

Instruction Manual

PIEZOELECTRIC ACCELEROMETERS CA XXX / CE XXX

MACA-CE/E



CA 134



CE 134
transducer head



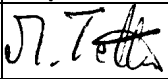
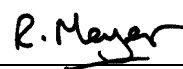
CE 134 attached
electronic conditioner



This document contains important information about products that are intended for use in potentially explosive atmospheres.

REVISION RECORD SHEET

Edition	Date of Issue	Written by /Modified by	PM No.	Description	Signature
1	23.07.97	R. Meyer /ew	-	Original edition in English language (translated from French version of manual)	---
2	28.07.99	R. Meyer / jlb	-	Cable layout diagrams modified to better show grounding technique (Figs 6-11, 6-23, 6-35)	
3	---	---	-	(Edition 3 skipped for English version to keep numbering consistent in all languages)	---
4	06.09.04	R. Meyer	-	General revision. Updated "Ex" information according to directive 94/9/CE.	

Master copy stored at : Technical Publications Department				
	Department	Name	Date	Signature
Technical content of original issue approved by	Development	H.-P. Aeby	4.8.97	
	Product Management	F. Micco	23.7.97	
Document released by	Technical Publications	R. Arnaud	04.08.97	

Copyright © Vibro-Meter S.A., 1995-2004

All rights reserved

Published and printed by Vibro-Meter S.A. in Fribourg, Switzerland

The names of actual companies and products mentioned
herein may be the trademarks of their respective owners.

The information contained in this document is subject to change without notice.
This information shall not be used, duplicated or disclosed, in whole or in part,
without the express written permission of Vibro-Meter.

THIS PAGE INTENTIONALLY LEFT BLANK

TABLE OF CONTENTS

TITLE PAGE	i
REVISION RECORD SHEET	ii
COPYRIGHT	iii
TABLE OF CONTENTS	v
PREFACE	ix
About This Manual	.ix
Who Should Use This Manual?	.ix
Related Documentation	.ix
SAFETY	xi
Symbols and Styles Used in This Manual	.xi
Important Remarks on Safety	xii
Location of Safety Symbols	xii
Additional Remarks	xii
Equipment Used in Potentially Explosive Atmospheres	xiii
General Handling Precautions	xiii
Handling Precautions for Electrostatic Sensitive Devices	xiv

Part I : Background Information

1 INTRODUCTION	1-1
1.1 Choice of Transducer Type	1-1
1.2 Applications	1-5
1.3 Measurement Principle of Piezoelectric Accelerometers	1-6
1.4 Accelerometer Categories	1-8
1.4.1 Accelerometers with Separate Electronic Conditioner	1-8
1.4.2 Accelerometers with Attached Electronic Conditioner	1-9
1.4.3 Accelerometers with Incorporated Electronic Conditioner	1-10

2	MEASUREMENT CHAINS	2-1
2.1	Accelerometer with Connector + Separate Electronic Conditioner	2-1
2.2	Accelerometer with Integral Cable + Separate Electronic Conditioner	2-4
2.3	Accelerometer with Attached Electronic Conditioner	2-6
2.4	Accelerometer with Incorporated Electronic Conditioner	2-8
3	INFLUENCE OF THE FIXING METHOD	3-1
3.1	Amplitude Error and Phase Shift	3-1
3.2	Comparison of Fixing Methods	3-1
 Part II : Mounting Instructions		
4	GENERAL MOUNTING INSTRUCTIONS	4-1
4.1	Requirements for Equipment Used in Potentially Explosive Atmospheres	4-1
4.2	General Remarks	4-1
5	ACCELEROMETER WITH SEPARATE CONDITIONER	5-1
5.1	Introduction	5-1
5.2	Mechanical Aspects	5-3
5.2.1	Mounting the Accelerometer	5-3
5.2.1.1	CA 201 Accelerometer	5-3
5.2.1.2	Other Accelerometer Types	5-5
5.2.2	Fixing the Integral Cable	5-6
5.2.3	Mounting the Electronic Conditioner	5-7
5.2.4	Fixing the Transmission Cable	5-9
5.2.5	Mounting the Galvanic Separation Unit	5-11
5.3	Electrical Connections	5-12
5.3.1	Connecting Cables to the Electronic Conditioner	5-12
5.3.2	Connecting the Transmission Cable to the Galvanic Separation Unit	5-16

6	ACCELEROMETER WITH ATTACHED CONDITIONER	6-1
6.1	Introduction	6-1
6.2	Mechanical Aspects	6-3
6.2.1	Mounting the Accelerometer	6-3
6.2.1.1	CE 134 or CE 136 Accelerometer	6-3
6.2.2	Fixing the Integral Cable	6-5
6.2.3	Mounting the Attached Electronic Conditioner	6-6
6.2.4	Fixing the Transmission Cable	6-8
6.2.5	Mounting the Galvanic Separation Unit	6-9
6.3	Electrical Connections	6-10
6.3.1	Connecting Cables to the Electronic Conditioner	6-10
6.3.2	Connecting the Transmission Cable to the Galvanic Separation Unit	6-13
7	ACCELEROMETER WITH INCORPORATED CONDITIONER	7-1
7.1	Introduction	7-1
7.2	Mechanical Aspects	7-3
7.2.1	Mounting the Accelerometer	7-3
7.2.1.1	CE 310 Accelerometer	7-3
7.2.2	Fixing the Integral Cable	7-5
7.2.3	Mounting the Junction Box	7-6
7.2.4	Fixing the Transmission Cable	7-8
7.2.5	Mounting the Galvanic Separation Unit	7-9
7.3	Electrical Connections	7-10
7.3.1	Connecting Cables to the Junction Box	7-10
7.3.2	Connecting the Transmission Cable to the Galvanic Separation Unit	7-14
8	MOUNTING ACCESSORIES	8-1
8.1	Introduction	8-1
8.2	Mounting Studs	8-1
8.3	Insulating Supports	8-5
8.3.1	Electrically Insulating Support	8-5
8.3.2	Thermally Insulating Support	8-6

9 MAINTENANCE AND REPAIRS 9-1

9.1 Maintenance 9-1

9.1.1 General..... 9-1

9.1.2 Requirements for Equipment Used in Potentially Explosive Atmospheres 9-1

9.2 Technical Support 9-2

9.3 Repairs 9-2

Part III : Appendices

A ACCELERATION - VELOCITY - DISPLACEMENT NOMOGRAMSA-1

B EC TYPE EXAMINATION CERTIFICATESB-1

C cCSAus CERTIFICATESC-1

PRODUCT DEFECT REPORT

DOCUMENT EVALUATION FORM

PREFACE

About This Manual

This manual provides information on vibration measurement systems using Vibro-Meter's CA XXX or CE XXX range of piezoelectric accelerometers. It describes the installation and general use of these systems.

Who Should Use This Manual?

This manual is written for operators of process monitoring/control systems using Vibro-Meter's accelerometers for vibration measurement. These accelerometers form the "front end" of the overall monitoring/control system, which usually also includes a modular monitoring system (based on, for example, Vibro-Meter's MMS or VM 600 range).

The operator is assumed to have the necessary technical training in electronics and mechanical engineering (professional certificate/diploma, or equivalent) to enable him to install the front-end equipment and operate the monitoring system and the controlled system.

Related Documentation

Further information on a product can be found in the corresponding data sheet. This document can be found on Vibro-Meter's web site or obtained from your local Vibro-Meter agent.

Owners of equipment featuring mineral insulated (MI) cables should consult the document listed in [Table 1](#).

Document	Doc. Ref.
Mounting Instructions : CA XXX / CP XXX piezoelectric transducers with integral mineral insulated cables	MATRMOUNT-10/E

Table 1 : Related documentation

THIS PAGE INTENTIONALLY LEFT BLANK

SAFETY

Symbols and Styles Used in This Manual

The following symbols are used in this manual where appropriate :



The WARNING safety symbol

THIS INTRODUCES DIRECTIVES, PROCEDURES OR PRECAUTIONARY MEASURES WHICH MUST BE EXECUTED OR FOLLOWED. FAILURE TO OBEY A WARNING CAN RESULT IN INJURY TO THE OPERATOR OR THIRD PARTIES.



The CAUTION safety symbol

This draws the operator's attention to information, directives or procedures which must be executed or followed. Failure to obey a caution can result in damage to equipment.



The ELECTROSTATIC SENSITIVE DEVICE symbol

This indicates that the device or system being handled can be damaged by electrostatic discharges.

Refer to [Handling Precautions for Electrostatic Sensitive Devices](#) on page xiv for further information.

NOTE : This is an example of the NOTE paragraph style. This draws the operator's attention to complementary information or advice relating to the subject being treated.

Important Remarks on Safety



Read this manual carefully and observe the safety instructions before using the equipment described.

Location of Safety Symbols

The following safety symbols are found on the pages specified below :



THIS SYMBOL IS FOUND ON THE FOLLOWING PAGES:

xiii, 4-1, 9-1



This symbol is found on the following pages:

xii, xiii, 4-1, 5-3, 5-5, 5-6, 5-7, 5-9, 5-11, 6-3, 6-5, 6-6, 6-8, 6-9, 7-3, 7-5, 7-6, 7-8, 7-9



This symbol is found on the following page:

xiv

Additional Remarks

Every effort has been made to include specific safety-related procedures in this manual using the symbols described above. However, operating personnel are expected to follow all generally accepted safety procedures.

Safety procedures should be communicated to all personnel who are liable to operate the equipment described in this manual.

Vibro-Meter does not accept any liability for injury or material damage caused by failure to obey any safety-related instructions or due to any modification, transformation or repair carried out on the equipment without written permission from Vibro-Meter. Any modification, transformation or repair carried out on the equipment without written permission from Vibro-Meter will invalidate any warranty.

Equipment Used in Potentially Explosive Atmospheres



THIS MANUAL COVERS EQUIPMENT THAT CAN BE USED IN POTENTIALLY EXPLOSIVE ATMOSPHERES, AS WELL AS EQUIPMENT THAT CANNOT BE USED IN POTENTIALLY EXPLOSIVE ATMOSPHERES.

A PRODUCT THAT CAN BE USED IN POTENTIALLY EXPLOSIVE ATMOSPHERES IS IDENTIFIED BY SPECIAL MARKING. THIS MARKING MUST CORRESPOND TO THE MARKING DESCRIBED IN THE “EC TYPE EXAMINATION CERTIFICATE” FOR THE PRODUCT.

REFER TO [APPENDIX B - EC TYPE EXAMINATION CERTIFICATES](#) FOR FURTHER INFORMATION.

General Handling Precautions

Vibro-Meter’s transducers are rugged devices which can withstand a certain amount of careless handling. Nevertheless, certain precautions should be taken when handling.



Read the following recommendations carefully before handling transducers.

- Do not drop the transducer onto a hard surface or subject it to violent shocks.
- Protect the body/head of the transducer with plastic protective netting when it is being handled, stored or transported. Remove this protection only when mounting the transducer or when inspecting/testing it.
- Where appropriate, fit a plastic protection cap on the connector of the transducer. Remove this cap only when mounting the transducer or when inspecting/testing it.
- Check for dents when inspecting the transducer as this is a sign that it could have suffered a physical shock by impact. This may have caused damage to components within the transducer.
- Do not excessively bend the transducer cable or associated cables. Respect the minimum bending radius quoted in the appropriate documentation.
- When storing and using the equipment, respect the environmental specifications (temperature, humidity) quoted in the appropriate data sheet.
- Refer also to [Handling Precautions for Electrostatic Sensitive Devices](#) on page xiv.

Handling Precautions for Electrostatic Sensitive Devices

Certain devices used in electronic equipment can be damaged by electrostatic discharges resulting from built-up static electricity. Because of this, special precautions must be taken to minimize or eliminate the possibility of these electrostatic discharges occurring.



Read the following recommendations carefully before handling electronic circuits, printed circuit boards or modules containing electronic components.

- Before handling electronic circuits, discharge the static electricity from your body by touching and momentarily holding a grounded metal object (e.g. a pipe or cabinet).
- Avoid the build-up of static electricity on your body by not wearing synthetic clothing material, as these tend to generate and store static electric charges. Cotton or cotton blend materials are preferred because they do not store static electric charges.
- Do not handle electronic circuits unless it is absolutely necessary. Only hold modules by their front panel handles.
- Do not touch printed circuit boards, their connectors or their components with conductive devices or with your hands.
- Put the electronic circuit, printed circuit board or module containing electronic components into an antistatic protective bag immediately after removing it from the system rack.

Part I : Background Information

THIS PAGE INTENTIONALLY LEFT BLANK

1 INTRODUCTION

1.1 Choice of Transducer Type

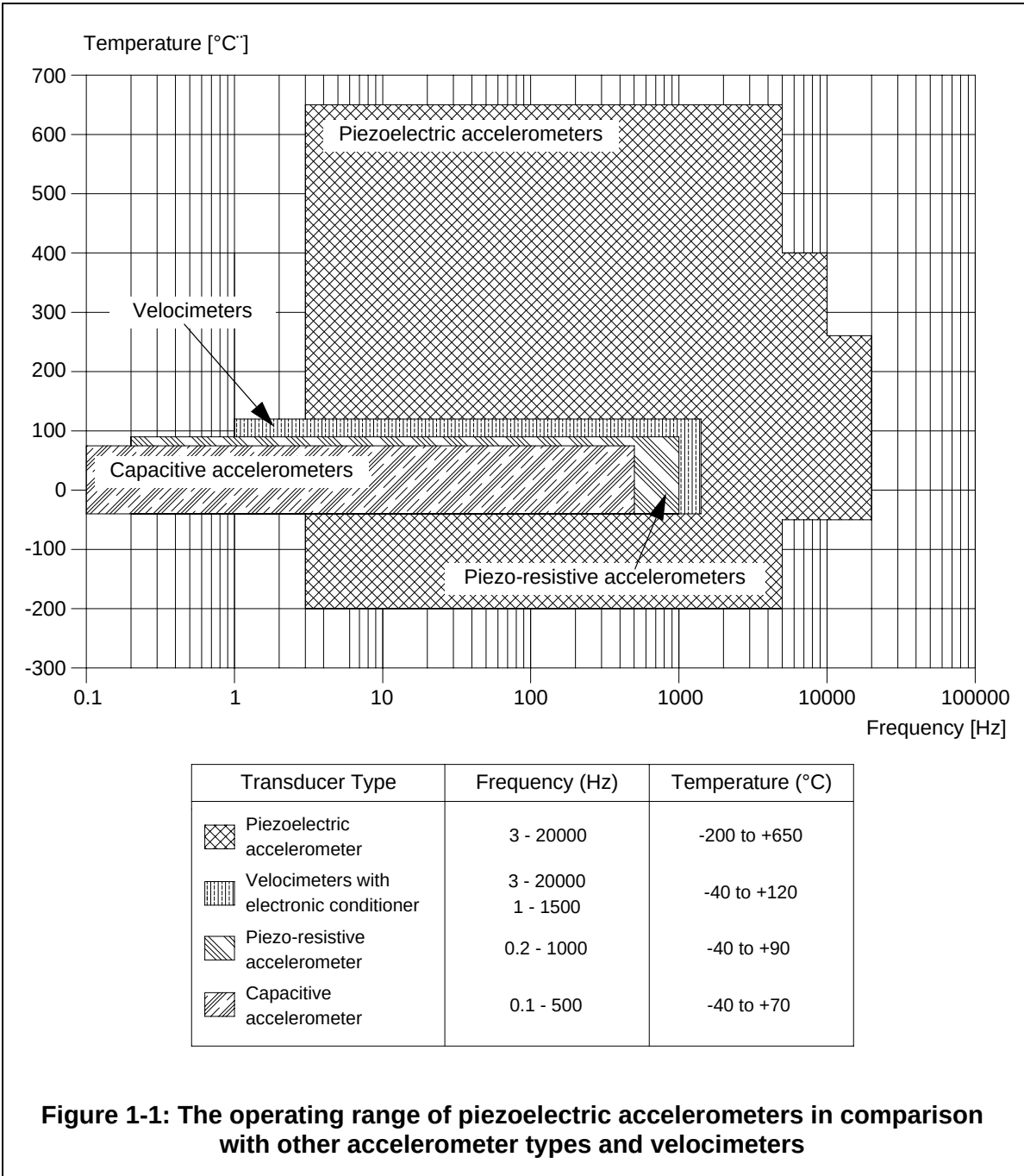
Various transducer types are available for measuring absolute vibration. These include:

- 1) Piezoelectric accelerometers
- 2) Capacitive accelerometers
- 3) Piezo-resistive accelerometers
- 4) Velocimeters

The choice of transducer type depends on the operating environment in which the device will be used, as shown in [Figure 1-1](#). As can be seen, the main advantages of piezoelectric accelerometers over the other devices are the wide operating temperature range (-196 to +620°C) and the ability to operate at high vibration frequencies (up to 20 kHz).

NOTE : Only piezoelectric accelerometers are described in this manual.

Further information for specific piezoelectric accelerometers manufactured by Vibro-Meter is given in [Figure 1-2](#) and [Figure 1-3](#).



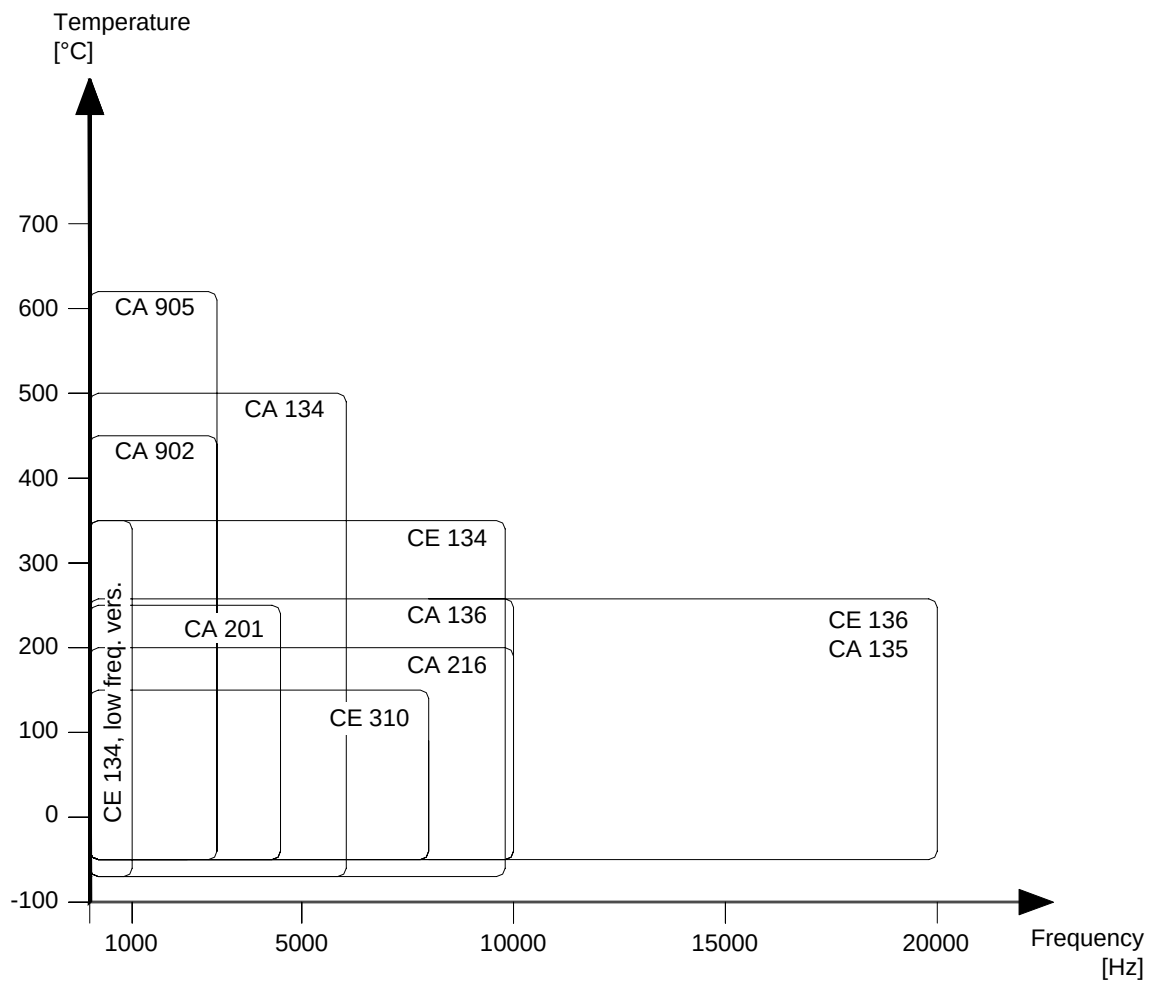


Figure 1-2: The choice of a standard accelerometer as a function of temperature and frequency range

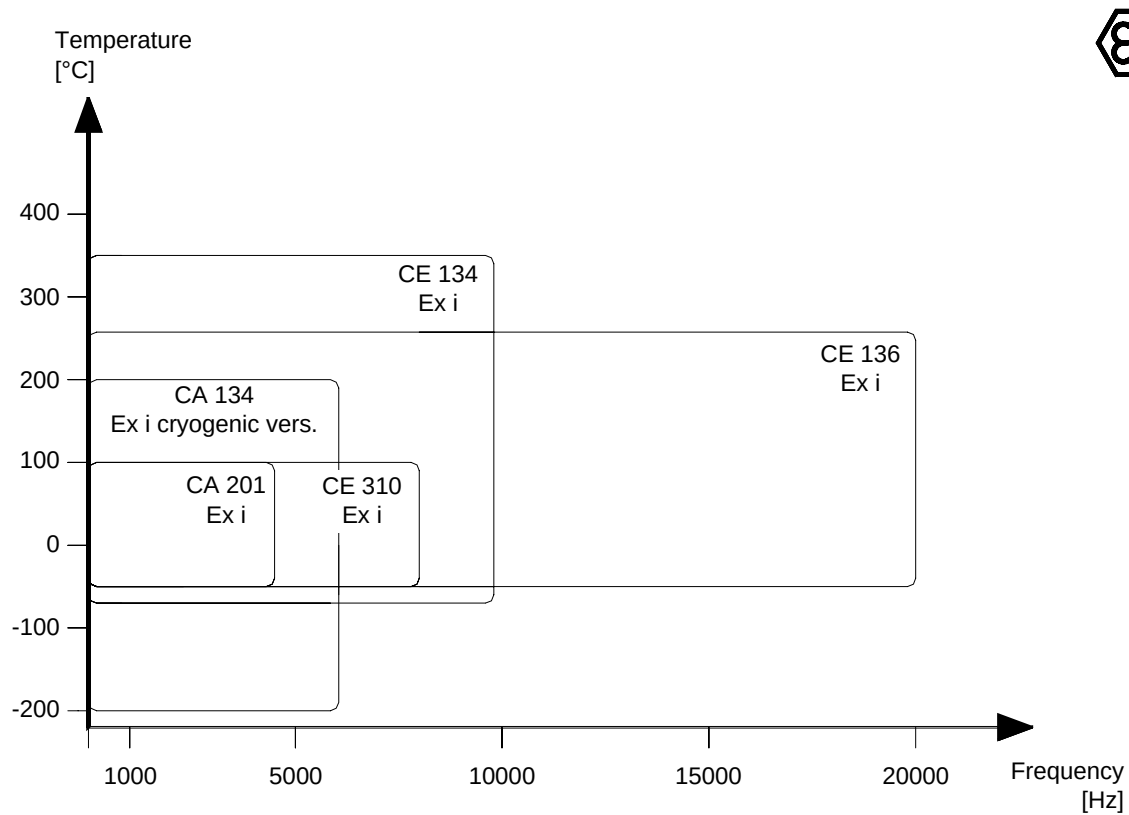


Figure 1-3: The choice of an Ex i version accelerometer as a function of temperature and frequency range

1.2 Applications

The accelerometers in Vibro-Meter's product range are suitable for monitoring a large variety of industrial machinery. Typical applications are listed below :

- 1) Rotating Machinery / Driving Elements
 - Electric motors
 - Combustion engines
 - Gas turbines, jet-derived
 - Gas turbines, heavy-duty
 - Steam turbines
 - Hydraulic turbines
 - Gear boxes
- 2) Rotating Machinery / Driven Elements
 - Fans
 - Pumps
 - Compressors, radial
 - Compressors, axial
 - Compressors, screw
 - Compressors, reciprocating
 - Generators, electrical
- 3) Miscellaneous
 - Vibration monitoring on structures
 - Loose parts monitoring in rotating machines

The application area (type of machine or equipment to be monitored) is an important factor in determining the choice of accelerometer.

NOTE : Refer to your Vibro-Meter agent for further information.

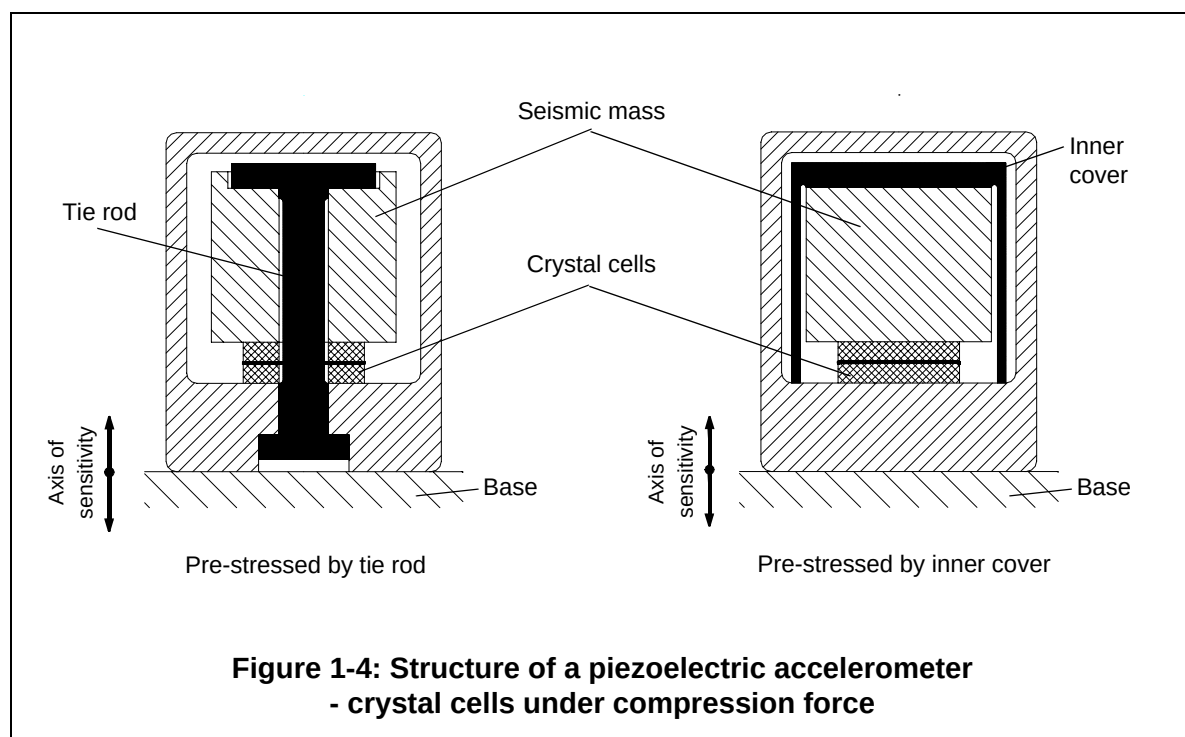
1.3 Measurement Principle of Piezoelectric Accelerometers

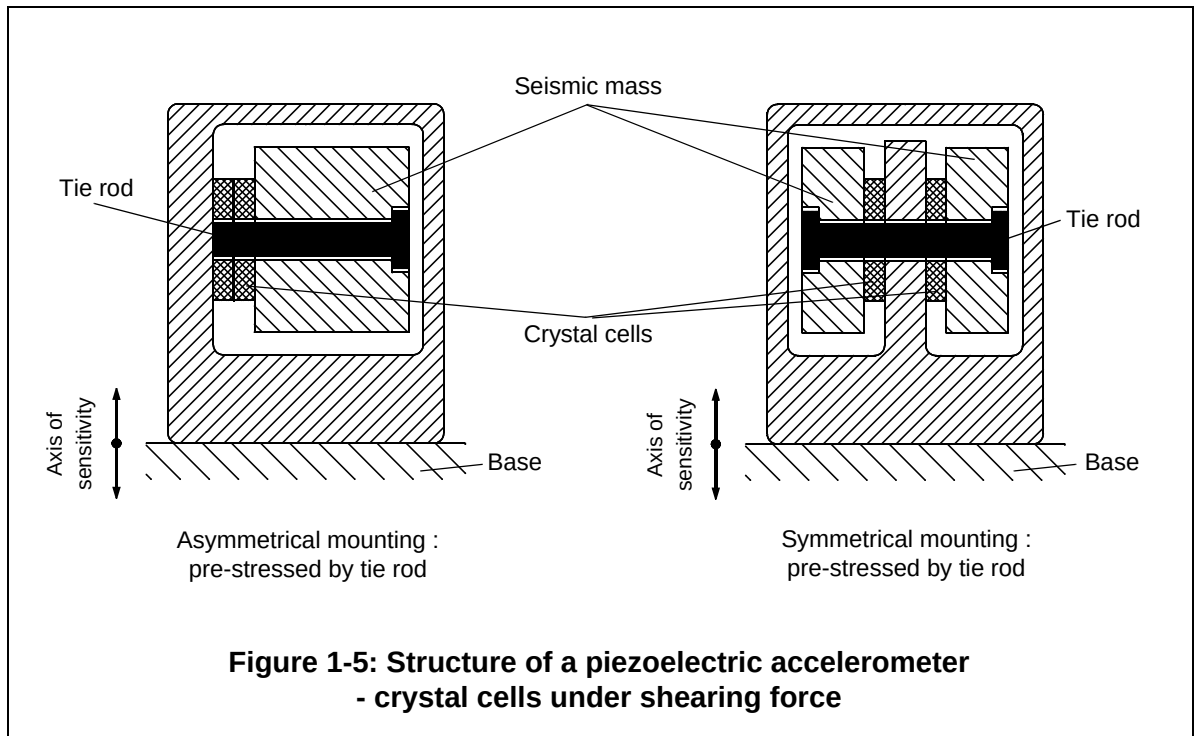
A piezoelectric accelerometer is a seismic transducer consisting of a quartz or ceramic crystal and a seismic mass. When this assembly is subjected to vibrations, a mechanical stress appears on the crystal cells embedded between the transducer body and the pre-stressed seismic mass.

Due to the piezoelectric effect, an electrical charge proportional to the acceleration appears on the surface of the crystal cells. The mechanical stress applied to the crystals can be brought about by compression or shearing (see [Figure 1-4](#) and [Figure 1-5](#)).

These transducers have various characteristics, depending on the mechanical construction, the kind and number of crystals as well as the seismic mass. Their application field is situated between 3 and 20 kHz, or more, for an operating temperature of -196 to +620°C (see [Figure 1-1](#)).

Piezoelectric accelerometers are generally used for measuring absolute bearing vibration or absolute shaft vibration. The vibration is normally measured on the bearings, although it is not directly produced by these elements. Because of their linking role between the fixed part of the machine (stator) and the moving part (rotor), the bearings provide the most appropriate measurement point, in terms of both accessibility and the presence of vibratory phenomena.





1.4 Accelerometer Categories

Vibro-Meter's piezoelectric accelerometers fall into three categories:

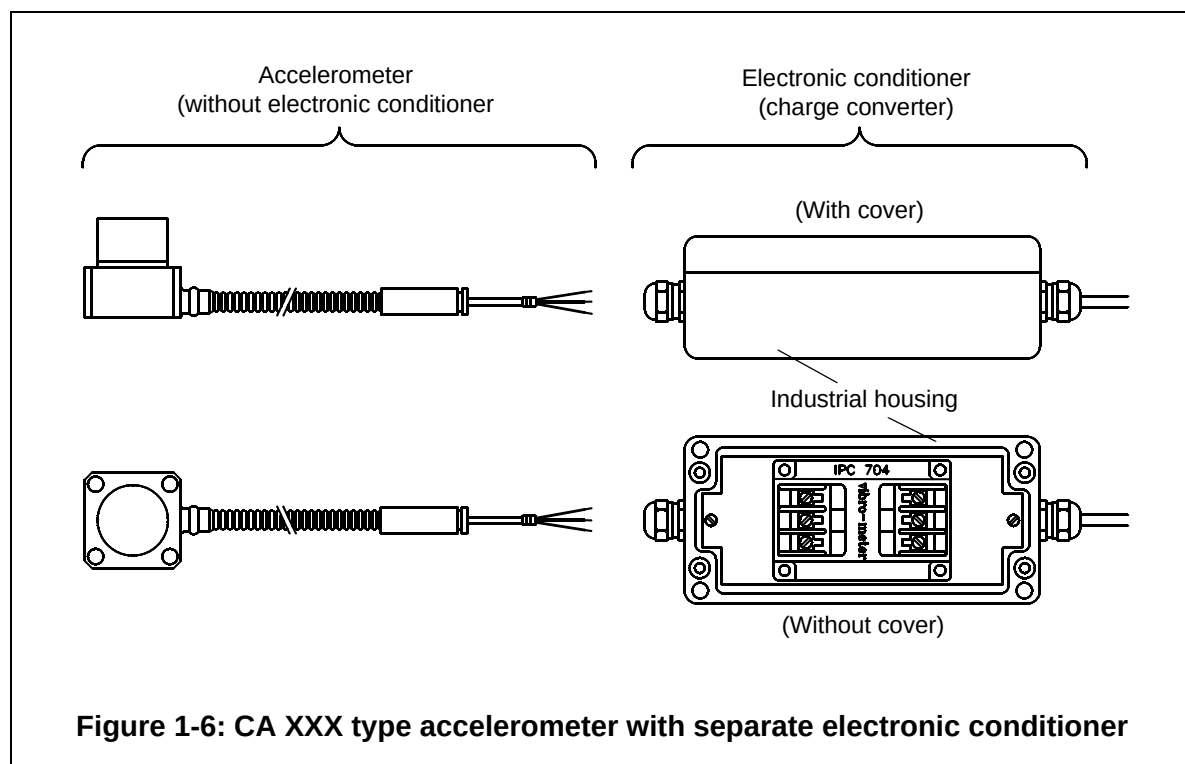
- 1) Accelerometers with separate electronic conditioner
- 2) Accelerometers with attached electronic conditioner.
- 3) Accelerometers with incorporated electronic conditioner

These three types are described in the following sections.

1.4.1 Accelerometers with Separate Electronic Conditioner

The electric charge resulting from the deformation of the crystal cells is not directly converted in the accelerometer. It is transmitted by means of a cable to a charge converter which performs the conversion of the charge-based signal into a current-modulated signal. This modulation technique allows transmission over considerable distances without external interference and with the use of a simple 2-wire cable. The modulated signal can be proportional to vibration acceleration or vibration velocity.

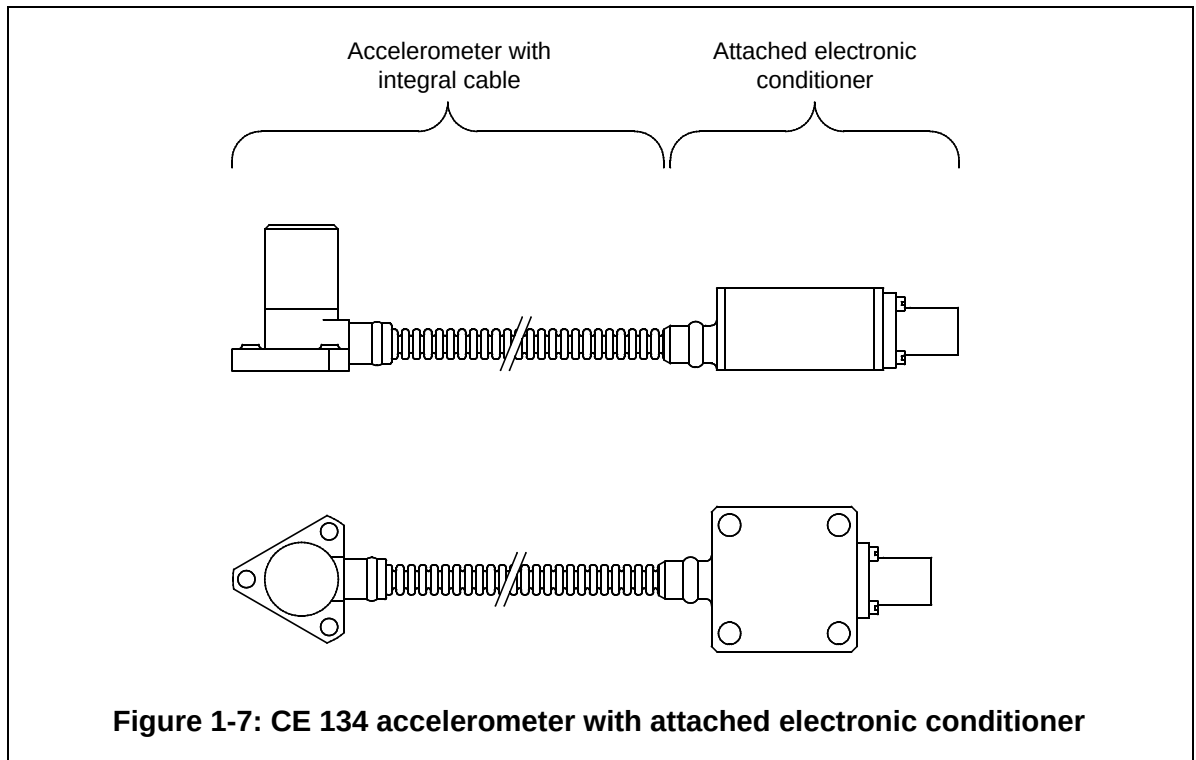
This accelerometer type (see [Figure 1-6](#)) has the advantage that it can be mounted in areas where the temperature is very high or very low. On the other hand, it requires the use of a charge converter placed close to it.



1.4.2 Accelerometers with Attached Electronic Conditioner

The conversion of the charge-based signal into a current-modulated signal does not take place directly within the accelerometer body, but in the attached electronic conditioner situated at the end of its cable.

This accelerometer type (see [Figure 1-7](#)) is current-supplied. Its operating temperature is higher than that of the accelerometer with incorporated electronic conditioner, due to the electronic conditioner being farther away from the accelerometer.



1.4.3 Accelerometers with Incorporated Electronic Conditioner

The conversion of the charge-based signal into a current-modulated signal takes place directly within the accelerometer body.

This accelerometer type (see [Figure 1-8](#)) is current-supplied and does not need the use of a charge converter. Its operating temperature (-30 to +150°C and -30 to +100°C in Ex i areas) is restricted due to the presence of the electronic conditioner in the accelerometer.

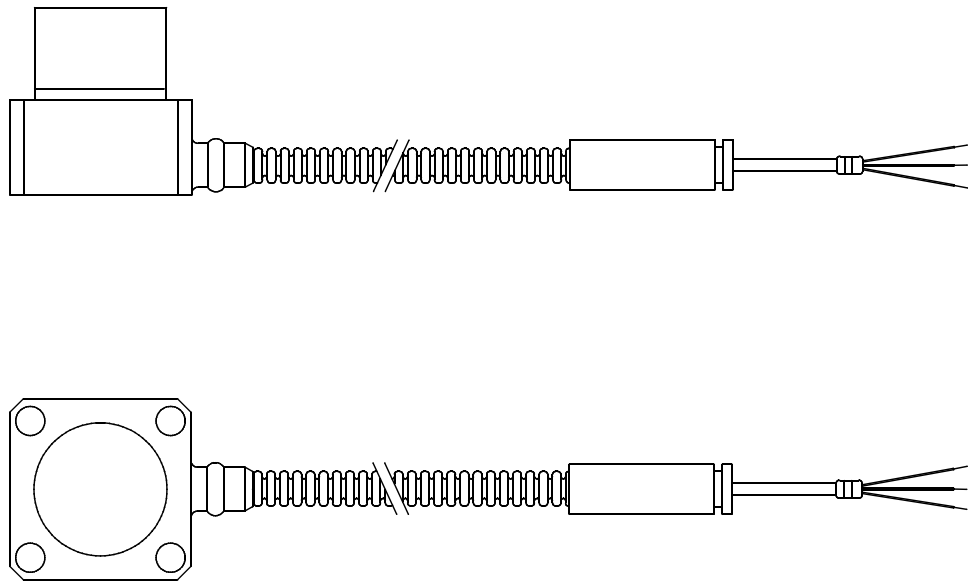


Figure 1-8: CE 310 accelerometer with incorporated electronic conditioner

2 MEASUREMENT CHAINS

This chapter describes the particularities of the various types of measuring chains available from Vibro-Meter. The following chains are considered :

- 1) Accelerometer with connector + connecting cable + separate electronic conditioner
- 2) Accelerometer with integral cable + separate electronic conditioner
- 3) Accelerometer with attached electronic conditioner
- 4) Accelerometer with incorporated electronic conditioner

2.1 Accelerometer with Connector + Separate Electronic Conditioner

This chain ([Figure 2-1](#)) is relevant to accelerometers that have a connector on the housing and no integral cable. Such devices include:

- CA 134 (certain versions)
- CA 135
- CA 136 (certain versions)
- CA 902
- CA 905

The following parts of the chain can be distinguished:

- 1) Accelerometer with connector
This type of accelerometer outputs a charge-based signal proportional to the vibration acceleration. Sensitivities are usually quoted in pC/g.
The CA 902, CA 905 and CA 135 accelerometers and certain versions of the CA 134 and CA 136 are equipped with a 7/16" - 27 UNS - 2A connector. A separate connecting cable must be used to connect the accelerometer to the charge amplifier.
- 2) Connecting cable
A low-noise, screened, 2-wire cable is used to connect the accelerometer to the charge converter. If required, a flexible stainless steel BOA sleeve can be used to provide mechanical protection for the cable.
- 3) Charge converter (IPC XXX)
The IPC XXX charge converter transforms the charge-based signal coming from the accelerometer into a current-modulated signal. This signal can be transmitted over large distances to a galvanic separation unit, then sent on to the electronic processing system. The device is provided with metallic screening as well as input and output RFI filters. These guarantee immunity against electromagnetic interference. A low-pass filter and an integrator circuit allow pre-processing of the signal before its transmission.
The IPC XXX is contained in a waterproof housing made of insulating polyester. Two stuffing glands assure waterproofness between the connecting cable, the charge converter and the transmission cable.

4) Transmission cable (K 2XX)

The transmission cable links the IPC XXX charge converter to the GSI XXX galvanic separation unit. It is a screened, 2-wire cable designed to resist temperatures of up to 100°C and can be used in harsh industrial environments. An optional flexible protection tube made of stainless steel (e.g. KS 106) can be used to provide additional mechanical protection to the cable.

Thanks to the low capacitance and resistance of the cable, current-modulated signals of up to 30 kHz can be transmitted over cable lengths exceeding 1000 m without any significant signal distortion.

5) Galvanic separation unit (GSI XXX)

The GSI XXX galvanic separation unit is used in 2-wire transmission systems. It eliminates problems (such as earth loops) that can arise due to potential differences between the measurement point and the electronic processing system.

The GSI XXX is used to supply the accelerometer and IPC XXX charge converter. It also reads the signal coming from the IPC XXX and outputs a voltage-based signal proportional to the current consumed by the charge converter. This voltage signal can be used directly by the electronic processing system.

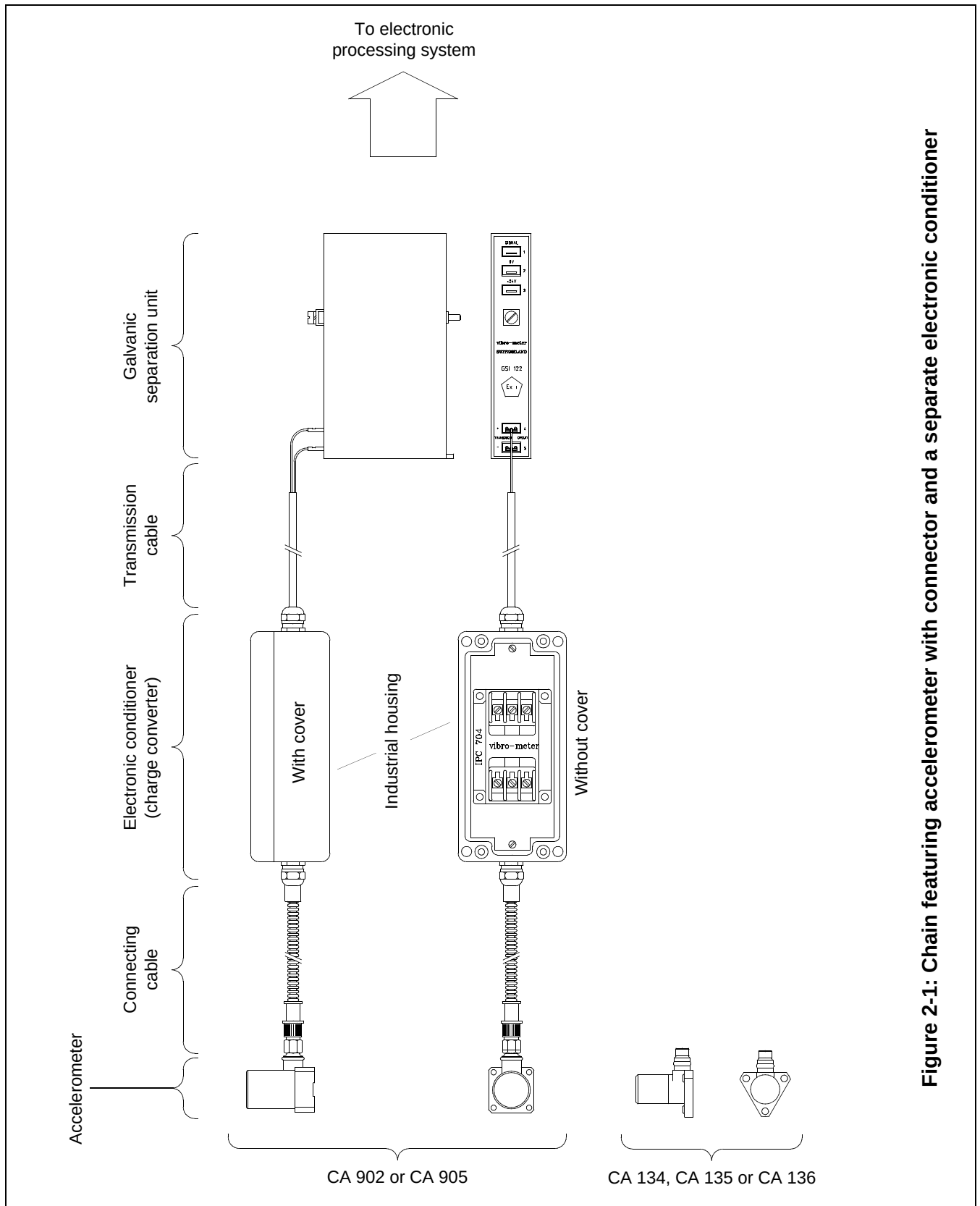


Figure 2-1: Chain featuring accelerometer with connector and a separate electronic conditioner

2.2 Accelerometer with Integral Cable + Separate Electronic Conditioner

This chain ([Figure 2-2](#)) is relevant to accelerometers that have an integral connecting cable. Such devices include:

- CA 134 (certain versions)
- CA 136 (certain versions)
- CA 201
- CA 216

The following parts of the chain can be distinguished:

1) Accelerometer with integral cable

This type of accelerometer outputs a charge-based signal proportional to the vibration acceleration. Sensitivities are usually quoted in pC/g.

These devices are equipped with a low-noise cable protected by a flexible stainless steel sleeve (BOA). This cable can be connected directly to the charge converter.

2) Charge converter (IPC XXX)

See paragraph 3 of section [2.1](#).

3) Transmission cable (K 2XX)

See paragraph 4 of section [2.1](#).

4) Galvanic separation unit (GSI XXX)

See paragraph 5 of section [2.1](#).

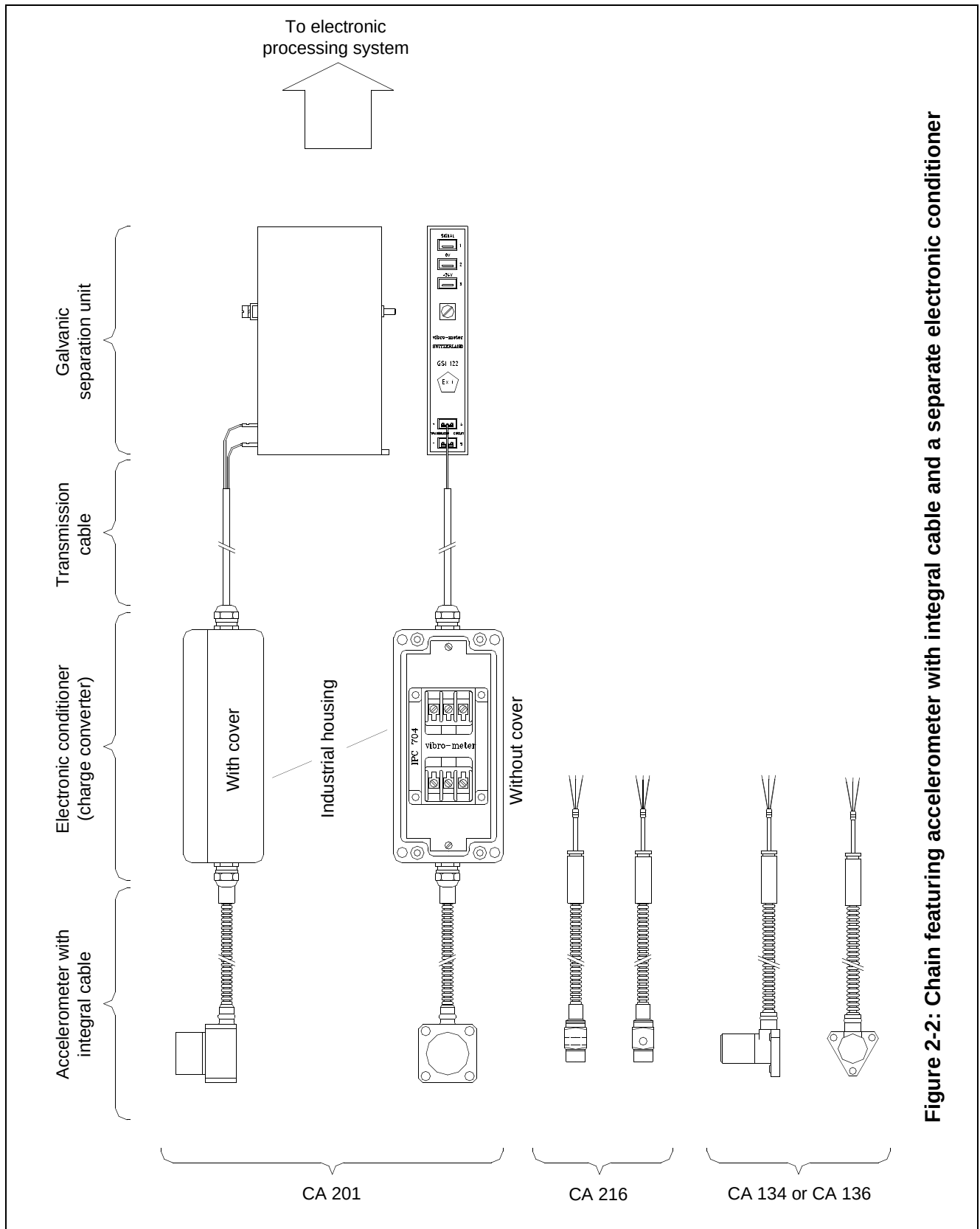


Figure 2-2: Chain featuring accelerometer with integral cable and a separate electronic conditioner

2.3 Accelerometer with Attached Electronic Conditioner

This chain ([Figure 2-3](#)) is relevant to accelerometers that have an attached electronic conditioner. Such devices include:

- CE 134
- CE 136

The following parts of the chain can be distinguished:

1) Accelerometer with attached conditioner

This type of accelerometer assembly outputs a current-based signal proportional to the vibration acceleration. Sensitivities are usually quoted in $\mu\text{A/g}$.

