

SRSB

Voltage regulator - limiter



Nominal voltage	230 V (400 V, 500 V)
Nominal current	25 A (2A, 4A, 6A, 16A, 20A, 25A)
Control range voltage	20 .. 230 V (40 - 400 V)

Voltage regulator - limiter	SRSB
Compact unit	SRSB K
Module device	SRSB M
Operating panel for module device	SRSB Me
Cassette panel for module device	SRSB MK
Plug-in unit	SRSB S

Voltage regulator - limiter

The device functions as voltage regulation - limitation and as current monitoring. With the help of the voltage regulator the effective current for the heating is adjusted. The adjustment is controlled on the amperemeter.

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Warning

The installation, configuration and commissioning may only be carried out by accordingly trained persons. The on-site installation and safety regulations must be observed.



Read these operating instructions before you take the unit into operation. Keep the operating instructions at a place accessible for all users at any time.

Please support us to improve these operating instructions. We are grateful for your suggestions.

Reservation

We reserve the right for technical changes. Changes, errors and printing errors do not justify any claim for damage. For safety components and systems the respective standards and regulations must be observed as well as the applicable operation and installation instructions.

Please contact us for technical queries!

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Repair

Disassembly takes place in reverse order than the installation. A repair of the device is referring to the switching element not possible. Any other repairs may only be carried out in the works of the manufacturer. The main units (socket without terminal box) are, capillaries excluded, irreparable. These may only be changed in the factory. An interventions is not admissible.

Changes which alter the design of the device bring about that the validity of the certificate and any warranty claim expires.



1.0 GENERAL DESCRIPTION SRSB

Characteristics

- Easy installation
- Input γ -signal
- Easy current limitation
- Current transformer output
- Actual value display

The device serves for voltage regulation and limitation and for current monitoring. By means of the voltage regulator the effective current for the heating is adjusted. The adjustment is controlled at the amperemeter.

For the heating conductor GH-IKO-1660 for example a maximum current of 3,5A is permitted and for GH-IKO-10000 a current of 1,4A is permitted.

- Constant output voltage because of regulation to the adjusted desired value
- Activation and disconnection via opto-coupler (VDE 700 - 730)
- Maximum monitoring individually adjustable (for SRSB with current limitation continuous current components are also monitored)
- Limiter function regardless of the load unit
- Limiter disconnection interrupts the circuit galvanically (relay)
- Current transformer output (according to VDE 0551)
- SRSB with current limitation: voltage monitoring at the limiter contact with "Off" function for the load current
- Galvanically separated output (open-collector-switch) (VDE 700 - 730) for standby signal
- Effective value display
- Actuator for analogue controller (γ -input)
- As effective constant current generator



SRSB.K

SRSB.S

Notes on the technical data:

¹ depending on design

² only for SRSB...M

³ only for SRSB...K

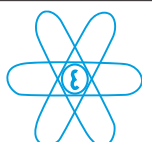
⁴ only for SRSB...S

⁵ Option 50 A for SRSB...K (S 40 A)

⁶ Depending on current flow angle please take the maximum loads from our information sheet

2.0 TECHNICAL DATA

	SRSB without current limitation	SRSB with current limitation
Controller		
Nominal voltage	230 V (400 V)~	230 V (400 V, 500 V) ~
Nominal current max.	2,5 - 4 - 6 A (10 A) $J^2t = 450$ (10 ms)	25 A, 16 A, 6 A (for SRSB . S 20 A) ⁶
Control ranges voltage	20 - 230 V~ (40 - 380 V~)	20 - 230 V~ (40 - 400 V~)
Max. current capacity of the semiconductor	0,2 s; 200 A - 500A	0,2 s; 200A .. 500 A ¹
Built-in fuses	10 A, 2 X 80 mA	2 X 80 mA
Limiter		
Tripping range current		1,35 .. 4 A (6 A)
Relay nominal current		10 A
Switching capacity		2500 W
Max. Switching capacity		10 ms, 32 A
Current transformer output	5/1 A $R_i = 1,5 \text{ k}\Omega$	25/1 A (6/1, 15/1); $R_i \leq 1,5 \text{ k}\Omega$
Input opto-coupler	6 .. 24 V, $R_i = 5 \text{ k}\Omega$ Cutoff according to VDE 0700	6 .. 24 V, $R_i = 2 \text{ k}\Omega$ Cutoff according to VDE 0700
Output opto-coupler	.. 20 mA; 24 V = Cutoff according to VDE 0700 - 730	
Auxiliary voltage	- 21 V=; $R_i = 5 \text{ k}\Omega$	- 21 V=; $R_i \Rightarrow 10 \text{ k}\Omega$
Dimensions ^{2 4}	Euro board 100 x 160 mm	Euro board 100 x 160 mm 14 TE; 3 HE
Excess length cooling element ⁴		+ 93mm
Multiple plug ⁴	DIN 41612 form H	DIN 41612 Form F; H
Cassette ²		H=157; B=93 (144); T=205
Connector ²		D15
Temperature range	0 .. 55°C	0 .. 55°C (cassette)
Cassette ³		H=150; B=85 (144); T=232
Input γ - signal	4 - 20 mA; 5 V	4 - 20 mA; $R_i \leq 20\Omega$



