

USV-88/X

Uninterruptible Power Supply

**with Interface Adapter
and Signal Amplifier**

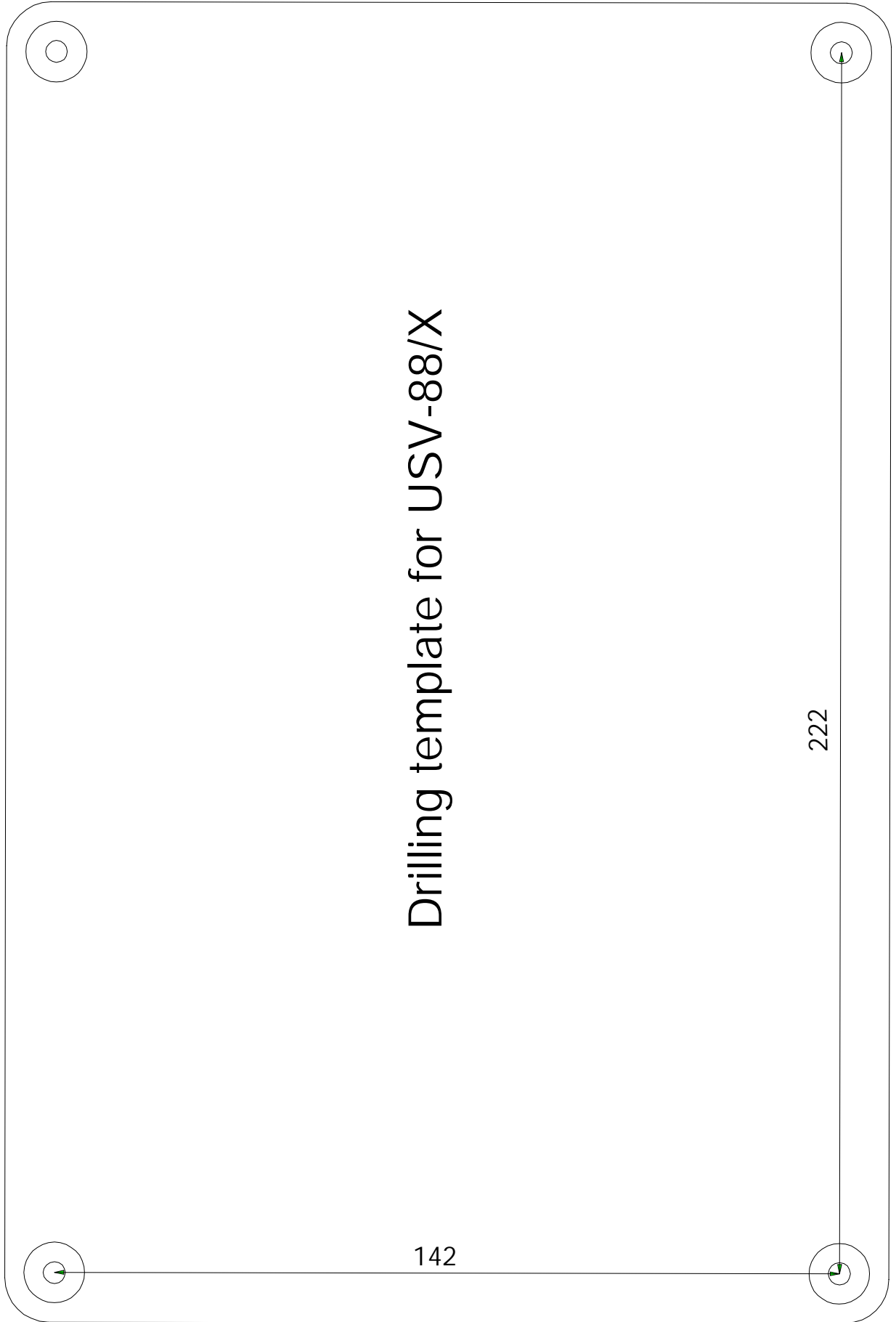
Uninterruptible Power Supply USV-88/X
Operating Instructions

Oper. Man.	73014860	Version	V14
Issued	12/1995	Edition	05

Drilling template for USV-88/X

142

222



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	Drilling template	Centre of manual


1 Safety information

The USV-88/X is supplied with 230 V mains voltage. Mains voltage can be highly dangerous!

 *Only switch on the mains voltage after all the cables have been connected and the cover of the housing is closed.*

The device is approved as "associated electrical equipment" in the category "ib" conforming to DIN EN 50020 with intrinsically safe circuits. It is therefore suitable for connection to a device located in an area subject to explosion hazards (Zone 1). The following information is very important in this application:

 *Follow the regulations in the relevant standards, in particular DIN VDE 0165.*

 *Make certain that limits stated in the certificate of conformance for the device to be connected do not violate those of the USV-88/X (do not undercut U_0 , I_k or exceed L_a , C_a).*

(When connecting a type "EK-88" Volume Corrector this is the case so that no further check is required.)

 *The cables for the intrinsically safe circuit of the USV-88/X must not exceed a length of 50 m.*

Also follow all the information contained in the chapter "Installation".

2 Description

2.1 Overview

The USV-88/X Uninterruptible Power Supply fulfils the following tasks:

- Supplies power for a terminal device (e.g. an "EK-88" Volume Corrector) with capability for bridging a mains failure.
- Adaptation of the serial interface on the terminal device to form a genuine V.24 interface.
- Amplification of a signal output on the terminal device.
- Complete electrical isolation of the terminal device.

The USV-88/X has explosion protection approval as "associated electrical equipment" for connection to a terminal device located in an area subject to explosion hazards.

This means that any devices can be connected via the USV-88 to the signal output or interface of the terminal device.

If the USV-88/X is connected to an EK-88 Volume Corrector, then it is supplied with power exclusively through the UPS (Uninterruptible Power Supply). The internal batteries in the EK-88 are saved and there is a two-stage power reserve available when a mains failure occurs.

- First, the internal rechargeable batteries in the USV-88 supply the power for about 20 hours. The function and the battery service life of the EK-88 are retained just as completely as with an intact mains supply.
- If the mains failure lasts longer than about 20 hours, the EK-88 switches automatically to battery operation due to its internal batteries. The total power reserve here corresponds to its battery life (see EK-88 Operating Instructions).

The USV-88/X Uninterruptible Power Supply consists basically of three parts for the following tasks (cf. Fig. 1: "Block diagram"):

- Power supply of a terminal device located in Ex Zone 1 (e.g. an "EK-88" Volume Corrector) with capability for bridging a mains failure.
- Adaptation of the serial interface of the terminal device and extension into the area not subject to explosion hazards so that any devices can be connected.
- Amplification of the signal output from the terminal device and extension into the area not subject to explosion hazards so that any devices can be connected.

