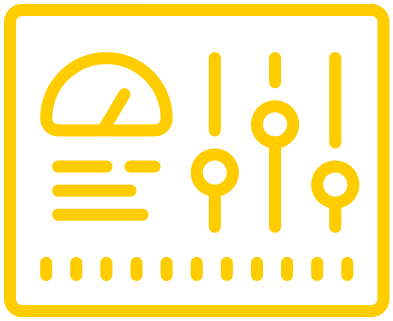
4



INSTRUMENTATION FROM THE PANEL AND MEASUREMENT

4 INSTRUMENTATION FROM THE PANEL AND MEASUREMENT

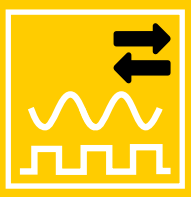
In the Instrumentation from the Panel and Measurement line, there are signal converters, digital indicators, totalizers, presetters, overvoltage protections, stabilized power supplies, temperature and humidity probes, multifunction calibrators. With a comprehensive offering dedicated to instrumentation for industrial monitoring, SENECA provides the most advanced optical, capacitive, and inductive technologies for normalizing field signals from sensors and actuators, galvanic isolation, electrical protection, connecting measurement loops, and controlling electrical and environmental parameters. The signal conditioning products can be used in universal applications, even in combination with other SENECA products. Their electrical and mechanical structure is designed to minimize wiring and maintenance activities.

4.1 MULTISTANDARD COMPACT ISOLATOR



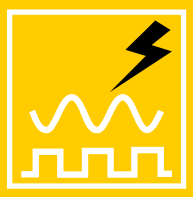
Z Series

4.2 MULTISTANDARD COMPACT CONVERTERS



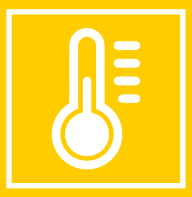
K Series

4.3 HIGH ISOLATION CONVERTERS

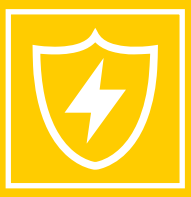


S Series

4.4 TEMPERATURE TRANSMITTERS

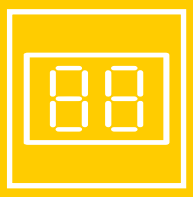


4.5 SURGE PROTECTION DEVICES



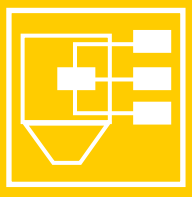
S400 Series

4.6 LED DIGITAL INDICATORS



S Series

4.7 BATCH CONTROLLERS



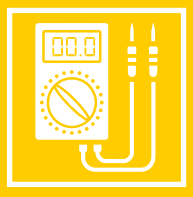
S20N1-S21N1 Series

4.8 PROFESSIONAL PORTABLE MEASUREMENT SYSTEMS



MY Series

4.9 MULTIFUNCTION CALIBRATORS



4.1



MULTISTANDARD ISOLATOR CONVERTERS

Z Line

Z Series

multistandard signal isolator converters with universal power supply

The modules of **Z Series** are reliable signal conditioners, designed for ease of use and installation. Available in multiple power standards, they meet the most common interface and conditioning needs. Most models feature 3-way galvanic separation at 1.5 kVac, compact dimensions (standard width 17.5 mm), DIN 42677 rail mounting, extended temperature range, high precision, and the ability to power the sensors connected to them. **Z Series** is the ideal solution for conditioning industrial analog signals, electrical signals from temperature sensors, load cells, serial, digital, and pulse signals.



UNIVERSAL POWER SUPPLY

Vac/dc switching; power from measurement loop

POWER SUPPLY FOR TRANSDUCERS

Loop current supply on input and output (min 20 Vdc)

REDUCED CONSUMPTION

< 2.5 W

HIGH MULTI-WAY ISOLATION

from 1.5 kVac up to 4kVac

ACCURACY

Up to 0.1%

SIGNALS STANDARD

mA, mV, A, V, Ohm, RTD, TC, load cell, Reed, Pnp, Npn, Hall effect, photoelectric sensor, 24V impulse

DURABILITY

Operational temperature up to -20..+65%, RH 90%

RELIABILITY

MTBF>500,000 hours

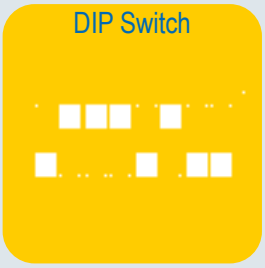
CERTIFICATIONS

COMPACT DIMENSIONS

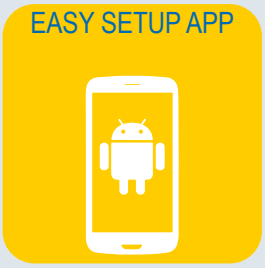
Width 17.5 mm

FLEXIBLE CONFIGURATION

The SENECA Z Series converters offer 3 configuration modes.
The vast majority of models allow for standard parameter configuration via DIP switches accessible on the side of the device.
In addition, some models offer extended functionality that can be set using the “EASY SETUP” PC software.
Other models, equipped with a Micro USB port on the front, are programmable via the “EASY SETUP APP” for Android terminals.











Removable screw terminals 2.5 mm²



Installation on 35 mm DIN rail (IEC/EN 60175)



Frontal 3.5 mm jack RS232 (COM)



Micro USB communication port

QUICK SELECTION

		CONVERSION			CONNECTION TYPES mA / Measurement Loop			
Model	Number of Inputs	Input Type	Number of Outputs	Output Type	Active Input	Passive Input	Active Output	Passive Output
ANALOG CONVERTERS								
Z102	1	Ohm	1	mA, V			x	x
Z109REG	1	mA, mV, V, Ohm, TC (J,K,R,S,T,B,E,N), Pt100	1	mA, V	x	x	x	x
Z109REG2-1	2	mA, mV, V, Ohm, TC (J,K,R,S,T,B,E,N), Pt100, Ni100, Pt500, Pt1000, (Strobe)	2	mA, V, (SPST Relay)	x	x	x	x
Z109REG2-H	2	mA, mV, V, Ohm, TC (J,K,R,S,T,B,E,N), Pt100, Ni100, Pt500, Pt1000, (Strobe)	2	mA, V, (SPST Relay)	x	x	x	x
Z109REG-BP	1	mA, mV, V, Ohm, TC (J,K,R,S,T,B,E,N), Pt100, Pt500, Pt1000, Ni100, KTY81, KTY84, NTC	1	mA, V	x	x	x	x
Z109S	1	mA	1	mA	x	x	x	x
Z109S-DI	1	mA	1	mA	x	x	x	x
Z109UI2-1	1	mA, V, mV	1	mA, V	x	x	x	x
Z110D	2	mA	2	mA		x	x	
Z110S	1	mA	1	mA		x	x	
Z170REG-1	1	mA, mV, V, Ohm, TC (J,K,R,S,T,B,E,N), Pt100, Ni100, Pt500, Pt1000, (Strobe)	2	mA, V, (SPST Relay)	x	x	x	x
Z190	2	mA, V	1	mA, V	x	x	x	x
Z-SG	1	mV, load cell	1	mA, V, RS485 ModBUS				
Z-SG3	1	mV, load cell	1	mA, V, RS485 ModBUS				
FREQUENCY CONVERTERS								
Z104	1	mA, V	1	Contact, NPN Open Collector, Reed Relay	x	x		
Z111	1	Contact, Reed, NPN, Namur, Photoelectric, Hall, Variable Reluctance, Impedance 24 V, TTL, Volumetric Counter	1	mA, V			x	x
ELECTRICAL MEASUREMENT CONVERTERS								
Z201	1	Aac	1	mA, V			x	x
Z201-H	1	Aac	1	mA, V			x	x
Z202	1	Vac	1	mA, V			x	x
Z202-H	1	Vac	1	mA, V			x	x
Z202-LP	1	Vac/dc	1	mA, V				x
Z203-2	1	A, V	1	mA, V, RS485 ModBUS				x
Z204-1	1	Vac/dc	1	mA, V, RS485 ModBUS				x
TEMPERATURE CONVERTERS								
Z109PT2-1	1	Pt100, Ni100, Pt500, Pt1000	1	mA, V			x	x
Z109TC2-1	1	TC (J,K,R,S,T,B,E,N)	1	mA, V			x	x
RELAYS THRESHOLDS CONVERTERS								
Z112A	1	Contact, Reed, NPN, PNP, Namur, Photoelectric, Hall, Variable Reluctance, Impedance 24 V, TTL, Volumetric Counter	1	SPDT Relay				
Z112D	2	Contact, Reed, NPN, PNP, Namur, Photoelectric, Hall, Variable Reluctance, Impedance 24 V, TTL, Volumetric Counter	2	SPST Relay				
Z113-1	1	mA, V, Ohm, RTD, TC	2	SPST Relay	x	x		
A/D CONVERTERS								
Z-4AI-D	4	mA, V	3	Digital contacts	x	x		
Z-4TC-D	4	TC	3	Digital contacts				

POWER SUPPLY			CONFIGURATION			OTHER FEATURES			
Power Supply	Power supply for transducers	Max isolation	DIP Switch	Software	App	Prediction Class	OPERATING TEMPERATURE	Certifications	Special Functions / Features
x		1.5 kVac, 3-way	x			0.2%	0..+50°C	CE, UKCA	Root extraction, input filter, rejection, burn-out
x	18 Vdc	1.5 kVac, 3-way	x	x		0.2%	0..+50°C	CE, UKCA	Root extraction, input filter, rejection, burn-out
10..40 Vdc; 19..28 Vac	20 Vdc	1.5 kVac, 3-way	x	x	x	0.1%	-10..+60°C	CE, UKCA, UL	Root extraction, input filter, rejection, burn-out
85..265 Vac/dc	20 Vdc	1.5 kVac, 3-way	x	x		0.1%	-10..+60°C	CE, UKCA	Root extraction, input filter, rejection, burn-out
10..40 Vdc; 19..28 Vac	17 Vdc	1.5 kVac, 3-way	x	x	x	0.1%	-10..+60°C	CE, UKCA	Root extraction, input filter, rejection, burn-out
19..40 Vdc; 19..28 Vac	20 Vdc	1.5 kVac, 3-way	x			0.2%	0..+50°C	CE, UKCA, UL	
10..40 Vdc; 19..28 Vac	17 Vdc	3.5 kVac, 3-way	x			0.2%	-20..+60°C	CE, UKCA	
10..40 Vdc; 19..28 Vac		1.5 kVac, 3-way	x	x	x	0.1%	0..+50°C	CE, UKCA, UL	Output mode zero elevation, scale inversion
External / From measurement loop		1.5 kVac, 2-way	x			0.1%	0..+50°C	CE, UKCA	
External / From measurement loop		1.5 kVac, 2-way	x			0.1%	0..+50°C	CE, UKCA	
10..40 Vdc; 19..28 Vac		1.5 kVac, 4-way	x	x	x	0.1%	-10..+60°C	CE, UKCA, UL	Root extraction, input filter, rejection, burn-out
19..40 Vdc; 19..28 Vac	20 Vdc	1.5 kVac	x			0.2%	0..+50°C	CE, UKCA	
10..40 Vdc; 19..28 Vac		1.5 kVac, 3-way	x	x		0.01%	-10..+60°C	CE, UKCA	Tare Functions (Reset, Acquisition); Stable weighing indication
10..40 Vdc; 19..28 Vac		1.5 kVac, 5-way	x	x		0.01%	-25..+70°C	CE, UKCA	Tare Functions (Silos, Reset, Acquisition); Piece Counting Function; Stable weighing indication;
19..40 Vdc; 19..28 Vac	20 Vdc	1.5 kVac, 3-way	x			0.2%	0..+50°C	CE, UKCA	Programmable integration constant
19..40 Vdc; 19..28 Vac	20 Vdc	1.5 kVac, 3-way	x			0.2%	0..+50°C	CE, UKCA, UL	
19..40 Vdc; 19..28 Vac		3.75 kVac, 3-way	x			0.3%	0..+55°C	CE, UKCA	
85..265 Vac/dc		4 kVac, 3-way	x			0.3%	0..+55°C	CE, UKCA	
10..40 Vdc; 19..28 Vac		3.75 kVac, 3-way	x			0.25%	0..+60°C	CE, UKCA	
85..265 Vac/dc		4 kVac, 3-way	x			0.25%	0..+60°C	CE, UKCA	
External / From measurement loop		4 kVac, 2-way	x			0.25%	0..+60°C	CE, UKCA	
10..40 Vdc; 19..28 Vac		3.75 kVac, 3-way	x	x		0.5%	0..+55°C	CE, UKCA, UL	
10..40 Vdc; 19..28 Vac		4 kVac, 3-way	x	x		0.5%	-20..+65°C	CE, UKCA	
10..40 Vdc; 19..28 Vac		1.5 kVac, 3-way	x	x	x	0.1%	-10..+60°C	CE, UKCA, UL	Output mode zero elevation, scale inversion
10..40 Vdc; 19..28 Vac		1.5 kVac, 3-way	x	x	x	0.2%	0..+50°C	CE, UKCA, UL	Output mode zero elevation, scale inversion
19..40 Vdc; 19..28 Vac	20 Vdc	3 kVac, 3-way	x				0..+50°C	CE, UKCA	Repeater / Pulse Divider
19..40 Vdc; 19..28 Vac	20 Vdc	1.5 kVac, 3-way	x				0..+50°C	CE, UKCA	
10..40 Vdc; 19..28 Vac		3 kVac, 3-way	x	x			-10..+65°C	CE, UKCA	
19..40 Vdc; 19..28 Vac		1.5 kVac, 3-way	x	x		0.1%	0..+55°C	CE, UKCA, UL	PLC interface (data, clock, strobe)
19..40 Vdc; 19..28 Vac		1.5 kVac, 3-way	x	x		0.1%	0..+55°C	CE, UKCA, UL	PLC interface (data, clock, strobe)

ANALOG SIGNAL CONVERTERS

	Z109REG	Z109REG2-1	Z109REG2-H
			
	Universal converter with galvanic isolation	Universal converter with galvanic isolation, relay output, Micro USB 9..40 Vdc/19..28 Vac	Universal converter with galvanic isolation, micro USB, 85..265 Vac/dc
GENERAL DATA			
Power Supply	10..40 Vdc; 19..28 Vac	10..40 Vdc; 19..28 Vac	85..265 Vac/dc
Power supply for transducers	Active input 2 wires (min 18 Vdc)	Active input 2 wires (min 20 Vdc)	Active input 2 wires (min 20 Vdc)
Max Consumption	2.5 W	2.5 W (max) 1.6 W (24 Vdc, 20 mA)	2.5 W (max) 1.6 W (24 Vdc, 20 mA)
Isolation	1.500 Vac (3-way)	1.500 Vac (3-way)	1.500 Vac (input/output); 3.750 Vac (power supply//input-output)
LED Status Indicators	Power Supply Error	Power Supply Error	Power Supply Error
Response Time	35 ms	35 ms (11 bit)..140 ms (16 bit)	35 ms (11 bit)..140 ms (16 bit)
Interfaces	Frontal 3.5 mm jack RS232 (COM)	Micro USB	Frontal 3.5 mm jack RS232 (COM)
Precision class	0.1%	0.1%	0.1%
Thermal Drift	0.01%/°K	0.01%/°K	0.01%/°K
Linearity	0,05% (V,I), 0,2% (RTD),1°C (TC)	0,05% / 0.4%	0,05% / 0.4%
Configuration	DIP Switch Software (EASY SETUP)	DIP Switch Software (EASY SETUP) Android App	DIP Switch Software (EASY SETUP)
Operating Temperature	-20..+60°C	-20..+60°C	-20..+60°C
Dimensions	17.5 x 100 x 112 mm	17.5 x 100 x 112 mm	17.5 x 100 x 112 mm
Connections	Removable screw terminals 2.5 mm^2	Removable screw terminals 2.5 mm^2	Removable screw terminals 2.5 mm^2
Enclosure	Nylon 6 with 30% fiberglass	Nylon 6 with 30% fiberglass	Nylon 6 with 30% fiberglass
Mounting	35 mm DIN rail (IEC/EN 60175)	35 mm DIN rail (IEC/EN 60175)	35 mm DIN rail (IEC/EN 60175)
Weight	200 g	200 g	200 g
Certifications	CE	CE- UL-UR CSA	CE- UL-UR CSA
INPUT DATA			
Channels	1	1 analog, 1 strobe	1 analog, 1 strobe
Type	• VOLTAGE (mV, V) Bipolar 0..2, 0..5, 0..10 V • CURRENT (mA) Bipolar 0..20 mA • RTD Pt100 (-200..+600°C) • THERMOCOUPLE Type J, K, R, S, T, E, B, N • POTENTIOMETER 0,5..15 kΩ	• VOLTAGE (mV, V) Bipolar from 75 mV to 20 V Resolution 15 bits + sign • CURRENT (mA) Bipolar up to 20 mA Resolution 1 µA • RTD Pt100, Pt500, Pt1000, Ni100, KTY81, KTY84, NTC 3, 4 wire measurement Scale: -200..600°C Resolution 0.1°C • THERMOCOUPLE Type J, K, R, S, T, E, B, N Resolution 2.5 µV • POTENTIOMETER: 500 Ω ..10 kΩ • RHEOSTAT: 500 Ω..25 kΩ • STROBE: Alternative to the relay output	• VOLTAGE (mV, V) Bipolar from 75 mV to 20 V Resolution 15 bits + sign • CURRENT (mA) Bipolar up to 20 mA Resolution 1 µA • RTD Pt100, Pt500, Pt1000, Ni100, KTY81, KTY84, NTC 3, 4 wire measurement Scale: -200..600°C Resolution 0.1°C • THERMOCOUPLE Type J, K, R, S, T, E, B, N Resolution 2.5 µV • POTENTIOMETER: 500 Ω ..10 kΩ • RHEOSTAT: 500 Ω..25 kΩ • STROBE: Alternative to the relay output
OUTPUT DATA			
Channels	1	1 analog, 1 relay	1 analog, 1 relay
Type	• VOLTAGE (V) 4 scales: 0..2, 0..10 V • CURRENT (mA) 2 scales: 0..20, 4..20 mA	• VOLTAGE (V) 4 scales: 0/1..5V, 0/2..10V Minimum load resistance: 2 kΩ • CURRENT (mA) 2 scales: 0/4..20 mA Maximum load resistance: 600 Ω • RELAY Alternative to strobe input NC / NO in case of alarm	• VOLTAGE (V) 4 scales: 0/1..5V, 0/2..10V Minimum load resistance: 2 kΩ • CURRENT (mA) 2 scales: 0/4..20 mA Maximum load resistance: 600 Ω • RELAY Alternative to strobe input NC / NO in case of alarm
ORDER CODES			
Code	**Z109REG**	**Z109REG2-1**	**Z109REG2-H**

The technical data and diagrams in this document are indicative and not binding.

Z109UI2-1	Z109REG-BP	Z109S-DI	Z109S
			
mA-V converter with galvanic isolation, micro USB	**Universal converter with bipolar voltage / current output, micro USB**	**Galvanic separator for high isolation current loops**	**Galvanic separator for current loops**
GENERAL DATA			
10..40 Vdc; 19..28 Vac	10..40 Vdc; 19..28 Vac	10..40 Vdc; 19..28 Vac	9..40 Vdc; 19..28 Vac
Active input 2 wires (min 20 Vdc)	Active input 2 wires (17 Vdc)	Active input 2 wires (17 Vdc)	Active input 2 wires (17 Vdc)
2.5 W	2.5 W	2.5 W	2.5 W
1.500 Vac (3-way)	1.500 Vac (power supply / input)	3500 Vac (3-way)	1.500 Vac (3-way)
Power Supply	Power Supply Error	Power Supply	Power Supply
35 ms (11 bit)..140 ms (16 bit)	35 ms (11 bit)..140 ms (16 bit)	< 200 µs	< 60 ms
Micro USB	Micro USB	-	
0.1%	0.1%	0.2% or 10µA	0.2%
0.01%/°K	0.01%/°K	0.02%/°K	0.02% f.s. / °C
0.05 % (V,I), 0.01% (Vout)	-	-	0.05%
DIP Switch Software (EASY SETUP) App (EASY SETUP) Android App	DIP Switch Software (EASY SETUP) Android App	-	-
-20..+60°C	-20..+65°C	-20..+60°C	-20..+60°C
17.5 x 100 x 112 mm	17.5 x 100 x 112 mm	17.5 x 100 x 112 mm	17.5 x 100 x 112 mm
Removable screw terminals 2.5 mm^2	Removable screw terminals 2.5 mm^2	Removable screw terminals 2.5 mm^2	Removable screw terminals 2.5 mm^2
Nylon 6 with 30% fiberglass	Nylon 6 with 30% fiberglass	Nylon 6 with 30% fiberglass	Nylon 6 with 30% fiberglass
35 mm DIN rail (IEC/EN 60175)	35 mm DIN rail (IEC/EN 60175)	35 mm DIN rail (IEC/EN 60175)	35 mm DIN rail (IEC/EN 60175)
200 g	200 g	200 g	200 g
CE- UL-UR CSA	CE	CE	CE - UL
INPUT DATA			
1	1	1	1
• VOLTAGE (mV, V) Bipolar from 75 mV to 20 V 9 scales Resolution 15 bits + sign • CURRENT (mA) Bipolar up to 20 mA Resolution 1 µA	• VOLTAGE Bipolar from 75 mV to 20 V • CURRENT Bipolar up to 20 mA • RTD Pt100, Pt500, Pt1000, Ni100, KTY81,KTY84, NTC 2.3, 4 wire measurement • THERMOCOUPLE Type J, K, R, S, T, E, B, N • POTENTIOMETER: 500 Ω ..100 kΩ • RHEOSTAT: 500 Ω..25 kΩ	CURRENT 0…20 / 4..20 mA	CURRENT 2 scales: 0/4..20 mA
OUTPUT DATA			
1	1 (bipolar)	1	1
• VOLTAGE (V) 4 scales: 0/1..5V, 0/2..10V Minimum load resistance: 2 kΩ • CURRENT (mA) 2 scales: 0/4..20 mA Maximum load resistance: 600 Ω	Voltage from -10 to +10 Vdc, min load 1000 Ω Current from -20 to + 20 mA, max load 500 Ω	Current, 0/4..20 mA, max load 600 Ω	• CURRENT (mA) 2 scales: 0/4..20 mA Maximum load resistance: 600 Ω

Z109UI2-1	Z109REG-BP	Z109S-DI	Z109S

The technical data and diagrams in this document are indicative and not binding.

ANALOG SIGNAL CONVERTERS

	Z102	Z110S	Z110D	Z170REG-1
				
	Potentiometric converter	**Self-powered galvanic separator single channel**	**Self-powered galvanic separator double channel**	**Universal converter with 2 galvanically isolated analog outputs, micro USB**
GENERAL DATA				
Power Supply	9..30 (optional) - 19..40 Vdc 19..28 Vac	Self-powered from input loop	Self-powered from input loop	10..40 Vdc; 19..28 Vac
Power supply for transducers	-	-	-	Yes max 25 mA, 17 Vdc
Max Consumption	2.5 W	-	-	0.5..2 W
Isolation	1.500 Vac (3-way)	1,500 Vac	1,500 Vac	1.500 Vac (4-way)
Protection class	IP20	IP20	IP20	IP20
LED Status Indicators	Power Supply	-	-	Power Supply Alarm
Response Time	< 40 ms	< 100 ms	< 100 ms	< 25 ms
Interface	-	-	-	Micro USB (front)
Communication with PLC	-	-	-	-
Precision class	0.2%	0.1%	0.1%	0.1%
Thermal Drift	0.02% f.s. / °C	0.02% f.s. / °C	0.02% f.s. / °C	0.01% /K
Linearity	0.05%	0.1% f.s.	0.1% f.s.	<1% (input), 0.01% (output)
Configuration	DIP Switch	-	-	DIP Switch Software (EASY SETUP) App (EASY SETUP)
Operating Temperature	0..+50°C	0..+50°C	0..+50°C	-20..+60°C
Dimensions	17.5 x 100 x 112 mm	17.5 x 100 x 112 mm	17.5 x 100 x 112 mm	17.5 x 100 x 112 mm
Connections	Screw-in removable terminals	Screw-in removable terminals	Screw-in removable terminals	Screw-in removable terminals
Enclosure	Nylon 6 30% glass fiber	Nylon 6 30% glass fiber	Nylon 6 30% glass fiber	Nylon 6 30% glass fiber
Mounting	35 mm DIN rail (IEC/EN 60715)	35 mm DIN rail (IEC/EN 60715)	35 mm DIN rail (IEC/EN 60715)	35 mm DIN rail (IEC/EN 60715)
Weight	200 g	200 g	200 g	200 g
Certifications	CE	CE	CE	CE- UL-UR CSA
INPUT DATA				
Channels	1	1	2	1
Type	• RHEOSTAT 2 wires: 0..300 Ω (I=6mA); 0..500 Ω (I=3.6mA); 0..1 K Ω (I=1,8 mA) • POTENTIOMETER 3 wires: Vref=1,8 Vcc, from 200 Ω to 1 M Ω	• CURRENT (mA) 4..20 mA	• CURRENT (mA) 4..20 mA	• VOLTAGE Configurable scale 0..10 V • CURRENT Configurable scale 0..20 mA (active/passive module) • POTENTIOMETER Configurable scale 1 kΩ ..100 kΩ THERMOCOUPLE: J,K,R,S,T,B,E,N • THERMAL RESISTANCE Pt100, Pt500, Pt1000, Ni100 14-bit resolution Configurable sampling period from 5 to 20 ms
OUTPUT DATA				
Channels	1	1	2	2
Type	• VOLTAGE (V) 4 scales: 0..5, 1..5, 0..10, 0..10 V Load impedance > 2.5 KΩ • CURRENT (mA) 2 scales: 0..20, 4..20 mA Loop impedance < 600Ω	• CURRENT (mA) 4..20 mA	• CURRENT (mA) 4..20 mA	• VOLTAGE Configurable scale 0..10 V • CURRENT Configurable scale 0..20 mA (active/passive) 14-bit resolution
ORDER CODES				
Code	**Z102**	**Z110S**	**Z110D**	**Z170REG-1**

The technical data and diagrams in this document are indicative and not binding.

