

Operating Instructions for Medium-Voltage Products

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1 Important instructions for use

The products of Hans von Mangoldt GmbH are developed and manufactured according to the current state of the art. Before delivery, they are checked for their safe working condition. The products may only be used for their intended purpose. If they are not used for their intended purpose, situations can arise that result in damage to property and personal injury.

As manufacturer, Hans von Mangoldt GmbH does not provide any warranty, liability or compensation for damage caused by the use of the products that is not in accordance with their intended use. The risks associated with the use of the products that are not in accordance with their intended purpose lie solely in the hands of the user. The products must not be used if they are exposed to operating conditions that do not meet the prescribed ambient conditions.

2 Safety instructions

Do not install or operate this device until you have read all the documents supplied with it carefully. The safety instructions and all other instructions for use must be read before working with this unit. If you do not have any user instructions for the device, please contact Hans von Mangoldt GmbH.

Improper handling of these products and disregarding the warnings in the product documentation can lead to property damage, bodily injury, electric shock or in extreme cases to death!

- In the event of damage due to non-observance of the warnings, Hans von Mangoldt GmbH assumes no liability.
- Read the operating, maintenance and safety instructions in the product documentation before commissioning.
- Use trained and qualified employees for the handling of electrical systems: Only appropriately trained and qualified employees should work on or in the vicinity of this device. The employee is qualified if he/she is sufficiently familiar with the assembly, installation and operation of the product as well as all warnings and precautions in accordance with these operating instructions. Furthermore, the employees are trained, instructed or authorized to switch on and off medium-voltage circuits and devices in accordance with the provisions of safety engineering, to ground them and to label them appropriately in accordance with the work requirements. They must have adequate safety equipment and be trained in first aid.
- The information on the use of the delivered components given in the product documentation is only intended as examples of applications and suggestions. The manufacturer of the systems must check the suitability of the supplied components for his individual application, coordinate them with the safety regulations and standards applicable to his application and carry out the necessary measures, modifications and additions.
- Commissioning of the delivered components is prohibited until it has been established that the system in which they are installed complies with the country-specific regulations, safety regulations and standards of the application. It is the responsibility of the manufacturer of the plant to comply with the limit values required by national regulations.

3 Danger of incorrect use

	DANGER	High electrical voltage and high operating current! Danger of death or serious bodily injury due to electric shock!
	DANGER	Dangerous movements! Risk of death, serious bodily injury or property damage due to unintentional movements of the products!
	WARNING	High electrical voltage due to incorrect connection! Risk of death or bodily injury from electric shock!
	WARNING	Health hazard for persons with heart-pacemakers, metal implants and hearing aids in the immediate vicinity of electrical equipment!
	CAUTION	Hot surfaces on product or housing components possible! Risk of injury! Risk of burns!
	CAUTION	Risk of injury from improper handling! Personal injury caused by crushing, shearing, cutting, knocking or improper handling during assembly!

4 Assembly

- The Hans von Mangoldt GmbH recommends mechanical mounting:
 - V2A hexagon socket head screw M12 x... , DIN 933
 - Washer M12-DIN125-A-140HV in version V2A
- Check whether components show visible damage. Damaged components must not be mounted.
- Ensure that the dimensions and tolerances on the plant-side are suitable for product installation.
- Ensure that installation is carried out in a clean, dry and dust-free environment.
- Have tools and auxiliary materials as well as measuring and testing equipment ready.
- Check all components, mounting surfaces and threads for cleanliness.
- Remove the transport screws.
- Use the medium-voltage supports only on the product with which they were supplied and at the intended place of installation. Do not damage the supports during installation. First connect the product to the supplied supports. Use the screws supplied with the product or supports.
- Connect the base plates of the product to the system.
- Remove the transport lock of the vibrating metals. Keep the transport lock for future use.
- Check the strength of the joint before proceeding.
- Record all performed tasks in the commissioning log.

5 Electrical connection

The electrical connection of the products must be carried out properly, as improper connection weakens the electric strength and can lead to the complete destruction of the product.

The necessary minimum distance due to the electrical range of the connection must be ensured by screwing the cable or rail connection as shown in Figure 1. The cable lug or the connecting rail is screwed on top of the product connection. The position of the screw heads is determined by the position of the winding start. If the start of the winding is at the bottom of the winding, the connection must be made with the screw head at the top (top). If the start of the winding is above the winding, then the screw heads are at the bottom (middle). At the end of the winding, the screw heads are positioned at the top (bottom). The length of the screws should be as short as possible. The maximum screw length in the test is 50 mm.

The start of the winding can be recognized by the fact that the connection is led out by means of a copper bar (top and middle). The end of the winding is located directly at the winding (bottom).

