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<th>Page</th>
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<td>21</td>
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<td>23</td>
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<td>25</td>
</tr>
<tr>
<td>7.1</td>
<td>Connection to a continuous contact series, horizontal/vertical lamp panel</td>
<td>25</td>
</tr>
<tr>
<td>7.2</td>
<td>Connection to a decade contact series, horizontal/vertical lamp panel</td>
<td>26</td>
</tr>
</tbody>
</table>
1 Introduction

This technical file contains detailed descriptions on the safe and proper installation, connection, commissioning and monitoring of the product.

It also includes safety instructions and general information about the product.

This technical file is intended solely for specially trained and authorized personnel.

1.1 Validity

This technical file is valid for the TAPIND® product.

1.2 Manufacturer

The product is manufactured by:

Maschinenfabrik Reinhausen GmbH
Falkensteinaße 8
93059 Regensburg, Germany
Tel.: (+49) 9 41/40 90-0
Fax: (+49) 9 41/40 90-7001
E-mail: sales@reinhausen.com

Further information on the product and copies of this technical file are available from this address if required.

1.3 Subject to change without notice

The information contained in this technical file comprises the technical specifications approved at the time of printing. Significant modifications will be included in a new edition of the technical file.

The document number and version number of this technical file are shown in the footer.

1.4 Completeness

This technical file is incomplete without the supporting documentation.

1.5 Supporting documents

The following documents also apply in addition to this technical file:

- Supplements
- Dimensional drawing
Also observe generally valid legislation, standards, guidelines and specifications on accident prevention and environmental protection in the respective country of use.

1.6 Safekeeping

This technical file and all supporting documents must be kept ready at hand and accessible for future use at all times.

1.7 Notation conventions

This section contains an overview of the symbols and textual emphasis used.

1.7.1 Abbreviations used

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>°C</td>
<td>Degrees Celsius</td>
</tr>
<tr>
<td>A</td>
<td>Ampere</td>
</tr>
<tr>
<td>AC</td>
<td>Alternating current</td>
</tr>
<tr>
<td>approx.</td>
<td>Approximately</td>
</tr>
<tr>
<td>DC</td>
<td>Direct current</td>
</tr>
<tr>
<td>EMC</td>
<td>Electromagnetic compatibility</td>
</tr>
<tr>
<td>g</td>
<td>Gram</td>
</tr>
<tr>
<td>Hz</td>
<td>Hertz</td>
</tr>
<tr>
<td>IP</td>
<td>Ingress protection</td>
</tr>
<tr>
<td>mm</td>
<td>Millimeter</td>
</tr>
<tr>
<td>mm²</td>
<td>Millimeter squared</td>
</tr>
<tr>
<td>MR</td>
<td>Maschinenfabrik Reinhausen</td>
</tr>
<tr>
<td>V</td>
<td>Volt</td>
</tr>
<tr>
<td>e.g.</td>
<td>For example</td>
</tr>
</tbody>
</table>

Table 1: Abbreviations used

1.7.2 Hazard communication system

Warnings in this technical file are displayed as follows.

1.7.2.1 Warning relating to section

Warnings relating to sections refer to entire chapters or sections, sub-sections or several paragraphs within this technical file. Warnings relating to sections use the following format:
1 Introduction

![WARNING]

**Type and source of danger**

**Consequences**
- Action
- Action

1.7.2.2 **Embedded warning information**

Embedded warnings refer to a particular part within a section. These warnings apply to smaller units of information than the warnings relating to sections. Embedded warnings use the following format:

⚠️ **DANGER!** Instruction for avoiding a dangerous situation.