ANALOG SIGNAL CONVERTERS

A/D CONVERTERS

Z190	Z-SG	Z-SG3	Z-4AI-D	Z-4TC-D
	 			
Signal summing subtractor with galvanic isolation	**Load cell converter**	**Advanced load cell converter**	**A/D converter for 4 analog signals**	**A/D converter for 4 thermocouples**
GENERAL DATA				
9..30 (optional) - 19..40 Vdc 19..28 Vac	9..30 (optional) - 19..40 Vdc 19..28 Vac	10..40 Vdc / 19..28 Vac	9..30 (option) - 19..40 Vdc 19..28 Vac (50..60 Hz)	9..30 (option) - 19..40 Vdc 19..28 Vac (50..60 Hz)
Active input 2 wires (min 20 Vdc)	-	-	-	-
2.5 W	2 W	2 W	2.5 W	2 W
1.500 Vac (3-way)	1.500 Vac (3-way)	1.5 kVac (5 channels)	1,500 Vac (3-way)	1,500 Vac (3-way)
IP20	IP20	IP20	IP20	IP20
Power Supply	Power Supply Error Data transmission Data reception	RX/TX RS485 Digital I/O Activation Power Supply Load cell overload	Power Supply RST signal status Data transmission Data reception	Power Supply RST signal status Data transmission Data reception
-	< 10 ms	<10 ms	-	-
-	Micro USB Front IDC10 ModBUS RTU RS485	Frontal Micro USB IDC ModBUS RTU RS495	Frontal 3.5 mm jack RS232 (COM)	Frontal 3.5 mm jack RS232 (COM)
-	-	-	Synchronous serial three-wire: CLOCK, DATA, STROBE, standard 24V PNP levels	Synchronous serial three-wire: CLOCK, DATA, STROBE, standard 24V PNP levels
0.2%	0.01%	0.01%	-	-
0.02% f.s./°C	0.0025% f.s. / °C	<25 ppm/°C	-	-
0.05%	0.01%	0.025%/°C	-	-
DIP Switch	DIP Switch Software (EASY SETUP) Tare Functions (Reset, Acquisition); Stable weighing indication	DIP Switch, Web Server, Special Functions (Tare Functions (Silos, Reset, Acquisition); Piece Counting Function; Stable weighing indication; Peer-To-Peer; Pass-Through)	PLC IEC 61131 libraries DIP Switch Z-PROG (PC software)	PLC IEC 61131 libraries DIP Switch Z-PROG (PC software)
0..50°C	-20..+65°C	-25°..+70°C	0..+55°C	0..+55°C
17.5 x 100 x 112 mm	17.5 x 100 x 112 mm	17.5 x 102.5 x 111 mm	17.5 x 100 x 112 mm	17.5 x 100 x 112 mm
Screw-in removable terminals	Screw-in removable terminals	Removable screw terminals for conductors up to 2.5 mm2	Screw-in removable terminals	Screw-in removable terminals
Nylon 6 30% glass fiber	Nylon 6 30% glass fiber	Nylon 6 30% glass fiber	Nylon 6 30% glass fiber	Nylon 6 30% glass fiber
35 mm DIN rail (IEC/EN 60715)	35 mm DIN rail (IEC/EN 60715)	Vertical position DIN rail 35mm IEC EN60715	35 mm DIN rail (IEC/EN 60715)	35 mm DIN rail (IEC/EN 60715)
200 g	200 g	Approximately 110 g	200 g	200 g
CE	CE	CE, UKCA	CE, UL	CE, UL
INPUT DATA				
2	1 analog, 1 digital	1 analog, 1 digital	4	4
VOLTAGE (V) 4 scales: 0..1, 0..5, 0..10, 2..10 V Input impedance 500 kΩ CURRENT (mA) 2 scales: 0/4..20 mA Active connection: loop powered 20 Vdc not stabilized Passive connection: input impedance 100 Ω	• ANALOG Strain gauge load cell, 4 or 6-wire connection, min 87 Ω for 1..4 load cells (350 Ω) or 1..8 load cells (1.000 Ω) Sensitivity: 1..64 mV/V • DIGITAL Tare calibration	• ANALOG Strain gauge load cell, 4 or 6-wire connection, min 87 Ω for 1 to 4 load cells (350 Ω) or 1 to 8 load cells (1,000 Ω); Sensitivity: 1..64 mV/V • DIGITAL Tare calibration	VOLTAGE (V) 2..10 V f.s Resolution: 16,000 points Impedance: 100 KΩ CURRENT (mA) ± 20 mA (bipolar) Resolution: 16,000 points Impedance: 100 Ω	VOLTAGE (mV) ± 80 mV Impedance 10 MΩ Thermocouple Types: J, K, R, S, T, E; B, N
OUTPUT DATA				
1	1 analog, 1 digital	1 analog, 1 digital	-	-
VOLTAGE (V) 4 scales: 0..5, 0..10, 1..5, 2..10 V, min load resistance 2 kΩ CURRENT (mA) 2 scales: 0/4..20 mA Passive/active connection (max loop impedance 600Ω)	CURRENT (mA) 0..20, 4..20 mA VOLTAGE (V) 0..10, 0..5 Vdc DIGITAL Weight threshold	CURRENT (mA) 0..20, 4..20 mA VOLTAGE (V) 0..10, 0..5 Vdc DIGITAL Weight threshold	-	-
Z190	**Z-SG**	**Z-SG3**	**Z-4AI-D**	**Z-4TC-D**

The technical data and diagrams in this document are indicative and not binding.

CONVERTERS FOR ELECTRICAL MEASUREMENTS

	Z201	Z201-H	Z202
			
	Alternating current converter, 10..40 Vdc; 19..28 Vac	**Alternating current converter, 85..265 Vac/dc**	**Alternating voltage converter, 10..40 Vdc; 19..28 Vac**
GENERAL DATA			
Power Supply	10..40 Vdc; 19..28 Vac	85..265 Vac/dc	10..40 Vdc; 19..28 Vac
Max Consumption	< 2.5 W	< 2.5 W	< 1.5 W
Isolation	3,750 Vac (input/output/power supply) 1,500 Vac (output/power supply)	4,000 Vac (input/output/power supply)	3,750 Vac (input/output; input/power supply) 1,500 Vac (output/power supply)
Protection class	IP20	IP20	IP20
LED Status Indicators	Power Supply	Power Supply	Power Supply
Response Time	< 200 ms	< 100 ms	< 30 ms
Interfaces	-	-	-
Precision class	0.3%	0.3%	0.25%
Thermal Drift	<200 ppm/K	<200 ppm/K	<150 ppm/K
Configuration	DIP Switch	DIP Switch	DIP Switch
Operating Temperature	0..+55°C	-10..+65°C	0..+60°C
Dimensions	17.5 x 100 x 112 mm	17.5 x 100 x 112 mm	17.5 x 100 x 112 mm
Connections	Screw-in removable terminals	Screw-in removable terminals	Screw-in removable terminals
Enclosure	Nylon 6 30% glass fiber	Nylon 6 30% glass fiber	Nylon 6 30% glass fiber
Mounting	35 mm DIN rail (IEC/EN 60715)	35 mm DIN rail (IEC/EN 60715)	35 mm DIN rail (IEC/EN 60715)
Weight	200 g	200 g	200 g
Certifications	CE	CE	CE
INPUT DATA			
Channels	1	1	1
Type	ALTERNATING CURRENT 0..5 / 0..10 Aac	ALTERNATING CURRENT 0..5 / 0..10 Aac	ALTERNATING VOLTAGE 0..500 Vac (41 scales), input impedance 2,000 Ω/V Frequency 10 Hz..1 kHz
OUTPUT DATA			
Channels	1	1	1
Type	CURRENT 0..20 / 4..20 mA, max load 600 Ω, active / passive connection VOLTAGE 0..5 / 0..10 / 1..5 / 2..10 Vdc, min load 2,500 Ω	CURRENT 0..20 / 4..20 mA, max load 600 Ω, active / passive connection VOLTAGE 0..5 / 0..10 / 1..5 / 2..10 Vdc, min load 2,500 Ω	CURRENT 0..20 / 4..20 mA, max load 600 Ω, active / passive connection VOLTAGE 0..5 / 0..10 / 1..5 / 2..10 Vdc, min load 2,500 Ω
ORDER CODES			
Code	**Z201**	**Z201-H**	**Z202**

The technical data and diagrams in this document are indicative and not binding.

CONVERTERS FOR ELECTRICAL MEASUREMENTS

Z202-H	Z202-LP	Z203-2	Z204-1
			
Alternating voltage converter, 85..265 Vac/dc	**Loop powered alternating voltage converter**	**Single-phase network analyzer**	**Alternating and direct voltage TRMS converter**
85..265 Vac/dc	5..28 Vdc (from loop)	10..40 Vdc; 19..28 Vac	10..40 Vdc; 19..28 Vac
< 1.5 W	<1mA	< 2.5 W	< 1 W
3,750 Vac (input/output; input/power supply) 1,500 Vac (output/power supply)	4,000 Vac (input/output)	3,750 Vac (input/output/power supply)	4,000 Vac (input/output; input/power supply) 1,500 Vac (output/power supply)
IP20	IP20	IP20	IP20
Power Supply	Power Supply	Power Supply Error RS485 communication	Power Supply Error RS485 communication
< 100 ms	< 100 ms	< 10 ms	For a step change: 1 s from 10 to 90 %
-	-	Frontal Micro USB RS485 (backplane), as an alternative to the analog output, speed up to 115,200 bps, ModBUS RTU protocol	RS232 (frontal connector for programming): baud rate, address, parity, data/stop bit RS485 (backplane), as an alternative to analog output, speed up to 115,200 bps, ModBUS RTU protocol
0.3%	0.3%	0.5%	0.5% input; 0.1% output
+150 ppm/K	+150 ppm/K	+150 ppm/K	+100 ppm/K
DIP Switch	DIP Switch	DIP Switch Software (EASY SETUP)	DIP Switch Software (EASY SETUP)
-20..+65°C	-20..+65°C	-20..+65°C	-20..+65°C
17.5 x 100 x 112 mm	35 x 100 x 112 mm	17.5 x 100 x 112 mm	35 x 100 x 112 mm
Screw-in removable terminals	Screw-in removable terminals	Screw-in removable terminals	Screw-in removable terminals
Nylon 6 30% glass fiber	Nylon 6 30% glass fiber	Nylon 6 30% glass fiber	Nylon 6 30% glass fiber
35 mm DIN rail (IEC/EN 60715)	35 mm DIN rail (IEC/EN 60715)	35 mm DIN rail (IEC/EN 60715)	35 mm DIN rail (IEC/EN 60715)
200 g	200 g	200 g	200 g
CE	CE	CE, UL	CE
1 (single phase load)	1	1 (single phase load)	1
ALTERNATING VOLTAGE 0..500 Vac (41 scales), input impedance 2,000Ω/V Frequency 10 Hz..1 kHz	ALTERNATING VOLTAGE 0..500 Vac DIRECT VOLTAGE 0..540 Vdc, max voltage 710 Vpk Frequency DC / 20 Hz..20 kHz	ALTERNATING VOLTAGE Max capacity: 500 Vac, frequency 35-75 Hz ALTERNATING CURRENT Nominal capacity: 5 A rms, crest factor max 3, max current 15 A, frequency 35-75 Hz	DIRECT VOLTAGE: 0..1,200 Vdc; ALTERNATING VOLTAGE 0..850 Vac Input impedance: 800 kΩ Frequency: 30..300 Hz
1	1	1 analog, 1 digital	1
CURRENT 0..20 / 4..20 mA, max load 600 Ω, active / passive connection VOLTAGE 0..5 / 0..10 / 1..5 / 2..10 Vdc, min load 2,500 Ω	CURRENT 4..20 mA, passive	VOLTAGE 0-5, 0-10, 1-5, 2-10 V Analog retransmission: Vrms, Irms, Watt, Var, frequency, cosϕ, energy CURRENT 0-20, 4-20 mA DIGITAL Impulse counter (200ms)	CURRENT Range: 0..20 mA; max impedance: 500 Ω VOLTAGE Range: 0..10 V; min impedance: 1 k Ω
Z202-H	**Z202-LP**	**Z203-2**	**Z204-1**

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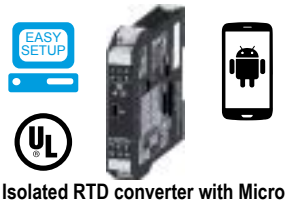
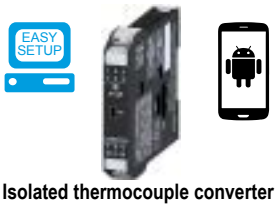
RELAY THRESHOLD CONVERTERS

	Z112A	Z112D	Z113S	Z113-1
				
	Power supply amplifier for digital contacts, 1 relay output	**Power supply amplifier for digital contacts, 2 relay outputs**	**Adjustable single alarm threshold**	**Dual alarm threshold with universal analog input and relay output**
GENERAL DATA				
Power Supply	19..40 (9..30 optional) Vdc; 19..28 Vac	19..40 (9..30 optional) Vdc; 19..28 Vac	19..40 (9..30 optional) Vdc; 19..28 Vac	10..40 Vdc; 19..28 Vac
Power supply for transducers	Yes, active input 2 wires (min 20 Vdc)	Yes, active input 2 wires (min 20 Vdc)	Yes, active input 2 wires (min 20 Vdc)	Yes, active input 2 wires
Max Consumption	2.5 W	2.5 W	2.5 W	2.5 W
Isolation	1,500 Vac (power/input) 4,000 Vac (input/power/output)	1,500 Vac	1,500 Vac (power/input) 4,000 Vac (input/power/output)	1.500 Vac (3-way)
Protection class	IP20	IP20	IP20	IP20
LED Status Indicators	Power Supply Relay attracted	Power Supply Relay attracted	Power Supply Threshold exceeded	Power Supply Alarm
Interfaces	-	-	-	Micro USB (front)
Thermal Drift	0.01%/°C	0.01%/°C	0.01%/°C	0.01%/°K
Linearity	0.05%	0.05%	0.05%	0.05%
Configuration	DIP Switch Trimmer	DIP Switch Trimmer	DIP Switch Trimmer	DIP Switch Software (EASY SETUP)
Operating Temperature	0..+50°C	0..+50°C	0..+50°C	-20..+65°C
Dimensions	17.5 x 100 x 112 mm	17.5 x 100 x 112 mm	17.5 x 100 x 112 mm	17.5 x 100 x 112 mm
Connections	Screw-in removable terminals	Screw-in removable terminals	Screw-in removable terminals	Screw-in removable terminals
Enclosure	Nylon 6 30% glass fiber	Nylon 6 30% glass fiber	Nylon 6 30% glass fiber	Nylon 6 30% glass fiber
Mounting	35 mm DIN rail (IEC/EN 60715)	35 mm DIN rail (IEC/EN 60715)	35 mm DIN rail (IEC/EN 60715)	35 mm DIN rail (IEC/EN 60715)
Weight	200 g	200 g	200 g	200 g
Certifications	CE	CE	CE	CE
INPUT DATA				
Channels	1	2	1	1
Type	Impulse (mechanical contact, reed, npn, pnp, Namur, imp. 24 Vdc, photoelectric sensor, Hall effect sensor), freq. Max 400 Hz	Impulse (mechanical contact, reed, npn, pnp, Namur, imp. 24 Vdc, photoelectric sensor, Hall effect sensor), freq. Max 400 Hz	Voltage (V), 4 scales (0/1..5 Vdc, 0/2..10 Vdc); input impedance 500 kΩ Current (mA), 2 scales (0..20, 4..20 mA); active/passive connection; input impedance 100Ω	Voltage up to 10 V Bipolar current up to 20 mA RTDs Pt100, Pt500, Pt1000, Ni100 Thermocouples Type J, K, R, S, T, B, E, N Potentiometer up to 100 kΩ
OUTPUT DATA				
Channels	1	2	1	2
Type	SPDT relay 1A - 30Vdc / 5A - 250 Vac (resistive load)	Reed SPST relay, max capacity 0.5A - 100 Vac/dc (10 VA resistive load)	SPDT relay 1A - 30Vdc / 5A - 250 Vac (resistive load)	SPST relay, 1 common contact, 2 NO contacts, capacity 250 Vac - 3 A
ORDER CODES				
Code	**Z112A**	**Z112D**	**Z113S**	**Z113-1**

The technical data and diagrams in this document are indicative and not binding.

TEMPERATURE SENSOR CONVERTERS

FREQUENCY SIGNAL CONVERTERS

	Z109PT2-1	Z109TC2-1	Z104	Z111
	 Isolated RTD converter with Micro USB interface	 Isolated thermocouple converter with Micro USB interface	 mA/V - frequency converter with galvanic isolation	 Frequency - mA/V converter with galvanic isolation
GENERAL DATA				
Power Supply	9..40 Vdc; 19..28 Vac	9..40 Vdc; 19..28 Vac	19..40 Vdc; 19..28 Vac	19..40 Vdc; 19..28 Vac
Power supply for transducers	-	-	Yes, 20 Vdc, max 20 mA, 2 wires	-
Max Consumption	2.5 W	2 W	2.5 W	2.5 W
Isolation	1.500 Vac (3-way)	1.500 Vac (3-way)	1.500 Vac (3-way)	1.500 Vac (3-way)
Protection class	IP20	IP20	IP20	IP20
LED Status Indicators	Power Supply Error setting Out of scale	Power Supply Error	Power Supply Output (Relay attracted)	Power Supply Error
Response Time	35..140 ms	35..140 ms	350 ms	250 ms
Interfaces	Micro USB (front)	Micro USB (front)	-	-
Precision class	0.1% (RTD) - 0.3% (voltage output)	0.1% (TC) - 0.3% (voltage output)	0.2%	0.3%
Thermal Drift	0.01%/°K	0.01%/°K	0.02% f.s./°C	0.01% f.s./°C
Configuration	DIP Switch Software (EASY SETUP) Android App	DIP Switch Software (EASY SETUP) Android App	DIP Switch Trimmer (full scale)	DIP Switch Trimmer (full scale)
Operating Temperature	-20..+60°C	-20..+60°C	0..+50°C	0..+50°C
Dimensions	17.5 x 100 x 112 mm	17.5 x 100 x 112 mm	17.5 x 100 x 112 mm	17.5 x 100 x 112 mm
Connections	Screw-in removable terminals	Screw-in removable terminals	Screw-in removable terminals	Screw-in removable terminals
Enclosure	Nylon 6 30% glass fiber	Nylon 6 30% glass fiber	Nylon 6 30% glass fiber	Nylon 6 30% glass fiber
Mounting	35 mm DIN rail (IEC/EN 60715)	35 mm DIN rail (IEC/EN 60715)	35 mm DIN rail (IEC/EN 60715)	35 mm DIN rail (IEC/EN 60715)
Weight	200 g	200 g	200 g	200 g
Certifications	CE	CE	CE	CE, UL-UR CSA
INPUT DATA				
Channels	1	1	1	1
Type	RTD Pt100, Pt500, Pt1000, Ni100 2, 3, 4-wire connection Excitation current: 1 mA Resolution 0.1°C	Thermocouple Type: J, K, R, S, T, E, B, N Resolution 5 µV Automatic break detection	VOLTAGE (V) 4 scales (0..1, 0..5, 0..10, 2..10 V); input impedance 1 MΩ CURRENT (mA) 2 scales (0/4..20 mA); active loop powered 15 Vdc non-stabilized; passive connection input impedance 100Ω	Impulse (mechanical contact, reed, npn, pnp, Namur, imp. 24 Vdc, photoelectric sensor, Hall effect sensor, variable reluctance TTL, measurable frequency from 1 mHz to 9.99 kHz
OUTPUT DATA				
Channels	1	1	1	1
Type	VOLTAGE (V) 4 scales: 0..5, 0..10, 1..5, 2..10 V Min load impedance 2 kΩ Resolution: 2.5 µA / 1.25 mV CURRENT (mA) 2 scales: 0..20, 4..20 mA Max load impedance 600Ω Resolution: 2.5 µA / 1.25 mV	VOLTAGE (V) 4 scales: 0..5, 1..5, 0..10, 2..10 V Min load impedance 2.5 KΩ Resolution: 0,025%..0,032 % CURRENT (mA) Active/passive connection 2 scales: 0..20, 4..20 mA Max load impedance: 600 Ω Resolution: 0,025..0.032%	npn open collector pulse, 30 Vdc, 300 mA; reed relay 30 Vac/dc, 100 mA, max frequency 10 kHz	VOLTAGE (V) 4 scales 0..5, 0..10, 1..5, 2..10 V, min load resistance 2,500Ω CURRENT (mA) 2 scales 0/4..20 mA, max load resistance 600Ω
ORDER CODES				
Code	**Z109PT2-1**	**Z109TC2-1**	**Z104**	**Z111**

The technical data and diagrams in this document are indicative and not binding.

SOFTWARE & ACCESSORIES

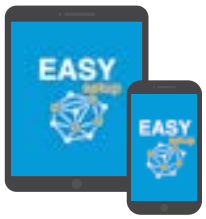
EASY SETUP / EASY SETUP 2
Configuration software



Programmable models:
Z109REG, Z109REG2-1, Z109UI-2, Z109REG-BP, Z170REG-1, Z-SG, Z203-1, Z204-1, Z113-1, Z109PT2-1, Z109TC2-1
Minimum hardware requirements:
CPU 1GHz, 256 MB free on HDD, graphics card resolution 1024x769 pixels
Download: free from**www.seneca.it**

- **Automatic connection to the module**
- **Operating and communication parameters setup**
- **Parameter monitoring**
- **Automatic module configuration**
- **Configuration testing and replication**

EASY SETUP APP
Android configuration app



Programmable models:
Z109REG2-1, Z109UI2-1,
Z109REG-BP, Z170REG-1, Z109PT2-1, Z109TC2-1
Android version: 4.0 or higher
Compatible terminals: Android Smartphone/Tablet with OTG function
Download: Google Play Store

Mobile Phone with USB OTG support
Google play

- **Automatic connection to the module**
- **Operating and communication parameters setup**
- **Parameter monitoring**
- **Automatic module configuration**
- **Configuration testing and replication**

S117P1
RS232 SERIAL CONVERTER↔USB, TTL↔USB, RS485↔USB



- **RS232, RS485, TTL asynchronous serial conversion**
- **Multiple S117P1 units can be connected to the same PC**
- **USB 1.0, 1.1, 2.0 standard compatibility**
- **RS485 communication, max 32 nodes**
- **External module power supply (100 mA, 12 Vdc)**
- **Included accessories: USB cable, TTL cable, driver CD**

ORDER CODES	
Code	**Description**
S117P1	RS232 asynchronous serial converter↔USB, TTL↔USB, RS485↔USB

SYSTEM FOR LOAD CELL EQUALIZATION AND CONNECTION



ORDER CODES	
Code	**Description**
SG-EQ4	Equalization and connection board for up to 4 load cells in parallel
SG-EQ4-BOXPG7	Equalization and connection board for up to 4 load cells in parallel + IP67 enclosure complete with 7 mm diameter cable glands and 2 sealing plugs

Z-POWER
19 Vac transformers for DIN rail mounting



- **Primary voltage 230 (115) Vac ± 10%**
- **Housing made of self-extinguishing thermoplastic material (class V-0)**
- **Thermal fuse protection**
- **Dimensions: 3 DIN modules (15 VA), 5 DIN modules (25 VA)**
- **IP 40**

ORDER CODES	
Code	**Description**
Z-POWER 230-15VA	19 Vac transformer, 230-15 VA
Z-POWER 230-25VA	19 Vac transformer, 230-25 VA
Z-POWER 115-15VA	19 Vac transformer, 115-15 VA

Z-SUPPLY,
single-phase switching power supply 24V @ 1.5 A



- **Input:** 110..230 Vac @ 47-63 Hz 0.7 A; 110..315 Vdc, 0.7 A
- **Output:** 24 Vdc ± 2%
- **Redundancy:** Parallel connection of two Z-SUPPLY modules (only via IDC10 connector)
- **Output current:** 1.5A
- **Output control:** "Power Good" relay output
- **Internal fuse:** 1.25A type T (time-delay)
- **Mounting:** On DIN 46277 rail
- **Isolation:** Up to 3 KV input to output voltage

ORDER CODES	
Code	**Description**
Z-SUPPLY,	Single-phase 24V @ 1.5 A switch power supply

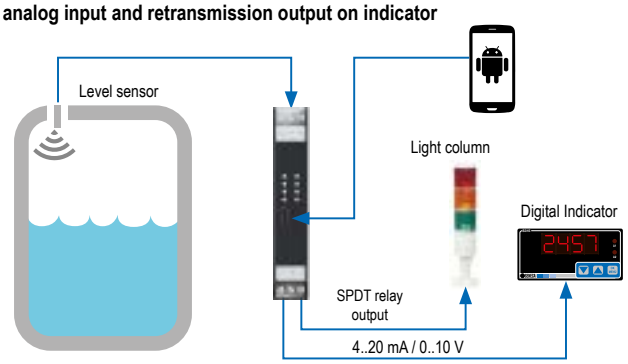
CABLES



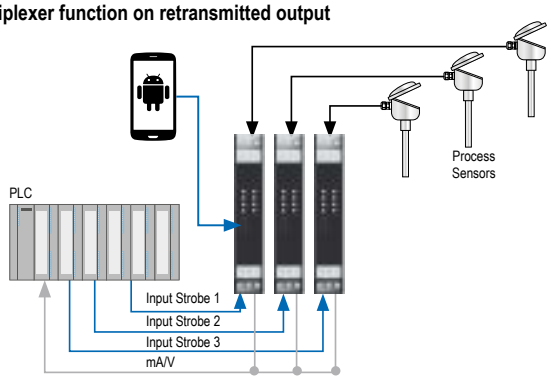
ORDER CODES	
Code	**Description**
CS-JACK-DB9F	Programming serial cable (Jack / DB9F)
CU-A-MICROB	USB-A Micro USB-B 5 P plug cable
CU-A-MICRO-OTG	Micro USB OTG to USB Type A female adapter cable

APPLICATION EXAMPLES

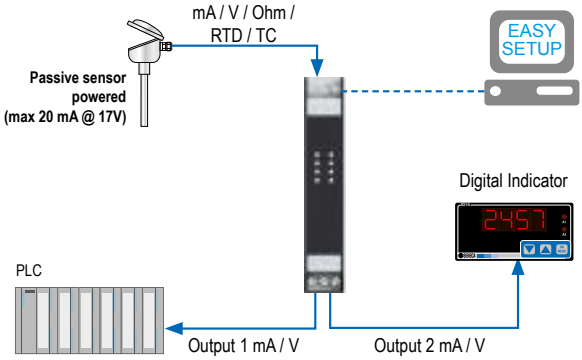
Z109REG2-1
Isolation and conversion with alarm threshold on analog input and retransmission output on indicator



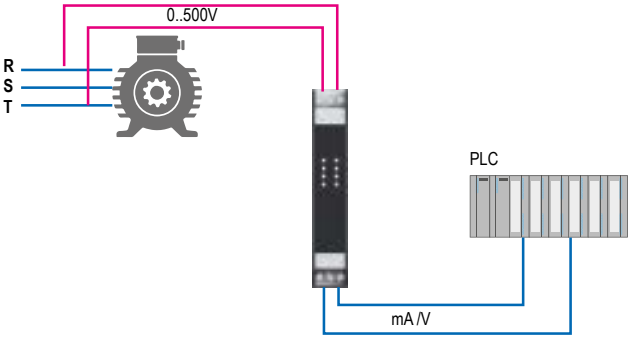
Z109REG2-1
Isolation and analog conversion with multiplexer function on retransmitted output



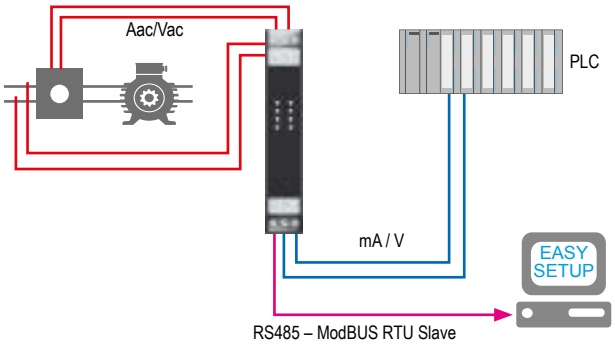
Z170REG-1
Analog signal duplication and retransmission



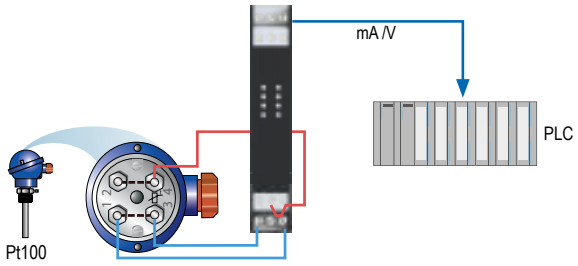
Z202
AC voltage conversion into a normalized mA/V signal



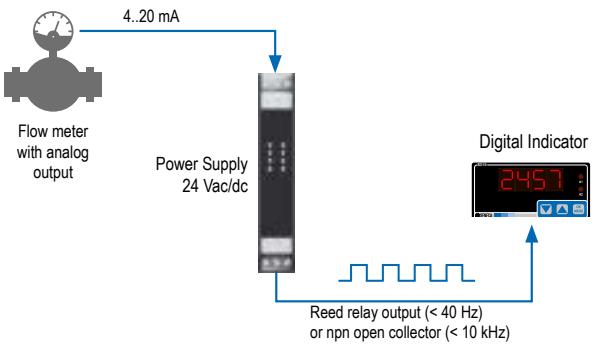
Z203-2
Single-phase network analyzer with signal retransmission at output



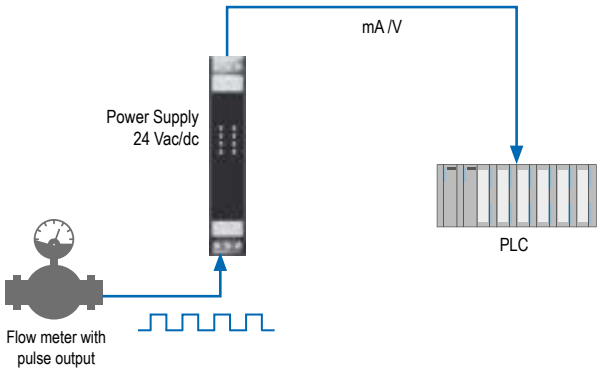
Z109PT2-1
Temperature conversion from Pt100 into a standard analog signal



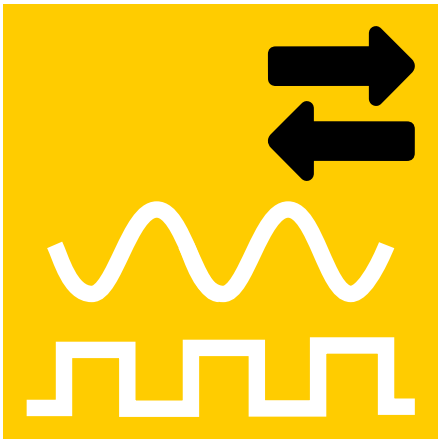
Z104
Pulse counting from flow meter with analog output



Z111
Instantaneous flow acquisition from meter with pulse output



4.2



COMPACT ISOLATOR CONVERTERS

K Line

K Line

Galvanic signal isolators

SENECA converter modules **K Series** feature 1.5 kVac three-way isolation using digital technology, with 0.1% precision class, power supply range from 19.2 to 30 Vdc, compact dimensions (102.5x93.1x6.2 mm), low power consumption, and an MTBF of over 500,000 hours. Signal configuration is immediate via DIP switch or software. Power supply technique is standard (on spring terminal) or distributed system, based on an expandable connector (K-BUS) that snaps onto 35 mm DIN rails according to EN 60715 standard.

