[1] # SUPPLEMENT No 2
to EC-TYPE EXAMINATION CERTIFICATE
KDB 04ATEX120

[2] Equipment, protective systems and components intended for use in potentially explosive atmospheres. Directive 94/9/EC
(Regulation of the MG from 22.12.2005. Official Journal (Dz.U.) No.263, Item 2203).

[3] Equipment or protective system:

Transducer type S2Ex...

[4] Manufacturer:

Labor-Aster
H.Gasztold, P.Ludwiczak

[5] Address:

ul. Czechowicka 19, 04-218 Warsaw, Poland

[6] Changes introduced to design or construction of component in accordance with the specification set out in the Schedule attached to this certificate and the document therein referred to.

This document shall be held with the original Certificate.

The examination and test results are recorded in confidential report KDB No. 14.010 [T-5127]

[7] Marking:

I (M1) [EExia] I
II (2) GD [EExia] IIC

[8] Compliance with the Essential Health and Safety Requirements has been assured by compliance with:

PN-EN 60079-0:2013 (EN 600079-0:2012)
PN-EN 60079-11:2012 (EN 60079-11:2012)

[9] The marking will change to:

I (M1) [Ex ia Ma] I
II (1) G [Ex ia Ga] IIC
II (1) D [Ex ia Da] IIIC

Date of issue: 10.02.2014

[10] # SCHEDULE

[11] **Supplement No 2 to EC-Type Examination Certificate KDB 04ATEX120**

[12] **Description:**

Variations of the transducers type S2Ex-… have been expanded to the following versions:

- S2Ex-SA-5,4; S2Ex-U-5,4; S2Ex-R-5,4; S2Ex-SBS; S2Ex-ZasLin; S2Ex-SBH, S2Ex-ZH; S2Ex-TP; S2Ex-RS;
- S2Ex-SB-27; S2Ex-SB-24/90; S2Ex-SB-24/120; S2Ex-22/90; S2Ex-20/90; S2Ex-SB-18; S2Ex-SB-16/90; S2Ex-SB-14/90; S2Ex-SB-12/90; S2Ex-SB-12/50; S2Ex-SB-(14÷24)/23,2; S2Ex-12/23,2; S2Ex-SB-10; S2Ex-SB-8,2; S2Ex-SB-6,2; S2Ex-SB-4,7; S2Ex-SB-24/70;
- S2Ex-Z-27; S2Ex-Z-24/92; S2Ex-Z-24/77; S2Ex-Z-22/92; S2Ex-Z-20/92; S2Ex-Z-18/92; S2Ex-Z-16/92; S2Ex-Z-16/48;
- S2Ex-F-27; S2Ex-F-24/119; S2Ex-F-24/86; S2Ex-F-22; S2Ex-F-20/86; S2Ex-F-18/86; S2Ex-F-16/86; S2Ex-F-12/86; S2Ex-F-(14÷24)/66; S2Ex-F-12/66; S2Ex-F-10; S2Ex-F-8,2/66; S2Ex-F-8,2/19; S2Ex-F-6,8; S2Ex-F-5,1;
- S2Ex-Zasilacz-27; S2Ex-Zasilacz-24/139; S2Ex-Zasilacz-22/167; S2Ex-Zasilacz-(12÷24)/116; S2Ex-Zasilacz-(12÷20)/204; S2Ex-Zasilacz-(4,7÷12)/118; S2Ex-Zasilacz-(4,7÷12)/209; S2Ex-Zasilacz-13/295; S2Ex-Zasilacz-12/295; S2Ex-Zasilacz-10/295; S2Ex-Zasilacz-8,2/295; S2Ex-Zasilacz-6,8/295; S2Ex-Zasilacz-4,7/295;

Transducers are designed to be used outside of the potentially explosive zones or to be installed in flameproof enclosure. Using transducers in flameproof enclosure in I explosive group does not require putting additional warning on the enclosure in accordance with PN-EN 60079-0 p. 29.11.
In case of using transducer in flameproof enclosure in II explosive group, on the outer part of the enclosure must be additional warning: "Do not open the enclosure within 10 minutes after turning off the power.".

Technical parameters:

Working temperature	-30 ÷ +70 ºC
Supply U_N	20 ÷ 28 V

Intrinsically safe circuits of the transducers can be connected by using:
- multicore cable type A or B in accordance with PN-EN 60079-14, or
- separate cables for each intrinsically safe circuit.

