Operating Instructions

Barrier box for connecting sensors for Ex zones

LRT 917 LRT 918 LRT 919 LRT 920

The special safety information for explosion protection must be followed.

CE

English
Translation of the Original Operating Instructions
Version 06/2014 b1
replaces version 08/2012 a3
YAAE0028
Valid from:
February 2014

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Table of contents

Appendix

Data sheets
Circuit diagrams

1 Safety

1.1 Explanation of safety information

Type and source
Consequences of non-compliance
• Action 1 • Action ...

"DANGER" indicates an immediate dangerous situation which – if the safety requirements are ignored – may result in fatal or severe, irreversible injuries.

Type and source
Consequences of non-compliance
• Action 1 • Action ...

"WARNING" indicates a possible dangerous situation which – if the safety requirements are ignored – may result in fatal or severe, irreversible injuries.

Type and source
Consequences of non-compliance
• Action 1 • Action ...

"CAUTION" indicates a possible dangerous situation which – if the safety requirements are ignored – may result in slight, reversible injuries.

Notice

Type and source
Consequences of non-compliance
• Action 1 • Action ...

"NOTICE" warns of possible property or environmental damage.

1.2 Explanation of the references

⇨ Reference Refers to further information in other chapters.

1.3 General safety

Read through the operating instructions carefully. They contain important information for working with this device. If you have any queries, please contact our Service Department (⇨ 5).

Follow all the directions in these operating instructions. Only in this way is the correct procedure ensured when working with the device.

The operating instructions only apply in conjunction with the operating instructions for the LAUDA device (thermostat) with which it is operated.

- Make sure that the device is only operated by instructed specialist personnel.
- Do not make technical modifications to the device. Infringements in this respect invalidate the warranty.
- Have service and repair work carried out only by specialists.

1.4 Special safety information

The use of this device is only admissible under the following conditions:

- The device may only be put into operation in suitable interior rooms. Siting the device outdoors is not regarded as using the device as intended.
- Operation up to a height of 2000 m above sea level is admissible.
- The mounting surface must be impervious, flat, non-slip and non-combustible.

1.5 Special safety information for explosion protection

The use of this device is only admissible under the following conditions:

- **The device may only be installed and operated by specialist personnel who are familiar with the installation, setting up and operation of this product.**
- **Explosion protection, repair of Ex-protected devices**
  The applicable national regulations and construction requirements must be followed for systems in connection with areas subject to explosion hazards.
  Important: National requirements must be observed for the repair or modification of explosion-protected devices. Only genuine replacement parts may be used for maintenance and repair.
- **Electrical connections**
  The national regulations of the country of destination apply to mounting and installation in areas subject to explosion hazards. The details given in the EC type-examination certificates apply to the connection of intrinsically safe circuits.

2 General remarks

2.1 Description of the device

This device is a barrier box. This barrier box is used for the connection of external sensors to certain LAUDA thermostats. The box is available in four variants:

Article		Catalogue number
Barrier Box with connection of external sensors	1 x 4-20 mA	LRT 917
Barrier Box with connection of external sensors	1 x Pt100	LRT 918
Barrier Box with connection of external sensors	2 x 4-20 mA	LRT 919
Barrier Box with connection of external sensors	1 x 4-20 mA, 1 x Pt100	LRT 920

The Barrier Box is used for the purpose of the safety decoupling of intrinsically safe electrical circuits from non-intrinsically safe circuits. Depending on the variant it contains up to two voltage and current-limited input circuits, up to two output circuits as well as a supply connection.

2.2 Intended application

The Barrier Box is constructed exclusively for operation with the following LAUDA thermostats:

LAUDA Integral XT

LAUDA Proline

LAUDA Proline Kryomat

LAUDA Eco

The devices must only be operated as intended and under the conditions stated in these operating instructions. Any other operating mode is not regarded as intended use.

2.3 Use other than that intended

The device must not be used...:

- for medical/pharmaceutical applications
- when sited outdoors.

2.4 Responsibility of the operating body - safety information

The operating body is responsible for the qualifications of the operating personnel.

- The device must only be configured, installed, maintained and repaired by specialist personnel.
- Persons operating the device must be instructed in their work by a specialist.
- Make sure that specialist personnel and operators have read and understood the operating instructions.
- The device must be used as intended (⇨ 2.2).
- The operating instructions of the thermostat with which this device is operated and the operating instructions of the built-in intrinsically safe components continue to be authoritative.

2.5 EC conformity

CE

The products described in the operating instructions conform to the regulations of the following European directives:

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- ATEX Product Directive 94/9/EC on equipment and protective systems intended for use in potentially explosive atmospheres
- Low Voltage Directive 2006/95/EC relating to electrical equipment designed for use within certain voltage limits
- EMC Directive 2004/108/EC regarding electromagnetic compatibility

Applicable standards:

- DIN EN 60079-0 :2010-03 Potentially explosive atmospheres, Part 0: General requirements
- DIN EN 60079-11 :2007-08 Potentially explosive atmospheres, Part 11: Equipment protection by inherent safety "i"
- DIN EN 61010-1:2002-08 Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements
- DIN EN 61326-1:2006-10 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements

3 Transport and unpacking

Shipping damage
Electric shock, open fire
• Never operate the device if you have found shipping damage.

Check the device and the accessories immediately after shipment for completeness and shipping damage. If contrary to expectations the device or accessories are found to be damaged, inform the shipping company immediately so that a report can be produced and the shipping damage examined.
Also, immediately inform **LAUDA Service Constant Temperature Equipment** (⇨ 5).

Standard accessories:

Order number	Quantity	Description
YAAE0028	1	Operating Instructions

Disposal of the packaging

The following applies to Europe: The disposal of the packaging must be carried out according to the EC Directive 94/62/EC.

4 Before putting the device into operation

Please note:

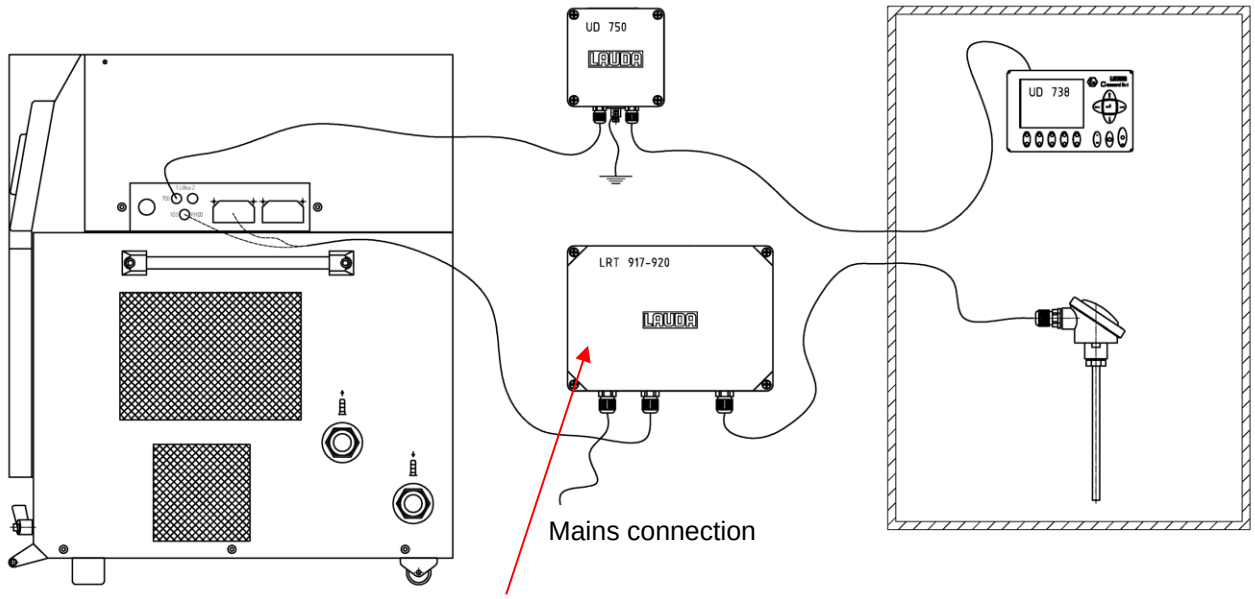
- The device can be operated up to an ambient temperature of 40°C.
- A higher ambient temperature leads to the loss of the Ex-protection approval.

4.1 Assembly and siting

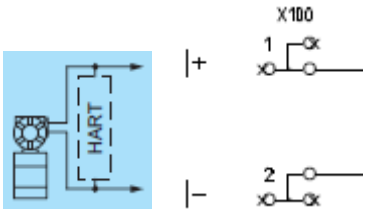
Always comply with the following safety information:

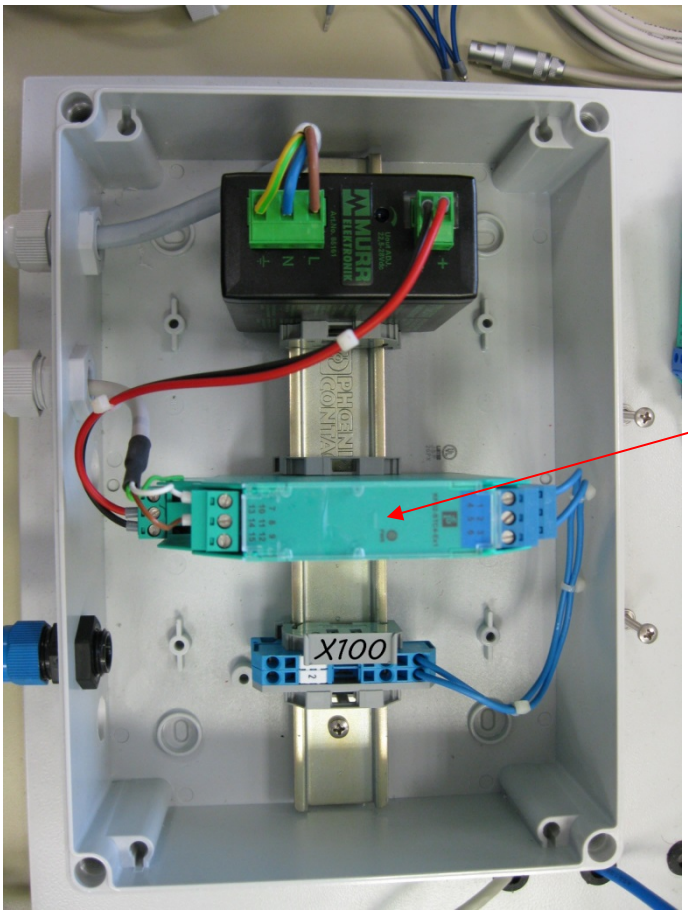
Warning!	**Falling / toppling equipment on sloping surfaces / table edge**
	Crushing of hands and feet
	• Only site the device on flat surfaces, not near the edge of the bench or table.

Setup diagram including optional accessories



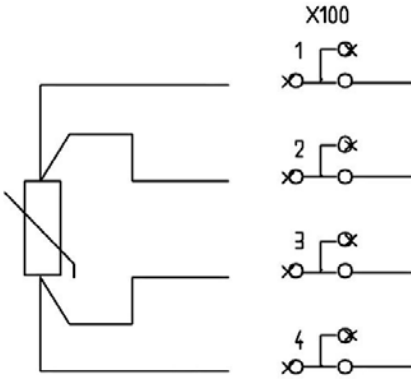
4.2 Connection of a sensor to the Barrier Box LRT 917

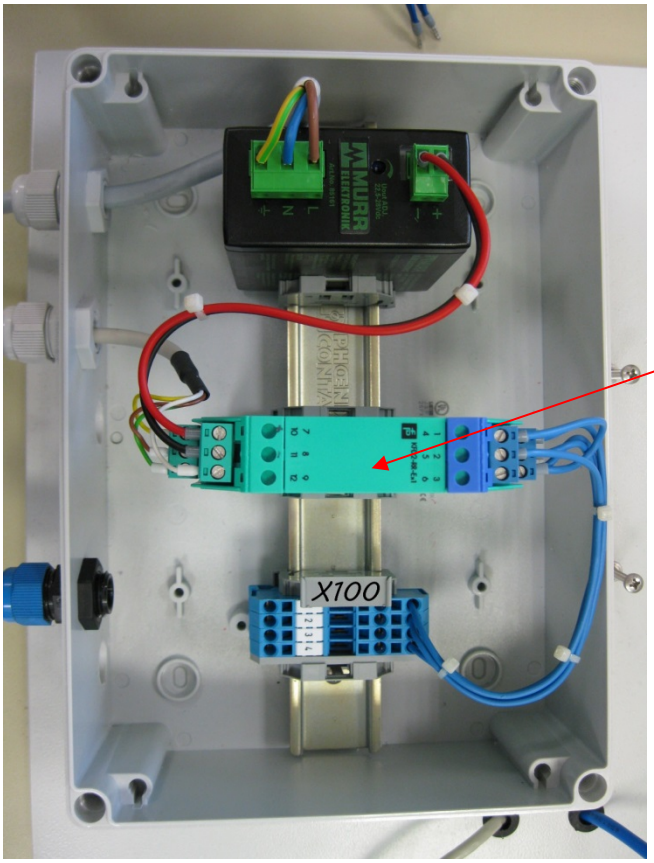




- Pay attention to the associated circuit diagram and the data sheets.
- Pass the sensor cable through the blue screw connection.
- Screw the sensor cable to terminal X100.

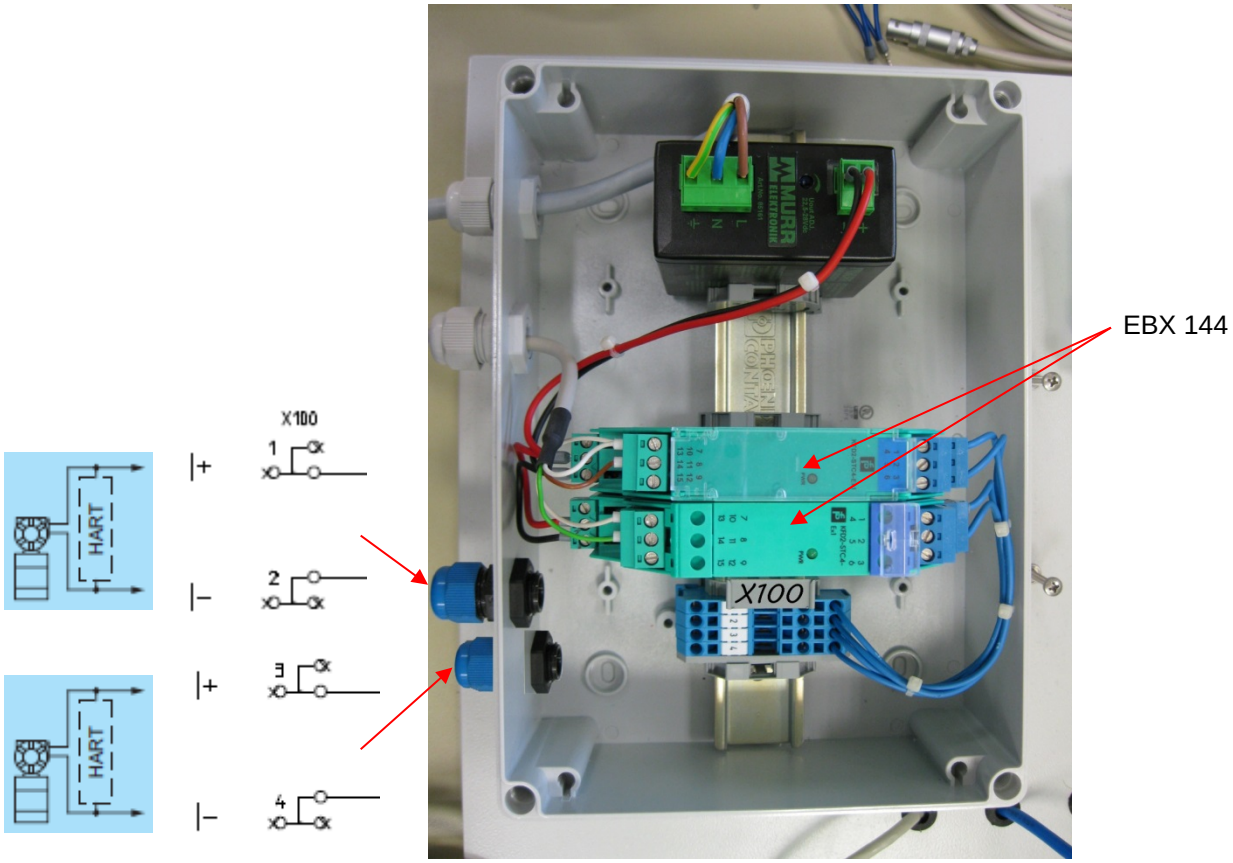
4.3 Connection of a Pt100 temperature probe to the Barrier Box LRT 918





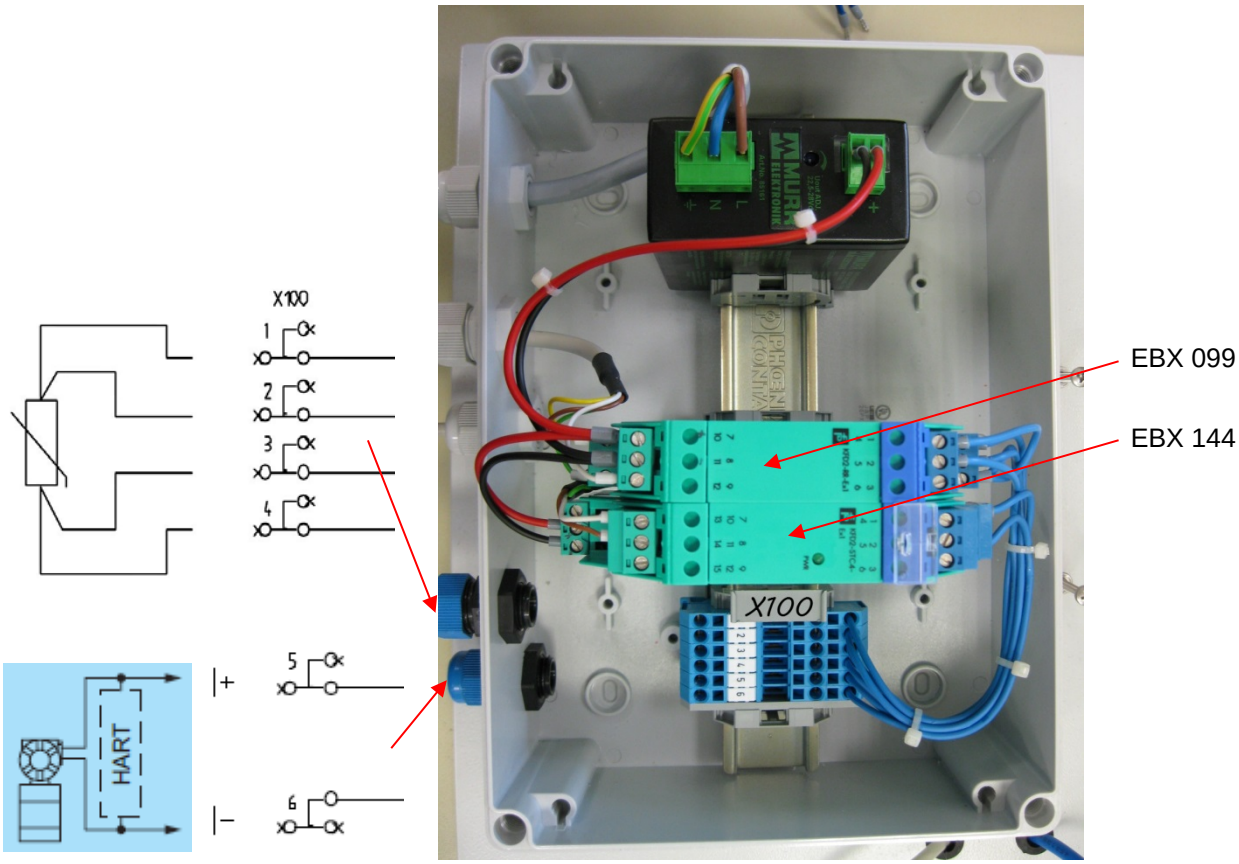
- Pay attention to the associated circuit diagram and the data sheets.
- Pass the sensor cable through the blue screw connection.
- Screw the sensor cable to terminal X100.

4.4 Connection of two sensors to the Barrier Box LRT 919



- Pay attention to the associated circuit diagram and the data sheets.
- Pass the sensor cables through the blue screw connections.
- Screw the sensor cables to terminal X100.

4.5 Connection of a Pt100 temperature probe and a sensor to the Barrier Box LRT 920



- Pay attention to the associated circuit diagram and the data sheets.
- Pass the sensor cables through the blue screw connections.
- Screw the sensor cables to terminal X100.

5 Ordering replacement parts / LAUDA Service

When ordering replacement parts state the serial number from the rating label; this helps to avoid queries and incorrect deliveries.

The serial number is composed as follows
e.g. **LRT917-14-0001**

LRT917 = Order number
14 = Year of manufacture 2014
0001 = Incremental numeration

Your contact for maintenance and expert service support.

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We are available at any time for queries and ideas!

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6 Technical data

Barrier Box LRT 917	
Non-intrinsically safe supply circuit	100 – 240 VAC; 50/60 Hz
Ambient temperature range T_a	-10 °C < T_a < +40 °C
Transmitter Supply Unit Cat. No. EBX 144	see Appendix 01

Barrier Box LRT 918	
Non-intrinsically safe supply circuit	100 – 240 VAC; 50/60 Hz
Ambient temperature range T_a	-10 °C < T_a < +40 °C
Resistance Isolating Repeater Cat. No. EBX 099	see Appendix 02

Barrier Box LRT 919	
Non-intrinsically safe supply circuit	100 – 240 VAC; 50/60 Hz
Ambient temperature range T_a	-10 °C < T_a < +40 °C
Transmitter Supply Unit Cat. No. EBX 144	see Appendix 01

Barrier Box LRT 920	
Non-intrinsically safe supply circuit	100 – 240 VAC; 50/60 Hz
Ambient temperature range T_a	-10 °C < T_a < +40 °C
Resistance Isolating Repeater Cat. No. EBX 099	see Appendix 02
Transmitter Supply Unit Cat. No. EBX 144	see Appendix 01

Technical modifications reserved.

Appendix 01: 3 pages about Cat. No. EBX 144

SMART Transmitter Power Supply — KFD2-STC4-Ex1

Features

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Input 2-wire and 3-wire SMART transmitters and 2-wire SMART current sources
- Output 0/4 mA ... 20 mA
- Terminals with test points
- Up to SIL2 acc. to IEC 61508

Function

This isolated barrier is used for intrinsic safety applications.

The device supplies 2-wire and 3-wire SMART transmitters in a hazardous area, and can also be used with 2-wire SMART current sources.

It transfers the analog input signal to the safe area as an isolated current value.

Digital signals may be superimposed on the input signal in the hazardous or safe area and are transferred bi-directionally.

If the HART communication resistance in the loop is too low, the internal resistance of 250 Ω between terminals 8 and 9 can be used.

Test sockets for the connection of HART communicators are integrated into the terminals of the device.

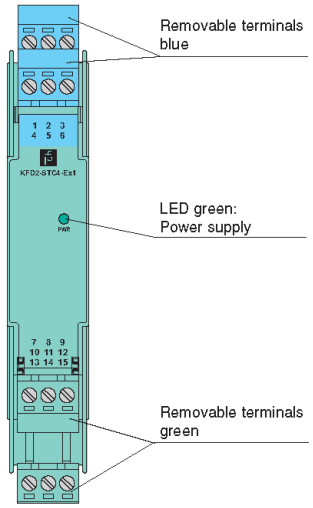
Application

The device supports the following SMART protocols:

- HART
- BRAIN
- Foxboro

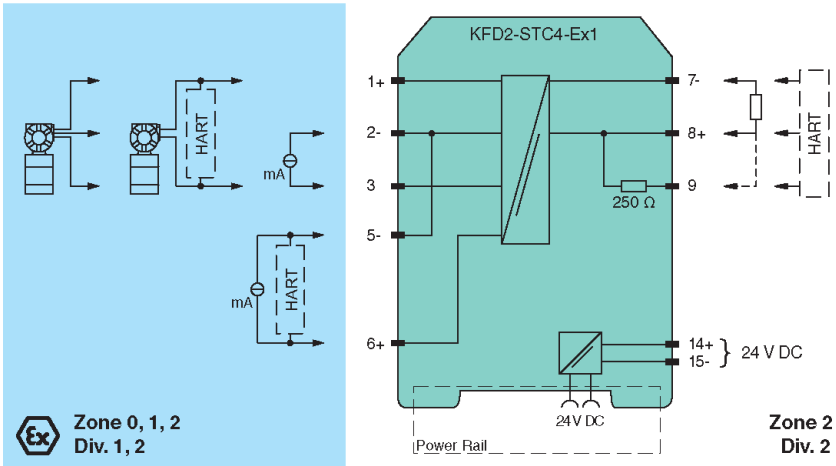
Assembly

Front view



CE Ex SIL2

Connection



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Appendix 01 continued: Cat. No. EBX 144

Technical data — KFD2-STC4-Ex1

General specifications		
Signal type		Analog input
Supply		
Connection		Power Rail or terminals 14+, 15-
Rated voltage		20 ... 35 V DC
Ripple		within the supply tolerance
Power loss		1.4 W
Power consumption		1.8 W
Input		
Connection		terminals 1+, 2-, 3 or 5-, 6+
Input signal		0/4 ... 20 mA
Voltage drop		≤ 2.4 V at 20 mA (terminals 5, 6)
Input resistance		≤ 64 Ω terminals 2-, 3 ; ≤ 500 Ω terminals 1+, 3 (250 Ω load)
Available voltage		≥ 16 V at 20 mA terminals 1+, 3
Output		
Connection		terminals 7-, 8+, 9
Load		0 ... 800 Ω
Output signal		0/4 ... 20 mA (overload > 25 mA)
Ripple		≤ 50 µA $_{rms}$
Transfer characteristics		
Deviation		at 20 °C (68 °F), 0/4 ... 20 mA ≤ 10 µA incl. calibration, linearity, hysteresis, loads and fluctuations of supply voltage
Influence of ambient temperature		0.25 µA/K
Frequency range		field side into the control side: bandwidth with 0.5 V_{pp} signal 0 ... 7.5 kHz (-3 dB) control side into the field side: bandwidth with 0.5 V_{pp} signal 0.3 ... 7.5 kHz (-3 dB)
Rise time		20 µs
Start-up time		200 µs
Electrical isolation		
Output/power supply		functional insulation, rated insulation voltage 50 V AC
Directive conformity		
Electromagnetic compatibility		
Directive 2004/108/EC		EN 61326-1:2006
Conformity		
Electromagnetic compatibility		NE 21:2006
Protection degree		IEC 60529:2001
Protection against electric shock		UL 61010-1
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications		
Protection degree		IP20
Mass		approx. 200 g
Dimensions		20 x 124 x 115 mm (0.8 x 4.9 x 4.5 in) , housing type B2
Mounting		on 35 mm DIN mounting rail acc. to EN 60715:2001
Data for application in connection with Ex-areas		
EC-Type Examination Certificate		BAS 99 ATEX 7060 , for additional certificates see www.pepperl-fuchs.com
Group, category, type of protection		⟨Ex⟩ II (1)GD, [Ex ia] IIC, [Ex iaD], (-20 °C ≤ T_{amb} ≤ 60 °C) [circuit(s) in zone 0/1/2]
Input		Ex ia IIC, Ex iaD
Supply		
Maximum safe voltage	U_m	250 V (Attention! The rated voltage can be lower.)
Equipment		terminals 1+, 3-
Voltage	U_o	25.4 V
Current	I_o	86.8 mA
Power	P_o	551 mW
Equipment		terminals 2-, 3
Current I_o/Current I_i		74 mA / 115 mA
Current	I_i	115 mA
Voltage	U_o	3.5 V
Current	I_o	74 mA
Power	P_o	64 mW
Equipment		terminals 1+, 2 / 3-
Voltage	U_i	30 V
Current	I_i	115 mA
Voltage	U_o	25.4 V
Current	I_o	115 mA

Release date 2012-07-10 14:57 Date of issue 2012-07-10 231364_eng.xml

Appendix 01 continued: Cat. No. EBX 144

Technical data — KFD2-STC4-Ex1

Power	P_o	584 mW
Equipment		terminals 5-, 6+
Voltage	U_i	30 V
Current	I_i	115 mA
Voltage	U_o	8.7 V
Current	I_o	0 mA
Output		
Maximum safe voltage	U_m	250 V (Attention! The rated voltage can be lower.)
EC-Type Examination Certificate		DMT 01 ATEX E 133
Group, category, type of protection		Ex I (M1) [Ex ia] I
Statement of conformity		TÜV 99 ATEX 1499 X , observe statement of conformity
Group, category, type of protection, temperature class		Ex II 3G Ex nA II T4 [device in zone 2]
Electrical isolation		
Input/Output		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Input/power supply		safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Directive conformity		
Directive 94/9/EC		EN 60079-0:2006, EN 60079-11:2007, EN 61241-11:2006 , EN 60079-15:2005 , EN 50303:2000
International approvals		
UL approval		
Control drawing		116-0173 (cULus)
IECEx approval		IECEx BAS 04.0016
Approved for		[Zone 0] [Ex ia] IIC, [Ex iaD], [Ex ia] I
General information		
Supplementary information		EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see www.pepperl-fuchs.com.

Accessories

Power feed module KFD2-EB2

The power feed module is used to supply the devices with 24 V DC via the Power Rail. The fuse-protected power feed module can supply up to 150 individual devices depending on the power consumption of the devices. A galvanically isolated mechanical contact uses the Power Rail to transmit collective error messages.

Power Rail UPR-03

The Power Rail UPR-03 is a complete unit consisting of the electrical inset and an aluminium profile rail 35 mm x 15 mm. To make electrical contact, the devices are simply engaged.

Profile Rail K-DUCT with Power Rail

The profile rail K-DUCT is an aluminum profile rail with Power Rail insert and two integral cable ducts for system and field cables. Due to this assembly no additional cable guides are necessary.

Power Rail and Profile Rail must not be fed via the device terminals of the individual devices!

Release date 2012-07-10 14:57 Date of issue 2012-07-10 231364_eng.xml

Appendix 02: 5 pages about Cat. No. EBX 099

Temperature Repeater — KCD2-RR-Ex1

Features

- 1-channel isolated barrier
- 24 V DC supply (Power Rail)
- Resistance and RTD input (Pt100, Pt500, Pt1000)
- Resistance output
- Accuracy 0.1 %
- Line fault detection (LFD) for Pt100
- Housing width 12.5 mm
- Up to SIL2 acc. to IEC 61508

Function

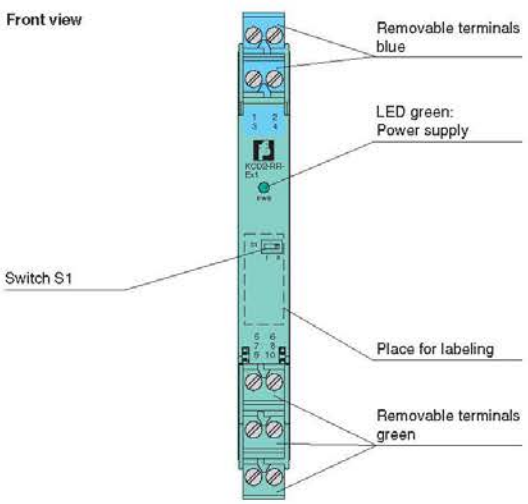
This isolated barrier is used for intrinsic safety applications.

It transfers resistance values of RTDs or potentiometers from hazardous areas to safe areas.

A 2-, 3-, or 4-wire technique is available depending on the required accuracy.

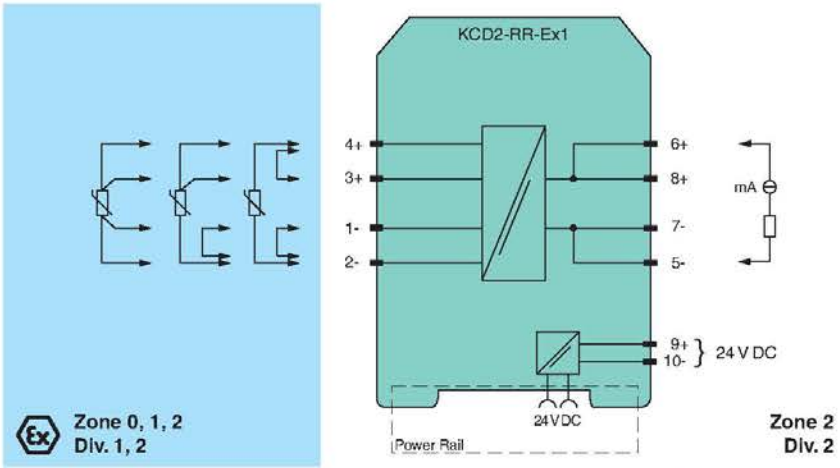
The input card of the control system measures the same load as if it were connected directly to the resistance in a hazardous area.

Assembly



CE Ex SIL2

Connection



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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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1

Appendix 02 continued: Cat. No. EBX 099

Technical data — KCD2-RR-Ex1

General specifications		
Signal type		Analog input
Supply		
Connection		Power Rail or terminals 9+, 10-
Rated voltage		19 ... 30 V DC
Ripple		within the supply tolerance
Rated current		< 20 mA
Power consumption		0.35 W (24 V and 1 mA sense current)
Input		
Connection		terminals 1, 2, 3, 4
Line fault detection		yes , at Pt100
Lead resistance		≤ 10 % of resistance value
Transmission range		0 ... 10 mA
Available voltage		9 V
Line fault detection		8 nA
Output		
Connection		terminals 5-, 7-, 6+, 8+
Current		0 ... 10 mA
Available voltage		0 ... 4.2 V
Fault signal		< 10 Ω or > 400 Ω, depending on lead disconnected (measuring current ≤ 1mA)
Transfer characteristics		
Deviation		4-wire $I_m \geq 1$ mA: ±0.1 % of R_m or ± 0.1 Ω (the larger value is applicable) $I_m < 1$ mA: accuracy reduces in proportion to I_m. e. g. $I_m = 0.1$ mA: ± 1 % of R_m or 1 Ω (the larger value is applicable). 3-wire $I_m \geq 1$ mA: (±0.1 % - 0.1 Ω Offset) or ± 0.2 Ω (the larger value is applicable) $I_m < 1$ mA: accuracy reduces in proportion to I_m. e. g. $I_m = 0.1$ mA: (±1 % - 0.1 Ω Offset) or ± 1.1 Ω (the larger value is applicable)
Influence of ambient temperature		$I_m \geq 1$ mA, $R_m \geq 100$ Ω : 0.01 %/K in the range -20 ... +60 °C (253 ... 333 K) $I_m < 1$ mA or $R_m < 100$ Ω: temperature stability reduces in proportion to I_m or R_m
Rise time		signal response time ≤ 2 ms (10 ... 90 %) response to application of I_m: $R_m > 50$ Ω and $I_m < 5$mA: < 5ms response to application of I_m: $R_m > 30$ Ω and $I_m < 5$mA: < 10ms response to application of I_m: $R_m > 18$ Ω and $I_m < 5$mA: < 20ms
Electrical isolation		
Input/Output		reinforced insulation acc. to EN 50178, rated insulation voltage 300 V_{eff}
Input/power supply		reinforced insulation acc. to EN 50178, rated insulation voltage 300 V_{eff}
Output/power supply		functional insulation, rated insulation voltage 50 V AC
Directive conformity		
Electromagnetic compatibility		
Directive 2004/108/EC		EN 61326-1:2013
Conformity		
Electromagnetic compatibility		NE 21:2011
Degree of protection		IEC 60529:2001
Protection against electrical shock		UL 61010-1
Ambient conditions		
Ambient temperature		-20 ... 60 °C (-4 ... 140 °F)
Mechanical specifications		
Degree of protection		IP20
Mass		approx. 100 g
Dimensions		12.5 x 114 x 124 mm (0.5 x 4.5 x 4.9 in) , housing type A2
Mounting		on 35 mm DIN mounting rail acc. to EN 60715:2001
Data for application in connection with Ex-areas		
EC-Type Examination Certificate		BASEEFA 10 ATEX 0061 , for additional certificates see www.pepperl-fuchs.com
Group, category, type of protection		⟨Ex⟩ II (1)G [Ex ia Ga] IIC ⟨Ex⟩ II (1)D [Ex ia Da] IIIC ⟨Ex⟩ I (M1) [Ex ia Ma] I
Input		[Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I
Voltage	U_o	12.4 V
Current	I_o	17.4 mA
Power	P_o	54 mW
Supply		
Maximum safe voltage	U_m	253 V (Attention! The rated voltage can be lower.)
Output		
Maximum safe voltage	U_m	253 V (Attention! The rated voltage can be lower.)

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Refer to "General Notes Relating to Pepperl+Fuchs Product Information".

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2

Appendix 02 continued: Cat. No. EBX 099

Technical data — KCD2-RR-Ex1

Statement of conformity	BASEEFA 10 ATEX 0062X , observe statement of conformity
Group, category, type of protection, temperature class	Ⓔx II 3G Ex nA II T4 Gc [device in zone 2]
Electrical isolation	
Input/Output	safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Input/power supply	safe electrical isolation acc. to IEC/EN 60079-11, voltage peak value 375 V
Directive conformity	
Directive 94/9/EC	EN 60079-0:2012, EN 60079-11:2012, EN 60079-15:2010
International approvals	
FM approval	
Control drawing	116-0129 (cFMus)
UL approval	
Control drawing	116-0332 (cULus)
IECEx approval	IECEx BAS 10.0024 IECEx BAS 10.0025X
Approved for	[Ex ia Ga] IIC, [Ex ia Da] IIIC, [Ex ia Ma] I
General information	
Supplementary information	EC-Type Examination Certificate, Statement of Conformity, Declaration of Conformity, Attestation of Conformity and instructions have to be observed where applicable. For information see www.pepperl-fuchs.com.

Release date 2014-05-19 11:47 Date of issue 2014-05-19 258075_eng.xml

Appendix 02 continued: Cat. No. EBX 099

Technical data KCD2-RR-Ex1

Additional information

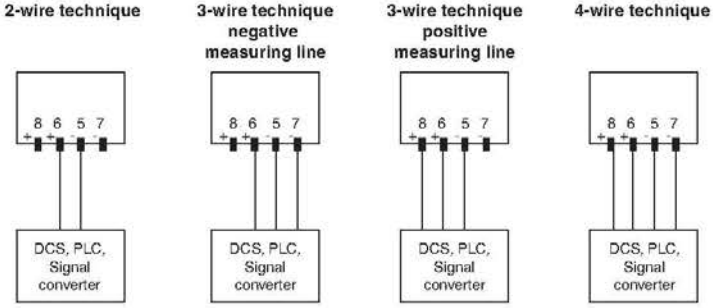
Function

When a signal converter, a DCS or PLC is connected to terminals 5, 6, 7, and 8 (control side), the measuring current is transferred to terminals 2 and 4 (field side). The resulting voltage at terminals 1, and 3 is transferred to terminals 5, 6, 7, and 8.

In the case of fast multiplex input cards, transmission problems might be experienced in connection with low resistance values and/or high sensor currents. For data see rise time.

The quoted accuracy is for a 4-wire technique connection. The accuracy in 3-wire technique will depend on the matching of the line resistance.

Connection types control side (safe area)



Connection types field side (hazardous area)

The resistance in the hazardous area can be measured with a 2-, 3- or 4-wire technique.

- 2-wire technique:
  Link terminals 1 and 2 and terminals 3 and 4. Connect the resistance to terminal 4 and terminal 2. Switch S1 in the position II.
- 3-wire technique:
  Link terminals 1 and 2. Connect the resistance to terminals 3 and 4 and terminal 2. Switch S1 in the position I.
- 4-wire technique
  Connect the resistance to terminals 3 and 4 and terminals 1 and 2. Switch S1 in the position II.

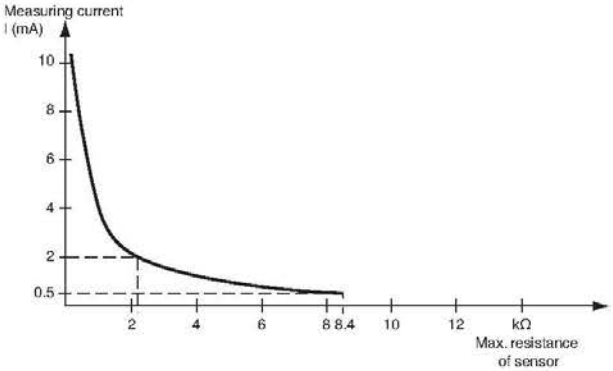
Measurement range

The resistance repeater can convey a maximum of 10 mA and a maximum of 7 V. The maximum connectable resistance value can be calculated with the following equations

- Resistance value = 4.2 V / measuring current
- Resistance value = 9 V / measuring current - 758 Ω

Use the smaller of these two resistance values as maximum allowed load.

The measuring current is determined by control.



An example of the maximum transferable resistance value:

- 8.4 kΩ at 0.5 mA measuring current
- 2.1 kΩ at 2 mA measuring current

Release date 2014-05-19 11:47 Date of issue 2014-05-19 258075_eng.xml

Appendix 02 continued: Cat. No. EBX 099

Technical data — KCD2-RR-Ex1

Line Fault Detection (LFD)

The output will indicate less than 10 Ω or greater than 400 Ω for a lead breakage at terminals 1, 2, 3 or 4 for measuring current of less than or equal to 1 mA i.e. out of range for Pt100.

Accessories

Power feed module KFD2-EB2

The power feed module is used to supply the devices with 24 V DC via the Power Rail. The fuse-protected power feed module can supply up to 150 individual devices depending on the power consumption of the devices. Collective error messages received from the Power Rail activate a galvanically-isolated mechanical contact.

Power Rail UPR-03

The Power Rail UPR-03 is a complete unit consisting of the electrical insert and an aluminium profile rail 35 mm x 15 mm. To make electrical contact, the devices are simply engaged.

Profile Rail K-DUCT with Power Rail

The profile rail K-DUCT is an aluminum profile rail with Power Rail insert and two integral cable ducts for system and field cables. Due to this assembly no additional cable guides are necessary.

Power Rail and Profile Rail must not be fed via the device terminals of the individual devices!

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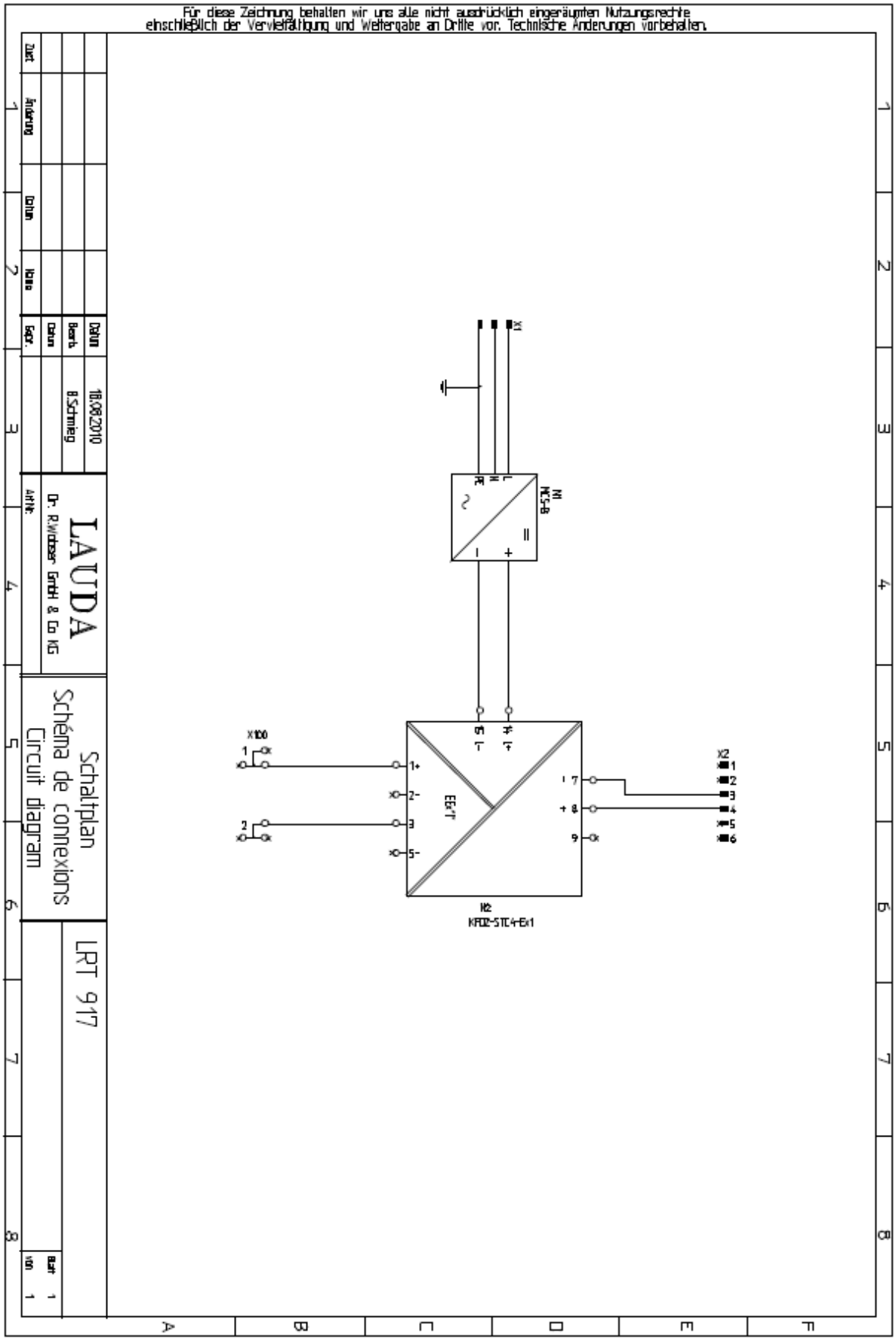
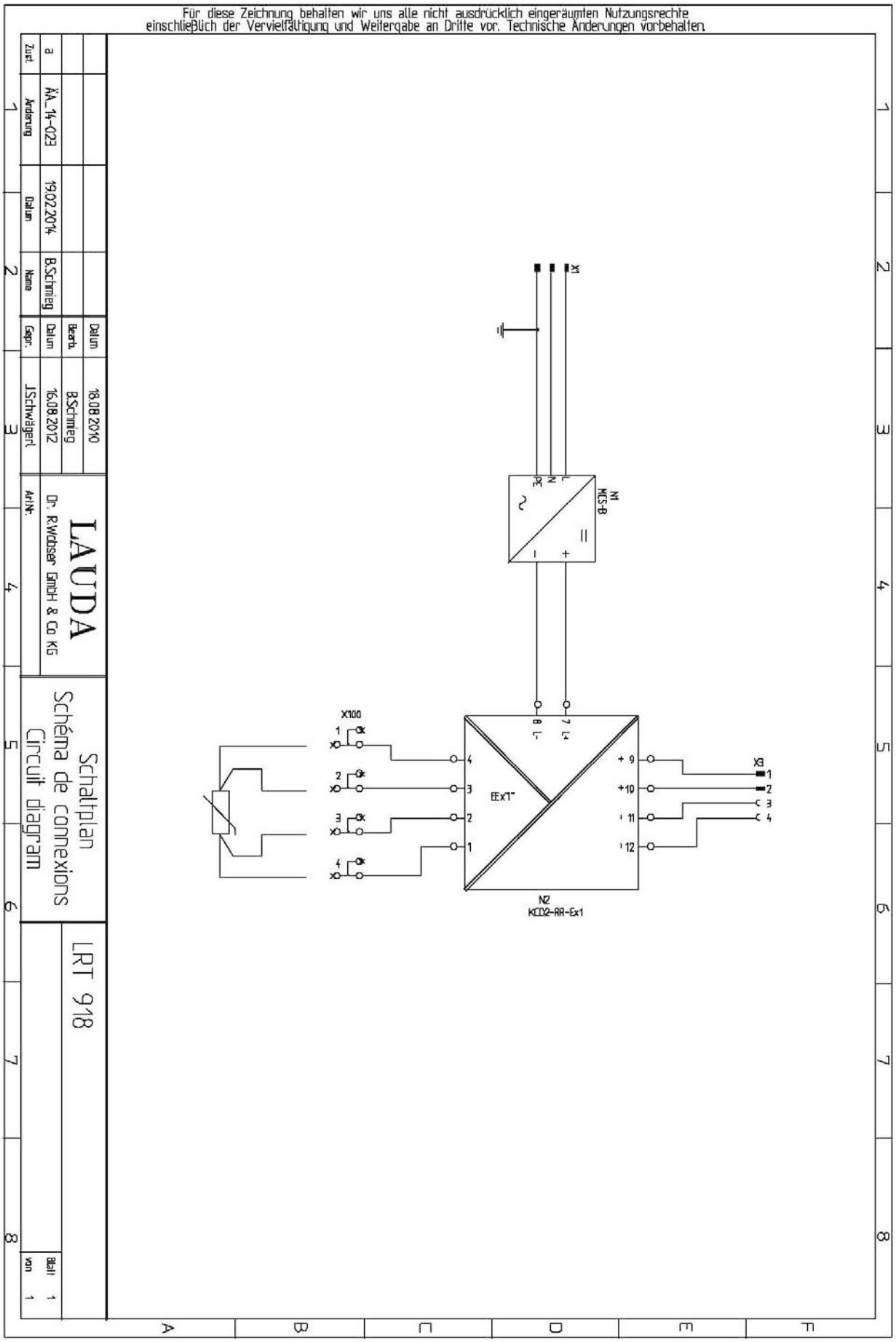
Appendix circuit diagram: 4 pages about Cat. No. LRT 917/ 918/ 919/ 920

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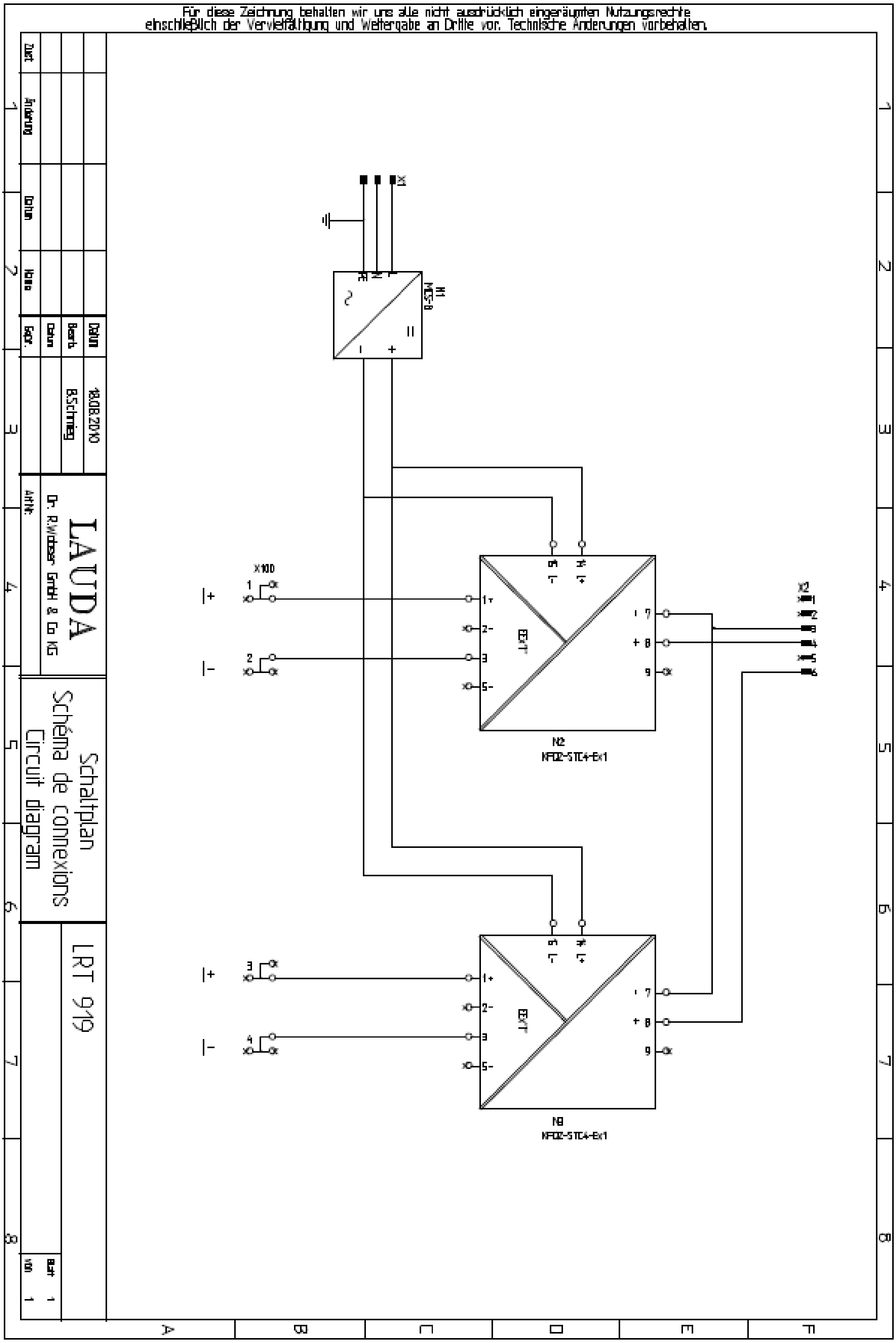
LAUDA
Dr. R.Wobser GmbH & Co KG
Schaltplan
Schéma de connexions
Circuit diagram
LRT 918
Art.Nr.
Zust. a
Änderung ÄA_14-023
Datum 19.02.2014
Name B.Schmieg
Gepr. Datum 16.08.2012
JSchwägert
Bearb. Datum 18.08.2010
B.Schmieg
Blatt 1 von 1
X1
N1 MCS-B
X100
N2 KCD2-RR-Ex1
EEx1"
X3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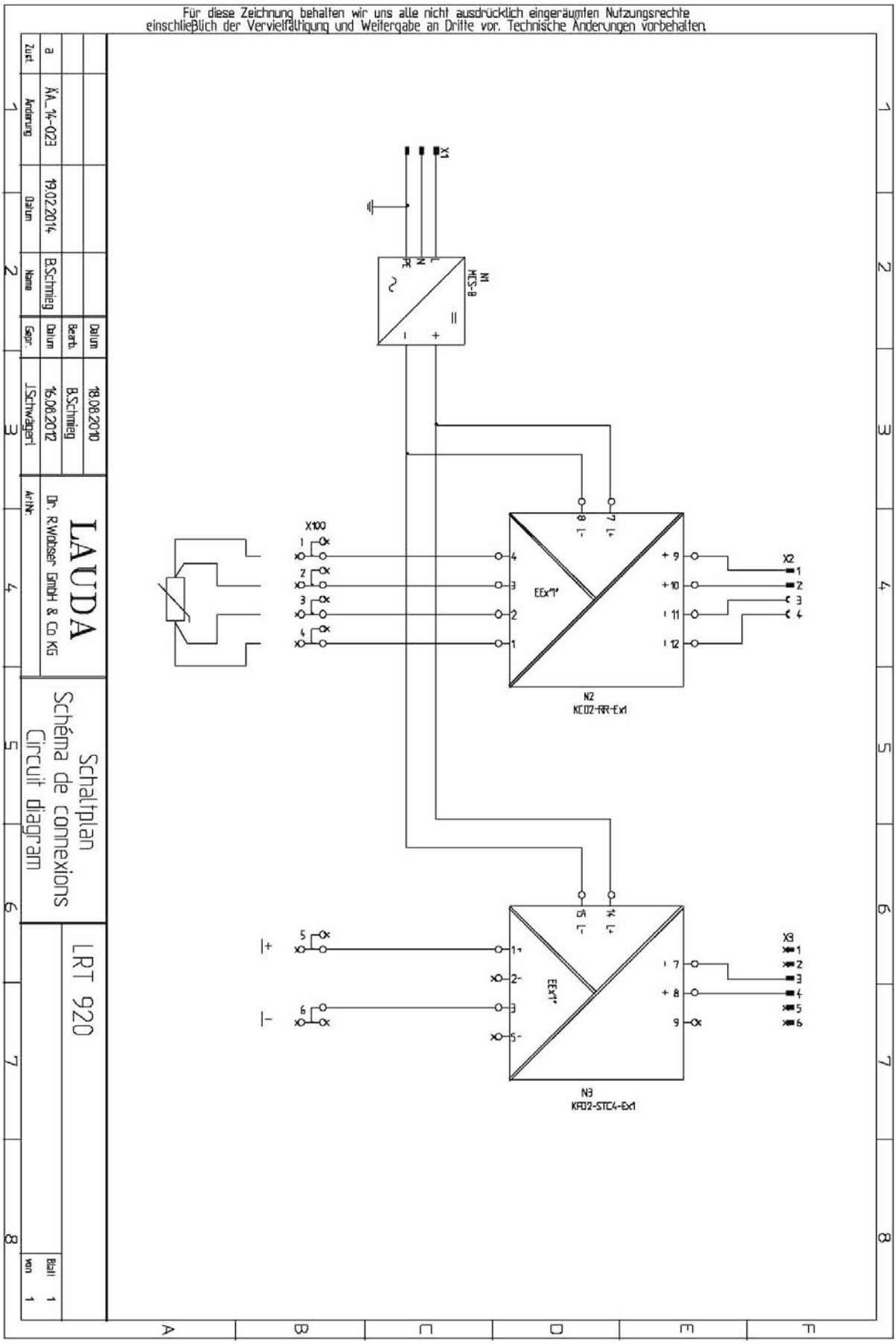
LAUDA
Dr. R.Wobser GmbH & Co KG
Schaltplan
Schéma de connexions
Circuit diagram
LRT 919
18.08.2010
B.Schmieg
X100
X1
X2
N2
NFD2-STC4-Ex1
N8
NFD2-STC4-Ex1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LAUDA
Dr. R.Wobser GmbH & Co KG
Schaltplan
Schéma de connexions
Circuit diagram
LRT 920
Blatt 1
von 1
X1
N1
MCS-8
X100
N2
KC02-AR-Ex1
X2
N3
KF02-STC4-Ex1
X3