

Level
Füllstand

Technical Information
Technische Information

56925T11L
Rev. No.: 02, 05/2019

2 wire technology

The DuoSeries/DuoXPert measuring system consists of a scintillation detector – CrystalSENS point detector or UniSENS rod detector – and a sophisticated evaluation unit (DuoXPert) for display and operation.

The evaluation unit is a state-of-the-art control unit with robust 3.5" TFT touch panel, powerful Dual Core CPU and diverse operator interfaces. Advanced self diagnostics and monitoring features ensure a safe function of the system. Furthermore the data logging functionality allows operators to analyze their processes in depth, e.g. develop trends, track process changes etc.

Sophisticated measuring system in 2 wire technology

- § Unique: Radiometric system with intrinsically safe power supply (Full Ex-i) for detectors
- § Real 2-wire technology, only 2 wires in the field
- § Advanced self diagnostics and monitoring features
- § Easy to use touch screen panel for local display and operation
- § Integrated gas density compensation feature
- § Direct replacement of predecessor model LB 440
- § Interfaces with all 2-wire detectors LB 44xx, LB 54xx and LB 47xx
- § Optional Radiation Interference Discrimination (LB470RID)

2-Leiter Technologie

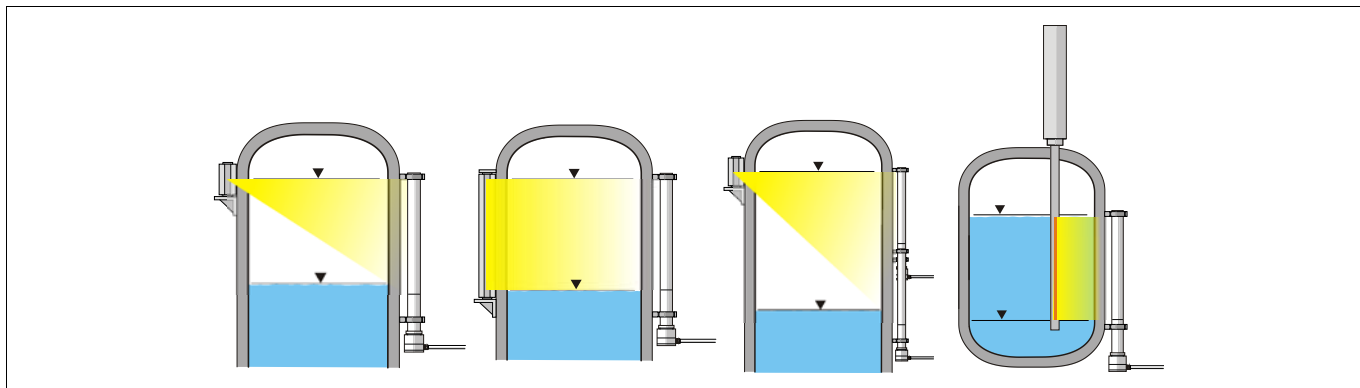
Das DuoSeries/DuoXpert Messsystem besteht aus einem Detektor mit Szintillator-Technologie – CrystalSENS Punktdetektor oder UniSENS Stabdetektor – sowie einer separaten Auswerteeinheit zur Anzeige und Bedienung.

Die moderne Auswerteeinheit verfügt über ein 3,5" Touch Panel, eine starke Dual Core CPU und verschiedenen Bedien-Optionen. Erweiterte Funktionen zur Selbstdiagnose und Überwachung sorgen zudem für höchste funktionale Sicherheit der Messung im Betrieb. Darüber hinaus können die Betreiber die Daten-Log Funktionen für eine detaillierte Prozessanalyse nutzen und so zum Beispiel Trends entwickeln oder Prozessänderungen nachvollziehen.

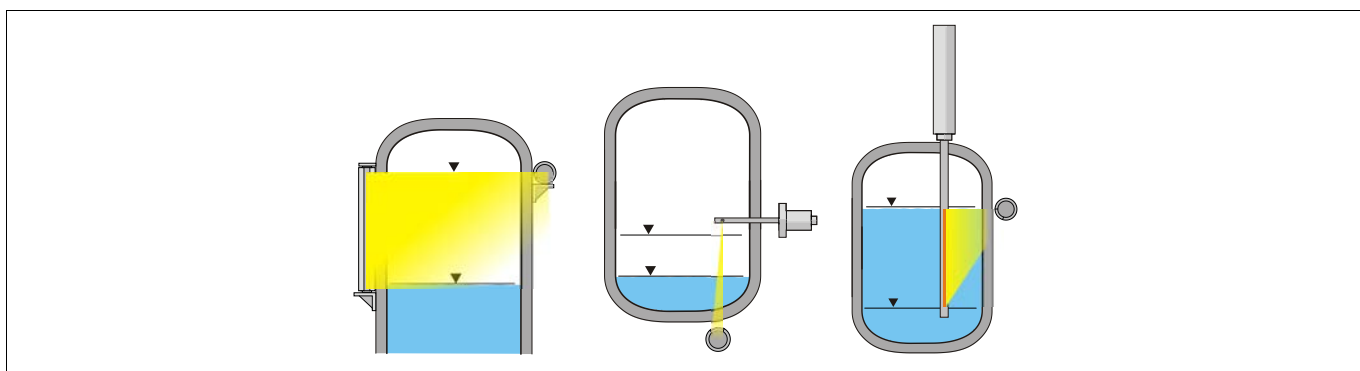
Hochentwickeltes Messsystem in 2-Leiter Technologie

- § *Einzigartig: Radiometrische Messung mit eigensicherer Spannungsversorgung (Voll Ex-i) für den Detektor*
- § *Echte 2-Leiter Technik, nur 2 Adern im Feld*
- § *Verbesserte Diagnosefunktionen und Selbstüberwachung*
- § *Einfache, intuitive Bedienung über Touch-Screen*
- § *Integriertes Feature zur Kompensation von Gas-Phasen Schwankungen*
- § *Volle Kompatibilität zum Vorgängermodell LB 440*
- § *Kompatibel zu alle 2-Leiter Detektoren LB 44xx, LB54xx und LB 47xx*
- § *Optionale Störstrahlungserkennung (LB 470RID)*

Measurement arrangements level *Messanordnungen Füllstand*

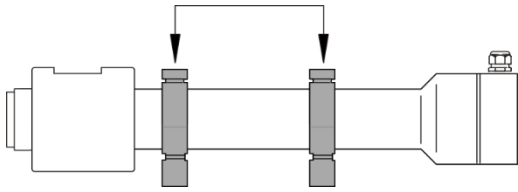


Measurement arrangements with rod detector
Messanordnungen mit Stabdetektor



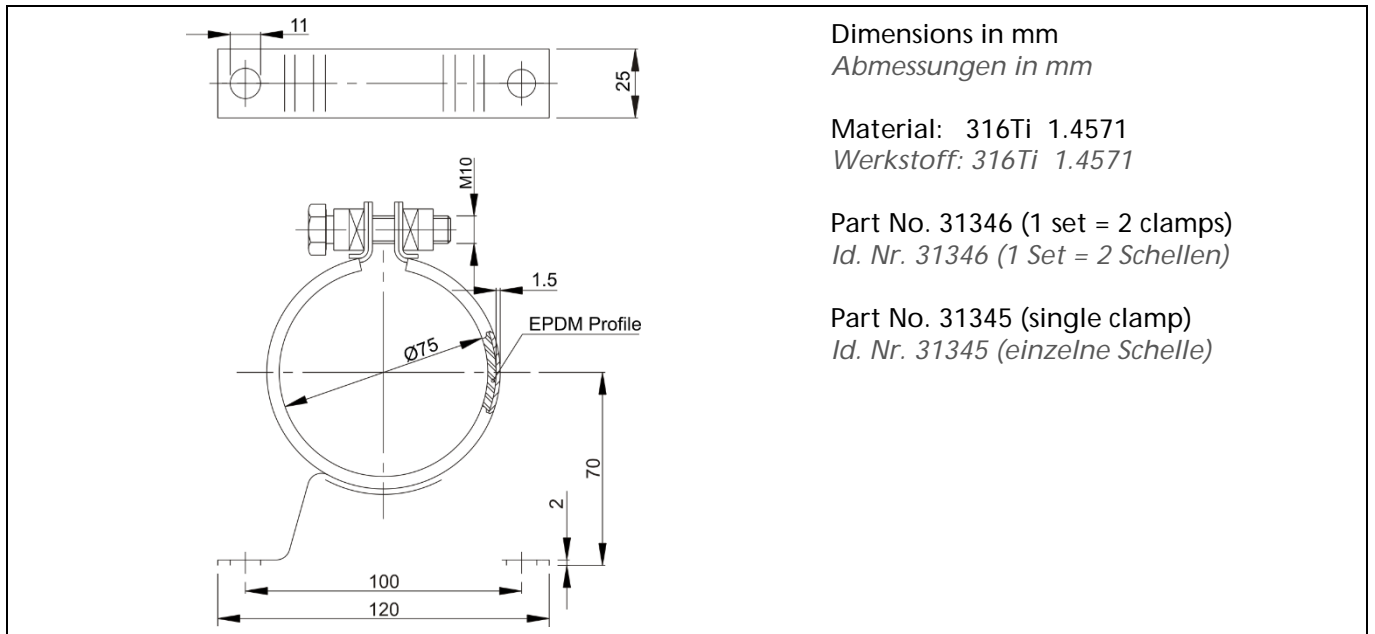
Measurement arrangements with point detector
Messanordnungen mit Punktdetektor

Mounting Clamps for Detector *Befestigungsschellen für Detektor*



Position for the clamps, see detector drawing.
Position für die Schellen-Befestigung siehe Detektor-Zeichnung.

for Detectors without water cooling *für Detektoren ohne Wasserkühlung*



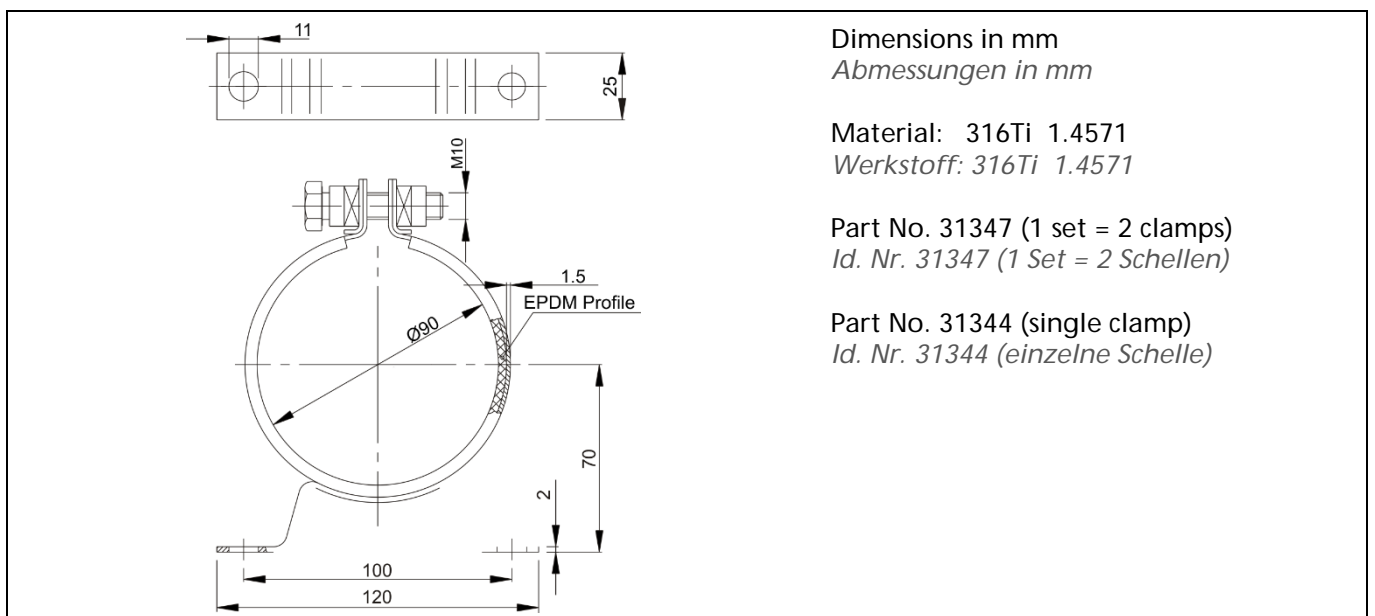
Dimensions in mm
Abmessungen in mm

Material: 316Ti 1.4571
Werkstoff: 316Ti 1.4571

Part No. 31346 (1 set = 2 clamps)
Id. Nr. 31346 (1 Set = 2 Schellen)

Part No. 31345 (single clamp)
Id. Nr. 31345 (einzelne Schelle)

for Detectors with water cooling *für Detektoren mit Wasserkühlung*



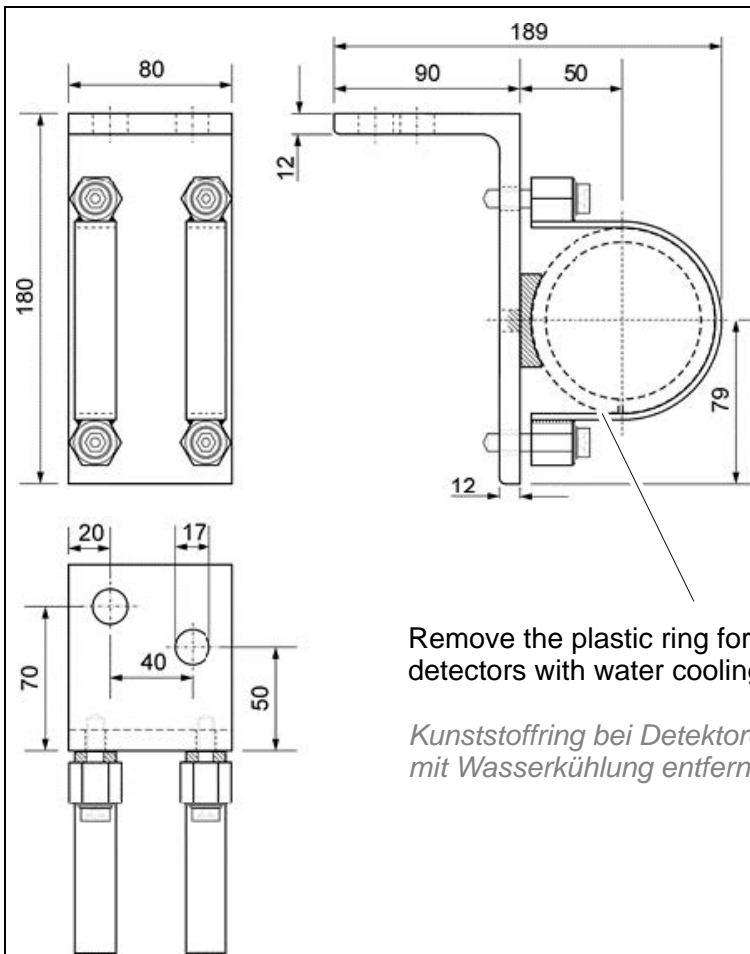
Dimensions in mm
Abmessungen in mm

Material: 316Ti 1.4571
Werkstoff: 316Ti 1.4571

Part No. 31347 (1 set = 2 clamps)
Id. Nr. 31347 (1 Set = 2 Schellen)

