WARRANTY 3 YEARS

AC 083 QMS

LABOR - ASTER

INDUSTRIAL AUTOMATION

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SEPARATORS
- ANALOG SEPARATORS, including HART system
- DUPLICATORS
- BINARY SEPARATORS
- TRANSMISSION LINES SEPARATORS

CONVERTERS
- TEMPERATURE, RESISTANCE, POSITION CONVERTERS
- VOLTAGE, CURRENT CONVERTERS
- FREQUENCY CONVERTERS, including PLC
- ANALOG → MODBUS → ANALOG, also multichannel
- TENSOMETRIC CONVERTERS

INDICATORS
- DIGITAL LED, LCD, 4÷20mA DISPLAYS
- LED BARS
- MULTICHANNELS
- SETTING UNITS, COUNTER-DISPENSERS
- SETTABLE SOURCES (auto/manual)
- METER and SETTABLE SOURCE with BATTERY SUPPLY

FUNCTION BLOCKS arithmetic - logic

MODBUS RTU CONVERTERS, including multichannel

VALVES CONTROL TRANSMITTERS

SUPPLIERS

OVERVOLTAGE PROTECTION UNITS

RELAY MODULES

Pt100 SENSORS

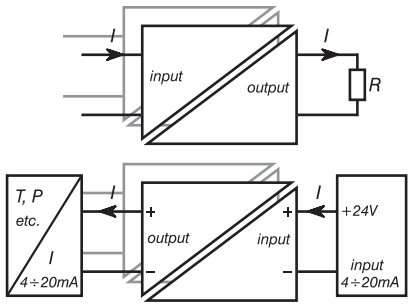
Ex DEVICES with INTRINSICALLY SAFE CIRCUITS
- separators, transmitters, suppliers,
- contacts to cooperate with hazardous zone,
- digital indicators, current source 4÷20mA

Valid price list and catalogue can be found on our website **WWW.LABOR-AUTOMATYKA.PL**

March 2015 *ap12e*

S1, S1-L2W, S1-L4 ISOLATED SELF-POWERED SEPARATOR

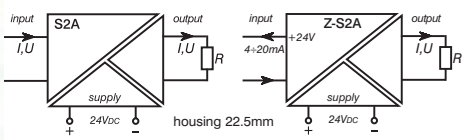
1, 2 or 4 channels

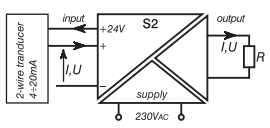


- galvanic isolation • 1 or 2 channels, housing 12.5mm - isolation 2kV/100pF
  1 or 2 channels, housing 22.5mm - isolation 2kV/10pF
  3 or 4 channels, housing 22.5mm - isolation 2kV/100pF
  1 channel, housing 22.5mm - isolation 4kV/10pF
- input • I_{IN}=0/4÷20mA (any I<50mA, U_{IN}<30V)
- output • I_{OUT}=0/4÷20mA (I_{OUT}=I_{IN} or as agreed)
- load resistance • R_L=0÷1000Ω or two-wire transmitter
- voltage drop on input • 2.5V + R_L · 20mA (when I=20mA)
- time constant • 5ms or as agreed
- accuracy • ±0.05% - 0.05% · R_L / 100Ω

1, 2, 3 or 4 channels in one housing
simplest isolation for current loop 0/4÷20mA,
for operating with two wire transmitter or fire and smoke sensors

S2A SEPARATOR WITH ISOLATED SUPPLY CIRCUIT - housing 22.5mm
Z-S2A SUPPLIER-SEPARATOR WITH ISLATED SUPPLY CIRCUIT -housing 22.5mm
S2 SEPARATOR and SUPPLIER-SEPARATOR WITH ISOLATED SUPPLY CIRCUIT - housing 40mm





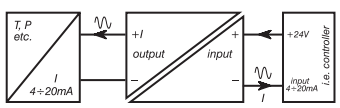
housing 40mm

- S2A input • any standard signal
- Z-S2A input • 4÷20mA current loop supplied from 24V, to operate with two-wire transmitter
- S2 input • any standard signal and 24V supply for two-wire transmitter
- output • any standard analog signal
- load resistance • 0÷700Ω for current output
  ⩾2kΩ for voltage output
- galvanic isolation • all circuits mutually separated
- S2A, Z-S2A supply • 24VDC
- S2 supply • 230VAC
- isolation test voltage • 2kV

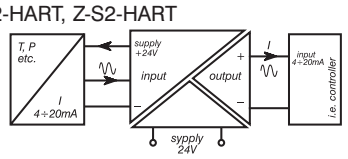
possibility of calibration the beginning and the end of the range

S1-HART, S2-HART, Z-S2-HART
BIDIRECTIONAL SEPARATORS TRANSPARENT FOR HART COMMUNICATION

S1-HART



S2-HART, Z-S2-HART



S1-HART self-powered separator
metrological parameters • same as for S1 separator

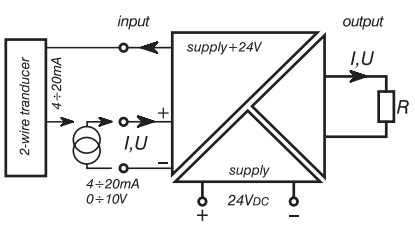
S2-HART separator with 24VDC object supply
metrological parameters • same as for S2A separator

Z-S2-HART supplier-separator with 24VDC object supply for operation with two-wire transmitters e.g. pressure, temperature etc.
metrological parameters • same as for Z-S2A separator

to operate with smart transmitter with HART communication

S2D SEPARATOR WITH ISOLATED SUPPLY CIRCUIT – housing 12.5mm width

thin housing 12.5mm

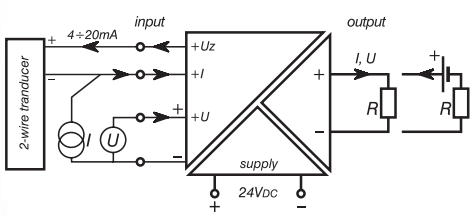


- galvanic isolation • all circuits mutually separated
- input • any standard signal, including powering 4÷20mA current loop for two-wire transmitters
- output • any standard analog signal, including passive 4÷20mA
- input resistance • 50Ω for current inputs,
  ⩾ 100kΩ for voltage signals
- load resistance • 0÷700Ω or current output,
  ⩾2kΩ or voltage output
- accuracy • 0.1% of range
- supply • 24VDC
- isolation test voltage • 2kV

possibility of calibration point at the beginning and the end of the range

S2E SEPARATOR WITH ISOLATED SUPPLY CIRCUIT – housing 6.2mm width

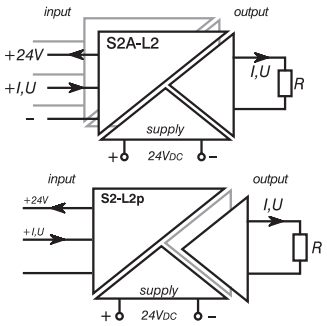
thin housing 6.2mm



- galvanic isolation • all circuits mutually separated
- input • any standard signal, including powering 4÷20mA current loop for two-wire transmitters
- output • any standard analog signal, including passive output controlling 4÷20mA loop powered by e.g. controller
- input resistance • 50Ω for current inputs,
  ⩾100kΩ or voltage signals
- load resistance • 0÷600Ω for current output,
  ⩾2kΩ for voltage output
- accuracy • 0.1% of range
- supply • 24VDC
- isolation test voltage • 2kV

S2-L2 SEPARATOR and SUPPLIER-SEPARATOR with isolated supply circuit: 1 or 2 channels
S2-L2p SUPPLIER-SEPARATOR-REPEATER with isolated supply circuit: 2 outputs

housing 22.5mm

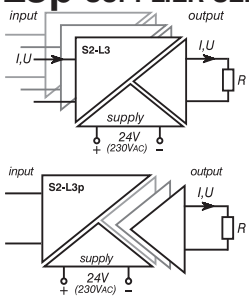


- galvanic isolation • all circuits mutually separated
- input • any standard signal, including 24V supplying 4÷20mA loop for two-wire transmitters
- output • any standard analog signal, including passive 4÷20mA
- nput resistance • 50Ω for current inputs, ⩾100kΩ for voltage signals
- load resistance • 0÷700Ω for current output, ⩾2kΩ or voltage output
- accuracy • 0.1% of range
- supply • 24VDC
- isolation test voltage • 2kV

low cost multichannel version

S2-L3 SEPARATOR with isolated supply circuit: 3 chnns. supply 24VDC or 2 chnns. supply 230VAC
Z-S2-L3 SEPARATOR and SUPPLIER-SEPARATOR: 3 chnns. supply 24VDC or 2 chnns. supply 230VAC
S2-L3p SUPPLIER-SEPARATOR-REPEATER with isolated supply circuit: 2 or 3 channels

housing 50mm

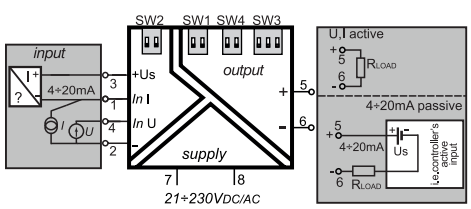


- galvanic isolation • all circuits mutually separated
- S2-L3 input • any standard I, U signal
- Z-S2-L3 input • 4÷20mA, supplying two-wire transmitter loop
- S2-L3p input • any standard I, U
- Z-S2-L3p input • 4÷20mA, supplying two-wire transmitter loop
- wyjście • dowolny sygnał standardowy
- nput resistance • 50Ω or current inputs, ⩾100kΩ for voltage signals
- load resistance • 0÷700Ω for current output, ⩾2kΩ or voltage output
- isolation test voltage • 2kV

for duplicating and repeating signals
rail or wall housing

S2Us-U UNIVERSAL SEPARATOR with universal supply

thin housing 12.5mm

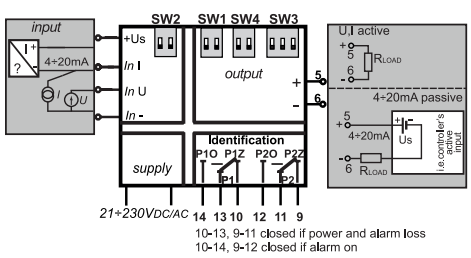


- galvanic isolation • all circuits mutually separated
- input • settable signal 0÷20mA, 4÷20mA or 0÷10V possibility of supplying input 4÷20mA loop with two-wire transmitter
- output • settable signal 0÷20mA, 4÷20mA or 0÷10V, including passive 4÷20mA
- input resistance • 50Ω for current inputs, ⩾100kΩ for voltage signals
- load resistance • 0÷700Ω for current output, ⩾2kΩ or voltage output
- settings • code switches for setting the input and output
- accuracy • 0.1% of range
- supply • universal: 21÷240VAC/DC
- isolation test voltage • 2kV

universal supply
setting the input and output signals with SW1, SW2, SW3, SW4 switches

S2Us-G SETTABLE SEPARATOR with alarm indication and universal supply

housing 22.5mm



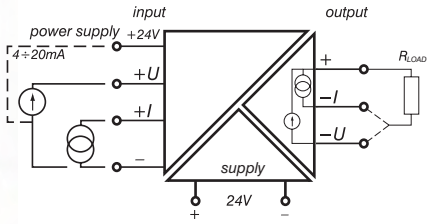
10-13, 9-11 closed if power and alarm loss
10-14, 9-12 closed if alarm on

- galvanic isolation • all circuits mutually separated
- input • settable signal 0÷20mA, 4÷20mA or 0÷10V possibility of supplying input 4÷20mA loop with two-wire transmitter
- output • settable signal 0÷20mA, 4÷20mA or 0÷10V, including passive 4÷20mA
- input resistance • 50Ω for current inputs, ⩾ 100kΩ or voltage signals
- load resistance • 0÷700Ω or current output, ⩾2kΩ for voltage output
- settings • code switches for setting the input and output
- accuracy • 0.1% of range
- supply • universal: 21÷240VAC/DC
- isolation test voltage • 2kV

setting the input and output signals with SW1, SW2, SW3, SW4 switches two relay alarm thresholds set by potentiometers

S2Us, S2Us-W UNIVERSAL SEPARATOR WITH SETTABLE IN/OUT STANDARDS
S2Us-L2 TWO CHANNELS WITH 24VDC SUPPLY IN HOUSING 22.5mm WIDTH
S2Us-L2p SETTABLE SEPARATOR-REPEATER (ONE INPUT, TWO OUTPUTS)

S2Us-L2 22.5mm width *S2Us-W 12.5mm width* *S2Us 25mm width*



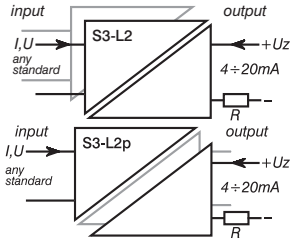
- galvanic isolation • all circuits mutually separated
- input • settable signal 0÷20mA, 4÷20mA or 0÷10V possibility of supplying input 4÷20mA loop with two-wire transmitter
- output • settable signal 0÷20mA, 4÷20mA or 0÷10V
- input resistance • 50Ω for current inputs, ⩾100kΩ for voltage signals
- load resistance • 0÷700Ω for current output, ⩾2kΩ for voltage output
- accuracy • 0.1% of range
- settings • code switches for setting the input and output
- isolation test voltage • 2kV

S2Us-W – optional universal supply 20÷230VAC/DC

universal separator – settable any standard of the input/output signal

S3, S3-L2 TWO-WIRE SEPARATOR any standard → 4÷20mA
S3U, S3U-L2 UNIVERSAL SEPARATOR with settable input standard → 4÷20mA
S3-L2p, S3U-L2p TWO-WIRE REPEATER, also with universal input

two channels 12.5mm width *one channel 22.5mm*



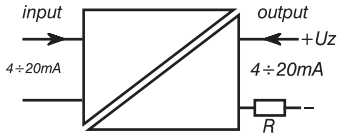
S3, S3U – housing 22.5mm, one channel
S3-L2, S3U-L2, S3-L2p, S3U-L2p – housing 12.5mm, two channels

- galvanic isolation • all circuits mutually separated
- input • S3, S3-L2, S3-L2p - any standard according to order S3U, S3U-L2, S3U-L2p – settable: 0/4÷20mA, 0÷10V
- input resistance • 50Ω for current inputs, ⩾100kΩ or voltage signals
- output • two-wire control of 4÷20mA current loop (external supply)
- external circuit power supply • 9V⩽Uz⩽36V
- load resistance • RMAX=(Uz – 9V)/ 20mA
- accuracy • 0.1%
- isolation test voltage • 2kV

two-wire separator for measurement cards with active current inputs

S3A, S3A-2 TWO-WIRE SEPARATOR 4÷20mA → 4÷20mA

one channel 6.5mm width *one or two channels 12.5mm width*



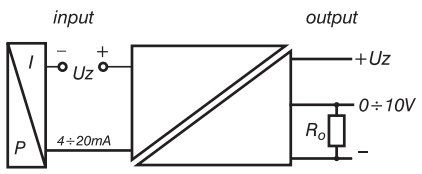
one or two independent channels in one housing

