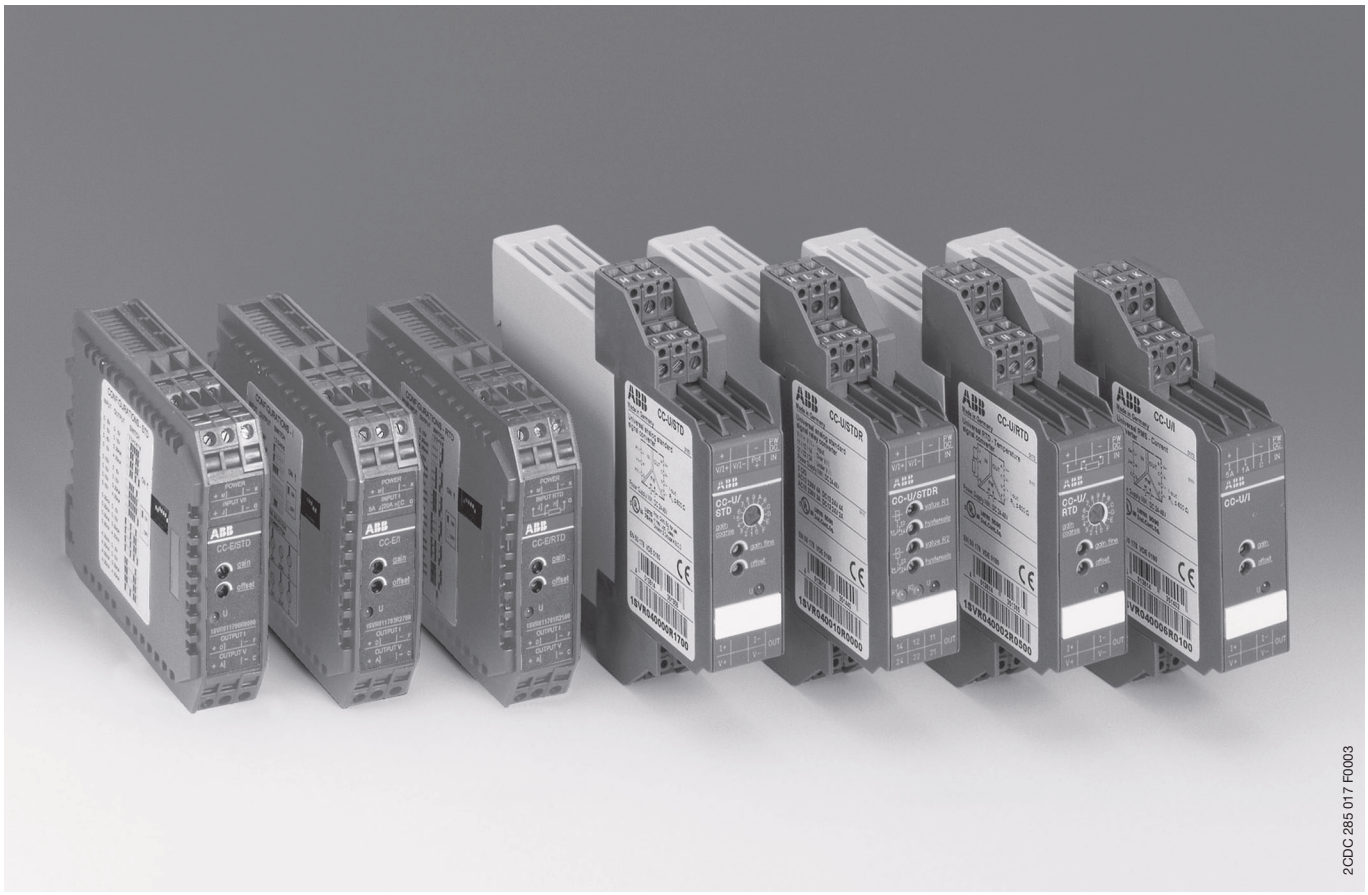
Analog signal converters
CC range

Content

Analog signal converters
CC range
Benefits and advantages



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CC-E product range for analog signal processing