3.0 TECHNICAL DESCRIPTION

Display

According to demand the display device can, for the purpose of optimal read of the operating current, be delivered with upper full scale of 2,5 A, 4 A or 6 A. The SRSB with current monitoring can be delivered with 25 A, 16 A or 6 A, other measuring ranges at request.

Limiter

The standard version is designed so that at the version without current limitation the operating currents can be adjusted between 1,35 A and 4 A over the complete phase angle. At the version with current limitation the operating currents can be adjusted between 12 and 100%. Other ranges at request.. If the voltage regulator panes is in good order, the output current can not increase more than 3% due to the control mode, at the version with current limitation not more than 8%. But if now the output current increases, due to an error, more than 10% larger than the adjusted nominal current, the limiter trips out.

Operation

Output signal via opto-coupler, (Open-Collector-Switch). Depending on the design the collector line (N.C. circuit) controlled through:

- when the device is ready for operation
- when the device is ready for operation and the Min. - current is exceeded.

Switching input (heating off)

The switching input via opto-coupler is standardly designed for a voltage of 6 to 24 V=, alternatively for current input 1,5 to 20 mA. (Operating current or closed current principle, see switching examples).

Fuses

The voltage actuator SRSB has three fuses. Hereof two are microfuses 80 mA for the internal supply voltage and one slow-blowing fuse of 4 A (6 A) for the operating current. Depending on the requirements this fuse can be boosted up to 10 A.

Auxiliary voltage

The auxiliary voltage connections may not be connected, if a galvanical separation is necessary for the control unit according to VDE or if the input must be similar to a device that is battery-powered. At the SRSB with current limitation the auxiliary voltage is connected to the potential at plug contact 26/28 or terminal 1 via a protective resistor = 1K Ω .

Limiter calibration

1.	Voltage actuator at zero (left hand limit stop)
2.	Limiter at maximum (right hand limit stop)
3.	Switch on position "operation"
4.	Switch on voltage
5.	Temperature controller at heating on (e.g. yellow pilot loop at TRB-P)
6.	Set required current intensity by use of the voltage actuator
7.	Set switch to the midpoint (calibration position)
8.	Turn limiter poti to the left, once that the required current has been on longer than 30 sec., until disconnection is made
9.	Set voltage actuator at zero
10.	Tap switch up "limiter reset" and set back to "operation" (lower position)
11.	Set required operating current again by use of the voltage actuator poti

Note:

Depending on operating condition it can be necessary to set the nominal value to be adjusted higher than the operating current.

Voltage monitoring at the limiter contact

The maker connection of the signalling relay of the current monitoring (plug contact 12z or terminal 11) is, related to the potential of the plug contacts 26/28 or terminal 1, monitored. When dropping below a specific voltage the output voltage of the voltage regulator is set on zero. The internal resistance of this measure arrangement is >50k Ω .

Current transformer output*

The current transformer output is designed as transmitter for the current input of the temperature controller TRB-P, TRB-PI (TRB-PC). Standard 25/1, on request 15/1 or 6/1. Display device with measuring range >15A is also connected in the secondary circuit of the converter, or else directly in the current path.

Option: min. current monitoring

Version without current converter and output opto-coupler Typ: SRSB.O

y-correcting variable-input

Devices, which are equipped with this input, serve as controlling element for analog controllers. The output voltage must be limited with the potentiometer with voltage scale to the desired max. value (serves as overload protection or power limitation to limit the overshoot during the adjustment), and changes thereby the proportional range.

* other measuring ranges on request.

Effective constant current generator

This execution is preferably used, when the load resistance changes so heavy dependent on the operating temperature, that the current between rating and start-up phase is so different, that due the high starting current otherwise the device would have to be switched one or two power stages higher (heating-up time is longer).

4.0 TYPE CODE

SRSB 1 2 3 4 5 6

1	-	Standard version current limiter
	a	only for arbitrary contact control

2.0	2,5	Measuring range of display (A) 2,5 *without current limitation
	4	Measuring range of display (A) 4 *without current limitation
	6	Measuring range of display (A) 6 *without current limitation

2.1	6	Measuring range of display (A) 6 *with current limitation
	16	Measuring range of display (A) 16 *with current limitation
	20	Measuring range of display (A) 20 *only SRSB S with current limitation
	25	Measuring range of display (A) 25 *with current limitation

3	-	Nominal voltage 230 V (20 - 220 V)
	3	Nominal voltage 400 V (35 - 380 V)
	5	Nominal voltage 500 V (40 - 500 V)

4	-	Input opto-coupler
	y	Input 4 - 20 mA y- signal
	ey	Input 4 - 20 mA y-signal intrinsically safe
	O	without current transformer and output opto-coupler

5	K	Compact unit
	M	Module device (consists of Me+MK)
	Me	Operating panel for module device
	MK	Cassette panel for module device
	S	Plug-in unit

6	-	Standard version
	G	constant current generator

Example: Voltage regulator SRSB with measuring range display 6 A, 230 V nominal voltage, Y-signal and as compact unit

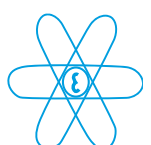
SRSB - 6 - y K - 6



SRSB.K



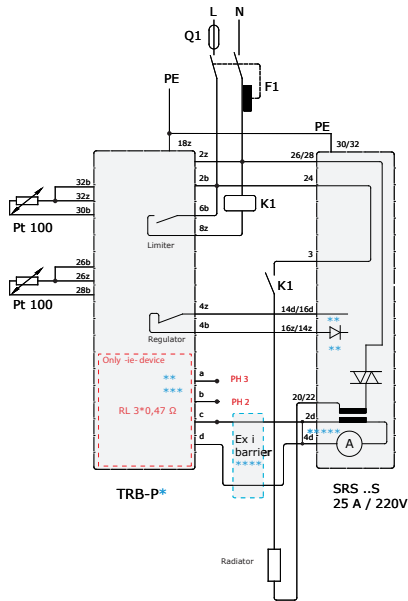
SRSB.S



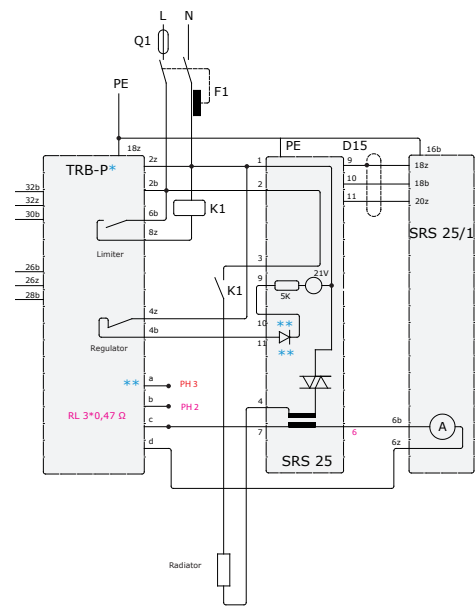
5.0 CIRCUIT DIAGRAMS AND DIMENSION LAYOUTS