- galvanic isolation • all circuits mutually separated
- input • 4÷20mA
- input resistance • 250Ω, always 5V on the input
- output • two-wire control of 4÷20mA current loop (external supply)
- external circuit power supply • 9V⩽Uz⩽36V
- load resistance • RMAX=(Uz – 9V)/ 20mA
- accuracy • 0.1%
- isolation test voltage • 2kV

low cost version of two-wire separator

As 416 SEPARATOR 4÷20mA → VOLTAGE, WITH THREE-WIRE OUTPUT

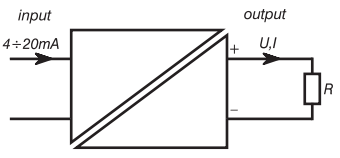
dimensions: width x height x depth
18mm x 90mm x 58mm



- galvanic isolation • all circuits mutually separated
- input • 4÷20mA
- input resistance • 250Ω, always 5V on the input
- three-wire output • 0÷10V, 0÷5V, 2÷10V, 1÷5V
- load resistance • RLOAD>4.7kΩ
- accuracy • 0.1% of full scale
- supply • Uz=16÷36V/ for Ro= ∞ current consumption <3mA
- isolation test voltage • 2kV

S4 SELF-POWERED SEPARATOR 4÷20mA → any standard

housing 22.5mm

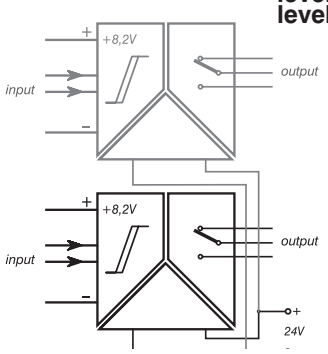


- galvanic isolation • all circuits mutually separated
- input • 4÷20mA
- input voltage dropout • 2V+UOUT or 2V+ 20mA · RLOAD
- output • any standard
- load resistance • 0÷500Ω for current output, ⩾2kΩ for voltage output
- accuracy • 0.1% of full scale
- isolation test voltage • 2kV

easiest separation and translation of 4÷20mA signal to any other signal

SB-L1, SB-L2 BISTATE SEPARATOR ONE or TWO CHANNELS
level translator for high frequencies e.g. 100kHz, 0/5V → 0/24V
level comparator for analog signals

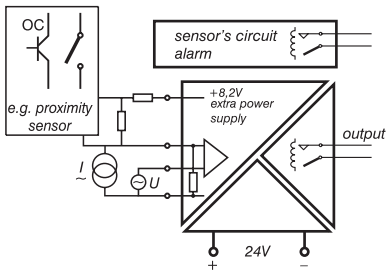
housing 40mm



- galvanic isolation • all circuits mutually separated
- input • proximity sensor, supplied with voltage 8.2÷12V from the separator, Hall sensor for current comparison, transistor or metallic switch, voltage 0÷100VAC/DC, current 0÷1AAC/DC, signal from an encoder 100kHz, 0/5V
- output • relay contact 2A/250V fMAX=3Hz, reed relay 0.3A/250V/50Hz, opto-relay 0.1A/350V/450Hz, OC 50mA/60V/20kHz, fast output 100kHz, 0/24V
- isolation test voltage • 2kV

transfer of contacts state
analog signal comparison – output power relay

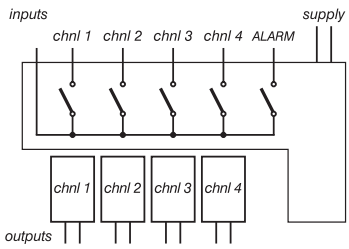
SB-2 BISTATE TWO-CHANNEL SEPARATOR
BKT CIRCUIT CONTROL BLOC



- galvanic isolation • all circuits mutually separated
- input • proximity sensor, Hall sensor for current comparison, transistor or metallic switch, voltage or current with hysteresis
- output • relay contact, opto-relay or OC
- alarm • shorting or opening in sensor circuit can be used as signal for control bloc
- output phase selection • switches
- supply • 24VDC
- isolation test voltage • 2kV

SB-4 BISTATE FOUR-CHANNEL SEPARATOR

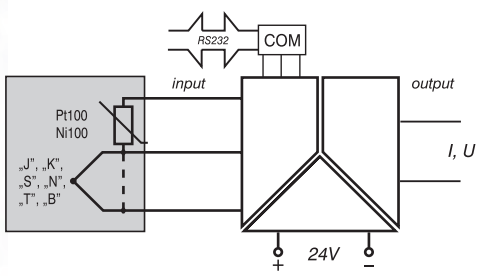
four channels in 22.5mm housing



- inputs • 4 inputs mutually separated, signals: contacts, NAMUR signals, bistate sensors
- outputs • 5 outputs with common terminal, including ALARM signals: relay contacts f⩽10Hz, opto-relay f⩽500Hz
- ALARM function • signaling of connection line, shorting and opening
- output phase selection • switches
- supply • 24VDC
- isolation test voltage • 2kV

when calculated on one channel - most economical version of separation barrier for bistate signals of contact or NAMUR type e.g. from inductive proximity sensors

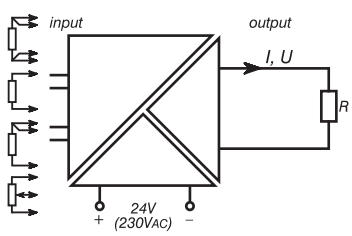
TP-S2 PROGRAMMABLE TEMPERATURE CONVERTER



- galvanic isolation • all circuits mutually separated
- input • cooperation with sensors: Pt, Ni, (or other according to agreement), hermocouples J, K, S, T, B, N (cold ends temperature compensation options)
- sensor connection • three-wire line
- output • programmable selection 0/4÷20mA, 0÷10V
- load resistance • 0÷700Ω for current output, ⩾2kΩ or voltage output
- parameters configuration • with AsSETUP program
- accuracy • 0.1% of full scale, for span of >50°C
- supply • 24VDC
- isolation test voltage • 2kV

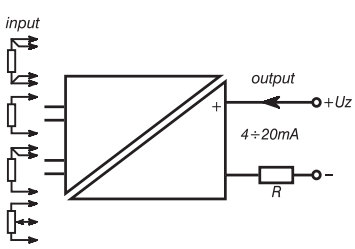
universal transmitter for temperature or potentiometer position measurement

R-S2 RESISTANCE, TEMPERATURE CONVERTER



- galvanic isolation • all circuits mutually separated
- input • resistance change – ΔRMIN=1Ω; ΔRMAX=5kΩ, Pt100, Pt500, Pt1000, Ni, Cu, PTC, NTC, potentiometer position – ΔR=10Ω÷5kΩ
- sensor connection • three or four-wire line
- output • any standard analog signal according to agreement
- load resistance • 0÷700Ω or current output, ⩾2kΩ or voltage output
- accuracy • 0.1% of full scale, for span of >50°C
- supply • 24VDC or 230VAC
- isolation test voltage • 2kV

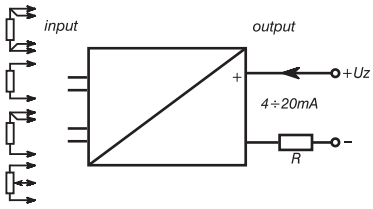
R-S3 TWO-WIRE RESISTANCE, TEMEPRATURE CONVERTER



- galvanic isolation • all circuits mutually separated
- input • resistance change – ΔRMIN=1Ω; ΔRMAX=5000Ω, Pt100, Ni100 – ΔTMIN=20°C, Pt500 – ΔTMIN=5°C, Pt1000 – ΔTMIN=2.5°C, potentiometer position – ΔR=10Ω÷5kΩ
- sensor connection • three or four-wire line
- line compensation • total
- sensor current • 0.4mA
- output • 4÷20mA
- output circuit • external supply 12V⩽Uz⩽36V
- load resistance • RLOAD⩽(Uz– 12V)/ 20mA
- accuracy • 0.1% of full scale, for span of >50°C
- isolation test voltage • 2kV

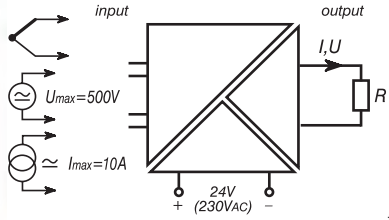
e.g. temperature converter with separation for card with active 4÷20mA inputs

RD, RD1 TWO-WIRE RESISTANCE, TEMPERATURE CONVERTER



input • resistance change – ΔRMIN=5Ω; ΔRMAX=1000Ω,
Pt100, Ni100 – ΔTMIN=20°C,
Pt500 – ΔTMIN=5°C,
Pt1000 – ΔTMIN=2.5°C,
potentiometer position – ΔR=10Ω÷5kΩ
sensor connection • two or three-wire line, (four-wire for RD1)
sensor current • 0.8mA
output • 4÷20mA
load resistance • RLOAD≤(UZ – 10V)/ 20mA
accuracy • 0.1% of full scale, for span >50°C
output circuit • external supply 10V≤UZ≤36V

U-S2, U-S2-W12.5, U-S2-W22.5 VOLTAGE, CURRENT, TEMPERATURE CONVERTER

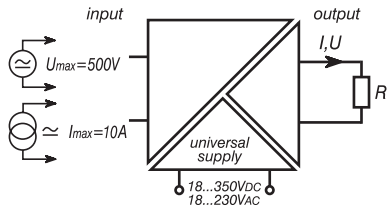


galvanic isolation • all circuits mutually separated
input • voltage – ΔUMIN=1mV; ΔUMAX=500VAC/DC,
current – ΔIMIN=1μA; ΔIMAX=10A AC/DC,
thermocouple – J, K, R, S, T, B, N, L etc.
output • any analog standard signal
input resistance • ⩾250kΩ for voltage signals,
50Ω for current inputs
linearization option • or thermocouple or other sensor
load resistance • 0÷700Ω for current output,
⩾2kΩ for voltage output
temperature compensation • for cold ends of thermocouple -20°C ÷ +70°C
accuracy • see Technical Data Sheet
isolation test voltage • 2kV

U-S2-W12.5 - housing 12.5mm, supply 24VDC
U-S2-W22.5 - housing 22.5mm, supply 24VDC, 230VAC or any other e.g. 200VDC
U-S2 - housing 40mm, supply 24VDC, 230VAC or any other e.g. 200VDC

typical application: high voltage, current from transformers, temperature measurement

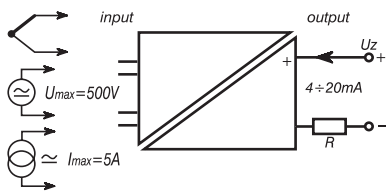
U-S2A HIGH CURRENTS OR VOLTAGE AC/DC RMS CONVERTER



galvanic isolation • all circuits mutually separated
input • RMS measurement (it means average value for DC)
1mA÷10A, 100mV÷500V
band 3Hz÷10kHz, sampling 100kHz
output • any standard analog signal according to agreement
input resistance • for voltage signals ⩾250kΩ,
internal shunt for current inputs
load resistance • output 0/4÷20mA 0÷800Ω,
0/1÷5mA 0÷3kΩ,
0÷10V ⩾2kΩ
supply • universal 18÷230VAC/DC
isolation test voltage • 2kV

high current, voltage AC and DC measurements, e.g. current measurement from transformers 1A, 5A, 10A

U-S3 TWO-WIRE VOLTAGE, CURRENT, TEMPERATURE CONVERTER



galvanic isolation • all circuits mutually separated
input • voltage – ΔUMIN=1mVDC; ΔUMAX=500VDC,
current – ΔIMIN=1μADC; ΔIMAX=5ADC,
thermocouple – J, K, R, S, T, B, N, L etc.
output • 4÷20mA current loop control
input resistance • ⩾250kΩ or voltage signals,
50Ω for current inputs
linearization option • for thermocouple or other sensor
temperature compensation • for cold ends of thermocouple -20°C ÷ +70°C
load resistance • RLOAD≤(UZ – 10V)/ 20mA
accuracy • see Technical Data Sheet
output circuit • external supply 19V≤UZ≤36V
isolation test voltage • 2kV

converter with separation for current, voltage or temperature changes measurement

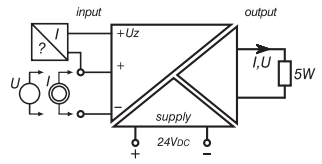
Z... NETWORK SUPPLIERS AND SEPARATING CONVERTERS DC-DC

Network supplier 230V/50Hz	Without pulse processing UOUT=24VDC or other according to order	**As401**	70mA or 2 x 35mA
		ZL1	100mA or 2 x 50mA
		As404	400mA or 2 x 200mA
		ZSB 0,8/24	800mA
	With pulse processing UOUT=24VDC or other according to order	**ZSB 4 x 0,1**	4 outputs 24V/50mA
		ZSB 1/24	1A
		As405	1.5A
		As406	2.5A
		As407	5A
		As408	10A
Separating transformers	With pulse processing UOUT=24VDC	**ZL2**	100mA/3W
		ZL4	1.5A/30W
Transformer up or down, supplied from 8÷35VDC, without separation		**ZL5**	5÷35V/10W

ANALOG CONTROL of:
VALVES, ACTUATORS, POSITIONERS and ELECTROMAGNETIC BRAKES

S2A-PWM	- pulse output 0/24V with PWM regulation without output current control
S2-5W	- analog output with current control or output voltage control, maximum output power 5W
S2-30W	- analog output with current control or output voltage control, maximum output power 30W
WZM- *(±150mA)*	- analog current source with range [-150÷150mA] and maximal load resistance R_{LOAD} ⩽450Ω
WZM-A *(-0 6÷0 6A)*	- analog current source with range [-0 6÷0 6A] and maximal load resistance R_{LOAD} ⩽50Ω
WZM-B *(0 6÷-0 6A)*	- analog current source with range [0 6÷-0 6A] and maximal load resistance R_{LOAD} ⩽50Ω
WZM-O *(0÷1 2A)*	- analog current source with range [0÷1 2A] and maximal load resistance R_{LOAD} ⩽22Ω
WZM-F *(1 2A÷0)*	- analog current source with range [1 2A÷0] and maximal load resistance R_{LOAD} ⩽22Ω
WZM-MFAC	- analog current source with range [0÷200mA] and maximal load resistance R_{LOAD} ⩽32Ω
WZM-PP	- two differential current sources in one housing: first with range [0.4÷0.8A] and second with range [0 8÷0 4A], maximal load resistance R_{LOAD} ⩽19 5Ω
ZPM	- current source settable by potentiometer with digital indication, maximal load resistance R_{LOAD} ⩽19.5Ω

S2-5W SEPARATOR WITH ANALOG POWER OUTPUT (DC)

