

Operating Manual

BROSA Amplifier in Housing, type 0606

English translation of German original operating manual

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1 General information

Read the operating instructions and the product-specific documents carefully before commissioning the sensor.

Make sure that the sensor is fully suitable for the applications in question.

Improper use or any use other than intended may result in a malfunction of the sensor or undesirable effects in your application. For this reason, installation, electrical connection, commissioning and maintenance of the sensor may only be carried out by trained personnel authorized by the plant operator.

We also expressly point out that any liability is excluded if instructions in this documentation are disregarded.

The specified properties apply exclusively in the unchanged delivery condition. Applicable standards and guidelines must be observed, especially when recoating.

Current certificates can be downloaded from the BROSA GmbH website.

Only the German version of this operating manual represents the original document.

1.1 Safety instructions – Explanation of symbols:



WARNING! This symbol indicates dangers that can lead to personal injury and property damage!

2 Description of the BROSA Amplifier in housing

2.1 Structure and functionality

BROSA Type 0606 amplifiers in housing are to be operated exclusively in combination with BROSA force measurement sensors. They are typically used when installation or attachment directly to the force measuring sensor is not possible or desired. This is particularly the case if the ambient temperature at the installation site of the force measuring sensor does not permit the permanent trouble-free operation of the amplifier.

In principle, all BROSA amplifier types can be supplied as amplifiers in housing. Depending on requirements, they can be offered in different designs to enable installation in a control cabinet or separately at a suitable location.

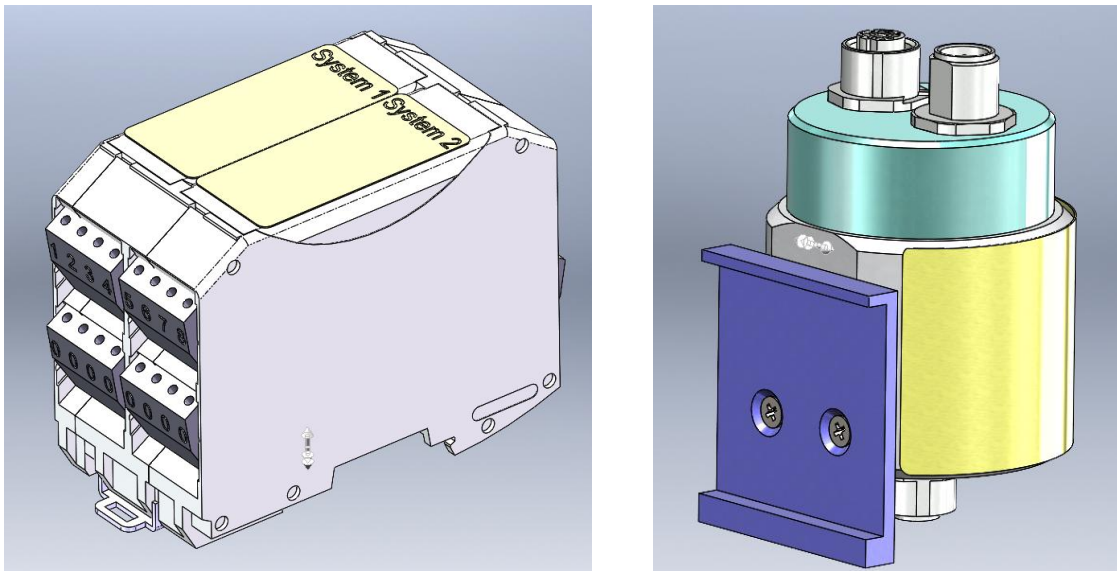


Figure 1, Figure 2: Amplifier in housing for top-hat rail mounting

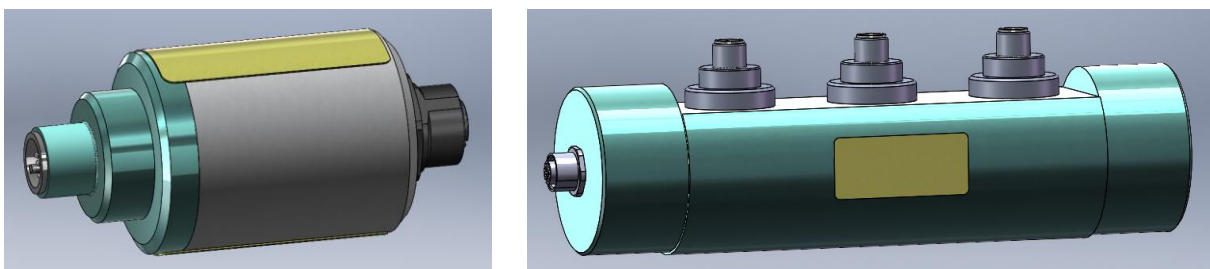


Figure 3, Figure 4: Amplifier in housing for mounting outside the control cabinet

Use underwater is generally possible after tests and approval by BROSA; there are special requirements for the materials and surface coatings used, as well as for the tightness and electrical connections.

