
ArgusOMDS | DynaMaster | DynaGo | SmartProtect

Component Manual

IfTA Charge Amplifier



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Specific Safety Instructions



Before using this product, the user has to be familiar with the general safety instructions. Use the separate **Safety Information** manual for this purpose.

This chapter only describes specific safety instructions for this product.

Field of Application

The *IFTA ChargeAmplifier* (CA) has been designed to be mounted as described in the chapter **Installation**. Other uses are not permitted due to safety aspects.

Use in potentially explosive Atmospheres

The CA can be installed in potentially explosive atmospheres. The product can be ordered with or without an external industrial housing as described in the chapter **Component Layout**.

In case the version without the industrial housing is used, the user has to ensure that the CA will be installed into a certified housing for the mounting in potentially explosive atmospheres.

The CA was certified within a complete *IFTA* measurement setup as shown in the chapter **Measurement Chain Example**. In order to get the best experience and measurement results we highly recommend to use the CA with this setup.

The certification is only valid within the technical specifications as described in the chapter **Specifications**.

For further information regarding the certifications please see chapter **Declarations**.



Please always verify that the components are marked with the special symbol as it is described in the separate **Safety Information** manual.

Product Description

The product is a charge amplifier to convert dynamic charge signals into a voltage signal for further analysis. It is usable for a wide range of sensor types and an essential part of the *IFTA* measurement setup.

Specifications

Features

- Support of Piezo pressure and acceleration sensors
- Certified according to IEC/EN 60079-0 and IEC/EN 60079-7
- A wide range of different sensitivities are available as shown in the chapter *Ordering Information* (others on request)
- Available for wall mounting, with DIN rail or with Ex certified housing

Environmental

Operating temperature: -20 ... 75 °C

Storage temperature: -40 ... 85 °C

Humidity: 0 ... 95 % non-condensing

Pollution degree: The device may only be used in areas with pollution degree 2 or better, as defined in IEC/EN 60991-1.

General

Charge Amplifier

Case material: Sheet steel, galvanized

Weight: 175 g

Dimensions: See *Figure 1*

Protection class: For Ex environment the CA must be installed in an enclosure that provides a degree of protection not less than IP54 in accordance with IEC/EN 60079-0.

Fire protection class: UL94V-0 self-extinguishing

Industrial Housing (with mounted CA)

| | |
|------------------------|-------------------------------------|
| Material: | Fibreglass reinforced polyester |
| Seal: | Silicone sealing cord up to 130 °C |
| Weight: | 690 g (including a mounted CA) |
| Dimensions: | See Figure 3 |
| Protection class: | > IP 65 according to IEC/EN 60079-0 |
| Fire protection class: | UL94V-0 self-extinguishing |

Technical Data

| | |
|------------------|----------------------------|
| Frequency range: | 3 Hz ... 20,000 Hz (-3 db) |
| Linearity: | ± 1 % FSO |
| Thermal drift: | 100 ppm/ °C typical |

Signal Input

| | |
|---------------------|--|
| Valid input ranges: | ± 20 ... ± 1000 pC ¹⁾ |
| Input coupling: | AC |
| Input protection: | 100 Ω series resistor |
| Input termination: | 1 M Ω |

Due to its construction, the CA does not emit any current or voltage through its input terminals.

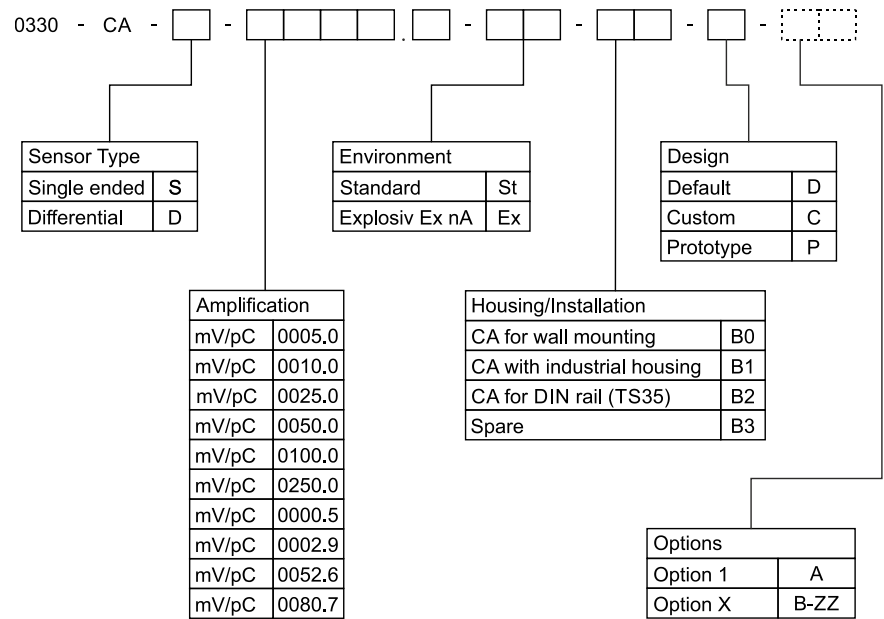
Signal Output and Power Supply

| | |
|----------------------|--|
| Output signal: | 12 V operating point; ± 5 V signal |
| IEPE current supply: | 8 ... 12 mA ²⁾ |
| Supply voltage: | 20 ... 28 VDC |

¹⁾ Option with enhanced input range available, see **Ordering Information - Option A**

²⁾ For the best performance the use of 12 mA is recommended.