1. Transducer type S2Ex-SA-5,4.

It converts intrinsically safe current or voltage signal to any nonintrisically safe analog signal which is passed to safe zone.

a) Intrinsically safe input circuit: **„input" - terminals „1-2": Uo=5,4V, Io=0,9mA, Po=1,2mW**

[10] # SCHEDULE

[11] **Supplement No 2 to EC-Type Examination Certificate KDB 04ATEX120**

[12] **Description continued:**

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

Explosive group	Lo [mH]	Co [μF]	L/R [mH/Ω]
I i IIA	**200**	**30**	**239**
IIB i III	**200**	**30**	**119**
IIC	**200**	**30**	**29,8**
Characteristic of the circuit is linear. For discrete values should be taken half of Co, Lo values given in the table above with the submission that the Co value cannot exceed 1μF for group I, IIA, IIB, III and 0,6μF for IIC.			

b) Input intrinsically safe parameters: **„input" - terminals „1-2"**:
Ui=30V, Ii=100mA, Pi=0,99W, **Li ≅ 0mH, Ci ≅ 0nF**

c) Nonintrinsically safe circuit parameters:
„output" - terminals „5-6" and „supply" - terminals „7-8": U_m=253V.

2. Transducer type S2Ex-U-5,4.

It converts intrinsically safe thermocouple signal or other input current or voltage signal from potentially explosive zone to current or voltage output signal which is passed to safe zone.

a) Intrinsically safe input circuit: **„input" - terminals „3-4": Uo=5,4V, Io=2,4mA, Po=1,2mW**
Values of Lo, Co and L/R connection cable parameters should be adopted according to the table shown below:

Explosive group	Lo [mH]	Co [μF]	L/R [mH/Ω]
I i IIA	**200**	**30**	**239**
IIB i III	**200**	**30**	**119**
IIC	**200**	**30**	**29,8**
Characteristic of the circuit is linear. For discrete values should be taken half of Co, Lo values given in the table above with the submission that the Co value cannot exceed 1μF for group I, IIA, IIB, III and 0,6μF for IIC.			

b) Input intrinsically safe parameters: **„input" - terminals „3-4"** :
Ui=30V, Ii=0,1A, Pi=1W, Li =0,1mH, Ci =10nF.

c) Nonintrinsically safe circuit parameters:
„output" - terminals „5-6" and **„supply" - terminals „7-8"**: **Um=253V**

[10] # SCHEDULE

[11] **Supplement No 2 to EC-Type Examination Certificate KDB 04ATEX120**

[12] **Description continued:**

3. Transducer type S2Ex-R-5,4.

It converts RTD resistance changes in potentially explosive zones to nonintrinsically safe analog signal.

a)) Intrinsically safe input circuit: **„input" - terminals „1, 2, 3, 4"**:
Uo=5,4V, Io=9,8mA, Po=42mW, Li =0,03mH, Ci =30nF,
Values of Lo, Co and L/R connection cable parameters should be adopted according to the table shown below:

Explosive group	Lo [mH]	Co [μF]	L/R [mH/Ω]
I i IIA	**200**	**30**	**4,3**
IIB i III	**200**	**30**	**2,1**
IIC	**200**	**30**	**0,54**
Characteristic of the circuit is trapezoidal.			

b) Nonintrinsically safe circuit parameters:
„output" - terminals „5-6" and „supply" - terminals „7-8": Um=253V

4. Transducer type S2Ex-SB-....

It converts nonintrinsically safe current or voltage signal from safe zone to output analog signal which is passed to potentially explosive zone.

a) Nonintrinsically safe circuit parameters:
„input" - terminals „5-6" and „supply" - terminals „7-8": U_m=253V.