- **Universally configurable devices and single-function devices**
- **Adjustment and operating elements on the front side**
- **Safe operation by electrical 3-way isolation**
- **Unambiguous and clear connecting terminal markings**

Conversion, measurement and separation of

- standard signals
  (0-5 V, 0-10 V, 0-20 mA, 4-20 mA)
- temperature signals of RTD sensors (PT 100)
- thermocouple signals (types J and K)
- current measurement signals
  (0-5 A, 0-20 A AC/DC)

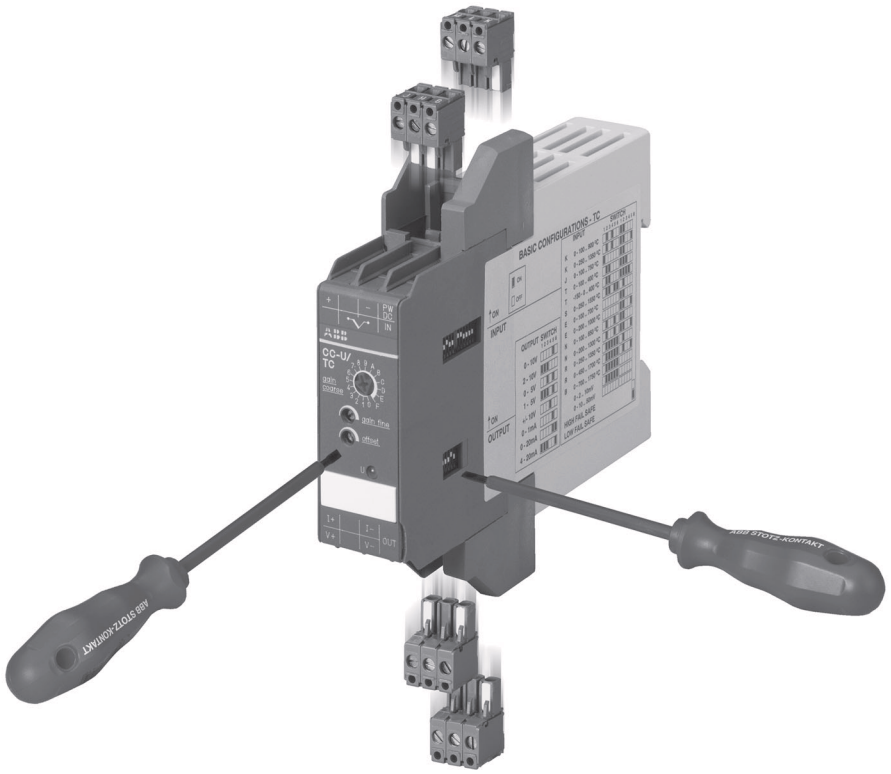
Characteristics of single-function devices

- No adjustment or balancing necessary.

Characteristics of universal devices

- The required input and output ranges can be configured by means of directly accessible DIP switches positioned on the side
- Gain adjustment of ± 5 % by means of an adjustment potentiometer on the front-side
- Offset adjustment of ±5 % by means of adjustment potentiometers on the front-side

Analog signal converters
CC range
Benefits and advantages



2CDC 283 016 F0003

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CC-U product range for analog signal processing

- **8 different standard signal outputs on one device**
- **Input and output side universally configurable**
- **Also available with 2 threshold relay outputs**
- **Adjustment and operating elements on the front side**
- **Safe operation by electrical 3-way isolation**
- **Plug-in connecting terminals, unambiguously and clearly marked**

Conversion, measurement and separation of

- standard signals
- signals of RTD sensors (PT10, PT100, PT1000)
- thermocouple signals
- RMS values of currents and voltages

Characteristics

- The required input and output ranges can be configured for all devices by means of directly accessible DIP switches positioned on the side.
- Due to the wide input range of the gain and offset stages all input signals between the minimum and the maximum input value can be universally converted to all common output signals.
- Devices for DC or AC (50/60 Hz) supply available.

