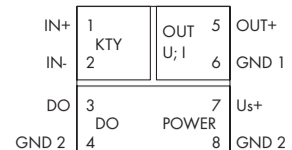


JUMPFLEX® – 857 Series

Temperature Signal Conditioner for KTY Sensors

857-820



1 Safety Information

DANGER
Do not work when devices are energized!
High voltage can cause electric shock or burns.
Switch off all power to the device prior to performing any installation, repair or maintenance work.

DANGER
Live parts are likely to be touched!
The party setting up the device is responsible for providing appropriate touch guards. The installation regulations must be observed for each individual application.

Note
Follow the instructions!
Incorrect installation may compromise safety in the event of a failure. Before installation and operation, please read these instructions thoroughly and carefully.

- Please especially observe the following:
- The device described in these instructions shall only be installed by a qualified electrician according to both DIN EN 50110-1/-2 and IEC 60364.
 - Before startup, check the device for any damage that may have occurred during shipping. The device shall not be put into operation in the event of mechanical damage.
 - Observe the applicable laws, standards and regulations.
 - Observe the current, accepted technology standards and practices at the time of installation
 - Only install this device in closed electrical service locations in accordance with DIN EN 50178.
 - Only install this device in dry indoor rooms.
 - Do not install the devices on or in the vicinity of easily flammable materials.

Improper use and failure to follow these instructions for use will render the warranty or guarantee null and void.

2 Short Description

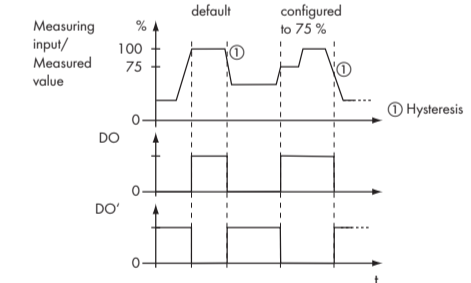
The temperature signal conditioner for KTY sensors records signals from KTY sensors featuring all standard characteristics. On the output side, the temperature signal conditioner for KTY sensors converts the temperature signal into a standard analog signal.

The temperature signal conditioner for KTY sensors is configurable via DIP switches, which are accessible from the side of the housing.

Features:

- Supports all standard KTY sensors
- Calibrated measurement range switching
- Switchable clipping
- Limitation of analog standard signal to upper range values
- Safe 3-way isolation with 2.5 kV test voltage acc. to EN 61140

2.1 Digital Output DO / Signaling



The DO (digital output) offers the capability to signal an error message. This output can be configured for this as required:
24 V → 0 V / 0 V → 24 V.

In order to increase the switching current of the DO, the latter may be expanded by a relay. Thanks to the contour uniformity of Series 857, for example, an 857-304 relay can be snapped in next to it. This output can be quickly and easily expanded to a switching current of 6 A by simply using an adjacent jumper (859-402).

Figure 1: Switching behavior, digital output DO

3 Technical Data

Table 1: Device	
Dimensions (mm) W × H × L	6 × 96 × 94 (height from upper-edge of DIN 35 rail)
Weight	50 g
Degree of protection	IP20

Table 2: Electrical Data	
Input	
Input signal	KTY sensors
Max. input signal	±30 VDC
Sensor types	KTY81-110, KTY81-120, KTY81-150, KTY82-110, KTY82-120, KTY82-150, KTY81-121, KTY82-121, KTY81-122, KTY82-122, KTY81-210, KTY81-220, KTY82-210, KTY82-220, KTY81-221, KTY82-221, KTY81-222, KTY82-222, KTY81-250, KTY82-250, KTY83-110, KTY83-120, KTY83-150, KTY83-121, KTY83-122, KTY83-151, KTY84-130, KTY84-150, KTY84-151, KTY16, KTY19, ST13, ST20
Sensor connection	2-wire connection
Output	
Output signal	0 mA ... 10 mA, 2 mA ... 10 mA, 0 mA ... 20 mA, 4 mA ... 20 mA 0 V ... 5 V, 1 V ... 5 V, 0 V ... 10 V, 2 V ... 10 V
Load impedance I output	≤ 600 Ω
Load impedance U output	≥ 2 kΩ
Step response	< 50 ms

(En)

