

# Analogue Signal Processing

## Analogue signal processing

### Problems

The real environment can be measured in many different forms, for example in terms of temperature, humidity or air pressure. The values of these physical variables change constantly. Elements which monitor the statuses and status changes of a given environment and supply an indication of this changed environment must be able to portray the continuous change.

In industrial monitoring tasks, sensors are responsible for registering ambient statuses. Sensors provide signals which allow detailed conclusions for downstream evaluation and monitoring systems with detailed conclusions about the statuses or status changes, for example in a production process. Sensor signals monitor continuous changes in the monitored field. They occur in digital and analogue form. As a rule, they supply an electrical voltage or current value which corresponds proportionally to the physical variables being monitored.

If automation processes are expected to reach certain statuses or keep them constant, then analogue signal processing is required. It is also important in areas where this has already been part of long established practice, for example process engineering or the chemicals industry.

In process engineering, standardised electrical signals are normally used. Currents from 0... 20 mA, 4... 20 mA or voltages from 0..10 V have become established as the output variable for sensors of various different physical parameters.

Weidmüller takes account of the continuing trend to automate – including and in particular with analogue signal processing – and offers a wide range of products tailor-made to the requirements involved in handling sensor signals. Units for the common signals (0..20 mA, 4..20 mA, 0..10 V) generate an output signal as proportional values of the variable input signal. “Protective separation” e.g. of the sensor circuit from the evaluation circuit is also taken into account. “Protective separation” prevents mutual interference of several sensor circuits, for example as in the case of earth ground circuits in linked measuring circuits.

The wide range of products completely covers the functions involved in signal conversion, signal separation and signal monitoring. The products thus satisfy nearly all applications in industrial measuring technology, and safeguard elementary functions between field signals and further processing systems. The mechanical properties of the products are built up around a continuous concept.

Signal converters can be used with other Weidmüller products and combined with each other. They are designed from an electrical and mechanical point of view so as to entail a minimum wiring workload and maintenance.



The product programme contains the following functions:

- dc/dc converters
- Current converters
- Voltage converters
- Temperature transformers for resistance thermometers and thermoelements
- Frequency converters
- Potentiometer transducers
- ac transducers
- Bridge transducers (strain gauges)
- Threshold monitoring modules
- AD/DA converters

The stated products are available as pure signal conversion, 2-way isolation, 3-way isolation and passive disconnectors – depending on the production functions in each case.

# Analogue Signal Processing

## Weidmüller interface units

**2-way isolation** separates the signals and decouples the measuring circuits. Potential differences, caused by long line leads and joint reference points, are eliminated. Signal isolation also protects from destruction by overvoltage together with inductive and capacitive gaps.

**3-way isolation** also separates the supply voltage to the input and output circuit and allows for operation with only one operating voltage.

**Passive isolators** have another crucial advantage: they do not need any additional power supply. The power supply for the module comes from the input or output circuit and is transferred to the input/output. The outstanding feature of this current loop feed is its very low own consumption.

There is a wide range of products for measuring temperature. **PT100** signals are converted in 2, 3 and 4-conductor system to standardised signals 0-20 mA, 4-20 mA and 0-10 V.

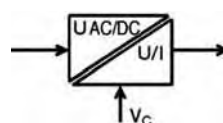
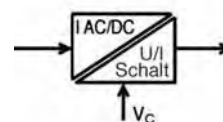
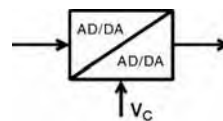
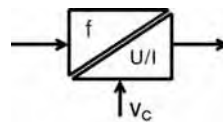
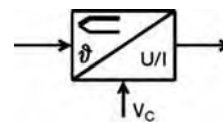
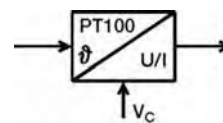
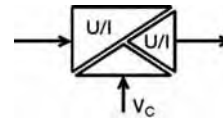
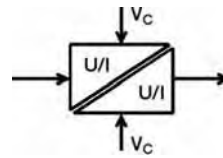
The modules for connecting to commercially available **thermocouples** have cold joint compensation as a standard feature. In addition, they amplify and linearise the voltage signal issued by the thermocouple. This guarantees exact conditioning of the analogue signal, eliminating interference or fault sources.

**Frequency converters** convert frequency into analogue standard signals so that subsequent controllers can directly process pulse sequences for speed or velocity measurement.

No kind of automation is conceivable without **AD or DA converters**. To bring together the analogue signals which portray the environment with the digital processing of the process monitoring system, analogue signals have to be converted into digital ones. Weidmüller also offers these modules for the common input and output signals 0 ... 20 mA, 4 ... 20 mA and 0 ... 10 V, with 8 bit or 12 bit available on the digital side. All modules have an additional input for freezing the current measured value.

**Current monitoring modules** control the current values up to 60 A for dc or ac current. If the values fall below or above the setting, then the switch output is triggered. Modules with analogue outputs monitor the current flow continuously using subsequent controllers.

**Voltage monitoring modules** are used to monitor dc and ac voltage. The freely adjustable switching threshold can be used to detect and report fluctuations in voltage as a result of switching procedures or mains overload.



## Advantages of the WAVESERIES

### The concept

The modules in the WAVESERIES are ideal when users need analogue separating transducers. Weidmüller's WAVESERIES combines the compact, space-saving design of the enclosure type (WAVEBOX) with many different functions. The product family offers a wide range of signal transducers.

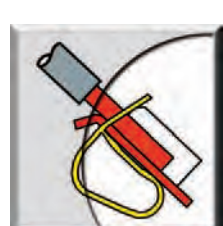
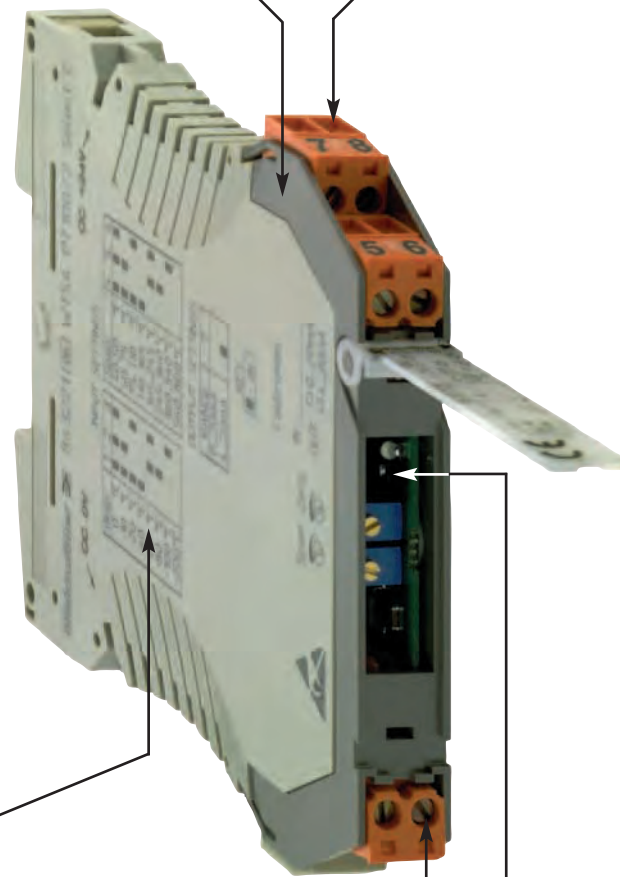
- Independent connection technology – screw or spring with pluggable socket connector
- Assembly without tools
- Fast commissioning – pluggable spare boards
- Standardised current and voltage signals
- Cross connectors for low wiring workload
- Highly functional
- Clear type designations for simple selection
- Ideal size – for more space in the switchgear cabinet
- Cost-saving

### Replacement

The PCB can be removed from the enclosure without any tools. Simple press in the locking hook at the top section and pull out the upper part with connection level and PCB.

### Cross connection

Cross connectors are used to connect up enclosures in the same family to bridge and transmit the power supply from one module to the next.



### Enclosure (WAVEBOX)

The WAVEBOX is an ideal combination of technology, design and functionality. The enclosure consists of recyclable plastic and comes in four different widths. It needs practically no tools for assembly and fulfils the EMC requirements. Ventilation slots allow good heat dissipation.

### Coding

The coding elements can be used to code the module for screw and also tension clamp connections without loss of poles. In this way, it is not possible to confuse the plugs.

### Connecting

Screw connection BLZ and the tension clamp system BLZF offer the greatest possible flexibility in the wiring stage (up to 2.5 mm<sup>2</sup>).

### Safety

"Protective separation" has to be guaranteed as per EN 50178. WAVESERIES complies with this requirement to the full with analogue signal transmission with potential separation.

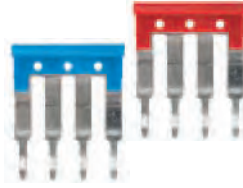
## Advantages of the MICROSERIES and MCZ SERIES

### Connecting

Screw connection BLZ and the tension clamp system BLZF offer the greatest possible flexibility in the wiring stage (up to 2.5 mm<sup>2</sup>).

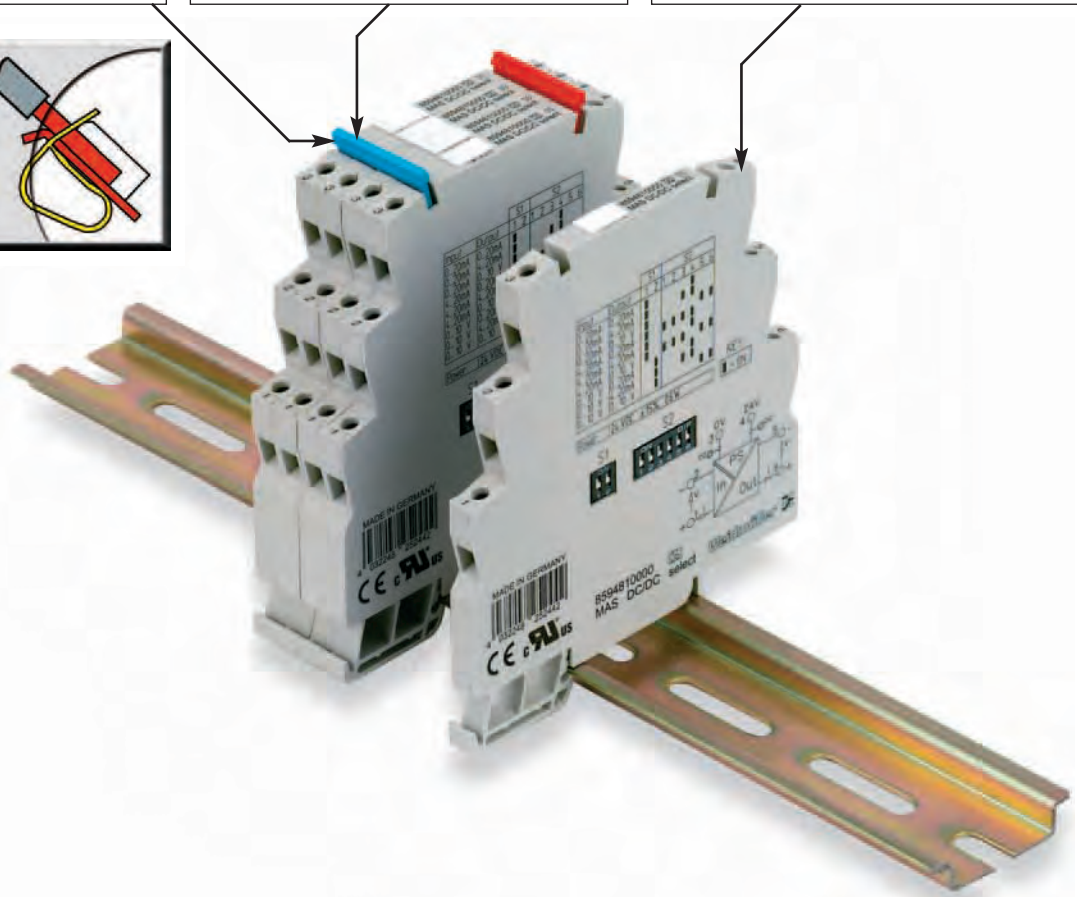
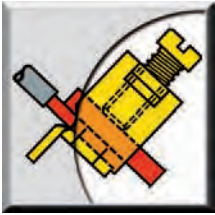
### Cross connection

The supply voltage can be bridged from one module to the next.



### Width

MICROANALOGUE sets standards for analogue signal processing. With a width of just 6 mm, MICROSERIES is highly functional with a completely closed enclosure.



### Connecting

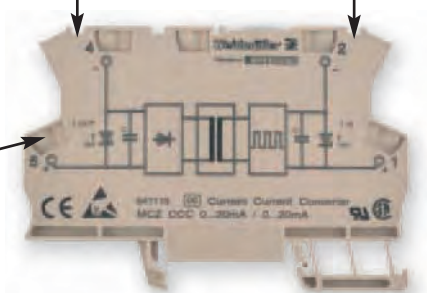
Tension spring connection

### Cross connection

The power supply and another potential can be cross connected

### Width

Just 6 mm wide (without cover plate), the MCZ SERIES offers enough space for electronic circuits.

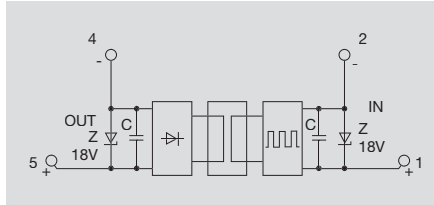
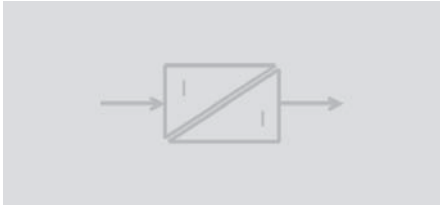
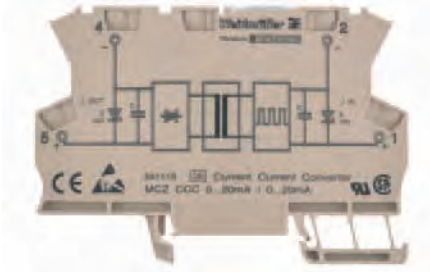


# DC/DC passive isolator

## Input current loop-fed

Passive isolator for electrical isolation of standard 0/4...20 mA signals. It is fed by the measuring signal and does not need any auxiliary power supply. Special features of this component are its low power consumption and the operating current of <math>< 100 \mu\text{A}</math>.

## MCZ CCC



### Technical data

#### Input

Input voltage/Input current  
Max. voltage/Max. current  
Operating current  
Voltage drop

/0(4)...20 mA current loop  
15 V/50 mA  
<math>< 100 \mu\text{A}</math>  
2.5...3 V at 20 mA

#### Output

Output voltage/Output current  
Load resistance voltage/Current  
Accuracy  
Temperature coefficient  
Influence of load impedance  
Residual ripple  
Chopper frequency

/0(4)...20 mA  
<math>/< = 500 \Omega</math>  
<math>< 0.1 \%</math> of final value  
<math>< 50 \text{ppm/K}</math> of measur. value at 0 $\Omega$  load resist.  
0.05 % of measurement value/100  $\Omega$  load resistance  
<math>< 10 \text{ mVeff}</math>  
Approx. 200 kHz

#### General data

Operation temperature  
Storage temperature  
Approvals

-25  $^{\circ}\text{C}$ ...+60  $^{\circ}\text{C}$   
-40  $^{\circ}\text{C}$ ...+85  $^{\circ}\text{C}$   
CSA / UL/UR / CE / ESD

#### Insulation coordinates

Standards  
EMC standards  
Isolation voltage Input, output

EN 60529, EN 61010-1  
EN 50081-1, EN 50082-2  
510 Veff

#### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

#### Tension clamp c.

1.50 / 0.50 / 1.50  
91.0 x 6.0 x 63.2

#### Information

### Ordering data

#### Type of connection

Tension clamp c.

Type	Qty.	Order No.
MCZ CCC 0-20mA/0-20mA	10	8411190000

#### Information

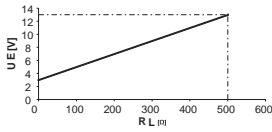
### Accessories

#### Information

# DC/DC passive isolator

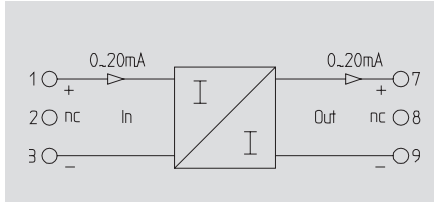
## Input current loop-fed

- Galvanic isolation
- Very low power consumption
- Secure disconnection



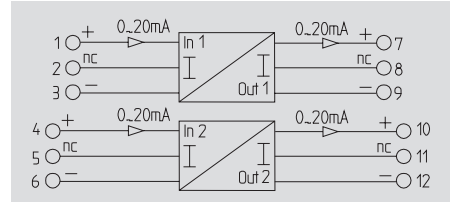
## CCC LP

### (1-channel)



## CCC LP

### (2-channel)



## Technical data

### Input

Input voltage/Input current  
Max. voltage/Max. current  
Operating current  
Voltage drop

### Output

Output voltage/Output current  
Load resistance voltage/Current  
Accuracy  
Temperature coefficient  
Influence of load impedance  
Residual ripple  
Chopper frequency

### General data

Operation temperature  
Storage temperature  
Approvals

### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Isolation voltage Input, output  
Overvoltage category  
Pollution severity  
Clearance & creepage path

/0(4)...20 mA current loop  
18 V/50 mA  
< 100  $\mu$ A  
approx. 3V at  $R_L=0 \Omega$ ; approx. 13V at  $R_L=500 \Omega$ ; ( $I_{in}=20mA$ )

/0(4)...20 mA  
< = 500  $\Omega$   
< 0.1 % of final value  
< 50 ppm/K of final value  
< 0.1 % of measurement value/100  $\Omega$  load resistance  
< 20 mVeff  
approx. 170 kHz

-25  $^{\circ}$ C...+70  $^{\circ}$ C  
-40  $^{\circ}$ C...+80  $^{\circ}$ C  
CSA / GL / UL/UR / CE / ESD

EN 50178 (safe separation)  
EN 50081, EN50082, EN55011  
300 V  
6 kV  
4 kVeff / 1 s  
III  
2  
>= 5.5 mm

/0(4)...20 mA current loop  
18 V/50 mA  
< 100  $\mu$ A  
approx. 3V at  $R_L=0 \Omega$ ; approx. 13V at  $R_L=500 \Omega$ ; ( $I_{in}=20mA$ )

/0(4)...20 mA  
< = 500  $\Omega$   
< 0.1 % of final value  
< 50 ppm/K of final value  
< 0.1 % of measurement value/100  $\Omega$  load resistance  
< 20 mVeff  
approx. 170 kHz

-25  $^{\circ}$ C...+70  $^{\circ}$ C  
-40  $^{\circ}$ C...+80  $^{\circ}$ C  
CSA / GL / UL/UR / CE / ESD

EN 50178 (safe separation)  
EN 50081, EN50082, EN55011  
300 V  
6 kV  
4 kVeff / 1 s  
III  
2  
>= 5.5 mm

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Information

### Screw connection

2.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4

### Tension clamp c.

1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4

T<sub>u</sub>=23 $^{\circ}$ C, single module

### Screw connection

2.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4

### Tension clamp c.

1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4

T<sub>u</sub>=23 $^{\circ}$ C, single module

## Ordering data

### Type of connection

Screw connection  
Tension clamp c.

Type	Qty.	Order No.
WAS5 CCC LP 0-20/0-20mA	1	8444950000
WAZ5 CCC LP 0-20/0-20mA	1	8444960000

Type	Qty.	Order No.
WAS5 CCC LP 0-20/0-20mA	1	8463580000
WAZ5 CCC LP 0-20/0-20mA	1	8463590000

### Information

## Accessories

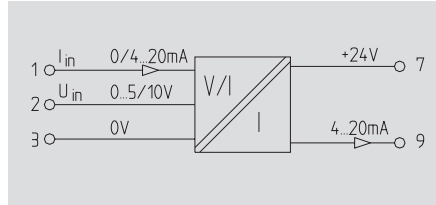
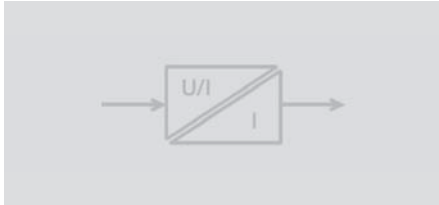
### Information

# DC/DC passive isolator

## Output current loop-fed

- Galvanic isolation
- Very low power consumption
- Input range selected via DIP switch
- Calibration not necessary

## O LP



## Switch position/setting options

Input	SW 1			
	1	2	3	4
0...20 mA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4...20 mA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0...5 V	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
0...10 V	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Transmission frequency</b>				
10 Hz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
100 Hz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

■ = on  
□ = off

## Technical data

### Input

Input voltage  
Max. voltage  
Input resistance voltage/Current  
Input current  
Max. current

0... (5) 10 V  
30 Vdc  
0...5V: 210 kΩ; 0...10V: 430 kΩ/51 Ω  
0(4)...20 mA  
40 mA

### Output

Output current  
Output signal limit  
Load resistance voltage/Current  
Accuracy  
Temperature coefficient  
Residual ripple  
Step response time  
Cut-off freq. (-3dB)

4...20 mA (current loop)  
approx. 24 mA  
/RL=(Ub-12V) / 20 mA e.g. 600 Ω at 24V  
0.2 % of measuring range final value  
≤ 150 ppm/K  
50 mVeff at 500 Ω  
< 10 Hz: 80 ms; 100 Hz: 50 ms  
10 Hz/ 100 Hz switchable

### General data

Supply voltage  
Operation temperature  
Storage temperature  
Default settings  
Approvals

min. 12 Vdc/ max. 30 Vdc  
0 °C...+55 °C (fitted)  
-20 °C...+85 °C  
0...20mA, 10 Hz  
CE / ESD / cURus

### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Isolation voltage Input, output  
Overvoltage category  
Pollution severity  
Clearance & creepage path

EN 50178  
EN 50082-2, EN 50081-1, -2, EN 55011  
300 V  
4 kV  
4 kVeff / 5s  
III  
2  
≥ 5.5 mm

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

### Information

Tu=23°C, single module

## Ordering data

### Type of connection

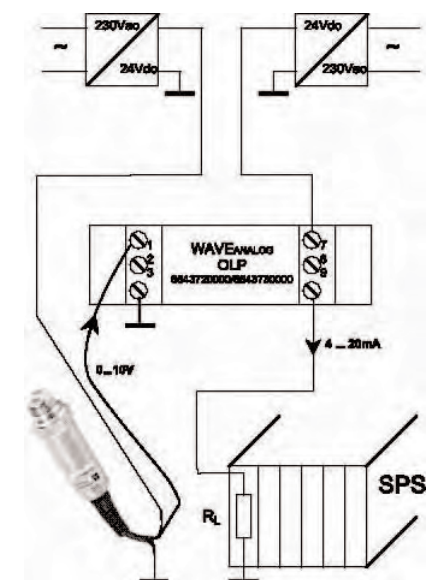
Screw connection  
Tension clamp c.

Type	Qty.	Order No.
WAS5 OLP	1	8543720000
WAZ5 OLP	1	8543730000

### Information

## Accessories

### Information

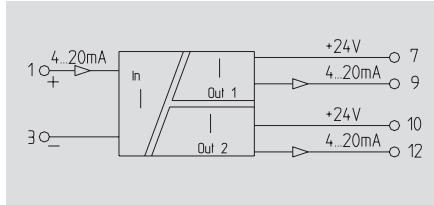
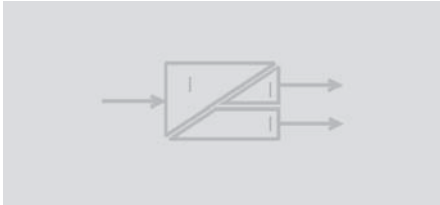


# DC/DC passive isolator

## Loop splitter

- Galvanic isolation
- Input and output current loop feed
- Very low power consumption
- Calibration not necessary

## 20LP



## Technical data

### Input

Input current  
Max. current  
Voltage drop

4...20 mA (current loop)  
40 mA  
3.8 V

### Output

Output current/  
Output signal limit  
Load resistance voltage/Current  
Accuracy  
Temperature coefficient  
Step response time  
Cut-off freq. (-3dB)

2 x 4...20 mA (current loop)/  
approx. 31 mA  
 $/R_L = (U_b - 12V) / 20 \text{ mA}$  e.g.  $600 \Omega$  at 24V  
typical 0.1%, max. 0.2%  
 $\leq 150 \text{ ppm/K}$   
 $< 20 \text{ ms}$   
30 Hz

### General data

Supply voltage  
Operation temperature  
Storage temperature  
Approvals

min. 12 Vdc/ max. 30 Vdc  
 $0^\circ\text{C} \dots +55^\circ\text{C}$  (fitted)  
 $-20^\circ\text{C} \dots +85^\circ\text{C}$   
CE / ESD / cURus

### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Isolation voltage Input, output/  
Overvoltage category  
Pollution severity  
Clearance & creepage path

EN 50178  
EN 50082-2, EN 50081-1, -2, EN 55011  
300 V  
4 kV  
4 kVeff / 5s/  
III  
2  
 $\geq 5.5 \text{ mm}$

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Screw connection

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

### Information

T<sub>u</sub>=23°C, single module

## Ordering data

### Type of connection

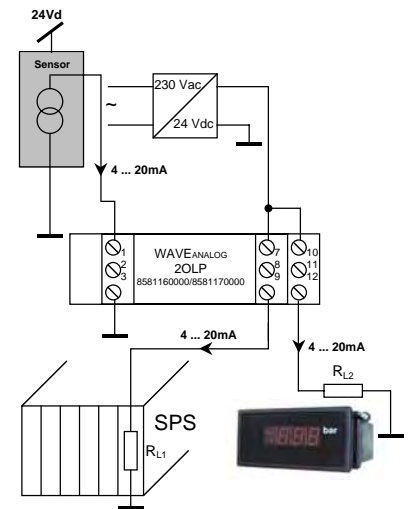
Screw connection  
Tension clamp c.

Type	Qty.	Order No.
WAS5 CCC 20LP	1	8581160000
WAZ5 CCC 20LP	1	8581170000

### Information

## Accessories

### Information



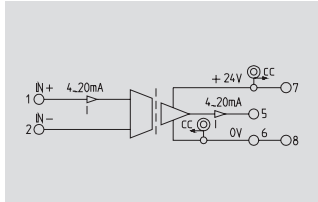


# DC/DC 2-way isolator

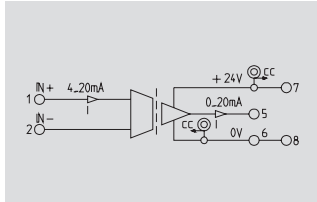
## Power supply on the output side

- Signal conversion
- Galvanic isolation between input/output signal
- Power supply can be cross-connected via plug-in jumpers

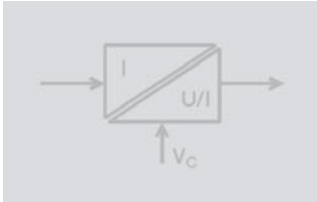
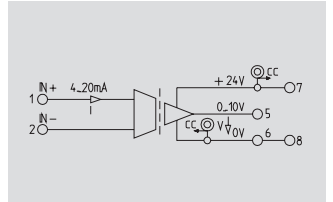
### 4...20mA/4...20mA



### 4...20mA/0...20mA



### 4...20mA/0...10V



## Technical data

### Input

Input voltage/Input current  
Max. voltage  
Max. current

### Output

Output voltage/Output current  
Load resistance voltage/Current  
Accuracy  
Temperature coefficient  
Step response time  
Cut-off freq. (-3dB)

### General data

Supply voltage  
Current consumption  
Current-carrying cap. of cross-connect.  
Operation temperature  
Storage temperature  
Approvals

### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Isolation voltage Input, output/  
Overvoltage category  
Pollution severity  
Clearance & creepage path

/4...20 mA (current loop)  
7 V  
25 mA

/4...20 mA  
< = 500 Ω  
+/- 0.2% of final value  
<= 250 ppm/K of final value  
<= 30 ms (typically 20 ms)  
>= 15 Hz (typically 20 Hz)

24 Vdc +/- 20 %  
< 32 mA at Iout = 20 mA  
<= 2 A  
0 °C...+55 °C (fitted)  
-20 °C...+85 °C  
CSA / UL/UR / CE / ESD

EN 50178  
EN 50081, EN50082, EN55011

300 V  
4 kV  
1.2 kVeff / 5s/  
III  
2  
>= 3 mm

/4...20 mA (current loop)  
7 V  
25 mA

/0...20 mA  
< = 500 Ω  
+/- 0.2% of final value  
<= 250 ppm/K of final value  
<= 30 ms (typically 20 ms)  
>= 15 Hz (typically 20 Hz)

24 Vdc +/- 20 %  
< 32 mA at Iout = 20 mA  
<= 2 A  
0 °C...+55 °C (fitted)  
-20 °C...+85 °C  
CSA / UL/UR / CE / ESD

EN 50178  
EN 50081, EN50082, EN55011

300 V  
4 kV  
1.2 kVeff / 5s/  
III  
2  
>= 3 mm

/4...20 mA (current loop)  
7 V  
25 mA

0...10 V/  
>= 1 kΩ/  
+/- 0.2% of final value  
<= 250 ppm/K of final value  
<= 30 ms (typically 20 ms)  
>= 15 Hz (typically 20 Hz)

24 Vdc +/- 20 %  
< 20 mA at Iout = 10 mA  
<= 2 A  
0 °C...+55 °C (fitted)  
-20 °C...+85 °C  
CSA / UL/UR / CE / ESD

EN 50178  
EN 50081, EN50082, EN55011

300 V  
4 kV  
1.2 kVeff / 5s/  
III  
2  
>= 3 mm

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Information

Screw connection	Tension clamp c.
2.50 / 0.50 / 2.50	1.50 / 0.50 / 2.50
92.4 x 12.5 x 112.4	92.4 x 12.5 x 112.4

Tu=23°C, single module

Screw connection	Tension clamp c.
2.50 / 0.50 / 2.50	1.50 / 0.50 / 2.50
92.4 x 12.5 x 112.4	92.4 x 12.5 x 112.4

Tu=23°C, single module

Screw connection	Tension clamp c.
2.50 / 0.50 / 2.50	1.50 / 0.50 / 2.50
92.4 x 12.5 x 112.4	92.4 x 12.5 x 112.4

Tu=23°C, single module

## Ordering data

### Type of connection

Screw connection  
Tension clamp c.