Ordering Information



Option A

Frequency range: 100 Hz ... 20,000 Hz (-3 db)

Valid input ranges: ± 20 ... $\pm 10,000$ pC

Component Layout

As mentioned above the CA is available in different versions:

- For wall mounting
- With DIN rail
- With Ex certified industrial housing

This chapter describes all three possibilities.

Charge Amplifier for Wall Mounting (B0)

Dimensions

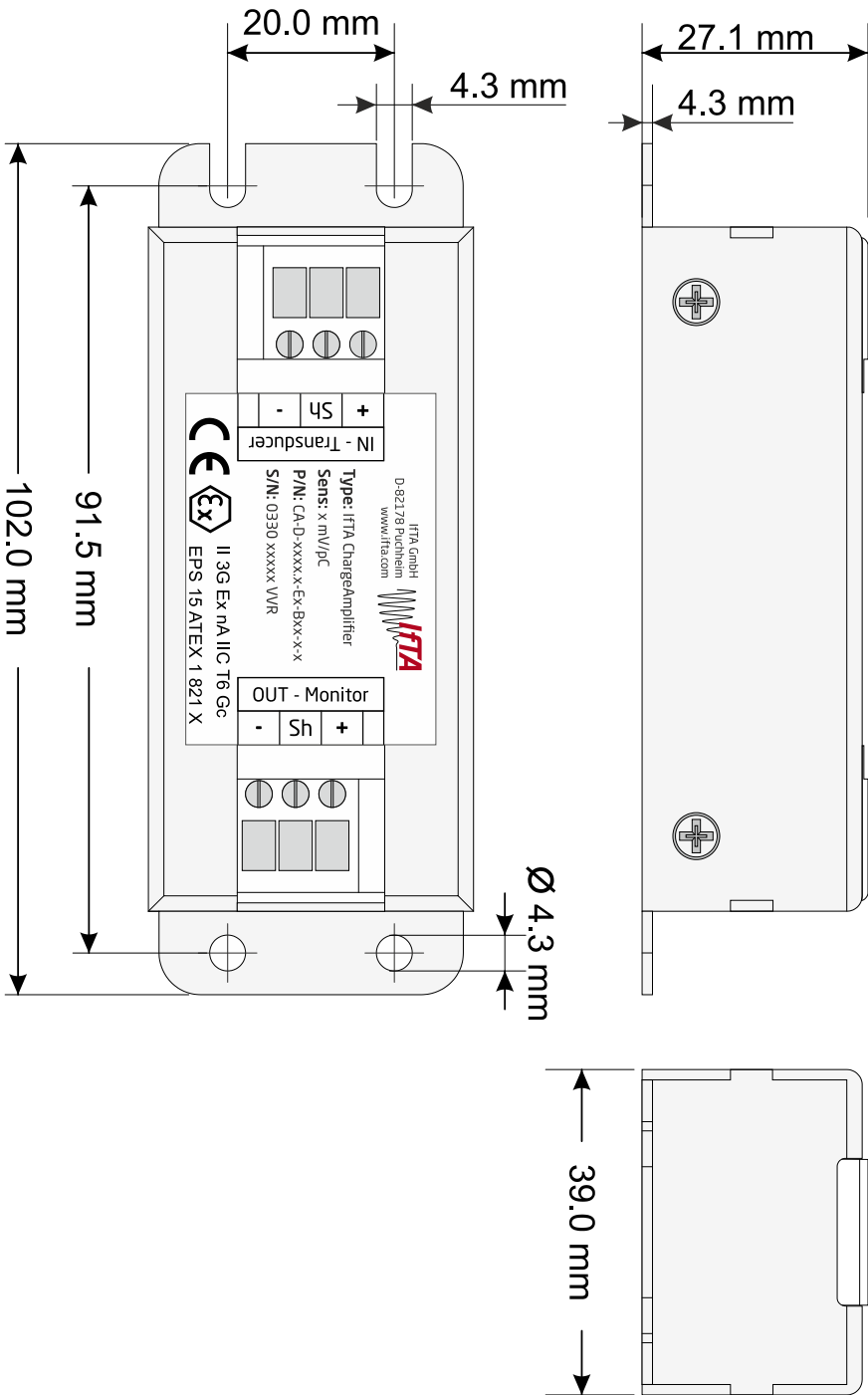


Figure 1: Dimensions of the CA for wall mounting (figure similar, subject to modification)