b) Intrinsically safe output circuit: **„output" - terminals „1-2".**

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

[10] # SCHEDULE

[11] **Supplement No 2 to EC-Type Examination Certificate KDB 04ATEX120**

[12] **Description continued:**

Version	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-SB-12/50	12,6	50	0,34	0,84	0,42	0,10	100	62	12	27	7,4	1,15
S2Ex-SB-12/90	12,6	90	0,61	0,46	0,23	0,058	28	17	3	27	7,4	1,15
S2Ex-SB-14/90	14,7						27	16	2,5	14,9	3,86	0,62
S2Ex-SB-16/90	16,8						27	16	2,1	9,3	2,29	0,39
S2Ex-SB-18	18,9						27	16	1,8	6,39	1,6	0,26
S2Ex-SB-20/90	21,0						27	16	1,8	4,78	1,27	0,188
S2Ex-SB-22/90	23,1						27	16	1,8	3,67	1,02	0,14
S2Ex-SB-24/90	25,2						27	16	1,8	2,9	0,82	0,108
S2Ex-SB-24/70	25,2	69,8	0,47	0,60	0,30	0,075	47	29	4,4	2,9	0,82	0,107
S2Ex-SB-24/120	25,2	120	0,78	0,35	0,17	0,043	14	7,8	0,012	2,9	0.82	0,107
S2Ex-SB-27	28	97,3	0,688	0,41	0,20	0,051	22,0	12,0	0,59	2,15	0,65	0,083
S2Ex-SB-14÷24/23,2	Uwyj +5%	23,2	0,156	1,82	0,91	0,22	100	100	68	2,9	0,82	0,107
S2Ex-SB-12/23,2	12,6		0,155				100	100	69	27	7,4	1,15
S2Ex-SB-10	10,5		0,148				100	100	71	75	16,8	2,41
S2Ex-SB-8,2	8,6		0,136				100	100	73	1000	50	5,9
S2Ex-SB-6,2	6,5		0,114				100	100	77	1000	570	25
S2Ex-SB-4,7	5,0		0,094				100	100	50	1000	1000	100
Characteristic of the circuit is trapezoidal.												

5. Transducer type S2Ex-Z-....

It supplies and converts signal 4÷20mA from two-wire transducers installed in potentially explosive zone to nonintrinsically safe output analog which is passed to safe zone.

a) Nonintrinsically safe circuit parameters:
„output" - terminals „5-6" and „supply" - terminals „7-8": U_m=253V.

b) Intrinsically safe supplying-measuring circuit: **„ input" - terminals „1-2".**

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

[10] # SCHEDULE

[11] **Supplement No 2 to EC-Type Examination Certificate KDB 04ATEX120**

[12] **Description continued:**

Version	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	23	3,3	2,9	0,82	0,107
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.												

6. Przetwornik typu S2Ex-Zasilacz-....

It supplies devices in potentially explosive zone. It is supplied from nonintrinsically safe circuit in safe zone.

a) Nonintrinsically safe circuit parameters: **„ supply" - terminals „7-8": U_m=253V.**

b) Intrinsically safe output circuit: **„output" - terminals „1-2"**.

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

[10] # SCHEDULE

[11] **Supplement No 2 to EC-Type Examination Certificate KDB 04ATEX120**

[12] **Description continued:**

Version Uwyj [V]	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-Zasilacz-27 Uwyj=27	28	97,3	0,688W	0,43	0,21	0,054	22	12	0,59	2,15	0,65	0,083
S2Ex-Zasilacz-12÷24/116 Uwyj=12 ÷ 24V	Uwyj+ 5%	116	0,77W	0,37	0,18	0,046	14	5	0,8	2,90	0,82	0,107
S2Ex-Zasilacz-4,7÷12/118 Uwyj=4,7 ÷ 12V	Uwyj+ 5%	118	Po=0,4W	0,71	0,35	0,089	14	5	0,8	27	7,4	1,15
S2Ex-Zasilacz-24/139 Uwyj=24V	25,0	139	0,92	0,31	0,15	0,038	8	3	0,2	2,97	0,84	0,11
S2Ex-Zasilacz-22/167 Uwyj=22V	23,1	167	1,0	0,28	0,14	0,035	8	2,5	0,16	3,67	1,02	0,140
S2Ex-Zasilacz-12÷20/204 Uwyj=12 ÷ 20V	Uwyj+ 5%	204	Po=1,35W	0,21	0,10	0,026	4	1,3	0,12	4,78	1,27	0,188
S2Ex-Zasilacz-4,7÷12/209 Uwyj=4,7 ÷ 12V	Uwyj+ 5%	209	Po=0,7W	0,4	0,2	0,05	4	1,3	0,12	27	7,4	1,15
S2Ex-Zasilacz-13/295	13,65	295	1,95	0,14	0,073	0,018	1,9	1,0	0,027	18,1	5,0	0,79
S2Ex-Zasilacz-12/295	12,6		1,95				2,0	1,2	0,1	27	7,4	1,15
S2Ex-Zasilacz-10/295	10,5		1,87				2,3	1,5	0,26	75	16,8	2,41
S2Ex-Zasilacz-8,2/295	8,6		1,72				2,6	1,7	0,36	1000	55	6,2
S2Ex-Zasilacz-6,8/295	7,2		1,55				2,9	2,0	0,43	1000	240	13,5
S2Ex-Zasilacz-4,7/295	5,0		1,2				3,3	2,3	0,55	1000	1000	100
Characteristic of the circuit is trapezoidal.												

