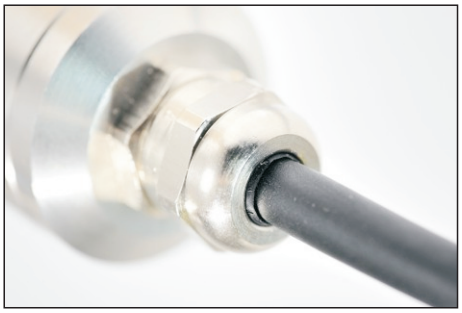
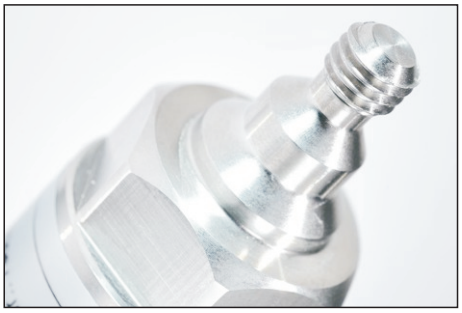
HAUBER
ELEKTRONIK

Vibration Control
Type 640

- Vibration Velocity (mm/s, rms)
- Analoge Current Output: 4...20 mA
- Frequency Range: 10 Hz...1000 Hz





Manual
English

Instruction Manual

Vibration Control
Type 640

Standard
Zone-1-21
Zone-2-22

Edition: 03.08.2015

Attention!
Before Start-Up Procedure the Instruction Manual must be read and understood!

Should any question arise, please contact:

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Content

1 Safety Informations

In General

The safety instructions serve the protection of persons and things from damage and danger that arise from not intended use and further misuse of products especially in explosion endangered areas. Therefore read the instruction manual carefully, before working with or starting-up the product. To the operating personnel the instruction manual has to be accessable anytime.

Before the starting-up or miscellaneous works with the product please check, wether all the documents are available completely. If not all the documents are committed completely or futher copies are required, they can be obtained in different languages.

Our product is designed to the latest state of the art. Nevertheless there are a number of residual risks. This means that each person in the operators firm, concerned with mounting and dismounting, installation, start-up, operating or maintanance of the product, has to have read and understood the instruction manual.
This means furthermore that each person in the operators firm, concerned with mounting and dismounting, installation, start-up, operating or maintanance of the product, has to be an authorized expert, familiar with the safety instructions for handling electrical components. For handling ATEX-certified products within explosion endangered surroundings the expert in addition has to be familiar with the safety instructions relevant there.

Used Symbols

This symbol indicates an explosion hazard.

This symbol indicates a risk from electrical current.

This symbol indicates a (non-safety relevant) information.

2 Instruction Manual Scope

The present instruction manual of the Vibration Control Type 640 is applicable for the following variants: Standard, Zone-1-21 and Zone-2-22.
The functionality of the variants is identical. In addition the variants have certifications and labellings, that allow operation in explosion endangered areas. (see chap. 7, Operation Areas)

3 The Vibration control Type 640

The Vibration control Type 640 ist applied for the measurement of machines absolute bearing vibration, referring to DIN ISO 10816. It offers the following features:

- Principle of operation: Two-wire system.
- Measured Variable: Root mean square (rms) of vibration velocity in mm/s.
- Analog Current Output: Interference-free direct-current signal of 4...20 mA, proportionately to the measuring range of the control.
- Cable break at the control cable detectable by a succeeding evaluation device: Value of the direct current signal < 3,5 mA.

4 Intended Use

The Type 640 exclusively serves for the measurement of mechanical vibrations of machines and mechanical facilities. The operation is valid exclusively within the specifications mentioned in this manual. **Main areas of application:** Industrial fans, ventilators, blowers, electric motors, pumps, centrifuges, seperators, generators, turbines, and similar, oscillatory mechanical equipment.