SRSB..S 220V with TRB-P

pin control

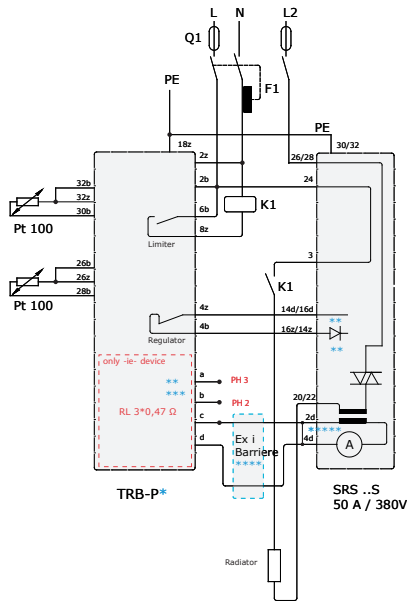


SRSBa... M with TRB-P



SRSB..S 380V with TRB-P

pin control

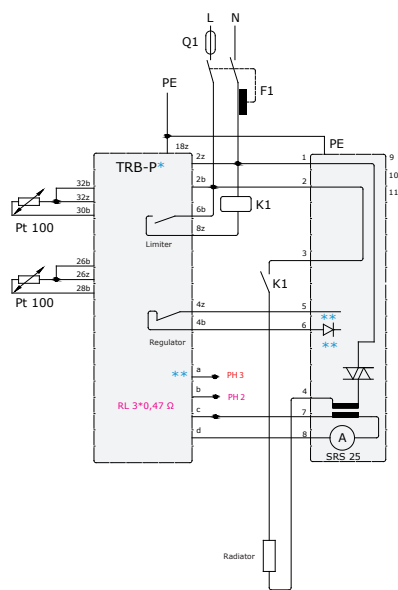


* for Ex- version ...d instead of ...b

**

	Pin assignment of the current transducer input		
	Power strip 2	Power strip 1	
	STB (SIL) BVS 07 ATEX F001	STB (SIL) + [Ex ib] IIC PTZ 16 ATEX 0027	old devices *** [Ex ib] IIC PTZ 16 ATEX 0027
a	22b	22d	8d
b	24b	24d	10d
c	26b	26d	12d
d	22z, 24z, 26z	22z, 24z, 26z	8d, 10d, 12d

SRSBa...K with TRB-P



* for Ex- version ...d instead of ...b

**

	Pin assignment of the current transducer input		
	Power strip 2	Power strip 1	
	STB (SIL) BVS 07 ATEX F001	STB (SIL) + [Ex ib] IIC PTZ 16 ATEX 0027	old devices *** [Ex ib] IIC PTZ 16 ATEX 0027
a	22b	22d	8d
b	24b	24d	10d
c	26b	26d	12d
d	22z, 24z, 26z	22z, 24z, 26z	8d, 10d, 12d

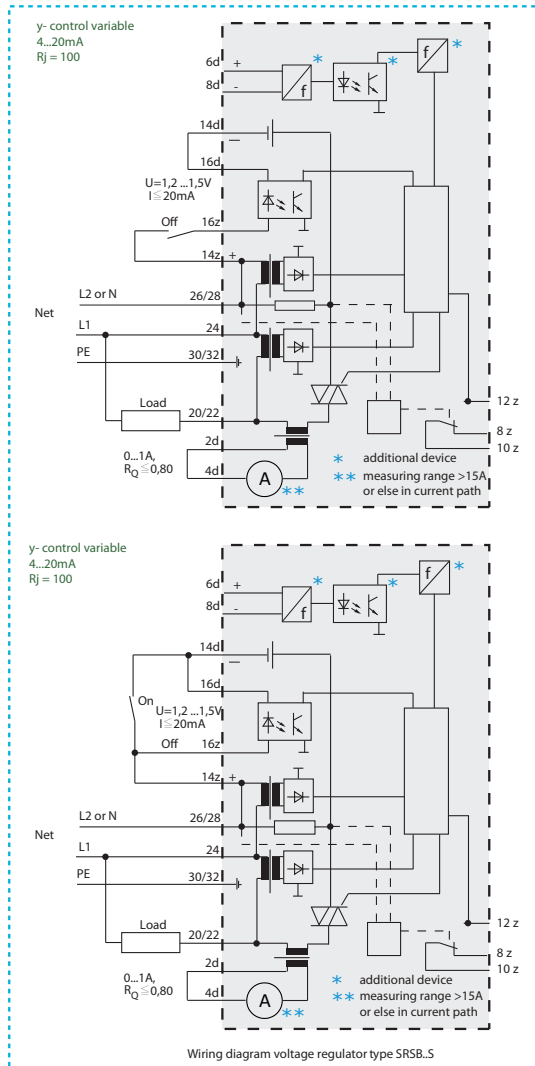
*** for 1-phase operation override a-c (only for TRB- P. VDE)