ROBUST INDUSTRIAL DESIGN

HIGH RELIABILITY
>500.000 h

WIDE OPERATING TEMPERATURE RANGE
-20..+65°C

LOW POWER CONSUMPTION
<25mA

MULTI-WAY ISOLATION
power OUT IN
1.5 kV

COMPACT DIMENSIONS
6.2 mm

HIGH PRECISION
0.1%



SPECIAL FEATURES

READING STABILIZATION FILTER

INPUT/OUTPUT SCALE INVERSION

CYLINDRICAL HORIZONTAL TANK LINEARIZATION

ROOT EXTRACTION



SETTINGS

FLEXIBLE CONFIGURATION VIA DIP-SWITCH

PROGRAMMING VIA PC

EASY SETUP

POWER SUPPLY

DISTRIBUTED/DIRECT POWER SUPPLY ON TERMINAL

19.2..30 Vdc

EXPANDABLE POWER CONNECTOR

CERTIFICATIONS

INTERNATIONAL STANDARDS

CE, UL, CSA

ATEX COMPLIANCE (K121)

II 3G Ex nA IIC T4 Gc X (gas)
II 3D Ex tc IIIC T135°C Dc X (dust)
EN 60079-0:2012
EN 60079-15:2010

QUICK SELECTION

		INPUTS		OUTPUTS			
Code	Conversion	#	Type	#	Type	Power Supply	Power Supply Rogowski
K121	Universal	1	mA, V, Ohm TC (J,K,R,S,T,B,E,N), RTD (Pt100, Ni100, Pt500, Pt1000)	1	mA (passive)	External / loop-powered	-
K109UI	Analog	1	mA, V	1	mA (active), V	19.2..30 Vdc	-
K109S	Analog	1	mA (active), V	1	mA (active), V	19.2..30 Vdc	yes
K109LV	Analog	1	mV	1	mA (active), V	19.2..30 Vdc	-
K111	Impulse/Digital	1	Contact, Namur, PNP/NPN 2/3 wires, reed, photocell, max frequency 20 kHz	2	PNP, NPN	19.2..30 Vdc	yes
K111D	Impulse/Digital	1	Contact, Namur, PNP/NPN 2/3 wires, reed, photocell; max freq. 20 kHz	2	PNP, NPN	19.2..30 Vdc	yes
K112	Impulse/Digital	1	Contact, Namur, PNP/NPN 2/3 wires, reed, photocell; frequency Max 400 Hz	2	PNP, NPN	19.2..30 Vdc	yes
K109PT	Temperature	1	Pt100	1	mA (active), V	19.2..30 Vdc	-
K109PT-HPC	Temperature	1	Pt100	1	mA (active), V	19.2..30 Vdc	-
K109PT1000	Temperature	1	Pt1000	1	mA (active), V	19.2..30 Vdc	-
K120RTD	Temperature	1	Pt100, Ni100	1	mA (passive)	External / loop-powered	-
K109TC	Temperature	1	TC (J,K,R,S,T,B,E,N)	2	mA (active), V, relay (alarm thresholds)	19.2..30 Vdc	-
K107A	Serial	1	RS485	1	RS485	19.2..30 Vdc	-
K107B	Serial	1	RS232	1	RS485	19.2..30 Vdc	-
K107USB	Serial	1	USB	1	RS485 (ModBUS)	External / via PC USB	-

				CONFIGURATION		
MAX ISOLATION	Precision Class	OPERATING TEMPERATURE	Certifications	DIP Switch	Software (EASY SETUP)	Special Features
1.5 kVac	0.1%	-20..+65°C	CE, Atex Zone 2	x	x	Measurement filter, fail-safe output, over-range, cable resistance compensation, cold junction compensation
1.5 kVac	0.1%	-20..+65°C	CE, UL	x	-	Programmable rejection, additional reading stabilization filter, programmable input over-scale, root extraction, cylindrical horizontal tank linearization
1.5 kVac	0.1%	-20..+65°C	CE, UL	x	-	Programmable rejection, additional reading stabilization filter, programmable input over-scale, root extraction, cylindrical horizontal tank linearization
1.5 kVac	0.1%	-20..+65°C	CE	x	-	Shunt release detection, programmable rejection, reading stabilization filter, input overload up to ± 50 V
1.5 kVac	-	-10..+65°C	CE	x	x	Short-circuit protected independent outputs, threshold operation, with hysteresis, window and inversion, input replicator/inverter, programmable input filter
1.5 kVac	-	-20..+65°C	CE	x	x	Frequency divider up to 256 pulses, independent outputs, input filter activatable with programmable cutoff frequency, input replicator
1.5 kVac	-	-10..+65°C	CE	x	-	
1.5 kVac	0.1%	-20..+65°C	CE, UL	x	-	Additional reading stabilization filter
1.5 kVac	0.1%	-20..+65°C	CE	x	-	Additional reading stabilization filter
1.5 kVac	0.1%	-20..+65°C	CE	x	-	Additional reading stabilization filter
-	0.1%	-20..+65°C	CE	x	x	Additional reading stabilization filter
1.5 kVac	0.1%	-20..+65°C	CE, UL	x	-	Additional reading stabilization filter
1.5 kVac	-	-20..+65°C	CE, UL	x	-	Automatic timed direction switching, automatic timed handshake
1.5 kVac	-	-20..+65°C	CE, UL	x	-	Automatic timed direction switching, automatic timed handshake
1.5 kVac	-	-20..+65°C	CE, UL	-	-	Ability to connect multiple units to the same PC

	UNIVERSAL	ANALOG		
	K121	**K109UI**	**K109S**	**K109LV**
	 **Universal converter (mA, V, Ohm, RTD, TC) isolated loop powered**	 **Optoisolated V-I / V-I converter**	 **Optoisolated V-I / V-I converter with active input (transducer power supply)**	 **Optoisolated shunt / V-I converter**
GENERAL DATA				
Power Supply	7..30 Vdc (from loop 4..20 mA)	19,2.. 30 Vdc	19,2.. 30 Vdc	19,2.. 30 Vdc
Power on side terminals		Yes	Yes	Yes
Max current consumption	24mA	22 mA (24 Vdc)	23 mA (24 Vdc); 45 mA (with aux power)	22 mA (24 Vdc)
Max dissipated power	<660 mW	500 mW	500 mW	500 mW
A/D Conversion	16 bit	14 bit	14 bit	14 bit
Rejection	50 or 60 Hz (programmable)	50 or 60 Hz (programmable)	50 or 60 Hz (programmable)	50 or 60 Hz (programmable)
Configurable	Software (EASY SETUP)	DIP Switch	DIP Switch	DIP Switch
Filter	Additional reading stabilization	Additional reading stabilization	Additional reading stabilization	Additional reading stabilization
Dimensions	6.2 x 93.1 x 102.5 mm	6.2 x 93.1 x 102.5 mm	6.2 x 93.1 x 102.5 mm	6.2 x 93.1 x 102.5 mm
Isolation	1.5 kVac (2 channels)	1,5 kVac (3-vie)	1,5 kVac (3-vie)	1,5 kVac (3-vie)
Isolation Technique	Digital / optocoupler	Digital / optocoupler	Digital / optocoupler	Digital / optocoupler
Processing	32-bit floating point calculation	32-bit floating point calculation	32-bit floating point calculation	32-bit floating point calculation
Color	Black	Black	Black	Black
Case Material	PBT	PBT	PBT	PBT
Weight	45 g	45 g	45 g	45 g
Operating Temperature	-20..+65°C	-20..+65°C	-20..+65°C	-20..+65°C
Connection	8 spring terminals	Spring and/or BUS	Spring and/or BUS	Spring and/or BUS
Protection class	IP 20	IP 20	IP 20	IP 20
Precision class	0.1%	0.1%	0.1%	0.1%
Thermal Drift	< 120 ppm/K	< 120 ppm/K	< 120 ppm/K	< 120 ppm/K
LED	Anomaly, alarm	Anomaly, alarm	Anomaly, alarm	Anomaly, alarm
Special Features	Cold junction compensation Insertable filter Output inversion	Root extraction Signal inversion Scalable ranges Tank linearization Programmable trimming	Root extraction Signal inversion Tank linearization Programmable trimming Auxiliary power supply 17..20 V, max current 25 mA	Programmable fault and trimming Insertable filter
Certifications	CE, II 3G Ex nA IIC T4 Gc X, II 3D Ex tc IIIC T135°C Dc X	CE, UL-UR CSA	CE, UL-UR CSA	CE
INPUT DATA				
Channels	1	1	1	1
Type	THERMOCOUPLE J, K, R, S, T, E, B, N, L (EN 60584) RTD (Pt100, Pt500, Pt1000, Ni100, Ni120, NI1000, Cu50, Cu100) with 2, 3, 4-wire connection VOLTAGE (V): 30V, impedance 200 kΩ VOLTAGE (mV): 150 mV, impedance 10 MΩ CURRENT: 24 mA, impedance 40 Ω Potentiometer: 500..100 kΩ, impedance 10 MΩ Resistance 0..400 (1760) Ω	VOLTAGE Range: 0..10 / 10..0 / 0..5 / 1..5/ 0..15 / 0..30 V (invertible) Impedance: 110 kΩ - 325 kΩ CURRENT Range: 4..20 / 20..4 / 0..20 / 20..0 mA Impedance: 35 Ω	VOLTAGE Range: 0..10 / 10..0 / 0..5 / 1..5 V Impedance: 110 kΩ CURRENT Range: 4..20 / 20..4 / 0..20 / 20..0 mA Impedance: 35 Ω	SHUNT Range: ±25, 50, 60, 75, 80, 100, 120, 150, 200, 250, 300, 400, 500, 1000, 2000 mV (via DIP switch)
OUTPUT DATA				
Channels	1	1	1	1
Type	Current 4-20 mA	VOLTAGE Range: 0..10 / 10..0 / 0..5 / 1..5 V Minimum load resistance: 2 kΩ CURRENT Range: 4..20 / 20..4 /0..20 /4..20 / 20..4 / 0..20 / 20..0 mA Maximum load resistance: 500Ω Protection: 25mA	VOLTAGE Range: 0..10 / 10..0 / 0..5 / 1..5 V Minimum load resistance: 2 kΩ CURRENT Range: 4..20 / 20..4 /0..20 /4..20 / 20..4 / 0..20 / 20..0 mA Maximum load resistance: 500Ω Protection: 25mA	VOLTAGE Range: 0..10 / 10..0 / 0..5 / 1..5 V Minimum load resistance: 2 kΩ CURRENT Range: 4..20 / 20..4 /0..20 /4..20 / 20..4 / 0..20 / 20..0 mA Maximum load resistance: 500Ω Protection: 25mA
Auxiliary static relay	-	-	-	-
Response time (10-90%):	140..620ms	< 40 ms (without filter) < 88 ms (with filter)	< 40 ms (without filter) < 88 ms (with filter)	< 25 ms (without filter) < 55 ms (with filter)
D/A conversion resolution				
ORDER CODES				
Code	K121	K109UI	K109S	K109LV

The technical data and diagrams in this document are indicative and not binding.

TEMPERATURE

K109PT	K109PT-HPC	K109PT1000	K120RTD	K109TC
				
Optoisolated converter Pt100 / V-I	**Optoisolated converter High-precision Pt100 / V-I**	**Optoisolated converter Pt1000 / V-I**	**Non-isolated Pt100 converter, Ni100 loop-powered**	**Optoisolated TC / V-I converter with adjustable threshold**
19.2..30 Vdc	19.2..30 Vdc	19.2..30 Vdc	Loop powered (5..30 Vdc)	19.2..30 Vdc
Yes	Yes	Yes	-	Yes
21..25 mA (24 Vdc)	21..25 mA (24 Vdc)	21..25 mA (24 Vdc)	21..25 mA (24 Vdc)	21..25 mA (24 Vdc)
500 mW	500 mW	500 mW	500 mW	500 mW
14 bit	14 bit	14 bit	14 bit	14 bit
50 or 60 Hz (programmable)	50 or 60 Hz (programmable)	50 or 60 Hz (programmable)	50 or 60 Hz (programmable)	50 or 60 Hz (programmable)
DIP Switch	DIP Switch	DIP Switch	DIP switch, Software (EASY SETUP)	DIP Switch
Additional for reading stabilization	Additional for reading stabilization	Additional for reading stabilization	Additional for reading stabilization	Additional for reading stabilization
6.2 x 93.1 x 102.5 mm	6.2 x 93.1 x 102.5 mm	6.2 x 93.1 x 102.5 mm	6.2 x 93.1 x 102.5 mm	6.2 x 93.1 x 102.5 mm
1.5 kVac 3-way (50 Hz, 1 min)	1.5 kVac 3-way (50 Hz, 1 min)	1.5 kVac 3-way (50 Hz, 1 min)	-	1.5 kVac 3-way (50 Hz, 1 min)
Digital (optoisolator)	Digital (optoisolator)	Digital (optoisolator)	-	Digital (optoisolator)
32-bit floating point calculation	32-bit floating point calculation	32-bit floating point calculation	32-bit floating point calculation	32-bit floating point calculation
Black	Black	Black	Black	Black
PBT	PBT	PBT	PBT	PBT
45 g	45 g	45 g	45 g	45 g
-20..+65°C	-20..+65°C	-20..+65°C	-20..+65°C	-20..+65°C
Spring and/or BUS	Spring and/or BUS	Spring and/or BUS	Spring	Spring and/or BUS
IP 20	IP 20	IP 20	IP 20	IP 20
0.1% (max range)	0.1% (max range)	0.1%	0.1%	0.1%
< 100 ppm/K	< 100 ppm/K	< 100 ppm/K	< 100 ppm/K	< 100 ppm/K
Anomaly, alarm	Anomaly, alarm	Anomaly, alarm	Anomaly, alarm	Anomaly, alarm Auxiliary output status
Programmable fault and trimming Insertable filter	Programmable fault and trimming Insertable filter	Programmable fault and trimming Insertable filter	Type / RTD connection, measurement range filter, error, output inversion, and over-range	Programmable fault and trimming Insertable filter
CE, UL-UR CSA	CE	CE	CE	CE, UL-UR CSA
1	1	1	1	1
PT100 IEC 751 / EN 60751 standard – ITS90 Range: -150..+650°C Minimum span: 50°C Current on transmitter 900 µA 2, 3, 4-wire connection Max cable resistance: 20 Ω	PT100 IEC 751 / EN 60751 standard – ITS90 Range: -200..+160°C Minimum span: 20°C Current on transmitter 900 µA 2, 3, 4-wire connection Max cable resistance: 20 Ω	PT1000 EN 60751/A2 standard – ITS90 Range: -200..+210°C Minimum span: 30°C Current on transmitter < 350 µA 2, 3, 4-wire connection Max cable resistance: 50 Ω	Pt100 (EN 60751/A2-ITS90) Range: -200..+650°C Minimum span: 20°C 2, 3, 4-wire connection Ni100 Range: -60..+250°C Minimum span: 20°C 2, 3, 4-wire connection	Thermocouple Type J, K, E, N, S, R, B, T (ITS90) Minimum span 100°C Impedance 10 MΩ Semiconductor cold junction, ADC 13-bit, precision 0.15°C, 10-second update Max voltage ± 32V
1	1	1	1	1
VOLTAGE Range: 0..10 / 10..0 / 0..5 / 1..5 V Minimum load resistance: 2 kΩ CURRENT Range: 4..20 / 20..4 / 0..20 / 20..0 mA Maximum load resistance: 500 Ω Protection: 25mA	VOLTAGE Range: 0..10 / 10..0 / 0..5 / 1..5 V Minimum load resistance: 2 kΩ CURRENT Range: 4..20 / 20..4 / 0..20 / 20..0 mA Maximum load resistance: 500 Ω Protection: 25 m	VOLTAGE Range: 0..10 / 10..0 / 0..5 / 1..5 V Minimum load resistance: 2 kΩ CURRENT Range: 4..20 / 20..4 / 0..20 / 20..0 mA Maximum load resistance: 500 Ω Protection: 25mA	CURRENT Range: 4..20 / 20..4 (2-wire) Load resistance: 1 kΩ Resolution: 0.5 µA (15 bits + sign) Protection: 30mA	VOLTAGE Range: 0..10 / 10..0 / 0..5 / 1..5 V Minimum load resistance: 2 kΩ CURRENT Range: 4..20 / 20..4 / 0..20 / 20..0 mA Maximum load resistance: 500 Ω
-	-	-	-	Nominal voltage: 24 Vac/dc Current: 60mA Surge protection: 50 V Adjustable hysteresis / alarm threshold
< 50 ms (without filter) < 200 ms (with filter)	< 50 ms (without filter) < 200 ms (with filter)	< 50 ms (without filter) < 200 ms (with filter)	< 220 ms (without filter) < 620 ms (with filter)	< 40 ms (without filter) < 88 ms (with filter)
1 mV, 2 µA	1 mV, 2 µA	1 mV, 2 µA	1 mV, 2 µA	1 mV, 2 µA
K109PT	K109PT-HPC	K109PT1000	K120RTD	K109TC

The technical data and diagrams in this document are indicative and not binding.

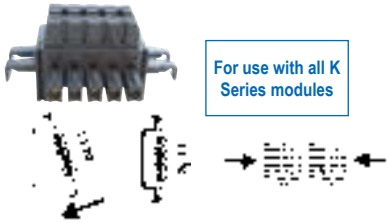
	FREQUENCY			SERIAL		
	K111	**K111D**	**K112**	**K107A**	**K107B**	**K107USB**
						
	Frequency threshold with two isolated outputs	**Frequency divider and repeater with two isolated outputs**	**Dual-channel isolated digital coupler**	**Isolated serial repeater converter RS485 / RS485**	**Optoisolated RS232 / RS485 serial converter**	**Optoisolated RS485 / USB serial converter**
GENERAL DATA						
Power Supply	19,2.. 30 Vdc	19.2..30 Vdc	19,2.. 30 Vdc	19.2..30 Vdc	19.2..30 Vdc	Via USB port
Power on side terminals	Yes	Yes	Yes	Yes	Yes	-
Hot swapping	Yes	Yes	Yes	Yes	Yes	Yes
Max current consumption	< 25 mA	< 25 mA	< 25 mA	22 mA (24 Vdc)	22 mA (24 Vdc)	60mA
Max dissipated power	500 mW	500 mW	500 mW	500 mW	500 mW	-
A/D Conversion	14 bit	14 bit	14 bit	-	-	-
Rejection	50 or 60 Hz (programmable)	50 or 60 Hz (programmable)	50 or 60 Hz (programmable)	50 or 60 Hz (programmable)	50 or 60 Hz (programmable)	50 or 60 Hz (programmable)
Configurable	DIP Switch, Software (EASY SETUP)	DIP Switch, Software (EASY SETUP)	DIP Switch	DIP Switch	DIP Switch	DIP Switch
Filter	Programmable software	Programmable software	-	-	-	-
Dimensions	6.2 x 93.1 x 102.5 mm	6.2x93.1x102.5 mm	6.2 x 93.1 x 102.5 mm	6.2 x 93.1 x 102.5 mm	6.2 x 93.1 x 102.5 mm	6.2 x 93.1 x 102.5 mm
Isolation	1,5 kVac (3-vie)	1.5 kVac (3 channels)	1,5 kVac (3-vie)	1.5 kVac 3-way (50 Hz, 1 min)	1.5 kVac 3-way (50 Hz, 1 min)	1.5 kVac (USB / RS485)
Isolation Technique	Digital / optocoupler	Digital / optocoupler	Digital / optocoupler	Digital (optoisolator)	Digital (optoisolator)	Digital (optoisolator)
Processing	32-bit floating point calculation	32-bit floating point calculation	32-bit floating point calculation	-	-	-
Color	Black	Black	Black	Black	Black	Black
Case Material	PBT	PBT	PBT	PBT	PBT	PBT
Weight	45 g	45 g	45 g	45 g	45 g	45 g
Operating Temperature	-20..+65°C	-20..+65°C	-20..+65°C	-20..+65°C	-20..+65°C	-20..+65°C
Connection	Spring and/or BUS	Spring and/or BUS	Spring and/or BUS	Spring and/or BUS	Spring and/or BUS	Spring and/or BUS
Protection class	IP 20	IP20	IP 20	IP20	IP20	IP20
LED	Power presence, active thresholds, error	Output states	Power presence, Output status	Power Supply Data Presence Reversed connection	Power Supply Data Presence Reversed connection	Power Supply Data Presence Reversed connection
Communication	-	-	-	Automatic handshake Baud rate: 1.200..115200 bps	Automatic handshake Baud rate: 1.200..115200 bps	RS485 line termination settable Baud rate: 1.200..115200 bps RS485 serial communication via ModBUS RTU, max 32 nodes
Special Features	Input repetition	Frequency divider Average measurement in a window of N pulses (N <= 256) Direct operation	-	-	-	Supported operating systems: Windows 98, 2000, XP, Vista, 7, 10, Linux 2.24.0 and later
Certifications	CE	CE	CE	CE, UL-UR CSA	CE, UL-UR CSA	CE, UL-UR CSA
INPUT DATA						
Channels	1	1	1	1	1	1
Type	IEC 1131.2 contact (type 1) Namur (DIN 19234, EN 60947-5-6) NPN / PNP (12 or 22 V) 2/3-wire Reed Photocell Max voltage: ±28 Vdc Frequency: Max 20 kHz, min 1 pulse every 116 minutes	IEC 1131.2 contact (type 1) Namur (DIN 19234, EN 60947-5-6) NPN / PNP (12 or 22 V) 2/3-wire Reed Photocell Max voltage: ±28 Vdc Frequency: Max 20 kHz, min 1 pulse every 116 minutes	IEC 1131.2 contact (type 1) Namur (DIN 19234, EN 60947-5-6) NPN / PNP (12 or 22 V) 2/3-wire Reed Photocell Max frequency: 400 Hz	SERIAL RS485 half duplex, 31 nodes, terminator, protection up to 30 Vdc	SERIAL RS232B, protection up to 30 Vdc	SERIAL USB standard 1.0 and 2.0, USB A and MINI USB B connectors
OUTPUT DATA						
Channels	2	2	2	1	1	1
Type	Independent PNP channels up to 200 mA, short-circuit protected	Independent PNP channels up to 200 mA, short-circuit protected	Independent PNP and NPN channels	SERIAL RS485 half duplex, 31 nodes, terminator, protection up to 30 Vdc	SERIAL RS485 half duplex, 31 nodes, terminator, protection up to 30 Vdc	SERIAL RS485, 31 nodes, spring terminal, ModBUS RTU Slave half-duplex protocol, max 1,200 m, 31 nodes
ORDER CODES						
Code	K111	K111D	K112	K107A	K107B	K107USB (complete with programming cable and CD ROM)

The technical data and diagrams in this document are indicative and not binding.