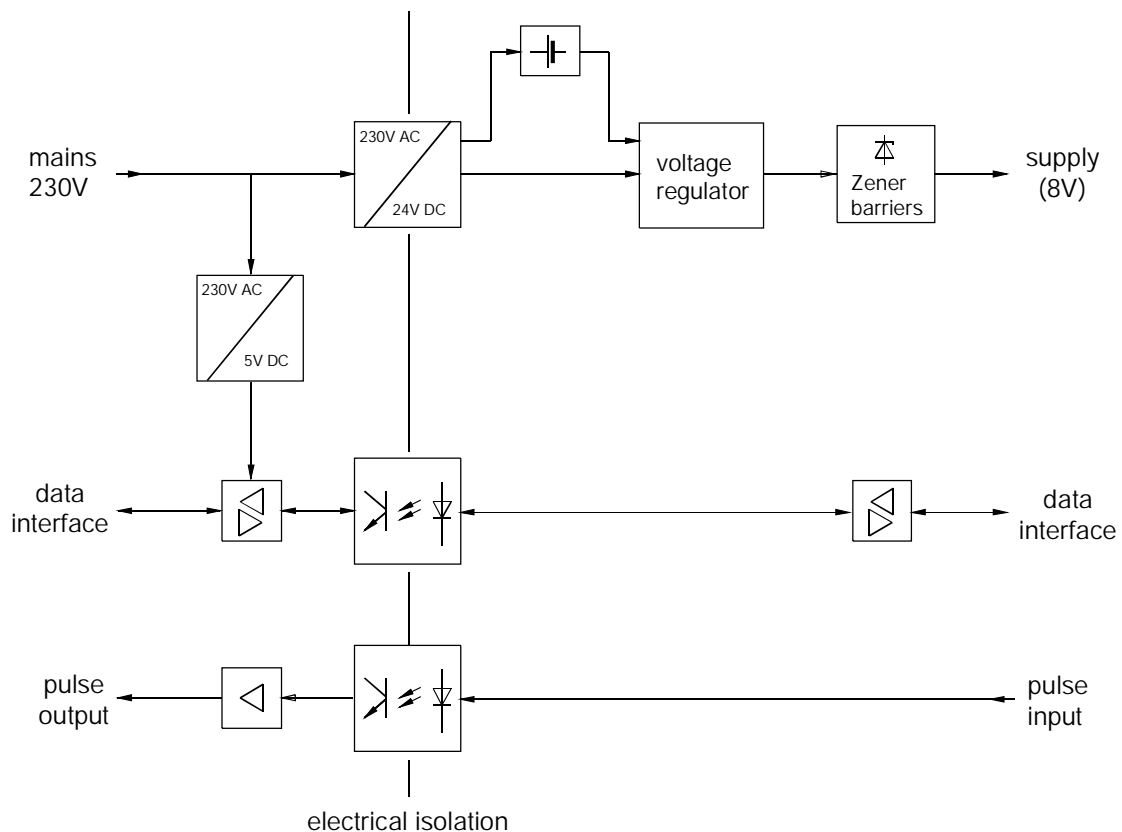


Fig. 1: Block diagram

2.2 EEx approval

The USV-88/X board is approved according DIN EN 50020 and to DIN VDE 0165 as "associated electrical equipment" with intrinsically safe input circuits to "[EEx ib] IIB". The certificate of conformance (PTB No. Ex-93.C.4076 X) can be found in the appendix.

This approval allows it to be connected to a terminal device (e.g. an EK-88 Volume Corrector) located in an area subject to explosion hazards (Ex Zone 1). Any devices can be connected to the peripheral circuits (interface, signal output) extended in this way, provided they are not supplied with more than $250 V_{ac}$ (limit).

2.3 Power supply output

The USV-88/X provides a power supply for a terminal device located in an area subject to explosion hazards. This connection is made to the upper two terminals on the terminal strip "K4" ("8V DC").

If the terminal device is an EK-88 Volume Corrector, then the power supply for the EK-88 is handled exclusively by the USV-88/X, extending the service life of the internal batteries in the EK-88.

In addition the USV-88 is fitted with internal rechargeable batteries which take over the supply of power for up to 20 hours after a mains failure. If these batteries become discharged due to a longer period of power failure, the EK-88 switches automatically to battery operation.

After connection of the USV-88 the functions "Measurement cycle" and "Permanent display" in the EK-88 are inhibited and the following mode activated:

- The display is switched to permanent operation with updating every second.
- The measurement cycle is automatically set to one second.

Also, the pulse and alarm outputs on the EK-88 can be used without restriction (see chapter "Signal output" below).

2.4 Signal output

A digital signal sent by the connected terminal device (e.g. pulse or alarm output) is electrically isolated and amplified. Here, the signal output of the terminal device is connected to the lower two terminals ("Al./Pul.") on terminal strip "K4".

The USV-88/X passes on the signal received from the terminal device unmodified in time. Any device can be connected to the signal output (terminal strip "K3") provided it does not exceed any of the limits stated in the chapter "Technical data".

Please take note of the information in the chapter "Installation" (see above).

With the connection of the USV-88/X to an EK-88 its pulse or alarm output can be used without restriction. In particular there are the following extensions to the range of functions:

- It is possible to use the alarm output.
- The service life of the internal batteries is no longer affected by the use of the pulse output.
- When using the pulse output, the pulse duration is extended to 250 ms.
- The source capacity of the signal output is increased to 30 V/0.5 A.

2.5 Interface adapter

The EK-88 Volume Corrector has a data interface which is very similar to the RS-232C / V.24, commonly found on personal computers. It differs in the following points:

	EK-88 interface	RS-232C / V.24
Output signal level H/L	> +2V / < +0.8V	> +3V / < -3V
Power supply	5...10V	none

Table 1: Differences between the EK-88 and RS-232C / V.24 interfaces

The EK-88 therefore does not completely fulfil the requirements of the signal level of an RS-232C / V.24 interface. In addition, it needs a power supply from the connected device for its interface driver.

Problems which might arise due to these restrictions with EK-88 special applications are solved by using the USV-88/X with the integral interface adapter:

The USV-88/X converts the signals from the EK-88 to genuine RS-232C / V.24 signals and makes the required power supply for the interface driver available. The interface extended by the USV-88/X is therefore fully compatible to the RS-232C / V.24 and can be connected without any problem to devices such as personal computers, laptops, printers, etc.

The connection is made on the round plug on the USV-88/X which is located at the cable gland (see Fig. 2: "Position of the interface connector.."). It is accessible after unscrewing the protective cap.

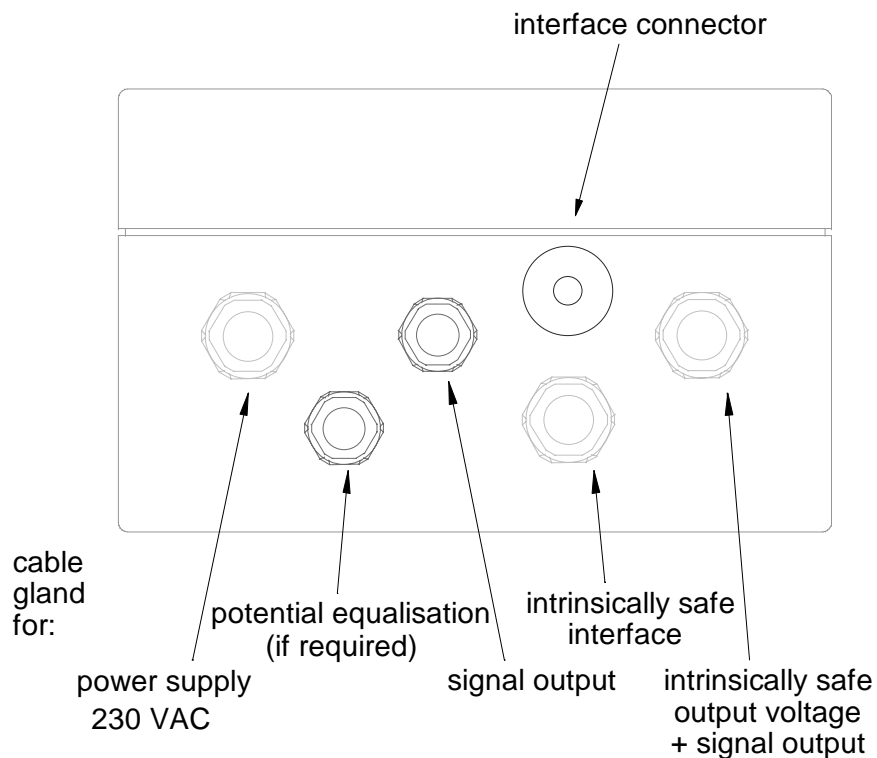


Fig. 2: Position of the interface connector and the cable glands


The EK-88 interface is connected to the terminal strip "K5" on the USV-88/X.