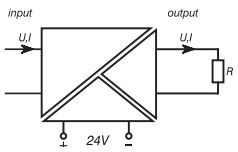


application • analog power output with current or voltage control
galvanic isolation • all circuits mutually separated
input • any analog standard, including possibility of supplying two-wire 4÷20mA line (e.g. from EMERSON DCS OVATION card)
output • any analog signal I⩽250mA, U⩽24V, P⩽5W
accuracy • 0.2% of full scale
supply • 24VDC
isolation test voltage • 2kV

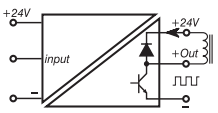
parameters modification is possible according to user needs

S2-30W SEPARATOR WITH ANALOG POWER OUTPUT (DC)
S2A-PWM SEPARATOR WITH PULSE POWER OUTPUT (PWM)

S2-30W



S2-PWM

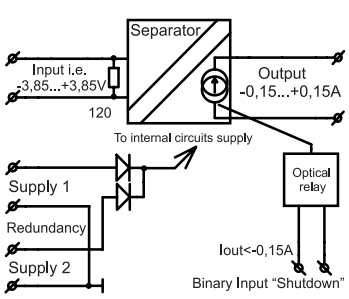


galvanic isolation • all circuits mutually separated
input • dowolny standard
output • S2-30W - any analog signal with power up to 30W
S2A-PWM - OC, 300Hz, I=2A, U=24V
accuracy • 0.2% of full scale
supply • 24VDC, 230VAC or according to agreement
isolation test voltage • 2kV

S2-30W - rail housing 108mm width
S2A-PWM - rail housing 22.5mm width

it can be used e.g. as positioner or valve driver

WZM- ±150mA AMPLIFIER with ANALOG POWER OUTPUT (DC)

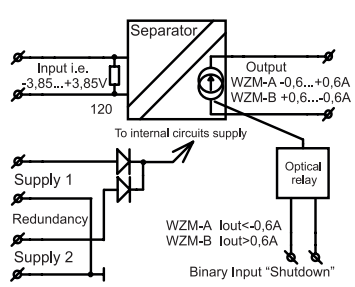


application • regulation of valve driven by current source ±150mA controlled by analog signal
galvanic isolation • all circuits mutually separated
input • any analog standard, e.g. from EMERSON DCS OVATION card
output • -150mA ÷ +150mA, coil resistance R_{LOAD} ⩽450Ω
"SHUTDOWN" • emergency shutdown I_{OUT}=-150mA, other setting possible according to agreement
accuracy • 0.2% of full scale
supply • 24VDC
isolation test voltage • 2kV

rail housing 108mm width

parameters modification is possible according to user needs

WZM-A-(-0.6A÷0.6A) AMPLIFIER with ANALOG POWER OUTPUT 0.6ADC
WZM-B-(0.6A÷-0.6A) AMPLIFIER with ANALOG POWER OUTPUT 0.6ADC

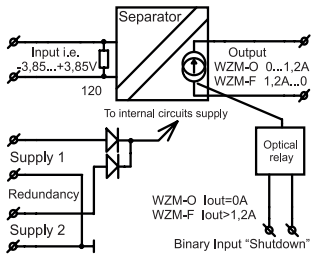


application • regulation of valve driven by current source ±0.6A controlled by analog signal
galvanic isolation • all circuits mutually separated
input • any analog standard, e.g. from EMERSON DCS OVATION card
output • *A*: -0.6A ... +0.6A *B*: +0.6A ... -0.6A coil resistance R_{LOAD} ⩽50Ω
"SHUTDOWN" • emergency shutdown *A*: I_{OUT}=-0.6A; *B*: I_{OUT}=+0.6A other setting possible according to agreement
accuracy • 0.2% of full scale
supply • 24VDC
isolation test voltage • 2kV

rail housing 108mm width

parameters modification is possible according to user needs

WZM-O-(0...1.2A) AMPLIFIER with ANALOG POWER OUTPUT 1.2ADC
WZM-F-(1.2A...0) AMPLIFIER with ANALOG POWER OUTPUT 1.2ADC

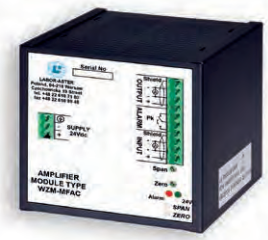


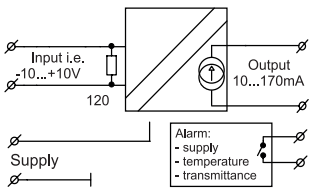
- application • regulation of valve driven by current source controlled by analog signal
- galvanic isolation • all circuits mutually separated
- input • any analog standard, e.g. from EMERSON DCS OVATION card
- output • ***O***: 0 ... 1.2A ***F***: 1.2A ... 0 coil resistance $R_{LOAD} \leqslant 22\Omega$
- "SHUTDOWN" • emergency shutdown ***O***: I_{OUT}=0A; ***F***: I_{OUT}>1.2A other setting possible according to agreement
- accuracy • 0.2% of full scale
- supply • 24VDC
- isolation test voltage • 2kV

rail housing 108mm width

parameters modification is possible according to user needs

WZM-MFAC AMPLIFIER with ANALOG POWER OUTPUT 0...200mADC





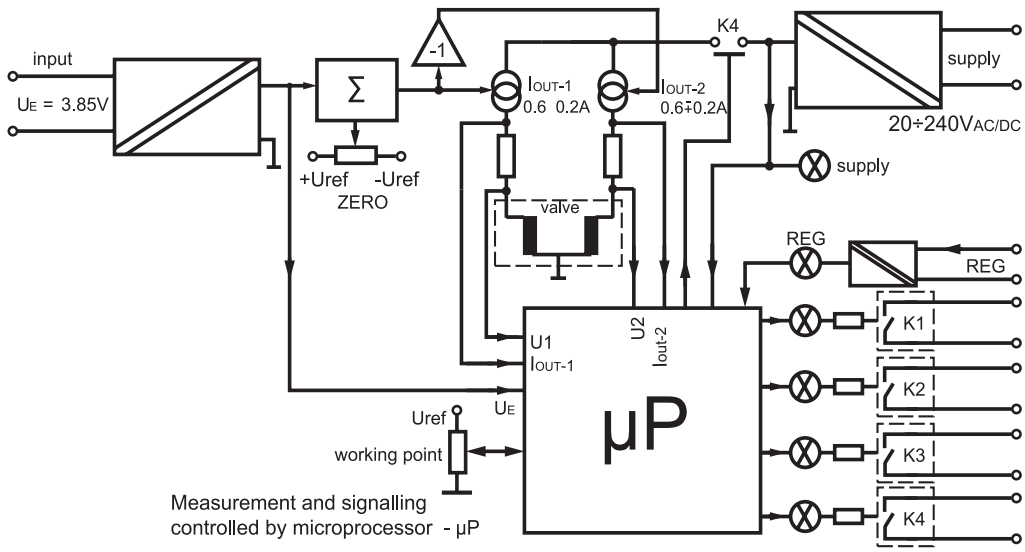
- application • regulation of valve driven by current source 10...170mA controlled by analog signal
- galvanic isolation • all circuits mutually separated
- input • any analog standard, e.g. from EMERSON DCS OVATION card
- output • 10...170mA coil resistance $R_{LOAD} \leqslant 32\Omega$
- alarm • exceeding temperature inside the amplifier, lack of supply, transmittance error Δ>5%
- accuracy • 0.2% of full scale
- supply • 24VDC
- isolation test voltage • 2kV

rail housing 108mm width

parameters modification is possible according to user needs

WZM-PP AMPLIFIER with ANALOG POWER OUTPUT I_1=0.4...0.8A; I_2=0.8...0.4A

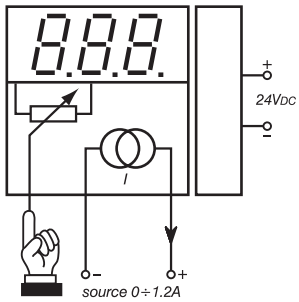
rail housing 108mm width



- application • regulation of valve driven by two current sources: I_1=0.4...0.8A; I_2=0.8...0.4A
- galvanic isolation • all circuits mutually separated
- input • any analog standard, e.g. from EMERSON DCS OVATION card
- output • push-pull with two current sources: I_1=0.4...0.8A; I_2=0.8...0.4A coil resistance $R_{LOAD} \leqslant 19\Omega$
- accuracy • 0.2% of full scale
- supply • 24VDC/AC ÷ 230VDC/AC
- isolation test voltage • 2kV

parameters modification is possible according to user needs

ZPM POWER CURRENT SETTING UNIT 0÷1.2ADC with separation from power supply



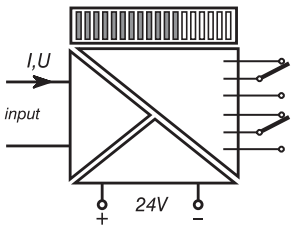
- current setting • any subrange from range 0.00÷1.20A
- oad resistance • Rmax≤32W/ I^2_{range} e.g. for electrovalve coil R≤22Ω for I≤1.2A
- output power • maximum 32W
- display • 4 digits LED 14mm
- current setting • internal potentiometer knob
- accuracy • 0.2% ±1 in the last digit
- supply • 24VDC, 230VAC or according to agreement
- isolation test voltage • 1.5kV

rail housing 108mm width

perfect for manual setting of high power electrovalves

WL-61 BAR INDICATOR 61 LEDs WITH EXTRA FUNCTIONS
WL-31 BAR INDICATOR 31 LEDs

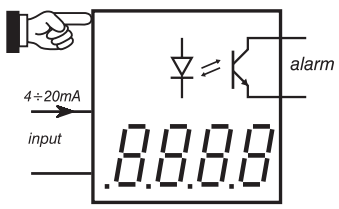
WL-61 board housing 192 x 24mm
WL-31 board housing 96 x 24mm



- input • any standard signal
- outputs • 2 relay alarm outputs (WL61)
- accuracy • WL31 3.2% of full scale
  WL61 1.6% of full scale
- linearization • WL61 five-points or $\sqrt{\ }$
- galvanic isolation • all circuits mutually separated
- isolation test voltage • 2kV

WL-31 vertical or horizontal scale

ML1-prog SELF-POWERED PROGRAMMABLE DIGITAL 4÷20mA LINE MONITOR

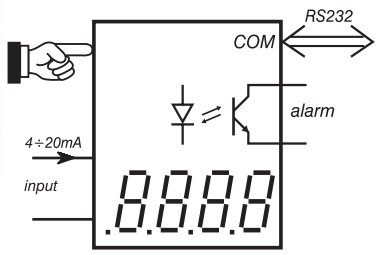


- input • 4÷20mA
- voltage dropout on terminals • 6V
- polarity • any
- display • 4 digits LED 13mm, with backlight
- accuracy • 0.1% of full scale ±1 in the last digit
- time constant • programmable: 0.5÷32s
- range setting • programmable with buttons
- alarm • threshold value programmable with buttons
- alarm circuit • OC transistor with optoisolation, 60VAC/DC/100mA

board, rail or wall housing 72x72x61mm, display with backlight

fully programmable indicator

ML4 SELF-POWERED PROGRAMMABLE DIGITAL 4÷20mA LINE MONITOR



- input • 4÷20mA
- voltage dropout on terminals • 5.6V
- display • 4 digits LED 13mm
- accuracy • 0.1% of full scale ±1 in the last digit
- configuring parameters • programmable with buttons on the front panel or from AsSETUP program by RS232
- time constant • programmable: 0.5÷32s
- alarm • threshold value programmable with buttons
- alarm circuit • OC transistor with optoisolation, 60VAC/DC/100mA

board housing 72 x 36 x 85mm
rail housing 75 x 75mm

two-wire, self-powered, glowing indicator

ML3 DIGITAL LED INDICATOR
ML7 INDICATOR WITH LED ARRAY 56x16 points

LED14mm
board housing 72 x 72mm
rail or wall housing,
supply 24VDC

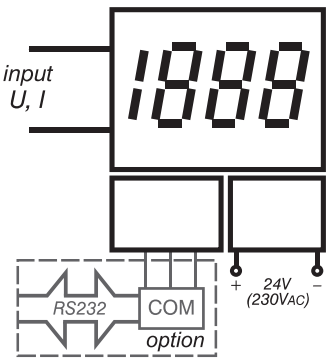
LED57mm
wall housing 230 x 80 x 57mm,
supply 24VDC or 230VAC

LED76mm
board housing 288 x 144mm,
supply 24VDC or 230VAC

matryca LED array 56 x 16
wall housing 300 x 106 x 50mm,
supply 24VDC

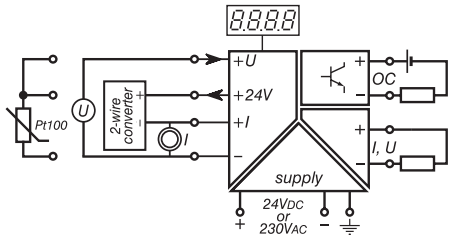
- input • any standard signal
- display ML3 • 3.5 digits
  LED 14mm - board housing
  LED 76mm - board housing
  LED 57mm - wall housing
- display ML7 • LED array 56x16 points
  wall housing - 7 characters 68mm or
  - 14 characters 31mm
- galvanic isolation • input, supply, RS232 - mutually separated
- isolation test voltage • 2kV

optional - MODBUS RTU version of RS232 or RS485:
- transferring digitalized input signal,
- transferring digits to indicate



indication in physical units according to agreement

S2-ML3 CIRCUIT SEPARATOR – TRANSMITTER WITH INDICATION
Z-S2-ML3 CIRCUIT SUPPLY-SEPARATOR – TRANSMITTER WITH INDICATION

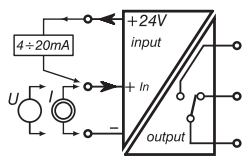


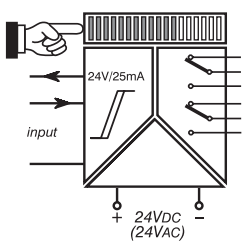
input	• 0/4÷20mA, 0÷10V or other according to agreement, Z-S2-ML3: 4÷20mA loop with supply 24V optional: Pt100, thermocouple, potentiometer
analog output	• any standard analog signal according to agreement
alarm output	• programmable, OC 36V/100mA
indicator	• programmable, LED 4 digits, 20mm
RS485 output	• MODBUS RTU (optional)
galvanic isolation	• all circuits mutually separated
isolation test voltage	• 2kV

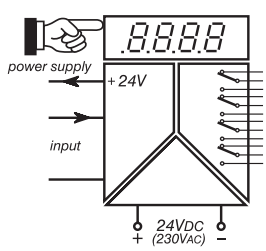
rail housing 75x75mm
wall housing 130x130x35mm

mainly as an indicator
in particular for use with two-wire transmitters

SG2 LIMIT INDICATOR
SG4 PROGRAMMABLE LIMIT INDICATOR WITH LED BAR
SG5 PROGRAMMABLE LIMIT INDICATOR WITH DIGITAL LED INDICATOR







input	• 0/4÷20mA, 0÷10V or other according to agreement, 4÷20mA loop with supply 24V
output	• switching relay contacts; 8A/250VAC
switching threshold	• settable by potentiometer or button, constant hysteresis 3% of the output range
galvanic isolation	• all circuits mutually separated
supply	• 24VDC
isolation test voltage	• 2kV