These devices are equipped with a screened, 2-wire integral cable protected by a flexible stainless steel sleeve (BOA). This is welded to the housing of the accelerometer and to the housing of the attached electronic conditioner.

The attached conditioner performs the conversion of the initial charge-based signal into a current-based signal. The output signal can be transmitted without interference over long distances.

Thanks to the distance separating the accelerometer and the conditioner, the accelerometer can be mounted in areas with temperatures up to 350°C.

2) Transmission cable (K 2XX)

The transmission cable links the accelerometer (and its attached conditioner) to the GSI XXX galvanic separation unit. See paragraph 4 of section [2.1](#) for further information.

3) Galvanic separation unit (GSI XXX)

See paragraph 5 of section [2.1](#).

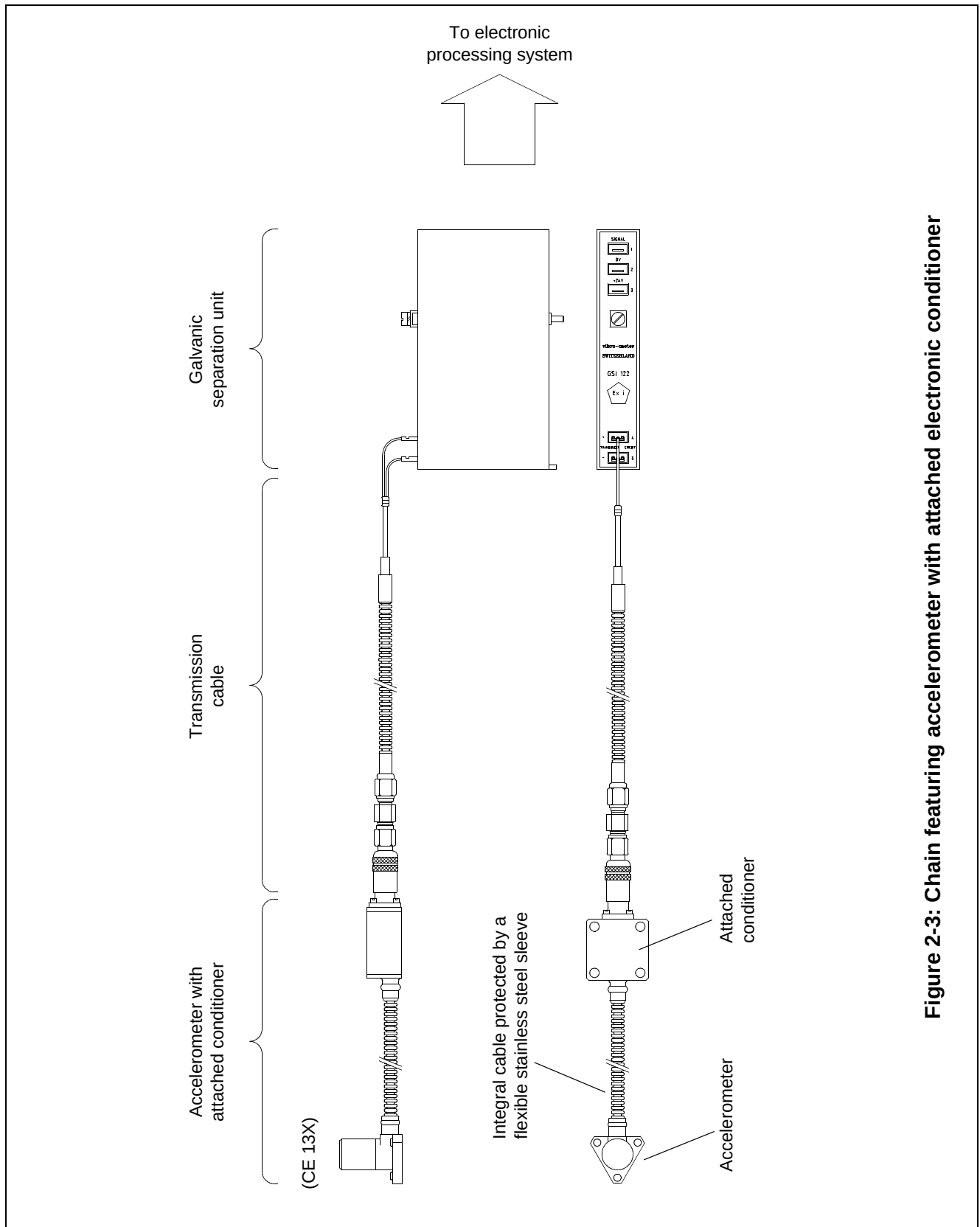


Figure 2-3: Chain featuring accelerometer with attached electronic conditioner

2.4 Accelerometer with Incorporated Electronic Conditioner

This chain ([Figure 2-4](#)) is relevant to accelerometers that have an incorporated electronic conditioner. Such devices include:

- CE 310

The following parts of the chain can be distinguished:

1) Accelerometer with incorporated conditioner

This type of accelerometer outputs a current-based signal proportional to the vibration acceleration. Sensitivities are usually quoted in $\mu\text{A/g}$.

The incorporated electronic conditioner performs the conversion of the initial charge-based signal into a current-based signal, thus eliminating the need for an external charge converter. The output signal can be transmitted without interference over long distances.

These devices are equipped with a screened, 2-wire integral cable protected by a flexible stainless steel sleeve (BOA) welded to the housing.

2) Junction box (JB XXX)

A junction box can be used to easily connect the accelerometer's integral cable to a transmission cable. Both cables are passed into the JB XXX through stuffing glands and then connected using screw terminals. The housing is made of injected aluminium and offers IP65 class protection.

3) Transmission cable (K 2XX)

The transmission cable links the accelerometer to the GSI XXX galvanic separation unit. See paragraph 4 of section [2.1](#) for further information.

4) Galvanic separation unit (GSI XXX)

See paragraph 5 of section [2.1](#).

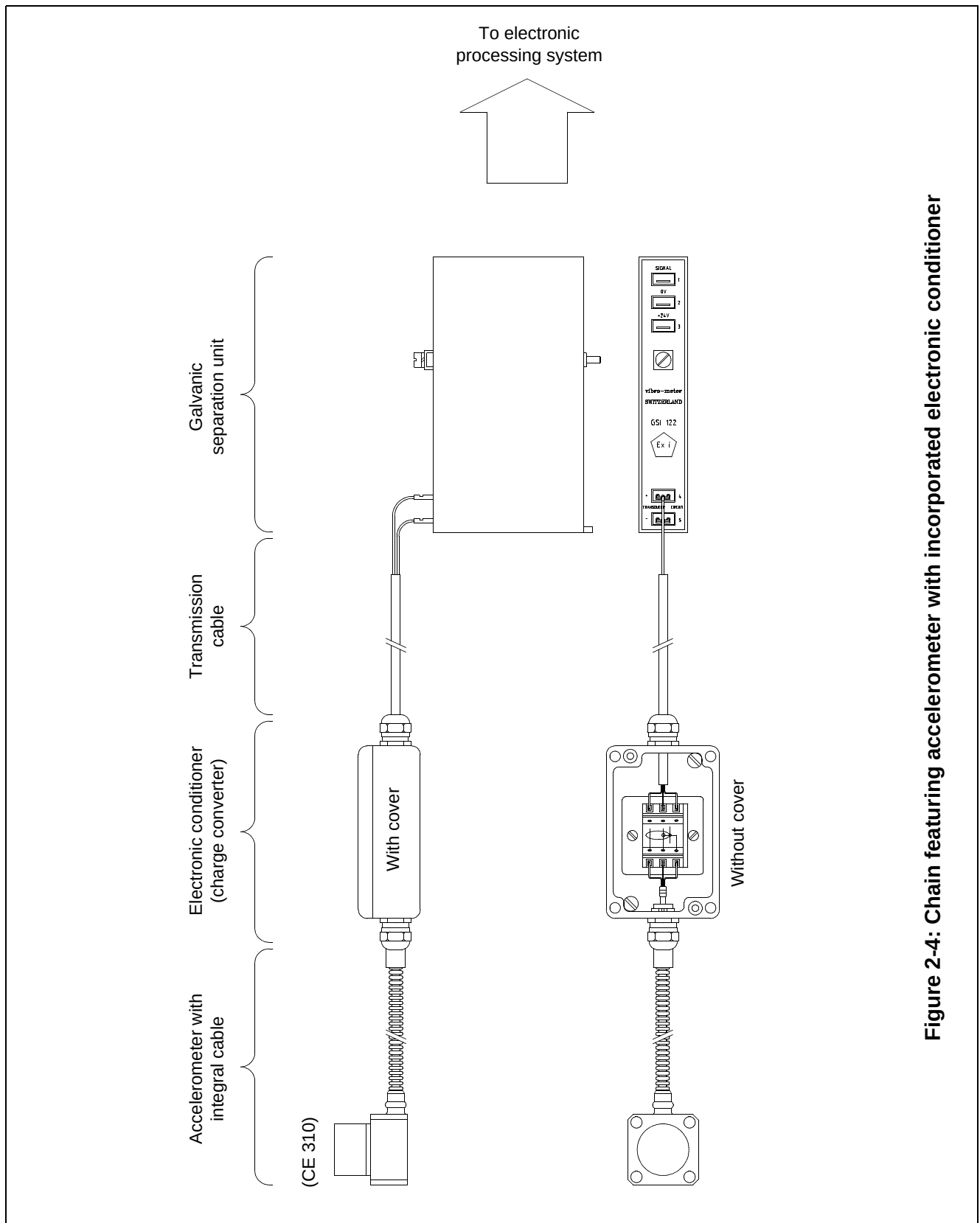


Figure 2-4: Chain featuring accelerometer with incorporated electronic conditioner

THIS PAGE INTENTIONALLY LEFT BLANK

3 INFLUENCE OF THE FIXING METHOD

3.1 Amplitude Error and Phase Shift

[Figure 3-1](#) shows the typical amplitude error and phase shift value (rough estimates) for four fixing types. It is assumed that the accelerometer has a mass of 18 grams and a circular contact surface having a diameter of 12 mm.

3.2 Comparison of Fixing Methods

[Figure 3-2](#) to [Figure 3-7](#) (taken from the ISO 5348 standard) show the influence of the fixing method.

NOTE : When comparing measurement values from several locations, it is important to know the fixing methods employed.

Manual methods of applying transducers can lead to large measurement errors. In the case of a hand-held transducer, the pass band can be reduced from 30 kHz (for screw fixing) to 2 kHz. For hand-held transducers, the measurement quality depends on several variable factors; the force exerted by the operator, the orientation of the probe, the damping of the vibration, the vibration brought about by the operator's hand, etc.

The base of the accelerometer generally has 3 or 4 holes to ensure correct fixing. Fixing screws must be tightened using a torque wrench according to the instructions given later in this manual (see [Part II : Mounting Instructions](#)).

The accelerometer's integral cable or connecting cable must not be strongly bent during installation (see [Figure 3-8](#)).

NOTE : Refer to the ISO 5348 standard for further information.

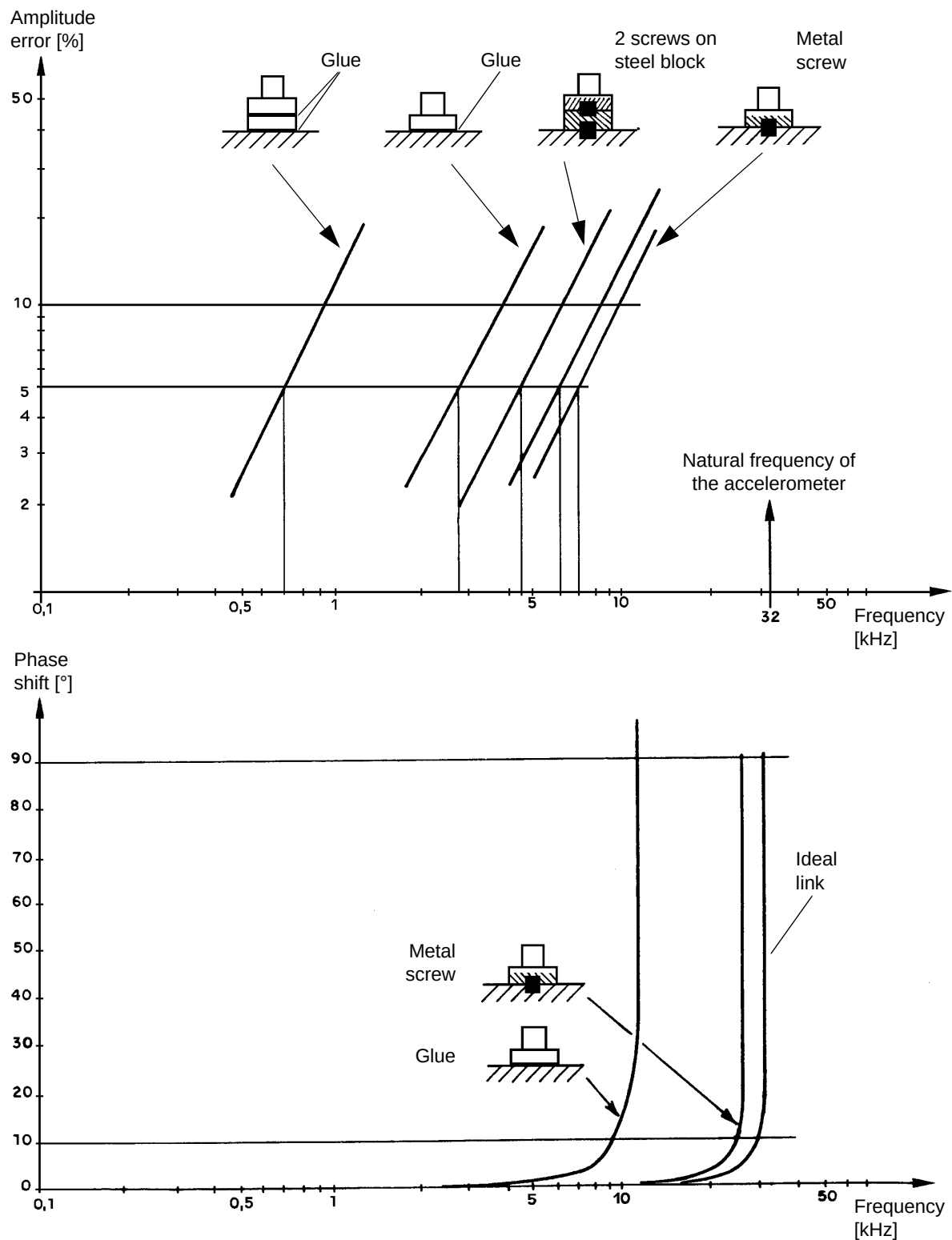


Figure 3-1: Influence of mounting method on the amplitude and phase shift (rough estimates)

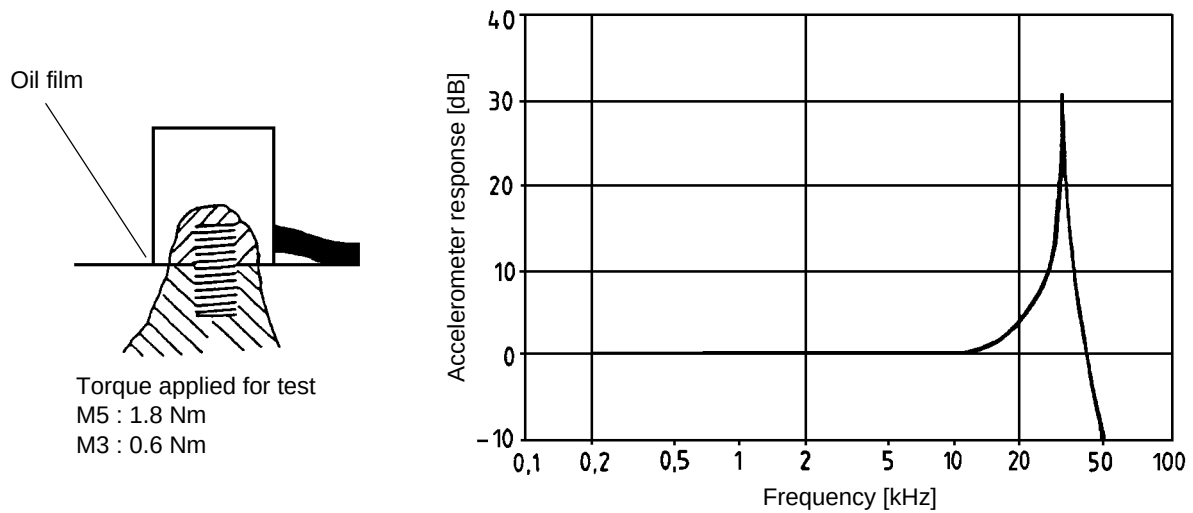


Figure 3-2: Accelerometer fixed on an oil film
(taken from ISO 5348 standard)

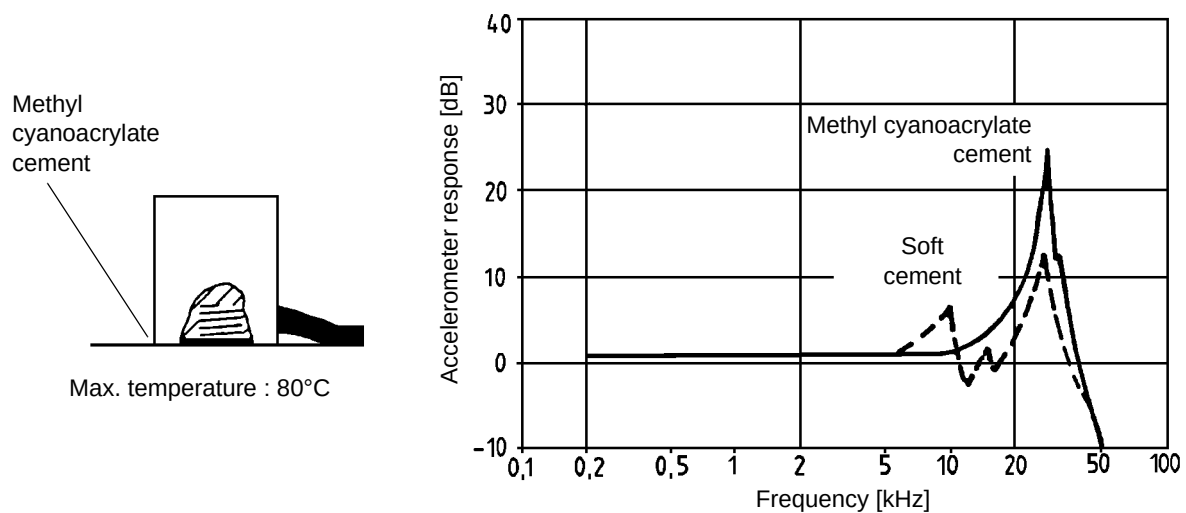
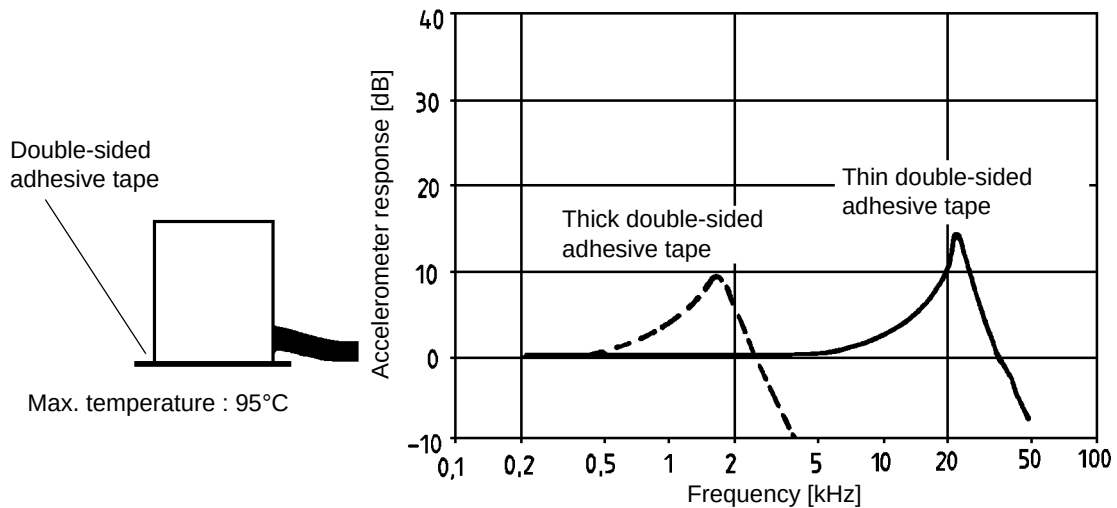


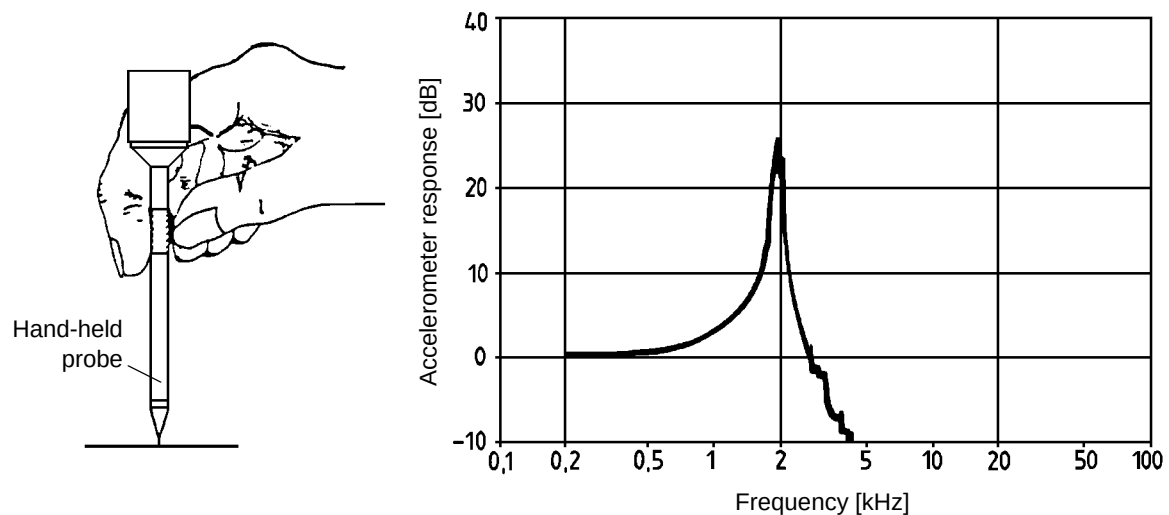
Figure 3-3: Accelerometer fixed on methyl cyanoacrylate cement
(taken from ISO 5348 standard)

NOTE : Limited use



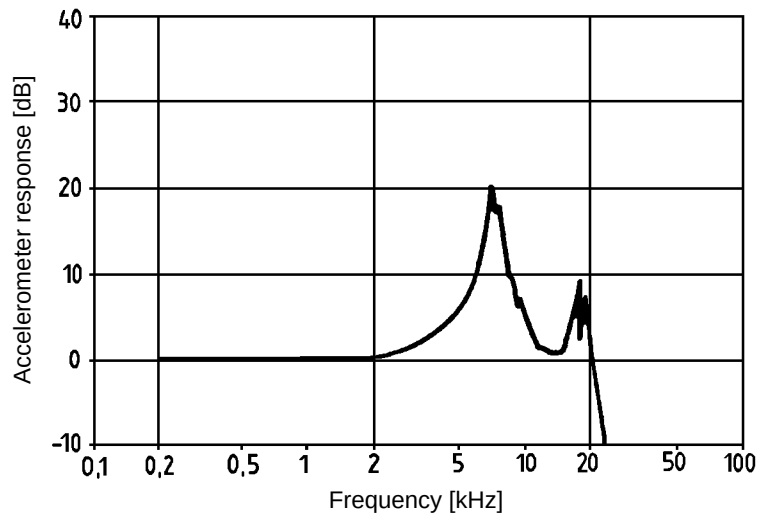
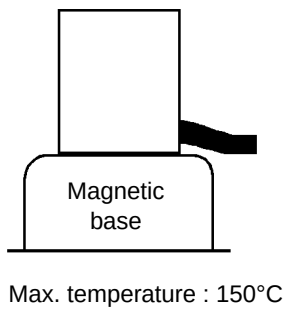
**Figure 3-4: Accelerometer fixed by double-sided adhesive tape
(taken from ISO 5348 standard)**

NOTE : Limited use



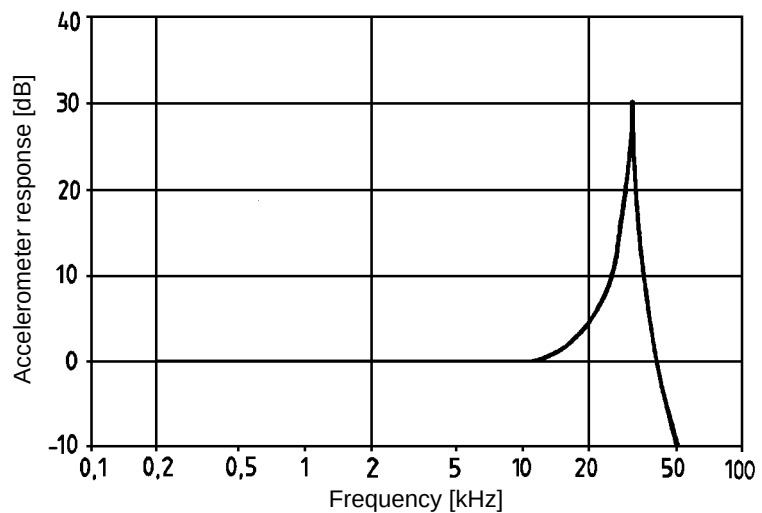
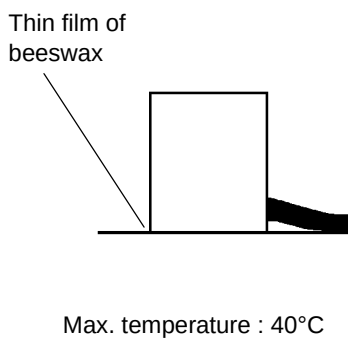
**Figure 3-5: Accelerometer fixed on a hand-held probe
(taken from ISO 5348 standard)**

NOTE : Limited use

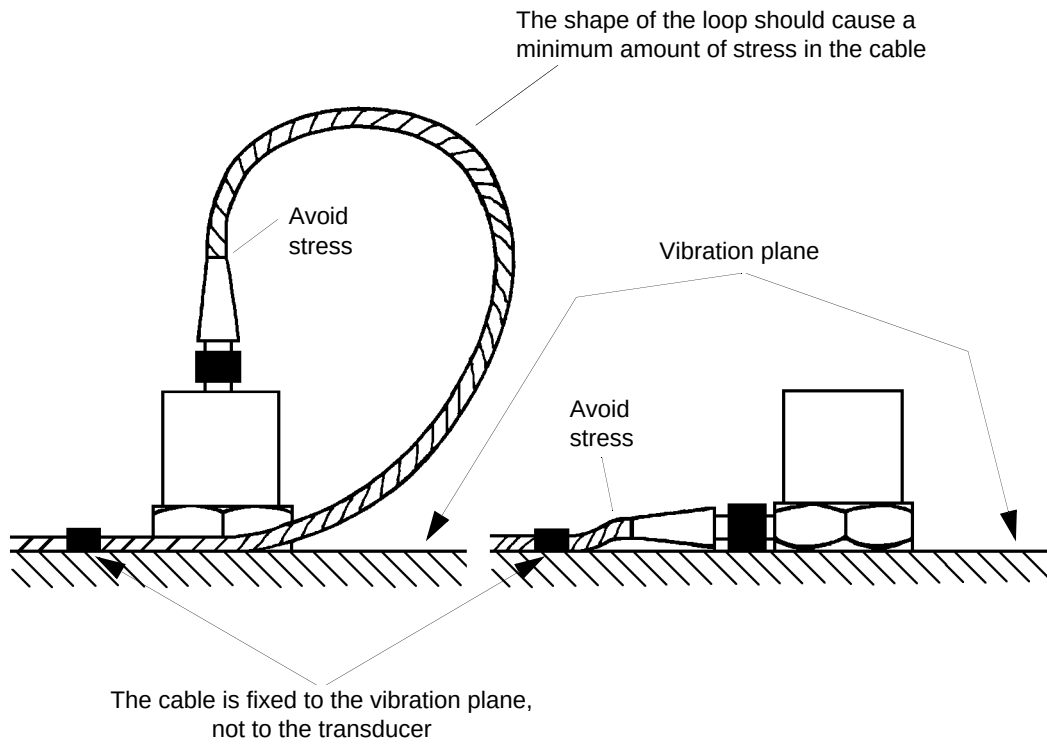


**Figure 3-6: Accelerometer fixed on a magnetic base
(taken from ISO 5348 standard)**

NOTE : Limited use



**Figure 3-7: Accelerometer fixed on a thin film of beeswax
(taken from ISO 5348 standard)**



**Figure 3-8: Fixing an accelerometer cable
(taken from ISO 5348 standard)**

Part II : Mounting Instructions

THIS PAGE INTENTIONALLY LEFT BLANK

4 GENERAL MOUNTING INSTRUCTIONS

4.1 Requirements for Equipment Used in Potentially Explosive Atmospheres



TO ENSURE THAT THE EQUIPMENT CAN SAFELY BE USED IN POTENTIALLY EXPLOSIVE ATMOSPHERES, IT IS ESSENTIAL TO RESPECT THE CRITERIA MENTIONED IN THE “EC TYPE EXAMINATION CERTIFICATE”.

AN “X” OR A “U” PLACED AFTER THE CERTIFICATE NUMBER INDICATES THAT THE EQUIPMENT IS SUBJECT TO SPECIAL CONDITIONS FOR SAFE USE. THESE CONDITIONS ARE MENTIONED IN THE “SCHEDULE” SECTION OF THE CERTIFICATE.

REFER TO [APPENDIX B - EC TYPE EXAMINATION CERTIFICATES](#) FOR FURTHER INFORMATION.

4.2 General Remarks

Accelerometers and associated hardware must be mounted very carefully in order to increase their reliability and lifetime. Accelerometers can be mounted on various parts of the machine, as illustrated in [Figure 4-1](#).



Mount the accelerometers as close as possible to the bearings. Always ensure they are fixed to very rigid machine parts.

False measurement values can be obtained if accelerometers are mounted on the machine housing or on other structures with low mechanical stiffness, as these are liable to resonate.

NOTE 1 : The procedures described in this manual should be strictly applied, in order to ensure the accelerometers and associated hardware are mounted correctly. This will ensure that measurement signals are not affected by interference.

NOTE 2 : The user should respect general safety procedures as well as general and specific machine constructor guidelines and instructions.

NOTE 3 : Not all mounting and connecting possibilities are described in this manual. Nevertheless, several specific configurations are described in detail. These can often be adapted for your own specific application. When in doubt, contact Vibro-Meter so that an optimum measurement solution can be found.

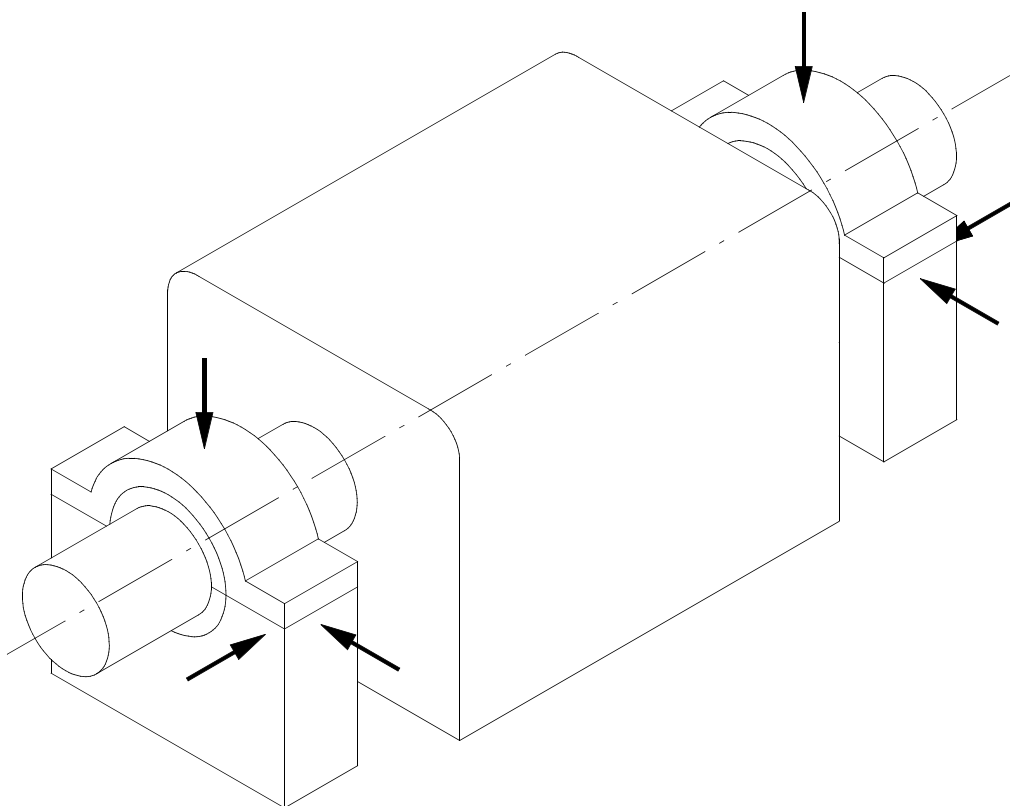


Figure 4-1: Recommended mounting points

5 ACCELEROMETER WITH SEPARATE CONDITIONER

5.1 Introduction

This chapter describes the installation of a chain having an accelerometer and a separate electronic conditioner (see [Figure 5-1](#)). It is relevant to the following types of accelerometers:

- CA 134
- CA 135
- CA 136
- CA 201
- CA 216
- CA 902
- CA 905

A complete description is presented for the CA 201 accelerometer. Specific information on other types of accelerometers is given in [5.2.1.2 - Other Accelerometer Types](#).

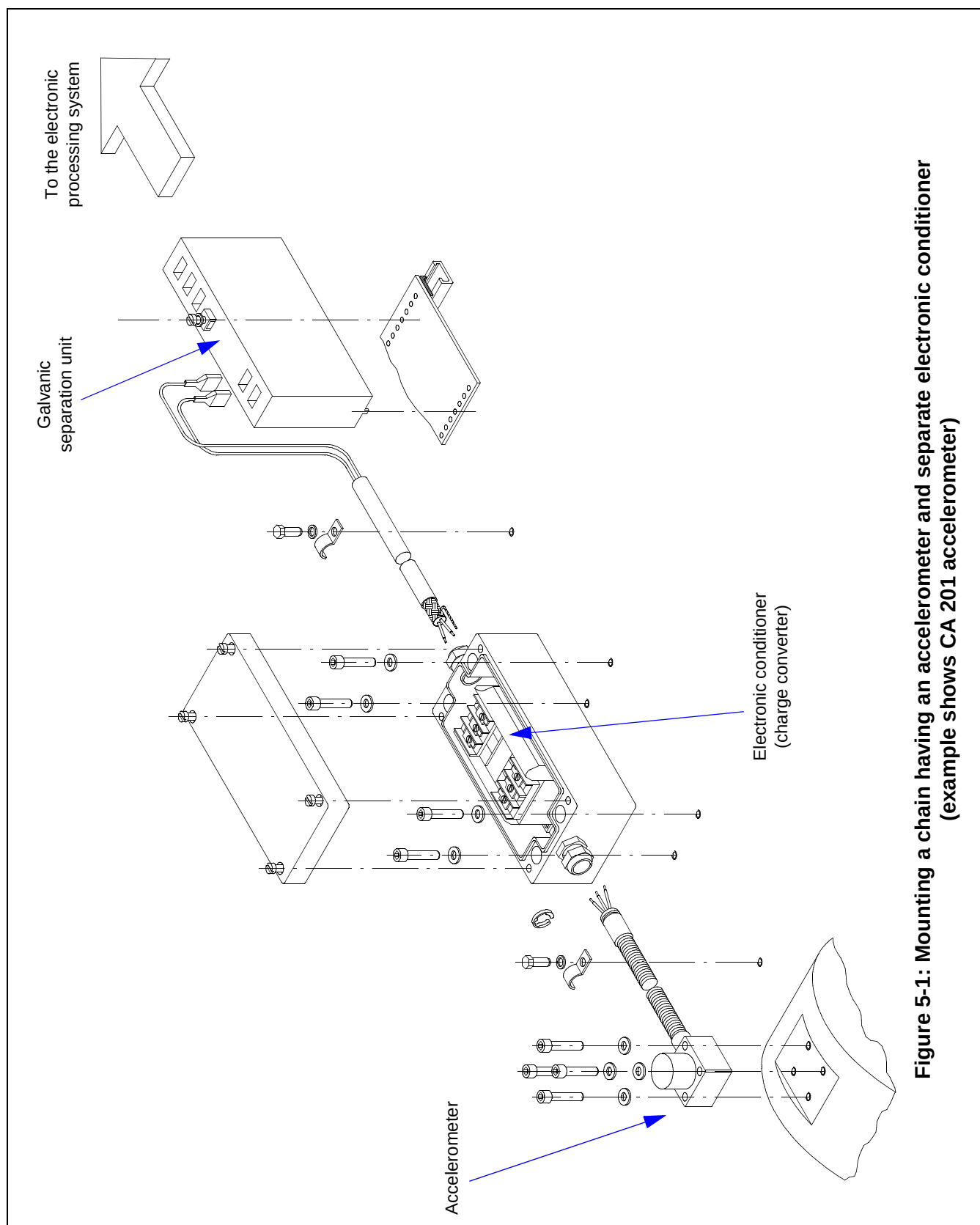


Figure 5-1: Mounting a chain having an accelerometer and separate electronic conditioner
(example shows CA 201 accelerometer)

5.2 Mechanical Aspects

5.2.1 Mounting the Accelerometer

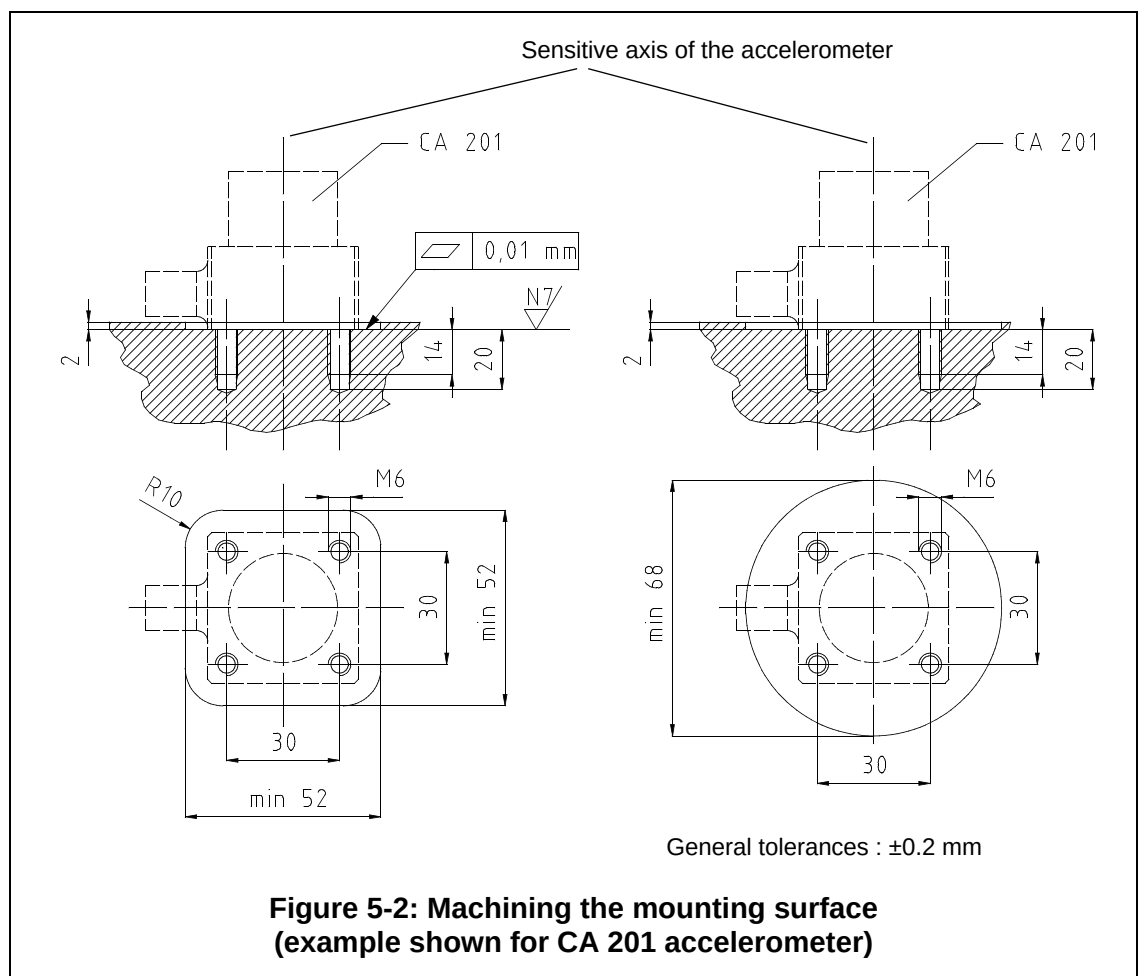
5.2.1.1 CA 201 Accelerometer



For the CA 201, the temperature of the area where the accelerometer will be mounted must be between -54°C and +260°C.

NOTE : Respect the machining tolerances to eliminate the possibility of vibration signals being distorted due to deformations in the accelerometer base.

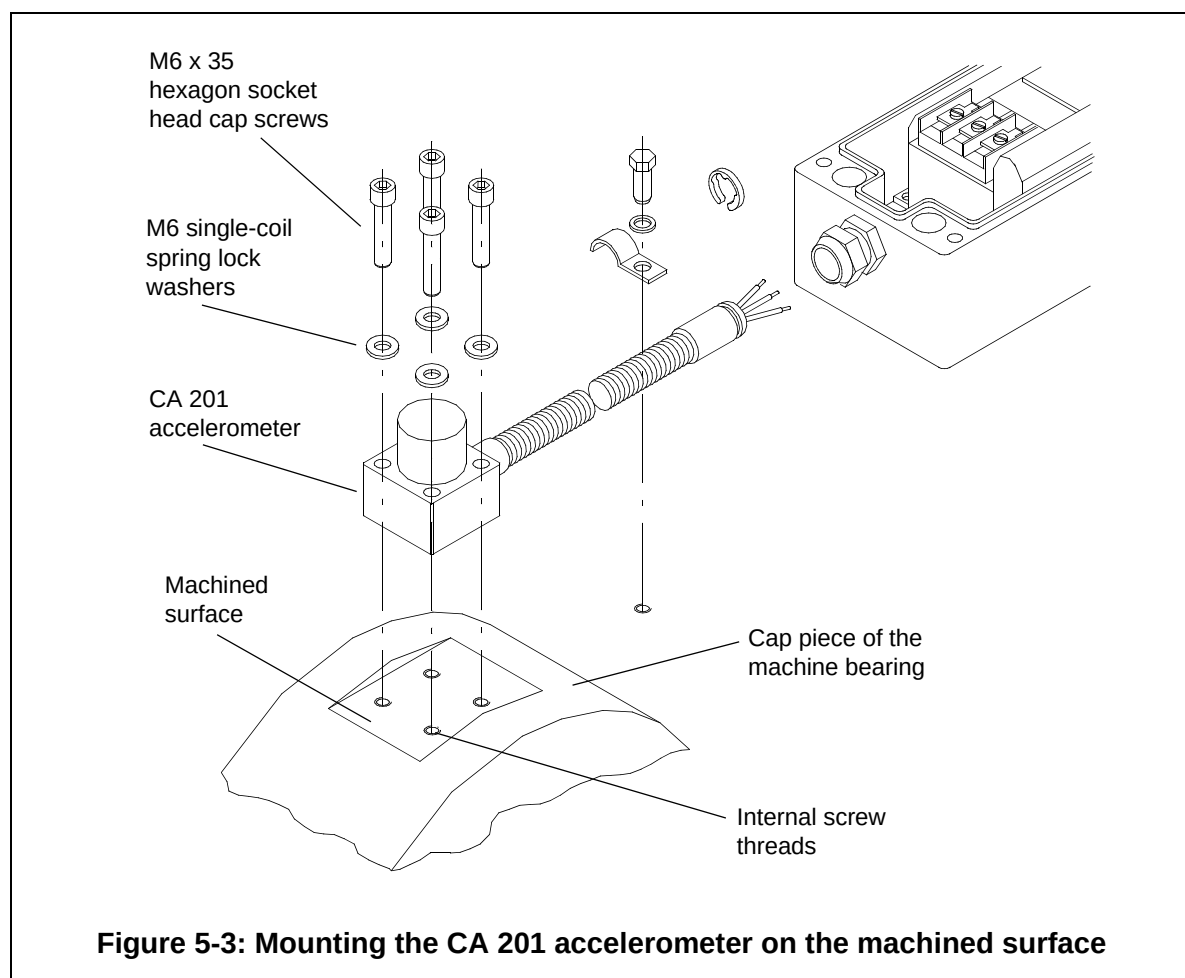
- 1) Prepare the part of the machine surface where the accelerometer will be mounted. This surface should be even and perpendicular to the desired sensitivity axis. The machined surface should have a surface evenness of 0.01 mm and a surface quality of N7 (see Figure 5-2).



- 2) Mark the position of the four tappings (internal screw threads) on the machined surface.
- 3) Drill four holes with a diameter of 4.8 mm and a depth of 20 mm.
- 4) Apply M6 screw taps in the four holes to a depth of 14 mm.
- 5) Prepare four M6 x 35 hexagon socket head cap screws and four M6 single-coil spring lock washers.
- 6) Coat the screws with LOCTITE 241 adhesive.

NOTE : LOCTITE 241 adhesive can be used to secure elements that are susceptible to vibrations, in order to stop them becoming loose. These elements can nevertheless be disassembled at a later stage if this is necessary.

- 7) Position the accelerometer, equipped with washers and screws, on the mounting surface as shown in [Figure 5-3](#).
- 8) Tighten the four screws using a torque wrench. Do not exceed a tightening torque of 15 Nm.



5.2.1.2 Other Accelerometer Types



Ensure that the temperature of the area where the accelerometer will be mounted lies in the range given in [Table 5-1](#).

Accelerometer Type	Operating Temperature Range
CA 134	-54°C to +450°C
CA 135	-54°C to +260°C
CA 136	-54°C to +260°C
CA 201	-54°C to +260°C
CA 216	-54°C to +200°C
CA 902	-54°C to +450°C
CA 905	-54°C to +620°C

Table 5-1 : Operating temperature ranges

NOTE : The corresponding data sheet provides information on mounting aspects such as the number of mounting holes required, the spacing between them, the dimensions of fixing screws and washers and the maximum tightening torque.

Accelerometers equipped with a connector (as opposed to an integral cable) require a separate connecting cable. The cable's mating connector has to be screwed to the accelerometer connector. This should be done with a torque wrench by applying a tightening torque of between 7 and 11 Nm.

5.2.2 Fixing the Integral Cable



Ensure that the temperature of the area where the integral cable (or the connecting cable) will be mounted lies in the range given in [Table 5-1](#).



Do not mount the cable near a high-voltage or high-frequency transmission line. The measurement signal can be degraded by interference if this is not respected.

- 1) Prepare an appropriate number of mounting clips intended for tubes with a diameter of about 8 mm. Prepare also the same number of fixing screws and washers.
- 2) Mark the position of the mounting clips every 100 to 200 mm on the machine.
- 3) Do not bend the cable beyond the minimum bending radius of 50 mm.
- 4) Drill and tap the holes for the fixing screws.
- 5) Coat the screws with LOCTITE 241 adhesive.
- 6) Position the mounting clips on the integral cable (see [Figure 5-4](#)).
- 7) Fix the screws by applying a tightening torque appropriate to the screw type used.

NOTE : Fixing the cable at regular intervals avoids interference due to the triboelectric effect. Relatively slow cable movements having a large amplitude can cause low-frequency noise to be added to the measurement signal.