7. Przetwornik typu S2Ex-F-....

It supplies and converts signal from transducers installed in potentially explosive zone to nonintrinsically safe output analog signal or pulse train which is passed to safe zone.
Terminals „4-1" and group of terminals „3-1, 2-1" are two separate intrinsically safe circuits which are galvanically connected. For simultaneous connection of these two circuits can be used separate cables or one multicore cable type A or B in accordance with IEC 60079-14.

a) Intrinsically safe supplying circuit: **„input" - terminals „4-1".**
W Values of Lo, Co and L/R connection cable parameters should be adopted according to the table shown below:

[10] # SCHEDULE

[11] **Supplement No 2 to EC-Type Examination Certificate KDB 04ATEX120**

[12] **Description continued:**

Version	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-F-8,2/19	8,6	19	0,11	2,22	1,11	0,27	100	100	50	1000	55	6,2
S2Ex-F-12/86	12,6	86	0,58	0,48	0,24	0,061	31	19	3,3	27	7,4	1,15
S2Ex-F-16/86	16,8						30	18	2,4	9,3	2,29	0,39
S2Ex-F-18/86	18,9						30	18	2,2	6,4	1,6	0,26
S2Ex-F-20/86	21						30	18	2,2	4,78	1,27	0,188
S2Ex-F-22	23,1						30	18	2,2	3,67	1,02	0,14
S2Ex-F-24/86	25,2						30	18	2,2	2,9	0,82	0,107
S2Ex-F-(14÷24)/66	Uwyj +5%	66	0,446	0,63	0,31	0,079	54	33	5,3	2,9	0,82	0,107
S2Ex-F-12/66	12,6		0,444				55	34	6,3	27	7,4	1,15
S2Ex-F-10	10,5		0,424				50	35	7,0	75	16,8	2,41
S2Ex-F-8,2/66	8,6		0,40				58	37	7,7	1000	55	6,2
S2Ex-F-6,8	7,2		0,349				60	39	8,3	1000	240	13,5
S2Ex-F-5,1	5,4		0,286				62	41	9,3	1000	1000	65
S2Ex-F-24/119	25,2	119	0,80	0,35	0,17	0,044	15	8,7	0,66	2,9	0,82	0,107
S2Ex-F-27	28	97,3	0,688	0,41	0,20	0,051	22,0	12,0	0,59	2,15	0,65	0,083
Characteristic of the circuits is trapezoidal.												

b) Intrinsically safe measuring circuit **„input" - terminals „4-1, 2-1, 3-1"**: **Li ≅ 0, Ci ≅ 0**
For simultaneous connection of all terminals can be used one multicore cable.
Values of Lo, Co and L/R connection cable parameters should be adopted according to the table shown below:

Version	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-F-8,2/19	8,6	20,6	0,11	2,7	1,35	0,33	100	100	50	1000	55	6,2
S2Ex-F-12/86	12,6	87,8	0,58	0,51	0,25	0,064	30	19	3,4	27	7,4	1,15
S2Ex-F-16/86	16,8						30	18	2,8	9,3	2,29	0,39
S2Ex-F-18/86	18,9						30	18	2,7	6,39	1,6	0,26
S2Ex-F-20/86	21						30	18	2,7	4,78	1,27	0,188
S2Ex-F-22	23,1						30	18	2,7	3,67	1,02	0,14
S2Ex-F-24/86	25,2						30	18	2,7	2,78	0,8	0,104
S2Ex-F-(14÷24)/66	Uwyj +5%	67,8	U>13,5V: Po=0,446	0,68	0,34	0,085	52	32	5,8	2,9	0,82	0,107
S2Ex-F-12/66	12,6		0,444				53	33	6,3	27	7,4	1,15
S2Ex-F-10	10,5		0,424				54	34	6,9	75	16,8	2,41
S2Ex-F-8,2/66	8,6		0,40				55	35	7,4	1000	55	6,2
S2Ex-F-6,8	7,2		0,349				57	37	8,0	1000	240	13,5
S2Ex-F-5,1	5,4		0,286				59	39	8,8	1000	1000	65
S2Ex-F-24/119	25,2	120	0,80	0,37	0,18	0,046	15	8,4	0,55	2,9	0,82	0,107
S2Ex-F-27	28	99	0,688	0,43	0,21	0,054	22	13,0	1,3	2,15	0,65	0,083
Characteristic of the circuits is trapezoidal.												