Layout

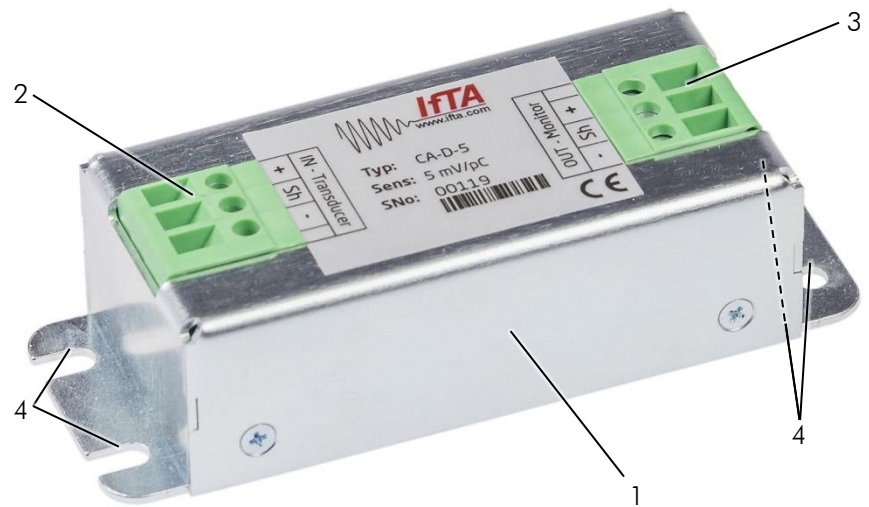


Figure 2: Layout of the CA for wall mounting (figure similar, subject to modification)

(1) Case

Housing of the CA

(2) Transducer - Input

3 pin screw terminal (the exact pin assignment is shown in **Figure 7** and **Figure 8**)

(3) Monitor - Output

3 pin screw terminal (the exact pin assignment is shown in **Figure 7** and **Figure 8**)

(4) Fixing Points

Four fixing points for the mounting of the CA (for details regarding the mounting see **Installing a Charge Amplifier**)

Charge Amplifier with industrial Housing (B1)