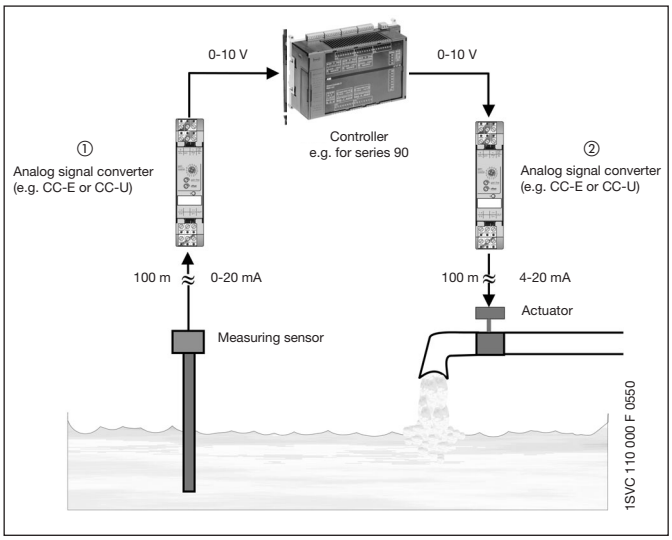
Analog signal converters
CC range
Application, Approvals and marks

Applications for analog signal processing and correct solution using CC-E and CC-U converters

Nearly every process includes a control system that receives data by means of analog signals and then evaluates the data and sets the respective parameters correspondingly.

When transmitting analog signals numerous problems may arise which can disturb or even block an ideal behavior of the process.

Below we have listed some processing problems together with the respective solutions to solve these problems:



Signal conversion

Sometimes the available signals cannot be processed by the controller or the actuator. In this case, signal converters are required to convert the input signal (or different input signals) to the desired output signal.

Signal amplification

If long lines or high burdens have to be operated, it may be necessary to amplify the signal. CC analog signal converters require only low input power and provide high output power.

Thus, there are no restrictions for the converter's position on the line, i.e. it can be used

- for signal refreshing ① at the end of the line (low input power)
- or for signal amplification ② at the beginning of the line (high output power).

Signal filtering

Particularly on long lines or in rough industrial environments the signals are exposed to high electromagnetic interferences. The frequency of the coupled interference signals may be in the range of the common mains frequency (50 Hz) or even much higher (in case of frequency converters). According to the specific requirements, analog signal converters are available which provide reliable suppression of those interferences by means of an input low-pass filter.

Signal separation

- **Protection against overvoltage**
  The increased use of micro-electronics make controls much more sensitive against overvoltages, resulting from lightning discharges or switching processes. Suppression diodes are incorporated in the input of the CC analog signal converters which enable the converters to arrest overvoltages with low energy level (resulting from switching processes) by themselves. The products furthermore provide electrical isolation between input, output and supply circuit for protection of the controller connected to the output.

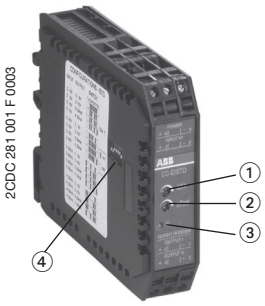
- **Protection against ground loops**
  If components are used which refer to ground, the measuring signals can be falsified by a so-called ground loop. In this case, certain parts of the signal are transmitted via earth and not via the analog transmission line, thus causing incorrect evaluation of the signal. The electrical isolation between the input and the output disconnects these ground loops and thus enables correct signal transmission.

■ all devices
▪ specific devices
□ pending

Approvals	CC-E/STD	CC-E I/I	CC-U/STD	CC-U/STDR	CC-E/RTD	CC-U/RTD	CC-U/RTDR	CC-E/TC	CC-U/TC	CC-U/TCR	CC-E/I	CC-E I_{AC} /ILPO	CC-U/I	CC-U/V			
c UL us LISTED UL 508	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
UL 1604 Class 1, Div. 2 (hazardous locations)	▪		■		▪	■		▪	■		▪		■	■			
	□	□	□	□	□	□	□	□	□	□	□	□	□	□			

Marks																	
CE	■	■	■	■	■	■	■	■	■	■	■	■	■	■			
C-Tick	■	■	■	■	■	■	■	■	■	■	■	■	■	■			

