



Professional Data Logger

FOR VALIDATION, ROUTINE CONTROL AND PROCESS MONITORING

MEDICINE
FOOD
PHARMACEUTICAL
LABORATORY

2018

-ebro-
a xylem brand



50 years of ebro®

Freiburg 01.04.1968. The Breisgau-founded company ebro Electronic used to only produce plug-in power supplies. From the middle of the seventies, ebro® used their own plastic injection department to manufacture police protection vests, as well as the formerly popular "Telegen" television lightning.

After ebro® moved to their current registered office in Ingolstadt, Bavaria, in 1976, they continued the production of the above-mentioned goods. The core business, developing and manufacturing temperature-measuring instruments, started only in 1980.

Today, ebro® is specialised in high-quality measurement technology such as hand-held meters, thermometers or dataloggers. They are mostly sold in the markets medicine, food, pharmacy, laboratory and industry.

You are looking for products or software to measure temperature, humidity, pH-value, oil quality, pressure and brix? Then you have found your partner in ebro®. From measuring and recording to analysing, we are offering quality goods and solutions.



KompetenzCentrum ebro

Seminar program 2018

Demands for solid technical Know How transfer are permanently increasing and therefore the requests for training and special workshops are on the rise. In the past we received these requests from practically all corners of the world. Due to the establishment of our own training centre here in Ingolstadt which includes especially equipped laboratories and a steam autoclave for testing procedures we offer ideal facilities to run seminars and workshops.

Theory and practice combined are the key to our successful transfer. Our instructors are all experts in their own fields. The aim is to achieve an in-depth understanding of hardware and software alike.

If you feel that you prefer an In-House seminar in your own facilities we are open to discussions and flexible to offer you a customized training program to match your demands. Please feel free in contacting us to tell us about your desired time schedule, what the training course should cover and how many participants will attend. We will gladly send you an offer.

You can find the current program on our homepage www.ebro.com



A promotional banner for the 'KompetenzCentrum: Seminar-Program 2018'. On the left, a woman with blonde hair and glasses, wearing a bright yellow jacket, stands next to a whiteboard. The whiteboard has the text 'KOMPETENZ CENTRUM: SEMINAR-PROGRAM 2018' written on it. On the right side of the banner, there is a red, rounded rectangular box containing the text: 'Booking before February 28th 2018 and you can avail of an early bird discount of 20%'. The '20%' is written in a large, white, bold font.

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FOOD

PHARMA-
CEUTICAL

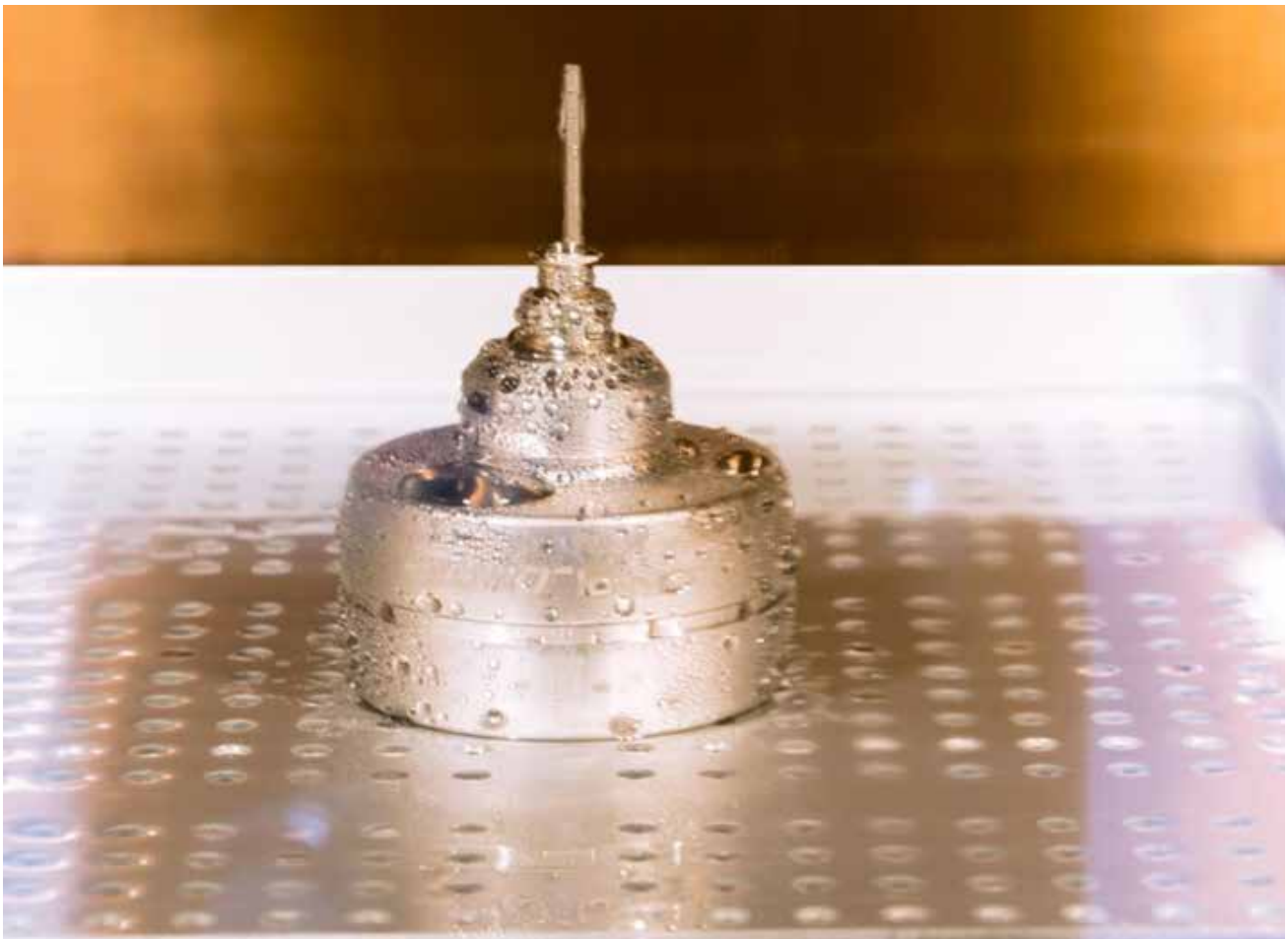
MEDICAL



INDUSTRIAL

EBI 12 - The new data logger generation

- High quality stainless steel housing
- Application range from -90 °C to 150 °C
- High temperature accuracy up to 0.05 °C
- Extended temperature measurement range -200 °C to +400 °C
- Pressure measurement up to 4,000 mbar
- Precision pressure measurement 0.1 mbar
- High pressure accuracy up to 0.25 mbar
- Humidity measurement from 0% rH to 100% rH
- Conductivity measurement 1 to 2,000 $\mu\text{S}/\text{cm}$
- Radio mode for real-time monitoring
- ATEX approved
- Full compatibility Interface EBI IF-100, EBI IF-150 and EBI IF-200
- Full compatibility to Winlog software



Data Loggers

ebro offers data loggers for many different applications:



Operation and Process qualification

Description:

- Highly accurate temperature, pressure, humidity and conductivity data loggers for thermal validation processes
- Wide range of probe types and configurations
- Wireless data loggers for real time monitoring
- Data loggers for low space

Applications:

- Process validation in steam sterilizers, autoclaves, in the production of canning, a.s.o.
- Process validation in washer-disinfectors and washer-disinfectors for endoscopes
- F_0 -value and A_0 -value calculation
- Process control

Routine control / Mapping

Description:

- Highly accurate temperature, pressure, humidity and conductivity data loggers for thermal process control
- Electronic Bowie&Dick-Test according to ISO 17665 and EN 285 / EN 13060
- Data loggers for low space
- Data loggers for regular process controls

Applications:

- Routine control in steam sterilizers and autoclaves
- Routine control in washer-disinfectors and washer-disinfectors for endoscopes
- Routine control at canning
- Mapping





Room Monitoring and Process control

Description:

- Highly accurate temperature, pressure and humidity data loggers
- Standard temperature and humidity data loggers with automatic PDF report generation
- Wireless system to monitor temperature and humidity
- Multichannel Thermo Couple temperature data loggers

Applications:

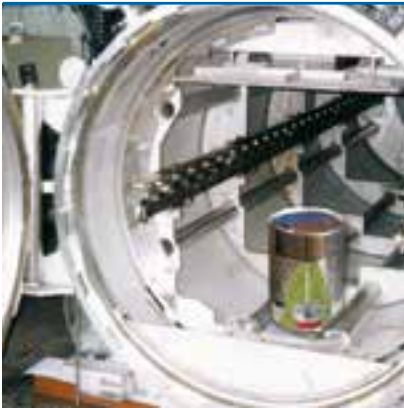
- Room monitoring
- Transport and storage monitoring
- Clean room and freezer monitoring

Logger systems

and accessories for Process monitoring, Routine control and Validation



Food



Applications

- Autoclaves / Sterilizers / Pasteurization Processes
- Continuous Fryers
- Lyophilization
- Hydrostatic Retorts
- Refrigerators / Freezers / Cooling Rooms
- Smokehouse
- Cooker / Cooler (Reel and Spiral)



Medical



- Steam Sterilization
- Washer disinfectors / bedpan washers
- H₂O₂-, LTSF- and EtO- Sterilization
- Depyrogenation / heat tunnel
- Incubators
- Refrigerators / Freezers / Cooling Rooms
- Stability Chambers



Pharmaceutical



- Steam-, H₂O₂ and EtO- Sterilization
- Washer disinfectors
- Depyrogenation / heat tunnel
- Lyophilization
- Incubators
- Refrigerators / Freezers / Cooling Rooms
- Climatic Test Chambers / Stability Chambers

Products



EBI 11 Series



EBI 12 Series



EBI 310 Series



EBI 25 Series



EBI 40



EBI 11 Series



EBI 12 Series



EBI 16



EBI 310 Series



EBI 25 Series



EBI 40



EBI 11 Series



EBI 12 Series



EBI 16



EBI 310 Series



EBI 25 Series



EBI 40

Process monitoring, Routine Control and Validation easy and safe

Validation

Is a reproducible proof that a process permanently generates the required results.

Validation is a clear demonstration that processes, equipment, materials, work steps or systems actually lead to the expected results.

Routine Control

Routine control is a regular test to determine the performance of the equipment. It is the verification that the limits are in accordance to the validation.

The frequency depends on device and process.

Continuous Process Monitoring

The continuous process check as a validated status during the commercial manufacturing process ensures that the ongoing process remains under continuous control. The recognition of unplanned deviations from the plan is indispensable to the achievement of the set objectives and the conformity with the requirements.

EX Area

Hazardous areas (except for mining)

The categories 1 to 3 are classified according to the ATEX Directive 94/9 / EC. The letter "G" stands for gas. In the IEC 60079-0 for electrical components and devices, and thus for approvals according to the IECEx scheme, Equipment Protection Levels (EPL) (German: Device Protection Level) are defined.

Devices according to Category 1G or EPL Ga

Devices must be designed in such a way as to ensure a very high degree of safety. Devices of this category must also ensure the required degree of safety even in the case of infrequent disturbances. Even if there are two faults on the unit, ignition must not occur. They may be used in Zone 0 (Category 1G).

Requirement for reprocessing of medical devices

Reprocessing of medical devices coming to an intended application as low-germ or sterile is to perform.

By using the manufacturer's instructions with suitable validated process and procedures, that the success of this procedure is reproducible and do not endanger the safety and health of patients, user and third parties.

Data Logger - Systems

ebro is specialist for measuring systems for flexible and reliable measurement and documentation systems for routine control and validation of various thermal processes in the medical field, the pharmaceutical and the food industry.

Our product range covers easy to use data loggers of the EBI 12 and EBI 11 series, which are placed directly in the process. An intuitive, TÜV certified software to routine testing or validation of processes assists to evaluate your process data.

In addition, we offer you the certified EBI 16 system to perform the daily Bowie&Dick-test with a clear „fail“ or „passed“ result.

TÜV certified evaluation software Winlog.med and Winlog.validation

With the Winlog.med / Winlog.validation we offer a TÜV certified, FDA 21 CFR Part 11 compliant software. The system is characterized by high data security. The automatic evaluation of the process is possible as well as the manual evaluation.

The software offers the possibility to create user defined evaluations. So it is possible to create individual process parameters and test criteria.



Conformance

Our Systems are compliant with the relevant standards and guidelines.

DIN EN ISO 17665	Sterilization of health care products. - Moist heat - Requirements for the development, validation and routine control of a sterilization process for medical devices
DIN EN 285	Sterilization - Steam sterilizers - Large sterilizer
DIN EN ISO 15883	Washer disinfectors - General requirements, terms and definitions and tests
DIN EN 13060	Small steam sterilizers
DIN SPEC 58929	Operation of small steam sterilizers in health care - Guidelines for validation and routine monitoring of sterilization processes
DIN EN ISO 11135	Sterilization of health care products - Ethylene oxide - Requirements for the development, validation and routine control of a sterilization process for medical devices.
DIN EN ISO 25424	Sterilization of medical devices - Low temperature steam and formaldehyde - Requirements for development, validation and routine control of a sterilization process for medical devices.
DIN EN ISO 11140-4	Sterilization of health care products - Chemical indicators - Class 2 indicators as an alternative to the Bowie&Dick-type test for detection of steam penetration.
DIN EN ISO 9241	Ergonomics of human-system interaction: Dialogue principles
DIN 12880	Electrical laboratory equipment - heaters and incubators
DIN EN ISO 13408-3	Aseptic processing of healthcare products -- Part 3: Lyophilization
DIN EN ISO 14937	Sterilization of healthcare products -- General requirements for characterization of a sterilizing agent and the development, validation and routine control of a sterilization process for medical devices.
ISO/IEC 25051	Software engineering -- Systems and software Quality Requirements and Evaluation (SQuaRE) -- Requirements for quality of Ready to Use Software Product (RUSP) and instructions for testing
FDA 21 CFR Part 11	Is the part of the FDA regulations about electronic records and electronic signatures, specifies the criteria under which electronic records and electronic signatures can be considered trustworthy and reliable as a paper document
FDA 21 CFR Part 210-211	Defines minimum requirements for the methods to be dispatched in the manufacture, processing, packaging and warehousing of drugs and vaccine and distribution and controls to be used.
Guidelines	Guidelines from DGKH, DGSV and AKI for the validation and routine monitoring of machine cleaning and thermal disinfection processes for medical devices
Recommendations	DGKH recommendations for validation and routine monitoring of sterilization processes with moist heat for medical devices

Temperature data logger of EBI 12 series

General technical specifications for EBI 12 T series

Operating temperature: logger	-90 °C ... +150 °C (-130 °F ... 302 °F)*
Operating temperature: radio operation	-30 °C ... +150 °C (-22 °F ... 302 °F)
Temperature accuracy	±1.5 °C (-200 °C ... -85 °C)* ±0.5 °C (-85 °C ... -40 °C)* ±0.2 °C (-40 °C ... 0 °C)* ±0.1 °C (0 °C ... +120 °C)* ±0.05 °C (+120 °C ... +140 °C)* ± 0.1 °C (+140 °C ... +150 °C)* ± 0.5 °C (+150 °C ... +250 °C)* ± 0.8 °C (+250 °C ... +400 °C)*
Time accuracy	< 5 sec (24 h)
Temperature resolution	0.01 °C
Memory	Max. 100,000 measurement values (total)*
Sensor	Pt 1000, Class A
Interval	250 ms ... 24 hours.*
Measurement mode	<ul style="list-style-type: none"> • Endless measurement • Start / stop measurement • Measure upon start temperature • Start immediately until end of memory
Storage temperature	0 °C ... +125 °C
Battery	Lithium cell, 3.6 V, user replaceable
Dimensions (Ø x H)	48 mm x 24 mm**
Weight	Approximately 110 g **
Housing material	316 L Stainless steel / PEEK
Protection class	IP 68
Certificate	Factory calibration certificate

* Deviating specifications can be found in the product descriptions.

** Dimensions and weight may be different depending on the type.



EBI 12-T100 Temperature Data Logger with internal temperature sensor



Application sample

- For process monitoring during convenience food production
- For routine control in badpan washers
- For temperature mappings



Technical Data

Measurement range	-90 °C ... +150 °C (-130 °F ... +302 °F)
Data memory	100,000 measurement values

- 1 internal temperature sensor
- Particularly robust

Type	Description	Part No.
EBI 12-T100	Internal temperature sensor	1340-6600

EBI 12-T100-EX Temperature Data Logger with internal temperature sensor



Application sample

- To measure in raw material storage



Technical Data

Use in EX Area	-40 °C ... +85 °C (-40 °F ... +185 °F)
Data memory	100,000 measurement values

Approximately available from end of Q1 2018

- 1 internal temperature sensor
- Particularly robust

Type	Description	Part No.
EBI 12-T100-EX	Internal temperature sensor	1340-6600-EX

EBI 12-T101 Temperature Data Logger with internal temperature sensor



Application sample

- For use in dry ice and in cryogenic
- In bedpan washers and washing machines



Technical Data

Measurement range	-90 °C ... +105 °C (-130 °F ... +221 °F)
Accuracy	± 0.5 °C (-90 °C ... -40 °C) ± 0.3 °C (-40 °C ... +105 °C)
Sampling rate	1 s ... 24 h
Data memory	27,000 measurement values

- 1 internal temperature sensor
- Particularly robust

Type	Description	Part No.
EBI 12-T101	Internal temperature sensor	1340-6601

EBI 12-T21X Temperature Data Logger rigid metal probe



Application sample

- For process monitoring during convenience food production

Technical Data

Measurement range	-40 °C ... +150 °C (-40 °F ... +302 °F)
Accuracy	± 0.1 °C (0 °C ... +150 °C) ± 0.3 °C (-40 °C ... 0 °C)
Sampling rate	1 s ... 24 h
Data memory	27,000 measurement values



- 1 external temperature probe, Ø 3 mm
- Radial pointed

Type	Description	Part No.
EBI 12-T210	Needle length = 50 mm	1340-6602
EBI 12-T211	Needle length = 75 mm	1340-6603

EBI 12-T23X Deep Temperature Data Logger rigid metal probe



Application sample

- Ideal for use in canning for pasteurization control

Technical Data

Measurement range	-40 °C ... +150 °C (-40 °F ... +302 °F)
Accuracy	± 0.1 °C (0 °C ... +150 °C) ± 0.3 °C (-40 °C ... 0 °C)
Sampling rate	1 s ... 24 h
Data memory	27,000 measurement values

- Axial pointed, M5 Thread
- 1 external temperature probe, Ø 3 mm
- Various needle length available

Type	Description	Part No.
EBI 12-T230	Needle length = 50 mm	1340-6606
EBI 12-T231	Needle length = 75 mm	1340-6607
EBI 12-T232	Needle length = 100 mm	1340-6608
EBI 12-T233	Needle length = 150 mm	1340-6609

EBI 12-T43X Temperature Data Logger rigid metal probes



Application sample

- Ideal for use in canning for pasteurization control

Technical Data

Measurement range	-40 °C ... +150 °C (-40 °F ... +302 °F)
Accuracy	± 0.1 °C (0 °C ... +150 °C) ± 0.3 °C (-40 °C... 0 °C)
Sampling rate	1 s ... 24 h
Data memory	2 x 13,500 measurement values

Approximately available from end of Q2 2018

- Axial pointed, M5 Thread
- 2 external temperature probes, Ø 3 mm
- Various needle length available

Type	Description	Part No.
EBI 12-T430	Needle length = 50 mm	1340-6614
EBI 12-T431	Needle length = 75 mm	1340-6615
EBI 12-T432	Needle length = 100 mm	1340-6616
EBI 12-T433	Needle length = 150 mm	1340-6617

EBI 12-T46X Bottle Logger rigid metal probe



Application sample

- Ideal for use in bottles

Technical Data

Measurement range	-40 °C ... +150 °C (-40 °F ... +302 °F)
Accuracy	± 0.3 °C (-40 °C ... +150 °C)
Sampling rate	1 s ... 24 h
Data memory	2 x 13,500 measurement values

Approximately available from end of Q2 2018

- Axial, blunt, M10 thread
- 1 external temperature probe, Ø 6 mm
- 1 external temperature probe, Ø 3 mm
- Various needle lengths available

Type	Description	Part No.
EBI 12-T461	Needle length = 135 mm	1340-6623
EBI 12-T462	Needle length = 190 mm	1340-6624
EBI 12-T463	Needle length = 245 mm	1340-6625
EBI 12-T464	Needle length = 270 mm	1340-6626
EBI 12-T465	Needle length = 300 mm	1340-6627

EBI 12-T22X Temperature Data Logger bendable metal probe



Application sample

- Measurement in drain of sterilizers
- In oven (protected by Thermal-Isolation-Box)

Technical Data

Measurement range	EBI 12-T220: -200 °C ... +200 °C (-328 °F ... +392 °F) EBI 12-T221: -200 °C ... +400 °C (-328 °F ... +752 °F)
Data memory	100,000 measurement values

- 1 external temperature probe, Ø 1.5 mm
- Radial arranged

Type	Description	Part No.
EBI 12-T220	Needle length = 250 mm	1340-6604
EBI 12-T221	Needle length = 500 mm	1340-6605

EBI 12-T220-EX Temperature Data Logger bendable metal probe



Application sample

- EtO sterilization

Technical Data

Use in EX Area	-40 °C ... +85 °C (-40 °F ... +185 °F)
Data memory	100,000 measurement values

Approximately available from end of Q1 2018



- 1 external temperature probe, Ø 1,5 mm
- Radial arranged

Type	Description	Part No.
EBI 12-T220-EX	Needle Length = 250 mm	1340-6604-EX

EBI 12-T24X Temperature Data Logger bendable metal probe



Application sample

- In washer disinfectors
- H₂O₂ sterilization

Technical Data

Measurement range	-200 °C ... +200 °C (-328 °F ... +392 °F)
Data memory	100,000 measurement values



- 1 external temperature probe, Ø 1,5 mm
- Axial arranged

Type	Description	Part No.
EBI 12-T240	Needle Length = 250 mm	1340-6611
EBI 12-T241	Needle Length = 500 mm	1340-6612

EBI 12-T421 Temperature Data Logger

bendable metal probes



Application sample

- In oven (in combination with Thermal-Insulation-Box)
- In washer disinfectors



Technical Data

Measurement range	-200 °C ... +400 °C (-328 °F ... +752 °F)
Data memory	2 x 50,000 measurement values

Approximately available from end of Q1 2018

- 2 external temperature probes, Ø 1.5 mm
- Radial arranged

Type	Description	Part No.
EBI 12-T421	Needle Length = 500mm	1340-6630

EBI 12-T441 Temperature Data Logger

bendable metal probes



Application sample

- In washer disinfectors
- H₂O₂ sterilization



Technical Data

Measurement range	-200 °C ... +200 °C (-328 °F ... +392 °F)
Data memory	2 x 50,000 measurement values

- 2 external temperature probes, Ø 1.5 mm
- Axial arranged

Type	Description	Part No.
EBI 12-T441	Needle Length = 500 mm	1340-6629

EBI 12-T441-EX Temperature Data Logger bendable metal probes



Application sample

- EtO sterilization

Technical Data

Use in EX Area	-40 °C ... +85 °C (-40 °F ... +185 °F)
Data memory	2 x 50,000 measurement values

Approximately available from end of Q1 2018

- 2 external temperature probes, Ø 1.5 mm
- Axial arranged

Type	Description	Part No.
EBI 12-T441-EX	Needle Length = 500 mm	1340-6629-EX

EBI 12-T490 Temperature Data Logger flexible cable probes



Application sample

- Steam sterilizer

Technical Data

Measurement range	-20 °C ... +150 °C (-4 °F ... +302 °F)
Data memory	2 x 50,000 measurement values



- 2 external temperature probes, Ø 1.2 mm
- Radial arranged

Type	Description	Part No.
EBI 12-T490	Cable Length = 600 mm	1340-6634

EBI 12-T690 Temperature Data Logger flexible cable probes



Application sample

- Steam sterilizer

Technical Data

Measurement range	-20 °C ... +150 °C (-4 °F ... +302 °F)
Data memory	4 x 25,000 measurement values

- 4 external temperature probes, Ø 1.2 mm
- Radial arranged

Type	Description	Part No.
EBI 12-T690	Cable Length = 600 mm	1340-6635

EBI 12-T47X Temperature Data Logger flexible cable probes



Application sample

- Steam sterilizer

Technical Data

Measurement range	-20 °C ... +150 °C (-4 °F ... +302 °F)
Data memory	2 x 50,000 measurement values

- 2 external temperature probes, Ø 1.2 mm
- Axial arranged

Type	Description	Part No.
EBI 12-T470	Cable Length = 600 mm	1340-6640
EBI 12-T471	Cable Length = 1,200 mm	1340-6644

EBI 12-T671 Temperature Data Logger flexible cable probes



Application sample

- Steam sterilizer

Technical Data

Measurement range	-20 °C ... +150 °C (-4 °F ... +302 °F)
Data memory	4 x 25,000 measurement values

- 4 external temperature probes, Ø 1.2 mm
- Axial arranged

Type	Description	Part No.
EBI 12-T671	Cable Length = 1,200 mm	1340-6645

Temperature / Pressure Data Loggers EBI 12 series

General technical specifications: valid for all EBI 12-TP data loggers

Operating temperature: pressure logger	0 °C ... +150 °C (+32 °F ... +302 °F)
Accuracy: temperature	±0.1 °C (0 °C ... +120 °C) ±0.05 °C (+120 °C ... +140 °C) ±0.1 °C (+140 °C ... +150 °C)
Accuracy: pressure	±10 mbar (50 mbar ... 150 mbar) ±10 mbar (2,050 mbar ... 2,250 mbar) ±10 mbar (3,000 mbar ... 3,250 mbar) ±15 mbar (for the remaining measurement range)
Resolution: temperature	0.01 °C
Resolution: pressure	1 mbar
Data memory	Max. 100,000 measurements (total)
Sensor: temperature	Pt 1000, Class A
Sensor: pressure	Piezoresistive pressure sensor (temperature compensated)
Sampling rate	250 ms ... 24 h
Measurement mode	<ul style="list-style-type: none"> • Endless measurement • Measure upon start time • Start immediately until end of memory • Start- / Stop measurement
Storage temperature	0 °C ... +125 °C (+32 °F ... +257 °F)
Time accuracy (24h)	< 5 sec
Battery	Lithium cell, 3.6 V, user replaceable
Dimensions (Ø x H)	48 mm x 32 mm*
Weight	Approximately 120 g *
Housing material	316 L Stainless steel / PEEK
Protection class	IP 68
Certificate	Factory calibration certificate

* Dimensions and weight may be different depending on the type.



EBI 12-TP222 Temperature / Pressure Data Logger bendable metal probe and Luer-Lock-Connection



Application sample

- Washer disinfectors
- Sterilizer

Technical Data

Measurement range: temperature	0 °C ... +150 °C (+32 °F ... +302 °F)
Measurement range: pressure	1 ... 4,000 mbar
Data memory	2 x 33,400 measurement values

- 1 external temperature probe, axial, bendable, Ø 1.5 mm
- 1 internal pressure sensor with Luer-Lock-Connection

Type	Description	Part No.
EBI 12-TP222	Needle Length = 500 mm, Luer-Lock-Connection	1340-6653



EBI 12-TP231 Temperature / Pressure Data Logger rigid metal probe and Luer-Lock-Connection



Application sample

- Washer disinfectors
- Sterilizer

Technical Data

Measurement range: temperature	0 °C ... +150 °C (+32 °F ... +302 °F)
Measurement range: pressure	1 ... 4,000 mbar
Data memory	2 x 33,400 measurement values

- 1 external temperature probe, axial, Ø 1.95 mm
- 1 internal pressure sensor with Luer-Lock-Connection

Type	Description	Part No.
EBI 12-TP231	Needle Length = 40 mm	1340-6655

EBI 12-TP231-EX Temperature / Pressure Data Logger rigid metal probe and Luer-Lock-Connection



Application sample

- EtO sterilizer

Technical Data

Use in EX Area	0 °C ... +85 °C (+32 °F ... +185 °F)
Measurement range: pressure	1 ... 4,000 mbar
Data memory	2 x 33,400 measurement values

Approximately available from end of Q1 2018

- 1 external temperature probe, axial, Ø 1.95 mm
- 1 internal pressure sensor with Luer-Lock-Connection

Type	Description	Part No.
EBI 12-TP231-EX	Needle Length = 40 mm	1340-6655-EX

EBI 12-TP234 Temperature / Pressure Data Logger tube connection and M 10x1 internal thread



Application sample

- Drainages

Technical Data

Measurement range: temperature	0 °C ... +150 °C (+32 °F ... +302 °F)
Measurement range: pressure	1 ... 4,000 mbar
Data memory	2 x 33,400 measurement values

- 1 external temperature probe, axial, Ø 1.95 mm
- 1 internal pressure sensor with tube connection

Type	Description	Part No.
EBI 12-TP234	Needle Length = 40 mm	1340-6652

EBI 12-TP322 Temperature / Pressure Data Logger bendable metal probes with Luer-Lock-Connection



Application sample

- Washer disinfectors
- Sterilizer

Technical Data

Measurement range: temperature	0 °C ... +150 °C (+32 °F ... +302 °F)
Measurement range: pressure	1 ... 4,000 mbar
Data memory	3 x 25,000 measurement values

- 2 external temperature probes, axial, bendable, Ø 1.5 mm
- 1 internal pressure sensor with Luer-Lock-Connection

Type	Description	Part No.
EBI 12-TP322	Luer-Lock-Connection	1340-6664

EBI 12-TP422 Temperature / Pressure Data Logger *bendable metal probes with Luer-Lock-Connection*



Application sample

- Washer disinfectors
- Sterilizer

Technical Data

Measurement range: temperature	0 °C ... +150 °C (+32 °F ... +302 °F)
Measurement range: pressure	1 ... 4,000 mbar
Data memory	4 x 20,000 measurement values

- 3 external temperature probes, axial, bendable, Ø 1.5 mm
- 1 internal pressure sensor with Luer-Lock-Connection

Type	Description	Part No.
EBI 12-TP422	Needle Length = 500 mm, Luer-Lock-Connection	1340-6662

EBI 12-TP45X Temperature / Pressure Data Logger *flexible cable probes*



Application sample

- Sterilization

Technical Data

Measurement range: temperature	0 °C ... +150 °C (+32 °F ... +302 °F)
Measurement range: pressure	1 ... 4,000 mbar
Data memory	4 x 20,000 measurement values

- 3 external temperature probes, axial, flexible, Ø 1.2 mm
- 1 internal pressure sensor with Luer-Lock-Connection

Type	Description	Part No.
EBI 12-TP451	Cable Length = 600 mm, Luer-Lock-Connection	1340-6643
EBI 12-TP453	Cable Length = 1,200 mm, Luer-Lock-Connection	1340-6647

EBI 12-TP460 Temperature / Pressure Data Logger *flexible cable probes*



Application sample

- In limited spaces e.g. in containers

- 3 external temperature probes, radial, Ø 1.2 mm
- 1 internal pressure sensor

Technical Data

Measurement range: temperature	0 °C ... +150 °C (+32 °F ... +302 °F)
Measurement range: pressure	1 ... 4,000 mbar
Data memory	4 x 20,000 measurement values

Type	Description	Part No.
EBI 12-TP460	Cable Length = 600 mm	1340-6648

EBI 12-TPX9X Precision Pressure Logger *high precision pressure measurement down to 0.1 mbar*



In the process of H₂O₂ Sterilizers a very precise pressure measurement is necessary. The system works with pressures down to 1 mbar abs. A Highly accurate pressure data logger is necessary caused by the very low pressure nearly by vacuum.



- 1 internal or 1 external temperature sensor, Ø 1.95 mm
- 1 internal pressure sensor

Technical Data

Measurement range: temperature	0 °C ... +85 °C (+32 °F ... +185 °F)
Measurement range: pressure	0.1 ... 1,050 mbar (0.1 ... 788 Torr)
Accuracy: temperature	±0.1 °C
Accuracy: pressure	± 0.25 mbar (0.1 mbar ... 50 mbar) ± 5% of measured value (50 mbar ... 100 mbar) ± 1% FS (100 mbar ... 1,050 mbar)
Resolution: temperature	0.01 °C
Resolution: pressure	0.1 mbar
Data memory	TP190: 50,000 measurement values TP290: 2 x 33,400 measurement values
Sensor: temperature	Pt 1000
Sensor: pressure	Piezoresistive pressure sensor
Measurement mode	<ul style="list-style-type: none"> • Endless measurement immediately • Start / Stop measurement • Measure immediately until end of memory
Operating temperature	0 °C ... +85 °C
Max. operating pressure	0.1 mbar ... 2,000 mbar abs.
Battery	Lithium cell, 3.6 V, user replaceable
Dimensions (D x H)	48 mm x 35 mm
Housing material	316 L Stainless steel / PEEK
Protection class	IP 68

Type	Description	Part No.
EBI 12-TP190	Internal temp. sensor	1340-6665
EBI 12-TP290	Needle Length = 40 mm	1340-6666

EBI 12-TC230 Temperature / Conductivity Data Logger Conductivity measurement



In processes like e.g. washer disinfectors, the measurement of conductivity in the last dishwater is required. This is reasonably done in the running process without any interruption.



Technical Data

Measurement range: temperature	0 °C ... +125 °C (+32 °F ... +257 °F)
Measurement range: conductivity	1 ... 2,000 µS/cm
Accuracy: temperature	± 0.1 °C
Accuracy: conductivity	± 0,5µS/cm (1 ... 100 µS/cm) ± 1 % measurement values (100 ... 2,000 µS/cm)
Data memory	2 x 50,000 measurement values
Sensor: temperature	Pt 1000
Sensor: conductivity	Conductivity electrode
Measurement mode	<ul style="list-style-type: none"> • Endless measurement immediately • Start / Stop measurement • Measure immediately until end of memory
Operating temperature	0 °C ... +125 °C (+32 °F ... +257 °F)
Battery	Lithium cell, user replaceable
Dimensions (D x H)	48 mm x 130 mm
Housing material	316 L Stainless steel / PEEK
Protection class	IP 68

- 1 external temperature probe
- 1 external conductivity probe

Approximately available from end of Q1 2018

Type	Description	Part No.
EBI 12-TC230	Needle Length = 40 mm	1340-6667

EBI 12-TH100 Temperature / Humidity Data Logger insensitive against chemicals



Technical Data

Measurement range: temperature	-20 °C ... +85 °C (-4 °F ... +185 °F)
Measurement range: humidity	0% rF ... 100% rF
Accuracy: temperature	± 0.1 °C
Accuracy: humidity	± 2% rH, non-condensing at 25 °C
Resolution: temperature	0.01 °C
Resolution: humidity	0.1 % rH
Data memory	2 x 50,000 measurement values
Measurement channels: temperature	external (Pt 1000)
Measurement channels: humidity	(capacitive); combined sensor replaceable
Measurement mode	<ul style="list-style-type: none"> • Endless measurement immediately • Start / Stop measurement • Measure immediately until end of memory
Storage temperature	-20 °C ... +70 °C (-4 °F ... +158 °F)
Battery	Lithium cell (3.6 V), user replaceable
Dimensions (D x H)	48 mm x 70 mm
Housing material	316 L Stainless steel / PEEK
Protection class	IP 52

- 1 external temperature sensor (Pt 1000)
- 1 external humidity sensor (capacitive)
- Combined sensor replaceable

Type	Description	Part No.
EBI 12-TH100	Temperature/Humidity	1340-6671

EBI 12-TH100-EX Temperature / Humidity Data Logger usable with EtO



- 1 external temperature sensor (Pt 1000)
- 1 external humidity sensor (capacitive)
- Combined sensor replaceable

Technical Data

Use in EX area	-20 °C ... +85 °C (-4 °F ... +185 °F)
Accuracy: temperature	± 0.1 °C
Accuracy: humidity	± 2% rH, non-condensing at 25 °C
Resolution: temperature	0.01 °C
Resolution: humidity	0.1 % rH
Data memory	2 x 50,000 measurement values
Measurement channels: temperature	external (Pt 1000)
Measurement channels: humidity	(capacitive); combined sensor replaceable
Measurement mode	<ul style="list-style-type: none"> • Endless measurement immediately • Start / Stop measurement • Measure immediately until end of memory
Operating temperature	-20 °C ... +70 °C
Battery	Lithium cell, 3.6 V, user replaceable
Dimensions (D x H)	48 mm x 70 mm
Housing material	316 L Stainless steel / PEEK
Protection class	IP 52

Approximately available from end of Q1 2018

Type	Description	Part No.
EBI 12-TH100-EX	Temperature/Humidity	1340-6671-EX

EBI 12-T480 Temperature Data Logger with strip to connect an external sensors



Sometimes it is necessary to record data with independent probes.

Technical Data

Measurement range	-200 °C ... +400 °C (-328 °F ... +732 °F)
Data memory	2 x 50,000 measurement values
Measurement mode	<ul style="list-style-type: none"> • Endless measurement immediately • Start / Stop measurement • Measure immediately until end of memory
Operating temperature	-90 °C ... +150 °C (-130 °F ... +302 °F)
Battery	Lithium cell, 3.6 V, user replaceable
Dimensions (D x H)	46 mm x 35 mm
Housing material	316 L Stainless steel / PEEK
Protection class	IP 52



- Strip for 2 external Pt 1000 sensors

Type	Description	Part No.
EBI 12-T480	Terminal strip	1340-6633

Data Loggers and Systems for special applications

EBI 16 Electronic Bowie&Dick-Test accordance to DIN EN 285 / ISO 17665 / ISO 11140-4



The EBI 16 Data Logger forms together with the evaluation software Winlog.med an easy to use and reliable electronic measurement system.



This allows implementing a comprehensive routine control of steam sterilizers by means of the electronic Bowie&Dick-Test according to EN 285 / DIN EN ISO 17665. In addition to checking the penetration of steam, the relevant sterilization parameters are also checked.

A vacuum test can also be carried out with this device.

The EBI 16 is designed to ensure the use of 500 cycles or 2 years without calibration or service.

Technical Data

Measurement range temperature	0 °C ... +150 °C (+32 °F ... +302 °F)
pressure	1 mbar ... 4,000 mbar
Accuracy temperature	± 0.1 °C
pressure	± 15 mbar
Resolution temperature	0.01 °C
pressure	1 mbar
Data memory	6,750 measurement values
Sampling rate	1 sec
Measurement mode	Start / Stop measurement
Sensor: temperature	Pt 1000
Sensor: pressure	Piezoresistive pressure sensor
Operating temperature	0 °C ... +150 °C
Storage temperature	0 °C ... +125 °C
Start temperature	+15 °C ... +35 °C
Protection class	IP68
Battery	Lithium cell (3,6 V), replaceable
Battery lifetime	Up to 2 Years
Dimension (D x H)	90 mm x 150 mm
Housing material	316 L Stainless steel / PEEK
Weight	Approx. 500 g (incl. battery)
Calibration	Factory calibration certificate

Accordance to EN ISO 11140-4 certified by an independent laboratory

- **Reliable:** clear, reproducible measurement results
- **Accurate:** high-resolution graphical cycle display
- **Secure:** digital data recording and storage
- **Easy:** to use and evaluate

Type	Description	Part No.
EBI 16	Electronic Bowie&Dick-Test	1340-6697

Accessories and Interface-Sets



Battery replacement set AL 120
for EBI 12

Consisting of 3 batteries, 6 O-rings with grease and opening tool EBI 12



AL 121 opening tool EBI 12

To open the data loggers e.g. for battery change

Battery set AL 104
for EBI 12

Consisting of 3 batteries, 8 O-rings with grease



AL 122 eyelet ring EBI 12

For securing the EBI 12 data loggers in process



Holding clamps probes

To hold the flexible cable probes of the EBI 12 data loggers.



AL 190 Silicone cable strap

To hold the flexible cable probes of the EBI 12 data loggers

Silicone protection box

- Protects EBI 12 Data Loggers against heat peaks
- Protects EBI 12 Data Loggers against mechanical damage
- Extends the life of EBI 12 Data Loggers



Silicone protection box AL 101

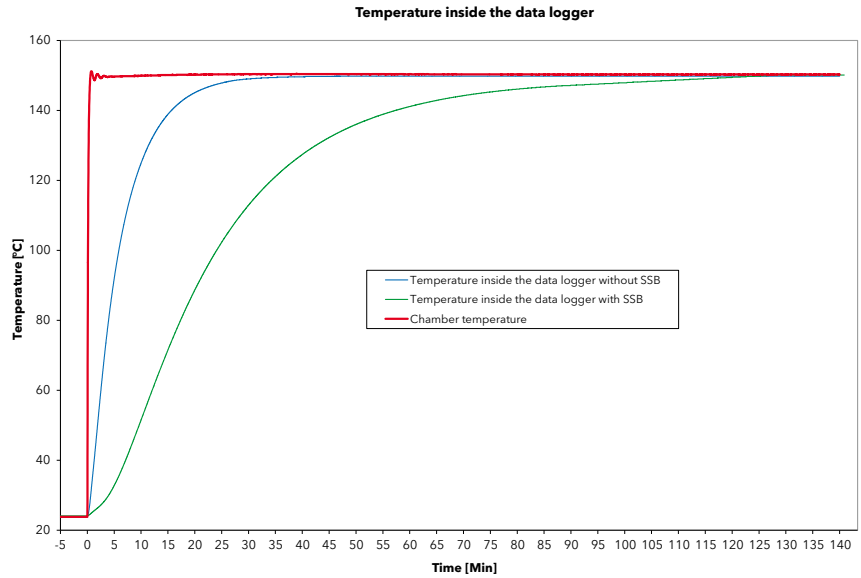
for e.g.
EBI 12-TP222,
EBI 12- TP322,
EBI 12-TP422 and
EBI 12-TP45x

Ø 78 mm,
Height: 50 mm

Silicone protection box AL 107

for e.g.
EBI 12- T24x,
EBI 12-T441,
EBI 12- T67x und
EBI 12-T471

Ø 78 mm,
Height: 44 mm



Thermal Insulation Boxes

- Usable from +150 °C ... +400 °C
- Thermal protection of data loggers
- Stainless steel

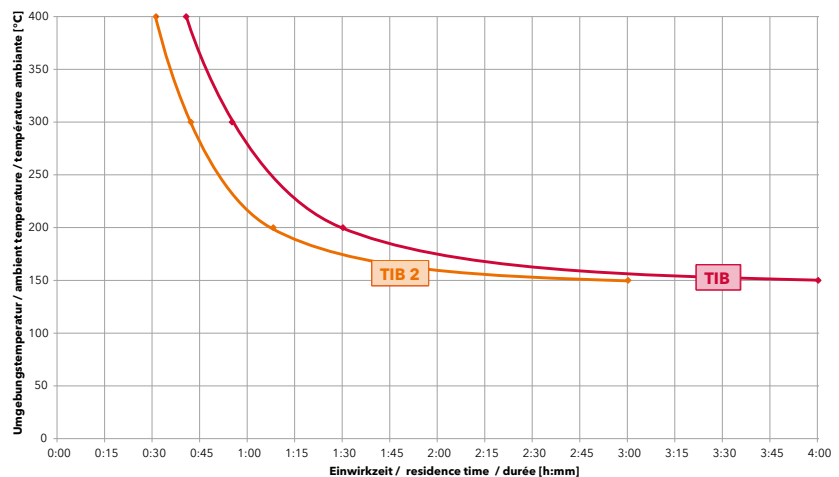


Thermal insulation boxes EBI TIB and EBI TIB 2

for EBI 12-T221 and EBI 12-T421

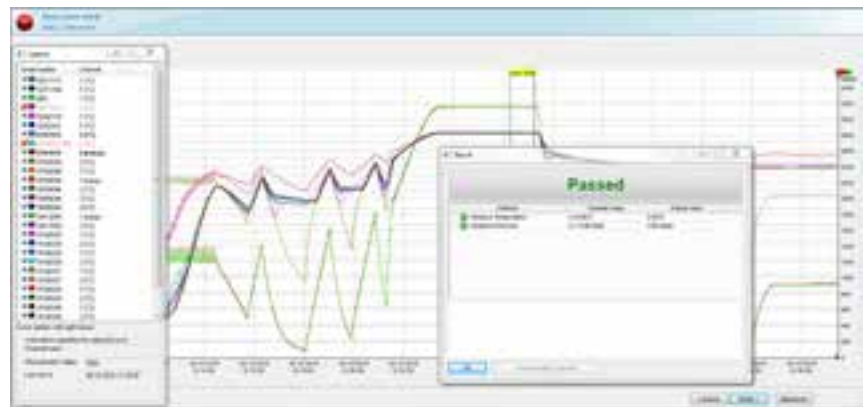
- EBI TIB: 160 mm x 160 mm x 82 mm
- EBI TIB 2: 160 mm x 160 mm x 60 mm

Grenzbedingung / limit condition / condition aux limites TIB / TIB 2



AL 285 **Logger-Check** For thermal validation *DAC UNIVERSAL*

In combination with the software Winlog.validation the AL 285 offers you a simple, on site functional check of the measuring channels.



EN ISO 17665-1, paragraph 9.1.4

Verification of the calibration value of the measuring instrument that is used for the validation of the sterilization process at process condition.

- Easy and reproducible test with automatic generation of reports.
- The tests are stored permanently in the database





Set SI 1100
for EBI 12 and EBI 11

- 2-port Interface IF 100
- Software Winlog.pro
- USB connection
- Colored LEDs signaling programming, readout and incorrect development
- Includes antenna



Set SI 1200
for EBI 12

- 4-port Interface IF 200
- Software Winlog.pro
- USB connection
- Colored LEDs signaling programming, readout and incorrect development
- Includes antenna



Set SI 2100
for EBI 12 and EBI 11

- 2-port Interface IF 100
- Software Winlog.med
- USB connection
- Colored LEDs signaling programming, readout and incorrect development
- Includes antenna



Set SI 2110
for EBI 12

- 4-port Interface IF 200
- Software Winlog.med
- USB connection
- Colored LEDs signaling programming, readout and incorrect development
- Includes antenna



Set SI 2150
for EBI 12 and EBI 16

- 1-port Interface IF 150
- Software Winlog.med
- USB connection
- Colored LEDs signaling programming, readout and incorrect development



Set SI 3200
for EBI 12

- 4-port Interface IF 200
- Software Winlog.validation
- USB connection
- Colored LEDs signaling programming, readout and incorrect development
- Includes antenna



AL 112
for IF100 and IF 200

- Developed for real time monitoring
- AL 112 is a cable with 3 m length
- Antenna placement in the field of the door seal of a sterilizer or washer-disinfector
- Antenna steam-tight
- It is possible by a sealing to introduce it in the chamber



Can adapter set
EBI DA-Set

With this adapter set you can fix the data loggers at cans or plastic bags. Designed for data loggers of the EBI 12 series with axial, radial or external probes. Hereby you assure the use to ensure proper probes placement.



Can adapter EBI DA
for bottle loggers
(see page 14)



Bottle adapter EBI FL-S
silicone
for bottle loggers
(see page 14)



Grommets for sensor fixing EBI NI-140
Allows precise mounting of the logger sensor in cans and glass.

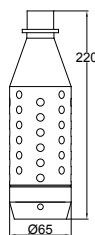


Compression fitting EBI KV-3
Allows precise mounting of the logger sensor in glass (caps).

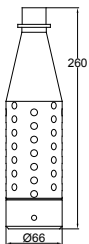
Dummy bottle

Please find EBI 12-T23X Temperature data logger from page 13.

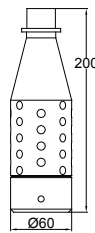
The dummy bottles can be screwed to the ground. This allows the EBI 12 to be positioned within the bottle.



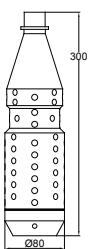
Dummy C



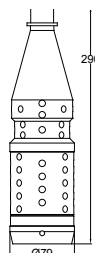
Dummy 0,5 l



Dummy E



Dummy 1 l



Dummy 0,7 l

Type	Description	Part No.
SI 1100	Set: Interface EBI IF 100 and Software Winlog.pro	1340-6061
SI 1200	Set: Interface EBI IF 200 and Software Winlog.pro	1340-6062
SI 2100	Set: Interface EBI IF 100 and Software Winlog.med	1340-6064
SI 2110	Set: Interface EBI IF 200 and Software Winlog.med	1340-6095
SI 2150	Set: Interface EBI IF 150 and Software Winlog.med	1340-6193
SI 3200	Set: Interface EBI IF 200 and Software Winlog.validation	1340-6068
AL 100	Silicone protection box for EBI 12 Temperature Data Logger	1340-6020
AL 101	Silicone protection box for EBI 12 Pressure Data Logger	1340-6021
AL 102	Silicone protection box for EBI 12 Temperature Data Logger	1340-6022
AL 120	Battery change set for EBI 12	1100-0130
AL 121	Battery change tool (2 parts) EBI 12	1100-0131
AL 122	Eyelet ring EBI 12	1100-0132
AL 104	Battery set for EBI 12	1100-0118
AL 106	Silicone protection box for EBI 12 Temperature Data Logger	1340-6023
AL 107	Silicone protection box for EBI 12 Temperature Data Logger	1340-6024
AL 112	Antenna steam sterilizer	1340-6007
AL 190	Silicone cable strap set	1248-0190
AL 285	Logger-Check	1248-0285
Clamp	Holding clamps for probes	1340-0005
EBI TIB	Thermal Isolation box, 160 x 160 x 82 mm	1340-1894
EBI TIB 2	Thermal Isolation box, 160 x 160 x 60 mm	1340-1892
EBI DA	Can adapter for bottle loggers	1340-1963
EBI DA-Set	Can adapter set for bottle loggers	1340-1984
EBI FL-S	Bottle adapter, silicone	1340-1961
EBI NI-140	Grommets for sensor fixing up to 140 °C (100 pieces)	1340-1988
EBI KV-3	Compression fitting	1340-2005
Dummy C	Dummy Bottle POM 220x65mm	1340-2255
Dummy 0,5L	Dummy Bottle POM 0,5l	1340-2256
Dummy E	Dummy Bottle POM 200x60mm	1340-2257
Dummy 1L	Dummy Bottle POM 1l	1340-2258
Dummy 0,7L	Dummy Bottle POM 0,7l	1340-2259

Mini Temperature Data Loggers EBI 11 Series

General technical specifications: valid for all EBI 11-T logger types

Operating temperature	-30 °C ... +150 °C (-22°F ... +302 °F)
Accuracy	±0.2 °C (-30 °C ... +0 °C) ±0.1 °C (0 °C ... +150 °C)
Time accuracy (24h)	< 5 sec
Resolution: temperature	0.01 °C
Data memory	15,000 measurements (total)
Sensor	Pt 1000, Class A
Sampling rate	1 sec ... 24 h
Measurement mode	<ul style="list-style-type: none"> • Endless measurement • Start- / Stop measurement • Measure upon start time • Start immediately until end of memory
Storage temperature	0 °C ... +60 °C (+32 °F ... +140 °F)
Battery	Lithium button cell, 2 x BR1225 A, 3V, replaceable
Dimensions (Ø x H)	16,5 mm x 24 mm*
Weight	Approximately 45 g *
Housing material	Stainless Steel (V4A)
Protection class	IP 68
Certificate	Factory calibration certificate

* Dimensions and weight may be different depending on the type.



EBI 11-T230 to T233 Mini Temperature Data Logger rigid metal probe



Technical Data

Measurement range: temperature	-30 °C ... +150 °C (-22 °F ... +302 °F)
Data memory	15,000 measurement values

- 1 external temperature probe, axial, pointed, Ø 3 mm
- Probe with M5 external thread

Type	Description	Part No.
EBI 11-T230	Needle Length = 20 mm	1340-6290
EBI 11-T231	Needle Length = 50 mm	1340-6292
EBI 11-T233	Needle Length = 100 mm	1340-6293

EBI 11-T235 to T237 Mini Temperature Data Logger rigid metal probe



Technical Data

Measurement range: temperature	-30 °C ... +150 °C (-22 °F ... +302 °F)
Data memory	15,000 measurement values

- 1 external temperature probe, axial, blunt, Ø 1.95 mm
- Probe with M5 external thread

Type	Description	Part No.
EBI 11-T235	Needle Length = 25 mm	1340-6270
EBI 11-T236	Needle Length = 80 mm	1340-6271
EBI 11-T237	Needle Length = 165 mm	1340-6272

EBI 11-T240 Mini Temperature Data Logger
bendable metal probe



Technical Data

Measurement range: temperature	-30 °C ... +150 °C (-22 °F ... +302 °F)
Data memory	15.000 measurement values

- 1 external temperature probe, axial, bendable, Ø 1.5 mm

Type	Description	Part No.
EBI 11-T240	Needle Length = 250 mm	1340-6291



Mini Temperature / Pressure Data Loggers EBI 11 Series

General technical specifications: valid for all EBI 11-P logger types

Operating temperature	0 °C ... +150 °C (+32 °F ... +302 °F)
Accuracy: temperature	±0.1 °C (0 °C ... +150 °C)
Accuracy: pressure	±15 mbar (0 mbar ... 4,000 mbar) ±20 mbar (4,000 mbar ... 10,000 mbar)
Time accuracy (24h)	< 5 sec
Resolution: temperature	0.01 °C
Resolution: pressure	1 mbar
Data memory	7,500 measurement values per channel
Sensor: temperature	Pt 1000, Class A
Sensor: pressure	Piezoresistive (temperature compensated)
Sampling rate	1 sec ... 24 h
Measurement mode	<ul style="list-style-type: none"> • Endless measurement • Start- / Stop measurement • Measure upon start time • Start immediately until end of memory
Storage temperature	0 °C ... +60 °C (+32 °F ... +140 °F)
Battery	Lithium, 2x BR1225A, 3V, user replaceable
Dimensions (Ø x H)	16,5 mm x 48 mm*
Weight	Approximately 45 g *
Housing material	Stainless Steel (V4A)
Protection class	IP 68
Certificate	Factory calibration certificate

* Dimensions and weight may be different depending on the type.



EBI 11-P100 Mini Temperature / Pressure Data Logger
internal sensor



Technical Data

Measurement range: temperature	0 °C ... +150 °C (+32 °F ... +302 °F)
Measurement range: pressure	1 mbar ... 10,000 mbar
Data memory	2 x 7,500 measurement values

- 1 internal temperature sensor
- 1 internal pressure sensor

Type	Description	Part No.
EBI 11-P100	Without pressure connector	1340-6295

EBI 11-P111 Mini Temperature / Pressure Data Logger
Luer-Lock connection



Technical Data

Measurement range: temperature	0 °C ... +150 °C (+32 °F ... +302 °F)
Measurement range: pressure	1 mbar ... 10,000 mbar
Data memory	2 x 7,500 measurement values

- 1 internal temperature sensor
- 1 internal pressure sensor

Type	Description	Part No.
EBI 11-P111	Luer-Lock connection	1340-6296

EBI 11-TP110 Mini Temperature / Pressure Data Logger
M5 thread connection



Technical Data

Measurement range: temperature	0 °C ... +150 °C (+32 °F ... +302 °F)
Measurement range: pressure	1 mbar ... 10,000 mbar
Data memory	2 x 7,500 measurement values

- 1 internal temperature sensor
- 1 internal pressure sensor

Type	Description	Part No.
EBI 11-TP110	M5 thread	1340.6297



Accessories for EBI 11 and 12



Set SI 1100
for EBI 12 and EBI 11

- 2-port Interface IF 100
- Software Winlog.pro
- USB connection
- Colored LEDs signaling programming, readout and incorrect development
- With antenna



Set SI 1300
for EBI 11

- 4-port Interface IF 300
- Software Winlog.pro
- USB connection
- Colored LED signalling programming, readout and incorrect development



Set SI 2100
for EBI 12 and EBI 11

- 2-port Interface IF 100
- Software Winlog.med
- USB connection
- Colored LEDs signaling programming, readout and incorrect development
- With antenna



Set SI 3300
for EBI 11

- 4-port Interface IF 300
- Software Winlog.validation
- USB connection
- Colored LED signalling programming, readout and incorrect development





Battery change set AL 113
for EBI 11

Suitable for 3 battery exchanges; contains 6 batteries, 3 O-rings with grease and changing tools.



AL 114 can/bag adapter set
for EBI 11-T230, EBI 11-T231 and EBI 11-T233



Bottle adapter set AL 115
for EBI 11-T230

Battery change set AL 113L
for EBI 11

Suitable for 10 battery exchanges; contains 20 batteries, 10 O-rings with grease and changing tools.



Sealing kit EBI11-Valiset

The set contains 5 seals. Developed for DAC universal and spypach dummy .

Type	Description	Part No.
SI 1100	Set: EBI IF 100 interface and Winlog.pro software	1340-6061
SI 1300	Set: EBI IF 300 interface and Winlog.pro software	1340-6063
SI 2100	Set: EBI IF 100 interface and Winlog.med software	1340-6064
SI 3300	Set: EBI IF 300 interface and Winlog.validation software	1340-6069
AL 113	Battery changing set for EBI 11	1100-0120
AL 113L	Battery changing set for EBI 11	1100-0125
AL 114	Can / bag adapter set for EBI 11-T230, EBI 11-T231 and EBI 11-T233	1340-6298
AL 115	Bottle adapter set for EBI 11-T230	1340-6299
Sealing kit	Sealing kit EBI11-Valiset	1340-0006



Validation-, routine- and Process control sets

Due to the different requirements for the process control, the routine control and validation of processes, there are different sets at ebro.

As an example, applications for the different sets are clearly displayed in the table. So, it is possible to choose the set suitable for your application at a glance.

	SL 1011	SL 1111	SL 1201	SL 1521	SL 1621	SL 1221	SL 2001	SL 3001	SL 3101	SL 3301	SL 4011	SL 4102	SL 4121
	1250-1011	1250-1111	1250-1201	1250-1521	1250-1621	1250-1221	1250-2001	1250-3001	1250-3101	1250-3301	1250-4011	1250-4102	1250-4121
Routine control in													
Bedpan washer	✓												
Washer disinfectant		✓	✓		✓	✓							
Endoscope washer disinfectant		✓	✓			✓							
Sterilizer < 60 l		✓	✓	BD *	BD */ ✓	✓							
Sterilizer > 60 l		✓	✓	BD *	BD */ ✓	✓		✓		✓			
Validation of Processes in													
Washer disinfectant							✓			✓			
Endoscope washer disinfectant						✓	✓			✓			
Sterilizer < 60 l							✓	✓	✓	✓			
Sterilizer > 60 l									✓				
DAC Universal										✓			
Process control in													
Pasteurization cans											✓		
Pasteurization bottles												✓	✓

* Bowie&Dick-Test

Data Logger Sets



Complete Data Logger Sets for Process control and Monitoring, for Routine Control, Mapping and against Acceptable Quality Limit (AQL)

Description:

- Data Loggers with evaluation software and extensive equipment
- FDA 21 CFR Part 11 conform software

Applications:

- Process control, Monitoring and routine control in steam sterilizers, washer disinfectors, washer disinfectors for endoscopes as well as bedpan washers.
- Implementation of the electronic Bowie&Dick-Test.
- Process and routine control of pasteurization and bottle cleaning processes
- Process and routine control in cooking processes
- Process and routine control in other thermal processes in the food, pharma or medical sector

Advantages:

- Fully automatic and tamper-proof evaluation
- Individual evaluation by user-defined evaluations
- Wide range of wireless data loggers for different applications
- Highly flexible temperature cable probe
- High precision Pt 1000 temperature sensors
- High accuracy up to $\pm 0,05$ °C
- TÜV certified, FDA 21 CFR Part 11 conform software
- 2 years warranty





Complete Data Logger Sets for Operation and Process Qualification

Description:

- Data Loggers for validation with evaluation software and extensive equipment
 - TÜV certified
 - FDA 21 CFR Part 11 conform software
-

Applications:

- Operation and Process Qualification in pasteurization and bottle cleaning processes.
 - Operation and Process Qualification in steam sterilizers, washer disinfectors, washer disinfectors for endoscopes as well as DAC-Universal
 - Operation and Process Qualification in cooking processes
 - Operation and Process Qualification in other thermal processes in the food, pharma or medical sector
-

Advantages:

- Fully automatic and tamper-proof evaluation
 - Individual evaluation by user-defined evaluations
 - Wide range of wireless data loggers for different applications
 - Highly flexible temperature cable probe
 - High precision Pt 1000 temperature sensors
 - High accuracy up to $\pm 0,05$ °C
 - TÜV certified, FDA 21 CFR Part 11 conform software
 - 2 years warranty
-

Data Logger Sets for process- and charge control, for routine control, mapping and Acceptable Quality Limit (AQL)

- **EBI 11 Mini Data Logger Sets**

SL 1201: for washer-disinfectors for endoscope (see page 45)
SL 400X: for temperature monitoring in cans (see page 47)
SL 4102: for temperature monitoring in bottles (see page 48)

- **EBI 16 Bowie&Dick-Test Sets**

according to EN 285 / ISO 17665
SL 1521: for steam sterilizers (see page 46)
SL 1621: for steam sterilizers and washer-disinfectors (see page 46)

- **EBI 12 Precision Data Logger Sets**

For process and routine control of food and pharma processes as well as medical processes according to the German guideline.
SL 1011: for bedpan washers (see page 44)
SL 1111: for steam sterilizers and washer-disinfectors (see page 45)
SL 401X: for temperature monitoring in tins (see page 48)
SL 412X: for temperature monitoring in bottles and cans (see page 49)
SL 4211: for temperature monitoring in different applications (see page 49)

The sets can individually be expanded or compiled yourself from one or more data loggers (EBI 11, EBI 16 or EBI 12), the appropriate interface and the corresponding software. Talk to us!

SL 1011 Temperature Data Logger Set

For temperature monitoring and A_0 value calculation in bedpan washers



The set contains:

- 1 x EBI 12-T100 Temperature data logger (see page 11)
- Winlog.med Software
- EBI IF 150 Interface
- Carrying case „SYSTAINER“
- pH & conductivity tester (see page 57)

Type	Description	Part No.
SL 1011	EBI 12 data logger set for bedpan washers	1250-1011

SL 1111 **Temperature / pressure data logger set** for temperature and pressure monitoring as well as for A_0 value calculation in steam sterilizers, washer-disinfectors and washer-disinfectors for endoscopes



The set contains:

- 1 x EBI 12-TP231 Pressure / temperature data logger with Luer-Lock connection (see page 21)
- AL 101 Silicone protection box for loggers
- Winlog.med Software
- EBI IF 150 Interface
- Carrying case „SYSTAINER“
- pH & conductivity tester (see page 57)



Type	Description	Part No.
SL 1111	EBI 12 Data logger set for steam sterilizers and washer-disinfectors	1250-1111

SL 1201 **Routine Control Set** for Washer-Disinfectors for Endoscopes



For the routine control of washer-disinfectors for endoscopes according to ISO 15883.

This reliable system consists of user-friendly mini data loggers and an Endoscope-Dummy that can be placed directly in the processes.

The set contains:

- 1 x EBI 11-T235 Mini temperature data logger, needle length: 25 mm
- 1 x EBI 11-P111 Mini pressure data logger
- Sealing kit DAC-validation set
- EBI IF 300, 4-port Interface
- Winlog.med, evaluation software
- spypach Endoscope-Dummy "spo-pro" Basic
- Aluminum carrying case EBI TAK ALU



Type	Description	Part No.
SL 1201	Endoscope set routine control BASIC	1250-1201

SL 1521 EBI 16 Bowie&Dick-Test Set for steam sterilizers certified according to ISO 11140-4



The set contains:

- 1 x Bowie&Dick-Test EBI 16
(see page 27)
- Winlog.med software
- EBI IF 150 interface
- Carrying case „SYSTAINER“

Type	Description	Part No.
SL 1521	EBI 16 Bowie&Dick-Test Set for steam sterilizers	1250-1521

SL 1621 EBI 16 Bowie&Dick-Test and Process Control Set for steam sterilizers and washer-disinfectors



The set contains:

- 1 x Bowie&Dick-Test EBI 16
(see page 27)
- 1 x EBI 12-TP231
Temperature / pressure data
logger (see page 21)
- Winlog.med software
- EBI IF 150 interface
- Carrying case „SYSTAINER“

Type	Description	Part No.
SL 1621	EBI 16 Bowie&Dick-Test Set for steam sterilizers and washer-disinfectors	1250-1621

SL 400X EBI 11 Mini Data Logger Set for Pasteurization and Sterilization



for temperature monitoring in cans



The set contains:

- 1 x EBI 11-T23x Mini temperature data logger, needle length: 20 mm, 50 mm or 100 mm
- AL 114 can adapter set
- EBI IF 100 interface
- Winlog.pro software
- Carrying case „SYSTAINER“



Mini Temperature Data Logger, 1-channel	
Type	
EBI 11-T230	Needle length: 20 mm
EBI 11-T231	Needle length: 50 mm
EBI 11-T233	Needle length: 100 mm

Type	Description	Part No.
SL 4002	EBI 11-T230 Set for pasteurization and sterilization	1250-4002
SL 4003	EBI 11-T231 Set for pasteurization and sterilization	1250-4003
SL 4004	EBI 11-T233 Set for pasteurization and sterilization	1250-4004

SL 401X EBI 12 Data Logger Set for Pasteurization and Sterilization for temperature monitoring in tins



The set contains:

- 1 x EBI 12-T23X Temperature data logger, needle length: 50 mm, 75 mm, 100 mm or 150 mm
- EBI DA-SET Can Adapter
- EBI IF 100 Interface
- Winlog.pro Software
- Carrying case „SYSTAINER“



Type	Description	Part No.
SL 4011	EBI 12-T230 set for pasteurization and sterilization	1250-4011
SL 4012	EBI 12-T231 set for pasteurization and sterilization	1250-4012
SL 4013	EBI 12-T232 set for pasteurization and sterilization	1250-4013
SL 4014	EBI 12-T233 set for pasteurization and sterilization	1250-4014

SL 4102 EBI 11 Mini Data Logger Set for Pasteurization for temperature monitoring in bottles



The set contains:

- 1 x EBI 11-T230 Mini temperature data logger, needle length: 20 mm
- AL 115 Bottle adapter set
- EBI IF 100 interface
- Winlog.pro software
- Carrying case „SYSTAINER“

Type	Description	Part No.
SL 4102	EBI 11-T230 Mini data logger set for pasteurization	1250-4102

SL 412X EBI 12 Data Logger Set for Pasteurization for temperature monitoring in bottles and cans



The set contains:

- 1 x EBI 12-T46X Temperature data logger, needle length: 135 mm, 190 mm, 245 mm, 270 mm or 300 mm
- EBI FL-S Bottle Adapter
- EBI DA Can Adapter
- EBI IF 100-1 Interface
- Winlog.pro Software
- Carrying case „SYSTAINER“

Type	Description	Part No.
SL 4121	EBI 12-T461 Data logger set for pasteurization	1250-4121
SL 4122	EBI 12-T462 Data logger set for pasteurization	1250-4122
SL 4123	EBI 12-T463 Data logger set for pasteurization	1250-4123
SL 4124	EBI 12-T464 Data logger set for pasteurization	1250-4124
SL 4125	EBI 12-T465 Data logger set for pasteurization	1250-4125

SL 4211 EBI 12 Basic Temperature Monitoring Set Temperature monitoring system for different applications



The set contains:

- 1 x EBI 12-T100 Temperature data logger
- EBI IF 100 Interface
- Winlog.pro Software
- Carrying case „SYSTAINER“

Type	Description	Part No.
SL 4211	EBI 12 Basic temperature monitoring set	1250-4211

Data Logger Sets for Operation and Process Qualification

- **EBI 11 Mini Data Logger Sets**

SL 1221: Validation set for washer-disinfectors for endoscopes (see page 50)

SL 3301: Validation set for DAC Universal, small sterilizers and washer-disinfectors (see page 52)

- **EBI 12 Precision Data Logger Sets**

SL 2001: for washer-disinfector (see page 51)

SL 3001: for benchtop sterilizers (see page 51)

SL 3101: for large steam sterilizers (see page 52)

The sets can individually be expanded or compiled by yourself from one or more data loggers (EBI 11, EBI 16 or EBI 12), the appropriate interface and the corresponding software. Talk to us!

SL 1221 Complete Validation Set for Washer-Disinfectors for Endoscopes



For the validation of thermal processes in washer-disinfectors for endoscopes according to ISO 15883.

This reliable system consists of user-friendly mini data loggers and an Endoscope-Dummy that can be placed directly in the processes.



The set contains:

- 3 x EBI 11-T235 Mini temperature data logger, needle length: 25 mm
- 1 x EBI 11-P111 Mini pressure data logger
- Sealing kit EBI 11-Valiset
- EBI IF 300, 4-port Interface
- Winlog.validation, evaluation software
- spypach Endoscope-Dummy "spo-pro" Professional
- Aluminum carrying case

Adequate pH and conductivity meters, see page 55.

Type	Description	Part No.
SL 1221	Endoscope set validation PROFESSIONAL	1250-1221
Spo-pro BASIC	Dummy BASIC without logger	1340-6086
Spo-pro-CLASSIC	Dummy CLASSIC without logger	1340-6087
Spo-pro PROFESSIONAL	Dummy PROFESSIONAL without logger	1340-6088

SL 2001 Complete Validation Set for washer-disinfectors



For the validation of washer-disinfectors according to ISO 15883. The set can individually be expanded or compiled yourself from one or more data loggers (EBI 12 or EBI 11), the appropriate interface and corresponding software. Talk to us!

The set contains:

- 1 x EBI 12-T220 Temperature data logger
- 2 x EBI 12-T441 Temperature data loggers
- 1 x EBI 12-TP231 Temperature/pressure data logger
- EBI IF 200, 4-port Interface with USB connection and antenna
- TÜV certified software Winlog.validation
- Carrying case „SYSTAINER“



Type	Description	Part No.
SL 2001	Validation set for washer-disinfectors	1250-2001

SL 3001 Complete Validation Set for benchtop steam sterilizers



For the validation of small steam sterilizers according to ISO 17665.

The set can individually be expanded or compiled yourself from one or more data loggers (EBI 11, EBI 16 or EBI 12), the appropriate interface and corresponding software. Talk to us!

The set contains:

- 1 x EBI 12-TP453 Temperature/pressure data logger with AL 101 silicone protection box
- EBI IF 200 4-port Interface with USB connection and antenna
- TÜV certified software Winlog.validation
- Carrying case „SYSTAINER“



Type	Description	Part No.
SL 3001	Validation set for small steam sterilizers	1250-3001

SL 3101 Complete Validation Set for large steam sterilizers



For the validation of steam sterilizers according to ISO 17665.

The set can individually be expanded or compiled yourself from one or more data loggers (EBI 11, EBI 16 or EBI 12), the appropriate interface and and corresponding software. Talk to us!

The set contains:

- 5 x EBI 12-T471 Temperature data loggers with AL 107 silicone protection boxes
- 1 x EBI 12-TP453 Temperature/pressure data logger with AL 101 silicone protection box
- EBI IF 200, 4-port Interface with USB connection and antenna
- TÜV certified software Winlog.validation
- 2 x AL 190 silicone cable strap sets
- Carrying case „SYSTAINER“



Type	Description	Part No.
SL 3101	Validation set for large steam sterilizers	1250-3101

SL 3301 Complete Validation Set for DAC UNIVERSAL, small steam sterilizers as wells as washer disinfectors



Very flexible data logger system to perform validations for various thermal processes in the DAC Universal and benchtop autoclaves according to ISO 17665/DIN 58929 as well as washer disinfectors according to ISO 15883.

This reliable system consists of user-friendly mini data loggers that can be placed directly in the processes and an evaluation software package that has been certified by the TÜV.

The set contains:

- 2 x EBI 11-T235 Mini temperature data logger, needle length: 25 mm
- 2 x EBI 11-T236 Mini temperature data logger, needle length: 80mm
- 1 x EBI 11-T237 Mini temperature data logger, needle length: 165mm
- 1 x EBI 11-P111 Mini pressure data logger
- Sealing-kit for EBI 11
- EBI IF 300, 4-port Interface
- Winlog.validation Software
- Carrying case „SYSTAINER“



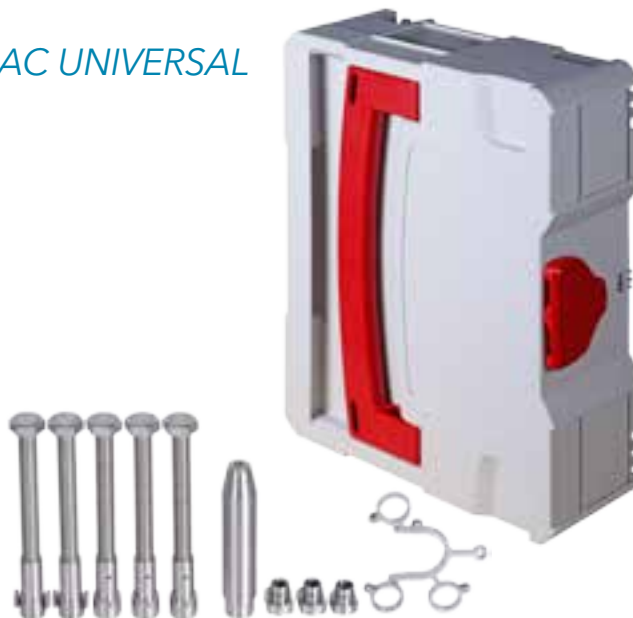
Type	Description	Part No.
SL 3301	Validation set for DAC Universal, small steam sterilizers as well as washer disinfectors	1250-3301

Equipment for operation- or process qualification

AL 3300 DAC Adapter-Set for validation of the thermal process in DAC UNIVERSAL

The set contains:

- 1 x Logger mount
- 1 x PCD test body incl. adapter for ISO, Sirona and KaVo
- 5 x M12x100 worst case load incl. adapter
- Carrying case „SYSTAINER“



AL 3301 – 3303 DAC Adapter-Set for validation of the cleaning capacity in the DAC UNIVERSAL

The AL 3301 set contains:

- 3 x Adapter for test soil „ISO“ Connection

The AL 3301 set contains:

- 3 x Adapter for test soil „Sirona“ Connection

The AL 3301 set contains:

- 3 x Adapter for test soil „KaVo“ Connection



Designed to use the test soil from the SMP GmbH Tübingen.

Other Accessories

AL 126 Test adapter for hollow bodies, hoses and endoscopes for validation in washer-disinfector and endoscope washer

For measuring the temperature and pressure within hollow bodies

Exact measurement of the temperature due the plastic housing



Approximately available from end of Q1 2018

AL 127 Trolley „SYSTAINER“ for the easy transport of Systainers

For transport of systainers

Fixed seat of the systainers on the trolley



Type	Description	Part No.
AL 3300	DAC Adapter set for thermal testing	1340-6052
AL 3301	DAC Test soil adapter set „ISO“	1248-3301
AL 3302	DAC Test soil adapter set „Sirona“	1248-3302
AL 3303	DAC Test soil adapter set "Kavo"	1248-3303
AL 126	Test adapter for hollow bodies, hoses and endoscopes	1248-0126
AL 127	Trolley „Systainer“	1248-0127

Adequate pH- and Conductivity Meters for Validation Sets

PHT 830 pH Meter with temperature compensation



- Configuration directly on device using 5 buttons and display
- Graphic LCD display with backlight
- Logging function
- Temperature compensated
- Software connection by IF 830, Winlog.pro, Winlog.med, Winlog.validation

Technical Data

Measurement range	pH:	0 pH ... 14 pH
	mV:	-1,999 ... 1,999 mV
	temperature:	-10 °C ... +100 °C
Resolution	pH:	0.01 pH;
	mV:	1 mV
	temperature:	0.1 °C
Accuracy	pH:	± 0.03 (± 2 pH-units)
	temperature:	± 0.1 °C
Memory		4,000 measurement values
Temperature		-10 °C ... +100 °C
Display		128 x 64 Pixel, backlight
Interface		USB with "Interface HMG USB", galvanically isolated
Battery		3 Batteries Type AA, IEC R6, LR6, 1.5 V
Ambient		-10 °C ... +55 °C
Relative humidity		Max. < 95% (not condensating)
Connections		Connectors BK (4-pin interface socket)
Housing		ABS
Protection class		IP 65
Dimension (L x W x D)		200 mm x 95 mm x 40 mm
Weight		290 g incl. Batteries

CT 830 Conductivity Meter with auto range



- Configuration directly on device using 5 buttons and display
- Graphic LCD display with backlight
- Logging function
- Temperature compensated
- Software connection by IF 830, Winlog.pro, Winlog.med, Winlog.validation

Technical Data

Measurement range		0 ... 200 µS	TDS 0 ... 200 mg/l
		0 ... 2,000 µS	TDS 0 ... 2,000 mg/l
Resolution		0.1 µS; 1 µS	
Accuracy	conductivity:	± 0.5 % of the measuring range	
	temperature:	± 0.1 °C	
Memory		4,000 measurement values	
Temperature		-10 °C ... +100 °C	
Display		128 x 64 Pixel, backlight	
Interface		USB with "Interface HMG USB", galvanically isolated	
Battery		3 Batteries Type AA, IEC R6, LR6, 1.5 V	
Ambient		-10 °C ... +55 °C	
Relative humidity		< 95% (not condensating)	
Connections		Connectors BK (4-pin interface socket)	
Housing		ABS	
Protection class		IP 65	
Dimension (L x W x D)		200 mm x 95 mm x 40 mm	
Weight		290 g incl. Batteries	

Type	Description	Part No.
PHT 830 SET 1	pH Meter with plastic electrode	1340-5812
CT830 SET	Conductivity Meter with plastic electrode	1340-5835

Various electrodes for PHT 830

AT 830 pH K Binder

Temperature compensated
Housing material: plastic
Cable length: 150 cm
Diameter: 12 mm
Shaft length: 120 mm



AT 830 pH G Binder, laboratory electrode

Temperature compensated
Shaft housing material: glass
Cable length: 100 cm
Shaft diameter: 12 mm
Shaft length: 120 mm



AT 830 pH E Binder, penetration electrode

Temperature compensated for measurements in semi-solid food products and other materials.

Housing material: glass
Cable length: 100 cm
Shaft/electrode diameter: 15 mm/5 mm
Shaft/electrode length: 65 mm/12 mm



Technical Data	AT 830 pH K	AT 830 pH G	AT 830 pH E
pH measurement range	0 pH ... 14 pH	0 pH ... 14 pH	2 pH ... 13 pH
Temperature measurement range	0 °C ... +100 °C (+32 °F ... +212 °F)	0 °C ... +100 °C (+32 °F ... +212 °F)	+5 °C ... +80 °C (+41 °F ... +176 °F)
Electrolyte	Gel	Gel	Referid®

Type	Description	Part No.
AT 830 pH K Binder	Plastic electrode	1339-0661
AT 830 pH G Binder	Measurement electrode for laboratories	1339-0662
AT 830 pH E Binder	Penetration electrode	1339-0663

Electrode for CT 830

AT 830 C Binder

Temperature compensated
Housing material: plastic
Cable length: 150 cm
Diameter: 12 mm
Shaft length: 120 mm



Technical Data	AT 830 C
Conductivity measurement range	0 μS ... 500 mS
Temperature measurement range	0 °C ... +100 °C (+32 °F ... +212 °F)

Type	Description	Part No.
AT 830 C Binder	Plastic electrode	1339-0660

Interface cable for PHT 830 and CT 830

EBI IF 830

For reading out the memory of the PHT 830 and CT830

- Software connection
Winlog.pro, Winlog.med,
Winlog.validation



Type	Description	Part No.
EBI IF 830	Interface for PHT 830 and CT 830	1340-6011

PHX 800 Basic pH Tester with acoustic signal



- Automatic deactivation
- Battery charge indicator
- Replaceable battery

Technical Data

pH measurement range	0 pH ... 14 pH
pH measurement accuracy	0.1 pH
pH resolution	±0.2 pH
Operating temperature	0 °C ... +50 °C (+32 °F ... 122 °F)
Storage temperature	-25 °C ... +60 °C (-13 °F ... 140 °F)
Housing material	ABS plastic
Dimension (L x W x H)	170 x 32 x 15 mm
Weight	Approximately 70 g
Battery	1.5 V A76/LR44
Battery lifetime	Approximately 150 hours
Deactivation	Automatically after 15 minutes

Type	Description	Part No.
PHX 800	Basic pH Tester	1340-5800

TDS 3 Basic Conductivity Tester Dual Display



- Battery charge indicator
- Replaceable battery

Technical Data

Measurement range	0 ... 1,999 µS	0 ... 1,999 ppm
	0 ... 19.99 mS	0 ... 19.99 ppt
Measurement accuracy	1 µS	
Resolution	1 µS	
Operating temperature	0 °C ... +50 °C (+32 °F ... 122 °F)	
Storage temperature	-25 °C ... +60 °C (-13 °F ... 140 °F)	
Housing material	ABS plastic	
Dimension (L x W x H)	170 x 32 x 15 mm	
Weight	Approximately 70 g	
Battery	4 x 1.5 V A76/LR44	
Battery lifetime	Approximately 150 hours	

Type	Description	Part No.
TDS 3	Basic Conductivity Tester	1340-5831

Process Monitoring



EBI 25
Wireless Data Logger System

Description:

- Radio data logger system for temperature and humidity measurements
- Other measurements can be integrated using Modbus over IP or other protocols
- Automatic alarm when limit is exceeded
- Automatic report generation

Applications:

- Continuous monitoring of Food in cooling or freezing areas, Drugs and vaccine in Drug Stores, clinical trials in labs and in Warehouses



EBI 40
Multi-Channel Temperature
Data Logger

Description:

- Temperature data logger for up to 6 or 12 thermocouple sensors with SMP connection
- Current measurement values and measurement curve shown on multi-color TFT display
- With USB connection for fast programming and readout of the measurement data

Applications:

- Monitoring of food in cooling or freezing areas, drugs and vaccine in drug stores, clinical trials in labs and in warehouses





EBI 3x0 PDF Data Logger

Description:

- Single-use and multi-use data loggers for temperature and humidity measurement
- USB connection
- Automatic PDF report generation with all measurement data
- Easy programming of the data loggers via the free online configurator at www.ebi300.com, no special software required

Applications:

- Monitoring of food in cooling or freezing areas, drugs and vaccine in drug stores, clinical trials in labs and in warehouses

EBI 40 Multi-Channel Temperature Data Logger

The EBI 40 Multi-Channel Temperature Data Logger records temperatures during process monitoring and validation. Current measurement values and the measurement curve can be read on the multi-colored TFT display. The thermal insulation using the thermo isolation box allows the use of the data logger at very high temperatures. The EBI 40 is suitable for the connection of up to six or twelve thermocouple probes.

Applications:

Monitoring and validation of processes in:

- Incubators
- Refrigerators
- Climate cabinets
- Storage rooms
- Transport studies
- Freeze-dryers etc.



EBI 40-TC Multi-Channel Data Logger for type K and T thermocouple sensors



EBI 40-TC-01

EBI 40-TC-02

Technical Data

Measurement range	-200 °C ... +1,200 °C (-328 °F ... +2,192 °F)
Accuracy	±0.5 °C (at 25 °C)
Resolution	0.1 °C (0.2 °F)
Channels	6 or 12 temperature channels
Sampling rate	Adjustable from 0.1 sec to 24 hours
Sensor	Thermocouple Type K / SMP connection
Operating temperature	0 °C ... +60 °C (0 °F ... +140 °F)
Storage temperature	0 °C ... +70 °C (32 °F ... 158 °F)
Memory	20,000 measurements per channel (max. 240,000 measurements)
Measurement mode	<ul style="list-style-type: none"> • Endless measurement immediatley • Measure immediatley until end of memory • Start / stop measurement
Display	TFT-display 3.5" (324 x 240 Pixel)
Dimensions (L x W x H)	140 x 118 x 35 mm
Housing material	ABS + PC
Protection class	IP 40
Certificate	Factory Calibration Certificate

Matching probes can be found
online at www.ebro.com

Type	Description	Part No.
EBI 40-TC-01	6-channel data logger (without probes)	1340-6400
EBI 40-TC-02	12-channel data logger (without probes)	1340-6401

Accessories for EBI 40



Similar to photo

EBI TIB 400-01 Thermal Isolation Box for EBI 40

Sturdy thermal barrier (stainless steel and ceramic)

- Heat resistant insulation
- Replaceable sealing and cooling element
- Easy to transport
- Protects EBI 40 for 2 hours at +250°C (+482 °F)
- Dimensions (with folded handles): 247 x 210 x 131 mm

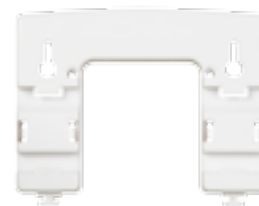


AN 141 Adapter cable, 1 m silicone (SMP/Lemo size 0)



AN 142 Extension cable, 1 m silicone, SMP

AN 144 Extension cable, 2.5 m, silicone, SMP



Wall mount **EBI 40-WH** Bracket for 35 mm cap rail

Type	Description	Part No.
AN 141	Adapter cable, 1 m silicone SMP/Lemo size 0	1341-2629
AN 142	Extension cable, 1 m silicone, SMP	1343-2626
AN 144	Extension cable, 2.5 m silicone, SMP	1343-2627
EBI TIB 400-01	Thermal Isolation Box for EBI 40	1340-6430
EBI 40-WH	EBI 40 wall mount	1340-6431

EBI 25 Wireless Data Logger System

The EBI 25 system for wireless monitoring of temperature, humidity and other measurements assures that perishable goods are produced and stored at the right conditions at all times. Other measurements can be integrated using Modbus over IP.

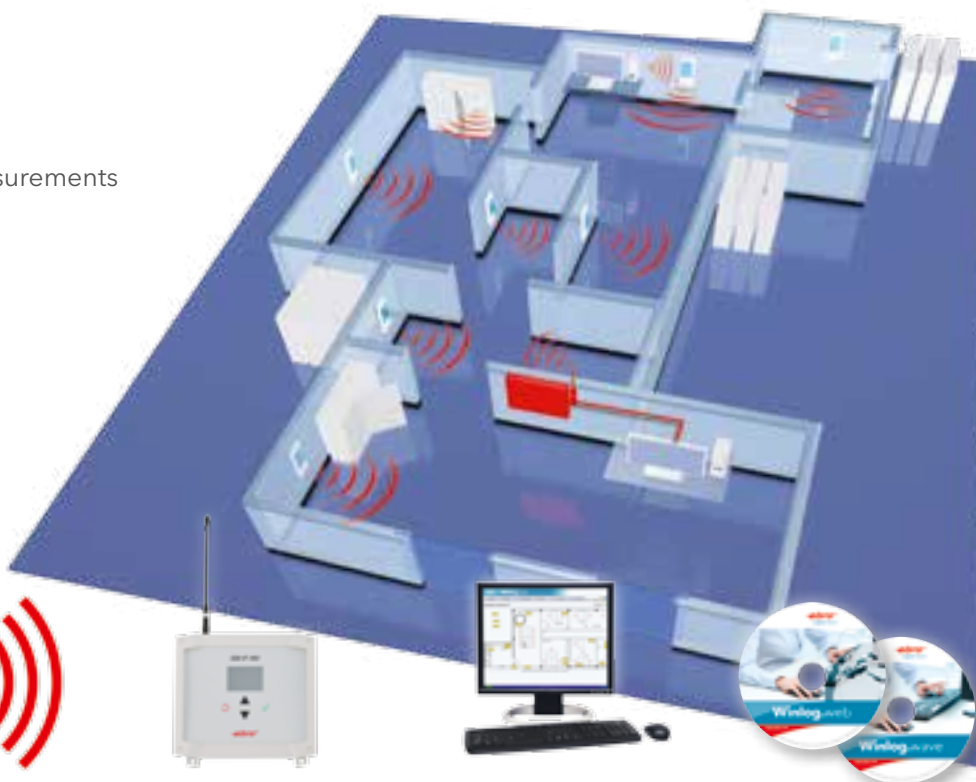
Benefits:

- Continuous monitoring
- Avoid loss of goods
- Quick intervention before it is too late
- Automatic documentation
- Worldwide access to the measurement data
- Easy handling, user replaceable battery



Embedding of other measurements possible:

- Differential pressure
- CO₂
- Particles
- Power demand
- Many others



EBI 25 data loggers

- Precise measurement of temperature and humidity (depends on logger type)
- Very large range of up to 500 m in a free field
- Long battery lifetime
- Easy installation

Base station: IF 400 interface

- Collects and stores the data of all connected EBI 25 data loggers
- Connection of up to 50 loggers per interface possible
- Stores up to 576 measurements per logger
- Direct connection of any number of interfaces to a PC or the network
- Audible alarm (with optional alarm box)

Evaluation software:

Winlog.web and Winlog.wave

Winlog.wave: Basic version for local PC usage.

Winlog.web: Professional version for internet and local network based use.



Please find more information from page 80.

General technical specifications: valid for all EBI 25 data logger types*

Resolution: temperature	0.1 °C (0.2 °F) in a range of -99.9 °C ... +199.9 °C (-147.8 °F ... +391.8 °F) 1 °C (2 °F) of the remaining measurement range
Resolution: humidity (humidity data loggers only)	0.1% rH
Memory	288 measurement values (per channel)
Sampling rate	1 min. to 24 hours, adjustable
Radio frequency	868 MHz in EU
Battery	3.6 V lithium (user replaceable)
Battery lifetime	Up to 2 years, depending on measurement and transmission rate
Storage temperature	-40 °C ... +85 °C (-40 °F ... +185 °F)
Operating temperature	-30 °C ... +60 °C (-22 °F ... +140 °F)
Measurement mode	Endless measurement
Housing material	ABS
Weight	Approximately 65 g

* Please find the exact technical data of each EBI 25 data logger type on the next pages.

EBI 25-T Wireless Temperature Data Logger with internal temperature sensor



Technical Data

Measurement range	-30 °C ... +60 °C (-22 °F ... +140 °F)
Accuracy	±0.5 °C at -20 °C ... +40 °C (±0.9 °F at -4 °F ... 104 °F) ±0.8 °C (±1.4 °F) for the remaining measurement range
Sensor	NTC
Protection class	IP67
Dimensions (L x W x H)	95 x 48 x 27 mm
Factory Calibration Certificate	-20 °C and 0 °C

Type	Description	Part No.
EBI 25-T	Wireless temperature logger (with internal sensor)	1340-6200

EBI 25-TE Wireless Temperature Data Logger with external probe



Technical Data

Measurement range	-40 °C ... +85 °C (-40 °F ... +185 °F)
Accuracy	±0.5 °C -20 °C ... +40 °C (±0.9 °F at 4 °F ... 104 °F) ±0.8 °C -30 °C ... -20 °C / +40 °C ... +60 °C (±1.4 °F at -22 °F ... -4 °F / +104 °F ... +140 °F) ±1.5 °C -40 °C ... -30 °C / +60 °C ... +85 °C (±2.7 °F at -40 °F ... -22 °F / +140 °F ... +185 °F)
Sensor	NTC
Probe	Ø 3.8 mm, L = 65 mm, with 2 m PUR cable
Protection class	IP 67
Dimensions (L x W x H)	95 x 48 x 27 mm (without probe)
Factory Calibration Certificate	-20 °C and 0 °C

Type	Description	Part No.
EBI 25-TE	Wireless temperature logger (with external probe)	1340-6201

EBI 25-TX Wireless Temperature Data Logger for high and low temperatures



Technical Data

Measurement range	-200 °C ... +199.9 °C (-328 °F ... +391.8 °F)
Accuracy*	±2 °C (-200 °C ... -100 °C) ±0.5 °C (-100 °C ... -20 °C and +60 °C ... +199.9 °C) ±0.4 °C (-20 °C ... +60 °C)
Probe	Ø 5 mm, L = 50 mm, with 3 m PTFE cable
Probe connection	Binder, series 620
Sensor	Pt 1000
Protection class	IP 67
Dimensions (L x W x H)	135 x 48 x 27 mm (without probe)
Factory Calibration Certificate	-80 °C, 0 °C and +134 °C

*Accuracy only applies when using an adjusted probe

Type	Description	Part No.
EBI 25-TX	Temperature data logger (with probe TPX 25-3)**	1340-6204
EBI 25-TX	Temperature data logger (without probe)	1340-0025
TPX 25-3	Pt 1000 probe for EBI 25-TX, 3 m	1341-0025
TPX 25-5	Pt 1000 probe for EBI 25-TX, 5 m	1341-0026
TPX 25-7,5	Pt 1000 probe for EBI 25-TX, 7,5 m	1341-0027
TPX 25-10	Pt 1000 probe for EBI 25-TX, 10 m	1341-0028

** Calibration certificate valid only for logger and probe.

EBI 25-TH Wireless Temperature / Humidity Data Logger with external humidity sensor



At www.ebro.com you will find matching filter caps for sensor protection.

Technical Data

Measurement range: temperature	-30 °C ... +60 °C (-22 °F ... +140 °F)
Measurement range: humidity	0% rH ... 100% rH
Accuracy: temperature	±0.5 °C -20 °C ... +40 °C (± 0.9 °F at -4 °F ... 104 °F) ±0.8 °C (±1.4 °F) for the remaining measurement range
Accuracy: humidity	±3 % rH (10 % ... 90 %)
Sensor	NTC for temperature / capacity humidity sensor
Protection class	IP 20
Dimensions (L x W x H)	124 x 48 x 27 mm (with probe)
Factory Calibration Certificate	0 °C and +20 °C

Type	Description	Part No.
EBI 25-TH	Wireless temperature / humidity logger	1340-6202
AH 100	PTFE filter for EBI 25-TH	1340-5627
AH 200	Bronze sintered filter for EBI 25-TH	1340-5626
AH 300	Stainless steel sintered filter for EBI 25-TH	1340-5625

Sets and Accessories for EBI 25



AL 250 - Protection Box for EBI 25 TE and TX

Protects the data logger from hose water, as it is the case when cleaning production sites.

Delivery Contents:
Incl. Mounting material, drill template, holder for EBI 25 logger.

Technical Data

Protection Class	IP 67
Dimensions (L x W x H)	170 x 80 x 68 mm



EBI 2 AB-2 - Alarmbox to connect to interface IF 400

If you prefer to be informed about a violation of the limit, close the alarm box to the IF 400 base station. Depending on the setting in the software, you will receive an alarm via this base station or the loggers.

The alarm box has a potential-free changeover contact which is used to connect additional devices for alarming.

Delivery Contents:
Incl. Mounting material

Technical Data

Supply Voltage	100 to 250 V AC
max. switched power	8A, 30V DC / 250V AC
Dimensions (L x W x H)	120 x 80 x 55 mm



AL 251 - orange Flash Light and buzzer combination

You can connect the LED / buzzer combination to the potential-free contact of the alarm box for visual alarm in case of limit violations.

Delivery Contents:
Power supply and connection cable are not included.

Technical Data

Supply Voltage	24 V DC
loudness	92 dB
Protection Class	IP 65
Dimensions (L x W x H)	120,5 x 91 x 91 mm



EBI IF 400 - Interface for EBI 25 data logger

The interface works as a communication interface between EBI 25 data logger and software Winlog.wave or Winlog.web

Delivery Contents:
Antenna, Power Supply, USB-cable.

Technical Data

Protection Class	IP 20
Dimensions (without Antenna) (L x W x H)	150 x 180 x 45 mm
Operating Temperature	-25 °C ... +50 °C
USB-Connection	Typ B 100 mA USB 1.1
LAN-Connection	Ethernet 10 / 100



AG 152 - Wall Mount for EBI 25 data logger

The AG 152 is used for simple and secure attachment of the EBI 25 data loggers.

Delivery Contents:
Logger fastening, Opening tool, Mounting material (double sided tape, screws, dowel, cable ties).

Technical Data

Material	ABS
Dimensions (L x W x H)	150 x 180 x 45 mm



AL 116 - external Antenna to connect with IF 400

Install the antenna in the wet area and increase the range.

Delivery Contents:
Mounting material (screws / dowel).

Technical Data

Cable length	3 m
Dimensions (L x W)	110 x 255 mm

Type	Description	Part No.
AG 152	Wall Mount for EBI 25 data logger	1340-6215
AL 250	Protection Box for EBI 25 TE and TX	1248-0250
EBI 2 AB-2	Alarm box to connect with interface IF 400	1613-1301
AL 251	Orange Flash Light and Buzzer combination	1340-6233
AL 252	Power supply 24V for AL 251 Flash - Light	1220-0355
EBI IF 400	Interface for EBI 25 data logger	1340-6210
AL 116	External Antenna	1340-6211
AL 120	Power supply 12V for Interface IF 400 - for replacement	1220-0350
Winlog.web	Web based Evaluation Software - Server solution	1340-2390
Battery	Battery for EBI 25 data logger	1100-0121

EBI 3x0 PDF Data Loggers

Cold Chain Monitoring

The easy to use data loggers with USB connection monitor the temperature and/or humidity during transport and storage of sensitive goods like medicine, food, serums etc. Measurement reports are created automatically as PDF files when you connect the logger to a PC.

The EBI 300 and EBI 310 PDF data loggers are suitable for multi-use, the EBI 330 data loggers are single-use versions which can be ordered preconfigured and are used especially when returning a more expensive multi-use logger to the sender after a shipment is difficult. Please contact us for more information.



Program | Measure

- Programming of the logger with the help of the free online configurator at **www.ebi300.com** or optionally via the ebro software Winlog.basic, Winlog.light or Winlog.pro
- Set optional limits and start to record the measurement data

Connect | Readout

- Connection of the logger to any PC via the USB port
- Automatic generation of a PDF report with all important measurement data

Evaluate | Archive

- Store, save or email the PDF-report
- Further processing of the measurement data with the software Winlog.basic, Winlog.light or Winlog.pro

Benefits

- Direct USB connection
- Automatic PDF report generation
- Programmable at **www.ebi310.com**, no special software for programming and readout required but available
- Indication of alarm status via flashing LED
- Data integrity
- Conforms with FDA 21 CFR Part 11, DIN EN 12830 and ATP
- The data loggers help you to comply with GMP and VO (EG) 37/2005
- Free firmware updates at your place via software
- Excellent value-for-money



Digital interface

- Digital interface between loggers and external probes (at EBI 300 TE, EBI 300 TH, EBI 310 TE, EBI 310 TH, EBI 310 DI and EBI 310 TX).
- Data logger functions as data collector with optional internal sensor
- Easy exchange of the external probes e.g. for calibration: remove and send probe, connect replacement probe, measure!
- No calibration of the data collector required, if internal probe is not used!

Which EBI 310 PDF data logger is the right one for your application?

Every EBI 3x0 PDF data logger has the afore mentioned properties. Depending on the application, claim and your purse, there are different requirements for which we have the right devices. The following overview shall help making the decision.

	EBI 310	EBI 310 TE	EBI 310 DI	EBI 310 TX	EBI 310 TH
Applications					
Monitoring of deep temperatures		✓	✓	✓*	
Monitoring of high temperatures		✓		✓*	
Humidity monitoring					✓
Storage monitoring	✓	✓	✓	✓*	✓
Transport monitoring	✓	✓	✓	✓*	✓
Process monitoring		✓		✓*	✓
Usage within dry ice			✓		
Measurement channels					
Internal temperature channel	✓	✓	✓	✓	✓
External temperature channel		1	1	2 *	1
Sensor cable		✓	✓	✓*	
High precision (Pt 1000)	✓	✓	✓	✓	✓
Humidity channel					✓
Usage					
Multi-use	✓	✓	✓	✓	✓
Calibration certificate					
Including factory calibration certificate	✓	✓	✓	✓*	✓
Other features					
Display	✓	✓	✓	✓	✓
Very flexible alarms (5 limits and MKT)	✓	✓	✓	✓	✓
High memory capacity (120,000 measurements)	✓	✓	✓	✓	✓

* with connected, exchangeable sensors

General technical specifications: valid for all EBI 310 data logger types*

Memory capacity	120,000 measurements
Alarm	5 ranges
PDF creation	PDF/A 1b
LED	Yes (red and yellow)
Storage temperature	-40 °C ... +85 °C (-40 °F ... +185 °F)
Sample rate	1 s ... 24 h
Measurement modes	<ul style="list-style-type: none"> • Endless measurement • Start / Stop • Measurement until end of memory • Start with key press
Display	Value, MIN / MAX, until end of memory, alarm on / off
Maximum start delay	72 h
Housing material	Polycarbonate
Certificate	Factory calibration certificate
Norms	DIN EN 12830

* Please find the exact technical data of each EBI 310 data logger type on the next pages.

EBI 310 Multi-Use PDF Data Logger
High precision version



Technical Data

Measurement range/operating temperature	-30 °C ... +75 °C (-22 °F ... +167 °F) <i>By connecting an external probe, the temperature measurement range can be extended.</i>
Accuracy	±0.2 °C (-30 °C ... +30 °C / -22 °F ... +86 °F) ±0.5 °C for the remaining measurement range
Sensor	PT 1000
Resolution	0.1 °C
Dimensions (L x W x H)	80 x 33 x 14 mm
Protection class	IP 65
Battery	Lithium button cell (CR 2450), 3 V
Battery lifetime	Up to 2 years, depending on applications
Factory calibration certificate	-20 °C, 0 °C and +60 °C

re-adjustable with Winlog.pro

Type	Description	Part No.
EBI 310	High Precision PDF Data Logger	1340-6331

Accessories for the EBI 310, EBI 310 TE, EBI 310 DI, EBI 310 TX and EBI 310 TH



EBI 300-WM2 Wall Mount for EBI 300 / 310



EBI 300 WM3 transportation mount for EBI 300 / 310 made of stainless steel

Type	Description	Part No.
EBI 300-WM2	Wall Mount for EBI 300 / 310	1340-6341
EBI 300 WM3	Transportation mount for EBI 300 / 310	1340-6344

EBI 310 TE Multi-Use PDF Data Logger with external precision temperature probe



Measurement of high and low temperatures



EBI 310 TE

- Simultaneous measurement of core temperature and ambient temperature
- Internal temperature probe usable additionally

Technical Data

Measurement range external temperature	-200 °C ... +250 °C (-328 °F ... +482 °F)
Measurement range internal temperature / operating temperature	-30 °C ... +75 °C (-22 °F ... +167 °F)
Accuracy (internal)	± 0.2 °C (-30 °C ... +30 °C / -22 °F ... +86 °F) ± 0.5 °C for the remaining measurement range
Accuracy (external)	± 2.0 °C (-200 °C ... -100 °C / -328 °F ... -148 °F) ± 1.0 °C (-100 °C ... -20 °C / -148 °F ... -4 °F) ± 0.2 °C (-20 °C ... +60 °C / -4 °F ... +160 °F) ± 0.5 °C (+60 °C ... +250 °C / +160 °F ... +482 °F)
Probe	Pt 1000, Stainless steel, Ø 5 mm, L = 50 mm, blunt
Cable	PTFE, L = 1 m, waterproof, oilproof and food safe
Resolution	0.1 °C
Dimensions (L x W x H)	91 x 33 x 14 mm
Protection class	IP 65
Battery	Lithium button cell (CR 2450), 3V
Battery life time	Up to 2 years, depending on applications
Factory calibration certificate	-80 °C, 0 °C, +60 °C and +134 °C

re-adjustable with Winlog.pro

Type	Description	Part No.
EBI 310 TE	PDF Data logger with external precision temperature probe	1340-6337
TPX 220	Replacement probe for EBI 310 TE	1341-6332
TPX 220-3	Replacement probe with 3 m cable for EBI 310 TE	1341-6332-0100

EBI 310 DI Multi-Use USB Data Logger for dry ice measurements



Precise temperature measurements in dry ice



EBI 310 DI

- Additional battery allows usage within dry ice
- Internal temperature probe usable additionally

Technical Data

Measurement range external temperature / operating temperature	-85 °C ... +50 °C (-121 °F ... +122 °F)
Measurement range internal temperature	-30 °C ... +75 °C (-22 °F ... +167 °F)
Accuracy (internal)	± 0.2 °C (-30 °C ... +30 °C / -22 °F ... +86 °F) ± 0.5 °C for the remaining measurement range
Accuracy (external)	± 1.0 °C (-85 °C ... -20 °C / -121 °F ... -4 °F) ± 0.2 °C (-20 °C ... +50 °C / -4 °F ... +122 °F)
Probe	Pt 1000, Stainless steel, Ø 5 mm, L = 50 mm, blunt
Cable	PTFE, L = 60 cm, waterproof, oilproof and food safe
Resolution	0.1 °C
Dimensions (L x W x H)	100 x 33 x 14 mm
Protection class	IP 65
Battery	Lithium button cell in the logger, lithium battery in the probe, both changeable by the user
Battery life time	10 transports of up to 100h each
Factory calibration certificate	-80 °C and 0 °C

re-adjustable with Winlog.pro

Type	Description	Part No.
EBI 310 DI	PDF Data logger for dry ice measurements	1340-6338
TPX 250	Replacement probe for EBI 310 DI	1341-6333
AL 118	Battery change set for TPX 250	1100-0126

EBI 310 TH Multi-Use PDF Data Logger with external humidity and temperature probe



Relative humidity monitoring in storages and during transports



EBI 310 TH

Technical Data

Measurement range temperature / operating temperature	-30 °C ... +75 °C (-22 °F ... +167 °F)
Accuracy (internal)	± 0.2 °C (- 30 °C ... + 30 °C / -22 °F ... +86 °F) ± 0.5 °C for the remaining measurement range
Accuracy (external)	± 0.5 °C (0 °C ... + 60 °C / +32 °F ... +140 °F) ± 0.8 °C for the remaining measurement range
Probe temperature	Pt 1000
Measurement range humidity	0% rH ... 100% rH
Accuracy humidity	± 2% between 10% rH ... 90% rH (at 25 °C / +77 °F) ± 4% for the remaining measurement range
Probe humidity	capacitive
Resolution temperature	0.1 °C
Resolution humidity	0.1% rH
Dimensions (L x W x H)	129 x 33 x 14 mm
Protection class	IP 20
Battery	Lithium button cell (CR 2450), 3V
Battery life time	Up to 2 years, depending on applications
Factory calibration certificate	0 °C and +20 °C; 32.8% and 75.4% rH

re-adjustable with Winlog.pro

You can find suitable filter caps for humidity sensors online at www.ebro.com

- Internal temperature probe usable additionally

Type	Description	Part No.
EBI 310 TH	PDF Data logger with external humidity probe	1340-6336
TPH 500	Replacement probe for EBI 310 TH	1341-6337
AH 100	PTFE filter	1340-5627
AH 200	Bronze sintered filter	1340-5626
AH 300	Stainless steel sintered filter	1340-5625

EBI 310 TX Multi-Use PDF Data Logger with temperature-two-channel-adapter



Temperature monitoring in storages and during transport, process monitoring



EBI 310 TX



exchangeable sensors

Technical Data

Measurement range external temperature	-200 °C ... + 400 °C (-328 °F ... +752 °F), dependent on probe type
Measurement range internal temperature / operating temperature	-30 °C ... +75 °C (-22 °F ... +167 °F)
Accuracy (internal)	± 0.2 °C (- 30 °C ... + 30 °C / -22 °F ... +86 °F) ± 0.5 °C for the remaining measurement range
Probe	Pt 1000
Resolution	0.1 °C
Dimensions (L x W x H)	111 x 33 x 14 mm
Protection class	IP 65
Battery	Lithium button cell (CR 2450), 3V
Battery life time	Up to 2 years, depending on applications
Factory calibration certificate	-200 °C, 0 °C and +400 °C

re-adjustable with Winlog.pro

- Up to two exchangeable probes can be connected; not included, see the following page
- Internal temperature probe usable additionally

Type	Description	Part No.
EBI 310 TX	PDF Data logger with temperature-two-channel-adapter	1340-6339
TPX 310	Replacement adapter for EBI 310 TX	1341-6335

Exchangeable probes for EBI 310 TX

**TPX 310-P1**

- Measurement range: -200 °C ... +200 °C (-328 °F ... +392 °F)
- Needle: L = 45 mm, Ø = 5 mm, blunt
- Cable: PTFE, L = 3 m

Temperature		Accuracy
-200...-100 °C	-328...-148 °F	1.7 °C
-100...-20 °C	-148...-4 °F	1.2 °C
-20...+60 °C	-4...+140 °F	1.0 °C
+60...+200 °C	+140...+392 °F	1.7 °C

**TPX 310-P2**

- Measurement range: -50 °C ... +180 °C (-58 °F ... +356 °F)
- Needle: L = 130 mm, Ø = 3 mm, blunt
- Cable: PTFE, L = 3 m

Temperature		Accuracy
-50...+60 °C	-58...+140 °F	0.6 °C
+60...+180 °C	+140...+356 °F	0.9 °C

**TPX 310-P3**

- Measurement range: -50 °C ... +180 °C (-58 °F ... +356 °F)
- Needle: L = 130 mm, Ø = 3 mm, blunt
- Cable: PTFE, L = 1 m

Temperature		Accuracy
-50...+60 °C	-58...+140 °F	0.5 °C
+60...+180 °C	+140...+356 °F	0.8 °C

**TPX 310-P4**

- Measurement range: +100 °C ... +400 °C (+212 °F ... +752 °F)
- Needle: L = 50 mm, Ø = 1.5 mm, blunt
- Cable: metal wrapped, L = 3 m, not waterproof

Temperature		Accuracy
+100...+250 °C	+212...+482 °F	1.1 °C
+250...+400 °C	+482...+752 °F	1.4 °C

**TPX 310-P5**

- Measurement range: -50 °C ... +180 °C (-58 °F ... +356 °F)
- Probe: L = 130 mm, Ø = 3 mm, blunt
- Cable: PTFE, L = 5 m

Temperature		Accuracy
-50...-20 °C	-58...-4 °F	0.5 °C
-20...+60 °C	-4...+140 °F	0.6 °C
+60...+180 °C	+140...+356 °F	0.8 °C

**TPX 310-P6**

- Measurement range: -50 °C ... +180 °C (-58 °F ... +356 °F)
- Probe: L = 130 mm, Ø = 3 mm, blunt
- Cable: PTFE, L = 7.5 m

Temperature		Accuracy
-50...+60 °C	-58...+140 °F	0.7 °C
+60...+180 °C	+140...+356 °F	1.0 °C

**TPX 310-P7**

- Measurement range: -50 °C ... +180 °C (-58 °F ... +356 °F)
- Probe: L = 130 mm, Ø = 3 mm, blunt
- Cable: PTFE, L = 10 m

Temperature		Accuracy
-50...+60 °C	-58...+140 °F	0.9 °C
+60...+180 °C	+140...+356 °F	1.1 °C

Type	Description	Part No.
TPX 310-P1	External sensor for EBI 310 TX	1341-6338
TPX 310-P2	External sensor for EBI 310 TX	1341-6339
TPX 310-P3	External sensor for EBI 310 TX	1341-6340
TPX 310-P4	External sensor for EBI 310 TX	1341-6341
TPX 310-P5	External sensor for EBI 310 TX	1341-6342
TPX 310-P6	External sensor for EBI 310 TX	1341-6343
TPX 310-P7	External sensor for EBI 310 TX	1341-6344

www.EBI310.com appear in a new design



Easy to Use!



Start



Connect



Inspect

Information

About Data Logger and Applications.

Configuration

Configure your PDF- data logger and program it by using Windows™ PC.

Simple and clear

Also usable with smartphone or Tablet.



Software

ebro offers exactly the software you need:

- Evaluation software for any applications:
Winlog.pro
- Evaluation software for EBI 25 data loggers:
Winlog.web
- Evaluation software for pharmaceutical and medical applications:
Winlog.med and Winlog.validation

Software/Features	Winlog.pro	Winlog.med	Winlog.validation	Winlog.web
Event Triggered Recording	●	●	●	●
Script-Calculations	●			●
System-Scripts	●			
Picture Manager	●		●	
Measure in Charts	●			
Cursor	●	●	●	
Realtime Calculations	●	●	●	●
Ranges	●	●	●	
Range-based Calculations	●	●	●	
Statistics per Range	●	●	●	
Relative Time Axis	●			
Configurations	●	●(2)	●(2)	
Firmware-Update	●	●	●	●
Import	●(1)			
Calibration	●	●	●	
Automatic File Name Generation	●			
21 CFR Part 11	●	●	●	●
User Administration	●	●	●	●
Audit-Trail	●	●	●	●
Advanced Chart Features	●			
Multi Document Support	●	●	●	
Export (Excel, PDF)	●	●	●	●
Customizable Company Logo	●	●	●	●
Wireless Support	●	●	●	●
2D Placement	●		●	●
3D Placement			●	
Routine Check	●(3)	●	●	
Validation	●(3)		●	
Unit Administration	●	●	●	●
Split Measurements	●	●	●	
Advanced Alarm-Management (Zones)	●(5)			
App Winlog.mobile				●
IQ/OQ	●		●	●

(1) Winlog.validation
(2) Template based

(3) Manual
(4) Since V2.5
(5) EBI 310 only

(6) Since V2.6
(7) Since V3.3
(8) Since V3.5

(9) Since V2.8
(10) Since V3.7



Supported Logger Types	Winlog.pro	Winlog.med	Winlog.validation	Winlog.web
EBI 10	●	●	●	
EBI 11	●	●	●	
EBI 12	●(9)	●(10)	●(10)	
EBI 16		●(8)	●(8)	
EBI 20	●	●(7)	●(7)	
EBI 25				●
EBI 40	●	●(7)	●(7)	
EBI 100	●	●	●	
EBI 310	●(6)	●(7)	●(7)	
CT 830	●	●	●	
PHT 830	●	●	●	

System Requirements	Winlog.pro	Winlog.med	Winlog.validation	Winlog.web
Windows Vista / 32 bit	●	●	●	●
Windows Vista / 64 bit	●	●	●	●
Windows 7 / 32 bit	●	●	●	●
Windows 7 / 64 bit	●	●	●	●
Windows 8 / 32 bit	●	●	●	●
Windows 8 / 64 bit	●	●	●	●
Windows 10 / 32 bit	●	●	●	●
Windows 10 / 64 bit	●	●	●	●
Memory	≥ 1GB	≥ 1GB	≥ 1GB	≥ 4 GB
Hard Disc Memory	≥ 300 MB	≥ 1 GB	≥ 1 GB	≥ 20 GB
CD/DVD Drive	●	●	●	●
Screen Resolution	≥ 1024x768	≥ 1024x768	≥ 1024x768	≥ 1024x768
Processor	Pentium 1GHz+	Pentium 1GHz+	Pentium 1GHz+	Dual Core 2 GHz+

Market Overview	Winlog.pro	Winlog.med	Winlog.validation	Winlog.web
Food	●			●
Industry	●		●	●
Pharmaceutical	●		●	●
Medical	●	●	●	●

Available Languages	Winlog.pro	Winlog.med	Winlog.validation	Winlog.web
English	●	●	●	●
French	●	●	●	●
Italian	●	●	●	●
Spanish	●	●	●	●
Chinese	●	●	●	●
Japanese	●	●	●	
Korean	●	●	●	
Portuguese		●	●	
Greek		●	●	
Czech	●	●	●	●
Swedish	●	●	●	
Dutch	●	●	●	
German	●	●	●	●
Turkish		●	●	
Polish		●	●	
Norwegian		●	●	

Evaluation Software for Any Applications

Winlog.pro

For the programming and reading of ebro data loggers and for the evaluation of the measured values, ebro offers the professional software **Winlog.pro**.

Benefits

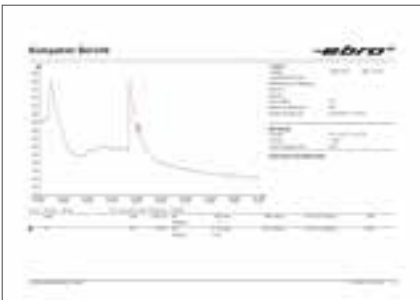
- Easy installation
- Easy programming of the data loggers, no prior knowledge required
- Extensive and custom report generation
- Suitable for all applications
- Security by compliance with FDA 21 CFR Part 11

Extensive Report Generation

The software makes it easy to generate standard and custom reports:

- Compact, one-sided report (1)
- Multi-page, detailed report (2)
- Tabular report with the measurement values (3)
- Insertion of your own company logo possible (4)
- Export data to Microsoft Excel® and PDF (5)
- Integration of pictures and graphics possible (Winlog.pro only) (6)

(1)



(3)

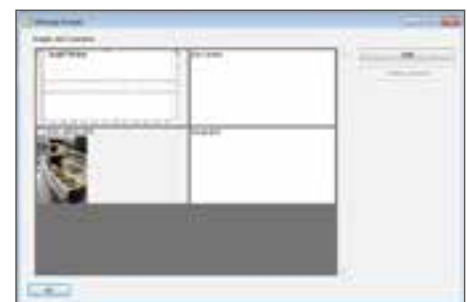
(5)



(2)



(4)



(6)



Winlog.pro Professional software



- Enables real-time monitoring with wireless data loggers
- Formula editor for calculating the F0-value of the absolute humidity, the PE value etc.
- Display off the timeline either absolute or relative
- Customized definition of individual areas possible (with their own statistics and calculations)
- Including calibration tool for data loggers
- Integration of pictures and graphics into reports possible
- IQ/OQ documentation optional



System Requirements

So that the software can run on your computer with any problem, your computer must meet the following requirements:

Hardware Requirements:

- At least 1 GHz processor speed
- At least 1 GB working memory
- At least 1 GB free hard disc space
- USB (Universal Serial Bus)

Software requirements:

- Operating system Microsoft®
- Windows Vista (32 Bit and 64 Bit)
- Windows 7 (32 Bit and 64 Bit)
- Windows 8 (32 Bit and 64 Bit)
- Windows 10 (32 Bit and 64 Bit)

Type	Description	Part No.
Winlog.pro	Professional evaluation software	1340-2355
IQ/OQ Winlog.pro	Installation and Operation Qualifications for Winlog.pro	1340-2286





Winlog.web

Professional version internet and local network based use



- Web based client/server solution: the measurement data can be evaluated on all PCs and smartphones via the internet or connected to the local network
- Very flexible and wide alarm management: alarm notifications upon user defined conditions, alarm notification via email; visual and audible alarm via the graphical user interface
- Connection of the interface IF 400 via USB and Ethernet
- FDA 21 CFR Part 11 data security functionality
- Management of larger data sets
- IQ / OQ documentation available

For users of the software Winlog.web ebro has designed an App called



- free of charge - to monitor the performance via smartphone.

System Requirements

To enable the software to operate smoothly, your computer must meet the following requirements:

Hardware requirements:

- Processor speed minimum 2 GHz
- Working memory 4 GB
- 20 GB free hard disc space
- USB (Universal Serial Bus)

Software requirements:

- Operating System Microsoft®
- Windows Vista (32 Bit and 64 Bit)
 - Windows 7 (32 Bit and 64 Bit)
 - Windows 8 (32 Bit and 64 Bit)
 - Windows 10 (32 Bit and 64 Bit)

Further requirements:

- Mozilla Firefox 3.0
- Microsoft Internet Explorer 10



Type	Description	Part No.
Winlog.web	Evaluation software (web-based server version)	1340-2390
IQ/OQ Winlog.web	Installation Qualification and Operation Qualification for Winlog.web	1340-2290

Evaluation Software for Pharmaceutical and Medical Applications

Winlog.med and Winlog.validation

The Winlog.med and Winlog.validation software versions is suitable for programming and readout of ebro data loggers as well as for evaluating the measurement values. The software guides you step by step through the validation or routine control process and evaluates the measurement automatically.

Flexible Report Generation

Whether you need a short process report or a table report with all measurement data - ebro's Winlog software makes it easy.

Table report

A screenshot of a 'Table report' from Winlog software. It displays a large table with multiple columns and rows of numerical data, likely representing sensor readings over time. The table is organized into sections with headers and footers.

Detailed result overview

A screenshot of a 'Detailed result overview' report. It shows a summary of key parameters and results, including a 'Result' status indicator (green) and various data points presented in a structured layout.

Process parameters, e.g. theoretical steam temperature calculation

A screenshot of a report showing 'Process parameters'. It includes a table with columns for parameter names, values, and units, such as 'Theoretical steam temperature calculation'.

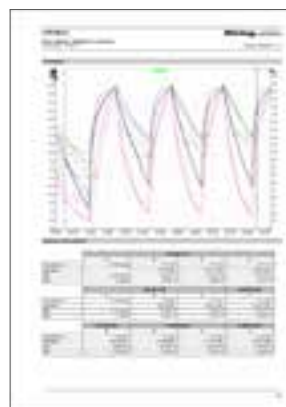
Lethality report

A screenshot of a 'Lethality report'. It features a table with columns for time intervals and corresponding lethality values, used for sterilization process validation.

Equipment used

A screenshot of a report titled 'Equipment used'. It lists various pieces of equipment and their associated parameters in a table format.

Graphical data



Statistical data



Winlog.med For routine controls



- TÜV certified
- User-friendly
- High precision measurements
- Automatic report generation
- Automatic user-defined calculations
- Automatic identification of process cycles
- Creation of user-defined masters for specific devices and thermal processes
- Three-dimensional demonstration of sensor placement or placement of the sensors directly on an application image possible
- FDA 21 CFR Part 11

Winlog.validation For routine control and validation



Powerful report and evaluation software fitting the requirements of validation and qualification in Pharmaceuticals and Medicine.

- TÜV Industrial Services certified
- User-friendly
- High precision measurements
- Automatic report generation
- Automatic user-defined calculations
- Automatic identification of process cycles
- Creation of user-defined masters for specific devices and thermal processes
- Three-dimensional demonstration of sensor placement or placement of the sensors directly on an application image possible
- FDA 21 CFR Part 11
- IQ / OQ available
- Automatic evaluation of validation processes

System Requirements

To enable the software to operate smoothly, your computer must meet the following requirements:

Hardware requirements:

- Processor speed minimum 1 GHz
- Working memory 1 GB
- 1 GB free hard disc space
- USB (Universal Serial Bus)

Software requirements:

- Operating System Microsoft®
- Windows Vista (32 Bit und 64 Bit)
 - Windows 7 (32 Bit und 64 Bit)
 - Windows 8 (32 Bit und 64 Bit)
 - Windows 10 (32 Bit und 64 Bit)



Type	Description	Part No.
Winlog.med	Standard evaluation software for routine controls	1340-2363
Winlog.validation	Professional evaluation software for routine controls and validations	1340-2394
IQ/OQ Winlog.validation	Installation Qualification and Operation Qualification for Winlog.validation	1340-2287

Calibration

Precision measurement and testing equipment such as thermometers and data loggers should be checked and calibrated regularly.

Factory Calibration

Most ebro measuring equipment is supplied with a factory calibration certificate. The functionality and the tolerances indicated in the technical specifications are thus ensured. Factory calibration is completed with DAkkS-calibrated factory normal.

- Calibration completed using special equipment.
- All factory certificates issued by trained personnel.
- The factory calibration certificate confirms the suitability of the device for official calibration.



Calibration according to ISO 9000

Modern quality assurance systems like ISO 9000, QS 9000, GxP and FDA require testing and measuring equipment checks, which also include a regular calibration of these devices. ebro ISO calibration is an economical, fast and precise option for the fulfillment of these requirements.

- Calibration is done by calibration experts in a special laboratory.
- The results are documented in detail, including traceability information of the reference devices, in a so-called ISO certificate.
- Manufacturer-independent calibration, devices from other manufacturers can be calibrated.
- Calibration also includes device adjustment, if necessary (only for ebro devices).

We recommend that calibration be completed once per year for thermometers and pressure meters and once every 6 months for humidity meters. We will be happy to include you in our free ebro calibration reminder service.

The price for the calibration according to ISO 9000 includes certificate and **2 specified standard calibration points**. Freely selectable calibration points between -85 °C and +250 °C (-121 °F ... +482 °F) are available for a small fee.

The calibration of temperature / humidity loggers includes 2 to 3 humidity calibration points in the price. In addition a temperature calibration in the range of -40 °C ... +75 °C (-40 °F ... 167 °F) can be completed. Incoming and outgoing calibrations can be done on demand.

ISO Calibrations



Type	Description	Part No.
EBI 12 - Family with 1 temperature channel	ISO Calibration	1020-3570
EBI 12 - Family with 2 temperature channels	ISO Calibration	1020-3571
EBI 12 - Family with 4 temperature channels	ISO Calibration	1020-3572
EBI 12 - Family with 1 pressure and 1 temp. channel	ISO Calibration	1020-3573
EBI 12 - Family with 1 pressure and 2 temp. channels	ISO Calibration	1020-3574
EBI 12 - Family with 1 pressure and 3 temp. channels	ISO Calibration	1020-3575
EBI 12 - Family with 1 humidity and 1 temp. channels	ISO Calibration	1020-3579
EBI 12 - Highly accurate pressure logger	ISO Calibration	1020-3578
EBI 12 - Temperature conductivity logger	ISO Calibration	1020-3577
PHT 830 / CT 830	ISO Calibration	1020-3530
EBI 40 with 6 temperature channels	ISO Calibration ¹⁾	1020-3540
EBI 40 with 12 temperature channels	ISO Calibration ¹⁾	1020-3541
EBI 11 - Family with 1 temperature channel	ISO Calibration	1020-3550
EBI 11 - Family with 1 pressure and 1 temp. channel	ISO Calibration	1020-3560
EBI 25 - Family with 1 temperature channel	3 Calibration points	1020-3580
EBI 25 - Family with 1 temperature channel	2 Calibration points	1020-3581
EBI 25 - Family with 1 humidity and 1 temp. channel	2x2 Calibration points	1020-3582
EBI 310 - With 1 temperature channel	ISO Calibration ¹⁾	1020-3585
EBI 310 TE, EBI 310 DI - With 2 temperature channels	ISO Calibration ¹⁾	1020-3586
EBI 310 TX - With 3 temperature channels	ISO Calibration ¹⁾	1020-3587
EBI 310 TH	ISO Calibration ¹⁾	1020-3588
TFX 430	ISO Calibration ¹⁾	1020-3593
Additional calibration point	ISO Calibration	1020-3599
ISO calibrations of other devices on request.		

- Certified according to DIN EN ISO 9001 : 2008

¹⁾ According to DIN ISO 9000 including certificate.

DAkKS Calibration

DAkKS calibration is often needed for working standard measuring equipment, measuring equipment used by certified experts and for certain measurement procedures in medicine and pharmaceuticals – in other words, everywhere where an especially high degree of safety is required. This calibration is done by special DAkKS accredited laboratories that are monitored by the Physikalisch-Technische Bundesanstalt (PTB).

- Internationally recognized and comparable measurement results.
- DAkKS calibration is done by specially DAkKS authorized persons only.
- Traceable calibration in accordance with DIN EN ISO 9001 and DIN EN ISO/IEC 17025.
- Identification and documentation of the measurement uncertainty.
- Manufacturer-independent calibration, devices from other manufacturers can be calibrated.

We recommend that calibration is completed once per year for thermometers and once every 6 months for pressure and humidity meters. We will be happy to include you in our ebro calibration reminder service free of charge.

The price for the DAkKS calibration includes certificate includes **3 freely selectable calibration points** in the range of -85 °C ... +300 °C (-121 °F ... +572 °F) or 10% ... 95% for humidity calibration.

With a pressure DAkKS calibration, the device is calibrated at 9 points. The calibration points cover the entire measuring range. Calibration takes place at room temperature, ie between +20 °C and +25 °C. Additional calibration points are available for a small fee.

DAkKS Calibrations



Type	Description	Part No.
EBI 12 - Family with 1 temperature channel	DAkKS Calibration ²⁾	1020-3670
EBI 12 - Family with 2 temperature channels	DAkKS Calibration ²⁾	1020-3671
EBI 12 - Family with 4 temperature channels	DAkKS Calibration ²⁾	1020-3672
EBI 12 - Family with 1 pressure and 1 temp. channel	DAkKS Calibration ²⁾	1020-3673
EBI 12 - Family with 1 pressure and 2 temp. Channels	DAkKS Calibration ²⁾	1020-3674
EBI 12 - Family with 1 pressure and 3 temp. Channels	DAkKS Calibration ²⁾	1020-3675
EBI 12 - Family with 1 humidity and 1 temp. Channels	DAkKS Calibration ²⁾	1020-3679
EBI 12 - Highly accurate pressure logger	DAkKS Calibration ²⁾	1020-3678
EBI 40 with 6 temperature channels	DAkKS Calibration ²⁾	1020-3640
EBI 40 with 12 temperature channels	DAkKS Calibration ²⁾	1020-3641
EBI 11 - Family with 1 temperature channel	DAkKS Calibration ²⁾	1020-3650
EBI 11 - Family with 1 pressure and 1 temp. channel	DAkKS Calibration ²⁾	1020-3660
EBI 25 - Family with 1 temperature channel	DAkKS Calibration ²⁾	1020-3680
EBI 25 - Family with 1 humidity and 1 temp. channel	DAkKS Calibration ²⁾	1020-3682
EBI 310 - With 1 temperature channel	DAkKS Calibration ²⁾	1020-3685
EBI 310 TE, EBI 310 DI - With 2 temperature channels	DAkKS Calibration ²⁾	1020-3686
EBI 310 TX - With 3 temperature channels	DAkKS Calibration ²⁾	1020-3687
EBI 310 TH	DAkKS Calibration ²⁾	1020-3688
TFX 430	DAkKS Calibration ²⁾	1020-3693
Additional calibration point	DAkKS Calibration ²⁾	1020-3699
DAkKS calibrations of other devices on request.		

²⁾ According to DAkKS (Traceability to German Standard) including certificate.

Calibration conditions for different calibrations

Temperature Calibrations

Calibration type	Calibration object	Measurement range	Measurement conditions
ISO	Temperature measurement devices with air and submersible sensors, Temperature data logger	> -85 °C ... +250 °C (-121 °F ... 482 °F) > +250 °C ... +1,000 °C (+482 °F ... +1,832 °F)	Temperature-regulated Liquid baths, Calibration source
DAkkS / DKD	Temperature measurement devices resistance thermometers, electronic thermometers and data loggers	0 °C (+32 °F) 0.01 °C (32.018 °F) -85 °C ... -35 °C (-121 °F ... -31 °F) -35 °C ... +250 °C (-31 °F ... +482 °F) +250 °C ... +300 °C (+482 °F ... +572 °F) > +300 °C ... +1,100 °C (>572 °F ... 2,012 °F)	Ice point Water triple point Liquid bath Liquid bath Liquid bath Tube furnace
	Thermocouple	-85 °C ... +200 °C > +200 °C ... +300 °C	Liquid bath Liquid bath

Humidity Calibrations

Calibration type	Calibration object	Measurement range	Measurement conditions
ISO	Measurement devices for relative humidity	10 % ... 30 % 30 % ... 60 % 60 % ... 95 % Temperature range: +5 °C ... +70 °C (+41 °F ... +158 °F)	Two pressure humidity generator Temperature range: +5 °C to +70 °C (+41 °F to +158 °F)
DAkkS / DKD	Measurement devices for relative humidity	10 % ... 30 % 30 % ... 60 % 60 % ... 95 % Temperature range: +5 °C ... +70 °C (+41 °F ... +158 °F)	Two pressure humidity generator Temperature range: +5 °C to +70 °C (+41 °F to +158 °F)

Pressure Calibrations

Calibration type	Calibration object	Measurement range	Measurement conditions
ISO	Absolute pressure	0 mbar ... 10,000 mbar	Pressure calibrator
DAkkS / DKD	Absolute pressure	0 mbar ... 5,000 mbar >5,000 mbar ... 25,000 mbar	In gases In gases

ISO Standard Calibration Points for ebro Products

Measurement device	Calibration points		
EBI 310	-20 °C	0 °C	+60 °C
EBI 310 TH	32,8% at +25 °C 0 °C	+20 °C	75,4% at +25 °C
EBI 12 T (depends on device type)	0 °C	+60 °C	+134 °C
EBI 12 TP (depends on device type)	100 mbar at +25 °C 0 °C	3,100 mbar at +25 °C +60 °C	3,100 mbar at +134 °C +134 °C
EBI 25 (depends on device type)	-20 °C	0 °C	

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Declarations



Hereby we declare

Xylem Analytics Germany Sales
GmbH & Co. KG, ebro
Peringerstraße 10
85055 Ingolstadt, Germany
Phone: +49 841 95478-0
Fax: +49 841 95478-80

that the following product

Product type:	Data logger
Type designation:	EBI 12-Txxx / -TPxxx, EBI 16, EBI 11-Txxx / -Pxxx / -TPxxx, EBI 25-T / -TE / -TX / -TH, EBI 310, EBI 40-TC

is in compliance with the essential requirements and other relevant provisions of Directive 37/2005 EC.

The following harmonized standards have been used:

- **Tests, performance, suitability: EN 12830**
- **Periodic verification and calibration: EN 13486**

Eckehard Peschel, Site Leader

Conditions of Delivery and Payment

May 2017. Changes reserved. Please find the latest version on our website: www.ebro.com/en/agb.html.

1. APPLICATION

Except as otherwise expressly agreed in writing, these conditions ("**General Conditions**") shall exclusively apply to all deliveries and services of XYLEM Analytics Germany Sales GmbH & Co. KG (in the following: Contract). Deviating conditions of the Purchaser shall not apply.

2. MINIMUM NET ORDER VALUE, VALIDITY OF QUOTATIONS, CUSTOM MADE PRODUCTS, EXCESS DELIVERIES AND CANCELLATION OF ORDERS, TRANSFER OF RISK

2.1 The minimum net order value amounts to EUR 100. For orders below this amount Supplier reserves the right to charge handling costs of EUR 20.

2.2 Quotations are valid for thirty (30) calendar days from the date of issuance unless otherwise agreed in writing by Supplier, subject to prior sale. Supplier reserves the right to cancel or withdraw the quotation at any time with or without notice or cause prior to acceptance by the Purchaser. Supplier nevertheless reserves its right to accept any contractual documents received from the Purchaser after this 30-day period.

2.3 The price for custom made products shall be separately agreed between the Parties.

2.4 Supplier shall have the right to deliver an excess quantity of up to 10% that has to be paid by Purchaser.

2.5 If the Purchaser fully or partly cancels an order for non-custom made products without justification Supplier shall be entitled, notwithstanding the right to assert a higher damage that has actually been incurred due to the cancellation, to demand 10% of the sales price for the cancelled order volume as compensation for the processing and minimum loss of profits unless Purchaser establishes proof of a lower damage. The cancellation or amendment of an order for custom made products shall not be possible.

3. PRODUCT INFORMATION

All information and data contained in general product documentation and price lists, whether in electronic or any other form, are binding only to the extent that they are by reference expressly included in the Contract.

4. DRAWINGS AND DESCRIPTIONS

4.1 All drawings and technical documents relating to the Product or its manufacture submitted by one party to the other, prior or subsequent to the formation of the Contract, shall remain the property of the submitting party.

4.2 Drawings, technical documents or other technical information received by one party shall not, without the consent of the other party, be used for any other purpose than that for which they were provided. They may not, without the consent of the submitting party, otherwise be used or copied, reproduced, transmitted or communicated to a third party.

4.3 Supplier shall, not later than at the date of delivery of Products, provide free of charge information and drawings which are necessary to permit the Purchaser to erect, commission, operate and maintain the Product. Such information and drawings shall be supplied in the number of copies agreed upon or at least one copy of each. Supplier shall not be obliged to provide manufacturing drawings for the Product or for spare parts.

5. INSPECTIONS AND TESTS

5.1 Inspections

5.1.1 If expressly agreed in the Contract, the Purchaser shall be entitled to have the quality of the materials used and the parts of the Product, both during manufacture and when completed, inspected and checked by its authorised representatives. Such inspection and checking shall be carried out at the place of manufacture during normal working hours after agreement with Supplier as to date and time, and at the Purchaser's expense.

5.2 Tests

5.2.1 Acceptance tests provided for in the Contract shall, unless otherwise agreed, be carried out at the place of manufacture during normal working hours.

5.2.2 If the Contract does not specify the technical requirements, the tests shall be carried out in accordance with the Supplier's standard practice.

5.2.3 If the Purchaser in due time has requested in writing, Supplier shall notify the Purchaser in writing of the acceptance tests in sufficient time to permit the Purchaser to be represented at the tests. If the Purchaser is not represented, the test report shall be sent to the Purchaser and shall be accepted as accurate. With regard to standard products (as defined by Supplier from time to time) only a "production card" will be delivered with the Product stating that the Product has passed the

test procedure and thereby is approved. If requested by the Purchaser in writing and prior to the performance of the test, a test report will be sent to the Purchaser at an additional cost reasonably determined by Supplier.

5.2.4 If the acceptance tests show the Product not to be in accordance with the Contract, Supplier shall without delay remedy any deficiencies in order to ensure that the Product complies with the Contract. New tests shall then be carried out at the Purchaser's request, unless the deficiency in Supplier's sole opinion was insignificant.

5.2.5 Supplier shall bear all costs for acceptance tests carried out at the place of manufacture. The Purchaser shall however bear all costs and expenses for its representatives in connection with such tests. The Purchaser shall bear all costs for any optional tests requested by the Purchaser.

6. DELIVERY, PASSING OF RISK

6.1 Any agreed trade term shall be construed in accordance with INCOTERMS 2010. If no trade term is specifically agreed, the delivery ("**Delivery**") shall be DAP, Purchaser's address as set out in the Purchaser's purchase order accepted by Supplier. However, Supplier's costs for DAP delivery shall be paid by Purchaser as set out in Clause 9.6 below.

6.2 Partial shipments shall be permitted unless otherwise agreed.

7. TIME FOR DELIVERY

7.1 Time for Delivery

If the Parties, instead of specifying the date for Delivery, have specified a period of time on the expiry of which Delivery shall take place, such period shall start to run as soon as the Contract is entered into, all official formalities have been completed, payments due at the formation of the Contract have been made, any agreed securities have been given and any other preconditions have been fulfilled.

7.2 Delay on part of Supplier

7.2.1 Any time periods specified by Supplier in the Contract for Delivery are to be treated as estimates whilst the Supplier shall make reasonable efforts to deliver on time. If Supplier anticipates that it will not be able to deliver the Product at the time for Delivery ("**Delay**"), Supplier shall inform the Purchaser thereof and, if possible, the time when Delivery can be expected.

7.2.2 If Delay is caused by any of the circumstances mentioned in Clause 14 or by an act or omission on the part of the Purchaser, including suspension under Clauses 9.4 or 14, the time for Delivery shall be extended by a period which is reasonable having regard to all the circumstances in the case. This provision applies regardless of whether the reason for the Delay occurs before or after the agreed time for Delivery.

7.2.3 In case of Delay, the Purchaser may in writing demand delivery within a final reasonable period which shall not be less than ninety (90) days from the Supplier's receipt of such demand. If Supplier does not deliver within such final period and this is not due to any circumstance for which the Purchaser is responsible or a Delay covered by Clauses 7.3 or 14, then the Purchaser may by notice in writing to Supplier terminate the Contract in respect of such part of the Product that cannot, in consequence of Supplier's failure to deliver, be used as intended by the Parties.

THE PURCHASER SHALL IN NO EVENT BE ENTITLED TO ANY LIQUIDATED DAMAGES IN THE CASE OF DELAY.

7.2.4 If the Purchaser terminates the Contract due to Delay, it shall be entitled to compensation for the loss it has suffered as a result of Supplier's Delay. The total compensation shall not exceed, except in cases of intent or gross negligence, 10 percent of that part of the purchase price which is attributable to the part of the Product in respect of which the Contract is terminated.

7.3 Delay on part of the Purchaser

7.3.1 If the Purchaser anticipates that it will be unable to accept Delivery of the Product at the Delivery time, it shall forthwith notify Supplier in writing thereof, stating the reason and, if possible, the time when it will be able to accept Delivery.

7.3.2 If the Purchaser for any reason fails to accept Delivery at the Delivery time, it shall nevertheless pay any part of the purchase price which becomes due on Delivery, as if Delivery had taken place. Supplier shall arrange for storage of the Product at the risk and expense of the Purchaser. Any other direct and/or financial costs incurred as a result of such failure to accept Delivery shall be borne by the Purchaser. Supplier shall, if the Purchaser so requires in writing, insure the Product on behalf of the Purchaser and at the Purchaser's expense.

7.3.3 Unless the Purchaser's failure to accept Delivery is due to any such circumstance as mentioned in Clause 14, Supplier may by notice in writing require the Purchaser to accept Delivery within a final reasonable period.

7.3.4 If, for any reason for which Supplier is not responsible, the Purchaser fails to accept Delivery within such period, Supplier may by notice in writing terminate the Contract in whole or in part. Supplier shall then be entitled to compensation for the loss it has suffered by reason of the Purchaser's default. The compensation shall not exceed that part of the purchase price which is attributable to that part of the Product in respect of which the Contract is terminated.

8. ALTERATIONS AND CANCELLATION

8.1 If the Purchaser requests an alteration of the Contract, and Supplier accepts such alteration (which acceptance shall not be unreasonably withheld), the alteration will be deemed as a new Contract entitling Supplier to a restart of the Delivery time which will start to run on the date of the approval in writing by Supplier of the alteration.

8.2 All additional costs incurred as a result of the alteration will be charged to the Purchaser, in addition to the purchase price.

8.3 If the Purchaser cancels the Contract in whole or in part without cause, the Purchaser shall, unless otherwise agreed in writing, reimburse Supplier for (i) all costs and expenses incurred by Supplier under the Contract up until and including the date of cancellation, and (ii) any additional costs and expenses incurred as a result of the cancellation.

9. PRICES AND PAYMENT

9.1 The purchase price shall be the price for such Products set out in Supplier's price list as of the date for Delivery if not specifically set forth in the Contract. For domestic sales, payments shall be made within 30 days of the date of the invoice in the currency stipulated in the Contract, unless otherwise agreed in writing. For export sales, full payment in advance by telegraphic transfer is required in the currency stipulated in the Contract, unless otherwise agreed in writing.

9.2 Whatever the means of payment used, payment shall not be deemed to have been effected until Supplier's account has been fully and irrevocably credited.

9.3 If the Purchaser fails to pay by the stipulated date, Supplier shall be entitled to interest from the day on which payment was due. The statutory law interest rates shall apply.

9.4 In case of late payment, Supplier may suspend its performance of the Contract until payment is received.

9.5 Notwithstanding other rights to terminate the Contract under other clauses in these General Conditions, the Supplier shall, if the Purchaser has not paid the amount due within three (3) months, be entitled to terminate the Contract by notice in writing to the Purchaser and to claim compensation for the loss it has incurred.

9.6 Unless otherwise agreed to in writing, all prices are FCA Supplier's plant, and do not, even if Delivery is DAP in accordance with Clause 6.1 above, include transportation costs or charges relating to transportation. This means that in addition to the Product price, Purchaser shall compensate Supplier for all its transportation costs and charges, as set out in invoice from Supplier to Purchaser, despite that DAP delivery applies and such costs and charges shall thus be solely the responsibility of the Purchaser. Prices exclude special packing unless otherwise agreed to by Supplier in writing. All costs and taxes for packing shall be paid by the Purchaser as an additional charge. Such costs and charges are subject to change without notice.

9.7 The price for the Products does not include any applicable sales, use, excise, GST, VAT, or similar tax. The Purchaser shall have the responsibility for the payment of such taxes if applicable.

9.8 If, during the performance of the Contract, the financial condition of the Purchaser is such that Supplier in good faith and in application of usual banking standards deems a payment in time insecure, or if a material change in the ownership of the Purchaser occurs, or if the Purchaser fails to make any payments in accordance with the terms of its Contract with Supplier, then, in any such event, Supplier is not obligated to continue performance under the Contract and may stop goods in transit and defer or decline to make delivery of goods, except upon receipt of satisfactory security or cash payments in advance.

9.9 If the Purchaser fails to make payments or fails to furnish security satisfactory to Supplier, then Supplier shall have the right to enforce payment to the full Contract price of the work completed and in process.

9.10 Upon default by the Purchaser in payment when due, the Purchaser shall immediately pay to Supplier the entire unpaid amounts for any and all shipments made to the Purchaser irrespective of the terms of said shipment and whether said shipments are made pursuant to this Contract or any other contract of sale between Supplier or any of its affiliates and the Purchaser, and Supplier may withhold all subsequent shipments until the full amount is settled. Acceptance by Supplier of less than full payment shall not be a waiver of any of its rights hereunder.

10. WARRANTY, PURCHASER'S DUTIES IN WARRANTY CASES, REIMBURSEMENT OF EXPENSES, LIABILITY

10.1 Purchaser's warranty claims depend on his proper compliance with his statutory duties of examination and notification. Notifications have to include specific information on the alleged defect and shall be in writing. Notifications based on incomplete delivery or other obvious defects shall be notified to Supplier in writing without delay, but at the latest within 10 working days of the delivery arriving at its destination. Claims of Purchaser on account of a defectiveness or incompleteness are excluded if Purchaser fails to comply with this obligation.

10.2 In the case of product defects Supplier can elect to remove the defects or to provide a defect-free replacement. Only if this repeatedly fails or is unreasonable and the defect is not only insubstantial Purchaser is entitled to rescission or reduction of the purchase price in accordance with the statutory provisions. Sec. 478 BGB remains unaffected. Purchaser is entitled to claims for damages in accordance with Clause 10.5.

10.3 Concerning any replacement of products or removal of defects a warranty period of 3 months since delivery respectively the execution of service applies which runs, however, at least until the expiry of the warranty period of the original service (see Clause 10.7).

10.4 Purchaser has to inform Supplier immediately about each indication of product defects by his clients concerning Supplier's services. Should Purchaser not fulfil this obligation his claims for product defects against Supplier shall expire. Moreover, Purchaser has to safeguard proofs in adequate manner and to give Supplier the opportunity of examination at his request.

10.5 Supplier is liable without restriction under the Product Liability Act, in the event of an express assumption of a warranty or of a procurement risk or in the event of willful or grossly negligent violations of a duty. Supplier is also liable without restriction in the event of willful or negligent injury to life, physical well-being or health. In the event of Supplier's negligence (other than gross negligence) resulting in property or pecuniary damage, Supplier shall only be liable for a breach of essential contractual duties the fulfillment of which is inevitable for the proper performance of the contract and Purchaser can particularly rely on, however, limited to characteristic damages that were foreseeable at the time of signature.

10.6 No warranty is given for damages of all kind caused by improper treatment, change, installation and/or operation of the delivered product or by incorrect advice or instruction by Purchaser unless Supplier has caused those damages at least negligently.

10.7 Defect claims shall become time-barred after 12 months, or such longer period as set out in Supplier's price list and order confirmation, from the transfer of risk. The same applies to legal defects. In the event of willful breaches of a duty, claims arising from tortious acts, the absence of a warranted quality, the assumption of procurement risks or personal injury, the statutory time periods apply. Secs. 438 para. 3, 479 and 634a para. 3 BGB remain unaffected.

10.8 A further-reaching liability for damages than that provided in the paragraphs of this Clause 10. is excluded - without regard to the legal nature of the asserted claim.

10.9 The aforementioned restrictions of liability also apply, in terms of the reason and amount, in favour of Supplier's statutory representatives, employees and other vicarious agents.

11. ALLOCATION OF LIABILITY FOR DAMAGE CAUSED BY THE PRODUCT

11.1 Supplier shall not be liable for any damage to property or the environment caused by the Product after it has been delivered to the Purchaser. Nor shall Supplier be liable for any damage to products manufactured by the Purchaser, or to products of which the Purchaser's products form a part.

11.2 The Purchaser shall indemnify, defend and hold Supplier harmless to the extent that the Supplier incurs liability towards any third party in respect of loss or damage for which the Supplier is not liable according to the preceding paragraph.

11.3 If a claim for damages as described in this Clause 12 is lodged by a third party against one of the Parties, the latter party shall forthwith inform the other party thereof in writing.

11.4 Supplier and Purchaser shall be mutually obliged to let themselves be summoned to the court or arbitral tribunal examining claims for damages lodged against one of them on the basis of damage allegedly caused by the Product.

12. CONFIDENTIALITY

The Parties agree that any information received from the other party in connection with the Contract that evidently or by its nature should reasonably be understood to be confidential, shall not be disclosed by the recipient to any third party without the prior written approval of the disclosing party, except to the extent (i) this is necessary for the receiving party to exercise rights and perform duties pursuant to the Contract, (ii) the information is available to the general public or later becomes publicly available other than through a breach of the Contract, (iii) the information is actually known to the receiving party on the date that such information is disclosed as evidenced

by written records in existence prior to the date of the receipt, (iv) the information is subsequently lawfully obtained by the receiving party from a third party or third parties, or (v) the information is independently developed by the receiving party prior to the disclosure.

13. FORCE MAJEURE

13.1 Either party shall be entitled to suspend performance of its obligations under the Contract to the extent that such performance is impeded or made unreasonably onerous by any of the following circumstances: industrial disputes and any other circumstance beyond the control of the parties such as pandemic, fire, earthquake, natural disaster, acts of God, war, extensive military mobilization, insurrection, requisition, seizure, embargo, acts of governments, strikes, lockouts, restrictions in the use of power and defects or delays in deliveries by sub-contractors ("Force Majeure").

13.2 The party claiming to be affected by Force Majeure shall notify the other party in writing without delay on the intervention and on the cessation of such circumstance.

13.3 If Force Majeure prevents the Purchaser from fulfilling its obligations, it shall compensate Supplier for expenses incurred in securing and protecting the Product.

13.4 Regardless of what might otherwise follow from these General Conditions, either party shall be entitled to terminate the Contract by notice in writing to the other party if performance of the Contract is suspended under this Clause 14 for more than six (6) months.

13.5 If the Purchaser terminates the Contract due to Force Majeure, the Purchaser shall, unless otherwise agreed in writing, reimburse Supplier for (i) all costs and expenses incurred by Supplier under the Contract up until and including the date of the termination and (ii) any additional costs and expenses incurred as a result of the termination.

14. ASSIGNMENT

The Purchaser shall not assign or transfer this Contract or any interest in it, or monies payable under it, without the prior written consent of Supplier and any assignment made without such consent shall be null and void. Supplier may assign its rights and/or delegate its duties in whole or in part to any affiliated company. Supplier shall notify Purchaser of any such assignment or delegation.

15. INVALIDITY

If any provision of this Contract is held to be illegal, invalid, or unenforceable by any court of competent jurisdiction, such provision will be of no force and effect, but the illegality, invalidity, or unenforceability will have no effect upon and will not impair the enforceability of any other provision of this Contract. The illegal, invalid or unenforceable provision shall be deemed to be substituted by a suitable provision which, to the extent legally permissible, comes as close as possible to the intent and purpose of the illegal, invalid or unenforceable provision. The same shall apply if the parties have unintentionally failed to address a certain matter in this Contract.

16. EXPORT REGULATIONS

The Purchaser has to comply with all legal provisions and administrative requirements as well as all other applicable laws, and in particular export regulations and the laws of the country in which the Purchaser operates. The Purchaser has to obtain all necessary approvals and licenses as well as all necessary permissions in good time, which are, according to all these applicable laws, required for the use or the export of the delivery item.

The Supplier is entitled to withhold his goods and services vis-à-vis the Purchaser if the Purchaser would violate those applicable laws or if not all necessary permissions are available and if this is not based on the Supplier's fault or responsibility.

The performance of the contract on the part of the Supplier is on condition that there are no opposing impediments due to national or international foreign trade legislation as well as embargos (and/or other sanctions).

The US Export Administration Regulations (EAR) are equally to be respected. Rights and duties of the Purchaser according to this clause endure after the expiration and premature termination of this Contract.

17. PLACE OF PERFORMANCE

Place of performance shall be the Supplier's place of business.

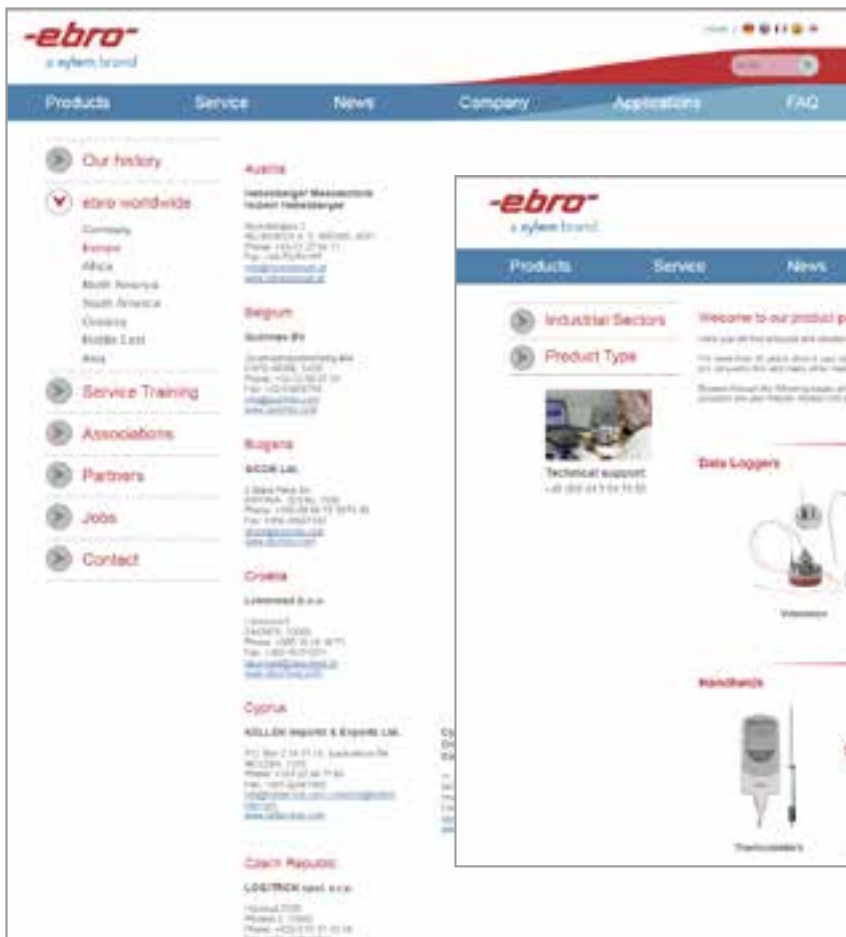
18. DISPUTES AND APPLICABLE LAW

18.1 All disputes arising out of or in connection with the Contract shall be finally settled by the competent courts of Weilheim, Germany, yet it is in the discretion of the Supplier to initiate court proceedings also at the Purchaser's place of business or, in disputes regarding bills of exchange, at the place of payment of the bills of exchange.

18.2 The Contract shall be governed by the substantive law of Germany, excluding the application of the Convention on International Sales of Goods (CISG).



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