Type	(Qty.=1)	Order No.
WAS4 CCC DC 4-20/4-20mA		8444980000
WAZ4 CCC DC 4-20/4-20mA		8444990000

Type	(Qty.=1)	Order No.
WAS4 CCC DC 4-20/0-20mA		8445010000
WAZ4 CCC DC 4-20/0-20mA		8445020000

Type	(Qty.=1)	Order No.
WAS4 CVC DC 4-20/0-10V		8445040000
WAZ4 CVC DC 4-20/0-10V		8445050000

### Information

## Accessories

### Information

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

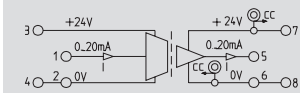
Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

# DC/DC 2-way isolator

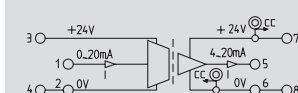
## Double sided power supply

- Signal conversion
- Galvanic isolation between input/output signal
- Power supply can be cross-connected via plug-in jumpers

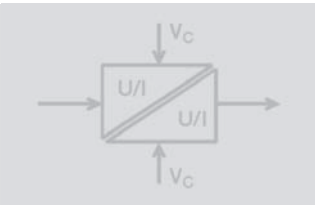
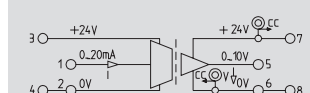
### 0...20mA/0...20mA



### 0...20mA/4...20mA



### 0...20mA/0...10V



## Technical data

### Input

Input voltage/Input current  
Max. voltage/Max. current  
Input resistance voltage/Current

### Output

Output voltage/Output current  
Load resistance voltage/Current  
Accuracy  
Temperature coefficient  
Step response time  
Cut-off freq. (-3dB)

### General data

Supply voltage  
Current consumption input  
Current consumption output  
Current-carrying cap. of cross-connect.  
Operation temperature  
Storage temperature  
Approvals

### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Isolation voltage Input, output  
Overvoltage category  
Pollution severity  
Clearance & creepage path

/0...20 mA  
/25 mA  
/50 Ω

/0...20 mA  
/< = 500 Ω  
+/- 0.2% of final value  
≤ 250 ppm/K of final value  
≤ 30 ms (typically 16 ms)  
≥ 15 Hz (typically 25 Hz)

24 Vdc +/- 20 %  
< 11 mA at lin = 20 mA  
< 32 mA at lout = 20 mA  
≤ 2 A  
0 °C...+55 °C (fitted)  
-20 °C...+85 °C  
CSA / UL/UR / CE / ESD

EN 50178  
EN 50081, EN50082, EN55011  
300 V  
4 kV  
1.2 kVeff / 5s  
III  
2  
≥ 3 mm

/0...20 mA  
/25 mA  
/50 Ω

/4...20 mA  
/< = 500 Ω  
+/- 0.2% of final value  
≤ 250 ppm/K of final value  
≤ 30 ms (typically 16 ms)  
≥ 15 Hz (typically 25 Hz)

24 Vdc +/- 20 %  
< 11 mA at lin = 20 mA  
< 32 mA at lout = 20 mA  
≤ 2 A  
0 °C...+55 °C (fitted)  
-20 °C...+85 °C  
CSA / UL/UR / CE / ESD

EN 50178  
EN 50081, EN50082, EN55011  
300 V  
4 kV  
1.2 kVeff / 5s  
III  
2  
≥ 3 mm

/0...20 mA  
/25 mA  
/50 Ω

0...10 V/  
≥ 1 kΩ/  
+/- 0.2% of final value  
≤ 250 ppm/K of final value  
≤ 30 ms (typically 16 ms)  
≥ 15 Hz (typically 25 Hz)

24 Vdc +/- 20 %  
< 11 mA at lin = 20 mA  
< 20 mA at lout = 10 mA  
≤ 2 A  
0 °C...+55 °C (fitted)  
-20 °C...+85 °C  
CSA / UL/UR / CE / ESD

EN 50178  
EN 50081, EN50082, EN55011  
300 V  
4 kV  
1.2 kVeff / 5s  
III  
2  
≥ 3 mm

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Information

Screw connection	Tension clamp c.
2.50 / 0.50 / 2.50	1.50 / 0.50 / 2.50
92.4 x 12.5 x 112.4	92.4 x 12.5 x 112.4

Tu=23°C, single module

Screw connection	Tension clamp c.
2.50 / 0.50 / 2.50	1.50 / 0.50 / 2.50
92.4 x 12.5 x 112.4	92.4 x 12.5 x 112.4

Tu=23°C, single module

Screw connection	Tension clamp c.
2.50 / 0.50 / 2.50	1.50 / 0.50 / 2.50
92.4 x 12.5 x 112.4	92.4 x 12.5 x 112.4

Tu=23°C, single module

## Ordering data

### Type of connection

Screw connection  
Tension clamp c.

Type	(Qty.=1)	Order No.
WAS4 CCC DC 0-20/0-20MA		8445070000
WAZ4 CCC DC 0-20/0-20MA		8445080000

Type	(Qty.=1)	Order No.
WAS4 CCC DC 0-20/4-20MA		8446970000
WAZ4 CCC DC 0-20/4-20MA		8446990000

Type	(Qty.=1)	Order No.
WAS4 CVC DC 0-20/0-10V		8447020000
WAZ4 CVC DC 0-20/0-10V		8447030000

### Information

## Accessories

### Information

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

# DC/DC 2-way isolator

## Double sided power supply

- Signal conversion
- Galvanic isolation between input/output signal
- Power supply can be cross-connected via plug-in jumpers

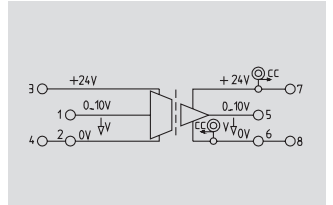
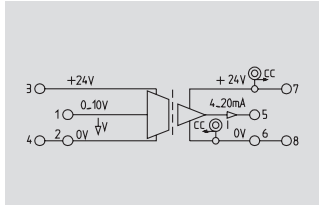
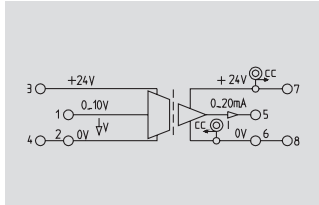
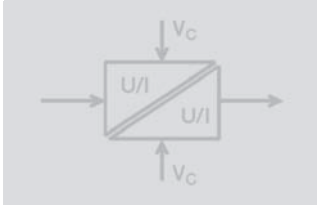
### 0...10V/0...20mA



### 0...10V/4...20mA



### 0...10V/0...10V



## Technical data

### Input

Input voltage/Input current  
Max. voltage/Max. current  
Input resistance voltage/Current

### Output

Output voltage/Output current  
Load resistance voltage/Current  
Accuracy  
Temperature coefficient  
Step response time  
Cut-off freq. (-3dB)

### General data

Supply voltage  
Current consumption input  
Current consumption output  
Current-carrying cap. of cross-connect.  
Operation temperature  
Storage temperature  
Approvals

### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Isolation voltage Input, output  
Overvoltage category  
Pollution severity  
Clearance & creepage path

0...10 V/  
15 V/  
500 k $\Omega$ /

/0...20 mA  
< = 500  $\Omega$   
+/- 0.2% of final value  
<= 250 ppm/K of final value  
<= 30 ms (typically 25 ms)  
>= 13 Hz (typically 17 Hz)

24 Vdc +/- 20 %  
< 11 mA at U<sub>in</sub> = 10 V  
< 32 mA at I<sub>out</sub> = 20 mA  
<= 2 A  
0 °C...+55 °C (fitted)  
-20 °C...+85 °C  
CSA / UL/UR / CE / ESD

EN 50178  
EN 50081, EN50082, EN55011  
300 V  
4 kV  
1.2 kVeff / 5s  
III  
2  
>= 3 mm

0...10 V/  
15 V/  
500 k $\Omega$ /

/4...20 mA  
< = 500  $\Omega$   
+/- 0.2% of final value  
<= 250 ppm/K of final value  
<= 30 ms (typically 25 ms)  
>= 13 Hz (typically 17 Hz)

24 Vdc +/- 20 %  
< 11 mA at U<sub>in</sub> = 10 V  
< 32 mA at I<sub>out</sub> = 20 mA  
<= 2 A  
0 °C...+55 °C (fitted)  
-20 °C...+85 °C  
CSA / UL/UR / CE / ESD

EN 50178  
EN 50081, EN50082, EN55011  
300 V  
4 kV  
1.2 kVeff / 5s  
III  
2  
>= 3 mm

0...10 V/  
15 V/  
500 k $\Omega$ /

0...10 V/  
>= 1 k $\Omega$ /  
+/- 0.2% of final value  
<= 250 ppm/K of final value  
<= 30 ms (typically 25 ms)  
>= 13 Hz (typically 17 Hz)

24 Vdc +/- 20 %  
< 11 mA at U<sub>in</sub> = 10 V  
< 20 mA at I<sub>out</sub> = 10 mA  
<= 2 A  
0 °C...+55 °C (fitted)  
-20 °C...+85 °C  
CSA / UL/UR / CE / ESD

EN 50178  
EN 50081, EN50082, EN55011  
300 V  
4 kV  
1.2 kVeff / 5s  
III  
2  
>= 3 mm

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Information

### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 12.5 x 112.4 92.4 x 12.5 x 112.4

Tu=23°C, single module

### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 12.5 x 112.4 92.4 x 12.5 x 112.4

Tu=23°C, single module

### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 12.5 x 112.4 92.4 x 12.5 x 112.4

Tu=23°C, single module

## Ordering data

### Type of connection

Screw connection  
Tension clamp c.

Type	(Qty.=1)	Order No.
WAS4 VCC DC 0-10/0-20MA		8447050000
WAZ4 VCC DC 0-10/0-20MA		8447080000

Type	(Qty.=1)	Order No.
WAS4 VCC DC 0-10/4-20MA		8447100000
WAZ4 VCC DC 0-10/4-20MA		8447110000

Type	(Qty.=1)	Order No.
WAS4 VCC DC 0-10/0-10V		8447130000
WAZ4 VCC DC 0-10/0-10V		8447140000

### Information

## Accessories

### Information

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

# DC/DC 3-way isolator

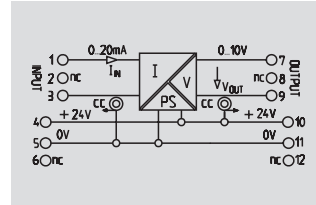
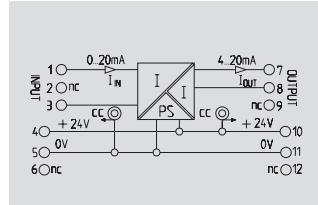
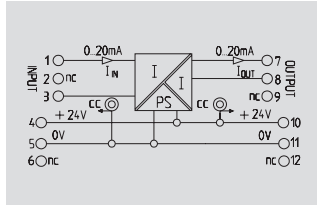
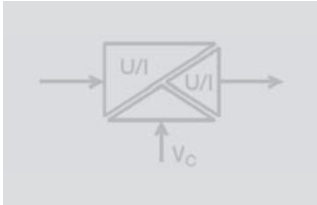
## 10Hz Cut-off frequency

- Signal conversion
- Galvanic isolation between input/output signal
- Power supply can be cross-connected via plug-in jumpers

## 0...(4)20mA/0...(4)20mA

## 0...20mA/4...20mA

## 0...20mA/0...10V



### Technical data

#### Input

Input voltage/Input current  
Max. voltage  
Max. current

#### Output

Output voltage/Output current  
Load resistance voltage/Current  
Accuracy  
Temperature coefficient  
Step response time  
Cut-off freq. (-3dB)

#### General data

Supply voltage  
Power consumption  
Current-carrying cap. of cross-connect.  
Operation temperature  
Storage temperature  
Approvals

#### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Isolation voltage Input, output/  
Overvoltage category  
Pollution severity  
Clearance & creepage path

/0(4)...20 mA

25 mA

/0(4)...20 mA

/ $\leq 600 \Omega$

0.2 %

+/- 250 ppm/K

$\leq 45$  ms

10 Hz

24 Vdc +/- 25 %

$< 1.5$  W at Iout = 20 mA

$\leq 2$  A

0 °C...+55 °C (horiz. mounting)

-20 °C...+85 °C

CE / cURus

EN 50178

EN 50081, EN50082, EN55011

300 V

4 kV

2 kVeff / 5s/

III

2

$\geq 3$  mm

/0...20 mA

25 mA

/4...20 mA

/ $\leq 600 \Omega$

0.2 %

+/- 250 ppm/K

$\leq 45$  ms

10 Hz

24 Vdc +/- 25 %

$< 1.5$  W at Iout = 20 mA

$\leq 2$  A

0 °C...+55 °C (horiz. mounting)

-20 °C...+85 °C

CE / cURus

EN 50178

EN 50081, EN50082, EN55011

300 V

4 kV

2 kVeff / 5s/

III

2

$\geq 3$  mm

/0...20 mA

25 mA

0...10 V/

$\geq 1$  k $\Omega$ /

0.2 %

+/- 250 ppm/K

$\leq 45$  ms

10 Hz

24 Vdc +/- 25 %

$< 1.3$  W at Iout = 5 mA

$\leq 2$  A

0 °C...+55 °C (horiz. mounting)

-20 °C...+85 °C

CE / cURus

EN 50178

EN 50081, EN50082, EN55011

300 V

4 kV

2 kVeff / 5s/

III

2

$\geq 3$  mm

#### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

#### Information

#### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

Tu=23°C, single module

#### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

Tu=23°C, single module

#### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

Tu=23°C, single module

### Ordering data

#### Type of connection

Screw connection  
Tension clamp c.

Type	(Qty.=1)	Order No.
WAS5 CCC 0-20/0-20mA		<b>8540180000</b>
WAZ5 CCC 0-20/0-20mA		<b>8540190000</b>

Type	(Qty.=1)	Order No.
WAS5 CCC 0-20/4-20mA		<b>8540250000</b>
WAZ5 CCC 0-20/4-20mA		<b>8540260000</b>

Type	(Qty.=1)	Order No.
WAS5 CVC 0-20mA/0-10V		<b>8540270000</b>
WAZ5 CVC 0-20mA/0-10V		<b>8540280000</b>

#### Information

### Accessories

#### Information

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

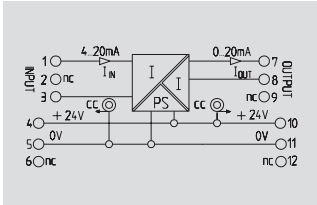
Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

# DC/DC 3-way isolator

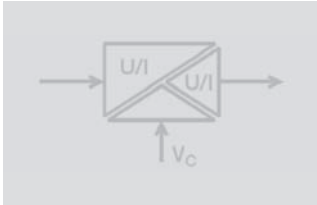
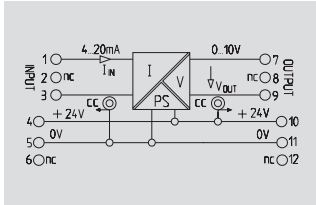
## 10Hz Cut-off frequency

- Signal conversion
- Galvanic isolation between input/output signal
- Power supply can be cross-connected via plug-in jumpers

## 4...20mA/0...20mA



## 4...20mA/0...10V



## Technical data

### Input

Input voltage/Input current  
Max. voltage  
Max. current

### Output

Output voltage/Output current  
Load resistance voltage/Current  
Accuracy  
Temperature coefficient  
Step response time  
Cut-off freq. (-3dB)

### General data

Supply voltage  
Power consumption  
Current-carrying cap. of cross-connect.  
Operation temperature  
Storage temperature  
Approvals

### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Isolation voltage Input, output/  
Overvoltage category  
Pollution severity  
Clearance & creepage path

/4...20 mA

25 mA

/0...20 mA

<= 600 Ω

0.2 %

+/- 250 ppm/K

<= 45 ms

10 Hz

24 Vdc +/- 25 %

< 1.5 W at Iout = 20 mA

<= 2 A

0 °C...+55 °C (horiz. mounting)

-20 °C...+85 °C

CE / cURus

EN 50178

EN 50081, EN50082, EN55011

300 V

4 kV

2 kVeff / 5s/

III

2

>= 3 mm

/4...20 mA

25 mA

0...10 V/

>= 1 kΩ/

0.2 %

+/- 250 ppm/K

<= 45 ms

10 Hz

24 Vdc +/- 25 %

< 1.3 W at Iout = 5 mA

<= 2 A

0 °C...+55 °C (horiz. mounting)

-20 °C...+85 °C

CE / cURus

EN 50178

EN 50081, EN50082, EN55011

300 V

4 kV

2 kVeff / 5s/

III

2

>= 3 mm

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Information

### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

Tu=23°C, single module

### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

Tu=23°C, single module

## Ordering data

### Type of connection

Screw connection  
Tension clamp c.

Type	(Qty.=1)	Order No.
WAS5 CCC 4-20/0-20MA		8540200000
WAZ5 CCC 4-20/0-20MA		8540210000

Type	(Qty.=1)	Order No.
WAS5 CVC 4-20mA/0-10V		8540230000
WAZ5 CVC 4-20mA/0-10V		8540240000

### Information

## Accessories

### Information

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

# DC/DC 3-way isolator

## 10Hz Cut-off frequency

- Signal conversion
- Galvanic isolation between input/output signal
- Power supply can be cross-connected via plug-in jumpers

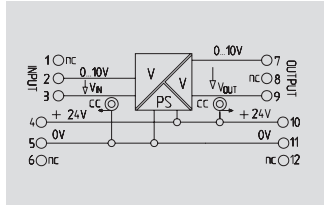
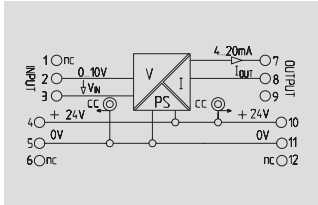
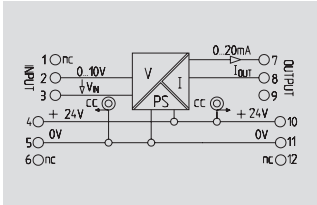
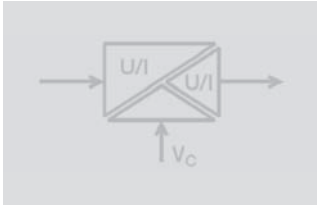
## 0...10V/0...20mA



## 0...10V/4...20mA



## 0...10V/0...10V



### Technical data

#### Input

Input voltage/Input current  
Max. voltage  
Max. current

#### Output

Output voltage/Output current  
Load resistance voltage/Current  
Accuracy  
Temperature coefficient  
Step response time  
Cut-off freq. (-3dB)

#### General data

Supply voltage  
Power consumption  
Current-carrying cap. of cross-connect.  
Operation temperature  
Storage temperature  
Approvals

#### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Isolation voltage Input, output/  
Overvoltage category  
Pollution severity  
Clearance & creepage path

0...10 V/  
15 V

/0...20 mA  
< = 600 Ω  
0.2 %  
+/- 250 ppm/K  
<= 45 ms  
10 Hz

24 Vdc +/- 25 %  
< 1.5 W at Iout = 20 mA  
<= 2 A  
0 °C...+55 °C (horiz. mounting)  
-20 °C...+85 °C  
CE / cURus

EN 50178  
EN 50081, EN50082, EN55011  
300 V  
4 kV  
2 kVeff / 5s/  
III  
2  
>= 3 mm

0...10 V/  
15 V

/4...20 mA  
< = 600 Ω  
0.2 %  
+/- 250 ppm/K  
<= 45 ms  
10 Hz

24 Vdc +/- 25 %  
< 1.5 W at Iout = 20 mA  
<= 2 A  
0 °C...+55 °C (horiz. mounting)  
-20 °C...+85 °C  
CE / cURus

EN 50178  
EN 50081, EN50082, EN55011  
300 V  
4 kV  
2 kVeff / 5s/  
III  
2  
>= 3 mm

0...10 V/  
15 V

0...10 V/  
>= 1 kΩ/  
0.2 %  
+/- 250 ppm/K  
<= 45 ms  
10 Hz

24 Vdc +/- 25 %  
< 1.3 W at Iout = 5 mA  
<= 2 A  
0 °C...+55 °C (horiz. mounting)  
-20 °C...+85 °C  
CE / cURus

EN 50178  
EN 50081, EN50082, EN55011  
300 V  
4 kV  
2 kVeff / 5s/  
III  
2  
>= 3 mm

#### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

#### Information

#### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

Tu=23°C, single module

#### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

Tu=23°C, single module

#### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

Tu=23°C, single module

### Ordering data

#### Type of connection

Screw connection  
Tension clamp c.

Type	(Qty.=1)	Order No.
WAS5 VCC 0-10V/0-20MA		8540310000
WAZ5 VCC 0-10V/0-20MA		8540320000

Type	(Qty.=1)	Order No.
WAS5 VCC 0-10V/4-20MA		8540290000
WAZ5 VCC 0-10V/4-20MA		8540300000

Type	(Qty.=1)	Order No.
WAS5 VCC 0-10V/0-10V		8540330000
WAZ5 VCC 0-10V/0-10V		8540340000

#### Information

### Accessories

#### Information

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

# DC/DC 3-way isolator

## 20kHz Cut-off frequency

- Signal conversion
- Galvanic isolation between input/output signal
- Power supply can be cross-connected via plug-in jumpers

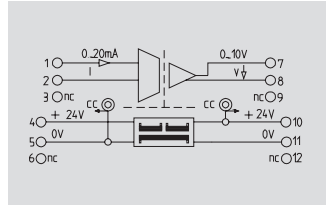
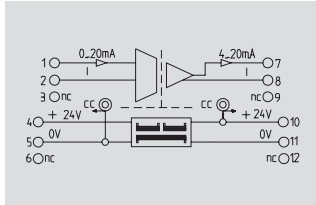
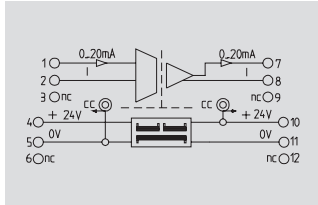
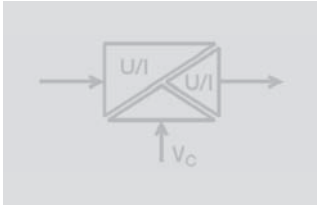
## 0(4)...20mA/0(4)...20mA



## 0...20mA/4...20mA



## 0...20mA/0...10V



## Technical data

### Input

Input voltage/Input current  
Max. voltage/Max. current  
Input resistance voltage/Current

### Output

Output voltage/Output current  
Load resistance voltage/Current  
Accuracy  
Temperature coefficient  
Step response time  
Cut-off freq. (-3dB)

### General data

Supply voltage  
Power consumption  
Current-carrying cap. of cross-connect.  
Operation temperature  
Storage temperature  
Approvals

### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Isolation voltage Input, output  
Coupling cap. in- resp. output/power supply  
Overvoltage category  
Pollution severity  
Clearance & creepage path

/0...20 mA  
/50 mA  
/50 Ω

/0...20 mA  
/< = 600 Ω  
< 0.2 % of final value  
≤ 250 ppm/K of final value  
≤ 40 μs (type 30 μs)  
>= 15 kHz (typ. 20 kHz)

24 Vdc +/- 25 %  
< 1.5 W at Iout = 20 mA  
≤ 2 A  
0 °C...+55 °C  
-20 °C...+85 °C  
CSA / UL/UR / CE / ESD

EN 50178  
EN 50081, EN50082, EN55011

300 V  
4 kV  
1.2 kVeff / 5s  
1 nF  
III  
2  
>= 3 mm

/0...20 mA  
/50 mA  
/50 Ω

/4...20 mA  
/< = 600 Ω  
< 0.2 % of final value  
≤ 250 ppm/K of final value  
≤ 40 μs (type 30 μs)  
>= 15 kHz (typ. 20 kHz)

24 Vdc +/- 25 %  
< 1.5 W at Iout = 20 mA  
≤ 2 A  
0 °C...+55 °C  
-20 °C...+85 °C  
CSA / UL/UR / CE / ESD

EN 50178  
EN 50081, EN50082, EN55011

300 V  
4 kV  
1.2 kVeff / 5s  
1 nF  
III  
2  
>= 3 mm

/0...20 mA  
/50 mA  
/50 Ω

0...10 V/  
>= 2 kΩ/  
< 0.2 % of final value  
≤ 250 ppm/K of final value  
≤ 40 μs (type 30 μs)  
>= 15 kHz (typ. 20 kHz)

24 Vdc +/- 25 %  
< 1.3 W at Iout = 5 mA  
≤ 2 A  
0 °C...+55 °C  
-20 °C...+85 °C  
CSA / UL/UR / CE / ESD

EN 50178  
EN 50081, EN50082, EN55011

300 V  
4 kV  
1.2 kVeff / 5s  
1 nF  
III  
2  
>= 3 mm

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Information

### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

Tu=23°C, single module

### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

Tu=23°C, single module

### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

Tu=23°C, single module

## Ordering data

### Type of connection

Screw connection  
Tension clamp c.

Type	(Qty.=1)	Order No.
WAS5 CCC HF 0-20/0-20MA		<b>8447160000</b>
WAZ5 CCC HF 0-20/0-20MA		<b>8447170000</b>

Type	(Qty.=1)	Order No.
WAS5 CCC HF 0-20/4-20MA		<b>8447190000</b>
WAZ5 CCC HF 0-20/4-20MA		<b>8447200000</b>

Type	(Qty.=1)	Order No.
WAS5 CVC HF 0-20/0-10V		<b>8447220000</b>
WAZ5 CVC HF 0-20/0-10V		<b>8447230000</b>

### Information

## Accessories

### Information

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

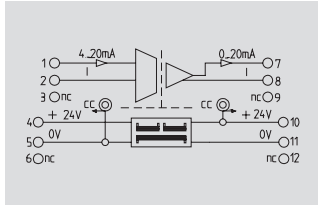
Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

# DC/DC 3-way isolator

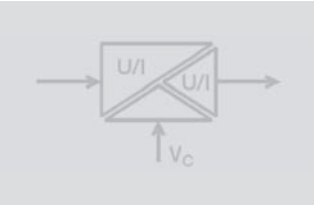
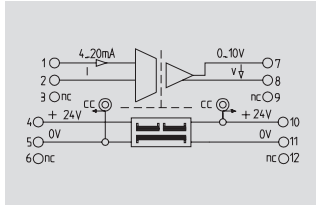
## 20kHz Cut-off frequency

- Signal conversion
- Galvanic isolation between input/output signal
- Power supply can be cross-connected via plug-in jumpers

## 4...20mA/0...20mA



## 4...20mA/0...10V



## Technical data

### Input

Input voltage/Input current  
Max. voltage/Max. current  
Input resistance voltage/Current

### Output

Output voltage/Output current  
Load resistance voltage/Current  
Accuracy  
Temperature coefficient  
Step response time  
Cut-off freq. (-3dB)

### General data

Supply voltage  
Power consumption  
Current-carrying cap. of cross-connect.  
Operation temperature  
Storage temperature  
Approvals

### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Isolation voltage Input, output  
Coupling cap. in- resp. output/power supply  
Overvoltage category  
Pollution severity  
Clearance & creepage path

/4...20 mA  
/50 mA  
/50 Ω

/0...20 mA  
/< = 600 Ω  
< 0.2 % of final value  
<= 250 ppm/K of final value  
<= 40 μs (type 30 μs)  
>= 15 kHz (typ. 20 kHz)

24 Vdc +/- 25 %  
< 1.5 W at Iout = 20 mA  
<= 2 A  
0 °C...+55 °C  
-20 °C...+85 °C  
CSA / UL/UR / CE / ESD

EN 50178  
EN 50081, EN50082, EN55011  
300 V  
4 kV  
1.2 kVeff / 5s  
1 nF  
III  
2  
>= 3 mm

/4...20 mA  
/50 mA  
/50 Ω

0...10 V/  
>= 2 kΩ/< = 600 Ω  
< 0.2 % of final value  
<= 250 ppm/K of final value  
<= 40 μs (type 30 μs)  
>= 15 kHz (typ. 20 kHz)

24 Vdc +/- 25 %  
< 1.3 W at Iout = 5 mA  
<= 2 A  
0 °C...+55 °C  
-20 °C...+85 °C  
CSA / UL/UR / CE / ESD

EN 50178  
EN 50081, EN50082, EN55011  
300 V  
4 kV  
1.2 kVeff / 5s  
1 nF  
III  
2  
>= 3 mm

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Information

### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

Tu=23°C, single module

### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

Tu=23°C, single module

## Ordering data

### Type of connection

Screw connection  
Tension clamp c.