1.7.2.3 **Signal words and pictograms**

The following signal words are used:

<table>
<thead>
<tr>
<th>Signal word</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>DANGER</td>
<td>Indicates a hazardous situation which, if not avoided, will result in death or serious injury.</td>
</tr>
<tr>
<td>WARNING</td>
<td>Indicates a hazardous situation which, if not avoided, could result in death or serious injury.</td>
</tr>
<tr>
<td>CAUTION</td>
<td>Indicates a hazardous situation which, if not avoided, could result in injury.</td>
</tr>
<tr>
<td>NOTICE</td>
<td>Indicates measures to be taken to prevent damage to property.</td>
</tr>
</tbody>
</table>

Table 2: Signal words in warning notices

Pictograms warn of dangers:

<table>
<thead>
<tr>
<th>Pictogram</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Warning of a danger point]</td>
<td>Warning of a danger point</td>
</tr>
<tr>
<td>![Warning of dangerous electrical voltage]</td>
<td>Warning of dangerous electrical voltage</td>
</tr>
</tbody>
</table>
### Table 3: Pictograms used in warning notices

<table>
<thead>
<tr>
<th>Pictogram</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Warning of combustible substances" /></td>
<td>Warning of combustible substances</td>
</tr>
<tr>
<td><img src="image2" alt="Warning of danger of tipping" /></td>
<td>Warning of danger of tipping</td>
</tr>
</tbody>
</table>

#### 1.7.3 Information system

Information is designed to simplify and improve understanding of particular procedures. In this technical file it is laid out as follows:

- Important information.
2 Safety

2.1 General safety information

The technical file contains detailed descriptions on the safe and proper installation, connection, commissioning and monitoring of the product.

▪ Read this technical file through carefully to familiarize yourself with the product.
▪ Particular attention should be paid to the information given in this chapter.

2.2 Appropriate use

The product and associated equipment and special tools supplied with it comply with the relevant legislation, regulations and standards, particularly health and safety requirements, applicable at the time of delivery.

If used as intended and in compliance with the specified requirements and conditions in this technical file as well as the warning notices in this technical file and attached to the product, then the product does not present any hazards to people, property or the environment. This applies throughout the product's entire life, from delivery through installation and operation to disassembly and disposal.

The operational quality assurance system ensures a consistently high quality standard, particularly in regard to the observance of health and safety requirements.

The following is considered appropriate use

▪ Only operate the product in accordance with this technical file and the agreed delivery conditions and technical data
▪ Use the equipment and special tools supplied solely for the intended purpose and in accordance with the specifications of this technical file
▪ Use the product only with the transformer specified in the order
▪ The serial numbers of on-load tap-changers and on-load tap-changer accessories (drive, drive shaft, bevel gear, protective relay etc.) must match if the on-load tap-changers and on-load tap-changer accessories are supplied as a set for one order.

2.3 Inappropriate use

Use is considered to be inappropriate if the product is used other than as described in the Appropriate use section. Please also note the following:

▪ Risk of explosion and fire from highly flammable or explosive gases, vapors, or dusts. Do not operate product in areas at risk of explosion.
2 Safety

- Unauthorized or inappropriate changes to the product may lead to personal injury, material damage, and operational faults. Only modify product following discussion with Maschinenfabrik Reinhausen GmbH.

2.4 Personnel qualification

The product is designed solely for use in electrical energy systems and facilities operated by appropriately trained staff. This staff comprises people who are familiar with the installation, assembly, commissioning and operation of such products.

2.5 Operator's duty of care

To prevent accidents, disruptions and damage as well as unacceptable adverse effects on the environment, those responsible for transport, installation, operation, maintenance and disposal of the product or parts of the product must ensure the following:

- All warning and hazard notices are complied with.
- Personnel are instructed regularly in all relevant aspects of operational safety, the operating instructions and particularly the safety instructions contained therein.
- Regulations and operating instructions for safe working as well as the relevant instructions for staff procedures in the case of accidents and fires are kept on hand at all times and are displayed in the workplace where applicable.
- The product is only used when in a sound operational condition and safety equipment in particular is checked regularly for operational reliability.
- Only replacement parts, lubricants and auxiliary materials which are authorized by the manufacturer are used.
- The specified operating conditions and requirements of the installation location are complied with.
- All necessary devices and personal protective equipment for the specific activity are made available.
- The prescribed maintenance intervals and the relevant regulations are complied with.
- Installation, electrical connection and commissioning of the product may only be carried out by qualified and trained personnel in accordance with this technical file.
- The operator must ensure appropriate use of the product.