5 Documents and Certificates

Following Type 640 Documents und Certificates can be consulted on www.hauber-elektronik.de:

- EC-Conformity-Declaration
- EC-Type-Examination-Certificate ATEX-Zone 1 und 21, no.: PTB 06 ATEX 1072
- Statement-of-Conformity ATEX-Zone 2 und 22, no.: LU 15 ATEX 0130X

6 Responsibility for the Safe Operation / Disclaimer

The correct layout of the electrical plant under conditions of explosion protection, as well as the correct switch on procedure, is the sole responsibility of the user of the plant.
The current valid explosion protection rules and security regulations must be adhered to and must be under given circumstances checked by a competent person. Should the plant on the order of the user be erected by a subcontractor, the plant must only be switched on after the subcontractor has submitted an installation certificate as prove of the correct nature of the installation, according to the relevant valid regulations.
The primary switch on of explosion protected plants or part of plants, as well as the subsequent switch on after major adjustments or maintenance work, must be reported to the relevant authorities by the owner.

7 Application Fields

Variante	Application Fields	Labelling
Standard	None explosion endangered areas	none
Zone-1-21	Explosion endangered areas Zone 1 and 21	**II 2 G Ex d IIC T4 Gb** **II 2 D Ex tb IIIC T120 °C Db**
Zone-2-22	Explosion endangered areas Zone 2 and 22	**II 3 G Ex nA IIC T4 Gc** **II 3 D Ex tc IIIC T125 °C Dc**

8 Delivery Contents

Variant	Delivery Contents
Standard	• Vibration Sensor Type 640 • Instruction Manual
Zone-1-21	• Vibration Sensor Type 640 • Integrated Cable, Length: 2, 5, 10, 25 m or on request • Instruction Manual
Zone-2-22	• Vibration Sensor Type 640 • Instruction Manual • Safety Clip • Protective Cover for M12-Plug
Available Supplies	• Evaluation Devices Types 651, 652, 656 • Handheld Meter Type 641 • Various Adapters, e.g. M8 -> M10 • Allocable Mating Connector, M12, 8-pole • Connection Cable, M12-Socket, 4-pole, 0,34 mm^2, L= 2 m, 5 m oder 10 m or on request • Magnet Foot • Rubber Protection Sleeve • EMC-Adapter

For OUTDOOR USE or with SPLASHWATER the Control for additional protection should be covered with the Rubber Protection Sleeve (see “Available Supplies“).

Gummischutztülle

9 Electrical Data

Before Starting-Up the control, the mains must be secured with a microfuse (time delay, 32 mA, breaking capacity C)!

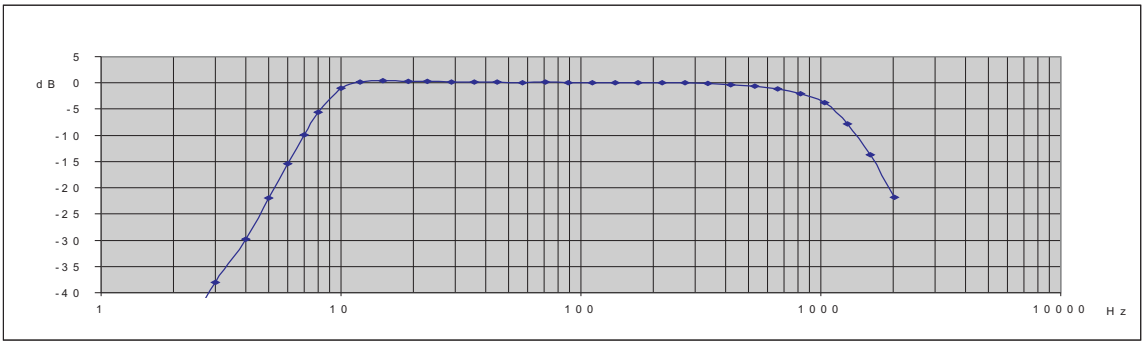
Measuring Range:	0... 8 mm/s 0... 16 mm/s 0... 32 mm/s 0... 64 mm/s 0... 128 mm/s 0... 256 mm/s 0... 512 mm/s 0...1000 mm/s
Measuring accuracy:	± 5%
Transverse sensitivity:	< 5 %
Frequency range:	10 Hz...1000 Hz
Output signals:	4...20 mA (Proportional to the Measuring Range)
Voltage supply:	24V DC ±10%
Power input (max.):	25 mA
Burden/Load (max.):	500 Ω
Fusing:	Microfuse (Time delay, 32 mA, breaking capacity C)

- Each Type 640 has **one** of the listed measuring ranges.
- Further measuring ranges on request.
- Please indicate the measuring range in your order.