Type	(Qty.=1)	Order No.
WAS5 CCC HF 4-20/0-20MA		<b>8447250000</b>
WAZ5 CCC HF 4-20/0-20MA		<b>8447260000</b>

Type	(Qty.=1)	Order No.
WAS5 CVC HF 4-20/0-10V		<b>8447280000</b>
WAZ5 CVC HF 4-20/0-10V		<b>8447290000</b>

### Information

## Accessories

### Information

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection



# DC/DC 3-way isolator

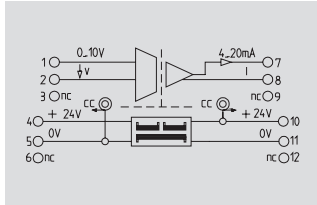
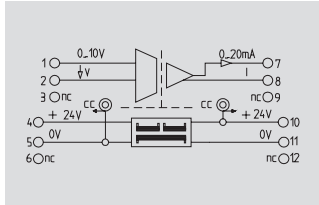
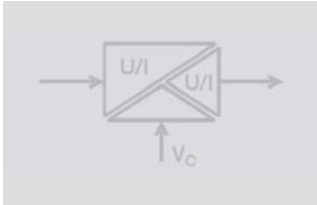
## 20kHz Cut-off frequency

- Signal conversion
- Galvanic isolation between input/output signal
- Power supply can be cross-connected via plug-in jumpers

## 0...10V/0...20mA



## 0...10V/4...20mA



## Technical data

### Input

Input voltage/Input current  
Max. voltage/Max. current  
Input resistance voltage/Current

### Output

Output voltage/Output current  
Load resistance voltage/Current  
Accuracy  
Temperature coefficient  
Step response time  
Cut-off freq. (-3dB)

### General data

Supply voltage  
Power consumption  
Current-carrying cap. of cross-connect.  
Operation temperature  
Storage temperature  
Approvals

### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Isolation voltage Input, output  
Coupling cap. in- resp. output/power supply  
Overvoltage category  
Pollution severity  
Clearance & creepage path

0...10 V/  
15 V/  
500 k $\Omega$ /

/0...20 mA  
< = 600  $\Omega$   
+/- 0.2% of final value  
<= 250 ppm/K of final value  
<= 40  $\mu$ s (type 30  $\mu$ s)  
>= 15 kHz (typ. 20 kHz)

24 Vdc +/- 25 %  
< 1.5 W at Iout = 20 mA  
<= 2 A  
0 °C...+55 °C  
-20 °C...+85 °C  
CSA / UL/UR / CE / ESD

EN 50178  
EN 50081, EN50082, EN55011

300 V  
4 kV  
1.2 kVeff / 5s  
1 nF  
III  
2  
>= 3 mm

0...10 V/  
15 V/  
500 k $\Omega$ /

/4...20 mA  
< = 600  $\Omega$   
+/- 0.2% of final value  
<= 250 ppm/K of final value  
<= 40  $\mu$ s (type 30  $\mu$ s)  
>= 15 kHz (typ. 20 kHz)

24 Vdc +/- 25 %  
< 1.5 W at Iout = 20 mA  
<= 2 A  
0 °C...+55 °C  
-20 °C...+85 °C  
CSA / UL/UR / CE / ESD

EN 50178  
EN 50081, EN50082, EN55011

300 V  
4 kV  
1.2 kVeff / 5s  
1 nF  
III  
2  
>= 3 mm

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Information

### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

Tu=23°C, single module

### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

Tu=23°C, single module

## Ordering data

### Type of connection

Screw connection  
Tension clamp c.

Type	(Qty.=1)	Order No.
WAS5 VCC HF 0-10/0-20MA		<b>8447310000</b>
WAZ5 VCC HF 0-10/0-20MA		<b>8447320000</b>

Type	(Qty.=1)	Order No.
WAS5 VCC HF 0-10/4-20MA		<b>8447340000</b>
WAZ5 VCC HF 0-10/4-20MA		<b>8447350000</b>

### Information

## Accessories

### Information

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

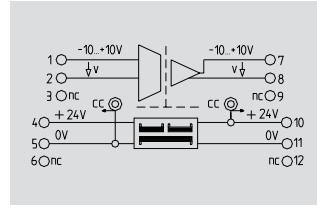
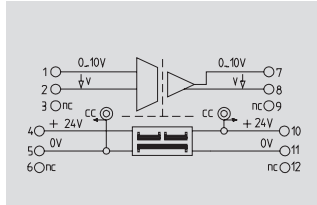
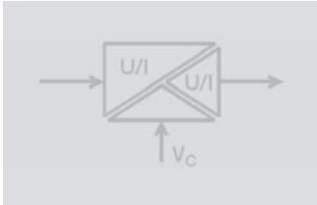
# DC/DC 3-way isolator

## 20kHz Cut-off frequency

- Signal conversion
- Galvanic isolation between input/output signal
- Power supply can be cross-connected via plug-in jumpers

## 0...10V/0...10V

## -10V...+10V/-10V...+10V



## Technical data

### Input

Input voltage/Input current  
Max. voltage/Max. current  
Input resistance voltage/Current

### Output

Output voltage/Output current  
Load resistance voltage/Current  
Accuracy  
Temperature coefficient  
Step response time  
Cut-off freq. (-3dB)

### General data

Supply voltage  
Power consumption  
Current-carrying cap. of cross-connect.  
Operation temperature  
Storage temperature  
Approvals

### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Isolation voltage Input, output  
Coupling cap. in- resp. output/power supply  
Overvoltage category  
Pollution severity  
Clearance & creepage path

0...10 V/  
15 V/  
500 kΩ/

0...10 V/  
≥ 2 kΩ/  
± 0.2% of final value  
≤ 250 ppm/K of final value  
≤ 40 μs (type 30 μs)  
≥ 15 kHz (typ. 20 kHz)

24 Vdc ± 25 %  
< 1.3 W at I<sub>out</sub> = 5 mA  
≤ 2 A  
0 °C...+55 °C  
-20 °C...+85 °C  
CSA / UL/UR / CE / ESD

EN 50178  
EN 50081, EN50082, EN55011  
300 V  
4 kV  
1.2 kVeff / 5s  
1 nF  
III  
2  
≥ 3 mm

-10...+10 V/  
± 15 V/  
500 kΩ/

-10...+10 V/  
≥ 2 kΩ/  
± 0.2 % of measuring range  
≤ 250 ppm/K of measuring range  
≤ 40 μs (type 30 μs)  
≥ 15 kHz (typ. 20 kHz)

24 Vdc ± 25 %  
< 1.3 W at I<sub>out</sub> = 5 mA  
≤ 2 A  
0 °C...+55 °C  
-20 °C...+85 °C  
CE / ESD / cURus

EN 50178  
EN 50081, EN50082, EN55011  
300 V  
4 kV  
1.2 kVeff / 5s  
1 nF  
III  
2  
≥ 3 mm

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Information

### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

T<sub>u</sub>=23°C, single module

### Screw connection Tension clamp c.

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

T<sub>u</sub>=23°C, single module

## Ordering data

### Type of connection

Screw connection  
Tension clamp c.

Type	(Qty.=1)	Order No.
WAS5 VVC HF 0-10/0-10V		<b>8447370000</b>
WAZ5 VVC HF 0-10/0-10V		<b>8447380000</b>

Type	(Qty.=1)	Order No.
WAS5 VVC HF +10V/+10V		<b>8561610000</b>
WAZ5 VVC HF +10V/+10V		<b>8587000000</b>

### Information

## Accessories

### Information

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

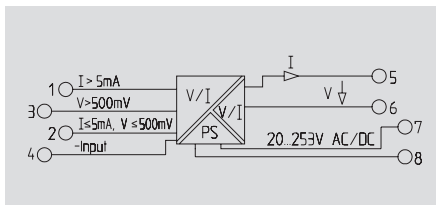
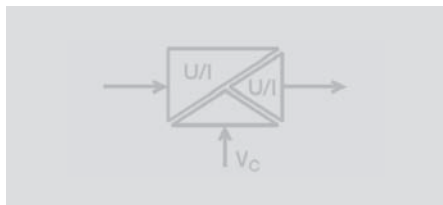
Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

# DC/DC 3-way isolator

## Configurable

- Universal adjustable via DIP-switch
- Service tool WAVETOOL via internet
- Voltage supply 20...230 V ac/dc
- Low power loss
- Adjustable transmission frequency

## PRO DC/DC



## Switch position/setting options

Input	Switch							
	S1				S2			
Input range	1	2	3	4	1	2	3	4
0 ... ±60 mV	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... ±100 mV	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
0 ... ±150 mV	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
0 ... ±300 mV	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
0 ... ±500 mV	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
0 ... ±1 V	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
0 ... ±5 V	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
0 ... ±10 V	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
0 ... ±100 V	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
0 ... ±-0.3 mA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... ±1 mA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... ±5 mA	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... ±10 mA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
0 ... ±20 mA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0 ... ±50 mA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4 ... ±20 mA*	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

\*Offset conversion not calibrated

Switch S2		4
calibratet ranges		<input checked="" type="checkbox"/>
Span-pot. activated: input x 0.33 ... x 3.30		

Output	Switch			
	S1			S3
Output range	5	6	7	1 2
0 ... ±10 V	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2 ... 10 V	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
0 ... ±5 V	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
1 ... 5 V	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
0 ... ±20 mA	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
4 ... 20 mA	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Offset	Switch			
	S1			S2
(in % of output voltage)	8	9	10	5
0 %	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
-100 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
-50 %	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
+50 %	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
+100 %	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Zero pot. activated: additional ±25 %

Switch S3		3
Bandwidth 10 kHz		<input type="checkbox"/>
Bandwidth 10 Hz		<input checked="" type="checkbox"/>
Set range can be documented on side of housing.		

■ = on  
□ = off

## Technical data

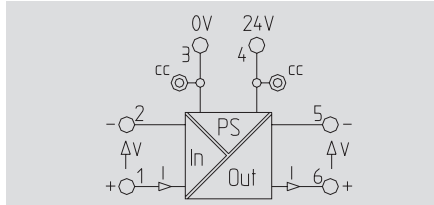
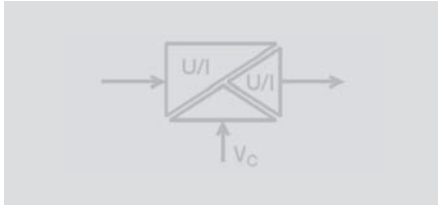
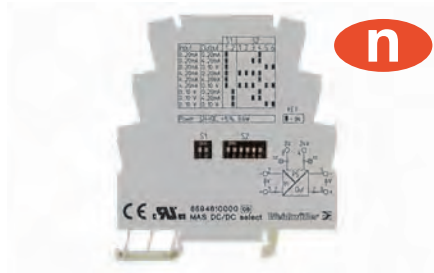
<b>Input</b>		
Input voltage/Input current	+/- 20 mV...+/- 200 V/+/-0.1mA...+/- 100 mA	
Input resistance voltage/Current	ca. 1 MΩ/< 5 mA: ca. 100 Ω; >5 mA: ca. 5 Ω	
Max. current	lin < 5mA: < 100mA, lin > 5mA < 300mA	
<b>Output</b>		
Output voltage/Output current	0...+/- 10 V/0...+/- 20 mA	
Load resistance voltage/Current	≥ 1 kΩ/< = 600 Ω	
Accuracy	< 0.1 % of final value	
Temperature coefficient	< 60 ppm/K of end value	
Cut-off freq. (-3dB)	> 10 kHz/ < 10 Hz	
Offset	20 µA resp. 10 mV	
Adjustment range, zero point	+25 % of measuring range of the chosen output range	
Adjustment range, amplification	0.33...3.30 x final value of the chosen output range	
Displacement	-100%, -50%, 0%, 50%, 100% of measuring range	
<b>General data</b>		
Supply voltage	22...230 Vac/dc +10 %/ 48...62 Hz	
Power consumption	approx. 1 W	
Operation temperature	-10 °C...+70 °C	
Storage temperature	-40 °C...+85 °C	
Default settings	0...10V / 0...10V / 10Hz	
Approvals	GL / CE / cURus	
<b>Insulation coordinates</b>		
Standards	EN 50178	
EMC standards	DIN EN 61326, EN 61326/A1, EN 50081-2, EN 61000-6-2	
Rated voltage	600 V	
Impulse withstand voltage	5 kV, 1.2/50 µs (IEC 255-4)	
Isolation voltage Input, output/	4 kVeff/	
Overvoltage category	III	
Pollution severity	2	
<b>Dimensions</b>		
Clamping range (rating- / min. / max.)	mm <sup>2</sup>	2.50 / 0.50 / 2.50
Length x width x height	mm	92.4 x 12.5 x 112.4
<b>Information</b>		Tu=23°C, single module
<b>Ordering data</b>		
<b>Type of connection</b>		
Screw connection	<b>Type</b>	<b>Qty.</b>
Tension clamp c.	WAS4 PRO DC/DC	1
	WAZ4 PRO DC/DC	1
		<b>Order No.</b>
		8560740000
		8560750000
<b>Information</b>		
<b>Accessories</b>		
<b>Information</b>		Information accessories

# DC/DC 3-way isolator

## Configurable

- 3-way isolation
- DIP-switch
- Power supply can be cross connected
- Low power loss

## DC/DC select

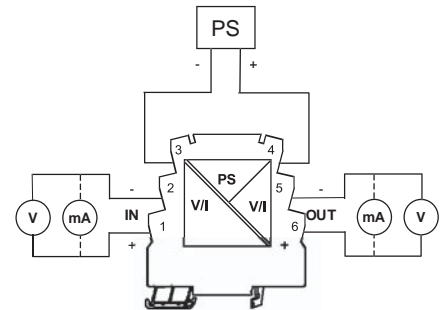


## Switch position/setting options

Input	Output	Switch							
		S1		S2					
		1	2	1	2	3	4	5	6
0 ... 20 mA	0 ... 20 mA	■	□	□	□	□	■	□	□
0 ... 20 mA	4 ... 20 mA	■	□	□	□	□	■	□	□
0 ... 20 mA	0 ... 10 V	■	□	□	□	□	■	□	□
4 ... 20 mA	0 ... 20 mA	■	□	■	■	■	■	□	□
4 ... 20 mA	4 ... 20 mA	■	□	□	□	□	■	□	□
4 ... 20 mA	0 ... 10 V	■	□	■	■	■	■	□	□
0 ... 10 V	0 ... 20 mA	□	■	□	□	□	■	□	□
0 ... 10 V	4 ... 20 mA	□	■	□	□	□	■	□	□
0 ... 10 V	0 ... 10 V	□	■	□	□	□	■	□	□

■ = on  
□ = off

## Connection



## Technical data

### Input

Input voltage/Input current  
Input resistance voltage/Current  
Voltage drop

### Output

Output voltage/Output current  
Load resistance voltage/Current  
Accuracy  
Temperature coefficient  
Cut-off freq. (-3dB)

### General data

Supply voltage  
Power consumption  
Current-carrying cap. of cross-connect.  
Operation temperature  
Storage temperature  
Default settings  
Approvals

### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Isolation voltage Input, output/  
Overvoltage category  
Pollution severity

0...10 V/0(4)...20 mA
100 kΩ/
< 0.1 V at Iin=20 mA (Current Input)
0...10 V/0(4)...20 mA
>= 10 kΩ/< = 600 Ω
< 0.5% of final value
< 150 ppm/K of final value
> 100 Hz
24 Vdc +/- 15 %
approx. 0.6 W
<= 20 A
0 °C...+55 °C
-20 °C...+85 °C
0...20mA / 0...20mA
CE / cURus
EN 50178
DIN EN 61326
50 V
500 Veff/
II
2

## Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

## Information

## Screw connection

2.50 / 0.50 / 2.50  
88.0 x 6.1 x 97.8

## Tension clamp c.

1.50 / 0.50 / 2.50  
92.0 x 6.1 x 97.8

Tu=23°C, single module

## Ordering data

### Type of connection

Screw connection  
Tension clamp c.

Type	Qty.	Order No.
MAS DC/DC select	10	8594810000
MAZ DC/DC select	1	8594840000

## Information

## Accessories

### Information

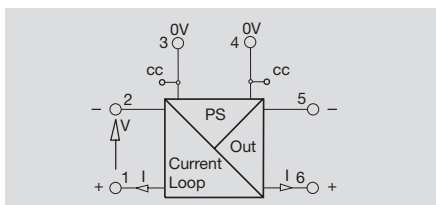
Information accessoriesVoltage supply 24V and 0V with ZQV 4N/x cross-connection

# Supply isolator

## Without HART

- 2-conductor technology
- 3-way isolation
- Voltage supply cross-connection

## MAS RPS



## Technical data

### Input

Input current  
Sensor  
Feed voltage

4...20 mA (sensor circuit)  
2-conductor  
16.5 V / constant for 3...22 mA

### Output

Output current  
Output signal limit  
Load resistance voltage/Current  
Accuracy  
Offset current  
Temperature coefficient  
Residual ripple

4...20 mA  
22...25 mA  
/ <math>\leq 600 \Omega</math>  
< 0.1 %  
< 30  $\mu\text{A}$   
< 50 ppm/K  
< 10 mVeff

### General data

Supply voltage  
Power consumption  
Current-carrying cap. of cross-connect.  
Operation temperature  
Storage temperature  
Approvals

24 Vdc +/- 15 %  
approx. 1 W  
<math>\leq 20 \text{ A}</math>  
0 °C...+55 °C  
-25 °C...+85 °C  
CE / cURus

### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Isolation voltage Input, output  
Overvoltage category  
Pollution severity

EN 50178  
DIN EN 61326 class B  
300 V  
1.5 kVac  
II  
2

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Screw connection

2.50 / 0.50 / 2.50  
88.0 x 6.1 x 97.8

### Information

## Ordering data

### Type of connection

Screw connection

Type	Qty.	Order No.
MAS RPS	1	8721150000

### Information

## Accessories

### Information

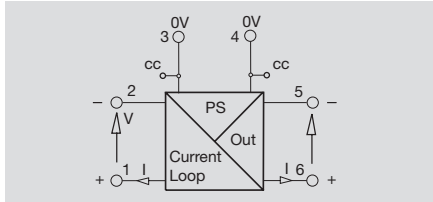
Voltage supply 24V and 0V with ZQV 4N/x cross-connection

# Supply isolator

## With HART

- 2-conductor technology
- 3-way isolation
- With Hart transmission
- Output switchable

## MAS RPSH



## Technical data

### Input

Input current	4...20 mA (sensor circuit)
Sensor	2-conductor
Feed voltage	16.5 V / constant for 3...22 mA

### Output

Output current	0(4)...20 mA
Output voltage	0...10 V
Output signal limit	22...25 mA resp. 11...12.5 V
Load resistance voltage/Current	$\geq 10 \text{ k}\Omega / < = 600 \Omega$
Accuracy	$I_{out} < 0.1 \% / U_{out} < 0.2\%$
Offset current	$< 30 \mu\text{A}$
Temperature coefficient	$< 50 \text{ ppm/K}$
Residual ripple	$< 10 \text{ mVeff}$

### General data

Supply voltage	24 Vdc +/- 15 %
Power consumption	approx. 1 W
Communication	according to HART Specification
Current-carrying cap. of cross-connect.	$\leq 20 \text{ A}$
Operation temperature	0 °C...+55 °C
Storage temperature	-25 °C...+85 °C
Approvals	CE / cURus

### Insulation coordinates

Standards	EN 50178 (safe separation)
EMC standards	DIN EN 61326 class B
Rated voltage	600 V
Isolation voltage Input, output	2.5 kVac
Overvoltage category	II
Pollution severity	2

### Dimensions

Clamping range (rating- / min. / max.)	mm <sup>2</sup>
Length x width x height	mm

### Screw connection

	1.50 / 0.50 / 2.50
	88.0 x 6.1 x 97.8

### Information

## Ordering data

### Type of connection

Screw connection

Type	Qty.	Order No.
MAS RPSH	1	8721170000

### Information

## Accessories

### Information

Voltage supply 24V and 0V with ZQV 4N/x cross-connection

# PT100 / RTD - signal isolator/converter

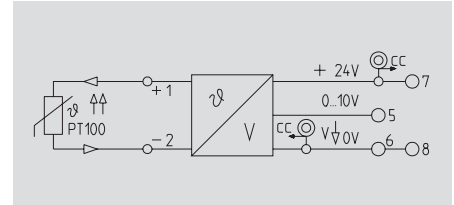
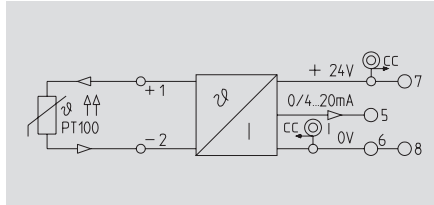
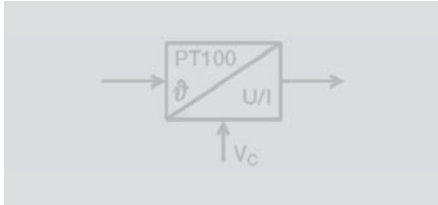
## PT100, 2-Conductor converter

- 2-conductor technology
- Adjustable temperature range  
– 200 °C ... + 800 °C
- Power supply can be cross connected via plug-in jumper

## PT100/2 0(4)...20mA



## PT100/2 0...10V



### Technical data

#### Input

Sensor  
Feed current

#### Output

Output voltage/Output current  
Load resistance voltage/Current  
Accuracy

#### General data

Supply voltage/Current consumption  
Operation temperature/Storage temperature  
Approvals  
Standards  
EMC standards

#### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

#### Information

PT100/2-conductor  
1.45 mA

/0(4)...20 mA

/ $\leq$  = 600  $\Omega$

+/-0.5% of measuring range

24 Vdc +/- 20 %/ $\leq$  48 mA at I<sub>out</sub> = 20 mA

0 °C...+55 °C/-20 °C...+85 °C

CSA / UL/UR / CE / ESD

EN 50178, EN 60751, IEC751

EN 50081, EN50082, EN55011

#### Screw connection

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50

92.4 x 12.5 x 112.4 92.4 x 12.5 x 112.4

T<sub>u</sub>=23°C, single module

PT100/2-conductor  
1.45 mA

0...10 V/

$\geq$  1 k $\Omega$ /

+/-0.5% of measuring range

24 Vdc +/- 20 %/ $\leq$  38 mA at I<sub>out</sub> = 20 mA

0 °C...+55 °C/-20 °C...+85 °C

CSA / UL/UR / CE / ESD

EN 50178, EN 60751, IEC751

EN 50081, EN50082, EN55011

#### Screw connection

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50

92.4 x 12.5 x 112.4 92.4 x 12.5 x 112.4

T<sub>u</sub>=23°C, single module

### Ordering data

Temperature input range	Type of connection
Adjustable -200...+800 °C	Screw connection
Adjustable -200...+800 °C	Tension clamp c.
Special adjustment	Screw connection
Special adjustment	Tension clamp connection
0...100 °C	Screw connection
0...100 °C	Tension clamp connection
0...100 °C	Screw connection
0...100 °C	Tension clamp connection

#### Information

Type	Qty.	Order No.
WTS4 PT100/2 C 0/4-20mA	1	8432210000
WTS4 PT100/2 C 0/4-20mA	1	8432220000
WTS4 PT100/2 C 0/4-20mA variable	1	8432219999
WTS4 PT100/2 C 0/4-20mA variable	1	8432229999
WTS4 PT100/2 C 0-20mA 0...100C	1	8432210001
WTS4 PT100/2 C 0-20mA 0...100C	1	8432220001
WTS4 PT100/2 C 4-20mA 0...100C	1	8432210011
WTS4 PT100/2 C 4-20mA 0...100C	1	8432220011

Specify temperature range by special calibrations.

Type	Qty.	Order No.
WTS4 PT100/2 V 0-10V	1	8432180000
WTS4 PT100/2 V 0-10V	1	8432190000
WTS4 PT100/2 V 0-10V variable	1	8432189999
WTS4 PT100/2 Vn 0-10V variable	1	8432199999
WTS4 PT100/2 V 0-10V 0...100C	1	8432180001
WTS4 PT100/2 V 0-10V 0...100C	1	8432190001

Specify temperature range by special calibrations.

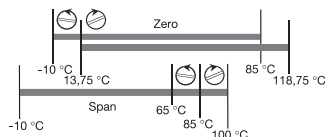
### Application

#### Example for Zero and Span

#### Temperature adjustment:

T<sub>min</sub> -10 °C  
Span 75...110 °C

Span 95 °C  
Adjustment of Span + 25 %



#### Temperature coefficient

Measurement range  $\geq$  200 K  $\leq$  200 ppm / °C (typ. 80 ppm / °C)  
100K  $\leq$  Measurement range < 200 K  $\leq$  225 ppm / °C (typ. 90 ppm / °C)  
40K  $\leq$  Measurement range < 100 K  $\leq$  450 ppm / °C (typ. 180 ppm / °C)

#### Aids

- Voltage supply 24 Vdc, 50 mA
- Simulator for PT 100 or precision-resistance-decade
- Ampere-/voltmeter which can be calibrated to an accuracy of >0.1% of the end value.

#### Switch position/setting options

	1	2	3	Span			4	5	6
0 °C	■	■	■	40 ... 50 °C	■	■	■	■	■
-10 °C	■	■	■	50 ... 75 °C	■	■	■	■	■
-20 °C	■	■	■	75 ... 110 °C	■	■	■	■	■
-40 °C	■	■	■	110 ... 165 °C	■	■	■	■	■
-60 °C	■	■	■	165 ... 245 °C	■	■	■	■	■
-80 °C	■	■	■	245 ... 360 °C	■	■	■	■	■
-100 °C	■	■	■	360 ... 540 °C	■	■	■	■	■
-200 °C	■	■	■	540 ... 800 °C	■	■	■	■	■

Output 1)		PT 100			
Range	7	8	9	10	
0 ... 20 mA	■	2 - wire	■	■	■
4 ... 20 mA	■	3 - wire	■	■	■
		4 - wire	■	■	■

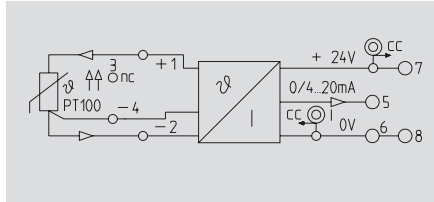
1) only modules with current output ■ = on □ = off

# PT100 / RTD - signal isolator/converter

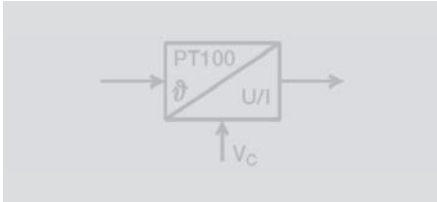
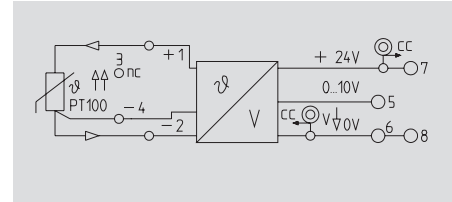
## PT100, 3-Conductor converter

- 3-conductor technology
- Adjustable temperature range  
- 200 °C ...+ 800 °C
- Power supply can be cross connected via plug-in jumper

## PT100/3 0(4)...20mA



## PT100/3 0...10V



### Technical data

<b>Input</b>	
Sensor	PT100/3-conductor
Feed current	1.45 mA
<b>Output</b>	
Output voltage/Output current	/0(4)...20 mA
Load resistance voltage/Current	/ $\leq$ = 600 $\Omega$
Accuracy	+/-0.5% of measuring range
<b>General data</b>	
Supply voltage/Current consumption	24 Vdc +/- 20 %/ $\leq$ 48 mA at Iout = 20 mA
Operation temperature/Storage temperature	0 °C...+55 °C/-20 °C...+85 °C
Approvals	CSA / UL/UR / CE / ESD
Standards	EN 50178, EN 60751, IEC751
EMC standards	EN 50081, EN50082, EN55011
<b>Dimensions</b>	
Clamping range (rating- / min. / max.)	mm <sup>2</sup>
Length x width x height	mm
<b>Information</b>	
Tu=23°C, single module	

<b>Input</b>	
Sensor	PT100/3-conductor
Feed current	1.45 mA
<b>Output</b>	
Output voltage/Output current	/0(4)...20 mA
Load resistance voltage/Current	/ $\leq$ = 600 $\Omega$
Accuracy	+/-0.5% of measuring range
<b>General data</b>	
Supply voltage/Current consumption	24 Vdc +/- 20 %/ $\leq$ 48 mA at Iout = 20 mA
Operation temperature/Storage temperature	0 °C...+55 °C/-20 °C...+85 °C
Approvals	CSA / UL/UR / CE / ESD
Standards	EN 50178, EN 60751, IEC751
EMC standards	EN 50081, EN50082, EN55011
<b>Dimensions</b>	
Clamping range (rating- / min. / max.)	mm <sup>2</sup>
Length x width x height	mm
<b>Information</b>	
Tu=23°C, single module	

<b>Input</b>	
Sensor	PT100/3-conductor
Feed current	1.45 mA
<b>Output</b>	
Output voltage/Output current	0...10 V/
Load resistance voltage/Current	$\geq$ = 1 k $\Omega$ /
Accuracy	+/-0.5% of measuring range
<b>General data</b>	
Supply voltage/Current consumption	24 Vdc +/- 20 %/ $\leq$ 38 mA at Iout = 20 mA
Operation temperature/Storage temperature	0 °C...+55 °C/-20 °C...+85 °C
Approvals	CSA / UL/UR / CE / ESD
Standards	EN 50178, EN 60751, IEC751
EMC standards	EN 50081, EN50082, EN55011
<b>Dimensions</b>	
Clamping range (rating- / min. / max.)	mm <sup>2</sup>
Length x width x height	mm
<b>Information</b>	
Tu=23°C, single module	

### Ordering data

Temperature input range	Type of connection
Adjustable -200...+800 °C	Screw connection
Adjustable -200...+800 °C	Tension clamp c.
Special adjustment	Screw connection
Special adjustment	Tension clamp connection
0...100 °C	Screw connection
0...100 °C	Tension clamp connection
0...100 °C	Screw connection
0...100 °C	Tension clamp connection

Type	Qty.	Order No.
WTS4 PT100/3 C 0/4-20mA	1	8432150000
WTS4 PT100/3 C 0/4-20mA	1	8432160000
WTS4 PT100/3 C 0/4-20mA variable	1	8432159999
WTS4 PT100/3 C 0/4-20mA variable	1	8432169999
WTS4 PT100/3 C 0-20mA 0...100C	1	8432150001
WTS4 PT100/3 C 0-20mA 0...100C	1	8432160001
WTS4 PT100/3 C 4-20mA 0...100C	1	8432150011
WTS4 PT100/3 C 4-20mA 0...100C	1	8432160011

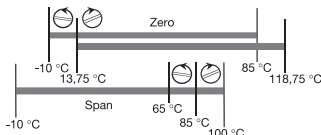
Type	Qty.	Order No.
WTS4 PT100/3 V 0-10V	1	8432090000
WTS4 PT100/3 V 0-10V	1	8432130000
WTS4 PT100/3 V 0-10V variabel	1	8432099999
WTS4 PT100/3 V 0-10V variabel	1	8432139999
WTS4 PT100/3 V 0-10V 0...100C	1	8432090001
WTS4 PT100/3 V 0-10V 0...100C	1	8432130001

### Application

#### Example for Zero and Span

#### Temperature adjustment:

Tmin	-10 °C
Span	75...110 °C
Span	95 °C
Adjustment of Span	+ 25 %



#### Temperature coefficient

Measurement range  $\geq$  200 K  $\leq$  200 ppm / °C (typ. 80 ppm / °C)  
 100K  $\leq$  Measurement range  $<$  200K  $\leq$  250 ppm / °C (typ. 100 ppm / °C)  
 40K  $\leq$  Measurement range  $<$  100K  $\leq$  500 ppm / °C (typ. 200 ppm / °C)

#### Aids

- Voltage supply 24 Vdc, 50 mA
- Simulator for PT 100 or precision-resistance-decade
- Ampere-/voltmeter which can be calibrated to an accuracy of  $>$ 0.1% of the end value.