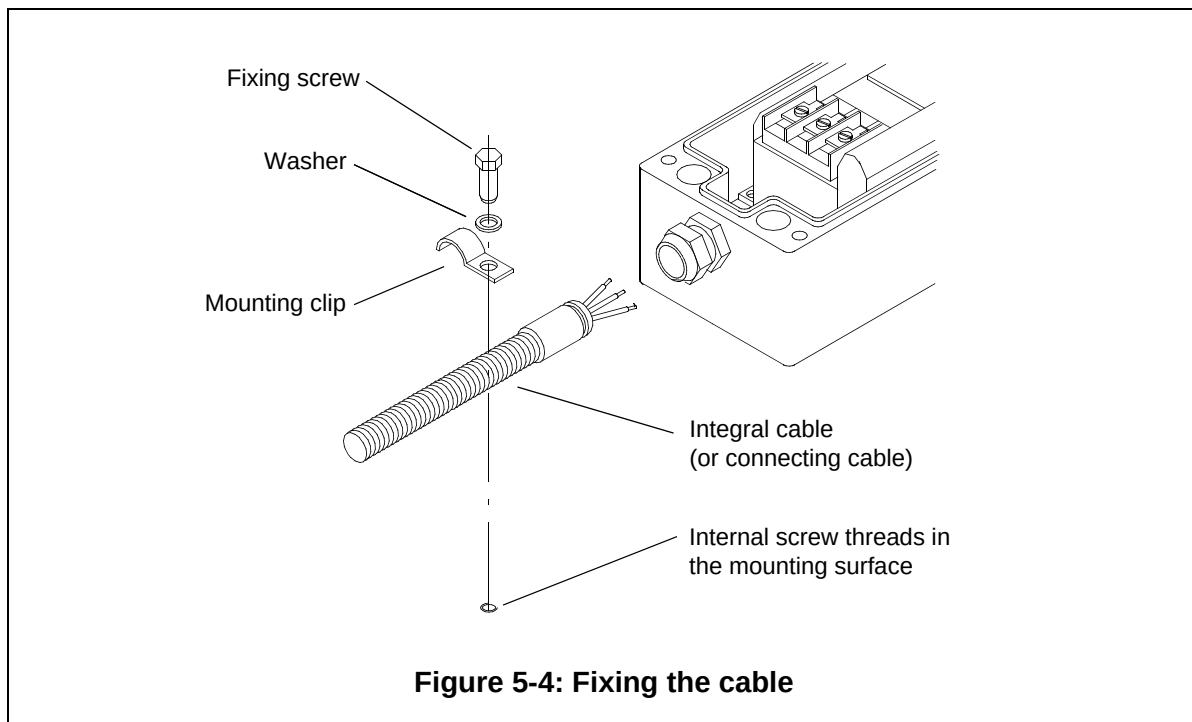


Figure 5-4: Fixing the cable

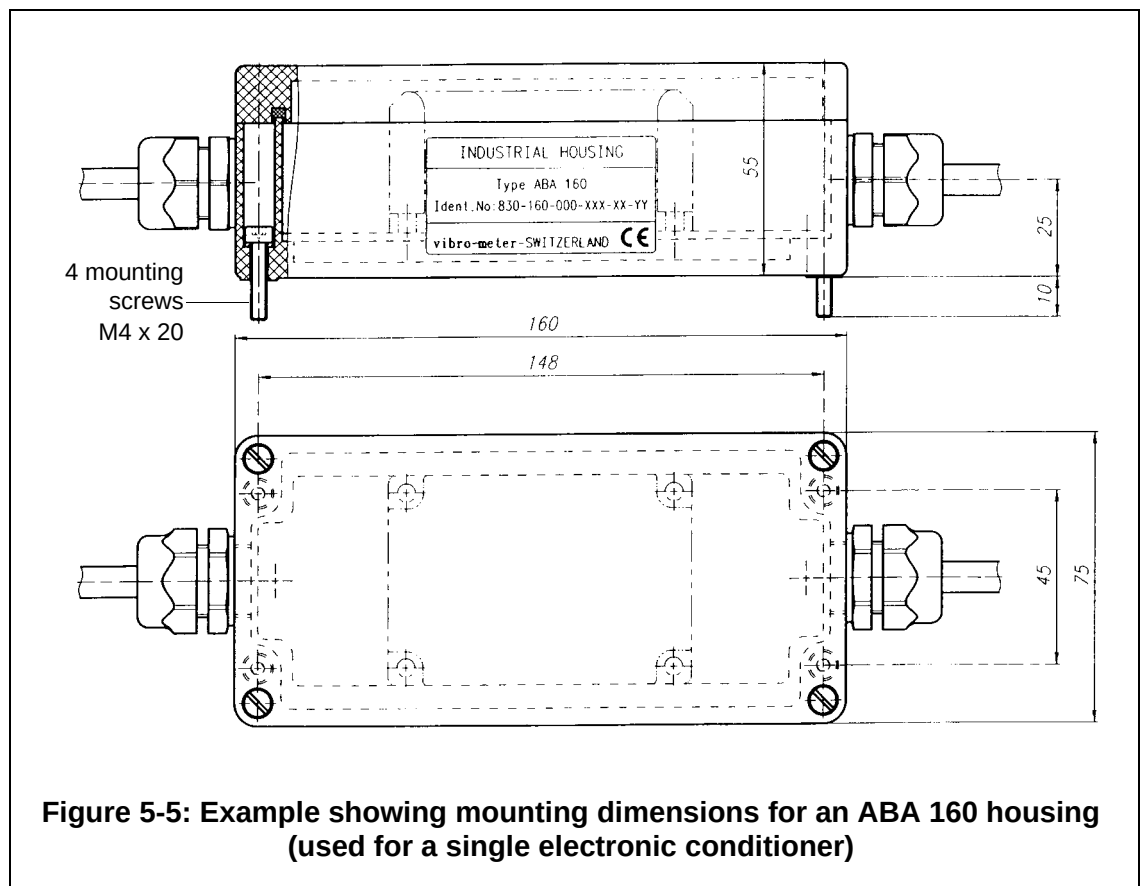
5.2.3 Mounting the Electronic Conditioner



Ensure that the temperature of the area where the electronic conditioner (charge converter) will be mounted lies in the range -25°C to $+70^{\circ}\text{C}$.

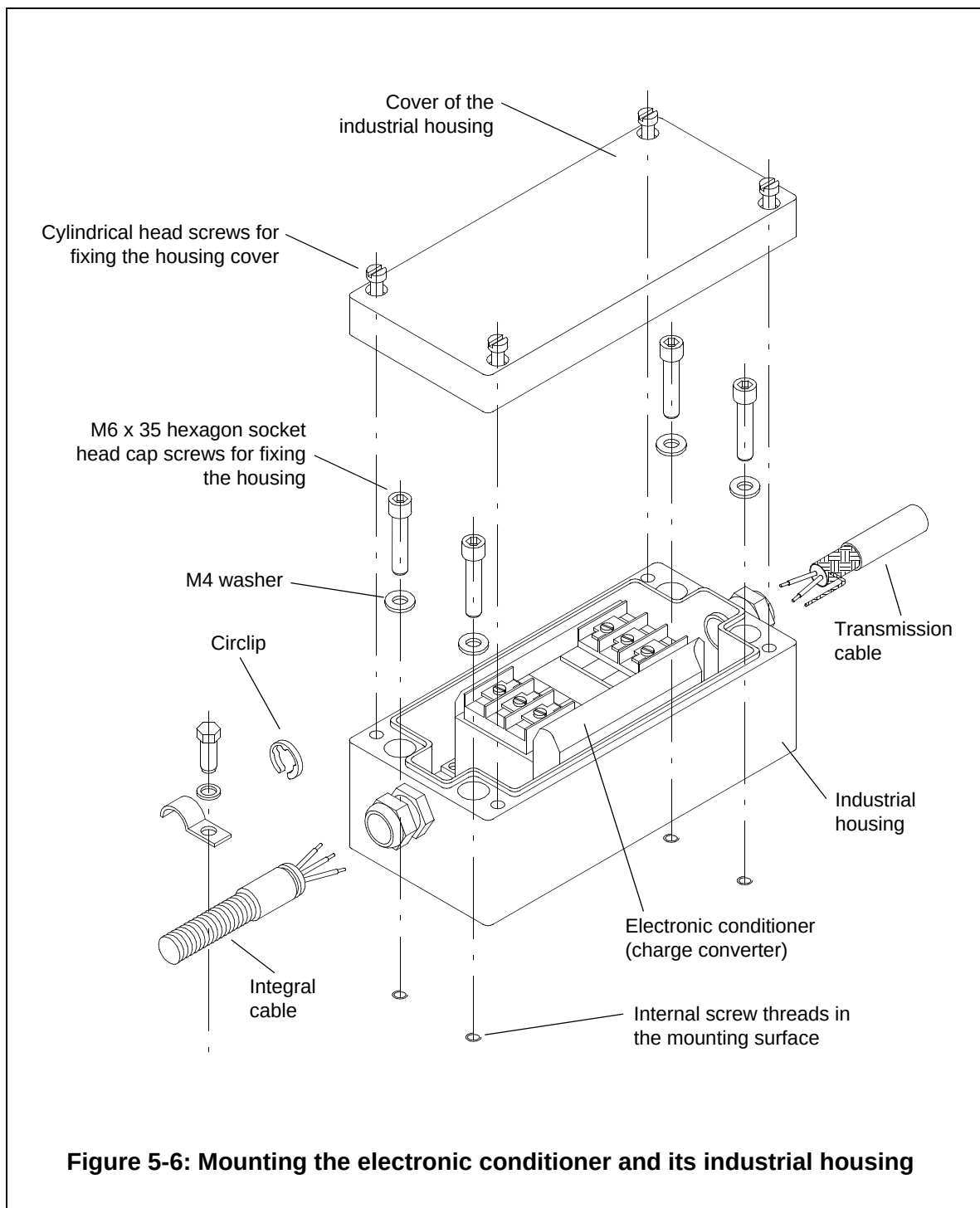
- 1) Choose a vibration-free place for mounting the electronic conditioner and its industrial housing.
- 2) Mark the position of the four tappings (internal screw threads) on the mounting surface. See example for an ABA 160 housing in [Figure 5-5](#).

NOTE : If a different type of industrial housing is used, refer to the corresponding data sheet for information on mounting dimensions.



- 3) Drill four holes with a diameter of 3.2 mm and a depth of 12 mm.
- 4) Apply M4 screw taps in the four holes to a depth of 6 mm.
- 5) Remove the cover of the industrial housing by unscrewing its four screws (see [Figure 5-6](#)).
- 6) Position the housing on the mounting surface and tighten the four M4 x 20 fixing screws. Apply a tightening torque appropriate to the screw type used.

- 7) Screw the electronic conditioner to the housing's aluminium base plate using the two M4 screws provided.
- 8) Before closing the cover of the housing, perform the electrical connections as described in [5.3 - Electrical Connections](#)
- 9) Place the cover on the industrial housing and tighten its four screws.



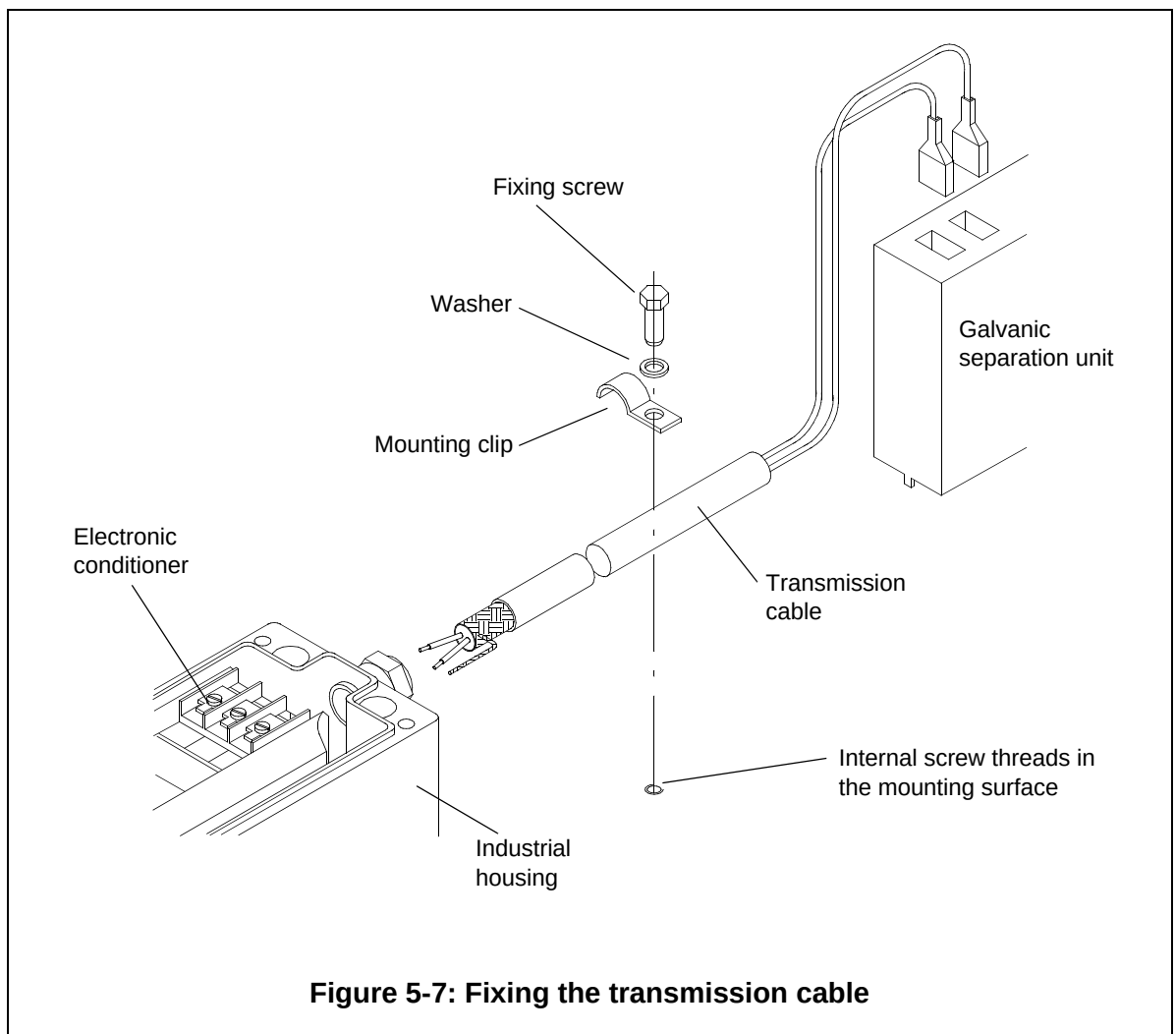
5.2.4 Fixing the Transmission Cable

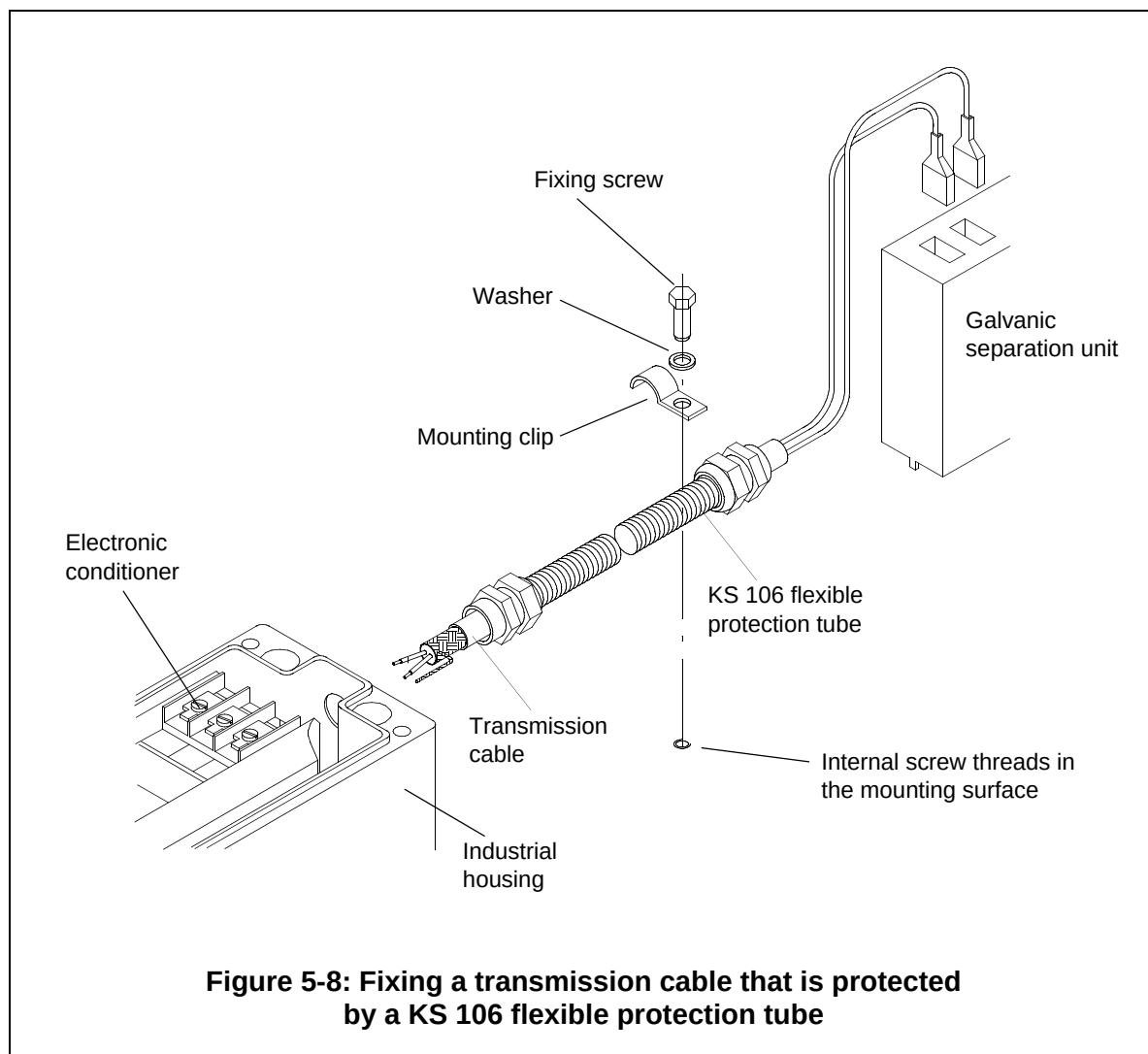


Ensure that the temperature of the area where the transmission cable will be mounted lies in the range -10°C to $+70^{\circ}\text{C}$.

This screened, 2-wire transmission cable can be mounted according to standards for low-voltage installations. It can be fixed by mounting clips as shown in [Figure 5-7](#). Refer to [5.2.2 - Fixing the Integral Cable](#) for further details.

Additional mechanical protection can be provided by placing the transmission cable in a conduit or galvanized steel flexible protection tube (e.g. KS 106). See [Figure 5-8](#) for details.





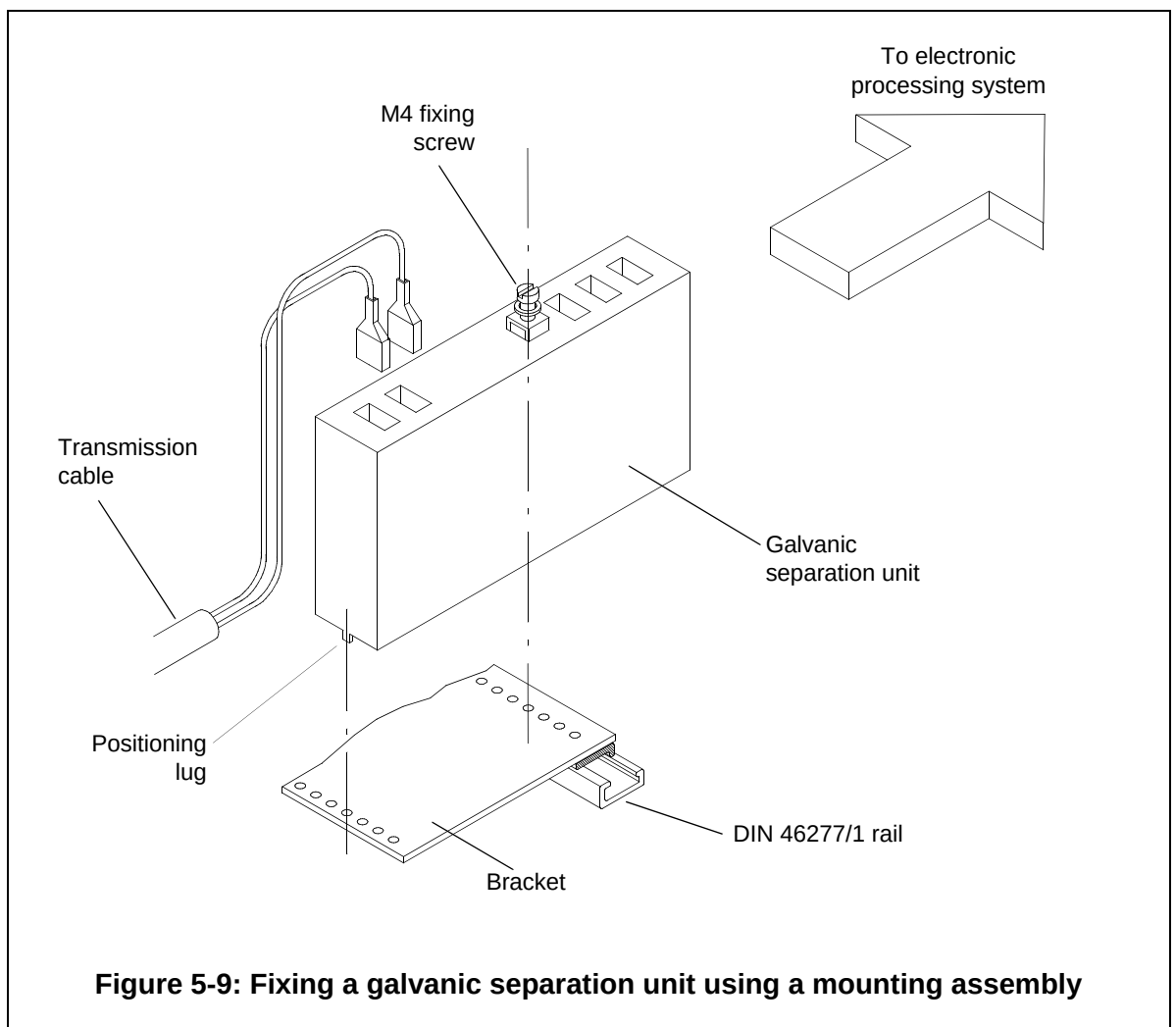
5.2.5 Mounting the Galvanic Separation Unit



Ensure that the temperature of the area where the galvanic separation unit will be mounted lies in the range 0°C to +55°C.

The galvanic separation unit is generally mounted in an industrial housing, a rack or a cabinet.

A mounting assembly kit is available from Vibro-Meter. This consists of a bracket fixed on a DIN 46277/1 rail by means of an M4 fixing screw (see [Figure 5-9](#)). A positioning lug allows the correct placing of the galvanic separation unit on the bracket and, when there are several units, ensures the necessary spacing between them.

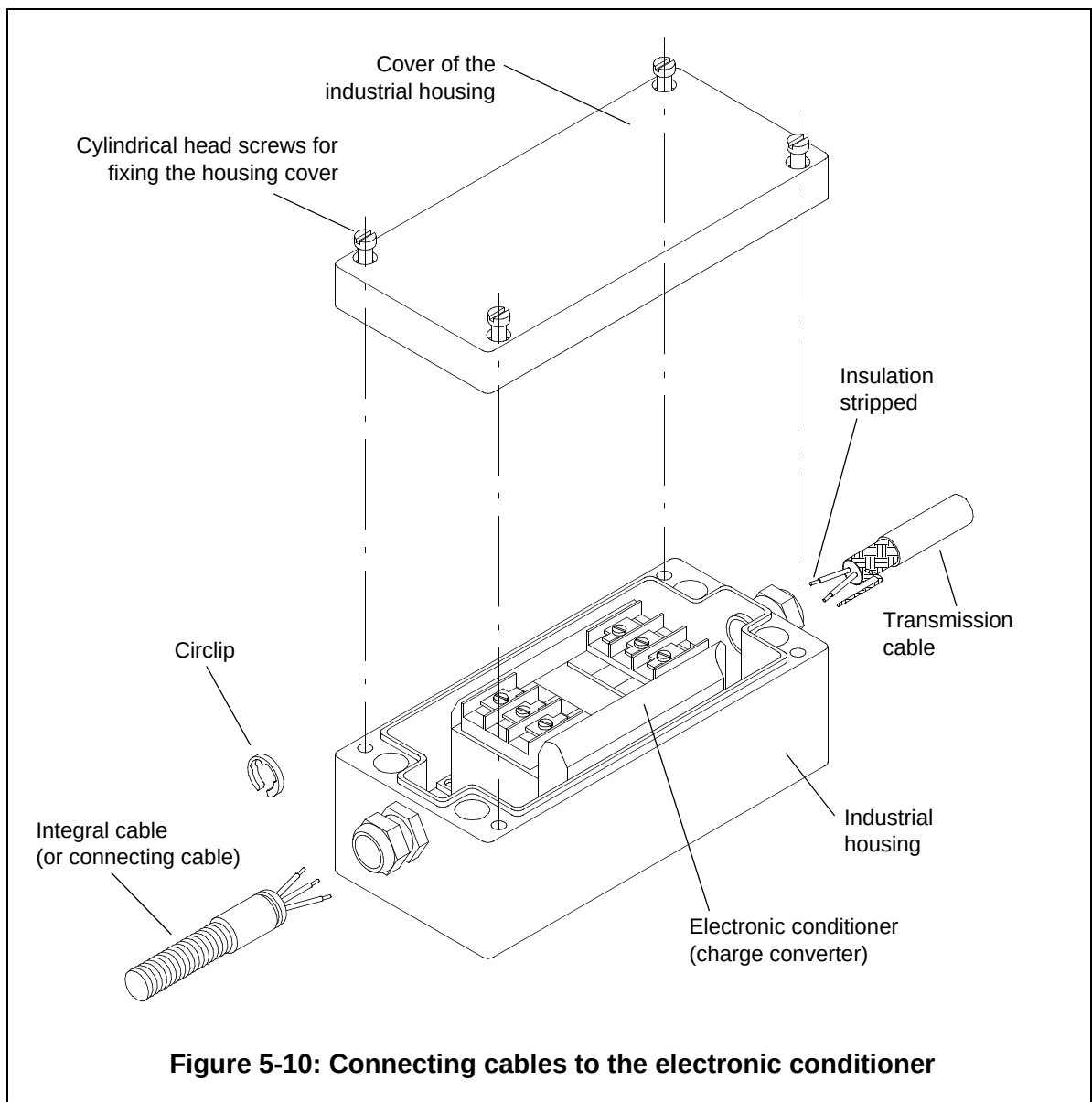


5.3 Electrical Connections

Refer to the general cabling diagram in [Figure 5-11](#).

5.3.1 Connecting Cables to the Electronic Conditioner

- 1) Strip the insulation off the wires in the integral cable (or connecting cable) and the transmission cable (see [Figure 5-10](#)).
- 2) Remove the cover of the industrial housing by unscrewing the four screws.



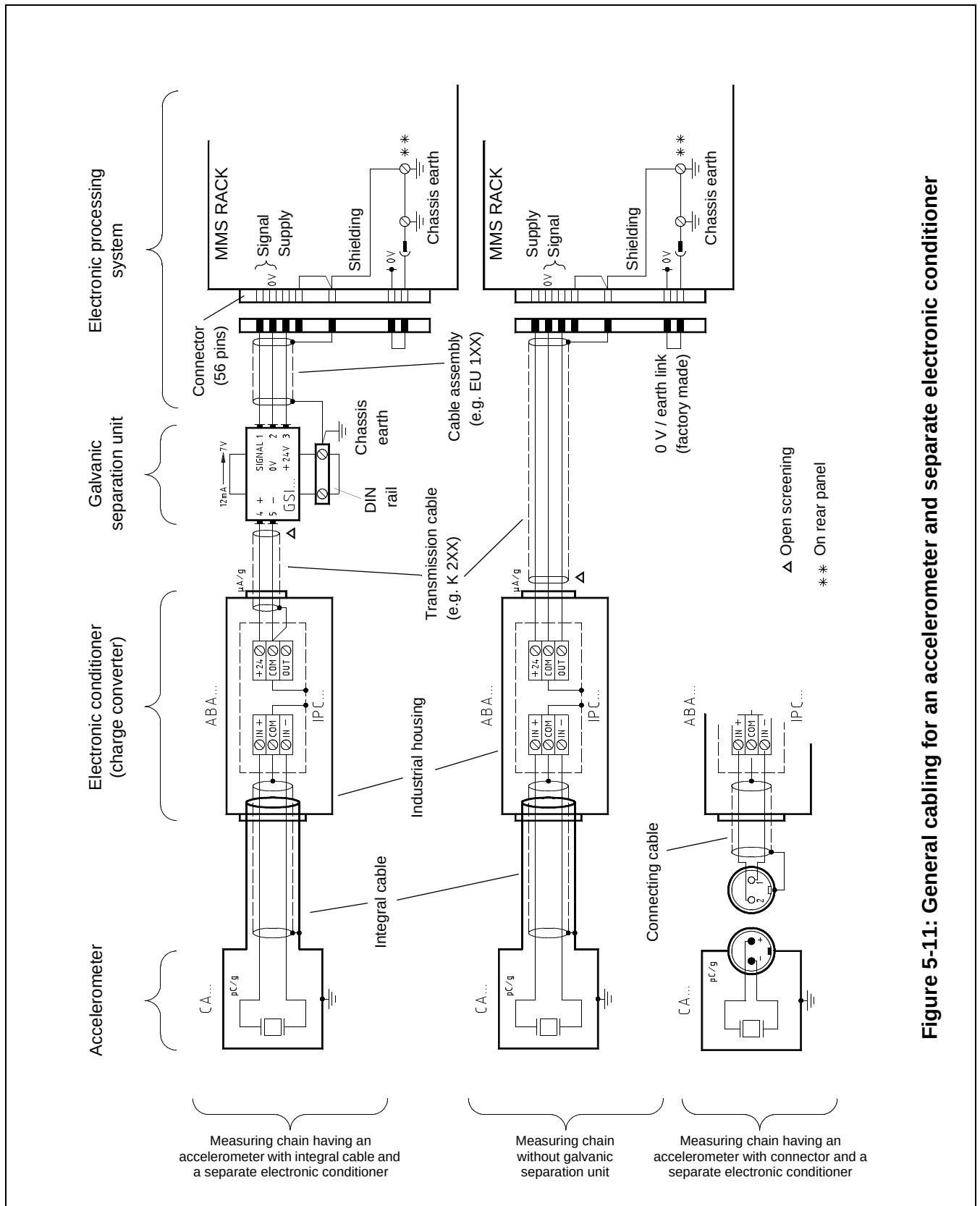
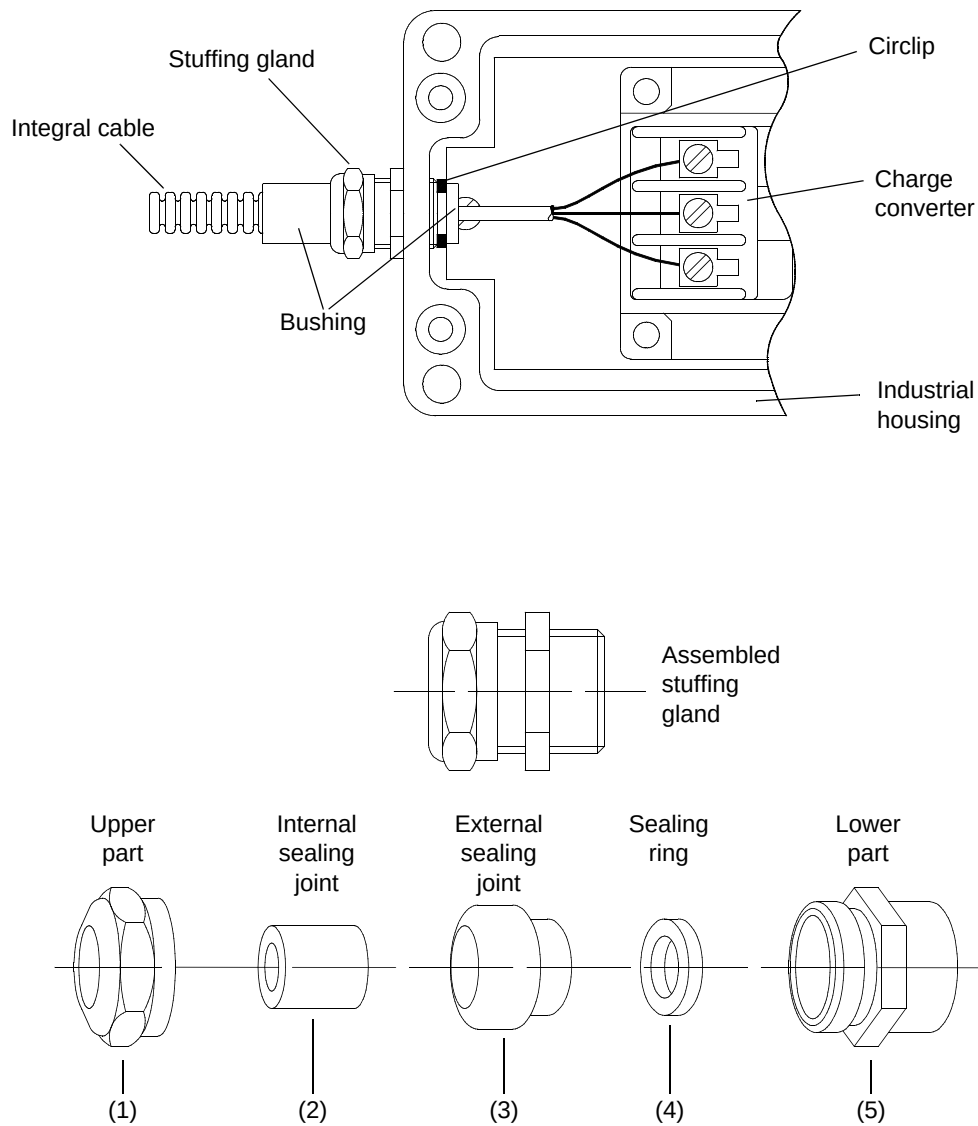


Figure 5-11: General cabling for an accelerometer and separate electronic conditioner

- 3) Pass the cables through the stuffing glands on the industrial housing. To do this, proceed as follows (see [Figure 5-12](#)) :
 - a. Unscrew element 1 anti-clockwise. Do not remove element 5 from the housing.
 - b. Pull elements 2 and 3 out of element 1 (elements 2 and 3 allow the stuffing gland to be adapted to different cable diameters). Element 2 can be removed from element 3 simply by pressing it outwards.
 - c. Pass the cable through elements 1, 2 (if used), 3, 4 and 5.
 - d. Assemble and tighten the elements of the stuffing gland.
 - e. Check that the cable is held fast by the stuffing gland. This is necessary to guarantee the required waterproofness.
- 4) Connect the wires of the integral cable (or connecting cable) and the transmission cable to the terminal strips on the charge converter (see [Figure 5-10](#)).
- 5) Place the Ø 8 circlip (supplied with the accelerometer) into the groove in the cable bushing (see [Figure 5-10](#) and [Figure 5-12](#)). This prevents the integral cable from slipping out of the stuffing gland.
- 6) Place the cover on the industrial housing and tighten its four screws.



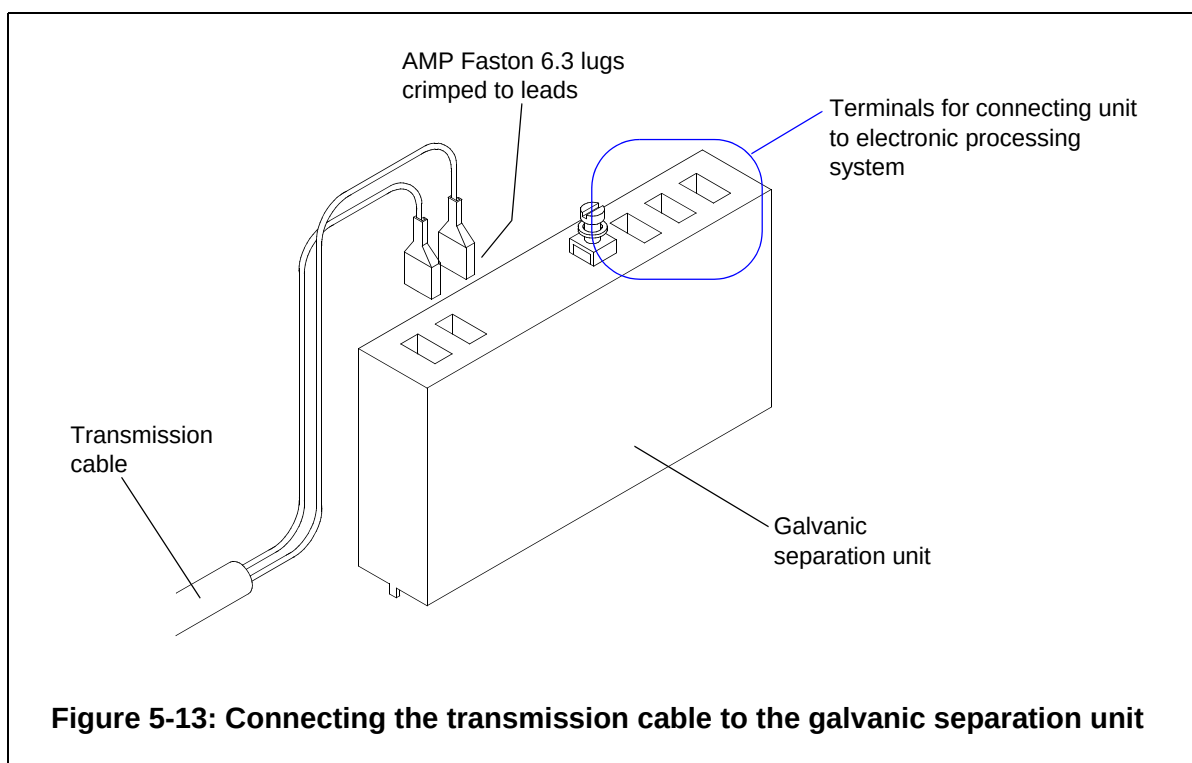
**Figure 5-12: Stuffing gland mounted on an industrial housing
(assembled and exploded views)**

5.3.2 Connecting the Transmission Cable to the Galvanic Separation Unit

- 1) Strip the insulation off the leads in the transmission cable.
- 2) Crimp these leads to two AMP Faston 6.3 lugs.
- 3) Plug the lugs into the galvanic separation unit (see [Figure 5-13](#)).

NOTE 1 : The screening of the transmission cable should not be connected to the galvanic separation unit.

NOTE 2 : The leads of the cable linking the galvanic separation unit to the electronic processing system must also be equipped with AMP Faston 6.3 lugs.



6 ACCELEROMETER WITH ATTACHED CONDITIONER

6.1 Introduction

This chapter describes the installation of a chain having an accelerometer with attached electronic conditioner (see [Figure 6-1](#)). It is relevant to the following types of accelerometers:

- CE 134
- CE 136

A complete description is presented for these accelerometer types.

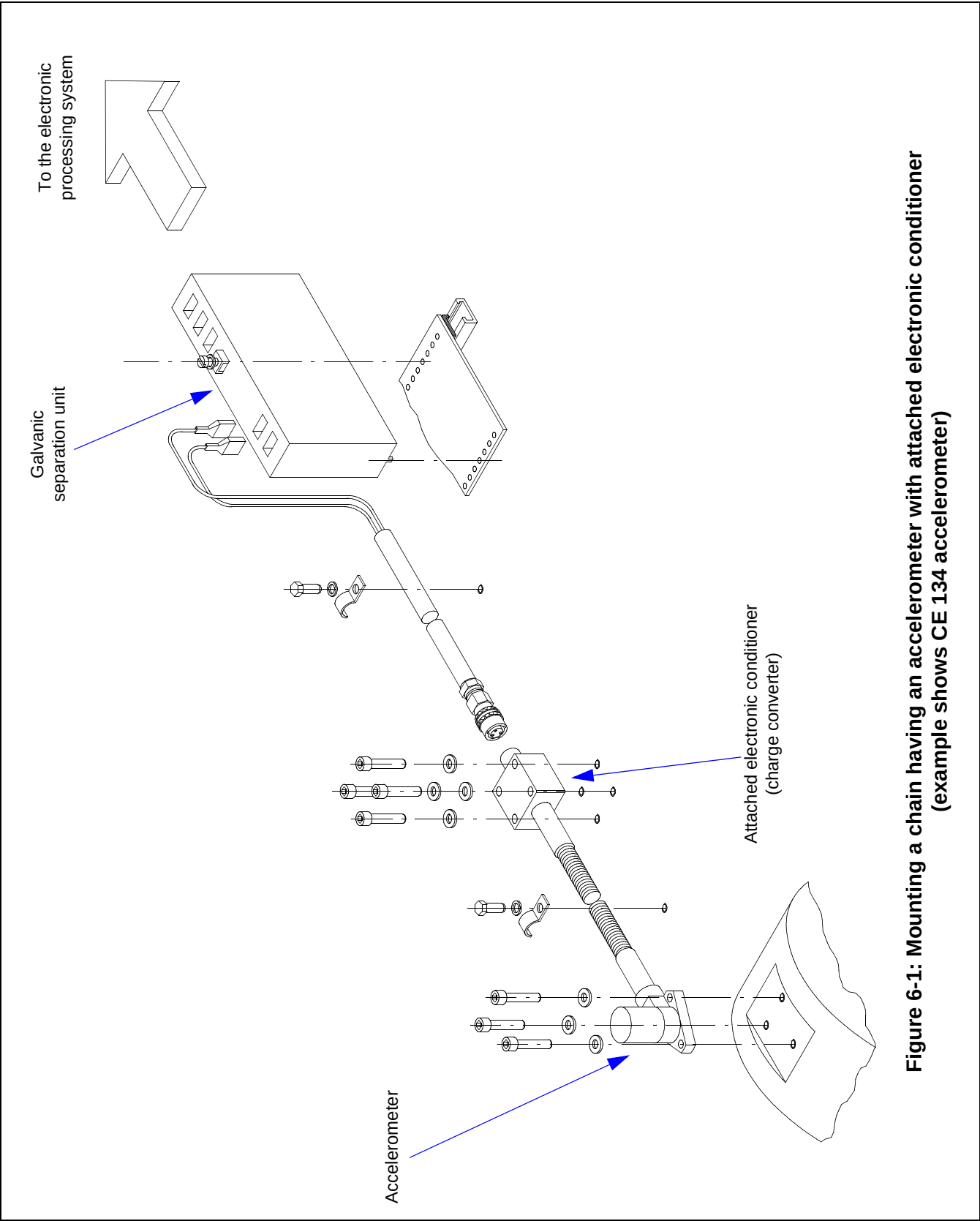


Figure 6-1: Mounting a chain having an accelerometer with attached electronic conditioner (example shows CE 134 accelerometer)

6.2 Mechanical Aspects

6.2.1 Mounting the Accelerometer

6.2.1.1 CE 134 or CE 136 Accelerometer



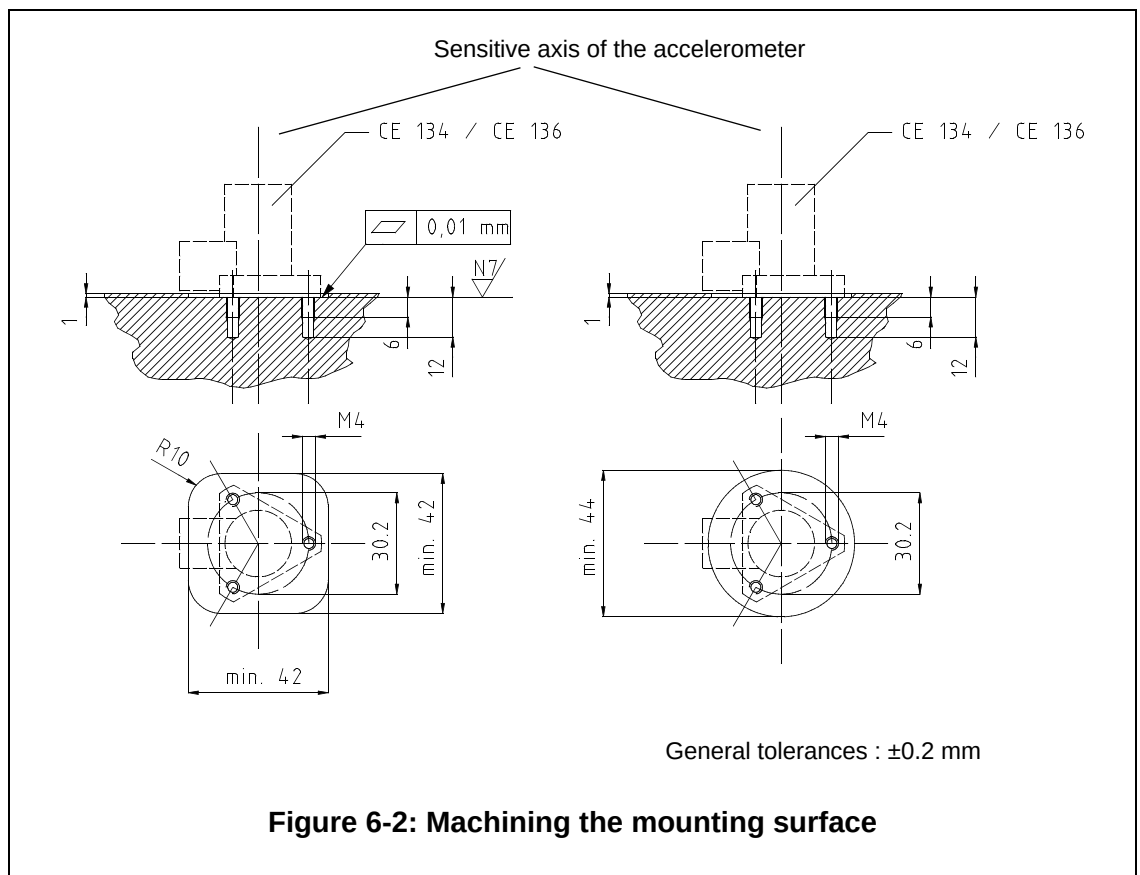
For the CE 134, the temperature of the area where the accelerometer will be mounted must be between -70°C and $+350^{\circ}\text{C}$.

For the CE 134 accelerometer's integral cable, the temperature of the area where it will be mounted must be between -54°C and $+260^{\circ}\text{C}$.

For the CE 136, the temperature of the area where the accelerometer and its integral cable will be mounted must be between -54°C and $+260^{\circ}\text{C}$.

NOTE : Respect the machining tolerances to eliminate the possibility of vibration signals being distorted due to deformations in the accelerometer base.

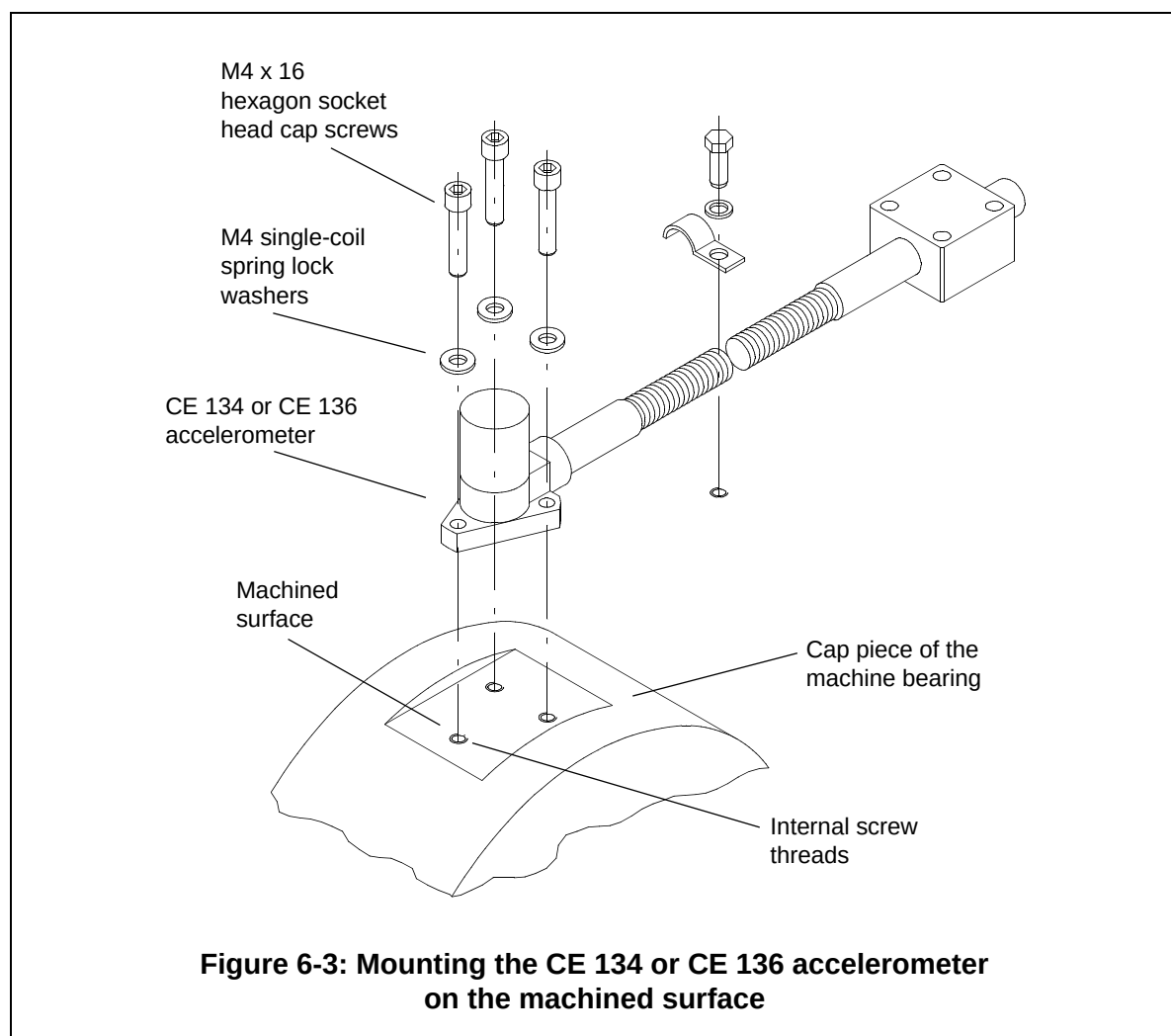
- 1) Prepare the part of the machine surface where the accelerometer will be mounted. This surface should be even and perpendicular to the desired sensitivity axis. The machined surface should have a surface evenness of 0.01 mm and a surface quality of N7 (see Figure 6-2).



- 2) Mark the position of the three tapings (internal screw threads) on the machined surface.
- 3) Drill three holes with a diameter of 3.2 mm and a depth of 12 mm.
- 4) Apply M4 screw taps in the three holes to a depth of 12 mm.
- 5) Prepare three M4 x 16 hexagon socket head cap screws and three M4 single-coil spring lock washers.
- 6) Coat the screws with LOCTITE 241 adhesive.

NOTE : LOCTITE 241 adhesive can be used to secure elements that are susceptible to vibrations, in order to stop them becoming loose. These elements can nevertheless be disassembled at a later stage if this is necessary.