Data transport devices from Elster, such as for example the AS-100 Read-out Device or the EM-100 Modem, have a genuine RS-232C / V.24 interface, but also fulfil all the requirements for the EK-88. Therefore, they can also be directly connected to the volume corrector, provided that the volume corrector is not located in Ex Zone 1.

The USV-88/X interface can also operate during a mains failure, provided the rechargeable batteries are still charged. However, one precondition is that the 5V supply voltage for the interface driver is also made available via the interface connector (as is the case, for example, with the AS-100 and the EM-100).

3 Installation


3.1 Mounting the device

 *The USV-88/X must not be installed in Ex Zone 1.*

Screws and plugs for mounting the device on a wall are included in the supplied items.

The drilling template in the centre of this manual can be used to position the fixing holes.

3.2 Connecting the cable


 *If the instructions in this chapter are not followed, data loss and functional problems may occur in the EK-88 Volume Corrector that is to be connected. In such cases guarantee claims cannot be considered.*

Cause:

In accordance with the applicable regulations, the EK-88 is insensitive to electrostatic discharge provided that the protective caps are screwed onto the connectors. However, since the protective cap on the connector for the external power supply must be removed when connecting the USV-88/X, a direct or indirect electrostatic discharge to the connector pins may occur in some circumstances.

Prevention:

The power supply cable to the EK-88 should be first connected to the USV-88/X terminals. Then before the connector is connected to the EK-88 power supply input, the metal housing on the connector should be kept at earth potential so that any electrical charge that exists is conducted to earth.

 *Only switch on the mains voltage after all cables are connected and the housing cover is closed.*

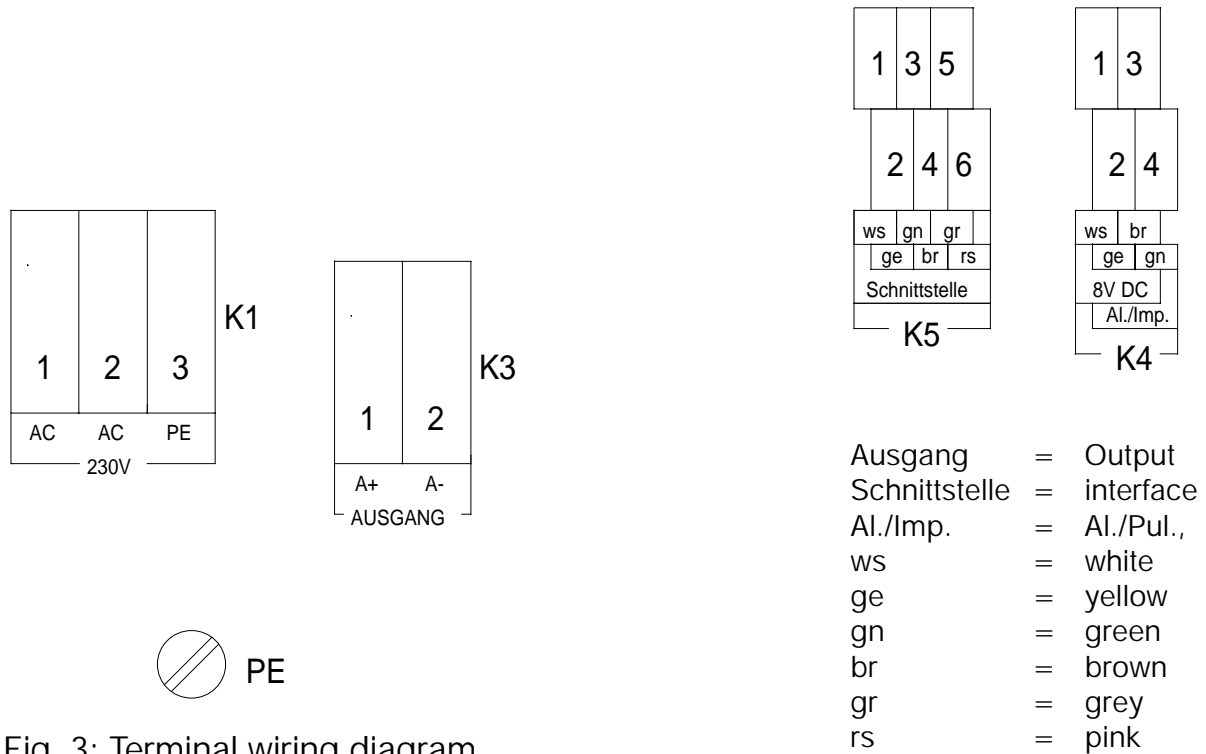


Fig. 3: Terminal wiring diagram

Terminal	Abbreviated name	Description
K1-1	AC	230V _{AC} AC mains voltage input (L or N)
K1-2	AC	230V _{AC} AC mains voltage input (L or N)
K1-3	PE	Earth (protective conductor)
K3-1	A+	Signal output (pulse or alarm output) "+"
K3-2	A-	Signal output (pulse or alarm output) "-"
K4-1	8V DC +	Power supply for EK-88 "+"
K4-3	8V DC -	Power supply for EK-88 "-"
K4-2	Al/Pul.	Signal input (pulse or alarm input) "+"
K4-4	Al/Pul.	Signal input (pulse or alarm input) "-"
K5-1	+5V	Intrinsically interface, power supply
K5-2	TxD	Intrinsically interface, data input
K5-3	RxD	Intrinsically interface, data output
K5-4	RTS	Intrinsically interface, control signal input
K5-5	CTS	Intrinsically interface, control signal output
K5-6	Gnd	Intrinsically interface, signal ground
PE	PE	Screw for separate potential equalisation lead (optional)