ACCESSORIES & SOFTWARE

K-BUS

Expandable connector for fast power supply (EN 60175)



For use with all K Series modules

ORDER CODES	
K-BUS	Expandable 2-slot connector for fast power supply

K-SUPPLY

Redundant power supply with surge protection

For use with all K Series modules



ORDER CODES	
K-SUPPLY	Power module with electronic line protections

EASY SETUP / EASY LP

Complete collection of plug&play configuration tools for programmable SENECA devices



K111
K121
K120RTD

Free download from www.seneca.it

EASY USB USB - UART TTL converter



Power supply	from PC 5V @ 100 mA
Protection rating	IP20
UART TTL serial c	onnection, RJ11 connector, baud rate from 300 bps up to 250 Kbps
USB serial	connection, USB type A compatible with standard 1.0, 1.1, and 2.0
Dimensions	84 x 21 x 17 mm
Supported operating systems	Windows, Mac OS-X, Linux

ORDER CODES	
EASY-USB	USB - UART TTL converter

S117P1 RS232-USB Serial Converter, TTL-USB, RS485-USB

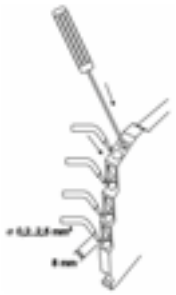


- **RS232, RS485, TTL asynchronous serial conversion**
- **Multiple S117P1 units can be connected to the same PC**
- **USB 1.0, 1.1, 2.0 standard compatibility**
- **RS485 communication, max 32 nodes**
- **External module power supply (100 mA, 12 Vdc)**
- **Included accessories: USB cable, TTL cable, driver CD + EASYLP (configuration software for K120RTD, K121, T120, and T121)**

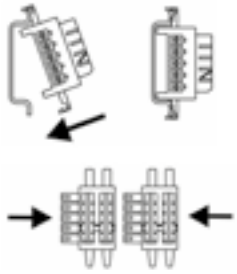
ORDER CODES	
S117P1	RS232↔USB asynchronous serial converter, TTL↔USB, RS485↔USB complete with USB cable, TTL cable, CD driver + EASYLP (configuration software for K120RTD, K121, T120, and T121)

CONNECTIONS AND INSTALLATION

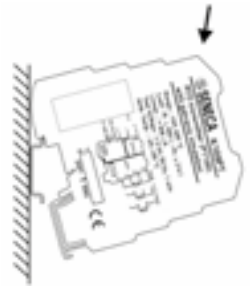
SPRING TERMINAL CONNECTION



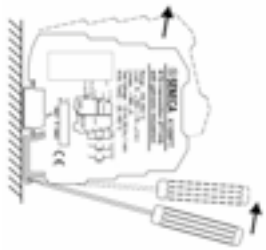
K-BUS CONNECTOR



MODULE INSERTION INTO THE RAIL



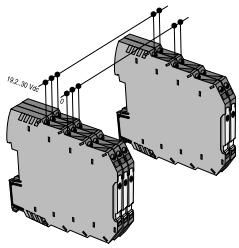
MODULE EXTRACTION FROM THE RAIL



POWER SUPPLY TECHNIQUES

Except for "loop powered" modules without bus power, K Series signal conditioners offer 3 power supply options: one traditional technique and two through the SMART SUPPLY distributed system. Direct module power involves connecting the (24 Vdc) source to the terminals of each device. The SMART SUPPLY system is based on the use of the expandable K-BUS connector. Typically, up to 16 modules can be powered via the bus by powering only one module, provided the total current consumption is below 400 mA. K-SUPPLY, an accessory with surge protection and differential mode filter, powers up to 75 modules, with a total maximum current consumption of 1.6 A (around 21 mA per module). It also features 2 independent inputs, enabling its use as a redundant power supply system, ensuring power availability even if one input source fails.

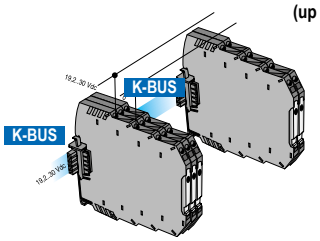
DIRECT POWER TO SPRING TERMINAL



1

SMART SUPPLY SYSTEM

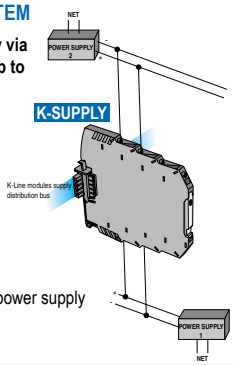
Distributed power supply with 2-slot K-BUS connector (up to 16 modules)



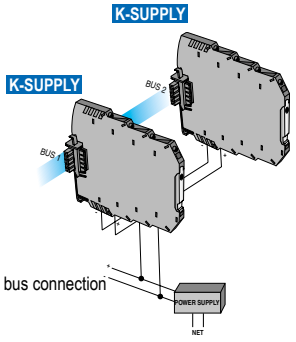
2

SMART SUPPLY SYSTEM

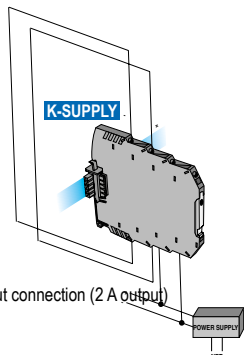
Distributed power supply via K-SUPPLY and K-BUS (up to 75 modules)



Redundant power supply



Multiple bus connection

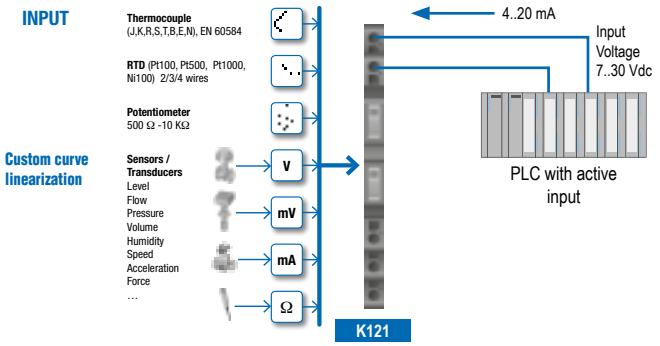


Parallel input connection (2 A output)

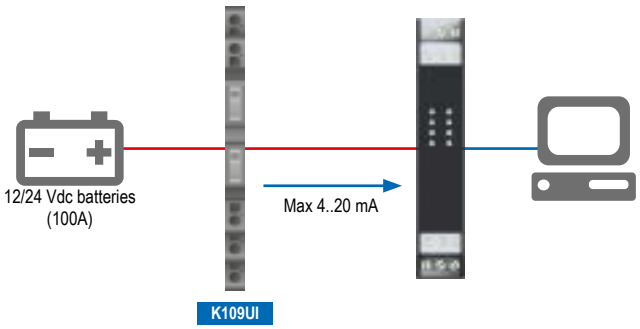
3

APPLICATION EXAMPLES

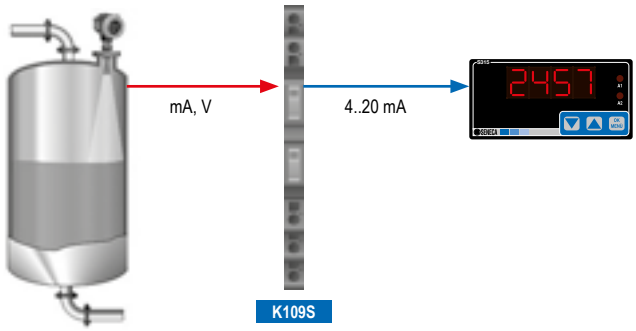
UNIVERSAL ANALOG SIGNAL CONVERSION AND TRANSMISSION TO PLC



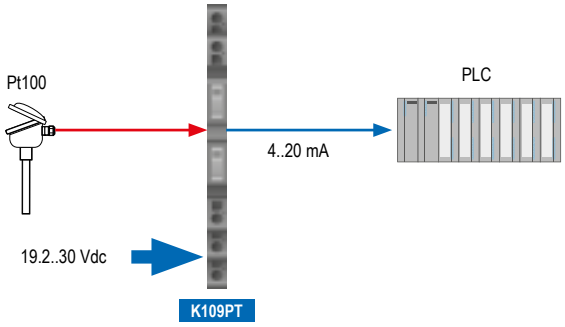
BATTERY CHARGING VOLTAGE MONITORING



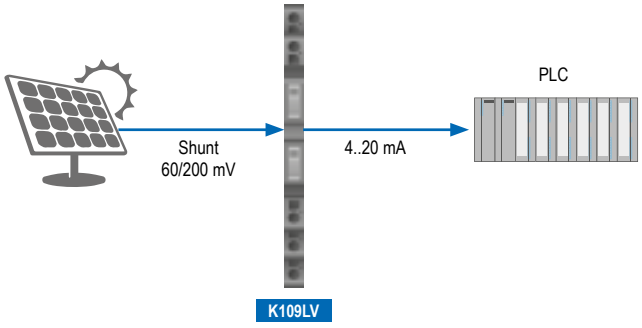
ANALOG SIGNAL CONVERSION, ISOLATION, AND RETRANSMISSION FROM 2-WIRE SENSOR



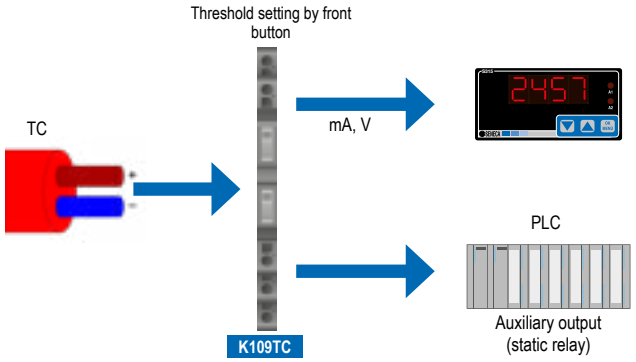
TEMPERATURE CONVERSION FROM PT100 INTO A STANDARD ANALOG SIGNAL



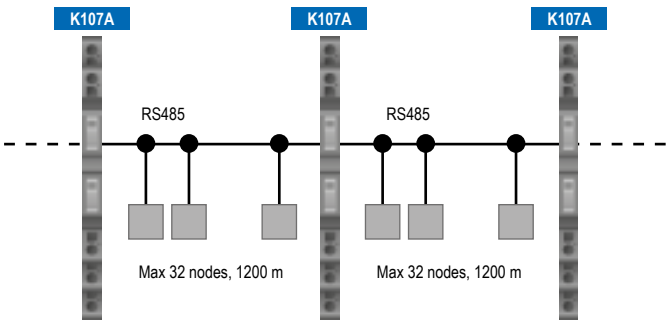
STRING CURRENT MEASUREMENT IN PHOTOVOLTAIC SYSTEMS



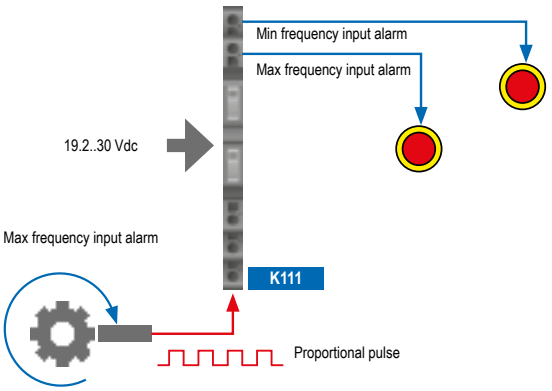
TEMPERATURE VALUE CONVERSION AND RETRANSMISSION FROM THERMOCOUPLE



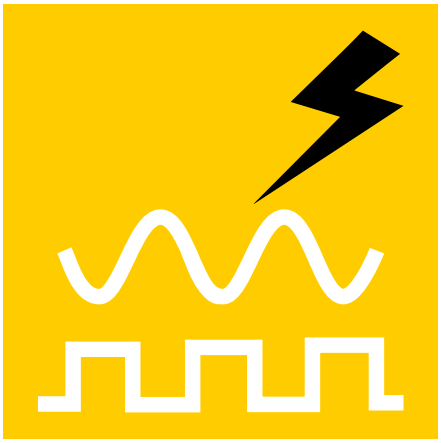
RS485 SERIAL REPEATER WITH GALVANIC ISOLATION



PULSE CONVERSION WITH ALARM THRESHOLD



4.3



HIGH ISOLATION CONVERTERS

S Line

S SERIES

The S Series includes signal converters, galvanic isolators, and high-isolation industrial power supplies (up to 4.5 kVac) that handle analog signals, Pt100, impulse signals, converting them into output signals in mA, V, pulse, SPDT/SPST relay. Designed for installation on 35 mm DIN rail (DIN 46277), they are powered within the range of 24 Vac/dc and 115/230 V.

ANALOG CONVERTERS

	S109REG	S109S	S102	S109PT
				
	V-I / V-I Converter	Galvanic isolation for 4..20 mA loop	Ohm / V-I Converter	Pt100 / V-I Converter
GENERAL DATA				
Power Supply	115 / 230 Vac ±10%, 50-60 Hz	115 / 230 Vac ±10%, 50-60 Hz	115 / 230 Vac ±10%, 50-60 Hz	115 / 230 Vac ±10%, 50-60 Hz
Sensor power supply	20 Vdc non-stabilized	24 Vdc non-stabilized	20 Vdc non-stabilized	20 Vdc non-stabilized
Max Consumption	3.5 VA	1.5 VA	1.5 VA	3.5 VA
Isolation	4,500 Vac	4,500 Vac (power/input-output) 2,000 Vac (input/output)	4,500 Vac	4,500 Vac
Protection class	IP20	IP20	IP20	IP20
Connections	Screw terminals for conductors up to 2.5 mm^2	Screw terminals for conductors up to 2.5 mm^2	Screw terminals for conductors up to 2.5 mm^2	Screw terminals for conductors up to 2.5 mm^2
Accuracy	±0.25%	±0.25%	±0.25%	±0.25%
Operating Temperature	-10..+60°C	-10..+60°C	0..+50°C	-10..+60°C
Dimensions	70 x 95 x 72 mm	35 x 95 x 72 mm	52.5 x 95 x 72 mm	70 x 95 x 72 mm
Weight	300 g	200 g	300 g	400 g
Mounting	Mounting on 35 mm DIN rail (DIN 46277)	Mounting on 35 mm DIN rail (DIN 46277)	Mounting on 35 mm DIN rail (DIN 46277)	Mounting on 35 mm DIN rail (DIN 46277)
Certifications	CE	CE	CE	CE
INPUT DATA				
Number	1	1	1	1
Type	mA, V	mA	Ohm	Pt100 2.3 wires
OUTPUT DATA				
Number	1	1	1	1
Type	mA, V	mA	mA, V	mA, V
ORDER CODES				
Model	S109REG-1-ST (115/230 Vac power supply) S109REG-1-X7 (with tachogenerator input)	S109S-1-ST (115/230 Vac power supply)	S102-1-ST (115/230 Vac power supply)	S109PT-1-ST (115/230 Vac power supply)

ANALOG CONVERTERS / IMPULSE CONVERTERS

	S170	S2000	S104	S111
				
	Signal duplicator	Microprocessor-based calculation module	V-I / frequency converter	Frequency / V-I converter
GENERAL DATA				
Power Supply	115 / 230 Vac ±10%, 50-60 Hz	115 / 230 Vac ±10%, 50-60 Hz	115 / 230 Vac ±10%, 50-60 Hz	115 / 230 Vac ±10%, 50-60 Hz
Sensor power supply	20 Vdc non-stabilized	20 Vdc non-stabilized	20 Vdc non-stabilized	20 Vdc non-stabilized
Max Consumption	3.5 VA	3.5 VA	1.5 VA	3.5 VA
Isolation	4.500 Vac (from/to power supply) 2.000 Vac (input/output)	4,500 Vac	4,500 Vac	4.500 Vac (from/to power supply) 2.000 Vac (input/output)
Protection class	IP20	IP20	IP20	IP20
Connections	Screw terminals for conductors up to 2.5 mm^2	Screw terminals for conductors up to 2.5 mm^2	Screw terminals for conductors up to 2.5 mm^2	Screw terminals for conductors up to 2.5 mm^2
Accuracy	-	±0.1%	-	-
Operating Temperature	-10..+60°C	-10..+60°C	0..+50°C	-10..+60°C
Dimensions	70 x 95 x 72 mm	157.5 x 95 x 72 mm	52.5 x 95 x 72 mm	105 x 95 x 72 mm
Weight	300 g	500 g	300 g	450 g
Mounting	Mounting on 35 mm DIN rail (DIN 46277)	Mounting on 35 mm DIN rail (DIN 46277)	Mounting on 35 mm DIN rail (DIN 46277)	Mounting on 35 mm DIN rail (DIN 46277)
Certifications	CE	CE	CE	CE
INPUT DATA				
Number	1	1	1	1
Type	mA, V	2DI, 4AI	mA, V	Clean contact, reed, NPN 2/3-wire, PNP 24 Vdc, NAMUR sensors, photoelectric, 24 Vdc pulses, freq. Max 680 Hz
OUTPUT DATA				
Number	2	6	1	1
Type	mA, V	4DO, 2AO	NPN open collector	mA, V
ORDER CODES				
Model	S170-1-ST (115 / 230 Vac)	S2000-1-ST (115 / 230 Vac)	S104-1-ST (115 / 230 Vac)	S111-1-ST (115 / 230 Vac)

The technical data and diagrams in this document are indicative and not binding.

CONTROL RELAYS			INDUSTRIAL POWER SUPPLIES
	S112	S113	S50
			
	Amplifiers for on/off sensors	Alarm thresholds	Power supply for current loop
GENERAL DATA			
Power Supply	115 / 230 Vac ±10%, 50-60 Hz; 24 Vac/dc (S112M-23-ST)	115 / 230 Vac ±10%, 50-60 Hz	115/230 Vac ± 10%, 50/60 Hz
Sensor power supply	20 Vdc non-stabilized	20 Vdc non-stabilized	-
Max Consumption	1.5 VA	1.5 VA (S113S); 3.5 VA (S113D, S113T)	1.5 VA
Isolation	4.500 Vac; 2.000 Vac (input/output S112M)	4,500 Vac	4,500 Vac
Protection class	IP20	IP20	IP20
Connections	Screw terminals for conductors up to 2.5 mm²	Screw terminals for conductors up to 2.5 mm²	Screw terminals for conductors up to 2.5 mm²
Operating Temperature	-10..+60°C	-10..+60°C	-10..+60°C
Dimensions	52.5 x 95 x 72 mm (S112A); 70 x 95 x 72 mm (S112D, S112M)	52.5 x 95 x 72 mm (S113S); 70 x 95 x 72 mm (S113D, S113T)	35 x 95 x 72 mm
Weight	250 g (S112A); 270 g (S112D); 280 g (S112M)	290 g (S113S); 280 g (S113D); 350 g (S113T)	150 g
Mounting	Mounting on 35 mm DIN rail (DIN 46277)	Mounting on 35 mm DIN rail (DIN 46277)	Mounting on 35 mm DIN rail (DIN 46277)
Certifications	CE	CE	CE
INPUT DATA			
Number	1, 2	1	-
Type	Clean contact, reed NPN 2/3-wire 12/24 Vdc, PNP 2/3-wire 24 Vdc, NAMUR sensors, photoelectric, Hall effect, 24 Vdc pulses (max freq. 400 Hz)	mA, V	-
OUTPUT DATA			
Number	1, 2, 5	1, 2, 3	1
Type	S112A: 1 SPDT relay S112D: 2 SPDT relays S112M: 5 Reed SPST relays	S113S: 1 SPDT relays S113D: 2 SPDT relays S113T: 3 SPDT relays	Stabilized 24 Vdc, 40 mA
ORDER CODES			
Model	S112A-1-ST (115/230 Vac, 1 input, 1 relay output) S112D-1-ST (115/230 Vac, 2 inputs, 2 relay outputs) S112M-1-ST (115/230 Vac, 1 input, 5 relay outputs) S112M-1-ST (115/230 Vac, 1 input, 5 relay outputs) S112M-23-ST (24 Vac/dc, 1 input, 5 relay outputs)	S113S-1-ST (115/230 Vac, 1 relay output) S113T-1-ST (115/230 Vac, 3 relay outputs)	S50-1-ST (115 / 230 Vac) S50-3-ST (24 Vac)

INDUSTRIAL POWER SUPPLIES			
	S100S	S200	S200REG
			
	Dual power supply for current loop	Dual stabilized power supply	Adjustable stabilized power supply
GENERAL DATA			
Power Supply	115/230 Vac ± 10%, 50/60 Hz	115 / 230 Vac ±10% 50 / 60 Hz	115 / 230 Vac ±10% 50 / 60 Hz
Max Consumption	3.5 VA	7.5 VA	10 VA
Isolation	4,500 Vac	4,500 Vac	4,500 Vac
Protection class	IP20	IP20	IP20
Connections	Screw terminals for conductors up to 2.5 mm²	-	-
Operating Temperature	-10..+60°C	-10..+60 °C	-10..+60 °C
Dimensions	52.5 x 95 x 72 mm	70 x 95 x 105 mm	70 x 95 x 105 mm
Weight	Approx. 300 g	Approximately 700 g	Approximately 700 g
Mounting	Mounting on 35 mm DIN rail (DIN 46277)	Mounting on 35 mm DIN rail (DIN 46277)	Mounting on 35 mm DIN rail (DIN 46277)
Certifications	CE	CE	CE
INPUT DATA			
Number	-	-	-
Type	-	-	-
OUTPUT DATA			
Number	2	-	-
Type	Independent stabilized and galvanically isolated 24 Vdc 50 mA	+ 15 Vdc 350 mA - 15 Vdc 75 mA	S200REG-16 : 14 / 18 Vdc 500 mA S200REG-24 : 22 / 26 Vdc 350 mA
ORDER CODES			
Model	S100-1-ST (115/ 230 Vac) S100-3-ST (24 Vac)	S200-1-ST (115 / 230 Vac)	S200REG-24 (22 to 26 Vdc, max current 350 mA)

The technical data and diagrams in this document are indicative and not binding.



S91 / S91-400

MULTI-PROTECTION RELAYS FOR MOTORS

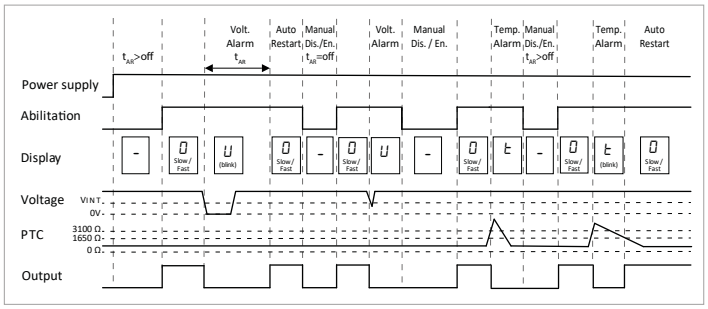
S91 and S91-400 are devices designed for motor protection, detecting phase sequence errors or phase loss, excessive current, and idle running by measuring power factor. They are equipped with rotary selectors for programming and an alarm display, featuring a PTC input for motor over-temperature protection and an enable input for motor start-up. S91 operates in 3 modes: single-phase or three-phase, with maximum current range of 5 or 16 A, functioning with or without PTC. Main applications include protection of single-phase or three-phase pumps against rotor blockage, over-temperature, and transmission system failure detection (e.g., belts or chains), with protection against system lock-up.

TECHNICAL DATA

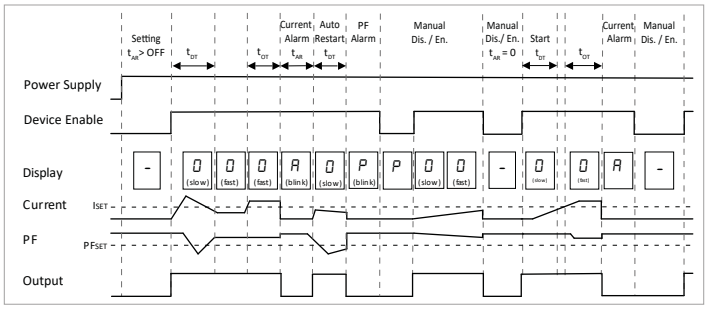
GENERAL DATA	
Power Supply	195 ÷ 255 Vac (S91); 400 Vac ±10% (S91-400)
Consumption	1.5 W (max)
Withstand voltage	2.5 kV
Impulse withstand voltage	4 kV
Nominal insulation voltage	600 V (cat II); 300 V (cat III)
Protection class	IP20
Operating temperature	-20 ÷ +65°C
Mounting	35 mm DIN rail IEC EN60715
Weight	250 g
Dimensions (WxHxD)	53.5 x 73 x 90 mm
Enclosure	UL94 VO, color ral7035
INDICATORS AND SETTINGS	
LED status indicator	Relay status
Front display	Disabled device; Inhibition time (slow rotation); Motor rotating (fast rotation); PTC sensor line shorted; PTC sensor line interrupted; Phase loss or undervoltage alarm; Phase sequence alarm; Overcurrent alarm; Minimum power factor alarm; Temperature alarm
Front selector	Single-phase or three-phase measurement; Maximum current range 5 or 16 A; Operation with or without PTC
Front trimmer adjustment	Auto-reset time setting, inhibition time, minimum power factor, intervention time, maximum current
Motor activation/ deactivation	Via enable input with inhibition time setting
CURRENT MEASUREMENT	
Types of insertion	Direct or via current transformer
Nominal Current	16 Aac
Current measurement limits	0.1 ÷ 16 Aac, measurement accuracy < 5%
Input type	Shunt
Measurement type	TRMS
Continuous thermal limit	16 Aac
Impulse thermal limit	45 Aac for 1 s
Dynamic limit	200 Aac for 10 ms
Power consumption	1.3 W
Phase loss intervention	< 200 ms
VOLTAGE MEASUREMENT	
Nominal voltage Ue	347 (L-N) / 600 (L-L) Vac Cat II; 277 (L-N) / 480 (L-L) Vac Cat III
Voltage measurement limits	60 ÷ 660 Vac, measurement accuracy < 5%
Frequency limits	50 – 60 Hz ±5%
Connection Modes	L1-L2-L3 or L-N
Voltage loss threshold	80 Vac (single-phase and three-phase)
Max phase difference - min	>20% (for three-phase only)
MOTOR COMMAND INPUT	
Nominal voltage	195 ÷ 255 Vac (S91); 400 Vac ±10% (S91-400)
Operating limits	0.85 ÷ 1.1 of nominal voltage
Power consumption/ dissipation	0.17 W
Minimum command duration	≥40 ms
RELAY OUTPUT	
Output type	SPDT
Working Voltage	250 Vac
Operating current	8A
PTC MEASUREMENT	
Input	Not isolated from the power grid, max cable length 30 m
Accuracy	1650 ÷ 3100 Ω; error < 5%
Short circuit detection	<25Ω±5Ω
Open circuit detection	>14kΩ±0,2kΩ

OPERATION DIAGRAMS

VOLTAGE / PTC

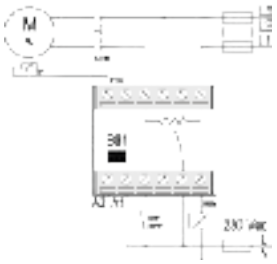


CURRENT / POWER FACTOR

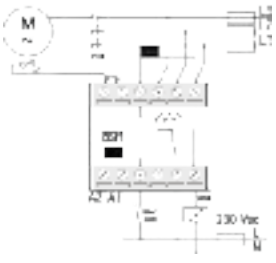


EXAMPLES OF CONNECTIONS

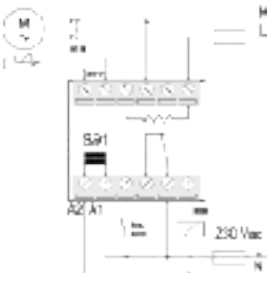
THREE-PHASE MOTOR WITH DIRECT CURRENT MEASUREMENT



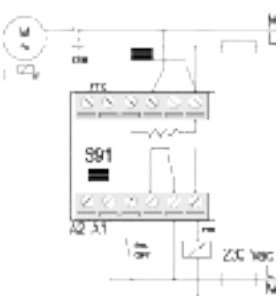
THREE-PHASE MOTOR WITH CURRENT MEASUREMENT VIA CURRENT TRANSFORMER



SINGLE-PHASE MOTOR WITH DIRECT CURRENT MEASUREMENT



SINGLE-PHASE MOTOR WITH CURRENT MEASUREMENT VIA CURRENT TRANSFORMER

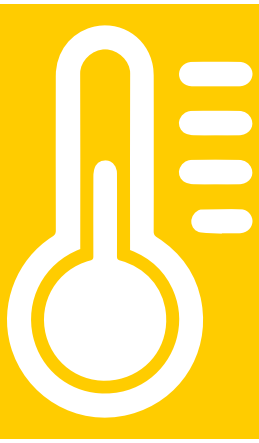


ORDER CODES

Code	Description
S91	Multi-protection relay for motors, 195 ÷ 255 Vac
S91-400	Multi-protection relay for motors, 400 Vac ±10%

The technical data and diagrams in this document are indicative and not binding.