- 7) Position the accelerometer, equipped with washers and screws, on the mounting surface as shown in [Figure 6-3](#).
- 8) Tighten the three screws using a torque wrench. Do not exceed a tightening torque of 4.5 Nm.



6.2.2 Fixing the Integral Cable



For the CE 134 and CE 136 accelerometers, the temperature of the area where the integral cable will be mounted must be between -54°C and $+260^{\circ}\text{C}$.



Do not mount the cable near a high-voltage or high-frequency transmission line. The measurement signal can be degraded by interference if this is not respected.

- 1) Prepare an appropriate number of mounting clips intended for tubes with a diameter of about 8 mm. Prepare also the same number of fixing screws and washers.
- 2) Mark the position of the mounting clips every 100 to 200 mm on the machine.
- 3) Do not bend the cable beyond the minimum bending radius of 50 mm.
- 4) Drill and tap the holes for the fixing screws.
- 5) Coat the screws with LOCTITE 241 adhesive.
- 6) Position the mounting clips on the integral cable (see [Figure 6-4](#)).
- 7) Fix the screws by applying a tightening torque appropriate to the screw type used.

NOTE : Fixing the cable at regular intervals avoids interference due to the triboelectric effect. Relatively slow cable movements having a large amplitude can cause low-frequency noise to be added to the measurement signal.

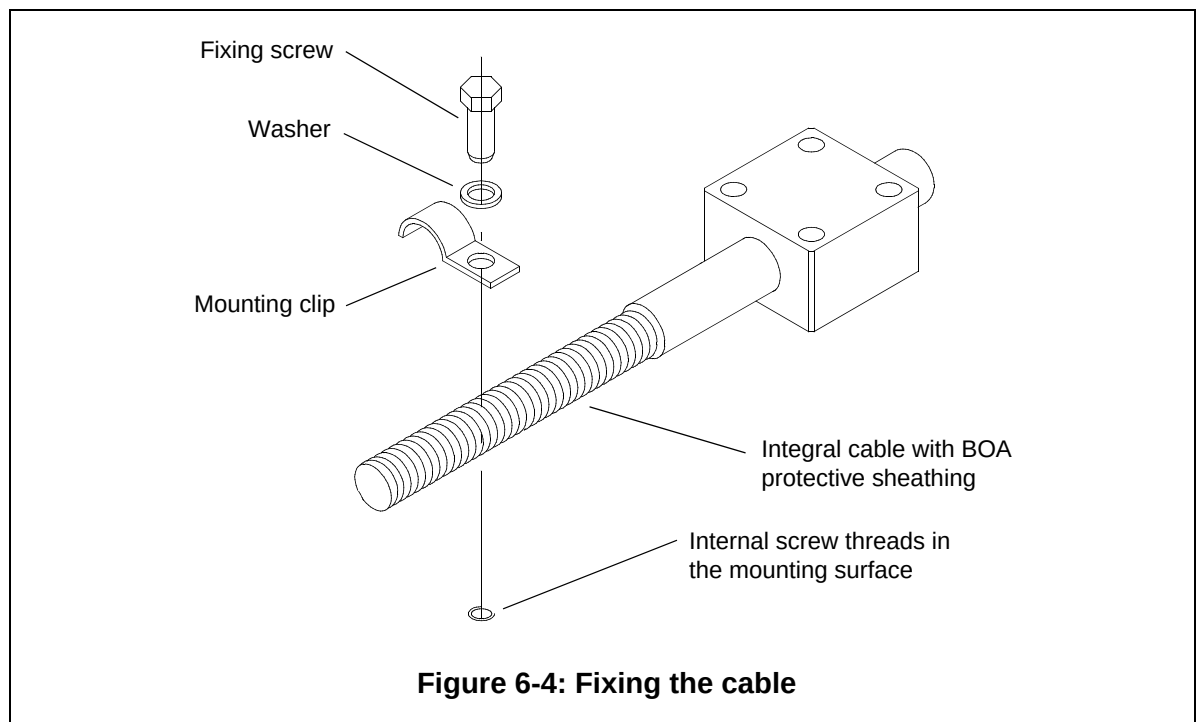


Figure 6-4: Fixing the cable

6.2.3 Mounting the Attached Electronic Conditioner



Ensure that the temperature of the area where the attached electronic conditioner (charge converter) will be mounted lies in the range -30°C to $+100^{\circ}\text{C}$.

- 1) Choose a vibration-free place for mounting the attached electronic conditioner.
- 2) Mark the position of the four tappings (internal screw threads) on the mounting surface (see [Figure 6-5](#)).

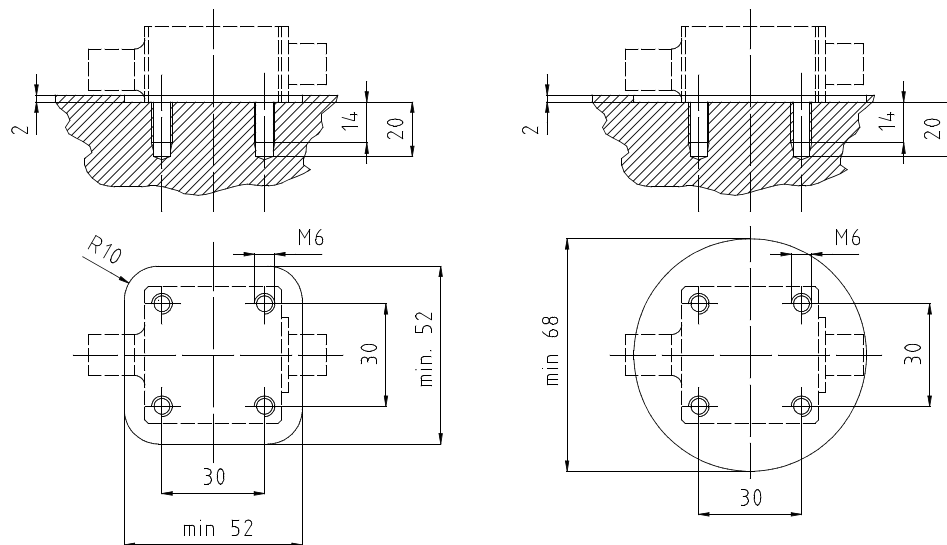
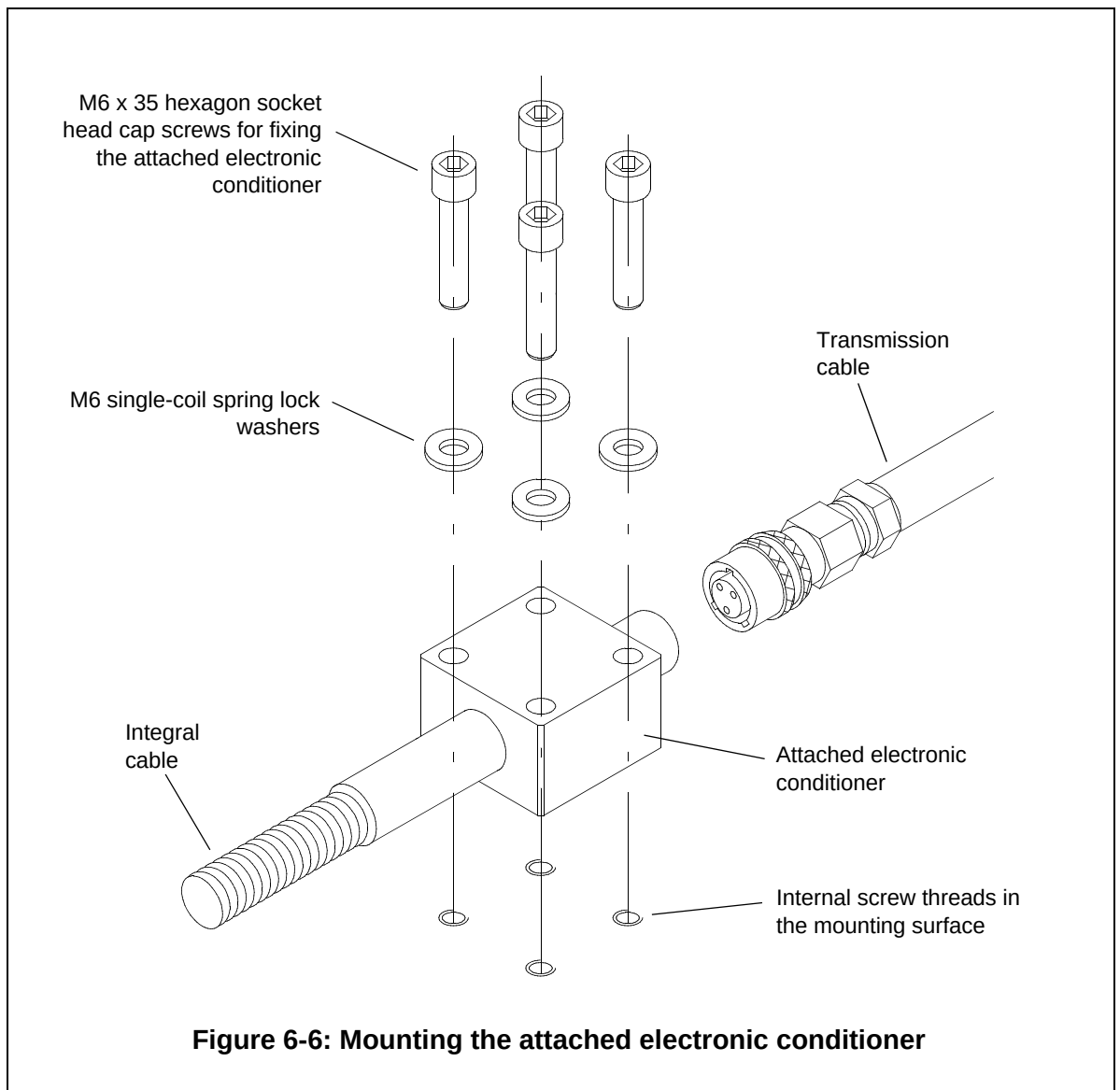


Figure 6-5: Dimensions for mounting the attached conditioner

- 3) Drill four holes with a diameter of 4.8 mm and a depth of 20 mm.
- 4) Apply M6 screw taps in the four holes to a depth of 14 mm.
- 5) Prepare four M6 x 35 hexagon socket head cap screws and four M6 single-coil spring lock washers.
- 6) Coat the screws with LOCTITE 241 adhesive.
- 7) Position the attached electronic conditioner, equipped with washers and screws, on the mounting surface as shown in [Figure 6-6](#).
- 8) Tighten the four screws using a torque wrench. Do not exceed a tightening torque of 15 Nm.



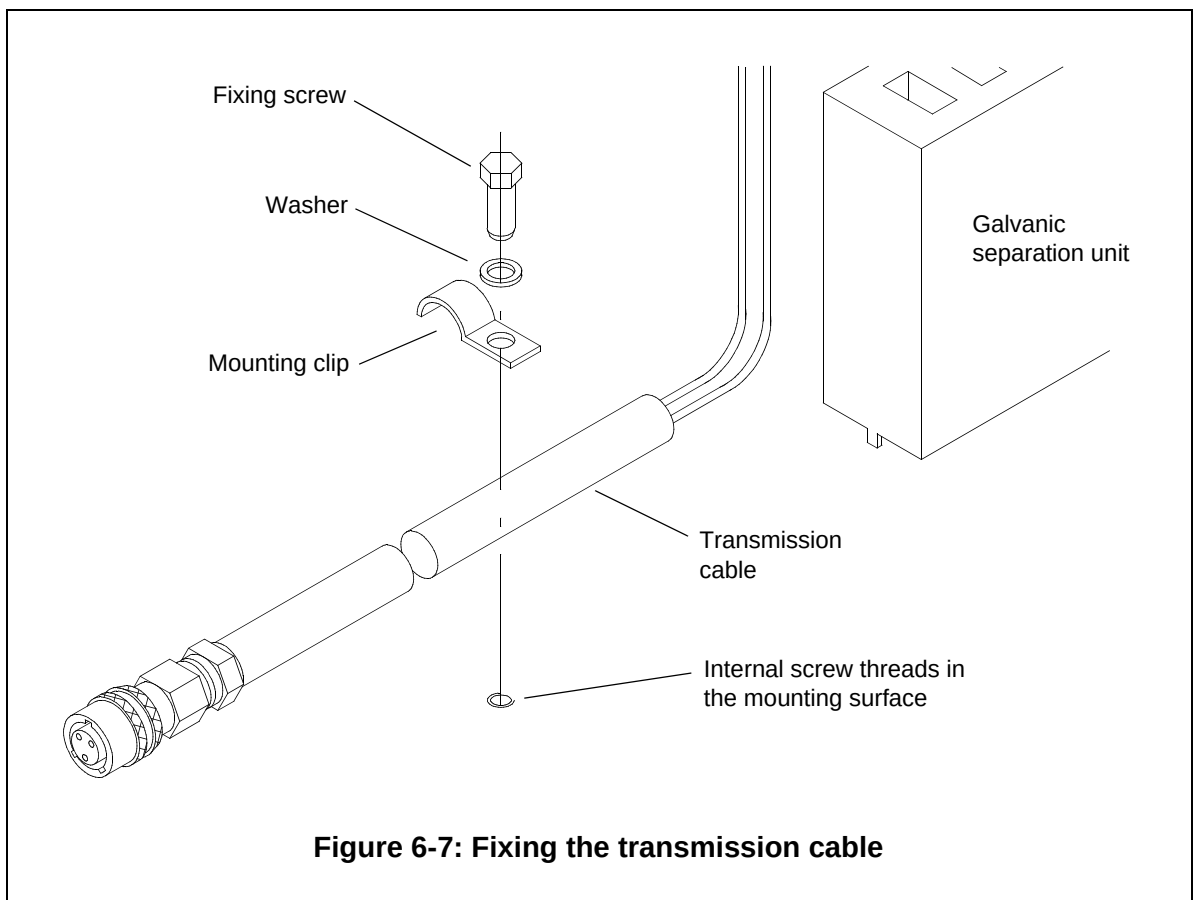
6.2.4 Fixing the Transmission Cable



Ensure that the temperature of the area where the transmission cable will be mounted lies in the range -10°C to $+70^{\circ}\text{C}$.

This screened, 2-wire transmission cable can be mounted according to standards for low-voltage installations. It can be fixed by mounting clips as shown in [Figure 6-7](#). Refer to [6.2.2 - Fixing the Integral Cable](#) for further details.

Additional mechanical protection can be provided by placing the transmission cable in a conduit or galvanized steel flexible protection tube (e.g. KS 106).



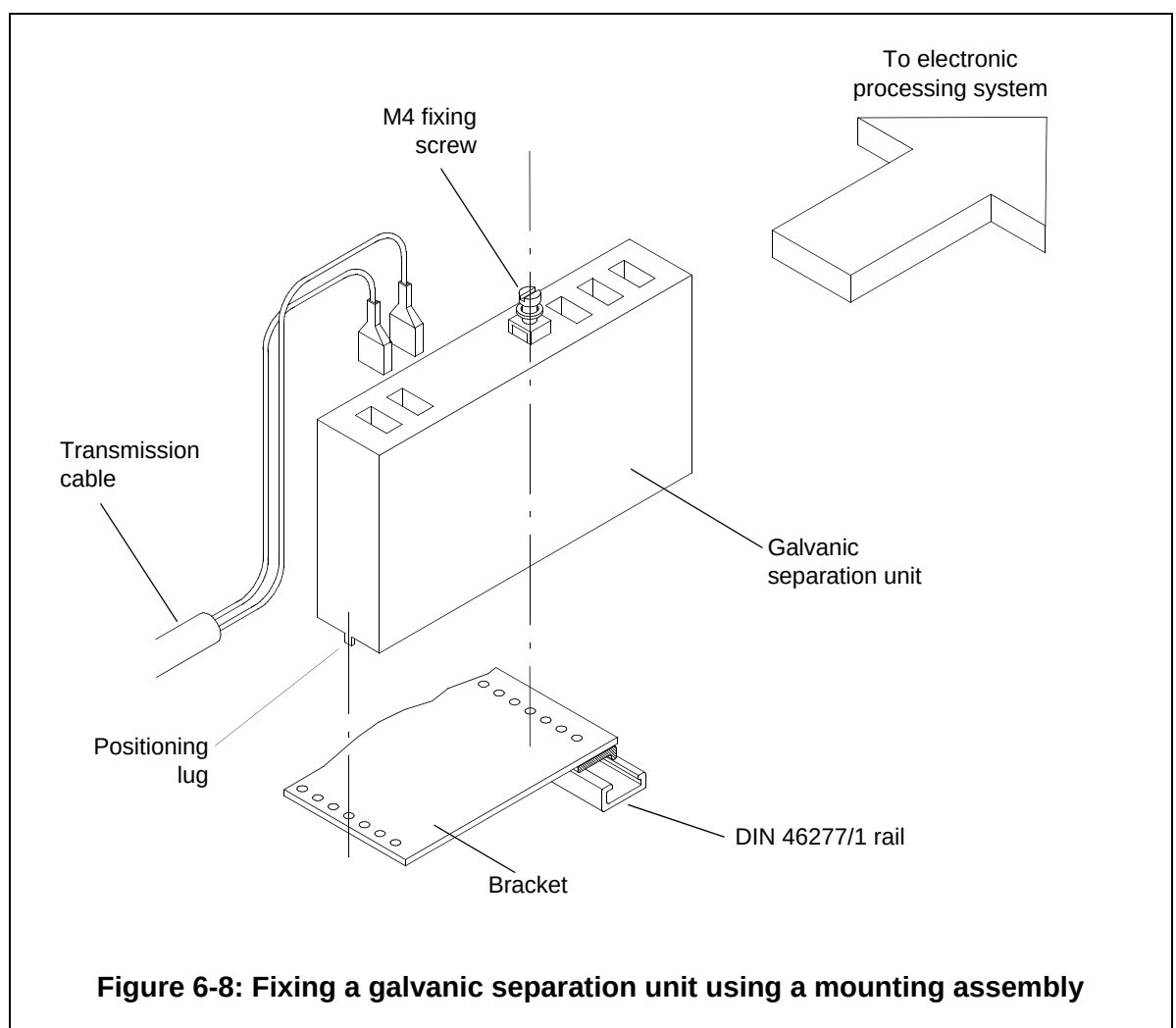
6.2.5 Mounting the Galvanic Separation Unit



Ensure that the temperature of the area where the galvanic separation unit will be mounted lies in the range 0°C to +55°C.

The galvanic separation unit is generally mounted in an industrial housing, a rack or a cabinet.

A mounting assembly kit is available from Vibro-Meter. This consists of a bracket fixed on a DIN 46277/1 rail by means of an M4 fixing screw (see [Figure 6-8](#)). A positioning lug allows the correct placing of the galvanic separation unit on the bracket and, when there are several units, ensures the necessary spacing between them.

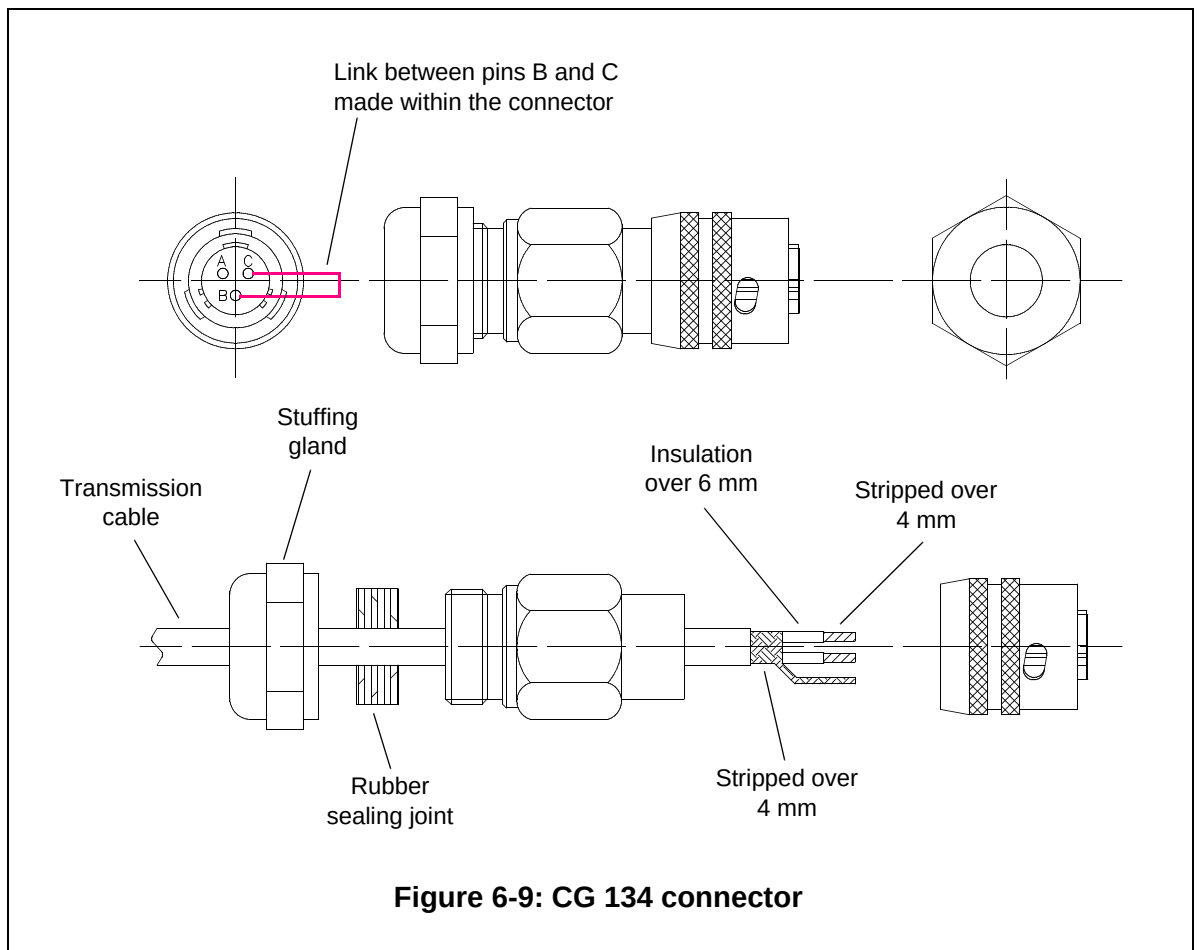


6.3 Electrical Connections

Refer to the general cabling diagram in [Figure 6-10](#).

6.3.1 Connecting Cables to the Electronic Conditioner

- 1) Strip the insulation off the wires in the transmission cable (see [Figure 6-9](#)).
- 2) Dismantle the CG 134 connector on the transmission cable by unscrewing its constituent elements.
- 3) Pass the transmission cable through the connector elements and solder its wires to pins A, B and C according to the general cable layout shown in [Figure 6-10](#).
- 4) Obtain a short length of insulated wire and strip both ends to make a linking wire. Solder this wire to pins B and C of the CG 134 connector (see [Figure 6-9](#)). This will ensure the vibration signals do not suffer any interference produced by leakage currents, earth loops, potential differences, etc. Such noise may be generated if the accelerometer is not earthed correctly (e.g. accelerometer mounted on an insulating support, mounting place not connected to earth, etc).
- 5) Coat the connector thread with LOCTITE 241 adhesive.
- 6) Reassemble the CG 134 connector by tightening its constituent elements. Make sure the cable is not twisted.
- 7) Plug the CG 134 connector into the mating connector on the attached electronic conditioner.



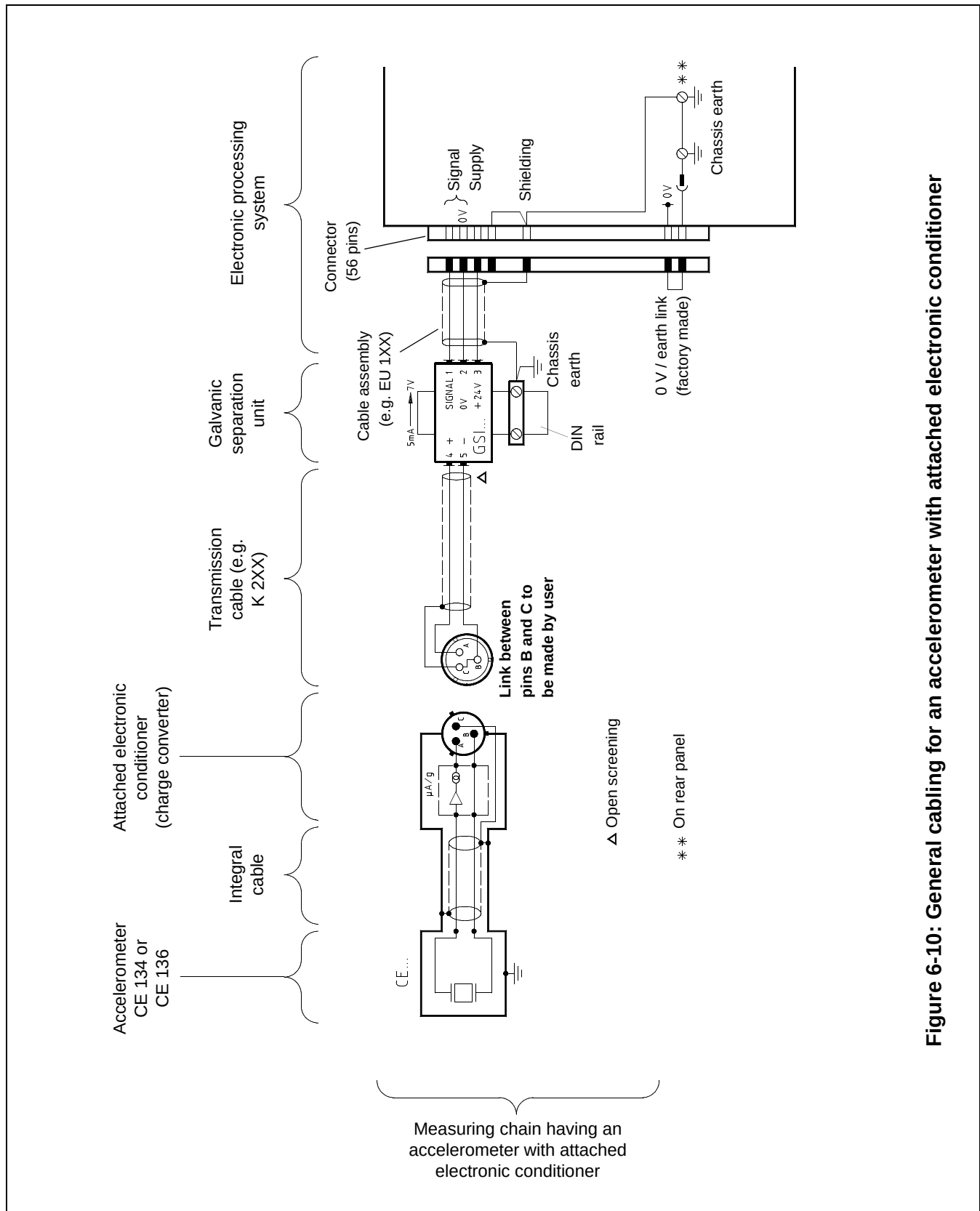


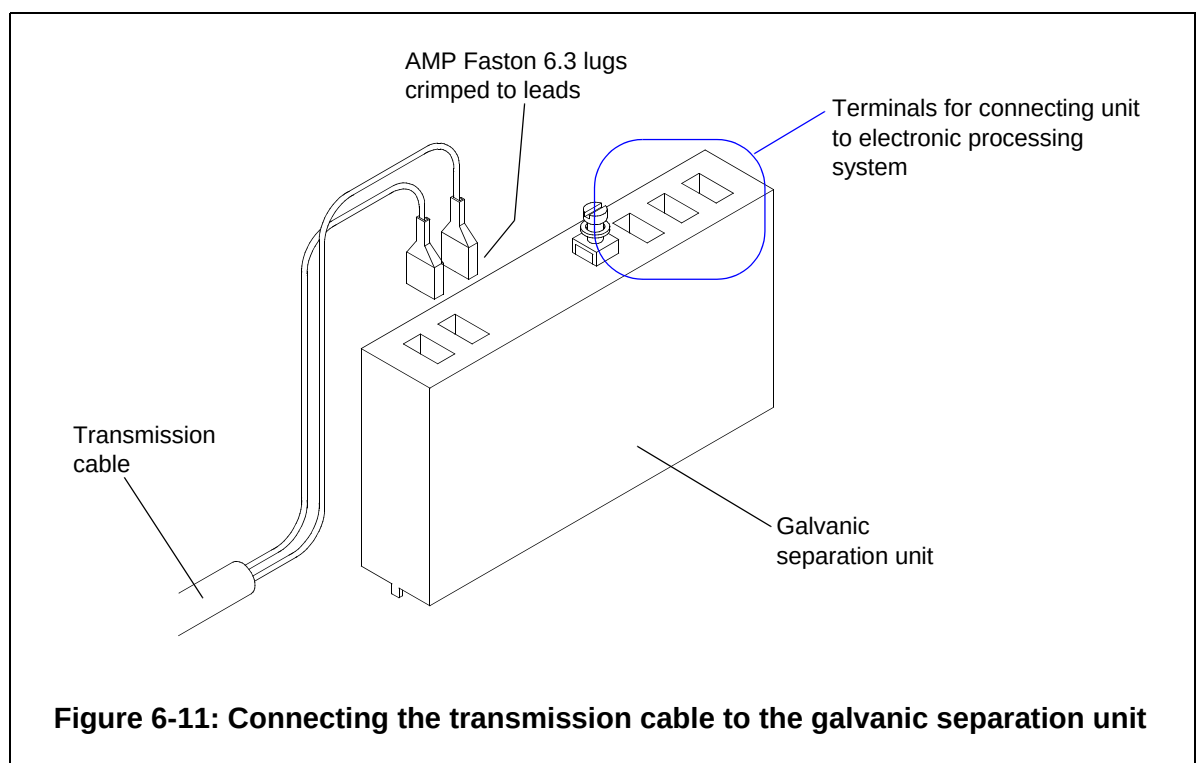
Figure 6-10: General cabling for an accelerometer with attached electronic conditioner

6.3.2 Connecting the Transmission Cable to the Galvanic Separation Unit

- 1) Strip the insulation off the leads in the transmission cable.
- 2) Crimp these leads to two AMP Faston 6.3 lugs.
- 3) Plug the lugs into the galvanic separation unit (see [Figure 6-11](#)).

NOTE 1 : The screening of the transmission cable should not be connected to the galvanic separation unit.

NOTE 2 : The leads of the cable linking the galvanic separation unit to the electronic processing system must also be equipped with AMP Faston 6.3 lugs.



THIS PAGE INTENTIONALLY LEFT BLANK

7 ACCELEROMETER WITH INCORPORATED CONDITIONER

7.1 Introduction

This chapter describes the installation of a chain having an accelerometer with an incorporated electronic conditioner (see [Figure 7-1](#)). It is relevant to the following type of accelerometer:

- CE 310

A complete description is presented for this accelerometer type.

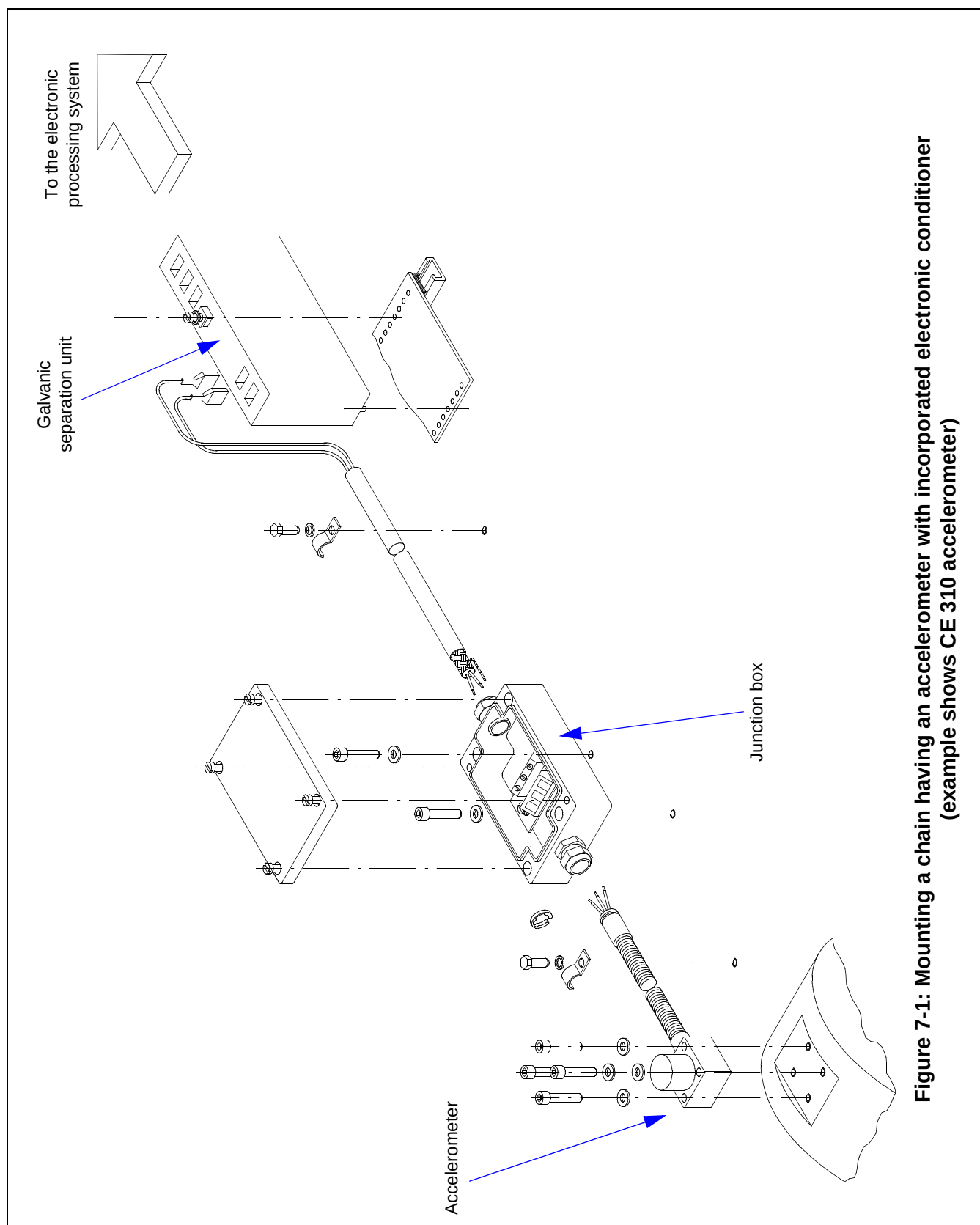


Figure 7-1: Mounting a chain having an accelerometer with incorporated electronic conditioner
(example shows CE 310 accelerometer)

7.2 Mechanical Aspects

7.2.1 Mounting the Accelerometer

7.2.1.1 CE 310 Accelerometer

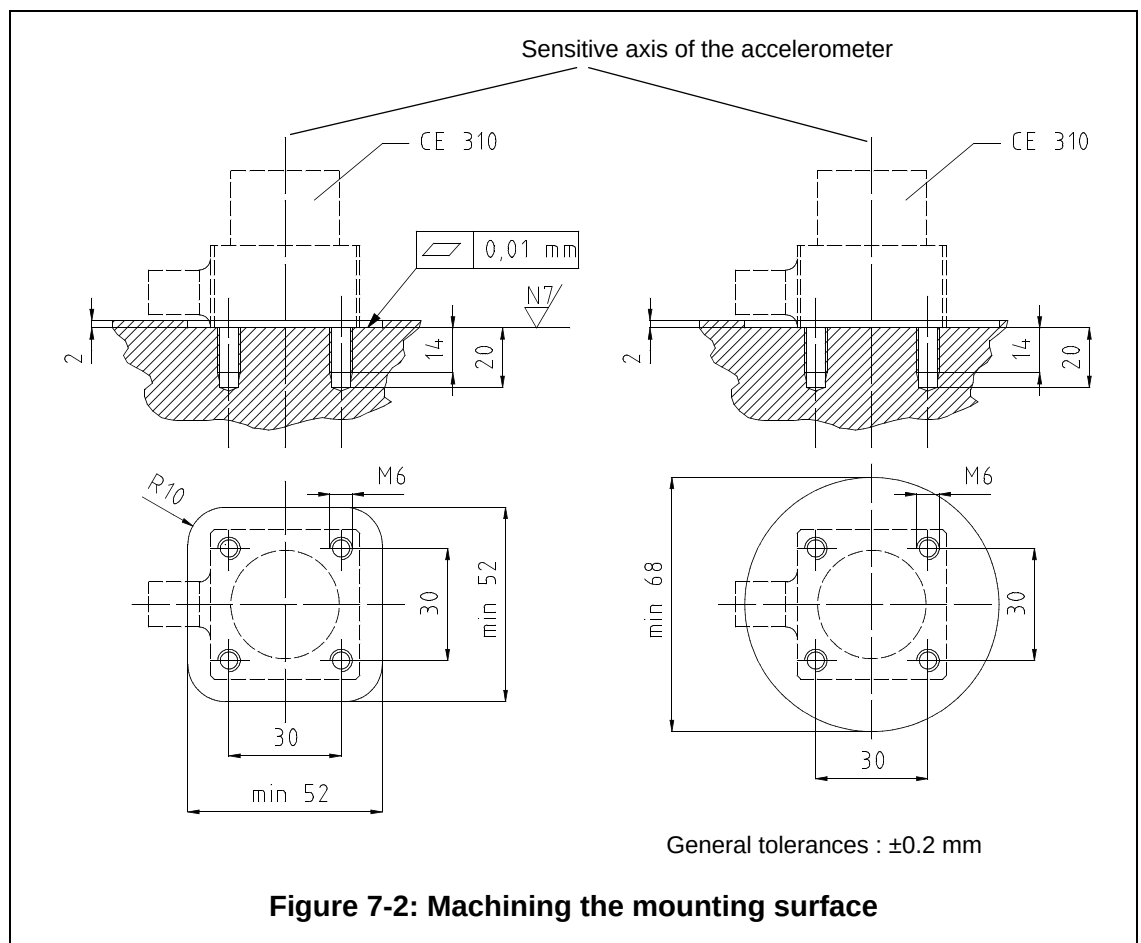


For the standard (non-Ex i) version of the CE 310, the temperature of the area where the accelerometer will be mounted must be between -30°C and +150°C.

For the Ex i version of the CE 310, the temperature must be between -30°C and +100°C.

NOTE : Respect the machining tolerances to eliminate the possibility of vibration signals being distorted due to deformations in the accelerometer base.

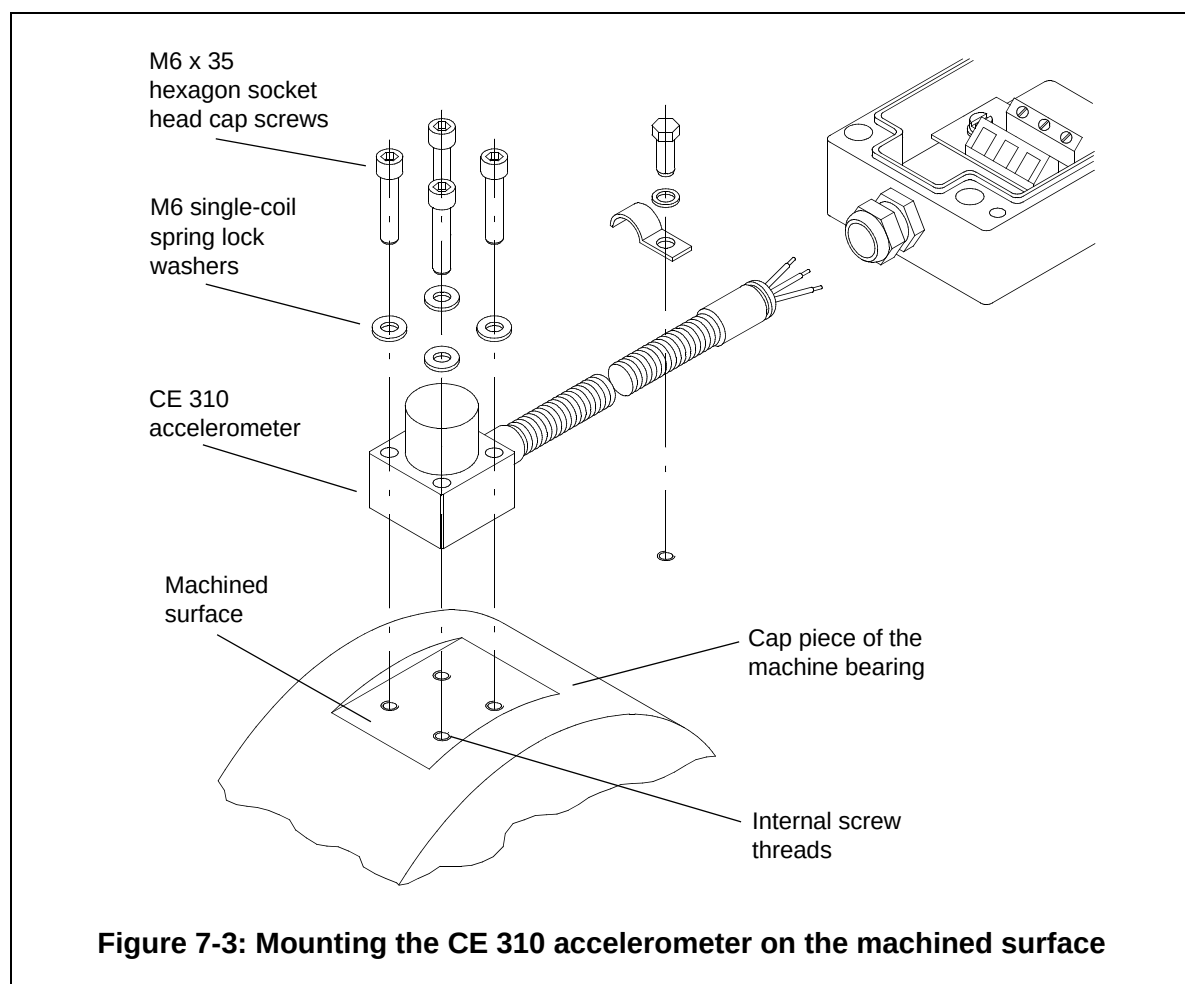
- 1) Prepare the part of the machine surface where the accelerometer will be mounted. This surface should be even and perpendicular to the desired sensitivity axis. The machined surface should have a surface evenness of 0.01 mm and a surface quality of N7 (see Figure 7-2).



- 2) Mark the position of the fourappings (internal screw threads) on the machined surface.
- 3) Drill four holes with a diameter of 4.8 mm and a depth of 20 mm.
- 4) Apply M6 screw taps in the four holes to a depth of 14 mm.
- 5) Prepare four M6 x 35 hexagon socket head cap screws and four M6 single-coil spring lock washers.
- 6) Coat the screws with LOCTITE 241 adhesive.

NOTE : LOCTITE 241 adhesive can be used to secure elements that are susceptible to vibrations, in order to stop them becoming loose. These elements can nevertheless be disassembled at a later stage if this is necessary.

- 7) Position the accelerometer, equipped with washers and screws, on the mounting surface as shown in [Figure 7-3](#).
- 8) Tighten the four screws using a torque wrench. Do not exceed a tightening torque of 15 Nm.



7.2.2 Fixing the Integral Cable



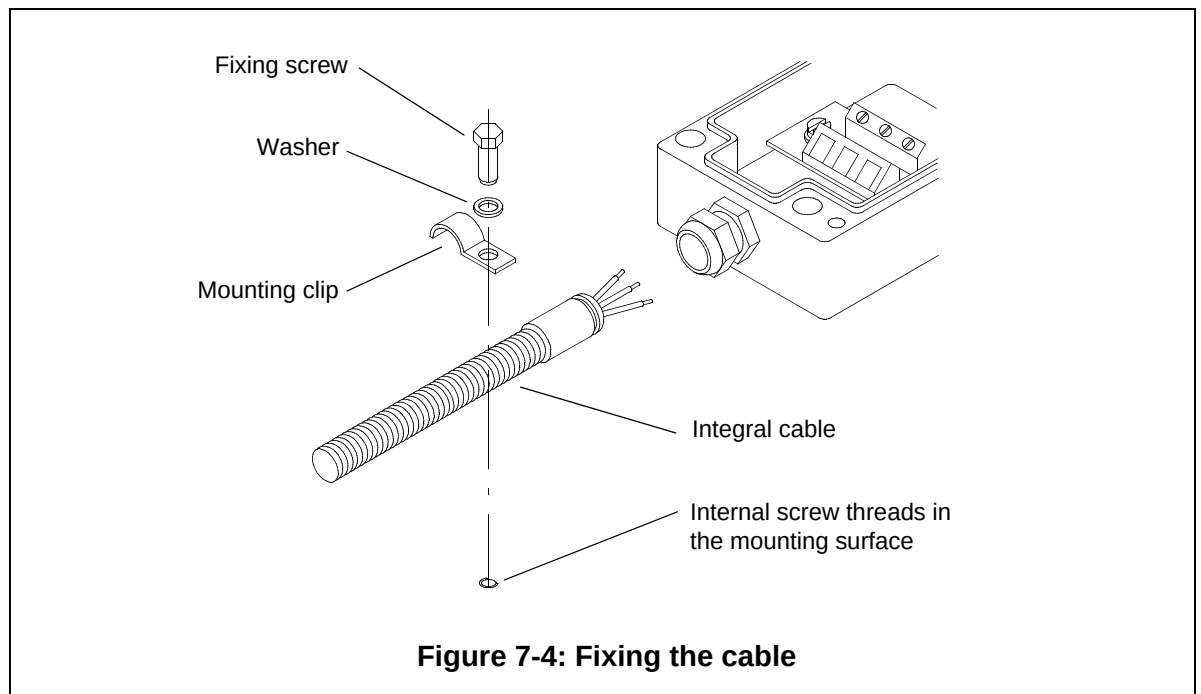
For the CE 310 accelerometer, the temperature of the area where the integral cable will be mounted must be between -30°C and +150°C.



Do not mount the cable near a high-voltage or high-frequency transmission line. The measurement signal can be degraded by interference if this is not respected.

- 1) Prepare an appropriate number of mounting clips intended for tubes with a diameter of about 8 mm. Prepare also the same number of fixing screws and washers.
- 2) Mark the position of the mounting clips every 100 to 200 mm on the machine.
- 3) Do not bend the cable beyond the minimum bending radius of 50 mm.
- 4) Drill and tap the holes for the fixing screws.
- 5) Coat the screws with LOCTITE 241 adhesive.
- 6) Position the mounting clips on the integral cable (see [Figure 7-4](#)).
- 7) Fix the screws by applying a tightening torque appropriate to the screw type used.

NOTE : Fixing the cable at regular intervals avoids interference due to the triboelectric effect. Relatively slow cable movements having a large amplitude can cause low-frequency noise to be added to the measurement signal.



7.2.3 Mounting the Junction Box



Ensure that the temperature of the area where the junction box will be mounted lies in the range -20°C to $+90^{\circ}\text{C}$.

- 1) Choose a vibration-free place for mounting the junction box.
- 2) Mark the position of the two tappings (internal screw threads) on the mounting surface. See example for a JB 105 junction box in [Figure 7-5](#).

NOTE : If a different type of junction box is used, refer to the corresponding data sheet for information on mounting dimensions.

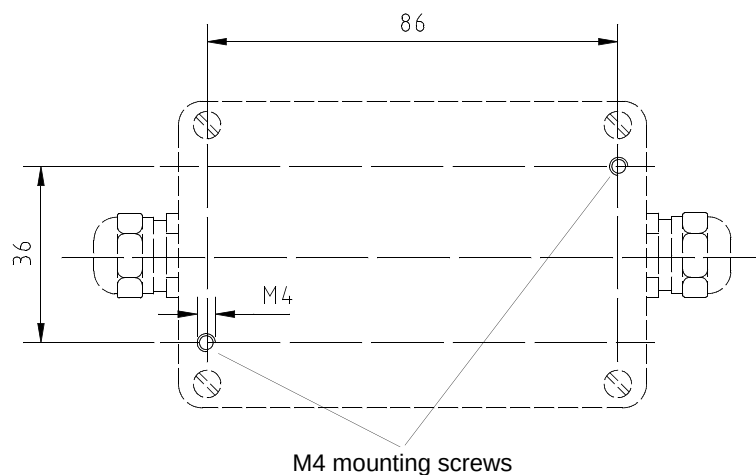
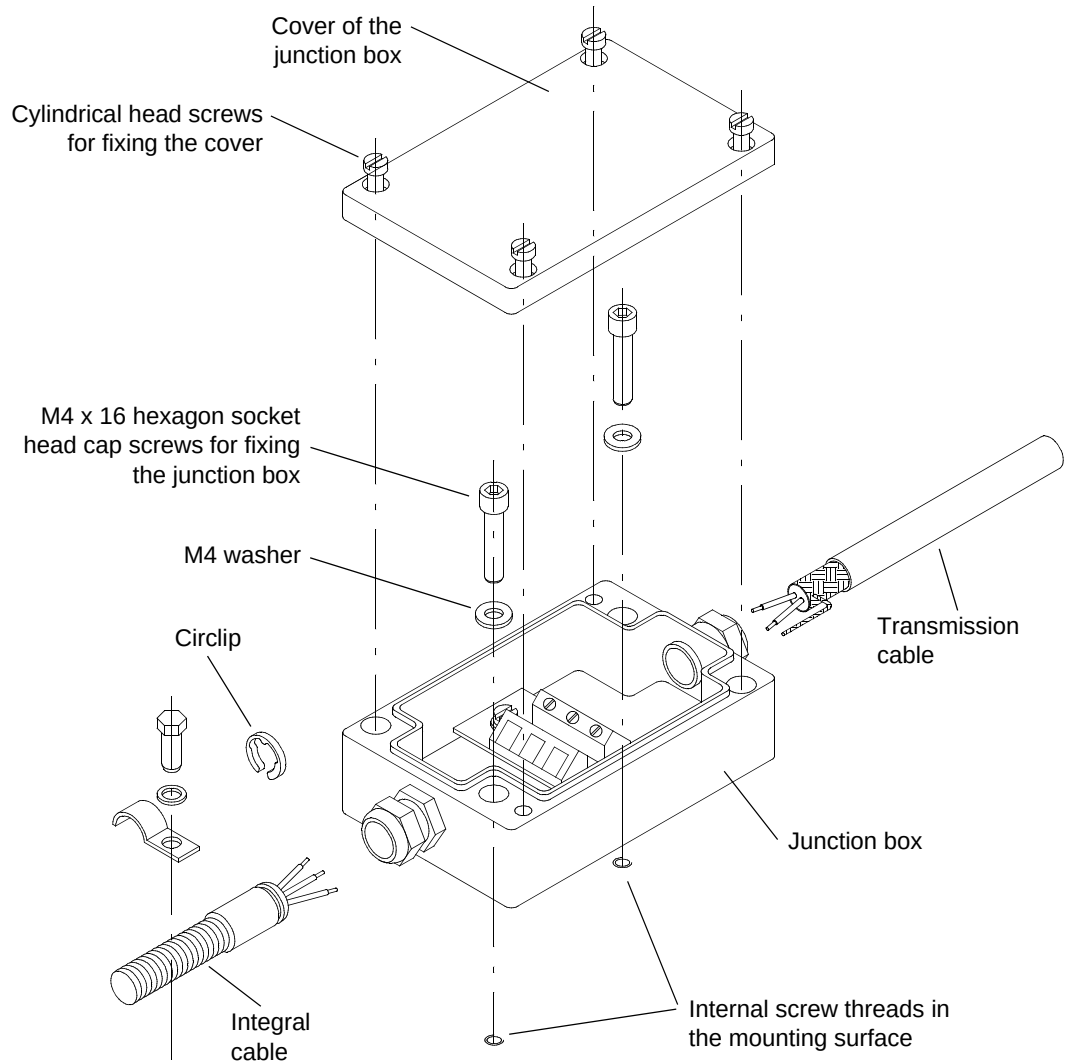


Figure 7-5: Example showing mounting dimensions for a JB 105 junction box

- 3) Drill two holes with a diameter of 3.2 mm and a depth of 14 mm.
- 4) Apply M4 screw taps in the two holes to a depth of 8 mm.
- 5) Remove the cover of the junction box by unscrewing its four screws (see [Figure 7-6](#)).
- 6) Position the junction box on the mounting surface and tighten the two M4 x 16 fixing screws. Apply a tightening torque appropriate to the screw type used.
- 7) Before closing the cover of the junction box, perform the electrical connections as described in [7.3 - Electrical Connections](#).
- 8) Place the cover on the junction box and tighten its four screws.



