

S2Ex-Z



ATEX

POWER SUPPLY – REPEATER for 2-wire transmitters mounted in a hazardous area

- associated apparatus group I ⇒ category (M1) and groups II, III ⇒ category (1),
- intrinsically safe input circuit with safety level of ia – consistent with ATEX,
- EC-Type Examination Certificate: KDB 04ATEX120

FEATURE I (M1) [Ex ia] I, II (1) G [Ex ia] IIC, II (1) D [Ex ia] IIIC

Protection level IP20

Range of working temperature -30..+70°C

- intrinsically safe input measurement-supply circuit can supply intrinsically safe input circuits with ia or ib protection level of devices located in hazardous zones 0, 1, 2, 20, 21, 22 and any explosive atmospheres. Safety parameters U_o , I_o , P_o are give in Technical data.
- Output and supply circuits can cooperate with non-intrinsically safe circuits of devices with voltage $U_m=253V$ e.g. supplied from 230Vac main network.
- The repeater power supply should be installed in explosion safe, dry and dust free room with no admittance to no trained personnel.
- S2Ex-Z can be mounted in hazardous zone in flameproof enclosure. Using in I explosive group does not require putting warning on the enclosure. After power supply is turned off it can be taken out of the enclosure with no delay. In case of using it in II and III explosive group, on outer part of the enclosure must be warning: "Do not open the enclosure within 10 minutes after turning off the power".

Application:

S2Ex-Z is designed to supply 2-wire transmitters working with 4÷20mA signal, mounted in hazardous area and to convert this signal after galvanic separation into one of the standard signals (0÷5mA, 0÷20mA, 4÷20mA, 0÷5V, 0÷10V, 1÷5V or other according to the order).

S2Ex-Z enables galvanic separation of the 2-wire transmitter circuit installed on the object in hazardous area from the central part located in the safe area (controller, regulator, indicator, registration, data collecting system). Moreover the separator diminishes the object interference on the central part and facilitates the configuration of measurements systems.

S2Ex-Z is produced in eight versions differing in the 2-wire transmitter supply voltage: 16V, 18V, 20V, 22V, 24V and 27V, maximal short-circuit current I_o (48mA, 92mA, 77mA) or the power P_o (0,32W, 0,65W, 0,52W). The version of choice should be consistent with the intrinsic safety requirements of the attest concerning the cooperating 2-wired transmitter.

Technical data:

Measurement-supply input to hazardous area - **supplies voltage feeding the 2-wire transmitter 4÷20mA**

S2Ex-Z-16/48	$U=16\pm 0,8V \Rightarrow U_o=16,8V, I_o=48mA, P_o=0.32W$
S2Ex-Z-16	$U=16\pm 0,8V \Rightarrow U_o=16,8V, I_o=92mA, P_o=0.65W$
S2Ex-Z-18	$U=18\pm 0,9V \Rightarrow U_o=18,9V, I_o=92mA, P_o=0.65W$
S2Ex-Z-20	$U=20\pm 1V \Rightarrow U_o=21V, I_o=92mA, P_o=0.65W$
S2Ex-Z-22	$U=22\pm 1,1V \Rightarrow U_o=23,1V, I_o=92mA, P_o=0.65W$
S2Ex-Z-24	$U=24\pm 1,2V \Rightarrow U_o=25,2V, I_o=92mA, P_o=0.65W$
S2Ex-Z-24/77	$U=24\pm 1,2V \Rightarrow U_o=25,2V, I_o=77mA, P_o=0.52W$
S2Ex-Z-27	$U=27\pm 1V \Rightarrow U_o=28V, I_o=96,7mA, P_o=0.68W$

Output signal - **any signal according to order**

Output load resistance:

for signal 0/4÷20mA, 4÷20mA - **0 ÷ 750 Ω**

for signal 0÷5mA, 1÷5mA - 0 ÷ 3 kΩ

for voltage signal - ≥ 10 kΩ

Supply voltage - **20V ÷ 27V**, typically 80 mA.

Note: In case of supply voltage >28V the protection barrier fuse blowing can occur – repair by the producer

Galvanic separation of circuits - **all circuits separated from each other**

Isolation test voltage - **2 kV, 50Hz**

Class - 0,1 %

Nonlinearity - ± 0,05 %

Error due to changes in

supply voltage or load - ± 0,02 %

Error due to changes in

ambient temperature - ± 0,005 % / °C

“zero” and “range” - ± 5 % with potentiometers

regulation

Time constant

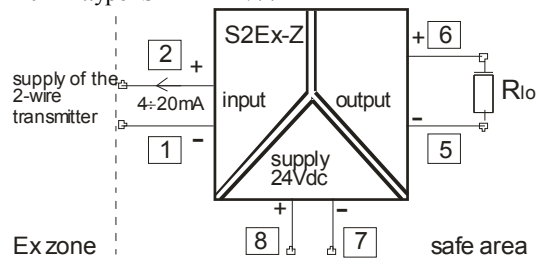
- typically 0,2 sec.,
after agreement 0,001÷1 sec.

Order code:

S2Ex-Z ---	repeater power supply of 2-wire transmitters
16/48-	supply voltage 16V ⇒ $I_o=48mA$
16 --	supply voltage 16V ⇒ $I_o=92mA$
18- --	supply voltage 18V ⇒ $I_o=92mA$
20- --	supply voltage 20V ⇒ $I_o=92mA$
22- --	supply voltage 22V ⇒ $I_o=92mA$
24- --	supply voltage 24V ⇒ $I_o=92mA$
24/77-	supply voltage 24V ⇒ $I_o=77mA$
27- --	supply voltage 27V ⇒ $I_o=96,7mA$
1 ---	output signal 0÷5mA
2 ---	output signal 0÷20mA
3 ---	output signal 4÷20mA
4 ---	output signal 0÷5V
5 ---	output signal 0÷10V
6 ---	output signal 1÷5V
7 ---	output signal untypical

Order example:

S2Ex-Z, supply voltage 24V, $I_o=77mA$, output signal 0÷20mA type S2Ex-Z-24/77-2



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Safety parameters for S2Ex-Z:

a) Intrinsically safe supply-measurement circuit „input” - terminals „1-2”.