4.4



TEMPERATURE TRANSMITTERS AND SENSORS



T120 / T121

HIGH-PRECISION TEMPERATURE TRANSMITTERS for head mounting, T120 and T121, are designed for universal use in machinery, plants, installations, and process industries. They convert input signals and retransmit them as a normalized current signal through a 4-20 mA loop. Input signals can come from 2, 3, 4-wire RTD sensors such as Pt100 (EN 60751) and Ni100 (DIN 43760). The T121 model also handles Cu50, Cu100, Ni121, and Ni1000 RTDs, and thermocouples type J, K, R, S, T, B, E, N, L (EN 60584), voltage, and resistance signals. T120 and T121 are characterized by compact dimensions and connections via spring terminals. All operating parameters can be configured via dedicated EASY SETUP / EASY LP software.

HIGHLIGHTS

OPERATING TEMPERATURE
-40..+85°C

RESOLUTION
UP TO 16 BITS

PRECISION CLASS
0.1%

SPRING TERMINAL CONNECTION

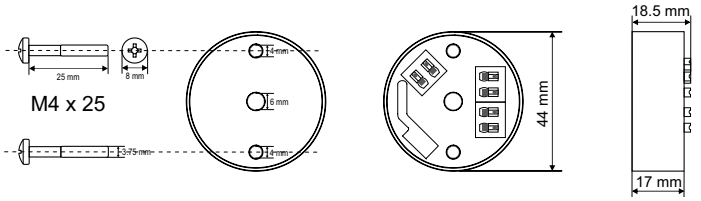
UNIVERSAL INPUT
RTD, TC, mV, Ω

LOOP OUTPUT / POWER SUPPLY
4..20 mA / 20..4 mA (2-wire); 5/7..30 Vdc

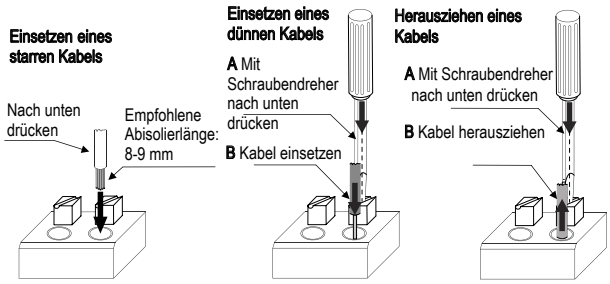
CALIBRATION CERTIFICATE

ATEX ZONE 2 PROTECTION (T121)

DIMENSIONS AND SPACE REQUIREMENTS

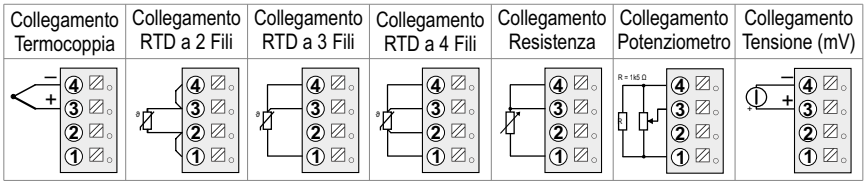


PUSH-WIRE TERMINAL CONNECTION

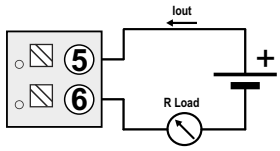




2/3/4-WIRE CONNECTION



CURRENT OUTPUT / LOOP



PROGRAMMING





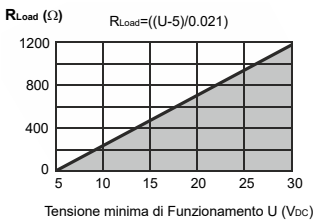
The T120 and T121 transmitters can be configured via the EASY USB tool, which converts the serial signal from the PC's USB to a UART TTL serial signal and vice versa, and the EASY LP software. The module can be configured even if it is not powered by the 4-20 mA loop, by drawing power through the programming connector.

The T120 and T121 transmitters can also be configured via S11P1, a USB – RS232/TTL converter, and EASY LP software. The module can be configured even if it is not powered by the 4-20 mA loop, by drawing power through the programming connector.

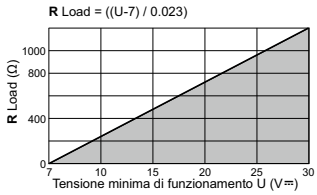
The EASY SETUP / EASY LP software allows configuring the T121 transmitter to linearize custom sensors within a specific working range. The software includes curves for all supported sensors. A tool is also provided to correctly configure the S311A indicator connected to the T121.

LOAD DIAGRAMS

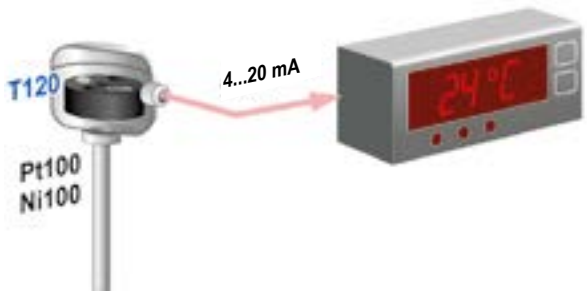
T120

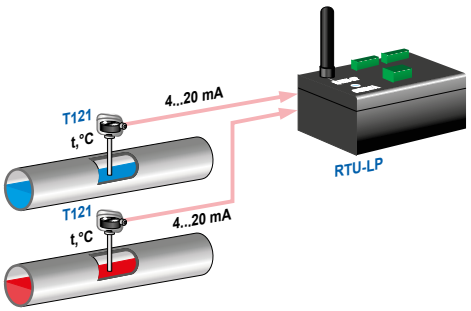


T121



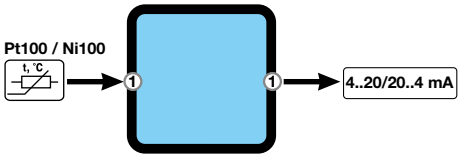
APPLICATION EXAMPLES



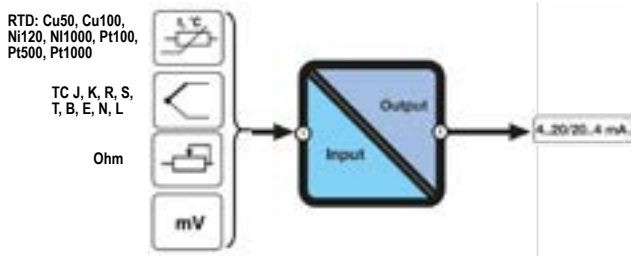


SIGNAL - ISOLATION DIAGRAMS

T120



T121



	T120	T121
		 
	Pt100 and Ni100 2-wire loop-powered transmitter	**Universal loop-powered isolated temperature transmitter**
GENERAL DATA		
Power Supply	5..30 Vdc (loop powered)	7..30 Vdc (loop powered)
Isolation and Protection	-	1.5 kVac
Protection class	IP20	IP20
Configurable sampling	100 ms (300 ms with 50/60 Hz rejection)	300 ms
Frequency rejection	50 / 60 Hz adjustable	> 60 dB at 50 and 60 Hz
Response Time	<220 ms (<620 ms with 50-60 Hz rejection)	< 620 ms
Precision class	0.1%	0.1% (min 0.1°C for RTD and 1°C for TC)
Thermal Drift	<100 ppm (30 ppm typical)	<100 ppm (30 ppm typical)
Measurement conversion	16 bit	16 bit
Transmission error	Max between 0.1% of measurement range or 0.1°C	Max between 0.1% of measurement range or 0.1°C
Error due to EMI	<0,5%	<0,5%
Operating temperature	-40..+85°C	-40..+85°C
Connections	6 spring terminals for 0.2 to 2.5 mm² cables, recommended stripping length 8 mm, 1 serial TTL 4-pin programming connector	6 spring terminals for 0.2 to 2.5 mm² cables, recommended stripping length 8 mm, 1 serial TTL 4-pin programming connector
Enclosure	Nylon / Glass, black color	Nylon / Glass, black color
Dimensions	Ø 43.7 x 20 mm	Ø 43.7 x 20 mm
Weight	35 g	35 g
INPUT DATA		
Number	1	1
Type	• Pt100 Standard: EN 60751/A2 (ITS-90) Measurement range: -200..+650°C Minimum span: 20°C 2, 3, 4-wire connection • Ni100 Measurement range: -60..+650°C Minimum span: 20°C 2, 3, 4-wire connection	• Cu50 (-180..+200°C, min span 20°C) • Cu100 (-180..+200°C, min span 20°C) • Ni100 (-60..+250°C, min span 20°C) • Ni120 (-80..+260°C, min span 20°C) • Pt100 (EN 60751/A2, -200..+650°C, min span 20°C) • Pt500 2, 3, 4-wire (-200..650°C, min span 20°C) • Pt1000 2, 3, 4-wire (-200..+200°C, min span 20°C) • TC J, K, R, S, T, B, E, N, L; input impedance 10 MΩ • Voltage: -150..+150 mV; input impedance 10 MΩ • POTENTIOMETER: 500 Ω..100 kΩ • Resistance 0..+400 (1.760) Ω
Resolution	Approx. 6 mΩ	Approx. 6 mΩ
OUTPUT DATA		
Number of channels	1	1
Type	CURRENT (mA) 4..20, 20..4 mA (2-wire)	CURRENT (mA) 4..20, 20..4 mA (2-wire)
Resolution	1µA (>14bit)	2µA (>13bit)
Output current protection	Approx. 30 mA	Approx. 30 mA
PROGRAMMING		
PC software EASY SETUP / EASY LP	Configuration of measurement start/end range, RTD connection type, rejection, measurement filter, cable resistance, fault/over-range output	Configuration of measurement start/end range, RTD connection type, rejection, measurement filter, cable resistance, fault/over-range output
STANDARD		
Certifications	CE	CE, II 3G Ex nA IIC T4 Gc X, II 3D Ex tc IIIC T135°C Dc X
Standards	EN 61000-6-4, EN 61000-6-2	EN 61000-6-4, EN 61000-6-2, EN 61010-1

ORDER CODES	
Code	**Description**
T120	2-wire loop-powered transmitter for Pt100 and Ni100 probes, standard
T120-C	2-wire loop-powered transmitter for Pt100 and Ni100 probes, calibrated
T121	Universal loop-powered isolated temperature transmitter, standard
T121-C	Universal loop-powered isolated temperature transmitter, calibrated
SOFTWARE	
EASY LP	Complete plug&play configuration tool collection for loop-powered devices (K120RTD, K121, T120, T121)
ACCESSORIES	
FLEX-DIN	DIN rail mount for T120 / T121
EASY-USB	USB - UART TTL converter
S117P1	Optoisolated asynchronous serial converter RS232/USB, TTL/USB, RS485/USB
PT100	
POZZ-100	Thermal well welded 100 mm length
POZZ-150	Thermal well welded 150 mm length
POZZ-200	Thermal well welded 200 mm length
POZZ-250	Thermal well welded 250 mm length
POZZ-300	Thermal well welded 300 mm length
POZZ-50	Thermal well welded 50 mm length
PT-150-3-M12	PT100 class B, d=3 mm, L=150 mm, M12 connector PT100 class B, d=3 mm, L=150 mm, M12 connector
PT-250-2-M12	PT100 class B, d=2 mm, L=250 mm, M12 connector
PT-150-3R-M12	PT100 class B, d=3 mm, L=150 mm, tapered terminal, M12 connector

ORDER CODES	
Code	**Description**
PT100	
PT100-100	Pt100 std Length 100 mm, 3-wire watertight head attachment 1/2" G.M.
PT100-100-MA	Pt100 std Length 100 mm, 3-wire watertight head attachment 1/2" G.M. 4-20 mA output
PT100-150	Pt100 std Length 150 mm, 3-wire watertight head attachment 1/2" G.M.
PT100-150-MA	Pt100 std Length 150 mm, 3-wire watertight head attachment 1/2" G.M. 4-20 mA output
PT100-200	Pt100 std Length 200 mm, 3-wire watertight head attachment 1/2" G.M.
PT100-200-MA	Pt100 std Length 200 mm, 3-wire watertight head attachment 1/2" G.M. 4-20 mA output
PT100-250	Pt100 std Length 250 mm, 3-wire watertight head attachment 1/2" G.M.
PT100-250-MA	Pt100 std Length 250 mm, 3-wire watertight head attachment 1/2" G.M. 4-20 mA output
PT100-300	Pt100 std Length 300 mm, 3-wire watertight head attachment 1/2" G.M.
PT100-300-MA	Pt100 std Length 300 mm, 3-wire watertight head attachment 1/2" G.M. 4-20 mA output
PT100-50	Pt100 std Length 50 mm, 3-wire watertight head attachment 1/2" G.M.
PT100-50-MA	Pt100 std Length 50 mm, 3-wire watertight head attachment 1/2" G.M. 4-20 mA output
PT100-A	Environmental Pt100
PT100-A-MA	Environmental Pt100 with 4-20mA output
PT100-SOLAR	Single-element Pt100 3-wire sensor for photovoltaic modules
PT100-SOLAR-MA	Single-element Pt100 3-wire sensor for photovoltaic modules, 4-20 mA output



PT100
PLATINUM TEMPERATURE PROBES

TECHNICAL DATA

GENERAL DATA

Sensor type	PT100
Execution	Standard, environmental, solar, with 4-20 mA analog output
Connection type	3-wire
Connection head	DIN B, watertight in painted die-cast aluminum
Insertion length	50, 100, 150, 200, 250, 300 mm
Threaded connection	1/2" G.M.
Standard	IEC / EN 60751, DIN 43760
Precision class	A (±0.15 °C or 1/10 DIN at 0°C) or B (±0.3°C at 0°C)
Ceramic insulator	Internal for insulation of connection wires from the protective sheath
Sheath material	AISI 316
Sheath diameter	Ø 6 - 8 mm (other values available on request)
Electrical connection	M20x1.5
Protection class	Minimum IP54

PROGRAMMING



The configuration of the T120 and T121 transmitters mounted on the head of the PT100 can be done using S11P1, USB - RS232/TTL converter, and EASY SETUP software. The module can be configured even if it is not powered by the 4-20 mA loop, by drawing power through the programming connector.

THERMOWELL

In specific conditions, it is advisable to cover the sheath with additional protection made from a thermowell created from a tube with a threaded process connection. With process connections with cylindrical thread.



ORDER CODES

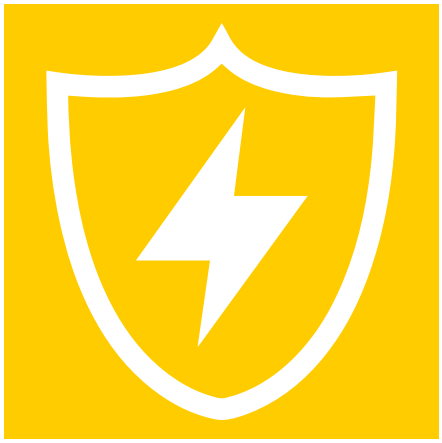
Code	Description
STANDARD PROBES	
PT100-100	Pt100 L=100 mm 3-wire watertight head attachment 1/2" G.M.
PT100-100-MA	Pt100 L=100 mm 3-wire watertight head attachment 1/2" G.M. 4-20 mA
PT100-150	Pt100 L=150 mm 3-wire watertight head attachment 1/2" G.M.
PT100-150-MA	Pt100 L=150 mm 3-wire watertight head attachment 1/2" G.M. 4-20 mA
PT100-200	Pt100 L=200 mm 3-wire watertight head attachment 1/2" G.M.
PT100-200-MA	Pt100 L=200 mm 3-wire watertight head attachment 1/2" G.M. 4-20 mA
PT100-250	Pt100 L=250 mm 3-wire watertight head attachment 1/2" G.M.
PT100-250-MA	Pt100 L=250 mm 3-wire watertight head attachment 1/2" G.M. 4-20 mA
PT100-300	Pt100 L=300 mm 3-wire watertight head attachment 1/2" G.M.
PT100-300-MA	Pt100 L=300 mm 3-wire watertight head attachment 1/2" G.M. 4-20 mA
PT100-50	Pt100 L=50 mm 3-wire watertight head attachment 1/2" G.M.
PT100-50-MA	Pt100 L=50 mm 3-wire watertight head attachment 1/2" G.M. 4-20 mA

ORDER CODES

Code	Description
PHOTOVOLTAIC PROBES	
PT100-SOLAR	Solar PT100 with 25x25x3 mm plate, 3 m cable
PT100-SOLAR-MA	Temperature probe for photovoltaic modules, 4-20 mA output
THERMOWELLS	
POZZ-100	Stainless steel thermowell attachment 1/2" GM for PT100 L=100mm
POZZ-150	Stainless steel thermowell attachment 1/2" GM for PT100 L=150mm
POZZ-200	Stainless steel thermowell attachment 1/2" GM for PT100 L=200mm
POZZ-250	Stainless steel thermowell attachment 1/2" GM for PT100 L=250mm
POZZ-300	Stainless steel thermowell attachment 1/2" GM for PT100 L=300mm
POZZ-50	Stainless steel thermowell attachment 1/2" GM for PT100 L=50mm
TEMPERATURE	
T120	2-wire loop-powered transmitter for Pt100 and Ni100 probes, standard
T120-C	2-wire loop-powered transmitter for Pt100 and Ni100 probes, calibrated
T121	Universal loop-powered isolated temperature transmitter, standard
T121-C	Universal loop-powered isolated temperature transmitter, calibrated
ACCESSORIES	
FLEX-DIN	DIN rail attachment T120 / T121
S117P1	Optoisolated asynchronous serial converter RS232/USB, TTL/USB, RS485/USB
SOFTWARE	
EASY SETUP	Configuration software for SENECA programmable instruments

The technical data and diagrams in this document are indicative and not binding.

4.5



SURGE PROTECTION

S400 Series

S400 SERIES

High-efficiency surge protection

The SENECA **S400** surge protection devices are designed to protect electrical systems and equipment against transient and impulsive over-voltages caused by atmospheric phenomena and electrical maneuvers. The S400 series includes:

- **Type 2 and 3 surge arresters for industrial power supply systems**
- **Protections for control, measurement, and regulation systems that can be used in binary and analog circuits, such as pulses, 0..10 Vdc signals, and 0/4..20 mA current loops**
- **Surge protection for computer and communication networks (Token Ring, ISDN, DS1, Ethernet, Power over Ethernet, RS232/422/485, etc.) with extremely high transmission speed and discharge capacity.**

S400HV-2



S400LV-1-N



K400CL



S400CL-1



S400CL-1-N

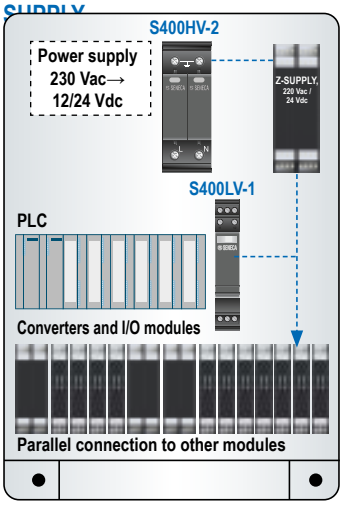


S400NET-1



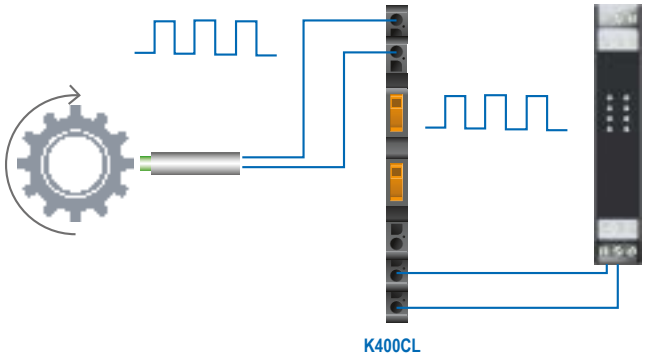
APPLICATION EXAMPLES

PROTECTION AND ISOLATION FOR TYPE 2 AND TYPE 3 POWER SUPPLY

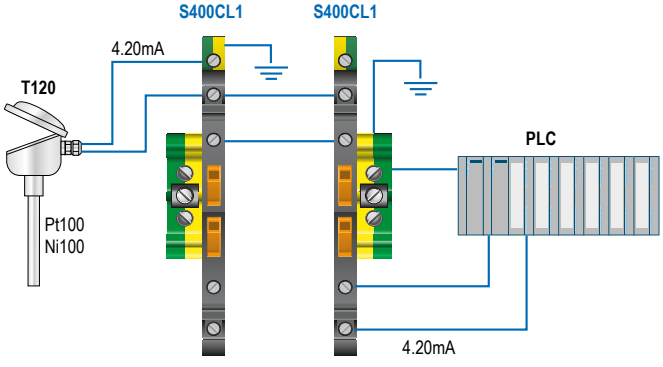


Automation panels, marshalling panels, PLC/DCS control panels, machine control panels, distribution boards, power center panels, MCC panels

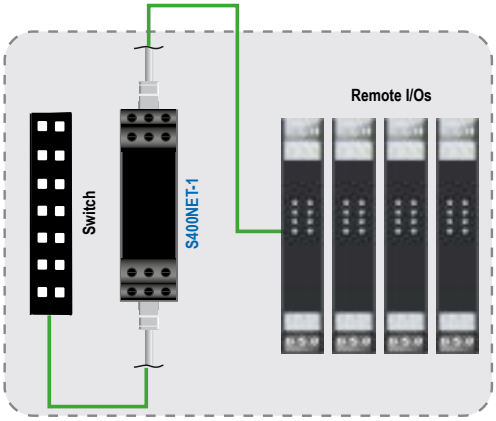
PROTECTION FOR PULSE MEASUREMENT DEVICES (REED, NAMUR, PNP, NPN, HALL EFFECT, ETC.)



PROTECTION OF AN ANALOG MEASUREMENT DEVICE



PROTECTION OF IT SIGNALS



Ethernet connection with the switch located in the local Electrical Panel

HIGH-EFFICIENCY INTELLIGENT SURGE PROTECTION

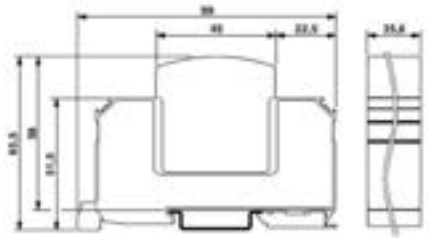
	TYPE 2/3 PROTECTION FOR POWER SUPPLY SYSTEMS		PROTECTION FOR MEASUREMENT AND CONTROL DEVICES			PROTECTION FOR COMPUTER NETWORKS AND TELECOMMUNICATIONS
	S400HV-2	**S400LV-1-N**	**K400CL**	**S400CL-1**	**S400CL-1-N**	**S400NET-1**
		 NEW		 UNTIL STOCKS LAST	 UNTIL STOCKS LAST COMING SOON	
	230 Vac surge protection, type 2 with 3 conductors (L, N, PE)	**Surge protection type 3, nominal voltage: 24 V AC/DC**	**Surge protection for analog and logic signals, slim format 6.2 mm**	**Surge protection for analog and logic signals with knife switch**	**Surge protection with integrated status indicator and knife switch for a potential-free signal circuit with 2 wires**	**Surge protection for Ethernet networks, serial networks, and field bus with 5 wires**
ELECTRICAL PROTECTION DATA (L-N / N-PE / L-PEN)						
Test class IEC / Type EN	II / T2	III / T3	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1	C1 / C2 / C3 / D1
Nominal voltage U_N	240 / 415 Vac (TN-S); 240 / 415 Vac (TT)	24 Vac (TN-S)	24 Vdc	24 Vdc	24 Vdc	5 Vdc
Max permanent voltage U_C	L-N 335 Vac (L-N); 260 Vac (N-PE)	34 Vac	36 Vdc / 25 Vac	30 Vdc / 21 Vac	30 Vdc / 21 Vac	5.2 Vdc / 3.6 Vac
Nominal discharge current In (8/20)µs	L-N 20 kA / L-PE 20 kA / N-PE 20 kA	1kA	(wire-to-wire) 5 kA / (wire-to-ground) 5 kA / 10 kA (total)	(wire-to-wire) 5 kA / (wire-to-ground) 5 kA	5kA	(wire-to-wire) 10 kA / (wire-to-ground) 10 kA
Max. Max discharge current Imax (8/20)µs	L-N 40 kA / L-PE 40 kA / N-PE 40 kA	1kA	(wire-to-wire) 10 kA / (wire-to-ground) 10 kA / 20 kA (total)		20kA	(wire-to-wire) 10 kA / (wire-to-ground) 10 kA
Atmospheric test current I_{imp} (10/350) µs per conductor			500A	500A	0.5kA	
Nominal load current I_L	80A	16 Aac (@63°C); 10 Adc				
Cumulative current (8/20)µs			20kA	10kA		20kA
Protection level Up	L-N ≤ 1,5 kV / L-PE ≤ 1,8 kV / N-PE ≤ 1,5 kV	≤ 0,18 kV (L-N) / ≤ 0,55 kV (L-PE) / ≤ 0,55 kV (N-PE)	(Conductor-to-conductor) 70 V (C2-10 kV / 5 kA / ≤50 V (C3-10A) / ≤80 V (D1 - 500 A) (Conductor-to-ground ≤650 V(C1-500 V / 250 A) / ≤700 V (C2-10 kV / 5 kA) / ≤700 V (D1 - 500 A)	(Conductor-to-conductor) ≤ 45 V (C1 - 500 V / 250 A ≤ 55 V /C2 - 10 kV / 5 kA)	(Conductor-to-conductor) ≤ 55 V (C1 - 1 kV / 500 A) ≤ 65 V (C2 - 10 kV / 5 kA) ≤ 50 V (C3 - 25 A) (Conductor-to-ground) ≤ 55 V (C3 - 100 A) ≤ 750 V (C1 - 1 kV / 500 A) ≤ 750 V (C2 - 10 kV / 5 kA) ≤ 700 V (C3 - 25 A) ≤ 750 V (C3 - 100 A) (Conductor-to-conductor) ≤ 50 V (C1 - 1 kV / 500 A) ≤ 65 V (C2 - 10 kV / 5 kA) (Conductor-to-ground) ≤ 750 V (C1 - 1 kV / 500 A) ≤ 750 V (C2 - 10 kV / 5 kA)	Conductor-to-conductor: ≤70 V (C1 - 1 kV / 500 A) ≤45 V (C3 - 25 A) ≤100 V (C2 - 10 kV / 5 kA) ≤70 V (6kV / 3 kA) Conductor-to-ground: ≤80 V /C1 - 1 kV / 500 A) ≤110 V (C2 - 10 kV / 5 kA) ≤100 V (6 kV / 3 kA) ≤45 V (C3 - 25 A) Conductor-GND: ≤45 V (C3 - 25 A)
Residual voltage at 5 kA	L-N ≤ 1,2 kV / L-PE ≤ 1,2 kV / N-PE ≤ 150 V					
Combination wave Uoc		≤ 25 ns				
Response time t_A	L-N ≤ 25 ns / N-PE ≤ 100 ns	L-N ≤ 25 ns / L-PE ≤ 100 ns / N-PE ≤ 100 ns	(wire-to-wire) ≤1 ns / (wire-to-ground) ≤100 ns	(wire-to-wire) ≤1 ns / (wire-to-ground) ≤100 ns		(wire-to-wire) ≤500 ns / (wire-to-ground) ≤500 ns
ELECTRICAL PROTECTION DATA (L-N / N-PE / L-PEN)						
Max prefuse for standard wiring	125 Aac (gG)	16 Aac - 10 Adc	315mA	315mA	630 mA (FF)	500mA
Max prefuse for pass-through wiring	80 Aac (gG)					
Short-circuit resistance I_{SCCR}	25kA					
Frequency limit fg (3dB) symmetric in the 50 Ohm system			typ. 6 MHz	typ. 6 MHz	typ. 940 kHz	
Conductor resistance			3.3 Ohm	3.3 Ohm	1.65 Ohm ±20%	2.2 Ohm
Limiting output voltage at 1 kV/ µs (spike/stat.)			(wire-to-wire) ≤ 60V / (wire-to-ground) ≤ 650V	≤45 V (wire-to-wire) / ≤650 V (wire-to-ground)		Spikes (wire-to-wire): ≤ 55 V Spikes (wire-to-ground): ≤ 55 V (PT 2x2-BE) / ≤ 1 µA (on PT 2x2+F-BE) Static voltage (wire-to-wire) ≤ 15 V Static voltage (wire-to-ground): ≤ 15 V / ≤ 30 V (PT 2x2+F-BE)
Dimensions (WxHxD)	35.6 x 90 x 58 mm	17.7 x 90 x 65.5 mm	6.2 x 93 x 102.5 mm	6.2 x 94.8 x 69.1 mm	6.2 x 105 x 83 mm	17.7 x 90 x 65.5 mm
Temperature range	-40°C.. +80°C	-40°C.. +80°C	-40°C.. +80°C	-40°C.. +80°C	-40..+70°C	-40°C.. +85°C
Protection class	IP20	IP20	IP20	IP20	IP20	IP20
UL 94 Combustibility class	V0	V0	V0	V0	V0	V0
Case Material	PA 6.6 - PBT	PA 6.6	PBT	PA 6.6	PBT	PA
Connection interface	Screw connection	Screw connection	Screw connection	Screw connection	Push-in connections	Screw connection (with the base element)
Certifications	CE, UL	CE	CE, UL	CE, UL	CE	CE, UL

The technical data and diagrams in this document are indicative and not binding.