Analog standard signal converters
CC-E/STD, CC-E x/x
Ordering details



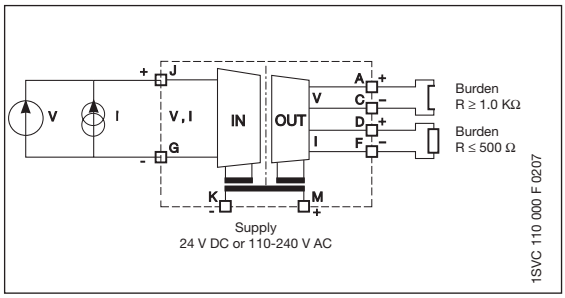
CC-E/STD

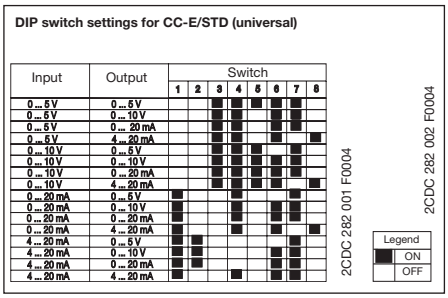
① Gain adjustment
② Offset adjustment
③ U: green LED - supply voltage
④ DIP switch for input and output configuration (only available on universal devices)

[1] UL 1604 Class I, Div.2 (universal devices)

CC-E/STD analog signal converter with 3-way electrical isolation

- Universally configurable device (type E-STD)
- 10 single-function devices
- "Plug and Play", no adjustment of single-function devices required





Type	Input signal	Output signal	Order code	Price 1 piece
Supply voltage: 24 V DC				
universal				
CC-E/STD	0-5 V, 0-10 V 0-20 mA, 4-20 mA	0-5 V, 0-10 V 0-20 mA, 4-20 mA	**1SVR 011 700 R0000**[1]	
single-function				
CC-E V/V **CC-E V/I** **CC-E V/I**	0-10 V	0-10 V 0-20 mA 4-20 mA	**1SVR 011 710 R2100** **1SVR 011 711 R1600** **1SVR 011 712 R1700**	
CC-E I/V **CC-E I/I** **CC-E I/I**	0-20 mA	0-10 V 0-20 mA 4-20 mA	**1SVR 011 713 R1000** **1SVR 011 714 R1100** **1SVR 011 715 R1200**	
CC-E I/V **CC-E I/I** **CC-E I/I**	4-20 mA	0-10 V 0-20 mA 4-20 mA	**1SVR 011 716 R1300** **1SVR 011 717 R1400** **1SVR 011 718 R2500**	
CC-E V/V	-10...+10 V	-10...+10 V	**1SVR 011 719 R2600**	
Supply voltage: 110-240 V AC				
universal				
CC-E/STD	0-5 V, 0-10 V 0-20 mA, 4-20 mA	0-5 V, 0-10 V 0-20 mA, 4-20 mA	**1SVR 011 705 R2100**	
single-function				
CC-E V/V **CC-E V/I** **CC-E V/I**	0-10 V	0-10 V 0-20 mA 4-20 mA	**1SVR 011 720 R2300** **1SVR 011 721 R1000** **1SVR 011 722 R1100**	
CC-E I/V **CC-E I/I** **CC-E I/I**	0-20 mA	0-10 V 0-20 mA 4-20 mA	**1SVR 011 723 R1200** **1SVR 011 724 R1300** **1SVR 011 725 R1400**	
CC-E I/V **CC-E I/I** **CC-E I/I**	4-20 mA	0-10 V 0-20 mA 4-20 mA	**1SVR 011 726 R1500** **1SVR 011 727 R1600** **1SVR 011 728 R2700**	
CC-E V/V	-10...+10 V	-10...+10 V	**1SVR 011 729 R2000**	