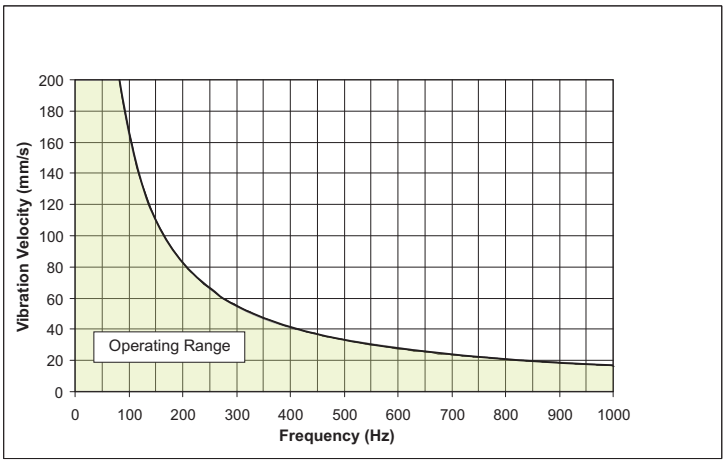
Valid Operating Temperature Ranges of all Variants

	Standard	Zone-1-21	Zone-2-22
Ambient Temperature	-20 °C…+60 °C	-20 °C…+60 °C	-20 °C…+60 °C
Measuring Head-Temperatur (at the Fastening)	-40 °C…+85 °C	-20 °C…+100 °C	-40 °C…+100 °C

Frequency Range 10 Hz...1000 Hz



Operating Range of Vibration Control Type 640



Reading example:

Frequency (Hz)	Max. measurable Vibration Velocity
100	160
400	40
1000	18

The operating range is independent of the measuring range. The diagram shows that with increasing frequency the height of the measurable vibration velocity decreases.

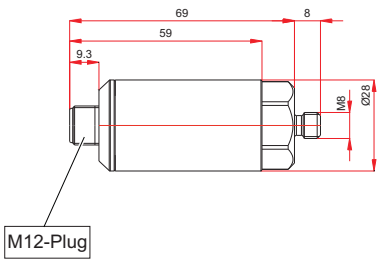
10 Mechanical Data

Housing Material:	Stainless Steel V2A; material no: 1.4305
M12-connector:	CuZn (brass), nickel plated
Cable gland:	Stainless Steel V2A
Fastening:	Wrench Size: 24 (hexagon), M8 x 8 mm, Threat pitch: 1,25 mm
Securing:	The control must be grounded via the M8 fastening (see chapt.12).
Weight:	ca. 150 g
Protection Style:	IP 67

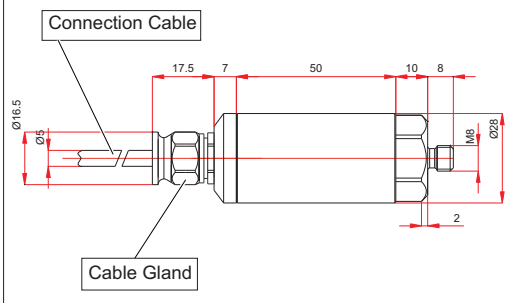
Housing Dimensions and Direction of Measurement