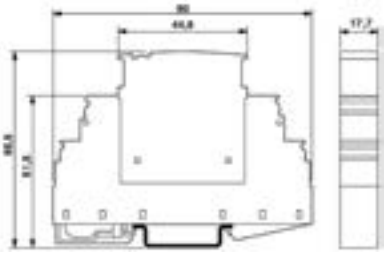
S400 SERIES

DIMENSIONS

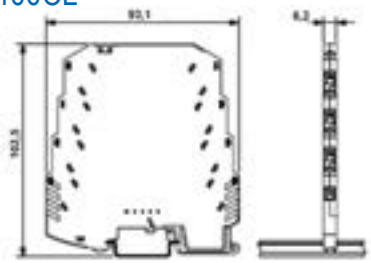
S400HV-2



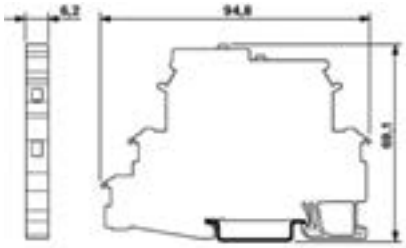
S400LV-1-N



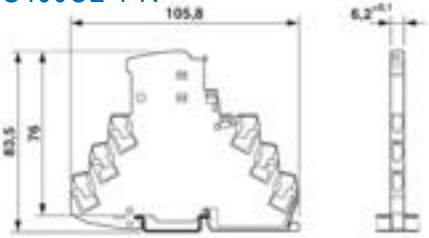
K400CL



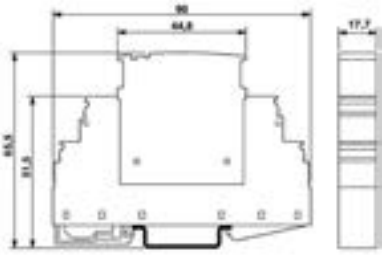
S400CL1



S400CL-1-N



S400NET-1



ACCESSORIES

S400HV-2-RIC-SL



S400HV-2-RIC-SN



S400LV-1-RIC-SL



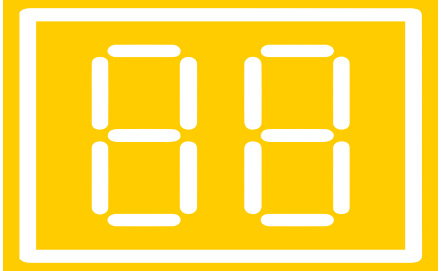
S400LV-1-RIC-SL



ORDER CODES

Code	Description
K400CL	Surge protection for analog and logic signals, slim format 6.2 mm
K400CL-10	Kit 10 p.zi K400CL
S400HV-2	230 Vac surge protection, type 2 with 3 conductors (L, N, PE)
S400HV-2-RIC-SL	Replacement plug 1L-N/PE for S400HV-2, without FM contact
S400HV-2-RIC-SN	Replacement plug N/PE for S400HV-2
S400LV-1	Surge protection 24VAac/dc, with FM contact, type 3 with 3 conductors (L, N, PE)
S400LV-1-RIC-SL	Replacement plug 24VAC/DC for S400LV-1, with FM contact
S400CL-1	Surge protection for analog and logic signals with knife switch
S400CL-1-15	Kit 15 pcs S400CL-1
S400CL-1-P5	Pack of 5 pcs closure walls for module S400CL-1
S400NET-1	Surge protection for Ethernet networks, serial networks, and field bus with 5 wires
S400NET-1-RIC-CL	Replacement plug for S400NET-1
S400ETH-DSK	Surge protection for Ethernet networks Class D/Cat.5 (100 Mbps)/5e (1 Gbps), PoE

4.6



DIGITAL INDICATORS

S Line

S Series

High-brightness and precision LED digital indicators

The S Series is a family of high-brightness and precision LED digital indicators for industrial applications. Equipped with scalable displays of 4, 6, 8, 4+7 digits, the S Series digital indicators handle universal inputs for analog, digital, and temperature sensor types, with retransmission output, ModBUS interface, and relay alarm activation via optional board. Available power supply ranges: 80-265 Vac, 10-40 Vdc, 19-28 Vac.
The indicators allow multiple display of instantaneous, integrated, and totalized values in increment or decrement mode. Programming can be done via front buttons or through the EASY SETUP 2 software.



High-brightness scalable display (4, 6, 8, 4+7 digits)

UNIVERSAL INPUT

Analog, Digital, Temperature (RTD, TC)

RETRANSMITTED OUTPUT

R

Analog or digital

OPTIONAL BOARD

ModBUS RS485 interface, relay SPDT outputs, reset input

ALARM ACTIVATION (RELAYS)

Threshold or hysteresis management

EXTENDED POWER SUPPLY

Range: 80-265 Vac; 10-40 Vdc / 19-28 Vac loop powered (S315)

POWER SUPPLY FOR TRANSDUCERS

SPECIAL FEATURES

TOTALIZER

S311A
S311D

Integrated values (S311A) and totalized in increment/decrement mode (S311D)

GENERATOR

S311G

Signal generation in auto/manual mode, bumpless filter

BATCH COUNTER

S311D

Batch counting associated with threshold (alarm/action on totalizer)



Alarm LED

Navigation and setting front buttons

Self-extinguishing PPO housing for DIN 43700 panel mounting

ACCURACY

Class 0.1%
A/D Conversion 14-16 bit

ISOLATION

Output
Input

1,500 Vac

PROGRAMMING

EASY SETUP

PC Software - Windows EASY SETUP accessible via serial converter (e.g., S107USB)

OPTIONAL HOUSING IP66

S315

PROTECTED ACCESS

FREQUENCY FILTER

S311D

HIGH-BRIGHTNESS AND PRECISION LED DIGITAL INDICATORS

	INDICATORS / TOTALIZERS WITH UNIVERSAL ANALOG INPUT				INDICATORS / GENERATORS WITH ANALOG INPUT
	S311A-4	**S311A-6**	**S311A-8**	**S311A-11**	**S311G**
					
	Indicator / Totalizer with 4-digit display with universal analog input	**Indicator / Totalizer with 6-digit display with universal analog input**	**Indicator / Totalizer with 8-digit display with universal analog input**	**Indicator / Totalizer with 11-digit display with universal analog input**	**Indicator / Generator with 4-digit display and analog input**
GENERAL DATA					
Power Supply	80-265 Vac (H version) 10-40 Vdc / 19-28 Vac (L version)	80-265 Vac (H version) 10-40 Vdc / 19-28 Vac (L version)	80-265 Vac (H version) 10-40 Vdc / 19-28 Vac (L version)	80-265 Vac (H version) 10-40 Vdc / 19-28 Vac (L version)	80-265 Vac (H version) 10-40 Vdc / 19-28 Vac (L version)
Power supply for transducers	Max 18 V, 25 mA	Max 18 V, 25 mA	Max 18 V, 25 mA	Max 18 V, 25 mA	Max 18 V, 25 mA
Max Consumption	3 W	3 W	3 W	3 W	3 W
Isolation	1,500 Vac	1,500 Vac	1,500 Vac	1,500 Vac	1,500 Vac
Communication interfaces	ModBUS RTU slave	ModBUS RTU slave	ModBUS RTU slave	ModBUS RTU slave	ModBUS RTU slave (optional card)
Operating Temperature	-10..+60°C	-10..+60°C	-10..+60°C	-10..+60°C	-10..+60°C
Frontal Protection	IP65	IP65	IP65	IP65	IP65
Removable	terminal blocks, pitch 3.5 - 5.08 mm	terminal blocks, pitch 3.5 - 5.08 mm	terminal blocks, pitch 3.5 - 5.08 mm	terminal blocks, pitch 3.5 - 5.08 mm	terminal blocks, pitch 3.5 - 5.08 mm
Dimensions	96x48x98 mm	96x48x98 mm	96x48x98 mm	96x48x98 mm	96x48x98 mm
Weight	200 g	200 g	200 g	200 g	200 g
Display	4-digit LED display	6-digit LED display	8-digit LED display	4+7 digit LED display	4-digit LED display
Status Indicators	2 alarm LEDs (threshold activatable)	2 alarm LEDs (threshold activatable)	2 alarm LEDs (threshold activatable)	2 alarm LEDs (threshold activatable)	2 Automatic / Manual LEDs
Front keys	3 navigation buttons	3 navigation buttons	3 navigation buttons	3 navigation buttons	3 navigation buttons
Accuracy	0.1%	0.1%	0.1%	0.1%	0.1%
Programming	Software EASY SETUP, front buttons	Software EASY SETUP, front buttons	Software EASY SETUP, front buttons	Software EASY SETUP, front buttons	Software EASY SETUP, front buttons
Special Features	Integrator	Integrator	Integrator	Integrator	Auto/Manual mode, Signal Generator, Bumpless filter
Certifications	CE	CE	CE	CE	CE
INPUT DATA					
Channels	1	1	1	1	1
Type and range	Voltage: 0-10 V Active/Passive current: 0-20 mA Potentiometer: 1..100 kΩ Pt100 2,3,4 wires (IEC 751 / EN 60751 – ITS90) Thermocouples J,K,R,S,T,B,E,N	Voltage: 0-10 V Active/Passive current: 0-20 mA Potentiometer: 1..100 kΩ Pt100 2,3,4 wires (IEC 751 / EN 60751 – ITS90) Thermocouples J,K,R,S,T,B,E,N	Voltage: 0-10 V Active/Passive current: 0-20 mA Potentiometer: 1..100 kΩ Pt100 2,3,4 wires (IEC 751 / EN 60751 – ITS90) Thermocouples J,K,R,S,T,B,E,N	Voltage: 0-10 V Active/Passive current: 0-20 mA Potentiometer: 1..100 kΩ Pt100 2,3,4 wires (IEC 751 / EN 60751 – ITS90) Thermocouples J,K,R,S,T,B,E,N	Voltage: 0-10 V Active/Passive current: 0-20 mA Potentiometer: 1..100 kΩ
Frequency	-	-	-	-	-
Reset	Yes: from digital input and front buttons	Yes: from digital input and front buttons	Yes: from digital input and front buttons	Yes: from digital input and front buttons	-
OUTPUT DATA					
Channels	1	1	1	1	1
Type and range	0-10 V (min 1 kΩ) 0-20 / 4-20 mA (max 500 Ω)	0-10 V (min 1 kΩ) 0-20 / 4-20 mA (max 500 Ω)	0-10 V (min 1 kΩ) 0-20 / 4-20 mA (max 500 Ω)	0-10 V (min 1 kΩ) 0-20 / 4-20 mA (max 500 Ω)	0-10 V (min 1 kΩ) 0-20 / 4-20 mA (max 500 Ω)
Relay Outputs	#2 SPDT 220 Vac 5A (resistive), 2A (inductive) - optional card	#2 SPDT 220 Vac 5A (resistive), 2A (inductive) - optional card	#2 SPDT 220 Vac 5A (resistive), 2A (inductive) - optional card	#2 SPDT 220 Vac 5A (resistive), 2A (inductive) - optional card	-

The technical data and diagrams in this document are indicative and not binding.

COMPACT INDICATORS WITH ANALOG INPUT			INDICATORS / TOTALIZERS / BATCH COUNTERS WITH DIGITAL INPUT			
S311AK	**S312A**	**S315**	**S311D-4**	**S311D-6**	**S311D-8**	**S311D-11**
						
4-digit Indicator with mA/V analog input	**4-digit Indicator with universal analog input, 4 relay outputs, ModBUS interface**	**4-digit Indicator with 4-20 mA input, loop powered**	**4-digit Indicator / Totalizer / Batch Counter with digital/ frequency input**	**6-digit Indicator / Totalizer / Batch Counter with digital/ frequency input**	**8-digit Indicator / Totalizer / Batch Counter with digital/ frequency input**	**11-digit Indicator / Totalizer / Batch Counter with digital/ frequency input**
10-40 Vdc, 19-28 Vac	80-265 Vac (H version) 10-40 Vdc / 19-28 Vac (L version)	From measurement loop (max 30 V)	80-265 Vac (H version), 10-40 Vdc / 19-28 Vac (L version)	80-265 Vac (H version), 10-40 Vdc / 19-28 Vac (L version)	80-265 Vac (H version), 10-40 Vdc / 19-28 Vac (L version)	80-265 Vac (H version), 10-40 Vdc / 19-28 Vac (L version)
Max 16 V, 25 mA	Max 16 V, 25 mA	-	Max 18 V, 25 mA	Max 18 V, 25 mA	Max 18 V, 25 mA	Max 18 V, 25 mA
0.9 W	3 W	-	3 W	3 W	3 W	3 W
1,500 Vac	1,500 Vac	-	1,500 Vac	1,500 Vac	1,500 Vac	1,500 Vac
-	ModBUS RTU slave	-	ModBUS RTU slave	ModBUS RTU slave	ModBUS RTU slave	ModBUS RTU slave
-10..+65°C	-10..+65°C	-10..+65°C	-10..+60°C	-10..+60°C	-10..+60°C	-10..+60°C
IP65	IP65	IP65	IP65	IP65	IP65	IP65
Screw terminals, pitch 5.08 mm	Screw terminals, pitch 5.08 mm	Screw terminals, pitch 5.08 mm	terminal blocks, pitch 3.5 - 5.08 mm	terminal blocks, pitch 3.5 - 5.08 mm	terminal blocks, pitch 3.5 - 5.08 mm	terminal blocks, pitch 3.5 - 5.08 mm
96 x 48 x 40 mm	96x 48x 96 mm	96 x 48 x 40 mm	96x48x98 mm	96x48x98 mm	96x48x98 mm	96x48x98 mm
100 g	200 g	100 g	200 g	200 g	200 g	200 g
4-digit LED display	4-digit LED display	4-digit LED display	4-digit LED display	6-digit LED display	8-digit LED display	4+7 digit LED display
-	Alarms	-	2 alarm LEDs (threshold activatable)	2 alarm LEDs (threshold activatable)	2 alarm LEDs (threshold activatable)	2 alarm LEDs (threshold activatable)
3 navigation buttons	3 navigation buttons	3 navigation buttons	3 navigation buttons	3 navigation buttons	3 navigation buttons	3 navigation buttons
0.05%	0.05%	0.05%	0.1%	0.1%	0.1%	0.1%
Front keys	Software EASY SETUP, front keys	Front keys	Software EASY SETUP, front buttons	Software EASY SETUP, front buttons	Software EASY SETUP, front buttons	Software EASY SETUP, front buttons
-	-	-	Totalizer, Threshold alarm (batch)	Totalizer, Threshold alarm (batch)	Totalizer, Threshold alarm (batch)	Totalizer, Threshold alarm (batch)
CE	CE	CE	CE	CE	CE	CE
1	1	1	1	1	1	1
Voltage: 0-10 V Current: 0-20 mA	Voltage: 0..10 V Current: 0..20 mA Potentiometer: 1..100 kΩ Pt100 2,3,4 wires (IEC 751/EN 60751 – ITS90) Thermocouples J,K,R,S,T,B,E,N	4..20 mA current	Mechanical contact, Reed, NPN with 2 or 3 wires, PNP with 3 wires with 24 Vdc supply, Namur, Photoelectric, Variable reluctance, 24V pulses, TTL	Mechanical contact, Reed, NPN with 2 or 3 wires, PNP with 3 wires with 24 Vdc supply, Namur, Photoelectric, Variable reluctance, 24V pulses, TTL	Mechanical contact, Reed, NPN with 2 or 3 wires, PNP with 3 wires with 24 Vdc supply, Namur, Photoelectric, Variable reluctance, 24V pulses, TTL	Mechanical contact, Reed, NPN with 2 or 3 wires, PNP with 3 wires with 24 Vdc supply, Namur, Photoelectric, Variable reluctance, 24V pulses, TTL
-	-	-	0.00015 Hz .. 10 kHz	0.00015 Hz .. 10 kHz	0.00015 Hz .. 10 kHz	0.00015 Hz .. 10 kHz
-	-	-	Yes: from digital input and front buttons	Yes: from digital input and front buttons	Yes: from digital input and front buttons	Yes: from digital input and front buttons
	1 analog output, 4 relays	-	1	1	1	1
-	0-10 V (min 1kΩ) 0-20 / 4-20 mA (max 500 Ω)	-	0-10 V (min 1kΩ) 0-20 / 4-20 mA (max 500 Ω)	0-10 V (min 1kΩ) 0-20 / 4-20 mA max 500 Ω)	0-10 V (min 1kΩ) 0-20 / 4-20 mA max 500 Ω)	0-10 V (min 1kΩ) 0-20 / 4-20 mA max 500 Ω)
-	Relay capacity 5A - 250 Vac	-	#2 SPDT 220 Vac 5A (resistive), 2A (inductive) - optional card	#2 SPDT 220 Vac 5A (resistive), 2A (inductive) - optional card	#2 SPDT 220 Vac 5A (resistive), 2A (inductive) - optional card	#2 SPDT 220 Vac 5A (resistive), 2A (inductive) - optional card

The technical data and diagrams in this document are indicative and not binding.

A COMPLETE RANGE

MODULAR INDICATORS / TOTALIZERS WITH UNIVERSAL ANALOG INPUT

S311A



MODULAR INDICATORS / TOTALIZERS / BATCH COUNTERS WITH DIGITAL INPUT

S311D



4-DIGIT LED INDICATORS WITH ANALOG INPUT

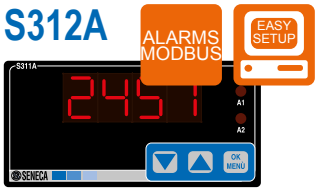
S311G



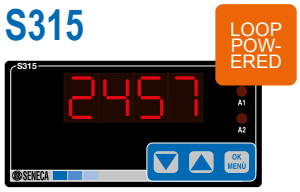
S311AK



S312A



S315



ORDER CODES

MODULAR INDICATORS / TOTALIZERS WITH UNIVERSAL ANALOG INPUT

Code				Description
Base model	S311A			Indicator / totalizer with universal analog input
Display		-4		4-digit LED display
		-6		6-digit LED display
		-8		8-digit LED display
		-11		4+7 digit LED display
Power Supply			-L	10-40 Vdc / 19-28 Vac
			-H	80-265 Vac
Optional board			-O	Card with 2 SPDT relays, ModBUS RTU interface, reset input

INDICATORS / GENERATORS WITH ANALOG INPUT

Code				Description
Base model	S311G			Indicator / signal generator with analog input
Display		-4		4-digit LED display
Power Supply			-L	10-40 Vdc / 19-28 Vac
			-H	80-265 Vac
Optional board			-O	ModBUS RTU

COMPACT INDICATORS / TOTALIZERS WITH ANALOG INPUT

Code	Description
S311AK-4-L	4-digit Indicator with mA/V analog input, 10-40 Vdc, 19-28 Vac
S311AK-4-L-IP66	4-digit Indicator with mA/V analog input, 10-40 Vdc, 19-28 Vac, with IP66 enclosure (130x80x60 mm)
S311AK-4-L-IP66D	4-digit Indicator with mA/V analog input, 10-40 Vdc, 19-28 Vac, with 2 instruments and double IP66 enclosure
S312A-4-H-4R	Indicator with 4-digit display, universal analog input, 4 relay outputs, ModBUS interface, 85-265 Vac
S312A-4-L-4R	Indicator with 4-digit display, universal analog input, 4 relay outputs, ModBUS interface, 10-40 Vdc, 19-28 Vac
S315	Loop powered 4-digit Indicator, 4-20 mA input
S315-IP66	Loop powered 4-digit Indicator, 4-20 mA input, with IP66 enclosure (130x80x60 mm)
S315-IP66D	Loop powered 4-digit Indicator, 4-20 mA input, with 2 instruments and double IP66 enclosure

MODULAR INDICATORS / TOTALIZERS / BATCH COUNTERS WITH DIGITAL INPUT

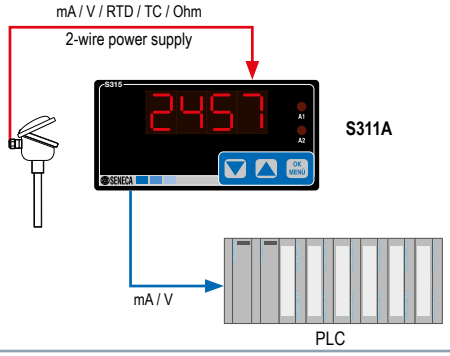
Code				Description
Base model	S311D			Indicator / totalizer / batch counter with digital/frequency input
Display		-4		4-digit LED display
		-6		6-digit LED display
		-8		8-digit LED display
		-11		4+7 digit LED display
Power Supply			-L	10-40 Vdc / 19-28 Vac
			-H	80-265 Vac
Optional board			-O	Card with 2 SPDT relays, ModBUS RTU interface, reset input

ACCESSORIES AND SOFTWARE

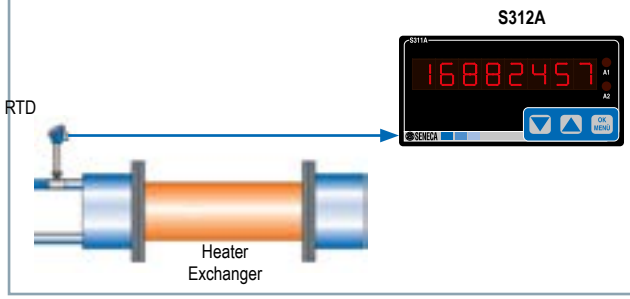
Code	Description
EASY SETUP	Configuration software for S311A, S311D, S312A models
S311OPZ	Optional card with 2 SPDT relay alarms, Modbus interface, reset input for S311A / S311D / S311G indicators (only ModBUS)
S311-T	Calibration service for S311 Series indicators - totalizers