2.6 Personal protective equipment

Personal protective equipment must be worn during work to minimize risks to health.

- Always wear the personal protective equipment required for the job at hand.
Follow information about personal protective equipment provided in the work area.

<table>
<thead>
<tr>
<th>Always wear</th>
<th>Protective clothing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Close-fitting work clothing with a low breaking strength, with tight sleeves and with no protruding parts. It mainly serves to protect the wearer against being caught by moving machine parts. Do not wear any rings, necklaces or other jewelry.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Safety shoes</th>
<th>To protect against falling heavy objects and slipping on slippery surfaces.</th>
</tr>
</thead>
</table>

Table 4: Personal protective equipment to be worn at all times

<table>
<thead>
<tr>
<th>Wear the following in special environments</th>
<th>Special personal protective equipment is needed in special environments. The choice of equipment depends on the circumstances.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety glasses</td>
<td>To protect the eyes from flying parts and splashing liquids.</td>
</tr>
<tr>
<td>Hard hat</td>
<td>To protect from falling and flying parts and materials.</td>
</tr>
<tr>
<td>Hearing protection</td>
<td>To protect from hearing damage.</td>
</tr>
</tbody>
</table>

Table 5: Personal protective equipment to be worn in special environments
3 Product description

This chapter contains an overview of the design and function of the product.

3.1 Function description

NOTICE
Damage to device due to failure to comply with the connection diagrams!

Failure to comply with the connection diagrams may result in the device being damaged.

► Connect the device in accordance with the connection diagrams, also see Annex [► 25].
► Be aware of modified connection diagrams if replacing a previous model.

The lamp panel is used for the display of the current operating position of the on-load tap-changer or de-energized tap-changer in any location. The distance between this location and the drive is limited by the voltage drop on the line and depends on the voltage applied on the drive. The maximum possible number of displayed operating positions depends on whether a continuous or decade contact series is connected to the lamp panel. With a continuous contact series, a maximum of 28 positions can be displayed.

In combination with a TAPMOTION® ED motor-drive unit, the three illuminated switching elements can also be used to perform the following remote actuations:

▪ Adjusting the operating position in the "RAISE" direction with integrated LED for displaying a (direction-dependent) run indication
▪ Adjusting the operating position in the "LOWER" direction with integrated LED for displaying a (direction-dependent) run indication
▪ Tripping the motor protective switch in the TAPMOTION® ED motor-drive unit with integrated LED for displaying the "Motor protective switch OFF" message
3 Product description

3.1.1 Continuous contact series

With the continuous contact series, a terminal of the position module is assigned to each position of the on-load tap-changer. The signal is only routed to the intended position if the terminals are assigned correctly.

There are 28 illuminated elements in the lamp panel. A maximum of 28 positions can be displayed with one continuous contact series connected to a lamp panel (for example, see table below).

<table>
<thead>
<tr>
<th>Decimal</th>
<th>Continuous contact series</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19</td>
<td></td>
</tr>
<tr>
<td>1 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>2 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>3 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>4 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>5 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>6 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>7 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>8 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>9 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>10 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>11 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>12 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>13 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>14 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0 0</td>
<td></td>
</tr>
<tr>
<td>15 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0 0</td>
<td></td>
</tr>
<tr>
<td>16 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0 0</td>
<td></td>
</tr>
<tr>
<td>17 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0</td>
<td></td>
</tr>
<tr>
<td>18 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1 0</td>
<td></td>
</tr>
<tr>
<td>19 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 1</td>
<td></td>
</tr>
</tbody>
</table>

Table 6: Example of continuous contact series

3.1.2 Decade contact series

If more than 28 positions are to be displayed, a decade contact series must be connected. The zero and first powers are displayed separately.