There is also the possibility that the measurement result can be influenced by the water pressure.

The electrical connection is made according to the pin assignment shown on the technical data sheet. The place of installation should be chosen so that the packaged amplifier is installed in a place where it is best protected against mechanical damage, strong vibrations and the effects of heat.

Versions with two measuring systems, either with output signals on separate connectors/cables or combined in one plug/cable, are available as options. More information can be found in the technical data sheets, which can be obtained free of charge from BROSA.

2.2 Information on explosion protection

The type 0606 Amplifier in housing is optionally available in an intrinsically safe design for use in potentially explosive atmospheres. The current certificates are available for download on the BROSA homepage.



Use of the intrinsically safe amplifiers in housing in zone 0 is not allowed.

3 Advice on the safe handling of BROSA force measuring sensors




WARNING! Non-compliance with the following instructions can lead to sensor damage and/or impairment of measurement results. The analysis of an erroneous measurement can result in personal injury or material damage.



WARNING! Despite their sturdy design, BROSA sensors may not be used for any other than the intended purpose. With improper use, dangers to life and limb of the user or third parties and/or impairment of the device in which the sensor is implemented or other material assets can be caused.

3.1 Handling

 **WARNING!** BROSA sensors contain high-quality measurement electronics. Make sure they are handled carefully.


- BROSA amplifiers in housing are delivered in transport-safe packaging. We recommend that you remove the sensors from the package immediately prior to installation.
- BROSA sensors must be secured against falling. Do not throw sensors!
- Use as a tool (e.g., impact, slotting or lever tool) is not permitted; it can cause damage to the sensor and thus falsify the measurement results.

3.2 Installation and commissioning

3.2.1 General information

We recommend taking the following actions in the given order using the “four-eye principle”.

- a) Checking the amplifier in housing measuring point assignment: It must be ensured that the amplifier-sensor combination to be installed is intended for use at the intended measuring point. For this purpose, the information on the technical data sheet and the nameplate, in particular, the item or ID number and the measuring range, must be compared with the data of the measuring point.

 **WARNING!** An amplifier not designed for the respective sensor must not be installed.

- b) Checking the packaged amplifier for intactness and function: It must be ensured that the amplifier to be installed is free of damage of any kind.

 **WARNING!** A damaged sensor must not be installed!

- c) Establishment of electrical connection: The elements for the electrical connection in the amplifier, including the ground connection if necessary, must

be connected to the power supply and the evaluation system of the device as well as the force measuring sensor. In doing so, the information given on the nameplate for plug or cable assignment and, if applicable, the installation guidelines of the cable are to be observed.



WARNING! An incorrect or incomplete electrical connection impairs or prevents measurement.

- d) Functional check: After the mechanical and electrical installation has been completed, the amplifier-sensor combination should be loaded over the entire intended measuring range if possible; the output measurement signals must be subjected to a plausibility check.



WARNING! If due to unusual events (e.g., deformation or unusual noise), measurement results are considered implausible or there is suspicion that the sensor is malfunctioning for any other reason, it must not be put into operation.

3.2.2 Additional information for operation in areas subject to explosion hazards



Only those sensors with the corresponding labels are approved for use in areas subject to explosion hazards.

If the open cable end is connected inside an area subject to explosion hazards, the connection must be inside a terminal box/switching cabinet certified in accordance with ATEX-directive. If it is connected outside an area subject to explosion hazards, it must be in line with the general requirements for electrical equipment.

When using intrinsically safe (Ex-i) sensors, the use of an Ex-i isolator is required to limit the energy supplied to the hazardous area and to provide electrical isolation from all other non-intrinsically safe circuits.

3.2.2.1 Intrinsically safe sensors

The sensors with amplifier ExDANGmicro2W*** are to be installed according to the following specifications:

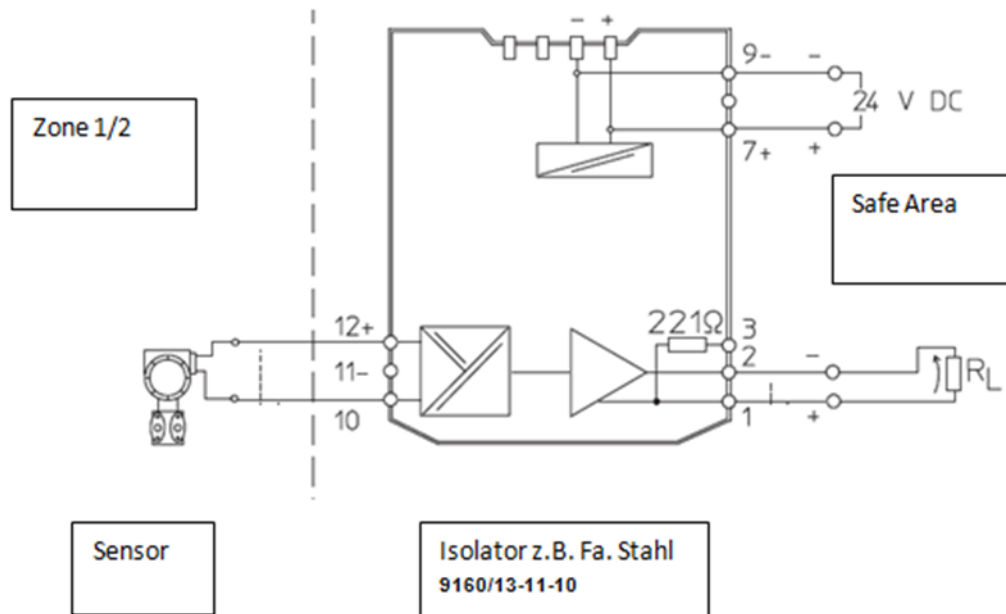


Figure 6: Connection example of the Ex i sensor with Ex DANGmicro2W*** amplifier

The supply and the measurement signal are guided over isolation amplifiers in the areas subject to explosion hazards. Isolation amplifiers from other manufacturers can also be used if they meet the safety-related limit values.

During installation, the distinction between the insulation resistance of the strain gauge resistance bridge and the sensor spring body must be taken into account. The amplifier type ExDANGmicro2W_A** is to be regarded as separate from the spring body. The amplifier type ExDANGmicro2W_B** is to be regarded as connected to the spring body in case of error.

The laying of the connection cable with the amplifier type ExDANGmicro2W_* B2 and type ExDANGmicro2W_* B4 requires protection against damage and tensile load, guaranteed by suitable installation.

The complete list of possible amplifier configurations can be found in the certificate.

3.3 Operation and maintenance

3.3.1 Operation

BROSA amplifiers in housing work automatically, no tools are required for operation. Direct manual intervention by the operator is not necessary; therefore, there are no requirements for the operator to wear protective equipment during operation. However, the relevant specifications for the device in which the force measuring sensor is installed must be observed.

BROSA amplifiers in housing emit neither airborne noise nor electromagnetic radiation.

The operation of BROSA amplifiers in housing is only permitted in combination with the corresponding force measuring sensor and within the parameters and properties given in the technical data sheets and on the nameplate. Among others, these are:

- Temperature range
- Pressure range
- Permissible supply voltage
- Electrical protection class
- Material

Inductive or capacitive coupling to the sensor connection cable(s) can falsify the measurement result and must therefore be avoided. Couplings of this type can, for example, arise through unfavourable cable routing (parallel high voltage power lines, frequency converters, transformers, motors, incorrect grounding/shielding, or similar).

When performing electric welding work near the sensor, disconnect and insulate all connections. It must be ensured that no welding current flows through the amplifier.



ATTENTION! Operation outside the specified parameters or contrary to the existing properties or use not in accordance with the intended purpose can damage the sensor and lead to its failure or result in incorrect measurement results.

3.3.2 Maintenance

BROSA sensors operate maintenance-free. As a preventive measure, each sensor must be checked regularly for proper condition. The intervals between tests depend on the intensity of use and must be determined by the end user.

A test includes the following items:

- Visual inspection for damage to the measuring body and wiring as well as contamination.
- Function test/plausibility check

The causes of existing errors are to be identified and remedied. If the test indicates an improper sensor state, it must be taken out of operation. If a malfunction or damage is detected on the sensor, it must be sent to the manufacturer's factory for diagnosis and, if necessary, repaired.



WARNING! The sensor may only be repaired in the factory. Intervention (e.g., opening, mechanical processing and the like) done by parties other than the manufacturer means the safe operation of the sensor is no longer ensured and voids the warranty.

3.4 Disassembly

We recommend performing the following actions in the order given.

- a) Disconnecting the electrical connection
- b) Removal of the sensor

3.5 Disposal

If the end of the service life is reached, the sensor is to be disposed of in an environmentally friendly way. Since the non-metallic components are a small proportion compared to the mass of the sensor, it can be recycled as a whole as scrap steel.

If the amplifier in housing is stored before final disposal, an appropriate storage location is to be selected which prevents harmful substances from entering the environment. If necessary, the sensor must be cleaned.



WARNING! BROSA amplifiers in housing contain traces of environmentally hazardous substances. This is also true of the impurities created during use. Contamination of the environment by these substances is to be prevented.