Table 2: Electrical Data	
Digital output	
Max. switching voltage	Supply voltage applied
Max. continuous current	500 mA (to 60 °C) 100 mA (60 °C ... 70 °C)
General	
Nominal supply voltage U _s	24 VDC (–25 % ... +30 %)
Supply voltage range	16.8 V ... 31.2 V
Current input at 24 VDC	≤ 40 mA
Transmission error	≤ 0.1 % of upper range value
Test voltage (input/output/supply)	2.5 kVAC, 50 Hz, 1 min.
Safe isolation (input/output/supply) acc. to DIN EN 61140 1 by increased isolation	DIN EN 61010-1
	Rated voltage 300 V AC/DC
	Overvoltage category II
	Rated impulse voltage 2.5 kV
	Pollution degree 2
Electrical isolation (input/output/supply)	DIN EN 61010-1
	Rated voltage 600 V AC/DC
	Overvoltage category II
	Rated impulse voltage 4.0 kV
	Pollution degree 2

Note
Different technical data for applications in hazardous areas!
If the device is used in an application in hazardous areas, it must be labeled accordingly by the user. This labeled device must only be used in hazardous areas.
The technical data contained in the ATEX/IECEX certificate are binding in this application!

Table 3: Different Electrical Data According to ATEX/IECEX Certificate	
Input	
Input signal	KTY sensors
Output	
Output signal	0 mA ... 10 mA, 2 mA ... 10 mA, 0 mA ... 20 mA, 4 mA ... 20 mA 0 V ... 5 V, 1 V ... 5 V, 0 V ... 10 V, 2 V ... 10 V
General	
Nominal supply voltage U _s	24 VDC (–10 % ... +10 %)
Power loss P _v	1.0 W

Table 4: Wiring	
Connection technology	Push-in CAGE CLAMP®
Solid "s"	0.08 mm² ... 2.5 mm² (AWG 28 ... 14)
Fine-stranded "f-st"	0.34 mm² ... 2.5 mm² (AWG 22 ... 14)
Strip length	9 mm ... 10 mm / 0.37 in

Table 5: Environmental Requirements	
Ambient operating temperature	–25 °C ... +70 °C
Storage temperature	–40 °C ... +85 °C
Operating altitude above sea level	Max. 2000 m

4 Standards and Approvals

4.1 Overview

Table 6: Standards and Approvals		
EMC	EN 61000-6-2, EN 61000-6-4, DIN EN 61326-1	
UL	UL 508	File No. E175199
ATEX	According to EN 60079-0 and EN 60079-15	
	TÜV 14 ATEX 112692X	II 3 G Ex nA IIC T4 Gc
IECEX	According to IEC 60079-0 and IEC 60079-15	
	IECEX TUN 14.0030X	Ex nA IIC T4 Gc
GL	Shipbuilding, GL (Germanischer Lloyd)	Certificate No. 44627-07 HH
	Shipbuilding, PRS (Polski Rejestr Statków)	Certificate No. TE/1989/880590/13

4.2 Special Conditions for Safe Use

- The devices of the JUMPFLEX® series have to be erected in such a way, that corresponding to IEC/EN 60079-15 a degree of protection of at least IP54 according to IEC/EN 60529 is achieved.
- Measures have to be taken, external to the modules, to provide a transient protection that ensures that the rated voltage, connected to the power supply terminals, is not exceeded by more than 40 %.
- The connecting and disconnecting of the non-intrinsically safe circuits is only permitted if no explosive atmosphere exists.
- The module 857-820 must be mounted with a spacing to all adjacent modules of not less than 1 cm.

4.3 Installation Instructions for Shipbuilding

Note
Use only shielded cables!
Use only shielded cables for the device output.

5 Pin Assignment

Table 7: Pin Assignment

Table 7: Pin Assignment		Pos.	Assignment	Pos.	Assignment
(1)	(5)	(1)	Sensor IN+	(5)	OUT+
(2)	(6)	(2)	Sensor IN–	(6)	GND 1
(3)	(7)	(3)	DO	(7)	U _s +
(4)	(8)	(4)	GND 2	(8)	GND 2
(a)	(b)	(a)	Transparent cover	(b)	DIP switch
(c)		(c)	Snap-in mounting foot		

6 Assembly

NOTICE
Avoid electrostatic discharge!
The devices are equipped with electronic components that you may destroy by electrostatic discharge when you touch. Pay attention while handling the devices to good grounding of the environment (persons, job and packing).

Install the device according to EN 60715 by snapping it onto DIN 35 rails without using any tools. For secure fixing on the DIN rail we recommend mounting an end stop (e.g., Item No. 249-116) at the beginning and at the end of the modules.

Use separators (Item No. 209-191) between adjacent contacts for safe disconnection when devices have been snapped in on each side.

To remove the device, rotate the snap-in mounting foot out of place, e.g., using the operating tool. Turn the device to release it from the DIN rail.

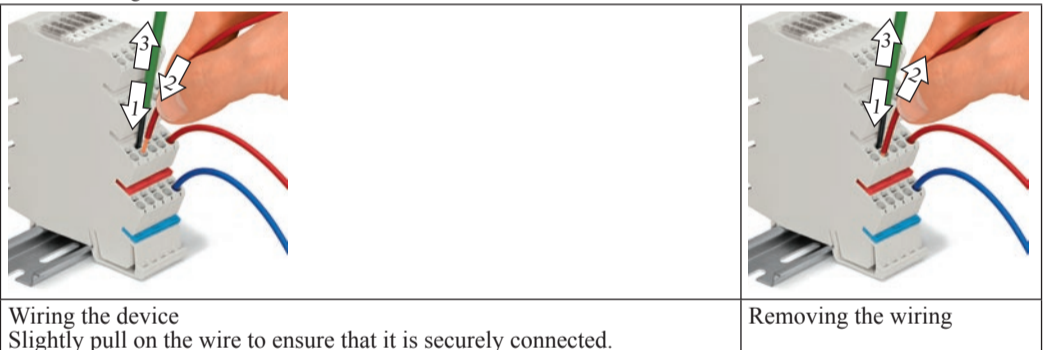
7 Wiring

DANGER
Ensure a standard connection!
To minimize any hazardous situations resulting in personal injury or to avoid failures in your system, the data and power supply lines shall be installed according to standards, with careful attention given to ensuring the correct terminal assignment. Always adhere to the EMC directives applicable to your application.

Always observe the max. permissible conductor cross sections for the signal and power cables (see "Technical Data").

Perform wiring of the device using an operating tool.

Table 8: Wiring



Push-in type jumper bars (859 series) can be used for potential commoning (see "Accessories").

8 LEDs and Error Indication

The LEDs (green/yellow/red), which are visible on the front, display the following states:

- Green LED illuminated: Supply voltage is applied
- Yellow LED illuminated: DO is switched (supply voltage is applied)
- Red LED flashes at 2 Hz: Measurement range underflow
- Red LED flashes at 2 Hz: Measurement range overflow
- Red LED flashes at 8 Hz: Wire break on the sensor side
- Red LED flashes at 8 Hz: Short circuit on the sensor side
- Red LED illuminated: Device failure; device must be returned!

9 Configuration

You have the following option to configure the device:

Table 9: Configuration Option

DIP switch	
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9.1 DIP Switches

To set the DIP switches (b), use an operating tool (see "Accessories").

- = ON
- = Default settings

Table 10: Configuration via DIP Switches – Sensor Types

DIP switch S1									
1	2	3	4	Sensor type	1	2	3	4	Sensor type
•	•	•	•	KTY81-110, KTY81-120, KTY82-110, KTY82-120	•	•	•	•	KTY83-110, KTY83-120
•	•	•	•	KTY81-121, KTY82-121	•	•	•	•	KTY83-121
•	•	•	•	KTY81-122, KTY82-122	•	•	•	•	KTY83-122
•	•	•	•	KTY81-150, KTY82-150	•	•	•	•	KTY83-150
•	•	•	•	KTY81-210, KTY81-220, KTY82-210, KTY82-220	•	•	•	•	KTY83-151
•	•	•	•	KTY81-221, KTY82-221	•	•	•	•	KTY84-130, KTY84-150
•	•	•	•	KTY81-222, KTY82-222	•	•	•	•	KTY84-151
•	•	•	•	KTY81-250, KTY82-250	•	•	•	•	KTY16, KTY19, ST13, ST20

Table 11: Configuration via DIP Switches – Output Signal

DIP switch S1		6	7	8	Output signal
•	•	•	•	•	0 mA ... 20 mA
•	•	•	•	•	4 mA ... 20 mA
•	•	•	•	•	0 mA ... 10 mA
•	•	•	•	•	2 mA ... 10 mA
•	•	•	•	•	0 V ... 10 V
•	•	•	•	•	2 V ... 10 V
•	•	•	•	•	0 V ... 5 V
•	•	•	•	•	1 V ... 5 V

Table 12: Configuration via DIP Switches – Diagnostics

DIP switch S1		9	10	Measurement range underflow	Measurement range overflow	Wire break	Short circuit
•	•	•	•	Lower limit of output range – 5 % ¹⁾ ²⁾	Upper limit of output range + 2.5 % ¹⁾	Upper limit of output range + 5 % ¹⁾	Lower limit of output range – 12.5 % ¹⁾ ²⁾
•	•	•	•	Lower limit of output range	Upper limit of output range + 2.5 %	Upper limit of output range + 5 %	Lower limit of output range
•	•	•	•	Lower limit of output range	Upper limit of output range	Upper limit of output range + 5 %	Upper limit of output range + 5 %
•	•	•	•	Lower limit of output range	Upper limit of output range	Lower limit of output range	Lower limit of output range

¹⁾ acc. to NAMUR NE 43

²⁾ but not when lower limit of output range = 0 V or 0 mA

Table 13: Configuration via DIP Switches – Start and End Temperature

DIP switch S2		Start temperature				End temperature										
1	2	3	°C	4	5	6	7	8	°C	4	5	6	7	8	°C	
•	•	•	0	•	•	•	•	•	100	•	•	•	•	•	•	210
•	•	•	–55	•	•	•	•	•	0	•	•	•	•	•	•	220
•	•	•	–50	•	•	•	•	•	10	•	•	•	•	•	•	230
•	•	•	–40	•	•	•	•	•	20	•	•	•	•	•	•	240
•	•	•	–30	•	•	•	•	•	30	•	•	•	•	•	•	250
•	•	•	–20	•	•	•	•	•	40	•	•	•	•	•	•	260
•	•	•	–10	•	•	•	•	•	50	•	•	•	•	•	•	270
•	•	•	0	•	•	•	•	•	60	•	•	•	•	•	•	280
•	•	•		•	•	•	•	•	70	•	•	•	•	•	•	290
•	•	•		•	•	•	•	•	80	•	•	•	•	•	•	300
•	•	•		•	•	•	•	•	90	•	•	•	•	•	•	300

Table 14: Configuration via DIP Switches – Digital Output

DIP switch S2	
9	10
Digital output DO	Measurement range overflow indication
DO not active	
•	GND → U _s (rising)
•	U _s → GND (falling)

9.2 Default Settings

The DIP switches are all set to "OFF" when the device is delivered.

Table 15: Default Settings

Sensor type	KTY81-110, KTY81-120, KTY82-110, KTY82-120
Start temperature	0 °C
End temperature	100 °C
Output signal	0 mA ... 20 mA
Measurement range underflow	0 mA
Measurement range overflow	20.5 mA
Wire break	21 mA
Short circuit	0 mA
Digital output (DO)	DO not active

10 Application Example

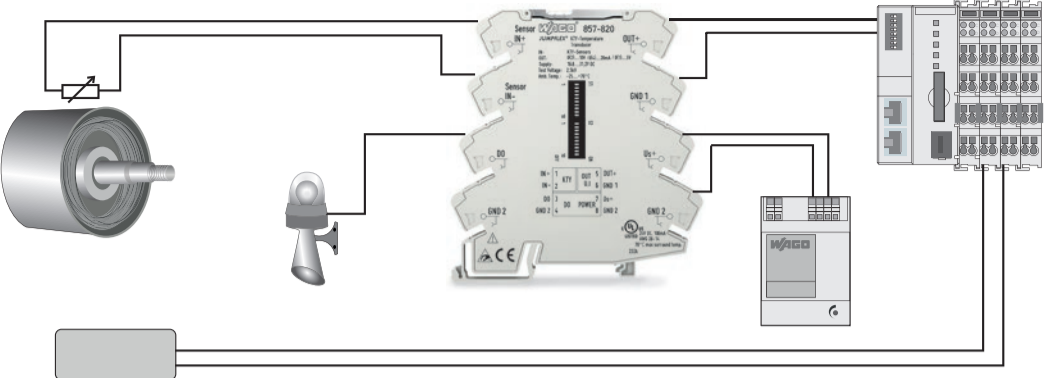


Figure 2: Application Example

11 Accessories

Details about accessories are given in the main catalog, Vol. 4 "INTERFACE ELECTRONIC" or on the internet at www.wago.com.

11.1 Tools

Use only the following tool:

Table 16: Accessories – Tools

Operating tool with partially insulated shaft	Type 2, (3.5 × 0.5) mm blade	210-720
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11.2 Push-In Type Jumper Bars

For easy wiring, you can install the push-in type jumper bar before attaching the connecting leads. Push the jumper bar into place all the way to the stop.