**Figure 7-6: Mounting the junction box
(example shows JB 105)**

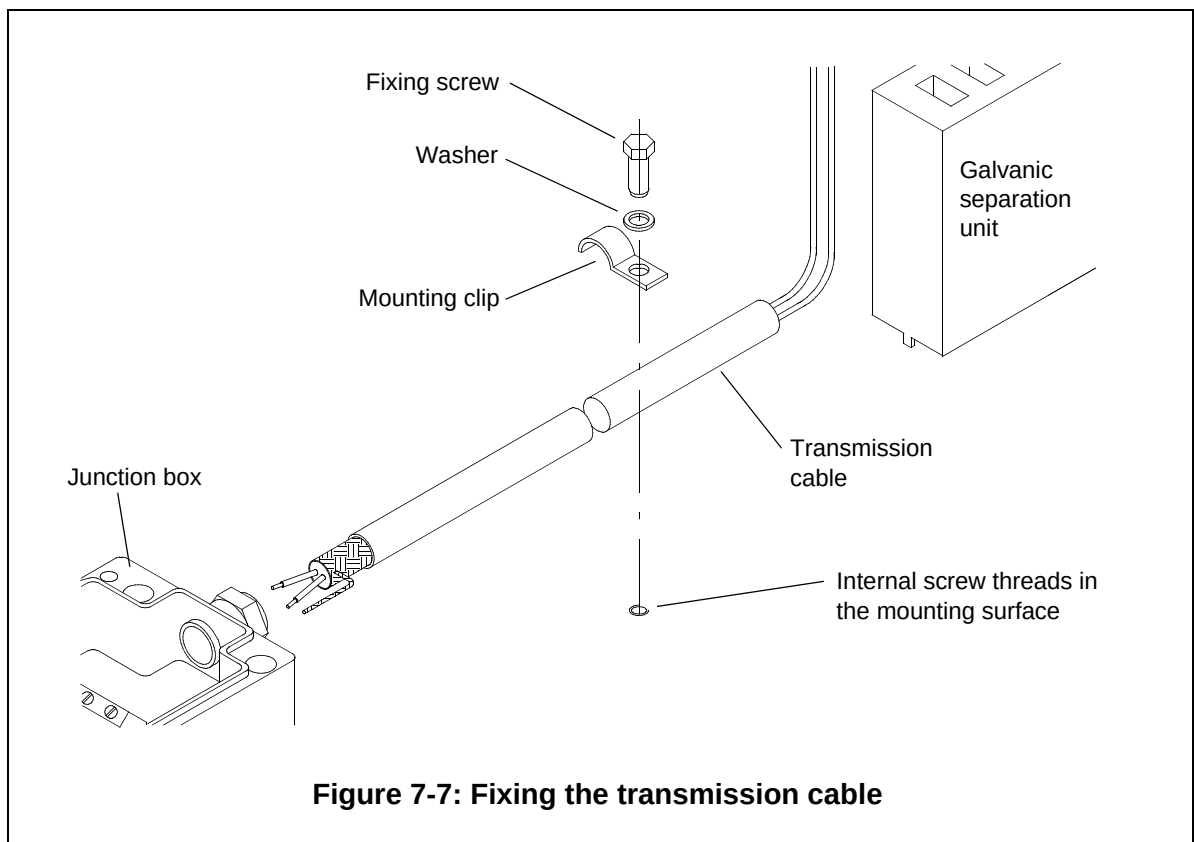
7.2.4 Fixing the Transmission Cable



Ensure that the temperature of the area where the transmission cable will be mounted lies in the range -10°C to $+70^{\circ}\text{C}$.

This screened, 2-wire transmission cable can be mounted according to standards for low-voltage installations. It can be fixed by mounting clips as shown in [Figure 7-7](#). Refer to [7.2.2 - Fixing the Integral Cable](#) for further details.

Additional mechanical protection can be provided by placing the transmission cable in a conduit or galvanized steel flexible protection tube (e.g. KS 106).



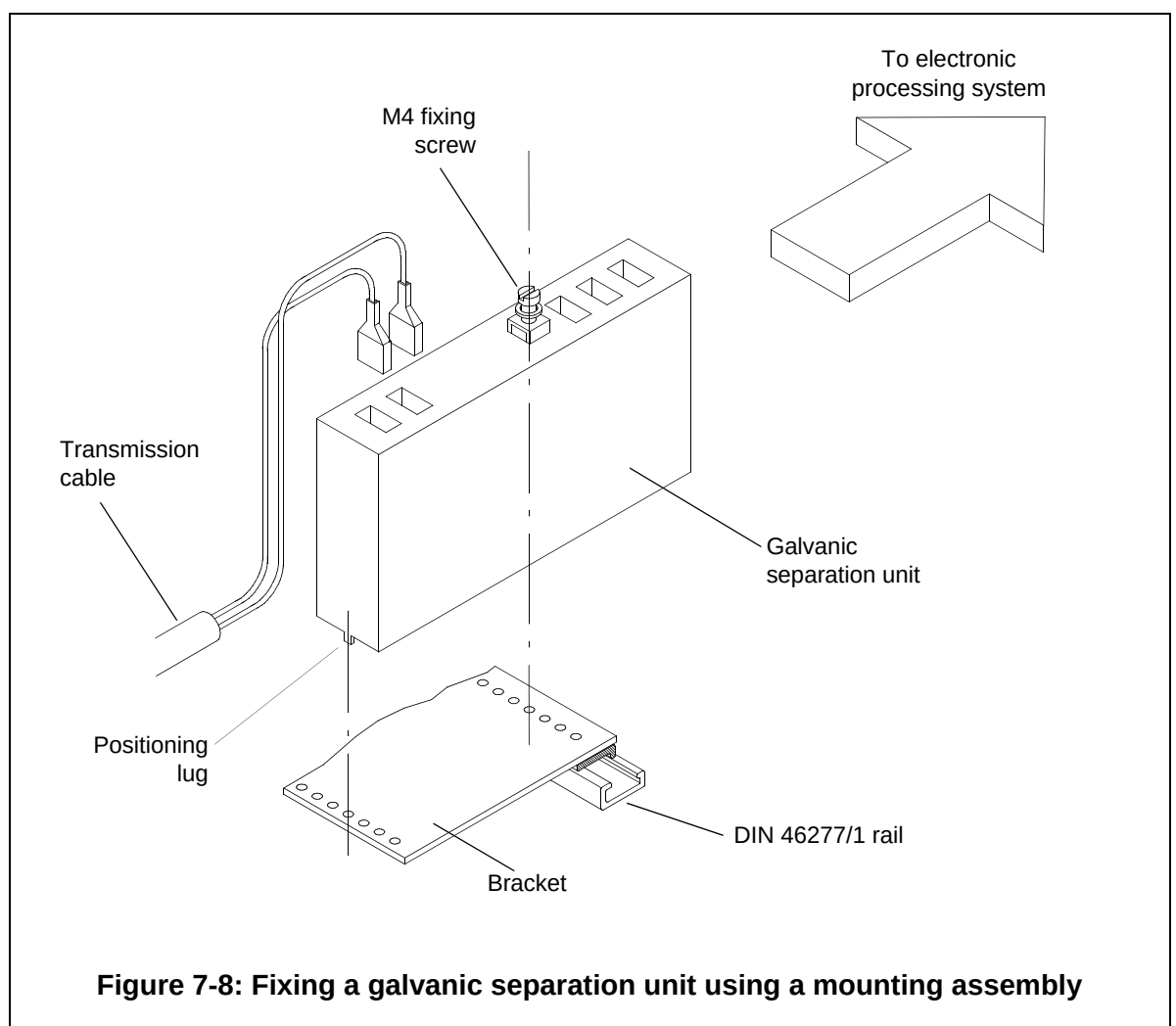
7.2.5 Mounting the Galvanic Separation Unit



Ensure that the temperature of the area where the galvanic separation unit will be mounted lies in the range 0°C to +55°C.

The galvanic separation unit is generally mounted in an industrial housing, a rack or a cabinet.

A mounting assembly kit is available from Vibro-Meter. This consists of a bracket fixed on a DIN 46277/1 rail by means of an M4 fixing screw (see [Figure 7-8](#)). A positioning lug allows the correct placing of the galvanic separation unit on the bracket and, when there are several units, ensures the necessary spacing between them.

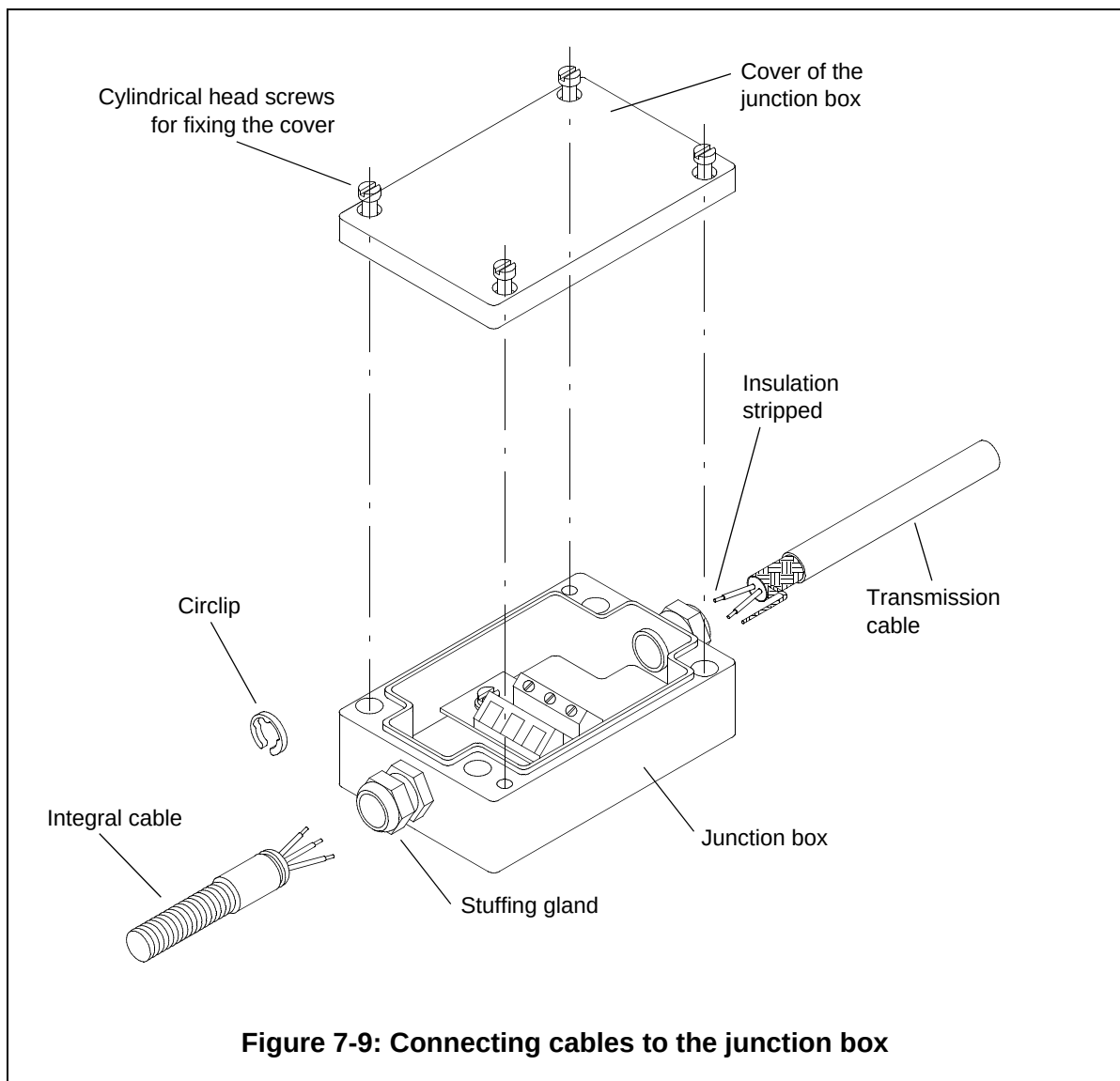


7.3 Electrical Connections

Refer to the general cabling diagram in [Figure 7-10](#).

7.3.1 Connecting Cables to the Junction Box

- 1) Strip the insulation off the wires in the integral cable and the transmission cable (see [Figure 7-9](#)).
- 2) Remove the cover of the junction box by unscrewing the four screws.



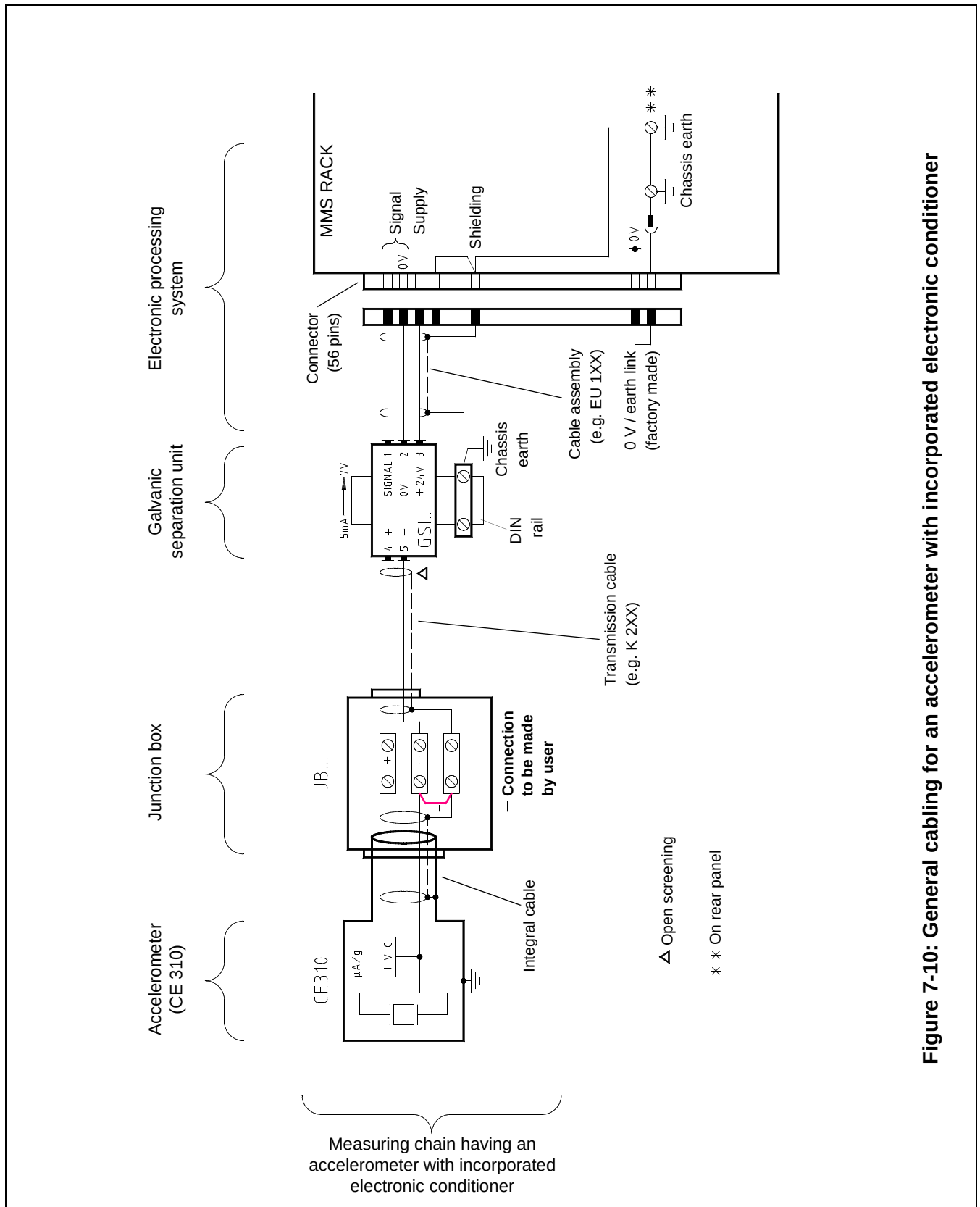
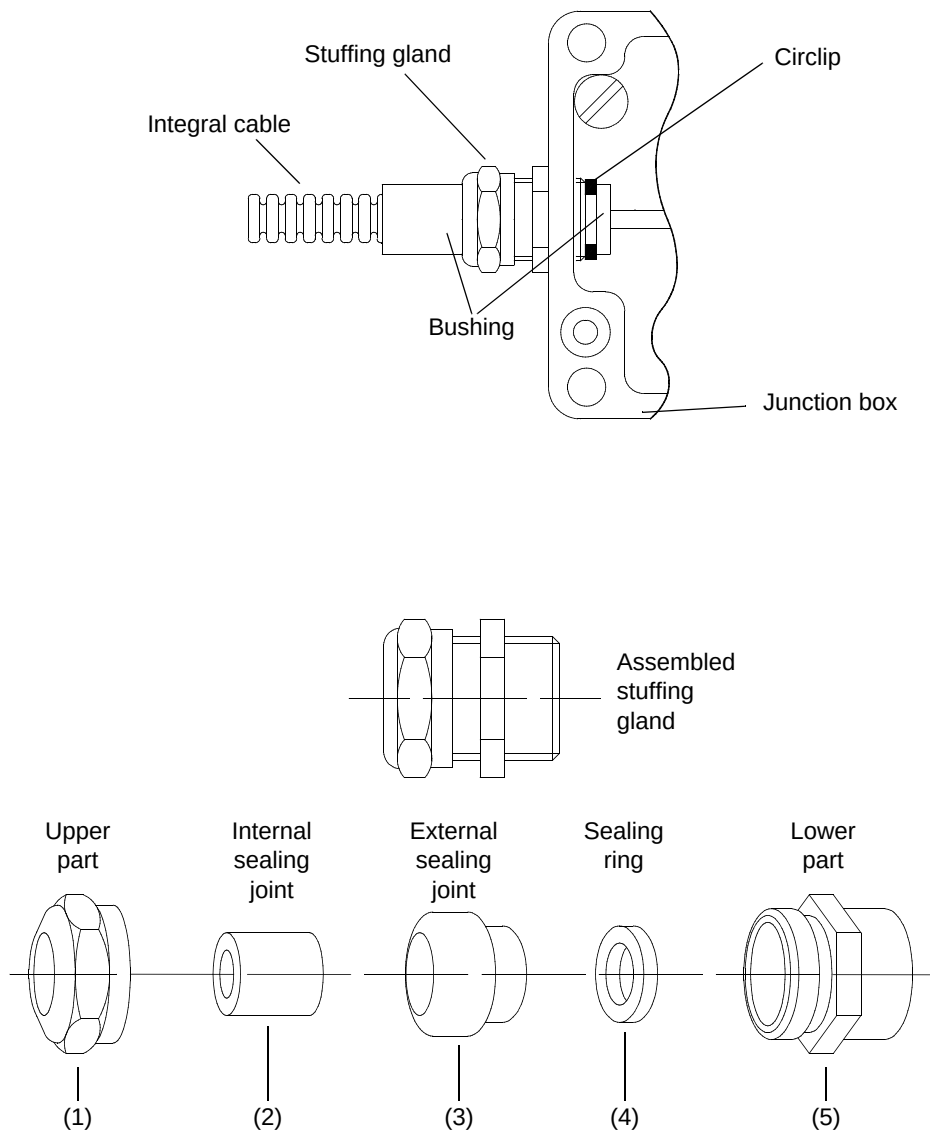


Figure 7-10: General cabling for an accelerometer with incorporated electronic conditioner

- 3) Obtain a short length of wire and connect it between the negative (-) and shielding terminals in the junction box (see [Figure 7-10](#)). This will ensure the vibration signals do not suffer any interference produced by leakage currents, earth loops, potential differences, etc. Such noise may be generated if the accelerometer is not earthed correctly (e.g. accelerometer mounted on an insulating support, mounting place not connected to earth, etc).
- 4) Pass the cables through the stuffing glands on the junction box. To do this, proceed as follows (see [Figure 7-11](#)) :
 - a. Unscrew element 1 anti-clockwise. Do not remove element 5 from the housing.
 - b. Pull elements 2 and 3 out of element 1 (elements 2 and 3 allow the stuffing gland to be adapted to different cable diameters). Element 2 can be removed from element 3 simply by pressing it outwards.
 - c. Pass the cable through elements 1, 2 (if used), 3, 4 and 5.
 - d. Assemble and tighten the elements of the stuffing gland.
 - e. Check that the cable is held fast by the stuffing gland. This is necessary to guarantee the required waterproofness.
- 5) Connect the wires of the integral cable and the transmission cable to the terminal strips of the junction box (see [Figure 7-9](#)).
- 6) Place the Ø 8 circlip (supplied with the accelerometer) into the groove in the cable bushing (see [Figure 7-9](#) and [Figure 7-11](#)). This prevents the integral cable from slipping out of the stuffing gland.
- 7) Place the cover on the junction box and tighten its four screws.



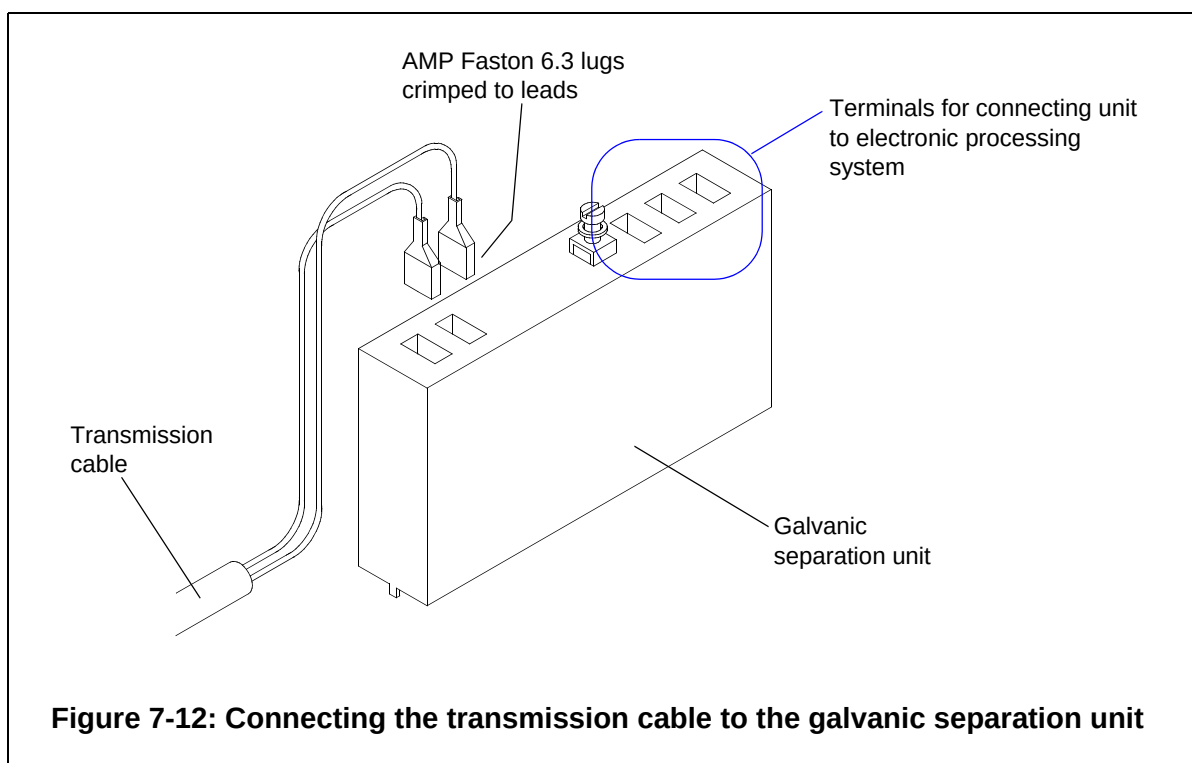
**Figure 7-11: Stuffing gland mounted on a junction box
(assembled and exploded views)**

7.3.2 Connecting the Transmission Cable to the Galvanic Separation Unit

- 1) Strip the insulation off the leads in the transmission cable.
- 2) Crimp these leads to two AMP Faston 6.3 lugs.
- 3) Plug the lugs into the galvanic separation unit (see [Figure 7-12](#)).

NOTE 1 : The screening of the transmission cable should not be connected to the galvanic separation unit.

NOTE 2 : The leads of the cable linking the galvanic separation unit to the electronic processing system must also be equipped with AMP Faston 6.3 lugs.



8 MOUNTING ACCESSORIES

8.1 Introduction

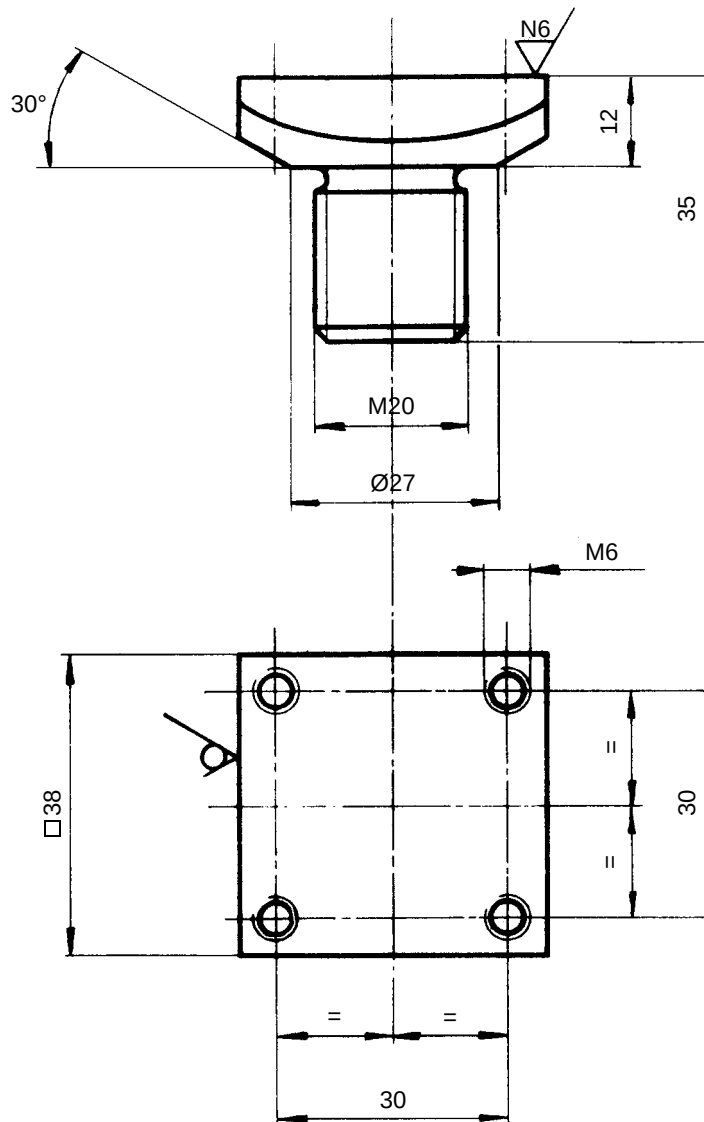
In certain applications the accelerometer cannot be mounted directly and a mounting accessory is required. This can be the case when :

- 1) Space is limited.
- 2) It is not possible to machine an even mounting surface.
- 3) It is necessary to electrically or thermally isolate the accelerometer.

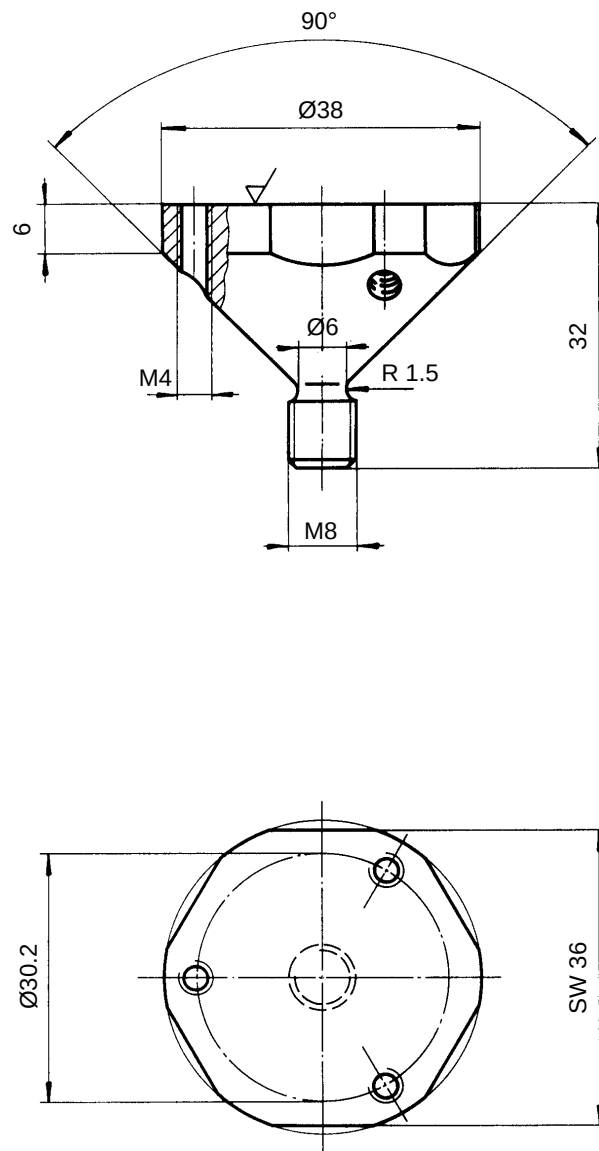
This chapter describes the accessories available from Vibro-Meter.

8.2 Mounting Studs

Several types of stainless steel mounting studs ([Figure 8-1](#) to [Figure 8-3](#)) are available to simplify the mounting of accelerometers on uneven surfaces. These studs enable high quality, rigid fixing of accelerometers without the need for special tools. Mechanical stress in the accelerometer due to uneven mounting is avoided, thereby increasing the reliability of the measured signal.

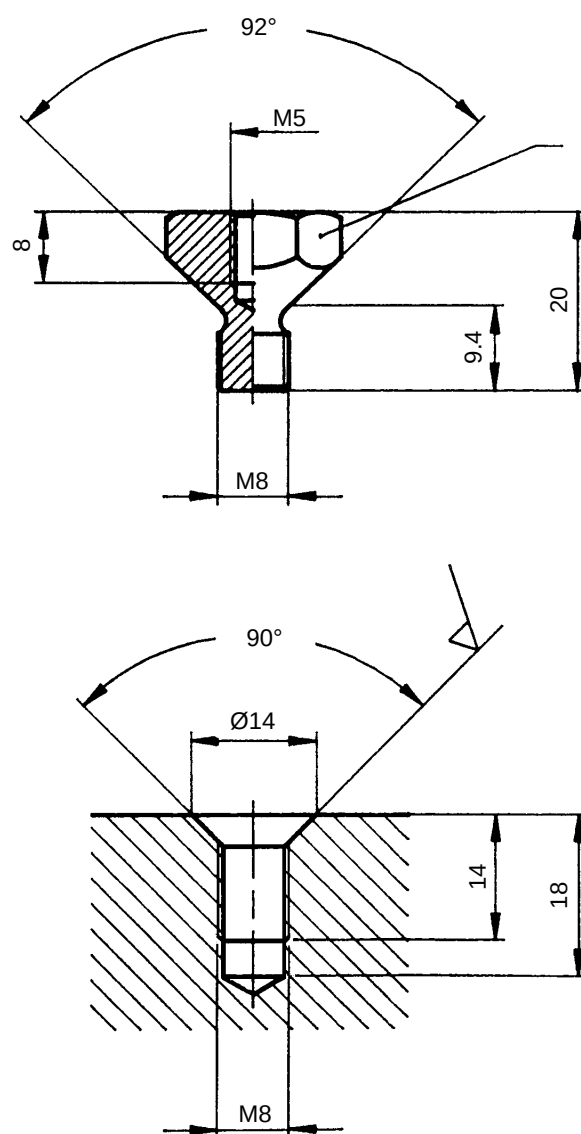


**Figure 8-1: TA 102 mounting stud
for CA 201 and CE 310 accelerometers**



P/N 144-136-301-101

**Figure 8-2: TA 104 mounting stud
for CA 134, CA 135, CA 136, CE 134 and CE 136 accelerometers**

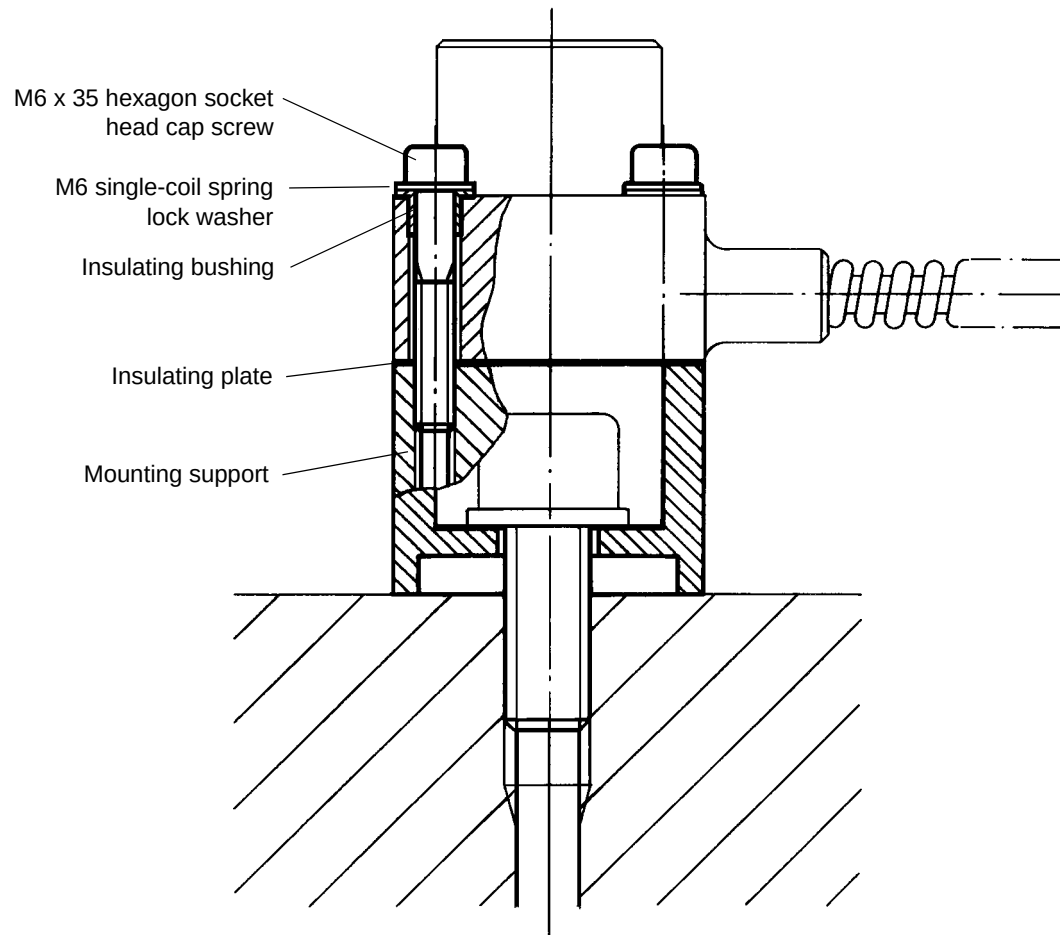


P/N 144-216-400-011

**Figure 8-3: TA 106 mounting stud
for CA 216 accelerometer**

8.3 Insulating Supports

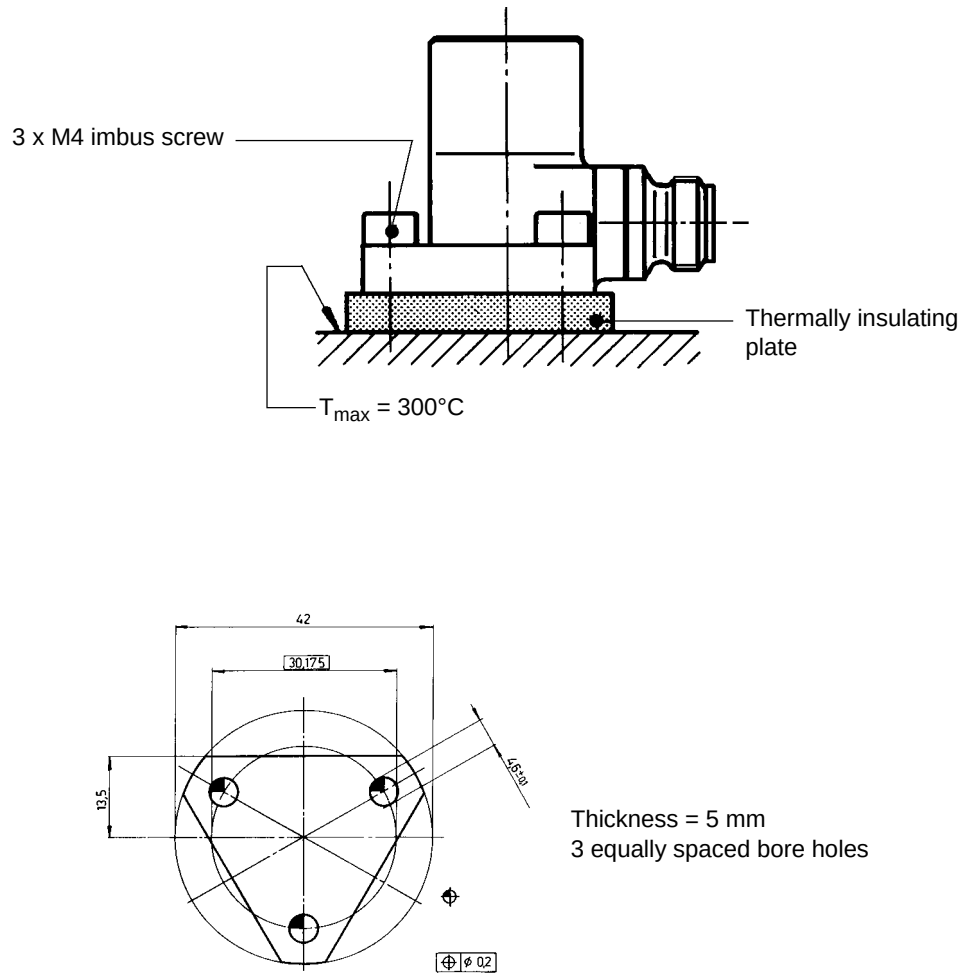
8.3.1 Electrically Insulating Support



P/N 444-310-500-201

**Figure 8-4: TA 101 electrically insulating support
for CA 201 and CE 310 accelerometers**

8.3.2 Thermally Insulating Support



P/N 144-136-302-101

**Figure 8-5: TA 105 thermally insulating support
for CA 135, CA 136 and CE 136 accelerometers**

9 MAINTENANCE AND REPAIRS

9.1 Maintenance

9.1.1 General

No specific maintenance is required for the CA XXX or CE XXX accelerometers or associated equipment described in this manual.

NOTE : Any attempt by unauthorized personnel to modify or repair equipment still under guarantee will invalidate the warranty.

Refer to [9.3 - Repairs](#) for contact details for repairing defective hardware.

9.1.2 Requirements for Equipment Used in Potentially Explosive Atmospheres



ANY MAINTENANCE WORK PERFORMED ON VIBRO-METER EQUIPMENT THAT CAN BE USED IN POTENTIALLY EXPLOSIVE ATMOSPHERES MUST RESPECT THE CRITERIA MENTIONED IN THE "EC TYPE EXAMINATION CERTIFICATE".

REFER TO [APPENDIX B - EC TYPE EXAMINATION CERTIFICATES](#) FOR FURTHER INFORMATION.

DO NOT ATTEMPT TO MODIFY OR REPAIR THESE PRODUCTS.

9.2 Technical Support

For technical advice, spare parts, troubleshooting site visits and general enquiries, customers should contact their local I&M Division representative. Your nearest representative can be found on the Vibro-Meter web site :

www.vibro-meter.com

Alternatively, customers can contact :

Vibro-Meter SA

Attn: I&M Customer Support

Route de Moncor 4

P. O. Box

CH-1701 Fribourg

Switzerland

Phone : +41 26 407 11 11

(Switchboard)

Fax : +41 26 407 15 55

(General Customer Support)

E-mail addresses :

support@vibro-meter.com

(General Customer Support)

techsupport.ch@vibro-meter.com

(Technical Support)

techpubs.ch@vibro-meter.com

(Technical Documentation)

9.3 Repairs

For warranty repairs and replacements, customers should contact their local I&M Division representative. Your nearest representative can be found on the Vibro-Meter web site :

www.vibro-meter.com

Alternatively, customers can contact :

Vibro-Meter SA

Attn: Repairs Department

Route de Moncor 4

P. O. Box

CH-1701 Fribourg

Switzerland

Phone : +41 26 407 13 43

(Direct)

Fax : +41 26 407 17 05

(Direct)

E-mail : repairs.ch@vibro-meter.com

Part III : Appendices

THIS PAGE INTENTIONALLY LEFT BLANK

A ACCELERATION - VELOCITY - DISPLACEMENT NOMOGRAMS

The nomograms in this chapter indicate the relationship between the vibration acceleration, velocity and displacement as a function of the vibration frequency (which is related to the machine speed). They allow the dynamic measuring range to be clearly defined for any type of vibration measuring equipment.

Nomograms are provided for metric and imperial measurement units :

Designation	Drawing Ref.	Comments
Nomogram for metric units	L 1347	See page A-2
Nomogram for imperial units	L 1458	See page A-3

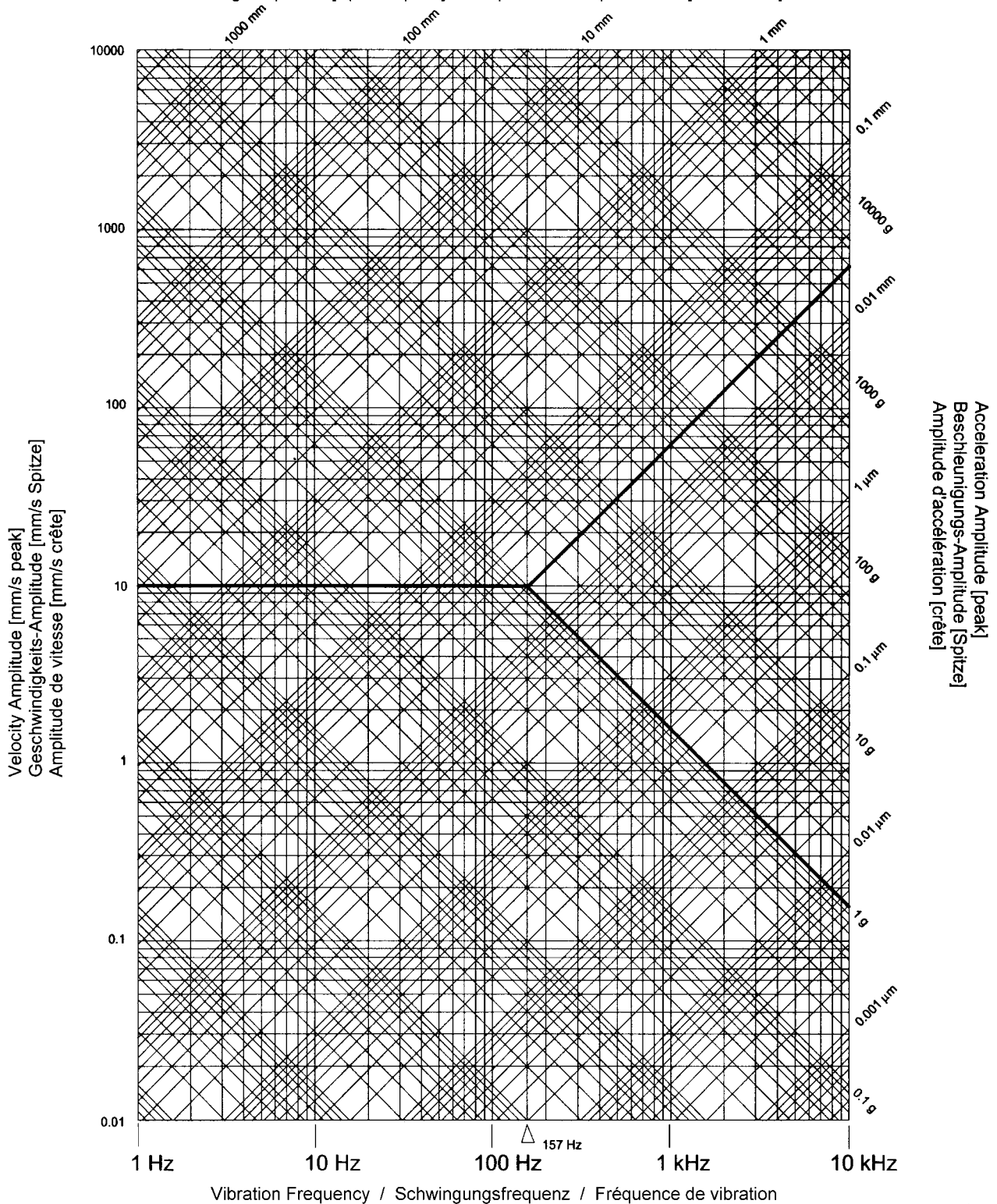
Example of Use

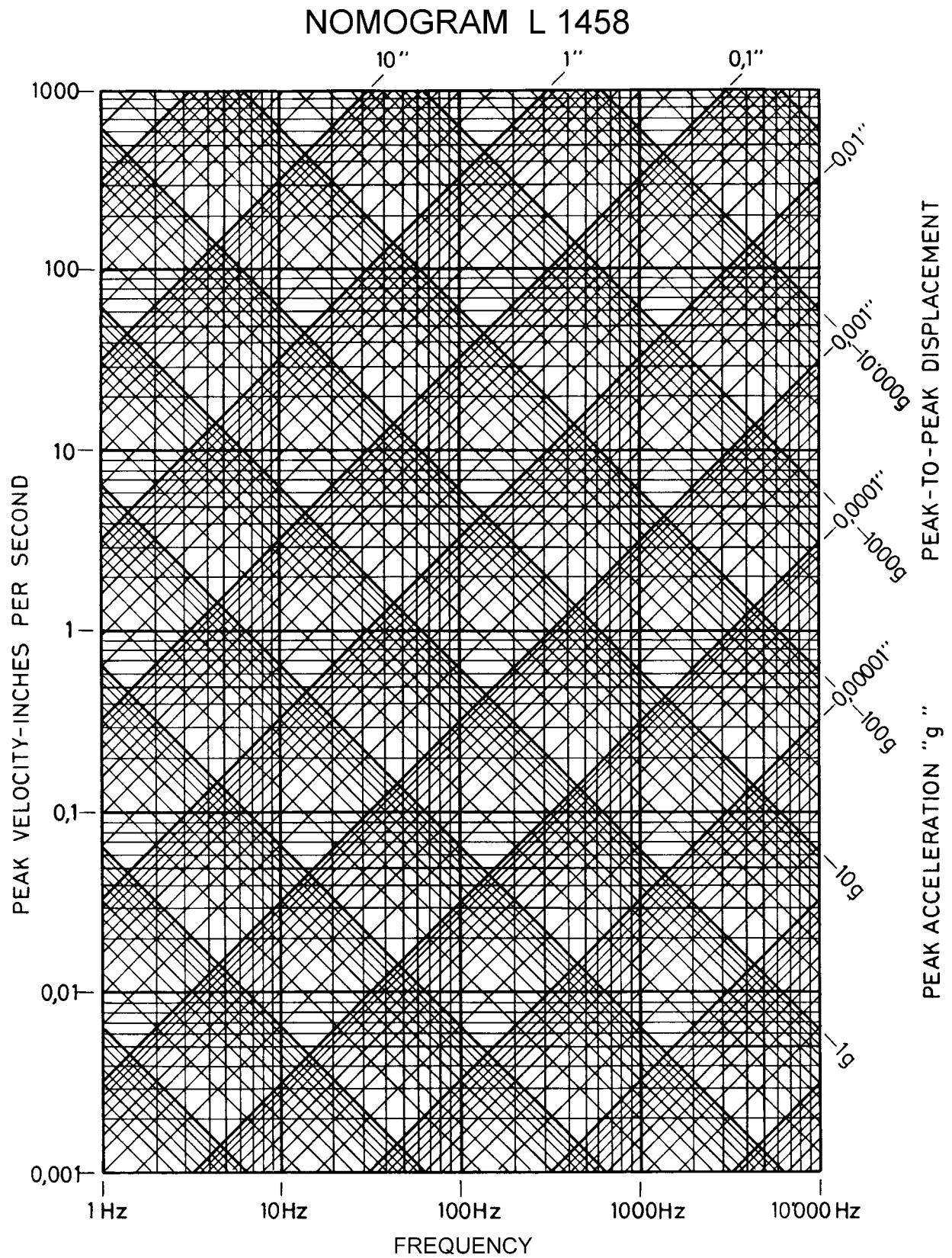
Refer to nomogram L 1347.