Dimensions

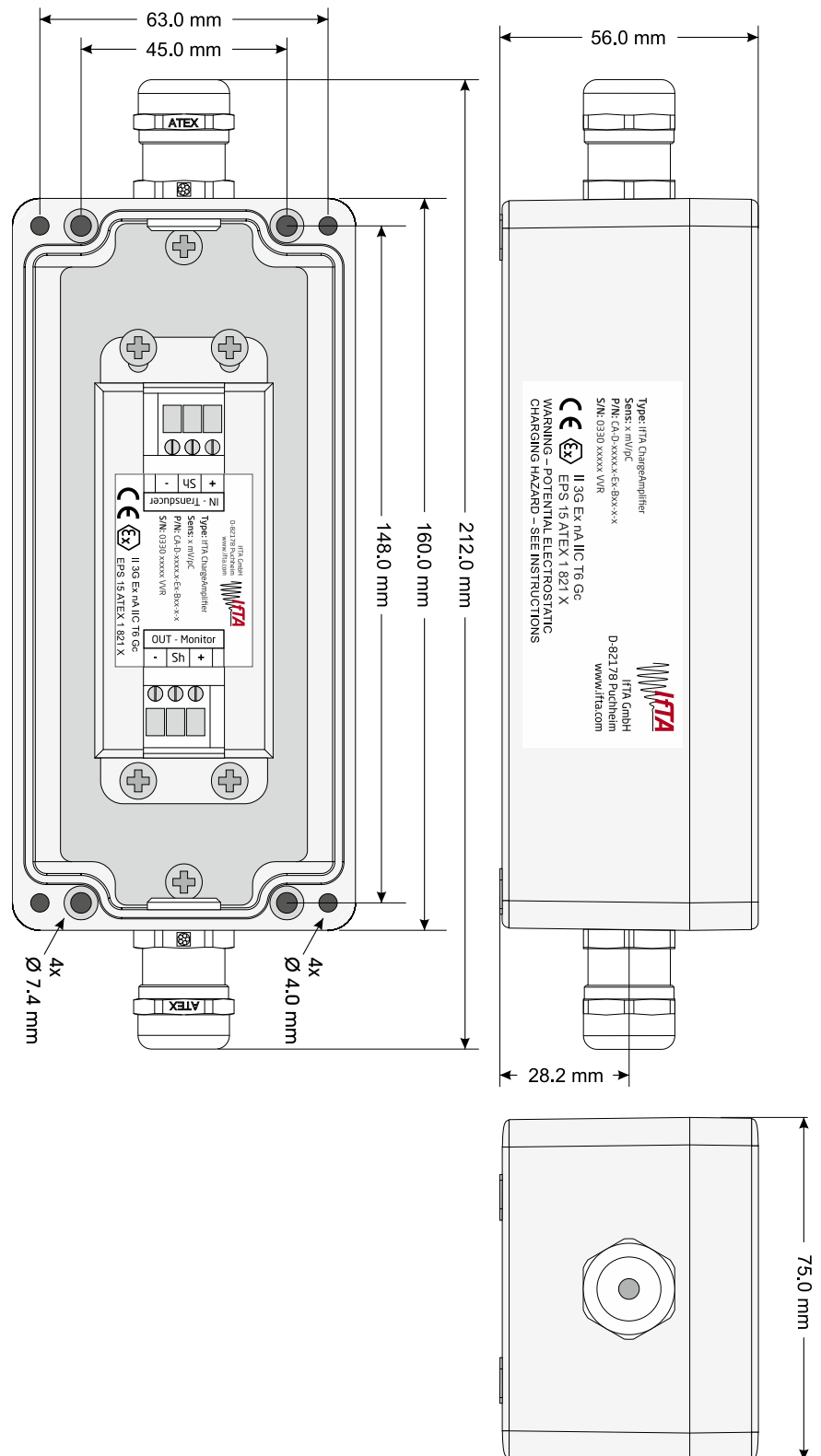


Figure 3: Dimensions of the industrial housing (figure similar, subject to modification)

Layout

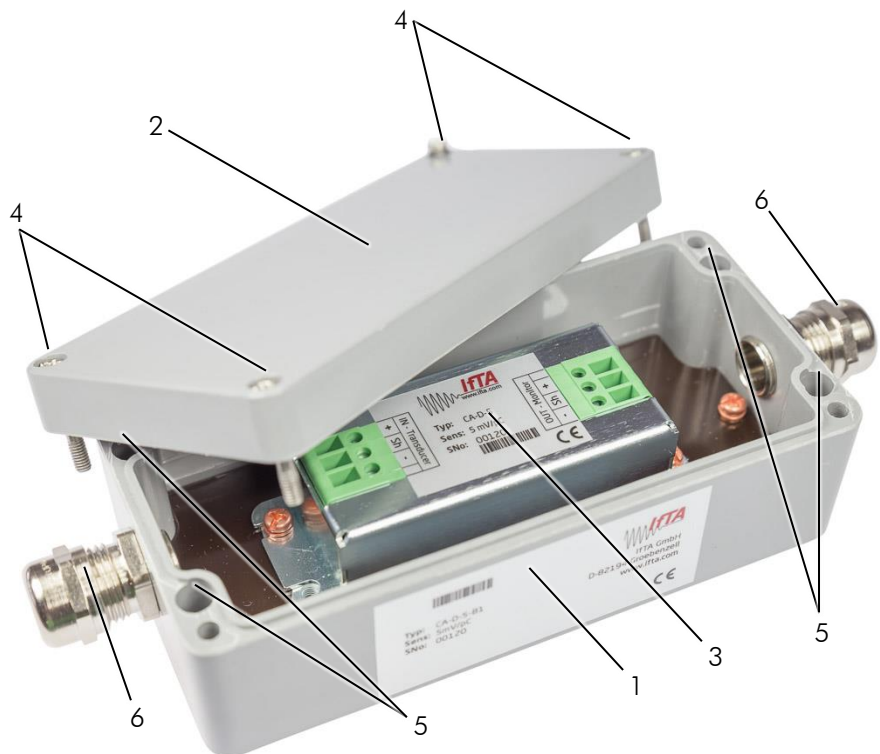


Figure 4: Layout of the industrial housing (figure similar, subject to modification)

(1) Industrial Housing

Ex certified industrial enclosure for the CA

(2) Cover

Cover of the industrial housing

(3) Charge Amplifier

Mounted CA

(4) Cover Screws

Four screws to attach the housing cover

(5) Fixing Points

Four holes for the mounting of the industrial housing (for details regarding the mounting see chapter *Installing a Charge Amplifier with industrial Housing*)

(6) Stuffing Gland

For the installation of the cables

Charge Amplifier with DIN Rail (B2)

Dimensions

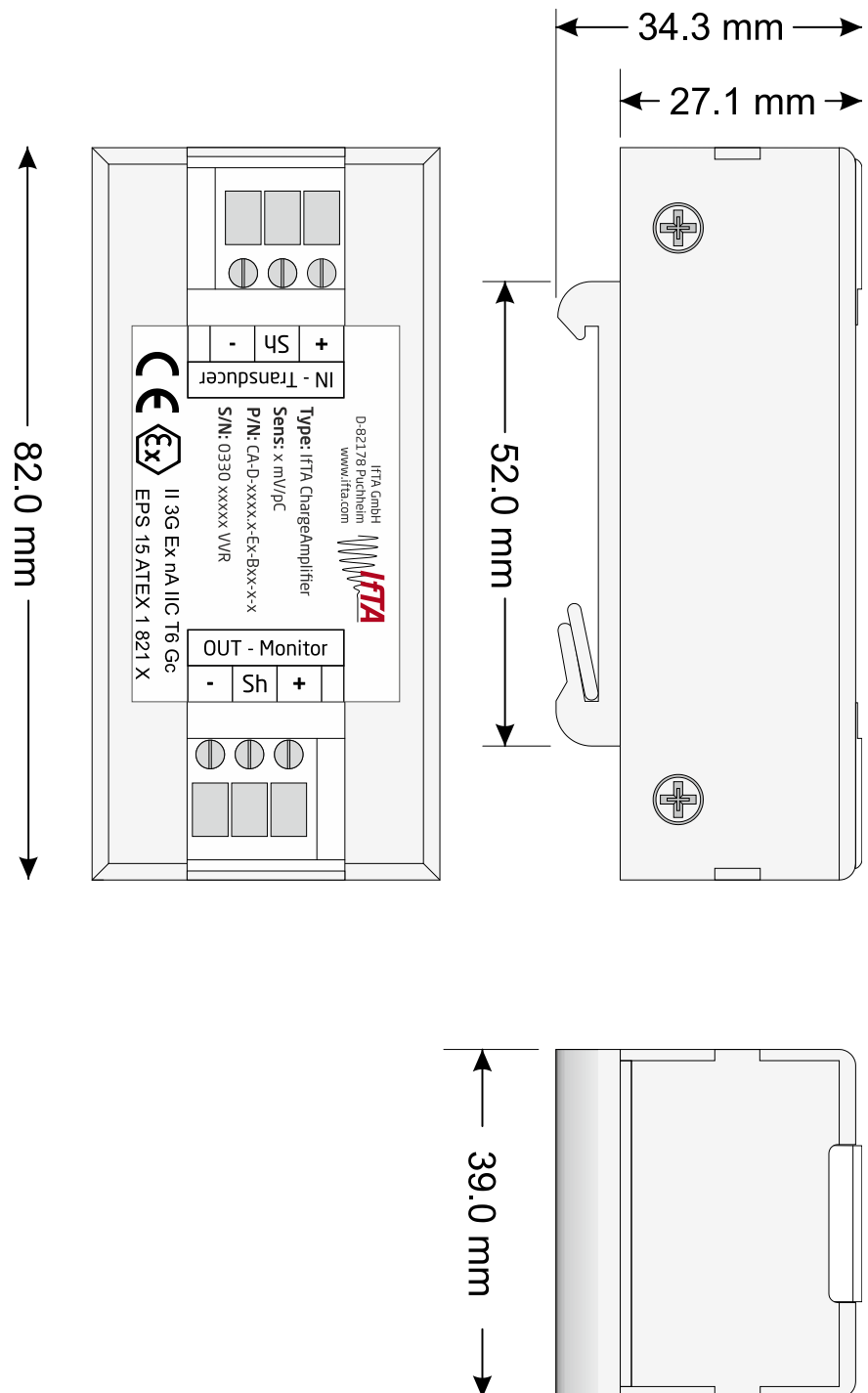


Figure 5: Dimensions of the CA with DIN rail (figure similar, subject to modification)

Layout

Beside the four fixing points, the layout is comparable to the version for wall mounting (see **Figure 2**).

Technical Description

Schematics

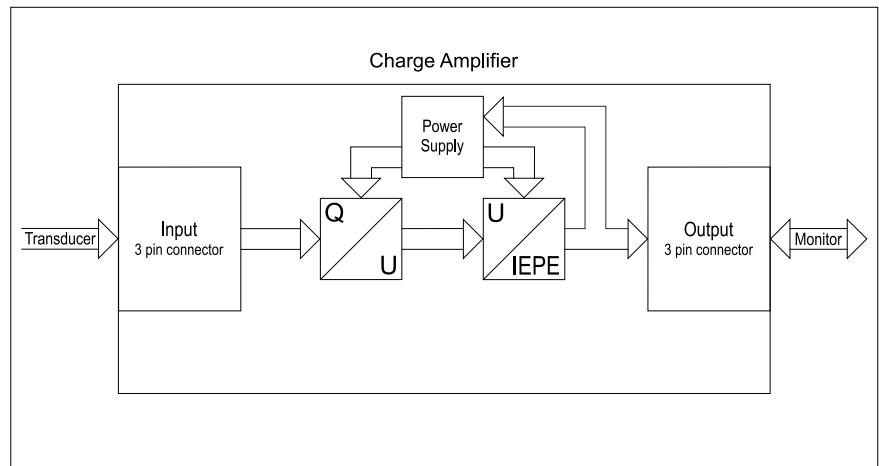


Figure 6: Schematics of the CA (figure similar, subject to modification)

Pin Assignment

For detailed information regarding the pin assignment see **Figure 7** and **Figure 8** below.

Measurement Chain Example

The CA is best used in a measurement setup with the ARGUS® OMDS® system. This chapter includes two example configurations for both differential and single ended mode and the use with an ARGUS® OMDS® system. The schematics are shown in the **Figure 7** and **Figure 8** below.