Table 2: Description of connections

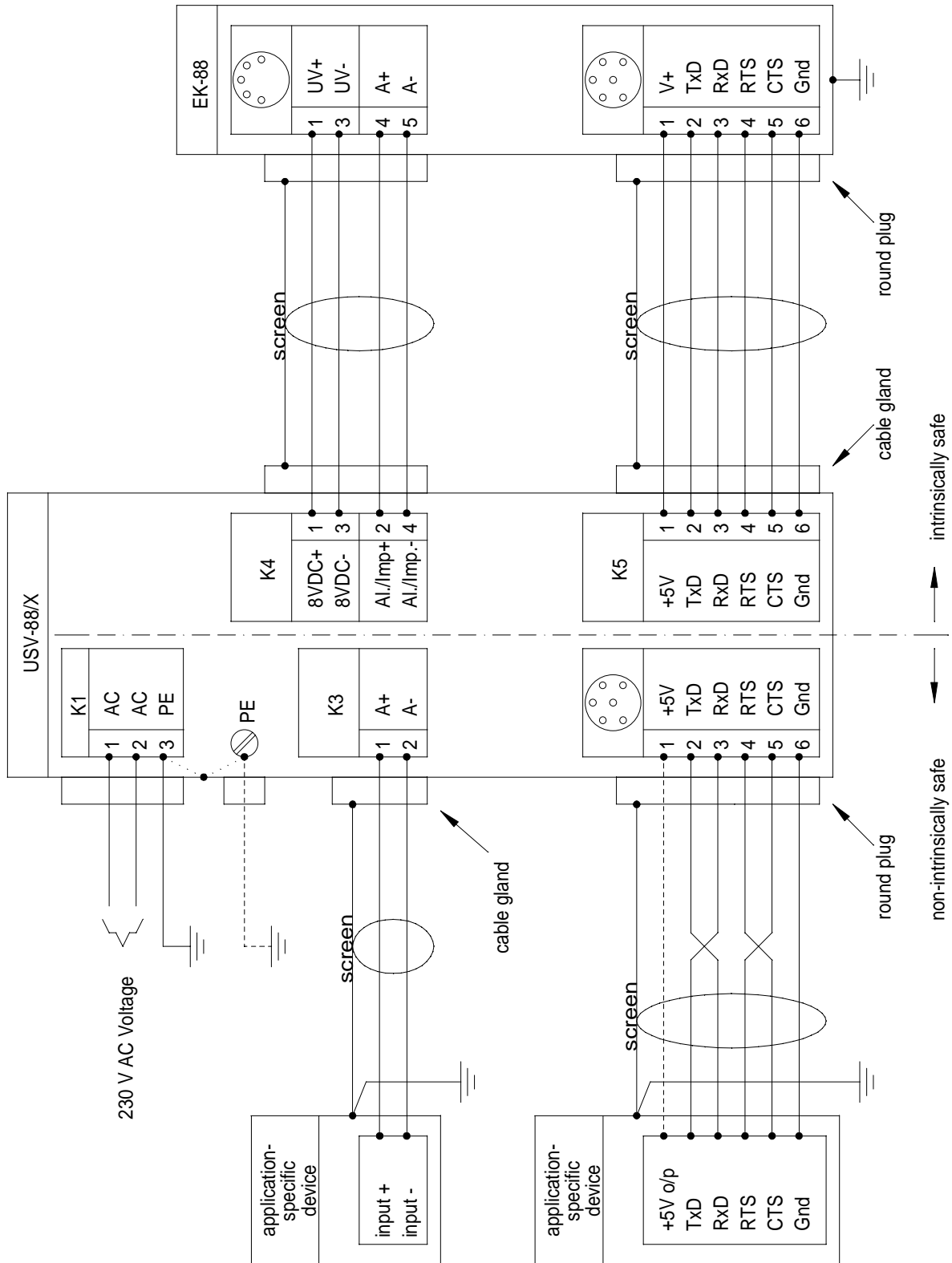


Fig. 4: Wiring diagram

The following should be observed when wiring up:

- The data and control signal connections on the intrinsically safe interface should be wired to the connections on the EK-88 having the same name, i.e. in the USV-88/X TxD and RTS are inputs and RxD and CTS are outputs.
- With the non-intrinsically safe interface (round plug) TxD and RTS are outputs and RxD and CTS are inputs. Correspondingly, the lines referring to signals with the same name on the device to be connected should be crossed.
- The connection of the +5V supply voltage to the non-intrinsically safe interface is optional. However, it is required if data is to be transferred during a mains failure.
- To improve the interference immunity to high energy phenomena such as electrostatic discharge ("ESD") or lightning strikes in the immediate vicinity, a separate low resistance potential equalisation lead can be connected to the screw labelled "PE" in front of the terminals. A cable gland is provided for this purpose (see Figs. 2 and 3).

3.2.1 Intrinsically safe circuits

The following should be noted when wiring intrinsically safe circuits:

- The cables for the intrinsically safe circuits must be identified as such (e.g. by a bright blue sheath colour) and must not exceed a length of 50 m. They must conform to all the requirements of DIN VDE 0165.
- All earth cables must be routed to one potential equalisation strip. Otherwise potential equalisation should be provided conforming to DIN VDE 0165, section 5.3 or DIN VDE 0100 Part 410.

In addition the other requirements of DIN VDE 0165 apply.

Ready made-up cables for the intrinsically safe circuits are available from Elster. The terminals on the USV-88/X are labelled with the wire colours of these cables and the connections can be made without problem. The exact specification and the order numbers of the cables can be taken from the Chapter "Technical data".

3.2.2 Screening

As shown in Fig. 4 (see above), screened cable should be used. The cable screen should be earthed at both ends. Extra potential equalisation lines can be routed to avoid equalisation currents due to any existing potential differences.

To ensure the electromagnetic compatibility of the device, proper connection of the cable screens is very important. The screens must be connected completely and flat.

3.2.2.1 Screen connection at the cable gland

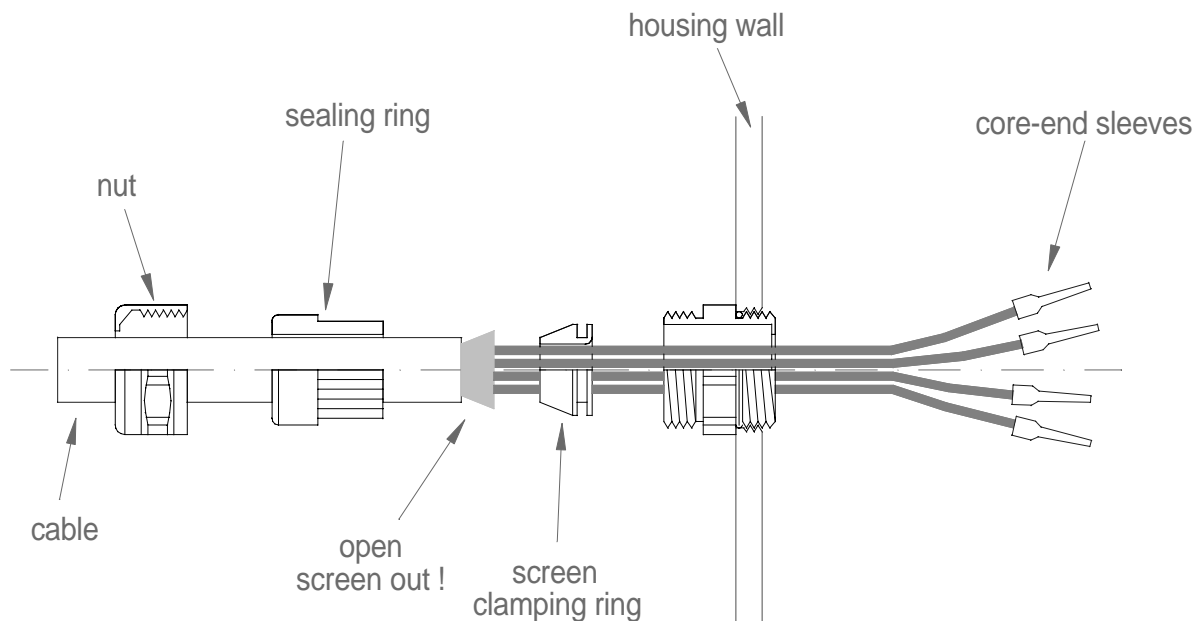


Fig. 5: Screen connection on the cable gland

Procedure for connecting the cable screen to the cable gland:

1. Push the nut and sealing ring over the cable.
2. Strip back the cable sheath to suit the distance between the housing wall and terminals (e.g. about 10 cm).
3. Cut off the screen so that it protrudes about 10 mm from the sheath.
4. Open out the screen slightly.
5. Push the screen clamping ring under the screen.
6. If necessary strip the wires and fit them with core-end sleeves.
7. Insert the cable into the cable gland until the screen clamping ring lightly rests against the gland. Do not use force to push the cable into the housing.
8. Push the sealing ring into the gland (over the screen and the clamping ring) and screw the nut tight. The cable must be firmly clamped to the gland.
9. Connect the wires to the terminals.