10 terminals are assigned the values 0...9 and 10 terminals the values 00...90.

In Position 19, e.g., the terminal with a value of 9 and the terminal with a value of 10 will route signals (for example, see table below).
### Table 7: Example of decade contact series

<table>
<thead>
<tr>
<th>Decimal</th>
<th>Decade contact series</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>0</td>
</tr>
<tr>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>6</td>
<td>0</td>
</tr>
<tr>
<td>7</td>
<td>0</td>
</tr>
<tr>
<td>8</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>0</td>
</tr>
<tr>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>13</td>
<td>0</td>
</tr>
<tr>
<td>14</td>
<td>0</td>
</tr>
<tr>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>16</td>
<td>0</td>
</tr>
<tr>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td>18</td>
<td>0</td>
</tr>
<tr>
<td>19</td>
<td>0</td>
</tr>
<tr>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>21</td>
<td>0</td>
</tr>
<tr>
<td>22</td>
<td>0</td>
</tr>
<tr>
<td>23</td>
<td>0</td>
</tr>
<tr>
<td>24</td>
<td>0</td>
</tr>
<tr>
<td>25</td>
<td>0</td>
</tr>
<tr>
<td>26</td>
<td>0</td>
</tr>
<tr>
<td>27</td>
<td>0</td>
</tr>
<tr>
<td>28</td>
<td>0</td>
</tr>
<tr>
<td>29</td>
<td>0</td>
</tr>
<tr>
<td>30</td>
<td>1</td>
</tr>
<tr>
<td>31</td>
<td>0</td>
</tr>
<tr>
<td>32</td>
<td>0</td>
</tr>
<tr>
<td>33</td>
<td>0</td>
</tr>
<tr>
<td>34</td>
<td>0</td>
</tr>
<tr>
<td>35</td>
<td>0</td>
</tr>
</tbody>
</table>

Table 7: Example of decade contact series
3.2 Performance features

The product is particularly characterized by the following properties:

▪ Easy installation and operation
▪ Compact, lightweight construction
▪ Display of the operating position of the on-load tap-changer in a control room
▪ Remote-controlled change of the operating position of the on-load tap-changer

3.3 Scope of delivery

The product is delivered as follows:

▪ Lamp panel (standard housing)
▪ 2 fastening clips (Form B)
▪ Operating instructions

Please note the following:

▪ Check the shipment for completeness on the basis of the shipping documents.
▪ Store the parts in a dry place until installation
▪ The product must remain in its airtight, protective wrapping and may only be removed immediately before installation
3.4 Design

This chapter contains an overview of the design of the lamp panel.

Front view

Figure 1: Front view of lamp panel

<table>
<thead>
<tr>
<th></th>
<th>Illuminated switching element for adjusting the operating position in the &quot;RAISE&quot; direction</th>
<th>Illuminated switching element for adjusting the operating position in the &quot;LOWER&quot; direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

1. Illuminated switching element for tripping the motor protective switch in the TAPMOTION® ED motor-drive unit

2. Display of the operating position of the on-load tap-changer
3 Product description

Rear view

Figure 2: Rear view of lamp panel

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X1</td>
<td>Motor-drive unit connection</td>
<td>X3</td>
<td>Internal wiring, lamp test</td>
</tr>
<tr>
<td></td>
<td>(RAISE, LOWER, motor protective switch)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>X2</td>
<td>Power, grounding</td>
<td>X4-X7</td>
<td>Motor-drive unit connection</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(operating position display)</td>
</tr>
</tbody>
</table>

The lamp panel's name plate is on the rear, in the bottom right.
4 Packaging, transport and storage

4.1 Packaging

4.1.1 Suitability, structure and production

The goods are packaged in a sturdy cardboard box. This ensures that the shipment is secure when in the intended transportation position and that none of its parts touch the loading surface of the means of transport or touch the ground after unloading.