Differential Mode

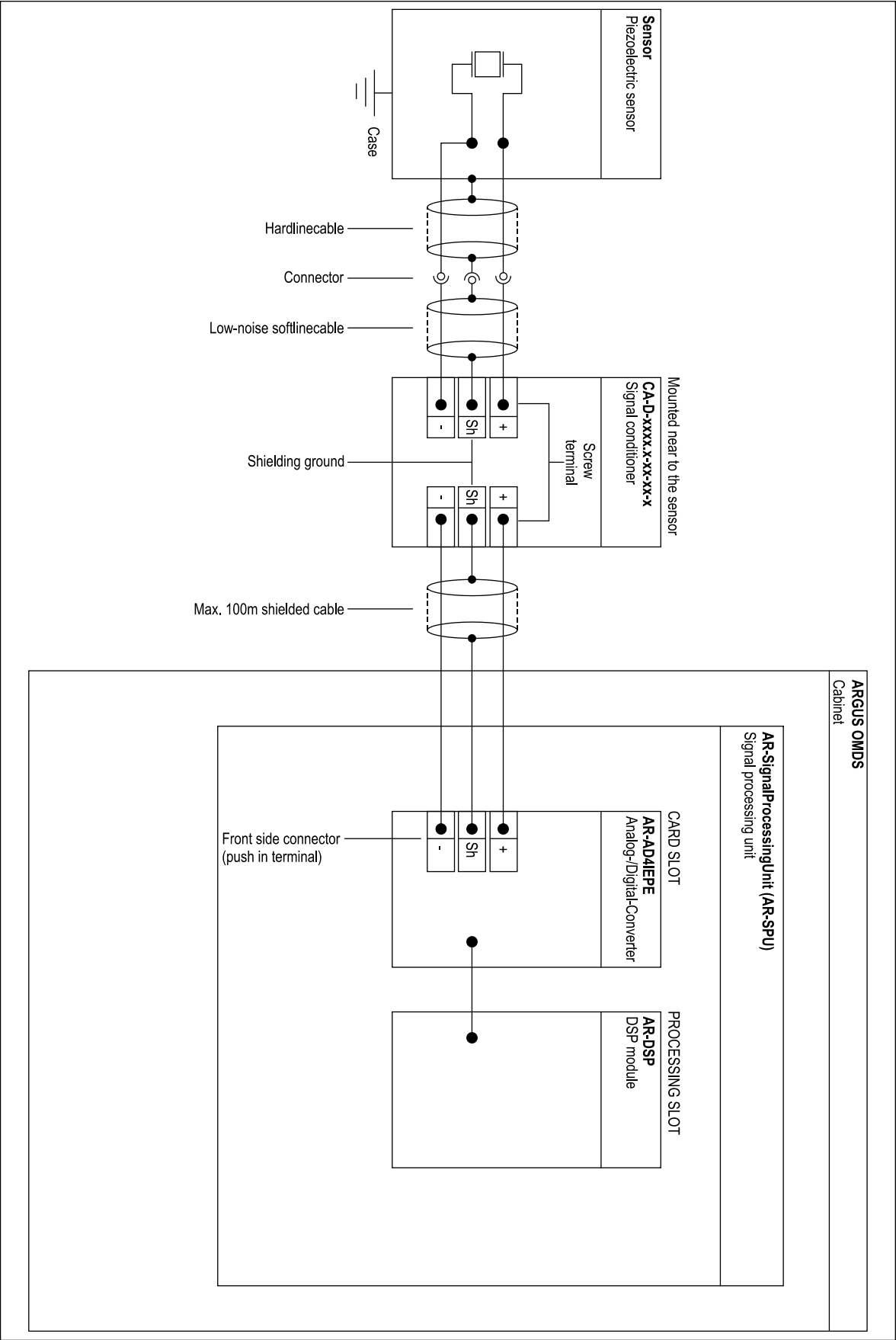


Figure 7: Schematics of the differential mode measurement chain (figure similar, subject to modification)