**** only for Ex i devices (TRB-P.ax..)

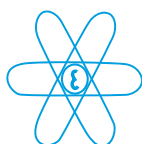
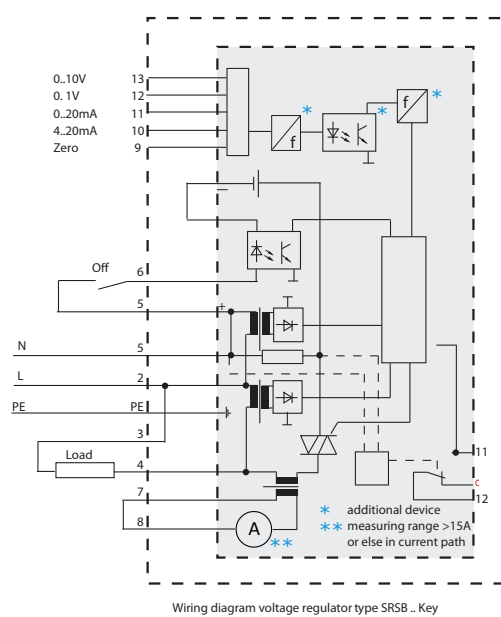
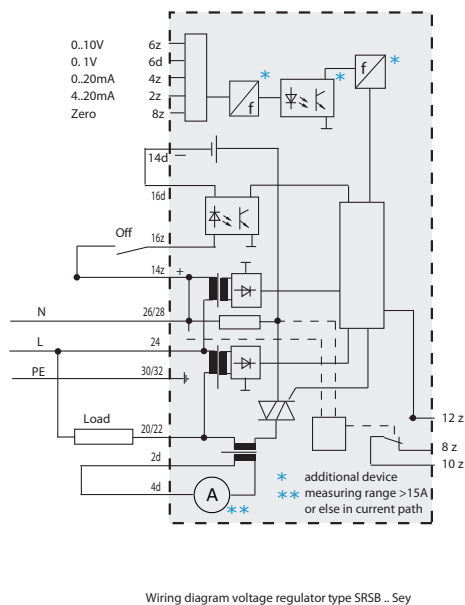
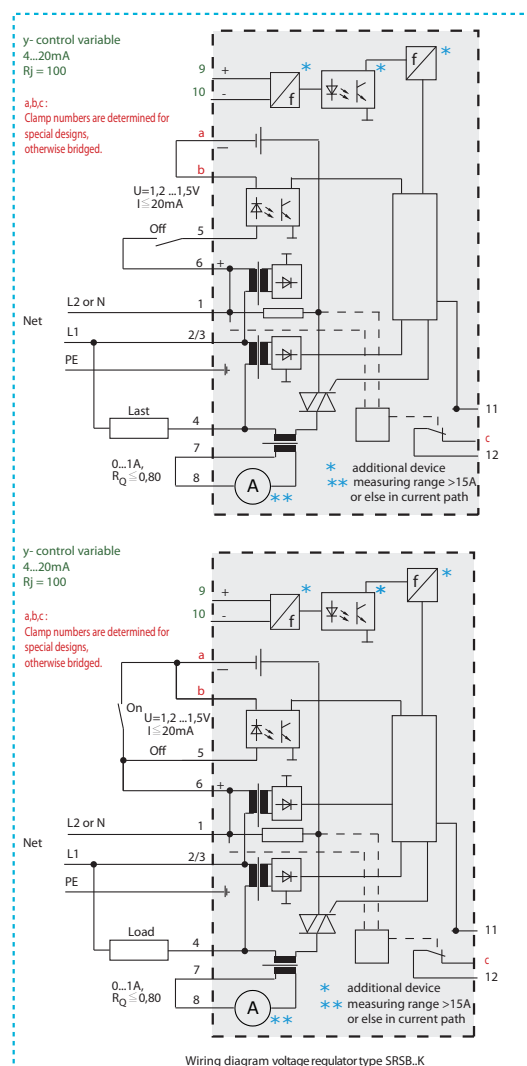
***** only for TRB-P. devices without current monitoring

Please demand for the wiring diagrams for the special designs when required.