- Always screw the connection as shown in Figure 1 on the left.
- Use the information provided by Hans von Mangoldt GmbH in Figure 1. When using other screws, make sure that the dimensions are identical.

connection (mm)	screw	washer	nut	lock washer	torque (according to DIN 9137/3 T.1, strength class 8.8)
11	M10, DIN6912 max. length 50	M10, DIN125	M10, DIN934	M10, DIN6796	45 Nm
14	M12, DIN6912 max. length 50	M12, DIN125	M12, DIN934	M12, DIN6796	75 Nm

Table 1: Recommended screw coupling for electrical connection

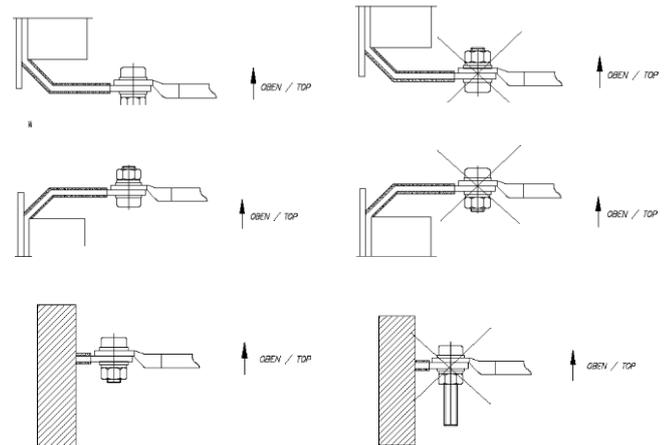


Figure 1: Principle sketches of screw connection at the electrical connection, top or bottom of the coil optional.

- Check that the bridge between the winding parts is firmly connected. If there are medium-voltage supports, check whether the bridge is firmly connected to the passive components of the product above the medium-voltage supports.
- Connect only the tappings to the system that you need.
- Connect the system wires or cables.
- Check that there is no mechanical stress on cables or wires.
- Check the strength of the joint before proceeding.
- Record all performed tasks in the commissioning log.

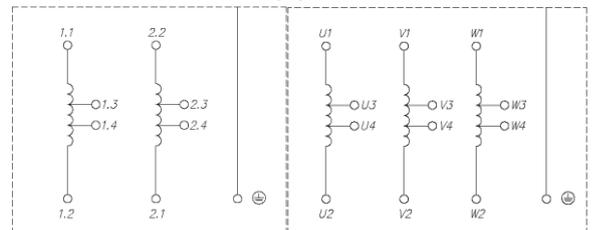


Figure 2: Wiring diagrams for single-phase (left) and three-phase (right) products with two tappings

6 Commissioning

- Check the utilization of the product under normal operating conditions and verify the measured data on the basis of the product range.
- Also check the load under maximum load, if possible.
- Check the thermal load of all system components.
- Record all measurements carried out in the commissioning log.

7 Decommissioning and dismantling

- Follow the instructions in the system documentation.
- Disconnect the system from the power supply.
- Secure the system against operation by unauthorized persons.
- Wait for the discharge time of the electrical systems and then disconnect all electrical connections.
- Allow the products to cool sufficiently long after switching off and before access.
- Before disassembly, secure the product and supply lines against falling or movement before disconnecting the mechanical connections.
- Store the product properly..
- Make a note of all measures performed in the commissioning report and the plant maintenance plan.

8 Maintenance

The products of Hans von Mangoldt GmbH operate maintenance-free within the specified operating conditions and service life. However, operation under unfavourable conditions can lead to restrictions on availability.

- Increase availability through regular preventive maintenance. Observe the information provided by the system manufacturer and the maintenance measures described below.
- Log all maintenance tasks in the asset maintenance plan.
 - Visual inspection:
 - According to the plant plan, but at the latest after one year of operation. Carry out regular visual inspections of the products. Pay particular attention to discoloration, which could indicate thermal overload.durch.
 - Check mechanical and electrical connections:
 - According to the plant maintenance plan, but at the latest after one year of operation.
 - Remove dust and other dirt from product components and connections:
 - Depending on the degree of soiling, but no later than after one year of operation.
 - Impurities that may affect the functioning of the system must be removed. Make sure that the insulation is not damaged. Use compressed air, for example.

9 Contact us

We can help you quickly and efficiently by providing the following information:

- Information on the nameplate of the relevant products, in particular type and test numbers.
- Telephone, fax numbers and email address under which you can be contacted for further inquiries.

Should you require further information, we will be happy to assist you:

Hans von Mangoldt GmbH
Hergelsbendenstraße 18
D-52080 Aachen, Germany
phone: +49 - 241 - 16607 - 0
fax: +49 - 241 - 16607 - 21
email: info@mangoldt.com

The contact possibilities are also available on the Internet. You can also find the current version of the product documentation on the Internet: www.mangoldt.com