3.2.2.2 Screen connection at the round plug

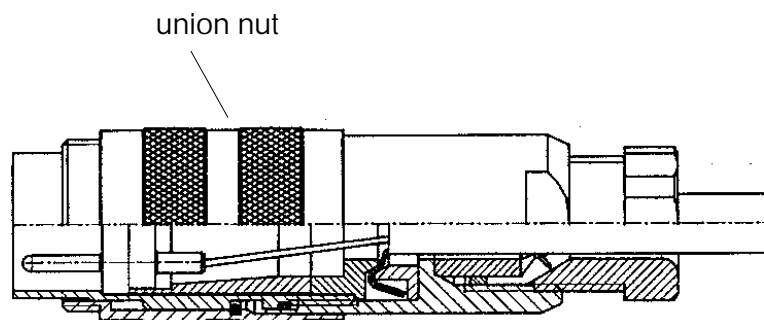
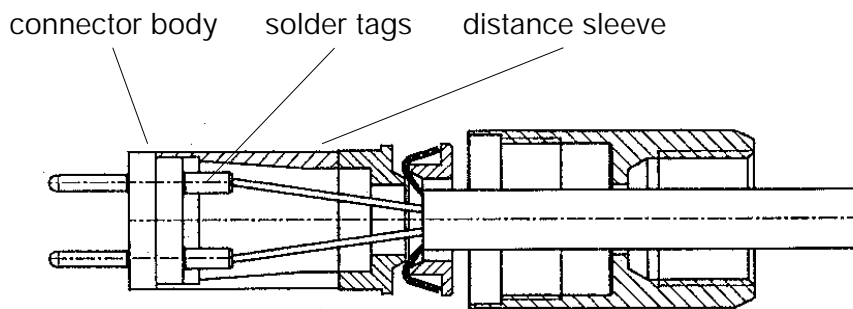
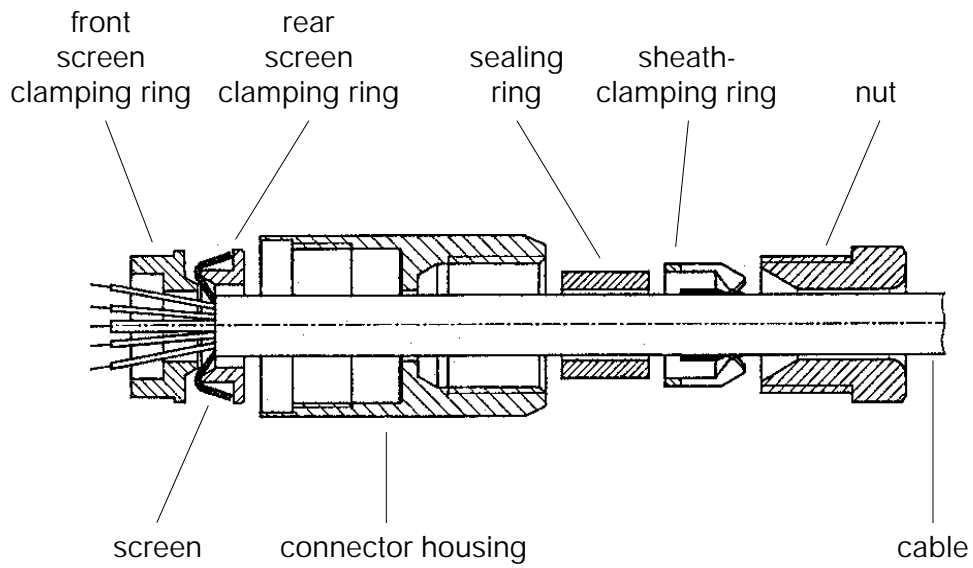


Fig. 6: Fitting the round plug to the cable with screen connection

Procedure when connecting the cable screen to the round plug:

1. Push the nut, sheath clamping ring, sealing ring, connector housing and rear screen clamping ring over the cable (thread on the housing towards the back).
2. Strip the cable sheath back approx. 3 to 4 cm.
3. Cut the screen such that about 1 to 2 cm protrudes from the sheath.
4. Bend the screen towards the back over the rear screen clamping ring. The screen must lie complete and flat on the clamping ring.
5. Push the front clamping ring over the wires up to the screen.
6. Strip the wires and solder them to the solder tags.
7. Place the distance sleeve round the wires and push onto the connector body. The through slot in the distance sleeve must be positioned on the groove in the connector body.
8. Push the connector body towards the front up to the clamping ring and screw on the union nut from the front. (A wrench is available for fitting the union nut.)
9. Push the sealing ring and sheath clamping ring into the connector housing and clamp the cable by screwing in the nut.

3.3 Settings

The jumper "J1" (see Fig. 7: Layout...), with which two settings can be selected, is located on the device board:

- a) Setting J1 = "normal (RTS=CTS)"
- b) Setting J1 = "RTS signal"

The setting designations are labelled on the board.

The jumper is intended for extensions to the EK-88 functions. Therefore, it should remain in the "normal (RTS=CTS)" basic position for the standard application.

Fitting the jumper J1 to the position "RTS signal" or its removal may cause problems when using the alarm or pulse outputs during data transmission via the interface.

