GESTRA®

MSB-1C, MSB-1.2C
Accessories: Steam trap, pressure-bearing screw (PBS) and mounting system

ecoBolt Continuous Steam Trap Monitor
MSB-1C, MSB-1.2C

System description

Continuous steam trap monitor for testing steam traps for loss of steam and banking up of condensate.

The MSB-1C or MSB-1.2C equipment is used to monitor steam traps for loss of steam and banking up of condensate.

The MSB-1.2C equipment is intended for use at higher noise levels, e.g. at higher pressures or condensate flowrates.

Monitoring enables the early detection of faulty steam traps and banking up of condensate.

The early detection of faulty steam traps increases the efficiency of the plant as a whole and reduces its energy consumption.

The detection of banked up condensate prevents damage and malfunctions in the plant as a whole.

To use the equipment, a LoRa gateway and LoRa network server are required for displaying readings.

Use in potentially explosive atmospheres

Do not use the equipment in potentially explosive atmospheres.

Function

The equipment monitors steam traps using ultrasonic and temperature measurements taken by a piezo element. These measurements are performed automatically at regular intervals.

The measured data is analysed in the MSBN... LoRa node and transferred to the LoRa gateway (accessory). The data is transferred by LoRa wireless technology via network protocol.

The measurement results are analysed on the basis of the sound and temperature values and parameters of the steam trap under test.

Accessories

- Pressure-bearing screw (PBS) of steel or stainless steel
- 90° adapter (ADP)
- Clips (RFC) for mounting on pipes (including clip adapters)
- Mounting system for pre-amplifier and LoRa node
- LoRa gateway

Further accessories are available on request.

Materials

Component	Material
Housing of MSBS-1 sensor	1.4305
Housing of MSBA-1C, MSBA-1.2C pre-amplifier	Polycarbonate GF10
MSBN-1C LoRa node	See LoRa node documentation
Battery	Lithium metal battery (Li-SOCl$_2$)

The equipment and its components contain electronic parts.

Ambient conditions

Area of application	Indoors and outdoors
Maximum altitude	2,000 m
Protection against ingress of foreign bodies	Suitable for industrial use
Pollution degree	4
Admissible ambient temperature	−20 — 50 °C

Connections

- Sensor thread: M6

The equipment sensor can be installed at the following measuring points:

- In a pressure-bearing screw (PBS), in place of a steam trap cover screw.
  With 90° adapter (ADP) if necessary.
- Fastened to the pipe by a clip (RFC)

Pressure and temperature ratings

MSB-1C, MSB-1.2C

Assembly	Storage/operating temperature °C	IP rating
MSBS-1 sensor[1]	−20 — 50	IP64
MSBA-1C, MSBA-1.2C pre-amplifier		IP66
MSBN-1C LoRa node		IP68

[1] The temperature of the fluid in the steam trap must not exceed 240 °C.

Electrical data

Assembly	Supply voltage	Protection class	Overvoltage category
MSBS-1 sensor	–	III (SELV)	I
MSBN-1C LoRa node	3.6 V		
MSBA-1C or MSBA-1.2C pre-amplifier	5.0 V / 5 mA		

Battery life with one measurement per hour: approx. 10 years in ideal conditions (SF7, constant ambient temperature of 20 °C)

Assembly	Wireless device class	Maximum output power	Frequency range	Detection range
MSBN-1C EU/UK	LoRaWAN Class A	+14 dBm / 25 mW	Network protocol LoRaWAN 863–870 MHz	Depending on installation location and gateway position. (Up to 3 km in urban areas, up to 10 km in rural areas)

For further versions for specific markets, see Installation & Operating Manual BAN 851072.

Equipment selection

Steam trap regulator	$\dot{m}_{max}$ Maximum condensate flowrate kg/h	p_{max} Maximum pressure barg	Measuring point	Δp Area of application bar	ecoBolt
Bimetal	1000	32	PBS[1]	0 — 22	MSB-1C
			ADP[1]	0 — 22	
			RFC	0 — 32	MSB-1C
Membrane	1800	32	PBS[1]	0 — 5	MSB-1C
				5 — 32	MSB-1.2C
			ADP[1]	0 — 10	MSB-1C
				10 — 32	MSB-1.2C
			RFC	0 — 10	MSB-1C
				10 — 32	MSB-1.2C
Ball float ≤ DN 65	6000	32	PBS[1]	0 — 5	MSB-1C
				5 — 32	MSB-1.2C
			ADP[1]	0 — 5	MSB-1C
				5 — 32	MSB-1.2C
			RFC	0 — 32	MSB-1C
Thermodynamic	2000	32	PBS[1]	0 — 20	MSB-1C
			ADP[1]	0 — 32	MSB-1C
			RFC	0 — 32	MSB-1C
Venturi	100	22	RFC	0 — 22	MSB-1C
Inverted Bucket	450	32	RFC	0 — 32	MSB-1C

Measuring points: pressure-bearing screws (PBS), 90° adapter (ADP), clips for pipes (RFC)

[1] PBS and ADP accessories are only available for GESTRA steam traps. For information about possible steam trap types, please refer to the Product Overview/Technical Information.

Measurement accuracy

| Measuring point	Loss of steam	Difference in surface temperature of measuring point
PBS	1 kg/h + 5% of final value	0 — 40 K
ADP	1 kg/h + 5% of final value	-20 — 20 K
RFC	3 kg/h + 30% of final value	-20 — 20 K

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Equipment overview

No.	Designation
1	MSBS-1 sensor
2	Sensor connecting cable
3	MSBN-1C LoRa node
4	Pre-amplifier connecting cable
5	MSBA-1C, MSBA-1.2C pre-amplifier
6	Accessories (pressure-bearing screw PBS shown here as an example)
7	Steam trap (BK 45 shown here as an example)
8	Accessory (mounting system)
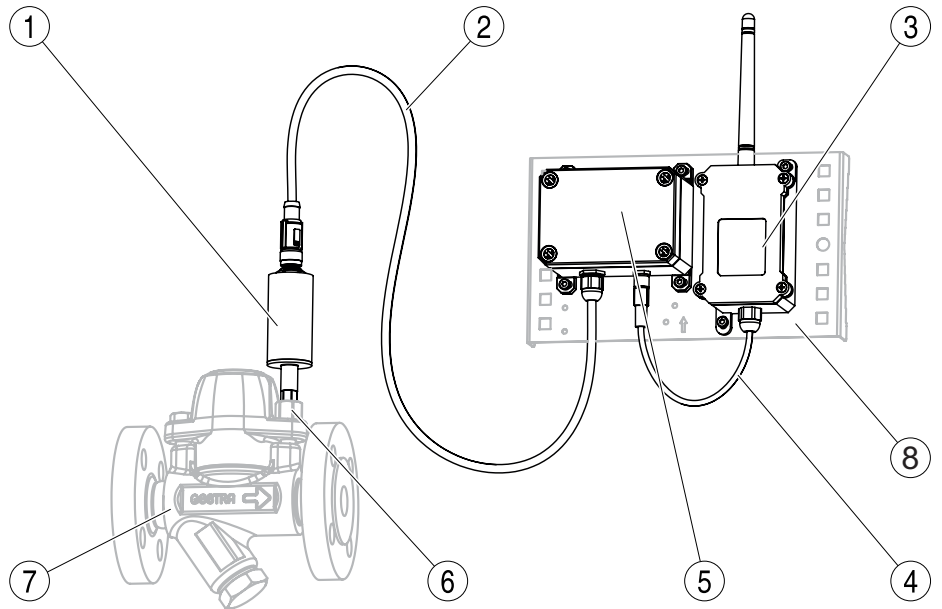
Dimensions and weights

Dimensions mm

Installation dimensions for securing 100 mm cable, bending radius >25 mm

MSBS-1   MSBA-1C, MSBA-1.2C   MSBN-1C
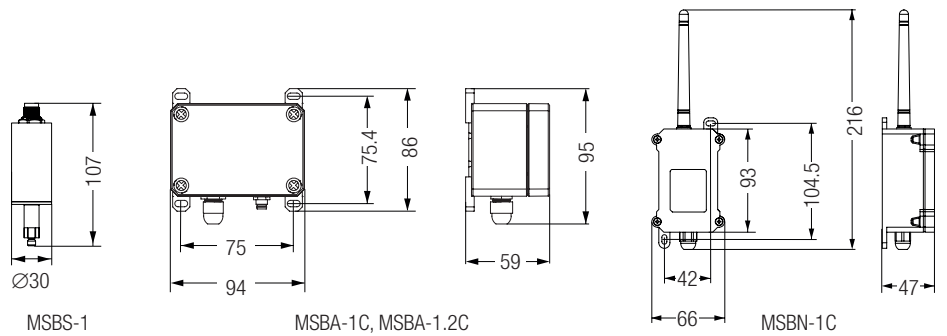
Assembly	Dimensions mm			Weight g
	Length/height	Width/diameter	Depth	
MSBS-1 sensor	107	30	–	160
MSBA-1C, MSBA-1.2C pre-amplifier	86	94	59	210[1]
Sensor connecting cable	1,000	–	–	–
Pre-amplifier connecting cable	200	–	–	–
MSBN-1C LoRa node	216	66	47	200[1]

[1] With connecting cable

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Performance profile

- Continuous steam trap monitor for steam traps (e.g. GESTRA BK, MK and UNA)
- Readings are analysed inside the equipment
- The LoRa payload includes test and analysis results
- Connection to the LoRa network server via LoRa wireless technology
- Option: Presentation of test and analysis results on the GESTRA IoT platform. To do this, the LoRa network server is connected to the GESTRA IoT platform via MQTT protocol.

CoMApp

- Fast and efficient support during installation and maintenance of the continuous steam trap monitor
- Transfers metadata to the installed equipment and guarantees confusion-proof integration in the GESTRA IoT platform
- A data connection is required for loading the CoMApp or for transferring data (Wi-Fi or SIM card) The CoMApp cannot be used without a data connection.
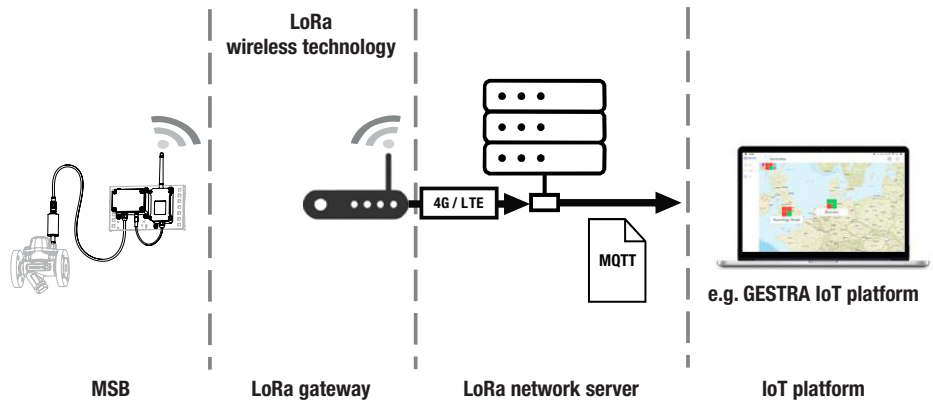
GESTRA IoT platform

The equipment can be connected to the GESTRA IoT (internet of things) platform.

Advantages:

- Access to the GESTRA IoT platform via a website (login credentials are provided by GESTRA)
- Online presentation of readings in real time on a website via your browser
- Presentation of test and analysis results on dashboards
- Summary of results from all steam traps
- Clear information about connected steam traps
- Live steam trap data can be compared with live data from other units (e.g. steam boilers, steam flowmeters)

MSB integration in IoT platform using LoRa wireless technology

How to order

ecoBolt Continuous Steam Trap Monitor

MSB-1C

MSB-1.2C

Country/frequency range…………..………........…

The MSB-1C, MSB-1.2C continuous steam trap monitor consists of a sensor, an amplifier and a LoRa node for automatically testing all makes of steam trap for loss of steam and banking up of condensate.

Faulty steam traps are detected and reported at an early stage by means of temperature measurements taken by a piezo element.

These measurements are performed continuously and automatically at regular intervals.

The measured data is analysed in the LoRa node and transferred to the LoRa gateway (accessory). The data is transferred using LoRa wireless technology.

Options

- Connection to the GESTRA IoT (internet of things) platform for viewing readings and the data derived from them, such as CO_2 emissions and costs due to loss of steam, for example.

Accessories

- Pressure-bearing screws (PBS) of steel or stainless steel for installing on GESTRA steam traps
- 90° adapter (ADP)
- Clips (RFC) for mounting on pipes
- Mounting system for pre-amplifier and LoRa node
- LoRa gateway

Directives and standards

You can find details on the conformity of the equipment and the relevant standards and directives, where applicable, in the Declaration of Conformity and associated certificates or approvals.

Please note our general terms of business.

GESTRA AG