Operating Manual

BROSA Type 0606 Amplifier in housing

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 device.

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

Improper use or any use other than intended may result in a malfunction of the device or undesirable effects on your application. For this reason, installation, electrical connection, commissioning and maintenance of the device 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.

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:

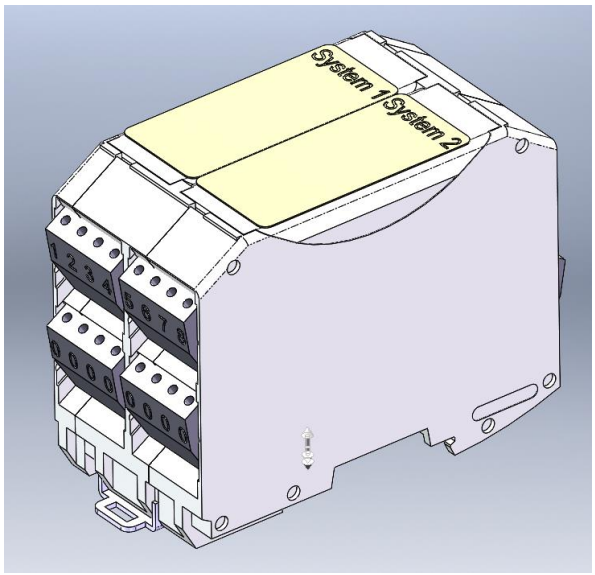
 WARNING! This symbol indicates dangers that can lead to personal injury and property damage!

2 Description of the BROSA Amplifier in housing

2.1 Structure and function

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 packaged amplifiers. Depending on requirements, they can be offered in different designs to enable installation in a control cabinet or separately at a suitable location.



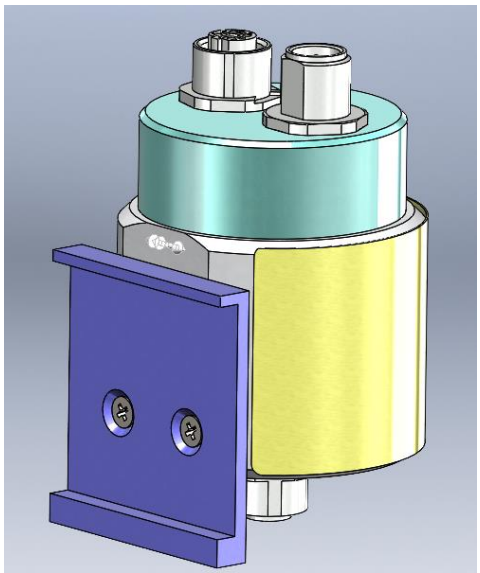
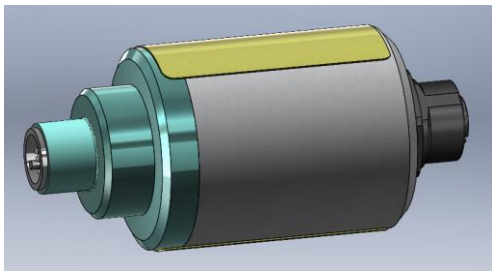


Figure 1, Figure 2: Amplifier in housing for top-hat rail mounting



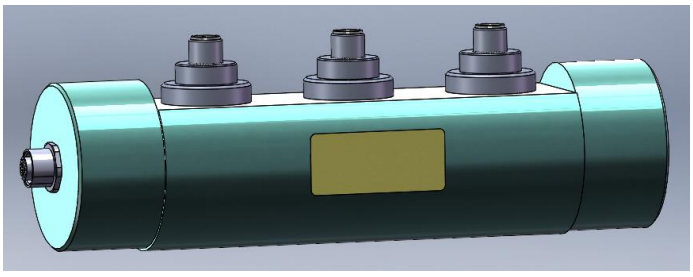


Figure 3, Figure 4: Amplifier in housing for mounting outside the control cabinet

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 packaged amplifiers in zone 0 is not allowed.

3 Advice on safe handling of BROSA force measuring sensors

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

 WARNING! BROSA packaged amplifiers may not be used for anything other than the intended purpose (see section 1.1). With improper use, dangers to life and limb of the user or third parties and/or impairment of the device in which the packaged amplifier is implemented or other material assets can be caused.

3.1 Handling

 WARNING! BROSA sensors contain quality measurement electronics. Make sure you handle them carefully.