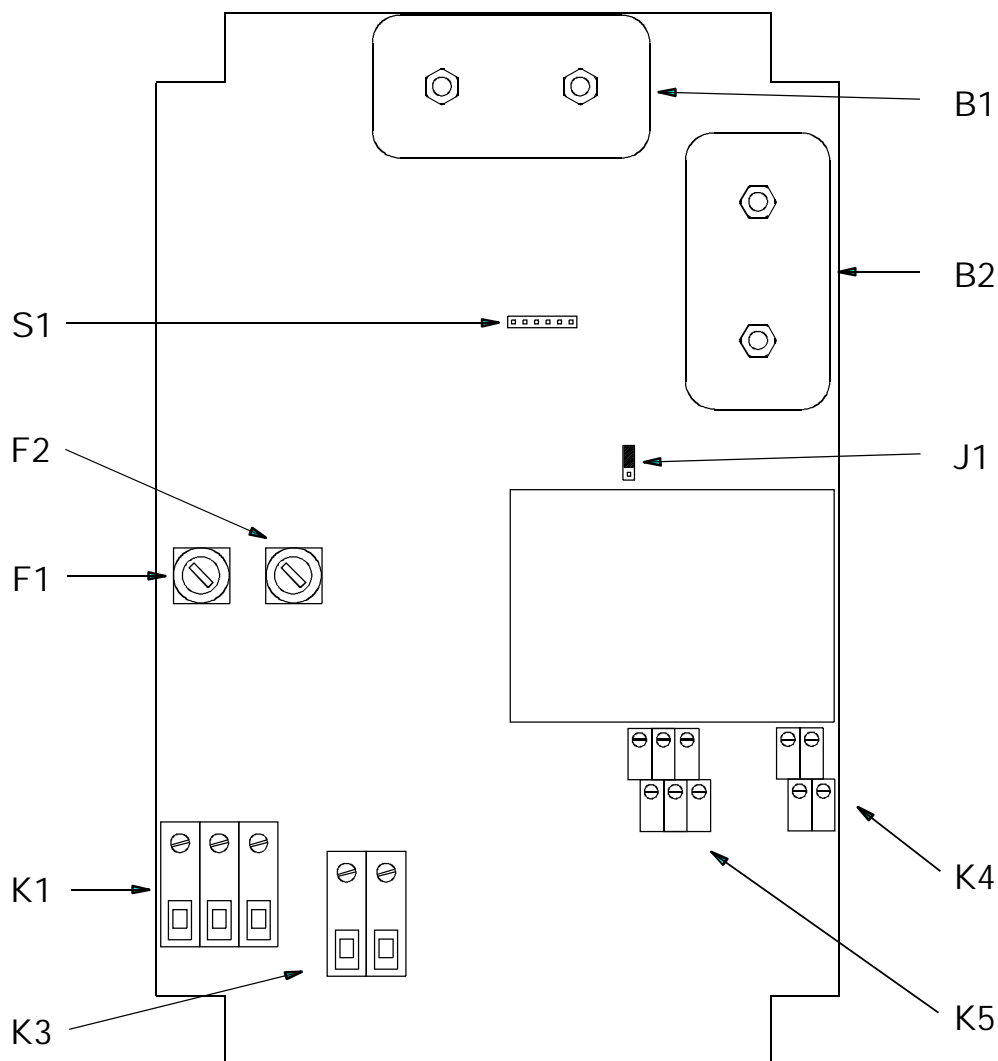


Fig. 7: Assembly diagram of the components on the board

- F1, F2: Fuses
- S1: Connector for connecting the round plug for the non-intrinsically safe interface
- B1, B2: Battery blocks
- J1: Jumper
- K1, K3, K4, K5: Connection terminals

4 Initial operation

After installation has been completed the mains voltage is switched on. The connected EK-88 will then activate its display and update it every second.

If all the cables have been correctly connected, the signal output and the interface can be operated.

If this is the case, then the installation and initial operation are finished.

The USV-88/X is supplied with charged batteries. After a longer period of disconnection from the mains they do however gradually lose their charge due to natural self-discharge. Therefore, normally after installation, the full capacity for bridging a mains failure only becomes available reliably after the device has been supplied on mains voltage for at least 24 hours.

5 Maintenance

The rechargeable batteries contained in the device lose their capacity in the course of time, as do all NiCd batteries. This means that the available bridging time for a mains failure reduces. The bridging period for the device as supplied is at least 20 hours. A rule of thumb is that the capacity of the rechargeable batteries approximately halves every 5 years.

When the bridging period has reduced to a level which is no longer acceptable, the two battery blocks must be replaced. The device can either be sent to Elster for this or you can carry out the replacement yourself, but appropriately trained staff are required.

If you replace the battery blocks yourself, please following the following instructions:

Equipment required:

- 1 soldering iron (possibly independent of mains)
- 1 spanner 7 mm
- 1 slot-head screwdriver 1.0 x 6 or similar
- 1 cross-head screwdriver

Procedure:

If the USV-88/X is connected to Ex Zone 1, take into account the relevant standards and regulations when replacing the battery blocks.

- Isolate the USV-88/X from mains voltage.
- Desolder the 4 solder tags on the battery blocks from the board. Heat up the solder tags and pads only until the solder tags can be bent up a little and then be removed from the board. Take care that you do not burn any components with the soldering iron (e.g. the battery cases).
- Loosen the four screws that attach the board to the housing and tip the board with the side on which the batteries are located to the front.
- Loosen the battery fixing screws and remove them.
- Fasten the new batteries with the appropriate screws and nuts.

The solder tags must contact the corresponding solder pads on the board.

The screw heads and the smaller washers are fitted to the bottom of the board and the nuts and the larger washers on the top of the battery blocks.

- Tip the board back and fasten it with the four screws. Only tighten the nuts such that they do not deform the covers on the battery blocks.
- Solder the solder tags on the battery blocks to the solder pads. Heat up the solder tags and pads only until the solder has wetted the surface. Proceed carefully and ensure that solder is only applied to the intended points. Take care that you do not burn any components with the hot soldering iron.
- Switch on the mains voltage again.

The new batteries will be loaded after 24 hours at the latest, so that then the full power reserve will be available.

6 Technical data

6.1 Ambient conditions

Ambient temperature: -10...+50°C

6.2 Mechanical details

Aluminium housing

Dimensions: 160 x 240 x 100 mm (W/H/D)

Mounting: Wall mounting
Screws and plugs included in supplied items

Drilling template: (see centre of manual)

Protection: IP 65 (DIN 40050)

6.3 Power supply

Supply voltage: 230 V_{AC} +10 / -15%

Power consumption: approx. 6 W

Fuses (F1, F2): each 80 mA slow blow

Cable gland: Pg 11

For cable diameter: 7.0 to 10.0 mm

6.4 Potential equalisation

Cable gland: Pg 9

For cable diameter: 6.5 to 9.0 mm

The connection of a separate potential equalisation strip is optional, but is recommended to improve the interference immunity.

6.5 Mains-failure bridging

NiCd rechargeable batteries:	8 x 1.2 V / 700 mAh
Type	8 / 700 RSE (Varta)
or	8 VE AA 026 (Saft)
Bridging period:	min. 20 h at 30 mA output current
Charging time:	max. 24 h (for discharged batteries)

6.6 Signal output

Switching voltage:	max. 30 V
Switching current:	max. 0.5 A
Cable gland:	Pg 9
For cable diameter:	6.5 to 9.0 mm

6.7 Serial interface RS232C / V.24

Fully compatible to the industrial standard RS-232C resp. V.24.

Baud rate:	max. 9600 baud
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Outputs: (TXD, RTS)

Output voltage "H":	+5...+10 V
Output voltage "L":	-5...-10 V
Output current:	max. 2 mA

Inputs: (RXD, CTS)

Input voltage "H":	min. +2.4 V
Input voltage "L":	max. +0.8 V
Input resistance:	min. 3 k Ω

Voltage supply input

Input voltage	4.5 ...5.5 V
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Connector:

Type:	Round connector, Binder Series 723
Protection:	IP67 (DIN 40050)
Pin layout:	conforms to DIN 45322

Pin assignment:	1:	+5V (Power supply)
	2:	TXD (Data output)
	3:	RXD (Data input)
	4:	RTS (Control signal output)
	5:	CTS (Control signal input)
	6:	Gnd (Signal ground)

With the mains supply connected to the USV-88/X, the voltage supply "+5V" (Pin 1) can be left unconnected.

If matching opposing connectors of other makes are used, problems with the screw locking may occur. But the electrical function is not impaired.