#### Switch position/setting options

Tmin	1	2	3	Span	4	5	6
0 °C	■	■	■	40 ... 50 °C	■	■	■
-10 °C	■	■	□	50 ... 75 °C	■	■	□
-20 °C	■	□	■	75 ... 110 °C	■	□	■
-40 °C	■	□	□	110 ... 165 °C	■	□	□
-60 °C	□	■	■	165 ... 245 °C	□	■	■
-80 °C	□	■	□	245 ... 360 °C	□	■	□
-100 °C	□	■	■	360 ... 540 °C	□	■	■
-200 °C	□	□	■	540 ... 800 °C	□	□	■

Output 1)	7
Range	7
0 ... 20 mA	□
4 ... 20 mA	■

1) only modules with current output

■ = on  
□ = off



# PT100 / RTD - signal isolator/converter

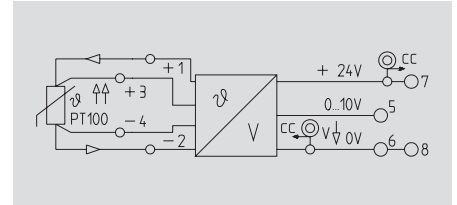
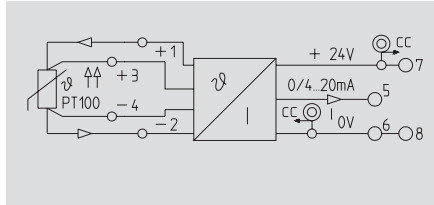
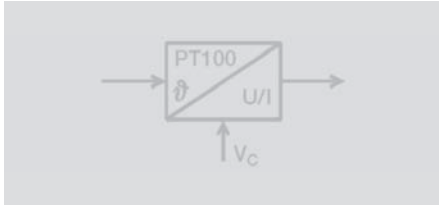
## PT100, 4-Conductor converter

- 4-conductor technology
- Adjustable temperature range  
– 200 °C ... + 800 °C
- Power supply can be cross connected via plug-in jumper

## PT100/4 0(4)...20mA



## PT100/4 0...10V



### Technical data

#### Input

Sensor  
Feed current

#### Output

Output voltage/Output current  
Load resistance voltage/Current  
Accuracy

#### General data

Supply voltage/Current consumption  
Operation temperature/Storage temperature  
Approvals  
Standards  
EMC standards

#### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

#### Information

PT100/4-conductor  
1.45 mA

/0(4)...20 mA

/< = 600 Ω

100K<=MR <600K: 0.1%;MR>=600K: 0.2% of MR

24 Vdc +/- 20 %/< 48 mA at Iout = 20 mA

0 °C...+55 °C/-20 °C...+85 °C

CSA / UL/UR / CE / ESD

EN 50178, EN 60751, IEC751

EN 50081, EN50082, EN55011

#### Screw connection

2.50 / 0.50 / 2.50  
92.4 x 12.5 x 112.4

#### Tension clamp c.

1.50 / 0.50 / 2.50  
92.4 x 12.5 x 112.4

Tu=23°C, single module

PT100/4-conductor  
1.45 mA

0...10 V/

>= 1 kΩ/

100K<=MR <600K: 0.1%;MR>=600K: 0.2% of MR

24 Vdc +/- 20 %/< 38 mA at Iout = 20 mA

0 °C...+55 °C/-20 °C...+85 °C

CSA / UL/UR / CE / ESD

EN 50178, EN 60751, IEC751

EN 50081, EN50082, EN55011

#### Screw connection

2.50 / 0.50 / 2.50  
92.4 x 12.5 x 112.4

#### Tension clamp c.

1.50 / 0.50 / 2.50  
92.4 x 12.5 x 112.4

Tu=23°C, single module

### Ordering data

Temperature input range	Type of connection
Adjustable -200...+800 °C	Screw connection
Adjustable -200...+800 °C	Tension clamp c.
Special adjustment	Screw connection
Special adjustment	Tension clamp connection
0...100 °C	Screw connection
0...100 °C	Tension clamp connection
0...100 °C	Screw connection
0...100 °C	Tension clamp connection

#### Information

Type	Qty.	Order No.
WTS4 PT100/4 C 0/4-20mA	1	8432270000
WTS4 PT100/4 C 0/4-20mA	1	8432280000
WTS4 PT100/4 C 0/4-20mA variable	1	8432279999
WTS4 PT100/4 C 0/4-20mA variable	1	8432289999
WTS4 PT100/4 C 0...20mA 0...100C	1	8432270001
WTS4 PT100/4 C 0...20mA 0...100C	1	8432280001
WTS4 PT100/4 C 4-20mA 0...100C	1	8432270011
WTS4 PT100/4 C 4-20mA 0...100C	1	8432280011

Specify temperature range by special calibrations

Type	Qty.	Order No.
WTS4 PT100/4 V 0-10V	1	8432240000
WTS4 PT100/4 V 0-10V	1	8432250000
WTS4 PT100/4 V 0-10V variabel	1	8432249999
WTS4 PT100/4 V 0-10V variabel	1	8432259999
WTS4 PT100/4 V 0-10V 0...100C	1	8432240001
WTS4 PT100/4 V 0-10V 0...100C	1	8432250001

Specify temperature range by special calibrations

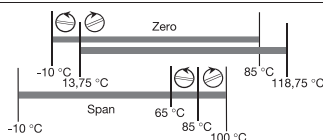
### Application

#### Example for Zero and Span

#### Temperature adjustment:

Tmin -10 °C  
Span 75...110 °C

Span 95 °C  
Adjustment of Span + 25 %



#### Temperature coefficient

Measurement range ≥ 200 K ≤ 200 ppm / °C (typ. 80 ppm / °C)  
100 K ≤ Measurement range < 200 K ≤ 225 ppm / °C (typ. 90 ppm / °C)  
40 K ≤ Measurement range < 100 K ≤ 450 ppm / °C (typ. 180 ppm / °C)

#### Aids

- Voltage supply 24 Vdc, 50 mA
- Simulator for PT 100 or precision-resistance-decade
- Ampere-/voltmeter which can be calibrated to an accuracy of >0.1% of the end value.

#### Switch position/setting options

	1	2	3	Span	4	5	6
0 °C	■	■	■	40 ... 50 °C	■	■	■
-10 °C	■	■	□	50 ... 75 °C	■	■	□
-20 °C	■	□	□	75 ... 110 °C	■	□	□
-40 °C	■	□	□	110 ... 165 °C	■	□	□
-60 °C	□	■	■	165 ... 245 °C	□	■	■
-80 °C	□	■	■	245 ... 360 °C	□	■	■
-100 °C	□	□	■	360 ... 540 °C	□	□	■
-200 °C	□	□	□	540 ... 800 °C	□	□	□

Output 1)		PT 100			
Range	7	8	9	10	
0 ... 20 mA	□	2 - wire	■	■	■
4 ... 20 mA	■	3 - wire	■	■	■
		4 - wire	□	□	□

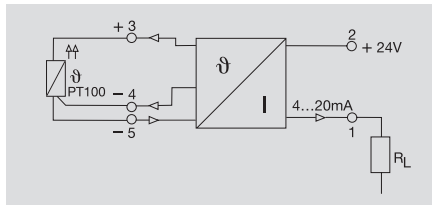
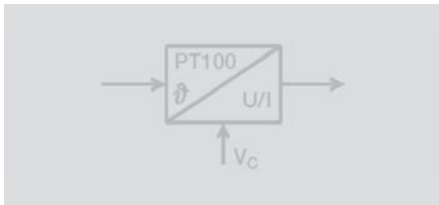
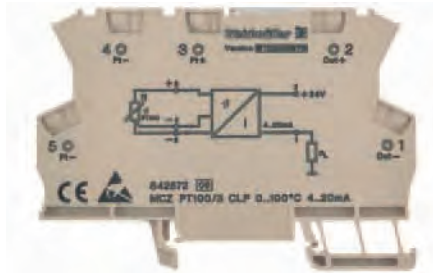
1) only modules with current output ■ = on □ = off

# PT100 / RTD - signal isolator/converter

## PT100, 2-/3-Conductor disconnector converter

- For 2- or 3-conductor PT100 sensors
- Loop-fed output current
- High accuracy and linearity

## MCZ PT100/3 CLP



### Technical data

Input	
Sensor	PT100/2-/3-conductor
Feed current	0.8 mA
Output	
Output current	4...20 mA (current loop)
Load resistance voltage/Current	$I < = 600 \Omega$
Accuracy/Influence of cable resistance	typical 0.2%, max. 0.5% of FSR/max. 0.6 K/ $\Omega$
Response time	10 ms
General data	
Operation temperature/Storage temperature	0 °C...+50 °C/-20 °C...+85 °C
Approvals	CSA;UL/UR;CE;ESD;
Standards	EN 50178, EN 60751, IEC751
EMC standards	EMVG, EN 50081-1, EN 50082-2
Dimensions	
Clamping range (rating- / min. / max.)	mm <sup>2</sup> 1.50 / 0.50 / 1.50
Length x width x height	mm 91.0 x 6.0 x 63.2
Information	
	Tu=23°C, single module

### Ordering data

Temperature input range	Type of connection	Type	Qty.	Order No.
0...100 °C	Tension clamp c.	MCZ PT100/3 CLP 0...100C	10	8425720000
0...120 °C	Tension clamp c.	MCZ PT100/3 CLP 0...120C	10	8483680000
0...150 °C	Tension clamp c.	MCZ PT100/3 CLP 0...150C	10	8604420000
0...200 °C	Tension clamp c.	MCZ PT100/3 CLP 0...200C	10	8473010000
0...300 °C	Tension clamp c.	MCZ PT100/3 CLP 0...300C	10	8473020000
-50...+150 °C	Tension clamp c.	MCZ PT100/3 CLP -50C...+150C	10	8473000000
-40...+100 °C	Tension clamp c.	MCZ PT100/3 CLP -40C...100C	10	8604430000
Information				

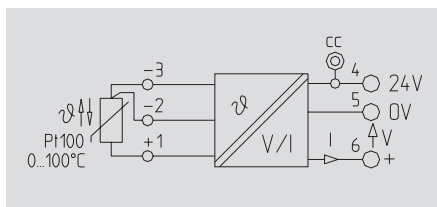
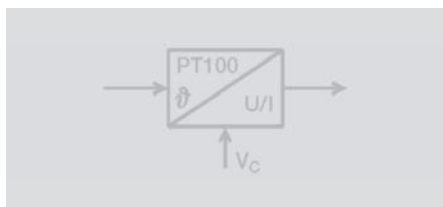
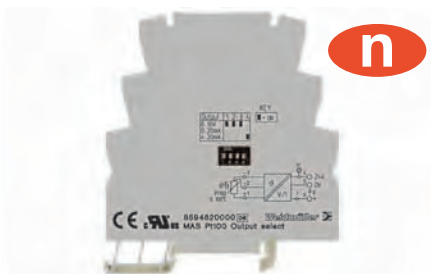
### Application

# PT100 / RTD - signal isolator/converter

## PT100, 2-/3-Conductor disconnector converter

- 2-way isolation between input/output and power supply
- PT100 2-/ 3-conductor
- Output can be switched calibrated via DIP-switch

## PT100 Output select



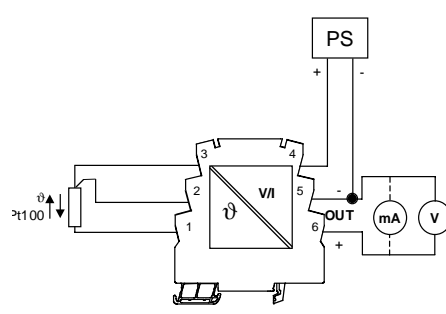
### Technical data

Input	
Sensor	PT100/2-/3-conductor
Feed current	0.8 mA
Temperature input range	0...100 °C
Output	
Output voltage/Output current	0...10V / 0...5V/0(4)...20 mA
Load resistance voltage/Current	>= 10 kΩ / < = 600 Ω
Accuracy	< 0.5 % out of measuring range
Temperature coefficient	<= 250 ppm/K of final value
Step response time	< 0.7 s
General data	
Supply voltage	24 Vdc +/- 10 %
Power consumption	approx. 0.6 W
Current-carrying cap. of cross-connect.	<= 20 A
Operation temperature	0 °C...+55 °C
Storage temperature	-20 °C...+85 °C
Default settings	0...20mA
Approvals	CE / ESD / cURus
Insulation coordinates	
Standards	EN 50178, EN 60751, IEC751
EMC standards	EN 50081, EN 50082, EN 55011, EN 61000-6-2, EN 61326
Rated voltage	100 V
Impulse withstand voltage	1.5 kV
Isolation voltage Input, output/	500 Veff/
Overvoltage category	III
Pollution severity	2
Clearance & creepage path	>= 1.5mm

Output	Switch			
	1	2	3	4
) ... 10 V	■	■	■	□
) ... 20 mA	□	□	□	□
† ... 20 mA	□	□	□	□
) ... 5 V	■	■	■	■

■ = ein  
□ = aus

### Connection



Dimensions	
Clamping range (rating- / min. / max.)	mm²
Length x width x height	mm
Information	
Tu=23°C, single module	

Screw connection	Tension clamp c.
2.50 / 0.50 / 2.50	1.50 / 0.50 / 2.50
88.0 x 6.1 x 97.8	92.0 x 6.1 x 97.8

### Ordering data

Type of connection	Screw connection
	Tension clamp c.

Type	Qty.	Order No.
MAS PT100 0...100C	1	8594820000
MAZ PT100 0...100C	1	8594850000

Information	
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### Accessories

Information	Information accessoriesVoltage supply 24V and 0V with ZQV 4N/x cross-connection
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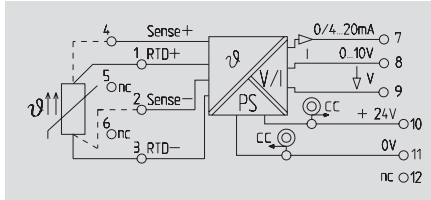
# PT100 / RTD - signal isolator/converter

## RTD, signal disconnecter converter

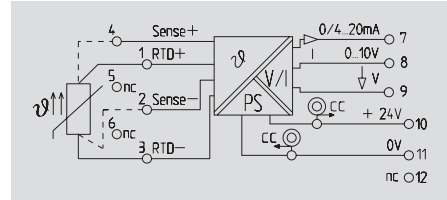
- Universal adjustable via DIP-switch
- 3-way isolation
- Linearization
- Power supply can be cross connected via plug-in jumper



## PRO RTD



## PRO RTD 1000



## Technical data

### Input

Sensor  
Temperature input range

### Output

Output current/Output voltage  
Offset current/Offset voltage  
Load resistance voltage/Current  
Step response time  
Line resistance in measuring circuit  
Influence of cable resistance  
Wire break detection  
Fine adjustment  
Status indicator

### General data

Supply voltage  
Power consumption  
Current-carrying cap. of cross-connect.  
Operation temperature  
Storage temperature  
Default settings  
Approvals

### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Isolation voltage Input, output  
Overvoltage category  
Pollution severity  
Clearance & creepage path

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Information

## Ordering data

### Type of connection

Screw connection  
Tension clamp c.

### Information

## Accessories

### Information

PT100/2-/3-/4-cond.; Ni100/2-/3-/4-cond.; potentiometer:  
min. 0...100Ω, max. 0...100kΩ; resistance: 0...450Ω  
configurable

0(4)...20 mA/0...10 V  
max. 100 μA/max. 0.05 V  
≥ 1 kΩ/≤ 600 Ω  
fast: 1.2 s/ slow: 2.2 s

50 Ω  
max. + 0.25°C at 50 Ω cond. resistance  
LED flashes (output value > 20mA, > 10V)  
≥ ±0.5%, Version 1: ≥ 12.5% / Poti: 12.5%...25%  
active: LED on/cond. broken: LED flashing/Error: LED off

24 Vdc +/- 25 %  
830...880...980mW at Iout=20mA

≤ 2 A  
0 °C...+55 °C  
-20 °C...+85 °C

PT100/3-cond./ 0...100°C / 4...20mA / man. adjustment: off /  
slow step response  
GL / CE / cURus

EN 50178, EN 60751, IEC 751, DIN 43760  
EN 50081, EN50082, EN55011

300 V

4 kV

2 kVeff / 5s

III

2

≥ 3 mm

### Screw connection

2.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4

### Tension clamp c.

1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4

Tu=23°C, single module

PT1000/2-/3-/4-cond.; Ni1000/2-/3-/4-cond.; potentiometer:  
min. 0-1kΩ, max. 0-100kΩ; resistance: 0-4,5kΩ  
configurable

0(4)...20 mA/0...10 V  
max. 100 μA/max. 0.05 V  
≥ 1 kΩ/≤ 600 Ω  
fast/slow: 2-/3-/4-cond.: 1.2s/2.3s; Poti: 0.5s/1.2s

50 Ω for 3- and 4-conductor  
max. + 0.25°C at 50 Ω cond. resistance  
LED flashes (output value > 20mA, > 10V)  
≥ ±0.5%; Poti: ± 12.5% ... ± 25%  
active: LED on/cond. broken: LED flashing/Error: LED off

24 Vdc +/- 25 %  
830...880...980mW at Iout=20mA

≤ 2 A  
0 °C...+55 °C  
-20 °C...+85 °C

PT1000/3-cond./ 0...100°C / 4...20mA / man. adjustment: off /  
slow step response

EN 50178, EN 60751, IEC 751, DIN 43760  
EN 50081, EN50082, EN55011

300 V

4 kV

2 kVeff / 5s

III

2

≥ 3 mm

### Screw connection

2.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4

### Tension clamp c.

1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4

Tu=23°C, single module

### Type

WAS5 PRO RTD 1000 Qty. 1 Order No. 8679490000  
WAZ5 PRO RTD 1000 Qty. 1 Order No. on demand

### Information

Voltage supply 24V and 0V with ZQV 2.5N/2  
cross-connection

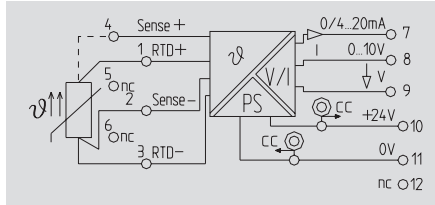
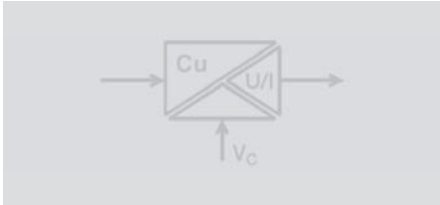


# PT100 / RTD - signal isolator/converter

## RTD, signal disconnecter converter

- Universally adjustable via DIP-switch
- 3-way isolation
- Linearization
- Power supply can be cross connected via plug-in jumper

## PRO RTD Cu



### Technical data

#### Input

Sensor  
Temperature input range

#### Output

Output current/Output voltage  
Offset current/Offset voltage  
Load resistance voltage/Current  
Step response time  
Line resistance in measuring circuit  
Influence of cable resistance  
Wire break detection  
Fine adjustment  
Status indicator

#### General data

Supply voltage  
Power consumption  
Current-carrying cap. of cross-connect.  
Operation temperature  
Storage temperature  
Default settings  
Approvals

#### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Isolation voltage Input, output  
Overvoltage category  
Pollution severity  
Clearance & creepage path

#### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

#### Information

### Ordering data

#### Type of connection

Screw connection  
Tension clamp c.

#### Information

### Accessories

#### Information

Cu 10, Cu 25, Cu 50, Cu 100; 3-/4-cond.  
adjustable -200...+260 °C

0(4)...20 mA/0...10 V  
max. 100 µA/max. 0.05 V  
>= 1 kΩ / < = 600 Ω  
fast: 1.2 s / slow: 2.2 s  
5 Ω Cu 10; 15 Ω Cu 25; 25 Ω Cu 50; 50 Ω Cu 100  
max. + 0.25°C at max. cond. resistance  
LED flashes (output value > 20mA, > 10V)  
>= +/- 12.5 %  
active: LED on/cond. broken: LED flashing/Error: LED off

24 Vdc +/- 25 %  
880...980...1030mW at Iout=20mA  
<= 2 A  
0 °C...+55 °C  
-20 °C...+85 °C  
CU 10/3-cond.; 0...100°C; 4...20mA; no filter, manual adjustment off; slow step response

GL / CE / ESD / cURus

EN 50178  
EN 50081, EN50082, EN55011

300 V  
4 kV  
2 kVeff / 5s  
III  
2  
>= 3 mm

#### Screw connection

2.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4

#### Tension clamp c.

1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4

Type	Qty.	Order No.
WAS5 PRO RTD Cu	1	8638950000
WAZ5 PRO RTD Cu	1	on demand

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

Selection of connection	Switch 1		Selection of sensor		
	1	2	Type	2	3
3-wire	■		Cu 10	■	■
4-wire	□		Cu 25	■	□
			Cu 50	□	■
			Cu 100	□	□

Selection of minimum input values	Switch 1			
	4	5	6	7
∅ <sub>min</sub>				
- 0 °C	■	■	■	■
-10 °C	■	■	■	□
-20 °C	■	■	□	■
-25 °C	■	■	□	□
-30 °C	■	□	■	■
-40 °C	■	□	■	□
-50 °C	■	□	□	■
-60 °C	■	□	□	□
-70 °C	□	■	■	■
-80 °C	□	■	■	□
-90 °C	□	■	□	■
-100 °C	□	■	□	□
-150 °C	□	□	■	■
-200 °C	□	□	■	□
special range	□	□	□	□

Selection of the measurement range	Switch 2				
	1	2	3	4	5
Span					
40 K	■	■	■	■	■
50 K	■	■	■	■	□
60 K	■	■	■	□	■
70 K	■	■	■	□	□
80 K	■	■	□	■	■
90 K	■	■	□	■	□
100 K	■	■	□	□	■
110 K	■	■	□	□	□
120 K	■	□	■	■	■
125 K	■	□	□	■	□
130 K	■	□	■	□	□
140 K	■	□	■	□	□
150 K	■	□	□	■	■
160 K	■	□	□	■	□
170 K	■	□	□	□	■
180 K	■	□	□	□	□
190 K	□	■	■	■	■
200 K	□	■	■	■	□
210 K	□	■	■	□	■
220 K	□	■	■	□	□
230 K	□	■	□	■	■
240 K	□	■	□	■	□
250 K	□	■	□	□	■
260 K	□	■	□	□	□
270 K	□	□	■	■	■
280 K	□	□	■	■	□
290 K	□	□	■	□	■
300 K	□	□	■	□	□
350 K	□	□	□	■	■
400 K	□	□	□	■	□
450 K	□	□	□	□	■
460 K	□	□	□	□	□

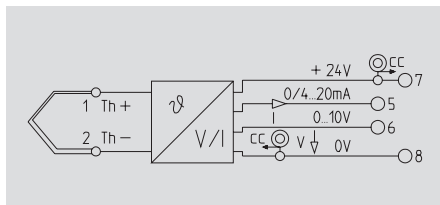
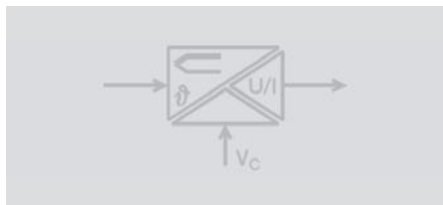
Selection of Output	Switch 2		Switching on the manual fine adjustment	
	6	7	man. adj.	Switch 1 8
0...10 V	■	□	off	□
0...20 mA	□	□	off	□
4...20 mA	□	■	on	■

Selection of step set time	Schalter 2	
	Time of step response	8
slow	■	■ = on
fast	□	□ = off

# Thermo element, signal isolator/converter

**Thermo disconnecter converter Type: Thermo Select**  
**K, J, T, E, N, R, S, B**

- Calibration not necessary
- Cold-junction compensation
- Output signal selectable
- Power supply can be cross connected via plug-in jumper



## Technical data

Input	
Sensor	thermo-elements (IEC 584) type: K,J,T,E,N,R,S,B
Temperature input range	-200...+1820 °C
Output	
Output voltage/Output current	0...10 V/0(4)...20 mA
Load resistance voltage/Current	>= 1 kΩ / <= 600 Ω
Temperature coefficient	+/- (200 ppm from span + 0.075 K)/K
Step response time	with filter: 1.1 s; without filter: 6 s
Wire break detection	LED flashes (output value > 20mA, > 10V)
General data	
Supply voltage	24 Vdc +/- 20 %
Current consumption	< 38 mA at Iout = 20 mA
Current-carrying cap. of cross-connect.	<= 2 A
Operation temperature	0 °C...+55 °C
Storage temperature	-20 °C...+85 °C
Approvals	CSA / UL/UR / CE / ESD
Insulation coordinates	
Standards	EN 50178, EN 60584, IEC 584
EMC standards	EN 50081, EN50082, EN55011

Dimensions	
Clamping range (rating- / min. / max.)	mm <sup>2</sup>
Length x width x height	mm

Information	
TU=23°C, single module	

## Ordering data

Type of connection	
Screw connection	
Tension clamp c.	

Information	
-------------	--

## Accessories

Information	
Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection	

Screw connection		Tension clamp c.	
2.50 / 0.50 / 2.50		1.50 / 0.50 / 2.50	
92.4 x 12.5 x 112.4		92.4 x 12.5 x 112.4	

Type	Qty.	Order No.
WTS4 THERMO	1	8432300000
WTZ4 THERMO	1	8432310000

Information	
Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection	

## Switch position/setting options

SW 1			SW 2					
Type	1	2	Span	1	2	3	4	5
K	■	■	100 °C	■	■	■	■	■
J	□	■	150 °C	■	■	■	■	□
T	■	□	200 °C	■	■	■	■	■
E	□	□	250 °C	■	■	■	□	□
N	■	□	300 °C	■	■	■	■	■
R	□	■	350 °C	■	■	■	□	□
S	■	□	400 °C	■	■	■	□	■
B	□	□	450 °C	■	■	■	□	□

SW 1						
Tmin	4	5	6	7	Span	
0 °C	■	■	■	■	600 °C	■
-10 °C	■	■	■	□	650 °C	■
-20 °C	■	■	□	■	700 °C	■
-30 °C	■	■	□	□	750 °C	■
-40 °C	■	□	■	■	800 °C	■
-50 °C	■	□	□	■	850 °C	■
-100 °C	■	□	□	■	900 °C	■
-150 °C	■	□	□	□	950 °C	■
-200 °C	■	□	■	■	1000 °C	■
+50 °C	□	■	■	■	1050 °C	■
+100 °C	□	■	□	■	1100 °C	■
+150 °C	□	■	□	□	1150 °C	■
+200 °C	□	■	■	■	1200 °C	■
+250 °C	□	□	■	■	1250 °C	■
+500 °C	□	□	□	■	1300 °C	■
					1350 °C	■
					1400 °C	■
					1450 °C	■
SW 2						
Output	6	7				
0 - 10 V	■	□				
0 - 20 mA	□	□				
4 - 20 mA	□	■				

Filter 8	
off	□
on	■

■ = on  
□ = off

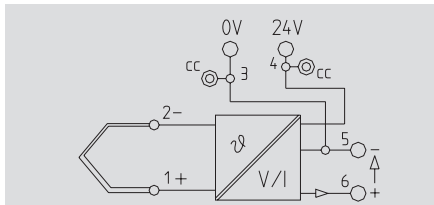
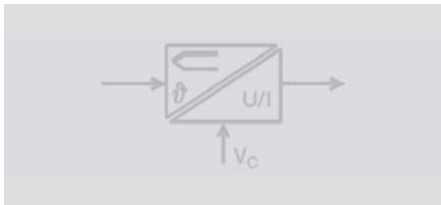
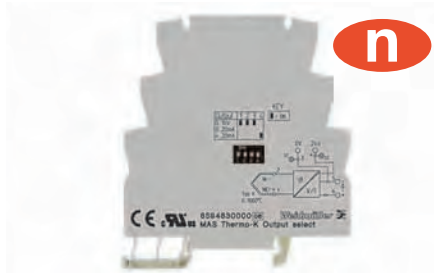
Temperature coefficient		
K	-200°C ... -150°C	± (5K + 0.1% of set range)
	-150°C ... 1200°C	± (3K + 0.1% of set range)
	1200°C ... 1372°C	± (4K + 0.1% of set range)
J	-200°C ... -150°C	± (4K + 0.1% of set range)
	-150°C ... 1200°C	± (3K + 0.1% of set range)
T	-200°C ... -150°C	± (5K + 0.1% of set range)
	-150°C ... 400°C	± (3K + 0.1% of set range)
E	-200°C ... -150°C	± (4K + 0.1% of set range)
	-150°C ... 1000°C	± (3K + 0.1% of set range)
N	-200°C ... -150°C	± (6K + 0.1% of set range)
	-150°C ... 1300°C	± (3K + 0.1% of set range)
R	-50°C ... 200°C	± (10K + 0.1% of set range)
	200°C ... 1760°C	± (6K + 0.1% of set range)
S	-50°C ... 200°C	± (10K + 0.1% of set range)
	200°C ... 1760°C	± (6K + 0.1% of set range)
B	50°C ... 250°C	± (25K + 0.1% of set range)
	250°C ... 500°C	± (10K + 0.1% of set range)
	500°C ... 1820°C	± (6K + 0.1% of set range)

# Thermo element, signal isolator/converter

## Thermo disconnecter converter type: K

- 2-way isolation between input/output and voltage supply
- Cold-junction compensation
- Linearization
- Output can be switched calib. via DIP-switch

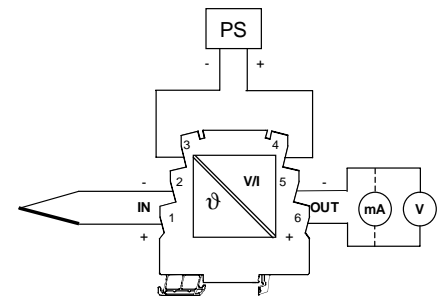
## Thermo K Output Select



Output	Switch			
	1	2	3	4
0 ... 10 V	■	■	■	□
0 ... 20 mA	□	□	□	□
4 ... 20 mA	□	□	□	■
0 ... 5 V	■	■	■	■

■ = on  
□ = off

### Connection



### Technical data

#### Input

Sensor  
Temperature input range

#### Output

Output voltage/Output current  
Load resistance voltage/Current  
Accuracy  
Temperature coefficient  
Step response time  
Wire break detection  
Residual ripple

#### General data

Supply voltage  
Power consumption  
Current-carrying cap. of cross-connect.  
Operation temperature  
Storage temperature  
Default settings  
Approvals

#### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Isolation voltage Input, output/  
Overvoltage category  
Pollution severity  
Clearance & creepage path

thermo-elements according IEC 584, type: K  
0...1000 °C

0...10V / 0...5V/0(4)...20 mA

>= 10 kΩ / < = 600 Ω

< 0.6 % of measuring range

<= 250 ppm/K of final value

< 0.7 s

output value: > 20 mA, > 10 V

< 20 mVeff

24 Vdc +/- 10 %

approx. 0.6 W

<= 20 A

0 °C...+55 °C

-20 °C...+85 °C

0...20mA

CE / ESD / cURus

EN 50178, EN 60584, IEC 584

EN 50081, EN 50082, EN 55011, EN 61000-6-2, EN 61326

100 V

1.5 kV

500 Veff/

III

2

>= 1.5mm

#### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

#### Information

#### Screw connection

2.50 / 0.50 / 2.50  
88.0 x 6.1 x 97.8

#### Tension clamp c.

1.50 / 0.50 / 2.50  
92.0 x 6.1 x 97.8

Tu=23°C, single module

### Ordering data

#### Type of connection

Screw connection  
Tension clamp c.