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

3.2 Installation and commissioning

3.2.1 General

We recommended taking the following actions in the given order using the four-eye principle.

a) Checking the packaged amplifier - sensor - 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 that is 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 amplifier must not be installed!

c) Establishment of electrical connection: The elements for the electrical connection in the packaged 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 amplifier 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:

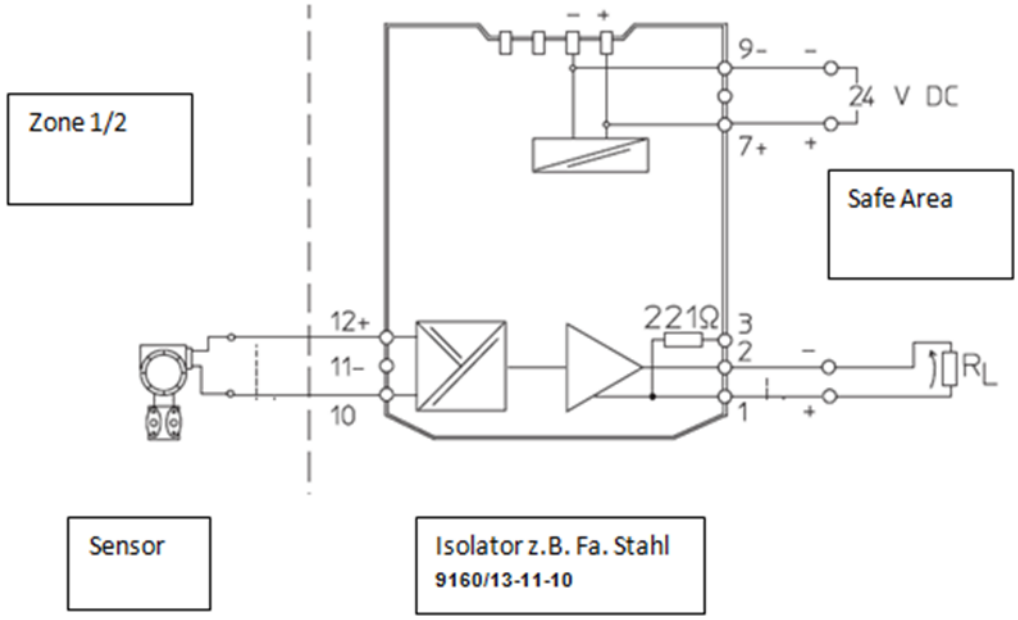


Figure 6: Connection example of the Ex i sensor with Ex DANGmirco2W*** amplifier

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 packaged amplifiers 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 packaged amplifiers emit neither airborne noise nor electromagnetic radiation.

The operation of BROSA packaged amplifiers 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:

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

Inductive or capacitive couplings to the connection cable(s) of the sensor can distort the measurement result and must be avoided. Some examples of these kinds of couplings are: caused by unfavourable cable routing (parallel power lines, frequency converters, transformers, motors, incorrect grounding/shielding and the like).

When performing electric welding in the vicinity of the amplifier, all connections must be disconnected and isolated. It must be ensured that no welding current is flowing through the amplifier.

 WARNING! Operation outside the specified parameters or contrary to existing properties or improper use may damage the amplifier and cause it to fail or output faulty measuring results.

3.3.2 Maintenance

In their capacity as sensors, BROSA packaged amplifiers are maintenance-free. Each angle sensor is to be inspected regularly for flawless condition as a preventive measure. The inspection intervals depend on the intensity of use and must be determined by the end-user.

An inspection includes the following points:

- Visual inspection for damage to the packaged amplifier and wiring as well as soiling
- Function test/plausibility check

The causes of any errors are to be identified and remedied. If the test indicates the amplifier is not in suitable condition, it must be taken out of operation. If a malfunction or damage is detected on the amplifier, it must be sent to the manufacturer's factory for diagnosis and, if necessary, repaired.

 WARNING! The packaged amplifier 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 guaranteed and voids the warranty.

3.4 Disassembly

We recommended performing the following actions in the given order.

a) Loosen the electrical connection
b) Removal of the packaged amplifier

3.5 Disposal

When the end of its service life has been reached, the packaged amplifier must be disposed of in an environmentally friendly manner. Since this consists largely of the built-in electronic components, it can be recycled as a whole as electronic waste.

If the packaged amplifier 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 packaged amplifiers contain traces of environmentally hazardous substances. This is also true of the impurities created during use. Contamination of the environment with these substances is to be prevented.