For a vibration acceleration of $1 g_{\text{peak}}$ at a frequency of 157 Hz the vibration velocity is $10 \text{ mm/s}_{\text{peak}}$ and the displacement is $20 \mu\text{m}_{\text{peak}}$.

NOMOGRAM L 1347

Displacement Amplitude [peak-peak]
Weg-Amplitude [Spitze-Spitze] / Amplitude de déplacement [crête-crête]





THIS PAGE INTENTIONALLY LEFT BLANK

B EC TYPE EXAMINATION CERTIFICATES

Refer to [Table B-1](#).

Product(s) covered	Certificate	Comments
CA 134, CA 136, CA 160 & CA 201	LCIE 02 ATEX 6110 X	See page B-3
CA 20X	LCIE 02 ATEX 6179 X	See page B-7
CA 28X, CE 28X, CE 31X	KEMA 04 ATEX 1055	See page B-11
CA 30X	KEMA 04 ATEX 1294	See page B-15
CE 134	LCIE 02 ATEX 6089 X	See page B-19
CE 136, CE 310	LCIE 02 ATEX 6194 X	See page B-23
GSI 122	LCIE 02 ATEX 6093 X	See page B-27
GSI 123	LCIE 02 ATEX 6087 X	See page B-33
IPC 620	LCIE 02 ATEX 6094 X	See page B-39
IPC 704	LCIE 02 ATEX 6085 X	See page B-43

Table B-1 : Relevant “EC Type Examination Certificates”

THIS PAGE INTENTIONALLY LEFT BLANK



1 ATTESTATION D'EXAMEN CE DE TYPE

2 Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles
Directive 94/9/CE

3 Numéro de l'attestation CE de type
LCIE 02 ATEX 6110 X

4 Appareil ou système de protection
Capteurs d'accélération
Type : CA134/CA136/CA160/CA201

5 Demandeur : VIBRO-METER S.A.

6 Adresse : BP 1071
1701 FRIBOURG - SUISSE

7 Cet appareil ou système de protection et ses variantes éventuelles acceptées est décrit dans l'annexe de la présente attestation et dans les documents descriptifs cités en annexe.

8 Le LCIE, organisme notifié sous la référence 0081 conformément à l'article 9 de la directive 94/9/CE du Parlement européen et du Conseil du 23 mars 1994, certifie que cet appareil ou système de protection est conforme aux exigences essentielles en ce qui concerne la sécurité et la santé pour la conception et la construction d'appareils et de systèmes de protection destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la directive. Les vérifications et épreuves figurent dans notre rapport confidentiel N° 41 031 010 K.

9 Le respect des exigences essentielles en ce qui concerne la sécurité et la santé est assuré par la conformité aux documents suivants :
- EN 50014 (1997) + amendements 1 et 2
- EN 50020 (1994)

10 Le signe X lorsqu'il est placé à la suite du numéro de l'attestation, indique que ce matériel ou système de protection est soumis aux conditions spéciales pour une utilisation sûre, mentionnées dans l'annexe de la présente attestation.

11 La présente attestation d'examen CE de type porte uniquement sur la conception, l'examen et l'essai de l'équipement ou du système de protection spécifié conformément à la directive 94/9/CE.
Toutes autres exigences de la Directive sont applicables au procédé de fabrication et de livraison de cet équipement ou système de protection. Ces derniers ne sont pas couverts par la présente attestation.

12 Le marquage de l'appareil ou du système de protection devra comporter, entre autres indications utiles, les mentions suivantes :



II 1G
EEx ia IIC T6 à T1 pour le type CA134
EEx ia IIC T6 à T2 pour les types CA136/CA160 et CA201

1 EC TYPE EXAMINATION CERTIFICATE

2 Equipment or Protective System Intended for use in Potentially explosive atmospheres
Directive 94/9/EC

3 EC type Examination Certificate number
LCIE 02 ATEX 6110 X

4 Equipment or Protective system
Accelerometers
Type : CA134/CA136/CA160/CA201

5 Applicant : VIBRO-METER S.A.

6 Address : BP 1071
1701 FRIBOURG - SUISSE

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 LCIE, notified body number 0081 in accordance with article 9 of the directive 94/9/EC of the European Parliament and Council of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective system intended for use in potentially explosive atmospheres, given in Annex II to the directive.
The examination and test results are recorded in confidential report No 41 031 010 K.

9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with :
- EN 50014 (1997) + amendments 1 and 2
- EN 50020 (1994)

10 If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC Type examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 94/9/EC.
Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

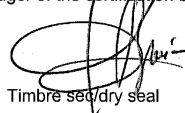
12 The marking of the equipment or protective system shall include the following :



II 1G
EEx ia IIC T6 to T1 for CA134 type
EEx ia IIC T6 to T2 for CA136/CA160/CA201 type

Fontenay-aux-Roses, le 29 août 2002

Le Directeur de l'organisme certificateur
Manager of the certification body



Timbre sec/dry seal

Par délégation
Michel BRÉNON
Directeur adjoint
à la Certification

Page 1/3

13-c

Seul le texte en français peut engager la responsabilité du LCIE. Ce document ne peut être reproduit que dans son intégralité, sans aucune modification
The LCIE's liability applies only on the French text. This document may only be reproduced in full and without any change.

LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES

Société anonyme à Directoire et Conseil de surveillance au capital de 15 745 984 euros - RCS Nanterre B 408 363 174

33, avenue du Général Leclerc - BP n° 8 - F 92266 FONTENAY-AUX-ROSES CEDEX - Tél. : +33 1 40 95 60 60



(A1) ANNEXE

(A2) ATTESTATION D'EXAMEN CE DE TYPE
LCIE 02 ATEX 6110 X

(A3) Description de l'équipement ou du système de protection

Capteurs d'accélération
Type : CA134/CA136/CA160/CA201

Ces capteurs sont des transducteurs électromécaniques fournissant à leurs bornes une charge électrique proportionnelle à la pression mesurée.

Ce type de capteur fonctionne avec un matériau piézo-électrique monté en compression (pour le type CA134/CA136/CA160) et en cisaillement (pour le type CA201).

Le marquage sera le suivant :

VIBRO-METER S.A.

Adresse : ...

Type : CA134 ou CA136 ou CA160 ou CA201

N° de fabrication : ...

Année de fabrication : ...

 II 1G

EEx ia IIC T6 à T1 pour le type CA134

EEx ia IIC T6 à T2 pour les types CA136/CA160/CA201

LCIE 02 ATEX 6110 X

Le marquage CE est accompagné du numéro d'identification de l'organisme notifié responsable de la surveillance du système approuvé de qualité (0081 pour le LCIE).

Le matériel devra également comporter le marquage normalement prévu par les normes de construction du matériel électrique concerné.

Paramètres spécifiques du ou des modes protection concernés :

Valeurs pour capteurs seuls.

	CA134	CA136	CA160	CA201
Cl	0,3 nF	6 nF	0,4 nF	2,5 nF
Li	~ 0	~ 0	~ 0	~ 0

(A4) Documents descriptifs

Dossier technique N° DT 1001, rév. 1 du 14 mars 2002.
Ce document comprend 19 rubriques (24 pages).

(A5) Conditions spéciales pour une utilisation sûre :

Le matériel ci-dessus défini est un matériel à "sécurité intrinsèque". Il peut être placé en atmosphères explosibles.

Le matériel ne doit être associé qu'à un matériel [ia] ou [ib] d'un type certifié et cette association, en tenant compte de la longueur du câble de raccordement, doit être compatible du point de vue de la sécurité intrinsèque.

Les caractéristiques du matériel associé ne devront excéder aucune des valeurs suivantes :

$U_o \leq 28 \text{ V}$, $I_{cc_o} \leq 100 \text{ mA}$ (source linéaire)
 $U_o \leq 28 \text{ V}$, $I_{cc_o} \leq 25 \text{ mA}$ (source non linéaire)
Soit une puissance $P_o \leq 0,7 \text{ W}$

(A1) SCHEDULE

(A2) EC TYPE EXAMINATION CERTIFICATE
LCIE 02 ATEX 6110 X

(A3) Description of Equipment or protective system

Accelerometers
Type : CA134/CA136/CA160/CA201

These sensors are electromechanic transducers delivering at their terminal blocks on electrical load proportional to the measures pressure.

It works with a piezoelectric material mounted in compression (for CA134/CA136/CA160 type) and in shearing (for CA201 type).

The marking will be the following :

VIBRO-METER S.A.

Address : ...

Type : CA134 or CA136 or CA160 or CA201

Serial number : ...

Year of construction : ...

 II 1G

EEx ia IIC T6 to T1 for CA134 type

EEx ia IIC T6 to T2 for CA136/CA160/CA201 type

LCIE 02 ATEX 6110 X

The CE marking shall be accompanied by the identification number of the notified body responsible for surveillance of the approved quality system (0081 for LCIE).

The equipment must also carry the usual marking required by the manufacturing standards applying to such equipments.

Specific parameters of the mode of protection concerned :

Values for sensors only.

(A4) Descriptive documents :

Technical file n° DT 1001, rev. 1 dated on March 14th, 2002.
This file includes 19 items (24 pages).

(A5) Special condition for safe use :

The sensors are intrinsically safe equipment. They could be mounted in explosive atmospheres.

The material must only be connected to a certified [ia] or [ib] apparatus and this combination, taking account to the length of joining cable, must be compatible as regards intrinsic safety.

Specific parameters of associated apparatus must not be over than no one of following values :

$U_o \leq 28 \text{ V}$, $I_{cc_o} \leq 100 \text{ mA}$ (linear supply)
 $U_o \leq 28 \text{ V}$, $I_{cc_o} \leq 25 \text{ mA}$ (not linear supply)
And power $P_o \leq 0,7 \text{ W}$



(A1) **ANNEXE**

(A2) **ATTESTATION D'EXAMEN CE DE TYPE**
LCIE 02 ATEX 6110 X (suite)

(A6) Exigences essentielles en ce qui concerne la sécurité et la santé

La conception du matériel satisfait aux normes européennes EN 50014 (1997 + amendements 1 et 2) et EN 50020 (1994).

(A1) **SCHEDULE**

(A2) **EC TYPE EXAMINATION CERTIFICATE**
LCIE 02 ATEX 6110 X (continued)

(A6) Essential Health and Safety Requirements

The design of the equipment complies to european standards EN 50014 (1997 + amendments 1 and 2) and EN 50020 (1994).



(A1) **ATTESTATION D'EXAMEN CE DE TYPE**
LCIE 02 ATEX 6110 X du 29 août 2002

AVENANT 02 ATEX 6110 X/01

(A2) DESIGNATION DE L'EQUIPEMENT OU DU
SYSTEME DE PROTECTION :

Capteurs d'accélération
Type : 144-YYY-000-XXX

Construit par :

VIBRO-METER S.A

(A3) OBJET DE L'AVENANT, DESCRIPTION DE
L'APPAREIL OU DU SYSTÈME DE PROTECTION :

Modifications des désignations des appareils CA134,
CA136, CA160 et CA201 qui seront désormais
respectivement les suivantes :

- 144-134-000-XXX
- 144-136-000-XXX
- 144-160-000-XXX
- 144-201-000-XXX

Ajout de variantes avec différents types de connecteurs et
différentes longueurs de câbles.

Le marquage est modifié comme suit :

Type : 144-YYY-000-XXX (*)

(*) : à compléter (YYY) selon modèle et (XXX) selon
variante

(A4) DOCUMENTS DESCRIPTIFS :

Dossier technique n° DT 1001 / 01 rév. 2 du 16 Juillet
2003.

Ce dossier comprend 5 rubriques (6 pages).

(A5) CONDITIONS SPECIALES POUR UNE
UTILISATION SURE :

Inchangées.

(A6) EXIGENCES ESSENTIELLES EN CE QUI
CONCERNE LA SECURITE ET LA SANTE :

Inchangées.

Fontenay-aux-Roses, le 4 Novembre 2003

(A1) **EC TYPE EXAMINATION CERTIFICATE**
LCIE 02 ATEX 6110 X dated August 29, 2002

VARIATION 02 ATEX 6110 X/01

(A2) NAME OF EQUIPMENT OR PROTECTIVE SYSTEM :

Accelerometers
Type : 144-YYY-000-XXX

Manufactured by :

VIBRO-METER S.A

(A3) SUBJECT OF THE VARIATION, DESCRIPTION OF
EQUIPMENT OR PROTECTIVE SYSTEM :

Modifications of designations of apparatuses CA134,
CA136, CA160 and CA201 which will be from now on
respectively the following ones.

- 144-134-000-XXX
- 144-136-000-XXX
- 144-160-000-XXX
- 144-201-000-XXX

Addition of variations with various types of connectors and
various lengths of cables.

The marking is modified as follows :

Type : 144-YYY-000-XXX

(*) : supplemented (YYY) according to model and (XXX)
according to variante

(A4) DESCRIPTIVE DOCUMENTS :

Certification file No. DT 1001 / 01 rév. 2 dated July 16th,
2003.

This file includes 5 items (6 pages).

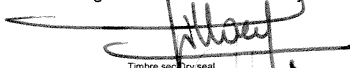
(A5) SPECIAL CONDITIONS FOR SAFE USE :

Unchanged.

(A6) ESSENTIAL HEALTH AND SAFETY REQUI-
REMENTS :

Unchanged.

Le Directeur de l'organisme certificateur
Manager of the certification body



Timbre security seal

(8) Seul le texte en français peut engager la responsabilité du LCIE. Ce document ne peut être reproduit que dans son intégralité, sans aucune modification.
The LCIE's liability applies only on the French text. This document may only be reproduced in full and without any change.

Page 1/1

LCIE 33, av du Général Leclerc
Laboratoire Central BP 8
des Industries Electriques 92266 Fontenay-aux-Roses cedex
Une société de Bureau Veritas France

Tél : +33 1 40 95 60 60
Fax : +33 1 40 95 86 56
contact@lcie.fr
www.lcie.fr
Société anonyme à directoire
et conseil de surveillance
au capital de 15 745 984 €
RCS Nanterre B 408 363 174

1.01



LCIE

ATTESTATION D'EXAMEN CE DE TYPE

1

EC TYPE EXAMINATION CERTIFICATE

- | | |
|---|---|
| <p>2 Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles
Directive 94/9/CE</p> <p>3 Numéro de l'attestation CE de type
LCIE 02 ATEX 6179 X</p> <p>4 Appareil ou système de protection
Capteur d'accélération
Type : CA 20 X</p> <p>5 Demandeur : VIBRO METER S.A.</p> <p>6 Adresse : Route de Moncor 4 – Box 1071
1701 FRIBOURG
SUISSE</p> <p>7 Cet appareil ou système de protection et ses variantes éventuelles acceptées est décrit dans l'annexe de la présente attestation et dans les documents descriptifs cités en annexe.</p> <p>8 Le LCIE, organisme notifié sous la référence 0081 conformément à l'article 9 de la directive 94/9/CE du Parlement européen et du Conseil du 23 mars 1994, certifie que cet appareil ou système de protection est conforme aux exigences essentielles en ce qui concerne la sécurité et la santé pour la conception et la construction d'appareils et de systèmes de protection destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la directive. Les vérifications et épreuves figurent dans notre rapport confidentiel N° 39 089 010 0010 B.</p> <p>9 Le respect des exigences essentielles en ce qui concerne la sécurité et la santé est assuré par la conformité aux documents suivants :
- EN 50014 (1997) + amendements 1 et 2
- EN 50020 (1994)</p> <p>10 Le signe X lorsqu'il est placé à la suite du numéro de l'attestation, indique que ce matériel ou système de protection est soumis aux conditions spéciales pour une utilisation sûre, mentionnées dans l'annexe de la présente attestation.</p> <p>11 La présente attestation d'examen CE de type porte uniquement sur la conception, l'examen et l'essai de l'équipement ou du système de protection spécifié conformément à la directive 94/9/CE.
Toutes autres exigences de la Directive sont applicables au procédé de fabrication et de livraison de cet équipement ou système de protection. Ces derniers ne sont pas couverts par la présente attestation.</p> <p>12 Le marquage de l'appareil ou du système de protection devra comporter, entre autres indications utiles, les mentions suivantes :
 II 1 G
EEx ia IIC T6 à T1</p> | <p>2 Equipment or Protective System Intended for use in Potentially explosive atmospheres
Directive 94/9/EC</p> <p>3 EC type Examination Certificate number
LCIE 02 ATEX 6179 X</p> <p>4 Equipment or Protective system
Accelerating transducer
Type : CA 20 X</p> <p>5 Applicant : VIBRO METER S.A.</p> <p>6 Address : Route de Moncor 4 – Box 1071
1701 FRIBOURG
SUISSE</p> <p>7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.</p> <p>8 LCIE, notified body number 0081 in accordance with article 9 of the directive 94/9/EC of the European Parliament and Council of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective system intended for use in potentially explosive atmospheres, given in Annex II to the directive. The examination and test results are recorded in confidential report N° 39 089 010 0010 B.</p> <p>9 Compliance with the Essential Health and Safety Requirements has been assured by compliance with :
- EN 50014 (1997) + amendments 1 et 2
- EN 50020 (1994)</p> <p>10 If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.</p> <p>11 This EC Type examination certificate relates only to the design, examination and tests of the specified equipment or protective system in accordance to the directive 94/9/EC.
Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.</p> <p>12 The marking of the equipment or protective system shall include the following :
 II 1 G
EEx ia IIC T6 to T1</p> |
|---|---|

Fontenay-aux-Roses, le 09 janvier 2003

Le Directeur de l'organisme certificateur
Manager of the certification body

Timbre Sec/dry seal

Par délégation
Michel BRÉNON
Directeur adjoint
à la Certification

Page 1/3

Seul le texte en français peut engager la responsabilité du LCIE. Ce document ne peut être reproduit que dans son intégralité, sans aucune modification.
The LCIE's liability applies only on the French text. This document may only be reproduced in full and without any change.

LCIE	33, av du Général Leclerc	Tél : +33 1 40 95 60 60	Société anonyme à directoire
Laboratoire Central	BP 8	Fax : +33 1 40 95 86 56	et conseil de surveillance
des Industries Electriques	92266 Fontenay-aux-Roses cedex	contact@lcie.fr	au capital de 15 745 984 €
Une société de Bureau Veritas	France	www.lcie.fr	RCS Nanterre B 408 363 174

L01



(A1) ANNEXE

(A2) ATTESTATION D'EXAMEN CE DE TYPE
LCIE 02 ATEX 6179 X

(A3) Description de l'équipement ou du système de protection

Le capteur est un transducteur électro-mécanique fournissant à ses bornes une charge électrique proportionnelle à l'accélération à laquelle il est soumis.
Il fonctionne avec un matériau piézo-électrique monté en cisaillement.

Le marquage sera le suivant :

VIBRO METER
Adresse : ...
Type : CA 20 X (*)
N° de fabrication : ...
Année de fabrication : ...
 II 1 G
EEx ia IIC T6 to T1
LCIE 02 ATEX 6179 X

(*) Complété par un des modèles décrit dans le dossier technique n° DT1000 Rév. 1 du 07/03/2002.

Le marquage CE est accompagné du numéro d'identification de l'organisme notifié responsable de la surveillance du système de qualité (0081 pour le LCIE)

Le matériel devra également comporter le marquage normalement prévu par les normes de construction du matériel électrique concerné.

Paramètres spécifiques du ou des modes de protection concernés :

Ci = 5 nF (avec 5 m de câble)
Ri = 0 ; Li = 0

(A4) Documents descriptifs

Dossier technique n° DT1000 Rév. 1 du 07/03/2002
Ce document comprend 3 rubriques (5 pages).

(A5) Conditions spéciales pour une utilisation sûre

Le capteur est un matériel à sécurité intrinsèque. Il peut être placé en atmosphère explosible.
Le matériel ne doit être raccordé qu'à un appareil certifié de sécurité intrinsèque et cette association doit être compatible vis à vis de la sécurité intrinsèque.
Lors de l'installation, la fixation de l'enveloppe devra être raccordée à un réseau de terre équipotentielle.

(A1) SCHEDULE

(A2) EC TYPE EXAMINATION CERTIFICATE
LCIE 02 ATEX 6179 X

(A3) Description of Equipment or protective system

The sensor is an electromechanic transducer delivering at its terminal blocks an electrical load proportional to the acceleration that it is subjected.
It works with a piezoelectric material mounted in shearing.

The marking will be the following :

VIBRO METER
Address : ...
Type : CA 20 X (*)
Serial number : ...
Year of construction : ...
 II 1 G
EEx ia IIC T6 to T1
LCIE 02 ATEX 6179 X

(*) Completed by one of the models described in the technical file n° DT1000 Rev. 1 issued 07/03/2002.

The CE marking shall be accompanied by the identification number of the notified body responsible for surveillance of the quality system (0081 for LCIE).

The equipment must also carry the usual marking required by the manufacturing standards applying to such equipments.

Specific parameters of the mode(s) of protection concerned :

Ci = 5 nF (with 5 m of cable)
Ri = 0 ; Li = 0

(A4) Descriptive documents :

Technical file n° DT1000 Rev. 1 issued 07/03/2002
This file includes 3 items (5 pages).

(A5) Special conditions for safe use

The sensor is an intrinsically safe equipment. It can be mounted in explosive atmosphere.
The material must only be connected to a certified IS apparatus and this combination must be compatible as regards intrinsic safety.
During installation, the fixation of the housing shall be bounded to a grounding bus.



(A1) **ANNEXE**

(A1) **SCHEDULE**

(A2) **ATTESTATION D'EXAMEN CE DE TYPE**
LCIE 02 ATEX 6179 X

(A2) **EC TYPE EXAMINATION CERTIFICATE**
LCIE 02 ATEX 6179 X

Le classement en température est le suivant :

The temperature classification is the following :

T6 jusqu'à Ta = 80 °C
T5 jusqu'à Ta = 95 °C
T4 jusqu'à Ta = 130 °C
T3 jusqu'à Ta = 195 °C
T2 jusqu'à Ta = 295 °C
T1 jusqu'à Ta = 445 °C

T6 up to Ta = 80 °C
T5 up to Ta = 95 °C
T4 up to Ta = 130 °C
T3 up to Ta = 195 °C
T2 up to Ta = 295 °C
T1 up to Ta = 445 °C

(A6) Exigences essentielles en ce qui concerne la sécurité et la santé

(A6) Essential Health and Safety Requirements

La conception du matériel satisfait aux normes européennes EN 50014 (1997 + amendements 1 et 2) et EN 50020 (1994).

The design of the equipment complies to European Standards EN 50014 (1997 + amendments 1 and 2) and EN 50020 (1994)

THIS PAGE INTENTIONALLY LEFT BLANK



(1) **EC-TYPE EXAMINATION CERTIFICATE**

(2) Equipment or protective system intended for use in potentially explosive atmospheres – Directive 94/9/EC

(3) EC-Type Examination Certificate Number: **KEMA 04ATEX1055**

(4) Equipment or protective system: **Piezoelectric Accelerometer**
Type 144-28X-000-YYY, Type 444-28X-000-YYY
and Type 444-31X-000-YYY

(5) Manufacturer: **Vibro-Meter SA**

(6) Address: **Rte de Moncor 4, 1701 Fribourg, Switzerland**

(7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) KEMA Quality B.V., notified body number 0344 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report no. 2037986.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014 : 1997 EN 50020 : 2002 EN 50284 : 1999

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment or protective system according to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

(12) The marking of the equipment or protective system shall include the following:



II 1 G EEx ia IIC T4 ... T6 or EEx ia IIC T1 ... T6

Arnhem, 10 March 2004
KEMA Quality B.V.

C.G. van Es
Certification Manager

© This Certificate may only be reproduced in its entirety and without any change

KEMA Quality B.V.
Utrechtseweg 310, 6812 AR Arnhem, The Netherlands
P.O. Box 5185, 6802 ED Arnhem, The Netherlands
Telephone +31 26 3 56 20 08, Telefax +31 26 3 52 58 00

ACCREDITED BY THE
DUTCH COUNCIL FOR
ACCREDITATION



Page 1/3



(13)

SCHEDULE

(14)

to EC-Type Examination Certificate KEMA 04ATEX1055(15) **Description**

Piezoelectric Accelerometers Type 144-28.-000-... (sensor only), Type 444-28.-000-... (sensor with remote conversion module) and Type 444-31.-000-... (sensor with integral conversion module) are used for vibration monitoring.

The sensor converts mechanical forces (e.g. vibrations) of the equipment to which it is mounted into an electrical signal, that is processed externally. When a conversion module is integrated, the sensor signal is converted to a modulated current output signal.

Ambient temperature range, depending on type and application:

All types:

- 50 °C ... +80 °C, if an explosive atmosphere may be present continuously or frequently and for long periods

Type 144-28.-000-...

sensor only: -55 °C ... +260 °C.

Type 444-28.-000-...

conversion module: -55 °C ... +100 °C.

sensor and cable: -55 °C ... +260 °C.

Type 444-31.-000-...

sensor and integral
conversion module: -55 °C ... +125 °C.

The relation between maximum ambient temperature and temperature class is as follows for all devices, taking into account the above mentioned temperature ranges:

Maximum ambient temperature:	+260 °C	for T2
	+195 °C	for T3
	+130 °C	for T4
	+95 °C	for T5
	+80 °C	for T6

Electrical data

Supply and output circuit ... in type of explosion protection intrinsic safety EEx ia IIC, only for connection to a certified intrinsically safe circuit, with following maximum values:

U_i	=	28 V
I_i	=	100 mA
P_i	=	0,7 W
L_i	=	0 mH
C_i	=	10,5 nF (with conversion module)
		6 nF (sensor only)

The capacitance of the integral cable is 0,2 nF/m.



(13) **SCHEDULE**
(14) **to EC-Type Examination Certificate KEMA 04ATEX1055**

(16) **Report**

KEMA No. 2037986.

(17) **Special conditions for safe use**

None

(18) **Essential Health and Safety Requirements**

Covered by the standards listed at (9).

(19) **Test documentation**

signed

Technical file no. DT 1023 (12 sheets)	)	
Technical file no. DT 1024 (13 sheets)	)	28.01.2004
Technical file no. DT 1025 (6 sheets)	)	

THIS PAGE INTENTIONALLY LEFT BLANK



(1) **EC-TYPE EXAMINATION CERTIFICATE**

(2) Equipment or protective system intended for use in potentially explosive atmospheres – Directive 94/9/EC

(3) EC-Type Examination Certificate Number: **KEMA 04ATEX1294**

(4) Equipment or protective system: **Accelerometer Type 144-30.-000-...**

(5) Manufacturer: **Vibro-Meter SA**

(6) Address: **Rte de Moncor 4, 1701 Fribourg, Switzerland**

(7) This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

(8) KEMA Quality B.V., notified body number 0344 in accordance with Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report no. 2071116.

(9) Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

EN 50014 : 1997 + A1, A2 EN 50020 : 2002 EN 50284 : 1999

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment or protective system according to the Directive 94/9/EC. Further requirements of the Directive apply to the manufacturing process and supply of this equipment or protective system. These are not covered by this certificate.

(12) The marking of the equipment or protective system shall include the following:



II 1 G EEx ia IIC T1... T6

Arnhem, 18 October 2004
KEMA Quality B.V.

C.G. van Es
Certification Manager

© This Certificate may only be reproduced in its entirety and without any change

KEMA Quality B.V.
Utrechtseweg 310, 6812 AR Arnhem, The Netherlands
P.O. Box 5185, 6802 ED Arnhem, The Netherlands
Telephone +31 26 3 56 20 08, Telefax +31 26 3 52 58 00

ACCREDITED BY THE
DUTCH COUNCIL FOR
ACCREDITATION



Page 1/3



(13) **SCHEDULE**
(14) **to EC-Type Examination Certificate KEMA 04ATEX1294**

(15) **Description**

The Accelerometer Type 144-30.-000-... is used for vibration monitoring of the equipment to which it is mounted.
A piezo electrical sensor converts mechanical forces (e.g. vibrations) into an electrical signal that is processed externally.

Ambient temperature range:
-30 °C ... +80 °C, if an explosive atmosphere is present continuously or frequently and during long periods;
-54 °C ... +500 °C, for sensor and cable;
-54 °C ... +500 °C, for high temperature VM connector;
-54 °C ... +260 °C, for standard temperature VM connector;
-65 °C ... +200 °C, for connector type M83723/98Y1020 or equivalent;
-65 °C ... +150 °C, for LEMO connector type 0 or equivalent.

The temperature class, depending on the ambient temperature, respectively depending on the process temperature, is listed in following table:

Temperature class	Ambient temperature, respectively process temperature
T6	≤ 75 °C
T5	≤ 90 °C
T4	≤ 125 °C
T3	≤ 190 °C
T2	≤ 290 °C
T1	≤ 440 °C

For an ambient temperature, respectively a process temperature over 440 °C, the temperature of the sensor is 10 K higher.

Electrical data

Output circuit in type of explosion protection intrinsic safety EEx ia IIC, (connector) only for connection to a certified intrinsically safe circuit, with following maximum values:

$$\begin{aligned}U_i &= 28 \text{ V} \\I_i &= 100 \text{ mA (linear characteristic)} \\&25 \text{ mA (non-linear characteristic)} \\P_i &= 0,7 \text{ W} \\L_i &= 0 \text{ mH} \\C_i &= 2 \text{ nF} + C_{\text{cable}}\end{aligned}$$

The capacitance of the integral cable is 0,2 nF/m

(16) **Report**
KEMA No. 2071116.



- (13) **SCHEDULE**
(14) **to EC-Type Examination Certificate KEMA 04ATEX1294**

- (17) **Special conditions for safe use**
None

- (18) **Essential Health and Safety Requirements**
Covered by the standards listed at (9).

- (19) **Test documentation**

Document DT 1027, including the documents
mentioned therein (2 pages)

signed

06.01.2004

THIS PAGE INTENTIONALLY LEFT BLANK



1 ATTESTATION D'EXAMEN CE DE TYPE

2 Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles
Directive 94/9/CE

3 Numéro de l'attestation CE de type
LCIE 02 ATEX 6089 X

4 Appareil ou système de protection :
Capteur d'accéléromètre
Type : CE 134

5 Demandeur : VIBRO-METER S.A.

6 Adresse : BP 1071
1701 FRIBOURG - SUISSE

7 Cet appareil ou système de protection et ses variantes éventuelles acceptées est décrit dans l'annexe de la présente attestation et dans les documents descriptifs cités en annexe.

8 Le LCIE, organisme notifié sous la référence 0081 conformément à l'article 9 de la directive 94/9/CE du Parlement européen et du Conseil du 23 mars 1994, certifie que cet appareil ou système de protection est conforme aux exigences essentielles en ce qui concerne la sécurité et la santé pour la conception et la construction d'appareils et de systèmes de protection destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la directive. Les vérifications et épreuves figurent dans notre rapport confidentiel N° 41 310 10 L.

9 Le respect des exigences essentielles en ce qui concerne la sécurité et la santé est assuré par la conformité aux documents suivants :
-EN 50014 (1997) + amendements 1 et 2
-EN 50020 (1994)

10 Le signe X lorsqu'il est placé à la suite du numéro de l'attestation, indique que ce matériel ou système de protection est soumis aux conditions spéciales pour une utilisation sûre, mentionnées dans l'annexe de la présente attestation.

11 Cette attestation d'examen CE de type concerne uniquement la conception et la construction de l'appareil ou du système de protection spécifié, conformément à la directive 94/9/CE. Des exigences supplémentaires de cette directive sont applicables pour la fabrication et la fourniture de l'appareil ou du système de protection.

12 Le marquage de l'appareil ou du système de protection devra comporter, entre autres indications utiles, les mentions suivantes :

Ex II 2 G

EEx ib IIC T6 à T1

Fontenay-aux-Roses, le 19 août 2002

1 EC TYPE EXAMINATION CERTIFICATE

2 Equipment or protective system intended for use in potentially explosive atmospheres
Directive 94/9/CE

3 EC type Examination Certificate number
LCIE 02 ATEX 6089 X

4 Equipment or protective system :
Accelerometer
Type : CE 134

5 Applicant : VIBRO-METER S.A.

6 Address : BP 1071
1701 FRIBOURG - SUISSE

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 LCIE, notified body number 0081 in accordance with article 9 of the Directive 94/9/CE of the European Parliament and Council of 23 March 1994, certifies that this equipment or protective system has been found to comply with the essential Health and Safety Requirements relating to the design and construction of equipment and protective system intended for use in potentially explosive atmospheres, given in Annex II to of the Directive.
The examination and test results are recorded in confidential report No 41 310 10 L.

9 Compliance with the Essential Health and Safety Requirements been assured by compliance with :
-EN 50014 (1997) + amendments 1 and 2
-EN 50020 (1994)

10 If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC Type examination certificate relates only to the design and construction of this specified equipment or protective system in accordance with the Directive 94/9/EC. Further requirements of the Directive applies to the manufacture and supply of this equipment or protective system.

12 The marking of the equipment or protective system shall include the following :

Ex II 2 G

EEx ib IIC T6 to T1

Le Directeur de l'organisme certificateur

Manager of the certification body

Timbre sec / Dry seal

Par délégation
Michel BRÉNON
Directeur adjoint
à la Certification

Page 1/3

Seul le texte en français peut engager la responsabilité du LCIE. Ce document ne peut être reproduit que dans son intégralité, sans aucune modification.
The LCIE's liability applies only on the French text. This document may be reproduced in full and without any change

LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES

Société anonyme à Directoire et Conseil de surveillance au capital de 15 745 984 euros - RCS Nanterre B 408 363 174

33, avenue du Général Leclerc - BP n° 8 - F 92266 FONTENAY-AUX-ROSES CEDEX - Tél. : +33 1 40 95 60 60



(A1) ANNEXE

(A1) SCHEDULE

(A2) ATTESTATION D'EXAMEN CE DE TYPE

(A2) EC TYPE EXAMINATION CERTIFICATE

LCIE 02 ATEX 6089 X

LCIE 02 ATEX 6089 X

(A3) Description de l'équipement ou du système de protection :

(A3) Description of Equipment or Protective System:

Capteur d'accélération
Type : CE 134

Accelerometer
Type : CE 134

Le matériel se compose d'un transducteur électromécanique qui fournit à ses bornes une charge électrique convertie en un courant proportionnel à l'accélération à laquelle il est soumis. Le convertisseur de charge/courant est alimenté par une source de tension en technique 2 fils.

This equipment is composed of an electromechanical transducer which supplies, at its terminals, an electrical load. This load is converted into a current which is proportional to submitted acceleration. Load/current converter is supplied by a 2-wires voltage supply.

Le marquage est le suivant :The marking is the following :

VIBRO-METER
Adresse
Type : CE 134
N° de fabrication
Année de construction
II 2 G
EEx ib IIC T6 à T1 (*)
LCIE 02 ATEX 6089 X

VIBRO-METER
Address
Type : CE 134
Serial number
Year of construction
II 2 G
EEx ib IIC T6 to T1 (*)
LCIE 02 ATEX 6089 X

Le marquage CE est accompagné du numéro d'identification de l'organisme notifié responsable de la surveillance du système approuvé de qualité (0081 pour le LCIE).

The CE marking shall be accompanied by the identification number of the notified body responsible for surveillance of the approved quality system (0081 for LCIE).

Le matériel devra également comporter le marquage normalement prévu par les normes de construction du matériel électrique concerné

The equipment must also carry the usual marking required by the manufacturing standards applying to such equipments.

(*) Le classement en température des différents sous-ensembles de l'appareil dépend de la température maximale d'utilisation, comme indiquée en (A5).

(*) Temperature classification of each element of the equipment is function of maximal operating temperature, as described on (A5).

Paramètres spécifiques du ou des modes de protection concerné(s) :Specific parameters of the mode of protection concerned :

$U_i \leq 28 \text{ V}$, $I_i \leq 100 \text{ mA}$, $P_i \leq 2 \text{ W}$
 $C_i \leq 15 \text{ nF}$, $L_i \leq 0,5 \text{ mH}$.

$U_i \leq 28 \text{ V}$, $I_i \leq 100 \text{ mA}$, $P_i \leq 2 \text{ W}$
 $C_i \leq 15 \text{ nF}$, $L_i \leq 0,5 \text{ mH}$.

(A4) Documents descriptifs :

(A4) Descriptive documents :

Dossier technique N° DT 1002 Rév 1 du 14 mars 2002.
Ce document comprend 12 rubriques (14 pages).

Technical file N° DT 1002 Rev 1 dated March 14th, 2002.
This file includes 12 items (14 pages).


(A1) ANNEXE
(A2) ATTESTATION D'EXAMEN CE DE TYPE
LCIE 02 ATEX 6089 X (suite)
(A5) Conditions spéciales pour une utilisation sûre :

Le matériel défini ci-dessus est un matériel de sécurité intrinsèque : il peut être placé en atmosphères explosibles.

Le matériel ci-dessus ne doit être associé qu'à un matériel de sécurité intrinsèque d'un type certifié et cette association doit être compatible du point de vue de la sécurité intrinsèque.

Classement en température :
- Electronique :

T6 à Ta=+60°C
T5 à Ta=+80°C
T4 à Ta=+100°C

- Câble de liaison :

T6 à Ta=+85°C
T5 à Ta=+100°C
T4 à Ta=+135°C
T3 à Ta=+200°C
T2 à Ta=+260°C

- Capteur :

T6 à Ta=+85°C
T5 à Ta=+100°C
T4 à Ta=+135°C
T3 à Ta=+200°C
T2 à Ta=+300°C
T1 à Ta=+350°C

(A6) Exigences essentielles en ce qui concerne la sécurité et la santé :

Conformité aux normes européennes EN 50014 (1997 + amendements 1 et 2) et EN 50020 (1994).

(A1) SCHEDULE
(A2) EC TYPE EXAMINATION CERTIFICATE
LCIE 02 ATEX 6089 X (continued)
(A5) Special conditions for safe use:

This equipment is intrinsically safe and can be used in potentially explosive atmospheres.

The above mentioned equipment must only be associated to a IS certified apparatus, and this combination must be compatible as regards intrinsic safety.

Operating temperature range :
- Electronic elements :

T6 à Ta=+60°C
T5 à Ta=+80°C
T4 à Ta=+100°C

- Connection wire :

T6 à Ta=+85°C
T5 à Ta=+100°C
T4 à Ta=+135°C
T3 à Ta=+200°C
T2 à Ta=+260°C

- Sensor :

T6 à Ta=+85°C
T5 à Ta=+100°C
T4 à Ta=+135°C
T3 à Ta=+200°C
T2 à Ta=+300°C
T1 à Ta=+350°C

(A6) Essential Health and Safety Requirements:

Conformity to the European standards EN 50014 (1997 + amendments 1 and 2) and EN 50020 (1994).



L C I E

(A1) **ATTESTATION D'EXAMEN CE DE TYPE**
02 ATEX 6089 X
du 19 août 2002

AVENANT 02 ATEX 6089 X / 01

(A1) **EC TYPE EXAMINATION CERTIFICATE**
02 ATEX 6089 X
dated August 19, 2002

VARIATION 02 ATEX 6089 X / 01

(A2) DESIGNATION DE L'EQUIPEMENT OU DU
 SYSTEME DE PROTECTION :

Capteur d'accélération
 Type : CE 134
 Construit par : VIBRO METER

(A2) NAME OF EQUIPMENT OR PROTECTIVE SYSTEM :

Capteur d'accélération
 Type : CE 134
 Manufactured by : VIBRO METER

(A3) OBJET DE L'AVENANT, DESCRIPTION DE
 L'APPAREIL OU DU SYSTÈME DE PROTECTION :

Remplacement du compound RTV-428 par Q-SIL 550

(A3) SUBJECT OF THE VARIATION, DESCRIPTION OF
 EQUIPMENT OR PROTECTIVE SYSTEM :

Replacement of compound RTV-428 by Q-SIL 550

Marquage :

Inchangé

Marking :

Unchanged

(A4) DOCUMENTS DESCRIPTIFS :

Lettre du constructeur du 16/02/2005 comportant 4 pages.

(A4) DESCRIPTIVE DOCUMENTS :

Letter of the manufacturer dated 16/02/2005 containing 4 pages.

(A5) CONDITIONS SPECIALES POUR UNE UTILISATION
 SURE :

Inchangées.

(A5) SPECIAL CONDITIONS FOR SAFE USE :

Unchanged.

(A6) VERIFICATIONS ET EPREUVES INDIVIDUELLES :
 Inchangées.

(A6) INDIVIDUAL EXAMINATIONS AND TESTS :
 Unchanged.

(A7) EXIGENCES ESSENTIELLES EN CE QUI
 CONCERNE LA SECURITE ET LA SANTE :

Inchangées.

(A7) ESSENTIAL HEALTH AND SAFETY REQUIREMENTS :

Unchanged.

Fontenay-aux-Roses, le 10 mars 2005

Le Directeur de l'organisme certificateur
 Manager of the certification body

Timbre/sec/Dry seal

Page 1/1

(8) Seul le texte en français peut engager la responsabilité du LCIE. Ce document ne peut être reproduit que dans son intégralité, sans aucune modification.
 The LCIE's liability applies only on the French text. This document may only be reproduced in full and without any change.

LCIE 33, av du Général Leclerc
 Laboratoire Central BP 8
 des Industries Electriques 92266 Fontenay-aux-Roses cedex
 Une société de Bureau Veritas France

Tél : +33 1 40 95 60 60
 Fax : +33 1 40 95 86 56
 contact@lcie.fr
 www.lcie.fr

Société anonyme à directoire
 et conseil de surveillance
 au capital de 15 745 984 €
 RCS Nanterre B 408 363 174

1/1



LCIE

1 ATTESTATION D'EXAMEN CE DE TYPE

2 Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles
Directive 94/9/CE

3 Numéro de l'attestation CE de type
LCIE 02 ATEX 6194 X

4 Appareil ou système de protection :
Capteur d'accélération
Type : CE 136 ou CE 310
Modèle : 444-136-000-XXX ou 444-310-000-XXX

5 Demandeur : VIBRO-METER S.A.

6 Adresse : BP 1071
1701 FRIBOURG SUISSE

7 Cet appareil ou système de protection et ses variantes éventuelles acceptées est décrit dans l'annexe de la présente attestation et dans les documents descriptifs cités en annexe.

8 Le LCIE, organisme notifié sous la référence 0081 conformément à l'article 9 de la directive 94/9/CE du Parlement européen et du Conseil du 23 mars 1994, certifie que cet appareil ou système de protection est conforme aux exigences essentielles en ce qui concerne la sécurité et la santé pour la conception et la construction d'appareils et de systèmes de protection destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la directive. Les vérifications et épreuves figurent dans notre rapport confidentiel N° 41 031 010 F.

9 Le respect des exigences essentielles en ce qui concerne la sécurité et la santé est assuré par la conformité aux documents suivants :
-EN 50014 (1997) + amendements 1 et 2
-EN 50020 (1994)

10 Le signe X lorsqu'il est placé à la suite du numéro de l'attestation, indique que ce matériel ou système de protection est soumis aux conditions spéciales pour une utilisation sûre, mentionnées dans l'annexe de la présente attestation.

11 Cette attestation d'examen CE de type concerne uniquement la conception et la construction de l'appareil ou du système de protection spécifié, conformément à la directive 94/9/CE. Des exigences supplémentaires de cette directive sont applicables pour la fabrication et la fourniture de l'appareil ou du système de protection.

12 Le marquage de l'appareil ou du système de protection devra comporter, entre autres indications utiles, les mentions suivantes :

Ex II 2 G

EEx ib IIC T5 à T2, pour le type CE 136.

EEx ib IIC T5 à T3, pour le type CE 310.

Fontenay-aux-Roses, le 30 octobre 2002

1 EC TYPE EXAMINATION CERTIFICATE

2 Equipment or protective system intended for use in potentially explosive atmospheres
Directive 94/9/CE

3 EC type Examination Certificate number
LCIE 02 ATEX 6194 X

4 Equipment or protective system :
Accelerometer
Type : CE 136 or CE 310
Model : 444-136-000-XXX or 444-310-000-XXX

5 Applicant : VIBRO-METER S.A.

6 Address : BP 1071
1701 FRIBOURG SUISSE

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 LCIE, notified body number 0081 in accordance with article 9 of the Directive 94/9/CE of the European Parliament and Council of 23 March 1994, certifies that this equipment or protective system has been found to comply with the essential Health and Safety Requirements relating to the design and construction of equipment and protective system intended for use in potentially explosive atmospheres, given in Annex II to of the Directive. The examination and test results are recorded in confidential report No 41 031 010 F.

9 Compliance with the Essential Health and Safety Requirements been assured by compliance with :
-EN 50014 (1997) + amendments 1 and 2
-EN 50020 (1994)

10 If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC Type examination certificate relates only to the design and construction of this specified equipment or protective system in accordance with the Directive 94/9/EC. Further requirements of the Directive applies to the manufacture and supply of this equipment or protective system.

12 The marking of the equipment or protective system shall include the following :

Ex II 2 G

EEx ib IIC T5 to T2, for CE 136 type.

EEx ib IIC T5 to T3, for CE 310 type.

Le Directeur de l'organisme certificateur

Manager of the certification body

Jean-Pierre GOMEL
Président et directeur général

Timbre sec / Dry seal

Seul le texte en français peut engager la responsabilité du LCIE. Ce document ne peut être reproduit que dans son intégralité, sans aucune modification
The LCIE's liability applies only on the French text. This document may be reproduced in full and without any change

Page 1/3

LCIE	33, av du Général Leclerc	Tél : +33 1 40 95 60 60	Société anonyme à directeur
Laboratoire Central	BP 8	Fax : +33 1 40 95 86 56	et conseil de surveillance
des Industries Electriques	92266 Fontenay-aux-Roses cedex	contact@lcie.fr	au capital de 15 745 984 €
Une société de Bureau Veritas	France	www.lcie.fr	RCS Nanterre B 408 363 174



(A1) ANNEXE

(A1) SCHEDULE

(A2) ATTESTATION D'EXAMEN CE DE TYPE

(A2) EC TYPE EXAMINATION CERTIFICATE

LCIE 02 ATEX 6194 X

LCIE 02 ATEX 6194 X

(A3) Description de l'équipement ou du système de protection :

(A3) Description of Equipment or Protective System:

Capteur d'accélération
Type : CE 136 ou CE 310
Modèle : 444-136-000-XXX ou 444-310-000-XXX

Accelerometer
Type : CE 136 or CE 310
Model : 444-136-000-XXX or 444-310-000-XXX

Le matériel se compose d'un transducteur électromécanique qui fournit à ses bornes une charge électrique convertie en un courant proportionnel à l'accélération à laquelle il est soumis.

This equipment is composed of an electromechanical transducer which supplies, at its terminals, an electrical load. This load is converted into a current which is proportional to submitted acceleration.

Il fonctionne avec un matériau piézo-électrique monté en compression.

It works with a piezoelectric material mounted in compression.

Le convertisseur de charge/courant est alimenté par une source de tension en technique 2 fils.

Load/current converter is supplied by a 2-wires voltage supply.

L'accéléromètre CE 136 est constitué d'un capteur, d'un câble de liaison et d'un conditionneur. L'ensemble est indémontable.

CE 136 type accelerometer is made up of a sensor, a connection wire and a conditioner. The whole can not be dismantled.

L'accéléromètre CE 310 est constitué d'un capteur avec électronique intégrée et d'un câble de liaison.

CE 310 type accelerometer is made up of a sensor with integrated electronic elements and a connection wire.

Le marquage est le suivant :The marking is the following :

VIBRO-METER

VIBRO-METER

Adresse

Address

Type : ...

Type : ...

N° de fabrication

Serial number

Année de construction

Year of construction

II 2 G

II 2 G

EEx ib IIC T5 à T2 (*), pour le type CE 136

EEx ib IIC T5 à T2 (*), for CE 136 type

EEx ib IIC T5 à T3 (*), pour le type CE 310

EEx ib IIC T5 à T3 (*), for CE 310 type

LCIE 02 ATEX 6194 X

LCIE 02 ATEX 6194 X

Le marquage CE est accompagné du numéro d'identification de l'organisme notifié responsable de la surveillance du système approuvé de qualité (0081 pour le LCIE).

The CE marking shall be accompanied by the identification number of the notified body responsible for surveillance of the approved quality system (0081 for LCIE).

Le matériel devra également comporter le marquage normalement prévu par les normes de construction du matériel électrique concerné

The equipment must also carry the usual marking required by the manufacturing standards applying to such equipments.

(*) Le classement en température des différents sous-ensembles de l'appareil dépend de la température maximale d'utilisation, comme indiquée en (A5).

(*) Temperature classification of each element of the equipment is function of maximal operating temperature, as described on (A5).

Paramètres spécifiques du ou des modes de protection concerné(s) :Specific parameters of the mode of protection concerned :

$U_i \leq 28 \text{ V}$, $I_i \leq 100 \text{ mA}$, $P_i \leq 2 \text{ W}$
 $C_i \leq 15 \text{ nF}$, $L_i \leq 0,5 \text{ mH}$.

$U_i \leq 28 \text{ V}$, $I_i \leq 100 \text{ mA}$, $P_i \leq 2 \text{ W}$
 $C_i \leq 15 \text{ nF}$, $L_i \leq 0,5 \text{ mH}$.

(A4) Documents descriptifs :

(A4) Descriptive documents :

Dossier technique N°DT1016 Rév 1 en date du 22 mai 2002.
Ce document comprend 9 rubriques (12 pages).

Technical file No DT1016 Rev 1 dated May, 22nd, 2002.
This file includes 9 items (12 pages).


LCIE
(A1) ANNEXE
(A1) SCHEDULE
(A2) ATTESTATION D'EXAMEN CE DE TYPE
(A2) EC TYPE EXAMINATION CERTIFICATE
LCIE 02 ATEX 6194 X (suite)
LCIE 02 ATEX 6194 X (continued)
(A5) Conditions spéciales pour une utilisation sûre :
(A5) Special conditions for safe use:

Le matériel défini ci-dessus est un matériel de sécurité intrinsèque : il peut être placé en atmosphères explosibles.

This equipment is intrinsically safe and can be used in potentially explosive atmospheres.

Le matériel ci-dessus ne doit être associé qu'à un matériel de sécurité intrinsèque d'un type certifié et cette association doit être compatible du point de vue de la sécurité intrinsèque.

The above mentioned equipment must only be associated to a IS certified apparatus, and this combination must be compatible as regards intrinsic safety.

Les paramètres électriques du matériel certifié pouvant être raccordé à l'accéléromètre ne doivent excéder aucune des valeurs suivantes :

The electrical parameters of certified equipment can be connected to the accelerometer must not exceed any of these following values :

$U_0 \leq 28 \text{ Vdc}$; $I_0 \leq 100 \text{ mA}$; $P_0 \leq 2 \text{ W}$.