Part No. 31344 (single clamp)
Id. Nr. 31344 (einzelne Schelle)

Heavy Duty Detector Holder (stainless steel) *Robuste Detektor Halterung (Edelstahl)*



Part No. 39246 = without water cooling
Id. Nr. 39246 = ohne Wasserkühlung

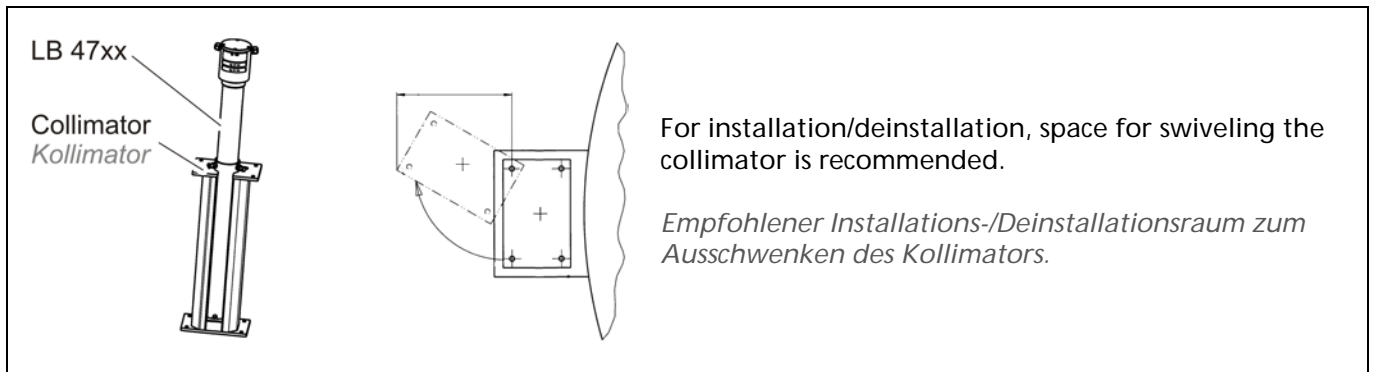
Part No. 39247 = with water cooling
Id. Nr. 39247 = mit Wasserkühlung

Remove the plastic ring for
detectors with water cooling.

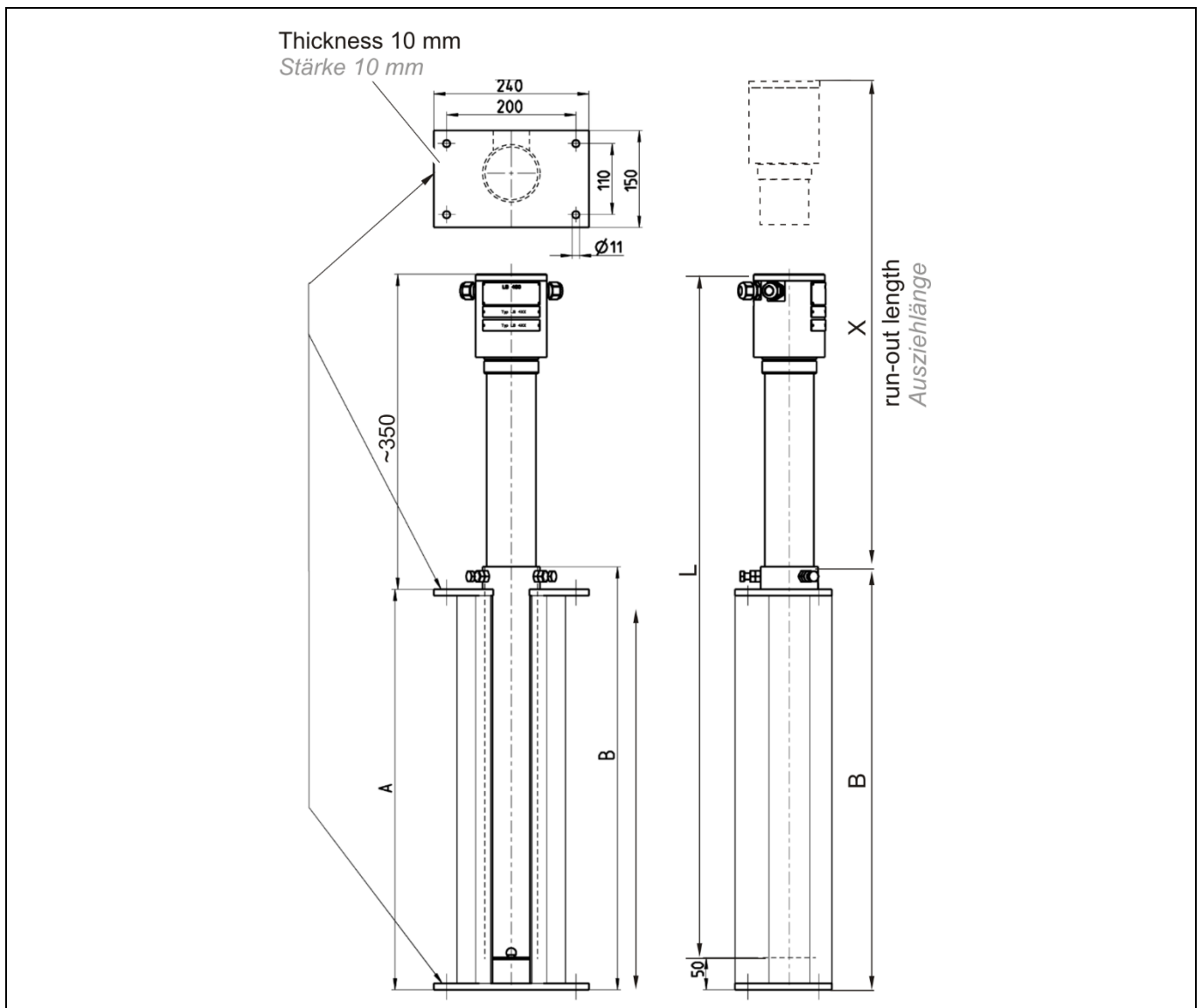
*Kunststoffring bei Detektoren
mit Wasserkühlung entfernen.*

Dimensions in mm
Abmessungen in mm

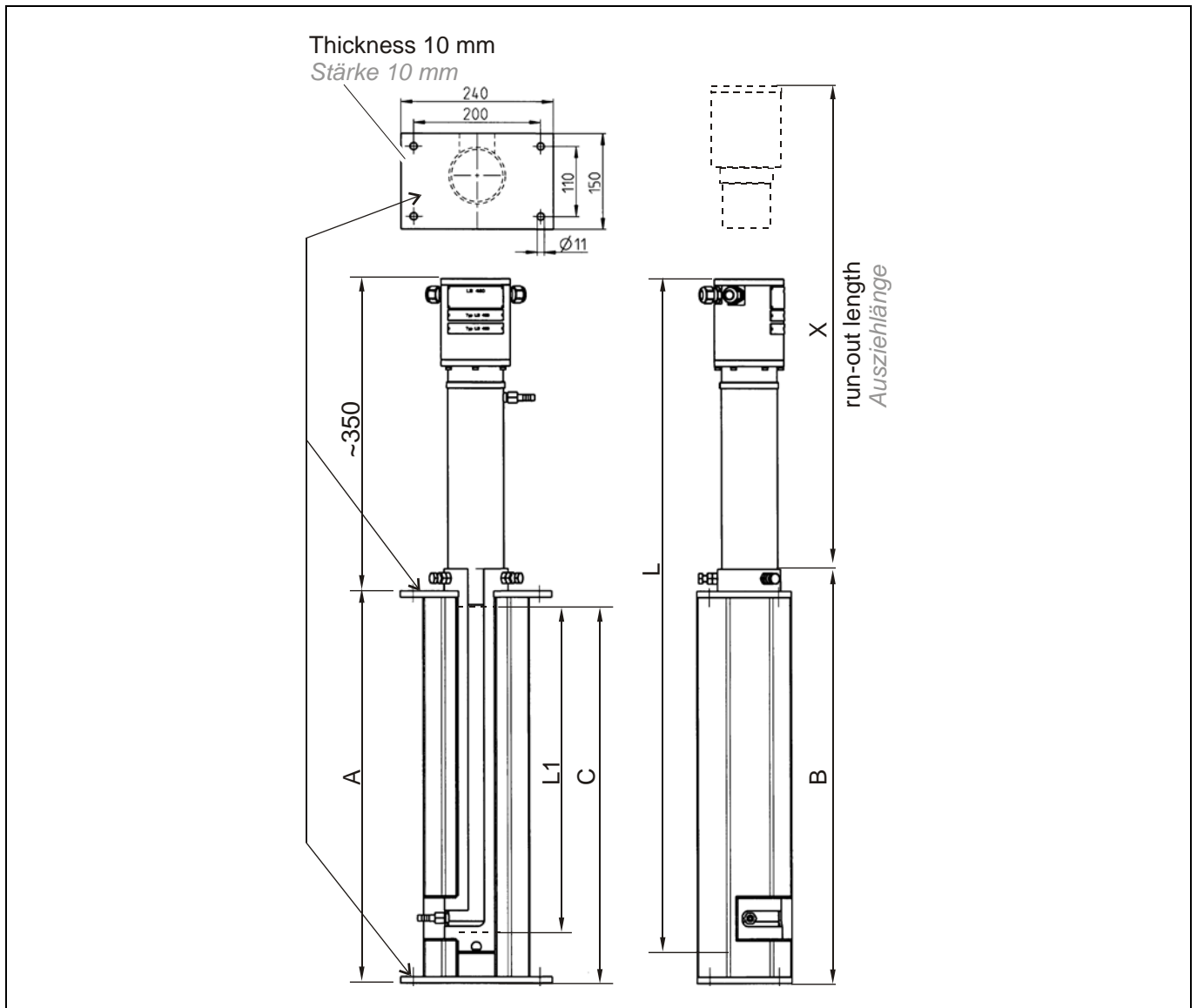
Collimator for Rod Detector *Kollimator für Stabdetektor*



for Detectors without water cooling *für Detektoren ohne Wasserkühlung*



for Detectors with water cooling
 für Detektoren mit Wasserkühlung

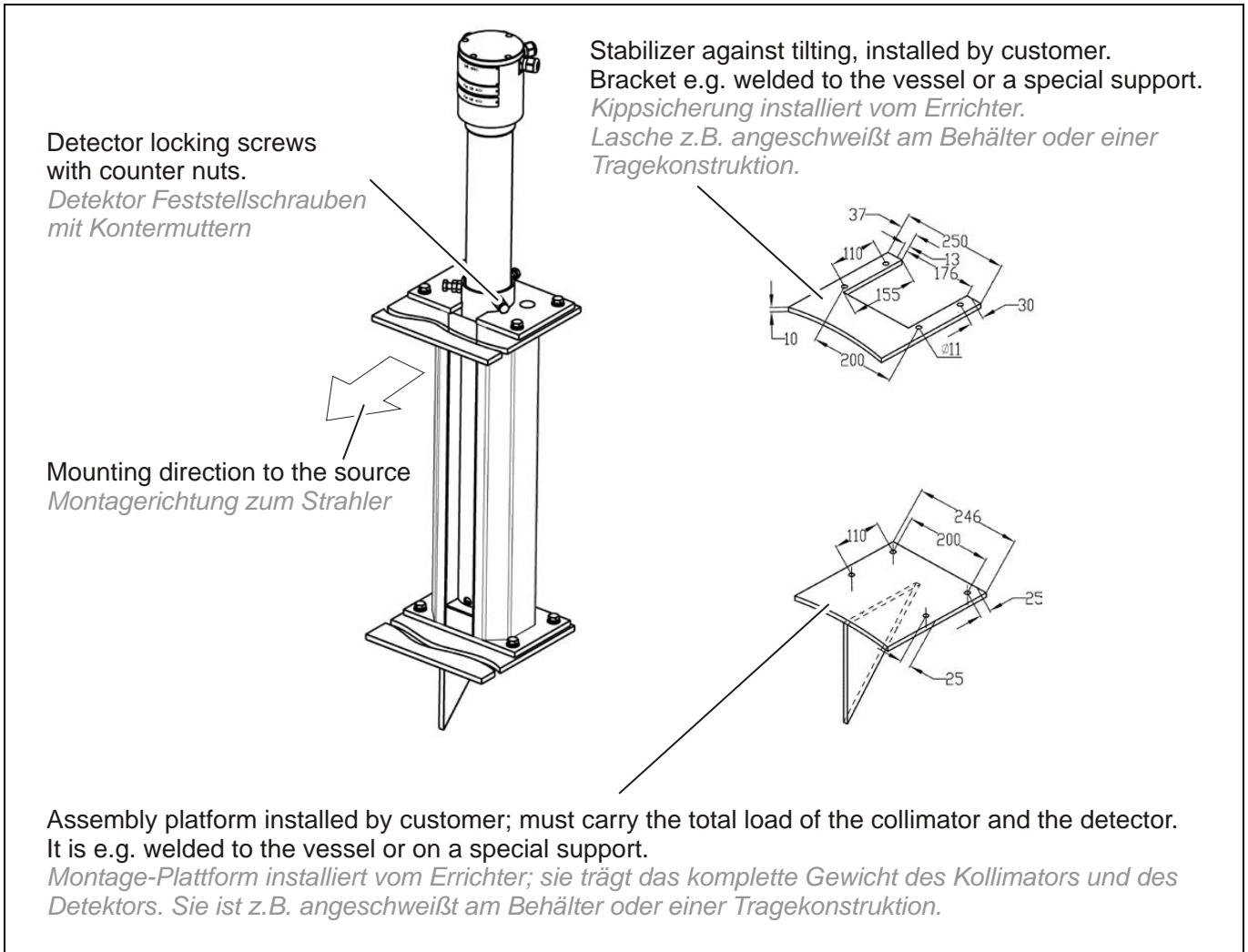


Part No. Id. Nr.	for WC* für WK*	L1 (sensitive length) (empfindliche Länge)	A	B	L (detector length) (Detektorlänge)	C	X	Weight (kg) Gewicht (kg)
59957-050	-	500	620	655	925	560	1000	110
59957-100		1000	1220	1155	1425	1090	1500	195
59957-150		1500	1620	1655	1925	1590	2000	280
59957-200		2000	2120	2155	2425	2090	2500	365
60085-050	ü	500	620	655	929	590	1000	100
60085-100		1000	1120	1155	1429	1090	1500	180
60085-150		1500	1620	1655	1929	1590	2000	255
60085-200		2000	2120	2155	2429	2090	2500	330