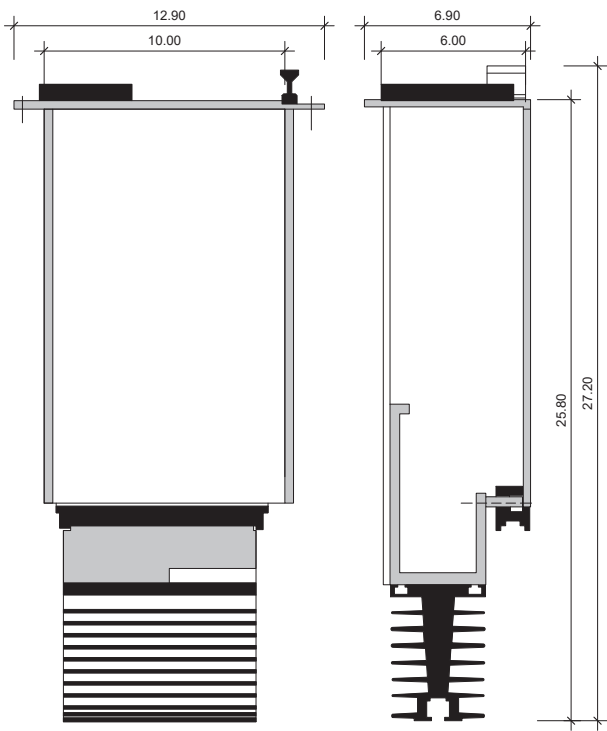
6.0 CIRCUIT DIAGRAM SRSB ...S



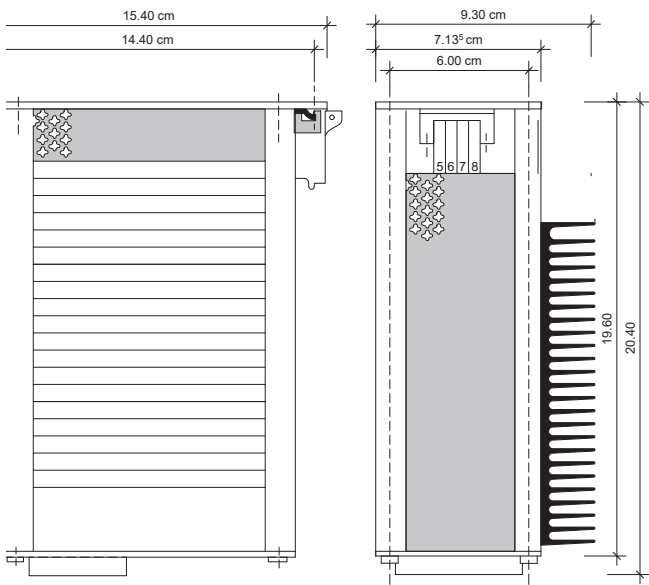
6.1 CIRCUIT DIAGRAM SRSB ...K



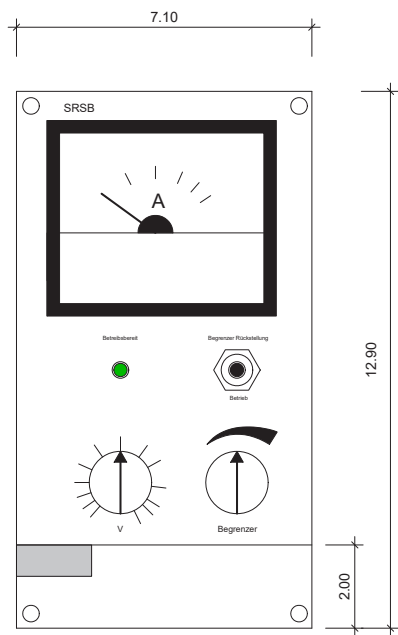
7.0 DIMENSIONS SRSB ..S



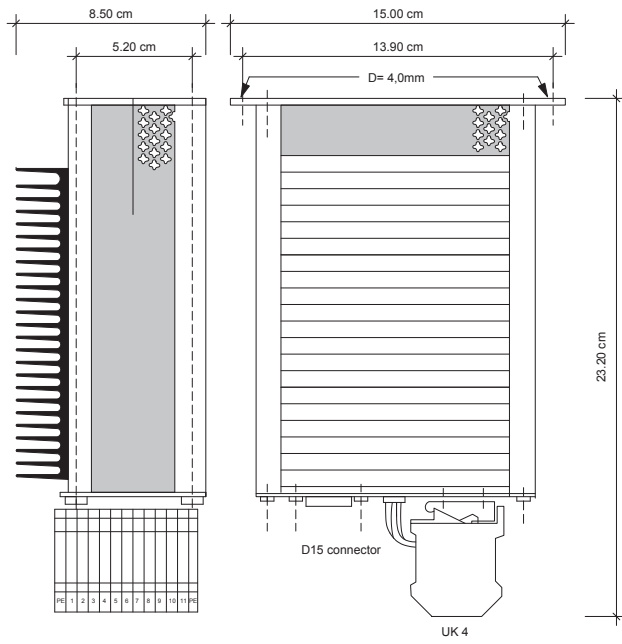
7.2 DIMENSIONS SRSB ..K
COMPACT UNIT



7.1 DIMENSIONS OPERATING COMPONENT SRSB.. S



7.3 DIMENSIONS SRSB ..MK
WITHOUT OPERATING COMPONENT



SRSB MK
without display



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