6.8 Intrinsically safe output voltage

Intrinsically safe circuit [EEx ib] IIB, PTB No. Ex-93.C.4076 X

Safety limits: see certificate of conformance

Output voltage: $8\text{ V} \pm 0.2\text{ V}$

Output current: max. 30 mA

Ripple: max. 5 mV_{pp}

Cable gland: Pg 11

For cable diameter: 7.0 to 10.0 mm

(The intrinsically safe output voltage is routed via the same cable as the intrinsically safe signal input, see below.)

6.9 Intrinsically safe signal input

Intrinsically safe circuit [EEx ib] IIB, PTB No. Ex-93.C.4076 X

Safety limits: see certificate of conformance

For connection to mechanical contacts, transistor switches or optocouplers.

Open-circuit voltage: $8\text{ V} \pm 0.2\text{ V}$

Input current: max. 1 mA

Cable gland: Pg 11

For cable diameter: 7.0 to 10.0 mm

(The intrinsically signal input is routed via the same cable as the intrinsically safe output voltage, see above.)

6.10 Intrinsically safe serial interface

Similar to industrial standard RS-232C resp. V.24.

Intrinsically safe circuit [EEx ib] IIB, PTB No. Ex-93.C.4076 X

Safety limits: see certificate of conformance

Baud rate: max. 9600 baud

Outputs: (TXD, RTS)

Output voltage "H": +4...+5 V

Output voltage "L": 0...+0.4 V

Output current: max. 5 mA

Inputs: (RXD, CTS)

Input voltage "H": min. +3.5 V

Input voltage "L": max. +1.5 V

Input resistance: min. 1 MΩ

Power supply output: (+5V)

Output voltage: 4.5...5.0 V

Output current: max. 5 mA

Terminal strip: (K5)

Type: MKKDS3/6-5.08 (Phoenix)

Core cross-section: max. 2.5 mm²

Pin assignment:	1: +5V (Power supply)	(white wire)
	2: TxD (Data output)	(yellow wire)
	3: RxD (Data input)	(green wire)
	4: RTS (Control signal output)	(brown wire)
	5: CTS (Control signal input)	(grey wire)
	6: Gnd (Signal ground)	(pink wire)

Cable gland: Pg 11

For cable diameter: 7.0 to 10.0 mm

7 Ordering information

7.1 Included items

The following items are supplied with USV-88/X:

- USV-88/X Power Supply Unit
- 4 screws and 4 plugs for wall mounting
- Operating Instructions

7.2 Ordering data

	Order no.
USV-88/X complete:	83480510
Available as accessories:	
Connecting cable for power supply and signal output, ready made-up, length 5 m	73014977
Connecting cable for power supply and signal output, ready made-up, length 10 m	73012560
Connecting cable for power supply and signal output, ready made-up, length 20 m	73014978
Connecting lead for interface, ready made-up, length 5 m	73014979
Connecting lead for interface, ready made-up, length 10 m	73013554
Connecting lead for interface, ready made-up, length 20 m	73014980

8 EC Declaration of Conformance

EG-Konformitätserklärung

gemäß „Gesetz über die elektromagnetische Verträglichkeit von Geräten (EMVG)“
bzw. EMV-Richtlinie 89/336/EWG des Rates vom 3. Mai 1989 (EMV-Richtlinie)

Die Unterbrechungsfreie Stromversorgung

Typ USV-88/X

erfüllt die EMV-Anforderungen gemäß

DIN EN 50082 Teil 1

sowie

DIN VDE 0878 Teil 3 bzw. EN 55022



i.V. Pfaff



i.A. Dörfler

Mainz-Kastel, den 13. Dezember 1995

ELSTER 

Elster Produktion GmbH, Steinernstraße 19, 55252 Mainz-Kastel
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8.1 EC Declaration of Conformance

(Translation of German document)

EC Declaration of Conformance

according to "Law on the electromagnetic compatibility of equipment (EMCL)" and the EMC Guideline 89/336/EEG of the Council of 3rd May 1989 (EMC Guideline)

The Electronic Volume Corrector

USV-88/X

fulfils the EMC requirements according to

DIN EN 50082 Part 1
and
DIN VDE 0878 Part 3 or EN 55022

Mainz-Kastel, 13th December 1995

ELSTER

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9 EEx Certificate of Conformance


Physikalisch-Technische Bundesanstalt



- (1) **KONFORMITÄTSBESCHEINIGUNG**
- (2) **PTB Nr. Ex-93.C.4076 X**
- (3) Diese Bescheinigung gilt für das elektrische Betriebsmittel
Platine Typ U8X-5V2
- (4) der Firma **Elster Produktion GmbH**
D-90509 Mainz-Kastel
- (5) Die Bauart dieses elektrischen Betriebsmittels sowie die verschiedenen zulässigen Ausführungen sind in der Anlage zu dieser Konformitätsbescheinigung festgelegt.
- (6) Die Physikalisch-Technische Bundesanstalt bescheinigt als Prüfstelle nach Artikel 14 der Richtlinie des Rates der Europäischen Gemeinschaften vom 18. Dezember 1975 (76/117/EWG) die Übereinstimmung dieses elektrischen Betriebsmittels mit den harmonisierten Europäischen Normen
Elektrische Betriebsmittel für explosionsgefährdete Bereiche
EN 50 014:1977 + A1 ... A5 (VDE 0170/0171 Teil 1/1.87) Allgemeine Bestimmungen
EN 50 020:1977 + A1 ... A2 (VDE 0170/0171 Teil 7/1.87) Eigensicherheit "1"
- nachdem das Betriebsmittel mit Erfolg einer Bauartprüfung unterzogen wurde. Die Ergebnisse dieser Bauartprüfung sind in einem vertraulichen Prüfprotokoll festgelegt.
- (7) Das Betriebsmittel ist mit dem folgenden Kennzeichen zu versehen:
- [EEx ib] IIB**
- (8) Der Hersteller ist dafür verantwortlich, daß jedes derart gekennzeichnete Betriebsmittel in seiner Bauart mit den in der Anlage zu dieser Bescheinigung aufgeführten Prüfungsunterlagen übereinstimmt und daß die vorgeschriebenen Stückprüfungen erfolgreich durchgeführt wurden.
- (9) Das elektrische Betriebsmittel darf mit dem hier abgedruckten gemeinschaftlichen Unterscheidungszeichen gemäß Anhang II der Richtlinie des Rates vom 6. Februar 1979 (79/196/EWG) gekennzeichnet werden.

Im Auftrag

Braunschweig, 23.09.1993


 Dr.-Ing. Schebske
 Regierungsdirektor


Die Bescheinigungen ohne Unterschrift und ohne Dienststempel haben keine Gültigkeit.

Die Bescheinigungen dürfen nur unverändert weiterverbreitet werden.

Auszüge oder Änderungen bedürfen der Genehmigung der Physikalisch-Technischen Bundesanstalt, Bundesallee 100, Postfach 33 45, D-3300 Braunschweig.

Physikalisch-Technische Bundesanstalt

A N L A G E

zur Konformitätsbescheinigung PTB Nr. Ex-93.C.4076 X

Die Platine Typ U8X-SVB dient zur Stromversorgung und zur Signalübertragung von im explosionsgefährdeten Bereich befindlichen Baugruppen.

Die höchstzulässige Umgebungstemperatur beträgt 50 °C.