The box is designed for a maximum load of 10 kg.

Inlays inside the box stabilize the goods, preventing impermissible changes of position, and protect them from vibration.

4.1.2 Markings

The packaging bears a signature with instructions for safe transport and correct storage. The following symbols apply to the shipment of non-hazardous goods. Adherence to these symbols is mandatory.

<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Protect against moisture" /></td>
<td>Protect against moisture</td>
</tr>
<tr>
<td><img src="image" alt="Top" /></td>
<td>Top</td>
</tr>
<tr>
<td><img src="image" alt="Fragile" /></td>
<td>Fragile</td>
</tr>
<tr>
<td><img src="image" alt="Attach lifting gear here" /></td>
<td>Attach lifting gear here</td>
</tr>
<tr>
<td><img src="image" alt="Center of mass" /></td>
<td>Center of mass</td>
</tr>
</tbody>
</table>

Table 8: Shipping pictograms

4.2 Transportation, receipt and handling of shipments

In addition to oscillation stress and shock stress, jolts must also be expected during transportation. In order to prevent possible damage, avoid dropping, tipping, knocking over and colliding with the product.

If a crate tips over, falls from a certain height (e.g. when slings tear) or experiences an unbroken fall, damage must be expected regardless of the weight.

Every delivered shipment must be checked for the following by the recipient before acceptance (acknowledgment of receipt):

- Completeness based on the delivery slip
- External damage of any type.

The checks must take place after unloading when the crate or transport container can be accessed from all sides.
4 Packaging, transport and storage

Visible damage  If external transport damage is detected on receipt of the shipment, proceed as follows:

- Immediately record the transport damage found in the shipping documents and have this countersigned by the carrier.
- In the event of severe damage, total loss or high damage costs, immediately notify the sales department at Maschinenfabrik Reinhausen and the relevant insurance company.
- After identifying damage, do not modify the condition of the shipment further and retain the packaging material until an inspection decision has been made by the transport company or the insurance company.
- Record the details of the damage immediately onsite together with the carrier involved. This is essential for any claim for damages!
- If possible, photograph damage to packaging and packaged goods. This also applies to signs of corrosion on the packaged goods due to moisture inside the packaging (rain, snow, condensation).
- Be absolutely sure to also check the sealed packaging.

Hidden damage  When damages are not determined until unpacking after receipt of the shipment (hidden damage), proceed as follows:

- Make the party responsible for the damage liable as soon as possible by telephone and in writing, and prepare a damage report.
- Observe the time periods applicable to such actions in the respective country. Inquire about these in good time.

With hidden damage, it is very hard to make the transportation company (or other responsible party) liable. Any insurance claims for such damages can only be successful if relevant provisions are expressly included in the insurance terms and conditions.

4.3 Storage of shipments

When selecting and setting up the storage location, ensure the following:

- Protect stored goods against moisture (flooding, water from melting snow and ice), dirt, pests such as rats, mice, termites and so on, and against unauthorized access.
- Store the crates on timber beams and planks as a protection against rising damp and for better ventilation.
- Ensure sufficient carrying capacity of the ground.
- Keep entrance paths free.
- Check stored goods at regular intervals. Also take appropriate action after storms, heavy rain or snow and so on.
4.4 Unpacking shipments and checking for transportation damages

- Wherever possible keep the crate packaged for transport to the place where installation will take place.
- When unpacking, check the condition of the packaged goods.
- Check completeness based on the delivery slip.
5 Connecting lamp panel

**WARNING**

Electric shock

Danger of death due to electrical voltage when assembling and connecting the device.

▸ De-energize device and system periphery and lock to prevent switching back on again.

**NOTICE**

Damage to device due to electrical voltage!

If electrical voltage is present when connecting the device, individual components may be damaged.

▸ Before connecting the device, make sure it is de-energized!

**NOTICE**

Damage to device due to failure to comply with the connection diagrams!

Failure to comply with the connection diagrams may result in the device being damaged.