Values of Lo, Co and L/R connection cable parameters should be adopted according to the table shown below:

Realization	Uo [V]	Io [mA]	Po [W]	L/R [mH/Ω]			Lo [mH]			Co [μF]		
				I i IIA	IIB i III	IIC	I i IIA	IIB i III	IIC	I i IIA	IIB i III	IIC
S2Ex-Z-16/48	16,8	48	0,32	0,88	0,44	0,11	100	66	12	9,3	2,29	0,39
S2Ex-Z-16/92	16,8	92	0,62	0,45	0,22	0,057	26	15	2	9,3	2,29	0,39
S2Ex-Z-18/92	18,9						26	15	1,7	6,39	1,6	0,26
S2Ex-Z-20/92	21						26	15	1,7	4,78	1,27	0,188
S2Ex-Z-22/92	23,1						26	15	1,7	3,67	1,02	0,14
S2Ex-Z-24/92	25,2						26	15	1,7	2,9	0,82	0,107
S2Ex-Z-24/77	25,2						77	0,52	0,54	0,27	0,068	38
S2Ex-Z-27	28	96,7	0,68	0,41	0,20	0,051	22,0	13	0,64	2,15	0,65	0,083

Characteristic of the circuit is trapezoidal.

b) Parameters for non-intrinsically safe circuits:

„output” - terminals „5-6” and „supply” - terminals „7-8”: $U_m=253V$.

Safety parameters for group III (dust) are the same as for group IIB (gas).

Conditions of use:

Maximal values of capacity and inductivity connected to intrinsically safe terminals „1-2” of the repeater – power supply should be set according to the criteria applying to the connected device (this means Co, Lo given in the use conditions of the device supplied with the supply-measurement input of the repeater - power supply S2Ex-Z). However, none of the values can exceed those given in the table above.

The intrinsically safe measurement-supply input circuit of the S2Ex-Z (terminals „1-2”) with „ia” protection level can supply „ia” and „ib” protection level circuits of devices located in area 0, 1, 2 of mixtures explosive with air, classified to the explosiveness group IIA, IIB, IIC, III or in areas 20, 21 and 22 of dust explosion (group III). The device can be 2-wire measurement transmitter.

Output terminals „5-6” and supply terminals „7-8” cooperate with non-intrinsically safe circuits of devices with voltage $U_m=253V$ e.g. supplied from 230Vac main network.

S2Ex-Z is placed in the housing designed for installation on TS35 rail.

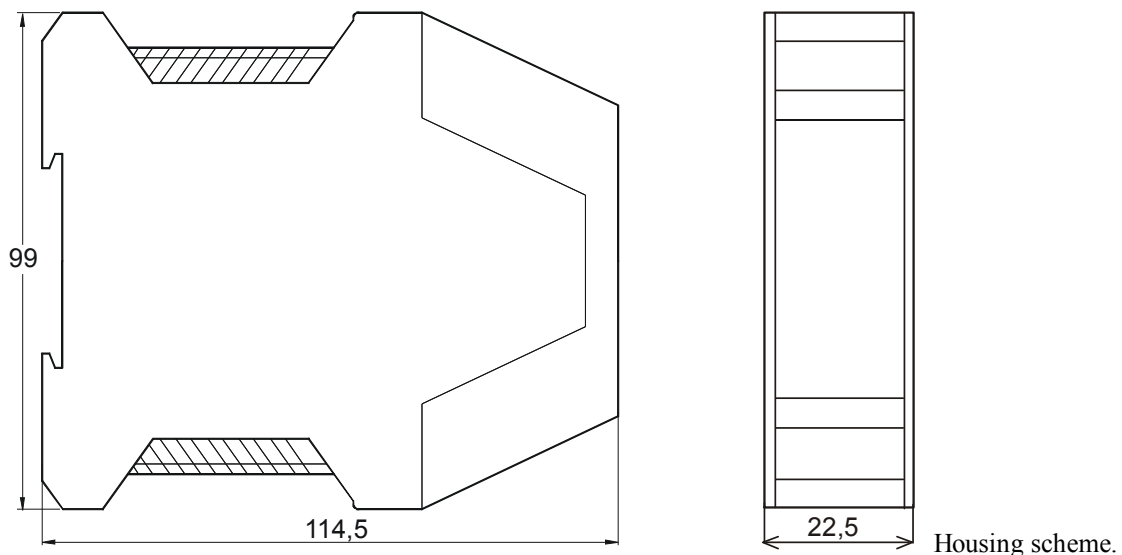
External connections should be lead with cables consisting of $0,5 \div 2,5 \text{ mm}^2$ wires.

Conformity with ATEX - directive 94/9/WE: PN-EN 60079-0:2013, PN-EN 60079-11:2012.

EMC requirements - PN-EN 61000-6-1, PN-EN 61000-6-3 Safety requirements - PN-EN 61010-1:2002

Working conditions:

- Ambient temperature – storage - $-30 \div +70^\circ\text{C}$
- Ambient temperature - working - $-30 \div +70^\circ\text{C}$
- Relative humidity - max 90%
- Ambient atmosphere - free from dust and aggressive fumes
- Working position - any



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