

ELECTRICAL VALUE MEASURING TRANSDUCERS WITH GALVANIC SEPARATION

Usage

The converters are designed for electrical values (voltage, current) conversion to electric DC signal in current or voltage form. The conversion characteristic is linear.

Characteristics

Small dimensions, low weight, simple and fast mounting to DIN rail, high reliability, high accuracy and conversion stability.



E2

E1

Technical data – general:

Mounting: DIN rail
 Dimensions (W x H x D): E1 - 24 x 75 x 102 mm
 E2 - 35 x 75 x 102 mm
 Ingress protection: IP 20,
 IP 00 – SP 30xx only
 Weight: 0,1 to 0,2kg
 Cooling: natural

Ambient conditions according to ČSN 33 2000-3:

Ambient temperature	AB7 (-25 °C to + 55 °C)
Altitude	AC1 (to 2000 m above sea level)
Water occurrence	AD1 (insignificant)
Occurrence of foreign matters	AE1 (insignificant)
Occurrence of corrosents or pollutants	AF1 (insignificant)
Vibrations	AH2 (middle)
EMC	CSN EN 61000
Electrical safety	CSN EN 60950: 2002
Storage temperature range	from -25 to +40°C, no longer than 24 h to +70°C

INSULATION AMPLIFIERS – SP 20, SP 25, SP 50, SP 52

Usage

Isolation amplifiers are devices serving for the transmission of the measured signal from the power circuits of voltage to 1000V_{ef} into control circuits, while both systems are galvanically separated. The transducers can be used wherever it is necessary to transform the unified voltage or current signal to unified current or voltage signal. In the case of current measuring, it is necessary to prefix the by-pass, in the case of voltage measuring, it is necessary to prefix the voltage divider. The transducers are manufactured with fixed predetermined conversion.

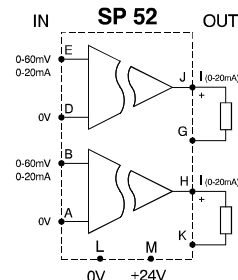
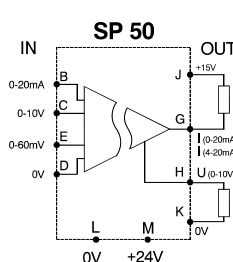
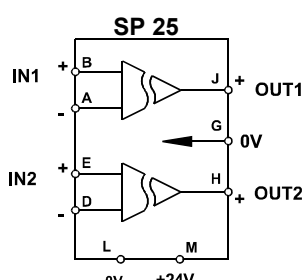
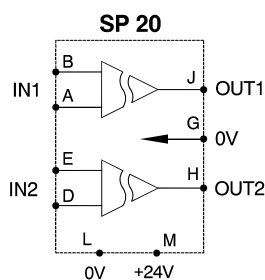
Main parts of isolation amplifier - converter

Switching power supply, modulator - demodulator, input protections, operation amplifier, magnetic circuits.

Technical data – general for SP20 ... 52:

Type / box type	SP 20x / E1	SP 25x / E1	SP 52x / E1	SP 50x / E1
Input voltage / current:	24V= +15%, -5% / I _{max} =70mA			
Input / output signal:	DC with AC part (±±)			DC
Numer of channels:	2			1
Maximum input voltage, current:	50V / 1ms	50V / 1ms	50V / 1ms	100V / 1ms
Input resistance:	300kΩ ±30%	2,2kΩ by 100% of measured value	3Ω for 60mV	3Ω for 60mV
			330Ω for 20mA	10kΩ for 10V 330Ω for 20mA
DC offset max:	150mV	150mV	0,15 mA	150mV, 0,15 mA
Output load resistance or output current:	2kΩ	max. 5 mA	do 500Ω - current	2kΩ - voltage to 500Ω for current
Linearity / accuracy:	less than 1% from full range			
Insulation strength:	input - output 4,0 kV, input - supply 4,0 kV, supply – output 0,5 kV	Unm – 1,8 kV Input – output 4,6 kV Uni – 10 kV	input - output 4,0 kV, input - supply 4,0 kV, supply – output 0,5 kV	
Galvanic separation	circuit: optoelement, power supply: transformer			
Bandwidth / for decrease:	5 – 10 kHz / 3dB	1 kHz / 6dB	5 – 10 kHz / 3dB	

External connection of SP transducers:



Operating ranges of transducers – SP 2xx, SP 5xx:

TYPE	Input 1	Input 2	Output 1	Output 2
SP 20A, SP 25A	100 mV	100 mV	10 V	10 V
SP 20B, SP 25B	60 mV	60 mV	10 V	10 V
SP 20C, SP 25C	220 mV	220 mV	10 V	10 V
SP 20D, SP 25D	100 mV	60 mV	10 V	10 V
SP 20E, SP 25E	60 mV	220 mV	10 V	10 V
SP 20F, SP 25F	100 mV	220 mV	10 V	10 V
SP 20G, SP 25G	10 V	10 V	5 V	5 V
SP 20H, SP 25H	220 mV	220 mV	5 V	5 V
SP 20J, SP 25J	10 V	10 V	10 V	10 V
SP 20K, SP 25K	150 mV	150 mV	10 V	10 V
SP 20L, SP 25L	12V	12V	12V	12V
SP 20P, SP 25P	60 mV	150 mV	10 V	10 V
SP 20M, SP 25M	100 mV	150 mV	10 V	10 V
SP 20N, SP 25N	50 mV	5 V	10 V	10 V

Other operating ranges values on demand.

TYPE	Input 1	Input 2	Output 1	Output 2
SP 50	0-20 mA	0-10V	0-20 mA	0-10V
SP 50A	0-20 mA	-	0-20 mA	-
SP 50B	0-10 V	-	4-20 mA	-
SP 50C	0-20 mA	-	4-20 mA	-
SP 50D	0-60 mV	-	0-20 mA	-
SP 50E	0-60 mV	-	4-20 mA	-
SP 50F	4-20 mA	-	0-10 V	-
SP 50G	0-10 V	-	0-20 mA	-
SP 50H	-60 až +60 mV	-	4-20 mA	-
SP 50I	0-30 V	-	4-20 mA	-
SP 50J	0-60 V	-	0-10 V	-
SP 50K	0-5 V	-	4-20 mA	-
SP 50L	0-40 V	-	0-10 V	-
SP 52A	0-60 mV	0-60 mV	0-20 mA	0-20 mA
SP 52B	0-20 mA	0-20 mA	0-20 mA	0-20 mA
SP 52C	0-100 mV	0-100 mV	0-20 mA	0-20 mA
SP 52D	0-150 mV	0-150 mV	0-20 mA	0-20 mA
SP 52E	0-5 V	0-5 V	4-20 mA	4-20 mA
SP 52F	0-10 V	0-10 V	4-20 mA	4-20 mA
SP 52G	0-60 mV	0-60 mV	4-20 mA	4-20 mA

VOLTAGE AND CURRENT EFFECTIVE VALUE TRANSDUCERS – SP 100U, SP 100I

Usage

Voltage and current effective value transducers SP100U, SP100I are designed to measure the effective values of currents and voltages in power circuits by means of voltage and currents measuring transformers. The output is DC signal in voltage or current form. The power supply for current loop supply is external. If the voltage output is not available, the transducer can be supplied only through the current loop.

Technical data – general for SP100I, SP100U:

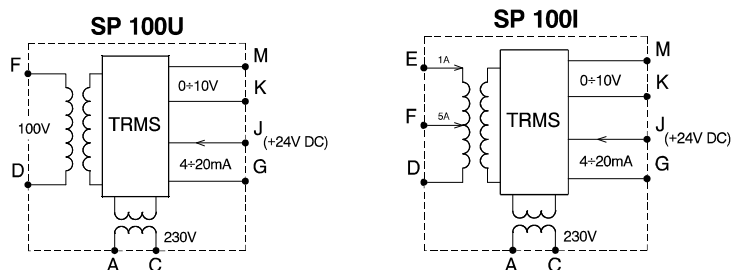
Type / box type	SP 100I / E1 SP 100I.10 / E2	SP 100U / E1 SP 100U.200, SP 100U.300 / E2
Input voltage / current :	1AC 230V 50Hz for voltage signal 0-10V, 22 – 31V DC / 60mA for current loop 4-20mA	
Input / output signal :	AC / DC	
Maximum input voltage, current :	5 x I _{in} during 10s	1,5 x U _{in}
DC offset max:	0,5mA	100mV
Output load resistance:	0,5kΩ	2kΩ
Linearity / accuracy:	less than 0,3% / 1% from full range	
Insulation strength:	input - output 4,0 kV, input - supply 4,0 kV, supply – output 0,5 kV	
Galvanic separation	circuit: optoelement, power supply: transformer	
Bandwidth for decrease 3dB:	5 – 10 kHz	

Operating ranges of transducers SP100I.x, SP100U.x:

TYP	Input 1	Input 2	Output 1	Output 2
SP 100I	0-1 A	0-5 A	0-10 V	4-20 mA
SP 100I.10	0-10 A	-	0-10 V	4-20 mA
SP 100U	0-100 V	-	0-10 V	4-20 mA
SP 100U.200	0-200 V	-	0-10 V	4-20 mA
SP 100U.300	0-300 V	-	0-10 V	4-20 mA

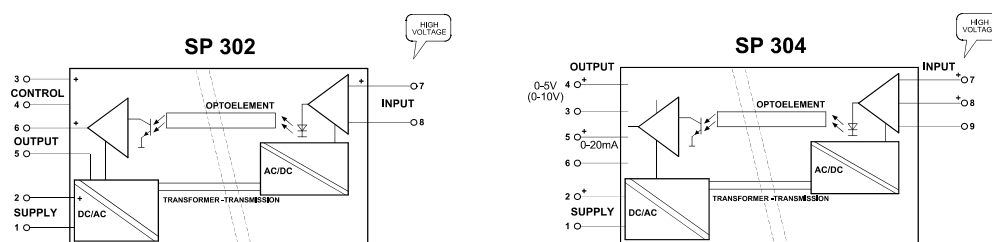
Other operating ranges values on demand.

External connection of transducers – SP100x.x:



SIGNAL TRANSDUCERS SP 302, SP 304, FOR HIGH VOLTAGE TO 3000V DC

Signal transducers are designed for galvanic separation and conversion of voltage signal to output voltage (current) from power circuits with voltage to 3000V DC. SP302 can amplify basic effective signal 10 times by connecting the logic signal between the clamps 3 and 4. The unit is placed in plastic box that enables mounting on the panel.



Technical data – SP302, 304:

TYPE	SP 302	SP 304
Supply voltage	19,2 – 143V DC	19,2 – 143V DC
Control logic voltage	19,2 – 143V DC	no control
Current consumption, input power	20 mA by 110V	1,8 W by 24V=, 2,75W by 110V=
Conversion 1	$\pm 100\text{mV} / \pm 10\text{V}$	$\pm 60\text{mV} / \pm 5\text{V}, (\pm 10\text{V}), \pm 0\text{-}20\text{mA}$
Conversion 2	$\pm 10\text{mV} / \pm 10\text{V}$	$\pm 10\text{V} / \pm 5\text{V}, (\pm 10\text{V}), \pm 0\text{-}20\text{mA}$
Linearity	1% by conversion 1	1%
Input resistance	10 k Ω	10 k Ω
Load resistance of output	-	do 560 Ω
Permissible output load	10 mA	10 mA
Bandwidth	50 Hz	1 kHz
Electric strength	15 kV input – output	12 kV ac, 25 kV cr. input – output
	1,5 kV output - supply – control	0,7 kV ac, 1,5 kV cr. output - supply – control
Dimensions	51 x 200 x 110 mm	51 x 200 x 110 mm
Weight	0,35 kg	0,35 kg



TEMPERATURE MEASURING CONTROL – ST 101, ST 102, ST 201

Usage

The transducers are designed for the conversion of resistance signal from the temperature sensor PT100 or KTY. Output signal is in the range 0(4)-20mA or 0-10V according to the type.

Characteristics:

Input limiting temperatures of the transducers can be adjust according the requirements in the range from -200°C to $+800^{\circ}\text{C}$ (depending from the temperature sensor possibilities) with minimal temperature scale ranging 50°C . Switching power supply galvanically separated from the input and output is used in the transducers. The units are placed in the E1 cases, therefore enabling mounting on DIN rail.

Technické parametry ST 101, 102, 201:

TYPE	ST 201x	ST 101x	ST 102x	Temperature range, input conversion of resistance signal code x
Supply voltage	24 V DC $\pm 30\%$	19,2 to 100 V AC/DC	19,2 to 100 V AC/DC	
Current consumption	100 mA by 24 V DC	50 mA by 24 V DC	50 mA by 24 V DC	ST ... A - -50° to $+150^{\circ}\text{C}$ ST ... B - 0° to $+200^{\circ}\text{C}$ ST ... C - 0° to $+400^{\circ}\text{C}$ ST ... D - 0° to $+150^{\circ}\text{C}$ other range on demand
Input – temperature sensor	PT100	PT100, P1-8	KTY	
Output signal	0-20 mA option: 4-20mA, 0-10V	0-20 mA option: 4-20mA, 0-10V	0-10 V option: 0(4)-20mA	
Insulation strength input - output	4 kV	500 V	500 V	
Insulation strength supply – input / supply – output	4 kV / 500 V	500 V / 500 V	500 V / 500 V	

External connection of ST transducers:

