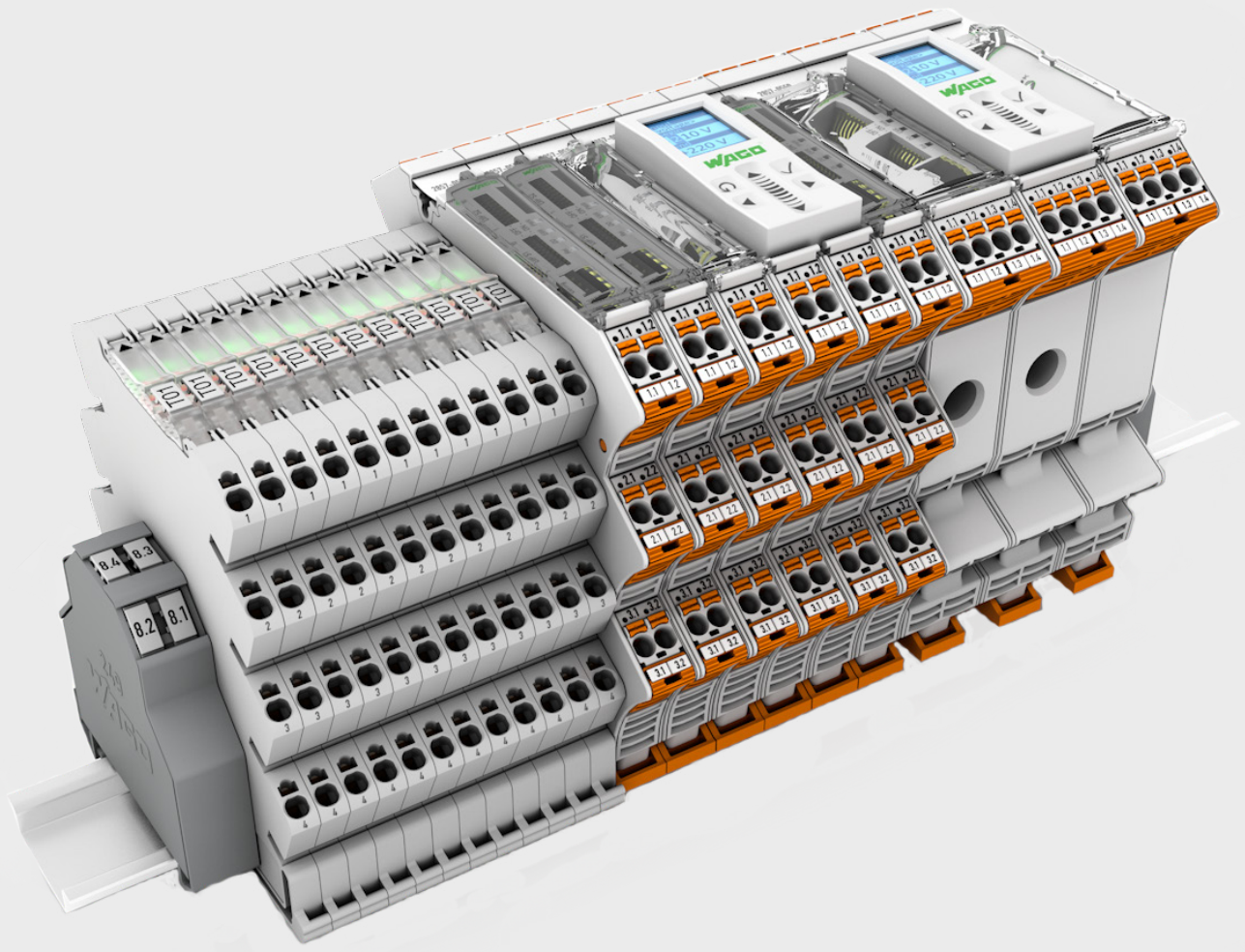
WAGO Signal Conditioners

We Set Benchmarks!



Contents

Current and
Voltage Signal Conditioners

Power Measurement
Modules

Temperature Signal
Conditioners

Signal Conditioners

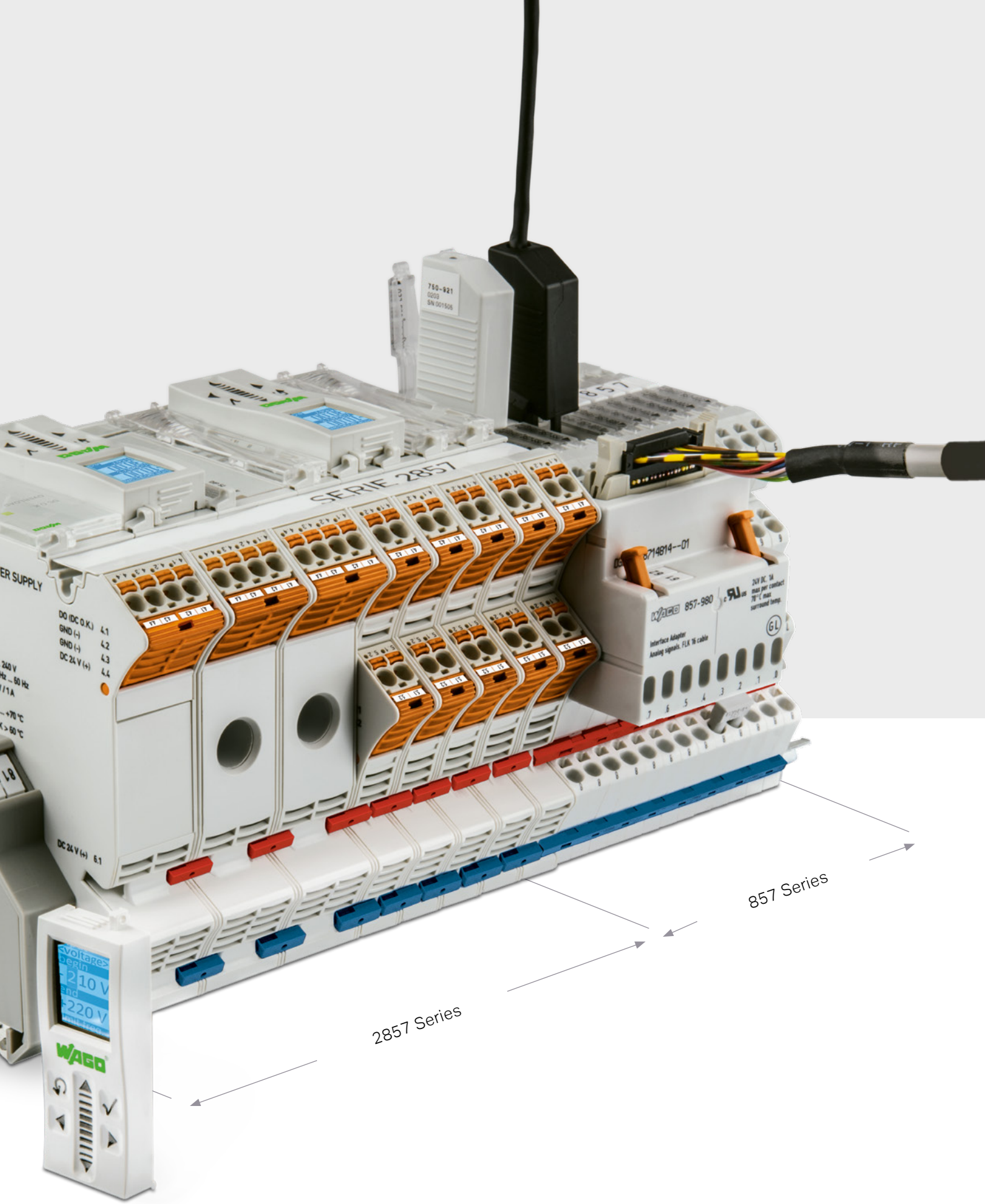
Signal Conditioners
with Special Functions

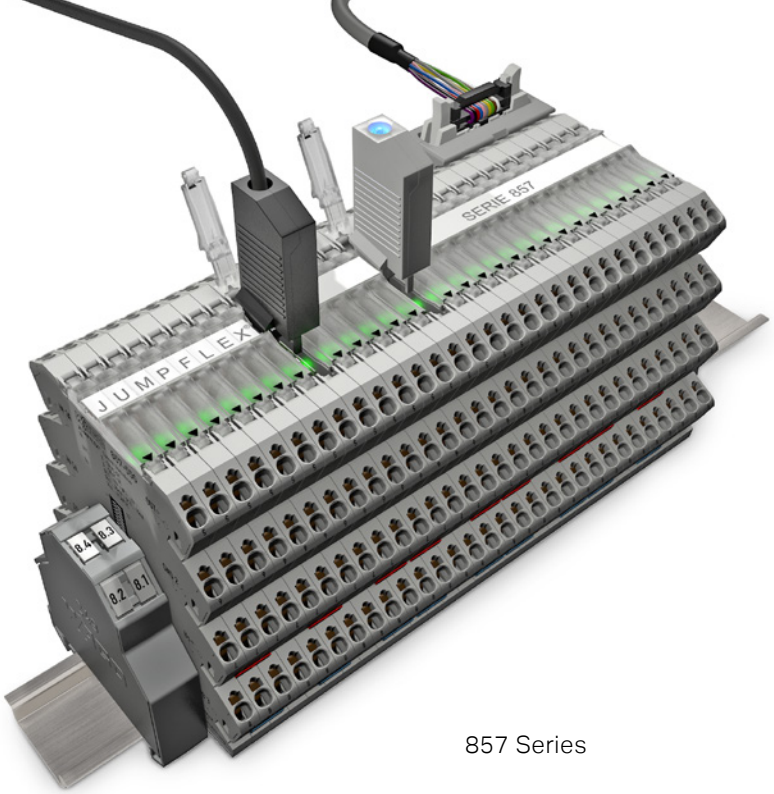
Threshold Value Switches

WAGO Signal Conditioners

The development of WAGO's signal conditioners was driven by customers' needs for greater flexibility during system planning, while maintaining uniformity in the cabinet. The advantage rests in the palm of your hand: There is no need to wire each individual component, thanks to push-in jumpers that save time and effort.

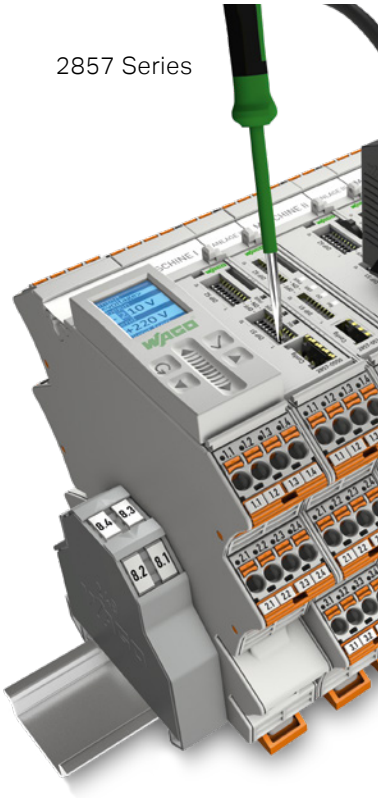
Tightly integrating the desirable mechanical and electrical characteristics of the signal conditioners has led to a series of unique features that continue setting the standard for signal conditioners. The product range is supplemented with the new line of WAGO 3-Phase Power Measurement Modules in a DIN-rail-mount enclosure.


SERIE 2857
857-980
857 Series
2857 Series



857 Series

2857 Series

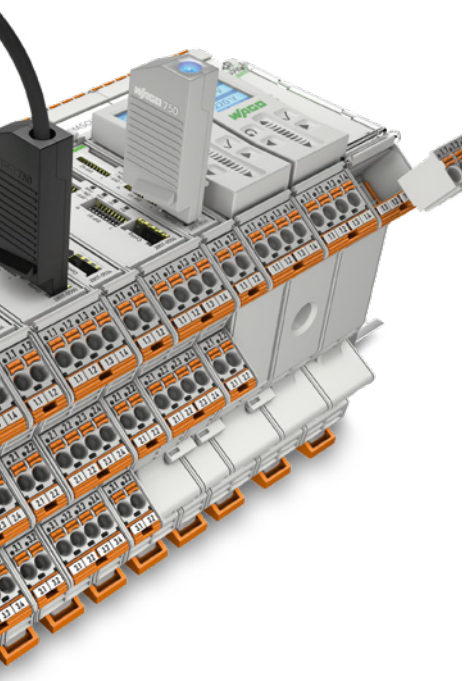


The Right Signal is Crucial

857 and 2857 Series

The success of the 857 Series Signal Conditioners shaped the design of the new 2857 Series. Just like with the 857 Series, usability and absolute reliability are at the core of the 2857 Series. However, the 2857 Series takes flexibility to new levels by providing several convenient configuration options. In addition to DIP switches, PC configuration software and a smartphone configuration app, there is also a newly developed touch panel display. Every aspect has been designed for maximum flexibility – exactly what you'd expect from WAGO.

The signal conditioners have a logical housing concept with cross-product commoning options on each clamping point, eight Push-in CAGE CLAMP® connections and a width of only 6.0 mm. These features form the basis for a successful overall solution. Additional benefits include "safe isolation," extended operating temperature range and calibrated, configurable signals. Combined with excellent technical specifications, these features lead to a line of advanced signal conditioning solutions that maximize panel space while reducing signal wiring and downtime.



Push-In Termination Saves Time!

Terminate both solid conductors and fine-stranded conductors with ferrules by simply pushing them in – no operating tool needed.

Vibration-Proof – Fast – Maintenance-Free

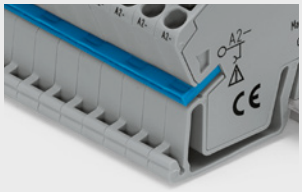
Push-in CAGE CLAMP® termination for all conductor types

PUSH-IN CAGE CLAMP®

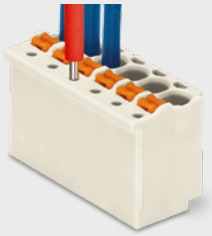
The Industry's Most Compact (857 Series)
"True" 6.0 mm (0.23 inch) width maximizes panel space

For Extreme Temperatures
New applications thanks to an extended temperature range from −25°C to +70°C; select devices can even tolerate −40 … 70°C.

Pluggable Connection Technology

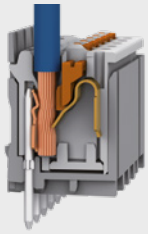


Commoning, Not Discrete Wiring
Same profile allows use of a single in-line, push-in jumper



Measuring Points for Test Probes (735-500 Test Pin)
*Applies to 2857 Series

Continuous Marking
With WMB or TOPJOB® S Marking System



***picoMAX*® Pluggable Connectors**
with Push-in CAGE CLAMP® for push-in termination of solid conductors and fine-stranded conductors with ferrules
*Applies to 2857 Series

Isolating, Amplifying, Filtering, Converting

Isolation Technologies

In industrial applications, there are several requirements for safe and economical signal matching that demand appropriate solutions. This is precisely where the strengths of signal conditioners lie – they have a long and successful history of serving all branches of industry, including factory automation and process technology.

Disconnecting

Galvanic Isolation
A signal conditioner's main task is galvanic isolation of the supply, input and output signals. Signal conditioners can be used to completely isolate these signals and prevent measurement errors that would otherwise arise due to equalizing currents triggered by potential differences such as ground current loops.

Requirements due to: potential differences, ground loops

Amplifying/Processing

Amplifying Signals
Signal amplification by signal conditioners supports the transmission of weak process signals over long lines, enabling the use of these signals for applications that require greater signal power.

Requirements due to: high loads, long cable runs

Filtering

Filtering Signals
Process-related sources of interference that plague process measurements, such as capacitive and inductive coupling, are safely filtered out by the signal conditioners.

Requirements due to: faults

Converting

Converting Signals
Depending on which type of signal a controller must process, signal conditioners can convert the measured signal accordingly, e.g., from 0 to 10 V or Pt100, into a conditioned current signal of 4 to 20 mA. This significantly reduces the susceptibility to faults in voltage measurement values by converting them into current signals that are extremely immune to interference.

Requirements due to: various signals – PT, TC, KTY, Ni analog

WAGO Signal Conditioners

With Power Supply (Active Input and Output Signal Conditioners)

Pre-Configured Signal Conditioners

- Pre-configured signal conditioners convert, amplify, filter and electrically isolate standard analog signals, e.g., 0 … 10 V into 0 … 20 mA.

Configurable Signal Conditioners

- For signal conditioners, and particularly two-wire signal conditioners, the measured signal is often in the 4 … 20 mA range as a current value. For the analog input card of a PLC, however, input voltages in the ranges of 0 … 10 V or 0 … 5 V are required.
- Configurable signal conditioners support various standard signals at the input and output; the devices also convert, amplify, filter and electrically isolate analog standard signals. DIP switches accessible from the side can be used to configure the input and output signals. Measurement range configuration via DIP switch is calibrated.

Universal Signal Conditioners

- In addition to the configurable signal conditioners, the universal signal conditioners can also be configured via PC configuration software or smartphone app. The configuration software also offers additional options, such as special input and output signal combinations with intermediate values or inversion of the analog output. An error message can be signaled via digital switching output.

Bipolar Signal Conditioners

- Bipolar measurement signals often require processing, e.g., when motor currents are measured in both directions of rotation. Bipolar signals are also processed for recording distances or for better resolution of measurement signals.

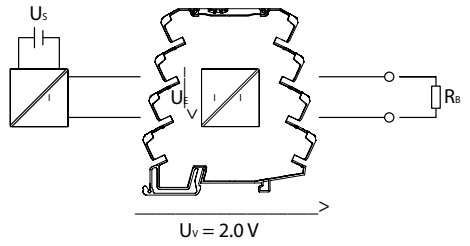
Isolation Amplifiers

- Isolation amplifiers energize transmitters.
- Two-wire transmitters self-regulate power consumption proportionally to the measured value; the 4 … 20 mA connection provides auxiliary power for the transmitter. The current's magnitude matches the output measured value.
- Three-wire transmitters usually have an active current output for the measured value and additional connections for the supply voltage (auxiliary power).

Signal Splitters

- Signal splitters divide a standard signal into two signals. The measured signal can be supplied to different downstream devices without interference.
- Example: A signal conditioner supplies 4 … 20 mA input current.
- Output 1 is configured to 4 … 20 mA and transmits the measured value to a controller.
- Output 2 is configured to 0 … 20 mA and regulates a controller.

Without Power Supply (Loop-powered Isolators)



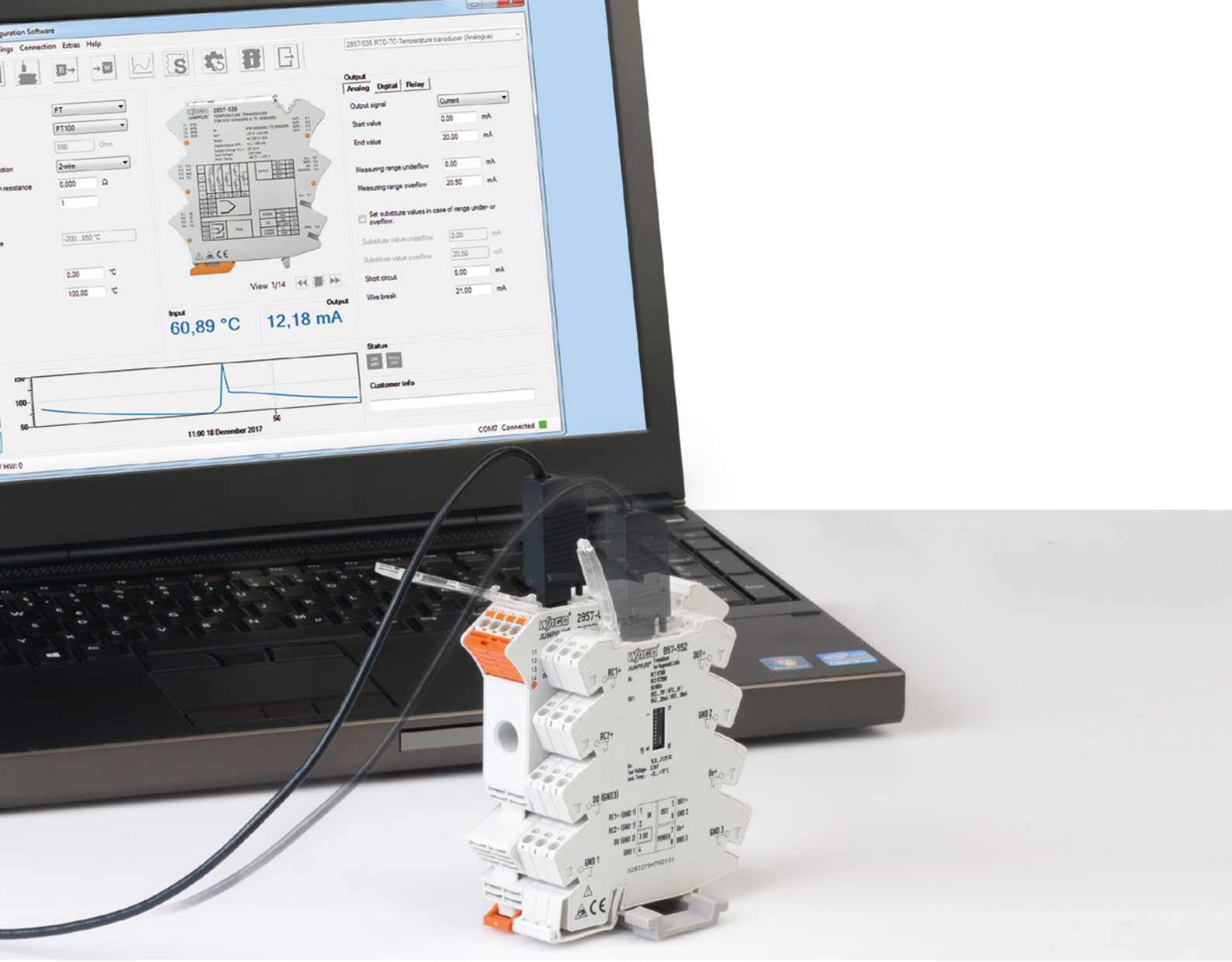
Example calculation for a passive isolator with a 20 mA signal:
$U_S \geq U_E = 2.0\ V + 20\ mA \times 600\ \Omega$
$U_S \geq U_E = 14\ V$

Passive Isolators

- Passive isolators draw their power from the input signal (4 … 20 mA) and require no additional wiring or auxiliary power.

Loop-Powered Isolators

- Loop-powered isolators draw their power from the output signal (4 … 20 mA) and require no additional wiring or auxiliary power.



Versatile Configuration Options

Interface Configuration Software

Signal conditioners with a service interface offer user-friendly configuration at a glance using the interface configuration software.

Free software download from:
www.wago.com

Software Features:

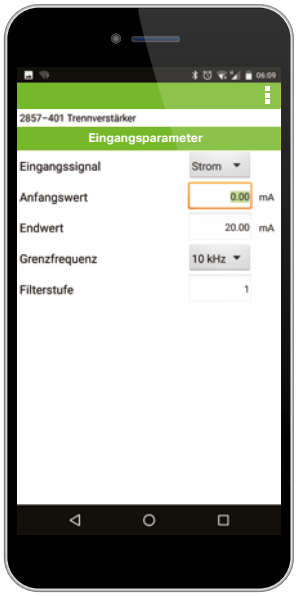
- Automatic module recognition
- Simulation of input and output parameters (2857 Series)
- Configuration and visualization of process values
- Parameterization of digital switch output (threshold functionality)
- Communication via WAGO USB Service Cable (750-923) or WAGO *Bluetooth*® Adapter (750-921), pluggable on both series
- Creation of configuration reports
- Backup of configuration settings

WAGO Configuration Display for 2857 Series

Flexibility at its Finest!

The removable display can be quickly and easily attached to the 2857 Series. It includes an innovative capacitive touch panel for intuitively configuring devices. Passwords for protecting configured data may be assigned to prevent unauthorized access and changes.

Configuration display for 2857 Series



Configuration App

The free app brings the power of PC-based configuration software to your Android smartphone or tablet.

Free download from Google Play Store

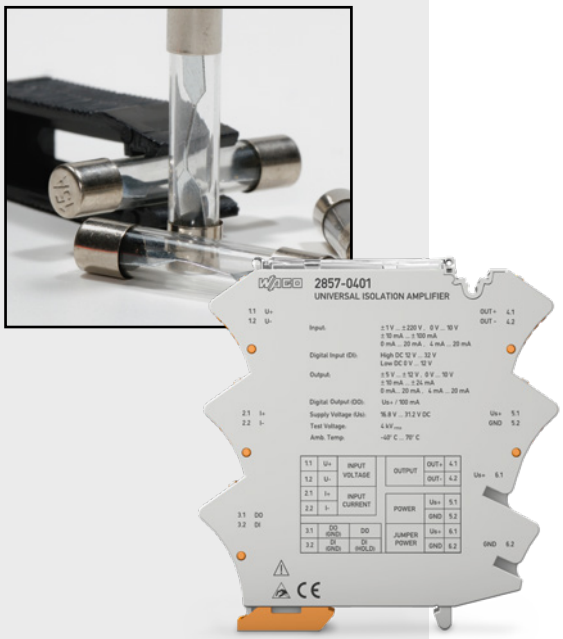
App Features:

- Configuration of input and output parameters with a single click
- Simple display of configuration data and current value
- Communication via WAGO Bluetooth® Adapter (750-921)

JETZT BEI Google Play

WAGO INTERFACE

Key Features



Effectively Protected

The input circuit is effectively protected against overcurrent!

- Bipolar Signal Conditioner, 857-409
- Universal Signal Conditioners, 857-402 and 2857-401

The Need
Input circuit protection against overcurrent

The Solution
An auto-reset fuse that resets once an overcurrent is removed

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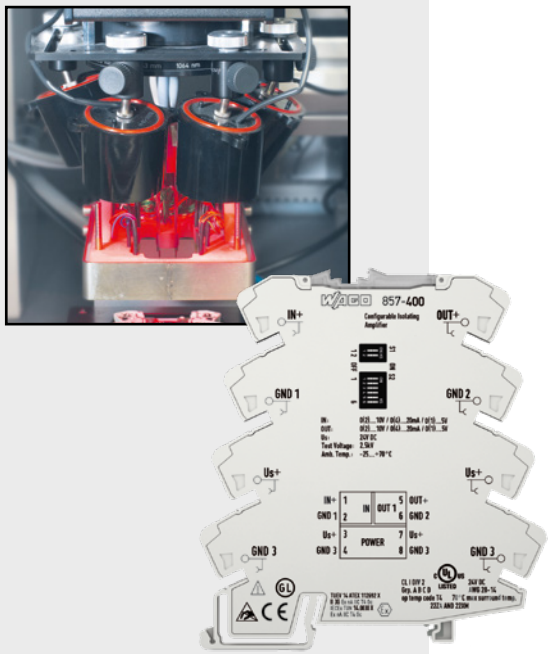


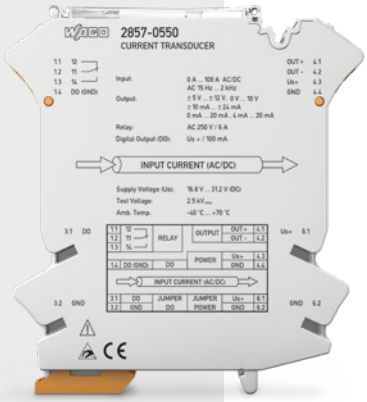
Automatically Accurate

No recalibration is necessary after switching between measurement ranges!

- For all signal conditioners

The Need
Achieving constant accuracy values, even after signal range change

The Solution
Laser-trimmed resistors for each DIP switch setting to avoid recalibration



Highest Level of Reliability and Signal Quality

High signal quality and long service life

The transformer concept with safe galvanic isolation ensures precise, fault-free signal transfer. You benefit from a long service life and high level of operational reliability throughout the entire operating temperature range, thanks to the low power consumption and self-heating.

The Need
Guarantee safe galvanic isolation of all circuits (input, output and power supply) without additional costs

The Solution
Provide multilayer PCB windings with a ferrite core

High signal quality and long service life

The transformer concept with safe galvanic isolation ensures precise, fault-free signal transfer. You benefit from a long service life and high level of operational reliability throughout the entire operating temperature range, thanks to the low power consumption and self-heating.

More on the topic of approvals on pages 38, 39

WAGO Signal Conditioners

Isolate, Amplify, Filter or Convert:

Signal conditioners handle a large number of functions in industrial applications while providing secure and error-free signal transmission.
The range of signal conditioners provides the right solution for every application:

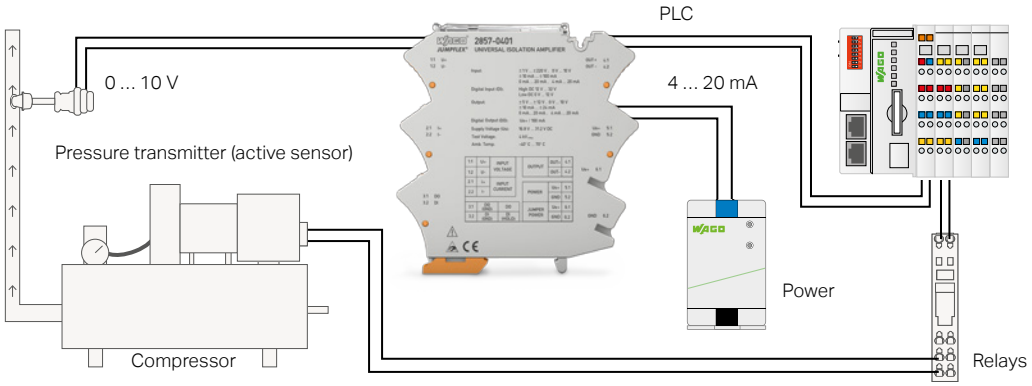
- With a power supply: signal conditioners (permanently configured), signal conditioners (configurable), universal signal conditioners, bipolar signal conditioners, repeater power supplies, signal splitters
- Without a power supply: passive isolators, loop-powered isolators

Your Benefits:

- Galvanic isolation between input/output/power supply
- Zero and span adjustment to compensate for error or signal shifts
- Switchable filter function to prevent signal interference
- Reliable protection of the input circuit against overcurrent (857-409, 857-402, 2857-401)
- A digital signal output (DO) reacts to freely configurable measurement range limits (this allows use as a threshold value switch – with activation/deactivation delay)

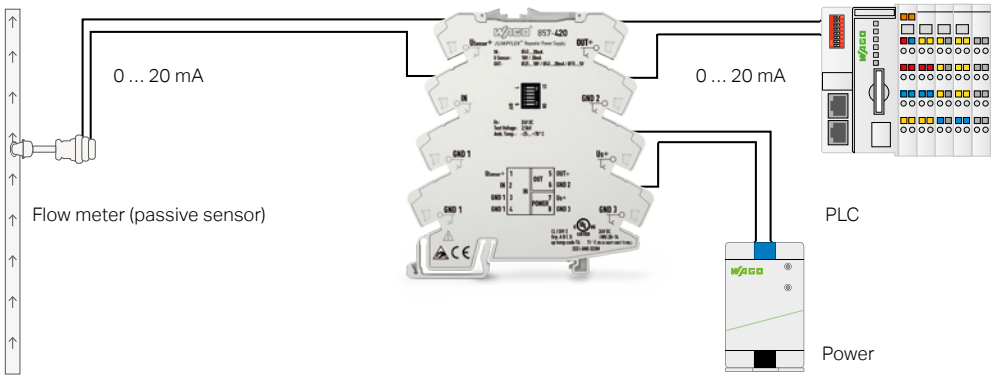
Application Examples

With Power Supply



Universal Signal Conditioner, 2857-401

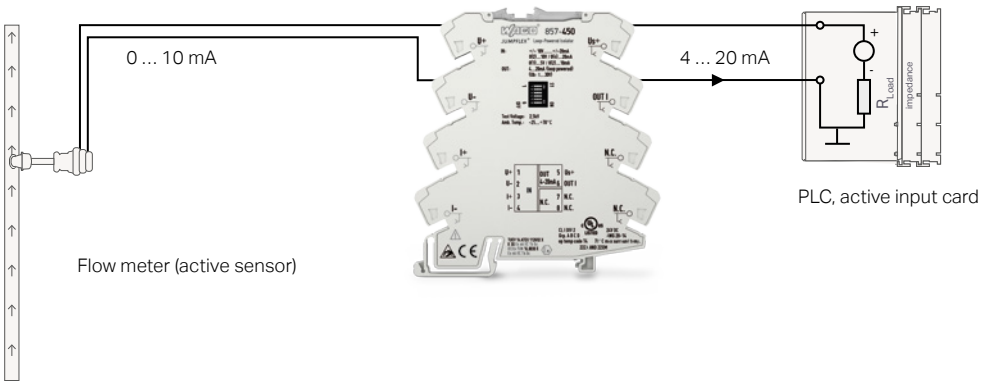
Pressure monitoring



Isolation Amplifier, 857-420

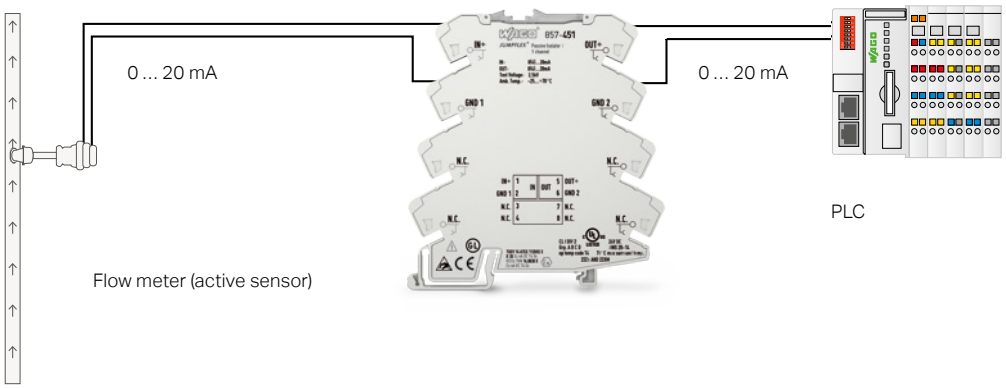
Flow measurement

Without Power Supply



Loop-Powered Isolator, 857-450

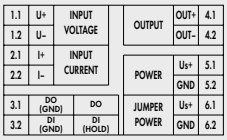
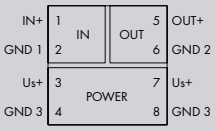
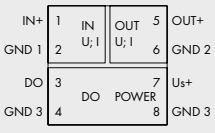
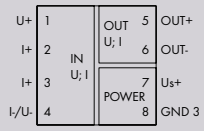
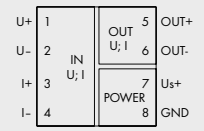
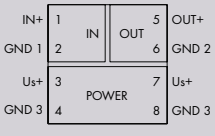
Flow measurement



Passive Isolator, 857-451

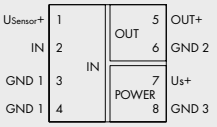
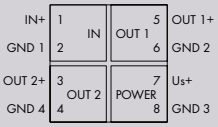
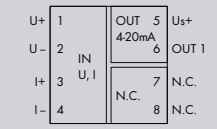
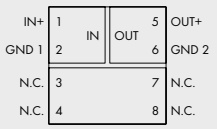
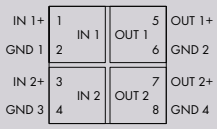
Flow measurement

Technical Details
WAGO Signal Conditioners

	Description	Image	Circuit Diagram	Input			Output	
Signal Conditioners	**Signal Conditioners**			A	V	±1 mA ± 10 mA ± 20 mA ± 100 mA ±1 V ±10 V ±30 V ±100 V ±200 V	A	V
	Universal Signal Conditioner			0 … 1 mA 0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA 0 … 100 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V 0 … 220 V		0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0…5 V 1…5 V 0…10 V 2…10 V
	Signal Conditioner; configurable; with zero/span adjustment			0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V		0 … 20 mA 4 … 20 mA	0…5 V 1…5 V 0…10 V 2…10 V
	Signal Conditioner; configurable; with digital output			0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V	± 20 mA ±10 V	0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0…5 V 1…5 V 0…10 V 2…10 V
	Universal Signal Conditioner			0 … 0.3 mA to 0 … 100 mA	0 … 60 mV to 0 … 200 V	±0.3 mA … ±100 mA ±60 mV … ±200 V	0 … 20 mA 4 … 20 mA	0…5 V 1…5 V 0…10 V 2…10 V
	Bipolar Signal Conditioner			0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V	± 10 mA ± 20 mA ±5 V ±10 V	0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0…5 V 1…5 V 0…10 V 2…10 V
	Signal Conditioner; pre-configured			0(4) … 20 mA 0 … 20 mA 4 … 20 mA	0(2) … 10 V 0 … 10 V 0 … 10 V		0(4) … 20 mA 0 … 20 mA 4 … 20 mA	0(2) … 10 V 0…10 V 0…10 V

	Special Functions				Configuration					Power Supply	Item No.	EAN No.
													
±12 V ±24 mA	x	x		x	x		x	x	x	24 VDC	**2857-401**	4050821676966
			x		x					24 VDC	**857-400**	4045454471293
	x	x			x		x	x		24 VDC	**857-401**	4045454828509
± 10 mA ± 20 mA ±5 V ±10 V		x	x		x	x				24 VDC	**857-402**	4050821099772
± 10 mA ± 20 mA ±5 V ±10 V			x		x					24 VDC	**857-409**	4045454828493
										24 VDC	**857-411**	4045454471224
											857-412	4045454471309
											857-413	4045454609870
											857-414	4045454609863
											857-415	4045454609856
											857-416	4045454609849

Technical Details
WAGO Signal Conditioners

	Description	Image	Circuit Diagram	Input			Output	
	Signal Conditioners			A	V		A	V
Isolation Amplifier	**Isolation Amplifier**			0 … 20 mA 4 … 20 mA			0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V
Signal Splitters	**Signal Splitter; with current output**			0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V		2 x 0(4) … 20 mA	
	Signal Splitter, with voltage/current Output			0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V		2 x 0 … 20 mA 4 … 20 mA	2 x 0 … 10 V 2 … 10 V
Passive Isolators	**Loop-Powered Isolator**			0 … 5 mA 0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 1 V 0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V	± 5 mA ± 10 mA ± 20 mA ± 1 V, ± 5 V ± 10 V ± 20 V	4 … 20 mA	
	Passive Isolator; 1-channel			0(4) … 20 mA			0(4) … 20 mA	
	Passive Isolator; 2-channel			2 x 0(4) … 20 mA			2 x 0(4) … 20 mA	

	Special Functions				Configuration					Power Supply	Item No.	EAN No.
													
					x					24 VDC	**857-420**	4045454471330
					x					24 VDC	**857-423**	4045454471316
					x					24 VDC	**857-424**	4055143595476
			x		x					Power via output circuit	**857-450**	4045454828479
										Power via input circuit	**857-451**	4045454471323
										Power via input circuit	**857-452**	4045454471354

WAGO Current/Voltage Signal Conditioners and Power Measurement Modules

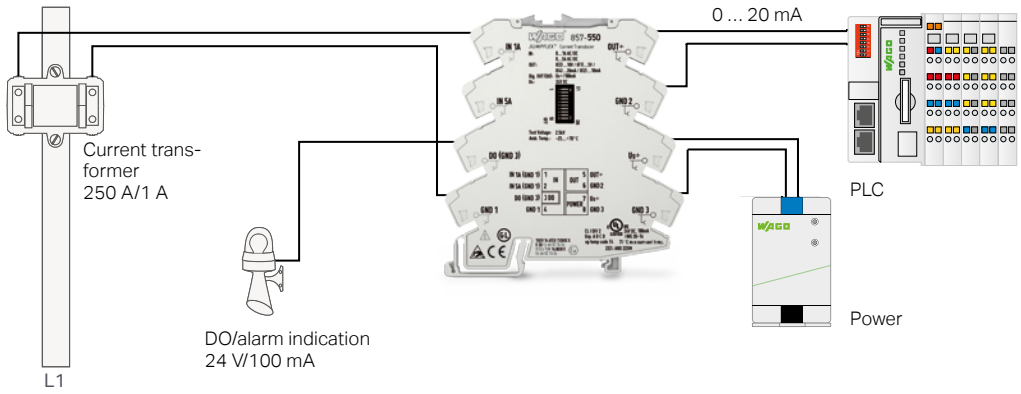
Besides current and voltage signal conditioners which record DC and AC currents and voltages, this impressive range also includes a power measurement module that can measure current and voltage in parallel, convert them to power and output them as an analog standard signal. Additionally, WAGO's signal conditioner for Rogowski coils offers a solution for retrofitting existing systems. Thus it is not necessary to disconnect the live conductor.

Your Benefits:

- Signal acquisition of DC and AC voltages up to 300 VAC/VDC using modules that are just 6 mm wide
- AC currents up to 4000 A via Rogowski coil
- Switchable filter function to prevent signal interference
- A digital signal output (DO) reacts to freely configurable measurement range limits (this allows use as a threshold value switch – with activation/deactivation delay)

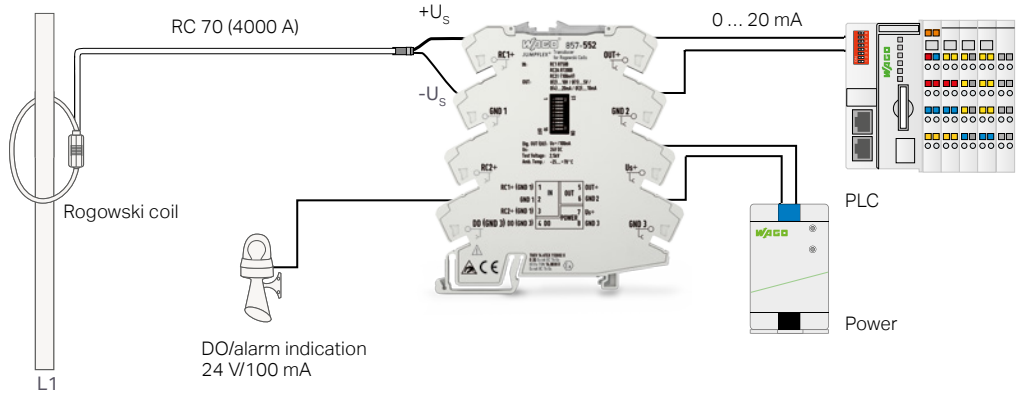
Application Examples

WAGO Current Signal Conditioners



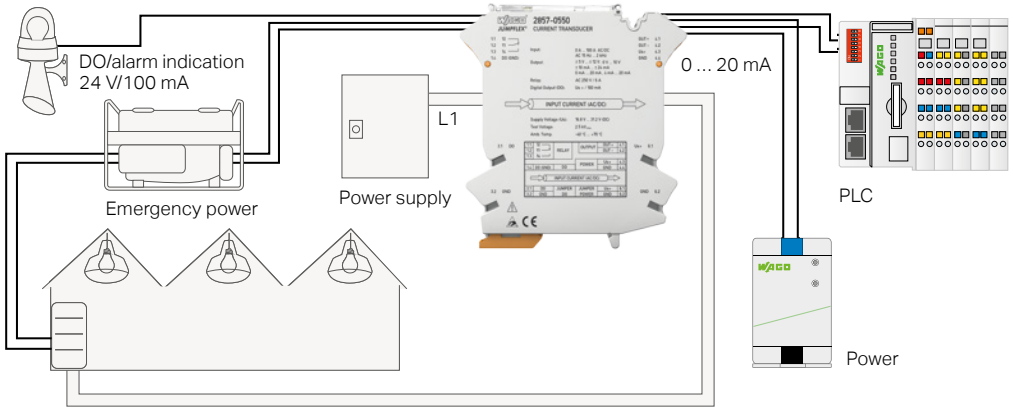
Current Signal Conditioner, 857-550

Current measurement via plug-in current transformers



Rogowski Signal Conditioner, 857-552

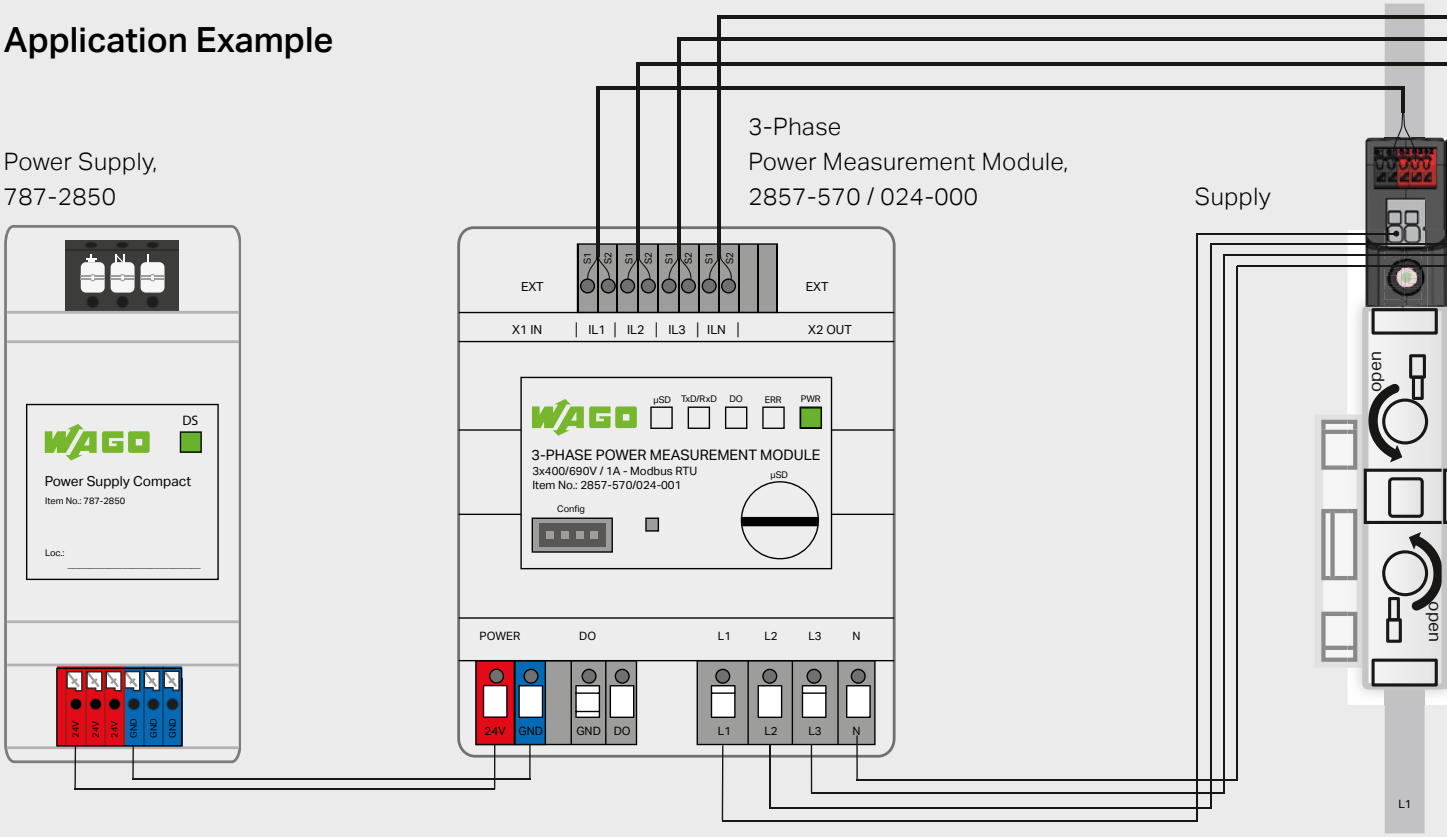
Current measurement via Rogowski coils



Current Signal Conditioner, 2857-550

Lighting monitoring

Application Example



WAGO 3-Phase Power Measurement Module

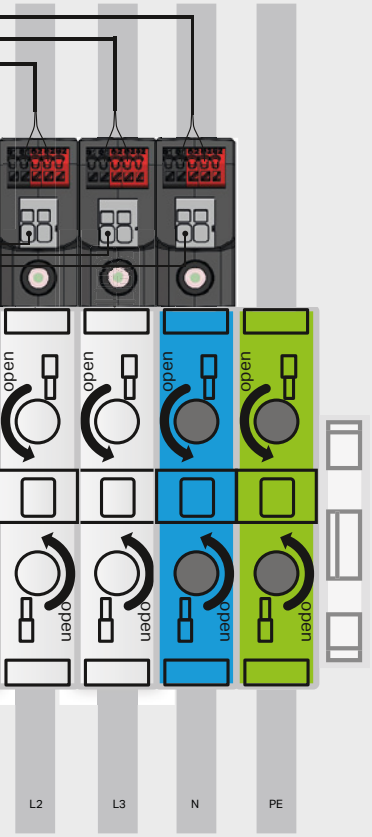
Measure Electrical Data in Three-Phase Supply Networks

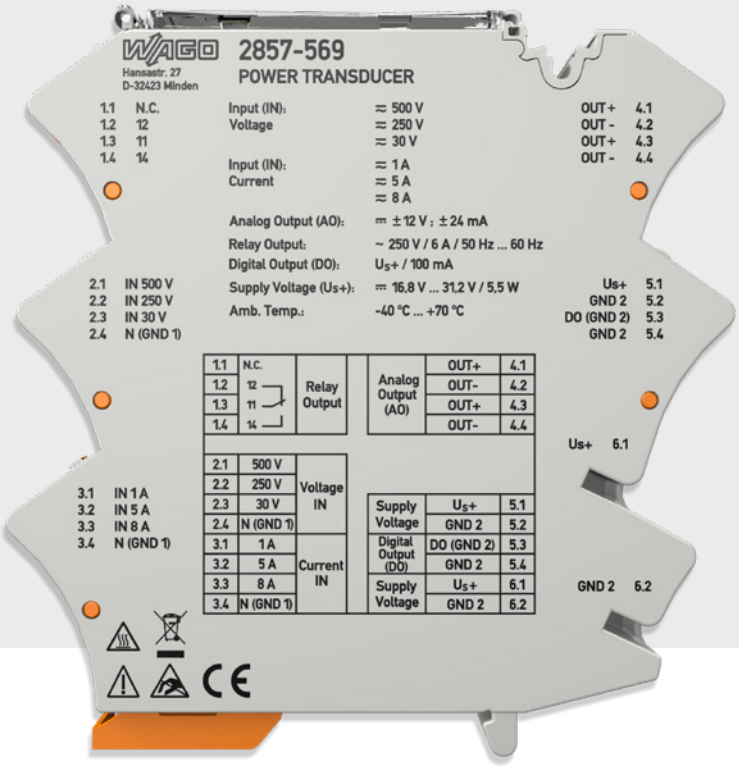
For successful energy management, consumption values of machines and systems must be known. With the 3-phase power measurement module in a DIN-rail-mount enclosure, WAGO offers the ideal solution to measure currents and voltages in a three-phase supply network, remotely from the control level. Measured variables such as active/apparent/reactive power, energy consumption, power factor, phase angle and frequency can be accessed via Modbus® interface. Two integrated RJ-45 sockets streamline the interconnection of up to 32 devices. In addition, the 3-phase power measurement module can log the corresponding measured variables on a microSD card. Simple configuration and display of measured variables using WAGO's Interface Configuration Software enable the user to perform comprehensive data analysis.

Your Benefits:

- Flexible selection of upcoming measurement tasks
- **Slot for microSD cards:** Fast and secure mobile measurement, including recording
- **Compact device in DIN-rail-mount enclosure:** Saves space in building technology
- **Modbus® Interface (RS-485):** Provision of the measured values via Modbus®
- **Digital signal output as pulse output (pulses/kWh are configurable):** Continuous energy consumption monitoring

Further information on WAGO's energy management can be found here: **www.wago.com/energymanagement**





WAGO 1-Phase Power Measurement Module

Measure Current, Voltage and Power

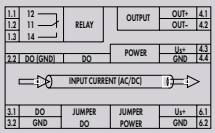
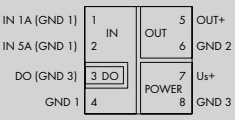
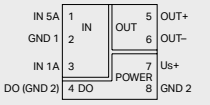
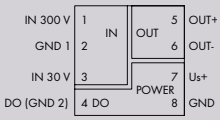
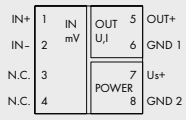
The 1-phase power measurement module directly measures both DC and AC currents up to 8 A, as well as DC and AC voltages up to 500 V. Measured variables, such as current, voltage, all types of power and many more can be flexibly configured and evaluated – in the configuration software or directly on the device display. It also monitors, reports and displays signal statuses with up to two switching thresholds and provides these statuses to a higher-level PLC via an analog or serial interface. A relay and digital output are integrated to use this power measurement module as a current, voltage or power threshold switch.

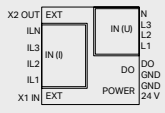
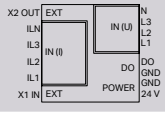
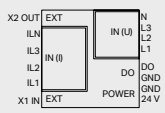
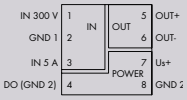
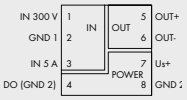
Your Benefits:

- Display connection for display and configuration
- Simulation of input/output response for quick start-up
- Additional digital signal output for configured measurement range limits

Technical Details

WAGO Current/Voltage Signal Conditioners and Pov

	Description	Image	Circuit Diagram	Input			Output	
Current and Voltage Signal Conditioners	**Current and Voltage Signal Conditioners**			A	V		A	V
	Through-Hole Current Signal Conditioner			100 A AC/DC			0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V
	Current Signal Conditioner			1 A AC/DC 5 A AC/DC (SELV)			0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V
	Current Signal Conditioner			1 A AC/DC 5 A AC/DC*			0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V
	Voltage Signal Conditioner			300 V AC/DC			0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V
	Millivolt Signal Conditioner				0 … 200 mV 0 … 1000 mV	±100 mV	0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V

	Description	Image	Circuit Diagram	Input			Output	
Power Measurement Modules	**Power Measurement Modules**			A	V		A	V
	3-Phase Power Measurement Module; 1 A; Modbus RTU			1 AAC	U_{LN} 400 VAC U_{LL} 690 VAC			
	3-Phase Power Measurement Module; 5 A; Modbus RTU			5 AAC	U_{LN} 400 VAC U_{LL} 690 VAC			
	3-Phase Power Measurement Module; RC; Modbus RTU			22.5 mV/kA (Rogowski coil)	U_{LN} 400 VAC U_{LL} 690 VAC			
	Power Measurement Module			300 V AC/DC	5 V AC/DC		± 20 mA	±10 V
	Power Measurement Module			8 A AC/DC	500 V AC/DC		±24 mA	±12 V

*When mounted individually, the new module can directly measure up to 6 A AC/DC (setting via WAGO Interface Configuration Software).

ver Measurement Modules

	Special Functions					Configuration				Power Supply	Item No.	EAN No.
												
±12 V ±24 mA	x	x	x	x	x	x	x	x	x	24 VDC	**2857-550**	4050821676997
	x	x				x	x	x		24 VDC	**857-550**	4050821226734
±10 V ± 20 mA	x	x				x	x			24 VDC	**857-551**	4050821476917
±10 V ± 20 mA	x	x				x	x	x		24 VDC	**857-560**	4055143481571
		x				x	x	x		24 VDC	**857-819**	4045454665975

	Special Functions				Configuration					Power Supply	Item No.	EAN No.
												
Modbus RTU	x						x			24 VDC	**2857 - 570 / 024 – 001**	4055143827539
Modbus RTU	x						x			24 VDC	**2857 - 570 / 024 – 005**	4055143827461
Modbus RTU	x						x			24 VDC	**2857 - 570 / 024 – 000**	4055143829199
	x	x			x		x	x		24 VDC	**857-569**	4055143501026
	x	x	x	x			x		x	24 VDC	**2857-569**	4055143907323

WAGO Temperature Signal Conditioners

With WAGO's temperature signal conditioners, signals from Pt, TC, Ni, KTY and RTD sensors and resistors can be recorded and converted into an analog standard signal on the output side. Whether a resistive temperature device or a thermocouple is used depends on factors such as the maximum temperature range, the installation environment and the required measurement accuracy:

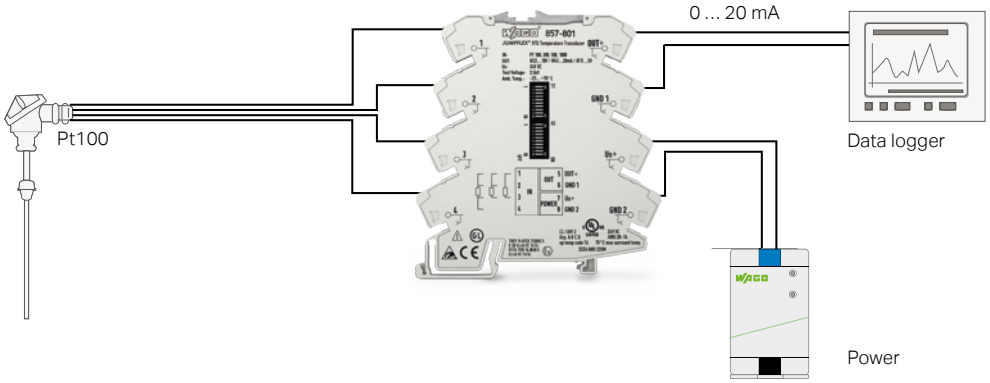
- Resistive temperature device: temperature range up to 850°C – high accuracy
- Thermocouple (TC): temperature range up to 2320°C – better response time

Your Benefits:

- Signal acquisition of Pt, TC, Ni, KTY and RTD sensors and resistors up to 4.5 kΩ (e.g., Pt100 sensors)
- 2-, 3- and 4-wire connection technology
- Fault signaling: wire break/short-circuit detection of the sensor
- Signaling measurement range underflow/overflow

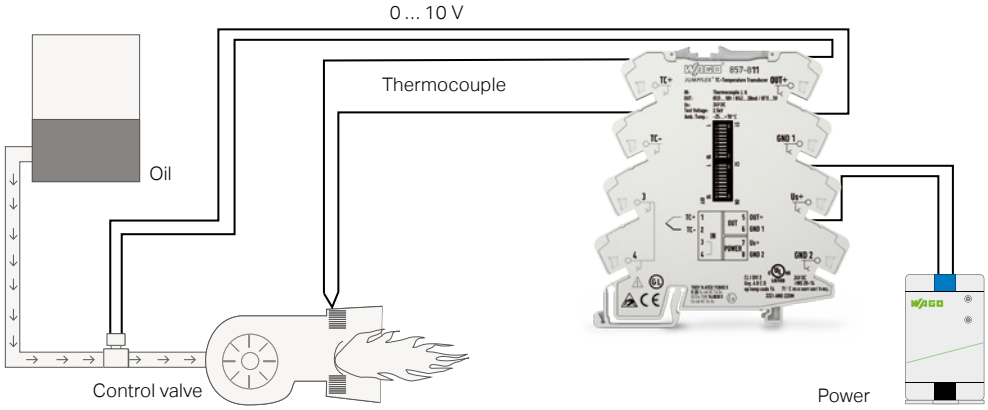
Application Examples

WAGO Temperature Signal Conditioners



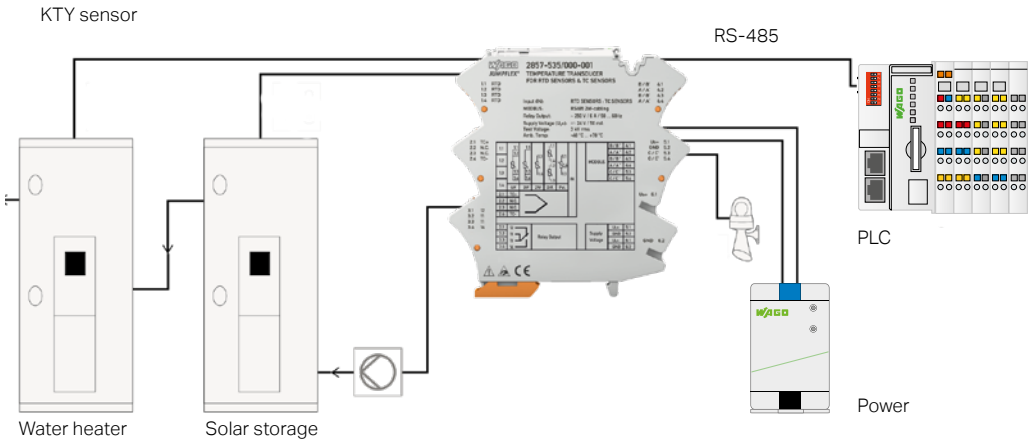
Temperature Signal Conditioner, for Pt Sensors and Resistance Sensors, 857-801

Temperature monitoring via Pt sensors



Temperature Signal Conditioner for Thermocouples, 857-811

Temperature monitoring via TC sensors



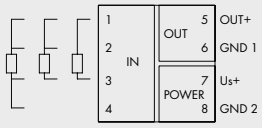
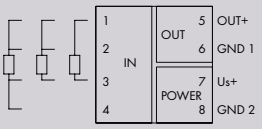
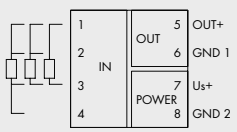
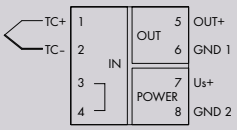
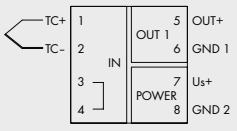
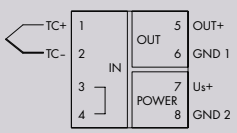
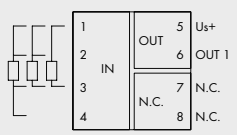
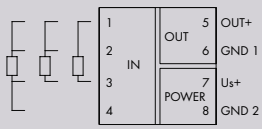
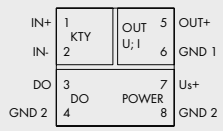
RTD/TC Temperature Signal Conditioner, Serial, 2857-535/000-001

Differential temperature monitoring of a water heater and solar storage

Technical Details

WAGO Temperature Signal Conditioners

Temperature Signal Conditioners

Description	Image	Circuit Diagram	Input			Output	
Temperature Signal Conditioners							
Temperature Signal Conditioner; for Pt sensors and resistance sensors			Pt100 Pt200 Pt500 Pt1000	0 … 1 kΩ 0 … 4.5 kΩ	2-wire 3-wire 4-wire	0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V
Temperature Signal Conditioner; for Pt sensors and resistance sensors			Pt100 Pt200 Pt500 Pt1000*	0 … 1 kΩ 0 … 4.5 kΩ	2-wire 3-wire 4-wire	0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V
Temperature Signal Conditioner; for Pt46 sensors and Cu53 sensors			Pt46 Cu53		2-wire 3-wire 4-wire	0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V
Temperature Signal Conditioner; for thermocouples			Type J, K			0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V
Temperature Signal Conditioner; for thermocouples			Type J, K, L, E, R, N, S, T, B, S*			0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V
Temperature Signal Conditioner; for thermocouples			Type K, S, B, R			0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V
Loop-Powered RTD Temperature Signal Conditioner			Pt100 Pt200 Pt500 Pt1000	0 … 1 kΩ 0 … 4.5 kΩ	2-wire 3-wire 4-wire	0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V
Temperature Signal Conditioner; for Ni sensors			Ni100 Ni120 Ni200 Ni500 Ni1000		2-wire 3-wire 4-wire	0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V
Temperature Signal Conditioner; for KTY sensors			KTY sensors		2-wire	0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V

*Additional settings via interface configuration software

	Special Functions				Configuration					Power Supply	Item No.	EAN No.
													
		x			x					24 VDC	**857-800**	4045454470128
		x			x		x	x		24 VDC	**857-801**	4045454502713
					x					24 VDC	**857-808**	4050821468929
		x			x					24 VDC	**857-810**	4045454470135
		x			x		x	x		24 VDC	**857-811**	4045454502751
					x					24 VDC	**857-812**	4050821255291
					x					Power supply via output circuit	**857-815**	4055143475648
		x			x					24 VDC	**857-818**	4050821099789
	x	x			x					24 VDC	**857-820**	4050821053002

WAGO Threshold Value Switches

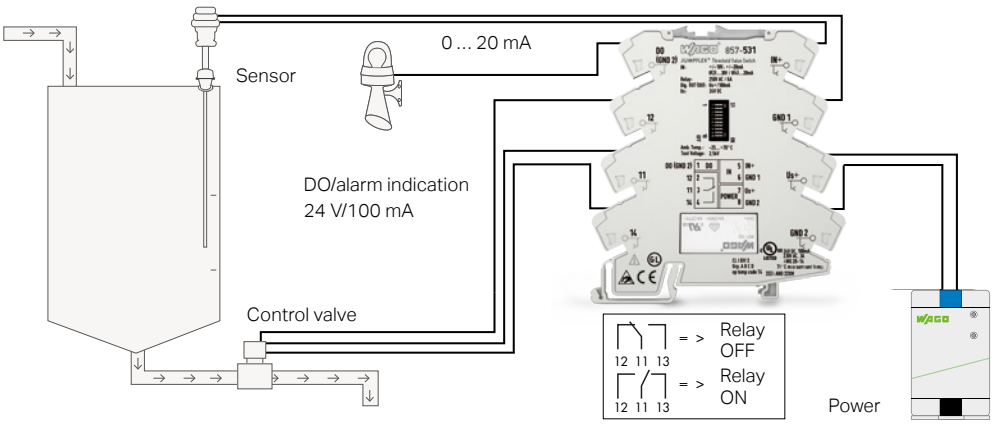
WAGO's threshold value switches monitor various measurement signals such as temperature, current or voltage. If a value falls above or below a limiting value setting, emergency stops or alarms can be triggered, for example. In addition to threshold value switches for analog signals, WAGO also offers RTD threshold value switches for resistance temperature sensors and potentiometers, as well as TC threshold value switches for thermocouples, allowing both signal monitoring and measurement.

Your Benefits:

- Input/output response simulation (2857 Series)
- Relays as threshold value switches (e.g., activation/deactivation delay)
- A digital signal output (DO) reacts to freely configurable measurement range limits (this allows use as a threshold value switch – with activation/deactivation delay)

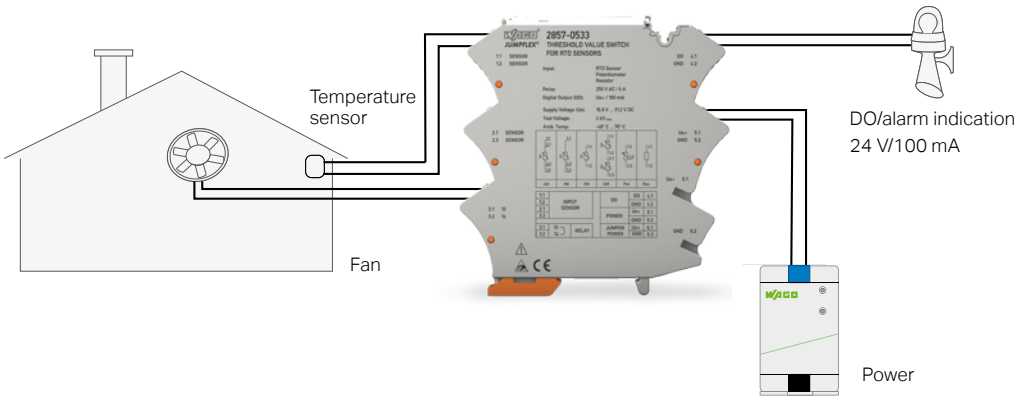
Application Examples

WAGO Threshold Value Switches



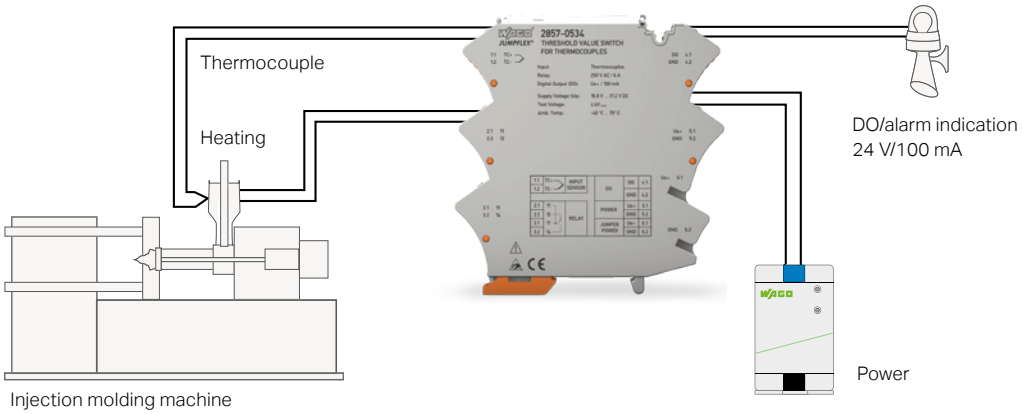
Analog Threshold Value Switch, 857-531

Fill level monitoring



Resistance Threshold Value Switch, 2857-533

Temperature monitoring with threshold value functionality

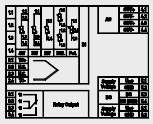
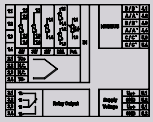


Thermocouple Threshold Value Switch, 2857-534

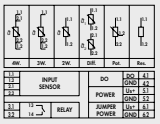
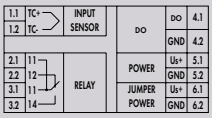
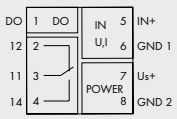
Temperature monitoring with threshold value functionality

Technical Details
WAGO Threshold Value Switches

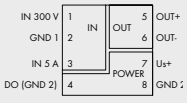
Temperature Signal Conditioners

Description	Image	Circuit Diagram	Input		Output		
Temperature Signal Conditioners							
RTD/TC Temperature Signal Conditioner; analog			RTD sensors Potentiometers Resistors Thermocouples	2-wire 3-wire 4-wire Difference measurement Potentiometers	−24 … +24 mA (load impedance ≤ 600 Ω)	−12 … +12 V (load impedance ≥ 2 kΩ)	
RTD/TC Temperature Signal Conditioner; serial							Modbus RTU

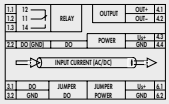
Threshold Value Switches

Description	Image	Circuit Diagram	Input					
Threshold Value Switches								
RTD Threshold Value Switch						2-wire 3-wire 4-wire	Potentiometers 0 … 100 kΩ	0 … 100 kΩ
Thermocouple Threshold Value Switch								
Analog Threshold Value Switch			0 … 10 mA 2 … 10 mA 0 … 20 mA 4 … 20 mA	0 … 5 V 1 … 5 V 0 … 10 V 2 … 10 V 0 … 15 V 0 … 30 V	± 10 mA ± 20 mA ±5 V ±10 V			

Power Measurement Module

Description	Image	Circuit Diagram	Input			Output	
Power Measurement Module							
Power Measurement Module			8 A AC/DC	500 V AC/DC		±24 mA	±12 V

Current Signal Conditioner

Description	Image	Circuit Diagram	Input			Output	
Current Signal Conditioner							
Through-Hole Current Signal Conditioner			100 A AC/DC			±24 mA	±12 V

Special Functions			Configuration				Power Supply	Item No.	EAN No.
									
1 change-over contact (1 u) 250 VAC / 6 A	x	x	x	x	x		9.6 ... 31.2 V	**2857-535**	4055143655507
		x	x	x	x	x		**2857-535/ 000-001**	4055143655514

	Special Functions				Configuration					Power Supply	Item No.	EAN No.
												
Pt100 Pt200 Pt500 Pt1000 Pt5000, Pt10,000 Pt10 ... 20,000	250 VAC 6 A		x	x	x		x	x	x	24 VDC	**2857-533**	4050821676973
Type J, K, E, N, R, S, T, B, C		250 VAC 6 A	x	x	x		x	x	x	24 VDC	**2857-534**	4055143242318
		250 VAC 6 A	x		x	x	x	x		24 VDC	**857-531**	4045454885229

	Special Functions				Configuration					Power Supply	Item No.	EAN No.
												
	x	x	x	x			x		x	24 VDC	**2857-569**	4055143907323

	Special Functions					Configuration					Power Supply	Item No.	EAN No.
												
± 10 mA ± 20 mA ±5 V ±10 V	x	x	x	x	x	x	x	x	x	24 VDC	**2857-550**	4050821676997

WAGO Signal Conditioners with Special Functions

Among other things, WAGO's potentiometer signal conditioner records resistance signals, e.g., from potentiometers, and converts them into a standard analog signal.

Your Benefits with Potentiometer Signal Conditioners:

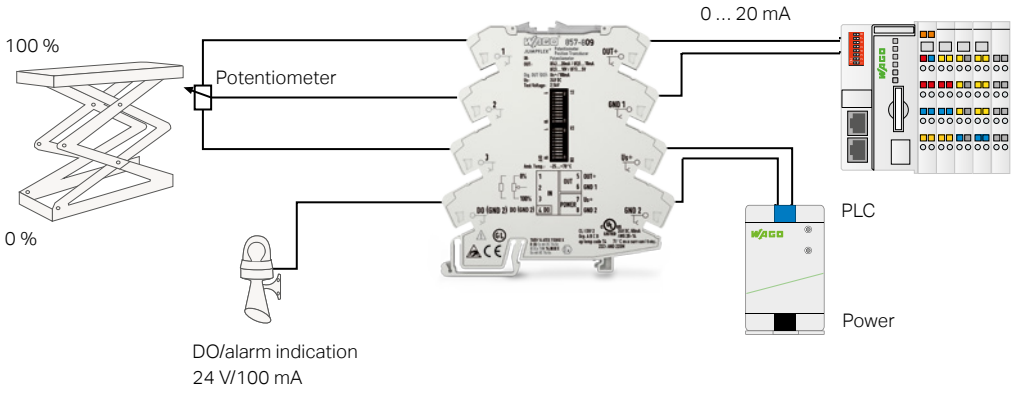
- Signal acquisition from potentiometers and resistors
- Automatic potentiometer identification
- Configurable input and output parameters
- A digital signal output (DO) reacts to freely configurable measurement range limits (this allows use as a threshold value switch – with activation/deactivation delay)
- WAGO's frequency signal conditioners record 0.1 kHz to 120 kHz signals from NAMUR, NPN or PNP sensors and convert the frequency into an analog standard signal.

Your Benefits with Frequency Signal Conditioners:

- Signal acquisition from NAMUR, NPN or PNP sensors
- Frequency range: 0.1 … 120 kHz
- Fault signaling: wire break/short-circuit detection for NAMUR proximity sensors

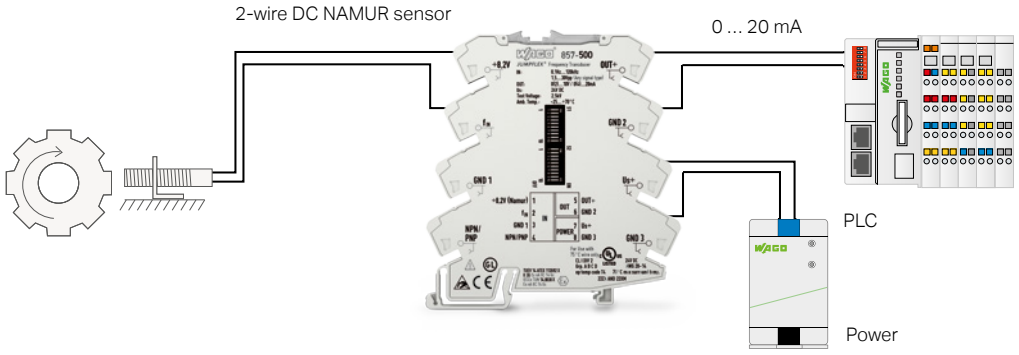
Application Examples

Special Functions/Power Measurement Module



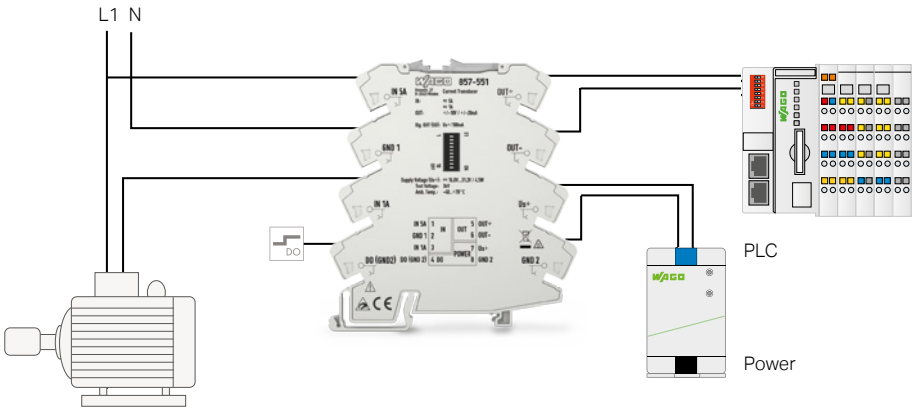
Potentiometer Signal Conditioner, 857-809