* Watercooling
 * Wasserkühlung

Collimator mounting Devices *Kollimator Halterungen*

Stabilizer *Kippsicherung*



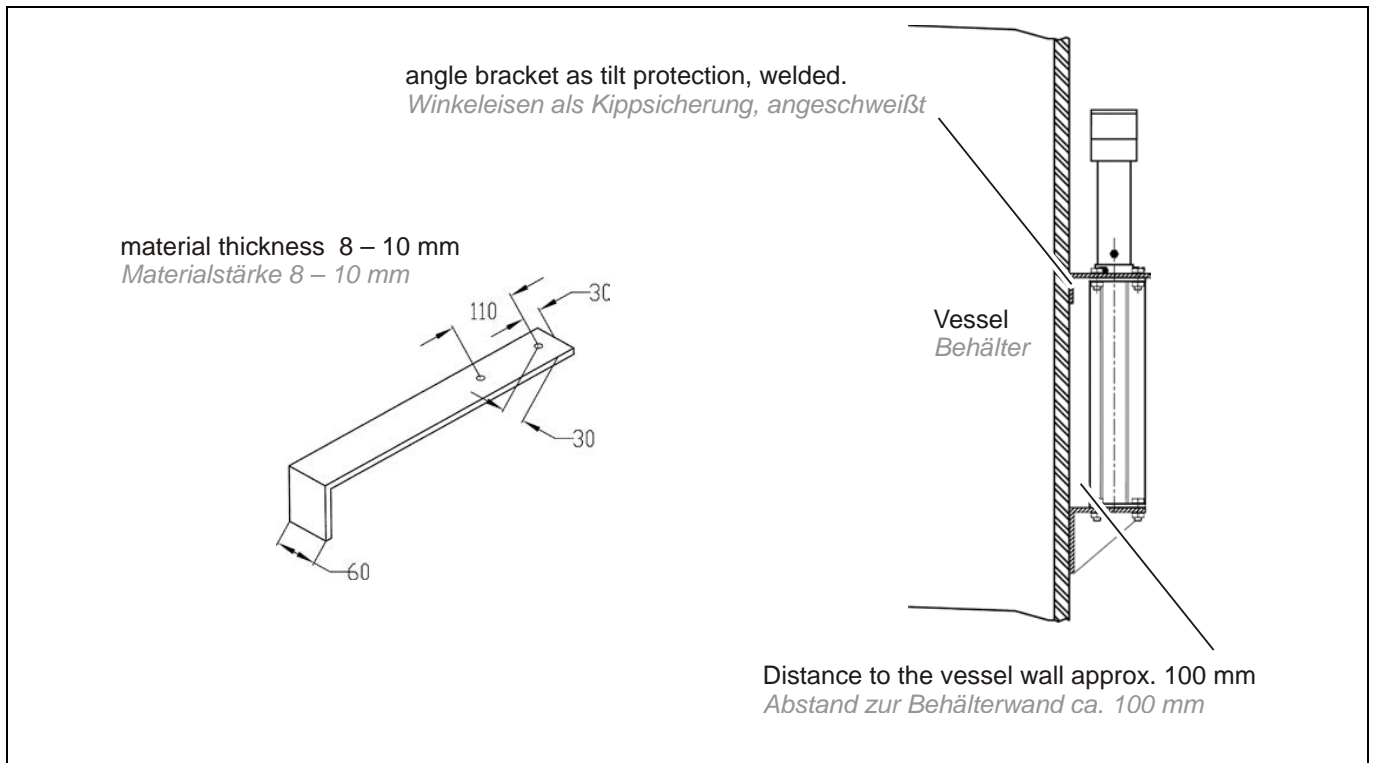
NOTICE / HINWEIS



Alternative to the stabilizer against tilting, you can use a one-sided mounted angle bracket as a stabilizer too (see next drawing).

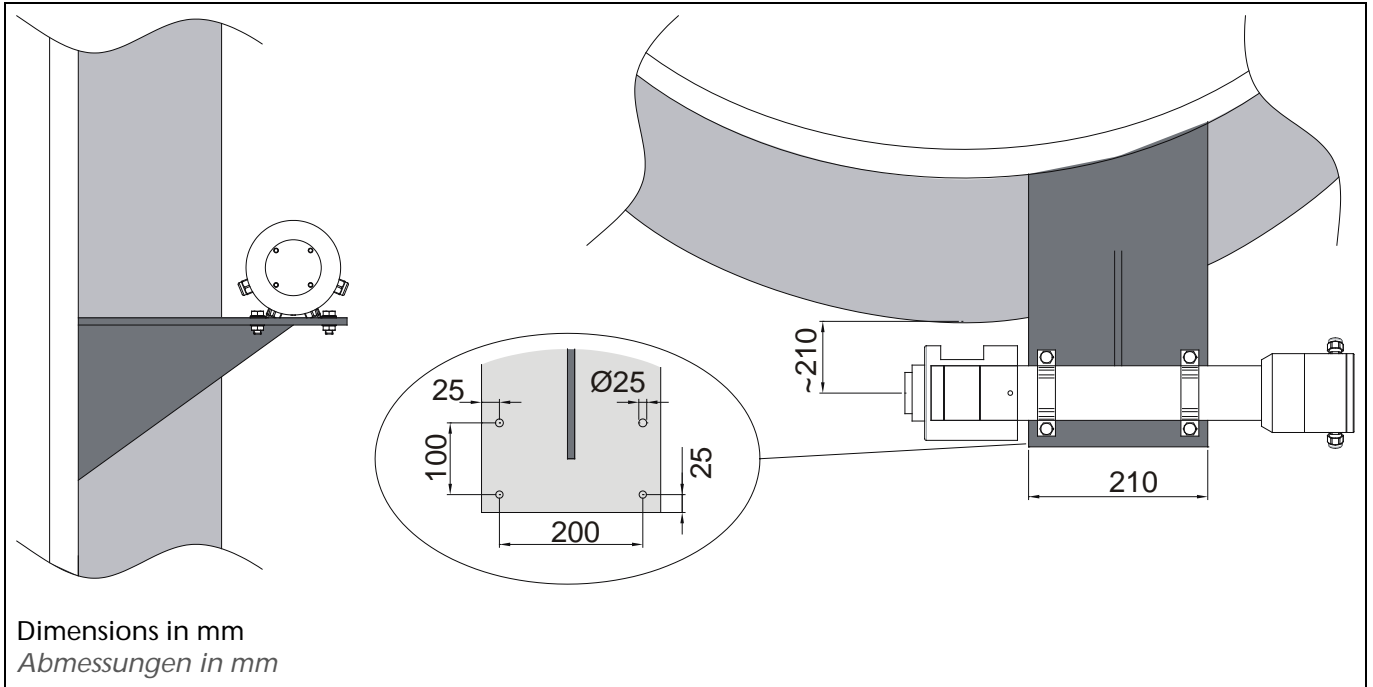
Alternativ zur Kippsicherung, können auch einseitig montierte Winkeleisen als Kippsicherung verwendet werden (siehe nächste Zeichnung).

Angle bracket *Winkeleisen*

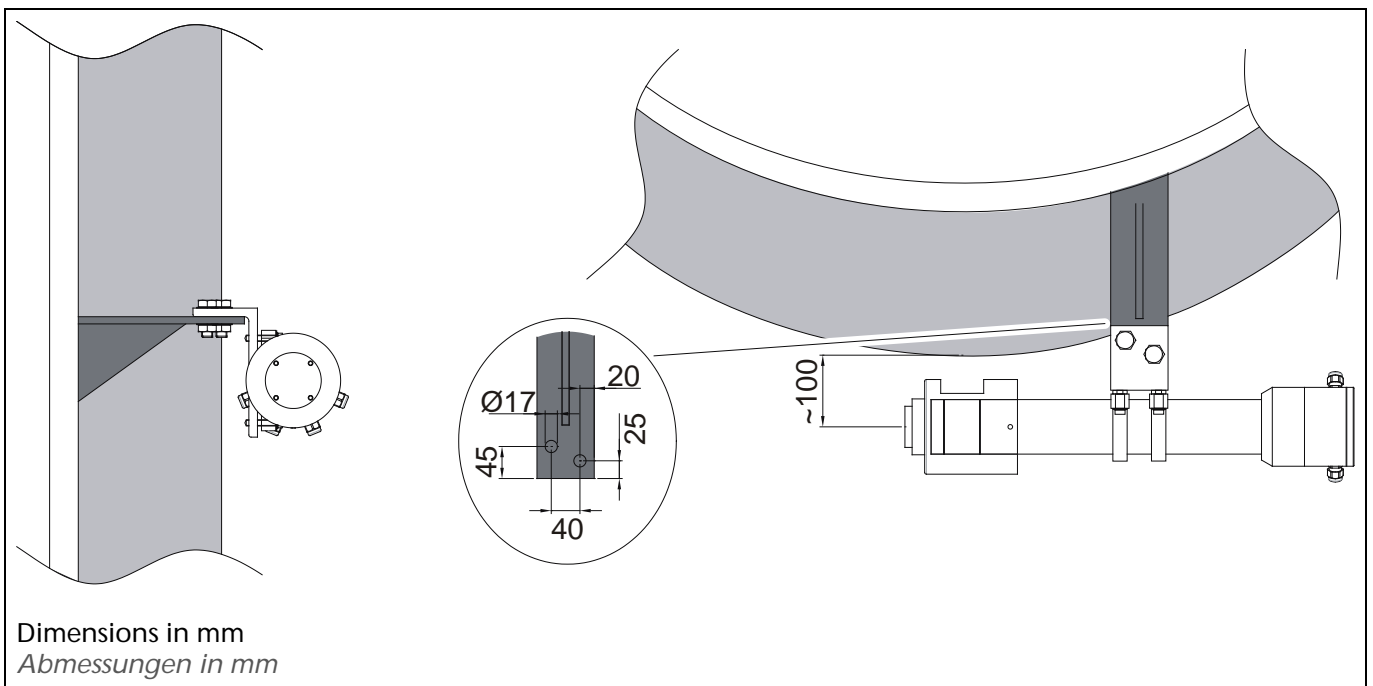


Mounting point detector *Befestigung Punktdetektor*

Mounting with clamps *Montage mit Schellen*



Mounting with detector holder *Montage mit Detektorhalterung*



NOTICE / HINWEIS

Direct sun radiation can overheat the detector. If the detector temperature can reach more than 50°C, a suitable sun roof must be installed. The heating of the detector by thermal radiation from the vessel can also be moderated by a thermal sheet, e.g. by a thin metal plate. For each detector a water cooling (option) is available.

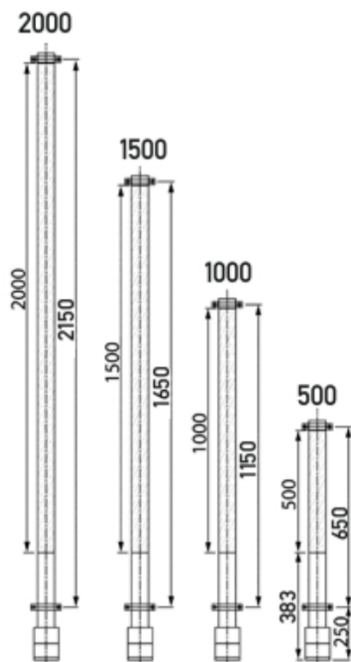


Wird durch Sonneneinstrahlung eine Detektortemperatur von über 50°C erreicht, so ist ein geeigneter Sonnenschutz zu montieren. Auch die Aufheizung des Detektors durch Wärmeabstrahlung vom Behälter kann durch ein dünnes Wärmeableitblech gemildert werden. Für jeden Detektor steht auch eine geeignete Wasserkühlung (Option) zur Verfügung.

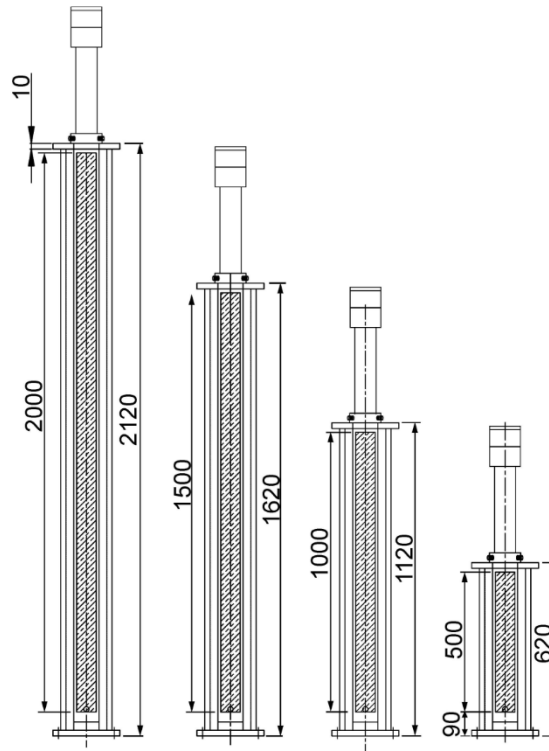
Clamping and Mounting Positions for rod detectors

Klemmenposition und Montageposition Stabdetektoren

Clamping Position for Rod Detectors
Klemmenposition für Stabdetektoren

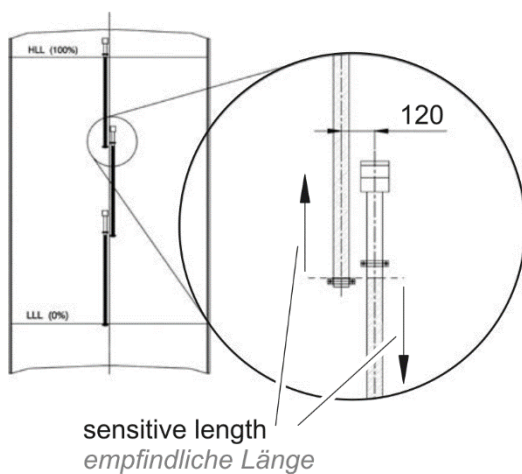


Mounting Position for Rod Detector Shieldings
Klemmenposition für Stabdetektorabschirmungen

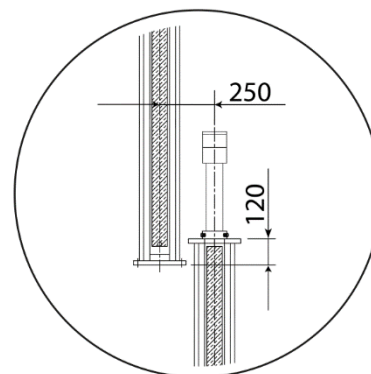


The drawings on this valid for Detectors with and without water cooling jacket.
Die Zeichnungen auf dieser Seite sind gültig für Detektoren mit und ohne Wasserkühlung.

Clamping Position for Multi Detector Arrangement
Klemmenposition für Multidetektor-Anordnung



Mounting Position for Rod Detector Shieldings
Klemmenposition für Stabdetektorabschirmungen



Dimensions in mm
 Abmessungen in mm



Evaluation unit
Auswerteeinheit

Evaluation unit

The modules can be installed either in wall housings or 19" subracks. It can be equipped differently, depending on requirements. The rear clamp blocks or terminal panels are used for the electrical connection. The connection between the master EVU and slave modules (level measurement only) is made with a 4-pin master/slave plug.

Auswerteinheit

Die Module können entweder in Wandgehäusen oder 19"-Baugruppenträgern eingebaut und kann je nach Bedarf unterschiedlich bestückt werden. Zum elektrischen Anschluss werden die rückwärtigen Klemmenblöcke oder Anschlussplatinen verwendet. Die Verbindung zwischen Master-AWE und Slave-Modulen erfolgt mit einem 4-poligen Master/Slave-Stecker.

NOTICE / HINWEIS



Detector of the type LB44xx and LB54xx can capture measurement data only with master EVU.

Messdaten der Detektoren vom Typ LB44xx und LB54xx können nur mit einem Master-Modul erfasst werden.

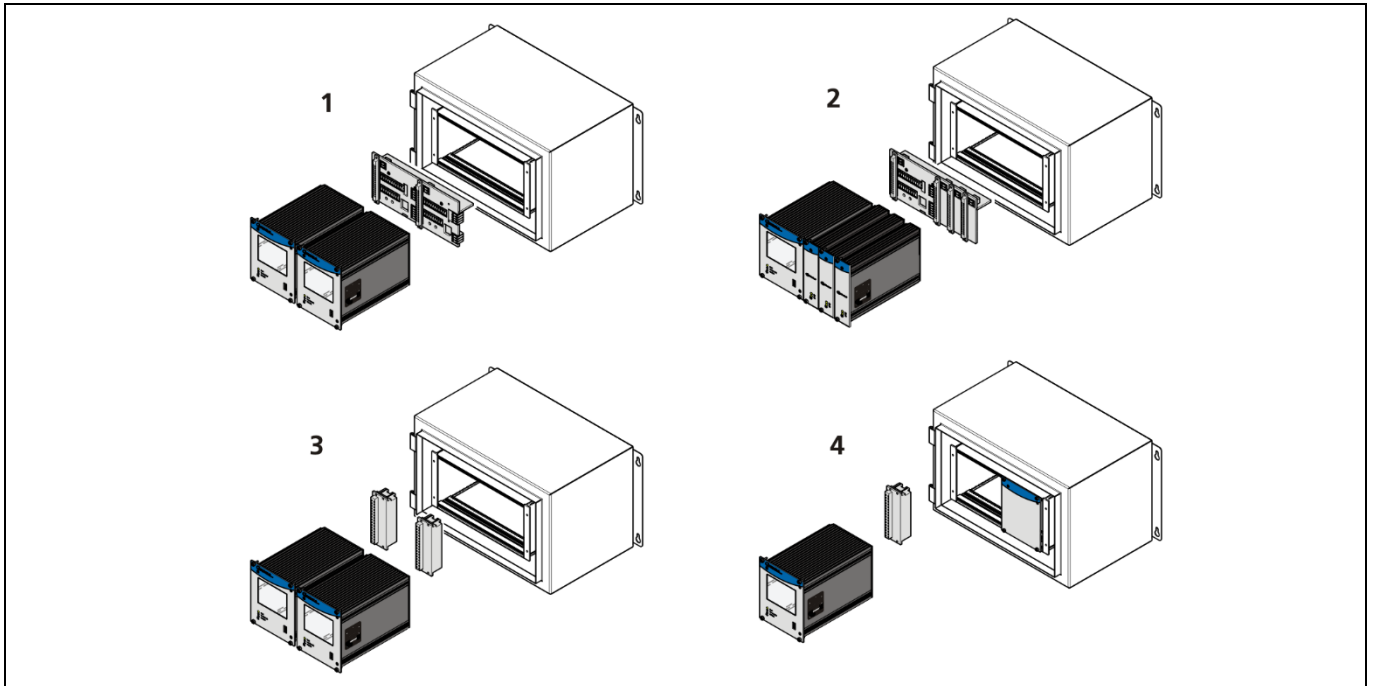
NOTICE / HINWEIS



The Evaluation unit is not explosion protected and is not designed for hazardous environments.

Diese Auswerteinheit ist nicht ex-geschützt ausgeführt und darf nicht in explosionsgefährdete Bereiche verwendet werden.

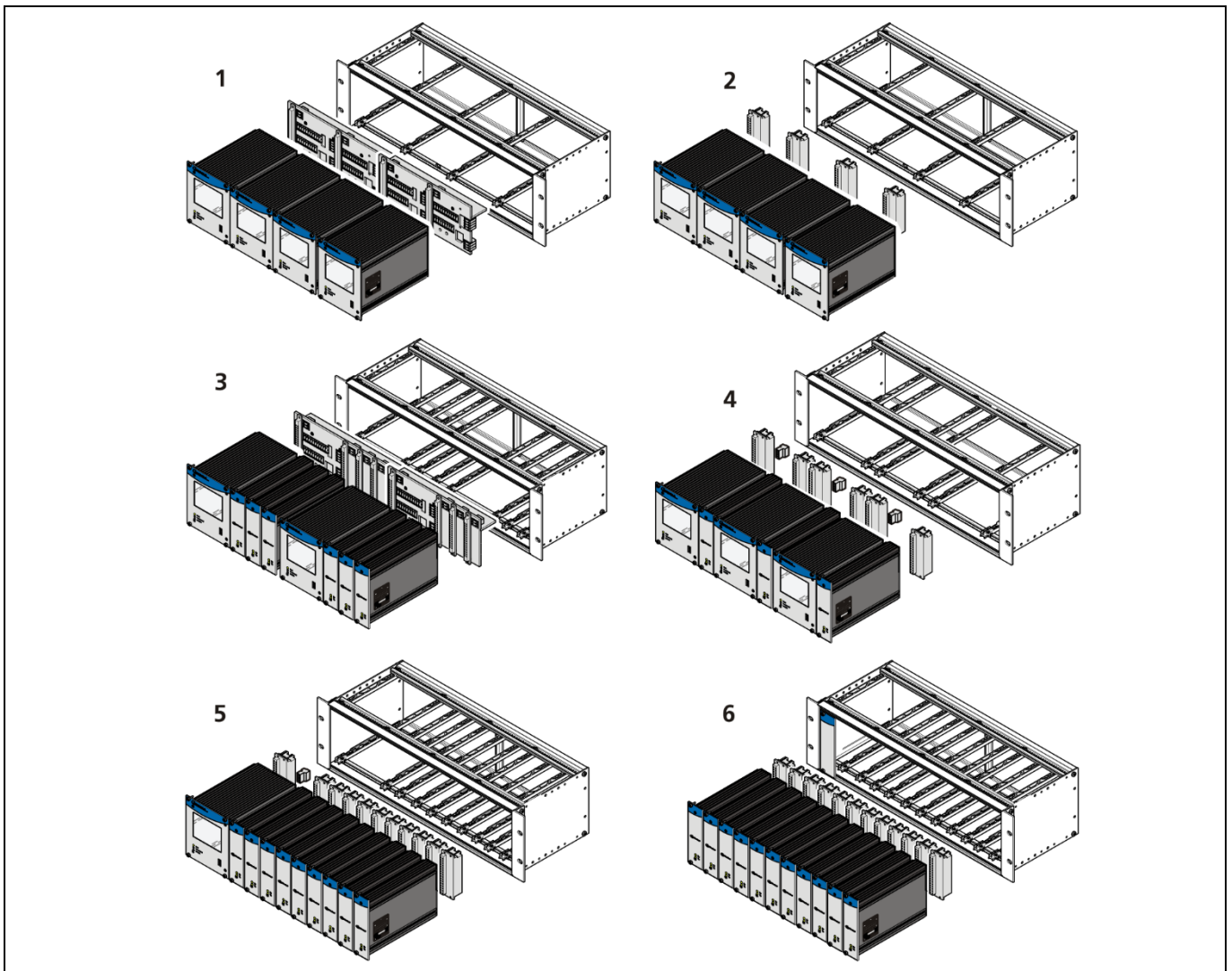
Installation variants wall housing Einbauvarianten Wandgehäuse



Item Pos.	Componsens Komponenten	Connection Anschluss
1	2 Master	1 Terminal panel master/master ¹ 1 Anschlussplatine Master/Master ¹
2	1 Master, 3 Slaves	1 Terminal panel master/slave ¹ 1 Anschlussplatine Master/Slave ¹
3	2 Master	2 Terminal blocks 2 Klemmenblöcke
4	1 Master, 0 – 3 Slaves	1 Terminal block for master, 0 – 3 Terminal block for slave module 1 Klemmenblock für Master, 0 – 3 Klemmenblöcke für Slave Modul

¹ NRTL certification US/CAN
 NTRL Zertifikat US/CAN

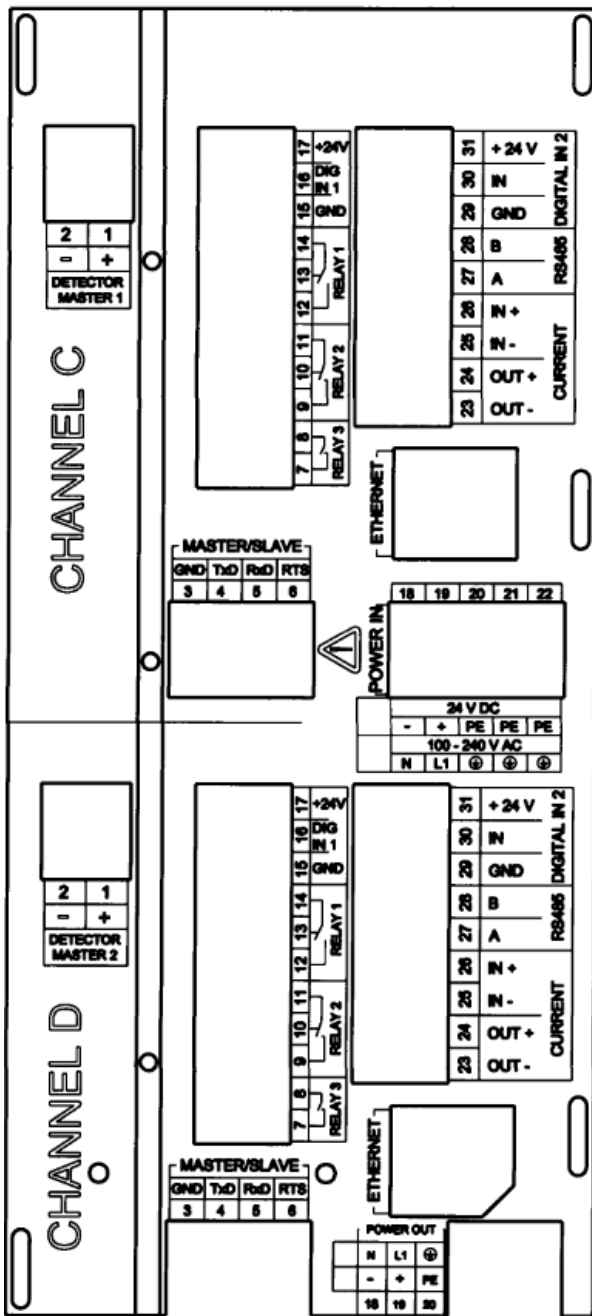
Installation variants 19" subrack Einbauvarianten 19" Baugruppenträger



Item Pos.	Components Komponenten	Connection Anschluss
1	4 Master	2 Terminal panel master 2 Anschlussplatine Master
2	4 Master ²	4 Terminal blocks 4 Klemmenblöcke
3	2x (1 Master, 3 Slaves)	2 Terminal panel master/slave 2 Anschlussplatten Master/Slave
4	4x (1 Master, 1 Slave) ²	6 Terminal blocks; master/slave plugs 6 Klemmenblöcke; Master/Slave Stecker
5	1 Master, 9 Slaves ²	10 Terminal blocks; master/slave plug 10 Klemmenblöcke; Master/Slave Stecker
6	11 Slaves ²	11 Terminal blocks 11 Klemmenblöcke

²Application example. The modules can be arranged arbitrarily with terminal blocks.
 Anwendungsbeispiele. Mit Klemmenblöcken können Module frei zusammengestellt werden.

Connection diagram terminal board master/master Anschlussplan Anschlussplatine Master/Master

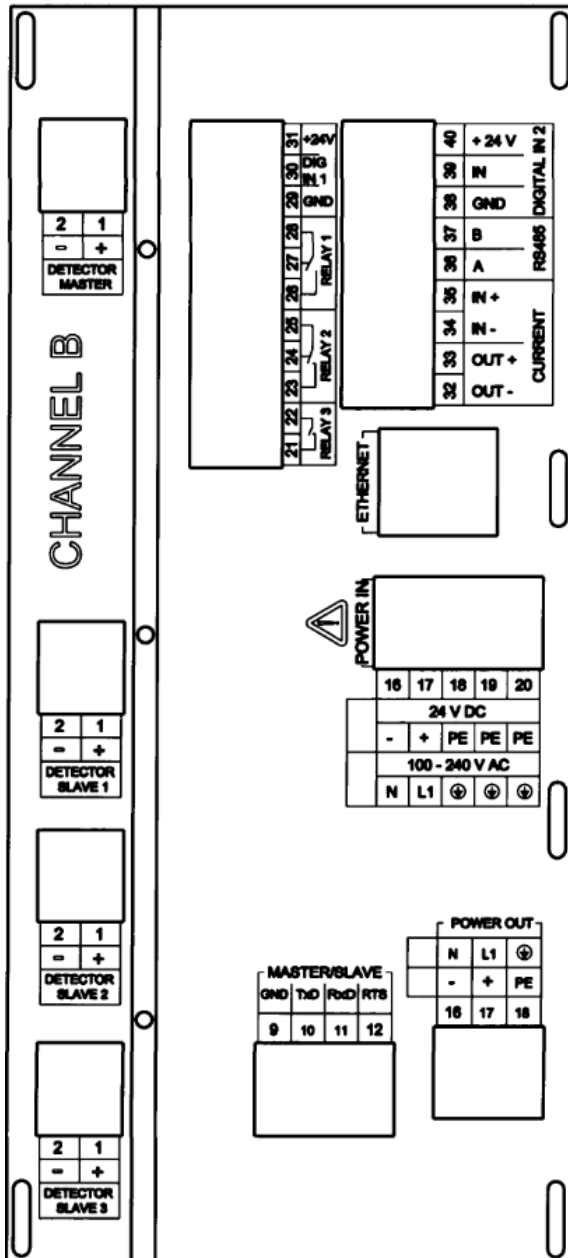


#	Connector Anschluss	Function Funktion
1	DETECTOR MASTER +	Connection Detector Verbindung Detektor LB 4700 / LB 44xx
2	DETECTOR MASTER -	
3	MASTER/SLAVE GND	Connection of additional slave units Anschluss von weiteren Slave-Einheiten
4	MASTER/SLAVE TxD	
5	MASTER/SLAVE RxD	
6	MASTER/SLAVE RTS	
7	RELAIS 3 NC	DIGITAL OUT
8	RELAIS 3 COM	
9	RELAIS 2 NC	DIGITAL OUT
10	RELAIS 2 NO	
11	RELAIS 2 COM	Error DIGITAL OUT Fehler DIGITAL OUT
12	RELAIS 1 NC	
13	RELAIS 1 NO	Error DIGITAL OUT Fehler DIGITAL OUT
14	RELAIS 1 COM	
15	DIGITAL IN 1 GND	GND
16	DIGITAL IN 1 IN	Logic Input
17	DIGITAL IN 1 + 24 V	24 V out (max. 200 mA)
18	POWER DC 24 V - / AC N	24 V DC / 100-240 V AC
19	POWER DC 24 V + / AC L1	
20	PE	
21	PE	
22	PE	4 mA ... 20 mA
23	CURRENT OUT -	
24	CURRENT OUT +	Not used for LB 470 / LB470RID Wird bei LB 470 / LB 470RID nicht verwendet
25	CURRENT IN -	
26	CURRENT IN +	Communication and service interface (Master-Master) Kommunikations- und Service-Schnittstelle (Master-Master)
27	RS 485 A	
28	RS 485 B	Communication and service interface (Master-Master) Kommunikations- und Service-Schnittstelle (Master-Master)
29	DIGITAL IN 2 GND	
30	DIGITAL IN 2 IN	Logic Input
31	DIGITAL IN 2 + 24 V	24 V out (max. 200 mA)

In a 19" subrack for 4 masters (Id 59484), there is another one with Channel C / D next to the connector board for Channel A / B. The channel assignment of Channel C / D is identical to that of Channel A / B.

In einem 19" Baugruppenträger für 4 Master (Id.59484), ist neben der oben gezeigten Anschlussplatine für Channel A/B, eine weitere mit Channel C/D enthalten. Die Klemmenbelegung von Channel C/D ist identisch mit der von Channel A/B.

Connection diagram terminal board master/slave Anschlussplan Anschlussplatine Master/Slave

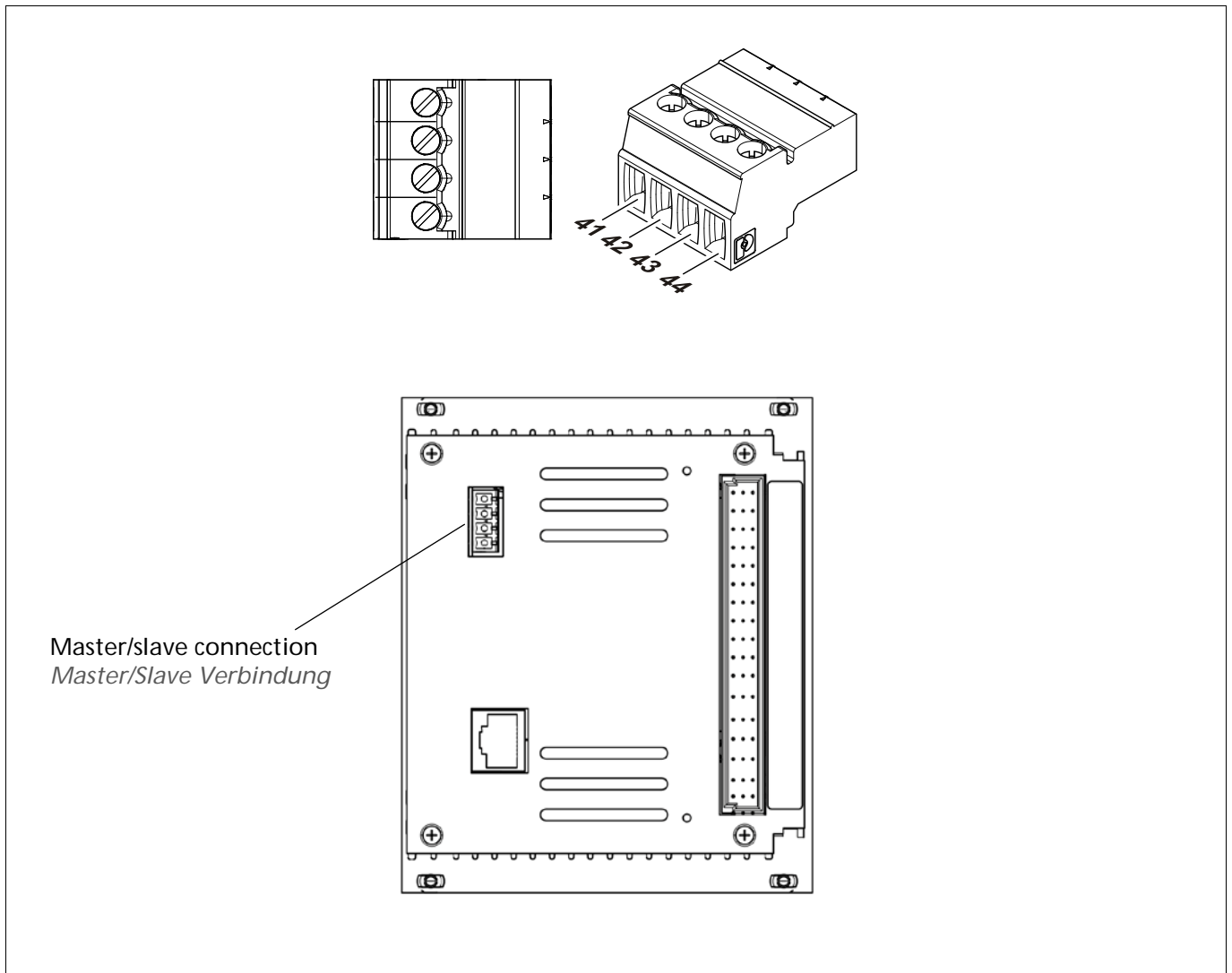


The connections master/slave A and master/slave B are identical.

Die Anschlüsse Master/Slave A und Master/Slave B sind identisch.

#	Connector Anschluss	Function Funktion
1	DETECTOR MASTER +	Connection Detector Verbindung Detektor LB 4700 / LB 44xx
2	DETECTOR MASTER -	
1	DETECTOR SLAVE 1 +	Connection Detector Verbindung Detektor LB 4700 / LB 44xx
2	DETECTOR SLAVE 1 -	
1	DETECTOR SLAVE 2 +	
2	DETECTOR SLAVE 2 -	
1	DETECTOR SLAVE 3 +	
2	DETECTOR SLAVE 3 -	
9	MASTER/SLAVE GND	Connection of additional slave units Anschluss von weiteren Slave-Einheiten
10	MASTER/SLAVE TxD	
11	MASTER/SLAVE RxD	
12	MASTER/SLAVE RTS	
16	POWER DC 24 V - / AC N	24 V DC / 100-240 V AC
17	POWER DC 24 V + / AC L1	
18	PE	
19	PE	
20	PE	
21	RELAIS 3 NC	DIGITAL OUT
22	RELAIS 3 COM	
23	RELAIS 2 NC	DIGITAL OUT
24	RELAIS 2 NO	
25	RELAIS 2 COM	
26	RELAIS 1 NC	Error DIGITAL OUT Fehler DIGITAL OUT
27	RELAIS 1 NO	
28	RELAIS 1 COM	
29	DIGITAL IN 1 GND	GND
30	DIGITAL IN 1 IN	Logic Input
31	DIGITAL IN 1 + 24 V	24 V out (max. 200 mA)
32	CURRENT OUT -	4 mA ... 20 mA
33	CURRENT OUT +	
34	CURRENT IN -	Not used for LB 470 / LB 470RID
35	CURRENT IN +	Wird bei LB 470 / LB 470RID nicht verwendet
36	RS 485 A	Communication and service interface (Master- Master)
37	RS 485 B	
38	DIGITAL IN 2 GND	GND
39	DIGITAL IN 2 IN	Logic Input
40	DIGITAL IN 2 + 24 V	24 V out (max. 200 mA)

Assignment terminals master/slave plug Klemmenbelegung Master/Slave Stecker



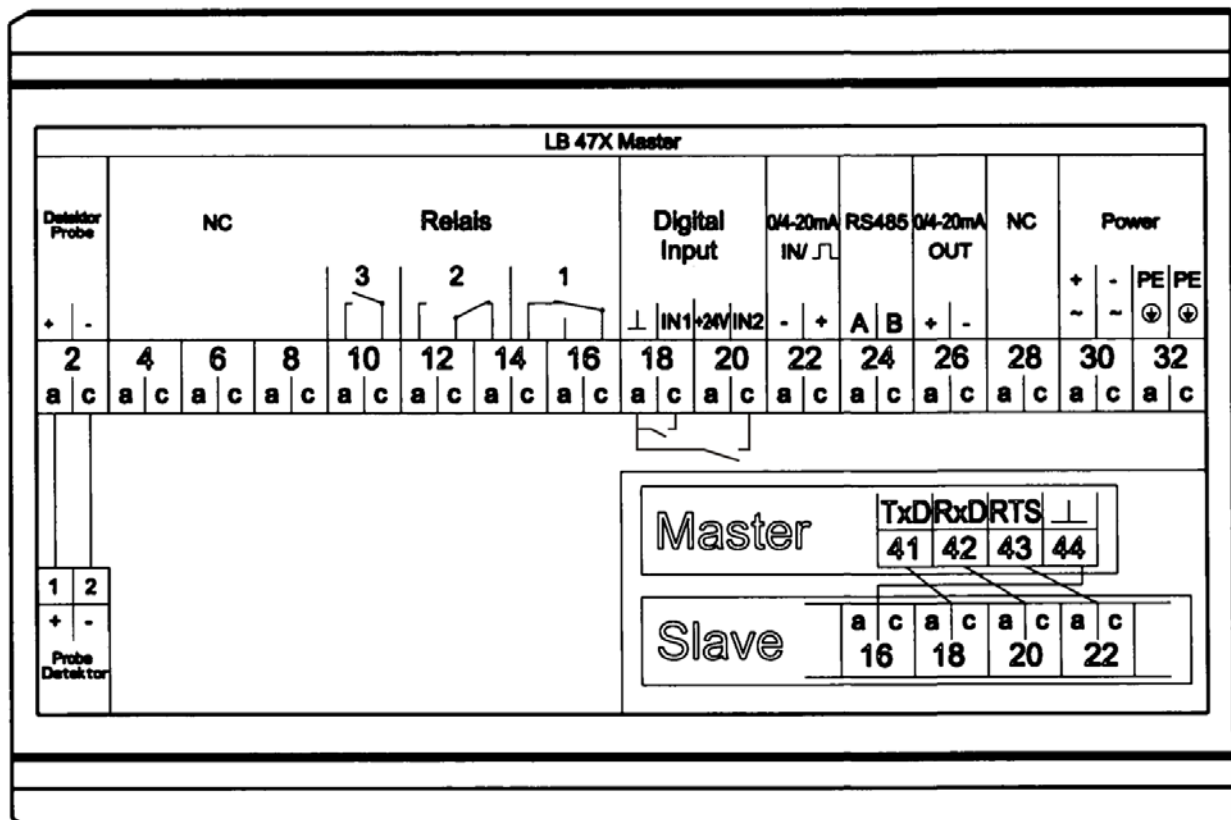
Signal	Pin
TxD	41
RxD	42
RTS	43
GND	44

The master/slave plug is not used by applications with terminal panels. The master/slave plug is contained in the purchase order terminal block (Part No. 59477). In the case of existing 19" subrack and retrofitting to LB470, the master-slave plug (Part No. 64608) must be ordered separately.

Der Master/Slave Stecker wird bei Einbauvarianten mit Anschlussplatten nicht benötigt. Der Master/Slave Stecker ist im Lieferumfang des Klemmenblocks (Id. Nr. 59477) enthalten. Bei der Nachrüstung eines 19" Baugruppenträgers mit LB470 Modulen muss der Master-Slave Stecker (Id. Nr. 64608) gesondert bestellt werden

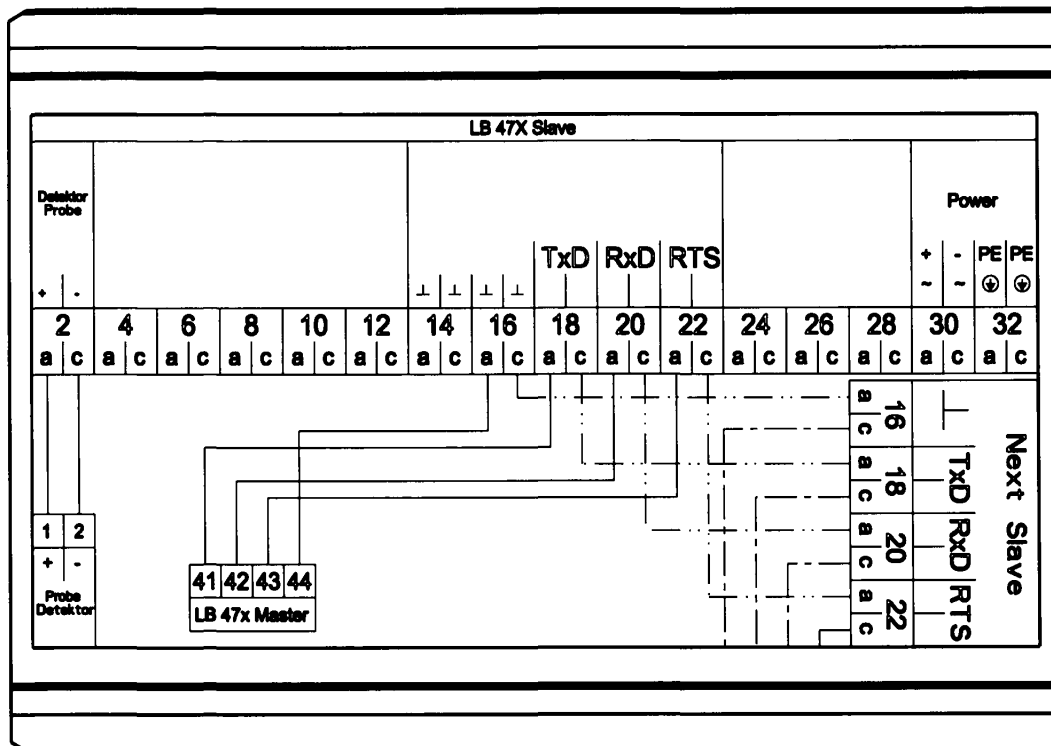
Assignment terminal block master EVU Belegung Klemmenblock Master AWE

Signal	Pin		Pin	Signal
DETECTOR GND	C - 2		A - 2	DETECTOR +
not assigned <i>nicht belegt</i>	C - 4		A - 4	not assigned <i>nicht belegt</i>
not assigned <i>nicht belegt</i>	C - 6		A - 6	not assigned <i>nicht belegt</i>
not assigned <i>nicht belegt</i>	C - 8		A - 8	not assigned <i>nicht belegt</i>
RELAY <i>RELAIS</i> 3 COM	C - 10		A - 10	RELAY <i>RELAIS</i> 3 NO
RELAY <i>RELAIS</i> 2 COM	C - 12		A - 12	RELAY <i>RELAIS</i> 2 NO
RELAY <i>RELAIS</i> 1 NC	C - 14		A - 14	RELAY <i>RELAIS</i> 2 NC
RELAY <i>RELAIS</i> 1 COM	C - 16		A - 16	RELAY <i>RELAIS</i> 1 NO
DIGITAL IN 1	C - 18		A - 18	DIGITAL IN 1 GND
DIGITAL IN 2	C - 20		A - 20	+ 24 V
CURRENT IN +	C - 22		A - 22	CURRENT IN -
RS 485 B	C - 24		A - 24	RS 485 A
CURRENT OUT -	C - 26		A - 26	CURRENT OUT +
not assigned <i>nicht belegt</i>	C - 28		A - 28	not assigned <i>nicht belegt</i>
Main <i>Netz</i> N, DC 24 V -	C - 30		A - 30	Main <i>Netz</i> L1, 24 V DC +
Protective conductor PE <i>Schutzleiter PE</i>	C - 32		A - 32	Protective conductor PE <i>Schutzleiter PE</i>



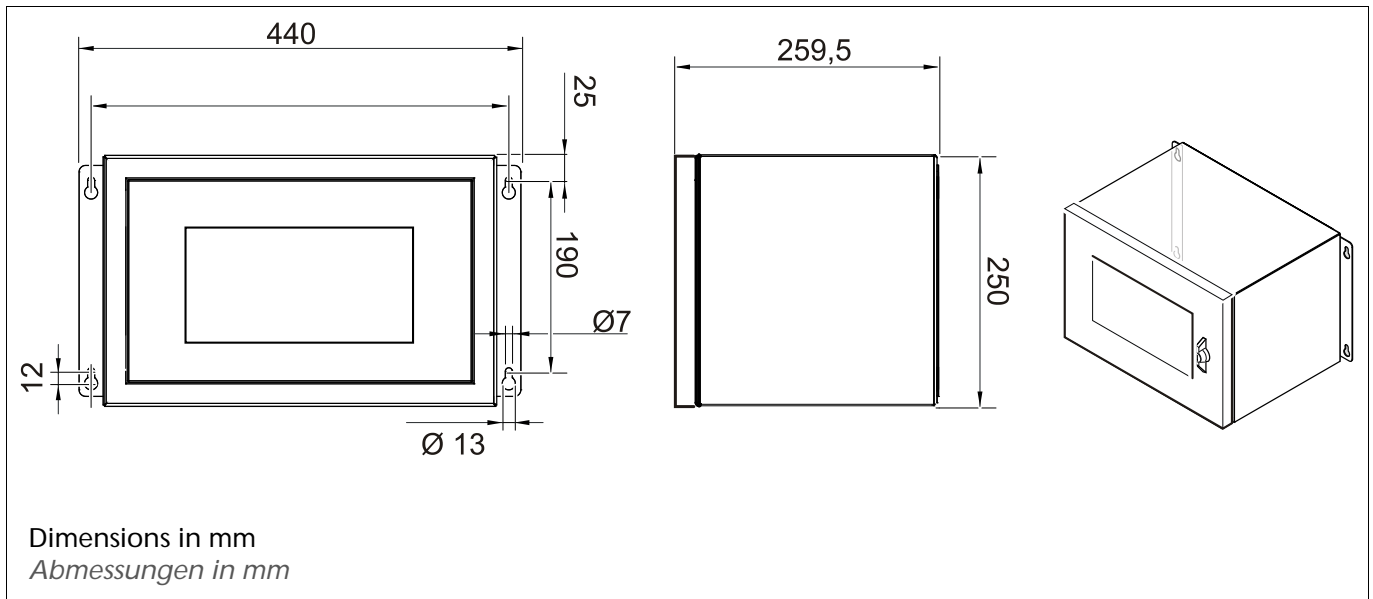
Assignment terminal block slave module Belegung Klemmenblock Slave Modul

Signal	Pin		Pin	Signal
DETECTOR SLAVE GND	C - 2		A - 2	DETECTOR SLAVE +15 V
not assigned <i>nicht belegt</i>	C - 4		A - 4	not assigned <i>nicht belegt</i>
not assigned <i>nicht belegt</i>	C - 6		A - 6	not assigned <i>nicht belegt</i>
not assigned <i>nicht belegt</i>	C - 8		A - 8	not assigned <i>nicht belegt</i>
not assigned <i>nicht belegt</i>	C - 10		A - 10	not assigned <i>nicht belegt</i>
not assigned <i>nicht belegt</i>	C - 12		A - 12	not assigned <i>nicht belegt</i>
GND	C - 14		A - 14	GND
GND	C - 16		A - 16	GND
RTS to the SLAVE	C - 18		A - 18	RTS to MASTER/SLAVE *
RxD to the SLAVE	C - 20		A - 20	RxD to the MASTER/SLAVE
TxD to the SLAVE	C - 22		A - 22	TxD to the MASTER/SLAVE
not assigned <i>nicht belegt</i>	C - 24		A - 24	not assigned <i>nicht belegt</i>
not assigned <i>nicht belegt</i>	C - 26		A - 26	not assigned <i>nicht belegt</i>
not assigned <i>nicht belegt</i>	C - 28		A - 28	not assigned <i>nicht belegt</i>
Main Netz N AC, DC 24 V (-)	C - 30		A - 30	Main Netz L1 AC, DC 24 V (+)
Protective conductor PE <i>Schutzleiter PE</i>	C - 32		A - 32	Protective conductor PE <i>Schutzleiter PE</i>



* optional

Wall housing Wandgehäuse



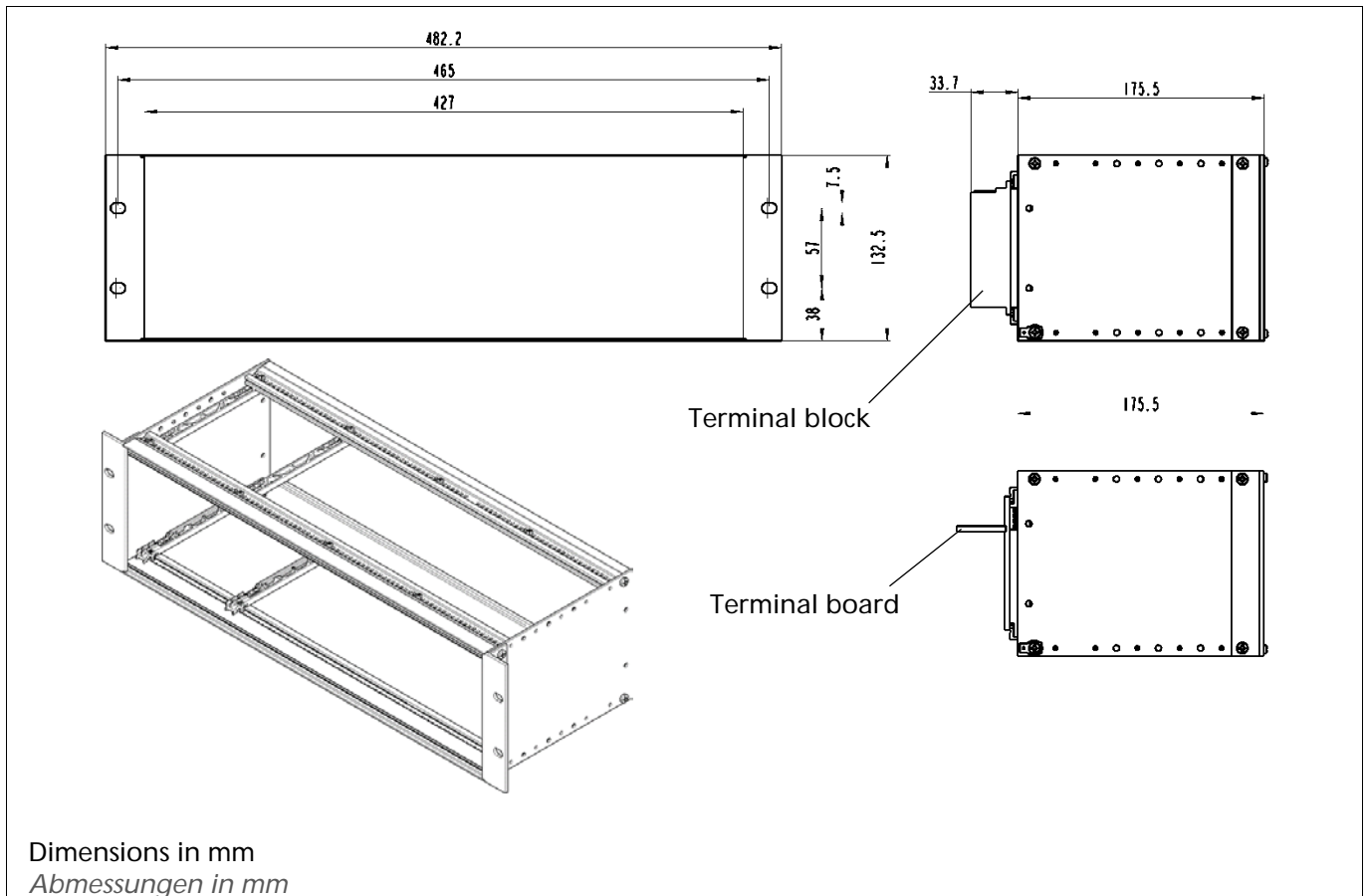
Technical Data Technische Daten

Dimensions Abmessungen	440x250x257mm (WxHxD)
Max. Assembly Max. Bestückung	<ul style="list-style-type: none"> - 2 Master with terminal board (master/master) ¹ - 2 Master mit Anschlussplatine (Master/Master) ¹ - 1 Master, 3 Slave with terminal board (master/slave) - 1 Master, 3 Slave mit Anschlussplatine (Master/Slave) - 2 Master with calmp blocks ² - 2 Master mit Klemmenblöcken ²
Weight (with circuit board, without modules) Gewicht (mit Anschlussplatine, ohne Module)	8.8 kg
Degree of protection Schutzgrad	IP65
Operational temperature Betriebstemperatur	-20°C ... +40°C
User interface, colours Oberfläche, Farbe	powder coated, grey pulverbeschichtet, grau

¹ NRTL certification US/CAN
 NRTL Zertifikat US/CAN

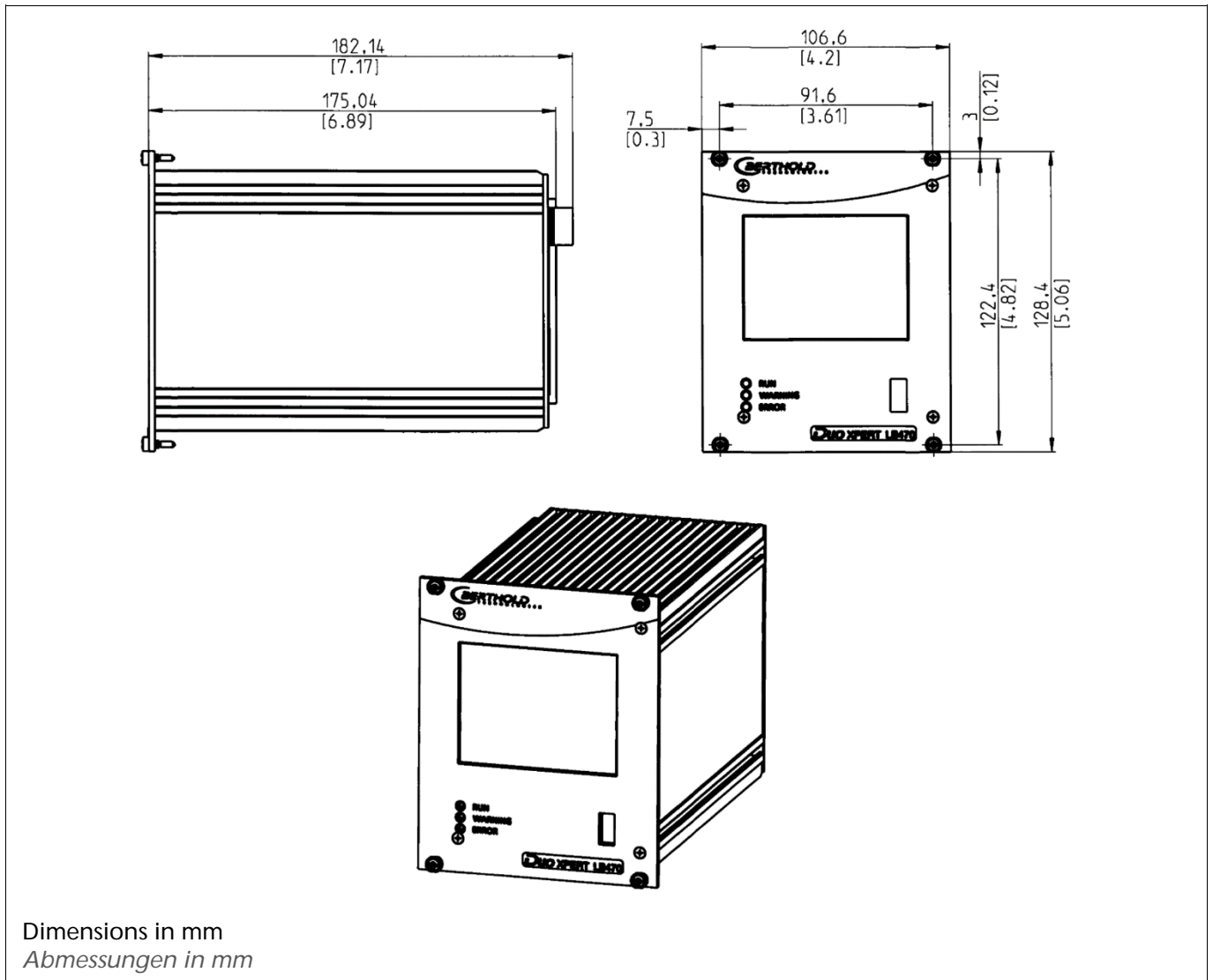
² Kein Zertifikat
 No certification

19" subrack 19" Baugruppenträger



Technical Data Technische Daten	
Dimensions Abmessungen	3HE/84TE/5T, 482x132x172mm (WxHxD)
Max. Assembly Max. Bestückung	- 3 Master, 3 Slave - 2 Master, 6 Slave - 4 Master - 1 Master, 9 Slave - 12 Slave
Weight (with circuit board, without modules) Gewicht (mit Anschlussplatine, ohne Module)	1.4 kg
Weight terminal block Gewicht Klemmenblock	220 g
Operational temperature Betriebstemperatur	-20°C ... +50°C, not condensing nicht kondensierend
Storage temperature Lagerungstemperatur	-30°C ... +60°C
Degree of protection Schutzklasse	IP20

Master EVU Master AWE



Technical Data Technische Daten

Dimensions Abmessungen	117/128/172mm (WxHxD)
Weight Gewicht	1200 g
Operational temperature Betriebstemperatur	-20°C ... +50°C, not condensing. Avoid direct sunlight. Unobstructed air circulation must be provided to the subrack. -20°C ... +50°C nicht kondensierend. Direkte Sonneneinstrahlung ist zu vermeiden. Für eine ungehinderte Luftzirkulation um den Baugruppenträger ist zu sorgen.
Storage temperature Lagerungstemperatur	-20°C ... +85°C
Degree of protection Schutzgrad	IP20

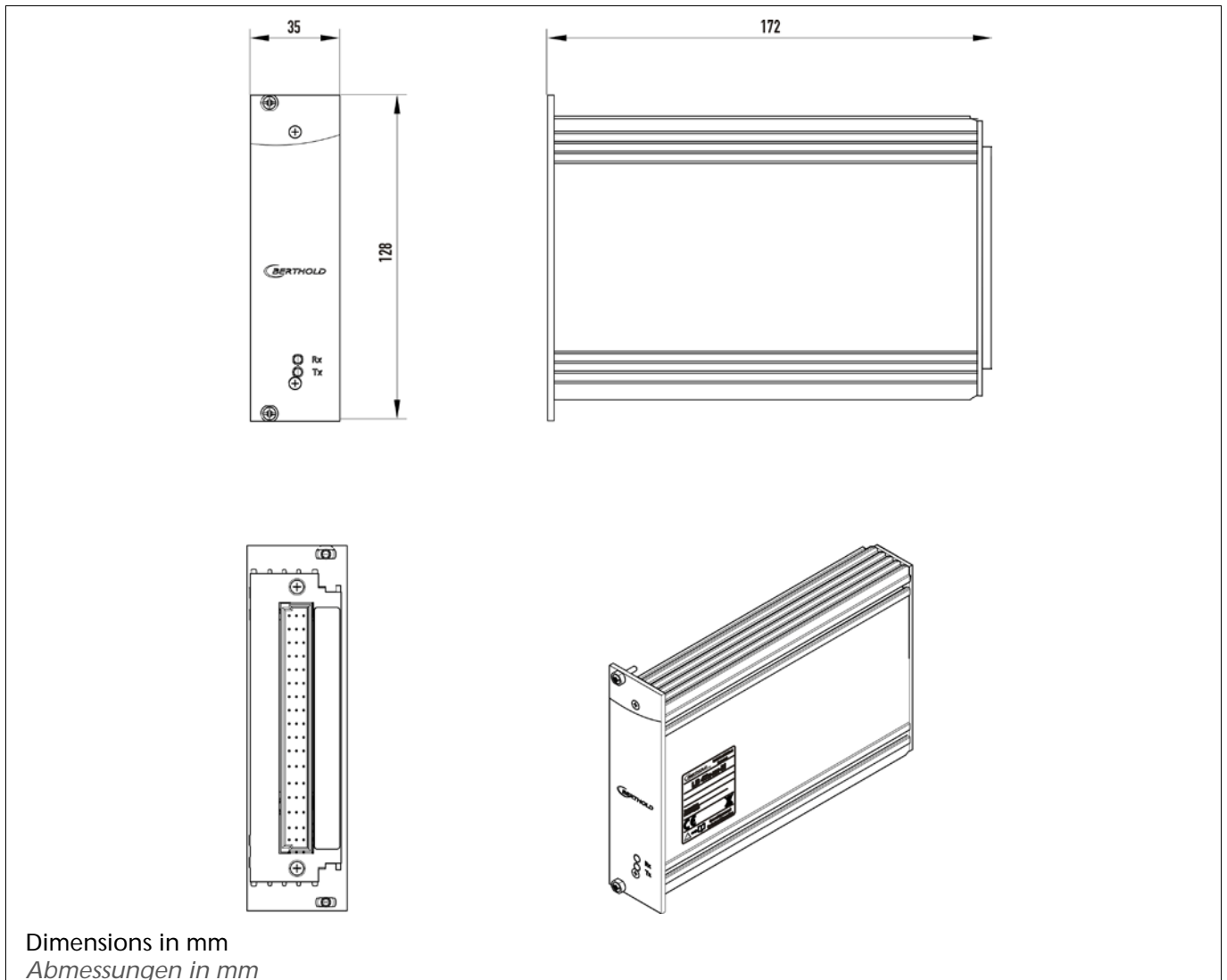
<p>Connections</p> <p><i>Anschlüsse</i></p>	<ul style="list-style-type: none"> - USB port for the connection to the USB storage medium - Master/slave connection (4-pin) and plug - RJ45 connection for Ethernet (on back wall) - 32-pin plug connector according to DIN 19465 Series C <ul style="list-style-type: none"> - <i>USB-Port zum Anschluss von USB-Speichermedium</i> - <i>Master/Slave Buchse (4-polig) und Stecker</i> - <i>RJ45-Buchse für Ethernet (an Rückwand)</i> - <i>32 polige Stiftleiste nach DIN 19465 Baureihe C</i>
<p>Display</p>	<ul style="list-style-type: none"> - graphical LCD display - 320 x 240 points, 262,000 colours - Dimmable LED background lighting - Touch screen <ul style="list-style-type: none"> - <i>graphisches LCD-Display</i> - <i>320 x 240 Punkte, 262.000 Farben</i> - <i>Dimmbare LED Hintergrundbeleuchtung</i> - <i>Touchscreen</i>
<p>Computer core</p> <p><i>Rechnerkern</i></p>	<ul style="list-style-type: none"> - Processor: Dual Core DSP/ARM Controller - clock frequency: 300 MHz internal (20 MHz external quartz) - ROM: 512 KByte - RAM: 64 MByte ext. SDRAM, 128 KByte int. shared RAM - FLASH: 8 MByte external serial <ul style="list-style-type: none"> - <i>Prozessor: Dual Core DSP/ARM Controller</i> - <i>Taktfrequenz: 300 MHz intern (20 MHz externer Quarz)</i> - <i>ROM: 512 KByte</i> - <i>RAM: 64 MByte ext. SDRAM, 128 KByte int. shared RAM</i> - <i>FLASH: 8 MByte extern seriell</i>

Power Supply Stromversorgung	
<p>Voltage</p> <p><i>Spannung</i></p>	100-240 V AC 50/60 Hz (wide range input) +/- 10% 21-32 V DC (24 V DC power input)
<p>Power consumption</p> <p><i>Leistungsaufnahme</i></p>	22 VA, 15 W
<p>Fuses</p> <p><i>Sicherungen</i></p>	Internal, 2 x 250 V, 1A delayed, 5x20 mm, 1500 A breaking capacity IEC 60127-2, 1x 250 V TR5 T80 mA (Ø 8,5 mm)

Interfaces Schnittstellen	
Current output <i>Stromausgang</i>	<p>4-20mA internally switched from power source to sink current (according to NAMUR recommendation NE 006 and NE 043). Continuous short circuit proof and isolated (500 V). Internal resistance about 105 ohms max. Burden when operating as a power source: 850 ohm. Internal monitoring of the loop current and additional error signalling by hardware on detection of a fault condition.</p> <p><i>4-20mA (nach Namur-Empfehlung NE 006 und NE 043) intern von Stromquelle auf Stromsenke umschaltbar. Dauerhaft kurzschlussfest und potentialgetrennt (500 V). Innenwiderstand ca. 105 Ohm max. Bürde bei Betrieb als Stromquelle: 850 Ohm. Interne Überwachung des Schleifenstroms und zusätzliche Fehlersignalisierung durch Hardware bei Erkennung eines Fehlerzustands.</i></p>
Current input <i>Stromeingang</i>	<p>4-20 mA (according to NAMUR recommendation NE 006 and NE 043) switchable via software on frequency input, electrically isolated (500 V). Internal resistance approx. 300 ohm max. input voltage: 24 V DC</p> <p><i>4-20 mA (nach Namur-Empfehlung NE 006 und NE 043) per Software umschaltbar auf Frequenzeingang, potentialgetrennt (500 V). Innenwiderstand ca. 300 Ohm max. Eingangsspannung: 24 V DC</i></p>
Impulse input <i>Impuls-eingang</i>	<p>Frequency 0-100 kHz, $U_{max} = 28 V$, right angle signal form, low <1,5 V; high 4 – 28 V. Switchable to current input</p> <p><i>Frequenz 0-100 kHz, $U_{max} = 28 V$, Rechteck-Signalform, Low <1,5V; High 4 – 28 V. Umschaltbar auf Stromeingang</i></p>
Digital outputs <i>Digitale Ausgänge</i>	<p>3 relays, $U_{max} = 33 V AC_{eff}, 46 V DC$; $I_{max} = 1 A$ functions: Relay 1: SPDT for error signalling Relay 2: SPDT assignable by software Relay 3: SPST assignable by software</p> <p><i>3 Relais, $U_{max} = 33 V AC_{eff}, 46V DC$; $I_{max} = 1 A$ Funktionen: Relais 1: SPDT zur Fehlersignalisierung Relais 2: SPDT über Software zuweisbar Relais 3: SPST über Software zuweisbar</i></p>
Digital inputs <i>Digitale Eingänge</i>	<p>2 x together electrically isolated (500 V) Switch between DigIn and GND, U_{outmax} approx. 24 V Function configurable via software</p> <p><i>2 x gemeinsam potentialgetrennt (500 V), Schalter zwischen DigIn und GND, U_{outmax} ca. 24 V Funktion über Software konfigurierbar</i></p>
External supply <i>Externe ersorgung</i>	<p>Output voltage: 24 V DC Output current: max. 150 mA</p> <p><i>Ausgangsspannung: 24 V DC Ausgangsstrom: max. 150 mA</i></p>
RS485	<p>for master/master communication, and testing and evaluation purposes. not isolated from main electronics and USB port electrically isolated from remaining I/Os (500 V)</p> <p><i>für Master/Master Kommunikation und Prüf-und Testzwecke. Nicht potentialgetrennt von Hauptelektronik und USB-Anschluss potentialgetrennt von restlichen I/Os (500 V)</i></p>

USB port	<p>1 x USB 2.0 Type A (Host) via front plate to the connection of an ext. mouse, keyboard or storage medium Uout = 5 V, Ioutmax = 0.5 A</p> <p><i>1 x USB 2.0 Typ A (Host) über Frontplatte zum Anschluss einer ext. Maus, Tastatur oder Speichermedium Uout = 5 V, Ioutmax = 0,5 A</i></p>
Ethernet	<p>RJ45 connection via back wall, 10 Mbit, DHCP supported, max. 3 m</p> <p><i>RJ45-Buchse über Rückwand, 10 Mbit, DHCP unterstützt, max. 3 m</i></p>

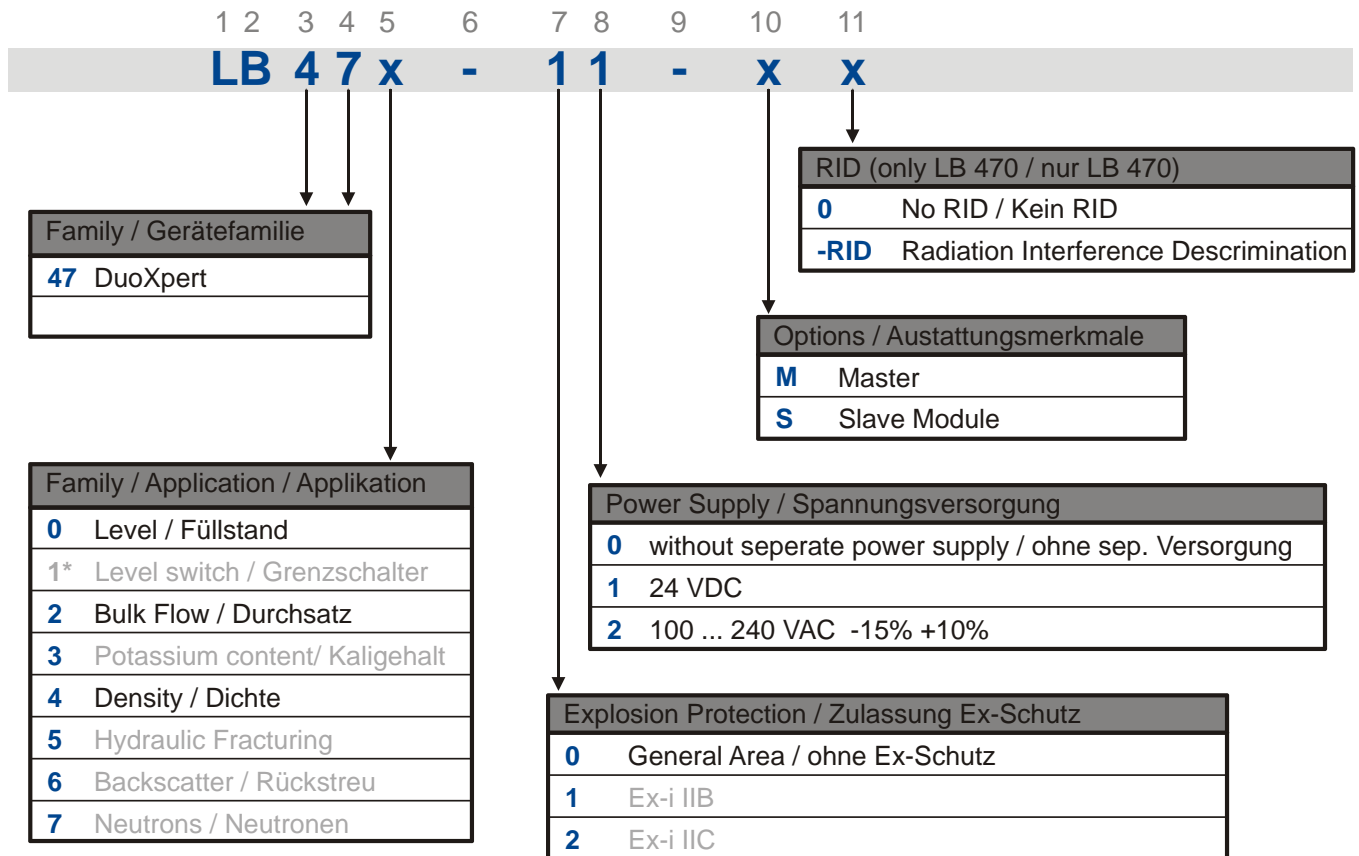
Slave Module Slave Modul



Technical Data Technische Daten	
Dimensions Abmessungen	35/128/172 mm (WxHxD)
Weight Gewicht	600 g
Operational temperature Betriebstemperatur	-20 °C ... +50 °C, not condensing. Avoid direct sunlight. Unobstructed air circulation must be provided to the subrack. -20°C ... +50°C nicht kondensierend. Direkte Sonneneinstrahlung ist zu vermeiden. Für eine un-gehinderte Luftzirkulation um den Baugruppenträger ist zu sorgen.
Storage temperature Lagertemperatur	-20 °C ... +60 °C
Degree of protection Schutzgrad	IP20

Electrical data <i>Elektrische Daten</i>	
Power consumption <i>Leistungsaufnahme</i>	6 VA, 5W
Fuses <i>Sicherungen</i>	Internal, 2 x 250 V, 1 A delayed, 5x20 mm, 1500 A breaking capacity IEC 60127-2 <i>Intern, 2 x 250 V, 1 A träge, 5x20 mm, 1500 A Abschaltvermögen IEC 60127-2</i>
Connections <i>Anschlüsse</i>	- 32-pin plug connector - 32 polige Stiftleiste

Number Key LB 47x Nummernschlüssel LB 47x



* used by othe hardware / belegt durch andere Hardware

Declaration of Conformity Konformitätserklärung



BERTHOLD TECHNOLOGIES GmbH & Co. KG
Calmbacher Straße 22
75323 Bad Wildbad, Germany
Phone +49 7081 177-0
Fax +49 7081 177-100
info@Berthold.com
www.Berthold.com

EG-Declaration of Conformity (ORIGINAL)

File.No.: CE20028-2

We, hereby declare under our sole responsibility that the design of the following products / systems / units / machines brought into circulation by us comply with the relevant harmonized rules of the EU.

This declaration loses its validity should modifications or unsuitable and improper use take place without our authorisation.

Product name: **radiometric evaluation system
DuoXpert**

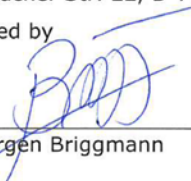
Type / model: **LB 47x**

	directive	applied standards
LVD	2014/35/EU	EN 61010-1 2010
RoHS	2011/65/EG	
EMC	2014/30/EU	EN 61326-1 2013 EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-11 EN 61000-3-2 Namur NE21 2012

This declaration is issued by the manufacturer

BERTHOLD TECHNOLOGIES GmbH & Co. KG
Calmbacher Str. 22, D-75323 Bad Wildbad, Germany

released by


Dr. Jürgen Briggmann

Head of R&D
Bad Wildbad, 1st of September, 2015

Registergericht / Court of Registration
Persönlich haftende Gesellschafterin / Fully liable Associates
Registergericht / Court of Registration
Geschäftsführung / Management
USt.-Id.-Nr. / VAT Reg. No.
Deutsche Steuernummer / German Tax No.
WEEE-Reg. No.

Stuttgart HRA 330991
BERTHOLD TECHNOLOGIES Verwaltungs-GmbH
Stuttgart HRB 331520
Horst Knauff, Dr. Dirk Mörmann
DE813050511
49038/08038
DE99468690

Sparkasse PF-CW	75323 Bad Wildbad	Konto/Account No. 8 045 003 (BLZ 666 500 85)	SWIFT-BIC PZHSDE66	IBAN: DE37 6665 0085 0008 0450 03
Volksbank	75119 Pforzheim	Konto/Account No. 957 004 (BLZ 666 900 00)	SWIFT-BIC VBPFDE66	IBAN: DE85 6669 0000 0000 9570 04
Commerzbank	75105 Pforzheim	Konto/Account No. 6 511 120 (BLZ 666 800 13)	SWIFT-BIC DRESDEFF 666	IBAN: DE05 6668 0013 0651 1120 00



BERTHOLD TECHNOLOGIES GmbH & Co. KG

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75323 Bad Wildbad, Germany

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Fax +49 7081 177-100
info@Berthold.com
www.Berthold.com

EG-Konformitätserklärung (ORIGINAL)

Dok.Nr.: CE20028-1

Hiermit erklären wir in alleiniger Verantwortung, dass die Bauart des(r) nachfolgend bezeichneten Geräte / Systems / Anlage / Maschine in der von uns in den Verkehr gebrachten Ausführung den unten genannten einschlägigen Harmonisierungsvorschriften der EU entsprechen.

Durch nicht mit uns abgestimmte Änderungen oder nicht bestimmungsgemäßen Gebrauch verliert diese Erklärung ihre Gültigkeit.

Produktbezeichnung: **radiometrisches Auswertesystem DuoXpert**


Typenbezeichnung / Modell: **LB 47x**

	Richtlinie (Fundstelle)	angewendete Normen und weitere Spezifikationen	
NSR	2014/35/EU	EN 61010-1	2010
RoHS	2011/65/EG		
EMV	2014/30/EU	EN 61326-1 EN 61000-4-2 EN 61000-4-3 EN 61000-4-4 EN 61000-4-5 EN 61000-4-6 EN 61000-4-11 EN 61000-3-2 Namur NE21	2013 2012

Diese Erklärung wird verantwortlich für den Hersteller

BERTHOLD TECHNOLOGIES GmbH & Co. KG
Calmbacher Str. 22, D-75323 Bad Wildbad

abgegeben durch


Dr. Jürgen Briggmann

Leiter Entwicklung

Bad Wildbad, den 1. September 2015

Registergericht / Court of Registration
Persönlich haftende Gesellschafterin / Fully liable Associates
Registergericht / Court of Registration
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USt.-Id-Nr. / VAT Reg. No.
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Horst Knauff, Dr. Dirk Mörmann
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Sparkasse PF-CW	75323 Bad Wildbad	Konto/Account No. 8 045 003 (BLZ 666 500 85)	SWIFT-BIC PZHSDE66	IBAN: DE37 6665 0085 0008 0450 03
Volksbank	75119 Pforzheim	Konto/Account No. 957 004 (BLZ 666 900 00)	SWIFT-BIC VBPFDE66	IBAN: DE85 6669 0000 0000 9570 04
Commerzbank	75105 Pforzheim	Konto/Account No. 6 511 120 (BLZ 666 800 13)	SWIFT-BIC DRESDEFF 666	IBAN: DE05 6668 0013 0651 1120 00

Certificates Zertifikate

NRTL certification US/CAN wall-mounted housing NTRL Zertifikat US/CAN Wandgehäuse



Certificate of Compliance

Nemko-CCL, Inc.

Certificate: NA201610530

Date Issued: January 20, 2016

Project: 257087-7.1

Issued to: Berthold Technologies GmbH & Co. KG
Calmbacher Straße 22
75323 Bad Wildbad
Germany

The products listed below have been certified as being compliant with all applicable requirements of the specifications listed and are eligible to bear the following certification mark



Issued by:

Robert Keller, Senior Engineer/Safety Supervisor

Authorized by:

Thomas Jackson, Certification Manager

PRODUCTS

MEASUREMENT, CONTROL, OR LABORATORY EQUIPMENT – Certified to US and Canada Standards

Product: Process measurement unit

Model: Wall-mounted LB 47x, 1M/3S; Wall-mounted LB 47x, 2M (x can be 0 to 8 and describes different software versions for the master and slave modules not affecting safety).

Ratings: Wall-mounted LB 47x, 1M/3S: 40VA 100-240V, 50/60Hz, Class I; Wall-mounted LB 47x, 2M: 44VA 100-240V, 50/60Hz, Class I

The certification system, as described in ISO/IEC Guide 67 (Conformity Assessment – Fundamentals of Product Certification), most closely resembles System 3

Nemko-CCL, Inc. 1940 West Alexander Street Salt Lake City, Utah 84119-2039 Tel (801) 972-6146 Fax (801) 972-8432



NFCC-002 Issue 2 May 2014

Page 1 of 3

NRTL certification US/CAN wall-mounted housing (continued) NTRL Zertifikat US/CAN Wandgehäuse (Fortsetzung)

APPLICABLE REQUIREMENTS

UL Std. No. 61010-1 2nd Edition - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements

CAN/CSA-C22.2 No. 61010-1-04 Second Edition - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements

This certificate is issued on condition that the holder complies and will continue to comply with the requirements of the above mentioned specifications and pursuant to the terms and conditions specified in the Certification Agreement.

The certification system, as described in ISO/IEC Guide 67 (Conformity Assessment – Fundamentals of Product Certification), most closely resembles System 3

Nemko-CCL, Inc. 1940 West Alexander Street Salt Lake City, Utah 84119-2039 Tel (801) 972-6146 Fax (801) 972-8432

NFCC-002 Issue 2 May 2014



Page 2 of 3

NRTL certification US/CAN wall-mounted housing (continued) *NTRL Zertifikat US/CAN Wandgehäuse (Fortsetzung)*

Supplement to Certificate of Compliance

Certificate: NA201610530

Project: 257087-7.1

Nemko-CCL grants a license to the applicant to apply the Certification Mark to the certified products and that the mark shall only be affixed at the following factory locations

Factory Information

Factory Name	Location
Berthold Technologies GmbH & Co. KG	Calmbacher Straße 22 75323 Bad Wildbad Germany

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
257087-7.1	January 20, 2016	Original Certification: Model: Wall-mounted LB 47x, 1M/3S; Wall-mounted LB 47x, 2M (x can be 0 to 8 and describes different software versions for the master and slave modules not affecting safety). Ratings: Wall-mounted LB 47x, 1M/3S: 40VA 100-240V, 50/60Hz, Class I; Wall-mounted LB 47x, 2M: 44VA 100-240V, 50/60Hz, Class I

This Supplement forms an integral part of the Certificate of Compliance

The certification system, as described in ISO/IEC Guide 67 (Conformity Assessment – Fundamentals of Product Certification), most closely resembles System 3

Nemko-CCL, Inc. 1940 West Alexander Street Salt Lake City, Utah 84119-2039 Tel (801) 972-6146 Fax (801) 972-9432



NFCC-002 Issue 2 May 2014

Page 3 of 3

NRTL certification US/CAN DuoXpert LB 47x
NTRL Zertifikat US/CAN DuoXpert LB 47x



Certificate of Compliance

Nemko-CCL, Inc.

Certificate: NA201510498

Date Issued: September 17, 2015

Project: 235982-14.1

Issued to: Berthold Technologies GmbH & Co. KG
Calmbacher Straße 22
75323 Bad Wildbad
Germany

The products listed below have been certified as being compliant with all applicable requirements of the specifications listed and are eligible to bear the following certification mark



Issued by:

Robert Keller, Senior Engineer/Safety Supervisor

Authorized by:

Thomas Jackson, Certification Manager

PRODUCTS

MEASUREMENT, CONTROL, OR LABORATORY EQUIPMENT – Certified to US and Canada Standards

Product: Process measurement unit for building-in

Model: DuoXpert LB47x-02-M; DuoXpert LB47x-02-S (x can be 0 to 8 and describes different software versions for the master and slave modules not affecting safety)

Ratings: LB47x-02-M: 100-240V AC 22VA 50/60Hz; LB47x-02-S: 100-240V AC 6VA 50/60Hz

APPLICABLE REQUIREMENTS

UL Std. No. 61010-1 3rd Edition - Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements

CAN/CSA-C22.2 No. 61010-1-12 Third Edition – Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use – Part 1: General Requirements

This certificate is issued on condition that the holder complies and will continue to comply with the requirements of the above mentioned specifications and pursuant to the terms and conditions specified in the Certification Agreement.

The certification system, as described in ISO/IEC Guide 67 (Conformity Assessment – Fundamentals of Product Certification), most closely resembles System 3

Nemko-CCL, Inc. 1940 West Alexander Street Salt Lake City, Utah 84119-2039 Tel (801) 972-6146 Fax (801) 972-8432



NRTL certification US/CAN DuoXpert LB 47x (continued) NTRL Zertifikat US/CAN DuoXpert LB 47x (Fortsetzung)

Supplement to Certificate of Compliance

Certificate: NA201510498

Project: 235982-14.1

Nemko-CCL grants a license to the applicant to apply the Certification Mark to the certified products and that the mark shall only be affixed at the following factory locations

Factory Information

Factory Name	Location
Berthold Technologies GmbH & Co. KG	Calmbacher Straße 22 75323 Bad Wildbad Germany

The products listed, including the latest revision described below, are eligible to be marked in accordance with the referenced Certificate.

Product Certification History

Project	Date	Description
235982-14.1	September 17, 2015	Original Certification: Model: DuoXpert LB47x-02-M; DuoXpert LB47x-02-S (x can be 0 to 8 and describes different software versions for the master and slave modules not affecting safety) Ratings: LB47x-02-M: 100-240V AC 22VA 50/60Hz; LB47x-02-S: 100-240V AC 6VA 50/60Hz

This Supplement forms an integral part of the Certificate of Compliance

The certification system, as described in ISO/IEC Guide 67 (Conformity Assessment - Fundamentals of Product Certification), most closely resembles System 3

Nemko-CCL, Inc. 1940 West Alexander Street Salt Lake City, Utah 84119-2039 Tel (801) 972-6146 Fax (801) 972-8432



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Page 2 of 2

Parts overview Übersicht Zubehör

ID. No. Id. Nr.	Description Beschreibung
63284	LB 470-01-M Level Transmitter (Master, 24 VDC) LB 470-01-M Füllstandmessgerät (Master, 24 VDC)
63283	LB 470-02-M Level Transmitter (Master, 100...240 VAC) LB 470-02-M Füllstandmessgerät (Master, 100...240 VAC)
68640	LB 470-01-M Level Transmitter with RID (Master, 24 VDC) LB 470-01-M Füllstandmessgerät mit RID (Master, 24 VDC)
68639	LB 470-02-M Level Transmitter with RID (Master, 100...240 VAC) LB 470-02-M Füllstandmessgerät mit RID (Master, 100...240 VAC)
63286	LB 470 Slave (24 VDC) LB 470 Slave (24 VDC)
63285	LB 470 Slave (100...240 VAC) LB 470 Slave (100...240 VAC)
56925BA1	Operating manual DuoSeries LB 470 Level, German Betriebsanleitung Füllstand (deutsch)
56925BA2	Operating manual DuoSeries LB 470 Level, English Betriebsanleitung Füllstand (englisch)
56925-1BA1	Operating manual DuoSeries LB 470RID Level, German Betriebsanleitung DuoSeries LB 470RID Füllstand, Deutsch
56925-1BA2	Operating manual DuoSeries LB 470RID Level, English Betriebsanleitung DuoSeries LB 470RID Füllstand, Englisch
63781	Wall-mounted Housing for LB 47x 1x Master / 3x Slave (24 VDC) Wandgehäuse für LB 47x, 1x Master / 3x Slave (24 VDC)
63782	Wall-mounted Housing for LB 47x 1x Master / 3x Slave (110...240 VAC) Wandgehäuse für LB 47x, 1x Master / 3x Slave (110...240 VAC)
63783	Wall-mounted Housing for 2x LB 47x Master (24 VDC) Wandgehäuse für LB 47x, 2x Master (24 VDC)
63784	Wall-mounted Housing for 2x LB 47x Master (110...240 VAC) Wandgehäuse für LB 47x, 2x Master (110...240 VAC)
64402	Wall-mounted Housing for 2x LB 47x Master (terminal blocks) Wandgehäuse für LB 47x, 2x Master (Klemmblöcke)
59484	19" rack for LB 47x, 4 x Master 19"-Baugruppenträger für LB 47x, 4 x Master
59481	19" rack for LB 47x, 3x (1x Master & 1x Slave) 19"-Baugruppenträger für LB 47x, 3x (je 1x Master & 1x Slave)
64607	19" rack, 84 HP / 3 RU for use with terminal blocks 19"-Baugruppenträger für den Einsatz mit Klemmblöcken
59477	Terminal block for LB 47x, Master Klemmenblock für LB 47x, Master
59478	Terminal block for LB 47x, Slave Klemmenblock für LB 47x, Slave (mit Führungsschienen)
37526	Front Cover Plate 21 HP / 3 RU (Master) Blindplatte 21TE / 3 HE (Master)

59501	Front Cover Plate 7 HP / 3 RU (Slave) <i>Blindplatte 7TE / 3 HE (Slave)</i>
64608	Connector for LB 47x slaves when changing from LB 44x to LB 47x slaves <i>Stecker für LB 47x Slaves bei Umrüstung von LB44x auf LB47x Slaves</i>