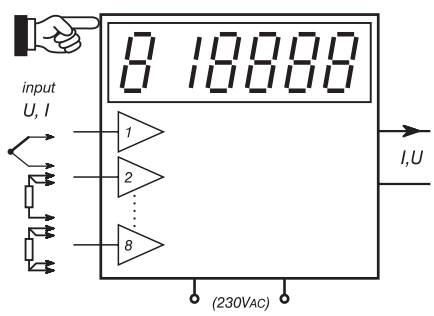
input	• any standard signal, optional sensor: Pt, Cu, Ni, thermistor, potentiometer, thermocouple, input with current loop 4÷20mA/24V, isolation leakage measurement with AC voltage
output	• 2 alarm thresholds, OC or relay
programing	• with button on the front panel
indicator	• LED bar, 20 points
accuracy	• 0.5% of full scale
setting accuracy	• 1% of full scale
output for sensor supply	• 24VDC/25mA
galvanic isolation	• all circuits mutually separated
supply	• 24VDC or 24VAC
isolation test voltage	• 2kV

input	• ±20mA, ±10V, optional: Pt100, thermocouple, potentiometer or input with 4÷20mA/24V current loop supply
output	• 4 alarm thresholds, OC or relay
digital indication	• -9999 ÷ +9999, LED 14mm
accuracy	• 0.1% of full scale ±1 in the last digit
galvanic isolation	• all circuits mutually separated
supply	• 24VDC, 24VAC or 230VAC
isolation test voltage	• 2kV
housing	• board or rail

rail housing 75x75mm
board housing 72x72x105mm

simple programming without a necessity of using a computer

WT BOARD INDICATOR – 8 ANALOG CHANNELS

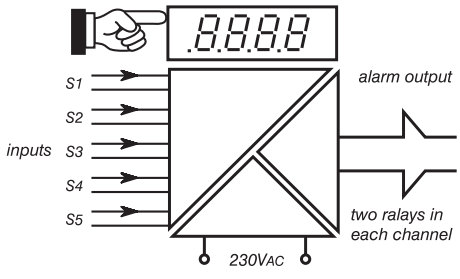


inputs	• 8 separated inputs: - voltage or current DC, - resistance sensors e.g. Pt100, - thermocouples
indicator	• 4.5 digits LED 14mm
outputs	• analog, RS232 or RS485
alarms	• 12 relay outputs
accuracy	• 0.1% of full scale ±1 in the last digit
supply	• 230VAC/14VA
galvanic isolation	• all circuits mutually separated
isolation test voltage	• 2kV

board housing 72x192x163mm

typical application – multipoint temperature measurement

RSG-5 LIMIT INDICATOR (5 channels)

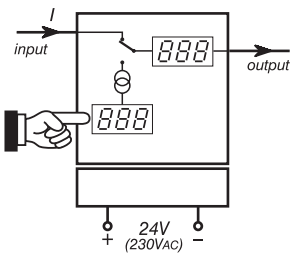


inputs	• 8 non-separated inputs: - voltage or current DC, - 5 current loops 4÷20mA, - sensors Pt, Ni, Cu
indicator	• 5 fields, 4 digits each, LE 14mm
alarms	• 2 relays on each channel
output	• RS485 MODBUS RTU
accuracy	• 0.1% of full scale ±1 in the last digit
galvanic isolation	• all circuits mutually separated
supply	• 230VAC/14VA
isolation test voltage	• 2kV

board housing 72x144x116mm

e.g. for controlling bearing temperature in a turbine or engine

SZP NON-IMPACT CURRENT SETTING DEVICE

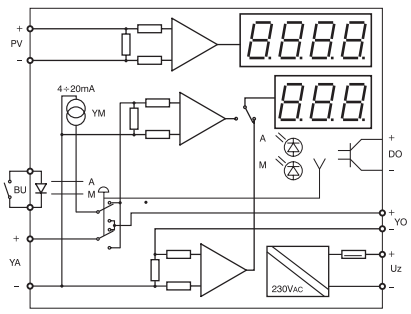


input	• 0÷20mA or 4÷20mA
output	• 0÷20mA or 4÷20mA
accuracy	• 0.1mA or ±0.4% (3 digits)
indication	• mA, %, V or according to agreement
delay between measurements	• 0.3s
time between changing control from manual to automatic	• programmable: 1s÷3min
supply	• 24VDC or 230VAC
galvanic isolation	• all circuits mutually separated
isolation test voltage	• 2kV

board housing 72x72x163mm

before changing to manual control from a setting device, SZP can automatically balance to process control

As 550 MANUAL CONTROL SETTING DEVICE (with potentiometer)

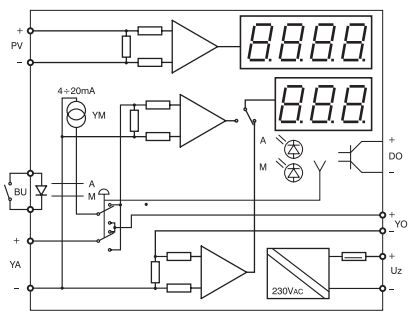


setting signal level	• by rotative potentiometer in range 4÷20mA
indication of input PV signal	• programmable in physical units, 4 digits; accuracy 0.1% of full range
ind. of output current A and M	• 3 digits
resolution	• 12 bits
manual balancing	• changing A→M, M→A
indication of operation state	• elevation + feedback to controller
failover	• *BACKUP* - switch to the last before failure control value
supply	• 230VAC or 24VDC

board housing 72x72x116.5mm

free AsSETUP software for setup using RS232

As 560 MANUAL CONTROL SETTING DEVICE (with buttons)

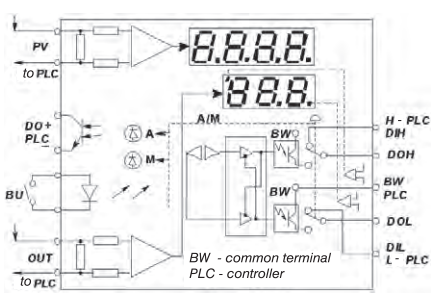


setting signal level	• by buttons in range 4÷20mA
indication of input PV signal	• programmable in physical units, 4 digits; accuracy 0.1% of full range
ind. of output current A and M	• 3 digits
resolution	• 12 bits
non-impact switching	• A→M
manual balancing	• M→A
indication of operation state	• elevation + feedback to controller
failover	• *BACKUP* - switch to the last before failure control value
supply	• 230VAC or 24VDC

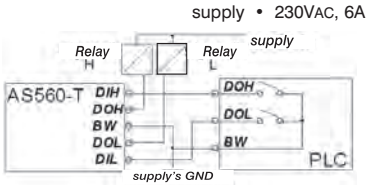
board housing 72x72x116.5mm

free AsSETUP software for setup using RS232

As 560-T THREE-STATE SETTING DEVICE for actuators with feedback



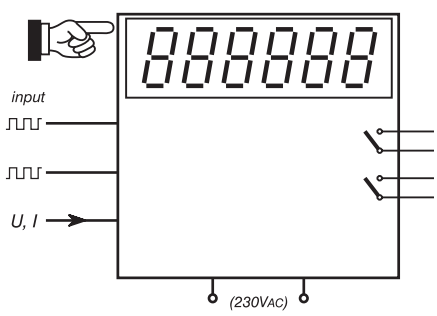
PV input	• input signal measurement 0/4÷20mA
indicator	• programmable 4 digits; accuracy 0.1% of full range
OUT input	• measurement of the feedback signal 4÷20mA, 3 digits indicator
DOH, DOL output	• actuator control signals
indication of operating state	• elevation and to system
failover	• *BACKUP* - switch to the manual mode until failure discontinuation
supply	• 230VAC, 6A



board housing 72x72x116.5mm

free AsSETUP software for setup using RS232

LD COUNTER-DISPENSER

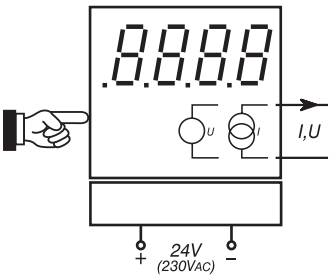


inputs	• analog or 2 pulse inputs e.g. from proximity sensors
outputs	• 2 alarm outputs (relays)
counters	• global 12 digits counter for dose measuring 6 digits counter of doses number 6 digits
analog accuracy	• 0.1% of full range ±1 in the last digit
indicator	• 6 LED digits 14mm
supply	• 230VAC/14VA

board housing 72x144x163mm

input analog signal is counted by integration ∫y(t)dt, or pulse sting is counted from proximity sensors (e.g. NAMUR type), contacts, flow-meters with pulse output etc., portions are measured and valves are controlled – BRAKE and STOP signals

ZIU CURRENT OR VOLTAGE SETTING DEVICE

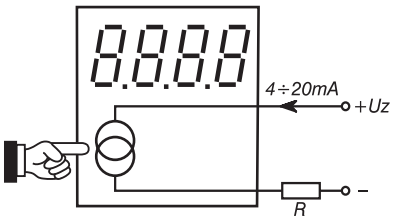


- current output • 0.00÷25.00mA
- voltage output • 0.00÷12.50V
- load resistance • 0÷800Ω – current output
  ⩾2kΩ – voltage output
- display • 4 LED digits 14mm
- accuracy • 0.1% of full scale ±1 in the last digit
- settings • keyboard
- settings memory • 5 cells for current
  5 cells for voltage
- galvanic isolation • output circuits separated from power supply circuit
- supply • 24VDC for board housing, also 230VAC
- isolation test voltage • 2kV

rail housing 75x75mm
board housing 72x72x163mm

convenient device for system start-up or checking

ZD TWO-WIRE 4÷20mA SETTING DEVICE

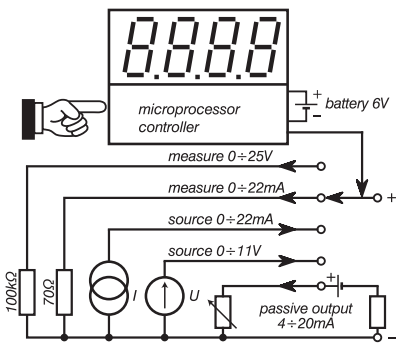


- current output • 3.00÷25.00mA, any polarization
- Uz voltage • 6÷36VDC
- display • 4 LED digits 13mm with backlight
- accuracy • 0.1% of full scale ±1 in the last digit
- settings • keyboard “up”, “down”
  buttons programming indication and alarm
- settings memory • 8 cells of settings in non-volatile memory

board housing 72x72x61mm
rail housing 75x75mm

convenient device for system start-up or checking powered from current loop

PZM PORTABLE, BATTERY CURRENT OR VOLTAGE SETTING DEVICE AND METER

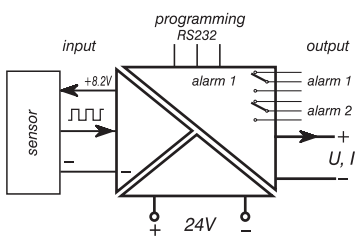


- current measurement • 0.00÷22.00mA (max 25mA)
- setting current • 0.00÷22.00mA; load R⩽600Ω
  passive output 4÷25mA
- voltage measurement • 0.00÷25.00V (max 30V)
- voltage setting • 0.00÷11.00V; RLOAD ⩾2kΩ
- display • LCD, 4 digits 10mm with backlight
- settings • incremental buttons
- functions programming • buttons
- accuracy • 0.05% of full scale ±1 in the last digit
- operation time • recommended 230mAh 4xAA 1.2V rechargeable batteries,
  depending on the selected function:
  min. 15h for setting current 20mA, max 500h
- batteries charging • internal, powered from external supplier,
  typical for devices USB 5VDC/1A

hand housing made of ABS plastic
with usefull magnetic attachment

perfect for automation system diagnostic on site

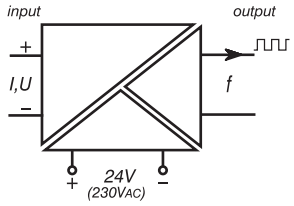
FP-S2 PROGRAMMABLE FREQUENCY TO ANALOG SIGNAL CONVERTER



- input • pulses in frequency range 0.001Hz÷100kHz operation
  with proximity sensors, encoders etc.
- output • optional: 0÷20mA, 4÷20mA or 0÷10V
- alarms • two relay outputs
- programming • selection of frequency range,
  selection of output signal,
  two alarm thresholds
- output for sensor supply • 8.2V
- accuracy • 0.1% of full scale
- galvanic isolation • all circuits mutually separated
- supply • 24VDC
- isolation test voltage • 2kV

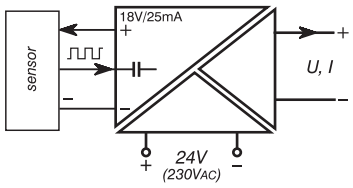
low cost, universal, programmable frequency converter
free AsSETUP software for setup using RS232

SF-S2 ANALOG SIGNAL TO FREQUENCY CONVERTER with separation
ZSF-S2 SELF-POWERED TWO-WIRE TRANSMITTERS TO FREQUENCY CONVERTER



- input • any standard (SF-S2)
  4÷20mA (ZSF-S2)
- output • square wave, 50% duty cycle
- frequency • any range 0÷10kHz
- output OC • NPN or PNP max 40V/100mA
- accuracy • 0.2% of full scale
- galvanic isolation • all circuits mutually separated
- supply • 24VDC/60mA or 230VAC/2VA
- isolation test voltage • 2kV

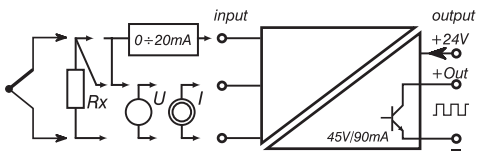
F-S2 FREQUENCY TO STANDARD SIGNAL CONVERTER with full separation



- input • voltage - 1mV÷100V
  current - 10μA÷5A
- frequency band • 0÷10kHz
- output • any standard analog signal
- output for sensor supply • 18V/25mA
- accuracy • 0.2% of full scale
- galvanic isolation • all circuits mutually separated
- supply • 24VDC/60mA or 230VAC/2VA
- isolation test voltage • 2kV

easy to use due to separation,
when paired with SF-S2 it can be used to transfer analog signal for long distances e.g. 5km

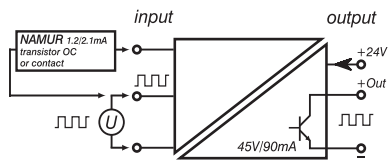
SF-S2A STANDARD SIGNAL TO FREQUENCY CONVERTER with separation
RF-S2A RESISTANCE (TEMPERATURE) TO FREQUENCY CONVERTER with separation