Elektrische Daten

Versorgungsstromkreis 220 VAC; 6 VA
(Klemme K1)

Impulsausgang U = 24 V
(Klemme K3) U_m = 250 V

serielle Schnitt- U = ± 15 V
stelle U_m = 250 V
(Klemme S1)

Versorgungs- und in Zündschutzart Eigensicherheit EEx ib IIB
Signalstromkreis Höchstwerte:
(Klemme K4) U₀ = 9,6 V
I_k = 75 mA

Kennlinie: trapezartig
höchstzul. äußere Induktivität 25 mH
höchstzul. äußere Kapazität 12 µF

digitale Schnitt- in Zündschutzart Eigensicherheit EEx ib IIB
stelle Höchstwerte:
(Klemme K5) U₀ = 9,6 V
I_k = 33 mA

Kennlinie: trapezartig
höchstzul. äußere Induktivität 25 mH
höchstzul. äußere Kapazität 11 µF

Die eigensicheren Stromkreise sind galvanisch untereinander verbunden und von allen übrigen Stromkreisen bis zu einem Scheitelwert der Nennspannung von 375 V sicher galvanisch getrennt.

Prüfungsunterlagen sind unterschrieben

1. Beschreibung (21 Blatt)
2. Zeichnung u. Stückliste Nr. 730 135 46 (10 Blatt)
Zeichnung Nr. 730 135 57

Blatt 1/2

Physikalisch-Technische Bundesanstalt

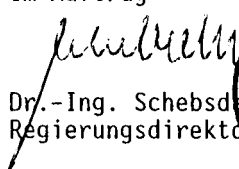
Anlage zur Konformitätsbescheinigung PTB Nr. Ex-93.C.4076 X

Besondere Bedingungen

1. Die Platine U8X-SVB ist so zu errichten, daß mindestens die Schutzart IP 20 gemäß IEC-Publikation 529 erreicht wird.
2. Da die eigensicheren Stromkreise kapazitiv geerdet sind, ist längs des Leitungszuges (außer- und innerhalb des explosionsgefährdeten Bereiches) Potentialausgleich zu realisieren.

Im Auftrag

Braunschweig, 23.09.1993


Dr.-Ing. Schebsda
Regierungsdirektor



Blatt 2/2

Physikalisch-Technische Bundesanstalt

1. NACHTRAG zur Konformitätsbescheinigung PTB Nr. Ex-93.C.4076 X

der Firma Elster Produktion GmbH
D-Mainz-Kastel

Die Platine Typ U8X-SVB darf künftig auch entsprechend den unten aufgeführten Prüfungsunterlagen gefertigt werden.


Die Änderungen betreffen den Aufbau der Platine.

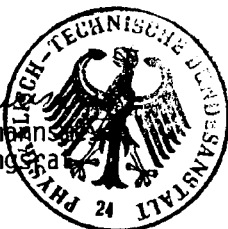
Die "Elektrischen Daten" sowie alle übrigen Angaben bleiben unverändert.

<u>Prüfungsunterlagen</u>	unterschrieben am
1. Beschreibung der Änderung (1 Blatt)	19.04.1995
2. Zeichnung Nr. 73013546 (2 Bl. Schaltplan)	16.02.1995
73013546 (3 Bl. Bestückungsplan und Layout)	12.04.1995
3. Stückliste Nr. 730135 (5 Blatt)	16.02.1995

Im Auftrag

Braunschweig, 19.05.1995


Dr.-Ing. Johannes
Oberregierungsrat



9.1 EEx Certificate of Conformance

(Translation of German certificate)

Federal Standards Board

(1) CERTIFICATE OF CONFORMANCE

(2) **PTB No. Ex-93.C.4076 X**

(3) This certificate applies to the electrical equipment:

Board Type UBX-SVB

(4) from the company Elster Production GmbH,
Mainz-Kastel

(5) The construction of this electrical equipment and the various approved versions are specified in the appendix to this certificate.

(6) The Federal Standards Board grants this certificate as a testing station according to Article 14 of the guidelines from the Council of the European Community of 18th December 1975 (76/117/EWG) for the conformance of this electrical equipment to the harmonised European standards.

Electrical equipment for areas subject to explosion hazard

EN 50:014:1977 + A1...A5 (VDE 0170/0171 Part 1/1.87) General requirements

EN 50:020:1977 + A1...A2 (VDE 0170/0171 Part 7/1.87) Intrinsic safety "i"

(7) The equipment should be labelled as follows:

[EEx ib] IIB

(8) The manufacturer is responsible for ensuring that each item of equipment labelled as above fulfils the test documentation as stated in the appendix to this certificate and that the prescribed sample tests have been successfully carried out.

(9) The electrical equipment may be labelled with the community differentiating symbol printed here according to Appendix II of the guidelines from the Council of 6th February 1979 (79/196/EWG).

Braunschweig, 23rd Sept. 1993

Dr. Ing. Schebsdal
Senior Government Official

Approval certificates without signature and official stamp are not valid.

Approval certificates may only be reproduced without modification.

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Federal Standards Board

APPENDIX

to Certificate of Conformance PTB No. Ex-93.C.4076 X

The board type UBX-USV is intended for the power supply and signal transmission of component assemblies located in areas subject to explosion hazards.

The highest permissible ambient temperature is 50°C.

Electrical data

Supply circuit (Terminal K1)	220 VAC; 6 VA
Pulse output (Terminal K3)	U = 24 V U _m = 250 V
Serial interface (Terminal S1)	U = ±15 V U _m = 250 V
Supply and signal circuits (Terminal K4)	In explosion-protection intrinsically safe EEx ib IIB Highest values: U ₀ = 9.6 V I _k = 75 mA Characteristic: trapezoidal Highest perm. ext. inductance 25mH Highest perm. ext. capacitance 12µF
Digital interface (Terminal K5)	In explosion-protection intrinsically safe EEx ib IIB Highest values: U ₀ = 9.6 V I _k = 33 mA Characteristic: trapezoidal Highest perm. ext. inductance 25mH Highest perm. ext. capacitance 11µF

The intrinsically safe circuits are electrically connected to one another and safely electrically isolated from all other circuits up to a peak value of nominal voltage of 375 V.

Test documents are signed

1. Description (21 pages)
2. Drawing and parts list no. 730 135 46 (10 pages)
Drawing no. 730 135 57

Federal Standards Board

Appendix to Certificate of Conformance PTB No. Ex-93.C.4076 X

Special conditions

1. The board UBX-USV must be installed such that at least IP 20 protection to IEC Publication 529 is achieved.
2. Since the intrinsically safe circuits are earthed capacitively, potential equalisation should be provided along the course of the cable (outside of and inside the area subject to explosion hazards).

Braunschweig, 23rd Sept. 1993

Dr. Ing.Schebsdal
Senior Government Official

Federal Standards Board**1st SUPPLEMENT****to Certificate of Conformance PTB No. Ex-93.C.4076 X**

from the company Elster Produktion GmbH
D-Mainz-Kastel

The board Type UBX-SVB may also in future be produced according to the test documentation listed below.

The modifications relate to the construction of the board.

The "Electrical Data" and all other specifications remain unaltered.

Test documentation	signed on
1. Description of the modification (1 page)	19.04.1995
2. Drawing no. 73013546 (2 pgs. Wiring diagram)	16.02.1995
73013546 (3 pgs. Assembly diagram and layout)	12.04.1995
3. Parts list no. 730135 (5 pages)	16.02.1995

Braunschweig, 19.05.95

Dr.-Ing. Johannson
Senior Executive Officer

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