Standard, Zone-2-22

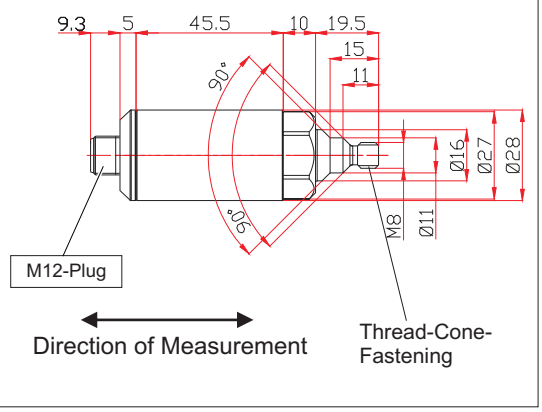
Measures in mm



Zone-1-21



Standard with Thread-Cone

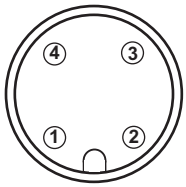


Direction of Fastening
=
Direction of Measurement

11 Connections

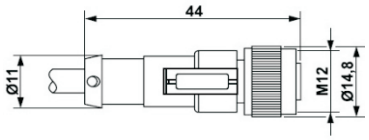
Standard, Zone-2-22

M12-Plug



M12-Plug, 4-pole.
Pin allocation see Connection Plan.

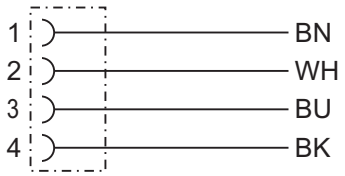
Connection Cable Socket
(Supplies)



Connection cable socket M12, 4-pole,
0,34 mm². Pin allocation see Connection Plan.

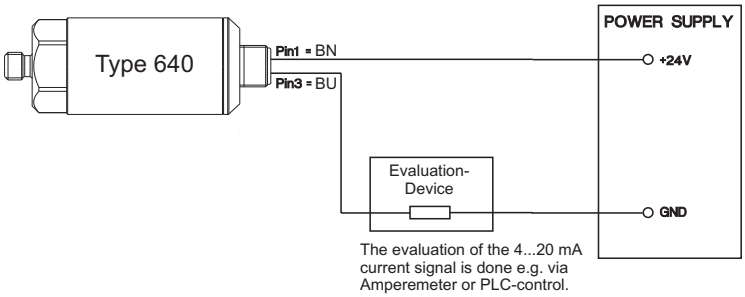
Zone-1-21

Connection Cable



PUR-sheathed-cable, Ø: ca. 6,5 mm,
4-pole, 0,25 mm².
Pin allocation see Connection Plan.

Connection Plan for all 3 Variants



The system works according to Two-wire-technology.
This means, the overall function (Power supply and Current-signal)
is realized using 2 wires (Pin 1 und Pin 3).

To avoid capacitive Coupling Interferences, the Pins 2 and 4 have to stay **open** resp. **free!**

12 Mounting and Dismounting

Mounting and Dismounting works at and with the control may only be executed by an authorized expert, familiar with the safety instructions for handling electrical components. For handling ATEX-certified controls within explosion endangered surroundings the expert in addition has to be familiar with the safety instructions relevant there.

Before mounting and dismounting works the control has to be seperated from the mains! Seperated plug and socket devices always have to be disconnected from the mains! Otherwise danger of explosion because of sparkling, when operating ATEX-certified controls in explosion endangered areas!

The Sonsor housing must be earthed via ist fastening - i. e. via machine earth or via a seperate earth wire (PE)!

12.1 Fastening at the Mounting Surface

Preconditions

- Mounting surface clean and flat, i.e. free from paint, rust, etc.
- Threaded hole at the Mounting surface:
  Depth: 10 mm
  Thread: M8

Tools and Materials

- Allen wrench, SW24

Working Steps

- Tighten control **friction-locked** into the threated hole of the mounting surface.

To obtain exact measuring values, the control has to be tighten **friction-locked** at the mounting surface!

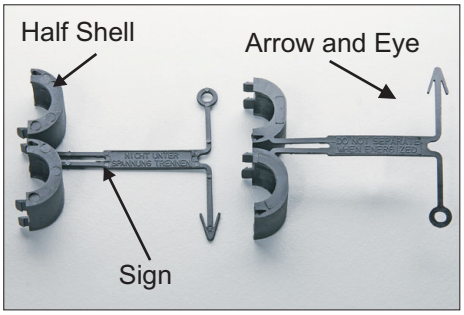
Avoid Auxiliary Constructions! If unavoidable, implement it as stiff as possible!