- SF-S2A input • 0/4÷20mA, 0÷10V or other according to agreement
- RF-S2A input • Pt100÷1000, Ni100, Cu, potentiometer, thermocouple
- output • OC, 45V/90mA,
  typically 1kHz, option: 10Hz, 100Hz, 2kHz,
  wave, 50% duty cycle
  or constant constant pulse width:
  0.05ms; 0.1ms; 1ms; 10ms
- accuracy • 0.2% of full scale
- galvanic isolation • output and supply isolated from input,
  (common "-" of supply and output)
- supply • 18÷24VDC
- isolation test voltage • 2kV

good price

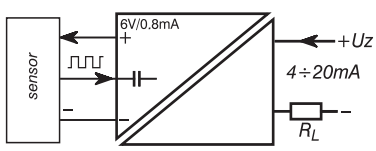
IF-S2B FREQUENCY DIVIDER with separation



- input • pulse string e.g. 0/24V or NAMUR 1.2/2.1mA
  e.g. from proximity sensors
- output • OC, 45V/90mA, freq. 0÷20kHz according to agreement;
  square wave with 50% duty cycle or constant pulse width:
  0.05ms, 0.1ms, 1ms, 10ms or according to agreement
- frequency divider • set by 4 switchers or according to agreement
- galvanic isolation • output and supply isolated from input,
  (common "-" of supply and output)
- supply • 18÷24VDC
- isolation test voltage • 2kV

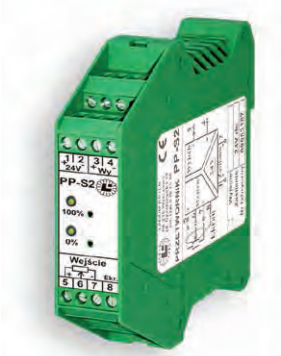
to operate with PLC drivers, good price

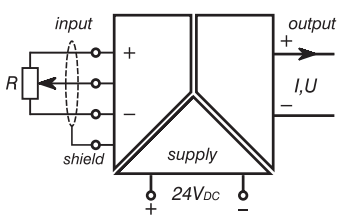
F-S3 TWO-WIRE FREQUENCY CONVERTER with separation



- input • voltage - 1mV÷100V
  current - 10μA÷5A
- frequency band • 1Hz÷10kHz
- output • 4÷20mA
- load resistance • Rmax=(Uz-12V)/20mA
- output for sensor supply • 6V/0.8mA
- accuracy • 0.2% of full scale
- galvanic isolation • all circuits mutually separated
- supply • 12÷36V
- isolation test voltage • 2kV

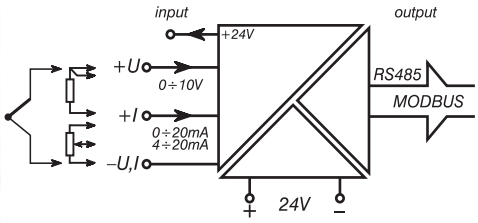
PP-S2 POTENTIOMETER POSITION CONVERTER





- input • any potentiometer 50Ω÷100kΩ
- output • any standard analog signal e.g.
  0/4÷20mA, ROBC=0÷850Ω
  0/1÷5mA, ROBC=0÷3kΩ
  0/2÷10V, ROBC>2kΩ
- accuracy • 0.1% of full scale
- galvanic isolation • all circuits mutually separated
- supply • 24VDC
- solation test voltage • 2kV

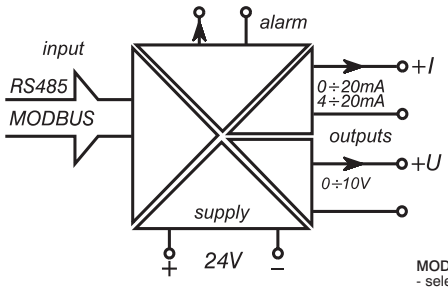
S2-MOD ANALOG SIGNALS ⇒ MODBUS RTU



- input • voltage: 0÷10V, 0÷30mV, 0÷75mV
  current: 0/4÷20mA
  supply 24VDC for 4÷20mA loop
  Pt100÷1000, Ni, Cu, thermocouple
- output • RS485 connection, half-duplex
- transmission protocol • MODBUS RTU (serial transmission RS-485 with MODBUS RTU protocol)
- transmission speed • 4800, 9600, 19200 bit/s
- galvanic isolation • all circuits mutually separated
- isolation test voltage • 2kV

for systems based on MODBUS RTU bus

S2B-MOD MODBUS RTU ⇒ ANALOG SIGNAL TRANSLATOR (two analog outputs)



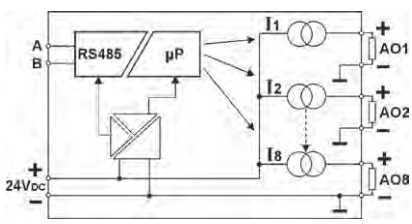
translation of digital value (written in register) to two mutually separated analog outputs: current or voltage

- input • RS485 MODBUS RTU, 50÷115200 b/s
  possibility of connecting 254 devices in a network
- output • two independent standard outputs (0÷21mA, 0÷11V) configurable by user
- alarm • loss of transmission
- transmission speed • 4800, 9600, 19200 bit/s
- accuracy • 0.1% of full scale
- galvanic isolation • full separation between RS485 interface, analog outputs and supply
- supply • 24VDC
- isolation test voltage • 2kV

MODBUS RTU MASTER functions:
- selection of standard analog signal
- retransmission from LABOR-ASTER devices
- retransmission and rescale of any register
- alarm when transmission or supply is lost
- setting the last value after start

MODBUS RTU SLAVE functions:
- conversion of register value to standard analog signal
- alarm when transmission or supply is lost
- setting the last value after start
- full standard realization

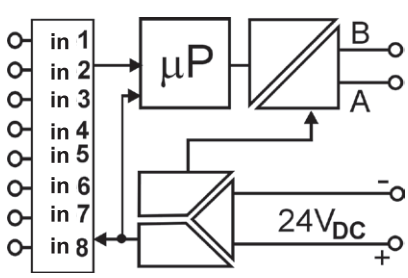
As701 MODBUS RTU ⇒ 8 ANALOG OUTPUTS CONVERTER



- input • RS485 MODBUS RTU, max 19200 b/s
- outputs • 8 analog outputs: 0/4÷20mA,
  common ground for all 8 outputs (terminal „–")
- repetition • 5 refreshes/s
- load resistance • ≤750Ω
- accuracy • 0.25% of full scale
- galvanic isolation • full separation between RS485 interface, analog outputs and supply
- supply • 24VDC
- isolation test voltage • 2kV

can operate as "SLAVE" in a set with As702
for systems based on MODBUS RTU bus

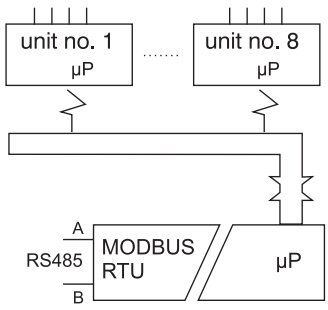
As702 8 ANALOG INPUTS ⇒ MODBUS RTU CONVERTER



- input • 8 differential analog inputs:
  0/4÷20mA or 0÷10V, high impedance separation between channels for voltages ≤66V
- output • RS485 MODBUS RTU, max 19200 b/s
- repetition • 5 refreshes/s
- accuracy • 0.25% of full scale
- galvanic isolation • full separation between RS485 interface, analog outputs and supply
- supply • 24VDC
- isolation test voltage • 2kV

can operate as "MASTER" in a set with As701
for systems based on MODBUS RTU bus

As703 MODBUS RTU ⇒ INPUTS or OUTPUTS CONVERTER with separation



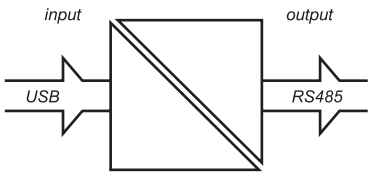
- RS485 MODBUS RTU • SLAVE, 300÷115200b/s
- inputs/outputs • 8 sets mutually separated galvanically

As part of one set you can implement:
- 1 or 2 analog outputs with separation, 3 outputs without separation,
- 2 binary channels with separation, 3 binary channels without separation,
- universal analog input; voltage 0÷10V, current 0/4÷20mA, current loop 4÷20mA/24VDC,
- Pt100 3- or 4-wire input,
- 2 analog outputs without separation.

With 8 sets there can be maximum 4 different sets of input/output functions.
It means that 2 sets always must have the same function.

- accuracy of analog processing • 0.1% of full scale
- galvanic isolation • full separation between RS485 interface, input/output sets and supply
- supply • 24VDC
- isolation test voltage • 1kV

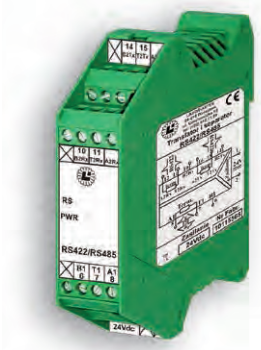
USB-RS485 CONVERTER WITH SEPARATION



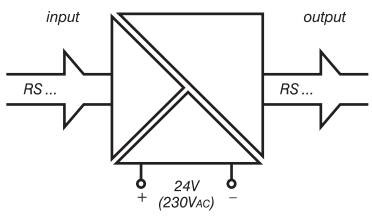
application • safety connection of portable computer to a device with two-wire RS485 interface
transmission speed • 50...115200 b/s
number of devices • max 254 on one RS485 line
maximum line length • 1200m
galvanic isolation • all circuits mutually separated
supply • from USB port; 5VDC/0.12A
isolation test voltage • 2kV

RS485 connector with optoisolation

ST-RS.../RS... TRANSLATOR WITH SEPARATION



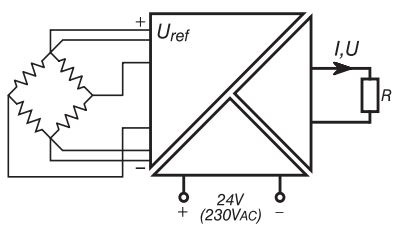
rail or wall housing



type		signal conversion		
ST-RS232/RS422	•	RS232	⇔	RS422; RS485 full-duplex
ST-RS232/RS485	•	RS232	⇔	RS485 half-duplex
ST-RS422/RS422	•	RS422	⇔	RS422
		RS485	⇔	RS485 full-duplex
ST-RS422/RS485	•	RS422	⇔	RS485 half-duplex
ST-RS232/RS232	•	RS232	⇔	RS232
ST-RS232/TTY	•	RS232	⇔	TTY
ST-RS232/M-Bus	•	RS232	⇔	M-Bus 300÷9600bps
ST-RS485/M-Bus	•	RS485	⇔	M-Bus 300÷9600bps

transmission speed • for RS485, RS 422 ⩽115200bps
for RS232, TTY ⩽19200bps
galvanic isolation • all circuits mutually separated
supply • 24VDC/60mA, for wall housing also 230VAC
isolation test voltage • 2kV

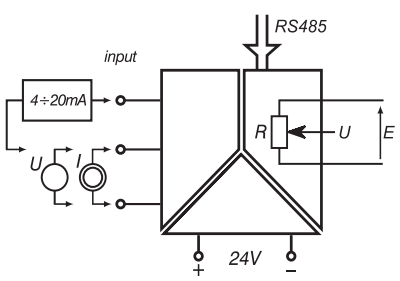
T-S2 TENSOMETRIC CONVERTER with separation



input • signal from strain gauge bridge ΔUMIN=2mV
bridge resistance • 50÷1000Ω
output • any standard analog signal
reference voltage • 2÷10V - according to order
reference source load current • ⩽50mA
bridge connection • 4 or 6 wires
settings • „ZERO" (TARA) and „RANGE" buttons
time constant (averaging) – push both buttons
accuracy • 0.1% of full scale
galvanic isolation • all circuits mutually separated
supply • 24VDC/70mA
isolation test voltage • 2kV

for operating with bridge or half-bridge input
signal does not have to start with zero

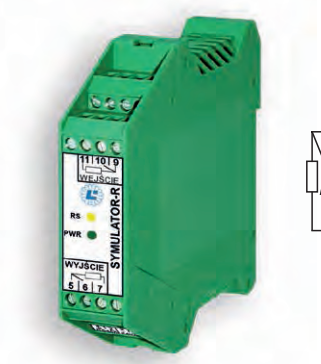
POT-S2 POTENTIOMETER CONTROLLED BY STANDARD SIGNAL with separation

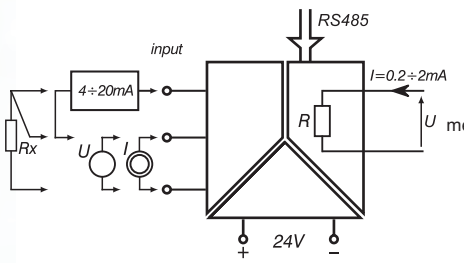


input • any standard signal, according to order
output • linear potentiometer divider proportional to the input signal
voltage • E=2÷20V, U=(1÷100%) · E
„potentiometer" resistance • R=100Ω÷35kΩ - according to order
time constant • 0.2s
RS485 input • setting and reading the position from MODBUS RTU
accuracy • 0.2% of full scale
galvanic isolation • all circuits mutually separated
supply • 24VDC/60mA
isolation test voltage • 2kV

can replace mechanically driven potentiometer

SYMULATOR-R RESISTANCE SIMULATOR (including Pt100) with separation



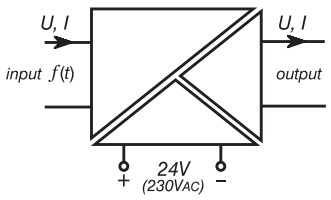


resistance sensors repeater
e.g. Pt100 sensor in range (-200÷+400)°C

input • any standard signal – according to order, supplying for two-wire 4÷20mA loop, resistance sensor e.g. Pt100
output • simulated input resistance 30Ω÷35kΩ - subranges according to agreement, simulator (repeater) of the input resistance according to agreement, including temperature sensor e.g. Pt100 emulator (repeater)
measurement current on output • I=0.2÷2mA
voltage on output • U=0.2÷7V
accuracy • 0.1% of full scale
time constant • 0.2s
RS485 input • setting and reading the position from MODBUS RTU
galvanic isolation • all circuits mutually separated
supply • 24VDC/60mA
isolation test voltage • 2kV

RMS-S2 RMS CONVERTER WITH SEPARATION

RMS: $y(t)=\sqrt{\frac{1}{T}\int_0^T[f(t)]^2dt}$



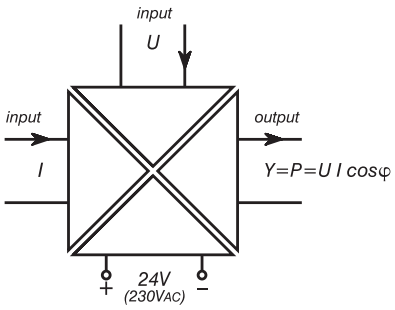
input	•	any signal e.g. from a shunt, frequency band 3Hz÷20kHz
output	•	any standard analog signal, optional RS485 output
accuracy	•	0.1% of full scale
galvanic isolation	•	all circuits mutually separated
isolation test voltage	•	2kV
supply	•	24VDC/70mA