#### Type

MAS Thermo-K 0...1000°C Output select1  
MAZ Thermo-K 0...1000°C Output select1

#### Qty.

#### Order No.

8594830000  
8594860000

#### Information

### Accessories

#### Information

Voltage supply 24V and 0V with ZQV 4N/x  
cross-connection

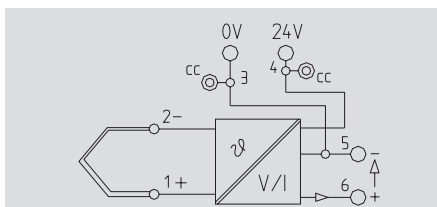
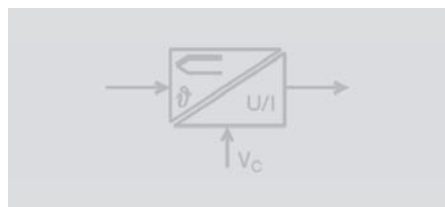
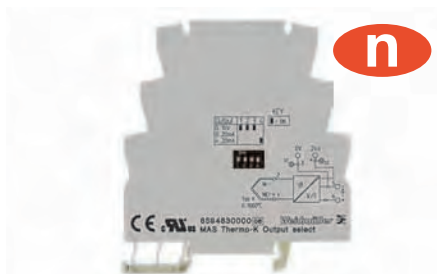


# Thermo element, signal isolator/converter

## Thermo disconnecter converter type: J

- 2-way isolation between input/output and voltage supply
- Cold-junction compensation
- Linearization
- Output can be switched calib. via DIP-switch

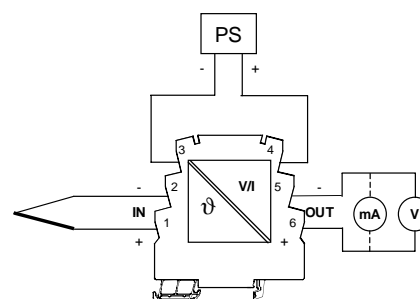
## Thermo J Output Select



Output	Switch			
	1	2	3	4
0 ... 10 V	■	■	■	□
0 ... 20 mA	□	□	□	□
4 ... 20 mA	□	□	□	■
0 ... 5 V	■	■	■	■

■ = on  
□ = off

### Connection



### Technical data

#### Input

Sensor  
Temperature input range

#### Output

Output voltage/Output current  
Load resistance voltage/Current  
Accuracy  
Temperature coefficient  
Step response time  
Wire break detection  
Residual ripple

#### General data

Supply voltage  
Power consumption  
Current-carrying cap. of cross-connect.  
Operation temperature  
Storage temperature  
Default settings  
Approvals

#### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Isolation voltage Input, output/  
Overvoltage category  
Pollution severity  
Clearance & creepage path

thermo-elements according IEC 584, type: J  
0...700 °C

0...10V / 0...5V/0(4)...20 mA

$\geq 10 \text{ k}\Omega / < = 600 \Omega$

$< 0.7 \%$  of measuring range

$\leq 250 \text{ ppm/K}$  of final value

$< 0.7 \text{ s}$

output value:  $> 20 \text{ mA}$ ,  $> 10 \text{ V}$

$< 20 \text{ mVeff}$

24 Vdc +/- 10 %

approx. 0.6 W

$\leq 20 \text{ A}$

0 °C...+55 °C

-20 °C...+85 °C

0...20mA

CE / ESD / cURus

EN 50178, EN 60584, IEC 584

EN 50081, EN 50082, EN 55011, EN 61000-6-2, EN 61326

100 V

1.5 kV

500 Veff/

III

2

$\geq 1.5 \text{ mm}$

#### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

#### Information

#### Screw connection

2.50 / 0.50 / 2.50  
88.0 x 6.1 x 97.8

#### Tension clamp c.

1.50 / 0.50 / 2.50  
92.0 x 6.1 x 97.8

Tu=23°C, single module

### Ordering data

#### Type of connection

Screw connection  
Tension clamp c.

Type	Qty.	Order No.
MAS Thermo-J 0...700°C Output select	1	8615210000
MAZ Thermo-J 0...700°C Output select	1	8615240000

#### Information

### Accessories

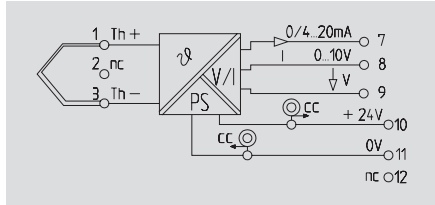
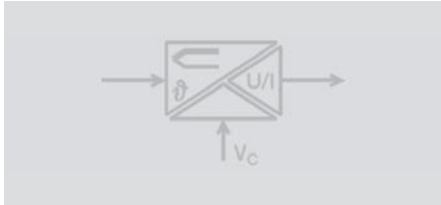
#### Information

Voltage supply 24V and 0V with ZQV 4N/x  
cross-connection

# Thermo element, signal isolator/converter

## Thermo disconnecter converter Type: PRO Thermo K, J, T, E, N, R, S, B

- 3-way isolation
- Calibration not necessary
- Cold-junction compensation
- Output signal selectable
- Power sup. can be cross-conn. by jumper



### Technical data

<b>Input</b>	
Sensor	thermo-elements (IEC 584) type: K,J,T,E,N,R,S,B
Temperature input range	-200...+1820 °C
<b>Output</b>	
Output voltage/Output current	0...10 V/0(4)...20 mA
Load resistance/voltage/current	>= 1 kΩ / <= 600 Ω
Offset current/Offset voltage	max. 100 μA/max. 0.05 V
Step response time	max. 1.4 s; with filter: max. 7.5 ms
Line resistance in measuring circuit	50 Ω
Wire break detection	LED flashes (output value > 20mA, > 10V)
Fine adjustment	>= +/- 5 % (switchable)
Status indicator	active: LED on/cond. broken: LED flashing/Error: LED off
<b>General data</b>	
Supply voltage	24 Vdc +/- 25 %
Power consumption	800...850...950 mW at Iout= 20 mA
Current-carrying cap. of cross-connect.	<= 2 A
Operation temperature	0 °C...+55 °C
Storage temperature	-20 °C...+85 °C
Default settings	type K; 0...1000°C; 4...20mA; filter: off; man. adjustment: off
Approvals	GL / CE / cURus
<b>Insulation coordinates</b>	
Standards	EN 50178, EN 60584, IEC 584
EMC standards	EN 50081, EN50082, EN55011
Rated voltage	300 V
Impulse withstand voltage	4 kV
Isolation voltage Input, output/	2 kVeff / 5s/
Overvoltage category	III
Pollution severity	2
Clearance & creepage path	>= 3 mm

<b>Dimensions</b>	
Clamping range (rating- / min. / max.)	mm²
Length x width x height	mm
<b>Information</b>	TU=23°C, single module

### Ordering data

<b>Type of connection</b>	
Screw connection	WAS5 PRO Thermo
Tension clamp c.	WAZ5 PRO Thermo

### Information

### Accessories

<b>Information</b>	Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection
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<b>Screw connection</b>	2.50 / 0.50 / 2.50	<b>Tension clamp c.</b>	1.50 / 0.50 / 2.50
	92.4 x 17.5 x 112.4		92.4 x 17.5 x 112.4

<b>Type</b>	<b>Qty.</b>	<b>Order No.</b>
WAS5 PRO Thermo	1	8560720000
WAZ5 PRO Thermo	1	8560730000

Select of thermocoupler	SW1			Selection of minimum temperature					
	Typ	1	2	3	ϑ <sub>min</sub>	4	5	6	7
K	■	■	■		0°C	■	■	■	■
J	□	■	■		-10°C	■	■	■	□
T	■	□	■		-20°C	■	■	□	■
E	□	□	■		-30°C	■	■	□	□
N	■	■	□		-40°C	■	□	■	■
R	□	■	□		-50°C	■	□	■	□
S	■	□	□		-100°C	■	□	□	■
B	□	□	□		-150°C	□	□	□	□
					-200°C	□	■	■	■
					+50°C	□	■	■	■
					+100°C	□	■	■	■
					+150°C	□	■	■	■
					+200°C	□	□	■	■
					+250°C	□	□	■	■
					500°C	□	□	■	■
					Special range	□	□	□	□

Selection of temperature span	SW2					Selection of output			
	Span	1	2	3	4	5	Output	SW2	
100°C	■	■	■	■	■		0...10V	■	□
150°C	■	■	■	■	□		0...20mA	□	□
200°C	■	■	■	□	□		4...20mA	□	■
250°C	■	■	■	□	□				
300°C	■	■	■	□	□				
350°C	■	■	□	■	□				
400°C	■	■	□	□	□				
450°C	■	■	□	□	□				
500°C	■	□	■	■	■				
550°C	■	□	■	■	□				
600°C	■	□	■	■	□				
650°C	■	□	■	■	□				
700°C	■	□	■	■	□				
750°C	■	□	■	■	□				
800°C	■	□	■	■	□				
850°C	■	□	■	■	□				
900°C	□	■	■	■	■				
950°C	□	■	■	■	□				
1000°C	□	■	■	■	□				
1050°C	□	■	■	■	□				
1100°C	□	■	■	■	■				
1150°C	□	■	■	■	□				
1200°C	□	■	■	■	□				
1250°C	□	■	■	■	□				
1300°C	□	□	■	■	■				
1350°C	□	□	■	■	□				
1400°C	□	□	■	■	□				
1450°C	□	□	■	■	□				
1500°C	□	□	■	■	□				
1600°C	□	□	■	■	□				
1700°C	□	□	■	■	■				■ = on
1800°C	□	□	■	■	□				□ = off

Switching on the manual fine adjustment	
man. adjust.	SW1
off	□
on	■

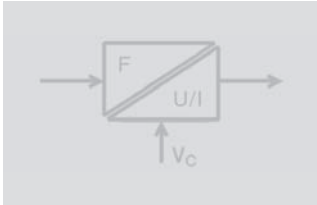
Switching on the filter function	
Filter	SW2
off	□
on	■

Temperature coefficient	
K -200°C...-150°C	± (5K + 0,1% of set range)
-150°C...1200°C	± (3K + 0,1% of set range)
1200°C...1372°C	± (4K + 0,1% of set range)
J -200°C...-150°C	± (4K + 0,1% of set range)
-150°C...1200°C	± (3K + 0,1% of set range)
T -200°C...-150°C	± (5K + 0,1% of set range)
-150°C...400°C	± (3K + 0,1% of set range)
E -200°C...-150°C	± (4K + 0,1% of set range)
-150°C...1000°C	± (3K + 0,1% of set range)
N -200°C...-150°C	± (6K + 0,1% of set range)
-150°C...1300°C	± (3K + 0,1% of set range)
R -50°C...200°C	± (10K + 0,1% of set range)
200°C...1760°C	± (6K + 0,1% of set range)
S -50°C...200°C	± (10K + 0,1% of set range)
200°C...1760°C	± (6K + 0,1% of set range)
B 50°C...250°C	± (25K + 0,1% of set range)
250°C...500°C	± (10K + 0,1% of set range)
500°C...1820°C	± (6K + 0,1% of set range)

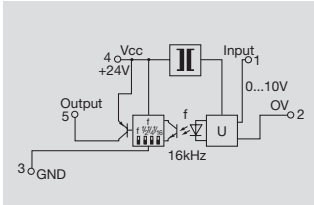
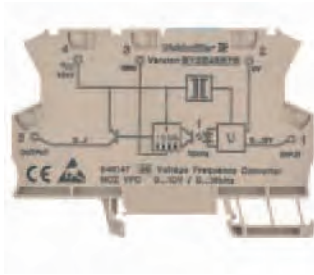
# Frequenzy signal isolator/converter

## DC/f disconnecter converter

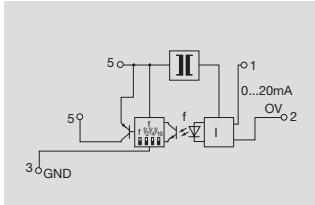
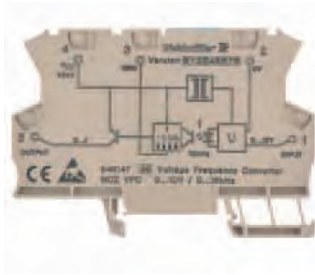
By the conversion of analog signals to frequency it is possible to read in analog signals out of the array via the counter-inputs of the controller.



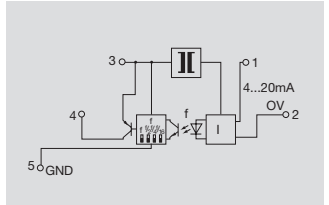
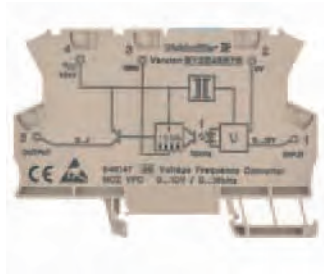
## MCZ VFC



## MCZ CFC



## MCZ CFC



## Technical data

### Input

Input voltage/Input current  
Max. voltage/Max. current  
Input resistance voltage/Current  
Voltage drop

### Output

Output frequency/  
Output level  
Output current  
Fine adjustment  
Accuracy  
Temperature coefficient  
Status indicator

### General data

Supply voltage  
Current consumption  
Current-carrying cap. of cross-connect.  
Operation temperature  
Storage temperature  
Approvals

### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Isolation voltage Input, output  
Overvoltage category  
Pollution severity  
Clearance & creepage path

0...10 V/  
30 V/  
100 kΩ/

0...1/ 4/ 8/ 16 kHz/  
PNP, Ub-0.7 V  
max. 20 mA  
+/- 10 %, internal  
0.2% of FSR  
<= 250 ppm/K  
LED, pulsing

24 Vdc +/- 10 %  
14 mA without load  
<= 20 A  
0 °C...+50 °C  
-20 °C...+85 °C  
CE / ESD

EN 50178  
EN 50081, EN50082, EN55011  
100 V  
1.5 kV  
1 kVdc  
III  
2  
>= 1.5mm

### Tension clamp c.

1.50 / 0.50 / 1.50  
91.0 x 6.0 x 63.2

/0...20 mA  
/50 mA  
/50 Ω  
1 V at 20 mA

0...1/ 4/ 8/ 16 kHz/  
PNP, Ub-0.7 V  
max. 20 mA  
+/- 10 %, internal  
0.2% of FSR  
<= 250 ppm/K  
LED, pulsing

24 Vdc +/- 10 %  
14 mA without load  
0 °C...+50 °C  
-20 °C...+85 °C  
CE / ESD

EN 50178  
EN 50081, EN50082, EN55011  
100 V  
1.5 kV  
1 kVdc  
III  
2  
>= 1.5mm

### Tension clamp c.

1.50 / 0.50 / 1.50  
91.0 x 6.0 x 63.2

/4...20 mA (current loop)  
/50 mA  
/  
5.8...6.4 V at 20 mA

0...1/ 4/ 8/ 16 kHz/  
PNP, Ub-0.7 V  
max. 20 mA  
+/- 10 %, internal  
0.15 % of FSR  
<= 250 ppm/K  
LED, pulsing

24 Vdc +/- 20 %  
14 mA without load  
0 °C...+50 °C  
-20 °C...+85 °C  
CE / ESD

EN 50178  
EN 50081, EN50082, EN55011  
150 V  
2.5 kV  
III  
2  
>= 2 mm

### Tension clamp c.

1.50 / 0.50 / 1.50  
91.0 x 6.0 x 63.2

Without DC/DC-converter input is current-loop-fed

## Ordering data

### Type of connection

Tension clamp c.

Type	(Qty.=1)	Order No.
MCZ VFC 0-10V		8461470000

Type	(Qty.=1)	Order No.
MCZ CFC 0-20MA		8461480000

Type	(Qty.=1)	Order No.
MCZ CFC 4-20MA		8461490000

### Information

## Accessories

### Information

Voltage supply 24V,0V and GND with ZQV 4/x cross-connection

Voltage supply 24V,0V and GND with ZQV 4/x cross-connection

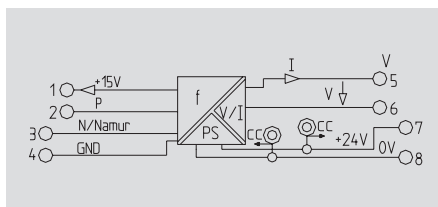
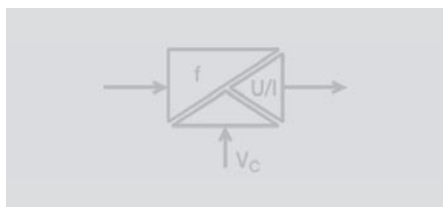
Voltage supply 24V,0V and GND with ZQV 4/x cross-connection

# Frequency signal isolator/converter

## f/DC disconnecter converter

- 3-way isolation
- Max. input frequency 100 kHz
- Input and output adjustable via DIP-switch
- Calibration not necessary
- Special partitions can be programmed

## PRO Frequency



### Technical data

Input	
Sensor/	2-, 3-wire PNP/NPN, namur initiator, push-pull step/
Rated input level	threshold / hysteresis: namur: ca 1.7 mV/ca 0.2 mA;
Resolution	NPN: ca 6.5 V/ca 0.2V; PNP: ca 6.7V/ca 0.5V
Output	
Output voltage/Output current	0.1 mHz resp. 5 ppm of measurement value
Load resistance voltage/Current	0...10 V/0(4)...20 mA
Offset current/Offset voltage	>= 1 kΩ / <= 600 Ω
Accuracy	max. 100 µA/max. 0.05 V
Temperature coefficient	0.2 % of output range
Step response time	max. 200 ppm/K of output range
Status indicator	360 ms + 2-fold period time of input frequency
General data	
Supply voltage	LED green
Power consumption	24 Vdc +/- 25 %
Current-carrying cap. of cross-connect.	max. 1.6 W at Iout= 20 mA
Operation temperature	<= 2 A
Storage temperature	0 °C...+55 °C
Default settings	-20 °C...+85 °C
Approvals	0...10kHz / 4...20mA
Insulation coordinates	
Standards	CE / ESD / cURus
EMC standards	EN 50178 (safe separation)
Rated voltage	EN 50081, EN 50082, EN 55011, EN 61000-6-2, EN 61326
Impulse withstand voltage	300 V
Isolation voltage Input, output/	6 kV
Overvoltage category	4 kVeff / 5s/
Pollution severity	III
Clearance & creepage path	>= 5.5 mm

Dimensions	
Clamping range (rating- / min. / max.)	mm <sup>2</sup>
Length x width x height	mm
Information	
TU=23°C, single module	

### Ordering data

Type of connection	Type	Qty.	Order No.
Screw connection Tension clamp c.	WAS4 PRO Freq	1	8581180000
	WAZ4 PRO Freq	1	8581190000

### Information

### Accessories

Information	Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection
-------------	--

Screw connection		Tension clamp c.	
2.50 / 0.50 / 2.50	1.50 / 0.50 / 2.50	2.50 / 0.50 / 2.50	1.50 / 0.50 / 2.50

### Selecting the operating mode

Operating mode	Switch 2	
	3	4
0...fmax	<input type="checkbox"/>	<input type="checkbox"/>
fmin...fmax	<input type="checkbox"/>	<input checked="" type="checkbox"/>
saving	<input type="checkbox"/>	<input type="checkbox"/>
fmin	<input checked="" type="checkbox"/>	<input type="checkbox"/>

$$f = (A+B) \times C$$

Selecting the frequency				
A	Switch 1			
0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
3	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
4	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
6	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
7	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
10	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
11	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
12	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
13	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
14	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
15	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Selecting the frequency							
B	Switch 1						
0	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0,1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
0,2	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
0,3	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
0,4	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0,5	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
0,6	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
0,7	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
0,8	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0,9	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

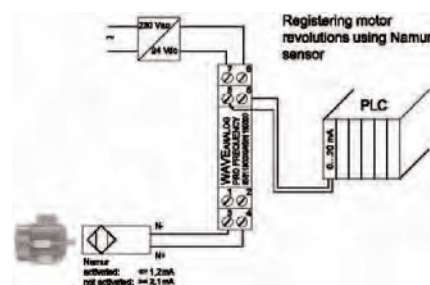
Selecting the frequency		
C	Switch 2	
x1	<input type="checkbox"/>	<input type="checkbox"/>
x10	<input type="checkbox"/>	<input type="checkbox"/>
x100	<input checked="" type="checkbox"/>	<input type="checkbox"/>
x1000	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Selecting the output				
Output	Switch 2			
0...10 V	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
0...20 mA	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4...20 mA	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0...5 V	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

Special range (frequency generator is required)				
Funktion	Switch 2			
save min. frequency	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
save max. frequency	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
select special range	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

■ = ein  
□ = aus

### Application

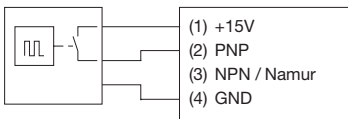


# Frequency signal transformer

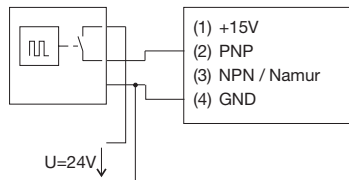
WAVEANALOGUE PRO Frequency

## Connection configuration of the sensors

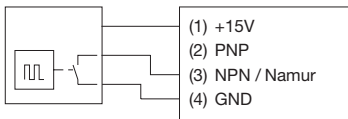
3-wire initiator with PNP output



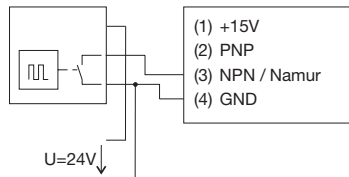
3-wire initiator with PNP output and external supply



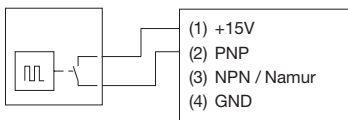
3-wire initiator with NPN output



3-wire initiator with NPN output and external supply

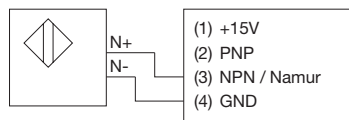


2-wire initiator

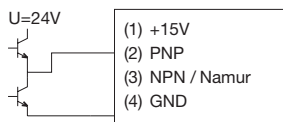


(residual current < 1 mA)

Namur initiator



Push pull output cascade



## Setting help for any input and output values

### Setting the input range using the DIP switches (no frequency generator required):

There are 2 different cases:

#### 1. Lower measuring frequency = 0 Hz

- Choose operating mode "= ... fmax" S2.3 = 0 and S2.4 = 0
- Set the upper measuring frequency using DIP switches S1 and S2.1, S2.2 (see table)
- That's all

#### 2. Lower measuring frequency ≠ 0 Hz

- First the lower measuring frequency must be saved. Select mode "save fmin". S2.3 = 1 and S2.4 = 0. Set the frequency using DIP switches S1 and S2.1, S2.2 (see table)
- To save the frequency, briefly connect the module to the power supply.
- Select mode "fmin...fmax" S2.3 = 0 and S2.4 = 1
- Set the upper measuring frequency using DIP switches S1 and S2.1, S2.2 (see table).
- That's all.

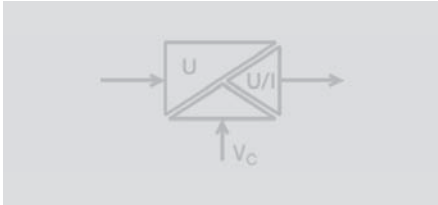
### Adjusting the input range using a frequency generator

- Select the switch setting for saving the frequency: S2.1 = 0, S2.2 = 1, S2.3 = 1 and S2.4 = 1
- Apply min. frequency to the module
- Connect the module to the power supply
- The LED lights up when the input frequency is being measured. If the LED goes off, the frequency has been saved and the module can be disconnected from the power supply again.
- Repeat with max. frequency: S2.1 = 1, S2.2 = 0, S2.3 = 1 and S2.4 = 1
- Select special range: S2.1 = 1, S2.2 = 1, S2.3 = 1 and S2.4 = 1

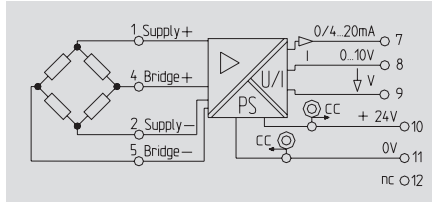
# Bridge measuring converter

## Configurable

- 3-way isolation
- Input and output selectable via DIP-switch
- Calibration not necessary
- Inverse output signal



## PRO BRIDGE



## Switch position/setting options

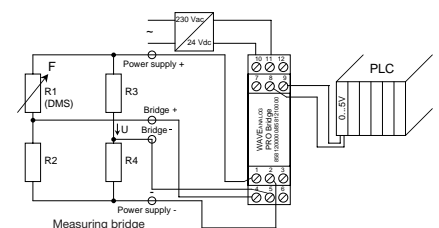
Input voltage	SW 1									
	1	2	3	4	5	6	7	8	9	10
0...10 mV							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0...20 mV							<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
0...50 mV							<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
0...100 mV							<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
0...200 mV							<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
0...500 mV							<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-10 mV...10 mV							<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
-20 mV...20 mV							<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
-50 mV...50 mV							<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-100 mV...100 mV							<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-200 mV...200 mV							<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
-500 mV...500 mV							<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Ausgang										
0...+10 V							<input type="checkbox"/>	<input type="checkbox"/>		
0...+5 V							<input type="checkbox"/>	<input checked="" type="checkbox"/>		
0...20 mA							<input checked="" type="checkbox"/>	<input type="checkbox"/>		
4...20 mA							<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
<b>Bridge supply voltage</b>										
+10V							<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
+5V							<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	
+4,8...+10,2V adjustable							<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
+4,8...+10,2V adjustable man. adjustment and offset possible							<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
<b>Transmission method</b>										
standard output signal										<input type="checkbox"/>
inverse output signal										<input checked="" type="checkbox"/>

■ = on  
□ = off

## Status LED

LED on	normal operating
LED off	Error
LED blinks slow	measurement range undershoot $U_{in} < U_{max} + 10\%$
LED blinks fast	measurement range overshoot $U_{in} < U_{max} - 10\%$

## Application

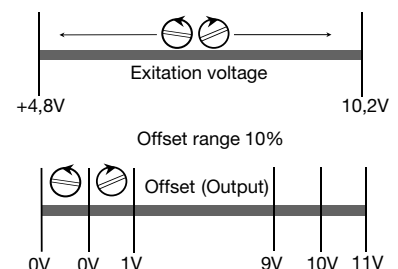


## Example for bridge supply voltage

### Temperature adjustment:

Input voltage	0...10 mA
Output	0...10 V
Bridge supply voltage	+4,8...10,2 V
Bridge excitation	1 mV/V

(Declaration from manufacturer)



## Technical data

### Input

Input voltage/  
Input resistance voltage

-500mV...+500mV/  
> 1 M $\Omega$

### Output

Output voltage/Output current  
Load resistance voltage/Current  
Offset current/Offset voltage

0...5 V, 5...0 V, 10...0 V, 0...10 V/  
0...20 mA, 20...0 mA, 4...20 mA, 20...4 mA  
>= 1 k $\Omega$  / <= 600  $\Omega$

### Accuracy

Temperature coefficient

max. 100  $\mu$ A/max. 0.05 V

Step response time

+/- 250 ppm/K of output range

Status indicator

typ. < 200 ms

Wire break detection

Bridge supply voltage

LED green

### General data

Supply voltage  
Power consumption  
Current-carrying cap. of cross-connect.  
Operation temperature  
Storage temperature  
Default settings  
Approvals

output: 0 V resp. 0/4 mA

+10 V, +5 V, 4,8...10,2 V; offset adjustable; max. 40mA

### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Isolation voltage Input, output/  
Overvoltage category  
Pollution severity  
Clearance & creepage path

<= 2 A

0  $^{\circ}$ C...+55  $^{\circ}$ C

-20  $^{\circ}$ C...+85  $^{\circ}$ C

EN 50178

EN 61000-6-2, EN 50081-2

300 V

4 kV

2 kVeff / 5s/

III

2

>= 3 mm

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Screw connection

2.50 / 0.50 / 2.50 1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4 92.4 x 17.5 x 112.4

### Tension clamp c.

### Information

TU=23 $^{\circ}$ C, single module

## Ordering data

### Type of connection

Screw connection  
Tension clamp c.