Resistance measurement via potentiometer



Frequency Signal Conditioner, 857-500

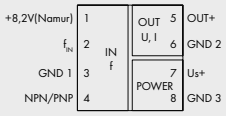
Speed measurement with NAMUR indicator

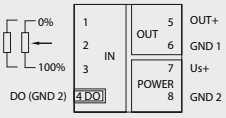


Power Measurement Module, 857-569

1-phase power measurement

Technical Details
WAGO Signal Conditioners with Special Functions

	Description	Image	Circuit Diagram	Input	Output	
Frequency Signal Conditioner	Frequency Signal Conditioner					
	Frequency Signal Conditioner			Frequency signals, NAMUR, NPN or PNP sensors: 0.1 ... 120 kHz	0 ... 10 mA 2 ... 10 mA 0 ... 20 mA 4 ... 20 mA	0 ... 5 V 1 ... 5 V 0 ... 10 V 2 ... 10 V

	Description	Image	Circuit Diagram	Input		Output		
Potentiometer Signal Conditioner	Potentiometer Signal Conditioner							
	Potentiometer Signal Conditioner			Potentiometer 0 ... 100 kΩ	10 ... 100 kΩ	0 ... 10 mA 2 ... 10 mA 0 ... 20 mA 4 ... 20 mA	0 ... 5 V 1 ... 5 V 0 ... 10 V 2 ... 10 V	

	Special Functions				Configuration				Power Supply	Item No.	EAN No.
											
		x			x	x	x		24 VDC	**857-500**	4050821226741

Special Functions				Configuration					Power Supply	Item No.	EAN No.
											
x	x			x	x	x	x		24 VDC	**857-809**	4050821480761

Approvals

857 and 2857 Series

	cULus	E175199, UL 508
	cULus	E198726, ANSI/ISA 12.12.01
	BV (Bureau Veritas)	40179/A0 BV
	DNV (Det Norske Veritas)	A-13346
	GL (German Lloyd)	44627-07 HH
	NKK (Nippon Kaiji Kyokai)	TA12716M
	Polski Rejestr Statkow	TE/1989/880590/13
	ATEX	TÜV 14 ATEX 112692X, II 3 G Ex nA IIC T4 Gc
	IECEx	IECEx TUN 14.0030X, Ex nA IIC T4 Gc

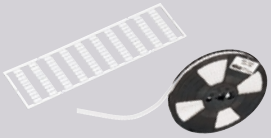
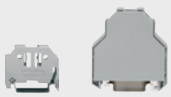
Item No.	Item Description	Ex	Marine Approvals					UL	
			PRS	NKK	GL	DNV	BV		
Signal Conditioners									
2857-401	Universal Signal Conditioner								
857-400	Signal Conditioner; configurable; with zero/span adjustment	■	■	■	■	■	■	■	■
857-401	Signal Conditioner; configurable; with digital output		■		■		■	■	■
857-402	Universal Signal Conditioner							■	■
857-409	Bipolar Signal Conditioner	■	■	■		■		■	■
857-411	Signal Conditioner; pre-configured	■	■	■	■	■	■	■	■
857-412	Signal Conditioner; pre-configured	■	■	■	■	■	■	■	■
857-413	Signal Conditioner; pre-configured	■	■	■	■	■	■	■	■
857-414	Signal Conditioner; pre-configured	■	■	■	■	■	■	■	■
857-415	Signal Conditioner; pre-configured	■	■	■	■	■	■	■	■
857-416	Signal Conditioner; pre-configured	■	■	■	■	■	■	■	■
Signal Conditioners									
857-420	Isolation Amplifier				■	■		■	■
857-423	Signal Splitter	■	■	■	■	■	■	■	■
857-424	Signal Splitter, (I/U)								
857-450	Loop-Powered Isolator	■	■					■	■
857-451	Passive Isolator; 1-channel	■	■	■	■	■	■	■	■
857-452	Passive Isolator; 2-channel	■	■	■	■	■	■	■	■
Current and Voltage Signal Conditioners									
2857-0550	Through-Hole Current Signal Conditioner								
857-550	Current Signal Conditioner	■	■		■		■	■	■
857-552	Current Signal Conditioner; for Rogowski coils	■	■						
857-560	Voltage Signal Conditioner								
857-569	Power Measurement Module								
857-819	Millivolt Signal Conditioner	■	■	■	■	■	■	■	■
Power Measurement Modules									
2857-570/000-000	3-Phase Power Measurement Module; Modbus RTU				■	■			
2857-570/000-001	3-Phase Power Measurement Module; Modbus RTU; 1 A				■	■			
2857-570/000-005	3-Phase Power Measurement Module; Modbus RTU; 5 A				■	■			

	cULus	E175199, UL 508
	cULus	E198726, ANSI/ISA 12.12.01
	BV (Bureau Veritas)	40179/A0 BV
	DNV (Det Norske Veritas)	A-13346
	GL (German Lloyd)	44627-07 HH
	NKK (Nippon Kaiji Kyokai)	TA12716M
	Polski Rejestr Statkow	TE/1989/880590/13
	ATEX	TÜV 14 ATEX 112692X, II 3 G Ex nA IIC T4 Gc
	IECEx	IECEx TUN 14.0030X, Ex nA IIC T4 Gc

Item No.	Item Description	Ex	Marine Approvals					UL	
			PRS	NKK	GL	DNV	BV		
Temperature Signal Conditioners									
857-800	Temperature Signal Conditioner; for Pt and resistance sensors	■	■	■	■	■	■	■	■
857-801	Temperature Signal Conditioner; for Pt and resistance sensors	■	■	■	■	■	■	■	■
857-810	Temperature Signal Conditioner; for thermocouples	■	■	■	■	■	■	■	■
857-811	Temperature Signal Conditioner; for thermocouples	■	■	■	■	■	■	■	■
857-812	Temperature Signal Conditioner; for thermocouples							■	■
857-808	Pt46 and Cu53 Temperature Signal Conditioner	■	■		■		■	■	■
857-815	Loop-Powered RTD Temperature Signal Conditioner								
857-818	Temperature Signal Conditioner; for Ni sensors	■	■		■		■	■	■
857-820	Temperature Signal Conditioner; for KTY sensors	■	■		■		■	■	■
2857-535	RTD/TC Temperature Signal Conditioner; analog								
2857-535/000-001	RTD/TC Temperature Signal Conditioner; serial								
Threshold Value Switches									
2857-533	RTD Threshold Value Switch								
2857-534	Thermocouple Threshold Value Switch								
857-531	Analog Threshold Value Switch		■	■	■	■	■		■
Special Functions									
857-500	Frequency Signal Conditioner	■	■		■		■	■	■
857-809	Potentiometer Signal Conditioner		■		■		■	■	■
Accessories									
857-979	Supply and Through Module	■	■		■			■	■
857-980	Interface Adapter; for system wiring		■	■	■	■	■		■

WAGO Accessories

Software			Item No.	EAN No.
	Interface Configuration Software Configuration and display tool for PC		Download from **www.wago.com/configuration-software**	–
	JUMPFLEX®-*ToGo* Smartphone App Configuration and display tool for smartphones (Android)		Download from "Google Play Store"	–
	**WAGO USB Service Cable** Connects a PC (notebook) to the 857 Series Signal Conditioner's service interface		**750-923** (2.5 m long) ***750-923/000-001*** (5 m long)	4045454571641 4045454765200
	**WAGO *Bluetooth*® Adapter** Connects a PC (notebook) to the 857 Series Signal Conditioner's service interface		**750-921**	4044918368100
Push-In Type Jumper Bars			**Item No.**	**EAN No.**
	**Push-In Type Jumper Bar**; light gray; insulated; 18 A	2-way 3-way 4-way 5-way 6-way 7-way 8-way 9-way 10-way	**859-402** **859-403** **859-404** **859-405** **859-406** **859-407** **859-408** **859-409** **859-410**	4044918506434 4044918507240 4044918507820 4044918508155 4044918508278 4044918508339 4044918508513 4044918508421 4044918508513
	Item no. suffixes for colored push-in type jumper bars	yellow red blue	**… /000-029** **… /000-005** **… /000-006**	–
	**Comb-Style Jumper Bar** Only suitable for 857 Series	2-way	**281-482**	4044918523042
Wiring			**Item No.**	**EAN No.**
	**Interface Adapter for System Wiring**		**857-980**	4045454995164
	**Supply and Through Module**		**857-979**	4050821088189
	**WAGO Interface Cable,** 16-pole/free end, 2 m long		**706-100/1602-200**	4050821452447

Current Transformers, Rogowski Coils and Power Supplies		Item No.	EAN No.
	**Current Transformers** Primary current: 50 … 2500 A Secondary current: 1 A and 5 A (other values upon request or at **www.wago.com**)	**855 Series**	–
	**Rogowski Coils** Primary current up to 4000 A	**855 Series**	–
	**Switched-Mode Power Supply** in 22.5 mm wide 2857 Series housing; shares a common profile with the 2857 and 857 Series Signal Conditioners; Output current: 1 A	**787-2852**	4055143060554
	**Power Supply** in the signal conditioner housing; Output current: 1.25 A	**787-2850**	–
Relays		**Item No.**	**EAN No.**
	**Relay with 1 Changeover Contact** 24 VDC / 250 V / 6 A	**857-359**	4050821797807
Marking		**Item No.**	**EAN No.**
	**WMB Multi Marking System** **TOPJOB® S Marking System**	**793 Series** **2009-110**	4044918102483
Other Accessories		**Item No.**	**EAN No.**
	**Operating Tool** with a partially insulated shaft; Type 2; 3.5 x 0.5 mm blade	**210-720**	4045454937393
	**End Stops**	**249-116** (6 mm wide) **249-117** (10 mm wide) **249-197** (14 mm wide)	4017332270823 4017332270830 4050821517535
	**Test Pin**	**735-500**	4050821226932
	**DC/DC CONVERTERS**	**787-2801** (5 VDC) **787-2802** (10 VDC) **787-2803** (24 VDC) **787-2805** (12 VDC) **787-2810** (5/10/12 VDC, configurable)	–

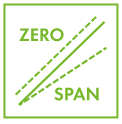
Glossary

Zero/Span Adjustment

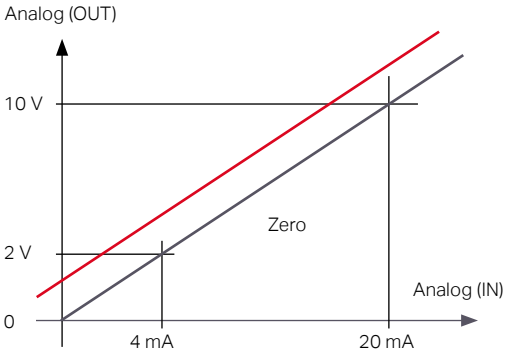
Error or signal offsets that may arise from sensor tolerances can be readily fine-tuned via front-mount potentiometers on the signal conditioner. Measurement range compensation can be performed at the zero/span potentiometers to correct such deviations, ensuring downstream devices, e.g., a PLC, can continue receiving correct values.

The following devices have an integrated zero/span adjustment:

- 857-400
- 857-409
- 857-402 (via push/slide switch)
- 857-450



Zero Adjustment

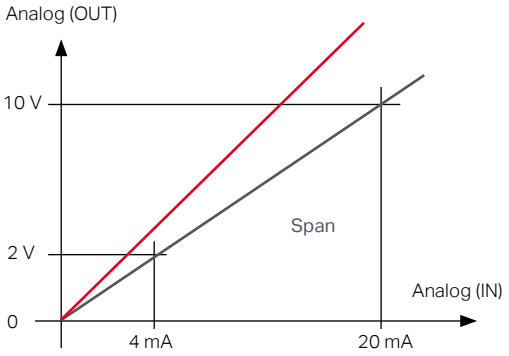


Zero: offset
Span: amplification factor

Zero-Span Potentiometer

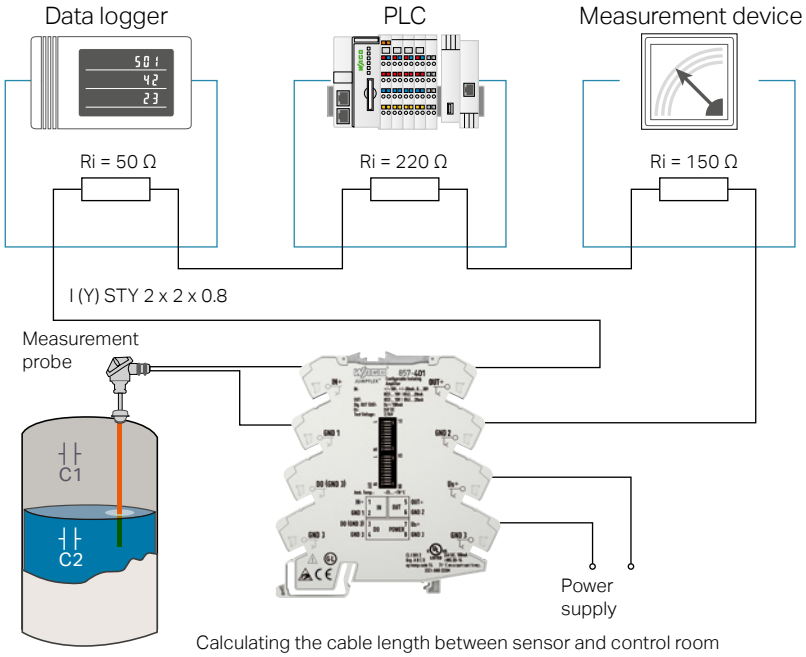
(z) Zero potentiometer
(s) Span potentiometer

Span Adjustment



Example:
A sensor, connected to the input of the signal conditioner, delivers a maximum analog signal of 9.7 V. Using the zero/span potentiometers, the signal can be readjusted to 10.0 V.

Wiring



Calculating the cable length between sensor and control room

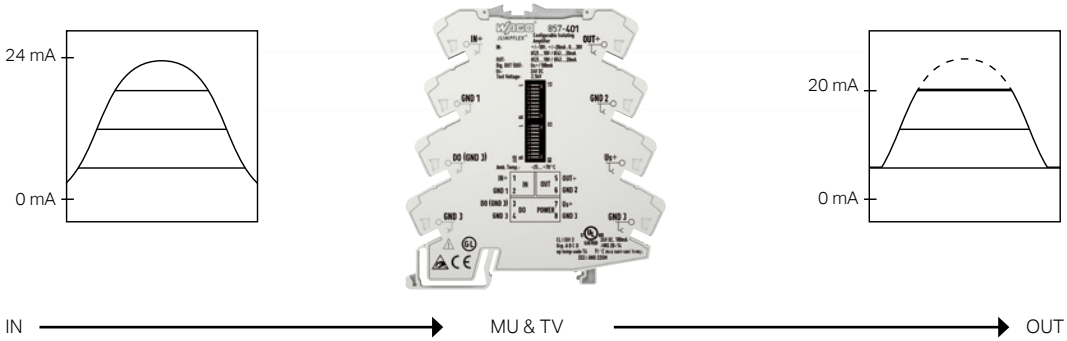
R_{wire} = max. R_{load} – R_{input}
R_{wire} = 600 Ω (–50 Ω +220 Ω +150 Ω)
R_{wire} = 180 Ω
L_{loop} = R_{wire} / $R_{per\ meter}$
L_{loop} = 180 Ω/ (0.036 Ω/m)= 5,000 m

Example:
857-401 Signal Conditioner's load impedance
Load impedance ≤ 600 Ω (current output)

Specific electrical resistance of copper = 0.0178 Ω/m

Clipping Mode

"Clipping Mode" means: limiting the analog standard signal to the end values of the measurement range. For example, if the standard 4 … 20 mA signal has been configured and Clipping Mode is activated, the output signal "freezes" at 4 mA (lower) and at 20 mA (upper) – even if the input signal exceeds one of these limits. This function is advantageous, for example, when the downstream control system cannot process negative signals, or when it is necessary to ensure that the analog signal does not exceed 20 mA at the output.



The DIP switches, configuration software or smartphone configuration app can be used to quickly switch Clipping Mode on/off.

Glossary

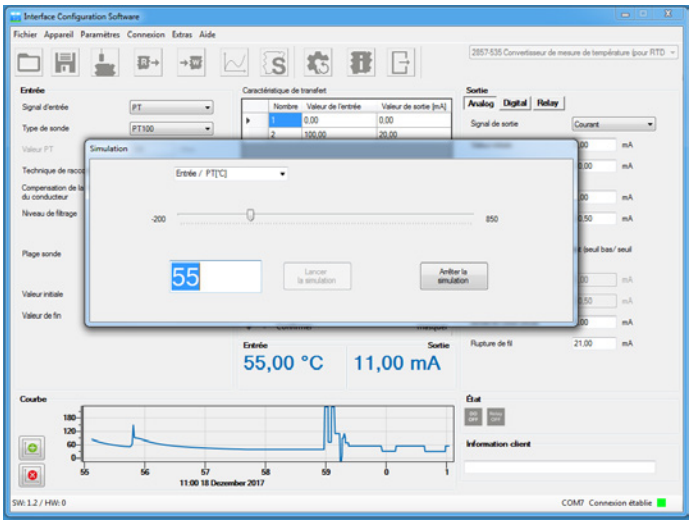
Simulation Mode – 2857 Series

The 2857 Series devices have a simulation mode. This allows the input/output response to be simulated simply and quickly with the interface configuration software or the configuration display. In the example, 100 A is simulated at the input of a current signal conditioner (2857-0550). When the analog output is preconfigured to 0 ... 20 mA, it reacts and provides 20 mA on the output side. The same function is available with threshold value switches, which allow simulation of the temperature on the input side, switching the relay or digital output (DO) on the output side.

This results in the advantage that system parts can be pre-installed and tested without signals or sensors being present on the input side.

The following devices support simulation mode:

- 2857-401
- 2857-550
- 2857-533
- 2857-534
- 2857-535
- 2857-535/000-001
- 2857-569

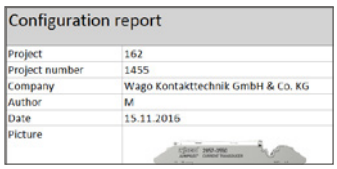


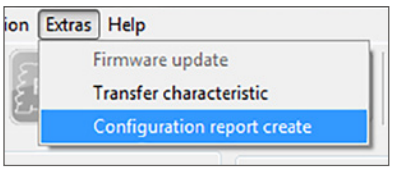
"Copy and Save" Configurations – 857 and 2857 Series

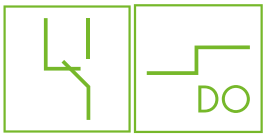
The interface configuration software allows all device settings to be saved as files and transferred or copied to other devices with the same functions. The configuration display also allows the saved data to be loaded on the display and then transferred or copied to other devices with the same functions.

This saves time during configuration!

Configuration Report – 857 and 2857 Series
All information such as hardware and software status, input, output, relays or DO can be provided for system documentation with the “Configuration Report” setting.

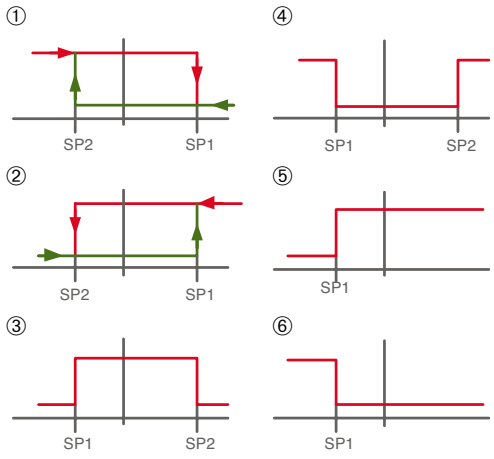




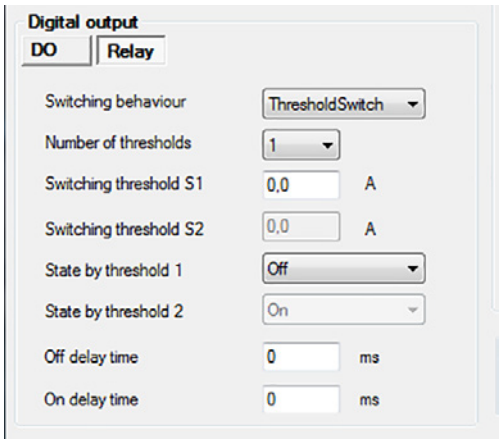


Relay/Digital Switching Output (DO)

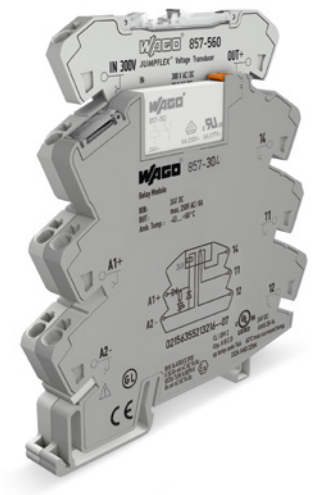
The switching output (relay or DO) signals switching thresholds that can be set relative to the signal conditioner’s input signal. Several configuration options are available (see figure). These switching thresholds, for example, can also be configured as a hysteresis to achieve simple two-point control.



Switching output configuration options



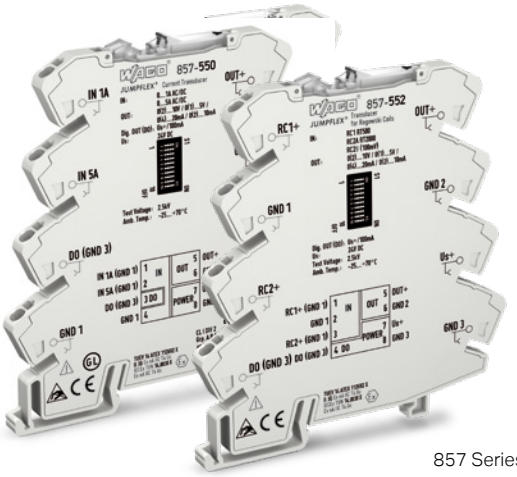
Pull-in/drop-out delay
Two switching thresholds in threshold value switch mode (for DO and relay)



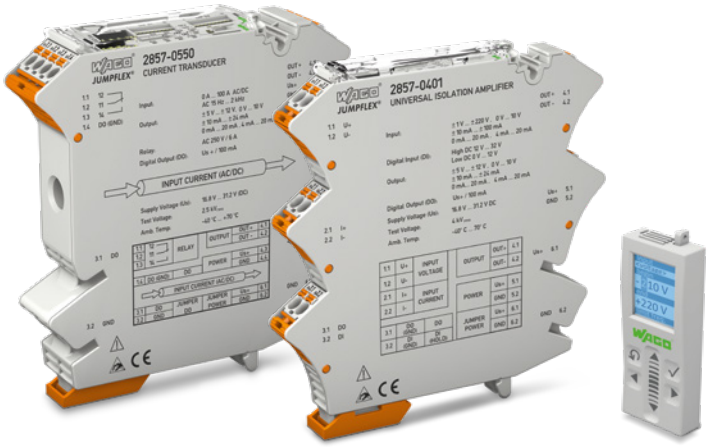
In order to increase the DO’s switching current, a relay can be added to the DO. For example, a relay (857-359) can be snapped onto the rail next to it, since the 857 and 2857 Series modules share the same profile. This output can be quickly and easily expanded to a 6 A switching current by simply using an adjacent jumper (859-402).

WAGO Signal Conditioners

PUSH-IN CAGE CLAMP®



857 Series



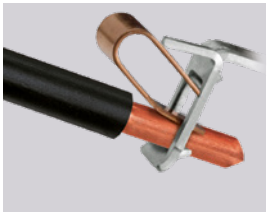
2857 Series

WAGO Termination Technology

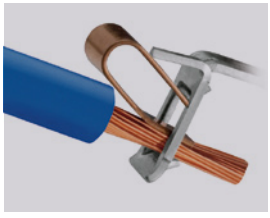
Push-in termination saves time!
Terminate both solid conductors and fine-stranded conductors with ferrules by simply pushing them in – no operating tool needed.

Vibration-Proof – Fast – Maintenance-Free

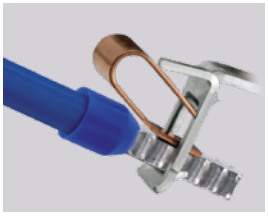
Push-in CAGE CLAMP® termination
for all conductor types



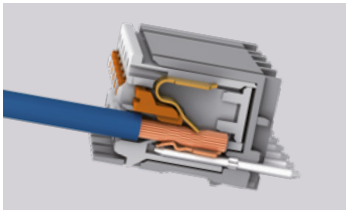
Solid



Fine-stranded



Ferrule



picoMAX®
Pluggable Connectors

857 Series → 2857 Series

Signs and Symbols

Signal Conditioners


Signal conditioner


Temperature signal conditioner


Threshold value switch


Frequency signal conditioner


Potentiometer signal conditioner


Resistance signal conditioner


Current signal conditioner


Voltage signal conditioner


Power measurement module

Isolation Technologies


Disconnecting


Amplifying


Filtering


Converting

Special Functions

Zero/span adjustment


Clipping function

Digital output (DO)


Relay, 1 changeover contact


Relay, 1 make contact

Configuration


DIP switch


Rotary coding switch


Configuration software


Configuration app


Configuration display


Teach-in switch


Save


Simulation

General


Temperature sensors


Connection technology


Supply voltage

Input Signals


Frequencies


Potentiometers


Resistors


Current


Voltage


Bipolar signals
Current and voltage

Output Signals


Current


Voltage


Bipolar signals
Current and voltage

RS-485 serial interface

0888-0172/0605-6901 SIGNAL CONDITIONERS BROCHURE 6.5 US – 10/2019 – Printed in Germany – Subject to changes

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