After agreement possibility of measuring average or rectifiered average value

used for current measurement from thyristor regulators

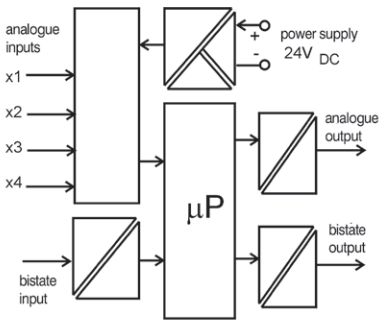
MOC-S2A POWER CONVERTER WITH SEPARATION

rail housing 22.5mm width



voltage input	•	0÷750VAC/DC
current input	•	0÷5AAC/DC
		input signal frequency 3Hz÷10kHz
output	•	any standard analog signal representing the power
accuracy	•	0.4% of full scale
supply	•	universal 24÷230VAC/DC
galvanic isolation	•	all circuits mutually separated
isolation test voltage	•	2kV

BF-S2 MATHEMATIC-LOGIC FUNCTION BLOC optionally with time relations



- a lot of arithmetic function from library to choose, any function on agreement
- maximum 4 analog, differential inputs with 0.025% resolution without separation
- 1 analog output of any standard with 0.025% resolution
- 1 bistate input type contact or OC
- 1 bistate output type OC
- analog inputs, bistate input, outputs and supply circuits mutually separated
- isolation test voltage 2kV

differential function *df/dt*

$$\frac{Y(s)}{X(s)}=\frac{s\tau}{1+s\tau}$$

integrator function $\int X(t)\,dt$

$$\frac{Y(s)}{X(s)}=\frac{\tau}{s}$$

pulse integrator function:
converts the state of pulse counter to analog signal $Y_D \longrightarrow \sqcup\!\sqcap$

LEAD/LAG function:

$$\frac{Y(s)}{X(s)}=\frac{\tau_1 s+1}{\tau_2 s+1}$$

sum or difference function

$Y = k_1 X_1 \pm k_2 X_2 \pm k_3 X_3 \pm k_4 X_4$

product function $Y = k_1 X_1\ k_2 X_2$
including $Y = k\ X^2$

quotient function $Y = \frac{k_1 X_1}{k_2 X_2}$

square root function

$Y = \Delta X_{max}\sqrt{\frac{\Delta X}{\Delta X_{max}}} + C$

phase shift function

$Y = Y_0 + \Delta Y_{max}\cos(\varphi_1, \varphi_2)$
or $Y = Y_0 + \Delta Y_{max}\,\varphi(X_1, X_2)/2\pi$

operation indication function

$Y = 1$ *for* $f \geq f_{upper}$
$Y = 0$ *for* $f < f_{lower}$

addtitional delays can be perform

the highest/lowest analog signal choosing function

$Y =$ *the highest of signals* (X_1, X_2, X_3, X_4),
$Y =$ *the lowest of signals* (X_1, X_2, X_3, X_4)

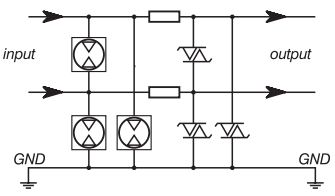
comparator function

$Y = 1$ *for* $X_1 \geq X_2$

this bloc performs one of chosen in the order function from above set, e.g. sum, product, comparison, choosing the highest signal etc.

MZN VOLTAGE SECURE MODULE
MZN-LT TRANSMISSION LINES VOLTAGE SECURE MODULE

rail or wall housing



barrier voltage	•	between lines	- 5.5V÷100V (according to order)
		between line and GND	- 5.5V÷100V (according to order)
serial resistance	•	each of both lines: 10Ω (or according to order)	
line leakage current to GND	•	≤10μA	
current consumed in a pulse	•	≤150A	
capacity between the lines and a line to GND	•	for MZN-LT	- ≤90pF
		for MZN	- ≤10000pF
frequency band	•	for MZN-LT	- 10MHz
		for MZN	- 1MHz

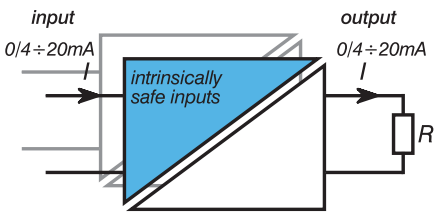
EXPLOSIONPROOF CONSTRUCTION DEVICES

Group I, category (M1) - designed to operate in mines underground in the presence of methane
Group II, category (1) - designed to operate in zone 0, 1, 2, 20, 21, 22
ATEX compliance

Marks according to explosionproof construction certificate of KDB BARBARA:		
I (M1) [Ex ia] I	II (1) G [Ex ia] IIC	II (1) D [Ex ia] IIIC
Appropriate EPL marks:		
I (M1) [Ex ia Ma]	II (1) G [Ex ia Ga] IIC	II (1) D [Ex ia Da] IIIC
Appropriate marks according to Russian certificates ГОССТАНДАРД РОССИИ and Custom Union:		
[Ex ia Ma] I	[Ex ia Ga] IIC	[Ex ia Da] IIIC

S1-ExA SELF-POWERED SEPARATOR - receives 0/4÷20mA signal from Ex zone

one or two channels, 22.5mm width

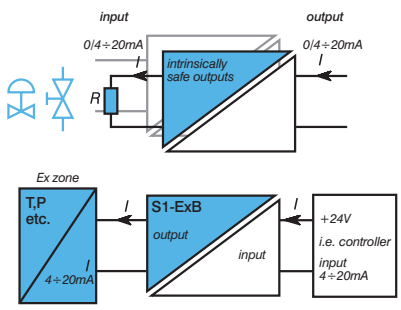


- intrinsically safe input • 0/4÷20mA (any I<100mA)
- output • 0/4÷20mA ($I_{OUT}=I_{IN}$)
- load resistance • 0÷800Ω
- input voltage drop • 3V + $R_{LOAD} \cdot I_{IN}$
- accuracy • ±0.05% − 0,05% · (R_{LOAD}/100Ω)
- safety parameters • Ui=30V, Ii=100mA, Pi=1W, Li≈0, Ci≈0, Uo=0, Io=0
- isolation test voltage • 2.5kV

1 or 2 independent channels in one housing
simplest separation for current inputs 0/4÷20mA

S1-ExB SELF-POWERED SEPARATOR - sends 0/4÷20mA signal to Ex zone

one or two channels, 22.5mm width



- input • 0/4÷20mA (any I<100mA)
- intrinsically safe output • 0/4÷20mA ($I_{OUT}=I_{IN}$)
- load resistance • 0÷700Ω
- input voltage drop • 2.5V + $I_{IN} \cdot (300\Omega + R_{LOAD})$
- accuracy • ±0.05% − 0,05% · (R_{LOAD}/100Ω)
- safety parameters • Uo=25.2V, Io=89mA, Po=0.56W
- isolation test voltage • 2.5kV

parameters for S1-ExBH3 for group IIC:
L/R=63μH/Ω, Lo=1mH, Co=0.064μF

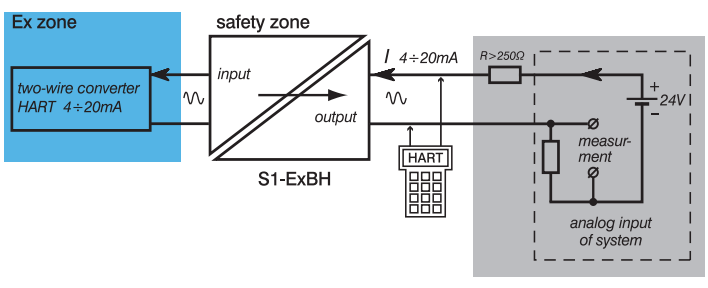
1 or 2 independent channels in one housing
simplest separation for current outputs 0/4÷20mA

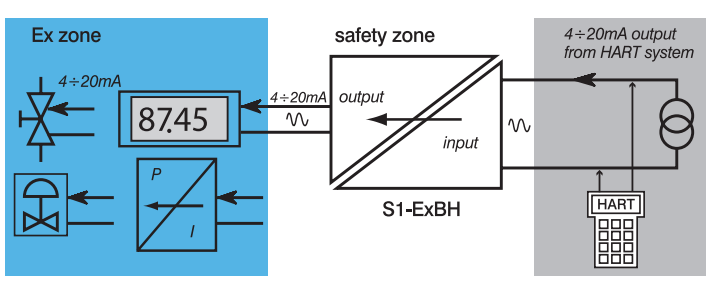
S1-ExBH SELF-POWERED SEPARATOR - transparent for HART transmission, sends 0/4÷20mA signal to Ex zone or supplies two-wire transmitter

one channel, 22.5mm width

- input • 4÷20mA
- intrinsically safe output • 4÷20mA ($I_{OUT}=I_{IN}$)
- load resistance • 0÷700Ω
- input voltage drop • 2.5V + $I_{IN} \cdot (300\Omega + R_{LOAD})$
- accuracy • ±0.05% − 0,05% · (R_{LOAD}/100Ω)
- safety parameters • Uo=25.2V, Io=89mA, Po=0.56W
- isolation test voltage • 2.5kV

parameters for S1-ExBH3 for group IIC:
L/R=63μH/Ω, Lo=1mH, Co=0.064μF

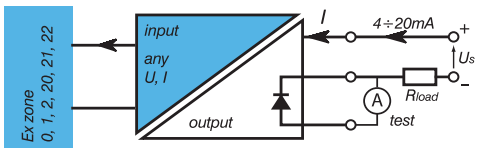




sends 0/4÷20mA signal to Ex zone

S3Ex-S TWO-WIRE SEPARATOR

any standard signal from Ex zone ⇒ passive 4÷20mA



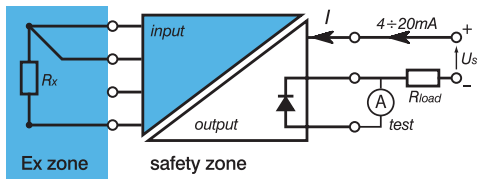
- intrinsically safe input • any standard analog signal
- output • two-wire (control of 4÷20mA current loop supplied from external source)
- input resistance • 50Ω or current input, 100kΩ or voltage signals
- load resistance • Rmax=(Uz-9V)/20mA
- accuracy • 0.1% of full scale
- safety parameters • Ui=30V, Ii=100mA, Pi=0.99W
- supply • 9V≤Uz≤36V
- isolation test voltage • 2kV

one channel, 22.5mm width

two-wire separator for measurement cards with active current inputs

S3Ex-R TWO-WIRE RESISTANCE-TEMPERATURE CONVERTER

sensors e.g. Pt100, potentiometers from Ex zone ⇒ passive 4÷20mA

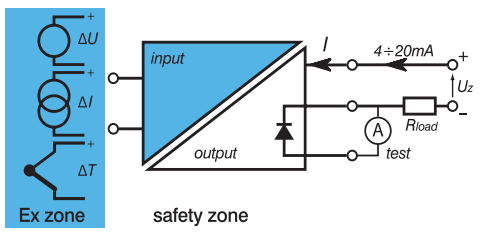


- intrinsically safe input • resistance change ΔR=4Ω÷5kΩ, Pt100, Ni100, Cu100, Pt500, Pt1000, potentiometer position ΔR=10Ω÷10kΩ
- sensor connection • 3- or 4-wire line
- RLINE compensation • total
- sensor current • typically 0.4÷0.8mA
- output • two-wire (control of 4÷20mA current loop supplied from external source)
- load resistance • Rmax=(Uz-9V)/20mA
- accuracy • 0.1% of full scale for span >50°C
- safety parameters • Uo=5.4V, Io=9.9mA, Po=17mW
- supply • 9V≤Uz≤36V
- isolation test voltage • 2kV

one channel, 22.5mm width

two-wire converter e.g. temperature from measurement cards with active current inputs

S3Ex-U TWO-WIRE CURRENT, VOLTAGE including TEMPERATURE CONVERTER



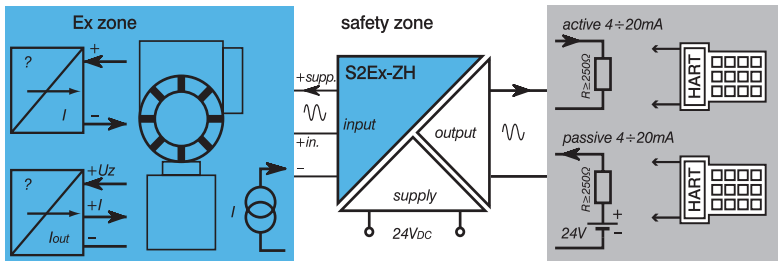
- intrinsically safe input • voltage ΔUmin=2mV; ΔUmax=30V, current ΔImin=1μA; ΔImax=100mA, thermocouple J, K, R, S, T, B, N, L itd.
- output • two-wire (control of 4÷20mA current loop supplied from external source)
- load resistance • Rmax=(Uz-9V)/20mA
- accuracy • see Technical Data Sheet
- safety parameters • Ui=30V, Ii=100mA, Pi=1W
- supply • 9V≤Uz≤36V
- isolation test voltage • 2kV

one channel, 22.5mm width

two-wire converter with separation for measurement of current, voltage increment and temperature with thermocouples

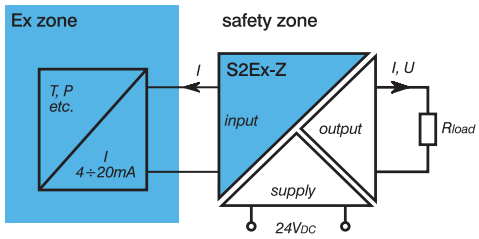
S2Ex-ZH SUPPLIER-SEPARATOR of two-wire 4÷20mA converters installed in Ex zone with HART transmission

- active intrinsically safe input • converts 4÷20mA current and simultaneously supplies two-wire converter in Ex zone
- passive intrinsically safe input • 4÷20mA
- output • 4÷20mA
- load resistance • 0÷700Ω
- accuracy • 0.1% of full scale
- safety parameters • e.g. for S2Ex-ZH-24: Uo=25.2V, Io=84mA, Po=0.53W
- supply • 24VDC, Imax=70mA
- isolation test voltage • 2kV



one channel, 22.5mm width

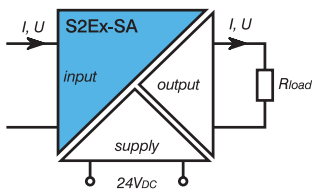
S2Ex-Z SUPPLIER-SEPARATOR of two-wire 4÷20mA converters installed in Ex zone ⇒ any standard signal