### Type

Type	Qty.	Order No.
WAS5 PRO Bridge	1	858120000
WAZ5 PRO Bridge	1	858121000

### Information

## Accessories

### Information

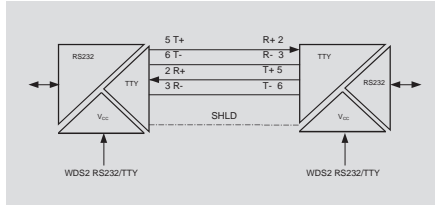
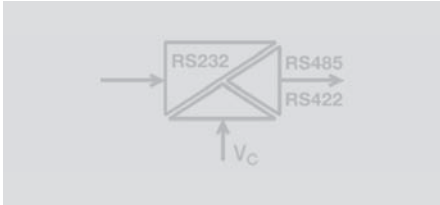
Voltage supply 24V and 0V with ZQV 2.5N/2  
cross-connection

# Serial interface converter

## RS232/RS485/422

- 3-way isolation
- RS232 connection via SUB-D 9
- RS485/422, TTY shield connection via KLBÜ
- DTE or DCE assignment selectable
- Bidirectional communication

## RS232/RS485/422



### Technical data

#### RS232

Connection/Input current

Assignment

#### RS485/422

Terminating resistors

Connection

Bit distortion

Bit delay

Control of data direction/

Shield connection

Status indicator

Max. bit rate

Transmission channels

Transmission distance

#### General data

Supply voltage

Power consumption

Operation temperature

Storage temperature

Approvals

#### Insulation coordinates

Standards

EMC standards

Rated voltage

Impulse withstand voltage

Pollution severity

Overvoltage category

Clearance & creepage path

Isolation voltage Input, output

SUB-D9 (pin)/

DTE/DCE switchable via DIP-Switch

pull down/ pull up via DIP-switch

BLZ screw connection

< 1.5%

<= 3µs

selfcontrolling or via RS232 RTS/CTS/

KLBÜ 4-6/Z1

LED green: supply voltage, TxD, RxD

115.2 kBit/s

half duplex (RS485-2 wire)

full duplex (RS485-4 wire and RS422)

max. 1200m twisted pair

24 Vdc +/- 25 %

approx. 1.5 W

0 °C...+55 °C (horiz. mounting)

-20 °C...+85 °C

CE / ESD / cURus

EN 50178

EN 61000-6-2, EN 61000-6-4, EN 55011

between adjacent electric circuits: 300 V

between electric circuits and PE: 150 V

4 kV

2

III

between adjacent electric circuits: 3mm

between electric circuits and PE: 1.5mm

2 kVdc / 1 min.

#### Dimensions

Clamping range (rating- / min. / max.)

mm<sup>2</sup>

Length x width x height

mm

#### Information

#### Screw connection

2.50 / 0.50 / 2.50

92.4 x 22.5 x 112.4

Tu=23°C, single module

### Ordering data

#### Type of connection

Screw connection

#### Type

WDS2 RS232/RS485/422

#### Qty.

1

#### Order No.

8615700000

#### Information

### Accessories

#### Information

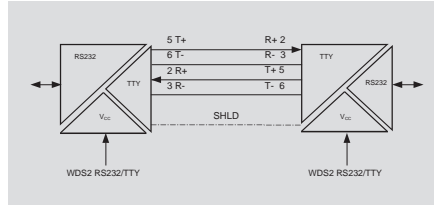
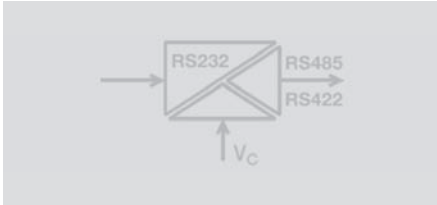
Voltage supply 24V and 0V with ZQV 2.5N/2  
cross-connection

# Serial interface converter

## RS232/TTY

- 3-way isolation
- RS232 connection via SUB-D 9
- RS485/422, TTY shield connection via KLBÜ
- DTE or DCE assignment selectable
- Bidirectional communication

## RS232/TTY



### Technical data

#### RS232

Connection/Input current  
Assignment

#### TTY

Connection  
Bit distortion  
Bit delay  
Burden  
Shield connection/  
Status indicator  
Max. bit rate  
Transmission channels  
Transmission distance

#### General data

Supply voltage  
Power consumption  
Operation temperature  
Storage temperature  
Approvals

#### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Pollution severity  
Overvoltage category  
Clearance & creepage path  
Isolation voltage Input, output

SUB-D9 (pin)/

DTE/DCE switchable via DIP-Switch

BLZ screw terminal

< 1.5%

<= 3 µs

<= 500 Ω

KLBÜ 4-6 Z/1/

LED green: supply voltage, TxD, RxD

19.2 kBit/s

full duplex

max. 1000m twisted pair

24 Vdc +/- 25 %

approx. 0.8 W

0 °C...+55 °C (horiz. mounting)

-20 °C...+85 °C

CE / ESD / cURus

EN 50178

EN 61000-6-2, EN 61000-6-4, EN 55011

between adjacent electric circuits: 300 V

between electric circuits and PE: 150 V

4 kV

2

III

between adjacent electric circuits: 3mm

between electric circuits and PE: 1.5mm

2 kVdc / 1 min.

#### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

#### Information

#### Screw connection

2.50 / 0.50 / 2.50  
92.4 x 22.5 x 112.4

Tu=23°C, single module

### Ordering data

#### Type of connection

Screw connection

#### Type

WDS2 RS232/TTY

#### Qty.

1

#### Order No.

8615690000

#### Information

### Accessories

#### Information

Voltage supply 24V and 0V with ZQV 2.5N/2  
cross-connection



# AD-/DA-Converter

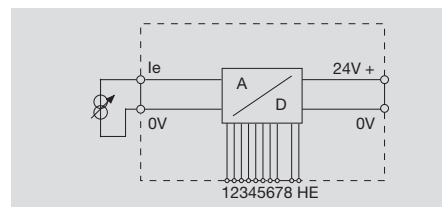
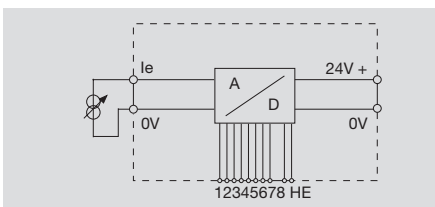
## AD-Converter 8-Bit

### RS I-D8 0...20mA

### RS I-D8 4...20mA



Terminal PIN								Digital volue	Analog voltage
MSB				LSB					
E8	E7	E6	E5	E4	E3	E2	E1		
0	0	0	0	0	0	0	0	0	0 V
0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0		
-	-	-	-	-	-	-	-		
1	1	1	1	1	1	0	1		
1	1	1	1	1	1	1	0		
1	1	1	1	1	1	1	1		+10 V



### Technical data

Input	
Input voltage/Input current	/0...20 mA
Max. voltage/Max. current	3.5 V/25 mA
Input resistance voltage/Current	/>= 51 Ω
Resolution	78 μA = 1 LSB
Output	
Number of outputs	8Bit (1 Bit sign)
Output level	17 V = H, 0 V = L
Signs	
Output current	<= 25 mA (as source)
Accuracy	+/- 1 LSB
Cut-off freq. (-3dB)	5 kHz at full scale (sinus)
Conversion time	<= 4 μs
General data	
Supply voltage	24 Vdc +/- 20 %
Current consumption	35 mA (plus output current)
Operation temperature	0 °C...+50 °C
Storage temperature	-40 °C...+80 °C
Approvals	CE / ESD
Insulation coordinates	
EMC standards	EMVG, EN 50081-1, EN 50082-2

Input voltage/Input current	/4...20 mA
Max. voltage/Max. current	3.5 V/25 mA
Input resistance voltage/Current	/>= 51 Ω
Resolution	62.5 μA = 1 LSB
Number of outputs	8Bit (1 Bit sign)
Output level	17 V = H, 0 V = L
Signs	
Output current	<= 25 mA (as source)
Accuracy	+/- 1 LSB
Cut-off freq. (-3dB)	5 kHz at full scale (sinus)
Conversion time	<= 4 μs
Supply voltage	24 Vdc +/- 20 %
Current consumption	35 mA (plus output current)
Operation temperature	0 °C...+50 °C
Storage temperature	-40 °C...+80 °C
Approvals	CE
EMC standards	EMVG, EN 50081-1, EN 50082-2

Input voltage/Input current	/4...20 mA
Max. voltage/Max. current	3.5 V/25 mA
Input resistance voltage/Current	/>= 51 Ω
Resolution	62.5 μA = 1 LSB
Number of outputs	8Bit (1 Bit sign)
Output level	17 V = H, 0 V = L
Signs	
Output current	<= 25 mA (as source)
Accuracy	+/- 1 LSB
Cut-off freq. (-3dB)	5 kHz at full scale (sinus)
Conversion time	<= 4 μs
Supply voltage	24 Vdc +/- 20 %
Current consumption	35 mA (plus output current)
Operation temperature	0 °C...+50 °C
Storage temperature	-40 °C...+80 °C
Approvals	CE
EMC standards	EMVG, EN 50081-1, EN 50082-2

Dimensions	
Clamping range (rating- / min. / max.)	mm²
Length x width x height	mm

Screw connection	
	4 / 0.50 / 4
	70.0 x 35.0 x 72.0

Screw connection	
	4 / 0.50 / 4
	70.0 x 35.0 x 72.0

### Ordering data

Type of connection	
Screw connection	

Type	Qty.	Order No.
RS I-D8 0...20MA	1	1160561001

Type	Qty.	Order No.
RS I-D8 4...20MA	1	1168561001

Information

Information

Information

### Accessories

Information

Information

Information

# AD-/DA-Converter

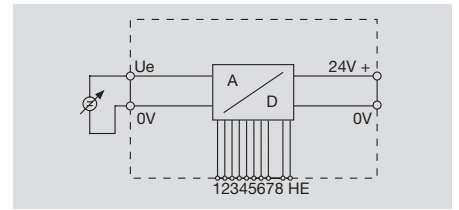
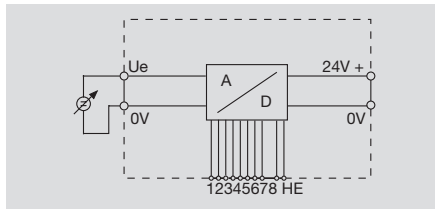
## AD-Converter 8-Bit

### RS U-D8 +/-10V

### RS U-D8 0...10V



Terminal PIN								Digital value	Analog current
MSB				LSB					
E8	E7	E6	E5	E4	E3	E2	E1		
0	0	0	0	0	0	0	0	0	0 V
0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0		
0	0	0	0	0	0	0	0		
-	-	-	-	-	-	-	-		
1	1	1	1	1	1	0	1		
1	1	1	1	1	1	1	0		+10 V



### Technical data

Input	
Input voltage/Input current	-10...+10 V/ /<= 55 µA
Max. voltage/Max. current	>= 200 kΩ/ 78 mV = 1 LSB
Input resistance voltage/Current	
Resolution	
Output	
Number of outputs	8Bit (1 Bit sign)
Output level	17 V = H, 0 V = L
Signs	MSB: H = positive; L = negative
Output current	<= 25 mA (as source)
Accuracy	+/- 1 LSB
Cut-off freq. (-3dB)	5 kHz at full scale (sinus)
Conversion time	<= 4 µs
General data	
Supply voltage	24 Vdc +/- 20 %
Current consumption	35 mA (plus output current)
Operation temperature	0 °C...+50 °C
Storage temperature	-40 °C...+80 °C
Approvals	CE / ESD
Insulation coordinates	
EMC standards	EMVG, EN 50081-1, EN 50082-2

Input voltage/Input current	-10...+10 V/ /<= 55 µA
Max. voltage/Max. current	>= 200 kΩ/ 78 mV = 1 LSB
Input resistance voltage/Current	
Resolution	
Output	
Number of outputs	8Bit (1 Bit sign)
Output level	17 V = H, 0 V = L
Signs	MSB: H = positive; L = negative
Output current	<= 25 mA (as source)
Accuracy	+/- 1 LSB
Cut-off freq. (-3dB)	5 kHz at full scale (sinus)
Conversion time	<= 4 µs
General data	
Supply voltage	24 Vdc +/- 20 %
Current consumption	35 mA (plus output current)
Operation temperature	0 °C...+50 °C
Storage temperature	-40 °C...+80 °C
Approvals	CE / ESD
Insulation coordinates	
EMC standards	EMVG, EN 50081-1, EN 50082-2

Input voltage/Input current	0...10 V/ /<= 25 µA
Max. voltage/Max. current	>= 400 kΩ/ 39 mV = 1 LSB
Input resistance voltage/Current	
Resolution	
Output	
Number of outputs	8Bit (1 Bit sign)
Output level	17 V = H, 0 V = L
Signs	
Output current	<= 25 mA (as source)
Accuracy	+/- 1 LSB
Cut-off freq. (-3dB)	5 kHz at full scale (sinus)
Conversion time	<= 4 µs
General data	
Supply voltage	24 Vdc +/- 20 %
Current consumption	35 mA (plus output current)
Operation temperature	0 °C...+50 °C
Storage temperature	-40 °C...+80 °C
Approvals	CE
Insulation coordinates	
EMC standards	EMVG, EN 50081-1, EN 50082-2

Dimensions	
Clamping range (rating- / min. / max.)	mm <sup>2</sup>
Length x width x height	mm

Screw connection	
	4 / 0.50 / 4
	70.0 x 35.0 x 72.0

Screw connection	
	4 / 0.50 / 4
	70.0 x 35.0 x 72.0

Information	

### Ordering data

Type of connection	
Screw connection	

Type	Qty.	Order No.
RS U-D8 +/-10V	1	1122361001

Type	Qty.	Order No.
RS U-D8 0...10V	1	1160361001

Information	

### Accessories

Information	

Information	

Information	

Information	

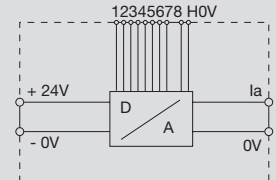
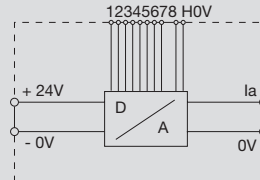
Information	

# AD-/DA-Converter

## DA-Converter 8-Bit

### RS D8-I 0...20mA

### RS D8-I 4...20mA



### Technical data

#### Input

Input/Output  
Max. voltage  
Max. current  
Input voltage/Input current  
Signs  
Resolution

#### Output

Output voltage/Output current  
Offset current/Offset voltage  
Load resistance voltage/Current  
Accuracy  
Conversion time

#### General data

Supply voltage  
Current consumption  
Operation temperature  
Storage temperature  
Approvals

#### Insulation coordinates

EMC standards

8 Bit / Analogue  
max. 30 V

5...24 V/

78 µA = 1 LSB

/0...20 mA (as source)

max. 0.08 mA/

/< = 600 Ω

+/- 1 LSB

<= 30 µs

24 Vdc +/- 20 %

25 mA (plus output current)

0 °C...+50 °C

-40 °C...+80 °C

CE / ESD

EMVG, EN 50081-1, EN 50082-2

8 Bit / Analogue  
max. 30 V

5...24 V/

62.5 µA = 1 LSB

/4...20 mA (as source)

4 mA/

/< = 600 Ω

+/- 1 LSB

<= 30 µs

24 Vdc +/- 20 %

25 mA (plus output current)

0 °C...+50 °C

-40 °C...+80 °C

CE

EMVG, EN 50081-1, EN 50082-2

#### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

#### Information

#### Screw connection

4 / 0.50 / 4  
70.0 x 35.0 x 72.0

#### Screw connection

4 / 0.50 / 4  
70.0 x 35.0 x 72.0

### Ordering data

Type of connection	
Screw connection	

Type	Qty.	Order No.
RS D8-I 0...20MA	1	1165861001

Type	Qty.	Order No.
RS D8-I 4...20MA	1	1169261001

#### Information

### Accessories

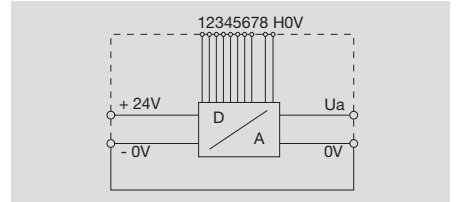
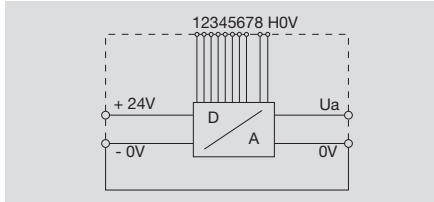
#### Information

# AD-/DA-Converter

## DA-Converter 8-Bit

### RS D8-U +/-10V

### RS D8-U 0...10V



### Technical data

#### Input

Input/Output  
Max. voltage  
Max. current  
Input voltage/Input current  
Signs  
Resolution

8 Bit / Analogue  
max. 30 V  
2.5 mA  
5...24 V/  
MSB: H = positive; L = negative  
78 mV = 1 LSB

8 Bit / Analogue  
max. 30 V  
2.5 mA  
5...24 V/

#### Output

Output voltage/Output current  
Offset current/Offset voltage  
Load resistance voltage/Current  
Accuracy  
Conversion time

-10...+10 V/<= 10 mA max. current  
/<= 20 mV  
>= 1 kΩ/< = 600 Ω  
+/- 1 LSB  
<= 30 μs

39 mV = 1 LSB

0...10 V/<= 10 mA max. current  
/<= 20 mV  
>= 1 kΩ/< = 600 Ω  
+/- 1 LSB  
<= 30 μs

#### General data

Supply voltage  
Current consumption  
Operation temperature  
Storage temperature  
Approvals

24 Vdc +/- 20 %  
25 mA (plus output current)  
0 °C...+50 °C  
-40 °C...+80 °C  
CE

24 Vdc +/- 20 %  
25 mA (plus output current)  
0 °C...+50 °C  
-40 °C...+80 °C  
CE / ESD

#### Insulation coordinates

EMC standards

EMVG, EN 50081-1, EN 50082-2

EMVG, EN 50081-1, EN 50082-2

#### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

#### Screw connection

4 / 0.50 / 4  
70.0 x 35.0 x 72.0

#### Screw connection

4 / 0.50 / 4  
70.0 x 35.0 x 72.0

#### Information

### Ordering data

Type of connection	
Screw connection	

Type	Qty.	Order No.
RS D8-U +/-10V	1	1123361001

Type	Qty.	Order No.
RS D8-U 0...10V	1	1160761001

#### Information

### Accessories

#### Information

# AD-/DA-Converter

## AD-Converter 12-Bit

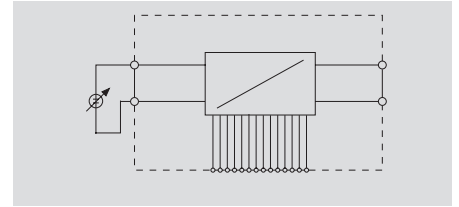
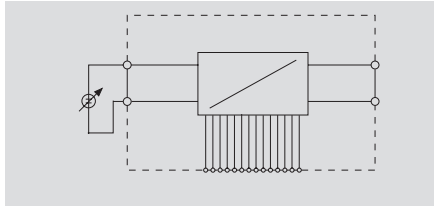
### RS I-D12 0...20mA

### RS I-D12 4...20mA



Terminal PIN											
MSB						LSB					
12	11	10	9	8	7	6	5	4	3	2	1
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	1
1	1	1	1	1	1	1	1	1	1	1	0
1	1	1	1	1	1	1	1	1	1	1	1
1	1	1	1	1	1	1	1	1	1	1	1

Digital volue  
Analog current  
4 mA  
20 mA



### Technical data

#### Input

Input voltage/Input current  
Max. voltage/Max. current  
Input resistance voltage/Current  
Resolution

/0...20 mA  
/30 mA  
/500 Ω  
4.9 μA = 1 LSB

/4...20 mA  
/30 mA  
/500 Ω  
4 μA = 1 LSB

#### Output

Number of outputs  
Output level  
Signs  
Output current  
Accuracy  
Conversion time

12Bit  
24 V = H, 0 V = L  
≤ 25 mA (as source)  
± 1 LSB  
≤ 50 μs

12Bit  
24 V = H, 0 V = L  
≤ 25 mA (as source)  
± 1 LSB  
≤ 50 μs

#### General data

Supply voltage  
Current consumption  
Operation temperature  
Storage temperature  
Approvals

24 Vdc ± 20 %  
0 °C...+50 °C  
-40 °C...+80 °C  
CE / ESD

24 Vdc ± 20 %  
0 °C...+50 °C  
-40 °C...+80 °C  
CE / ESD

#### Insulation coordinates

EMC standards

EMVG, EN 50081-1, EN 50082-2

EMVG, EN 50081-1, EN 50082-2

#### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

#### Screw connection

4 / 0.50 / 4  
70.0 x 90.0 x 47.4

#### Screw connection

4 / 0.50 / 4  
70.0 x 90.0 x 47.4

#### Information

### Ordering data

Type of connection
Screw connection

Type	Qty.	Order No.
RS I-D12 0...20MA	1	1168461001

Type	Qty.	Order No.
RS I-D12 4...20MA	1	1169161001

#### Information

### Accessories

#### Information

# AD-/DA-Converter

## AD-Converter 12-Bit

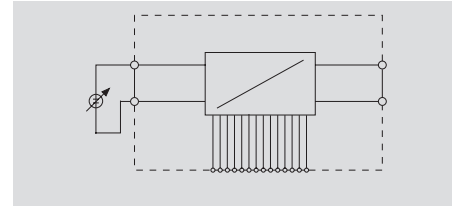
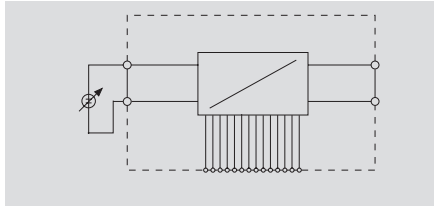
### RS U-D12 +/-10V

### RS U-D12 0...10V



Terminal PIN											
MSB						LSB					
12	11	10	9	8	7	6	5	4	3	2	1
0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	1
0	0	0	0	0	0	0	0	0	0	0	1
1	1	1	1	1	1	1	1	1	1	1	0
1	1	1	1	1	1	1	1	1	1	1	0
1	1	1	1	1	1	1	1	1	1	1	1

Digital volue  
Analog current  
4 mA  
20 mA



### Technical data

#### Input

Input voltage/Input current  
Max. voltage/Max. current  
Input resistance voltage/Current  
Resolution

-10...+10 V/  
+/- 15 V/  
100 kΩ/  
4.88 mV = 1 LSB

0...10 V/  
15 V/  
100 kΩ/  
2.44 mV = 1 LSB

#### Output

Number of outputs  
Output level  
Signs  
Output current  
Accuracy  
Conversion time

12Bit  
24 V = H, 0 V = L  
MSB: H = positive; L = negative  
<= 25 mA (as source)  
+/- 1 LSB  
<= 50 μs

12Bit  
24 V = H, 0 V = L  
<= 25 mA (as source)  
+/- 1 LSB  
<= 50 μs

#### General data

Supply voltage  
Current consumption  
Operation temperature  
Storage temperature  
Approvals

24 Vdc +/- 20 %  
0 °C...+50 °C  
-40 °C...+80 °C  
CE / ESD

24 Vdc +/- 20 %  
0 °C...+50 °C  
-40 °C...+80 °C  
CE / ESD

#### Insulation coordinates

EMC standards

EMVG, EN 50081-1, EN 50082-2

EMVG, EN 50081-1, EN 50082-2

#### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

#### Screw connection

4 / 0.50 / 4  
70.0 x 90.0 x 47.4

#### Screw connection

4 / 0.50 / 4  
70.0 x 90.0 x 47.4

#### Information

### Ordering data

Type of connection
Screw connection

Type	Qty.	Order No.
RS U-D12 +/-10V	1	1168261001

Type	Qty.	Order No.
RS U-D12 0...10V	1	1168361001

#### Information

### Accessories

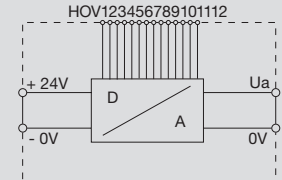
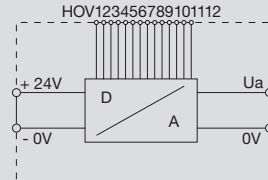
#### Information

# AD-/DA-Converter

## DA-Converter 12-Bit

### RS D12-I 0...20mA

### RS D12-I 4...20mA



### Technical data

#### Input

Input/Output  
Max. voltage  
Max. current  
Input voltage/Input current  
Signs  
Resolution

#### Output

Output voltage/Output current  
Offset current/Offset voltage  
Load resistance voltage/Current  
Accuracy  
Conversion time

#### General data

Supply voltage  
Current consumption  
Operation temperature  
Storage temperature  
Approvals

#### Insulation coordinates

EMC standards

12 Bit / analogue

24 Vdc +/- 20 %/4.2 mA

4.9  $\mu$ A = 1 LSB

/0...20 mA (as source)

/< = 600  $\Omega$

+/- 1 LSB

<= 4  $\mu$ s

24 Vdc +/- 20 %

60 mA

0  $^{\circ}$ C...+50  $^{\circ}$ C

-40  $^{\circ}$ C...+80  $^{\circ}$ C

CE / ESD

EMVG, EN 50081-1, EN 50082-2

12 Bit / analogue

24 Vdc +/- 20 %/4.2 mA

4  $\mu$ A = 1 LSB

/4...20 mA (as source)

/< = 600  $\Omega$

+/- 1 LSB

<= 4  $\mu$ s

24 Vdc +/- 20 %

60 mA

0  $^{\circ}$ C...+50  $^{\circ}$ C

-40  $^{\circ}$ C...+80  $^{\circ}$ C

CE / ESD

EMVG, EN 50081-1, EN 50082-2

#### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

#### Information

#### Screw connection

4 / 0.50 / 4  
70.0 x 90.0 x 47.4

#### Screw connection

4 / 0.50 / 4  
70.0 x 90.0 x 47.4

### Ordering data

Type of connection	
Screw connection	

Type	Qty.	Order No.
RS D12-I 0...20MA	1	1166061001

Type	Qty.	Order No.
RS D12-I 4...20MA	1	1165961001

#### Information

### Accessories

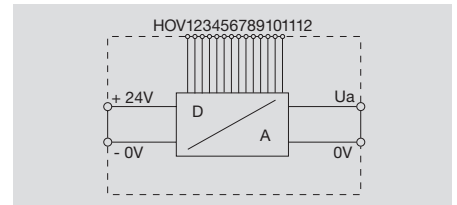
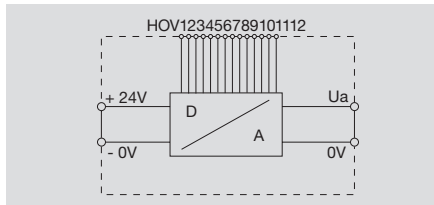
#### Information

# AD-/DA-Converter

## DA-Converter 12-Bit

### RS D12-U +/-10V

### RS D12-U 0...10V



### Technical data

#### Input

Input/Output  
Max. voltage  
Max. current  
Input voltage/Input current  
Signs  
Resolution

12 Bit / analogue  
  
24 Vdc +/- 20 %/4.2 mA  
MSB: H = positive; L = negative  
4.88 mV = 1 LSB

12 Bit / analogue  
  
24 Vdc +/- 20 %/4.2 mA  
  
2.44 mV = 1 LSB

#### Output

Output voltage/Output current  
Offset current/Offset voltage  
Load resistance voltage/Current  
Accuracy  
Conversion time

-10...+10 V/<= 10 mA  
/  
>= 1 kΩ/< = 600 Ω  
+/- 1 LSB  
<= 4 μs

0...10 V/<= 10 mA  
/  
>= 1 kΩ/< = 600 Ω  
+/- 1 LSB  
<= 4 μs

#### General data

Supply voltage  
Current consumption  
Operation temperature  
Storage temperature  
Approvals

24 Vdc +/- 20 %  
40 mA  
0 °C...+50 °C  
-40 °C...+80 °C  
CE / ESD

24 Vdc +/- 20 %  
40 mA  
0 °C...+50 °C  
-40 °C...+80 °C  
CE / ESD

#### Insulation coordinates

EMC standards

EMVG, EN 50081-1, EN 50082-2

EMVG, EN 50081-1, EN 50082-2

#### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

#### Screw connection

4 / 0.50 / 4  
70.0 x 90.0 x 47.4

#### Screw connection

4 / 0.50 / 4  
70.0 x 90.0 x 47.4

#### Information

### Ordering data

#### Type of connection

Screw connection

Type	Qty.	Order No.
RS D12-U +/-10V	1	1160861001

Type	Qty.	Order No.
RS D12-U 0...10V	1	1166161001

#### Information

### Accessories

#### Information

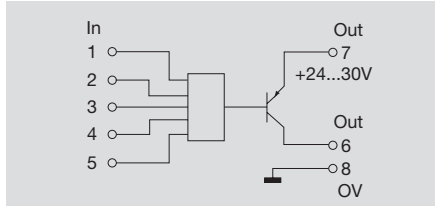
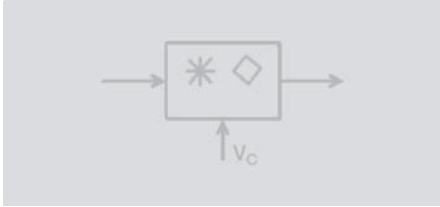
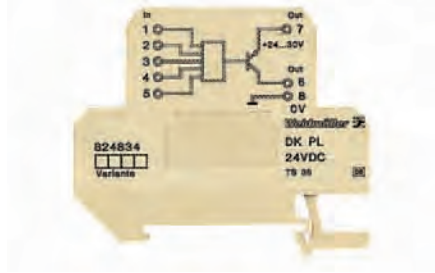


# Preprocessing logic

## Preprocessing logic

- Logic function and time function can be combined
- Individually programmable (further functions on request)

## DKPL



### Technical data

#### Input

Rated input level/  
Input current  
Max. voltage  
Pulse duration/

24 Vdc = high, 0 V = low/  
approx. 1.5 mA each input (24V)  
30 Vdc  
> 1 ms/

#### Output

Output level/  
Output current/  
Switching thresholds/

PNP,  $U_b - 1$  V/  
max. 20 mA/  
high > 18 V, low < 7 V/

#### General data

Supply voltage  
Current consumption  
Operation temperature  
Storage temperature  
Approvals

24 Vdc +/- 20 %  
< 10 mA  
0 °C...+50 °C  
-40 °C...+60 °C  
CE / ESD

#### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

#### Screw connection

4 / 0.50 / 4  
65.0 x 6.0 x 57.0

#### Information

### Ordering data

#### Type of connection

Screw connection

#### Type

DKPL 35 24VDC

#### Qty.

5

#### Order No.

8248340000

#### Information

not programmed - functions see following page

### Accessories

#### Information

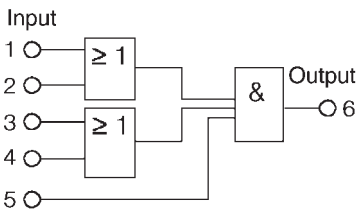
**Remarks:**

The module is programmed specifically to customer requirements. Up to 5 inputs can be linked with various logic and time functions, e.g. AND, OR, EXOR, NAND, NOR, EXNOR, delay links, etc.  
The output is either low- or high-active.

**824834 0001 DKPL**

A = (E1 OR E2) AND (E3 OR E4) AND E5

Status	Input	Output
	5 4 3 2 1	6
1	0 0 0 0 0	0
2	0 0 0 0 1	0
3	0 0 0 1 0	0
4	0 0 0 1 1	0
5	0 0 1 0 0	0
6	0 0 1 0 1	0
7	0 0 1 1 0	0
8	0 0 1 1 1	0
9	0 1 0 0 0	0
10	0 1 0 0 1	0
11	0 1 0 1 0	0
12	0 1 0 1 1	0
13	0 1 1 0 0	0
14	0 1 1 0 1	0
15	0 1 1 1 0	0
16	0 1 1 1 1	0
17	1 0 0 0 0	0
18	1 0 0 0 1	0
19	1 0 0 1 0	0
20	1 0 0 1 1	0
21	1 0 1 0 0	0
22	1 0 1 0 1	1
23	1 0 1 1 0	1
24	1 0 1 1 1	1
25	1 1 0 0 0	0
26	1 1 0 0 1	1
27	1 1 0 1 0	1
28	1 1 0 1 1	1
29	1 1 1 0 0	0
30	1 1 1 0 1	1
31	1 1 1 1 0	1
32	1 1 1 1 1	1

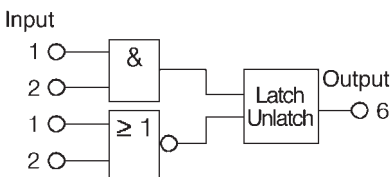


**824834 0002 DKPL**

Inputs 1 and 2 have the function of an RS FLIP-FLOP  
Inputs 3, 4 and 5 have no function

Input	Output
2 1	6
0 0	0 (is saved)
0 1	no change to the saved status
1 0	no change to the saved status
1 1	1 (is saved)

Inputs 3, 4 and 5 with-out function

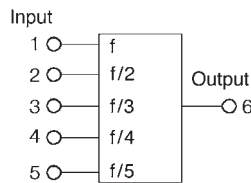


**824834 0003 DKPL Frequency divider**

Inputs 1 - 5 determine the division factor  
Input 1 = division factor 1:  $F_{OUT} = F_{IN} \cdot 1$   
Input 2 = division factor 2:  $F_{OUT} = F_{IN} \cdot 2$   
Input 5 = division factor 5:  $F_{OUT} = F_{IN} \cdot 5$ ;  $F_{IN} \text{ max.} = 12 \text{ kHz}$

Input	Output
	6
1	$f_{out} = f_{in}$
2	$f_{out} = f_{in} / 2$
3	$f_{out} = f_{in} / 3$
4	$f_{out} = f_{in} / 4$
5	$f_{out} = f_{in} / 5$

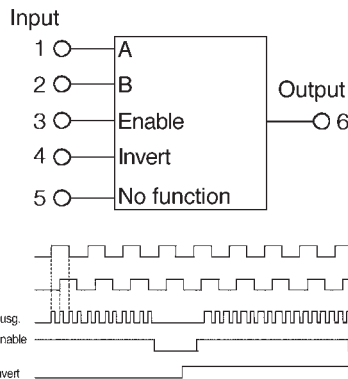
Remarks: a new division factor can only be used after the operating voltage has been switched off.  $f_{in} \text{ max.} = 12 \text{ kHz}$



**824834 0004 DKPL**

Input 1: signal A from an incremental transducer  
Input 2: signal B90 offset  
Input 3: enable high active  
Input 4: output signal inverted high active  
Input 5: no function  
Output: the output is set for 20 - 30  $\mu$ s at every edge of signal A or B  
(i.e.:  $F_{OUT} = 4 \times F_{IN}$ )  
 $F_{IN} \text{ max.} = 1 \text{ kHz}$

Connection	Description
1	A Signal A 90° leading $F_{max} = 1 \text{ kHz}$
2	B Signal B 90° trailing $F_{max} = 1 \text{ kHz}$
3	enable enable output
4	invert invert output signal
5	no function
6	$f_{out} = 4 \times f_{A/B} \text{ (max. } 4 \text{ kHz)}$



**824834 0005 DKPL**

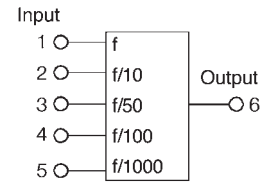
Input pulse length between 80 and 100 ms  
Output pulse length 100 ms, only 2 pulses  
Pulse/pause ratio 1:1.  
The positive edge of the input signal must be evaluated.  
Only input E1 is used.

**824834 0006 DKPL**

Input 1:  $F_{OUT} = F_{IN}$   
Input 2:  $F_{OUT} = F_{IN} \cdot 10$

Input	Output
	6
1	$f_{out} = f_{in}$
2	$f_{out} = f_{in} / 10$
3	$f_{out} = f_{in} / 50$
4	$f_{out} = f_{in} / 100$
5	$f_{out} = f_{in} / 1000$

Remarks: a new division factor can only be used after the operating voltage has been switched off.  $f_{in} \text{ max.} = 3 \text{ kHz}$



**824834 0007 DKPL**

Input	Output
1 2 3 4 5	Out
L L X X X	no function
H L X X X	$f = 1 \text{ Hz}$
L H X X X	$f = 10 \text{ Hz}$
H H X X X	$f = 1 \text{ Hz}$

L -> 0 V or connection open  
H -> +24 ...30 Vdc  
X -> no influence on the output function, L or H

**824834 0008 DKPL**

Input	Output
1 2	
H H	H
L H	L

**824834 0010 DKPL**

RS FLIP-FLOP with superimposed S-input (connection 2)  
Inputs connections 3, 4 and 5 must be at 0V or remain open!

Connection1 logic	Connection2 logic	Connection6 logic		
R-input	S-input	Output		
0 V or open	L	0 V or open	L	previous status is saved
+24 Vdc	H	0 V or open	L	0 V
0 V or open	L	+24 Vdc	H	+24 Vdc
+24 Vdc	H	+24 Vdc	H	+24 Vdc

**824834 0501 DKPL**

The component allows for division of the input frequency at connection 1 (0 .. max. 50 kHz) with 2 fixed division factors. Depending on connection 2, the output frequency is issued at the output connection 6.  
Connections 3, 4 and 5 have no function

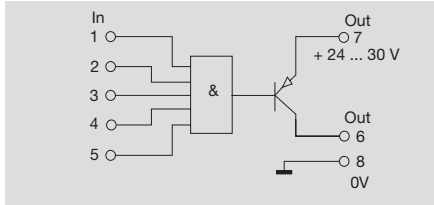
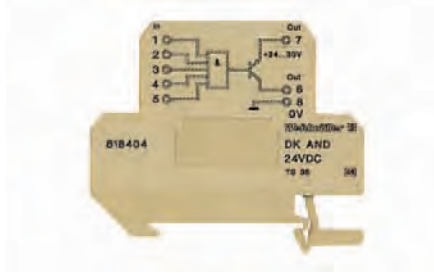
Connection2 logic	Factor	Input frequency	Output frequency	
	Connection 1	Connection 2		
0 V or open	L	75	0...30 kHz	0...400 Hz
24 Vdc	H	27	0...10.8 kHz	0...400 Hz

# Preprocessing logic

## Preprocessing logic

- Logic functions
- Compact design
- PLC load reduction

## AND



### Technical data

#### Input

Rated input level/  
Input current  
Max. voltage  
Pulse duration/

24 Vdc = high, 0 V = low/  
approx. 1.5 mA each input (24V)  
30 Vdc  
> 50 µs/

#### Output

Output level/  
Output current/  
Switching thresholds/

PNP,  $U_b - 1.8$  V/  
max. 20 mA/  
high < 15 V, low < 9 V/

#### General data

Supply voltage  
Current consumption  
Operation temperature  
Storage temperature  
Approvals

24...30 Vdc  
< 5 mA  
0 °C...+50 °C  
-40 °C...+60 °C  
CE / ESD

#### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

#### Screw connection

4 / 0.50 / 4  
65.0 x 6.0 x 57.0

#### Information

### Ordering data

#### Type of connection

Screw connection

#### Type

DK AND 35 24VDC

#### Qty.

5

#### Order No.

8184040000

#### Information

### Accessories

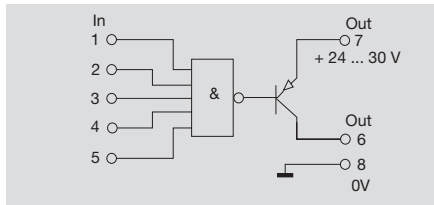
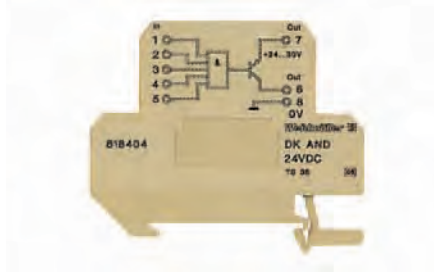
#### Information

# Preprocessing logic

## Preprocessing logic

- Logic functions
- Compact design
- PLC load reduction

## NAND



## Technical data

### Input

Rated input level/  
Input current  
Max. voltage  
Pulse duration/

24 Vdc = high, 0 V = low/  
approx. 1.5 mA each input (24V)  
30 Vdc  
> 50 µs/

### Output

Output level/  
Output current/  
Switching thresholds/

PNP,  $U_b - 1.8$  V/  
max. 20 mA/  
high < 15 V, low < 9 V/

### General data

Supply voltage  
Current consumption  
Operation temperature  
Storage temperature  
Approvals

24...30 Vdc  
< 5 mA  
0 °C...+50 °C  
-40 °C...+60 °C  
CE / ESD

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Screw connection

4 / 0.50 / 4  
65.0 x 6.0 x 57.0

### Information

## Ordering data

### Type of connection

Screw connection

### Type

DK NAND 35 24VDC

### Qty.

5

### Order No.

8248320000

### Information

## Accessories

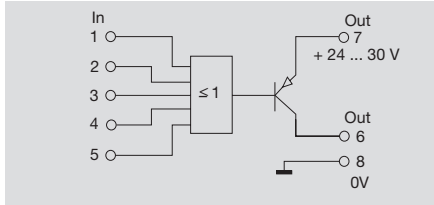
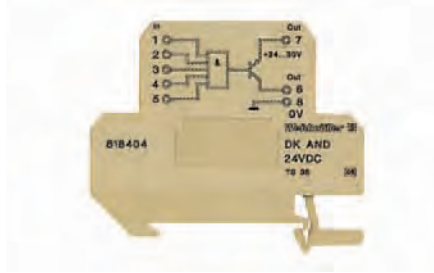
### Information

# Preprocessing logic

## Preprocessing logic

- Logic functions
- Compact design
- PLC load reduction

## OR



## Technical data

### Input

Rated input level/  
Input current  
Max. voltage  
Pulse duration/

24 Vdc = high, 0 V = low/  
approx. 1.5 mA each input (24V)  
30 Vdc  
> 50 µs/

### Output

Output level/  
Output current/  
Switching thresholds/

PNP,  $U_b - 1.8$  V/  
max. 20 mA/  
high < 15 V, low < 9 V/

### General data

Supply voltage  
Current consumption  
Operation temperature  
Storage temperature  
Approvals

24...30 Vdc  
< 5 mA  
0 °C...+50 °C  
-40 °C...+60 °C  
CE / ESD

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Screw connection

4 / 0.50 / 4  
65.0 x 6.0 x 57.0

### Information

## Ordering data

### Type of connection

Screw connection

### Type

DK OR 35 24VDC

### Qty.

5

### Order No.

8218440000

### Information

## Accessories

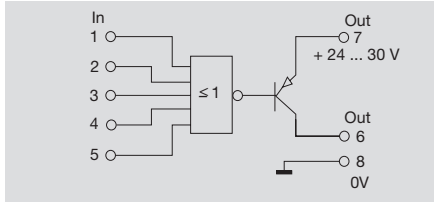
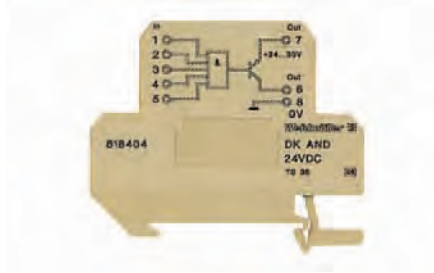
### Information

# Preprocessing logic

## Preprocessing logic

- Logic functions
- Compact design
- PLC load reduction

## NOR



## Technical data

### Input

Rated input level/  
Input current  
Max. voltage  
Pulse duration/

24 Vdc = high, 0 V = low/  
approx. 1.5 mA each input (24V)  
30 Vdc  
> 50 µs/

### Output

Output level/  
Output current/  
Switching thresholds/

PNP,  $U_b$ -1.8 V/  
max. 20 mA/  
high <15 V, low < 9 V/

### General data

Supply voltage  
Current consumption  
Operation temperature  
Storage temperature  
Approvals

24...30 Vdc  
< 5 mA  
0 °C...+50 °C  
-40 °C...+60 °C  
CE / ESD

### Dimensions

Clamping range (rating- / min. / max.)      mm<sup>2</sup>  
Length x width x height                              mm

### Screw connection

4 / 0.50 / 4  
65.0 x 6.0 x 57.0

### Information

## Ordering data

### Type of connection

Screw connection

Type	Qty.	Order No.
DK NOR 35 24VDC	5	8248330000

### Information

## Accessories

### Information

## Monitoring modules

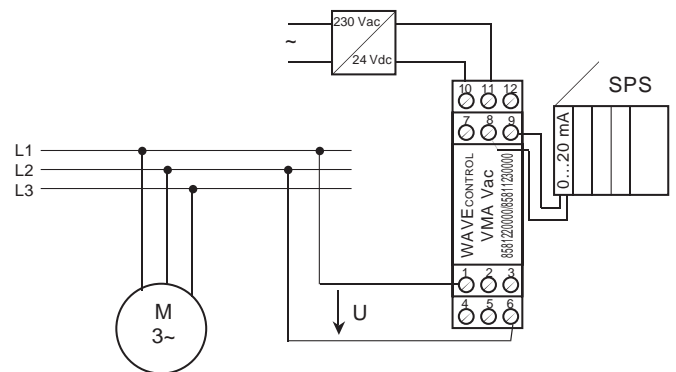
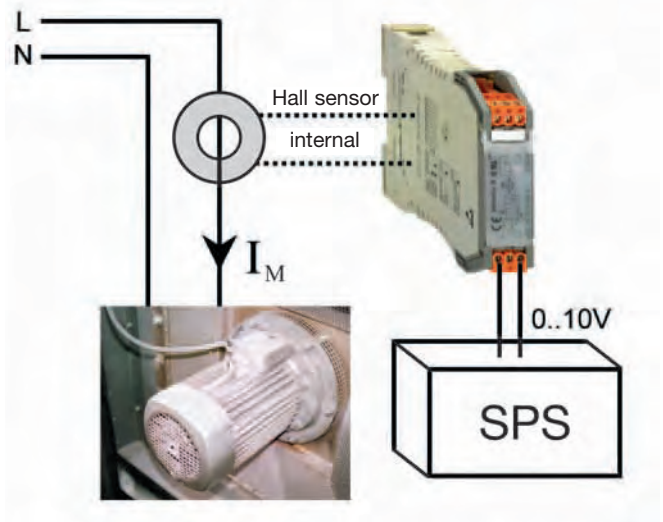
### Current and voltage monitoring

The monitoring of current and voltage allows constant control of individual systems or installation parts. Deviations or interruptions occurring in the electric circuits can be evaluated as operation interruptions. Specific measures can be taken to remedy the problem.

Products for monitoring current convert sinus or non-sinus ac and dc current up to 60 A into analogue standard signals. The measuring procedures are based on two principles. On the one hand, ac current up to 10 A and 50/60 Hz are measured using the **transforming method**. The module is looped directly into the measuring circuit. From 10 A ac/dc, the **Hall sensor** is used.

The conductor is pushed through the module free of potential and allows current measurements up to 60 A ac/dc. Often there are high-frequency signal parts on the line being measured. To take account of the signal parts, so-called **TRMS converters (true root mean square)** are connected up in series. They allow measurements up to 2 kHz regardless of the curve shape. Available outputs are standard signals 0..20 mA, 4..20 mA, 4 ..20 mA current loop feed, 0..10 V or a switch output.

Modules for voltage monitoring measure the mains voltage up to max. 450 V ac. The unit provides isolated qualitative information in the form of a standard signal (0..20 mA, 4..20 mA, 0..10 V). Extreme loads or load relief on the power supply can cause short-term voltage fluctuations with a negative influence on the process. The WAVECONTROL module VMA transmits the relevant information to the control so that suitable process safety measures can be taken.



# Current monitoring

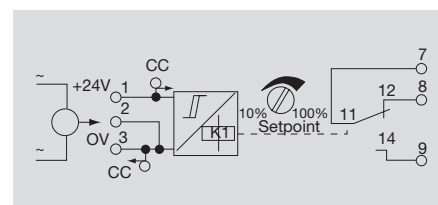
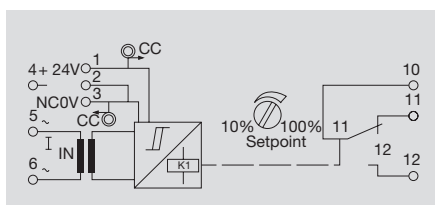
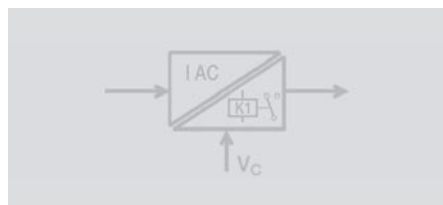
## Relay output

- Current range adjustable via DIP-switch
- Switchable hysteresis
- Operating current or closed current principle

### 1/5/10A ac



### 20/40/60A ac



## Technical data

Input	1/5/10A ac	20/40/60A ac
Input current	0...1 Aac/ 0...5 Aac/ 0...10 Aac	0...20 Aac/ 0...40 Aac/ 0...60 Aac
Input frequency	50...60 Hz	50...60 Hz
Max. current	100 A for 1s	dependent on conductor cross-section
Max. voltage	250 Vac	400 Vac, > 400V ac depends on wire insulation
Sensor	Transforming (internally)	hall sensor (internal)
Diameter of bushing		8 mm
Output		
Switching thresholds	10...100 % by front poten.	10...100 % by front poten.
Hysteresis	5 % or 10 % of threshold value	5 % or 10 % of threshold value
Switching voltage max./Switching voltage min.	60 Vdc/ 250 Vac/6 Vdc/ac	60 Vdc/ 250 Vac/6 Vdc/ac
Switching current max./Switching current min.	7 A/100 mA	7 A/100 mA
Step response time	typ. 700 ms	typ. 700 ms
Temperature coefficient	<= 800 ppm/K	<= 250 ppm/K
Status indicator	LED green	LED green
General data		
Supply voltage	24 Vdc +/- 10 %	24 Vdc +/- 10 %
Current consumption	8.3 mA (Relay not triggered)/ 24 mA (Relay triggered)	23 mA (Relay not triggered)/ 47 mA (Relay triggered)
Current-carrying cap. of cross-connect.	<= 2 A	<= 2 A
Operation temperature	0 °C...+50 °C	0 °C...+50 °C
Storage temperature	-20 °C...+70 °C	-20 °C...+70 °C
Default settings	0...5A / 10% Hysteresis / current principle	0...40A / 10% Hysteresis / current principle
Approvals	CE / ESD / cURus	CE / ESD / cURus
Contact arrangement	1 changeover contact	1 changeover contact
Insulation coordinates		
Rated voltage	300 V	300 V
Impulse withstand voltage	4 kV	4 kV
Pollution severity	2	2
Overtoltage category	III	III
Clearance & creepage path	>= 3 mm	>= 3 mm
Isolation voltage Input, output	4 kVeff / 5s	4 kVeff / 5s
Dimensions		
Clamping range (rating- / min. / max.)	mm <sup>2</sup>	
Length x width x height	mm	
Information		
	Tu=23°C, single module	Tu=23°C, single module
Ordering data		
Type of connection		
	Screw connection	
	Tension clamp c.	
Information		
	Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection	Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection
Accessories		
Information		

## Dimensions

Clamping range (rating- / min. / max.)	mm <sup>2</sup>
Length x width x height	mm

## Information

## Screw connection

2.50 / 0.50 / 2.50	1.50 / 0.50 / 2.50
92.4 x 22.5 x 112.4	92.4 x 22.5 x 112.4

Tu=23°C, single module

## Tension clamp c.

## Screw connection

2.50 / 0.50 / 2.50	1.50 / 0.50 / 2.50
92.4 x 22.5 x 112.4	92.4 x 22.5 x 112.4

Tu=23°C, single module

## Tension clamp c.

## Ordering data

Type of connection	Type	Qty.	Order No.
Screw connection	WAS2 CMR 1/5/10A ac	1	8516560000
Tension clamp c.	WAZ2 CMR 1/5/10A ac	1	8516570000
Information			
	Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection		
Information			
	Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection		

## Accessories

### Information



# Current monitoring

## Analogue output

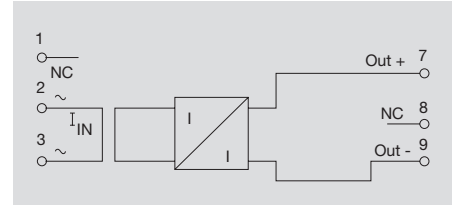
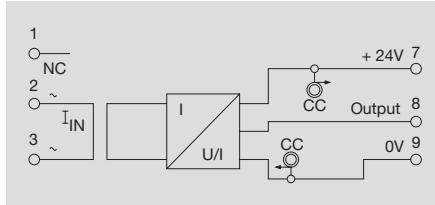
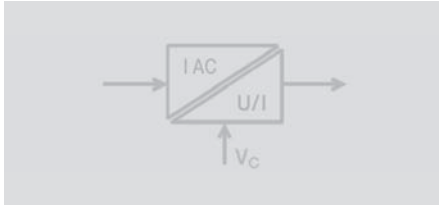
- Input and output adjustable via DIP-switch
- Calibration not necessary

## 1/5/10A ac



## 1/5/10A ac 4...20mA

### Current loop



## Technical data

Input	1/5/10A ac	1/5/10A ac 4...20mA
Input current	0...1 Aac/ 0...5 Aac/ 0...10 Aac	0...1 Aac/ 0...5 Aac/ 0...10 Aac
Input frequency	50...60 Hz	50...60 Hz
Max. current	100 A for 1s	100 A for 1s
Voltage of measuring circuit	250 Vac	250 Vac
Sensor	Transforming (internally)	Transforming (internally)
Diameter of bushing		
Output		
Output current/Output voltage	0(4)...20 mA/0...10 V	4...20 mA (current loop)/
Offset current	max. 100 µA	max. 100 µA
Output signal limit	approx. 13 V resp. 24 mA	approx. 24 mA
Load resistance voltage/Current	>= 1 kΩ / < = 600 Ω	/ < = 600 Ω
Step response time	typ. 700 ms	typ. 700 ms
Accuracy	0.5% FSR	0.5% FSR
Temperature coefficient	<= 200 ppm/K	<= 200 ppm/K
Status indicator	LED ON: OK; FLASHING: signal out of range; OFF: Error	LED ON: OK; FLASHING: signal out of range; OFF: Error
General data		
Supply voltage	24 Vdc +/- 10%	13...30 Vdc
Current consumption	40 mA at Iout=20 mA	
Current-carrying cap. of cross-connect.	<= 2 A	
Operation temperature/Storage temperature	0 °C...+50 °C/-20 °C...+70 °C	0 °C...+50 °C/-20 °C...+70 °C
Default settings	0...5Aac, 4...20mA	0...5Aac, 4...20mA
Approvals	CE / ESD / cURus	CE / ESD / cURus
Insulation coordinates		
Rated voltage	300 V	300 V
Impulse withstand voltage	6 kV	6 kV
Pollution severity	2	2
Overvoltage category	III	III
Clearance & creepage path	>= 5.5 mm	>= 5.5 mm
Isolation voltage Input, output	4 kVeff / 5s	4 kVeff / 5s

Dimensions	Screw connection		Tension clamp c.	
Clamping range (rating- / min. / max.)	2.50 / 0.50 / 2.50	2.50 / 0.50 / 2.50	2.50 / 0.50 / 2.50	2.50 / 0.50 / 2.50
Length x width x height	72.0 x 22.5 x 92.4	72.0 x 22.5 x 92.4	72.0 x 22.5 x 92.4	72.0 x 22.5 x 92.4
Information	Tu=23°C, single module		Tu=23°C, single module	

## Ordering data

Type of connection	Type	Qty.	Order No.
Screw connection Tension clamp c.	WAS1 CMA 1/5/10A ac	1	852340000
	WAZ1 CMA 1/5/10A ac	1	852341000
Screw connection Tension clamp c.	WAS1 CMA LP 1/5/10A ac	1	852865000
	WAZ1 CMA LP 1/5/10A ac	1	852866000

## Accessories

Information
Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

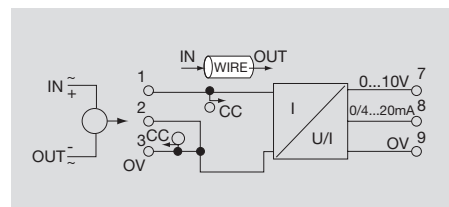
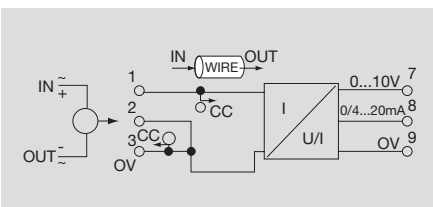
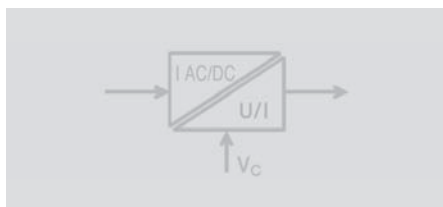
# Current monitoring