Single ended Mode

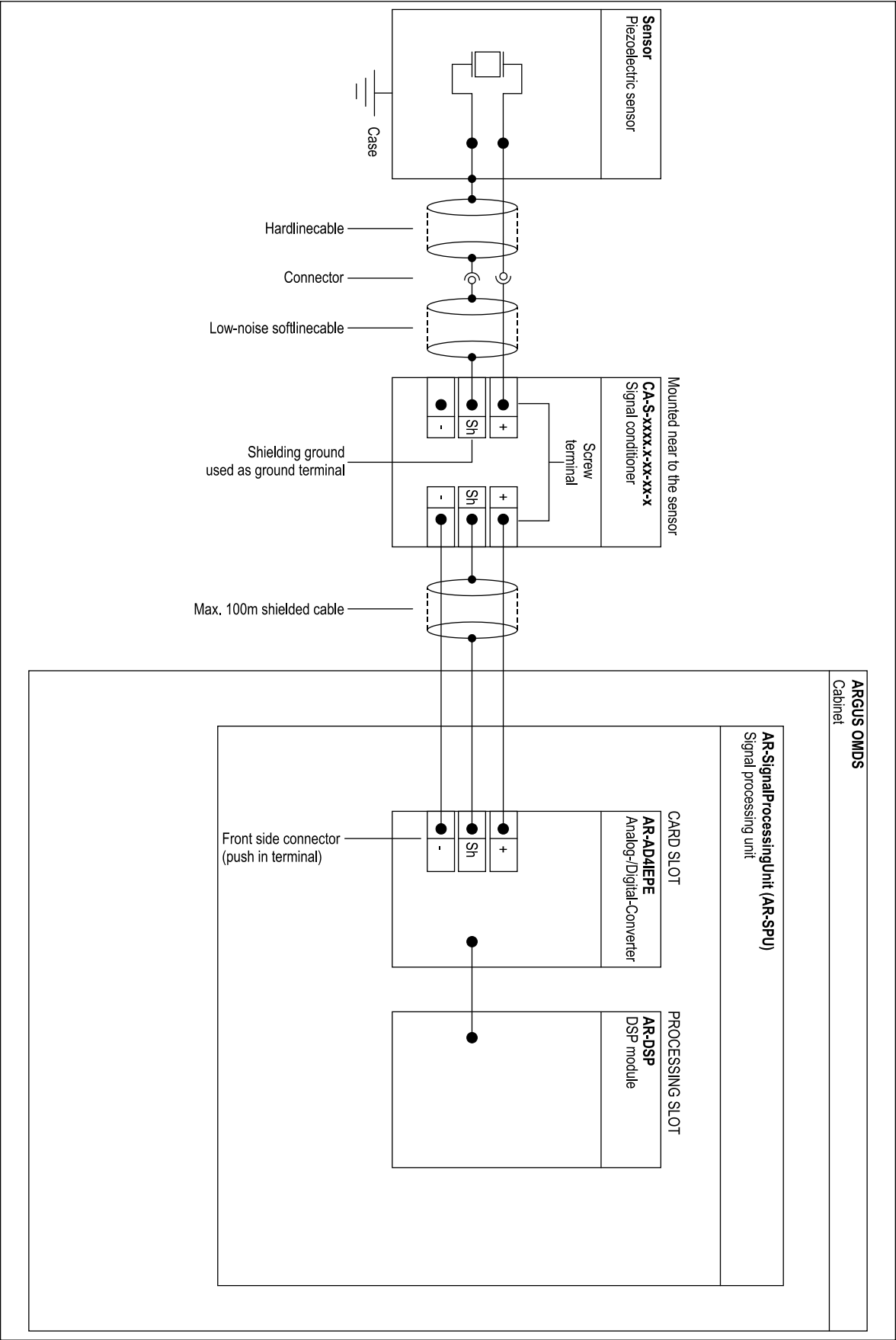


Figure 8: Schematics of the single ended mode measurement chain (figure similar, subject to modification)

Installation

Installing a Charge Amplifier with industrial Housing

Mounting of the industrial Housing

- (1) Choose a vibration-free place for the mounting.
- (2) Remove the cover of the industrial housing by unscrewing the four cover screws (see **Figure 4**).
- (3) Use the four fixing points (see **Figure 4**) to mount the housing on a suitable surface.
- (4) Continue with the steps described in the chapter below.

Connecting Cables



Risk of electrostatic discharge. Equipment for fixed installation where the installation is intended to minimize the risk from electrostatic discharge. Clean with damp cloth only. Not suitable for application with strong electrostatic charging processes.

Industrial Housing

- (1) Loosen the stuffing glands (see **Figure 4**).
- (2) Pass the cables through the stuffing glands into the designated position.
- (3) Tighten the stuffing glands and verify that the cables are securely fastened by the stuffing glands to ensure a proper sealing.
- (4) Continue with the next chapter to connect cables to the charge amplifier.

Charge Amplifier



Before connecting anything to the charge amplifier, ensure to be familiar with the requirements as shown in the chapter **Specifications** and the terminal specifications as shown below.

The charge amplifier has two 3 pin screw terminals for the signal in- and output as shown in **Figure 2**. The terminal specification is as follows:

| | |
|--------------------|--|
| Valid cable types: | 0.2 ... 2.5 mm ² solid wire |
| | 0.2 ... 2.5 mm ² flexible |
| | 0.25 1.5 mm ² flexible with end sleeve |
| | AWG24 ... AWG14 |
| Stripping length: | 9.0 mm |
| Tightening torque: | 0.4 ... 0.5 Nm |

- (1) Ensure that the cable type is fitting the described specification above.
- (2) Connect the cable to the corresponding pin of the two screw terminals (the exact pin assignment is shown in **Figure 7** and **Figure 8**).
- (3) Install the cover of the industrial housing again.

Installing a Charge Amplifier without Housing

Mounting of the Charge Amplifier



The user has to ensure that the CA will be installed into a certified housing for the mounting in potentially explosive atmospheres.

Charge Amplifier for Wall Mounting

Use the four fixing points (see **Figure 2**) to mount the CA into a suitable housing.

Charge Amplifier with DIN Rail

Use the DIN rail at the back to mount the CA into a suitable housing.

Connecting Cables

Please use the chapter *Connecting Cables - Charge Amplifier*.

Declarations



EC Declaration of Conformity

Address: IfTA Ingenieurbuero fuer Thermoakustik GmbH
Industriestrasse 33
D-82194 Groebenzzell
Germany

Product: Charge Amplifier

Model: CA-x-xxx-Ex-Bx

The product complies with the requirements of the following European directives:

2014/30/EU Electromagnetic Compatibility (EMC)

2011/65/EU Restriction of Hazardous Substances (RoHS)

94/9/EC¹
2014/34/EU² Potentially Explosive Atmospheres (ATEX)

Compliance was proved by the application of the following standards:

EMC: EN 61326-1:2013

ATEX: EN 60079-0:2012 + A11:2013
EN 60079-15:2010

Year of CE marking: 2016

2017-10-05, Groebenzzell
Date / Place


Dr. Jakob Hermann, General Manager

¹ Valid until 2016-04-19

² Valid from 2016-04-20

We declare that the product is only affected by minor or formal changes in respect to the new edition of the standard. These changes are not relevant for compliance with the EHSRs and consequently the product still complies with the ATEX directive.



FCC Declaration of Conformity

Address: IfTA Ingenieurbuero fuer Thermoakustik GmbH
Industriestrasse 33
D-82194 Groebenzell
Germany

Product: Charge Amplifier

Model: CA-x-xxx-xx-Bx

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Test Standards: 47 CFR Part 15: 10-2014
ANSI C63.4: 09-2009

Year of FCC marking: 2015

December 14th, 2015 / Groebenzell

Date / Place

[Signature]

Dr. Jakob Hermann, General Manager



Declaration of Conformity

Equipment: Charge Amplifier: CA-x-xxx-Ex-Bx
(see Annex 1 for nomenclature)

This equipment and any acceptable variation thereto are specified in Annex 1 to this certificate and the documents therein referred to.

Manufacturer: IfTA Ingenieurbüro für Thermoakustik GmbH
Address: Junkersstr. 8, 82178 Puchheim, Germany

The equipment mentioned in this declaration complies with the fundamental health and safety protection requirements according to

a) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres -
Directive 2014/34/EU

and the following standards: EN 60079-0:2012 + A11:2013
EN 60079-15:2010

b) Electromagnetic compatibility -
Directive 2014/30/EU

and the following standards: EN 61326-1:2013

This declaration of conformity is issued under the sole responsibility of the manufacturer.

Puchheim, 28 October 2019
Date / Place

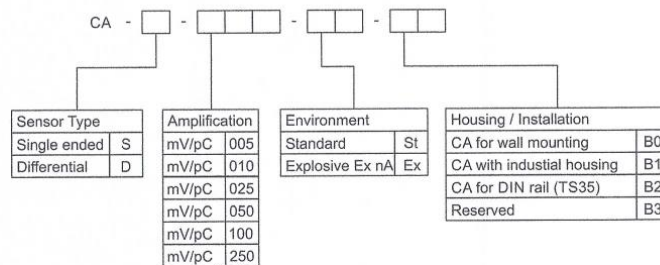

Dr. Jakob Hermann, General Manager

Annex 1

Description of equipment:

The equipment is a charge amplifier to convert dynamic charge signals into a voltage signal for further analysis. It is usable for a wide range of sensor types and an essential part of the IfTA measurement setup. The Charge Amplifier is available in two versions:

- Model CA-x-xxx-Ex, CA-x-xxx-Ex-B0 and CA-x-xxx-Ex-B2 are provided with functional enclosure only and are intended for built-in use, enclosure must be provided by the installation
 - Model CA-x-xxx-Ex-B1 is provided with enclosure
- Sensor type and amplification do not affect safety.



Electrical data:

Power supply: 20 - 28 Vdc; 8 - 12 mA

Test report: CA-002F_ATEX_TT01_V01

Special conditions for safe use:

- Special ambient temperature range: -20°C -< Tamb < +75°C
- For models with suffix "B0" or "B2" or without suffix (without enclosure) only: The equipment shall be installed in an enclosure that provides a degree of protection not less than IP 54 in accordance with EN 60079-15.
- For models with suffix "B1" (with enclosure) only: Equipment for fixed installations where the installation is intended to minimize the risk from electrostatic discharge (refer to instructions).

The marking of the equipment includes, among others, the following:

 II 3G Ex nA IIC T5 Gc

Puchheim, 28 October 2019
Date / Place


Dr. Jakob Hermann, General Manager

Appendix

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Technical Support

If you have any questions about the use of this product, please contact:

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