- intrinsically safe input • converts 4÷20mA current and simultaneously supplies two-wire converter installed in Ex zone
- output • any standard analog signal
- load resistance • 0÷700Ω for current input, ≥2kΩ for voltage signals
- accuracy • 0.1% of full scale
- safety parameters • e.g. for S2Ex-Z-24: Uo=25.2V, Io=92mA, Po=0.62W
- supply • 24VDC, Imax=90mA
- isolation test voltage • 2kV

one channel, 22.5mm width

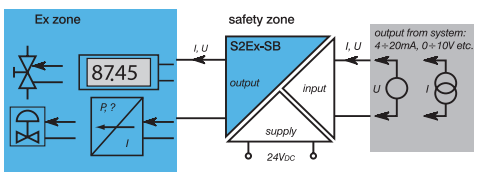
S2Ex-SA CIRCUITS SEPARATOR any standard signal from Ex zone ⇒ any standard signal



- intrinsically safe input • any standard signal
- input resistance • 50Ω or current input, 100kΩ for voltage signals
- output • any standard signal
- load resistance • 0÷700Ω for current input ≥2kΩ for voltage signals
- accuracy • 0.1% of full scale
- safety parameters • Ui=30V, Ii=100mA, Pi=0.99W
- supply • 24VDC, Imax=70mA
- isolation test voltage • 2kV

one channel, 22.5mm width

S2Ex-SB CIRCUTIS SEPARATOR any standard signal ⇒ any standard signal to Ex zone



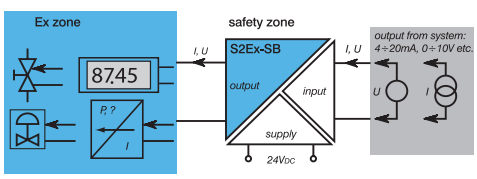
zone: **0, 1, 2, 20, 21, 22**
indications: **I (M1) [Ex ia] I,**
II (1) G [Ex ia] IIC,
II (1) D [Ex ia] IIIC

- input • any standard signal
- input resistance • 50Ω or current input, 100kΩ for voltage signals
- intrinsically safe output • current or voltage taking into account Uo, Io
- load resistance • to be agreed
- accuracy • 0.1% of full scale
- safety parameters • e.g. for S2Ex-SB-24/70: Uo=25.2V, Io=70mA, Po=0.47W
- supply • 24VDC
- isolation test voltage • 2kV

one channel, 22.5mm width

analog control of e.g. valve or indicator in hazardous zone maximum power 0.96W

S2Ex[nL]-SB CIRCUITS SEPARATOR, only to zone 2 and 22



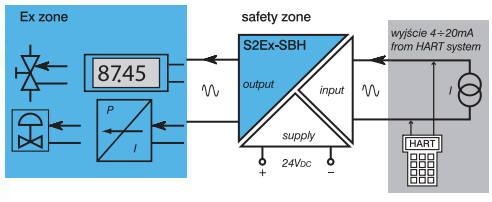
zone: **2, 22**
indications: **II (3) G [Ex nL] IIC,**
II (3) G [Ex ia] IIC
II (3) D [Ex ia] IIIA *or* IIIB *or* IIIC

- input • any standard signal
- input resistance • 50Ω or current input, 100kΩ for voltage signals
- intrinsically safe output • category (3) current or voltage taking into account Uo, Io, Po
- load resistance • to be agreed
- accuracy • 0.1% of full scale
- safety parameters • e.g. for S2Ex[nL]-SB, Uwyj=24V: Uo=25.2V, Io=120mA, Po=3.1W
- supply • 24VDC
- isolation test voltage • 2kV

one channel, 22.5mm width

analog control of e.g. valve or indicator in hazardous zone maximum power 3.1W

S2Ex-SBH SUPPLIER-SEPARATOR – transparent for HART transmission active 4÷20mA input ⇒ active 4÷20mA output to Ex zone



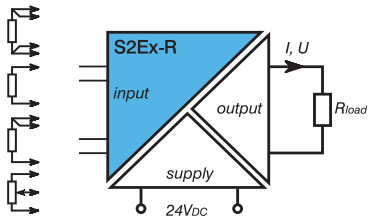
- passive input • 4÷20mA
- intrinsically safe output • 4÷20mA
- accuracy • 0.1% of full scale
- safety parameters • e.g. for S2Ex-ZH-24: Uo=25.2V, Io=84mA, Po=0.53W
- supply • 24VDC, Imax=70mA
- isolation test voltage • 2kV

one channel, 22.5mm width

S2Ex-R RESISTANCE-TEMPERATURE CONVERTER

sensor e.g. Pt100, potentiometer from Ex zone ⇒ any standard signal

one channel, 22.5mm width



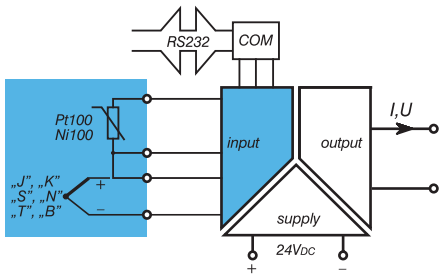
- intrinsically safe input • resistance change ΔR=4Ω÷5kΩ, Pt100, Ni100, Cu100, Pt500, Pt1000, potentiometer position ΔR=10Ω÷10kΩ
- sensor connection • 3- or 4-wire line
- RLINE compensation • total
- sensor current • typically 0.4÷0.8mA
- output • any standard analog signal
- load resistance • 0÷700Ω for current inputs, ≥2kΩ for voltage signals
- accuracy • 0.1% of full scale for range span >50°C
- safety parameters • Uo=5.4V, Io=9.8mA, Po=42mW
- supply • 20V≤Uz≤27V, Imax=70mA
- isolation test voltage • 2kV

converter with separation for measurement of resistance increment, temperature with sensors e.g. Pt100 and potentiometer position

S2Ex-TP PROGRAMMABLE TEMPERATURE CONVERTER

for thermocouples and resistance sensors ⇒ signal 0/4÷20mA, 0÷10V

one channel, 22.5mm width



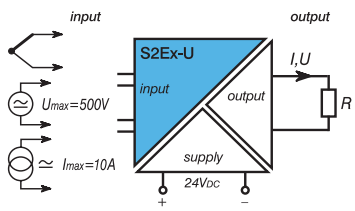
- programmable selection • sensor type, range, output type, filter (time constant), cold ends compensation for thermocouples
- intrinsically safe input • thermocouples: J, K, S, N, T, B or other acc. to agreement; resistance sensors: PT100, Ni100, Cu100, Cu50 or other according to agreement
- sensor connection • 3-wire line of resistance sensor, 4-wire after agreement
- output • 4÷20mA, 0÷20mA, 0÷10V
- load resistance • 0÷700Ω for current inputs, ≥2kΩ for voltage signals
- accuracy • 0.1% of full scale for range span >50°C
- measurement frequency • every 0.25s
- supply • 24VDC/80mA
- isolation test voltage • 2kV

universal converter with separation for temperature measurement

S2Ex-U CURRENT, VOLTAGE including TEMPERATURE CONVERTER

sensor e.g. thermocouple, alternator from Ex zone ⇒ any standard signal

one channel, 22.5mm width



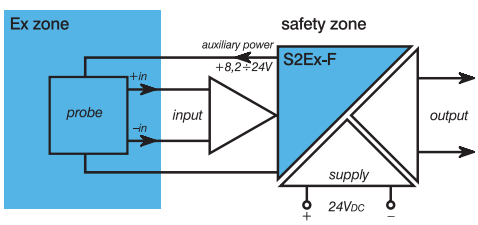
- intrinsically safe input • voltage ΔUmin=2mV; ΔUmax=30V, current ΔImin=1μA; ΔImax=100mA, thermocouple J, K, R, S, T, B, N, L etc.
- output • any standard analog signal
- oad resistance • 0÷700Ω for current inputs, ≥2kΩ for voltage signals
- accuracy • see Technical Data Sheet
- safety parameters • Ui=30V, Ii=100mA, Pi=1W
- supply • 24VDC, Imax=70mA
- isolation test voltage • 2kV

two-wire converter with separation for measurement of current, voltage increment and temperature with thermocouples

S2Ex-F FREQUENCY CONVERTER

frequency (pulse string) from Ex zone Ex ⇒ any standard signal or pulse string

one channel, 22.5mm width

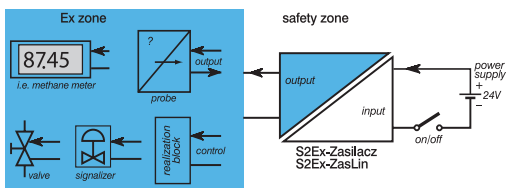


- intrinsically safe input • pulse string: voltage, current, NAMUR, etc. 0÷10kHz
- output • any standard analog signal, pulse string with OC output
- accuracy • 0.2% of full scale for *f* ⇒ analog conversion
- safety parameters • e.g. for S2Ex-F-8,2: Uo=8.6V, Io=19mA, Po=0.11W
- supply • 24VDC, Imax=70mA
- isolation test voltage • 2kV

S2Ex-Zasilacz
S2Ex-ZasLin

with output to Ex zone and trapezoidal characteristic
with output to Ex zone and linear characteristic

one channel, 22.5mm width

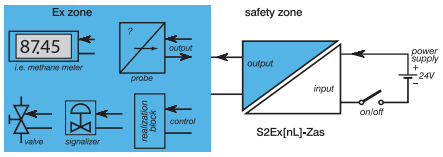


- intrinsically safe input • 3÷24VDC
- zone • 0, 1, 2, 20, 21, 22 and mines undergrounds
- safety parameters • given in Technical Data Sheet and EC-Type Examination Certificate, e.g. for S2Ex-Zasilacz-24/139: Uo=25V, Io=139mA, Po=0.92W
- indications • I(M1)[Ex ia]I, II(1)G[Ex ia]IIC, II(1)D[Ex ia]IIIC
- supply • 24VDC
- isolation test voltage • 2kV

most common versions: UOUT=5V; 8.2V; 10V; 12V; 15V; 18V, 24V

S2Ex[nL]-ZAS OUTPUT CIRCUIT WITH LIMITTED POWER, only to zone 2, 22 with maximum power Po≤3.1W to Ex zone

one channel, 22.5mm width

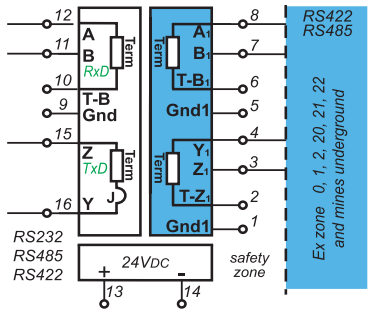


- intrinsically safe output • 3÷24VDC
- LED indication • supply operating
- safety parameters • given in datasheet, e.g. for S2Ex[nL]-ZAS-24V: Uo=25.2V; Io=120mA; Po=3.1W
- zone • only 2, 22
- indications • II(3)G[Ex nL]IIC, II(3)G[Ex ia]IIC, II(3)D[Ex ia]IIIA lub IIIB lub IIIC
- galvanic isolation • output and object 24VDC supply separated
- supply • 24VDC
- isolation test voltage • 2kV

most common versions: U_{OUT}=5V; 8.2V; 10V; 12V; 15V; 18V; 24V

S2Ex-RS TRANSMISSION LINES SEPARATOR RS232/RS485, RS232/RS422, RS422/RS485, RS422/RS422, RS485/RS485

one channel, 22.5mm width



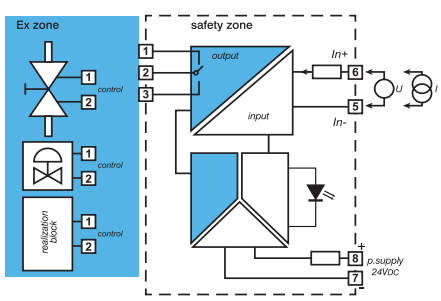
Separation and translation to zone:

Safe zone	Explosion hazardous zone
RS232 RS485 RS422	RS485 RS422

- transmission speed • 50÷115200b/s
- line length for RS485, RS422 • max 1200m
- line length for RS232 • 15m for 19200b/s; 5m for 115200b/s
- number of devices in line • max 32
- line terminators • internal
- LED indication • supply operating, transmission, line damage
- galvanic isolation • all circuits mutually separated
- supply • 24VDC
- isolation test voltage • 2kV

S2Ex-SBS CONVERTER-LIMIT INDICATOR with relay output to Ex zone

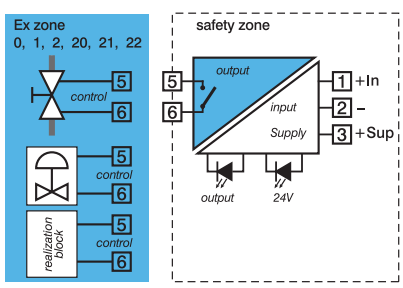
one channel, 22.5mm width



- input • any bistate signal or analog in case of operating as comparator
- intrinsically safe output • relay switching contact
- switching parameters • 1A/(24÷30VDC); 0.5A/(30÷60VDC); 5A/60VAC t_{on}=5ms, t_{off}=3ms at 20Hz
- galvanic isolation • all circuits mutually separated
- supply • 24VDC
- isolation test voltage • 2kV

SBEx-B BISTATE SEPARATOR – intrinsically safe output with relay contact

one channel, 22.5mm width

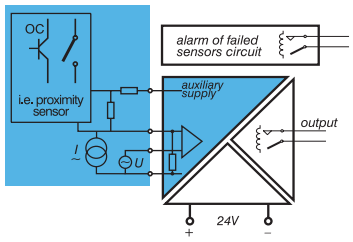


- input • any bistate signal, to operate with proximity sensors e.g. NAMUR, contacts, current or voltage signals e.g. 0/24V
- intrinsically safe output • NO relay contact:
  - current - ≤0.5A
  - voltage - ≤200V
  - resistance - ≤0.15Ω
  - switching - t_{on}=2ms, t_{off}=2.5ms
- operating phase selection • to be agreed
- supply • 24VDC
- isolation test voltage • 1.5kV

note: input and supply have common "minus" - ground

SBEx-2, SBEx-2S BISTATE SPEARATOR two-channel, intrinsically safe inputs (NAMUR signal, contacts, sensors) ⇒ output contacts

two channels, 22.5mm width



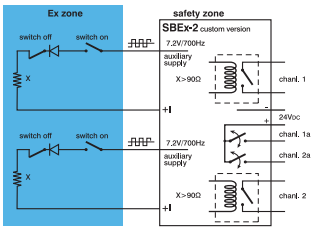
- intrinsically safe inputs • 2 mutually separated inputs: contacts, NAMUR signals, bistate sensors, voltage or current signals
- auxiliary supply • for SBEx-2: 8.2V
  for SBEx-2S: 16V
- outputs • 2 outputs plus *ALARM*, mutually separated
- alarm • short/opening connection line control
- supply • 24VDC
- isolation test voltage • 1.5kV

option 1: for one-channel version it is possible to have output with switching contact
option 2: for two-channel version it is possible to have output with switching contact but without ALARM signal

note: on the next page are presented special versions to:
- ground wire resistance testing
- controling line resistance testing