## Analogue output

- Input and output adjustable via DIP-switch
- Calibration not necessary

### 5/10A ac/dc

### 20/25/30A ac/dc



## Technical data

Input	5/10A ac/dc	20/25/30A ac/dc
Input current	0...5 Aac/dc/ 0...10 Aac/dc	0...20 Aac/dc/0...25 Aac/dc / 0...30 Aac/dc
Input frequency	0...2 kHz (true RMS to DC converter)	0...2 kHz (true RMS to DC converter)
Max. current	dependent on conductor cross-section	dependent on conductor cross-section
Voltage of measuring circuit	400 Vac, >400V ac depends on conductor insulation	400 Vac, >400V ac depends on conductor insulation
Sensor	hall sensor (internal)	hall sensor (internal)
Diameter of bushing	8 mm	8 mm
Output		
Output current/Output voltage	0(4)...20 mA/0...10 V	0(4)...20 mA/0...10 V
Offset current	max. 150 µA	max. 150 µA
Output signal limit	approx. 13 V resp. 24 mA	approx. 13 V resp. 24 mA
Load resistance voltage/Current	>= 1 kΩ / <= 600 Ω	>= 1 kΩ / <= 600 Ω
Step response time	typ. 700 ms	typ. 700 ms
Accuracy	0.5% FSR	0.5% FSR
Temperature coefficient	<= 650 ppm/K	<= 650 ppm/K
Status indicator	LED ON: OK; FLASHING: signal out of range; OFF: Error	LED ON: OK; FLASHING: signal out of range; OFF: Error
General data		
Supply voltage	24 Vdc +/- 10 %	24 Vdc +/- 10 %
Current consumption	50 mA at Iout=20 mA	50 mA at Iout=20 mA
Current-carrying cap. of cross-connect.	<= 2 A	<= 2 A
Operation temperature/Storage temperature	0 °C...+50 °C/-20 °C...+70 °C	0 °C...+50 °C/-20 °C...+70 °C
Default settings	0...5A, 4...20mA	0...25A, 4...20mA
Approvals	CE / ESD / cURus	CE / ESD / cURus
Insulation coordinates		
Rated voltage	300 V	300 V
Impulse withstand voltage	6 kV	6 kV
Pollution severity	2	2
Oversoltage category	III	III
Clearance & creepage path	>= 5.5 mm	>= 5.5 mm
Isolation voltage Input, output	4 kVeff / 5s	4 kVeff / 5s

Dimensions	Screw connection	Tension clamp c.	Screw connection	Tension clamp c.
Clamping range (rating- / min. / max.)	2.50 / 0.50 / 2.50	1.50 / 0.50 / 2.50	2.50 / 0.50 / 2.50	1.50 / 0.50 / 2.50
Length x width x height	92.4 x 22.5 x 112.4	92.4 x 22.5 x 112.4	92.4 x 22.5 x 112.4	92.4 x 22.5 x 112.4
Information	Tu=23°C, single module		Tu=23°C, single module	

## Ordering data

Type of connection	Type	Qty.	Order No.
Screw connection Tension clamp c.	WAS2 CMA 5/10A uc	1	8526610000
	WAZ2 CMA 5/10A uc	1	8526620000
Screw connection Tension clamp c.	WAS2 CMA 20/25/30A uc	1	8545830000
	WAZ2 CMA 20/25/30A uc	1	8545840000

## Accessories

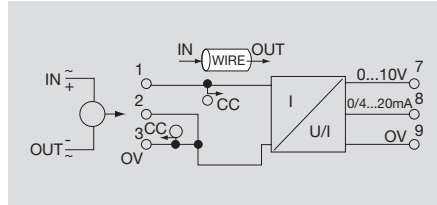
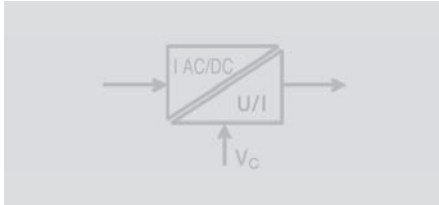
Information
Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

# Current monitoring

## Analogue output

- Input and output adjustable via DIP-switch
- Calibration not necessary

## 40/50/60A ac/dc



## Technical data

### Input

Input current  
Input frequency  
Max. current  
Voltage of measuring circuit  
Sensor  
Diameter of bushing

0...40 Aac/dc/ 0...50 Aac/dc/ 0...60 Aac/dc  
0...2 kHz (true RMS to DC converter)  
dependent on conductor cross-section  
400 Vac, >400V ac depends on conductor insulation  
hall sensor (internal)  
8 mm

### Output

Output current/Output voltage  
Offset current  
Output signal limit  
Load resistance voltage/Current  
Step response time  
Accuracy  
Temperature coefficient  
Status indicator

0(4)...20 mA/0...10 V  
max. 150  $\mu$ A  
approx. 13 V resp. 24 mA  
 $\geq 1 \text{ k}\Omega / < 600 \Omega$   
typ. 700 ms  
0.5% FSR  
 $\leq 650 \text{ ppm/K}$   
LED ON: OK; FLASHING: signal out of range; OFF: Error

### General data

Supply voltage  
Current consumption  
Current-carrying cap. of cross-connect.  
Operation temperature/Storage temperature  
Default settings  
Approvals

24 Vdc +/- 10 %  
50 mA at Iout=20 mA  
 $\leq 2 \text{ A}$   
0 °C...+50 °C/-20 °C...+70 °C  
0...50A, 4...20mA  
CE / ESD / cURus

### Insulation coordinates

Rated voltage  
Impulse withstand voltage  
Pollution severity  
Overvoltage category  
Clearance & creepage path  
Isolation voltage Input, output

300 V  
6 kV  
2  
III  
 $\geq 5.5 \text{ mm}$   
4 kVeff / 5s

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Screw connection

2.50 / 0.50 / 2.50  
92.4 x 22.5 x 112.4

### Tension clamp c.

1.50 / 0.50 / 2.50  
92.4 x 22.5 x 112.4

### Information

Tu=23°C, single module

## Ordering data

### Type of connection

Screw connection  
Tension clamp c.

### Type

WAS2 CMA 40/50/60A uc  
WAZ2 CMA 40/50/60A uc

### Qty.

1  
1

### Order No.

8513330000  
8526590000

### Information

## Accessories

### Information

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

# Current monitoring

## Analogue output

- Max. conductor diameter 35mm
- Can be added sideways
- Mounting on mounting-rail TS35

### CMA 100/5A



### CMA 250/5A



### CMA 500/5A



## Technical data

### Input

Input current  
Input frequency  
Max. current  
Voltage of measuring circuit  
Diameter of bushing

100 Aac  
Class 1: 50...60Hz / Class 1.5: 16...400Hz  
thermal current I<sub>th</sub> >3 kA  
600 V eff (unfinished conductor)  
35 mm

250 Aac  
Class 1: 50...60Hz / Class 1.5: 16...400Hz  
thermal current I<sub>th</sub> >3 kA  
600 V eff (unfinished conductor)  
35 mm

500 Aac  
Class 1: 50...60 Hz / Class 1.5: 16...400 Hz  
thermal current I<sub>th</sub> >3 kA  
600 V eff (unfinished conductor)  
35 mm

### Output

Output current  
Load resistance voltage/Current  
Accuracy

5 Aac  
/< = 600 Ω  
class 1 / 1.5; residual current factor < 5

5 Aac  
/< = 600 Ω  
class 1 / 1.5; residual current factor < 5

5 Aac  
/< = 600 Ω  
class 1 / 1.5; residual current factor < 5

### General data

Operation temperature/Storage temperature  
Approvals

-5 °C...+40 °C/-40 °C...+85 °C  
CE / cURus

-5 °C...+40 °C/-40 °C...+85 °C  
CE / cURus

-5 °C...+40 °C/-40 °C...+85 °C  
CE / cURus

### Insulation coordinates

Isolation voltage Input, output

4 kVeff / 1 min.

4 kVeff / 1 min.

4 kVeff / 1 min.

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Screw connection (secondary)

50.0 x 78.0 x 90.5

### Screw connection (secondary)

50.0 x 78.0 x 90.5

### Screw connection (secondary)

50.0 x 78.0 x 90.5

### Information

## Ordering data

### Type of connection

Screw connection (secondary)

Type	(Qty.=1)	Order No.
CMA 100/5A		8662140000

Type	(Qty.=1)	Order No.
CMA 250/5A		8664570000

Type	(Qty.=1)	Order No.
CMA 500/5A		8664580000

### Information

## Accessories

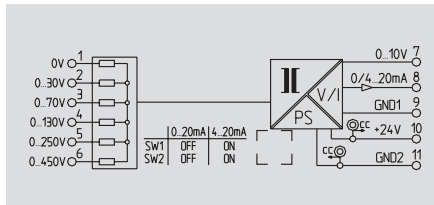
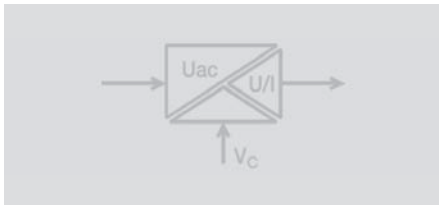
### Information

# Voltage monitoring

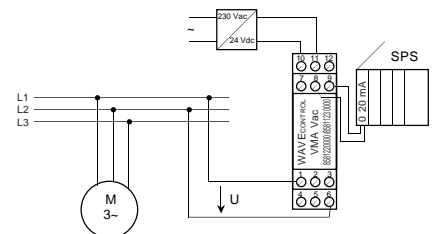
## Analogue output

- 3-way disconnection
- Max. measuring-voltage 450 V<sub>ac</sub>eff
- Output selectable via DIP-switch
- Calibration not necessary

## VMA Vac



## Application



## Technical data

### Input

Input voltage	0...30Vac/ 0...70Vac/ 0...130Vac/ 0...250Vac/ 0...450Vac
Input frequency	40...40 Hz sinus
Input voltage	0...30Vac/ 0...70Vac/ 0...130Vac/ 0...250Vac/ 0...450Vac
Max. voltage	45 Vac / 100 Vac / 180 Vac / 270 Vac / 475 Vac (short time)

### Output

Output voltage/Output current	0...10 V/0(4)...20 mA
Offset voltage/Offset current	max. 0.02 V/max. 40 µA
Load resistance voltage/Current	>= 1 kΩ / <= 600 Ω
Accuracy	1.3 % (40...60 Hz) typ. 1 % / 2 % (70...400 Hz) typ. 1.5 %
Temperature coefficient	<= 250 ppm/K
Step response time	300 ms
Status indicator	LED green

### General data

Supply voltage	24 Vdc +/- 25 %
Current consumption	40...30...24 mA at I <sub>out</sub> =20 mA
Current-carrying cap. of cross-connect.	<= 2 A
Default settings	0...10V/0...20mA
Operation temperature	0 °C...+50 °C
Storage temperature	-20 °C...+70 °C
Approvals	CE / ESD / cURus

### Insulation coordinates

Standards	EN 50178
EMC standards	EN 50081-1, EN 61000-2-6, EN 61326
Rated voltage	supply/output: 300 V; input/output, supply/output: 600 V
Impulse withstand voltage	supply/output: 4 kV; input/output, supply/output: 6kV
Isolation voltage Input, output/	4 kV <sub>eff</sub> / 5s/
Overtoltage category	III
Pollution severity	2
Clearance & creepage path	supply/output: 3mm; input/output, supply/output: 5.5mm

### Dimensions

Clamping range (rating- / min. / max.)	mm <sup>2</sup>
Length x width x height	mm

### Information

### Screw connection

2.50 / 0.50 / 2.50	1.50 / 0.50 / 2.50
92.4 x 22.5 x 112.4	92.4 x 22.5 x 112.4

### Tension clamp c.

T<sub>u</sub>=23°C, single module

## Ordering data

### Type of connection

Screw connection  
Tension clamp c.

Type	Qty.	Order No.
WAS2 VMA V ac	1	8581220000
WAZ2 VMA V ac	1	8581230000

### Information

## Accessories

### Information

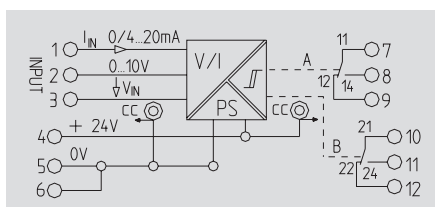
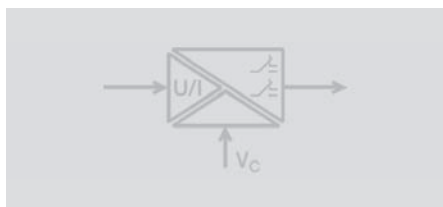
Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

# Threshold monitoring

## Relay output

- 3-way disconnection
- Low trip / high trip
- FAILSAFE / NON FAILSAFE
- 2 Relay outputs 250Vac/3A

## DC/Alarm



## Switch position/setting options

function	SW 1			
	1	2	3	4
Kanal A High Trip	■			
Kanal A Low Trip	□			
Kanal B High Trip		■		
Kanal B Low Trip		□		
FAILSAFE, Kanal 1 & 2		□	□	
NON FAILSAFE, Kanal 1 & 2		■	■	

■ = on  
□ = off

NON FAILSAFE: The relay picks up when the alarm is triggered

FAILSAFE: The relay drops out when the alarm is triggered. An alarm is also triggered in the FAILSAFE mode, if for example, the operating voltage to the module fails

Low Trip: Alarm is triggered if the signal is undershoot the threshold.

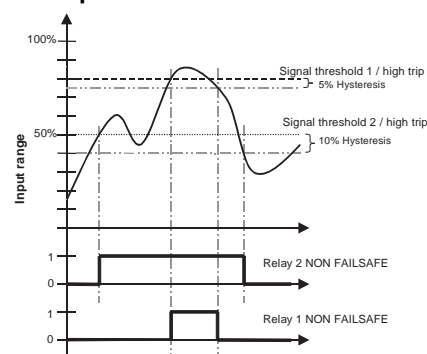
High Trip: Alarm is triggered if the signal is overshoot the threshold.

Signal threshold: Adjustments of the signal threshold (1...90%) are made for channel 1 with the potentiometer P1, and separately for channel 2 via potentiometer P2.

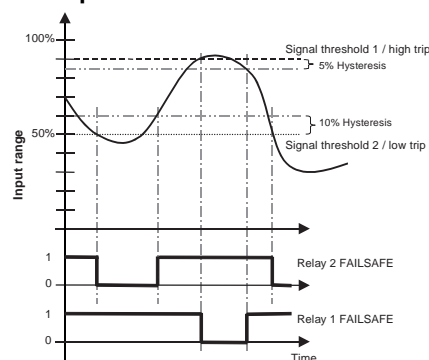
Hysteresis: Adjustments of the hysteresis (1...10%) are made for channel 1 with the potentiometer P3, and separately for channel 2 via potentiometer P3.

## WAVEANALOG DC/Alarm – Alarm indication

### Example 1



### Example 2



## Technical data

### Input

Input voltage  
Input current  
Input resistance voltage/Current

### Output

Contact arrangement  
Contact material  
Switching thresholds  
Hysteresis  
Switching voltage max./Switching voltage min.  
Continuous current  
Function  
Temperature coefficient  
Status indicator

### General data

Supply voltage  
Power consumption  
Current-carrying cap. of cross-connect.  
Operation temperature  
Storage temperature  
Default settings  
Approvals

### Insulation coordinates

Standards  
EMC standards  
Rated voltage  
Impulse withstand voltage  
Pollution severity  
Overvoltage category  
Clearance & creepage path  
Isolation voltage Input, output

0...10 V  
0(4)...20 mA  
>= 100 kΩ / <= 110 Ω

2 change-over contacts  
AgNi 90/10  
1...90 % (independently for channel 1 and channel 2)  
1...90 % (independently for channel 1 and channel 2)  
253 Vac/  
3 A  
failsafe / non failsafe  
<= 500 ppm/K  
LED green ON: OK, LED red ON: alarm (per channel)

24 Vdc +/- 25 %  
typ. 1 W both relays picked up  
<= 2 A  
0 °C...+55 °C (fitted)  
-20 °C...+85 °C  
channel A/B: low trip and FAILSAFE  
CE / ESD / cURus

EN 50178  
EN 61000-4-2, -3, -4, -5, -6  
300 V  
4 kV  
2  
III  
>= 3 mm  
1.2 kVeff / 5s

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Information

**Screw connection**      **Tension clamp c.**  
2.50 / 0.50 / 2.50      1.50 / 0.50 / 2.50  
92.4 x 17.5 x 112.4      92.4 x 17.5 x 112.4

Tu=23°C, single module

## Ordering data

### Type of connection

Screw connection  
Tension clamp c.

Type	Qty.	Order No.
WAS5 DC/Alarm	1	8543820000
WAZ5 DC/Alarm	1	8543880000

### Information

## Accessories

### Information

Voltage supply 24V and 0V with ZQV 2.5N/2 cross-connection

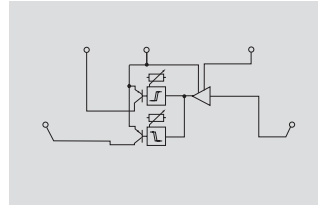
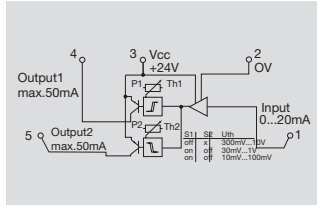
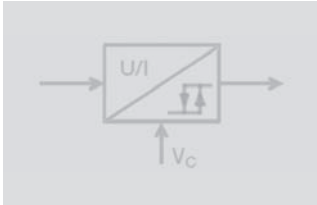
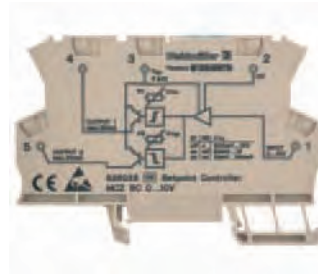
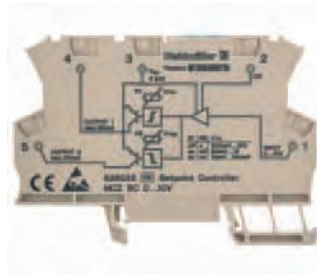
# Threshold monitoring

## Transistor output

- 2 digital outputs
- Monitoring of upper and lower level

### MCZ SC 0...10V

### MCZ SC 0...20mA



## Technical data

### Input

Input voltage/Input current  
Input resistance voltage/Current  
Voltage drop

### Output

Contact arrangement/  
Function  
Switching thresholds  
Hysteresis  
Switching current max.  
Step response time  
Cut-off freq. (-3dB)  
Temperature coefficient

### General data

Supply voltage  
Current consumption  
Operation temperature  
Storage temperature  
Approvals

0...10 V/  
60 kΩ/

double switch output PNP/  
U<sub>in</sub> < U<sub>th1</sub>: Output 1 active / U<sub>in</sub> > U<sub>th2</sub>: Output 2 active  
via 2 potentiometers (12 turns)  
1% of adjusted final value  
50 mA - per channel (voltage drop at output transistor: < 1.2 V at 50 mA)  
< 250 μs (switch threshold at 90% of the max. input signal; R<sub>I</sub> <= 1 kΩ)  
100 Hz  
250 ppm/K (max. 500 ppm/K)  
24 Vdc +/- 20 %  
15 mA  
0 °C...+50 °C  
-25 °C...+60 °C

/0.5...20 mA  
/50 Ω  
1 V

double switch output PNP/  
I<sub>in</sub> < I<sub>th1</sub>: Output 1 active / I<sub>in</sub> > I<sub>th2</sub>: Output 2 active  
via 2 potentiometers (12 turns)  
1% of final value  
50 mA - per channel (voltage drop at output transistor: < 1.2 V at 50 mA)  
< 250 μs (switch threshold at 90% of the max. input signal; R<sub>I</sub> <= 1 kΩ)  
100 Hz  
max. 250 ppm/K  
24 Vdc +/- 20 %  
15 mA  
0 °C...+50 °C  
-25 °C...+60 °C

### Dimensions

Clamping range (rating- / min. / max.) mm<sup>2</sup>  
Length x width x height mm

### Information

### Tension clamp c.

1.50 / 0.50 / 1.50  
91.0 x 6.0 x 63.2

### Tension clamp c.

1.50 / 0.50 / 1.50  
91.0 x 6.0 x 63.2

## Ordering data

### Type of connection

Tension clamp c.

Type	(Qty.=1)	Order No.
MCZ SC 0-10V		8260280000

Type	(Qty.=1)	Order No.
MCZ SC 0-20MA		8227350000

### Information

## Accessories

### Information

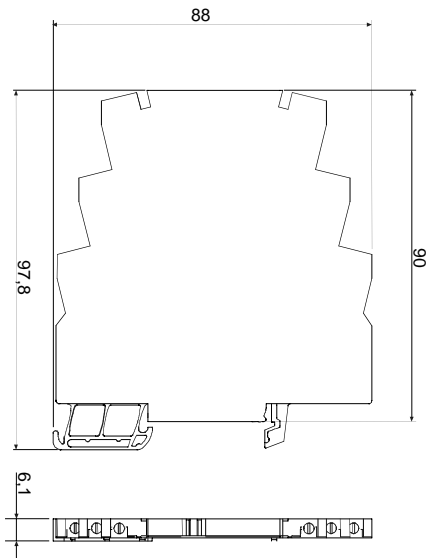
Voltage supply 24V and 0V with ZQV 4/x cross-connection

Voltage supply 24V and 0V with ZQV 4/x cross-connection

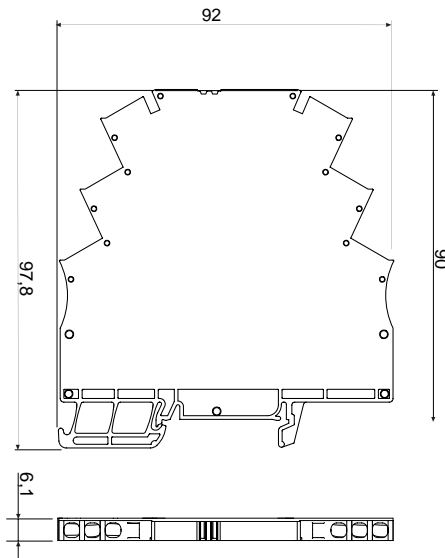
# Accessories

## MICROANALOG

### Srew connection



### Tension clamp connection

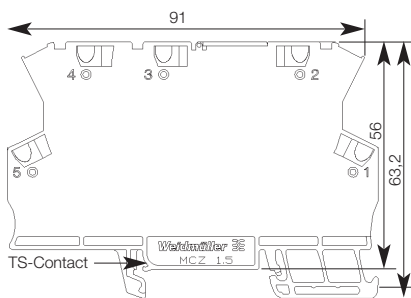


Accessories	
Cross connection, 2-poles, red	
Cross connection, 3-poles, red	
Cross connection, 4-poles, red	
Cross connection, 10-poles, red	
Cross connection, 41-poles, red	
Cross connection, 2-poles, blue	
Cross connection, 3-poles, blue	
Cross connection, 4-poles, blue	
Cross connection, 10-poles, blue	
Cross connection, 41-poles, blue	
Terminalmarker	

Type	Order no.	Qty
ZQV 4N/2 rt	1793950000	60
ZQV 4N/3 rt	1793980000	60
ZQV 4N/4 rt	1794010000	60
ZQV 4N/10 rt	1794040000	20
ZQV 4N/41 rt	1794070000	10
ZQV 4N/2 bl	1793960000	60
ZQV 4N/3 bl	1793990000	60
ZQV 4N/4 bl	1794020000	60
ZQV 4N/10 bl	1794050000	20
ZQV 4N/41 bl	1794080000	10
WS10/6	1060960000	200



## MCZ



Accessories	
Cross connection, 2-poles, yellow	
Cross connection, 3-poles, yellow	
Cross connection, 4-poles, yellow	
Cross connection, 5-poles, yellow	
Cross connection, 6-poles, yellow	
Cross connection, 7-poles, yellow	
Cross connection, 8-poles, yellow	
Cross connection, 9-poles, yellow	
Cross connection, 10-poles, yellow	
Terminalmarker	

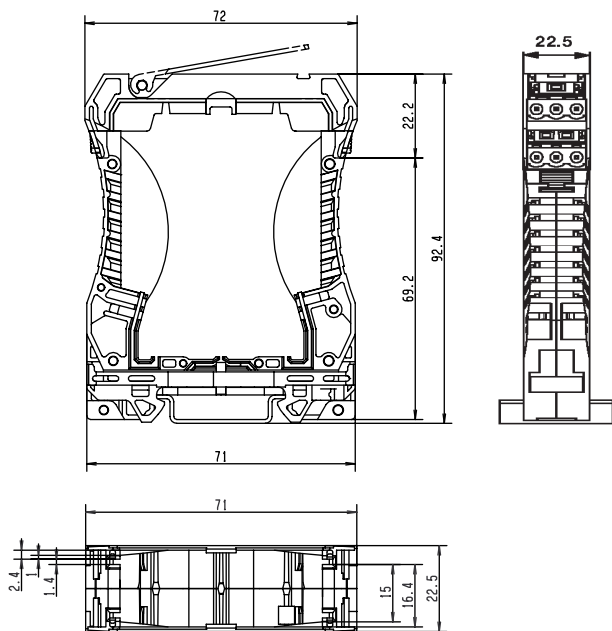
Type	Order no.	Qty
ZQV 4N/2 ge	1608950000	20
ZQV 4N/3 ge	1608960000	20
ZQV 4N/4 ge	1608970000	20
ZQV 4N/5 ge	1608980000	20
ZQV 4N/6 ge	1608990000	20
ZQV 4N/7 ge	1609000000	20
ZQV 4N/8 ge	1609010000	20
ZQV 4N/9 ge	1609020000	20
ZQV 4N/10 ge	1609030000	20
WS10/6	1060960000	200



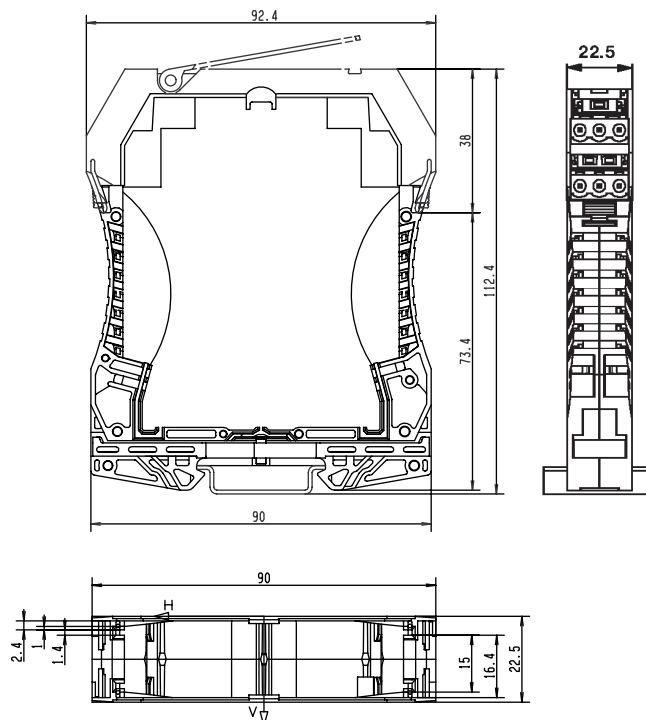


# Accessories

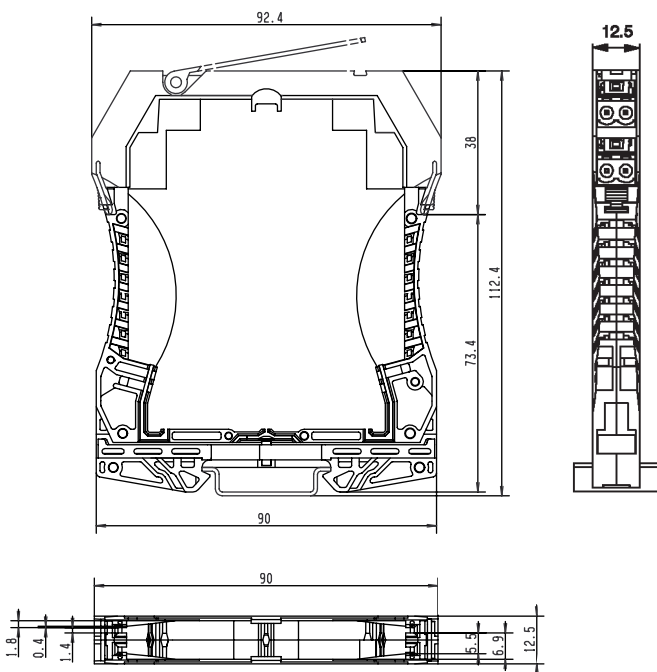
**WAVEBOX S 22,5**



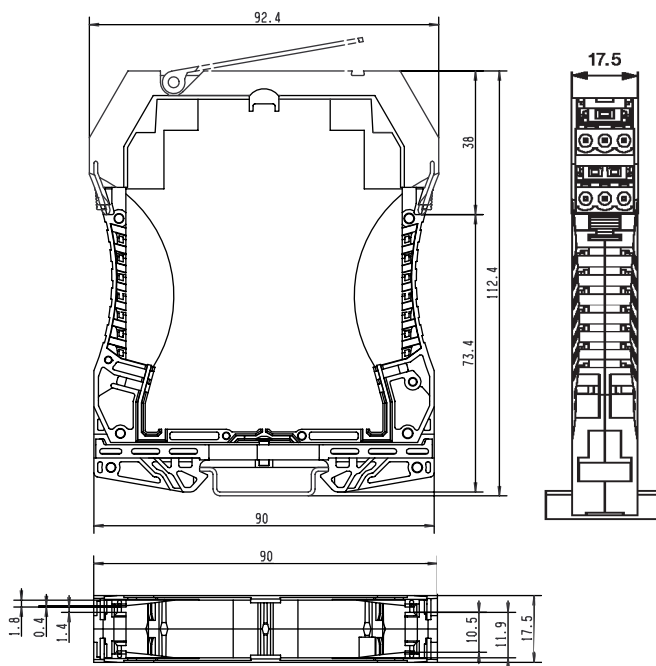
**WAVEBOX L 22,5**



**WAVEBOX 12,5**



**WAVEBOX 17,5**



Accessories	
Cross connection ZQV 2,5N/2 black	
Cross connection ZQV 2,5N/2 red	
Cross connection ZQV 2,5N/2 blue	
Cross connection ZQV 2,5N/2 yellow	
Terminalmarkers	
WS 10/5 Multicard	
WS 10/5 Neutral	

Type	Order no.	Qty
ZQV 2,5N/2 sw	1718080000	60
ZQV 2,5N/2 rt	1717900000	60
ZQV 2,5N/2 bl	1717990000	60
ZQV 2,5N/2 ge	1693800000	60
Terminalmarkers		
WS 10/5	1635010000	144
WS 10/5 Neutral	1060860000	200