APPLICATION DIAGRAMS

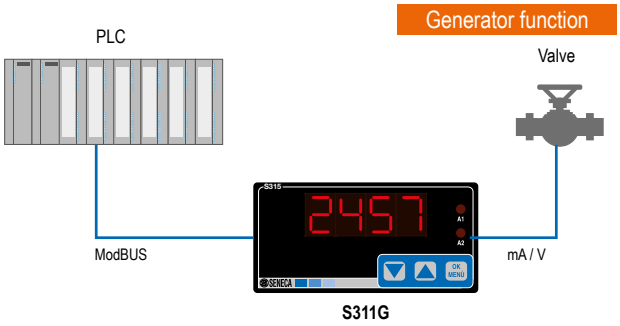
DISPLAY OF ANALOG SIGNAL AND RETRANSMISSION TO PLC



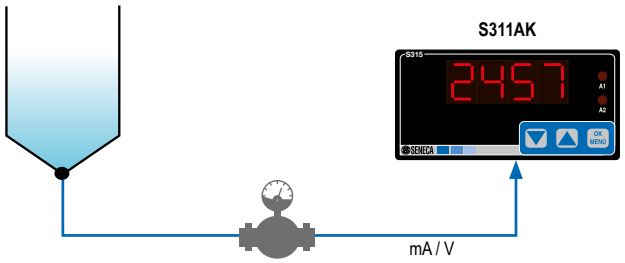
DATA VISUALIZATION FOR CONSUMPTION CALCULATION – HEAT EXCHANGER



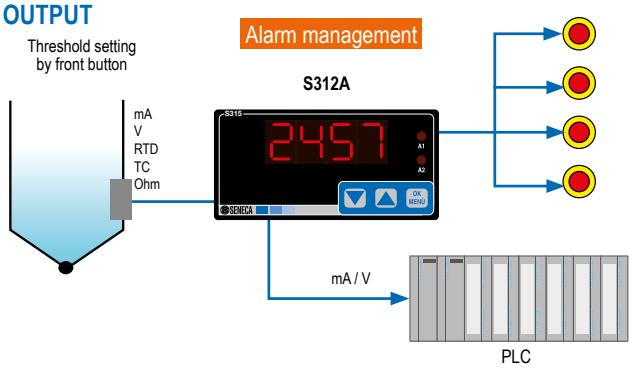
SIGNAL GENERATION IN AUTO/MAN MODE WITH BUMPLESS FUNCTION



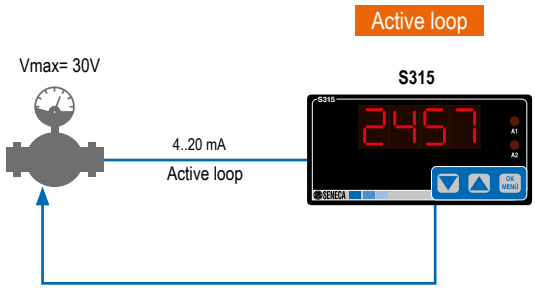
INSTANT DISPLAY OF ANALOG SIGNAL FROM SENSOR



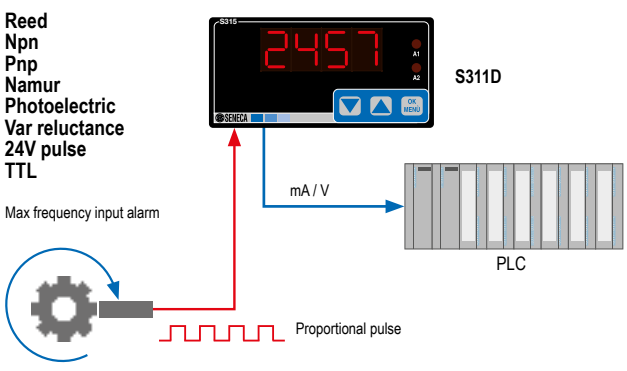
SIGNAL DISPLAY AND RETRANSMISSION WITH ALARMS OUTPUT



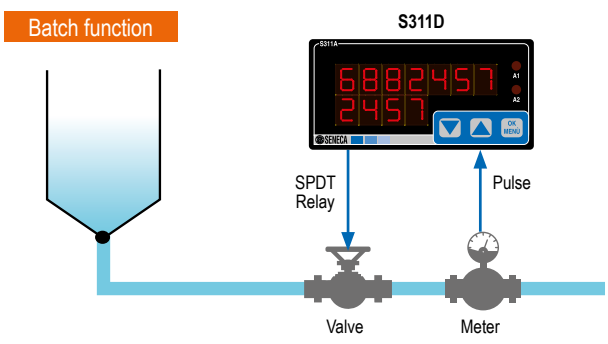
ANALOG SIGNAL VISUALIZATION FROM TRANSDUCER WITH ACTIVE LOOP



IMPULSE SIGNAL VISUALIZATION AND TOTALIZATION



OUTPUT ACTIVATION WITH TOTALIZER / BATCH COUNTER FUNCTION



HIGH BRIGHTNESS LED INDICATORS WITH ANALOG INPUT

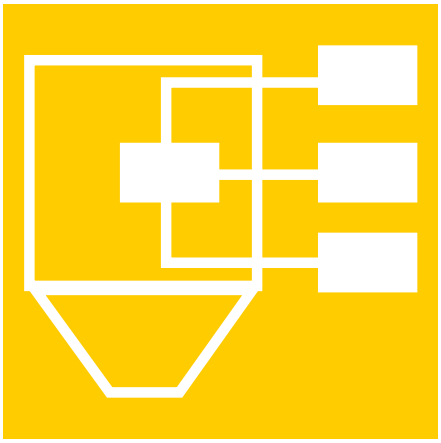
	S200 / S201	S301 / S301 B	S310 / S320A
			
	3 ½ digit digital indicators	4-digit Indicators with universal analog input and retransmitted output	3 ½ digit Indicators with analog input (V,I) and SPDT relay alarms
GENERAL DATA			
Power Supply	115 - 230 Vac ± 10% 50 - 60 Hz	115 - 230 Vac ± 10% 50 - 60 Hz	115 - 230 Vac ± 10% 50 - 60 Hz
Power supply for transducers	+15 Vdc 350 mA and -15 Vdc 75 mA; 24 Vdc, 500 mA	-	-
Max Consumption	11 VA	4 VA	3.5 VA
Rejection	40 dB	-	-
Communication Interfaces	-	RS232 / RS485, 9.600 bbs, max 1.000 m and 31 instruments	-
Memory	-	EEPROM, 10 years	-
DISPLAY AND MEASUREMENT			
Display	3 ½ digits Red 14 mm LEDs	4 digits Bargraph with 20 elements (50 mm) Red 14 mm LEDs	3 ½ digits Red 14 mm LEDs
Accuracy	0.3%	0.1% (voltage/current input, retransmitted output) 0.2% (thermoresistance, potentiometer)	0.3%
Stability	0.01%/°C	0.01%/°C	0.01%/°C
Linearity	-	From 0.01% to 0.5%	-
Cold junction	-	1°C (20-40°C)	-
INPUT DATA			
Channels	1	1	1
Type and range	Current: 0 – 20, 4 - 20 mA Voltage: 0 – 5/ 1-5/ 0 –10/ 2 -10 Vdc	Voltage from 200 mV to 10 V (4 scales) Current up to 20 mA Potentiometer up to 15 kOhms Pt100 (-200..+650°C) TC J,K,R,S,T,B	Current 0-20, 4-20 mA Voltage 0-2 / 0.4-2 / 0-5 / 1-5 (0-10, 2-10 on request) Vdc Pt100 (optional) TC K, J (optional)
Frequency	-	3 readings per second	-
ANALOG OUTPUT DATA			
Channels	1	1	1
Type and range	Precision potentiometer setpoint (0/1-5 Vdc; 4-20mA active)	Impressed current 0..20/4..20 mA Voltage 0..5 / 0..10 / 1..5 / 2..10 V	Active/passive retransmitted output, optically isolated, 0..20 / 4..20 mA
Resolution		From 0.025% to 0.032%	
ALARM OUTPUT DATA			
Contacts	-	3, 4	1, 2
Type	-	SPDT relay 5A - 250 Vac Open collector 35 Vdc - 200 mA	SPDT relay 5A - 250 Vac (resistive load)
THERMOMECHANICAL DATA			
Operating Temperature	-10..+60°C	-10..+55°C	0..50°C
Enclosure	Self-extinguishing Noryl “V0” shock-resistant	Self-extinguishing Noryl “V0” shock-resistant	Self-extinguishing Noryl “V0” shock-resistant
Frontal Protection	IP41	IP41	IP41
Removable	Removable	Removable	Removable
Dimensions	96x96x117 mm	96x48x148 mm (S301); 96x96x148 mm (S301B)	96x48x148 mm (S310); 96x96x148 mm (S320A)
Weight	750 g	500 g (S301); 600 g (S301B)	500 g (S310); 600 g (S320A)
SETTINGS, STANDARDS			
Software	-	Data request and writing	-
Front keys	-	Diagnostics and programming	-
Trimmer	Zero, span display (from -999 to 1,999)	-	Zero, span display (from -999 to 1,999); alarms
Jumpers / Shunt	Decimal point	-	Full scale, alarms, input type, decimal point, retransmitted output
Compliance	CE	CE	CE

ORDER CODES	
Code	**Description**
S200-1-ST	Stabilized dual power supply 115 / 230 Vac
S200D-1-ST	3 ½ digit Indicator with power supply 115 / 230 Vac
S201D-1-ST	3 ½ digit Indicator with power supply 115 / 230 Vac, powered Transducer 24 Vdc
S201DP-1-ST	3 ½ digit Indicator with power supply 115 / 230 Vac, powered Transducer 24 Vdc + setpoint
S301-1-R	4-digit Indicator with µP universal input and retransmitted output, powered 115 / 230 Vac
S301-1-R-AOC-S	4-digit Indicator with µP universal input and retransmitted output, Power Supply 115 / 230 Vac, 4 open collector alarms, RS232/RS485
S301-1-R-AR-S	4-digit Indicator with µP universal input and retransmitted output, Power Supply 115 / 230 Vac, 3 SPDT alarms, RS232/RS485
S301-23-R	4-digit Indicator with µP universal input and retransmitted output, powered 24 Vac/dc
S301-23-R-AOC-S	4-digit Indicator with µP universal input and retransmitted output, Power Supply 24 Vac/dc, 4 open collector alarms, RS232/RS485
S301-23-R-AR-S	4-digit Indicator with µP universal input and retransmitted output, Power Supply 24 Vac/dc, 3 SPDT alarms, RS232/RS485

ORDER CODES	
Code	**Description**
S301B-1-R	4-digit Indicator with µP and bargraph, universal input and retransmitted output, powered 115 / 230 Vac
S301B-1-R-AOC-S	4-digit Indicator with µP and bargraph, universal input and retransmitted output, powered 115 / 230 Vac, open collector alarms, RS232/RS485
S301B-1-R-AR-S	4-digit Indicator with µP and bargraph, universal input and retransmitted output, Power Supply 115 / 230 Vac, 3 SPDT alarms, RS232/RS485
S301B-23-R	4-digit Indicator with µP and bargraph, universal input and retransmitted output, powered 24 Vac/dc
S301B-23-R-AOC-S	4-digit Indicator with µP and bargraph, universal input and retransmitted output, Power Supply 24 Vac/dc, 4 open collector alarms, RS232/RS485
S301B-23-R-AR-S	4-digit Indicator with µP and bargraph, universal input and retransmitted output, powered 24 Vac/dc, 3 SPDT alarms, RS232/RS485
S320A-1-ST	3 ½ digit Indicator with V/I input and 2 relay alarms, dim. 96x96, powered 115 / 230 Vac
S320A-1-ST-R	3 ½ digit Indicator with V/I input and 2 relay alarms, dim. 96x96, Power Supply 115 / 230 Vac, retransmitted output
S320A-23-ST	3 ½ digit Indicator with V/I input and 2 relay alarms, dim. 96x96, powered 24 Vac/dc
S320A-23-ST-R	3 ½ digit Indicator with V/I input and 2 relay alarms, dim. 96x96, Power Supply 24 Vac/dc, retransmitted output

The technical data and diagrams in this document are indicative and not binding.

4.7



BATCH CONTROLLERS

S20N1-S21N1 Series

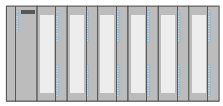


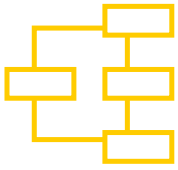
S20N1 / S21N1

BATCH CONTROLLER WITH PULSE INPUT, LED DISPLAY AND MODBUS INTERFACE

The SENECA S20N1 and S21N1 batch controllers represent economical, simplified, and safe solutions for process automation. Equipped with a front polycarbonate membrane measuring 72x144 mm with two 5-digit high-brightness red LED numerical displays, 7 operational status indication LEDs, and 6 front buttons for programming, S20N1 and S21N1 acquire digital signals from clean contacts, reed contacts, NPN transistors, Namur sensors, Hall effect sensors, or photoelectric sensors.
The systems are designed to control measuring probes and operate valves or motors to manage dosing, filling, withdrawal, and fluid regeneration processes in an automatic, timed, and highly precise manner. The SENECA S20N1 and S21N1 batch controllers can be used as stand-alone dosing units or as “auto-manual” stations. In this second mode, they act as local control units, allowing manual correction, integration, or interruption of dosages commanded remotely by the PLC. This improves system flexibility and redundancy, dosing capacity, recipe development, and energy efficiency of controlled processes.

STAND-ALONE OPERATION OR AUTO-MANUAL STATION IN COMBINATION WITH PLC CONTROL	FLEXIBLE RECIPE TMANAGEMENT	1 CONFIGURABLE PULSE INPUT (FREQ. MAX 2.2 kHz)	2 DIGITAL SPDT RELAY OUTPUTS (CAPACITY 5 A, 250 V, RESISTIVE LOAD)
CONFIGURABLE RS485 MODBUS SERIAL PORT	RS232 SERIAL PORT FOR IMPACT PRINTER CONNECTION	S20N1KIT COMMAND BOARD FOR EXTERNAL BUTTONS AND LAMPS	2 5-DIGIT HIGH BRIGHTNESS RED LED NUMERIC DISPLAYS (SET + DOSING)
MICRO USB CONNECTOR FOR SW/FW UPDATES	6 FRONT PROGRAMMING BUTTONS	SPECIAL EX AND IP65 VERSIONS	SELF-POWERED INPUT AMPLIFICATION BOARDS

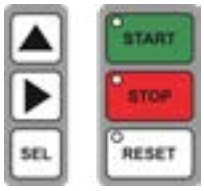














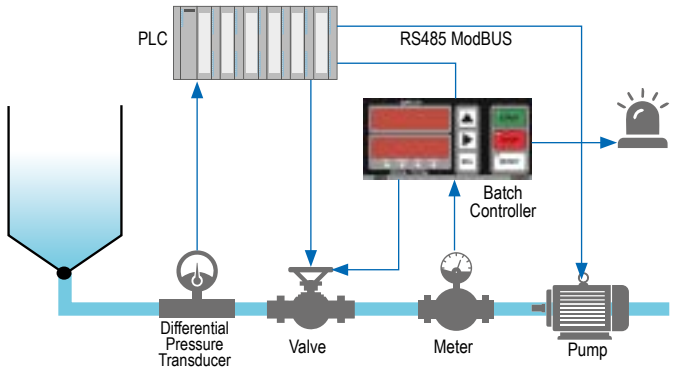


APPLICATION FIELDS

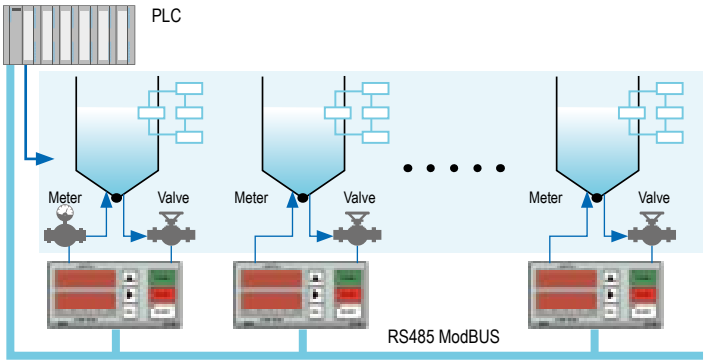
WATER TREATMENT	WASTEWATER	WINE, BEER, AND SPIRITS PRODUCTION	PAPER MILLS
FOOD & BEVERAGE	PHARMACEUTICAL AND BIOENGINEERING	OIL & GAS	PRODUCTION OF SOLVENTS, DILUENTS, PAINTS

APPLICATION EXAMPLES

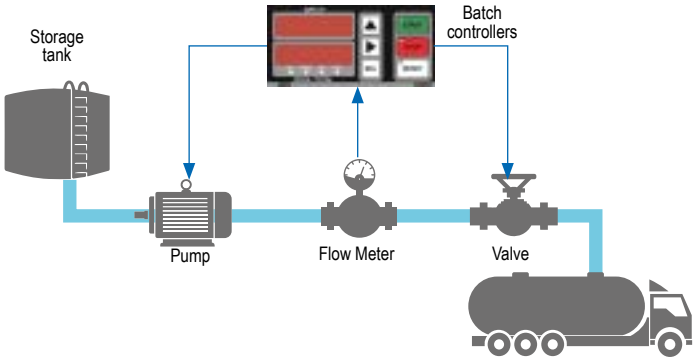
BATCH MANAGEMENT IN COMBINATION WITH PLC



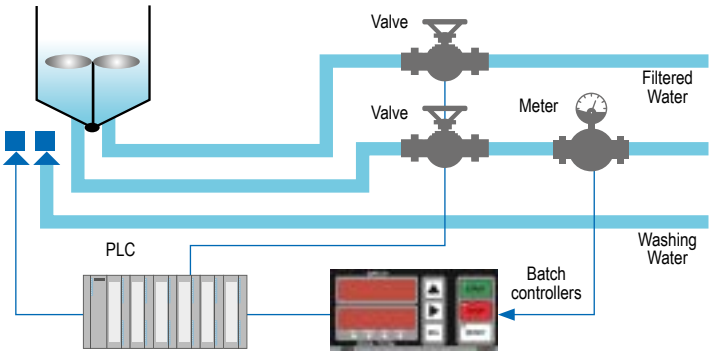
MULTI-RECIPE MANAGEMENT FROM REMOTE (PLC) OR LOCAL (AUTO-MANUAL STATION)



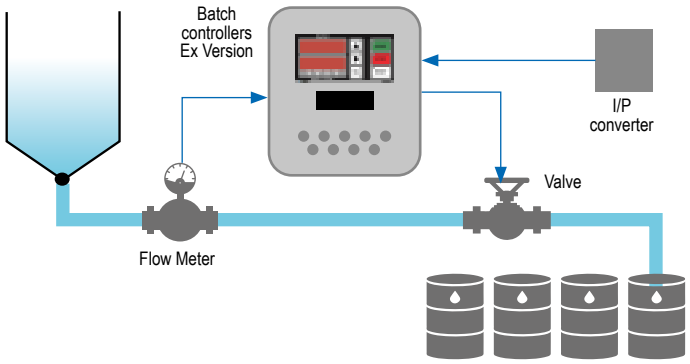
BATCH CONTROL FOR TANKER TRUCK FILLING



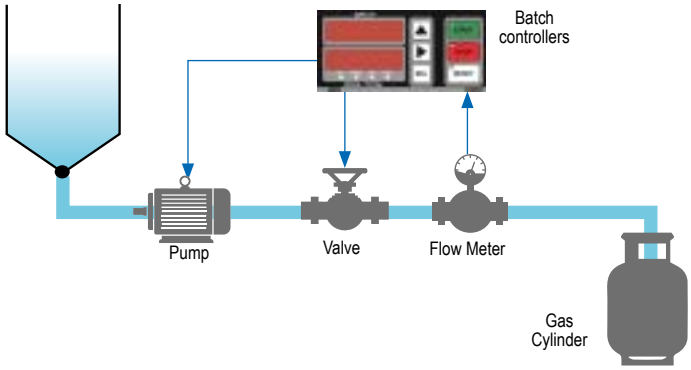
FILTER REGENERATION SYSTEM FOR AQUEDUCT SECTOR



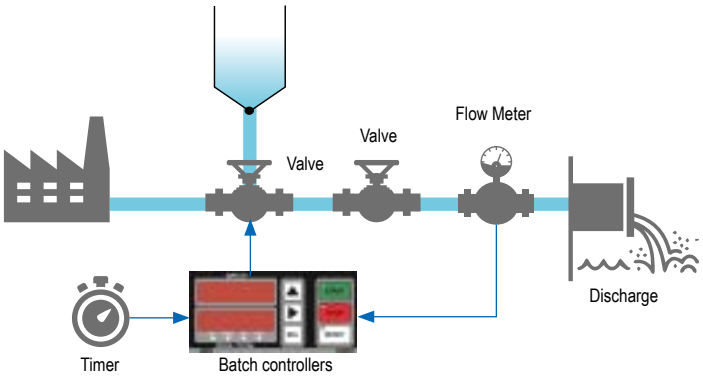
BARREL FILLING SYSTEM IN HAZARDOUS ENVIRONMENTS



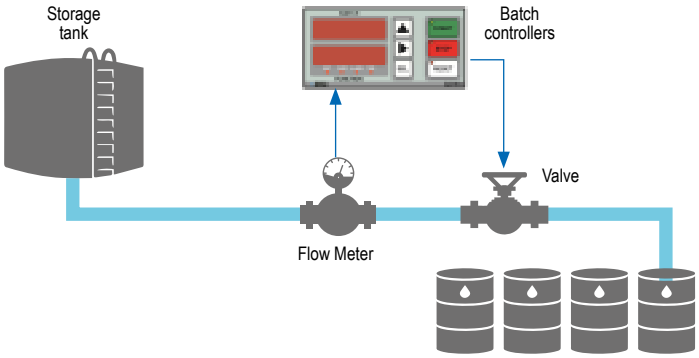
GAS REPLENISHMENT SYSTEM FOR THE OENOLOGY SECTOR



INDUSTRIAL DISCHARGE CONTROL SYSTEM



REPETITIVE BARREL FILLING SYSTEM WITH 2-SPEED VALVE CONTROL



PREDETERMINATORS

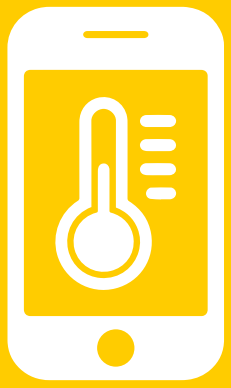
	S20N1	S21N1
		
	Basic Predeterminator	**Predeterminator with clock**
GENERAL DATA		
Power Supply	115/230 Vac ± 50/60 Hz; 24 Vac/dc	115/230 Vac ± 50/60 Hz; 24 Vac/dc
Power supply for transducers	12/24 Vdc, 30 mA (max)	12/24 Vdc, 30 mA (max)
Max Consumption	10 VA	10 VA
Data Storage	EEPROM, data storage	EEPROM, data storage
Clock	-	Clock with autonomous battery, data memory, automatic daylight saving time correction
Interfaces	#1 RS232 (printer command) #1 RS485 / ModBUS (data control and monitoring) #1 Micro USB (firmware update)	#1 RS232 (printer command) #1 RS485 / ModBUS (data control and monitoring) #1 Micro USB (firmware update)
DISPLAY AND MEASUREMENTS		
Display	2 numeric 5-digit LED displays	2 numeric 5-digit LED displays
Status Indicators	Start, stop, reset	Start, stop, reset
INPUT DATA		
Number of channels	1 (isolated)	1 (isolated)
Type	From reed sensor, npn (2/3 wire), Namur, Hall effect, photoelectric	From reed sensor, npn (2/3 wire), Namur, Hall effect, photoelectric
Frequency	1,000 Hz, minimum pulse duration 0.1 ms	1,000 Hz, minimum pulse duration 0.1 ms
Process	3 inputs (start, stop, reset)	3 inputs (start, stop, reset)
OUTPUT DATA		
Number of channels	2	2
Type	SPDT relay, 5 A 250 V (resistive load)	SPDT relay, 5 A 250 V (resistive load)
THERMOMECHANICAL DATA		
OPERATING TEMPERATURE	0..50°C	0..50°C
Enclosure	Self-extinguishing Noryl V0	Self-extinguishing Noryl V0
Frontal Protection	Front polycarbonate membrane	Front polycarbonate membrane
Connections	Removable rear terminal blocks	Removable rear terminal blocks
Dimensions (w x h x d)	144 x 72 x 130 mm	144 x 72 x 130 mm
Panel cutout dimensions	135 x 67 mm	135 x 67 mm
Weight	800 g	800 g
SETTINGS, STANDARDS		
Programming / Dosing	Via front buttons	Via front buttons
Operating Modes	Stand-alone or Auto-Manual in combination with remote PLC control (via RS485 - ModBUS)	Stand-alone or Auto-Manual in combination with remote PLC control (via RS485 - ModBUS)
Max # of recipes	1	8
Compliance	CE	CE

ORDER CODES	
Code	**Description**
Batch Controller - Standard Versions	
S20N1-1-ST	Batch controller with pulse input, LED display and ModBUS interface, powered 115 / 230 Vac
S20N1-23-ST	Batch controller with pulse input, LED display and ModBUS interface, powered 24 Vac/dc
S21N1-1-ST	Batch controller with pulse input, LED display, ModBUS interface, and self-powered clock, powered 115 / 230 Vac
S21N1-23-ST	Batch controller with pulse input, LED display, ModBUS interface, and self-powered clock, powered 24 Vac/dc
Batch Controller - EX Versions	
S20N1EX-1-ST	Batch controller with pulse input, LED display, and ModBUS interface in an explosion-proof Eexd housing, powered 115 / 230 Vac
S20N1EX-23-ST	Batch controller with pulse input, LED display, and ModBUS interface in an explosion-proof Eexd housing, powered 24 Vac/dc
S21N1EX-1-ST	Batch controller with pulse input, LED display, ModBUS interface, and self-powered clock in an explosion-proof Eexd housing, powered 115 / 230 Vac
S21N1EX-23-ST	Batch controller with pulse input, LED display, ModBUS interface, and self-powered clock in an explosion-proof Eexd housing, powered 24 Vac/dc

ORDER CODES	
Code	**Description**
Batch Controller - IP65 Versions	
S20N1IP65-1-ST	Batch controller with pulse input, LED display, and ModBUS interface in an IP65-rated housing, powered 115 / 230 Vac
S20N1IP65-23-ST	Batch controller with pulse input, LED display, and ModBUS interface in an IP65-rated housing, powered 24 Vac/dc
S21N1IP65-1-ST	Batch controller with pulse input, LED display, ModBUS interface, and self-powered clock in an IP65-rated housing, powered 115 / 230 Vac
S21N1IP65-23-ST	Batch controller with pulse input, LED display, ModBUS interface, and self-powered clock in an IP65-rated housing, powered 24 Vac/dc
Accessories	
FH190-24	24-column impact printer for S21N1, powered 9-40 Vdc
S20ADP	Standard input amplification board
S20ADP-CM	Input amplification board in modular housing
S20ADP-IP65	Input amplification board in waterproof housing
S20N1-KIT-1-ST	Power supply board for buttons, powered 115 / 230 Vac
S20N1-KIT-23-ST	Power supply board for buttons, powered 24 Vac/dc

The technical data and diagrams in this document are indicative and not binding.

4.8



PROFESSIONAL PORTABLE MEASUREMENT SYSTEMS

MY Series



MY Series

PORTABLE PROFESSIONAL PROBES FOR TEMPERATURE AND HUMIDITY MEASUREMENTS

The **MY Series** is a range of portable transmitters capable of transforming mobile devices such as smartphones or tablets into Android-based data acquisition systems.
Easily configurable via a dedicated app, the MY Series allows the display of temperature (RTD, TC) and humidity values in analog or digital form, enabling the sharing of current measurements via SMS, email, and other data platforms.
The MY Series is the ideal candidate for professional and industrial measurements in various contexts (machinery, climate chambers, food storage and transport, laboratories, HVAC systems), both for diagnostic purposes and environmental parameter monitoring.