SBEx-2, SBEx-2S BISTATE SEPARATOR two-channel in special version
for protective conductor resistance control

two channels, 22.5mm width

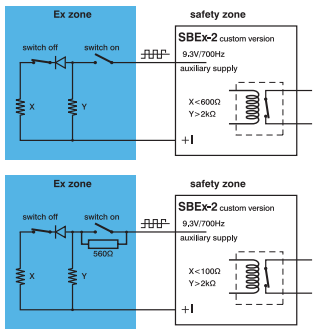


- intrinsically safe inputs • 2 mutually separated inputs for measurement of protective conductor resistance
- activation threshold • X<100Ω lub X<50Ω, including condition on connection line and serial diode operational
- auxiliary supply • for SBEx-2: 8.2V; for SBEx-2S: 16V
- outputs • 2 main contacts plus 2 repetitive contacts
- galvanic isolation • all circuits mutually separated
- supply • 24VDC
- isolation test voltage • 1.5kV

note: SBEx-2S version is more immune to interferences, especially 50Hz

SBEx-2, SBEx-2S BISTATE SEPARATOR two-channel in special version
for control line resistance testing, also in version with maintaining 560Ω

one channel, 22.5mm width

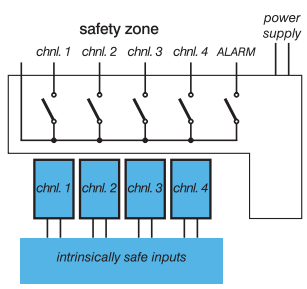


- intrinsically safe input • input for control line testing
- activation threshold • X<600Ω or Y>2kΩ, including condition on connection line and serial diode operational
- auxiliary supply • for SBEx-2: 8.2V; for SBEx-2S: 16V
- output • relay contact
- galvanic isolation • all circuits mutually separated
- supply • 24VDC
- isolation test voltage • 1.5kV

note: SBEx-2S version is more immune to interferences, especially 50Hz

SBEx-4
SBEx-4S
BISTATE SEPARATOR four-channel
Ex inputs (NAMUR signals, contacts, sensors) ⇒ output contacts
BISTATE SEPARATOR two-channel,
also in version SBEx-4S-SR as a machine movement indicator

22.5mm width
SBEx-4: 1 to 4 channels
SBEx-4S, SBEx-4S-SR: 1 or 2 channels

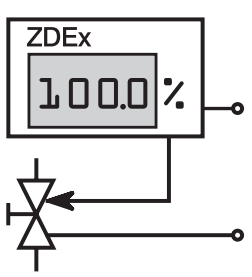


- intrinsically safe inputs • 4 mutually separated inputs: contacts, NAMUR signals, bistate sensors
- inputs supply • for SBEx-4: 8.2V; for SBEx-4S: 16V
- outputs • 1÷4 outputs plus alarm with common terminal, relay or optorelay contacts
- alarm • short/opening connection line control
- galvanic isolation • all circuits mutually separated
- supply • 24VDC
- isolation test voltage • 2kV

in machine movement indicator version, pulse signal activates output relay

ZDEx TWO-WIRE SETTING DEVICE 4÷20mA

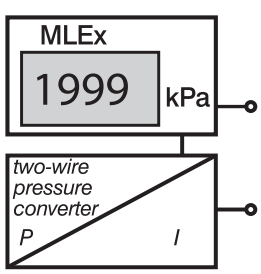
board housing 72x72x61mm



- **ZDExnL** – currently to operate with hazardous zones: *2, 22*
- indication • II 3G Ex nL IIC T6, II(3)G[Ex nL] IIC, II 3G Ex ia IIC T6, II 3G [Ex ia] IIC, II 3D Ex ia IIIA lub IIIB lub IIIC T85°C, II (3)D [Ex ia] IIIA lub IIIB lub IIIC
- **ZDEx** – after certification it is possible to operate with hazardous zones: *0, 1, 2, 20, 21, 22*
- memory settings • 4 programmable memory cells
- current range • 3.00÷21.00mA
- display • programmable, e.g. in physical units, 4 digits 14mm LCD with backlight
- accuracy • 0.1% of full scale ±1 in the last digit
- supply • 9.5÷30V

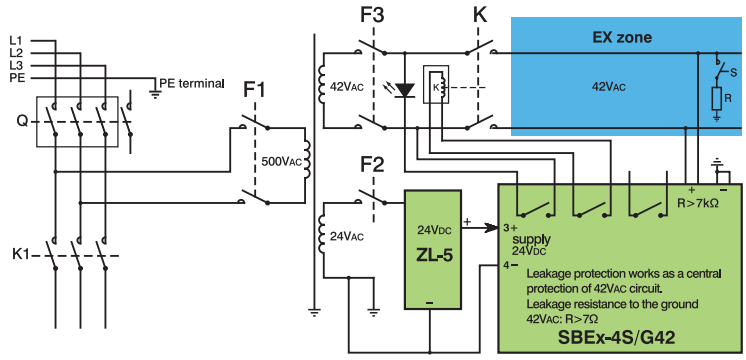
MLEx TWO-WIRE 4÷20mA INDICATOR

board housing 72x72x61mm



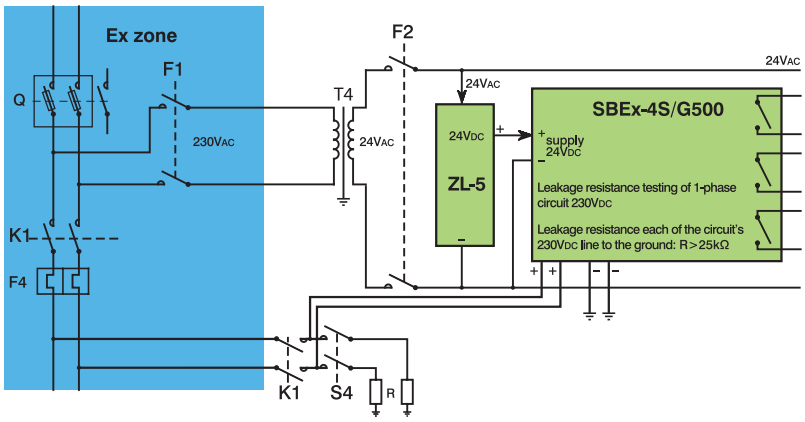
- **MLExnL** – currently to operate with hazardous zones: *2, 22*
- indication • II 3G Ex nL IIC T6, II(3)G[Ex nL] IIC, II 3G Ex ia IIC T6, II 3G [Ex ia] IIC, II 3D Ex ia IIIA lub IIIB lub IIIC T85°C, II (3)D [Ex ia] IIIA lub IIIB lub IIIC
- **MLEx** – after certification it is possible to operate with hazardous zones: *0, 1, 2, 20, 21, 22*
- current range • 3.00÷24.00mA
- voltage drop • 4.5V maximum
- alarm • programmable alarm threshold with separated OC output
- display • programmable, e.g. in physical units, 4 digits 14mm LCD with backlight
- accuracy • 0.1% of full scale ±1 in the last digit

SBEx-4S/G42 BISTATE SEPARATOR for earth fault protection



The separator SBEx-4S/G42 can operate as a leakage protection to protect not grounded electric installations with rated voltage U≤24VDC; U≤42VAC and frequency 50÷60Hz from earth fault protection. In a network disconnected from voltage works as a blocking protection and after turning on the voltage it works as a central protection.
Measurement intrinsically safe circuits (terminals 13-14, 15-16) measures leakage in both conductors of power supply.
The separator is made as custom version after agreement with the customer.
The separator operates properly as a central protection for circuits with voltage U≤24VDC when the lines capacity to the ground is less than 1μF. In the case of central protection, the measurement circuit does not have to be intrinsically safe and in this case it is suggested to choose separator SB-4S/G42. It can operate with circuits with U≤42VDC, U≤42VAC. SB-4S/G42 identifies more accurately even with lines capacity to the ground C≤3μF.
The separator indicates (3 non-intrinsically safe contacts) resistance drop of controlled circuit below the value of Rx defined by the client (e.g. Rx=7kΩ).

SBEx-4S/G500 BISTATE SEPARATOR for leakage-blocking protection



	version 230VAC/15kΩ
blocking resistance	15kΩ ±20%
unblocking resistance	≥22.5kΩ
reaction time	resistance step 15⇔22.5kΩ, t<1s
operational after turning on the power	3s

Protection function is based on blocking turning on the power voltage on damaged part of the network or disconnecting the voltage when the leakage resistance drops below 15kΩ.

The separator SBEx-4S/G500 has “ia” protection level. This allows the measurement channel can be powered with voltage (not bigger than Ui=60V) even after exceeding methane concentration above 2%.Power supply of the separator does not have to be turned off.
The separator SBEx-4S/G500 is designed to control the condition of isolation in isolated electrical networks.
Isolated networks marked with IT symbol characterizes with isolation of all active elements of the network to the ground potential. It allows higher shock protection because the shock current is limited with high capacity impedance to the ground. IT networks can have high ground resistance allowed.
The separator SBEx-4S/G500 can be used as:

a) leakage-blocking protection designed to control the ground isolation resistance in non-voltage state in intrinsically safe as well as in non-intrinsically safe circuits,
b) central-blocking leakage protection or central leakage protection for circuits in which after turning on the voltage does not exceed 238V. These circuits after turning on the power voltage are no longer intrinsically safe (Ui>60V),
c) central-blocking leakage protection or central leakage protection for circuits in which after turning on the voltage does not exceed 60V. These circuits after turning on the power voltage can still be intrinsically safe in Ui≤60V).

The separator SBEx-4S/G500 in version for voltages 230VAC can operate as leakage blocking protection, central or central-blocking designed to test the ground isolation resistance in one-phase and isolated networks with rated voltage U=230VAC.

supply • 24VDC
isolation test voltage • 1.5kV

Terms of use explosionproof devices:

Accompanying devices of: Group I, Category (M1) and Group II, Category (1) - **ATEX** compliance
Intrinsically safe circuits with **ia** protection level to operate with zones ***0, 1, 2, 20, 21, 22***
Explosionproof construction marks: **I (M1) [Ex ia] I** **II (1) G [Ex ia] IIC** **II (1) D [Ex ia] IIIC**

Protection level IP20. Operating temperature range (−30 ÷ +70)°C.

All circuits mutually separated - it allows intrinsically safe circuit in a zone to be galvanically connected to ground (grounding, GND, metal construction of a cabinet etc.).

A few separated intrinsically safe circuits can be lead in one multi-core cable of type A or B according to IEC 60079-14. In other case they must be separated cables.

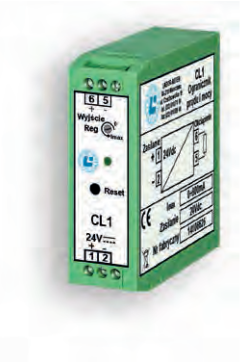
Installing outside the explosion hazardous zone or in a flameproof housing when installed in a hazardous zone. Using of the converters in

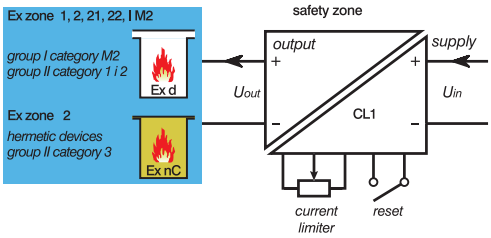
flameproof housings in explosive group I does not required any additional warning on the flameproof housing cover, but for converters in flameproof housing used in explosive groups **II (IIG, IID)** or **IIID**, opening of the housing can occurred only after 10 minutes delay after disconnecting the power supply.

If you need to install our devices in explosion hazardous zone ***2*** and ***22*** we can deliver our devices ZDEx and MLEx (setting device and indicator) in wall housing IP66 made of plastic (with glands).

If you need to install our devices in explosion hazardous zone ***2*** we can deliver our accompanying devices with intrinsically safe circuits in wall housings IP66 made of plastic (with glands) as hermetic sets. They will have then explosionproof housing marks, including marking an external circuits to the hazardous zone: **II 3G Ex nC [nL] IIC T4 Gc**.

CL1 CURRENT AND POWER LIMITER



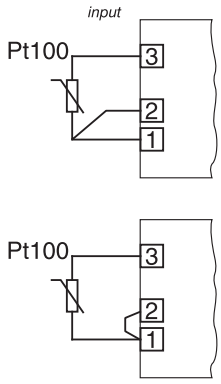


It is designed to supply a device (including electronic) installed in a hazardous zone, e.g. in housings:
- flameproof Exd, oil Exo, sand Exq Exq → zone M2, 1, 2
- gas with hypertension Exp, hermetic Exmp → zone M2, 1, 2, 21, 22
- hermetic Exma → zone M1, 0, 1, 2, 20, 21, 22.

For hermetic device ExnC → zone 2.
The limiter is set up according to the requirements of EC-Type Examination Certificate of such equipment.

input voltage	•	20÷30VDC
output voltage	•	approximately equals to the input voltage
output current limiter	•	regulated by potentiometer 0÷0.8A

TEMPERATURE SENSORS also together with 4÷20mA converter



Pt100	•	single or after agreement double measurement resistor
accuracy	•	B or after agreement A
connection	•	2, 3 or 4 wires
pressure sleeves	•	on request
connection spigots	•	airtight welded or sliding
screw	•	M20/1.5 or according to agreement
measurement seatpost size	•	to be agreed
connection head kind	•	to be agreed

Note: offered sensors as simple devices without EC-Type Examination Certificate can be installed in hazardous zones M1, M2, 1, 2, 21, 22 if operates with our S2Ex-R, S2Ex-TP, S3Ex-R converters.
All circuits are mutually separated so intrinsically safe circuit can be galvanically connected to ground (grounding, GND, metal construction of a cabinet, etc.). In general it is not recommended to ground in hazardous zone, but in this case it is allowed.
For group II EPL Ga and group II EPL Gb (zones 1, 2, 21, 22) sensors in housings made of stainless steel (for Ga is allowed: 10% of total aluminum, magnesium, titanium, zirconium and 7.5% of total magnesium, titanium and zirconium; for Gb is allowed: only 7.5% of total magnesium, titanium and zirconium; for I EPL Ma and Mb is allowed: 15% of total aluminum, magnesium, titanium, zirconium and 7.5% of total magnesium, titanium and zirconium) can be used.
In zones 2 and 22 are not such restrictions and sensors with aluminum alloy heads can be used.

When you buy our products:

- you get 3 years warranty,
- you know that we are the manufacturer so you will get full and detailed information about the product,
- we guarantee technical support 24h,
- you will be advised about explosion hazardous zones,
- we can make untypical devices on request,
- we are flexible in time issues if needed,
- you can borrow a device for tests before purchase,
- if a product did not meet your expectations we can discuss about returning,
- if you made a mistake in specification you can change the product for a suitable one,
- you can send a product for parameters modification,
- you do not need the warranty card for reclamation ,
- you can send a reclamation to us even if you bought the device from an agent,
- for efficient service each reclamation agree by phone,
- we can do service for devices after warranty date,
- ask about discount when buying again.

Our products have high reliability, we we provide 3 years guarantee.
We also do untypical single orders. Short terms. After agreement we can do some modifications in offered products.

We can send a CD with full catalogs of typical products and Ex.

LABOR - ASTER

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