$U_0 \leq 28 \text{ Vdc}$; $I_0 \leq 100 \text{ mA}$; $P_0 \leq 2 \text{ W}$.

Classement en température du CE 136 :
Operating temperature range CE 136 type :
- Conditionneur électronique :
- Electronic conditioner :

T5 à Ta=+80°C
T4 à Ta=+100°C

T5 à Ta=+80°C
T4 à Ta=+100°C

- Câble de liaison :
- Connection wire :

T5 à Ta=+100°C
T4 à Ta=+135°C
T3 à Ta=+200°C
T2 à Ta=+260°C

T5 à Ta=+100°C
T4 à Ta=+135°C
T3 à Ta=+200°C
T2 à Ta=+260°C

- Capteur :
- Sensor :

T5 à Ta=+100°C
T4 à Ta=+135°C
T3 à Ta=+200°C
T2 à Ta=+260°C

T5 à Ta=+100°C
T4 à Ta=+135°C
T3 à Ta=+200°C
T2 à Ta=+260°C

Classement en température du CE 310 :
Operating temperature range CE 310 type :
- Câble de liaison :
- Connection wire :

T5 à Ta=+100°C
T4 à Ta=+125°C

T5 à Ta=+100°C
T4 à Ta=+125°C

- Capteur avec électronique intégrée :
- Sensor with integrated electronic elements :

T5 à Ta=+80°C
T4 à Ta=+115°C
T3 à Ta=+125°C

T5 à Ta=+80°C
T4 à Ta=+115°C
T3 à Ta=+125°C

(A6) Exigences essentielles en ce qui concerne la sécurité et la santé :
(A6) Essential Health and Safety Requirements:

Conformité aux normes européennes EN 50014 (1997 + amendements 1 et 2) et EN 50020 (1994).

Conformity to the European standards EN 50014 (1997 + amendments 1 and 2) and EN 50020 (1994).



L C I E

(A1) **ATTESTATION D'EXAMEN CE DE TYPE**
02 ATEX 6194 X
du 30 octobre 2002

AVENANT 02 ATEX 6194 X / 01

(A1) **EC TYPE EXAMINATION CERTIFICATE**
02 ATEX 6194 X
dated October 30, 2002

VARIATION 02 ATEX 6194 X / 01

(A2) DESIGNATION DE L'EQUIPEMENT OU DU
 SYSTEME DE PROTECTION :

Capteur d'accélération
 Type : CE 136, CE 310
 Construit par : VIBRO METER

(A2) NAME OF EQUIPMENT OR PROTECTIVE SYSTEM :

Capteur d'accélération
 Type : CE 136, CE 310
 Manufactured by : VIBRO METER

(A3) OBJET DE L'AVENANT, DESCRIPTION DE
 L'APPAREIL OU DU SYTEME DE PROTECTION :

Remplacement du compound RTV-428 par Q-SIL 550

(A3) SUBJECT OF THE VARIATION, DESCRIPTION OF
 EQUIPMENT OR PROTECTIVE SYSTEM :

Replacement of compound RTV-428 by Q-SIL 550

Marquage :

Inchangé

Marking :

Unchanged

(A4) DOCUMENTS DESCRIPTIFS :

Lettre du constructeur du 16/02/2005 comportant 4 pages.

(A4) DESCRIPTIVE DOCUMENTS :

Letter of the manufacturer dated 16/02/2005 containing 4 pages.

(A5) CONDITIONS SPECIALES POUR UNE UTILISATION
 SURE :

Inchangées.

(A5) SPECIAL CONDITIONS FOR SAFE USE :

Unchanged.

(A6) VERIFICATIONS ET EPREUVES INDIVIDUELLES :
 Inchangées.

(A6) INDIVIDUAL EXAMINATIONS AND TESTS :
 Unchanged.

(A7) EXIGENCES ESSENTIELLES EN CE QUI
 CONCERNE LA SECURITE ET LA SANTE :
 Inchangées.

(A7) ESSENTIAL HEALTH AND SAFETY REQUIREMENTS :
 Unchanged.

Fontenay-aux-Roses, le 10 mars 2005

Le Directeur de l'organisme certificateur
 Manager of the certification body

Timbre sec/Dry seal

Page 1/1

(8) Seul le texte en français peut engager la responsabilité du LCIE. Ce document ne peut être reproduit que dans son intégralité, sans aucune modification.
 The LCIE's liability applies only on the French text. This document may only be reproduced in full and without any change.

LCIE 33, av du Général Leclerc
 Laboratoire Central BP 8
 des Industries Electriques 92266 Fontenay-aux-Roses cedex
 Une société de Bureau Veritas France

Tél : +33 1 40 95 60 60
 Fax : +33 1 40 95 86 56
 contact@lcie.fr
 www.lcie.fr Société anonyme à directoire
 et conseil de surveillance
 au capital de 15 745 984 €
 RCS Nanterre B 408 363 174

101



1 ATTESTATION D'EXAMEN CE DE TYPE

2 Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles
Directive 94/9/CE

3 Numéro de l'attestation CE de type
LCIE 02 ATEX 6093 X

4 Appareil ou système de protection :
Module de séparation galvanique
Type : GSI 122

5 Demandeur : VIBRO-METER S.A.

6 Adresse : BP 1071
1701 FRIBOURG SUISSE

7 Cet appareil ou système de protection et ses variantes éventuelles acceptées est décrit dans l'annexe de la présente attestation et dans les documents descriptifs cités en annexe.

8 Le LCIE, organisme notifié sous la référence 0081 conformément à l'article 9 de la directive 94/9/CE du Parlement européen et du Conseil du 23 mars 1994, certifie que cet appareil ou système de protection est conforme aux exigences essentielles en ce qui concerne la sécurité et la santé pour la conception et la construction d'appareils et de systèmes de protection destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la directive. Les vérifications et épreuves figurent dans notre rapport confidentiel N° 41 031 010 G.

9 Le respect des exigences essentielles en ce qui concerne la sécurité et la santé est assuré par la conformité aux documents suivants :
-EN 50014 (1997) + amendements 1 et 2
-EN 50020 (1994)

10 Le signe X lorsqu'il est placé à la suite du numéro de l'attestation, indique que ce matériel ou système de protection est soumis aux conditions spéciales pour une utilisation sûre, mentionnées dans l'annexe de la présente attestation.

11 Cette attestation d'examen CE de type concerne uniquement la conception et la construction de l'appareil ou du système de protection spécifié, conformément à la directive 94/9/CE. Des exigences supplémentaires de cette directive sont applicables pour la fabrication et la fourniture de l'appareil ou du système de protection.

12 Le marquage de l'appareil ou du système de protection devra comporter, entre autres indications utiles, les mentions suivantes :

 II (2) G
[EEEx ib] IIC

Fontenay-aux-Roses, le 6 septembre 2002

1 EC TYPE EXAMINATION CERTIFICATE

2 Equipment or protective system intended for use in potentially explosive atmospheres
Directive 94/9/CE

3 EC type Examination Certificate number
LCIE 02 ATEX 6093 X

4 Equipment or protective system :
Galvanic separation module
Type : GSI 122

5 Applicant : VIBRO-METER S.A.

6 Address : BP 1071
1701 FRIBOURG SUISSE

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 LCIE, notified body number 0081 in accordance with article 9 of the Directive 94/9/CE of the European Parliament and Council of 23 March 1994, certifies that this equipment or protective system has been found to comply with the essential Health and Safety Requirements relating to the design and construction of equipment and protective system intended for use in potentially explosive atmospheres, given in Annex II to of the Directive.
The examination and test results are recorded in confidential report No 41 031 010 G.

9 Compliance with the Essential Health and Safety Requirements been assured by compliance with :
-EN 50014 (1997) + amendments 1 and 2
-EN 50020 (1994)

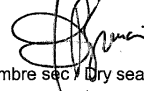
10 If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC Type examination certificate relates only to the design and construction of this specified equipment or protective system in accordance with the Directive 94/9/EC. Further requirements of the Directive applies to the manufacture and supply of this equipment or protective system.

12 The marking of the equipment or protective system shall include the following :

 II (2) G
[EEEx ib] IIC

Le Directeur de l'organisme certificateur
Manager of the Certification body


Timbre sec / Dry seal
Par délégation
Michel BRÉNON
Directeur adjoint
à la Certification

Page 1/3

Seul le texte en français peut engager la responsabilité du LCIE. Ce document ne peut être reproduit que dans son intégralité, sans aucune modification
The LCIE's liability applies only on the French text. This document may be reproduced in full and without any change

LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES

Société anonyme à Directoire et Conseil de surveillance au capital de 15 745 984 euros - RCS Nanterre B 408 363 174

33, avenue du Général Leclerc - BP n° 8 - F 92266 FONTENAY-AUX-ROSES CEDEX - Tél. : +33 1 40 95 60 60

13-c



(A1) ANNEXE

(A1) SCHEDULE

(A2) ATTESTATION D'EXAMEN CE DE TYPE

(A2) EC TYPE EXAMINATION CERTIFICATE

LCIE 02 ATEX 6093 X

LCIE 02 ATEX 6093 X

(A3) Description de l'équipement ou du système de protection :

(A3) Description of Equipment or Protective System:

Module de séparation galvanique
Type : GSI 122

Galvanic separation module
Type : GSI 122

Ce module est destiné à alimenter et à lire les informations transmises par un capteur ou un conditionneur opérant en technique 2 fils.

This system is used to supply and to treat data transmitted by a sensor or a 2-wires conditioner.

Le marquage est le suivant :The marking is the following :

VIBRO-METER
Adresse
Type : GSI122
N° de fabrication
Année de construction
 II (2) G
[EEEx ib] IIC
LCIE 02 ATEX 6093 X

VIBRO-METER
Address
Type : GSI122
Serial number
Year of construction
 II (2) G
[EEEx ib] IIC
LCIE 02 ATEX 6093 X

Le marquage CE est accompagné du numéro d'identification de l'organisme notifié responsable de la surveillance du système approuvé de qualité (0081 pour le LCIE).

The CE marking shall be accompanied by the identification number of the notified body responsible for surveillance of the approved quality system (0081 for LCIE).

Le matériel devra également comporter le marquage normalement prévu par les normes de construction du matériel électrique concerné

The equipment must also carry the usual marking required by the manufacturing standards applying to such equipments.

Paramètres spécifiques du ou des modes de protection concerné(s) :Specific parameters of the mode of protection concerned :

- Circuit d'alimentation (Bornes 1-2 ou 2-3) :
 $U = 24 \text{ V}$ (21 à 28 V), $I_{\max} \leq 100 \text{ mA}$.
(pour connexion à des appareils dont la tension de service est inférieure à 250 V).

- Power circuit (Terminals 1-2 or 2-3) :
 $U = 24 \text{ V}$ (from 21 to 28 V), $I_{\max} \leq 100 \text{ mA}$.
(for connection to apparatus with operating voltage of the circuit is inferior to 250 V).

- Circuit de traitement : $U_{\max} \leq 20 \text{ V}$; $I_{\max} \leq 10 \text{ mA}$.
(pour connexion à des appareils dont la tension de service est inférieure à 250 V).

- Circuit of treatment : $U_{\max} \leq 20 \text{ V}$; $I_{\max} \leq 10 \text{ mA}$.
(for connection to apparatus with operating voltage of the circuit is inferior to 250 V).

- Circuit de mesure (Bornes 4-5) :
 $U_0 \leq 23 \text{ V}$, $I_0 \leq 100 \text{ mA}$,
 $C_0 \leq 125 \text{ nF}$, $L_0 \leq 2,9 \text{ mH}$.

- Circuit of measure (Terminals 4-5) :
 $U_0 \leq 23 \text{ V}$, $I_0 \leq 100 \text{ mA}$,
 $C_0 \leq 125 \text{ nF}$, $L_0 \leq 2,9 \text{ mH}$.

(A4) Documents descriptifs :

(A4) Descriptive documents :

Dossier technique N° DT 1019 Rév 1 du 15 mai 2002.
Ce document comprend 10 rubriques (17 pages).

Technical file N° DT 1019 Rev 1 dated May 15th, 2002.
This file includes 10 items (17 pages).

Page 2/3
05/0



(A1) ANNEXE

(A1) SCHEDULE

(A2) ATTESTATION D'EXAMEN CE DE TYPE

(A2) EC TYPE EXAMINATION CERTIFICATE

LCIE 02 ATEX 6093 X (suite)

LCIE 02 ATEX 6093 X (continued)

(A5) Conditions spéciales pour une utilisation sûre :

Ce type d'appareil est un matériel associé de sécurité intrinsèque. Il ne peut être placé en atmosphères explosibles.

Les bornes de sortie (circuit de mesure – bornes 4 et 5) ne doivent être raccordées qu'à des matériels certifiés de sécurité intrinsèque, et ces associations doivent être compatibles vis-à-vis de la sécurité intrinsèque.

Plage de température d'utilisation :

$0^{\circ}\text{C} \leq T_a \leq +55^{\circ}\text{C}$.

(A5) Special conditions for safe use :

This equipment is intrinsically safe associated electrical apparatus, and must not be installed in potentially explosive atmospheres.

The output terminals (measurement circuit – terminals 4 and 5) must only be associated to certified IS apparatus. These combinations must be compatible as regards intrinsic safety.

Operating temperature range :

$0^{\circ}\text{C} \leq T_a \leq +55^{\circ}\text{C}$.

(A6) Exigences essentielles en ce qui concerne la sécurité et la santé :

Conformité aux normes européennes EN 50014 (1997 + amendements 1 et 2) et EN 50020 (1994).

Vérifications et épreuves individuelles :

Essai de rigidité diélectrique du transformateur B1, pendant une minute, sous une tension sinusoïdale de 50 Hz, d'une valeur efficace égale à 1 500 volts entre les enroulements primaires et les enroulements secondaires.

(A6) Essential Health and Safety Requirements:

Conformity to the European standards EN 50014 (1997 + amendments 1 and 2) and EN 50020 (1994).

Individual examinations and tests :

Dielectric strength test of B1 transformer during 1 minute, with a sine-shaped voltage at 50 Hz of 1 500 V r.m.s. between the primary windings and the secondary windings which are interconnected to each other.



LCIE

(A1) ATTESTATION D'EXAMEN CE DE TYPE
LCIE 02 ATEX 6093X du 6 septembre 2002

(A1) EC TYPE EXAMINATION CERTIFICATE
LCIE 02 ATEX 6093X dated September 6, 20

AVENANT 02 ATEX 6093X/01

VARIATION 02 ATEX 6093X/01

(A2) DESIGNATION DE L'EQUIPEMENT OU DU
SYSTEME DE PROTECTION :

Module de séparation galvanique
Type : GSI 122

Construit par :

VIBRO-METER S.A.

(A2) NAME OF EQUIPMENT OR PROTECTIVE SYSTEM :

Galvanic separation module
Type : GSI 122

Manufactured by :

VIBRO-METER S.A.

(A3) OBJET DE L'AVENANT, DESCRIPTION DE
L'APPAREIL OU DU SYSTÈME DE PROTECTION :

- Remplacement de la résistance PTC (R25) et modifications
mineures du circuit électronique.

Le marquage reste inchangé.

(A3) SUBJECT OF THE VARIATION, DESCRIPTION OF
EQUIPMENT OR PROTECTIVE SYSTEM :

- Replacement of PTC (R25) resistive element and minor
modifications on the circuitry.

The marking is unchanged.

(A4) DOCUMENTS DESCRIPTIFS :

Dossier technique n° DT1019/01 rév.2 du 30 octobre 2002.
Ce dossier comprend 3 rubriques (6 pages).

(A4) DESCRIPTIVE DOCUMENTS :

Certification file No DT1019/01 rev.2 dated October 30th, 2002.
This file includes 3 items (6 pages).

(A5) CONDITIONS SPECIALES POUR UNE UTILISATION
SURE :

Inchangées.

(A5) SPECIAL CONDITIONS FOR SAFE USE :

Unchanged

(A6) EXIGENCES ESSENTIELLES EN CE QUI
CONCERNE LA SECURITE ET LA SANTE :

Inchangées.

(A6) ESSENTIAL HEALTH AND SAFETY REQUI-
REMENTS :

Unchanged.

Fontenay-aux-Roses, le 06 décembre 2002

Le Directeur de l'organisme certificateur
Manager of the certification body

Timbre sec/Dry seal

Par délégation
Michel BRÉNON
Directeur adjoint
à la Certification

(8) Seul le texte en français peut engager la responsabilité du LCIE. Ce document ne peut être reproduit que dans son intégralité, sans aucune modification.
The LCIE's liability applies only on the French text. This document may only be reproduced in full and without any change.

LCIE 33, av du Général Leclerc
Laboratoire Central BP 8
des Industries Electriques 92266 Fontenay-aux-Roses cedex
Une société de Bureau Veritas France

Tél : +33 1 40 95 60 60 Société anonyme à directoire
et conseil de surveillance
Fax : +33 1 40 95 36 56 au capital de 15 745 984 €
contact@lcie.fr
www.lcie.fr RCS Nanterre B 408 363 17A

Page 1/1



(A1) **ATTESTATION D'EXAMEN CE DE TYPE**
02 ATEX 6093 X
du 6 septembre 2002

AVENANT 02 ATEX 6093 X / 02

(A1) **EC TYPE EXAMINATION CERTIFICATE**
02 ATEX 6093 X
dated September 6, 2002

VARIATION 02 ATEX 6093 X / 02

(A2) DESIGNATION DE L'EQUIPEMENT OU DU
SYSTEME DE PROTECTION :

Module de séparation galvanique
Type : GSI 122
Construit par : VIBRO METER

(A2) NAME OF EQUIPMENT OR PROTECTIVE SYSTEM :

Galvanic separation module
Type : GSI 122
Manufactured by : VIBRO METER

(A3) OBJET DE L'AVENANT, DESCRIPTION DE
L'APPAREIL OU DU SYSTÈME DE PROTECTION :

Remplacement du compound RTV-428 par Q-SIL 550

(A3) SUBJECT OF THE VARIATION, DESCRIPTION OF
EQUIPMENT OR PROTECTIVE SYSTEM :

Replacement of compound RTV-428 by Q-SIL 550

Marquage :

Inchangé

Marking :

Unchanged

(A4) DOCUMENTS DESCRIPTIFS :

Lettre du constructeur du 16/02/2005 comportant 4 pages.

(A4) DESCRIPTIVE DOCUMENTS :

Letter of the manufacturer dated 16/02/2005 containing 4 pages.

(A5) CONDITIONS SPECIALES POUR UNE UTILISATION
SURE :

Inchangées.

(A5) SPECIAL CONDITIONS FOR SAFE USE :

Unchanged.

(A6) VERIFICATIONS ET EPREUVES INDIVIDUELLES :
Inchangées.

(A6) INDIVIDUAL EXAMINATIONS AND TESTS :
Unchanged.

(A7) EXIGENCES ESSENTIELLES EN CE QUI
CONCERNE LA SECURITE ET LA SANTE :

Inchangées.

(A7) ESSENTIAL HEALTH AND SAFETY REQUIREMENTS :

Unchanged.

Fontenay-aux-Roses, le 10 mars 2005

Le Directeur de l'organisme certificateur
Manager of the certification body

Timbre sec/Dry seal

(8) Seul le texte en français peut engager la responsabilité du LCIE. Ce document ne peut être reproduit que dans son intégralité, sans aucune modification.
The LCIE's liability applies only on the French text. This document may only be reproduced in full and without any change.

LCIE
Laboratoire Central
des Industries Electriques
Une société de Bureau Veritas
33, av du Général Leclerc
BP 8
92266 Fontenay-aux-Roses cedex
France

Tél : +33 1 40 95 60 60
Fax : +33 1 40 95 86 56
contact@lcie.fr
www.lcie.fr
Société anonyme à directoire
et conseil de surveillance
au capital de 15 745 984 €
RCS Nanterre B 308 363 174

1/01

THIS PAGE INTENTIONALLY LEFT BLANK



LCIE

1 ATTESTATION D'EXAMEN CE DE TYPE

2 Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles
Directive 94/9/CE

3 Numéro de l'attestation CE de type
LCIE 02 ATEX 6087 X

4 Appareil ou système de protection :
Module de séparation galvanique
Type : GSI 123

5 Demandeur : VIBRO-METER S.A.

6 Adresse : BP 1071
1701 FRIBOURG SUISSE

7 Cet appareil ou système de protection et ses variantes éventuelles acceptées est décrit dans l'annexe de la présente attestation et dans les documents descriptifs cités en annexe.

8 Le LCIE, organisme notifié sous la référence 0081 conformément à l'article 9 de la directive 94/9/CE du Parlement européen et du Conseil du 23 mars 1994, certifie que cet appareil ou système de protection est conforme aux exigences essentielles en ce qui concerne la sécurité et la santé pour la conception et la construction d'appareils et de systèmes de protection destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la directive. Les vérifications et épreuves figurent dans notre rapport confidentiel N° 41 310 10 T.

9 Le respect des exigences essentielles en ce qui concerne la sécurité et la santé est assuré par la conformité aux documents suivants :
-EN 50014 (1997) + amendements 1 et 2, EN 50020 (1994).

10 Le signe X lorsqu'il est placé à la suite du numéro de l'attestation, indique que ce matériel ou système de protection est soumis aux conditions spéciales pour une utilisation sûre, mentionnées dans l'annexe de la présente attestation.

11 Cette attestation d'examen CE de type concerne uniquement la conception et la construction de l'appareil ou du système de protection spécifié, conformément à la directive 94/9/CE. Des exigences supplémentaires de cette directive sont applicables pour la fabrication et la fourniture de l'appareil ou du système de protection.

12 Le marquage de l'appareil ou du système de protection devra comporter, entre autres indications utiles, les mentions suivantes :

 II (2) G
[EEEx ib] IIC

Fontenay-aux-Roses, le 09 août 2002

1 EC TYPE EXAMINATION CERTIFICATE

2 Equipment or protective system intended for use in potentially explosive atmospheres
Directive 94/9/CE

3 EC type Examination Certificate number
LCIE 02 ATEX 6087 X

4 Equipment or protective system :
Galvanic separation module
Type : GSI 123

5 Applicant : VIBRO-METER S.A.

6 Address : BP 1071
1701 FRIBOURG SUISSE

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 LCIE, notified body number 0081 in accordance with article 9 of the Directive 94/9/CE of the European Parliament and Council of 23 March 1994, certifies that this equipment or protective system has been found to comply with the essential Health and Safety Requirements relating to the design and construction of equipment and protective system intended for use in potentially explosive atmospheres, given in Annex II to of the Directive.
The examination and test results are recorded in confidential report No 41 310 10 T.

9 Compliance with the Essential Health and Safety Requirements been assured by compliance with :
-EN 50014 (1997) + amendments 1 and 2, EN 50020 (1994).

10 If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC Type examination certificate relates only to the design and construction of this specified equipment or protective system in accordance with the Directive 94/9/EC. Further requirements of the Directive applies to the manufacture and supply of this equipment or protective system.

12 The marking of the equipment or protective system shall include the following :

 II (2) G
[EEEx ib] IIC

Le Directeur de l'organisme certificateur
Manager of the certification body

PO

Michel EQUI

Timbre sec / Dry seal

Seul le texte en français peut engager la responsabilité du LCIE. Ce document ne peut être reproduit que dans son intégralité, sans aucune modification
The LCIE's liability applies only on the French text. This document may be reproduced in full and without any change

Page 1/3

Rev A

LCIE 33, av du Général Leclerc
Laboratoire Central BP 8
des Industries Electriques 92266 Fontenay-aux-Roses cedex
Une société de Bureau Veritas France

Tél : +33 1 40 95 60 60 Société Anonyme
Fax : +33 1 40 95 86 56 au capital de 15 745 984 €
contact@lcie.fr RCS Nanterre B 408 363 174
www.lcie.fr

1-01



(A1) ANNEXE

(A1) SCHEDULE

(A2) ATTESTATION D'EXAMEN CE DE TYPE

(A2) EC TYPE EXAMINATION CERTIFICATE

LCIE 02 ATEX 6087 X

LCIE 02 ATEX 6087 X

(A3) Description de l'équipement ou du système de protection :

(A3) Description of Equipment or Protective System:

Module de séparation galvanique
Type : GSI 123

Galvanic separation module
Type : GSI 123

Ce module est destiné à alimenter et à lire les informations transmises par un capteur ou un conditionneur opérant en technique 2 fils.

This system is used to supply and to treat data transmitted by a sensor or a 2-wires conditioner.

Le marquage est le suivant :The marking is the following :

VIBRO-METER
Adresse
Type : GSI123
N° de fabrication
Année de construction
II (2) G
[EEEx ib] IIC
LCIE 02 ATEX 6087 X

VIBRO-METER
Address
Type : GSI123
Serial number
Year of construction
II (2) G
[EEEx ib] IIC
LCIE 02 ATEX 6087 X

Le marquage CE est accompagné du numéro d'identification de l'organisme notifié responsable de la surveillance du système approuvé de qualité (0081 pour le LCIE).

The CE marking shall be accompanied by the identification number of the notified body responsible for surveillance of the approved quality system (0081 for LCIE).

Le matériel devra également comporter le marquage normalement prévu par les normes de construction du matériel électrique concerné

The equipment must also carry the usual marking required by the manufacturing standards applying to such equipments.

Paramètres spécifiques du ou des modes de protection concerné(s) :Specific parameters of the mode of protection concerned :

- Circuit d'alimentation (Bornes 1-2 ou 2-3) :
 $U = 24\text{ V}$ (21 à 28 V), $I_{\max} \leq 100\text{ mA}$.
(pour connexion à des appareils dont la tension de service est inférieure à 250 V).

- Power circuit (Terminals 1-2 or 2-3) :
 $U = 24\text{ V}$ (from 21 to 28 V), $I_{\max} \leq 100\text{ mA}$.
(for connection to apparatus with operating voltage of the circuit is inferior to 250 V).

- Circuit de traitement : $U_{\max} \leq 20\text{ V}$; $I_{\max} \leq 10\text{ mA}$.
(pour connexion à des appareils dont la tension de service est inférieure à 250 V).

- Circuit of treatment : $U_{\max} \leq 20\text{ V}$; $I_{\max} \leq 10\text{ mA}$.
(for connection to apparatus with operating voltage of the circuit is inferior to 250 V).

- Circuit de mesure (Bornes 4-5) :
 $U_0 = 26\text{ V}$, $I_0 = 68\text{ mA}$, $C_0 = 30\text{ nF}$ pour $L_0 = 1\text{ mH}$
 $C_0 = 99\text{ nF}$ pour $L_0 = 0$.

- Circuit of measure (Terminals 4-5) :
 $U_0 = 26\text{ V}$, $I_0 = 68\text{ mA}$, $C_0 = 30\text{ nF}$ for $L_0 = 1\text{ mH}$
 $C_0 = 99\text{ nF}$ for $L_0 = 0$.

Rev A Page 2/3



(A1) ANNEXE

(A1) SCHEDULE

(A2) ATTESTATION D'EXAMEN CE DE TYPE

(A2) EC TYPE EXAMINATION CERTIFICATE

LCIE 02 ATEX 6087 X (suite)

LCIE 02 ATEX 6087 X (continued)

(A4) Documents descriptifs :

Dossier technique N°DT1010 Rév 1 en date du 18 mars 2002.
Ce document comprend 9 rubriques (24 pages).

Plans référencés :

N° PZ6405 Ind. 01 daté du 23 juillet 2004 (1 page),
N° PZ6406 Ind.01 daté du 23 juillet 2004 (3 pages).

(A5) Conditions spéciales pour une utilisation sûre :

Ce type d'appareil est un matériel associé de sécurité intrinsèque. Il ne peut être placé en atmosphères explosibles.

Les bornes de sortie ne doivent être raccordées qu'à des matériels certifiés de sécurité intrinsèque, et ces associations doivent être compatibles vis-à-vis de la sécurité intrinsèque.

Lors de l'installation du matériel GSI123 et du matériel auquel il sera relié, on devra tenir compte de la possibilité d'un défaut au sens de la norme EN50020, en mettant les points V_H (borne 4) et 0V (borne 2) en court-circuit.

(A6) Exigences essentielles en ce qui concerne la sécurité et la santé :

Conformité aux normes européennes EN 50014 (1997 + amendements 1 et 2) et EN 50020 (1994).

Vérifications et épreuves individuelles :

Les transformateurs T1 et T2 doivent être soumis à une épreuve diélectrique individuelle entre enroulements primaires et secondaires sous une tension alternative de valeur efficace de 1500V.

Il ne doit se produire aucune rupture d'isolation.

(A4) Descriptive documents :

Technical file N° DT1010 Rev 1 dated March 18th, 2002.
This file includes 9 items (24 pages).

Referenced drawings :

N° PZ6405 Ind. 01 dated July 23rd, July 2004 (1 page),
N° PZ6406 Ind.01 dated July 23rd, July 2004 (3 pages).

(A5) Special conditions for safe use:

This equipment is intrinsically safe associated electrical apparatus, and must not be installed in potentially explosive atmospheres.

The output terminals must only be associated to certified IS apparatus. These combinations must be compatible as regards intrinsic safety.

During the set-up of this equipment GSI123 and the main equipment which it will be linked, the user must take care about the possibility of defect, as regards EN50020, which short-circuit between terminal V_H (terminal 4) et 0V (terminal 2)

(A6) Essential Health and Safety Requirements:

Conformity to the European standards EN 50014 (1997 + amendments 1 and 2) and EN 50020 (1994).

Individual examinations and tests :

T1 and T2 transformers must be submitted to an individual dielectric strength test on primary and secondary windings at 1500V AC.

No lack of isolation must happen.



LCIE

(A1) **ATTESTATION D'EXAMEN CE DE TYPE**
LCIE 02 ATEX 6087X du 10 septembre 2002

(A1) **EC TYPE EXAMINATION CERTIFICATE**
LCIE 02 ATEX 6087X dated September 10th, 2002

AVENANT 02 ATEX 6087X/01

VARIATION 02 ATEX 6087X/01

(A2) DESIGNATION DE L'EQUIPEMENT OU DU
SYSTEME DE PROTECTION :

Module de séparation galvanique
Type : GSI 123

Construit par :

VIBRO-METER S.A.

(A2) NAME OF EQUIPMENT OR PROTECTIVE SYSTEM :

Galvanic separation module
Type : GSI 123

Manufactured by :

VIBRO-METER S.A.

(A3) OBJET DE L'AVENANT, DESCRIPTION DE
L'APPAREIL OU DU SYTEME DE PROTECTION :

- Modifications mineures du circuit électronique.

Le marquage reste inchangé.

(A3) SUBJECT OF THE VARIATION, DESCRIPTION OF
EQUIPMENT OR PROTECTIVE SYSTEM :

- Minor modifications on the circuitry.

The marking is unchanged.

(A4) DOCUMENTS DESCRIPTIFS :

Dossier technique n° PZ6407 rév.3 du 02 avril 2004.
Ce dossier comprend 2 rubriques (5 pages).

(A4) DESCRIPTIVE DOCUMENTS :

Certification file No PZ6407 rev.3 dated April 02nd, 2004.
This file includes 2 items (5 pages).

(A5) CONDITIONS SPECIALES POUR UNE UTILISATION
SURE :

Inchangées.

(A5) SPECIAL CONDITIONS FOR SAFE USE :

Unchanged

(A6) EXIGENCES ESSENTIELLES EN CE QUI
CONCERNE LA SECURITE ET LA SANTE :

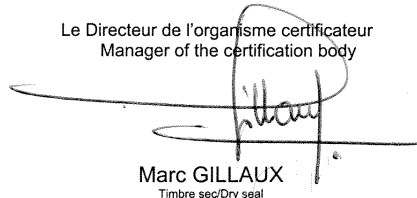
Inchangées.

(A6) ESSENTIAL HEALTH AND SAFETY REQUI-
REMENTS :

Unchanged.

Fontenay-aux-Roses, le 10 mai 2004

Le Directeur de l'organisme certificateur
Manager of the certification body



Marc GILLAUX

Timbre sec/Dry seal

Page 1/1

(8) Seul le texte en français peut engager la responsabilité du LCIE. Ce document ne peut être reproduit que dans son intégralité, sans aucune modification.
The LCIE's liability applies only on the French text. This document may only be reproduced in full and without any change.

LCIE 33, av du Général Leclerc
Laboratoire Central BP 8
des Industries Electriques 92266 Fontenay-aux-Roses cedex
Une société de Bureau Veritas France

Tel : +33 1 40 95 60 60 Société anonyme à direction
Fax : +33 1 40 95 86 56 ~~et conseil de surveillance~~
contact@lcie.fr au capital de 15 745 984 €
www.lcie.fr RCS Nanterre B 408 363 174

101



L C I E

(A1) **ATTESTATION D'EXAMEN CE DE TYPE**
02 ATEX 6087 X
du 10 septembre 2002

AVENANT 02 ATEX 6087 X / 02

(A1) **EC TYPE EXAMINATION CERTIFICATE**
02 ATEX 6087 X
dated September 10, 2002

VARIATION 02 ATEX 6087 X / 02

(A2) DESIGNATION DE L'EQUIPEMENT OU DU
SYSTEME DE PROTECTION :

Module de séparation galvanique
Type : GSI 123
Construit par : VIBRO METER

(A2) NAME OF EQUIPMENT OR PROTECTIVE SYSTEM :

Galvanic separation module
Type : GSI 123
Manufactured by : VIBRO METER

(A3) OBJET DE L'AVENANT, DESCRIPTION DE
L'APPAREIL OU DU SYSTÈME DE PROTECTION :

Remplacement du compound RTV-428 par Q-SIL 550

(A3) SUBJECT OF THE VARIATION, DESCRIPTION OF
EQUIPMENT OR PROTECTIVE SYSTEM :

Replacement of compound RTV-428 by Q-SIL 550

Marquage :

Inchangé

Marking :

Unchanged

(A4) DOCUMENTS DESCRIPTIFS :

Lettre du constructeur du 16/02/2005 comportant 4 pages.

(A4) DESCRIPTIVE DOCUMENTS :

Letter of the manufacturer dated 16/02/2005 containing 4 pages.

(A5) CONDITIONS SPECIALES POUR UNE UTILISATION
SURE :

Inchangées.

(A5) SPECIAL CONDITIONS FOR SAFE USE :

Unchanged.

(A6) VERIFICATIONS ET EPREUVES INDIVIDUELLES :
Inchangées.

(A6) INDIVIDUAL EXAMINATIONS AND TESTS :
Unchanged.

(A7) EXIGENCES ESSENTIELLES EN CE QUI
CONCERNE LA SECURITE ET LA SANTE :

Inchangées.

(A7) ESSENTIAL HEALTH AND SAFETY REQUIREMENTS :

Unchanged.

Fontenay-aux-Roses, le 10 mars 2005

Le Directeur de l'organisme certificateur
Manager of the certification body

Timbre sec/Dry seal

(8) Seul le texte en français peut engager la responsabilité du LCIE. Ce document ne peut être reproduit que dans son intégralité, sans aucune modification.
The LCIE's liability applies only on the French text. This document may only be reproduced in full and without any change.

Page 1/1

LCIE	33, av du Général Leclerc	Tel : +33 1 40 95 60 60	Société anonyme à directoire
Laboratoire Central	BP 8	Fax : +33 1 40 95 86 56	et conseil de surveillance
des Industries Electriques	92266 Fontenay-aux-Roses cedex	contact@lcie.fr	au capital de 15 745 984 €
Une société de Bureau Veritas	France	www.lcie.fr	RCS Nanterre B 408 363 174

L01

THIS PAGE INTENTIONALLY LEFT BLANK



LCIE

1 ATTESTATION D'EXAMEN CE DE TYPE

2 Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles
Directive 94/9/CE

3 Numéro de l'attestation CE de type
LCIE 02 ATEX 6094 X

4 Appareil ou système de protection :
Conditionneur de signal de charge
Type : IPC 620
Modèle : 244-620-000-XXX

5 Demandeur : VIBRO-METER S.A.

6 Adresse : BP 1071
1701 FRIBOURG SUISSE

7 Cet appareil ou système de protection et ses variantes éventuelles acceptées est décrit dans l'annexe de la présente attestation et dans les documents descriptifs cités en annexe.

8 Le LCIE, organisme notifié sous la référence 0081 conformément à l'article 9 de la directive 94/9/CE du Parlement européen et du Conseil du 23 mars 1994, certifie que cet appareil ou système de protection est conforme aux exigences essentielles en ce qui concerne la sécurité et la santé pour la conception et la construction d'appareils et de systèmes de protection destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la directive. Les vérifications et épreuves figurent dans notre rapport confidentiel N° 41 031 010 J.

9 Le respect des exigences essentielles en ce qui concerne la sécurité et la santé est assuré par la conformité aux documents suivants :
-EN 50014 (1997) + amendements 1 et 2
-EN 50020 (1994)

10 Le signe X lorsqu'il est placé à la suite du numéro de l'attestation, indique que ce matériel ou système de protection est soumis aux conditions spéciales pour une utilisation sûre, mentionnées dans l'annexe de la présente attestation.

11 Cette attestation d'examen CE de type concerne uniquement la conception et la construction de l'appareil ou du système de protection spécifié, conformément à la directive 94/9/CE. Des exigences supplémentaires de cette directive sont applicables pour la fabrication et la fourniture de l'appareil ou du système de protection.

12 Le marquage de l'appareil ou du système de protection devra comporter, entre autres indications utiles, les mentions suivantes :



EEx ib IIC T6 à T5

Fontenay-aux-Roses, le 30 octobre 2002

1 EC TYPE EXAMINATION CERTIFICATE

2 Equipment or protective system intended for use in potentially explosive atmospheres
Directive 94/9/CE

3 EC type Examination Certificate number
LCIE 02 ATEX 6094 X

4 Equipment or protective system :
Signal charge conditioner
Type : IPC 620
Model : 244-620-000-XXX

5 Applicant : VIBRO-METER S.A.

6 Address : BP 1071
1701 FRIBOURG SUISSE

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 LCIE, notified body number 0081 in accordance with article 9 of the Directive 94/9/CE of the European Parliament and Council of 23 March 1994, certifies that this equipment or protective system has been found to comply with the essential Health and Safety Requirements relating to the design and construction of equipment and protective system intended for use in potentially explosive atmospheres, given in Annex II to of the Directive. The examination and test results are recorded in confidential report No 41 031 010 J.

9 Compliance with the Essential Health and Safety Requirements been assured by compliance with :
-EN 50014 (1997) + amendments 1 and 2
-EN 50020 (1994)

10 If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC Type examination certificate relates only to the design and construction of this specified equipment or protective system in accordance with the Directive 94/9/EC. Further requirements of the Directive applies to the manufacture and supply of this equipment or protective system.

12 The marking of the equipment or protective system shall include the following :



EEx ib IIC T6 to T5

Le Directeur de l'organisme certificateur
Manager of the certification body

Jean-Pierre GOMEL
Président et directeur général

Timbre sec / Dry seal

Page 1/3

Seul le texte en français peut engager la responsabilité du LCIE. Ce document ne peut être reproduit que dans son intégralité, sans aucune modification
The LCIE's liability applies only on the French text. This document may be reproduced in full and without any change

LCIE 33 av du Général Leclerc
Laboratoire Central BP 8
des Industries Electriques 92266 Fontenay-aux-Roses cedex
Une société de Bureau Veritas France

Tél : +33 1 40 95 60 60 Société anonyme à directoire
et conseil de surveillance
Fax : +33 1 40 95 86 56 au capital de 15 745 984 €
contact@lcie.fr RCS Nanterre B 408 363 174
www.lcie.fr

L-01



(A1) ANNEXE

(A1) SCHEDULE

(A2) ATTESTATION D'EXAMEN CE DE TYPE

(A2) EC TYPE EXAMINATION CERTIFICATE

LCIE 02 ATEX 6094 X

LCIE 02 ATEX 6094 X

(A3) Description de l'équipement ou du système de protection :

(A3) Description of Equipment or Protective System:

Conditionneur de signal de charge
Type : IPC 620
Modèle : 244-620-000-XXX

Signal charge conditioner
Type : IPC 620
Model : 244-620-000-XXX

L'appareil transforme une charge électrique d'entrée en un signal électrique de sortie proportionnel à l'accélération ou à la pression.

The apparatus converts an input electrical charge to an output electric signal proportional to the acceleration or pressure.

Le marquage est le suivant :The marking is the following :

VIBRO-METER
Adresse
Type : ...
N° de fabrication
Année de construction
 II 2 G
EEx ib IIC T6 à T5
LCIE 02 ATEX 6094 X

VIBRO-METER
Address
Type : ...
Serial number
Year of construction
 II 2 G
EEx ib IIC T6 to T5
LCIE 02 ATEX 6094 X

Le marquage CE est accompagné du numéro d'identification de l'organisme notifié responsable de la surveillance du système approuvé de qualité (0081 pour le LCIE).

The CE marking shall be accompanied by the identification number of the notified body responsible for surveillance of the approved quality system (0081 for LCIE).

Le matériel devra également comporter le marquage normalement prévu par les normes de construction du matériel électrique concerné

The equipment must also carry the usual marking required by the manufacturing standards applying to such equipments.

Paramètres spécifiques du ou des modes de protection concerné(s) :Specific parameters of the mode of protection concerned :

- Bornier « alimentation » :
 $U_i \leq 23 \text{ V}$, $I_i \leq 100 \text{ mA}$, $C_i \leq 5 \text{ nF}$, $L_i \leq 0,5 \text{ mH}$.
- Bornier « capteur » :
 $U_o \leq 23 \text{ V}$, $I_o \leq 46 \text{ mA}$, $C_o \leq 30 \text{ nF}$, $L_o \leq 5 \text{ mH}$, $P_o \leq 265 \text{ mW}$.

- « Power » terminal block :
 $U_i \leq 23 \text{ V}$, $I_i \leq 100 \text{ mA}$, $C_i \leq 5 \text{ nF}$, $L_i \leq 0,5 \text{ mH}$.
- « Sensor » terminal block :
 $U_o \leq 23 \text{ V}$, $I_o \leq 46 \text{ mA}$, $C_o \leq 30 \text{ nF}$, $L_o \leq 5 \text{ mH}$, $P_o \leq 265 \text{ mW}$.

(A4) Documents descriptifs :

(A4) Descriptive documents :

Dossier technique N°DT1021 Rév 1 en date du 15 mai 2002.
Ce document comprend 9 rubriques (15 pages).

Technical file N° DT1021 Rev 1 dated May 15th, 2002.
This file includes 9 items (15 pages).


LCIE
(A1) ANNEXE
(A1) SCHEDULE
(A2) ATTESTATION D'EXAMEN CE DE TYPE
(A2) EC TYPE EXAMINATION CERTIFICATE
LCIE 02 ATEX 6094 X (suite)
LCIE 02 ATEX 6094 X (continued)
(A5) Conditions spéciales pour une utilisation sûre :

L'appareil est un matériel à sécurité intrinsèque ; il peut être placé en atmosphères explosibles.

Les borniers de l'appareil ne doivent être raccordés qu'à des appareils de sécurité intrinsèque certifiés et ces associations doivent être compatible vis-à-vis de la sécurité intrinsèque.

Les caractéristiques électriques des matériels pouvant être raccordés aux bornes ne doivent excéder aucune des valeurs suivantes :

- Bornier « alimentation » : $U_o \leq 23 \text{ V}$, $I_o \leq 100 \text{ mA}$
- Bornier « capteur » : $C_i \leq 30 \text{ nF}$, $L_i \leq 5 \text{ mH}$

Classement en température :

T6 à $T_a = + 60^\circ\text{C}$,
T5 à $T_a = + 80^\circ\text{C}$.

(A5) Special conditions for safe use:

The apparatus is an intrinsically safe equipment ; it can be mounted in explosive atmospheres.

The terminal blocks of the apparatus must be only connected to certified intrinsically safe equipments and these combinations must be compatible as regards intrinsic safety rules.

The electrical parameters of equipments connected to the terminal blocks, must not exceed any of the following values :

- « Power » terminal blocks : $U_o \leq 23 \text{ V}$, $I_o \leq 100 \text{ mA}$
- « Sensor » terminal blocks : $C_i \leq 30 \text{ nF}$, $L_i \leq 5 \text{ mH}$

Temperature classification :

T6 at $T_a = + 60^\circ\text{C}$,
T5 at $T_a = + 80^\circ\text{C}$.

(A6) Exigences essentielles en ce qui concerne la sécurité et la santé :

Conformité aux normes européennes EN 50014 (1997 + amendements 1 et 2) et EN 50020 (1994).

(A6) Essential Health and Safety Requirements:

Conformity to the European standards EN 50014 (1997 + amendments 1 and 2) and EN 50020 (1994).



L C I E

(A1) **ATTESTATION D'EXAMEN CE DE TYPE**
02 ATEX 6094 X
du 30 octobre 2002

AVENANT 02 ATEX 6094 X / 01

(A1) **EC TYPE EXAMINATION CERTIFICATE**
02 ATEX 6094 X
dated October 30, 2002

VARIATION 02 ATEX 6094 X / 01

(A2) **DESIGNATION DE L'EQUIPEMENT OU DU**
SYSTEME DE PROTECTION :

Conditionneur de signal de charge
 Type : IPC 620
 Construit par : VIBRO METER

(A2) **NAME OF EQUIPMENT OR PROTECTIVE SYSTEM :**

Signal charge conditioner
 Type : IPC 620
 Manufactured by : VIBRO METER

(A3) **OBJET DE L'AVENANT, DESCRIPTION DE**
L'APPAREIL OU DU SYTEME DE PROTECTION :

Remplacement du compound RTV-428 par Q-SIL 550

(A3) **SUBJECT OF THE VARIATION, DESCRIPTION OF**
EQUIPMENT OR PROTECTIVE SYSTEM :

Replacement of compound RTV-428 by Q-SIL 550

Marquage :

Inchangé

Marking :

Unchanged

(A4) **DOCUMENTS DESCRIPTIFS :**

Lettre du constructeur du 16/02/2005 comportant 4 pages.

(A4) **DESCRIPTIVE DOCUMENTS :**

Letter of the manufacturer dated 16/02/2005 containing 4 pages.

(A5) **CONDITIONS SPECIALES POUR UNE UTILISATION**
SURE :

Inchangées.

(A5) **SPECIAL CONDITIONS FOR SAFE USE :**

Unchanged.

(A6) **VERIFICATIONS ET EPREUVES INDIVIDUELLES :**
 Inchangées.

(A6) **INDIVIDUAL EXAMINATIONS AND TESTS :**
 Unchanged.

(A7) **EXIGENCES ESSENTIELLES EN CE QUI**
CONCERNE LA SECURITE ET LA SANTE :

Inchangées.

(A7) **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS :**

Unchanged.

Fontenay-aux-Roses, le 10 mars 2005

Le Directeur de l'organisme certificateur
 Manager of the certification body

Timbre sec/Dry seal

Page 1/1

(8) Seul le texte en français peut engager la responsabilité du LCIE. Ce document ne peut être reproduit que dans son intégralité, sans aucune modification.
 The LCIE's liability applies only on the French text. This document may only be reproduced in full and without any change.

LCIE
 Laboratoire Central
 des Industries Electriques
 Une société de Bureau Veritas

33, av du Général Leclerc
 BP 8
 92266 Fontenay-aux-Roses cedex
 France

Tel : +33 1 40 95 60 60
 Fax : +33 1 40 95 86 56
 contact@lcie.fr
 www.lcie.fr

Société anonyme à directoire
 et conseil de surveillance
 au capital de 15 745 984 €
 RCS Nanterre B 408 363 174

ATEX Certificate :
LCIE_02_ATEX_6085_X
for IPC 704

Although the certificate is available in the 3 languages (English, French and German), the liability of the notified body applies only on the text of the original copy of the certificate that it published.

EN

Bien que le certificat soit traduit dans le 3 langues (Anglais, Français et Allemand), seul le texte de la copie originale du certificat peut engager la responsabilité de l'organisme notifié qui l'a publié.

FR

Obwohl das Zertifikat in 3 Sprachen (Englisch, Französisch und Deutsch) übersetzt ist, können nur die bescheinigten Behörden, die den Text auf der Originalausgabe des Zertifikates herausgegeben haben, zur rechtlichen Verantwortung gezogen werden.

DE



**THIS PAGE INTENTIONALLY LEFT BLANK
CETTE PAGE EST LAISSÉE INTENTIONNELLEMENT VIDE
DIESE SEITE WURDE ABSICHTLICH LEER GELASSEN**

**1 ATTESTATION D'EXAMEN CE DE TYPE**

2 Appareils et systèmes de protection destinés à être utilisés en atmosphères explosibles
Directive 94/9/CE

3 Numéro de l'attestation CE de type
LCIE 02 ATEX 6085 X

4 Appareil ou système de protection :
Conditionneur de signal de charge
Type : IPC 704

5 Demandeur : VIBRO-METER S.A.

6 Adresse : BP 1071
1701 FRIBOURG - SUISSE

7 Cet appareil ou système de protection et ses variantes éventuelles acceptées est décrit dans l'annexe de la présente attestation et dans les documents descriptifs cités en annexe.

8 Le LCIE, organisme notifié sous la référence 0081 conformément à l'article 9 de la directive 94/9/CE du Parlement européen et du Conseil du 23 mars 1994, certifie que cet appareil ou système de protection est conforme aux exigences essentielles en ce qui concerne la sécurité et la santé pour la conception et la construction d'appareils et de systèmes de protection destinés à être utilisés en atmosphères explosibles, données dans l'annexe II de la directive. Les vérifications et épreuves figurent dans notre rapport confidentiel N° 41 310 10 U.

9 Le respect des exigences essentielles en ce qui concerne la sécurité et la santé est assuré par la conformité aux documents suivants :
-EN 50014 (1997) + amendements 1 et 2
-EN 50020 (1994)

10 Le signe X lorsqu'il est placé à la suite du numéro de l'attestation, indique que ce matériel ou système de protection est soumis aux conditions spéciales pour une utilisation sûre, mentionnées dans l'annexe de la présente attestation.

11 Cette attestation d'examen CE de type concerne uniquement la conception et la construction de l'appareil ou du système de protection spécifié, conformément à la directive 94/9/CE. Des exigences supplémentaires de cette directive sont applicables pour la fabrication et la fourniture de l'appareil ou du système de protection.