PIV - APP

Google play

HIGHLIGHTS

- IMMEDIATE SENSOR DATA DISPLAY ON SMARTPHONE OR TABLET
- FREE APP AVAILABLE FOR ANDROID DEVICES WITH MICRO USB OTG
- INSTANT MEASUREMENT AND SHARING VIA EMAIL, SMS, SOCIAL MEDIA, AND MESSAGING PLATFORMS
- PROBES AVAILABLE FOR RTD, THERMOCOUPLE, RELATIVE HUMIDITY, AND TEMPERATURE
- ANALOG OR DIGITAL DISPLAY OF THE MEASUREMENT
- MANAGEMENT OF MULTIPLE TRANSMITTERS WITH THE SAME APP
- QUICK SELECTION OF SCALES AND MEASUREMENT UNITS
- M121 CONNECTOR FOR RELIABLE AND PRECISE COUPLING WITH THE SENSOR ELEMENT

PT100 PROBES • MY-PT

	MY-PT-150-3	MY-PT-250-2	MY-PT-150-3R
			
	Portable PT100 probe, class B, d=3 mm, L=150 mm, rounded tip, M12M connector	**Portable PT100 probe, class B, d=2 mm, L=250 mm, rounded tip, M12M connector**	**Portable PT100 probe, class B, d=3 mm, L=150 mm, pointed tip, M12M connector**
GENERAL DATA			
Measurement type	Temperature	Temperature	Temperature
Power Supply	Powered by USB port	Powered by USB port	Powered by USB port
Environmental conditions	-20..+50°C (handle)	-20..+50°C (handle)	-20..+50°C (handle)
Interface	Micro USB	Micro USB	Micro USB
Accuracy	Class B (sensor), conversion error (whichever is greater between 1% of the measurement or 0.5°C)	Class B (sensor), conversion error (whichever is greater between 1% of the measurement or 0.5°C)	Class B (sensor), conversion error (whichever is greater between 1% of the measurement or 0.5°C)
Measurement Range	-30..300°C	-30..300°C	-30..300°C
Response Time	15 s	15 s	15 s
Probe connector	M12	M12	M12
Configuration system	Android PIV APP via smartphone with USB OTG	Android PIV APP via smartphone with USB OTG	Android PIV APP via smartphone with USB OTG
Functions / settings (through the app)	Analog and digital measurement display Max and min session storage Session reset with measurement time indication Scale change in analog mode Unit of measurement change (K, °C, °F, °R) Current measurement logging with date, time, value, and sharing option (SMS, Email, Whatsapp)	Analog and digital measurement display Max and min session storage Session reset with measurement time indication Scale change in analog mode Unit of measurement change (K, °C, °F, °R) Current measurement logging with date, time, value, and sharing option (SMS, Email, Whatsapp)	Analog and digital measurement display Max and min session storage Session reset with measurement time indication Scale change in analog mode Unit of measurement change (K, °C, °F, °R) Current measurement logging with date, time, value, and sharing option (SMS, Email, Whatsapp)
Marking	CE	CE	CE
SENSOR			
Thermocouple	Pt100, accuracy per IEC 751	Pt100, accuracy per IEC 751	Pt100, accuracy per IEC 751
Isolation	100 MΩ a 100 Vcc	100 MΩ a 100 Vcc	100 MΩ a 100 Vcc
Electrical connection	M12x1 (DIN-VDE0627) screw-in molded 4-contact nylon connector with metal thread	M12x1 (DIN-VDE0627) screw-in molded 4-contact nylon connector with metal thread	M12x1 (DIN-VDE0627) screw-in molded 4-contact nylon connector with metal thread
Protection class	IP67	IP67	IP67
Construction	High insulation compact mineral (MgO), AISI 316 stainless steel sheath	High insulation compact mineral (MgO), AISI 316 stainless steel sheath	High insulation compact mineral (MgO), AISI 316 stainless steel sheath
Diameter	3 mm	2 mm	3 mm
Length	150 mm	250 mm	150 mm

ORDER CODES

PT100 MEASUREMENT SYSTEM

Code	Description
TRANSMITTER	
MY-PT-150-3	Portable transmitter for PT100 with PT-150-3-M12 probe
MY-PT-250-2	Portable transmitter for PT100 with PT-250-2-M12 probe
MY-PT-150-3R	Portable transmitter for PT100 with PT-150-3R-M12 probe
ACCESSORIES / SPARE PARTS	
PT-150-3-M12	PT100 class B, d=3 mm, L=150 mm, M12 connector
PT-250-2-M12	PT100 class B, d=2 mm, L=250 mm, M12 connector
PT-150-3R-M12	PT100 class B, d=3 mm, L=150 mm, tapered terminal, M12 connector
COMPLETE MEASUREMENT KIT	
MY-PT-KIT	Portable transmitter for PT100 with PT-150-3-M12, PT-250-3-M12, and PT-150-3R-M12 probes

COMPLETE MEASUREMENT KIT WITH PORTABLE CASE



The image is indicative and does not necessarily reflect the contents of the KIT

The technical data and diagrams in this document are indicative and not binding.

THERMOCOUPLE PROBES TYPE K • MY-TC

	MY-TC-250-3	MY-TC-250-1.5	MY-TC-AC	MY-UT
				
	Portable thermocouple probe K, d=3 mm, L=250 mm, rounded tip, M12M connector	**Portable thermocouple probe K, d=1.5 mm, L=250 mm, rounded tip, M12M connector**	**Portable type K thermocouple probe with arch, M12M connector**	**Portable probe for temperature and relative humidity measurement, M12M connector**
GENERAL DATA				
Measurement type	Temperature	Temperature	Temperature	Temperature / Relative humidity
Power Supply	Powered by USB port	Powered by USB port	Powered by USB port	Powered by USB port
Environmental conditions	-20..+50°C (handle)	-20..+50°C (handle)	-20..+50°C (handle)	-20..+50°C (handle)
Interface	Micro USB	Micro USB	Micro USB	Micro USB
Accuracy	Greater of 1% of measurement / 2°C	Greater of 1% of measurement / 2°C	Greater of 1% of measurement / 2°C	±3% RH (20..80% RH) ±5% (<20%RH, >80%RH) ±0.5°C at 25°C, 1.5°C between -10..+60°C
Measurement Range	0..1,150°C	0..1,150°C	0..1,150°C	-40..+120°C (Temp.) / 0..100% (UR)
Response Time	15 s	15 s	15 s	10 s
Probe connector	M12	M12	M12	M12
Configuration system	Android PIV APP via smartphone with USB OTG	Android PIV APP via smartphone with USB OTG	Android PIV APP via smartphone with USB OTG	Android PIV APP via smartphone with USB OTG
Functions / settings (via app)	Analog and digital measurement display Max and min session storage Session reset with measurement time indication Scale change in analog mode Unit of measurement change (K, °C, °F, °R) Current measurement logging with date, time, value, and sharing option (SMS, Email, Whatsapp)	Analog and digital measurement display Max and min session storage Session reset with measurement time indication Scale change in analog mode Unit of measurement change (K, °C, °F, °R) Current measurement logging with date, time, value, and sharing option (SMS, Email, Whatsapp)	Analog and digital measurement display Max and min session storage Session reset with measurement time indication Scale change in analog mode Unit of measurement change (K, °C, °F, °R) Current measurement logging with date, time, value, and sharing option (SMS, Email, Whatsapp)	Analog and digital measurement display Max and min session storage Session reset with measurement time indication Scale change in analog mode Unit of measurement change (K, °C, °F, °R) Current measurement logging with date, time, value, and sharing option (SMS, Email, Whatsapp)
Marking	CE	CE	CE	CE
SENSOR				
Thermocouple	Single-element K thermocouple per IEC 584 class 2 (ASTM e 230)	Single-element K thermocouple per IEC 584 class 2 (ASTM e 230)	Compact version K thermocouple arch	Integrated capacitive temperature and relative humidity sensor
Isolation	100 MΩ a 500 Vcc	100 MΩ a 500 Vcc	100 MΩ a 500 Vcc	
Electrical connection	Molded male connector in nylon with screw-in M12x1 (DIN-VDE0627) connector with metal thread	Molded male connector in nylon with screw-in M12x1 (DIN-VDE0627) connector with metal thread	Molded male connector in nylon with screw-in M12x1 (DIN-VDE0627) connector with metal thread	Nylon-molded male connector with screw-in fitting M12x1 (DIN-VDE0627) with metal threading
Protection class	IP67	IP67		
Construction	Compact mineral insulation (MgO) with isolated hot junction, Inconel 600 sheath	Compact mineral insulation (MgO) with isolated hot junction, Inconel 600 sheath	Compact mineral insulation (MgO) with isolated hot junction	AISI 316 stainless steel (d=6 mm)
Diameter	3 mm	1.5 mm	12 mm	6 mm
Length	250 mm	250 mm	82 mm	120 mm
Additional equipment	K thermocouple, L=1000 mm, flat FEP wire ANSI M12M connector	K thermocouple, L=1000 mm, flat FEP wire ANSI M12M connector	K thermocouple, L=1000 mm, flat FEP wire ANSI M12M connector	-

ORDER CODES

PORTABLE THERMOCOUPLE MEASUREMENT SYSTEM FOR TC-K

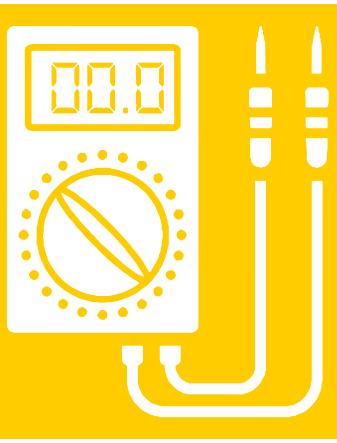
Code	Description
TRANSMITTER	
MY-TC-250-3	Portable transmitter for thermocouple with TCK-250-3-M12 and TCK-W-1000-M12 probes
MY-TC-250-1.5	Portable transmitter for thermocouple with TCK-250-1.5-M12 and TCK-W-1000-M12 probes
MY-TC-AC	Portable transmitter for thermocouple with TCK-AC-M12 and TCK-W-1000-M12 probes
ACCESSORIES / SPARE PARTS	
TCK-250-3-M12	Type K thermocouple, d=3 mm, L=250 mm, M12 connector attachment
TCK-250-1.5-M12	Type K thermocouple, d=1.5 mm, L=100 mm, M12 connector attachment
TCK-W-1000-M12	Type K thermocouple, exposed junction, L=1000 mm, M12 connector attachment
TCK-AC-M12	Type K thermocouple with arch, M12 connector attachment
COMPLETE MEASUREMENT KIT	
MY-TC-KIT	Portable transmitter for thermocouple with TCK-AC-M12, TCK-250-3-M12, TCK-250-1.5-M12, and TCK-W-1000-M12 probes

TEMPERATURE/HUMIDITY MEASUREMENT SYSTEM

Code	Description
TRANSMITTER	
MY-UT	Portable temperature/humidity transmitter with UT-M12 probe
ACCESSORIES / SPARE PARTS	
UT-M12	Temperature/relative humidity probe, M12 connector attachment
CONFIGURATION APP	
PIV-APP	Android app for data visualization, scaling, and sharing. Works with smartphones using USB OTG

The technical data and diagrams in this document are indicative and not binding.

4.9



MULTIFUNCTION CALIBRATORS



TEST-4

PORTABLE SIGNAL GENERATOR / MEASUREMENT DEVICE FOR ANALOG SIGNALS

Test-4 is an essential tool for calibration sessions, laboratory tests, and the simulation of analog measurements controlled by industrial devices (PLCs, regulators, data acquisition systems, etc.). With a total precision of less than 0.1% and a resolution of 1 µA / 1 mV, Test-4 guarantees optimal calibration results. It allows for the simulation of both voltage and current ramps (active or passive). It is equipped with a low-power OLED display, multi-turn trimmer knob, and a non-slip shell. Test-4 can be powered by a 220 Vac network through a dedicated power adapter or by 2 NiMh batteries, providing an average autonomy of 20 hours.

TECHNICAL DATA

GENERAL DATA

Power Supply	2 NiMh AA batteries, 2650 mAh Autonomy: 8 hours (minimum with max load), 20 hours (average) From 220 Vac network via dedicated charger/battery charger
Protection class	IP 20
Operating temperature	0..50°C (recommended)
Humidity	30..90% non-condensing
Dimensions	140 x 75 x 33 mm
Weight	250 g
Isolation	Battery-powered device, intrinsically isolated
Rejection	50-60 Hz
Max frequency Sampling	10 Hz
Input/Output signals	Measurement/Generation voltage: 0..11 V Measurement/Generation current: 0..21 mA Protection ± 30 V
Accuracy	0.1% for each input/output type
Resolution	0,002 mA 0,001 V
Standards	EN61000-6-4; EN61000-6-2; EN61010-1

OPERATIONAL DATA

Function buttons	ESC key for ESC / ON/OFF functions and reset from screensaver after 7 minutes of inactivity Knob: Increase/decrease current/voltage value (by rotating); change of "weight" with value*10N, N=0, 1, 2, 3 (by pressing)
Available languages	Italian, English, German, French, Spanish
Contrast	15 levels
Screensaver	Vertical scroll of display content after 7 minutes of inactivity. Restoration by pressing ESC / ON/OFF key
Function menu	General setup (select operation type, signal type, language, display contrast, encoder sensitivity) Generation (select voltage/current/passive current) Measurement (select voltage/current) Ramp mode for generating currents and voltages
Error signals	Overvoltage: Reading voltage higher than 11 V Undervoltage: Reading voltage lower than -0.2 V Overcurrent: Reading current higher than 21 mA Undercurrent: Reading current lower than -0.1 mA Flashing value: Voltage/Current generation failed

CONNECTIONS

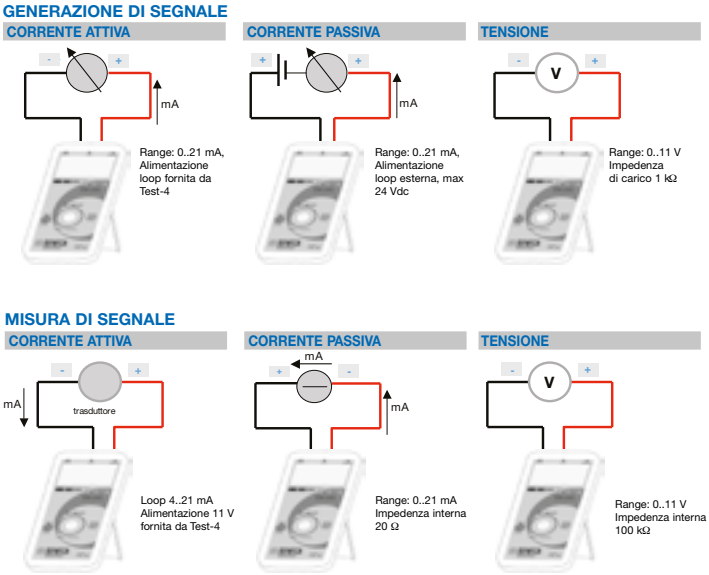
Input/Output	2 mm diameter test leads
Power Supply	Battery charger socket, battery compartment on the back, under protective rubber cover
Micro USB	For future updates

EXAMPLES



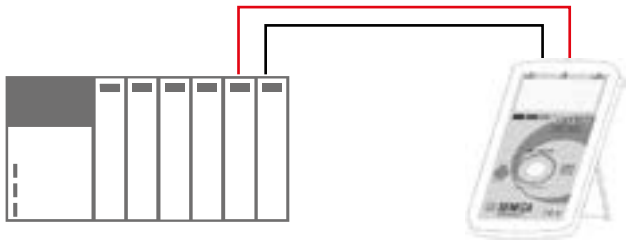
(1) Portable case
(2) Test-4 complete with NiMh 2650 mAh batteries
(3) Charger, (4) Test leads
(5) Operating manual

WIRING DIAGRAMS



EXAMPLES

FIELD SIGNAL SIMULATION



PROCESS CALIBRATION FOR SENSORS, ACTUATORS, POSITIONERS, PLCs, REGULATORS, ETC.



ORDER CODES

Code	Description
TEST-4	Signal generator, portable V-mA meter with ramp simulation
TEST-4-PK	Precision Kit (set of precision test leads and alligator clips) for Test-4
TEST-4-R	Set of precision test leads for Test-4
TEST-4-T	ISO 9001 calibration certificate for Test-4

The technical data and diagrams in this document are indicative and not binding.



MSC
MULTIFUNCTION SMART CALIBRATOR

TECHNICAL DATA

GENERAL DATA

Powered by mains	From 230 Vac network via standard USB charger
Battery-powered	1 Lithium Polymer (LiPo) battery, 3400 mAh; autonomy: 8 hours (minimum @ max load), 20 hours (max)
Protection class	IP20
Operating temperature	-20..50°C (not during charging), 0-45°C during charging
Storage temperature	0..35°C
Humidity	30..90% non-condensing
Isolation	Battery-powered device, intrinsically isolated No isolation from USB port
Overvoltage protection	230 Vac max without permanent damage
Rejection	50/ 60 Hz
Max frequency Sampling	10 Hz
Operating Modes	Measurement, Generation, Datalogger Ramp
Dimensions	88 x 147 x 25 mm
Weight	330 g
Included items	Connection cables (4), charger
Factory calibration certificate	included
Approval	CE
Standards	EN61326-1; EN61010-1

MEASUREMENT ACCURACY

Accuracy	Base accuracy: 0.03%, 0.04% for current
Resolution	1 µA; 1 mV; 5 µV; 0.1°C; 0.1 µV/V

GENERATION ACCURACY

Accuracy	Base accuracy: 0.03%, 0.04% for current
Resolution	1 µA; 1 mV; 5 µV; 0.1°C; 0.02 Ohm; 0.1 µV/V

INTERFACES AND SIGNALS

Buttons	On / Off / Pairing
LED	Power-on indicator LED Communication indicator LED Error indicator LED PAIRING BT indicator LED Datalogger on indicator LED (future) Battery status indicator LED
Buzzer	Buzzer for overload signal and inability to simulate requested value
Standard sockets	# 4 4mm sockets
Thermocouple connection	Mini plug (7.9mm) for thermocouple measurement and simulation
Power Supply	Micro USB
Micro USB	For firmware update or modbus communication (virtual COM)
Wireless communication	Bluetooth Low Energy 4.1 to smartphone and Android or iOS tablet

MEASUREMENT FUNCTIONS

Current	0..24 mA active and passive; protection ±28 V
VOLTAGE (V)	0,0÷27 V
VOLTAGE (mV)	-10mV÷+90mV
Thermocouple	Type J, K, T, E, N, R, S, B, L
Resistance thermometers (2, 3, 4 wires)	Pt100, Pt500, Pt1000, Cu50, Cu100, Ni100, Ni120
Load cell	350 Ohm; -0.2 to +2.4mV/V
Impulse	Max counting frequency 1000 Hz
Frequency	0.1..1000 Hz

GENERATION FUNCTIONS

Current	0.1 to 24 mA active and passive; protection ±28 V
VOLTAGE (V)	0,1÷26 V
VOLTAGE (mV)	-10mV÷+90mV
Thermocouple	Type J, K, T, E, N, R, S, B, L
Resistance thermometers (2 wires)	Pt100, Pt500, Pt1000, Cu50, Cu100, Ni100, Ni120
Load cell	350 Ohm; -0.2 to +2.4mV/V
Impulse	Min 0.5 ms (1 to 24V) adjustable number of pulses
Frequency	0.1..1000 Hz

DATALOGGER

Datalogger	Yes
Sampling Time	>500 ms

RAMP FUNCTION

.	Current/Voltage/TC/RTD/Load Cell
Functions	Single or Loop
Type	Maximum 9 segments, ramp resolution 100 ms, minimum ramp time 1 second

MANAGEMENT APP

Available languages	App in language
O.S / Store	iOS 10.3 or higher (App Store) / Android 4.0.3 or higher (Play Store)
Function Menu	General setup (operation type selection, signal type, language) Measurement (voltage/current/passive current/thermocouple/ resistance thermometers/load cell/impulses; average-min-max value, counter reset, measurement pause; value sharing; scale change) Generation (voltage/current/passive current/thermocouple/resistance thermometers/load cell/impulses; on-off; scale change)
Error Signals	Out of measurement scale Overload generation warning Low battery Internal anomaly

LEGEND



1. Socket for thermocouple measurement/ generation
2. Measurement/generation socket -EX
3. Measurement/generation socket -SN
4. Measurement/generation socket +SN
5. Measurement/generation socket +EX
6. Power ON/OFF button
7. Bluetooth RESET button
8. PWR power indicator LED
9. Bind connection indicator LED
10. Battery status indicator LED
11. Bluetooth/USB communication LED
12. Data recording LED
13. Error signaling LED
14. Micro USB connector for power/ communication
15. RESET button
16. Battery charging status LED

INCLUDED ITEMS



(1) Portable case, (2) MSC complete with batteries, (3) power plug, (4) USB data and charging cable, (5) calibration report, (6) operating manual, (7) test cables

MEASUREMENT RANGE

MAGNITUDE	Unit of Measure	GENERATION	MEASUREMENT
Voltage (high range)	[dc V]	0..26 V	0..26 V
Voltage (low range)	[dc mV]	-10..+90 mV	-10..+90 mV
Active current	[dc mA]	0.1..+24 mA	0..+24 mA
Passive current	[dc mA]	0,1..+24 mA (3..29 V)	0..+24 mA
Pt100	[°C]	-200..+859°C	-200..+850°C
Pt500	[°C]	-200..+859°C	-200..+850°C
PT1000	[°C]	-200..+859°C	-200..+850°C
Cu50 / Cu100	[°C]	-180..+200°C	-180..+200°C
Ni100 / Ni120	[°C]	-80..+260°C	-60..+250°C
Thermocouple J	[°C]	-210..+1200°C	-210..+1200°C
Thermocouple K	[°C]	-270..+1372°C	-200..+1372°C
Thermocouple T	[°C]	-270..+400°C	-200..+400°C
Thermocouple E	[°C]	-270..+1000°C	-200..+1000°C
Thermocouple N	[°C]	-270..+1300°C	-200..+1300°C
Thermocouple R	[°C]	-50..+1768°C	-50..+1768°C
Thermocouple S	[°C]	-50..+1768°C	-50..+1768°C
Thermocouple B	[°C]	0..+1820°C	250..+1820°C
Thermocouple L	[°C]	-200..+800°C	-200..+800°C
Load Cell 350 Ohm	[mV/V]	-0.2..+2.4 mV/V	-0.2..+2.4 mV/V
Pulse / Frequency	[Hz]	01..1000 Hz (1..24 V)	0,1..1000 Hz (3..24 Vdc)

ORDER CODES

Code	Description
MSC	Multifunction Smart Calibrator - Signal generator / meter, Bluetooth app-based calibrator
MSC TOOL	Free Windows application for firmware updates and data extraction in .csv format
USB-ISO	PC-USB isolator (accessory)
MSC-POWER	1A / 5V power supply (replacement)

The technical data and diagrams in this document are indicative and not binding.



MSC-D

MULTIFUNCTION SMART CALIBRATOR WITH LCD DISPLAY

TECHNICAL DATA

GENERAL DATA

Powered by mains	From 230 Vac network via standard USB charger
Battery-powered	1 Lithium Polymer (LiPo) battery, 3400 mAh; autonomy: 8 hours (minimum @ max load), 20 hours (max)
Protection class	IP20
Operating temperature	-20..50°C (not during charging), 0-45°C during charging
Storage temperature	0..35°C
Humidity	30..90% non-condensing
Isolation	Device powered with LCD display No isolation from USB port
Overvoltage protection	230 Vac max without permanent damage
Rejection	50/ 60 Hz
Max frequency Sampling	10 Hz
Operating Modes	Measurement, Generation, Datalogger Ramp
Dimensions	88 x 147 x 25 mm
Weight	330 g
Included items	Connection cables (4), charger
Factory calibration certificate	included
Approval	CE
Standards	EN61326-1; EN61010-1

MEASUREMENT ACCURACY

Accuracy	Base accuracy: 0.03%, 0.04% for current
Resolution	1 µA; 1 mV; 5 µV; 0.1°C; 0.1 µV/V

GENERATION ACCURACY

Accuracy	Base accuracy: 0.03%, 0.04% for current
Resolution	1 µA; 1 mV; 5 µV; 0.1°C; 0.02 Ohm; 0.1 µV/V

INTERFACES AND SIGNALS

Display	Capacitive touch screen, TFT-LCD color 3.5" resolution 320x480, with backlight
Buttons	On / Off / Pairing
LED	Power-on indicator LED Communication indicator LED Error indicator LED PAIRING BT indicator LED Datalogger on indicator LED (future) Battery status indicator LED
Buzzer	Buzzer for overload signal and inability to simulate requested value
Standard sockets	# 4 4mm sockets
Thermocouple connection	Mini plug (7.9mm) for thermocouple measurement and simulation
Power Supply	Micro USB
Micro USB	For firmware update or modbus communication (virtual COM)
Communication	Ethernet

MEASUREMENT FUNCTIONS

Current	0..24 mA active and passive; protection ±28 V
VOLTAGE (V)	0,0÷27 V
VOLTAGE (mV)	-10mV÷+90mV
Thermocouple	Type J, K, T, E, N, R, S, B, L
Resistance thermometers (2, 3, 4 wires)	Pt100, Pt500, Pt1000, Cu50, Cu100, Ni100, Ni120
Load cell	350 Ohm; -0.2 to +2.4mV/V
Impulse	Max counting frequency 1000 Hz
Frequency	0.1..1000 Hz

GENERATION FUNCTIONS

Current	0.1 to 24 mA active and passive; protection ±28 V
VOLTAGE (V)	0,1÷26 V
VOLTAGE (mV)	-10mV÷+90mV
Thermocouple	Type J, K, T, E, N, R, S, B, L
Resistance thermometers (2 wires)	Pt100, Pt500, Pt1000, Cu50, Cu100, Ni100, Ni120
Load cell	350 Ohm; -0.2 to +2.4mV/V
Impulse	Min 0.5 ms (1 to 24V) adjustable number of pulses
Frequency	0.1..1000 Hz

DATALOGGER

Datalogger	Yes
Sampling Time	>500 ms

RAMP FUNCTION

.	Current/Voltage/TC/RTD/Load Cell
Functions	Single or Loop
Type	Maximum 9 segments, ramp resolution 100 ms, minimum ramp time 1 second

MANAGEMENT APP

Available languages	App in language
O.S / Store	iOS 10.3 or higher (App Store) / Android 4.0.3 or higher (Play Store)
Function Menu	General setup (operation type selection, signal type, language) Measurement (voltage/current/passive current/thermocouple/ resistance thermometers/load cell/impulses; average-min-max value, counter reset, measurement pause; value sharing; scale change) Generation (voltage/current/passive current/thermocouple/resistance thermometers/load cell/impulses; on-off; scale change)
Error Signals	Out of measurement scale Overload generation warning Low battery Internal anomaly

MEASUREMENT RANGE

MAGNITUDE	Unit of Measure	GENERATION	MEASUREMENT
Voltage (high range)	[dc V]	0..26 V	0..26 V
Voltage (low range)	[dc mV]	-10..+90 mV	-10..+90 mV
Active current	[dc mA]	0.1..+24 mA	0..+24 mA
Passive current	[dc mA]	0,1..+24 mA (3..29 V)	0..+24 mA
Pt100	[°C]	-200..+859°C	-200..+850°C
Pt500	[°C]	-200..+859°C	-200..+850°C
PT1000	[°C]	-200..+859°C	-200..+850°C
Cu50 / Cu100	[°C]	-180..+200°C	-180..+200°C
Ni100 / Ni120	[°C]	-80..+260°C	-60..+250°C
Thermocouple J	[°C]	-210..+1200°C	-210..+1200°C
Thermocouple K	[°C]	-270..+1372°C	-200..+1372°C
Thermocouple T	[°C]	-270..+400°C	-200..+400°C
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Thermocouple N	[°C]	-270..+1300°C	-200..+1300°C
Thermocouple R	[°C]	-50..+1768°C	-50..+1768°C
Thermocouple S	[°C]	-50..+1768°C	-50..+1768°C
Thermocouple B	[°C]	0..+1820°C	250..+1820°C
Thermocouple L	[°C]	-200..+800°C	-200..+800°C
Load Cell 350 Ohm	[mV/V]	-0.2..+2.4 mV/V	-0.2..+2.4 mV/V
Pulse / Frequency	[Hz]	0,1..+24 mA (1..24 V)	0,1..1000 Hz (3..24 Vdc)

ORDER CODES

Code	Description
MSC-D	Multifunction Smart Calibrator - Signal generator / meter, Bluetooth app-based calibrator with LCD display
MSC TOOL	Free Windows application for firmware updates and data extraction in .csv format
USB-ISO	PC-USB isolator (accessory)
MSC-POWER	1A / 5V power supply (replacement)

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