12.2 Zone-2-22 - Fastening Safety Clip / Protective Cover

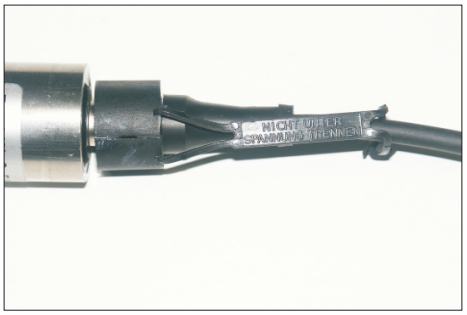
The operation of variant Zone-2-22 is not permitted without the Safety Clip, to avoid accidently disconnecting the plug-in connection! Otherwise danger of explosion because of sparkling, when operating in explosion endangered areas!

Fastening Safety Clip

1. Plug in the connection cable socket into the M12-plug completely. (Pay attention to the code cam!).
2. Tighten firmly the lock-nut of the connection cable socket by hand.
3. Fasten the safety clip against accidental disconnection of the plug connection:
    1. Put both shell halves of the safety clip around the plug connection.
    2. Press together by hand both shell halves of the safety clip until the catch lock snaps in.
    3. Put the arrow connected to one shell halve around the cable, then stick it through the eye on the other end, so that the notice sign is readable alongside the cable.



Safety Clip



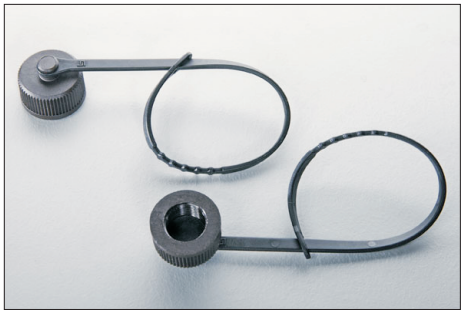
Fastened Safety Clip

Fastening Protective Cover

After disconnecting the plug connection the protective cover has to be mounted!

Disassemble the safety clip and mount the protective cover:

1. Disconnect mains / electric circuit.
2. Separate both shell halves of the fuse clip with a screw driver.
3. Fasten protective cover and skrew it tightly onto the control plug.



Protective Cover

Fastened Protective Cover

13 Installation and Start-Up

Installing and starting-up the control may only be executed by an authorized expert, familiar with the safety instructions for handling electrical components. For handling ATEX-certified controls within explosion endangered surroundings the expert in addition has to be familiar with the safety instructions relevant there.

Prior to starting-up the control, the mains must be secured with a microfuse (time delay, 32 mA, breaking capacity C)!

The connection cable and possible extension cables must be protected against electrical influenzes and mechanical damages. Here local regulations and commissions absolutely have to be considered.

14 Maintenance and Repair

Repairing the control may only be executed by an authorized expert, familiar with the safety instructions for handling electrical components. For handling ATEX-certified controls within explosion endangered surroundings the expert in addition has to be familiar with the safety instructions relevant there.

Prior to repair and cleaning works the control has to be seperated from the mains! Seperated plug and socket devices always have to stay disconnected from the mains! Otherwise danger of explosion because of sparkling, when operating ATEX-certified controls in explosion endangered areas!

Defective connection cables immediately have to be replaced! Otherwise danger of explosion because of sparkling, when operating ATEX-certified controls in explosion endangered areas!

A defective control has to be changed completely!

Note: The Type 640 and its variants are maintenance free!

Errortable

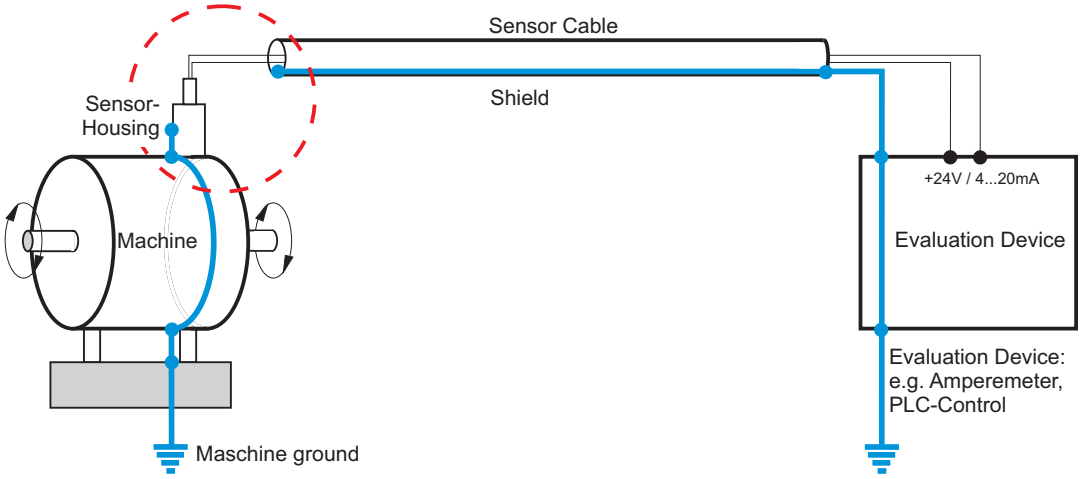
Error	Cause	Activity
No measured Value	No Power Supply	Check Power Supply and/or Connection Cable
	Connection Cable interrupted	Replace Connection Cable
	Fuse defective	Replace Fuse
	Connection wrong Polarity	Provide correct Polarity
	Control defektive	Replace Control
Wrong measured Value	Control mounting not friction-locked	Mount Control friction-locked
	Control mounting at wrong position	Mount Control at correct postion
EMC-Problems		see. Cap. 15 Grounding Concepts

15 Grounding Concepts to avoid Ground Loops

Ground loops are among the most frequent problems for measurement setups with sensitive sensor technology. They arise through unwanted potential differences inside the current circuit between sensor and evaluation device. As countermeasure we recommend our Standard-Grounding Concept or, according to application, our Alternative-Grounding Concept.

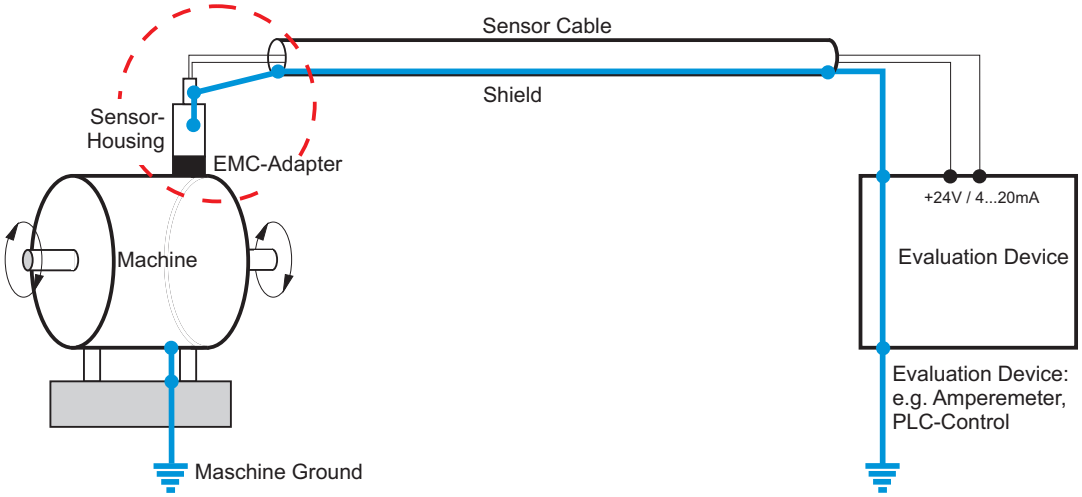
Standard-Grounding Concept

In the Standard-Grounding Concept the shield of the sensor cable has no connection to the sensor-hausing (dotted circle). The sensor housing lies on the same potential as the machine ground.



Alternativ-Grounding Concept

In the Alternative-Grounding Concept the shield of the sensor cable has connection to the sensor-hausing (dotted circle). The sensor hausing is decoupled from the machine ground via EMC-adapter (black).



Please indicate in your order, if you decide to use the **Alternative-Grounding Concept**.
We will then offer to you the according Sensor Cable and EMC-Adapter.