12 Le marquage de l'appareil ou du système de protection devra comporter, entre autres indications utiles, les mentions suivantes :



EEx ib IIC T6 à T4

Fontenay-aux-Roses, le 19 août 2002

1 EC TYPE EXAMINATION CERTIFICATE

2 Equipment or protective system intended for use in potentially explosive atmospheres
Directive 94/9/CE

3 EC type Examination Certificate number
LCIE 02 ATEX 6085 X

4 Equipment or protective system :
Signal charge conditioner
Type : IPC 704

5 Applicant : VIBRO-METER S.A.

6 Address : BP 1071
1701 FRIBOURG - SUISSE

7 This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 LCIE, notified body number 0081 in accordance with article 9 of the Directive 94/9/CE of the European Parliament and Council of 23 March 1994, certifies that this equipment or protective system has been found to comply with the essential Health and Safety Requirements relating to the design and construction of equipment and protective system intended for use in potentially explosive atmospheres, given in Annex II to of the Directive. The examination and test results are recorded in confidential report No 41 310 10 U.

9 Compliance with the Essential Health and Safety Requirements been assured by compliance with :
-EN 50014 (1997) + amendments 1 and 2
-EN 50020 (1994)

10 If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC Type examination certificate relates only to the design and construction of this specified equipment or protective system in accordance with the Directive 94/9/EC. Further requirements of the Directive applies to the manufacture and supply of this equipment or protective system.

12 The marking of the equipment or protective system shall include the following :



EEx ib IIC T6 to T4

Le Directeur de l'organisme certificateur
Manager of the certification body

Par délégation
Michel BRÉNON
Directeur adjoint
à la Certification

Timbre sec / Dry Seal

Page 1/1

Seul le texte en français peut engager la responsabilité du LCIE. Ce document ne peut être reproduit que dans son intégralité, sans aucune modification
The LCIE's liability applies only on the French text. This document may be reproduced in full and without any change

LABORATOIRE CENTRAL DES INDUSTRIES ELECTRIQUES

Société anonyme à Directoire et Conseil de surveillance au capital de 15 745 984 euros - RCS Nanterre B 408 363 174

33, avenue du Général Leclerc - BP n° 8 - F 92266 FONTENAY-AUX-ROSES CEDEX - Tél. : +33 1 40 95 60 60



(A1) ANNEXE

(A1) SCHEDULE

(A2) ATTESTATION D'EXAMEN CE DE TYPE

(A2) EC TYPE EXAMINATION CERTIFICATE

LCIE 02 ATEX 6085 X

LCIE 02 ATEX 6085 X

(A3) Description de l'équipement ou du système de protection :

(A3) Description of Equipment or Protective System:

Conditionneur de signal de charge
Type : IPC 704

Signal charge conditioner
Type : IPC 704

L'appareil transforme une charge électrique d'entrée en un signal électrique de sortie proportionnel à l'accélération ou à la pression.

The apparatus converts an input electrical charge to an output electric signal proportional at the acceleration or pressure.

Le marquage est le suivant :

The marking is the following :

VIBRO-METER
Adresse
Type : IPC 704
N° de fabrication
Année de construction
Ex II 2 G
EEx ib IIC T6 à T4
LCIE 02 ATEX 6085 X

VIBRO-METER
Address
Type : IPC 704
Serial number
Year of construction
Ex II 2 G
EEx ib IIC T6 to T4
LCIE 02 ATEX 6085 X

Le marquage CE est accompagné du numéro d'identification de l'organisme notifié responsable de la surveillance du système approuvé de qualité (0081 pour le LCIE).

The CE marking shall be accompanied by the identification number of the notified body responsible for surveillance of the approved quality system (0081 for LCIE).

Le matériel devra également comporter le marquage normalement prévu par les normes de construction du matériel électrique concerné

The equipment must also carry the usual marking required by the manufacturing standards applying to such equipments.

Paramètres spécifiques du ou des modes de protection concerné(s) :

Specific parameters of the mode of protection concerned :

- Bornier « alimentation » (+24, OUT, COM) :
 $U_i \leq 28 \text{ V}$, $I_i \leq 100 \text{ mA}$,
 $C_i \leq 20 \text{ nF}$, $L_i \leq 0,5 \text{ mH}$.

- « Power » terminal block (+24, OUT, COM) :
 $U_i \leq 28 \text{ V}$, $I_i \leq 100 \text{ mA}$,
 $C_i \leq 20 \text{ nF}$, $L_i \leq 0,5 \text{ mH}$.

- Bornier « capteur » (IN+, IN-, COM) :
 $U_0 \leq 28 \text{ V}$, $I_0 \leq 30 \text{ mA}$,
 $C_i \leq 66 \text{ nF}$, $L_i \leq 0,5 \text{ mH}$.

- « Sensor » terminal block (IN+, IN-, COM) :
 $U_0 \leq 28 \text{ V}$, $I_0 \leq 30 \text{ mA}$,
 $C_i \leq 66 \text{ nF}$, $L_i \leq 0,5 \text{ mH}$.

(A4) Documents descriptifs :

(A4) Descriptive documents :

Dossier technique N° DT 1011 Rév 1 en date du 15 mars 2002.
Ce document comprend 7 rubriques (22 pages).

Technical file N° DT 1011 Rev 1 dated March 15th, 2002.
This file includes 7 items (22 pages).

Page 2/3



(A1) ANNEXE

(A2) ATTESTATION D'EXAMEN CE DE TYPE

LCIE 02 ATEX 6085 X (suite)

(A5) Conditions spéciales pour une utilisation sûre :

Le matériel défini ci-dessus est un matériel de sécurité intrinsèque : il peut être placé en atmosphères explosibles.

Lors de l'installation, le boîtier de l'appareil doit être au même potentiel que la terre de la barrière de sécurité intrinsèque associée.

Les borniers de l'appareil ne doivent être raccordés qu'à des matériels de sécurité intrinsèque d'un type certifié et ces associations doivent être compatibles du point de vue de la sécurité intrinsèque.

Les caractéristiques électriques des matériels pouvant être raccordés aux bornes ne doivent excéder une des valeurs suivantes :

- bornier « alimentation » :
 $U_i \leq 28 \text{ V}$, $I_i \leq 100 \text{ mA}$,

- bornier « capteur » :
 $C_i \leq 17 \text{ nF}$, $L_i \leq 30 \text{ mH}$.

Classement en température :

T6 à $T_a = +60^\circ\text{C}$
 T5 à $T_a = +75^\circ\text{C}$
 T4 à $T_a = +85^\circ\text{C}$

(A6) Exigences essentielles en ce qui concerne la sécurité et la santé :

Conformité aux normes européennes EN 50014 (1997 + amendements 1 et 2) et EN 50020 (1994).

(A1) SCHEDULE

(A2) EC TYPE EXAMINATION CERTIFICATE

LCIE 02 ATEX 6085 X (continued)

(A5) Special conditions for safe use:

This equipment is intrinsically safe and can be used in potentially explosive atmospheres.

The above mentioned equipment must only be associated to a IC certified apparatus, and this combination must be compatible as regards intrinsic safety.

The terminal blocks of the apparatus must be only connected to certified intrinsically safe equipments and these combination must be compatible as regards intrinsic safety rules.

The electrical parameters of equipments must be connected to the terminal blocks, must not exceed one of these following values :

- « power » terminal blocks :
 $U_i \leq 28 \text{ V}$, $I_i \leq 100 \text{ mA}$,

- « sensor » terminal blocks :
 $C_i \leq 17 \text{ nF}$, $L_i \leq 30 \text{ mH}$.

Operating temperature range :

T6 at $T_a = +60^\circ\text{C}$
 T5 at $T_a = +75^\circ\text{C}$
 T4 at $T_a = +85^\circ\text{C}$

(A6) Essential Health and Safety Requirements:

Conformity to the European standards EN 50014 (1997 + amendments 1 and 2) and EN 50020 (1994).



L C I E

(A1) **ATTESTATION D'EXAMEN CE DE TYPE**
02 ATEX 6085 X
du 19 août 2002

AVENANT 02 ATEX 6085 X / 01

(A1) **EC TYPE EXAMINATION CERTIFICATE**
02 ATEX 6085 X
dated August 19, 2002

VARIATION 02 ATEX 6085 X / 01

(A2) DESIGNATION DE L'EQUIPEMENT OU DU
 SYSTEME DE PROTECTION :

Conditionneur de signal de charge
 Type : IPC 704
 Construit par : VIBRO METER

(A2) NAME OF EQUIPMENT OR PROTECTIVE SYSTEM :

Signal charge conditioner
 Type : IPC 704
 Manufactured by : VIBRO METER

(A3) OBJET DE L'AVENANT, DESCRIPTION DE
 L'APPAREIL OU DU SYSTÈME DE PROTECTION :

Remplacement du compound RTV-428 par Q-SIL 550

(A3) SUBJECT OF THE VARIATION, DESCRIPTION OF
 EQUIPMENT OR PROTECTIVE SYSTEM :

Replacement of compound RTV-428 by Q-SIL 550

Marquage :

Inchangé

Marking :

Unchanged

(A4) DOCUMENTS DESCRIPTIFS :

Lettre du constructeur du 16/02/2005 comportant 4 pages.

(A4) DESCRIPTIVE DOCUMENTS :

Letter of the manufacturer dated 16/02/2005 containing 4 pages.

(A5) CONDITIONS SPECIALES POUR UNE UTILISATION
 SURE :

Inchangées.

(A5) SPECIAL CONDITIONS FOR SAFE USE :

Unchanged.

(A6) VERIFICATIONS ET EPREUVES INDIVIDUELLES :

Inchangées.

(A6) INDIVIDUAL EXAMINATIONS AND TESTS :

Unchanged.

(A7) EXIGENCES ESSENTIELLES EN CE QUI
 CONCERNE LA SECURITE ET LA SANTE :

Inchangées.

(A7) ESSENTIAL HEALTH AND SAFETY REQUIREMENTS :

Unchanged.

Fontenay-aux-Roses, le 10 mars 2005

Le Directeur de l'organisme certificateur
 Manager of the certification body

Timbre sec/Dry seal

Page 1/1

(8) Seul le texte en français peut engager la responsabilité du LCIE. Ce document ne peut être reproduit que dans son intégralité, sans aucune modification.
 The LCIE's liability applies only on the French text. This document may only be reproduced in full and without any change.

LCIE

Laboratoire Central

des Industries Electriques

Une société de Bureau Veritas

33, av du Général Leclerc

BP 8

92266 Fontenay-aux-Roses cedex

France

Tél : +33 1 40 95 60 60

Fax : +33 1 40 95 86 56

contact@lcie.fr

www.lcie.fr

Société Anonyme

au capital de 15 745 984 €

RCS Nanterre B 408 363 174

LCIE



L C I E

(A1) **ATTESTATION D'EXAMEN CE DE TYPE**
LCIE 02 ATEX 6085X du 19 août 2002

AVENANT 02 ATEX 6085X/02

(A2) **DESIGNATION DE L'EQUIPEMENT OU DU**
SYSTEME DE PROTECTION :

Conditionneur de signal de charge
 Type : IPC 704

Construit par : VIBRO-METER

(A3) **OBJET DE L'AVENANT, DESCRIPTION DE**
L'APPAREIL OU DU SYTEME DE PROTECTION :

L'appareil peut être monté dans un boîtier certifié de sécurité intrinsèque.

Marquage :

Inchangé

(A4) **DOCUMENTS DESCRIPTIFS :**

Dossier de certification n° DT 1011/01 rév. 2 du 11/07/2005.
 Ce dossier comprend 3 rubriques (4 pages).

(A5) **CONDITIONS SPECIALES POUR UNE UTILISATION**
SURE :

Inchangées.

(A6) **VERIFICATIONS ET EPREUVES INDIVIDUELLES :**

Inchangées.

(A7) **EXIGENCES ESSENTIELLES EN CE QUI**
CONCERNE LA SECURITE ET LA SANTE :

Inchangées.

(A1) **EC TYPE EXAMINATION CERTIFICATE**
LCIE 02 ATEX 6085X dated August 19, 2002

VARIATION 02 ATEX 6085X/02

(A2) **NAME OF EQUIPMENT OR PROTECTIVE SYSTEM :**

Signal charge conditioner
 Type : IPC 704

Manufactured by : VIBRO-METER

(A3) **SUBJECT OF THE VARIATION, DESCRIPTION OF**
EQUIPMENT OR PROTECTIVE SYSTEM :

The apparatus can be mounted inside an intrinsically safe certified enclosure.

Marking :

Unchanged.

(A4) **DESCRIPTIVE DOCUMENTS :**

Certification file n° DT 1011/01 rev. 2 dated 11/07/2005
 This file include 3 items (4 pages).

(A5) **SPECIAL CONDITIONS FOR SAFE USE :**

Unchanged.

(A6) **INDIVIDUAL EXAMINATIONS AND TESTS :**

Unchanged.

(A7) **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS :**

Unchanged.

Fontenay-aux-Roses, le 25 juillet 2005

Le Directeur de l'organisme certificateur
 Manager of the certification body

Michel BRÉNON

Timbre sec/Dry seal

Page 1/1

(8) Seul le texte en français peut engager la responsabilité du LCIE. Ce document ne peut être reproduit que dans son intégralité, sans aucune modification.
 The LCIE's liability applies only on the French text. This document may only be reproduced in full and without any change.

16A

LCIE

Laboratoire Central

des Industries Electriques

Une société de Bureau Veritas

33, av du Général Leclerc

BP 8

92260 Fontenay-aux-Roses cedex

France

Tél : +33 1 40 95 60 60

Fax : +33 1 40 95 86 56

contact@lcie.fr

www.lcie.fr

Société Anonyme

au capital de 15 745 984 €

RCS Nanterre B 408 363 174

101

THIS PAGE INTENTIONALLY LEFT BLANK
CETTE PAGE EST LAISSÉE INTENTIONNELLEMENT VIDE
DIESE SEITE WURDE ABSICHTLICH LEER GELASSEN

- Deutsche Übersetzung der originalen französischen Kopie der Seite -1 -

- 1 **EG-PRÜFZERTIFIKAT**
- 2 Geräte und Schutzsysteme zur Verwendung in explosionsgefährdeten Bereichen - **Richtlinie 94/9/EG**
- 3 EG-Prüfzertifikatnummer
LCIE 02 ATEX 6085 X
- 4 Gerät oder Schutzsystem
Ladungssignalwandler
Typ : IPC 704
- 5 Hersteller : VIBRO-METER SA
- 6 Anschrift : BP 1071, CH-1701 FRIBOURG, SCHWEIZ
- 7 Dieses Gerät oder Schutzsystem und die möglichen, zulässigen Varianten sind im Anhang dieses Zertifikats und den darin aufgeführten Unterlagen beschrieben.
- 8 LCIE, eingetragen unter der Nummer 0081 gemäß Artikel 9 der Richtlinie 94/9/EG des Europaparlamentes und des Rates vom 23. März 1994, bestätigt, dass dieses Gerät oder Schutzsystem die wesentlichen Gesundheits- und Sicherheitsanforderungen in Bezug auf die Auslegung und die Bauart von Geräten und Schutzsystemen zur Verwendung in explosionsgefährdeten Bereichen nach Anhang II der Richtlinie erfüllt.
Die Prüf- und Testergebnisse sind im vertraulichen Bericht Nr. 41 310 10 U aufgezeichnet.
- 9 Die Einhaltung der wesentlichen Gesundheits- und Sicherheitsanforderungen wird durch die Übereinstimmung mit den den folgenden Dokumenten sichergestellt :
- EN 50014 (1997) + Änderungen 1 und 2
- EN 50020 (1994)
- 10 Ein "X" nach der Zertifikatnummer gibt an, dass für die sichere Verwendung des Gerätes oder Schutzsystemes besondere Bedingungen gemäß dem Anhang dieses Zertifikates gelten.
- 11 Dieses EG-Prüfzertifikat betrifft nur die Bauart und die Prüfungen und Tests des betreffenden Gerätes oder Schutzsystemes nach der Richtlinie 94/9/EG.
Zusätzliche Anforderungen dieser Richtlinie gelten für die Fertigung und Lieferung des Gerätes oder Schutzsystemes.
- 12 Die Kennzeichnung des Gerätes oder Schutzsystems muss unter anderem die folgenden Angaben enthalten:
 II 2 G
EEx ib IIC T6 bis T4

Fontenay-aux-Roses, 19. August 2002

Leiter Zertifizierung

Trockenstempel

Seite 1/3

LCIE haftet nur für den französischen Text.

Dieses Zertifikat darf nur vollständig und ohne Änderungen vervielfältigt werden.

Obwohl das Zertifikat in drei Sprachen (Englisch, Französisch und Deutsch) übersetzt ist, können nur die bescheinigten Behörden, die den Text auf der Originalausgabe des Zertifikates herausgegeben haben, zur rechtlichen Verantwortung gezogen werden.

- Deutsche Übersetzung der originalen französischen Kopie der Seite -2 -

- (A1) **ANHANG**
- (A2) **EG-PRÜFZERTIFIKAT**
LCIE 02 ATEX 6085 X
- (A3) Beschreibung des Gerätes oder Schutzsystems :
Ladungssignalwandler
Typ : IPC 704
Die Kennzeichnung ist wie folgt :
VIBRO-METER
Adresse
Typ : IPC 704
Herstellungsnummer
Herstellungsjahr
II 2 G EEx ib IIC T6 bis T4
LCIE 02 ATEX 6085 X
Die EG-Kennzeichnung wird von der Kennnummer der Stelle begleitet, die für die Überwachung des genehmigten Qualitätssystems verantwortlich ist (0081 für LCIE).
Die Geräte müssen ebenfalls mit der Kennzeichnung versehen sein, die in den Herstellungsnormen der betreffenden elektrischen Geräte normalerweise vorgesehen sind.
Spezielle Parameter der betroffenen Schutzart(en) :
- Klemmleiste "Versorgung" (+24, OUT, COM) :
 $U_i \leq 28 \text{ V}$, $I_i \leq 100 \text{ mA}$,
 $C_i \leq 20 \text{ nF}$, $L_i \leq 0,5 \text{ mH}$.
- Klemmleiste "Geber" (IN+, IN-, COM) :
 $U_0 \leq 28 \text{ V}$, $I_0 \leq 30 \text{ mA}$,
 $C_i \leq 66 \text{ nF}$, $L_i \leq 0,5 \text{ mH}$.
- (A4) Beschreibende Unterlagen
Technische Unterlagen Nr. DT 1011 Änd 1 vom 15. März 2002.
Dieses Dokument umfasst 7 Teile (22 Seiten).

Seite 2/3

- Deutsche Übersetzung der originalen französischen Kopie der Seite -3 -

- (A1) **ANHANG**
- (A2) **EG-PRÜFZERTIFIKAT**
LCIE 02 ATEX 6085 X (Fortsetzung)
- (A5) Spezielle Bedingungen für eine sichere Verwendung:
Das oben genannte Gerät ist ein eigensicheres Gerät: es kann in explosionsgefährdeten Bereichen verwendet werden.
Beim Einbau muss das Gerätegehäuse an das gleiche Potential wie die Masse der dazugehörigen eigensicheren Sicherheitsbarriere gelegt werden.
Die Klemmleisten des Gerätes dürfen nur an eigensichere Geräte eines zertifizierten Typs angeschlossen werden und diese Verbindungen müssen in Bezug auf die Eigensicherheit kompatibel sein.
Die elektrischen Eigenschaften der Geräte, die an die Klemmen angeschlossen werden können, dürfen die folgenden Werte nicht überschreiten:
- Klemme " Versorgung " :
 $U_i \leq 28 \text{ V}$, $I_i \leq 100 \text{ mA}$,
- Klemme " Geber " :
 $C_i \leq 17 \text{ nF}$, $L_i \leq 30 \text{ mH}$.
Temperatureinteilung :
T6 bis Ta = +60°C
T5 bis Ta = +80°C
T4 bis Ta = +85°C
- (A6) Wesentliche Anforderungen in Bezug auf Sicherheit und Gesundheit:
Übereinstimmung mit den europäischen Normen EN 50014 (1997 + Änderungen 1 und 2) und EN 50020 (1994).

Seite 3/3

- Deutsche Übersetzung der originalen französischen Kopie der Seite -4 -

- (A1) **EG-PRÜFZERTIFIKAT**
02 ATEX 6085 X vom 19. August 2002
NACHTRAG 02 ATEX 6085X/01
- (A2) BESCHREIBUNG DES GERÄTES ODER SCHUTZSYSTEMS :
 Ladungssignalwandler
 Typ : IPC 704
 Hergestellt von Vibro-Meter
- (A3) BETREFF DES NACHTRAGS, BESCHREIBUNG DES GERÄTES ODER SCHUTZSYSTEMS :
 Ersetzen der RTV-428 Vergussmasse durch Q-SIL 550
Kennzeichnung :
 Unverändert
- (A4) BESCHREIBENDE UNTERLAGEN:
 Vierseitiges Schreiben des Herstellers vom 16.02.2005.
- (A5) SPEZIELLE BEDINGUNGEN FÜR DIE SICHERE VERWENDUNG:
 Unverändert
- (A6) EINZELKONTROLLEN UND –PRÜFUNGEN:
 Unverändert
- (A7) WESENTLICHE ANFORDERUNGEN IN BEZUG AUF SICHERHEIT UND GESUNDHEIT:
 Unverändert

Fontenay-aux-Roses, 10 März 2005

Leiter Zertifizierung

Trockenstempel

Seite 1/1

LCIE haftet nur für den französischen Text.

Dieses Zertifikat darf nur vollständig und ohne Änderungen vervielfältigt werden.

- Deutsche Übersetzung der originalen französischen Kopie der Seite -5 -

- (A1) **EG-PRÜFZERTIFIKAT**
02 ATEX 6085 X vom 19. August 2002
NACHTRAG 02 ATEX 6085X/02
- (A2) BESCHREIBUNG DES GERÄTES ODER SCHUTZSYSTEMS :
 Ladungssignalwandler
 Typ : IPC 704
 Hergestellt von Vibro-Meter
- (A3) BETREFF DES NACHTRAGS, BESCHREIBUNG DES GERÄTES ODER SCHUTZSYSTEMS :
 Das Gerät ist in einem zertifizierten, eigensicheren Gehäuse einzubauen.
Kennzeichnung :
 Unverändert
- (A4) BESCHREIBENDE UNTERLAGEN:
 Zertifizierungsunterlagen Nr. DT 1011/01 Änd.2 vom 11.07.2005. Diese Unterlagen umfassen 3 Teile (4 Seiten).
- (A5) SPEZIELLE BEDINGUNGEN FÜR DIE SICHERE VERWENDUNG:
 Unverändert
- (A6) EINZELKONTROLLEN UND –PRÜFUNGEN:
 Unverändert
- (A7) WESENTLICHE ANFORDERUNGEN IN BEZUG AUF SICHERHEIT UND GESUNDHEIT:
 Unverändert

Fontenay-aux-Roses, 25. Juli 2005

Leiter Zertifizierung

Trockenstempel

Seite 1/1

LCIE haftet nur für den französischen Text.

Dieses Zertifikat darf nur vollständig und ohne Änderungen vervielfältigt werden.

THIS PAGE INTENTIONALLY LEFT BLANK
CETTE PAGE EST LAISSÉE INTENTIONNELLEMENT VIDE
DIESE SEITE WURDE ABSICHTLICH LEER GELASSEN

Obwohl das Zertifikat in drei Sprachen (Englisch, Französisch und Deutsch) übersetzt ist, können nur die bescheinigten Behörden, die den Text auf der Originalausgabe des Zertifikates herausgegeben haben, zur rechtlichen Verantwortung gezogen werden.

C cCSAus CERTIFICATES

Refer to [Table C-1](#).

Product(s) covered	Certificate	Comments
CA 134	1636188	See page C-3
CA 136	1545317	See page C-7
CA 28X, CE 28X, CE 31X	1514310	See page C-11
CA 30X	1550831	See page C-15
CE 134 and GSI 122	1545315	See page C-19
IPC 704	1243981	See page C-25

Table C-1 : Relevant cCSAus Certificates

THIS PAGE INTENTIONALLY LEFT BLANK



Certificate of Compliance

Certificate: 1636188

Master Contract: 175074

Project: 1636188

Date Issued: March 22, 2005

Issued to: Vibro Meter
Route de Moncor 4
1701 Fribourg
SWITZERLAND

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US'



Authorized by: G. Foulem

PRODUCTS

CLASS 2258 04 – PROCESS CONTROL EQUIPMENT- Intrinsinsically Safe Entity –For Hazardous Locations
CLASS 2258 84 – PROCESS CONTROL EQUIPMENT- Intrinsinsically Safe Entity –For Hazardous Locations
– Certified for US Standards

CLASS I, Division 1, Groups A,B,C and D

Acceleration transducer Type 144-134-000-YYY

Intrinsically safe with entity parameters when connected per drawing PZ 6734.

Ratings:

Voc<28 Vdc, Isc<100 mA. (linear source) and Isc<25mA (non linear source)
Ci=0,3nF The capacitance of the integral cable is 0,2 nF/m
Li=0 mH

The 'C' and 'US' indicators adjacent to the CSA Mark signify that the product has been evaluated to the applicable CSA and ANSI/UL Standards, for use in Canada and the U.S., respectively. This 'US' indicator includes products eligible to bear the 'NRTL' indicator. NRTL, i.e. National Recognized Testing Laboratory, is a designation granted by the U.S. Occupational Safety and Health Administration (OSHA) to laboratories which have been recognized to perform certification to U.S. Standards 163618 March 22, 2001 75071636188

DQD 507 Rev. 2004-06-30



Page 2

Certificate: 1636188
Project: 1636188

Master Contract: 175074
Date: March 22, 2005

Temperature code :

Ambient temperatures are as follows :

- * -200°C/ / + 500°C for sensor and cable
- * -200°C/.../+500°C for sensor with high temperature VM connector
- * -65°C/ / + 200°C for connector Type M83723/89Y1020 or equivalent
- * -65°C/ / + 150°C for LEMO connector Type 0 or equivalent

The relation between maximum ambient temperature and temperature class is as follows for all devices, taking into account the above mentioned temperature ranges:

Maximum ambient temperature: Ta<+430 °C for T1
 Ta<+280 °C for T2
 Ta<+180 °C for T3
 Ta<+115 °C for T4
 Ta<+80 °C for T5
 Ta<+75 °C for T6

The maximum temperature, for ambient higher than 430 °C is the process temperature minus 10K.

APPLICABLE REQUIREMENTS

CAN/CSA-C22.2 No. 61010-1-04	Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use, Part 1: General Requirements
CSA C22.2 No 157-92	Intrinsically Safe and Non-Incendive Equipment for use in Hazardous Locations
UL 61010C-1	Standard for Process Control Equipment
UL 913	Standard for Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, III, Division 1, Hazardous (Classified) Locations



Page 3

Certificate: 1636188

Master Contract: 175074

Project: 1636188

Date: March 22, 2005

MARKINGS

VIBRO METER

CSA Monogram

Type : 144-134-000-YYY

Serial Number

Class I, Div 1, Groups A,B,C,D

Ex ia Tx

Entity Parameters: Voc, Isc, Ci, Li

Intrinsically safe when connected per Control Drawing PZ6734

Method of marking: engraved on the enclosure of the sensor



Supplement to Certificate of Compliance

Certificate: 1636188

Master Contract: 175074

*The products listed, including the latest revision described below,
are eligible to be marked in accordance with the referenced Certificate.*

Product Certification History

Project	Date	Description
1636188	March 22, 2005	Original cCSAus Certification for acceleration transducer Type 144-134-000-YYY



Certificate of Compliance

Certificate: 1545317

Master Contract: 175074

Project: 1545317

Date Issued: April 6, 2004

Issued to: VIBRO-METER
Route de Mancor 4
1701 FRIBOURG
SWITZERLAND

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US'



Authorized by: G. Foulem

PRODUCTS

CLASS 2258 04 – PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity – For Hazardous Locations.
CLASS 2258 84 – PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity – For Hazardous Locations,
Certified to US standards.

CLASS I, Division 1, Groups A, B, C and D.

Accelerometer Model PNR 144-136-000 (CA 136).

Intrinsically safe when installed per drawing PZ 6666, with entity parameters: $V_{max} = 28V_{dc}$ and $I_{max} = 100mA$ (linear supply) or $P_{max} = 0,7W$ and $I_{max} = 25mA$ (non linear supply), $C_i = 6nF$ and $L_i \approx 0\mu H$ (negligible).

APPLICABLE REQUIREMENTS

CAN/CSA Std C22.2 No. 157 - 92 Intrinsically Safe and Non-Incendive Equipment for use in Hazardous Locations

CAN/CSA Std C22.2 No. 1010-1 – 92 and Amendment 2: 1997

Safety requirements for electrical equipment for measurement, control, and laboratory use. Part 1: General requirements

UL Std No. 61010C-1 1st, Ed. Process Control Equipment

UL Std No. 913 6th, Ed. Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II and III, Division I, Hazardous Location

The 'C' and 'US' indicators adjacent to the CSA Mark signify that the product has been evaluated to the applicable CSA and ANSI/UL Standards, for use in Canada and the U.S., respectively. This 'US' indicator includes products eligible to bear the 'NRTL' indicator. NRTL, i.e. National Recognized Testing Laboratory, is a designation granted by the U.S. Occupational Safety and Health Administration (OSHA) to laboratories which have been recognized to perform certification to U.S. Standards.

DQD 507 Rev. 2003-01-31



Page 2

Certificate: 1545317**Master Contract:** 175074**Project:** 1545317**Date:** April 6, 2004**MARKINGS**

CSA Monogram with NRTL/C or C/US indicator

Submitter's identification and/or CSA master contract number " 175074 " adjacent to the CSA Monogram

Model designation

Serial number

A code traceable to the month and year of manufacture

Electrical rating

WARNING symbol

Hazardous Location designation i.e. Class I, Division 1, Groups A, B, C and D

The symbol Ex ia

Reference to installation drawing



Supplement to Certificate of Compliance

Certificate: 1545317

Master Contract: 175074

*The products listed, including the latest revision described below,
are eligible to be marked in accordance with the referenced Certificate.*

Product Certification History

Project	Date	Description
1545317	April 6, 2004	Original cCSAus Certification for model PNR 144-136-000 (CA 136).

DQD 507 Rev. 2003-01-31

THIS PAGE INTENTIONALLY LEFT BLANK



Certificate of Compliance

Certificate: 1514310

Master Contract: 175074

Project: 1648970

Date Issued: April 12, 2005

Issued to: VIBRO METER
Route de Moncor 4
1701 FRIBOURG
SWITZERLAND

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US'



Authorized by: G. Foulem

PRODUCTS

CLASS 2258 04 – PROCESS CONTROL EQUIPMENT- Intrinsinsically Safe Entity –For Hazardous Locations
CLASS 2258 84 – PROCESS CONTROL EQUIPMENT- Intrinsinsically Safe Entity –For Hazardous Locations
– Certified for US Standards

CLASS I, Division I, Groups A,B,C and D

Accelerometer Type 444-31X-000-YYY, 444-28X-000-YYY and 144-28X-000-YYY

Intrinsically safe with entity parameters when connected per drawing PZ6684,PZ6692 and PZ6704 (respectively for 444-31X-000-YYY, 444-28X-000-YYY and 144-28X-000-YYY).

Ratings:

For 444-31X-000-YYY, 444-28X-000-YYY and 144-28X-000-YYY used with linear source: Voc<28 V, Isc<100 mA.

For (only) 144-28X-000-YYY used with non linear source : P<0,7W, Isc<25mA

For 444-31X-000-YYY and 444-28X-000-YYY Types :

Ci = 10,45 nF Li=0 mH

The 'C' and 'US' indicators adjacent to the CSA Mark signify that the product has been evaluated to the applicable CSA and ANSI/UL Standards, for use in Canada and the U.S., respectively. This 'US' indicator includes products eligible to bear the 'NRTL' indicator. NRTL, i.e. National Recognized Testing Laboratory, is a designation granted by the U.S. Occupational Safety and Health Administration (OSHA) to laboratories which have been recognized to perform certification to U.S. Standards.

DQD 507 Rev. 2003-01-31



Page 2

Certificate: 1514310
Project: 1648970

Master Contract: 175074
Date: April 12, 2005

For 144-28X-000-YYY Type : Ci=6nF, Li=0 mH

Temperature code :

For 444-31X-000-YYY, $-55^{\circ}\text{C} < \text{Ta} < +125^{\circ}\text{C}$: T6 for $\text{Ta} = 80^{\circ}\text{C}$ T5 for $\text{Ta} = 95^{\circ}\text{C}$ T4 for $\text{Ta} = 125^{\circ}\text{C}$

For 444-28X-000-YYY, $-55^{\circ}\text{C} < \text{Ta} < +100^{\circ}\text{C}$ (electronic circuit): T6 for $\text{Ta} < 80^{\circ}\text{C}$ T5 for $\text{Ta} < 95^{\circ}\text{C}$ T4 for $\text{Ta} < 100^{\circ}\text{C}$

The ambient for the sensor and cable parts is $-55^{\circ}\text{C} < \text{Ta} < +260^{\circ}\text{C}$, the maximum temperature of the sensor part is therefore the process temperature minus 10K.

For 144-28X-000-YYY Type, the ambient for the sensor and cable part is $-55^{\circ}\text{C} < \text{Ta} < +260^{\circ}\text{C}$, the maximum temperature of the sensor part is therefore the process temperature minus 10K.

APPLICABLE REQUIREMENTS

CSA Standard 1010.1	Safety Requirements for Electrical Equipment for Measurement, Control & Laboratory Use - Part 1: General Requirements
CSA C22.2 No 157-92	Intrinsically Safe and Non-Incendive Equipment for use in Hazardous Locations
UL 61010B-1	Standard for Process Control Equipment
UL 913	Standard for Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, III, Division 1, Hazardous (Classified) Locations

MARKINGS

VIBRO METER

CSA Monogram

Type : 444-31X-000-YYY, 444-28X-000-YYY and 144-28X-000-YYY

Serial Number

Class I, Div 1, Groups A,B,C,D

Ex ia Tx

Entity Parameters: Voc, Isc, Ci, Li

Intrinsically safe when connected per Control Drawing PZ6684, PZ6692 and PZ6704 (respectively for 444-31X-000-YYY, 444-28X-000-YYY and 144-28X-000-YYY).

Method of marking : engraved on the enclosure of the sensor

DQD 507 Rev. 2003-01-31



Supplement to Certificate of Compliance

Certificate: 1514310

Master Contract: 175074

*The products listed, including the latest revision described below,
are eligible to be marked in accordance with the referenced Certificate.*

Product Certification History

Project	Date	Description
1648970	April 12, 2005	Update to report 1514310 to add a new compound reference Q-Sil 550.
1514310	January 9, 2004	Original cCSAus Certification for accelerometers Type 444-31X-000-YYY, 444-28X-000-YYY and 144-28X-000-YYY

DQD 507 Rev. 2003-01-31

THIS PAGE INTENTIONALLY LEFT BLANK



Certificate of Compliance

Certificate: 1550831

Master Contract: 175074

Project: 1550831

Date Issued: September 23, 2004

Issued to: VIBRO METER
Route de Mancor 4
1701 Fribourg
SWITZERLAND

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US'



Authorized by: G. Foulem

PRODUCTS

CLASS 2258 04 – PROCESS CONTROL EQUIPMENT- Intrinsinsically Safe Entity –For Hazardous Locations
CLASS 2258 84 – PROCESS CONTROL EQUIPMENT- Intrinsinsically Safe Entity –For Hazardous Locations
– Certified for US Standards

CLASS I, Division 1, Groups A,B,C and D

Accelerometer Type 144-30X-000-YYY

Intrinsically safe with entity parameters when connected per drawing PZ 6720

Ratings:

used with linear source: $V_{oc} < 28\text{ V}$, $I_{sc} < 100\text{ mA}$.
used with non linear source : $P < 0,7\text{ W}$, $I_{sc} < 25\text{ mA}$
 $C_i = 2\text{ nF}$, $L_i = 0\text{ mH}$

The 'C' and 'US' indicators adjacent to the CSA Mark signify that the product has been evaluated to the applicable CSA and ANSI/UL Standards, for use in Canada and the U.S., respectively. This 'US' indicator includes products eligible to bear the 'NRTL' indicator. NRTL, i.e. National Recognized Testing Laboratory, is a designation granted by the U.S. Occupational Safety and Health Administration (OSHA) to laboratories which have been recognized to perform certification to U.S. Standards.

DQD 507 Rev. 2003-01-31



Page 2

Certificate: 1550831**Master Contract:** 175074**Project:** 1550831**Date:** September 23, 2004**Temperature code :**

Ambient temperatures are as follows :

- * -54°C/ / + 500°C for sensor and cable
- * -54°C/.../+500°C for sensor with high temperature VM connector connectors :
- * -65°C/ / + 150°C for LEMO connector Type 0 or equivalent
- * -65°C/ / + 200°C for connector Type M83723/89Y1020 or equivalent
- * -54°C/ / + 260°C for standard temperature VM connector

The relation between maximum ambient temperature and temperature class is as follows for all devices, taking into account the above mentioned temperature ranges:

Maximum ambient temperature:

- Ta<+430 °C for T1
- Ta<+280 °C for T2
- Ta<+180 °C for T3
- Ta<+115 °C for T4
- Ta<+80 °C for T5
- Ta<+75 °C for T6

The maximum temperature, for ambient higher than 430 °C is the process temperature minus 10K.

APPLICABLE REQUIREMENTS

CSA Standard 1010.1	Safety Requirements for Electrical Equipment for Measurement, Control & Laboratory Use - Part 1: General Requirements
CSA C22.2 No 157-92	Intrinsically Safe and Non-Incendive Equipment for use in Hazardous Locations
UL 61010C-1	Standard for Process Control Equipment
UL 913	Standard for Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II, III, Division 1, Hazardous (Classified) Locations



Certificate: 1550831

Master Contract: 175074

Project: 1550831

Date: July 22, 2004

MARKINGS

VIBRO METER

CSA Monogram

Type : 144-30X-000-YYY

Serial Number

Class I, Div 1, Groups A,B,C,D

Ex ia Tx

Entity Parameters: Voc, Isc, Ci, Li

Intrinsically safe when connected per Control Drawing PZ6720

Method of marking : engraved on the enclosure of the sensor

DQD 507WD 2002/03/01



Supplement to Certificate of Compliance

Certificate: 1550831

Master Contract: 175074

*The products listed, including the latest revision described below,
are eligible to be marked in accordance with the referenced Certificate.*

Product Certification History

Project	Date	Description
1550831	September 23, 2004	Original cCSAus Certification for accelerometers Type 144-30X-000-YYY.



Certificate of Compliance

Certificate: 1545315 (LR 62075)

Master Contract: 175074

Project: 1648968

Date Issued: April 12, 2005

Issued to: VIBRO-METER
Route de Moncor 4
1701 FRIBOURG
SWITZERLAND

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C' and 'US'




Authorized by: G. Foulem

PRODUCTS

PART A

CLASS 2258 03 – PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity – For Hazardous Locations.
CLASS 2258 84 – PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity – For Hazardous Locations,
Certified to US standards.

Class I, Groups A, B, C and D.

Vibration monitoring system consisting of galvanic separation unit Model PNR 244-122-000 (GSI 122) (suitable for Class I, Division 2, Groups A, B, C and D), input rated 24Vdc, and 100mA max supply current, providing I.S. outputs to accelerometer Models CE 136 and CE 310, intrinsically safe when connected per Installation Drawings PZ 6671 and PZ 5390.

APPLICABLE REQUIREMENTS

CSA Std C22.2 No. 0.4 - M1982
CSA Std C22.2 No. 142 - M1983
CSA Std C22.2 No. 157 - M1979

CAN/CSA Std C22.2 No. 1010-1 –

Bonding and Grounding of Electrical Equipment (Protective Grounding)
Process Control Equipment.

Intrinsically Safe and Non-Incendive Equipment for use in Hazardous Locations.

92 and Amendment 2: 1997

Safety requirements for electrical equipment for measurement, control, and laboratory use. Part 1: General require

The 'C' and 'US' indicators adjacent to the CSA Mark signify that the product has been evaluated to the applicable CSA and ANSI/UL Standards, for use in Canada and the U.S., respectively. This 'US' indicator includes products eligible to bear the 'NRTL' indicator. NRTL, i.e. National Recognized Testing Laboratory, is a designation granted by the U.S. Occupational Safety and Health Administration (OSHA) to laboratories which have been recognized to perform certification to U.S. Standards.

DQD 507 Rev. 2003-01-31



Page 2

Certificate: 1545315

Master Contract: 175074

Project: 1648968

Date: April 12, 2005

PART B

CLASS 2258 03– PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity – For Hazardous Locations.
 CLASS 2258 83– PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity – For Hazardous Locations,
 Certified to US standards.

Class I, Groups A, B, C and D.

Vibration monitoring system consisting of galvanic separation unit Model PNR 244-122-000 (GSI 122) (suitable for Class I, Division 2, Groups A, B, C and D), input rated 24Vdc, and 100mA max supply current, providing I.S. outputs to accelerometer Model PNR 444-134-000 (CE 134), intrinsically safe when connected per Installation Drawings PZ 6671 and PZ 6673.

Temperature code of accelerometer Model PNR 444-134-000 (CE 134):

- electronics: T6 for Ta = 60C, T5 for Ta = 75C, T4 for Ta = 100C
- connecting cable: T6 for Ta = 80C, T5 for Ta = 95C, T4 for Ta = 130C,
T3 for Ta = 195C, T2 for Ta = 260C
- sensor: T6 for Ta = 80C, T5 for Ta = 95C, T4 for Ta = 130C,
T3 for Ta = 195C, T2 for Ta = 295C, T1 for Ta = 350C

APPLICABLE REQUIREMENTS

CSA Std C22.2 No. 0.4 - M1982

CSA Std C22.2 No. 157 - M1979

CAN/CSA Std C22.2 No. 1010-1 –

UL Std No. 61010C-1 1st, Ed.

UL Std No. 913 6th, Ed.

Bonding and Grounding of Electrical Equipment (Protective Grounding)
 Intrinsically Safe and Non-Incendive Equipment for use in Hazardous
 Locations.

92 and Amendment 2: 1997

Safety requirements for electrical equipment for measurement, control,
 and laboratory use. Part 1: General requirements

Process Control Equipment

Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I,
 II and III, Division I, Hazardous Location



Page 3

Certificate: 1545315

Master Contract: 175074

Project: 1648968

Date: April 12, 2005

MARKINGS

PART A

PNR 244-122-000 (GSI 122):

Marking of GSI 122 is identical to the one indicated in PART B

CE 136, CE 310:

CSA Monogram
 Submitter's name
 Model designation
 Serial number
 Electrical rating
 Hazardous Location designation i.e. Class I, Division 1, Groups A, B, C and D
 The words "INTRINSICALLY SAFE/SECURITE INTRINSEQUE"
 The symbol Ex ia
 Reference to installation drawing

PART B

PNR 244-122-000 (GSI 122):

CSA Monogram with NRTL/C or C/US indicator
 Submitter's identification and/or CSA master contract number "175074" adjacent to the CSA Monogram
 Model designation
 Serial number
 A code traceable to the month and year of manufacture
 Electrical rating
 DC symbol
 WARNING symbol
 Hazardous Location designation i.e. Class I, Division 2, Groups A, B, C and D
 The words "ASSOCIATED EQUIPMENT/APPAREILLAGE CONNEXE"
 The symbol [Ex ia]
 Reference to installation drawing



Page 4

Certificate: 1545315**Master Contract:** 175074**Project:** 1648968**Date:** April 12, 2005PNR 444-134-000 (CE 134):

CSA Monogram with NRTL/C or C/US indicator

Submitter's identification and/or CSA master contract number "175074" adjacent to the CSA Monogram

Model designation

Serial number

A code traceable to the month and year of manufacture

Electrical rating

DC symbol

WARNING symbol

Hazardous Location designation i.e. Class I, Division 1, Groups A, B, C and D.

The symbol Ex ia

Reference to installation drawing

SPECIAL CONDITIONS FOR SAFE USE :

" On the installation, the enclosure of the equipment shall be connected to the ground of the associated I.S. apparatus or be isolated from the surface on which it is mounted ".



Supplement to Certificate of Compliance

Certificate: 1545315 (LR62075)

Master Contract: 175074

*The products listed, including the latest revision described below,
are eligible to be marked in accordance with the referenced Certificate.*

Product Certification History

Project	Date	Description
1648968	April 12, 2005	Update to report –1545315 to add a new compound reference.
1545315	August 12, 2004	Update to cover cCSAus Certification of GSI 122 and CE 134 including evaluation according to CAN/CSA – C22.2 No. 1010-1 – 92.
-7	July 22/99	Delete Model RGT 17 “Monitor” from Certification File, combine -1 and -2 files, update drawings.
-1	Nov. 19/86	Original Certification.

THIS PAGE INTENTIONALLY LEFT BLANK



Certificate of Compliance

Certificate: 1243981**Master Contract:** 175074**Project:** 1709818**Date Issued:** September 8, 2005**Issued to:** **VIBRO-METER**
Route de Moncor 4
1701 FRIBOURG
SWITZERLAND

*The products listed below are eligible to bear the CSA Mark shown
with adjacent indicators 'C' and 'US'*

Issued by: E. Giusti**Authorized by:** M.H.J. Hoendervangers

PRODUCTS

CLASS 2258 04 – PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity – For Hazardous Locations.
CLASS 2258 84 – PROCESS CONTROL EQUIPMENT - Intrinsically Safe Entity – For Hazardous Locations,
Certified to US standards.

CLASS I, Division 1, Groups A, B, C and D.

Charge amplifier Model PNR 244-704-000 (IPC 704), optionally the amplifier can be mounted in an industrial housing according to drawing PZ6760 (control drawing is also relevant for this option).

Intrinsically safe with entity parameters when connected per drawing PZ 6667, rated:

- “Power” terminal block (+24V, OUT, COM): $V_{max} < 28\text{ V}$; $I_{max} < 100\text{ mA}$; $C_i = 40\text{ nF}$; $L_i = 0.26\text{ mH}$
- “Sensor” terminal block (IN+, IN-, COM): $V_{oc} < 28\text{ V}$; $I_{sc} < 87\text{ mA}$; $C_a = 22.78\text{ nF}$; $L_a = 4.44\text{ mH}$

Temperature code: T6 for $T_a = 60\text{ C}$, T5 for $T_a = 75\text{ C}$ and T4 for $T_a = 85\text{ C}$

**Certificate:** 1243981**Master Contract:** 175074**Project:** 1709818**Date:** September 8, 2005**APPLICABLE REQUIREMENTS**

CAN/CSA Std C22.2 No. 157 - 92	Intrinsically Safe and Non-Incendive Equipment for use in Hazardous Locations
CAN/CSA Std C22.2 No. 1010-1 - 92 and Amendment 2: 1997	Safety requirements for electrical equipment for measurement, control, and laboratory use. Part 1: General requirements
UL Std No. 61010C-1 1 st , Ed.	Process Control Equipment
UL Std No. 913 6 th , Ed.	Intrinsically Safe Apparatus and Associated Apparatus for Use in Class I, II and III, Division I, Hazardous Location

MARKINGS

CSA Monogram with NRTL/C or C/US indicator
Submitter's identification and/or CSA master contract number "175074" adjacent to the CSA Monogram
Model designation
Serial number
A code traceable to the month and year of manufacture
Electrical rating
Hazardous Location designation i.e. Class I, Division 2, Groups A, B, C and D
The symbol Ex ia (T6 for Ta = 60 C, T5 for Ta = 75 C and T4 for Ta = 85 C).
Reference to installation drawing

SPECIAL CONDITIONS FOR SAFE USE: On installation, the enclosure of the equipment shall be connected to the ground of the associated I.S. apparatus or be isolated from the surface on which it is mounted.



Supplement to Certificate of Compliance

Certificate: 1243981

Master Contract: 175074

*The products listed, including the latest revision described below,
are eligible to be marked in accordance with the referenced Certificate.*

Product Certification History

Project	Date	Description
1709818	September 8, 2005	Update to report 1648969 to add a new option (enclosure) and to correct administrative error.
1648969	April 12, 2005	Update to reort 1514311 to add a new compound reference Q-Sil 550.
1545604	August 9, 2004	Extension of certification from CSA to cCSAus Certification for model IPC 704 including evaluation according to stds CAN/CSA – C22.2 No. 1010-1 - 92 and Amendment 2: 1997, UL No. 61010C-1 - 2002 and UL No. 913 - 2002.
1514311	Jan. 9, 2004	Update of 1243981 report – Modification of the entity parameters.
1243981	July 16, 2002	Original Certification.

THIS PAGE INTENTIONALLY LEFT BLANK

PRODUCT DEFECT REPORT

If you have any problems with your Vibro-Meter product would you please contact your **Vibro-Meter agent**. You may need to return a defective unit to Vibro-Meter. If you do, please **photocopy then fill in this form (in English) and attach it to the defective unit**. Your completed Product Defect Report is important because it can help us rapidly solve the problem.

NOTE : Always provide a filled-in photocopy of the Product Defect Report for each defective unit. The report must accompany the unit at all times.

Contact Details: You or the designated Contact Person for your company.

Name _____ Job Title _____
Company _____ Email _____
Address _____
Country _____ Post Code _____
Telephone _____ Fax _____
Signature _____ Date _____

Product Details: Plug-in modules display Product Detail information on a sticker stuck on the unit.

Module type: _____
Serial number (S/N): _____ Part number (P/N): _____
Vibro-Meter order number: _____
Date of purchase: _____ Site where used: _____

Problems Observed:

(Please continue on back of sheet if necessary)

Is the problem (put an ☒ where appropriate) :

☐ Always evident ? ☐ Intermittent ? ☐ Temperature dependent?

Please use this space for any additional information:

DOCUMENT EVALUATION FORM

Vibro-Meter welcomes your evaluation of this document. Your comments and suggestions help us improve the quality of our documentation.

Document Title Piezoelectric Accelerometers, CA XXX / CE XXX

Reference	MACA-CE/E	Edition	4	Date of Issue	06.09.2004
-----------	-----------	---------	---	---------------	------------

Circle Yes or No to answer the following questions:

- | | | |
|--|-----|----|
| • Is the document well organized? | Yes | No |
| • Is the information technically accurate? | Yes | No |
| • Would you like more technical detail? | Yes | No |
| • Are the instructions clear and complete? | Yes | No |
| • Are the descriptions easy to understand? | Yes | No |
| • Are the examples and diagrams/photos helpful? | Yes | No |
| • Are there enough examples and diagrams/photos? | Yes | No |
| • Is the style/wording easy to read? | Yes | No |
| • Is any information not included? (please list in "Comments" below) | Yes | No |

Comments

(Please continue on back of sheet if necessary)

Contact Details: You or the designated Contact Person for your company:

Name	Job Title
------	-----------

Company	Email
---------	-------

Address

Signature _____ Date _____

Please mail, email or fax this document evaluation form to:

Technical Publications

Vibro-Meter S.A.

Route de Moncor 4

1701 Fribourg, Switzerland

web: www.vibro-meter.com , email: techpubs.ch@vibro-meter.com, Fax: +41 (0)26 407 15 55

Please use this space for any additional comments: