



-ebro-[®]
MEASUREMENTS FOR LIFE



Food

**Instruments for
Food Technology
2010/2011**



The EBI 25 Set

- Temperature recording and monitoring
- Monitoring with alarm function
- Suitable for cold storage, transport and refrigerated display cases
- Detailed information starting at page 67

Food technology all-in-one

We are pleased to present our new catalogue 'Instruments for Food Technology 2010/2011' as a comprehensive guide. This catalogue details our current products and services and highlights some exciting new innovations pertaining to the safe manufacture, storage and transportation of common foodstuffs.

■ New Products

TFI 220, TDC 200, EBI 100, EBI 11-P110

■ Transition period for temperature measuring instruments ends

According to Regulation (EG) 37/2005, temperature measuring instruments for deep-frozen foods in transport, storage and distribution must meet the regulations listed below.

■ European Standards for Temperature Measurements:

- EN 12830** Temperature recording devices for transport, storage and refrigerated containers, frozen, deep-frozen food products and ice-tests, for suitability
Measuring range minimum from -25°C up to $+15^{\circ}\text{C}$
- EN 13485** Thermometers for measuring room temperature and ambient temperature for transport, storage and refrigerated containers, frozen, deep-frozen food products and ice-tests, for suitability.
Required measuring range for air temperature thermometers: -30°C ... $+15^{\circ}\text{C}$
Required measuring range for core temperature thermometers: -20°C ... $+30^{\circ}\text{C}$
- EN 13486** Temperature recording devices and thermometers for transport, storage and refrigerated containers, frozen, deep-frozen food products and ice-tests in Standard-Tests. Environmental conditions may not have any disturbing influences on testing equipment or units under test. An exact description of test methods exists.

■ Icons explain the applications

We have added icons (pictograms for butcher shop, bakery, beverage industry, gastronomy, food industry and trade) to the product pictures. So you can see at a glance, for which application the product is suitable.



TRADE



GASTRONOMY



BUCHTERY



BEVERAGE INDUSTRY



BAKERY



FOOD INDUSTRY

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Temperature-/Pressure Monitoring

World's smallest data logger – now also for pressure measurement

Mini-Data Logger **EBI 11**

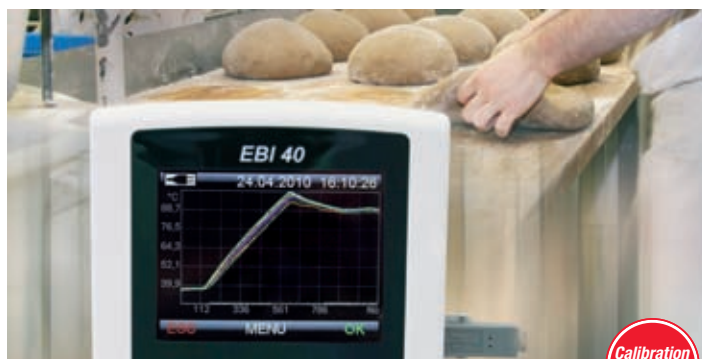
Attributes

- Temperature and pressure measurement directly in the package
- F-value, PE-value calculation and pressure measurement in the package
- Fits all cans, bottles and pouches, etc.

Technical Data

- Measuring range 0°C ... +150°C
- Accuracy $\pm 0.1^\circ\text{C}$

More info see page 47



Temperature monitoring

At high temperatures up to +500°C

Multi-channel Temperature Logger **EBI 40**

Attributes

- Records temperatures in ovens, feed ovens, baking stations...
- Determines temperature profiles
- Up to 12 temperature probes connectable
- Maximum insulation with thermal insulation case TIB 400 (insulation case available separately)

Technical Data

- Measuring range 0°C ... 500°C
- Accuracy 0.5°C

More info see page 73

Highlights

The special features of the current product range at a glance



Calibration certificate

Temperature Measurement

Dual-Infrared-/Fold-Back-Thermometer TLC 730



Technical Data

- Measuring range: $-50^{\circ}\text{C} \dots +350^{\circ}\text{C}$
- Accuracy Infrared: $\pm 4^{\circ}\text{C}$ ($-50^{\circ}\text{C} \dots -30.1^{\circ}\text{C}$)
 $\pm 2.5^{\circ}\text{C}$ ($-30^{\circ}\text{C} \dots 18.1^{\circ}\text{C}$)
 $\pm 1.5^{\circ}\text{C}$ ($-18^{\circ}\text{C} \dots -0.1^{\circ}\text{C}$)
 $\pm 1^{\circ}\text{C}$ ($0^{\circ}\text{C} \dots +65^{\circ}\text{C}$)
 $\pm 2^{\circ}\text{C}$ ($+65^{\circ}\text{C} \dots +350^{\circ}\text{C}$)
- Accuracy Penetration Probe:
 $\pm 0.8^{\circ}\text{C}$ ($-18^{\circ}\text{C} \dots +120^{\circ}\text{C}$)
 $\pm 0.1^{\circ}\text{C}$ for remaining range

Attributes

- Fast temperature measurement at incoming goods inspections
- Recommended by the Germany Federal Association of Food Inspectors
- Our top-selling combined thermometer with non-contact surface measurement and core temperature measurement
- over 100,000 satisfied customers



More info see page 23



NEW

Calibration certificate

Temperature Measurement

Robust Thermometer for Core Temperatures

Core Thermometer TDC 200



Technical Data

- Measuring range: $-50^{\circ}\text{C} \dots +300^{\circ}\text{C}$
- Accuracy: $\pm 0.3^{\circ}\text{C}$ ($-20^{\circ}\text{C} \dots +60^{\circ}\text{C}$)

Attributes

- One-hand operation with handy T-shape
- Temperature measurement for cheese, sausage and meat
- Exchangeable probe
- Modern, waterproof design with illuminated display
- Including belt clip / wall bracket
- Especially for fresh and frozen goods



More info see page 17



Temperature monitoring with radio technology

Switch on and nothing is forgotten

Temperature Logger with Radio Technology **EBI 25-T/-TE**



Attributes

- Temperature monitoring with radio technology for cooling chambers, storage, refrigerated display cases etc.
- Temperatures and alarm displayed directly on PC
- Alarm via e-mail / SMS

EBI 25-T

- Measuring range $-30^{\circ}\text{C} \dots +60^{\circ}\text{C}$
- Accuracy $\pm 0.5^{\circ}\text{C}$
- Temperature logger with radio technology with internal probe

EBI 25-TE

- Measuring range $-40^{\circ}\text{C} \dots +85^{\circ}\text{C}$
- Accuracy $\pm 0.5^{\circ}\text{C}$
- Temperature logger with radio technology with external probe



More info see page 67



with memory capacity of 40,000 measured values

Temperature Recording

Monitoring for Transport and Storage

Temperature Data Logger Family **EBI 20-T1**



Attributes

- Available immediately in XL version with memory capacity 40,000 measured values
- 416 days continuous recording at measuring rate 15 min
- according to DIN EN 12830
- Programming and evaluation with PC
- Waterproof

Technical Data

- Records 40,000 Measured Values
- EBI 20-T1 with internal probe, $-30^{\circ}\text{C} \dots +60^{\circ}\text{C}$
- EBI 20-TE1 with external probe, $-30^{\circ}\text{C} \dots +60^{\circ}\text{C}$
- EBI 20-TH1 with internal humidity sensor, $-30^{\circ}\text{C} \dots +60^{\circ}\text{C}$
- Accuracy: $\pm 0.5^{\circ}\text{C}$



More info see page 60

ebro® has handheld instruments for all measuring tasks ...

Core thermometers for bakeries, butcheries and for the food industry,
officially calibrated thermometers for food inspectors,
fold-back thermometers for quick measurements in refrigerated display cases,
NiCrNi thermometers for high temperatures,
infrared thermometers for non-contact surface measurement,
humidity measuring instruments for production and storage,
instruments for measuring salt content,
vacuum measuring instruments and **instruments for measuring the quality of deep-frying oil**.

ebro® handhelds: precise, waterproof and robust





TFE 510

8.6°C

ON / OFF

-ebro-

-ebro-
TLC1598
on
off
8.4
50 → 200°C

SSX 210

5.6
5.6

TFH 620

5.19
30.1

ON / OFF

HOLD
MIN
MAX
DP CLR

TTX 100

2.5°C

ON / HOLD

-ebro-

FOM 310

24%
15°C

ON / HOLD

-ebro-

TLC 730

1.9°C
2.2°C

MODE

-ebro-

Precision Core Thermometer

TFX 410 / TFX 410-1 / TFX 420



Technical Data

Type	TFX 410 / TFX 410-1 / TFX 420
Measuring range TFX 410	-50°C ... +300°C (-58°F ... 572°F)
Measuring range TFX 410-1	-50°C ... +300°C (-58°F ... 572°F)
Measuring range TFX 420	-50°C ... +400°C (-58°F ... 752°F)
Accuracy	±0.3°C (±0.5°F)
Resolution	0.1°C (0.2°F)
Sensor	Pt 1000 (different probe types available)
Operating temperature	-25°C ... +50°C (-13°F ... 122°F)
Storage temperature	-30°C ... +70°C (-22°F ... 158°F)
Battery	3.0 V lithium, exchangeable
Battery lifetime	approx. 5 years
Dimensions	54 x 22 x 109 mm without probe
Housing	ABS
Weight	approx. 90 g
Protection class	IP 67
Additional functions TFX 420	Hold, Min/Max
Certificate	3 point factory calibration
Deactivation	automatically after 2 hours, deactivatable

TFX 410 / TFX 410-1 / TFX 420



Applications

- | | | |
|--|---|--|
| <ul style="list-style-type: none"> • Food products industry • Incoming goods inspection • Cold stores | <ul style="list-style-type: none"> • Butcher's • Kitchen / Restaurant • Bakeries | <ul style="list-style-type: none"> • Catering • Laboratory |
|--|---|--|

Attributes

- | | | |
|---|---|--|
| <ul style="list-style-type: none"> • High accuracy • Precise Pt1000 probes • Robust and impact resistant | <ul style="list-style-type: none"> • Factory calibration certificate • According to EN 13485 • Dishwasher-safe | <ul style="list-style-type: none"> • Long battery lifetime • Replaceable battery |
|---|---|--|

Description	Type	Part No.
Thermometer with fixed probe TPX 410, pointed, 60 cm silicone cable	TFX 410	1340-5410
Thermometer without probe	TFX 410-1	1340-5415
Thermometer with pointed probe, 60 cm silicone cable (red) and grip, L = 120 mm, Ø 3 mm	TFX 410-1 + TPX 400	1340-5416
Thermometer with pointed probe, 60 cm silicone cable (red) and grip, L = 120 mm, Ø 3 mm	TFX 420 + TPX 400	1340-5426
Thermometer without probe	TFX 420	1340-5425
Pointed probe with 60 cm silicone cable (red) and grip, L = 120 mm, Ø 3 mm	TPX 400	1341-5416

Remarks

*See pages 12 - 13 for probe variants, replacement parts and accessories.

Verified / Verifiable Thermometer

TFX 422



Technical Data	
Type	TFX 422
Measuring range	-50°C ... +200°C (-58°F ... 392°F)
Accuracy	±0.3°C (±0.4°F)
Resolution	0.1°C (0.2°F)
Measuring sensor	Pt1000 (length 120 mm, Ø 3 mm)
Operating temperature	-25°C ... +50°C (-13°F ... 122°F)
Storage temperature	-30°C ... +70°C (-22°F ... 158°F)
Cable length	60 cm, silicone
Thermal constant T ₉₉ (moving water)	approx. 8 s
Battery	lithium button cell 3 V / 1 Ah, Type CR 2477
Battery lifetime	approx. 5 years
Deactivation	automatically after 2 hours, deactivatable
Dimensions (LxWxH)	109 x 54 x 22 mm
Housing	ABS
Protection class	IP 67
Weight	approx. 90 g

TFX 422



Applications		
<ul style="list-style-type: none"> • For food inspectors and veterinarians • Food products industry 	<ul style="list-style-type: none"> • Trade • Bakeries • Butcher's 	<ul style="list-style-type: none"> • Kitchen / Restaurant • Temperature monitoring

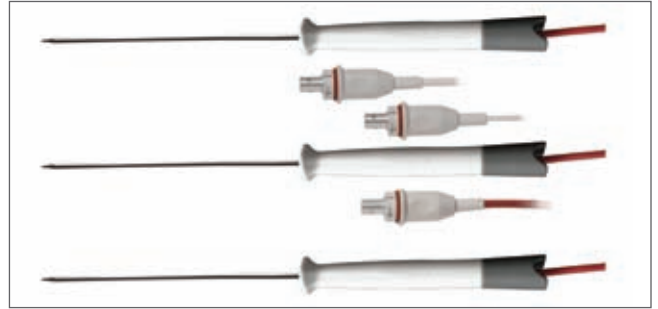
Attributes		
<ul style="list-style-type: none"> • Tested and recommended by the German Federal Association of Food Inspectors and Consumer Protection • PTB approved 	<ul style="list-style-type: none"> • Robust and impact resistant • High accuracy • Waterproof IP 67 	<ul style="list-style-type: none"> • Approx. 5 years battery lifetime • Also available with calibration certificate • According to EN 13485

Description	Type	Part No.
Thermometer*, verified, incl. calibration certificate with 0.6 m cable	TFX 422-verified	1340-5423
Thermometer*, verifiable, with 0.6 m cable	TFX 422-verifiable	1340-5422
Thermometer*, verified, incl. calibration certificate with 1.5 m cable	TFX 422-150	1340-5424
Thermometer*, verifiable, with 1.5 m cable	TFX 422-150	1340-5421

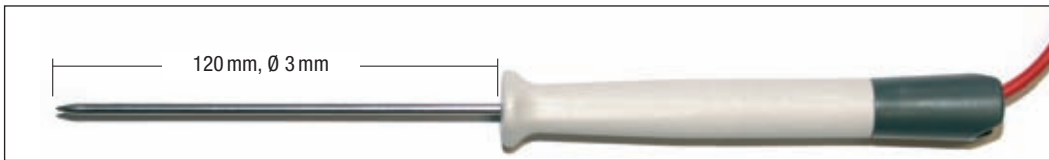
* incl. probe

Remarks
*Spare parts and accessories see pages 12 - 13.

Probes, Replacement Parts and Accessories for TFX 410 / 410-1 / 420

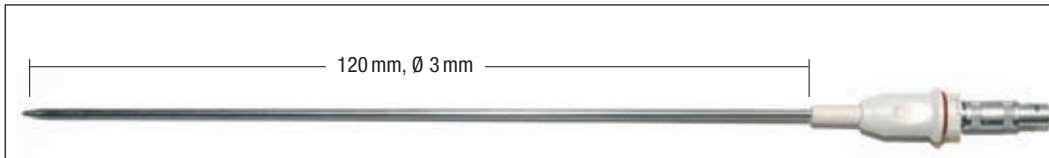


TPX 400



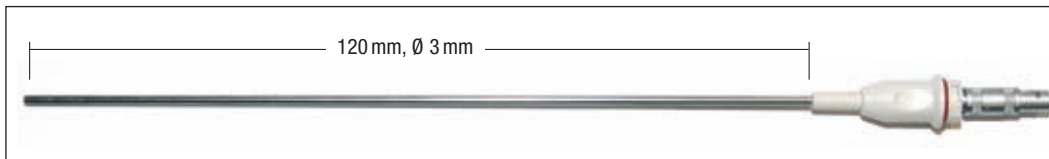
Pointed probe with 60 cm silicone cable (red), needle length: 120 mm, Ø 3 mm, temperature resistant (grip and cable): max. 200°C (392°F)

TPX 200



Pointed probe, needle length: 120 mm, Ø 3 mm, without cable

TPX 100



Blunt probe, needle length: 120 mm, Ø 3 mm, without cable

Pt 1000 Probes (with Lemosa size 0) for TFX 410 / 410-1 / 420

Description	Type	Part No.
Pointed probe, L = 120 mm, Ø 3 mm, without cable	TPX 200	1341-5418
Pointed probe, L = 200 mm, Ø 3 mm, without cable	TPX 200-20	1341-4182
Pointed probe, L = 300 mm, Ø 3 mm, without cable	TPX 200-30	1341-4183
Pointed probe, L = 400 mm, Ø 3 mm, without cable	TPX 200-40	1341-4184
Blunt probe, L = 120 mm, Ø 3 mm, without cable	TPX 100	1341-5417
Pointed probe with 60 cm silicone cable (red) and grip, L = 120 mm, Ø 3 mm	TPX 400	1341-5416
Pointed probe with 40 cm silicone cable (red) and grip, L = 120 mm, Ø 3 mm	TPX 400-40	1341-4164
Pointed probe with 150 cm silicone cable (red) and grip, L = 120 mm, Ø 3 mm	TPX 400-150	1341-4168
Pointed probe with 150 cm teflon cable (white) and grip, L = 120 mm, Ø 3 mm	TPX 440	1341-4169

Probes, Replacement Parts and Accessories for TFX 410 / 410-1 / 420

Replacement parts for TFX Thermometers

Description	Type	Part No.
Spare probe for TFX 410 (probe with fixed base)	TPX 410	1341-5410
Battery exchange-set, battery: 3V lithium CR 2477, (incl. battery, needle, screws, plug, O-ring, directions)	AG 170	1100-0106

Accessories for TFX Thermometers



AG 140

Protective cover, red



AG 160

Stainless steel bracket



AG 170

Battery exchange set

Accessories for TFX Thermometers

Description	Type	Part No.
Extension cable 1m for TFX devices (Lemosia size 0)	AX 100	1340-5015
Aluminum-case	AG 130	1341-3854
Protective cover, red	AG 140	1340-5005
Plastic bracket	AG 150	1340-5000
Stainless steel bracket	AG 160	1340-0595
Stainless steel bracket for TFX devices with AG 140	AG 161	1340-0596

Core Thermometer with fast response time

TFE 510



Technical Data	
Type	TFE 510
Measuring range	-50°C ... +300°C (-58°F ... 572°F)
Accuracy	±0.5°C (0.9°F)
Resolution	0.1°C (0.2°F)
Measuring probe	Thermal element, type T
Operating temperature	-25°C ... +50°C (-13°F ... 122°F)
Storage temperature	-30°C ... +70°C (-22°F ... 158°F)
Thermal constant T ₉₉	3 s
Battery	lithium 3.0 volt
Battery lifetime	approx. 5 years
Dimensions	109 x 54 x 22 mm
Housing material	ABS
Weight	approx. 90 g
Protection class	IP 67
Measuring rate	0.5 s ... 15 s
Certificate	3 point factory calibration
Deactivation	automatically after 2 hours, deactivatable

TFE 510



Applications		
<ul style="list-style-type: none"> • Cold store • Food products industry • Incoming goods inspection 	<ul style="list-style-type: none"> • Butcher's • Food products laboratories 	<ul style="list-style-type: none"> • Catering • Food inspections

Attributes		
<ul style="list-style-type: none"> • High accuracy • Very fast • According to EN 13485 	<ul style="list-style-type: none"> • Robust and impact resistant • Battery lifetime approx. 5 years • Battery charge indicator 	<ul style="list-style-type: none"> • Waterproof IP 67 • °C/°F switchable • Factory calibration certificate

Description	Type	Part No.
Thermometer without probe	TFE 510	1340-5510
Thermometer with probe, with silicone cable, 0.6 m, blue	TFE 510 + TPE 400	1340-5516
Probe with silicone cable, 0.6 m, blue, for TFE 510	TPE 400	1341-5516

Fold-Back Thermometer Pt 1000

TLC 1598




Technical Data

Type	TLC 1598
Measuring range	-50°C ... +200°C (-58°F ... 392°F)
Resolution	0.1°C (0.2°F)
Accuracy	±0.3°C (±0.5°F)
Sensor	Pt1000
Needle type probe	stainless steel, Ø 3 mm, L=105 mm, pointed
Thermal time constant (t ₉₉)	8 s (water)
Operating temperature	0°C ... +50°C (32°F ... 122°F)
Storage temperature	-10°C ... +60°C (14°F ... 140°F)
Display	LCD 9 mm
Battery	3.6 V lithium
Battery lifetime	approx. 4 years
Dimensions	44 x 18 x 158 mm
Material	ABS
Weight	approx. 70 g
Protection class	IP 54
Certificate	3 point factory calibration

TLC 1598



Applications

- | | | |
|---|---|--|
| <ul style="list-style-type: none"> • Fast, exact temperature monitoring for incoming goods inspections | <ul style="list-style-type: none"> • Catering / Serving • Food products industry • Trade | <ul style="list-style-type: none"> • Cool house • Temperature monitoring • Food products laboratories |
|---|---|--|

Attributes

- | | | |
|--|---|--|
| <ul style="list-style-type: none"> • High accuracy • Robust and impact resistant | <ul style="list-style-type: none"> • Battery lifetime approx. 4 years • Fold-back probe | <ul style="list-style-type: none"> • Short response time • Factory calibration certificate |
|--|---|--|

Description	Type	Part No.
Fold-back thermometer	TLC 1598	1340-1620
Accessories		
Plastic case, blue	EB 1598	1341-3845
Belt case, nylon	AG 121	1341-0624



The new TDC 200

For use everywhere, where freshness counts



- Fast temperature checks in cooling/refrigerator chambers
- Alarm at exceeding/shortfall of limit value
- Large display with visible alarm
- Easy to operate and robust in use

Core Thermometer for Food

TDC 200



Technical Data	
Type	TDC 200
Measuring range	-50°C ... +300°C (-58°F...572°F)
Resolution	0.1°C
Accuracy	±0.3°C (-20°C...+100°C) ±0.5°C (-50°C ... -20.1°C / 100.1°C ... 200°C) ±0.8°C (200.1°C ... +300°C)
Sensor	Pt 1000, Class A
Measuring rate	2 measurements per second
Operating temperature	-20°C...+50°C
Storage temperature	-40°C...+70°C
Temperature sensor	100 mm, Ø 3mm - 6mm
Battery	2 x AAA
Battery lifetime	typical 80 h
Housing	ABS
Weight	ca. 110g
Protection class	IP 65
Certificate	2-point factory calibration

TDC 200



Applications		
<ul style="list-style-type: none"> • According to DIN EN13485 	<ul style="list-style-type: none"> • Fast temperature control • Cooling/Refrigerator chamber 	<ul style="list-style-type: none"> • Incoming goods • Transport/Storage

Attributes		
<ul style="list-style-type: none"> • With belt case • Replaceable Battery • Auto-Off-Function 	<ul style="list-style-type: none"> • Large display, illuminated • Hold-Function • Exchangeable probe 	<ul style="list-style-type: none"> • Handy and robust • Acoustic and visual alarm • Adjustable limit values

Description	Type	Part No.
Core thermometer	TDC 200	1340-5130
Accessories		
Spare probe	TPC 200	1341-5130
Belt case	AC 200	1340-5042



Core Thermometer (Thermal Element Type T)

TTX 100



Technical Data

Type	TTX 100
Measuring range Type T	-50°C ... +350°C (-58°F ... 662°F)
Accuracy Type T (@ +25°C/77°F)	±0.8°C (±1.4°F) or ± 0.8%, whichever is larger
Resolution	0.1°C of -60°C ... +199.9°C (0.2°F of -76°F ... 391°F) and 1°C (1.8°F) for the remaining measuring range
Material	ABS
Operating temperature	-20°C ... +50°C (-4°F ... 122°F)
Storage temperature	-30°C ... +70°C (-22°F ... 158°F)
Reaction time (90%)	5 s
Dimensions	90 x 42 x 17 mm
Battery lifetime	typically 100 h of uninterrupted use
Battery	CR 2032, exchangeable
Temperature probe	permanently attached to the device, silicone cable 0.6 m long, probe with grip, needle ø 3 mm, L = 105 mm, pointed
Protection class	IP 55

TTX 100



Applications

- | | | |
|---|---|--|
| <ul style="list-style-type: none"> • Trade • Bakeries | <ul style="list-style-type: none"> • Butcher's | <ul style="list-style-type: none"> • Kitchens • Food products laboratories |
|---|---|--|

Attributes

- | | | |
|---|---|---|
| <ul style="list-style-type: none"> • According to EN 13485 • With cable, fixed connection | <ul style="list-style-type: none"> • Fast measurement • HACCP | <ul style="list-style-type: none"> • Robust and impact resistant • Replaceable battery • Factory calibration certificate |
|---|---|---|

Description	Type	Part No.
Core thermometer (thermal element type T)	TTX 100	1340-5100

Core Thermometer (Thermal Element Type T)

TTX 110



Technical Data

Type	TTX 110
Measuring range Type T	-50°C ... +350°C (-58°F ... 662°F)
Accuracy Type T (@ +25°C/77°F)	±0.8°C (±1.4°F) or ±0.8%, whichever is larger
Resolution	0.1°C of -60°C ... +199.9°C (0.2°F of -76°F ... 391°F) and 1°C (1.8°F) for the remaining measuring range
Material	ABS
Operating temperature	-20°C ... +50°C (-4°F ... 122°F)
Storage temperature	-30°C ... +70°C (-22°F ... 158°F)
Reaction time (90%)	5 s
Dimensions	90 x 42 x 17 mm
Battery lifetime	typically 100 h of uninterrupted use
Battery	CR 2032, exchangeable
Temperature probe	temperature probe has fixed connection to the device, Needle Ø 3 mm, L = 90 mm, pointed
Protection class	IP 55

TTX 110



Applications

- | | | |
|---|---|--|
| <ul style="list-style-type: none"> • Trade • Kitchens • Bakeries | <ul style="list-style-type: none"> • Butcher's | <ul style="list-style-type: none"> • Food products laboratories |
|---|---|--|

Attributes

- | | | |
|--|--|---|
| <ul style="list-style-type: none"> • According to EN 13485 • Fixed probe | <ul style="list-style-type: none"> • Fast measurement, high accuracy • HACCP | <ul style="list-style-type: none"> • Robust and impact resistant • Replaceable battery • Factory calibration certificate |
|--|--|---|

Description	Type	Part No.
Core thermometer (thermal element type T) with fixed probe	TTX 110	1340-5110



Low-Cost Thermometer

TDC 150



Technical Data

Type	TDC 150
Measuring range	-50°C ... +150°C (-58°F ... 302°F)
Resolution	0.1°C in range -20°C ... +150°C (0.2°F in range -4°C ... 302°F)
Accuracy	±1°C in range -30°C ... +150°C (±1.8°F in range -22°F ... 302°F)
Sensor	NTC
Needle type probe	stainless steel, Ø 3.5 mm, L = 125 mm, pointed
Thermal time constant (t ₉₉)	10 s (water)
Operating temperature	0°C ... +50°C (32°F ... 122°F)
Storage temperature	-10°C ... +60°C (14°F ... 140°F)
Display	LCD 7 mm
Battery	1.5 V, LR44, G13
Battery lifetime	approx. 5000 h
Dimensions	24 x 26 x 85 mm
Material	ABS
Weight	approx. 36 g
Protection class	IP 65

TDC 150



Applications

- Temperature checks for meat, cold cuts, fruit, fish, baked goods and pasta
- Bakeries / Butcher's
- Kitchen

Attributes

- Fixed probe, pointed
- Robust and impact resistant
- Replaceable battery
- Switchable between °C / °F
- Needle guard

Description	Type	Part No.
Thermometer, incl. needle guard	TDC 150	1340-1611

Low-Cost Thermometer

TDC 110



Technical Data

Type	TDC 110
Measuring range	-50°C ... +150°C C (-40°F ... 302°F)
Resolution	0.1°C (0.2°F)
Accuracy	±1°C (-10°C ... +120°C), ±1.8°F (14°F ... 248°F) ±2°C for the remaining measuring range
Sensor	NTC
Needle type probe	stainless steel, Ø 4 mm, L = 120 mm, pointed
Thermal time constant (t ₉₉)	19 s (water)
Operating temperature	0°C ... +50°C (32°F ... 122°F)
Storage temperature	-10°C ... +60°C (14°F ... 140°F)
Display	7 mm LCD
Battery	1,5 V, G 10-A
Dimensions	50 x 40 mm
Weight	approx. 13g

TDC 110



Applications

- | | | |
|--|--|---|
| <ul style="list-style-type: none"> • Temperature checks for meat, cold cuts, fruit, fish, baked goods and pasta | <ul style="list-style-type: none"> • Kitchens | <ul style="list-style-type: none"> • Bakeries • Butcher's |
|--|--|---|

Attributes

- | | | |
|--|--|--|
| <ul style="list-style-type: none"> • Fixed probe, pointed • Exchangeable battery | <ul style="list-style-type: none"> • °C/°F switchable • Needle guard | <ul style="list-style-type: none"> • Automatic deactivation after approx. 10 min. • ON/OFF |
|--|--|--|

Description	Type	Part No.
Thermometer, incl. needle guard and spare battery	TDC 110	1340-5121

The TLC 730

For use everywhere, where freshness counts



- Fast temperature checks at incoming goods
- Alarm at exceeding/shortfall of limit value
- Recommended by the German Federal Association of Food Inspectors

Dual Infrared / Fold-Back Thermometer

TLC 730




Technical Data

Type	TLC 730
Measuring range	-50°C ... +350°C (-58°F ... 662°F)
Accuracy infrared	±4°C at -50°C ... -30.1°C (±7.2°F at -58°F ... -22°F) ±2.5°C at -30°C ... -18.1°C (±4.5°F at -22°F ... -0.4°F) ±1.5°C at -18°C ... -0.1°C (±2.7°F at -0.4°F ... 32°F) ±1.0°C at 0°C ... +65°C (±1.8°F at 32°F ... 149°F)
Accuracy thermocouple	±2.0°C or 2% at +65°C ... +350°C (±3.6°F at 149°F... 662°F) ±0.8°C at -18°C ... +120°C (±1.44°F at -0.4°F ... 248°F) ±1°C (±2°F) or 1% for remaining range - the larger value is applicable
Resolution	0.1°C / 0.2°F
Sensor	Thermocouple type K
Operating temperature	-25°C ... +50°C (-13°F ... 122°F)
Storage temperature	-40°C ... +70°C (-40°F ... 158°F)
Battery	2 x Mignon AAA, exchangeable by user
Battery lifetime	15 h by permanent use
Dimensions	48 x 24 x 172 mm without probe
Housing	ABS
Weight	approx. 140 g
Protection class	IP 55
Certificate	4 point factory calibration
Deactivation	automatically after 2 hours, deactivatable

TLC 730


Applications

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> • Transport/Storage • Incoming goods inspection | <ul style="list-style-type: none"> • Cooling-/ Refrigerator chamber • Trade | <ul style="list-style-type: none"> • Restaurant / Catering |
|--|---|---|

Attributes

- | | | |
|---|---|--|
| <ul style="list-style-type: none"> • Surface measuring with infrared • Dual-Laser • Switchable between °C/°F | <ul style="list-style-type: none"> • Core measuring with penetration probe • Incl. drill for the measurement of frozen food | <ul style="list-style-type: none"> • Factory calibration certificate • Visible and audible alarm by exceeding / shortfall of limit value |
|---|---|--|

Description	Type	Part No.
Dual Infrared / Fold-Back Thermometer	TLC 730	1340-5730
Belt case	AG 121	1341-0624

The new TFI 220

For use everywhere, where freshness counts



- Fast, non-contact surface measurement at incoming goods inspection
- Pilot laser for determination of spot size
- Fixed emissivity factor for goods and packaging

Infrared-Thermometer

TFI 220





Technical Data

Type	TFI 220
Measuring range	-35°C ... +365°C
Accuracy	± 2.5°C or 2.5 % (larger value applies)
Resolution	0.2°C
Operating temperature	0°C ... +50°C
Reaction time	1 s
Emissivity factor	0,95 fixed
Optics	12:1
Battery	AAA 1,5 V
Battery life time	14 h in case of permanent use
Material	ABS
Dimensions	148 x 112 x 41 mm
Weight	145 g with batteries
Protection class	IP 20
Certificate	Factory calibration certificate

TFI 220



Applications

- Non-contact temperature measurement via infrared
- Incoming goods inspection
- Kitchens and refrigerator chambers
- Food distribution

Attributes

- Fast measurement
- Laser pointer
- Optics D:S = 12:1
- Exchangeable battery
- Factory calibration certificate
- Two fixed emissivity factors for goods and storage

Description

Infrared Thermometer
incl. Factory calibration certificate

Type

TFI 220

Part No.

1340-1789

Dual Infrared Measuring Device with Probe Connection

TFI 550



Technical Data

Type	TFI 550
Measuring range	-60°C ... +550°C (-76°F ... 1,022°F)
Accuracy	±2°C at -18°C ... +23°C (±3.6°F at 0°F ... 73°F) ±1% of measured value / ±1°C (whichever is larger) at +23°C ... +510°C / ±1.8°F (whichever is larger) at 73°F ... 950°F
Resolution	0.1°C at -9.9°C ... +199°C, otherwise 1°C (0.2°F at 14°F ... 391°F, otherwise 1.8°F)
Reaction time (90%)	approx. 1s
Emissivity factor	0.1 ... 1.0
Ratio distance-measurement spot	30:1
NiCrNi probe measurement	
Measuring range	-64°C ... +1400°C (-83°F ... 2,552°F)
Accuracy	±1% of measured value / ±1°C (±1.8°F), whichever is larger
Battery lifetime	typically 180 h
Operating temperature	0°C ... +50°C (32°F ... 122°F)
Storage temperature	-20° C ... +65°C (-4°F ... 149°F)
Housing	ABS
Protection class	IP 20
Weight incl. battery	approx. 180 g
Certificate	6 point factory calibration

TFI 550



Applications

- Fast refrigerated goods checks
- Climate control systems
- Incoming goods inspection
- Process monitoring
- Storage
- Food products industry

Attributes

- Infrared for non-contact surface temperature measurement
- Optics D:S = 30:1
- Double laser pointer
- NiCrNi connection for core temperature measurement with penetration probe
- Alarm when Min/Max exceeded
- Factory calibration certificate

Description	Type	Part No.
Infrared thermometer with NiCrNi connection	TFI 550	1340-1786
Penetration probe with cable, SMP	TPN 211	1343-1005
Surface / paddle probe with 1 m cable, SMP	TPN 341	1343-1015

Remarks

For all NiCrNi-probes with SMP port.

Thermo Case Infrared Thermometer

TBI 40



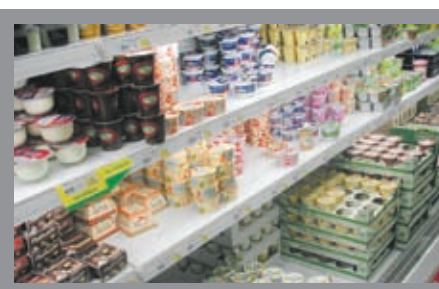
DIN EN
13485

Technical Data

Type	TBI 40
Measuring range	-33°C ... +60°C (-28°F ... 140°F)
Accuracy	±1°C / ±2°F at Tamb = 15°C ±5°C (59°F ±9°F) ±2°C / ±4°F for the remaining measuring range
Resolution	±0.1°C (±0.2°F)
Operating temperature	-25°C ... +60°C (-13°F ... 140°F)
Storage temperature	-25°C ... +70°C (-13°F ... 158°F)
D:S	≥ 1.1
Emission ratio	0.95 fixed
Battery lifetime	5 years
Protection class	IP 65
Deactivation	automatically after 15s LED Signal green > -15°C (5°F) or < +7°C (45°F) LED Signal red < -15°C (5°F) or > +7°C (45°F)



TBI 40



Applications

- Food temperature control during food transport
- Transport of food (cooled, frozen)
- Measuring temperature in closed thermo cases

Attributes

- TÜV certified according to Inspection Report No. 071101
- Differentiation of dairy products and frozen foods
- Temperature status via LED (green / red) with display for direct reading

Description	Type	Part No.
Thermo case infrared thermometer	TBI 40	1340-1798

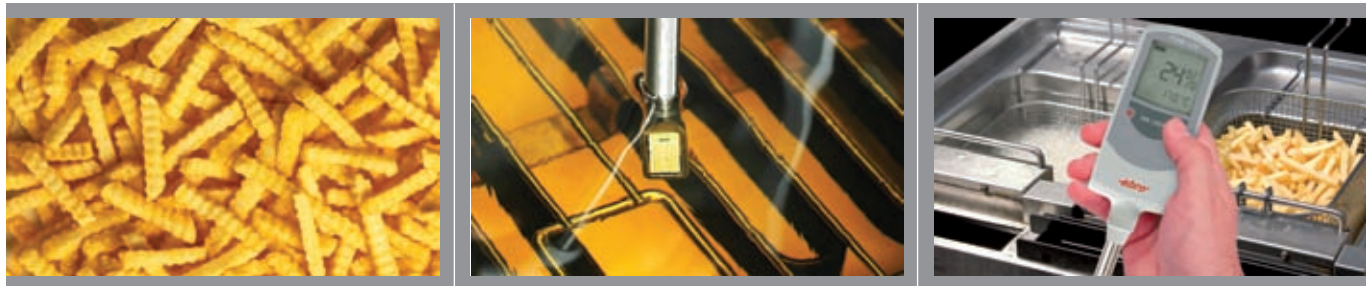
Food Oil Monitor

FOM 310



Technical Data	
Type	FOM 310
Measuring range oil	0% ... 40% polar compounds
Accuracy	typically ±2%
Resolution	0.5 %
Measuring range temperature	0°C ... +220°C (32°F ... 428°F)
Measuring range for oil	+50°C ... +200°C (122°F ... 392°F)
Accuracy	±1°C (±1.8°F)
Resolution	1°C (1.8°F)
Housing operating temperature	-20°C ... +50°C (-4°F ... 122°F)
Storage temperature	-25°C ... +60°C (-13°F ... 140°F)
Battery	3V lithium
Dimensions	125 x 54 x 22 mm (without probe)
Housing	ABS (food safe)
Weight	approx. 200 g
Protection class	waterproof IP 67
Battery change	possible by user
Battery lifetime	approx. 5 years
Certificate	2-point factory calibration

FOM 310



Applications		
<ul style="list-style-type: none"> • Change frying oil at the right time • Measurement of hot oil directly in fryer 	<ul style="list-style-type: none"> • Restaurants / Canteens • No health risks caused by spent oil 	<ul style="list-style-type: none"> • Fast, safe on-site measurement • Setting the right frying point

Attributes		
<ul style="list-style-type: none"> • Exact determination frying oil quality • 0% to 40% polar compounds • Temperature measurement up to +220°C (428°F) 	<ul style="list-style-type: none"> • Results within 10 s (simultaneous display of temperature and polar compounds) • Limit indication by flashing light (red / yellow / green) 	<ul style="list-style-type: none"> • Waterproof • Robust and impact resistant • Several oil types adjustable

Description	Type	Part No.
Food oil monitor set (incl. food oil monitor, protective cover, case)	FOM 310	1340-1522

Food Oil Monitor

Accessories for FOM 310

Accessories



AM 130

Case (without measuring device)



AG 160

Stainless steel bracket
(without measuring device)



AM 140

Protective cover

Description	Type	Part No.
Carrying case	AM 130	1340-1594
Protective cover for FOM 310 with strap, red	AM 140	1340-5007
Stainless steel bracket	AG 160	1340-0595
Stainless steel bracket (FOM 310 with AG 140)	AG 161	1340-0596

**Minimum
Oil-Savings
10%**

**Mindestens
-10%
ÖL-Einsparung**

pH-Meter Set ST 1000

consisting of PHT 810, elektrode and accessories



Technical Data

Type	PHT 810
pH-Measuring range	0 pH ... 14 pH
pH-Accuracy	±0.03 pH
pH-Resolution	0.01 pH
Memory	Hold, Max/Min
Input socket	BNC
Battery lifetime	up to 5 years
Display	LCD, 12 mm
Operating temperature	-10°C ... +50°C (14°F ... 122°F)
Storage temperature	-25°C ... +60°C (-13°F ... 140°F)
Dimensions	110 x 54 x 22 mm
Temperature compensation	manual
Weight	approx. 200 g
Certificate	2-point factory calibration certificate (included in pH-meter set)

PHT 810



Applications

- | | | |
|--|--|---|
| <ul style="list-style-type: none"> • Measurement of pH-value • Butcher's | <ul style="list-style-type: none"> • Meat, cold cuts, cheese • Dairy | <ul style="list-style-type: none"> • Fluids • Beverage production |
|--|--|---|

Attributes

- | | | |
|--|--|--|
| <ul style="list-style-type: none"> • Handy and robust • Current value memory • Battery lifetime approx. 5 years | <ul style="list-style-type: none"> • Simple calibration with keypad • Fully automatic pH-calibration | <ul style="list-style-type: none"> • Replaceable electrode • Factory calibration certificate |
|--|--|--|

Description	Type	Part No.
pH meter (without electrode*)	PHT 810	1340-5810
pH-set for food industries, butcheries, dairies included: PHT 810, penetration electrode AT 206, punching pin, buffer solution pH4, pH7, protein cleaner, KCl-solution, case	ST 1000	1339-0620
Replacement electrodes		
Penetration electrode with cable 1 m and BNC plug for measurement in meat, sausage, cheese and other semi-solid food products and materials	AT 206	1339-0629
Accessories		
Buffer solution pH 4	AT 400	1341-3836
Buffer solution pH 7	AT 401	1341-3838
KCl-solution	AT 405	1341-3839
Electrode cleaner	AT 410	1341-3840
Protective cover for pH meter	AG 140	1340-5005
Plastic case	AT 100	1340-5091

pH Tester

PHX 800



PHX 800

Technical Data

Type	PHX 800
Measuring range	0.0 pH ... 14.0 pH
Resolution	0.1 pH
Accuracy	±0.2 pH
Operating temperature	0°C ... +50°C (32°F ... 122°F)
Housing material	ABS-plastic
Size	170 x 32 x 15 mm
Weight	approx. 70 g
Battery	4 x 1.5V A76/LR44
Battery lifetime	approx. 150 hours
Deactivation	automatically after 15 min.



Applications

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> • Testing of pH-values | <ul style="list-style-type: none"> • Beverage production | <ul style="list-style-type: none"> • Food production |
|--|---|---|

Attributes

- | | | |
|--|---|--|
| <ul style="list-style-type: none"> • Hold-function, acoustic signal • Auto-Lock function • Automatic deactivation | <ul style="list-style-type: none"> • Battery indicator • Exchangeable battery | <ul style="list-style-type: none"> • Robust • Waterproof • Adjustable |
|--|---|--|

Description

pH tester

Type

PHX 800

Part No.

1340-5800

Hygrothermometer for Humidity and Temperature Measurement

TFH 620



Technical Data

Type	TFH 620
Measuring range humidity	0% rH ... 100% rH
Measuring range temperature	0°C ... +60°C (32°F ... 140°F)
Accuracy humidity	±2% rH (from 5% ... 95%)
Accuracy temperature	±0.3°C (±0.5°F)
Resolution humidity	0.1 %
Resolution temperature	0.1°C (0.2°F)
Operating temperature	0°C ... +50°C (32°F ... 122°F)
Storage temperature	-25°C ... +60°C (-13°F ... 140°F)
Protection class	IP 67 (device without probe)
Dimensions	115 x 54 x 22 mm
Housing	ABS
Weight	approx. 90 g
Display	LCD
Humidity sensor	capacitive
Temperature sensor	Pt 1000
Sensor position	external, removable probe
Number of channels	2
Battery	lithium button cell 3.0 V/1000mAh
Battery lifetime	up to 5 years
Measuring rate	1s - 15s

TFH 620

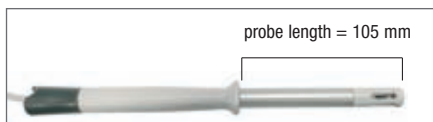


Applications

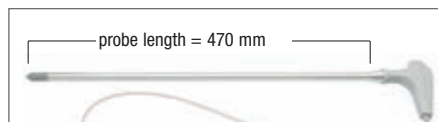
- Humidity and temperature measurement for sensitive food products
- Computer rooms
- Storage monitoring
- Incoming goods inspection
- Environment monitoring
- Food products industry

Attributes

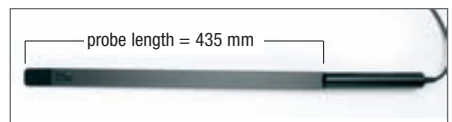
- Reliable and precise
- Robust and impact resistant
- Automatic deactivation
- °C/°F switchable
- HOLD, MIN / MAX
- Dew point calculation
- Factory calibration certificate
- Battery charge indicator
- Wet-bulb temperature calculation



TPH 100



TPH 200



TPH 300

Description	Type	Part No.
Hygrothermometer with air probe	TFH 620 + TPH 100	1340-5621
Hygrothermometer with penetration probe	TFH 620 + TPH 200	1340-5622
Hygrothermometer with blade probe	TFH 620 + TPH 300	1340-5623
Calibration Case for TFH 620	AH 600	1340-5097

Hygrothermometer for Humidity and Temperature Measurement

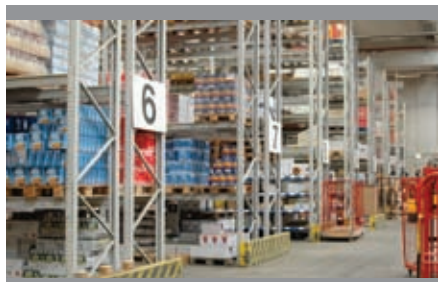
TFH 610



Technical Data

Type	TFH 610
Measuring range humidity	0% rH ... 100% rH
Measuring range temperature	0°C ... +50°C C (32°F ... 122°F)
Accuracy humidity	±2.5% rH (from 10% ... 90%)
Accuracy temperature	±0.5°C (±0.9°F)
Resolution humidity	0.1%
Resolution temperature	0.1°C (0.2°F)
Operating temperature	0°C ... +50°C (32°F ... 122°F)
Storage temperature	-25°C ... +60°C (-13°F ... 140°F)
Protection class	IP 40
Dimensions	115 x 54 x 22 mm
Housing	ABS
Weight	approx. 90 g
Display	LCD
Sensor humidity	capacitive
Sensor temperature	thermistor
Sensor position	internal
Probe connection	fixed connection
Number of measuring channels	2
Battery	lithium button cells, 3.0 Volt, 1000 mAh
Battery lifetime	up to 5 years
Measuring rate	1 s - 15 s

TFH 610



Applications

- | | | |
|--|---|--|
| <ul style="list-style-type: none"> • Production • Storage • Trade | <ul style="list-style-type: none"> • Computer rooms • Environmental control | <ul style="list-style-type: none"> • Food products industry • Laboratory |
|--|---|--|

Attributes

- | | | |
|--|---|---|
| <ul style="list-style-type: none"> • Robust and impact resistant • High accuracy | <ul style="list-style-type: none"> • Factory calibration certificate • °C/°F switchable | <ul style="list-style-type: none"> • Battery indicator • Automatic deactivation |
|--|---|---|

Description	Type	Part No.
Hygrothermometer (incl. probe)	TFH 610	1340-5610

Food Inspection Case

EB 4400

Food Inspection Case EB 4400



The new standard Food Inspection Case contains:

- **Frying oil quality measuring device FOM 310**
- **verifiable temperature measurement device TFX 422**
- **pH-measuring device PHT 810 incl. accessories**
(penetration electrode, buffer solution, electrode cleaner)
- **Dual Infrared / Fold-Back Thermometer TLC 730**
- **Temperature data logger set EBI 20-T-set** (logger, interface, evaluation software)
- **Torch / flashlight**
- **Knife, tweezers, scissors, magnifying glass**

The **FOM 310 food oil monitor** measures frying oil quality directly in the fryer. Through regular tests, it is possible to achieve consistently good quality of fried products, in accordance with the food hygiene regulations (HACCP). The user has the greatest possible assurance that he is changing the oil at the right time.

The Measuring range is 0°C ... +220°C (32°F ... 428°F), polar compounds are 0% ... 40%. (see p. 28)

The **TFX 422 thermometer** is particularly suitable for measuring core temperatures and measuring the temperature of deep-frozen food products.

The Measuring range is -50°C ... +200°C (-58°F ... 392°F). (see p. 11)

The **PHT 810 pH meter** measures pH values in meat, cold cuts, cheese and liquids. The device features user-friendly calibration with keypad.

The measuring range is 0 pH ... 14 pH. (see p. 30)

The **TLC 730 Dual Infrared thermometer** with laser pointer for food is suitable for fast checks on refrigerated goods during storage, goods receipt checks and process monitoring. It avoids product contamination by using a non-contact measuring process. Its practical pocket size makes it easy to transport.

The measuring range is -50°C ... +350°C (-58°F ... 662°F). (see p. 23)

The **temperature data logger EBI 20-T** monitors temperature during transport and storage. The set consists of logger, interface and evaluation software. The logger has an excellent price/performance ratio.

The measuring range is -30°C ... +60°C (-22°F ... 140°F). (see p. 60)

Additional accessories can be ordered:

- Notebook
- Printer
- Digital camera

Details on contents

The precise hand-held measuring unit **TFX 422** is delivered acceptable for official calibration (PTB approval certificate 14.40/96.01 on the unit).

If a calibrated device is required, the meter can be calibrated in any official gauging office for a small fee (for calibration and calibration certificate) for a validity period of 2 years.

For local authorities, calibration by the gauging office is free of charge. Calibrated meters with calibration certificate can also be ordered from **ebro®**.

Description	Type	Part No.
Food Inspection Case	EB 4400	1341-4400
Additional options on request		

Salt Meter

SSX 210



Technical Data

Type	SSX 210
Measuring range	0 ... 100
Resolution	1 Digit
Accuracy at +25°C/77°F)	±1 Digit
Operating temperature	+10°C ... +40°C (50°F ... 104°F)
Measurement interval	1s - 15s, adjustable
Deactivation	automatically after 5 min.
Protection class	IP 54
Dimensions (L x W x H)	100 x 46 x 25 mm
Housing material	ABS
Probe	2-conductor-measuring probe with gold-plated electrodes
Probe cable	silicone
Weight	approx. 200 g
Battery	lithium 3V/1Ah, Type CR2477
Battery lifetime	up to 5 years, depending on use

SSX 210



Applications

- Measurement of the relative salt content of food products
- Meat, sausages, ham, cheese, salads
- Allows consistent taste

Attributes

- Easy operation
- Handy and robust

Details on contents

The **SSX 210 salt meter** is used to measure the salt content in semi-solid food products, such as meat, cold cuts, cheese, salads etc. To achieve this, the electrical conductivity is measured, since this is dependent on the salt content. It is important that the medium to be measured also has a water component. This means that salt measurements cannot be completed in pure oil (does not contain water).

Every dish requires a specific salt content to ensure proper taste. The taste of each dish is different, however, which means that the user must prepare his or her own salt content table. If, for example, it is determined that the optimal seasoning of cured ham yields a value of 86, all further hams can be cured and seasoned until they reach this value.

Example	Display
yellow sausage	40
cured ham	86
cheese fondue	19

These values cannot be taken directly, as the salt content depends on the ingredients and recipes. Please also note that not only the salt content is measured when vinegar and acids are used, as these substances also increase the electric conductivity.

Description	Type	Part No.
Salt meter	SSX 210	1340-5210
Salt meter set (consisting of salt meter and case)	SSX 210-Set	1340-5211

The EBI 100 wireless logger makes it possible:

Wireless monitoring of hot processes up to +150°C (302°F) for many food product applications:

- monitoring of pasteurization systems
- F-value determination in the food industry
- bottle cleaning, temperature and pressure measurement in the beverage industry
- determination of the PE value in beverage production
- temperature process monitoring in production



Measuring range temperature
-85°C ... +150°C (-121...302°F)

Resolution
±0.3°C (32,5°F)

Memory
27,000 values



Temperature logger

EBI 100-T100



Technical Data	
Type	EBI 100-T100
Measuring range	-40°C ... +150°C (-40°F ... + 302°F)
Accuracy	±0.3°C
Resolution	0.1°C
Measuring channels	1 Temperature channel
Operating temperature	-40°C ... +150°C
Storage temperature	-40°C ... +70°C
Sensor	Pt 1000
Memory	27.000 measured values
Memory mode	- Endless measuring immediately, - Start- /stop measurement, - Measure immediately until end of memory - Measure upon start temperature - Measure until end of memory
Measuring rate	min: 1 sec, max: 24 h
Battery	Lithium cell ½ AA, exchangeable
Dimensions	48 x 48 x 24 mm
Housing material	Stainless steel (V4a), PEEK
Weight	ca. 70 g
Protection class	IP 68

EBI 100-T100



Applications		
<ul style="list-style-type: none"> • Determination of F-value in canned goods production 	<ul style="list-style-type: none"> • Monitoring of pasteurisation process 	<ul style="list-style-type: none"> • Temperature-process monitoring in production

Attributes		
<ul style="list-style-type: none"> • Temperature resistant up to +150 °C • Completely waterproof 	<ul style="list-style-type: none"> • Different models available • Factory calibration certificate 	<ul style="list-style-type: none"> • Programming and evaluation with PC

Description	Type	Part No.
Temperature logger	EBI 100-T100	1340-6500

Remarks
Spare parts and accessories see page 56.

Temperature logger for F-Value-Calculation

EBI 100-T210/211



Technical Data	
Type	EBI 100-T210/211
Measuring range	-40°C ... +150°C (-40°F ... + 302°F)
Accuracy	±0.3°C
Resolution	0.1°C
Measuring channels	1 temperature channel external, radial
Operating temperature	-40 °C ... +150 °C
Storage temperature	-40 °C ... +70 °C
Sensor	Pt 1000
Memory	27.000 Measured values
Measurement mode	- Endless measuring immediately, - Start- /stop measurement, - Measure immediately until end of memory - Measure upon start temperature
Measuring rate	min: 1 sec, max: 24 h
Battery	Lithium cell ½ AA, exchangeable
Dimensions	48 x 48 x 24 mm
Housing material	Stainless steel (V4a), PEEK
Protection class	IP 68
Weight	ca. 70 g

EBI 100-T210/211



Applications	Attributes
<ul style="list-style-type: none"> Determination of F-value in canned goods production Monitoring of pasteurisation process Temperature-process monitoring in production 	<ul style="list-style-type: none"> Temperature resistant up to +150°C Completely waterproof Different models available Factory calibration certificate Programming and evaluation with PC

Description	Type	Part No.
Temperature logger Ø3mm / L=50mm	EBI 100-T210	1340-6502
Temperature logger Ø3mm / L=75mm	EBI 100-T211	1340-6503

Remarks
Spare parts and accessories see page 56.

Temperature Logger for F-Value-Calculation

EBI 100-T23X



Technical Data	
Type	EBI 100-T23X
Measuring range	-40°C ... +150°C (-40°F ... + 302°F)
Accuracy	±0.3°C
Resolution	0.1°C
Operating temperature	1 temperature channel, external, axial
Storage temperature	-40 °C ... +150 °C
Sensor	-40 °C ... +70 °C
Memory	Pt1000
Measurement mode	27.000 measured values
	- Endless measuring immediately,
	- Start- /stop measurement,
	- Measure immediately until end of memory
	- Measure upon start temperature
Measuring rate	min: 1 sec, max: 24 h
Battery	Lithium cell ½ AA, exchangeable
Dimensions	48 x 48 x 24 mm
Housing material	Stainless steel (V4a), PEEK
Protection class	IP 68
Weight	ca. 70 g

EBI 100-T23X



Applications		
<ul style="list-style-type: none"> Determination of F-value in canned goods production 	<ul style="list-style-type: none"> Monitoring of pasteurisation process 	<ul style="list-style-type: none"> Temperature-process monitoring in production

Attributes		
<ul style="list-style-type: none"> Temperature resistant up to +150 °C Completely waterproof 	<ul style="list-style-type: none"> Different models available Factory calibration certificate 	<ul style="list-style-type: none"> Programming and evaluation with PC

Description	Type	Part No.
Temperature logger Ø3mm / L=50mm	EBI 100-T230	1340-6506
Temperature logger Ø3mm / L=75mm	EBI 100-T231	1340-6507
Temperature logger Ø3mm / L=100mm	EBI 100-T232	1340-6508
Temperature logger Ø3mm / L=150mm	EBI 100-T233	1340-6509

Remarks
Spare parts and accessories see page 56.

Temperature Logger for the Beverage Industry

EBI 100-T26x

NEW**DIN EN
13485****Technical Data**

Type	EBI 100-T26x
Measuring range	-40°C ... +150°C (-40°F ... + 302°F)
Accuracy	±0,3°C
Sensor	1 temperature channel, external, axial
Operating pressure	up to 20 bar
Channels	1 channel
Resolution	0.1 °C
Measuring rate	1s ... 24h
Memory	27.000 measured values
Measurement mode	- Endless - Measure upon start time - Event steered measurement - Start immediately until end of memory - Start-/stop measurement
Battery	Lithium cell ½ AA, exchangeable
Dimensions	48 x 48 x 24 mm
Weight	70 g *
Housing material	Stainless steel (V4A) / PEEK
Protection class	IP 68 / NEMA 6

*Size and weight are shown for EBI 100 body only

EBI 100-T26x**Applications**

- For wireless measurements in the beverage industry
- Bottle cleaning
- Core temperature measurement (PU-value)

Attributes

- Temperature resistant up to +150°C
- Battery exchangeable
- Completely waterproof (Protection class IP 68 / NEMA 6P)
- Factory calibration certificate
- 1 channel- (PE-value)

Description	Type	Part No.
Temperature logger, L: 135 mm, 1 Channel	EBI 100-T261	1340-6518
Temperature logger, L: 190 mm, 1 Channel	EBI 100-T262	1340-6519
Temperature logger, L: 245 mm, 1 Channel	EBI 100-T263	1340-6520
Temperature logger, L: 270 mm, 1 Channel	EBI 100-T264	1340-6521
Temperature logger, L: 300 mm, 1 Channel	EBI 100-T265	1340-6522

Remarks

Spare parts and accessories see page 42 and 56.

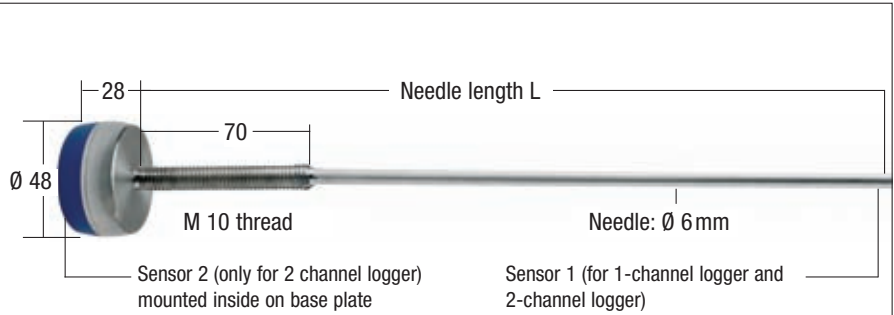
Temperature Logger for the Beverage Industry

EBI 100-T26x/-T36x for PE-Value Measurement

in bottles



Adapter EBI FL-S

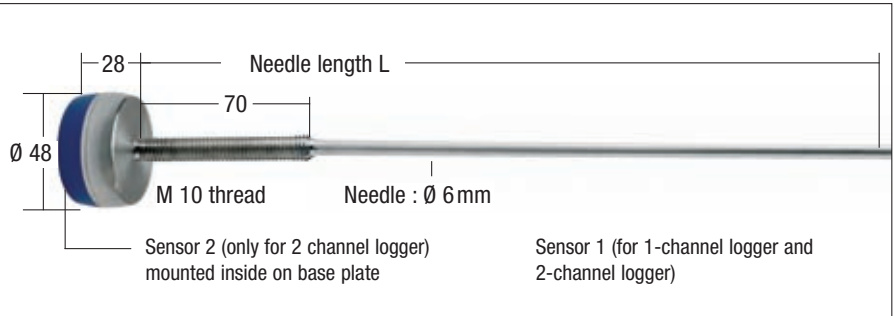


EBI 100-T26x/-T36x

in cans



Adapter EBI DA



EBI 100-T26x/-T36x



EBI FL-1T

Also suitable for cans. Please indicate bottle type and bottle size when ordering



GDB dummy bottle

Other bottle sizes (NRW, etc.) on request



Data Logger for dummy bottle

EBI 100-T100 Data Logger
(-85°C ... +150°C / -121°F ... 302°F)

Description	Type	Part No.
Temperature logger (-85°C ... +150°C / -121°F ... 302°F)	EBI 100-T100	1340-6500
Bottle adapter, silicone	EBI FL-S	1340-1961
Can adapter	EBI DA	1340-1963
Bottle adapter	EBI FL-1T	1340-2185
Dummy bottle 1,5 l		on request
Dummy bottle 1,0 l		on request
Dummy bottle 0,7 l	GDB	1340-2250
Dummy bottle 0,5 l	NRW	1340-2252

EBI 100 Data Logger Sets

EBI 100

EBI 100-Food-Set / SL 4010 for food industry

NEW

The Temperature-Control-System for the Food Industry

This set contains:

- 1 x Temperature Data Logger EBI 100-T230
- 1 x Can adapter EBI DA-SET
- 1 x Interface EBI IF 100-1
- 1 x Software Winlog.pro
- 1 x Aluminum-case EBI TAK ALU



Description	Type	Part No.
EBI 100-FOOD Set	SL 4010	1340-6575

EBI 100-Pasteur-Set / SL 4110 for pasteurisation

NEW

The Temperature-Control-System for Pasteurisation

This set contains:

- 1 x Temperature Data Logger EBI 100-T261
- 1 x Bottle adapter EBI FL-S
- 1 x Can adapter EBI DA
- 1 x Interface EBI IF 100-1
- 1 x Software Winlog.pro
- 1 x Aluminum-case EBI TAK ALU



Description	Type	Part No.
EBI 100-PASTEUR Set	SL 4110	1340-6576

EBI 100-Clean-Set / SL 4210 for bottle cleaning

NEW

The temperature-monitoring- system for bottle cleaning

This set contains:

- 1 x Temperature Data Logger EBI 100-T100
- 1 x GDB perforated plate
- 1 x Interface EBI IF 100-1
- 1 x Software Winlog.pro
- 1 x Aluminum-case EBI TAK ALU



Description	Type	Part No.
EBI 100-CLEAN SET	SL 4210	1340-6577

General Technical Specifications: (Valid for all types)

Type	EBI 10
Channels	1 ... 4
Sensor temperature	Pt 1000
Pressure (opt.):	Piezo resistive pressure sensor (temperature compensated)
Resolution	Temperature: 0,025°C
Pressure	(opt.) 1 mbar
Measuring range: Temperature logger	-85°C ... +400°C (EBI 10-T100: -85°C ... +150°C) (-121°F ... 302°F)
Measuring range:	0°C ... +150°C
Pressure/Temperature logger	1 mbar ... 4000 mbar
Accuracy Temperature:	±0.5°C (-85°C ... -40°C) (-121°F ... -40°F) ±0.2°C (-40°C ... 0°C) (-40°F ... 32°F) ±0.1°C (0°C ... +140°C) (32°F ... 284°F) ±0.2°C(+140°C ... +250°C) (284°F ... 482°F) ±0.5°C (+250°C ... +400°C) (482°F ... 752°F)
Accuracy Pressure:	± 15 mbar
Measurement interval adjustable:	250 ms, 500 ms, 1 s ... 24 h
Memory	100.000 measured values (total)
Measurement mode	· Endless · Start/stop time · Measure upon start time · Event steered measurement · Start immediately until end of memory
Communication	Wireless 2.4 GHz / IEEE 802.15.4
Eyelet	Optional, included in all types EBI 10
Operating temperature	-85°C ... +150°C
Battery	3.6 V, exchangeable
Dimensions	Ø 48 mm x 48 mm x 24 mm
Weight	70 g
Housing material	Stainless steel (V4A) / PEEK
Protection class	IP 68 / NEMA 6P

The wireless EBI 10 logger makes it possible:

With the wireless data logger EBI 10, faulty processes can be detected immediately and stopped, if necessary, saving much time and effort. The user can follow the process continuously in realtime on his PC screen. Wireless realtime monitoring of hot processes up to +400 °C is especially suitable for many food applications:

- Monitoring of pasteurisation equipment
- F-value-calculation in food products industry
- Bottle cleaning, temperature and pressure measurement in the beverage industry
- Determination of PE-value in beverage production
- Temperature-process monitoring in the production

Temperature Logger for the F-Value-Calculation

Logger and Probe Versions



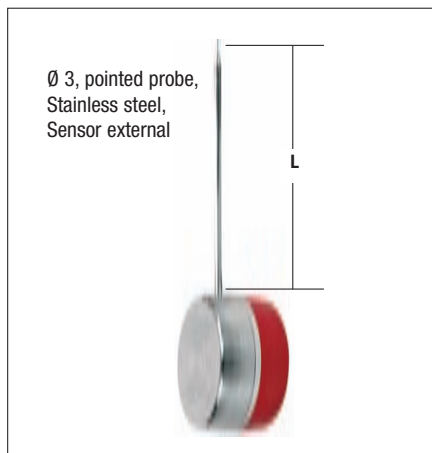
Logger Versions



Temperature logger EBI 10-T100

Measuring range: -85°C ... +150°C

Sensor: 1 Temperature, internal

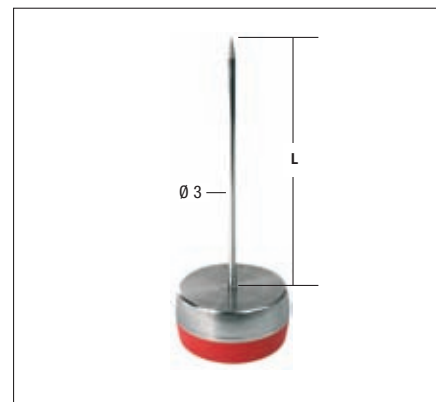


Temperature logger EBI 10-T210/T211

Measuring range: -85°C ... +400°C

** For measurements above 150°C, EBI-T1B must be used.*

Sensor: 1 Temperature, external



Temperature logger EBI 10-T23x

Measuring range: -85°C ... +400°C

** For measurements above 150°C, EBI-ID-114x116 must be used.*

Sensor: 1 Temperature, external, axial

Probe lengths: 50 mm, 75 mm, 100 mm and 150 mm



Bottle logger EBI 10-T26x

Measuring range: -85°C ... +150°C

Sensor: 26x: 1 Temperature, external, axial



Temperature-/Pressure logger EBI 10-TP 200

Measuring range

Temperature: 0°C ... +150°C

Pressure: 1 mbar ... 4000 mbar

Sensor

1 Temperature, external axial

1 Pressure / M10 inner winding



Interface EBI IF 100 for EBI 10

- USB connection
- Coloured LEDs signal programming, read-out and error
- Incl. antenna AL 111
- Works with: Winlog.pro

Description	Type	Part No.
Temperature logger (-85°C ... +150°C)	EBI 10-T100	1340-6100
Temperature logger, Ø 3 mm / L=50 mm	EBI 10-T210	1340-6102
Temperature logger, Ø 3 mm / L=75 mm	EBI 10-T211	1340-6103
Temperature logger, Ø 3 mm / L=50 mm	EBI 10-T230	1340-6106
Temperature logger, Ø 3 mm / L=75 mm	EBI 10-T231	1340-6107
Temperature logger, Ø 3 mm / L=100 mm	EBI 10-T232	1340-6108
Temperature logger, Ø 3 mm / L=150 mm	EBI 10-T233	1340-6109
Temperature logger, L: 135 mm, 1 Channel	EBI 10-T261	1340-6118
Temperature logger, L: 190 mm, 1 Channel	EBI 10-T262	1340-6119
Temperature logger, L: 245 mm, 1 Channel	EBI 10-T263	1340-6120
Temperature logger, L: 300 mm, 1 Channel	EBI 10-T265	1340-6122
Temperatur-/Pressure logger Ø 3 mm / L=40 mm	EBI 10-TP200	1340-6152
1-port Interface for EBI 10	EBI IF 100	1340-6001

The new EBI 11

... the solution when space is tight



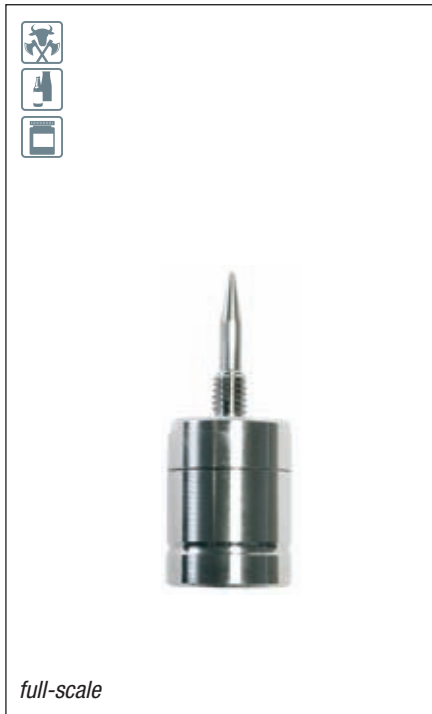
- F-Value Calculation in the Food and Beverage Industry
- Temperature resistant up to +150°C



Mini-Temperature Logger

EBI 11

DIN EN
13485



Technical Data

Type	EBI 11
Channels	1 temperature
Measuring range	0°C ... +150°C (32°F ... 302°F)
Accuracy	±0.1°C (±0.2°F)
Resolution	0.01°C (0.02°F)
Logging cycle	adjustable from 1 s to 24 h
Memory	15,000 values
Operating temperature	0°C ... +150°C (32°F ... 302°F)
Storage temperature	-30°C ... +150°C (-22°F ... 302°F)
Measuring sensor	1 temperature, external, axial, Ø 3 mm, probe length 20 mm
Sensor	PT1000
Memory mode	<ul style="list-style-type: none"> · endless measuring immediately · start immediately until end of memory · start / stop time · no measuring
Battery	exchangeable by user
Battery lifetime	0.1 s logging cycle: 64h 1 s logging cycle: 25 days 1 min logging cycle: 42 weeks 15 min logging cycle: 50 weeks
Dimensions	Ø 16.5 x 22 mm (without probe)
Housing material	V4A
Protection class	IP 68

EBI 11



Applications

- Determination of F-value in food / beverage production
- Especially for small packaging
- PE-value calculation
- Temperature monitoring during storage and transport in close quarters

Attributes

- Space-saving, especially suitable for close quarters
- Temperature resistant up to +150°C (302°F)
- High accuracy
- Factory calibration certificate
- Programming and evaluation with PC

Description	Type	Part No.
Mini-temperature logger, 1-channel, external, Ø 3 mm, probe length: 20 mm	EBI 11-T230	1340-6290
Mini-temperature logger, 1-channel, external, Ø 3 mm, probe length: 50 mm	EBI 11-T231	1340-6292
Mini-temperature logger, 1-channel, external, Ø 3 mm, probe length: 100 mm	EBI 11-T233	1340-6293

Mini-Pressure Logger

EBI 11-P110



Technical Data	
Type	EBI 11-P110
Measuring range	1 mbar ... 4.000 mbar
Accuracy	Pressure: ±10 mbar
Resolution	Pressure: 1 mbar
Channels	1 Pressure internal
Logging cycle	Adjustable from 1s to 24h
Memory	2 x 7.500 measured values
Operating temperature	0°C ... +150°C
Storage temperature	-30°C ... +150°C
Sensor	Pt1000
Sensor Pressure	piezo-resistive
Measuring mode	- Endless measurement immediately - Start- /stop measurement - Measure immediately until end of memory - No measurement
Communication	one-port interface in housing and contact area on underside of instrument
Protocol	ebro-GIMP protocol
Battery	exchangeable
Battery lifetime	1 s Logging cycle: 4 days 1 min Logging cycle: 15 weeks 15 min Logging cycle: 30 weeks
Dimensions	Ø 16,5 mm x 35 mm
Housing material	V4A
Protection class	IP 68

EBI 11-P110



Applications		
• Pressure control at canned goods production	• Monitoring of pasteurisation equipment	• Pressure-process monitoring in production

Attributes		
• Temperature resistant up to +150°C	• Battery exchangeable	• Factory calibration certificate
• Measurement without radio technology	• M5 outside thread for adaption	• Programming and evaluation with PC

Description	Type	Part No.
Mini-Pressure logger	EBI 11-P110	1340-6297



-ebro-

MEASUREMENTS FOR LIFE

Hersteller – Erklärung

DECLARATION OF CONFORMITY

Ingolstadt, 29.07.2009

Hiermit erklären wir,
Hereby we declare

ebro Electronic GmbH & Co. KG

Peringerstraße 10

D-85055 Ingolstadt

Tel. +49 (0) 841/95478-0

Fax: +49 (0) 841/95478-80

das sich das Gerät
that the following product

Geräteart:	Datenlogger
<i>Product type:</i>	<i>Datalogger</i>
Typebezeichnung:	EBI 2T- series 500, EBI 2T-112, EBI 2 Bus-Logger 721-724, EBI2T series 300, EBI 85-A, EBI 125-A, EBI 100
<i>Type designation:</i>	EBI 20-T, TE, EBI 25 T, TE, EBI 10, EBI 11

in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 37/2005 EG zur Überwachung der Temperaturen von tief gefrorenen Lebensmitteln in Beförderungsmitteln sowie Einlagerungs- und Lagereinrichtungen befindet.

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

Zur Beurteilung der Konformität wurden folgende harmonisierte Normen herangezogen:

The following harmonized standards have been used:

Prüfung, Leistung, Gebrauchstauglichkeit: EN 12830
tests, performance, suitability:

Regelmäßige Prüfung und Kalibrierung: EN 13486
Periodic verification and calibration:



Wolfgang Klün, Geschäftsführer
Managing Director



Eckehard Peschel, Produkt Manager
Product Manager

40
YEARS

-ebro-
Made in Germany

-ebro-[®]

MEASUREMENTS FOR LIFE



A guide to temperature limits

These temperature values insure optimum freshness:

Food

Incoming goods / Storage

Fresh meat (including big game) $\leq +7^{\circ}\text{C}$ $\leq +7^{\circ}\text{C}$ / 44°F
Fresh poultry, rabbits, $\leq +4^{\circ}\text{C}$ $\leq +4^{\circ}\text{C}$ / 39°F

Cold meals

Storage temperature until serving $\leq +7^{\circ}\text{C}$ / 44°F

Hot meals

Heated (core temperature) $> +70^{\circ}\text{C}$ / 158°F

small game

Offal

Ground meat (from EU-plants)

Ground meat¹

- for immediate resale

Meat preparations (from EU-plants)

Meat preparations (production/sales on site)

Fresh meat/sausages

Speciality foods/ delicatessen salads

Fresh fish²

Smoked fish

Meat/Fish, deep-frozen

Deep-frozen foods

Ice cream, re-packed for resale

Ice cream scooped and served

Diary products recommended

Bakery products, with part-baked filling

Eggs (temperature if eggs to be stored over 18 days)

≤ +3°C

≤ +4°C

≤ +4°C

≤ +7°C

≤ +4°C

≤ +7°C

≤ +7°C

≤ +7°C

≤ +2°C

≤ +7°C

≤ -18°C

≤ -18°C

≤ -18°C

≤ -18°C

≤ -18°C

/ 0°F

≤ +7°C

≤ +7°C

≤ +7°C

≤ +3°C / 37°F

≤ +4°C / 39°F

≤ +7°C / 44°F

≤ +4°C / 39°F

≤ +7°C / 44°F

≤ +7°C / 44°F

≤ +7°C / 44°F

≤ +7°C / 44°F

≤ +2°C / 35°F

≤ +7°C / 44°F

≤ -18°C / 0°F

≤ -18°C / 0°F

≤ -18°C / 0°F

≤ -8°C

/ 17°F

≤ +7°C / 44°F

≤ +7°C / 44°F

≤ +8°C / 46°F

¹ Production/storage at ≤ +4°C / 39°F e.g. butchers

² Incoming goods or storage under melting ice is possible

Food counter

Retain samples for testing

Save for a minimum of 9 days

≥ +65°C / 149°F

≤ -18°C / 0°F

The recommendations for temperatures are based on the publications of the Federal Institute for Health Protection of Consumers and Veterinary Medicine



Do not compromise with temperature measurements! German food inspectors recommend ebro®

European Standards for Temperature Measurements:

EN 12830

Temperature recording devices for transport, storage and refrigerated containers, frozen, deep-frozen food products and ice-tests; for suitability
Measuring range minimum from -25°C up to +15°C

EN 13485

Thermometers for measuring room temperature and ambient temperature for transport, storage and refrigerated containers, frozen, deep-frozen food products and ice-tests, for suitability.
Required measuring range for air temperature thermometers: -30°C ... +15°C

Required measuring range for core temperature thermometers -20°C ... +30°C

EN 13485

Temperature recording devices and thermometers for transport, storage and refrigerated containers, frozen, deep-frozen food products and ice-tests in Standard-Tests.
Environmental conditions may not have any disturbing influences on testing equipment or units under test. An exact description of test methods exists.

-ebro® Electronic GmbH & Co. KG • Peringerstraße 10 • D-85055 Ingolstadt

Tel. +49 (0) 841-9 54 78-0 • Fax +49 (0) 841-9 54 78-80

www.ebro.com • E-Mail: info@ebro.com



Hersteller – Erklärung

DECLARATION OF CONFORMITY

Ingolstadt, 29.07.2009

Hiermit erklären wir,
Hereby we declare

ebro Electronic GmbH & Co. KG

Peringerstraße 10

D-85055 Ingolstadt

Tel. +49 (0) 841/95478-0

Fax: +49 (0) 841/95478-80

das sich das Gerät
that the following product

Geräteart:	Thermometer
<i>Product type:</i>	<i>Thermometer</i>
Typebezeichnung:	TLC 730, TLC 1598, TFX 410, TFX 410-1, TFX 420, TFX 422, TFX 430, TTX 110, TTX 100, TFE 510, TBI 40
<i>Type designation:</i>	

in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 37/2005 EG zur Überwachung der Temperaturen von tief gefrorenen Lebensmitteln in Beförderungsmitteln sowie Einlagerungs- und Lagereinrichtungen befindet.

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

Zur Beurteilung der Konformität wurden folgende harmonisierte Normen herangezogen:

The following harmonized standards have been used:

Prüfung, Leistung, Gebrauchstauglichkeit: **EN 13485**
tests, performance, suitability:

Regelmäßige Prüfung und Kalibrierung: **EN 13486**
Periodic verification and calibration:

Wolfgang Klün, Geschäftsführer
Managing Director

Eckehard Peschel, Produkt Manager
Product Manager

EBI 11 Mini-Temperature Data Logger Set SL 4101

EBI 11 Mini-Temperature Logger Set for pasteurisation & bottle cleaning

The Temperature-Monitoring-System with EBI 11 Mini Data Logger

This set contains:

- Mini-Temperature Data Logger EBI 11-T23x:
- Needle length: 20 mm, 50 mm or 100 mm
(Special needle lengths on request)
- 1 x Bottle adapter set AL 115
- 1 x Interface EBI IF 100
- 1 x Software Winlog.pro
- 1 x Aluminum-case



Please name us the correct type of data logger in your order!

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

Description	Type	Part No.
EBI 11 Mini-Temperature Logger Set for pasteurisation & bottel cleaning	SL 4101	1340-6093

Applications EBI 11-P



Mini-Temperature Logger

Accessories for EBI 11 Temperature Logger



EBI 11-T230
EBI 11-T230: Ø 3 mm, probe length: 50 mm



Bag adapter - AL 114
Bag adapter for EBI 11



Can adapter - AL 114
Can adapter for EBI 11



Can adapter - AL 114
Can adapter for EBI 11



Bottle adapter - AL 115
EBI 11 T-230 (probe length: 20 mm) with bottle adapter



Bottle adapter - AL 115
Bottle adapter for EBI 11

Description	Type	Part No.
Battery exchange set for EBI 11 consisting of: 6 batteries, 3 lubricated O-rings, 1 crosstip screwdriver (without picture)	AL 113	1100-0120
Adapter set for EBI 11	AL 114	1340-6298
Bottle adapter set for EBI 11	AL 115	1340-6299



Accessories for EBI 100, 10 and EBI 11

Accessories



Thermo Silicone protection case AL 100

- protects temperature logger against heat peaks
- protects temperature logger against mechanical damage
- extends life of logger



Silicone protection case AL 101

- protects temperature/pressure logger against heat peaks
- protects temperature/pressure against mechanical damage
- extends life of logger



EBI TIB

- usable from +150°C ... +400°C (302°F ... 752°F)
- thermal protection of data loggers
- for **EBI 10** radial probes
- stainless steel, 160 x 160 x 82 mm



Interface EBI IF 100-1 for EBI 11 and EBI 100

- USB connection
- colored LEDs signal the status (program, read out, error)
- incl. antenna **AL 111**
- works with: **Winlog.pro/Winlog.light**



4-port interface EBI IF 200 for EBI 10 and EBI 100

- USB connection
- colored LEDs signal the status (program, read out, error)
- incl. antenna **AL 111**
- works with: **Winlog.pro**



4-port interface IF 300 for EBI 11

- USB connection
- colored LEDs signal the status (program, read out, error)
- works with : **Winlog.pro/Winlog.light**

Battery exchange set AL 103

Included: lubricated O-Ring, batteries, exchanging instruments, screwdriver, screw, operating instructions



AL 103

Battery exchange set AL 113 for EBI 11

Included: Batteries, exchanging instruments, lubricated oils



AL 113

Description	Type	Part No.
Thermo-silicone protection case (for EBI 10 - temperature)	AL 100	1340-6020
Silicone protection case (for EBI 10 - temperature and pressure)	AL 101	1340-6021
Thermal insulation case	EBI TIB	1340-1894
1-port interface for EBI 100 and EBI 11	EBI IF 100-1	1340-6004
4-port interface for EBI 10	EBI IF 200	1340-6002
4-port interface for EBI 11	EBI IF 300	1340-6003
Antenna, suitable for all interfaces	AL 111	1340-6006
Battery exchange set for EBI 10	AL 103	1100-0117
Battery exchange set for EBI 10 (batteries, gaskets, fat) without fig.	AL 104	1100-0118
Battery exchange set for EBI 11	AL 113	1100-0120

Declarations of Conformity



Hiermit erklären wir,
Hereby we declare

dass sich das Gerät
that the following product

ebro Electronic GmbH & Co. KG
Peringerstraße 10
D-85055 Ingolstadt
Tel. +49 (0) 841/95478-0
Fax: +49 (0) 841/95478-80

Geräteart / Product type:	Datenlogger / Data logger
Typebezeichnung/Type designation:	EBI 2T- series 500, EBI 2T-112, EBI 2 Bus-Logger 7121-724, EBI2T series 300, EBI 85-A, EBI 125-A, EBI 100 EBI 20-T, TE, EBI Type designation: 25 T, TE, EBI 10, EBI 11

in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 37/2005 EG zur Überwachung der Temperaturen von tief gefrorenen Lebensmitteln in Beförderungsmitteln sowie Einlagerungs- und Lagereinrichtungen befindet.

Zur Beurteilung der Konformität wurden folgende harmonisierte Normen herangezogen:

- **Prüfung, Leistung, Gebrauchstauglichkeit: EN 12830**
- **Regelmäßige Prüfung und Kalibrierung: EN 13486**

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**

Hiermit erklären wir,
Hereby we declare

dass sich das Gerät
that the following product

ebro Electronic GmbH & Co. KG
Peringerstraße 10
D-85055 Ingolstadt
Tel. +49 (0) 841/95478-0
Fax: +49 (0) 841/95478-80

Geräteart / Product type:	Thermometer / Thermometer
Typebezeichnung/Type designation:	TLC 730, TLC 1598, TFX 410, TFX 410-1, TFX 420, TFX 422, TFX 430, TTX 110, TTX 100, TFE 510, TBI 40

in Übereinstimmung mit den grundlegenden Anforderungen und den übrigen einschlägigen Bestimmungen der Richtlinie 37/2005 EG zur Überwachung der Temperaturen von tief gefrorenen Lebensmitteln in Beförderungsmitteln sowie Einlagerungs- und Lagereinrichtungen befindet.

Zur Beurteilung der Konformität wurden folgende harmonisierte Normen herangezogen:

- **Prüfung, Leistung, Gebrauchstauglichkeit: EN 12830**
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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**

ebro® has expanded its wide range of loggers in the food sector even further:

ebro® Data Logger Family EBI 20-T1 with 40,000 Measured Values Annual Memory

For the continuous documentation and monitoring of temperature, air pressure and humidity in storage, refrigeration and deep-freeze rooms and for the transportation of food products.

NEW
40,000
Measured values
Memory Capacity



The successful EBI 20-Family

now also available with 40,000 Measured Values Annual Memory!

- 40,000 instead of 8,000 measured values memory!
- 416 days continuous recording at a measuring rate of 15 min
- Technical specification same as EBI 20-standard instruments
- XL-memory for types EBI 20-T1, EBI 20-TE1 and EBI 20-TH1
- Inclusive calibration certificate!

40,000
Measured values
Annual Memory Capacity



Temperature Logger

EBI 20-T1



Technical Data	
Type	EBI 20-T1
Measuring range	-30°C ... +60°C (-22°F ... 140°F)
Accuracy	±0.5°C (-20°C ... +40°C) / ±0.9°F (-4°F ... 104°F) ±0.8°C (±1.4°F) for the remaining measuring range
Resolution	0.1°C (0.2°F)
Memory	1 channel, 40,000 values
Sensor	NTC
Operating temperature	-30°C ... +60°C (-22°F ... 140°F)
Measuring rate	1 min to 24 h
Memory mode	· endless, · start / stop measurement · start with key
Battery	3V lithium (CR2450), exchangeable by user
Battery lifetime	> 24 months, measuring rate 15 min. at +25°C (77°F)
Protection class	IP 67
Housing material	ABS
Dimensions	69 x 48 x 22 mm
Weight	45 g
NEW:	Factory calibration certificate



EBI 20-T1



Applications	Attributes
<ul style="list-style-type: none"> • Reliable temperature recording • Transport 	<ul style="list-style-type: none"> • Storage monitoring • Refrigerating and cooling rooms
<ul style="list-style-type: none"> • Refrigerated display cases • According to DIN EN 12830 	<ul style="list-style-type: none"> • Replaceable battery • Logger available as set with evaluation software and interface

Description	Type	Part No.
Temperature logger	EBI 20 T1	1601-0042
Starter set (logger, evaluation software, interface)	EBI 20-T1-Set	1601-0046
Interface for EBI 20	EBI 20-IF	1601-0020
EBI 20 wall bracket	EBI 20-WM	1601-0030
EBI 20 truck wall bracket	EBI 20-WM-1	1601-0033

Temperature Logger with external probe

EBI 20-TE1

NEW 40,000
Memory Capacity

DIN EN
13485



Technical Data	
Type	EBI 20-TE1
Measuring 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 measuring range
Resolution	0.1°C (0.2°F)
Memory	1 channel, 40,000 values
Sensor	NTC
Operating temperature	-30°C ... +60°C (-22°F ... 140°F)
Measuring rate	1 min to 24 h
Memory mode	· endless · start / stop measurement · start with key
Battery	3V lithium (CR2450), exchangeable by user
Battery lifetime	> 24 months, measuring rate 15 min. at +25°C (77°F)
Protection class	IP 67
Housing material	ABS
Dimensions	69 x 48 x 22 mm
Weight	45 g
NEW:	Factory calibration certificate

EBI 20-TE1

EBI 20-TE1



Applications	Attributes
<ul style="list-style-type: none"> • Reliable temperature recording • Core temperature measurement • Transport • Storage monitoring • Refrigerating and cooling rooms • Refrigerated display cases • According to DIN EN 12830 	<ul style="list-style-type: none"> • External probe for measuring core temperature • Excellent price / performance ratio • Automatic recording of temperature data • Stores 40,000 measured values • No network connection required • Programming and evaluation with PC • Waterproof

Description	Type	Part No.
Temperature logger with external probe	EBI 20-TE1	1601-0043
Temperature logger set (logger, evaluation software, interface)	EBI 20-TE1-Set	1601-0047
Interface for EBI 20	EBI 20-IF	1601-0020
EBI 20 wall bracket	EBI 20-WM	1601-0030
EBI 20 truck wall bracket	EBI 20-WM-1	1601-0033

Food Temperature Logger with external probe

EBI 20-TF



Technical Data	
Type	EBI 20-TF
Measuring range	0°C ... +100°C (+32°F ... 212°F)
Accuracy	±0.5°C at +50°C ... +100°C (±1.1°F at 122°F ... 212°F) ±1°C (±1.8°F) for the remaining range
Resolution	0.1°C (0.2°F)
Memory	1 channel, 8,000 measured values
Sensor	NTC
Storage temperature	-40°C ... +70°C / -40°F ... 158°F (logger) -40°C ... +110°C / -40°F ... 230°F (probe)
Measuring rate	1 s - 24h adjustable
Measurement mode	<ul style="list-style-type: none"> · endless measurement immediately · start immediately until end of memory · start/stop-measurement · start with key
Battery	CR2450, exchangeable by user
Battery lifetime	> 24 months at measuring rate 15 min. at +25°C (77°F)
Housing	ABS
Protection class	IP 67
Dimensions	69 x 48 x 22 mm
Weight	45 g
NEW:	Factory calibration certificate

EBI 20-TF



Applications		
<ul style="list-style-type: none"> • Reliable temperature recording • Core temperature measurement 	<ul style="list-style-type: none"> • Hot serving counters • «Meals on Wheels » 	<ul style="list-style-type: none"> • Catering in hospital/retirement home in accordance according to DIN EN 12830
Attributes		
<ul style="list-style-type: none"> • External probe for measuring core temperature • Excellent price / performance ratio 	<ul style="list-style-type: none"> • Automatic recording of temperature data • Stores 8,000 measured values 	<ul style="list-style-type: none"> • No network connection required • Programming and evaluation with PC • Waterproof

Description	Type	Part No.
Food temperature logger with external probe	EBI 20-TF	1601-0010
Interface for EBI 20	EBI 20-IF	1601-0020
EBI 20 wall bracket	EBI 20-WM	1601-0030
EBI 20 truck wall bracket	EBI 20-WM-1	1601-0033

Temperature-/Humidity Logger

EBI 20-TH1

NEW 40,000
Memory Capacity



Technical Data

Type	EBI 20-TH1
Measuring range temperature	-30°C ... +60°C (-22°F ... 140°F)
Measuring range humidity	0%rH ... 100%rH
Accuracy temperature	±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 measuring range
Accuracy humidity	±3% rH (10% rH ... 90 % rH)
Resolution temperature	0.1°C (0.2°F)
Resolution humidity	0.1% rH
Memory	40,000 values
Channels	channel 1: temperature channel 2: relative humidity
Sensor	NTC, capacitive humidity sensor, absolute pressure sensor
Operating temperature	-30°C ... +60°C (-22°F ... 140°F)
Measuring rate	1 min ... 24 h
Memory mode	endless measurement, start/stop measurement
Battery	3V lithium (CR2450), exchangeable by user
Battery lifetime	> 24 months, measuring rate 15 min. at +25°C (77°F)
Protection class	IP 52
Housing material	ABS
Dimensions	69 x 48 x 22 mm
NEW:	Factory calibration certificate

EBI 20-TH1



Applications

- | | | |
|---|---|---|
| <ul style="list-style-type: none"> • Safe temperature, air pressure and humidity recording | <ul style="list-style-type: none"> • Transport • Storage monitoring | <ul style="list-style-type: none"> • Refrigerating and cooling rooms • Laboratory |
|---|---|---|

Attributes

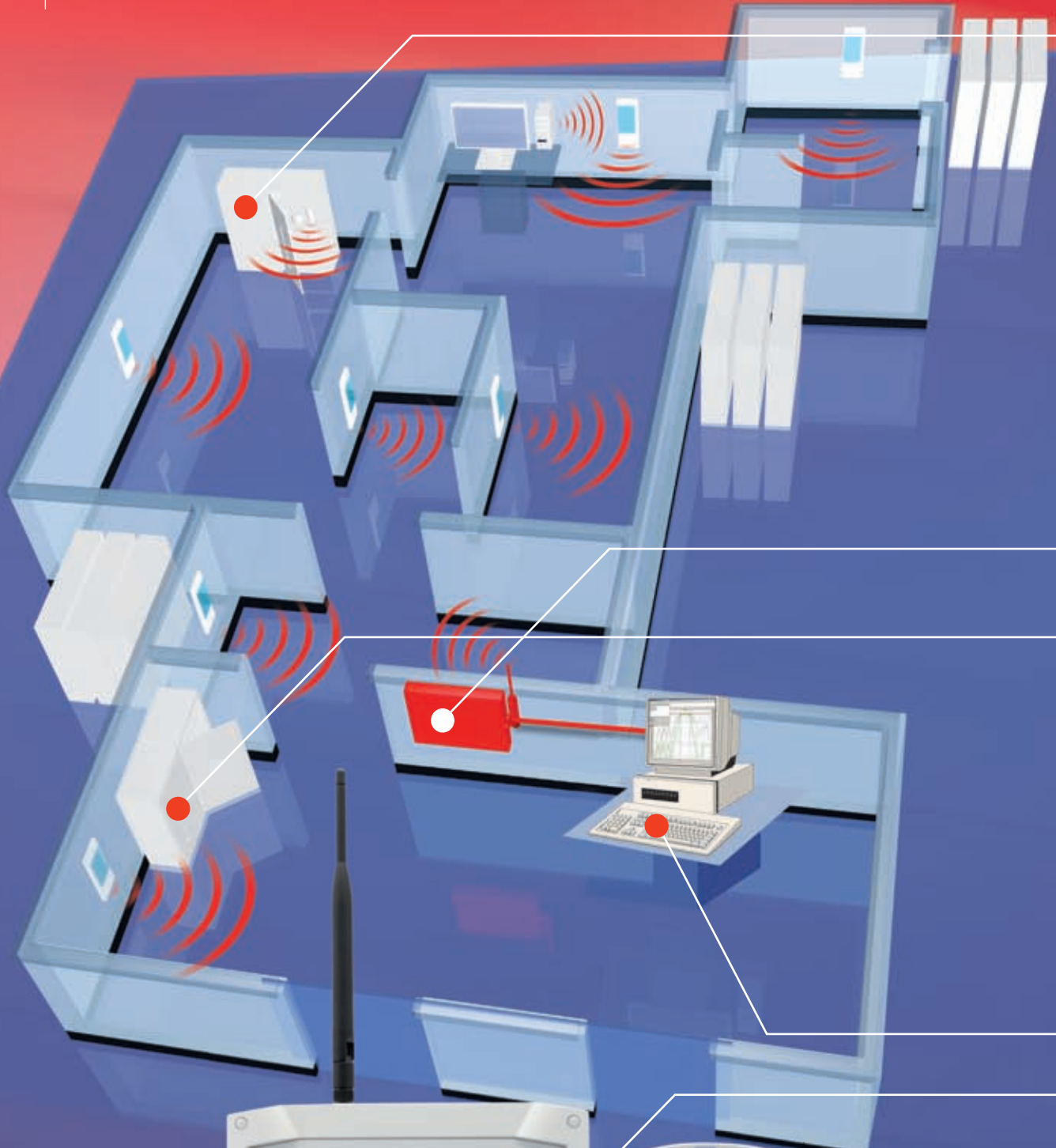
- | | | |
|---|---|--|
| <ul style="list-style-type: none"> • Excellent price/performance ratio • No network connection required | <ul style="list-style-type: none"> • Automatic recording of temperature and humidity | <ul style="list-style-type: none"> • Stores 40,000 measuring values • Programming and evaluation with PC |
|---|---|--|

Description	Type	Part No.
Temperature/humidity logger	EBI 20-TH1	1601-0044
Temperature/humidity logger set*	EBI 20-TH1-Set	1601-0048
Interface for EBI 20	EBI 20-IF	1601-0020
EBI 20 wall bracket	EBI 20-WM	1601-0030
EBI 20 truck wall bracket	EBI 20-WM-1	1601-0033

*(logger, evaluation software, interface)



The innovative **EBI 25** Wireless Sensor System monitors temperatures without wiring and transmits the temperature/humidity values in real-time to an interface and then to the desired server or PC. As soon as the system detects a temperature/humidity limit violation, it sends an alarm message via SMS or E-mail.





Food Storage



Refrigerator Monitoring



Deep-freeze Monitoring



Storage Monitoring



Desktop



Mobile



Network

EBI 25-T / EBI 25-TE / EBI 25-TH

- High accuracy temperature / humidity measurement
- Memory secures data in case of possible PC failure
- Very long range of up to 500 m in free field
- Very long battery life
- Easy installation

Receiver unit IF 400

- Overview of current temperature values
- Alarm message possible independent from the PC
- Direct connection to the PC or to the network leads to high flexibility

Winlog.web Software

- Internet-compliant
- Data can be accessed worldwide from every PC with an internet connection
- Password protected
- Mapping function

Get the whole picture with EBI 25

Which supermarket manager or storage manager wouldn't like to be able to monitor the refrigerators in his market branches continuously from at home or on the go, to see if everything is in order?

The new **ebro® EBI 25** wireless probe system makes it possible. It monitors temperatures in freezers, refrigerators and refrigerated display cases and reports temperature violations immediately via special software as an alarm, via SMS or E-Mail.



Wireless Temperature Logger

EBI 25-T

NEW

**DIN EN
12830**



Technical Data

Type	EBI 25-T
Measuring 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 range
Resolution	0.1°C (0.2°F)
Memory	1 channel, 288 measured values
Sensor	NTC
Operating temperature	-30°C ... +60°C (-22°F ... 140°F)
Measuring rate	1 minute to 24 hours adjustable
Measurement mode	· endless measurement · start / stop-measurement
Radio frequency	868 MHz
Battery	3.6 V lithium battery, exchangeable by user
Battery lifetime	< 2 years (depending on transceiver interval)
Storage temperature	-40°C ... +70°C (-40°F ... 158°F)
Housing	ABS
Protection class	IP 67
Dimensions	95 x 48 x 27 mm
Weight	approx. 65 g

EBI 25-T



Applications

- Logging and recording of temperatures
- Monitoring of temperature thresholds with alarm function via SMS/E-mail
- Battery exchangeable
- Transport
- Storage monitoring

Attributes

- Wireless interface 868 MHz
- Also available with external probe
- Waterproof

Description	Type	Part No.
Wireless temperature logger (internal probe)	EBI 25-T	1340-6200
Wireless temperature logger SET	EBI 25-T-SET	1340-6220
Interface incl. antenna for EBI 25	EBI IF 400	1340-6210
Bracket for EBI 25	AG 152	1340-6215
Evaluation software (single-user version)	Winlog.wave	1340-2391
Evaluation software (web-based server version)	Winlog.web	1340-2390

Remarks

ISO-calibration certificate available against surcharge!

Wireless Temperature Logger with external probe

EBI 25-TE



Technical Data	
Type	EBI 25-TE
Measuring 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 range
Resolution	0.1°C (0.2°F)
Memory	1 channel, 288 measured values
Sensor	NTC
Operating temperature	-30°C ... +60°C (-22°F ... 140°F)
Measuring rate	1 min. to 24 h adjustable
Measurement mode	· endless measurement · start/stop-measurement
Radio frequency	868 MHz
Battery	3.6 V lithium battery, exchangeable by user
Battery lifetime	< 2 years (depending on transceiver interval)
Storage temperature	-40°C ... +70°C (-40°F ... 158°F)
Housing	ABS
Protection class	IP 67
Dimensions	95 x 48 x 27 mm
Weight	approx. 65 g

EBI 25-TE



Applications	Attributes
<ul style="list-style-type: none"> • Logging and recording of temperatures • Monitoring of temperature thresholds with alarm function via SMS/E-mail 	<ul style="list-style-type: none"> • Deep-freezers • Refrigerators and refrigerated display cases
<ul style="list-style-type: none"> • Transport • Storage monitoring 	<ul style="list-style-type: none"> • Battery exchangeable • Waterproof

Description	Type	Part No.
Wireless temperature logger (external probe)	EBI 25-TE	1340-6201
Wireless temperature logger SET	EBI 25-TE-SET	1340-6221
Interface incl. antenna for EBI 25	EBI IF 400	1340-6210
Bracket for EBI 25	AG 152	1340-6215
Evaluation software (single-user version)	Winlog.wave	1340-2391
Evaluation software (web-based server version)	Winlog.web	1340-2390

Remarks
ISO-calibration certificate available against surcharge!

Wireless Temperature-/ Humidity Logger

EBI 25-TH

NEW



EBI 25-TH

Technical Data

Type	EBI 25-TH
Measuring range temperature	-30°C ... +60°C (-22°F ... 140°F)
Measuring range humidity	0% rH ... 100% rH
Accuracy temperature	±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 range
Accuracy humidity	±3% rH (10% ... 90%)
Resolution temperature	0.1°C (0.2°F)
Resolution humidity	0.1% rH
Memory	288 measured values
Sensor	NTC for temperature / capacity humidity sensor
Operating temperature	-30°C ... +60°C (-22°F ... 140°F)
Measuring rate	1 min. to 24 h adjustable
Measurement mode	<ul style="list-style-type: none"> · endless measurement · measuring from starting time · immediately measurement until memory full · start/stop-measurement · start from keypress
Radio frequency	868 MHz
Battery	3.6 V lithium battery, exchangeable by user
Battery lifetime	< 2 years (depending on transceiver interval)
Storage temperature	-40°C ... +70°C (-40°F ... 158°F)
Housing / Dimensions	ABS / 95 x 48 x 27 mm
Protection class	IP 40
Weight	approx. 65 g



Applications

- Logging and recording of temperatures
- Storage monitoring
- Transport
- Monitoring of temperature thresholds with alarm function via SMS / E-mail
- Refrigerators and refrigerated display cases
- Deep-freezers

Attributes

- Wireless interface 868 MHz
- Battery exchangeable

Description	Type	Part No.
Wireless temperature-/ humidity logger (external probe)	EBI 25-TH	1340-6202
Interface incl. antenna for EBI 25	EBI IF 400	1340-6210
Bracket for EBI 25	AG 152	1340-6215
Evaluation software (single-user version)	Winlog.wave	1340-2391
Evaluation software (web-based server version)	Winlog.web	1340-2390

Remarks

ISO-calibration certificate available against surcharge!



EBI 90 Monitors Trucks Worldwide via Mobile Radio Communication

The most modern, comfortable and safe way to monitor transport temperatures is to use central remote monitoring via mobile radio communication or satellite – for example, with the new EBI 90 system from ebro®.

With the EBI 90 system, you always have continuous access to all relevant measurements - no matter where you are. You can have the data sent to your mobile phone or you can retrieve the data on the internet.

Upon request, the incoming measurements can be monitored around the clock by an exchange that will inform you about all malfunctions immediately over mobile phone, with E-Mail or on site with an alarm.

Truck Logger

EBI 90



Technical Data

Type	EBI 90
Housing	
Size	Car radio fitted shaft according to DIN ISO 7736 165 x 188 x 52,6 mm
Material	steel sheet and ABS
Operating temperature	-20°C ... +80°C (-4°F ... 176°F)
Supply of electricity	12V to 24V on-board network
Logger	
Channels	up to 4 sensors (1-wire bus) 4 digital inputs (door contacts)
Sampling interval	1 min to 24h adjustable
Memory size	250,000 measured values
Measurands	temperature (other measurands possible)
Measuring range temperature	-30°C ... +50°C (-22°F ... 122°F)
Accuracy temperature	±0.8°C (±1.4°F)
Resolution temperature	0.1°C (0.2°F)
Display	
Type	graphic display
Presentation	measured temperatures with the position of the sensors threshold violations settings menu
Printer	
Type	thermal printer optional
Presentation	temperature values in table form threshold violations
Data transmission	
Interfaces	USB WLAN (optional) GSM (optional)
Function	automatic transmission of measured values and threshold violations via WLAN or GSM

EBI 90

Applications

- | | | |
|---|--|--|
| <ul style="list-style-type: none"> Monitoring / readout of temperature and events (e.g. door openings) via mobile radio or W-LAN | <ul style="list-style-type: none"> Transport Storage | <ul style="list-style-type: none"> Machine monitoring |
|---|--|--|

Attributes

- | | | |
|--|--|--|
| <ul style="list-style-type: none"> Central worldwide monitoring Up to 4 sensors can be connected | <ul style="list-style-type: none"> Waterproof housing optional Alarm and error recognition | <ul style="list-style-type: none"> Factory calibration certificate Data download also by USB-Stick |
|--|--|--|

Remarks

All necessary planning, installation and training is carried out by ebro® Electronic GmbH & Co. KG. Please request a quote!

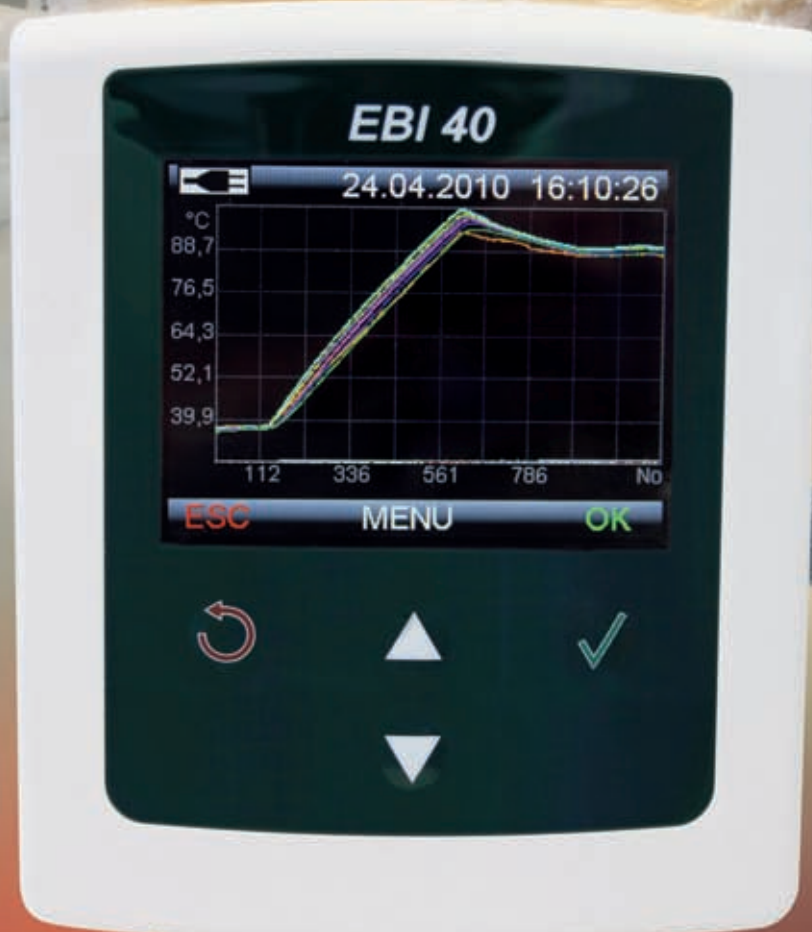
Description	Type	Part No.
Basic device	EBI 90-GG	1340-6900
Printer	EBI 90-PR	1340-6930
Probe 5 m	EBI 90-FUE-5M	1340-6940
Probe 10 m	EBI 90-FUE-10M	1340-6941
Probe 15 m	EBI 90-FUE-15M	1340-6942
Protective grid probe	EBI 90-SG	1340-6950
W-LAN-module	EBI 90-W-LAN	1340-6920
Antenna: 2 Types GSM / WLAN	EBI 90-A-W-LAN	1340-6960
GSM-Modul	EBI 90-GSM	1340-6910
Distribution-case incl. flex cable for housing of probe	EBI 90-CB	1340-6945
Evaluation software single-user solution	Winlog.wave	1340-2391
Evaluation software web server solution	Winlog.web	1340-2390

The Multi-Channel Temperature Logger EBI 40

... records temperatures during production and process monitoring time in baking stations, feed ovens and bakery ovens.

Current measured values can be read on the TFT display as the thermal insulation case of the EBI 40 guarantees maximum insulation.

Up to 12 temperature channels per temperature logger possible.



Multi-Channel Temperature Logger

EBI 40

NEW



Technical Data

Type	EBI 40
Measuring range	0°C ... +500°C (32°F ... 932°F)
Accuracy	±0.5°C (@ 25°C without sensor)
Resolution	0,1°C
Channels	6 or 12 temperature channels
Logging cycle	adjustable from 0.1s to 24h
Sensor	Thermocouple Type K / SMP connection
Operating temperature	0°C ... +60°C
Storage temperature	0°C ... +70°C
Memory	20.000 values / channel
Measuring mode	- Endless measurement immediately - Measure immediately until end of memory - Start-/stop measurement
Display	±TFT display 3,5" (324 x 240 Pixel)
Keys	4 keys (ESC, OK, Up, Down)
Dimensions	140 x 118 x 35 mm
Housing	ABS + PC
Protection class	IP40

EBI 40



Applications

- | | | |
|---|--|---|
| <ul style="list-style-type: none"> • Baking stations • Feed ovens | <ul style="list-style-type: none"> • Baking ovens • Process monitoring | <ul style="list-style-type: none"> • Product development |
|---|--|---|

Attributes

- | | | |
|--|---|--|
| <ul style="list-style-type: none"> • Connections for up to 12 temperature sensors • Current values visible in TFT display • USB interface for PC and USB • Battery lifetime max 100h | <ul style="list-style-type: none"> • Maximum insulation through thermal insulation case • Power supply via USB or battery • Automatic display deactivation | <ul style="list-style-type: none"> • Calculation of temperature profiles • Calibration certificate • Configuration / readout with software Winlog.pro |
|--|---|--|

Description	Type	Part No.
Multi-channel temperature logger (6 probes)	EBI 40 TC-01	1340-6400
Multi-channel temperature logger (12 probes)	EBI 40 TC-02	1340-6401
Thermal insulation case	EBI TIB 400	1340-6430

The ebro® EBI 2 data logger family: Robust, versatile, user-friendly

Wherever measurement data needs to be available immediately, the device of choice is a data logger from the **EBI 2** family. Values such as temperature and humidity are shown immediately on the large, easily readable display.

EBI 2 data loggers are used for a wide variety of applications:

Cost-effective refrigeration area loggers for butcher's shops and gastronomy, temperature and humidity loggers for the monitoring of humidity-sensitive food products, special butchery loggers for refrigeration areas and refrigerated display cases and truck loggers for the wireless monitoring of up to four measuring points in the cargo area.



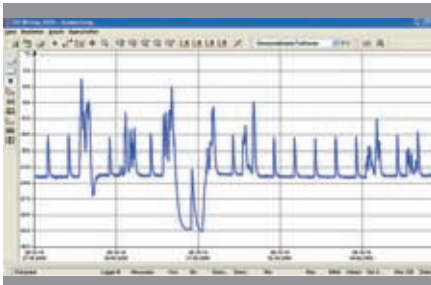
Precision Temperature Logger Pt 1000

EBI 2T-Series 300



Technical Data	
Type	EBI 2T-311 / EBI 2T-312 / EBI 2T-313
Number of channels	1, 2 or 4
Memory	up to 60,000 measured values
Measuring range	-50°C ... +150°C (-58°F ... 302°F) -50 °C ... +400°C (-58°F ... 752°F) at additional charge -200°C ... +50°C (-328°F ... 122°F) at additional charge -100°C ... +100°C (-148°F ... 212°F) at additional charge
Accuracy	±0.4°F (0.7°F) ±1 digit
Resolution	0.1°C (0.2°F)
Display function	housing temperature -20°C ... +50°C (-4°F ... 122°F)
Measuring rate	adjustable from 1s to 8h
Measurement mode	endless, start/stop
Battery	3.6 V lithium
Battery lifetime	approx. 5 to 8 years
Dimensions	96 x 48 x 28 mm
Weight	100g
Protection class	IP 40
Certificate	3-point factory calibration

EBI 2T-Series



Applications		
<ul style="list-style-type: none"> • Temperature recording 	<ul style="list-style-type: none"> • Refrigerating and cooling rooms 	<ul style="list-style-type: none"> • Refrigerated counters • Laboratory

Attributes		
<ul style="list-style-type: none"> • High accuracy • Different probes available 	<ul style="list-style-type: none"> • Programming and evaluation with PC 	<ul style="list-style-type: none"> • Current values shown on display • Factory calibration certificate

Description	Type	Part No.
Temperature logger for 1 ext. probe	EBI 2T-311	1641-1214
Temperature logger for 2 ext. probe	EBI 2T-312	1641-1424
Temperature logger for 4 ext. probe	EBI 2T-313	1641-1834
Interface set (without software)	EBI KSY-RS 232	1340-2084
Evaluation software	Winlog.light	1340-2354
Universal software	Winlog.pro	1340-2355

Remarks
See page 76–77 for software, interfaces and probes.

Temperature Logger

Accessories for EBI 2T-Series-300

Accessories

Pt 1000 probe class B-1/3 DIN



Probe with free cable end	L1 (m)	L2 (mm)	TYPE	Part No.
Teflon cable +200°C (392°F)	1.0	135	EBI FUE-T-1.0	1710-0006
Teflon cable +200°C (392°F)	2.5	135	EBI FUE-T-2.5	1710-0007
PUR cable +90°C (194°F)	1.0	135	EBI FUE-1.0	1710-0000
PUR cable +90°C (194°F)	2.5	135	EBI FUE-2.5	1710-0001

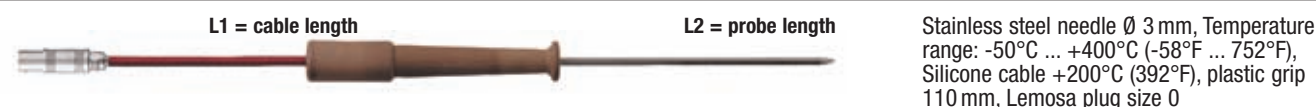


Probe with free cable end	L1 (m)	L2 (mm)	TYPE	Part No.
	2.5	120	EBI FUE-SKW	1730-0041

Pt 1000 probe class B-1/3 DIN



Probe with Lemos plug	L1 (m)	L2 (mm)	TYPE	Part No.
Teflon cable +200°C (392°F)	1.0	135	EBI FUE-T-1.0-L-F	1710-0019
Teflon cable +200°C (392°F)	2.5	135	EBI FUE-T-2.5-L-F	1710-0018



Probe with Lemos plug size 0	L1 (m)	L2 (mm)	TYPE	Part No.
	2.5	120	EBI FUE-SKW-L	1730-0042

Adapters for connection to data logger



Probe with Lemos plug	TYPE	Part No.
	EBI 2-AK-02 M	1344-0240

Description	Type	Part No.
Probe with free cable end, 1 m Teflon	EBI FUE-T-1,0	1710-0006
Probe with free cable end, 2.5 m Teflon	EBI FUE-T-2,5	1710-0007
Probe with free cable end, 1 m PUR	EBI FUE-1,0	1710-0000
Probe with free cable end, 2.5 m PUR	EBI FUE-2,5	1710-0001
Probe for 1- or 2-channel logger, 2.5 m with grip	EBI FUE-SKW	1730-0041
Probe with Lemo plug, 1 m Teflon	EBI FUE-T-1,0-L-F	1710-0019
Probe with Lemo plug, 2.5 m Teflon	EBI FUE-T-2,5-L-F	1710-0018
Probe with Lemo plug, 2.5 m with grip	EBI FUE-SKW-L	1730-0042
Adapter for logger connection, 0.2 m*	EBI 2-AK-02M	1344-0240

*needed for pluggable probes

Temperature Logger

Accessories for EBI 2T-Series-300

Software



EBI 2-AUF 2
Wall bracket, plastic with lock



EBI 2-AUF-3
Wall bracket, V2A with lock



EBI KSY-USB
USB adapter



EBI KSY-RS 232
Interface for all **EBI 2** loggers, USB adapter optional



Winlog.pro
Universal software



Winlog.light
Evaluation software

Description	Type	Part No.
Evaluation systems		
Interface set for EBI 2 (without software)	EBI KSY-RS 232	1340-2084
USB adapter	EBI KSY-USB	1900-0100
Accessories		
Wall bracket, plastic, with lock	EBI 2-AUF2	1740-0005
Wall bracket, V2A with lock	EBI 2-AUF3	1740-0010
Evaluation software	Winlog.light	1340-2354
Universal software	Winlog.pro	1340-2355

Precision Humidity / Temperature Logger

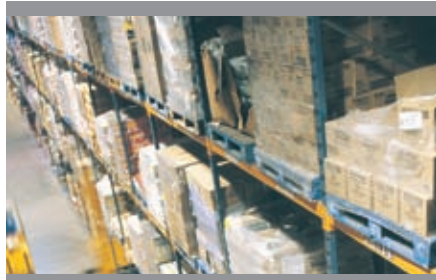
EBI 2-TH-611 / -611-Ex / -612



Technical Data

Type	EBI 2-TH-611 / -611-Ex / -612	
	Humidity (channel 1)	Temperature (channel 2)
Measuring range	0% rH ... 100% rH	-40°C ... +75°C (-40°F ... 167°F)
Accuracy	±2% rH ±1 Digit (-10°C...+50°C/14°F ... 122°F and 5% rH ... 95% rH)	±0.3°C (±0.5°F) ±1 digit
Resolution	0.1% rH	0.1°C (0.2°F)
Memory	30,000 values	30,000 values
Display function	-20°C ... +75°C (-4°F ... 167°F)	-20°C ... +75°C (-4°F ... 167°F)
Operating temperature	-40°C ... +75°C (-40°F ... 167°F)	-40°C ... +75°C (-4°F ... 167°F)
Storage temperature	-40°C ... +75°C (-40°F ... 167°F)	-40°C ... +75°C (-4°F ... 167°F)
Measuring rate	adjustable from 1 s to 8 h	adjustable from 1 s to 8 h
Measurement mode	endless, start/stop, start with set measuring rate	endless, start/stop, start with set measuring rate
Battery	3.6 V lithium	3.6 V lithium
Battery lifetime	approx. 3 to 5 years	approx. 3 to 5 years
Dimensions	96 mm x 48 mm x 28 mm	96 mm x 48 mm x 28 mm
Weight	100 g	100 g
Certificate	3 point factory calibration	3-point factory calibration

EBI 2-TH-611 / -611-Ex / -612



Applications

- Temperature and humidity monitoring
- Transport monitoring
- Climate monitoring

Attributes

- High accuracy
- Also available with external probe
- Programming and evaluation with PC
- Current values shown on display
- Factory calibration certificate

Description	Type	Part No.
Humidity / temperature logger with internal sensor	EBI 2-TH-611	1613-1303
Humidity / temperature logger with internal sensor	EBI 2-TH-611-Ex	1613-1304
Humidity / temperature logger with external sensor *	EBI 2-TH-612	1613-1305

*see page 79 for external probes

Precision Humidity / Temperature Logger

Accessories for EBI 2-TH-611/612

External probe for EBI 2-TH-612



Air probe incl. sinter filter

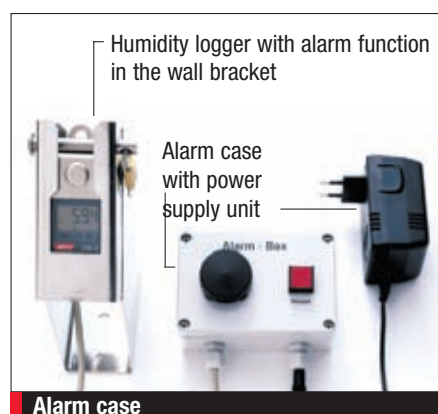
EBI FUE-L



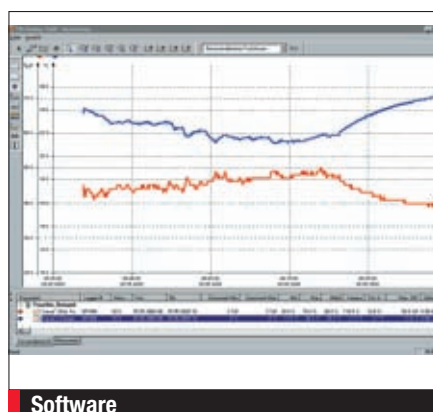
Penetration probe

EBI FUE-E

Accessories



Alarm case




Software



Calibration case EBI 2-TH-CAL

Description	Type	Part No.
Humidity / temperature logger, internal	EBI 2-TH-611	1613-1303
Humidity / temperature logger, external	EBI 2-TH-612	1613-1305
Probe for EBI 2-TH-612		
Air probe for EBI 2-TH-612	EBI FUE-L	1713-0070
Penetration probe for EBI 2-TH-612	EBI FUE-E	1713-0075
Accessories		
Calibration case	EBI 2-TH-CAL	1613-1325
Wall distance bracket with lock	EBI 2-WD	1740-0015
System case	EBI TAK ALU	1248-0020
Software		
Evaluation software	Winlog.light	1340-2354
Universal software	Winlog.pro	1340-2355
Interface set for EBI 2 (without software)	EBI KSY-RS 232	1340-2084
USB adapter	EBI KSY-USB	1900-0100



No matter what software requirements you may have: ebro[®] has the right software to meet your needs.

- Winlog.basic
- Winlog.pro
- Winlog.light
- Winlog.wave
- Winlog.web



-ebro⁺
www.ebro.com

Winlog.basic

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www.ebro.com

Winlog.pro

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NEW

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Evaluation Software for all ebro® Data Loggers

Winlog.light, Winlog.basic and Winlog.pro



Winlog.light

NEW



Winlog.light

New! The standard software for all ebro® Data Loggers. Evaluation made easy.

The universal software for programming and evaluation of ebro® data loggers

- User-friendly
- Programming and readout of data loggers
- Graphic and numeric presentation of measured data
- Supports all ebro® logger types
- Different types of reports selectable
- Statistics for measured date, i.e. average, standard deviation, MKT, MIN/MAX
- Data export into Microsoft® Excel
- 21 CFR Part 11 functions possible (optional)



Winlog.basic



Winlog.basic

The simple, free software for programming and evaluation of the EBI-20 Data Logger Family.

Self-explanatory and easy to operate

- User-friendly
- Programming and readout of data loggers
- Graphic and numeric presentation of measured data
- Protocol print out (with printer and computer)
- Scans and enlarges measured data
- Data export into Microsoft® Excel
- 21 CFR Part 11 functions possible (optional)



Winlog.pro



Winlog.pro

The professional software for all ebro® Data Loggers. Including calculations and realtime monitoring for loggers with radio communication.

- User-friendly
- Programming and readout of data loggers
- Graphic and numeric presentation of measured data
- Switch from absolut to relative time line possible
- Supports all ebro® logger types
- Real-time monitoring for loggers with wireless communication
- Different types of reports selectable
- Import of photos and graphics in reports possible
- Formular editor for calculating F₀-Value, PE-Value, absolute humidity, etc.
- 21 CFR Part 11 conform

System requirements

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

Hardware requirements:

Processor speed minimum 1.5 GHz
Working memory 512 MB
200 MB free hard disc space
USB (Universal Serial Bus)

Software requirements:

Operating System Microsoft® Windows® XP or Windows® 2000 or Windows® Vista

Description	Type	Part No.
Evaluation software	Winlog.light	1340-2354
Evaluation software	Winlog.basic	1340-2375
Universal software	Winlog.pro	1340-2355
Additional Licence for Universal Software Winlog.pro	Winlog.pro - Additional Licence	1340-2356

Evaluation Software for Data Logger EBI 25 and EBI 90

Winlog.web and Winlog.wave



Winlog.web



Winlog.web

The new ebro software supports the logger types EBI 25 and EBI 90.

Winlog.web

The web-based evaluation software for programming, control monitoring and evaluation of technical processes.

- Intranet- and internet capable
- Multi-protocol capable
- User-friendly
- Real-time monitoring for loggers with wireless communication
- Far-reaching, convenient alarm management
- Individually programmable reporting with automatic evaluation
- clear presentation of measured values with freely defined monitoring lists
- With mapping function
- Data points and data origin can be located
- High safety standards by means of user administration and audit trail



Winlog.wave



Winlog.wave

The new ebro software supports the logger type EBI 25.

Winlog.wave

The local PC evaluation software for programming, monitoring and evaluation.

- User-friendly
- Real-time monitoring for loggers with wireless communication
- Far-reaching, convenient alarm management
- Individually programmable reporting with automatic evaluation
- clear presentation of measured values with freely defined monitoring lists
- With mapping function
- Data points and data origin can be located
- High safety standards by means of user administration and audit trail

System requirements

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

Hardware requirements:
 Processor speed minimum 1.5 GHz
 Working memory 512 MB
 200 MB free hard disc space
 USB (Universal Serial Bus)

Software requirements:
 Operating System Microsoft® Windows® XP or Windows® 2000 or Windows® Vista
Further requirements:
 Mozilla Firefox 3.0, Microsoft Internet Explorer 7

Description	Type	Part No.
Evaluation software (single-user version)	Winlog.wave	1340-2391
Evaluation software (web-based server version)	Winlog.web	1340-2390

New EC Regulation on Temperature Monitoring *Mandatory from 01.01.2010*

Since January 1, 2006, Regulation (EC) No. 37/2005 of the Commission of the European Community on temperature monitoring of deep-frozen food in transport, warehousing and loading equipment has taken effect.

The regulation requires that transport and storage facilities be equipped with suitable devices for measuring and recording air temperature. The recorded measured data must be dated and stored for a minimum of one year, depending on the nature and perishability of the deep frozen food. Additionally, all devices used for measuring and monitoring these

temperatures must conform to the standards EN 12830, EN 13485 and EN 13486.

To facilitate the implementation of these measures by business and industry, the judiciary has allowed for a transition period ending 31.12.2009.

Beginning January 1, 2010, all of the above-mentioned measuring devices must conform to these regulations.



International Food Standard

Steadily increasing requirements

An increasingly competitive food industry and continuously rising demands regarding food safety are leading in turn to higher demands on manufacturers and sellers of food products. For the increased costs that individual operators have to carry because of these measures, a viable solution had to be brought forward.

Therefore, in 2003, the International Food Standard (IFS) of food retail representatives from many European countries was defined. The goal was to find a standard for both the verification and certification of food safety systems and for the quality definition of food products. The IFS is considered to be a uniform international safety standard and is an effective way of implementing existing norms and laws on food security. In plain language this means that all required quality assurance activities are concentrated in one standard.

Although the IFS is not a law, it must be observed that more and more retailers such as for example Aldi and Edeka in Germany or COOP in Italy demand an IFS certificate for all deliveries. The individual trading companies thus have the assurance that their suppliers are working in accordance with these common targets and that production of safe food is guaranteed.

The IFS is also enjoying growing recognition at an international level because it is relevant for all establishments within the food chain. The audits can be carried out by different certification bodies that possess the necessary approvals. When obtaining accreditation according to EN 45011, this would be for example, TÜV.

As not only individual companies are expected to meet growing demands and expectations, the IFS subjects itself to regular audits. This resulted in the founding of the IFS 5. Its goal was to make the

standard easier to understand and more transparent, despite the rising requirements and expectations. Significant changes are, among others:

- Reduction of requirements by more than 25% (no duplication)
- One request level (no subdivision)
- Clear and simple phrases
- Inclusion of new legislation

In order to attain the IFS, an audit is carried out in the operation. During this audit, QM and HACCP records and the processes themselves are reviewed. In the end, a scoring system leads to success or failure. The result of this audit is crucial for determining the frequency of monitoring audits.

The 10 KO-criteria defined in the IFS are important in determining if the audit is passed or failed. These criteria are, among others, „Monitoring of CCPs“, „Personal Hygiene“, „Specification for Raw Material“, „Observance of Customer Specifications“ or „Traceability“. In 40% of the KO-criteria, temperature control plays a very important role, because even irregular temperature checks can lead to an audit failure.



HACCP = Hazard Analysis of Critical Control Points

FOOD HYGIENE

The new hygiene package

in force since 1.1.2006

- EC-regulation 852/2004** on hygiene of foodstuffs
- EC-regulation 853/2004** with specific foodstuff regulations for food products of animal origin
- EC-regulation 854/2004** with special regulations for the official monitoring of products of animal origin intended for human consumption

European law applies since 1.1.2006. The so-called hygiene package replaces corresponding national rules such as the German food hygiene regulations (Lebensmittelhygieneverordnung (LMHV)). What is new in this regulation?

- Food safety is monitored at the EU-level. Corresponding national regulations are no longer in force.
- The documentation of food hygiene is mandatory. It should, however, be appropriate to the nature and size of the business.
- Raw materials must be stored separately from processed products.
- The temperature monitoring of food products requiring refrigeration is stipulated as a binding requirement.
- Every business that handles food products must instate a hygiene management system in accordance with HACCP.

HACCP = Hazard Analysis of Critical Control Points

HACCP basic principles:

- carry out hazard assessment
- identify critical control points (CCP)
- specify threshold values for the CCPs
- specify monitoring procedures of the CCPs
- specify response measures in case threshold values are exceeded
- regular verification of the HACCP-system
- documentation of processes and records

The HACCP-concept should protect the consumer against unacceptable residual health risks.

Depending on the nature and size of the business, such a hygiene management system can be more or less comprehensive.

The following problem areas are to be examined critically:

- building conditions
- water supply
- cleaning and disinfection
- serving counter
- circumstances of delivery
- personal hygiene
- preventing customer contact
- sanitary facilities
- handling of waste
- cutting and handling devices
- pest control
- clothing, head coverings
- health of employees

In the context of the hazard assessment, the following temperatures are to be taken into account:

- delivery temperatures
- ambient temperatures
- transport temperatures
- serving temperatures
- storage temperatures
- portioning temperatures
- heating and warm storage temperatures
- regeneration temperatures

Other monitoring procedures include:

- measuring pressure and humidity
- measuring salt content
- determination of pH-value or the shares of preservatives contained in food products
- determination of polar compounds in frying oil



Changes in DIN 10508

Temperatures for Food Products

INTRODUCTION

During production, handling, transport and during the introduction of food products into the market, temperature control and the adherence to specific temperatures play a decisive role in controlling the undesirable propagation of microorganisms.

In the past, various regulations with corresponding temperature requirements for food products have been issued; however, these were not coordinated. The DIN 10508 was first published in October 2002 and now revised with respect to the new food hygiene law as well as practical experience.

The temperature specifications of this standard aimed at facilitating uniform procedure. (Regulations according to the ATP agreement are considered).

Changes with respect to DIN 10508:2002-10:

- 1) The temperature specifications have been revised and updated according to the new food hygiene law. (see tables)
- 2) The standard was updated to the latest status.

APPLICATION AREA

This standard specifies temperatures that apply for deep-frozen, frozen, refrigerated and for food products that are kept warm as well as for ice cream.

These temperatures are partially established in statutory regulations, or they are recommended by the NAL study group on food hygiene. These recommendations are not legally binding. They can be consulted for self monitoring as well as for official monitoring.

Requirements

- Easily perishable food products of animal or plant origin should, as far as not specified by other regulations, be stored below +7°C (44°F).
- For packaged food products requiring refrigeration, a temperature of max. +7°C (44°F) should be assumed during transport and storage.
- In order to prevent germs from proliferating, the cooling down phase of hot food products (from +65°C down to 10°C) shall be carried out within 3 hours.

NOTE

Refrigeration alone can only slow down, but not prevent the multiplication of spoiling agents or disease agents. The multiplication of microorganisms also depends on the duration of storage as well as on additional internal and external factors.

Table 1 maximum temperatures for deep-frozen and frozen food products

Food industry products	Temperature °C/°F
Deep-frozen food products (except for ice cream)	-18°C (0°F)
Poultry, deep-frozen	-18°C (0°F)
Frozen food products	-12°C (10°F)
Meat, frozen	-12°C (10°F)
Poultry, frozen	-12°C (10°F)
Egg products, deep-frozen	-18°C (0°F)
Egg products, frozen	-12°C (10°F)
Egg products, refrigerated	+4°C (39°F)

Storage time at +4° (39°F) up to the time of processing may not exceed 48 hours

Table 2: maximum temperatures for ice cream

Food industry products	Temperature °C/°F
Ice cream in finished packs	-18°C (0°F)
Ice cream for portioning	-10°C (14°F)



HACCP = Hazard Analysis of Critical Control Points

Table: Maximum temperatures for food products requiring refrigeration

Food industry products	Temperature °C/°F
Butter	+10°C (50°F)
Cream cheese (cream cheese products)	+10°C (50°F)
Soft cheese and sliced cheese except for hard cheese	+10°C (50°F)
other milk products, requiring refrigeration	+10°C (50°F)
Milk in the production operation	
- in case of daily transfer	+6°C (42°F)
- in case of non-daily transfer	+6°C (42°F)
Milk ready for consumption, pasteurized	+8°C (46°F)
Attested milk	+8°C (46°F)
Storage after filling	+8°C (46°F)
Meat, fresh	+8°C (46°F)
Butchery side products, fresh	+3°C (37°F)
Poultry, fresh	+4°C (39°F)
Ground meat, processed meat, processed poultry	
From operations not at the location of distribution	+4°C (39°F) for ground meat** +4°C (39°F) for processed meat +8°C (46°F) for deep-frozen goods
From operations at the location of distribution, loose or self-packed	
- for immediate distribution	+7°C (44°F) ambient temperature
- distribution on the day of production or given special documentation filling within 24h	+7°C (44°F) +4°C (39°F) ambient temperature
Meat products, easily perishable	+7°C (44°F)
Meat-based instant meals	+10°C (50°F)
Fishery products, fresh, as well as crab and shellfish products, boiled	in melting ice or +2
Fishery products, processed (marinated, soured, smoked)	+7°C (44°F)
Chicken eggs (from 18th day after laying date)	+5°C to +8°C (41°F to 46°F)
Food products containing raw eggs (such as fresh egg mayonnaise)	+7°C (44°F)
Egg products previously treated, refrigerated	+4°C (39°F)
Other easily perishable food products such as:	
- baked goods with fillings that are not heated through	+7°C (44°F)
- fresh, chopped-up salads	+7°C (44°F)
- delicatessen salads	+7°C (44°F)

Special characteristics of ground meat

** In order to maintain the traditional marketing forms for ground meat, it can be refrigerated immediately after processing to a core temperature of no more than +4°C (39°F). This temperature is also to be adhered to during storage and transport. This ground meat may only be brought into circulation on the day of the production.

The ambient and core temperature of +4° (39°F) also applies for pre-packaged ground meat with a consumption date after the packaging is opened.

Note

Although some easily perishable food products are explicitly listed by name in the above table, many other products, for example from the area of processed meat and fishery products, also fall into this category, but these could not be listed individually because of their diversity. These products are to be classified in the group of other easily perishable food products.

Table: Minimum temperature for food products to be kept warm *

Food industry products	Temperature °C/°F
Food products ready for consumption that need to be kept warm	+65°C (149°F)

Easily perishable food products that are ready for consumption and that need to be kept warm should be kept at a product temperature of at least +65°C (149°F). The duration of the warming should be limited to about 3 h.

*Finished cooked dishes for immediate consumption are often found in cafeterias, canteens and primarily in fast-food gastronomy.

F-Value Calculation

General information regarding the F-value

Heat treatment of meat has two essential objectives:

1. Preserving desired characteristics such as aroma, colour, taste and structure.
2. Killing off bacteria and microorganisms sufficiently to achieve the desired preservability.

Today, the effect of killing off certain microorganisms is expressed both for pasteurization and for sterilization using the F-value.

For the cooking of meat products, the F-value is applied with the reference temperature (+70°C/158°F) and the Z-value (+10°C/50°F).

Pasteurization

Meat products which can also be preserved through refrigeration have been exposed to heat treatment known as «pasteurization».

Preservation varies from a few days to a few months, and is highly dependent on the storage temperature.

Pasteurized products are also known as «semi-conserved» products. In case of refrigeration below +4°C (39°F), the product lifetime being targeted is 6 months.

Investigations have shown that sufficient coagulation (stiffening) is already achieved at a cooking or core temperature of +60°C (140°F).

Although the product is already cooked, this does not mean that it is already sufficiently well-preserved. For this, a minimum F-value is required. To pasteurize effectively (killing off the so-called vegetative organisms), temperatures of between +60°C (140°F) and +90°C (194°F) are required.

Sterilization

Products which are to be stored for longer periods without refrigeration require heat treatment known as «sterilization». Apart from the vegetative organisms referred to above, it is also necessary to kill off heat-resistant bacteria as well. However, that process only starts at temperatures higher than +90°C (194°F).

These high cooking temperature result in a relatively high degree of damage (damage to the structure and the appearance of deposits of jelly and fat, as well as quality loss in terms of colour, aroma and taste).

The key to proper sterilization is adequate killing-off of bacteria.

The measurement of the F-value is simple.

With the newly developed **ebro®** temperature logger, measuring the F-value is very simple. Before the treatment, the probe is inserted in the thermal centre of the product.

The core temperature alone doesn't indicate much about the quality of the heat treatment. For a high-quality, safe product, it is absolutely necessary to carry out the heat treatment while monitoring the F-value. Working with the F-value optimizes the treatment of meat products.

The **advantages** are a clear profit for the producer:

- safely sustainable product
- better and more flavorful product
- better utilization of energy
- less damage due to cooking

Microorganisms

Microorganisms are killed by using heat. To be able to judge whether the microorganisms present have been killed off sufficiently, in most cases heat-resistant microorganisms are taken as the measure. When processing meat, the organisms concerned are the D-streptococci. The D-streptococci begin to be killed off at a temperature of +55°C (131°F). The other microorganisms exhibit lower temperature resistance. The microorganisms are not killed off all at once; instead, there is a relatively exponential pattern.

When one talks about killing off microorganisms, then one is talking about the microorganisms in the thermal centre. The heat being fed in from the boiling vessel, boiling chamber or autoclave reaches this centre last of all.

The thermal centre is not necessarily the geometric centre, but is dependent on the shape or on the packaging. The type of heat source also determines the position of the thermal centre. Working hygienically means lowering the required F-value.

To pasteurize meat products with normal best before dates, F-values between 20 and 80 are required. The precise value depends on the initial bacterial level, the pH-value, the AW-value and the desired best before date. If hygiene is not taken so seriously (which is surely the exception), then this has effects on the bacteriological quality of the meat.

Working hygienically also means that fewer microorganisms need to be killed off. The consequence of this, in turn, is that the F-value can also be lower.

Generally, for pasteurization the F-value is at values of up to 40. Cooking and measuring the core temperature is not an adequate check. Previously, it was assumed that at a core temperature of +68°C (145°F) meat products were cooked sufficiently. However, this traditional view is demonstrably not necessarily correct.

A «Knackwurst» type sausage, for example, which was treated with a final core temperature of +68°C (154°F), is absolutely not safe to be preserved. This is also true for pork sausage. A cooked ham weighing 4.5 to 5.5 kg with a final core temperature of +68°C is cooked to the point of being unuseable. If these products were cooked with a F-value of 60, the final core temperature for the «Knackwurst» would be around +75°C (167°F), for the pork sausage around +73°C (163°F), and for the ham around +63°C (145°F). From this, it is clearly apparent that the best before period is not only dependent on the final core temperature, but is even more dependent on the relationship between the core temperature and the cooking time.



Calibration

in accordance with EN 13486

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 DKD-calibrated working standard measuring equipment.

- 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.
- This calibration is completed for all new devices and standard replacement devices.

Calibration as per ISO 9000ff

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

- Calibration is done by calibration experts in a special laboratory.
- The results are documented in detail, including traceability information, in a so-called ISO calibration 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 once every six months for pressure and humidity meters.

DKD calibration

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

- Calibration is completed by accredited laboratories.
- Calibration is internationally recognized.
- DKD calibration is carried out by specially certified persons only.
- DKD calibration is documented in detail, including traceability.
- Manufacturer-independent calibration, devices from other manufacturers can be calibrated.

We recommend that calibration be completed once per year for thermometers and once every six months for pressure and humidity meters.

Calibration

Values measured by a device that has been officially calibrated are legally binding. Therefore such a device is ideal for use by government inspection authorities such as food inspectors or certified court experts.

- Official calibration is completed by government gauging offices only.
- Measuring equipment must have a special type approval from the Physikalisch-Technische Bundesanstalt (PTB) in order to be eligible for official calibration.
- The official calibration certificate indicates the display correction, calibration tolerances and duration of validity.
- The TFX 422 thermometer from ebro® is officially calibrated (or suitable for official calibration).

Following is normally applicable to ISO calibrations

The price for the calibration according to ISO 9000ff. incl. certificate includes 3 specified standard calibration points. Every deviating calibration point results in an surcharge.

Delivery time: approx. 1 week after reception of goods.

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.

Following is normally applicable to DKD calibrations

The price for the DKD calibration including certificate includes 3 optional calibration points in the range of -80°C ... +300°C (-112°F ... 572°F) or 10% rH ... 95% rH for humidity calibration. Every deviating calibration point results in an sur charge. Delivery time: approx. 1-2 weeks after reception of goods.



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

Certified according to

**EN ISO 9001 : 2000
DIN EN ISO / IEC 17025**



Measurement sizes and Calibration Areas



Temperature Calibration

Calibration type	Calibration object	Measuring range	Measurement conditions	Measurement uncertainty
ISO	Temperature measurement devices with air and submersible sensors, Temperature data logger	>-80°C ... +250°C (-112°F ... 482°F)	Temperature-regulated Liquid baths, Calibration source	0.1 K
		>+250°C ... +1000°C (+482°F ... 1832°F)		0.2 K
DKD	Temperature measurement devices with air and submersible sensors, Temperature data logger	-80°C ... -35°C (-112°F ... -31°F)	Liquid bath Water bath Oil bath Tube furnace	0.090 K
		-35°C ... +250°C (-31°F ... 482°F)		0.050 K
Calibration	ebro® Thermometer TFX 422	+250°C ... +300°C (482°F ... 572°F)	Temperature-regulated Liquid baths	0.1 K
		>+300°C ... +1100°C (>572°F ... 2012°F)		
		-40°C ... +200°C (-40°F ... 392°F)		

Surface Temperature Calibration

Calibration type	Calibration object	Measuring range	Measurement conditions	Measurement uncertainty
ISO	Temperature measurement devices with surface probe	+40°C ... +250°C (104°F ... 482°F)	Surface calibrator	0.9 K
ISO	non-contact IR Temperature measurement devices	-35°C ... +190°C (-31°F ... 374°F)	Reference emitter	0.5 K

Humidity Calibration

Calibration type	Calibration object	Measuring range	Measurement conditions	Measurement uncertainty
ISO	Capacitive sensors for relative humidity	10% rH ... 30% rH	Saturated salt solution Humidity generator Saturated salt solution	2% rH
		30% rH ... 60% rH 60% rH ... 95% rH		
DKD	Capacitive sensors for relative humidity	10% rH ... 30% rH	Temperature range: +5°C ... +70°C (41°F ... 158°F)	0.3% rH 0.6% rH 0.9% rH
		30% rH ... 60% rH 60% rH ... 95% rH		

Pressure Calibration

Calibration type	Measurand	Measuring range	Measurement conditions	Measurement uncertainty
ISO	Absolute pressure	0 mbar ... 10000 mbar	Pressure calibrator	1 mbar+ 0.5 x 10 ⁻⁴ Pabs
DKD	Absolute pressure	0 mbar ... 35000 mbar	In gases	0.1 mbar + 1.5x 10 ⁻⁴ Pabs

ISO - Standard Calibration Points for ebro® products

Measuring device		Calibration points	
EBI 1 Logger 85, -85A and EBI 10	-20°C (-4°F)	0°C (32°F)	+60°C (140°F)
EBI 1 Logger 125, -125A, EBI 10 and EBI 11	0°C (32°F)	+60°C (140°F)	+134°C (273°F)
EBI 2 Logger	-20°C (-4°F)	0°C (32°F)	+60°C (140°F)
EBI 20	-20°C (-4°F)	0°C (32°F)	
Thermometer with penetration probe	0°C (32°F)	+60°C (140°F)	+120°C (248°F)
Thermometer with surface probe	+50°C (122°F)	+100°C (212°F)	+200°C (392°F)
Thermometer without probe	-100°C (-148°F)	0°C (32°F)	+200°C / +1000°C (392°F / 1.832°F)
EBI 2 Humidity-Logger	32.8% rH -20°C (-4°F)	52.9% rH 0°C (32°F)	75.4% rH +60°C (140°F)
Pressure Logger 5 bar	0 mbar +20°C (68°F)	2500 mbar 0°C (32°F)	5000 mbar +60°C (140°F)
Pressure Logger 2 bar	0 mbar +20°C (68°F)	1000 mbar 0°C (32°F)	2000 mbar +60°C (140°F)



Conditions of Delivery and Payment

Conditions of Delivery and Payment

1. General

- 1.1 These Conditions of Delivery and Payment shall apply as binding conditions to the business relationship as a whole, to the present agreement, to all deliveries arising from future business transactions between the parties and to other performance.
- 1.2 Other conditions applied by Customer and not expressly acknowledged by us in writing shall remain non-binding for us, even if not expressly refused by us.
- 1.3 All other agreements, changes or supplements to agreements and ancillary agreements must be confirmed by us in writing. Statements by our staff and representatives shall be deemed effective in law only when confirmed by us in writing.

2. Offer and Order Confirmation

- 2.1 Our offers are subject to confirmation. The scope of our obligation to perform shall be determined solely by our written order confirmation.
- 2.2 Any documents forming the basis of an offer or order confirmation, such as sketches, drawings, cost estimates and other documentation, shall be utilised by Customer for the agreed purpose only and shall not be reproduced or made available to third parties by Customer without our express permission. Said documents shall be returned to us at our request.

3. Delivery and Delay

- 3.1 Punctual adherence to delivery deadlines assumes the timely supply of documentation and other necessary information to us by Customer and furthermore assumes that payment obligations on behalf of Customer do not fall into default.
- 3.2 In the case of our inability to comply with binding delivery dates for reasons of force majeure or other unavoidable circumstances such as war, industrial action, lockout or delay in the provision to us of parts, goods or services ordered from third parties, Customer shall be entitled to specify an appropriate extension of the delivery period with a minimum of four weeks, after the expiry of which Customer shall be entitled to withdraw from the contractual agreement in the form of a registered letter.
- 3.3 Should our delivery of the goods or services be rendered impossible under the circumstances given for reasons beyond our control, we shall be deemed exempt from our obligation to deliver. This shall also apply if said circumstances affect our operations to such an extent that our fulfilment of the agreement is hindered.
- 3.4 Customer shall be entitled to claim compensation against us, whether for withdrawal from the agreement or delay in delivery, in the circumstances given above. This shall not apply in cases where gross negligence or intention is imputed to us.
- 3.5 We shall be entitled to execute part-deliveries.

4. Acceptance and Transfer of Risk

- 4.1 Unless fixed acceptance periods are agreed, Customer shall undertake to accept the delivery item within eight days of notification of its completion.
- 4.2 If Customer has submitted an order on call, he shall undertake to call up the delivery item – or all items, in the case of multiple orders – within a period of twelve months from the date of ordering. If Customer fails to call up the order within this period we shall be entitled to undertake unsolicited dispatch and invoicing of the goods, or to withdraw from the contract and demand the return of any bulk discount already granted on the basis of the on-call order for earlier orders.
- 4.3 Risk shall be transferred to Customer on acceptance of the delivery item, in the case of groundless refusal on the part of Customer to accept the delivery item, or in the case of inaction on the part of Customer after the expiry of the time limit given in 4.1 and 4.2 above or a specifically agreed time limit for acceptance. If dispatch of the delivery item to Customer or a third party is agreed, risk shall be transferred when the delivery item is passed to the carriage agent (mail, rail, carrier etc.). In all cases risk is transferred with the commencement of use of the delivery item. If we accept goods returned for reasons over which we have no control, risk shall lie with Customer until the delivery item arrives at our premises.

5. Prices and Conditions of Payment

- 5.1 Unless otherwise specified, prices given by us are ex works exclusive of statutory Value Added Tax and packing costs. Packing of our choice will be invoiced.

- 5.2 Our invoices are due net cash 30 days after invoice date. Invoices for repairs are due immediately, strictly in full.
- 5.3 Prices are valid for a period of four months after receipt of our order confirmation. If longer delivery times have been agreed and prices of raw materials, wages and salaries, freight or public duties increase after conclusion of the agreement, shall be entitled to increase prices by an appropriate amount.
- 5.4 If Customer exceeds the time limit for payments, he shall be deemed to be in default from receipt of our first reminder. We reserve the right to charge default interest to the amount of 3% above the German Central Bank discount rate applicable at the time.
- 5.5 We are under no obligation to accept bills of exchange, which in all cases shall be deemed to be accepted only when the amount has been credited to our account. We accept no liability for the timely presentation, protest, notification or returning of the bill in the case of non-redemption. In case of default we shall reserve the right to exercise the claims specified in 5.4.
- 5.6 If Customer fails to meet his obligations of payment to a significant extent, ceases to render payment instalments or fails to redeem a cheque or bill of exchange, or if any serious deterioration in Customer's business status comes to our knowledge, we shall be entitled to demand payment in advance and call in all deliveries outstanding.
- 5.7 In the case of requests for modification or alteration issued on the part of Customer after order confirmation, we shall invoice Customer for any resulting additional costs.

6. Retention of Title

- 6.1 The goods delivered shall remain our property until all accounts arising from our business transactions with Customer have been settled in full. Retention of title shall be upheld if individual claims against Customer are included in an open account. A Customer indicating his status as reseller when ordering shall be entitled to resell the reserved goods as part of normal business transactions; however, pledging or cession by security shall not be permitted. In the case of resale of the reserved goods on credit, Customer shall undertake to secure our rights.
- 6.2 Claims arising from resale of the reserved goods shall be transferred to us by Customer at the time of conclusion of the agreement concerning resale of our delivery; we accept said transfer.

7. Warranty

- 7.1 Defects in the delivery items about which we are informed after the transfer of risk shall be repaired by us at our own option or replaced by us. We shall also be entitled to replace the goods if repair proves unsuccessful. Written notification of defects must be received by us within fourteen days of transfer of the delivery items to the Customer in the case of visible defects, or immediately after discovery in the case of hidden defects.
- 7.2 Any alterations or modifications to the goods undertaken by the recipient of the goods shall render null and void all obligation on our part to replace the goods. Defective items shall be returned freight and carriage free and shall be retained for our inspection. If the complaint proves justified we shall, at our own option, replace the goods free of charge and carriage free after return of the defective goods, or repair the defective goods. Claims concerning rescission of the contract, price reduction or compensation shall be excluded.
- 7.3 We accept no liability for damages arising for the following reasons: Faulty operation by Customer or a third party, inappropriate or improper use, non-observance of our operating instructions, chemical, electrochemical or electrical influence, alterations or maintenance work not approved by us.
- 7.4 Further claims on the part of Orderer shall be excluded, particularly claims concerning the reimbursement of damages not arising from the delivery item itself. This shall not apply in cases where intention or gross negligence are imputed to us.

8. Place of Fulfilment, Place of Jurisdiction

- 8.1 The place of fulfilment for delivery and payment shall be Ingolstadt. The place of jurisdiction for all disputes, including those involving bills of exchange or cheque processes, shall be Ingolstadt.
- 8.2 If a condition of these Terms and Conditions is or becomes invalid, the validity of all other conditions remains unaffected.



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Fax: +49 (0) 72 63/91 17 71
Mobil: +49 (0) 1 72/6 35 44 42
E-Mail: info@katec-gmbh.de
Internet: www.katec-gmbh.de

Regional Representative South-East

ebro Electronic GmbH & Co. KG
Reinhard Scharrer
Verdistr. 14
90455 Nürnberg
Tel.: +49 (0) 91 22/63 37 07
Fax: +49 (0) 91 22/63 37 08
Mobil: +49 (0) 0173/9 58 06 69
E-Mail: scharrer@ebro.com

Regional Representative South-West

Stöfl Mess- und Sensortechnik
S/T/Ö/F/L MESS- UND SENSORTECHNIK
Siegfried Stöfl
Beethovenstr. 67
71336 Waiblingen
Tel.: +49 (0) 71 46/2 81 85 17
Mobil: +49 (0) 161/1710266
Internet: www.stoeffl.de

Regional Representative West

ebro Electronic GmbH & Co. KG
Wilfried Kemna
Lohestraße 9
58093 Hagen
Tel.: +49 (0) 23 31/58 77 15
Fax: +49 (0) 23 31/3 48 05 92
Mobil: -49 (0) 0173/9 58 06 68
E-Mail: kemna@ebro.com

Regional Representative North-East

ebro Electronic GmbH & Co. KG
Holger Bottke
Lindenallee 5
24536 Neumünster
Tel.: +49 (0) 43 21/25 25 77
Fax: +49 (0) 43 21/25 25 76
Mobil: +19 (0) 0173/9 58 06 67
E-Mail: bottke@ebro.com

EUROPE

Belgium

Gullimex BV
Oudenaardsesteenweg 404
BE - 9420 ERPE-MERE
Tel.: +32-53 80 97 54
Fax: +32-53 80 97 55
E-Mail: info@gullimex.com
Internet: www.gullimex.com

Bulgaria

SICON Ltd.
2 Stara Reka Str.
BG - 1588 KRIVINA – SOFIA
Tel.: +359-2-9 99 73 33 / 74 00
Fax: +359-2-9 99 73 37
Mobil: +359-888-600015
E-Mail: sicon@siconbg.com
Internet: www.siconbg.com

Denmark

VWR - Bie & Berntsen A/S
Transformervej 8
DK - 2730 HERLEV
Tel.: +45-44 94 88 22
Fax: +45-44 91 89 65
E-Mail: info@dk.vwr.com
Internet: www.vwr.com

OJ Electronics A/S
Stenager 13B
DK - 6400 SOENDERBORG
Tel.: +45/73 12 13 14
Fax: +45/73 12 13 13
E-Mail: jlu@oj.dk
Internet: www.oj-electronics.dk

Estonia

OU EST Doma
Võru 165/5
EE - 50115 Tartu
Tel.: +3 72/7-36 27 16
Fax: +3 72/7-44 19 97
E-Mail: tartu@estdoma.ee
Internet: www.estdoma.ee

Finland

OY Teknocalor AB
Sinikellonkuja 4
FI - 01300 Vantaa
Tel.: +358-10 820 1100
Fax: +358-10 820 1101
Fax: +358-982 61 51
E-Mail: Johanna.Hokkanen@teknocalor.fi
Internet: www.teknocalor.fi

France

Fisher Bioblock Scientific SAS
BP 50111, Parc d'Innovation
FR - 67403 ILLKIRCH-CEDEX
Tel.: +33-3 88 67 53 23
Fax: +33-3 88 67 85 11
E-Mail: fr.commande@thermofisher.com
Internet: www.bioblock.com

SOPAC SA

142-176 avenue de Stalingrad
FR-92712 COLOMBES CEDEX
Tel.: +33-1-47-99-61-00
Fax: +33-1-47-99-61-19
E-Mail: ggorre@sopac.com
Internet: www.sopac.com

Great Britain

Klipspringer
Rynor House, Farthing Road
GB - IP1 5AP IPSWICH,
Tel.: +44/14 73 74 15 00
Fax: +44/14 73 74 72 00
E-Mail: info@klipspringer.co.uk
Internet: www.klipspringer.co.uk

Holland

Gullimex BV
Oostermaat 7, NL- 7623 CS Borne
Postbus 114, NL- 7620 AC Borne
Tel.: +31/7 42 65 77 88
Fax: +31/7 42 67 02 37
E-Mail: info@gullimex.com
Internet: www.gullimex.com

Ireland

SGR Scientific Limited
Unit B1 / Metropoint Business Park / Kettle Lane
IE - SWORDS, CO DUBLIN
Tel.: +353-18 07 70 60
Fax: +353-18 95 66 12

SCS - Service & Calibration Solutions
22 Fox Park, Finnstown Abbey, Lucan
IE - DUBLIN
Tel.: +353 868 373 336
Fax: +353 16 210 994
E-Mail: tech@scsie.net
Internet: www.scsie.net

Iceland

Landvelar ehf
Smidjuvegur 66
IS - 200 KÓPAVOGUR
Tel.: +354-5 80-58 00
Fax: +354-5 80-58 01
E-Mail: odinn@landvelar.is
Internet: www.landvelar.is

Italy

Tectronik s.r.l.
Via Cesare Battisti, 63 d
IT - 35010 LIMENA
Tel.: +39/0 49 76 86 99
Fax: +39/0 49 88 40 804
E-Mail: tectronik@hotmail.com
Internet: www.tectronik.it

Croatia

Labormed d.o.o.
Lomnicka 5
HR - 10000 ZAGREB
Tel.: +3 85-1-6 19 10 71
Fax: +3 85-1-6 19 10 71
E-Mail: labormed@labormed.hr
Internet: www.labormed.com

Latvia

AB Medical Group Riga Ltd.
Gustava Zemgala gatve 62
LV - 1039 RIGA
Tel.: +371-9244294
Fax: +371-7840360
E-Mail: gints@abtechnology.lv

Lithuania

Lintera UAB
Ukmerges str. 22
P.O. Case 10
LT-55101 JONAVA
Tel.: +370-34 96 14 48
Fax: +3 70/34 96 12 97
E-Mail: jonava@lintera.info
Internet: www.lintera.info

Elymus LTD

Laboratory Instruments & Service
Suvalku 5-1
LT-03106 VILNIUS
Tel.: +3 70/5 26-5 00 85
Fax: +3 70/5 26-5 00 95
E-Mail: info@elymus.lt
Internet: www.elymus.lt

Norway

ING. WESTAD AS
Nesbrunn. 82 - PB. 56
NO-1378 NESBRU - V. OSLO
Tel.: +47 66 84 66 67
Fax: +47 66 98 17 66
E-Mail: rw@ingwestad.no
Internet: www.ingwestad.no

Austria

Hubert Hebesberger
Grundstraße 2
A-4501 Neuhofen
Tel.: +43/72 27 64 71
Fax: +43/72 27 41 57
E-Mail: info@energo-system.com
Internet: www.hebesberger.at

Poland

PHU ENERGO-SYSTEM
ul. Witosa 1 i / 2
PL-10-688 OLSZTYN
Tel.: +48-504 793 574
Fax: +48-895 413 678
E-Mail: e-s-t@sprint.com.pl
Internet: www.energo-system.com

Portugal

Meditrom Comercial de Equipamentos, Tecnicos, Lda.
Rua de S. Macário
776-B Loja, Lazarim
PT - 2825-159 CAPARICA
Tel.: +3 51/2 12 94 63 84
Fax: +3 51/2 12 94 63 87
E-Mail: info@meditrom.pt
Internet: www.meditrom.pt

Distributors Worldwide

Romania

ARC Brasov SRL
Str. Grădinarilor Nr. 22
RO-500096 BRASOV
Tel.: +40-2-68 47 25 77
Fax: +40-2-68 41 97 49
E-Mail: arc@arc.ro
Internet: www.arc.ro

Tehnoplus Industry SRL
Str. Odobesti, nr.1, sector 3
RO – 032151 BUCURESTI
Tel.: +40-21-348-5272
Fax: +40-21-348-5343
E-Mail: industry@tehnoplus.ro
Internet: www.tehnoplus.ro

Russia

BiPack Ltd.
Olympiysky pr-kt 16, str. 2, entr. 6
RU-129110 Moscow
Tel.: +7/095-937-2229
Fax: +7/095-926-5858
E-Mail: bipackmoscow.chernova@gmail.com

Sweden

PROREG Control AB
Kvarnbergsvägen 29
SE - 14145 HUDDINGE
Tel.: +46/87 74 05 90
Fax: +46/87 11 93 15
Mobil: +46/70720590
E-Mail: info@proregcontrol.se
Internet: www.proregcontrol.se

Switzerland

ebro Electronic GmbH
Dorfstr. 26d
CH-8902 Urdorf
Tel.: +41/44-7 77 17 63
Fax: +41/44-7 77 17 64
Mobil: +41/794081666
E-Mail: hiitebrand@ebro-ch.ch
Internet: www.ebro-ch.ch

Serbia / Montenegro

Golden Lab & Engineering
Ugrinovacka 118
XS - 11080 ZEMUN / BELGRADE
Tel.: +381 11 2105 935
Fax: +381 11 2105 486
E-Mail: info@goldenlab.rs

Slovenia

Elpro Lepenik & Co. d.n.o.
Ob gozdu 7c, Rogozna
SI – 2204 MIKLAVZ NA DRAVSKEM POLJU
Tel.: +3 86/26 29 67 20
Fax: +3 86/26 29 67 21
E-Mail: info@elpro.si
Internet: www.elpro.si

Spain

CH Sistemas S.L.
El Molino, 12
ES – 39788 GURIEZO
Tel.: +34-942-877904
Fax: +34-942-877905
E-Mail: info@chsisistemas.com
Internet: www.chsisistemas.com

Czech Republic

LOGITRON spol. s.r.o.
Volutová 2520
CZ-15500 PRAHA
Tel.: +420/2 51 61 92 84
Fax: +420/2 51 61 28 31
E-Mail: info@logitron.cz
Internet: www.logitron.cz

Turkey

Biltek San.Ve Tic A.S
Setüstü Taslicikis
Sok. Lamia Cürük
TR - 80040 KABATAS/ISTANBUL
Tel.: +90/21 22 52 12 27
Fax: +90/21 22 52 41 67
E-Mail: info@biltekas.com
Internet: www.biltekas.com

Hungary

LEOTRADE
Technical, Servicing & Trading BT
Ormánság u. 4/b
HU - 1144 BUDAPEST
Tel.: +36 12 21 55 28
Fax: +36 12 22 70 10
E-Mail: info@leotrade.hu
Internet: www.leotrade.hu

Cyprus

KELLEN Imports & Exports Ltd.
P.O.B. 2 54 81 / 8, Ippokratous Str.
CY - 1310 NICOSIA
Tel.: +3 57/22-46 11 66
Fax: +3 57/22 46 11 65
E-Mail: imports@kellen-kiel.com
Internet: www.kellen-kiel.com

AFRICA

Egypt

Amson International Trading Co.
26, Syria Street Mohandeseen
EG – 12411 CAIRO
Tel.: +2 02/33356322
Fax: +2 02/37490764
E-Mail: nabil@amson.net

Algeria

Sté MICROLAB
27, Rue Ibn Charaf - Cité Jardins
TN-1002 TUNIS BELVÉDÈRE
Tel.: +216 71 287 866
Fax: +216 71 285 456
E-Mail: slim.ges@planet.tn

Morocco

TBMS Sarl
Technique Balance & Material Scientific
Résidence d'Or
3, Rue Sidi brahim
MA – 20000 CASABLANCA
Tel.: +212-2222 0890
Fax: +212-2229 3073
E-Mail: tbms@menara.net.ma

South Africa

TermoLog CC
Temperature Data logging Services
Unit 30, N1 Industrial Park
Corner 2nd Avenue & 16th Street
ZA – 7460 ELSIES RIVER
Tel.: +27 21 591 0945
Fax: +27/865129844
Mobil: +27 83 658 9662
E-Mail: karen@termolog.com
Internet: www.termolog.com

Tunisia

Sté MICROLAB
27, Rue Ibn Charaf - Cité Jardins
TN-1002 TUNIS BELVÉDÈRE
Tel.: +216 71 287 866
Fax: +216 71 285 456
Mobil: 0021698342976
E-Mail: slim.ges@planet.tn

NORTH AMERICA

USA

Measurement Technologies, Inc.
Pharmaceutical, Medical, Industrial Sales
4204 Sorrento Valley Blvd, Suite K
US – 92121 SAN DIEGO, CA
Tel.: +1 858 550 0339
Fax: +1 858 777 3474
Mobil: +18585184854
E-Mail: sales@meas-tech.com
Internet: www.meas-tech.com

Thermo Cense, Inc.

533 Capital Drive
US – 60047-6711 LAKE ZURICH, IL
Tel: +1-847-949 8070 (Mundelein Office)
Fax: +1-847-949 8074
E-Mail: sales@thermocense.com
Internet: www.thermocense.com

Canada

Cameron Instruments Inc.
173 Woolwich Street, Unit 103
CA- N1H 3V4 GUELPH, ON
Tel.: +1-888-863-8010
Fax: +1-5198247380
E-Mail: info@cameroninstruments.com
Internet: www.cameroninstruments.com

LATIN AMERICA

Argentina

Sensotec S.A
Av. De Los Constituyentes 4631
AR – C1431EXL Buenos Aires
Tel.: +54-11-45 21 60 60
Fax: +54-11-45 24-34 77
E-Mail: claudia.rivera@sensotec.com.ar
Internet: www.sensotec.com.ar

Werner A.P. Gebhardt

Rep. Arabe Siria 2659 P4-C
AR-C 1425 EYC Buenos Aires
Tel.: +54-11-4831-1134
Fax: +54-11-4833-7137
E-Mail: wagg@arnet.com.ar

Brazil

Tecnovip Instrumentos de Medicao Ltda.
R. Waldomiro Rossi 7 B.:Jardim Nova Espírito Santo
Tel.: +55-19 3859 9459
Fax: +55-19 3859 9456
Mobil: +55 1981986823
E-Mail: vendas@tecnovip.com
Internet: www.tecnovip.com

Chile

Bracker y Cia. Ltda.
Tax # "RUT 78.172.340-1"
Av. Concha y Toro 02294-A
CL - 9480097 PIRQUE
Tel.: +56 2 853 1312
Fax: +56 2 853 1890
E-Mail: fecheverria@bracker.cl
Internet: www.bracker.cl

Ecuador

Casa Comercial Almeida Cia. Ltda
Parque Industrial, Ave. 10 de Agosto 7194
EC – QUITO
Fax: +593-7-863460
E-Mail: almeidaj@az.pro.ec

Columbia

C4 Control De Contaminacion
Calle 13, No. 27 A-05 Acopi
CO - YUMBO
Tel.: +57-2-665-0079
Fax: +57-2-665-8271
E-Mail: control@contaminacion.net
Internet: www.contaminacion.net

Distributors Worldwide

Mexico

CoSeSi, S.A. de C.V.
Av. Hidalgo Oriente 1312 Col. San Sebastián
MX - Toluca, 50090
Tel.: +52-722-7732929
Fax: +52-722-7735697
E-Mail: ventas@css-fl.com

Peru

ALITECNO s.a.c.
Sucursal Lima
Av. Tambo Real No 264, Urb. Matellini - Chorrillos
PE - LIMA 09
Tel.: +511-467-2662
Fax: +511-251-9651
E-Mail: alitecno@alitecno.com
Internet: www.alitecno.com

Bracker & Cia. Ltda.

Delegado Peru / Sr. Niels Vagn Hansen
Bajada Balta 131 / 220
PE - 18 LIMA
Tel.: +51-14 40 51 97
E-Mail: nvh@idunsac.com
Internet: www.bracker.cl

Puerto Rico

CDTS Engineering Corp.
La Guna Gardens Shopping Center
10 Ave. Laguna Suite 260
PR - 00979-6494 CAROLINA
Tel.: +1-787-791 5927
Fax: +1-787-253 4078
E-Mail: melba.martinez@cdtscorp.com

Venezuela

CSS Custom Sales & Systems
Final Este. Boulevard de Sabana Grande
Edificio Onivas-Piso 7-Oficina 704
VE - CARACAS
Tel.: +58/21 29 54 64 10
Fax: +58/21 29 54 64 96
E-Mail: surmaq@internet.ve

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Australia

Ross Brown Sales Pty. Ltd.
21 Brookhollow Avenue
P.O. Case 6345
AU - NSW 2153 BAULKHAM HILLS
Tel.: +61-2-98 99 27 44
Fax: +61-2-98 99 42 33
E-Mail: sales@rossbrownsales.com.au
Internet: www.rossbrownsales.com.au

New Zealand

Argus Realcold Ltd.
9 Prescott Street, Penrose
NZ - 1061 PENROSE/AUCKLAND
Tel.: +64/95 26 57 57
Fax: +64/95 26 57 55
E-Mail: argord@realcold.co.nz
Internet: www.argus.co.nz

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Medent Ltd.
Mordey Hagetaot Str. 110
IL - 84206 BEER-SHEVA
Tel.: +972-8-6 23 79 84
Fax: +972-8-6 23 72 87
E-Mail: info@medent.co.il

Pakistan

Total Technologies (Pvt) Limited
630, Shadman-1
PK - 54000 LAHORE
Tel.: +92-42-757-7897
Fax: +92-42-753 6586
Mobil: +92-300-8433624
E-Mail: med@wol.net.pk
Internet: www.totalgroup.com.pk

United Arab Emirates

Venktron Electronics L.L.C.
Al-Wahda Street
P.O. Case 21873
AE - Sharjah
Tel.: +9 71/65 32 97 97
Fax: +9 71/65 32 97 98
E-Mail: venk@emirates.net.ae
Internet: www.venktron.com

ASIA

China

YI BEI LONG electronic technology
(Beijing) Co., LTD
No.6 East Beisanhuandong Rd.
CN - 100028 BEIJING
Tel.: +86-10 84 60 13 65
Fax: +86-10 84 60 13 67
Mobile: +86-13693570326
E-Mail: ling@ebro-china.com
Internet: www.ebro-china.com

Hong Kong

Lab'IN Co.
Flat 27, 10/F, Thriving Ind. Ctr.
26-38 Sha Tsui Rd., Tsuen Wan
HK - HONG KONG
Tel.: +8 52/24 13 78 84
Fax: +8 52/24 99 37 79
E-Mail: sales@labin.com.hk

India

Ambetronics Engineers
17-B The Tarun Industrial Estate
Opp. Sigma Paints, Andheri (E)
IN - 400069 MUMBAI
Tel.: +91-22 28 37 11 43
Fax: +91-22 28 22 65 70
E-Mail: sales@ambetronics.com
Internet: www.ambetronics.com

Indonesia

PT. Agriya Analitika
Jalan Puri Ayu Raya T7 No. T33
Puri Indah
ID - 11610 JAKARTA
Tel.: +62-21 583 04791 / Fax: +62-21 583 04792
E-Mail: office@agriya-analitika.com
Internet: www.agriya-analitika.com

PT Global Scientific International
Sentra Niaga Puri Indah Blok T3 No. 7
11610 JAKARTA
Tel.: +62-21-5830 2366
Fax: +62-21-5830 367
E-Mail: info@globalscientific.co.id
Internet: www.agriya-analitika.com

Japan

PLANSUR JAPAN Co., Ltd.
2-4-6 Sengoku
Bunkyo-Ku
JP - 112-0011 TOKYO
Tel: +81/3-5319-2311
Fax: +81/3-5319-2312
E-Mail: plansur@mb.infoweb.ne.jp
Internet: www.plansur.jp

Korea

ATS Korea
Advanced Technical Service
101-303, DongYang Paragon
34-3, Ingye-dong, Paldal-gu, Suwon City
KR - 442-833 GYUNGGI-DO

Tel.: +82-31 236 9780
Fax: +82-31 239 9781
E-Mail: hs.kim@atskorea.co.kr

Malaysia

Team Medical & Scientific Sdn Bhd
No. 41, Jalan Anggerik Vanilla T 31/T
Kota Kemuning
MY - 40460 SHA ALAM
Tel.: +60-35 12 25 108
Fax: +60-35 12 21 608
E-Mail: tms6009@tm.net.my
Internet: www.tms-lab.com

Philippines

STELLITE COMMERCIAL INC (SCI)
17 Calbayong St.
Mandaluyong City
PH - 1550 METRO-MANILA
Tel.: +632-5314681 / Fax: +632-5318882
E-Mail: byap@stellite.com.ph

Singapore

Shecey (Singapore) Pte Ltd
51 Bukit Batok Crescent
#07-30/31 Unity Centre
SG-658077 SINGAPORE
Tel.: +65-627 633 83
Fax: +65-631 623 28
E-Mail: sales@shecey.com.sg
Internet: www.shecey.com

Taiwan

Chien-Leh. Co., Ltd.
#98 Bouyang Street
TW- Kaohsiung City- TAIWAN
Tel.: +886-73 83 31 78 / Fax: +886-73 86 47 87
E-Mail: chienleh@ms41.hinet.net
Internet: www.chien-leh.com.tw

Today's Instruments Co. Ltd.
Lin Kou Hsiang
8FL, No. 71 Chung-Shan Rd.
TW-24441 TAIPEI
Tel.: +886-2-2603-2311
Fax: +886-2-2603-2333
E-Mail: jack@todays.com.tw
Internet: www.todays.com.tw

Thailand

DKSH (Thailand) Limited
1696 New Petchburi Road; Bangkapi, Huaykwang
TH - 10310 BANGKOK
Tel.: +66-22 54 49 00
Fax: +66-26 52 94 17 19
E-Mail: mail.s@dksh.com

Vietnam

VINH KHOI TECHNICAL SCIENTIFIC EQUIPMENT CO., LTD.
97 Nguyen Trong Tuyen Street
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