c) Intrinsically safe intput measuring circuit parameters „**input" - terminals „2-1, 3-1"**:
Ui=30V, Ii any, Pi any; Uo=5,4V, Io=1,66mA, Po=2,3mW, Li ≈ 0, Ci ≈ 0,

[10] # SCHEDULE

[11] **Supplement No 2 to EC-Type Examination Certificate KDB 04ATEX120**

[12] **Description continued:**

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

Explosive group	Lo [mH]	Co [μF]	L/R [mH/Ω]
I i IIA	**100**	**30**	**126**
IIB i III	**200**	**30**	**63**
IIC	**100**	**65**	**15**
Characteristic of the circuit is linear. For discrete values should be taken half of Co, Lo values given in the table above with the submission that the Co value cannot exceed 1μF for group I, IIA, IIB, III and 0,6μF for IIC.			

c) Nonintrinsically safe circuits parameters: **„output"- terminals „5-6" i „supply"- terminals „7-8": Um=253V**

8. Transducer type S2Ex-SBS.

Bistate switching circuit duplicates state of the bistate input signal from safe zone to appropriate state of the relays contacts which cooperate with devices in potentially explosive zones.

a) Contacts of intrinsically safe circuit (terminals **„1-2-3"**) with „ia" protection level and output parameters: Uo=0, Io=0, Po=0, Ci≈0, Li≈0 and input parameters shown in the table below:

Version	Ui	Ii
S2Ex-SBS	≤ $24V_{DC}$	5 A_{DC}
	$24V_{DC}$ - $30V_{DC}$	1 A_{DC}
	$30V_{DC}$ - $60V_{DC}$	0,5 A_{DC}
	≤ $60V_{AC}$	5 A_{AC}

b) Nonintrinsically safe circuit parameters:
„input" - terminals „5-6" and „supply" - terminals „7-8": U_m=253V.

9. Transducer type S2Ex-ZasLin-....

It supplies devices in potentially explosive zone. It is supplied from nonintrinsically safe circuit in safe zone.

a) Intrinsically safe output circuit: **„output" -** terminals **„1-2"**.

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

[10] # SCHEDULE

[11] **Supplement No 2 to EC-Type Examination Certificate KDB 04ATEX120**

[12] **Description continued:**

Version Uwyj [V]	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-ZasLin-27 Uwyj=27V	28	98	0,688	0,413	0,206	0,051	22,0	12,0	0,69	2,15	0,65	0,083
S2Ex-ZasLin-24 Uwyj=24V 200Ω-5%=190	25	132	0,82	0,345	0,172	0,043	12	6,9	0,35	2,97	0,84	0,11
S2Ex-ZasLin-22 Uwyj=22V	22,9	161	0,92	0,309	0,154	0,038	8,2	4,9	0,34	3,75	1,04	0,145
S2Ex-ZasLin-18 Uwyj =18V	18,9	219	1,0	0,275	0,137	0,034	4,9	3,1	0,47	6,39	1,60	0,26
S2Ex-ZasLin-15 Uwyj=15V	15,8	268	1,0	0,26	0,13	0,033	3,6	2,4	0,47	11,6	2,88	0,478
S2Ex-ZasLin-13 Uwyj=13V	13,7	193	0,66	0,43	0,21	0,053	7,4	5,0	1,1	18,1	5,0	0,79
S2Ex-ZasLin-5,1\190 Uwyj=5,1V	5,4	190	0,26	1,1	0,55	0,138	9,3	6,5	1,6	1000	1000	65
S2Ex-ZasLin-12 Uwyj = 12V	12,6	368	1,16	0,24	0,12	0,03	2,2	1,5	0,34	27	7,4	1,15
S2Ex-ZasLin-10 Uwyj = 10V	10,5	369	0,97	0,29	0,14	0,036	2,3	1,7	0,38	75	16,8	2,41
S2Ex-ZasLin-8,2 Uwyj=8,2V	8,6	377	0,81	0,35	0,17	0,043	2,4	1,7	0,41	1000	55	6,2
S2Ex-ZasLin-6,2 Uwyj=862V	6,5	428	0,70	0,40	0,20	0,051	2,0	1,5	0,36	1000	570	25
S2Ex-ZasLin-5,1 Uwyj=5,1V	5,4	437	0,59	0,48	0,24	0,06	2,0	1,5	0,36	1000	1000	65
Characteristic of the circuit is linear. For discrete values should be taken half of Co, Lo values given in the table above with the submission that the Co value cannot exceed 1µF for group I, IIA, IIB, III and 0,6µF for IIC.												

b) Nonintrinsically safe circuit parameters: **„supply" - terminals „7-8": U_m=253V.**

10. Transducer type S2Ex-SBH-....

It sends signal 4÷20mA from safe zone to potentially explosive zone providing transparency for HART signals and intrinsically safe circuit.

a) Intrinsically safe output circuit: **„output" – terminals „1-2" („Wy+, Wy-") .**
Values of Lo, Co and L/R connection cable parameters should be adopted according to the table shown below:

Version	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-SBH-28V	29	96,6	0,70	0,40	0,20	0,050	22,0	12,0	0,32	1,97	0,605	0.074
S2Ex-SBH-27V	28	93,2	0,66	0,43	0,21	0,054	24,0	14,0	1,0	2,15	0,65	0,083
S2Ex-SBH-26V	27	90	0,61	0,46	0,23	0,058	27,0	16,0	1,8	2,33	0,705	0,090
S2Ex-SBH-24V	25,2	84	0,53	0,53	0,26	0,067	33,0	20,0	3,1	2,9	0,82	0,107
S2Ex-SBH-22V	23,1	77	0,44	0,64	0,32	0,079	41,0	25,0	4,6	3,76	1,02	0,14
S2Ex-SBH-20V	21,0	70	0,37	0,77	0,38	0,096	52,0	33,0	6,5	4,78	1,27	0,188
Characteristic of the circuit is linear. For discrete values should be taken half of Co, Lo values given in the table above with the submission that the Co value cannot exceed 1µF for group I, IIA, IIB, III and 0,6µF for IIC.												

[10] # SCHEDULE

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[12] **Description continued:**

b) Nonintrinsically safe circuits parameters:
„input" - terminals „5-6" („We+, We-") and „supply" - terminals „7-8" („Zas+, Zas-")": Um=253V.

11. Transducer type S2Ex-ZH-....

It supplies and converts nonintrinsically safe signal 4÷20mA from two-wire transducers installed in potentially explosive zone to nonintrinsically safe output analog which is passed to safe zone.
To the input („input" - terminals „2-3-4") can be connected only two-wire cable – to terminals „4-3" (active input) or to „3-2" (passive input).

a) Intrinsically safe supplying-measuring circuit: **„input" - terminals „4-3" („Z+, We+") or „input" – terminals „4-2" („Z+, Gnd")** :

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

Version	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-ZH-28V	29	96,6	0,70	0,40	0,20	0,050	22,0	12,0	0,32	1,97	0,605	0.074
S2Ex-ZH-27V	28	93,2	0,66	0,43	0,21	0,054	24,0	14,0	1,0	2,15	0,65	0,083
S2Ex-ZH-26V	27	90	0,61	0,46	0,23	0,058	27,0	16,0	1,8	2,33	0,705	0,090
S2Ex-ZH-24V	25,2	84	0,53	0,53	0,26	0,067	33,0	20,0	3,1	2,9	0,82	0,107
S2Ex-ZH-22V	23,1	77	0,44	0,64	0,32	0,079	41,0	25,0	4,6	3,76	1,02	0,14
S2Ex-ZH-20V	21,0	70	0,37	0,77	0,38	0,096	52,0	33,0	6,5	4,78	1,27	0,188
Characteristic of the circuit is linear. For discrete values should be taken half of Co, Lo values given in the table above with the submission that the Co value cannot exceed 1µF for group I, IIA, IIB, III and 0,6µF for IIC.												

b) Intrinsically safe input parameters: „**input" - terminals „3-2" („We+. Gnd")**:

Ui=any, Ii=93mA, Pi any, Li ≈ 0, Ci ≈ 1nF

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

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
4,32	75	0,049	5,8	2,9	0,73	70	30	10	30		
Characteristic of the circuit is trapezoidal.											

[10] # SCHEDULE

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[12] **Description continued:**

c) Nonintrinsically safe circuits parameters:
„output" - terminals „5-6" („Wy+, Wy-") and „supply" - terminals „7-8" („Zas+, Zas-"): U_m=253V

12. Transducer type S2Ex-TP.

It converts intrinsically safe input signal from thermocouple, Pt100 or any other sensor installed in potentialy explosive zone to nonintrinsically safe output current or voltage signal which is passed to safe zone.

a) Intrinsically safe input parameters - terminals **„1, 2, 3, 4"**.:
Uo=5,88V, Io= 9,9mA, Po=36mW, Li=0,02mH, Ci≅ 0,2µF,
Values of Lo, Co and L/R connection cable parameters should be adopted according to the table shown below:

Explosive group	Lo [mH]	Co [µF]	L/R [mH/Ω]
I i IIA	**100**	**43**	**1,0**
IIB i III	**100**	**43**	**4,0**
IIC	**100**	**43**	**8,0**
Characteristic of the circuits is trapezoidal.			

b) Intrinsically safe input parameters: **terminals „3-4"**:
Ui=10,6V, Ii any, Pi any, Li =0,02mH, Ci =70nF.

c) Nonintrinsically safe circuits parameters:
„output" - terminals „5-6" and **„supply" - terminals „7-8"**: **Um=253V**
Configuration connector „COM" : Um= 14,3V

13. Transducer type S2Ex-RS-....

It is used for galvanic separatation and translation nonintrinsically safe transmission circuits RS232, RS485, RS422 to intrinsically safe RS485 or RS422 standard.

a) Intrinsically safe circuit terminals „T-B1, A1, B1, T-Z1, Z1, Y1, GND1":
Values of Co, Lo, L/R for connection cable should be adopted according to the table shown below.

[10] # SCHEDULE

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[12] **Description continued:**

Version	Uo [V]	Io [mA]	Po [mW]	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-RS-1	5	139	171	1,66	0,83	0,20	30	12	3,2	800	800	80
S2Ex-RS-2		141	174	1,64	0,82	0,20	30	12	2,1	800	800	80
S2Ex-RS-3		159	195	1,45	0,72	0,18	20	7	3,5	700	700	70
S2Ex-RS-4		191	236	1,20	0,60	0,15	11	5,2	1,6	600	600	60
S2Ex-RS-5		255	315	0,90	0,45	0,11	8	3,2	0,9	500	500	50
Characteristic of the circuit is linear. For discrete values should be taken half of Co, Lo values given in the table above with the submission that the Co value cannot exceed 1µF for group I, IIA, IIB, III and 0,6µF for IIC.												

b) Intrinsically safe circuit parameters - : terminals „T-B1, A1, B1, T-Z1, Z1, Y1, GND1": **Li ≅ 0, Ci ≅ 0.**

Version	Ui [V]	Ii [mA]	Pi [mW]
S2Ex-RS-1	30	299	any
S2Ex-RS-2		290	
S2Ex-RS-3		290	
S2Ex-RS-4		290	
S2Ex-RS-5		290	

c) Nonintrinsically safe circuits parameters:
terminals „A, B, T-B, Y, Z" and **„supply 24V" – terminals „+24Vdc, -24Vdc":** **Um=253V**

[10] # SCHEDULE

[11] **Supplement No 2 to EC-Type Examination Certificate KDB 04ATEX120**

[13] **Reports of studies**:.

Report No: KDB No 14.010

[14] **Special conditions of use:**

Lacking

[15] **The essential requirements for safety and health.:**
Completed by fulfilling the requirements the standards:
PN-EN 60079-0 :2013 *(EN 60079-0:2012)*
PN-EN 60079-11 :2012 *(EN 60079-11:2012)*