▸ Connect the device in accordance with the connection diagrams, also see Annex [► 25].

▸ Be aware of modified connection diagrams if replacing a previous model.

5.1 Electromagnetic compatibility

The device has been developed in accordance with applicable EMC standards. The following points must be noted in order to maintain the EMC standards.

5.1.1 Wiring requirement of installation site

Note the following when selecting the installation site:

• The system's overvoltage protection must be effective.

• The system's ground connection must comply with all technical regulations.

• Separate system parts must be joined by a potential equalization.

• The device and its wiring must be at least 10 m away from circuit-breakers, load disconnectors and busbars.
5.1.2 Wiring requirement of operating site

Note the following when wiring the operating site:

- The connection cables must be laid in metallic cable ducts with a ground connection.
- Do not route lines which cause interference (for example power lines) and lines susceptible to interference (for example signal lines) in the same cable duct.
- Maintain a gap of at least 100 mm between lines causing interference and those susceptible to interference.

![Diagram of recommended wiring]

**Figure 3: Recommended wiring**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cable duct for lines causing interference</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>Line causing interference (e.g. power line)</td>
<td>4</td>
</tr>
</tbody>
</table>

- Short-circuit and ground reserve lines.
- The device must never be connected using multi-pin collective cables.
- Signal lines must be routed in a shielded cable.
- The individual conductors (outgoing conductors/return conductors) in the cable core must be twisted in pairs.
- The shield must be fully (360°) connected to the device or a nearby ground rail.

Using "pigtails" may limit the effectiveness of the shielding. Connect close-fitting shield to cover all areas.
5.1.3 Wiring requirement in control cabinet

Note the following when wiring the control cabinet:

- The control cabinet where the device will be installed must be prepared in accordance with EMC requirements:
  - Functional division of control cabinet (physical separation)
  - Constant potential equalization (all metal parts are joined)
  - Line routing in accordance with EMC requirements (separation of lines which cause interference and those susceptible to interference)
  - Optimum shielding (metal housing)
  - Overvoltage protection (lightning protection)
  - Collective grounding (main grounding rail)
  - Cable bushings in accordance with EMC requirements
  - Any contactor coils present must be interconnected
- The device’s connection cables must be laid in close contact with the grounded metal housing or in metallic cable ducts with a ground connection.
- Signal lines and power lines/switching lines must be laid in separate cable ducts.
## 6 Technical data

### General technical data

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>Phoenix plug connectors with 0.25…0.75 mm² screw connections</td>
</tr>
<tr>
<td>Power supply</td>
<td>3 connection terminals (2 x power, 1 x PE), in a pluggable design</td>
</tr>
<tr>
<td>Input voltage</td>
<td>Via all-voltage power supply unit DC/AC 48…260 V (50/60 Hz), preliminary fuse 1 A</td>
</tr>
<tr>
<td>Activation</td>
<td>28 connection terminals (input 1…28), in a pluggable design</td>
</tr>
<tr>
<td>Motor-drive unit activation</td>
<td>9 connection terminals, in a pluggable design</td>
</tr>
<tr>
<td>Lamp test</td>
<td>2 connection terminals (potential-free N/O contact)</td>
</tr>
</tbody>
</table>
| Operating tempera
ture     | -25°C – +50°C                                                                              |
| Storage temperature | -25°C – +70°C                                                                            |
| Protection       | IP 20                                                                                      |
| Dimensions       | 96 x 192 x 116.5 mm                                                                        |
| Control panel section | 91 x 185 mm                                 |
| Fastening        | Fastening clip, Form B - DIN 43835                                                         |
| Installation depth | Maximum 125 mm (8 mm front frame height)                                                  |
| Weight           | approx. 800 g                                                                               |

Table 9: General technical data
7 Appendix

7.1 Connection to a continuous contact series, horizontal/vertical lamp panel
7.2 Connection to a decade contact series, horizontal/vertical lamp panel
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