
<td>10</td>
<td>Allen cylinder screw – M5x30 mm</td>
<td>216 372</td>
</tr>
<tr>
<td>11</td>
<td>Pneumatic group – see separate spare parts list</td>
<td></td>
</tr>
</tbody>
</table>
# Pneumatic group – spare parts list

<table>
<thead>
<tr>
<th></th>
<th>Part Description</th>
<th>Part Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Solenoid valve – 1/8&quot;-5</td>
<td>1001 002</td>
</tr>
<tr>
<td>2</td>
<td>Valve coil – 24 VDC</td>
<td>254 142</td>
</tr>
<tr>
<td>3</td>
<td>Valve cable – 5 m, complete (incl. pos. 3.1 and 3.2)</td>
<td>1007 366</td>
</tr>
<tr>
<td>3.1</td>
<td>Cable socket – 3 pins</td>
<td>227 919</td>
</tr>
<tr>
<td>3.2</td>
<td>Cable – 3x1 mm²</td>
<td>255 033*</td>
</tr>
<tr>
<td>4</td>
<td>Pressure regulator – 0.5-6 bar, 1/4&quot;</td>
<td>264 342</td>
</tr>
<tr>
<td>5</td>
<td>Pressure gage – 0-6 bar, 1/8&quot;</td>
<td>258 989</td>
</tr>
<tr>
<td>6</td>
<td>Elbow joint – 1/8&quot;-Ø 8 mm</td>
<td>251 372</td>
</tr>
<tr>
<td>7</td>
<td>Elbow joint – 1/4&quot;-Ø 8 mm</td>
<td>254 029</td>
</tr>
<tr>
<td>8</td>
<td>Silencer – 1/8&quot;</td>
<td>251 305</td>
</tr>
<tr>
<td>9</td>
<td>Double nipple – 1/8&quot;-1/8&quot; divisible</td>
<td>253 847</td>
</tr>
<tr>
<td>10</td>
<td>Elbow joint – 1/8&quot;-1/8&quot;</td>
<td>237 604</td>
</tr>
<tr>
<td>11</td>
<td>Adapter nipple – 1/8&quot;-1/4&quot;</td>
<td>265 454</td>
</tr>
<tr>
<td>12</td>
<td>Sealing plug – 1/4&quot;</td>
<td>263 834</td>
</tr>
</tbody>
</table>

* Please indicate length