Pack. units: 1 piece

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NEW

Current / current isolator
CC-E I/I
Ordering details

CC-E I/I-1

CC-E I/I-2

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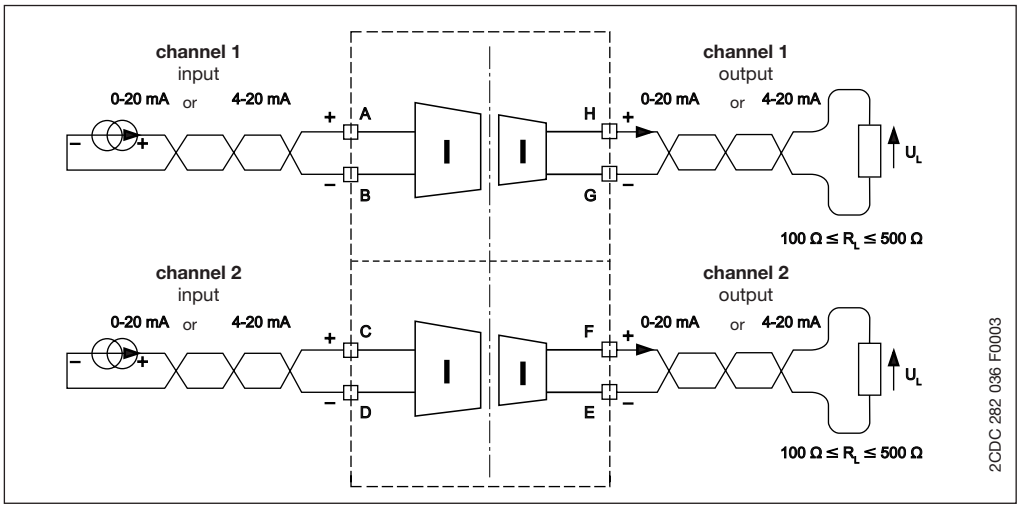
Loop-powered I/I isolator without external power supply for analog current signals of 0-20 mA and 4-20 mA

- Electrical isolation between input and output
- Very low internal voltage drop ≤ 2.5 V
- Available with one or two independent channels
- Width only 18 mm (1 and 2 channels)

Wiring instruction



Type	Number of channels	Order code	Price 1 piece
CC-E I/I-1	1 channel	1SVR 010 200 R1600	
CC-E I/I-2	2 channel	1SVR 010 201 R0300	

Packing unit: 1 piece

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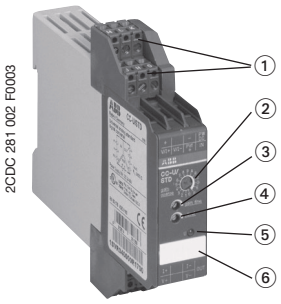
Analog standard signal converter CC-U/STD
Ordering details

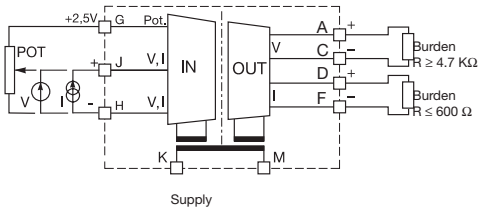


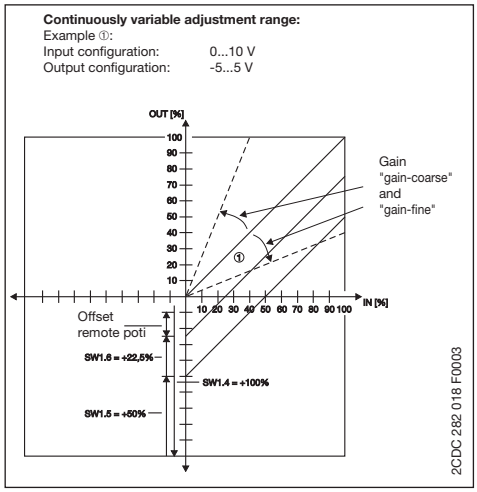
CC-U/STD

① Plug-in terminals
② Gain: Coarse adjustment
③ Gain: Fine adjustment
④ Offset adjustment
⑤ U: green LED - supply voltage
⑥ Marker

CC-U/STD universal signal converter with 3-way electrical isolation

- More than 120 configurations possible
- Configurable output signal response on input signal interruption (low fail safe / high fail safe)
- Adjustment and operating elements on the front
- Short-circuit proof signal outputs
- Plug-in connecting terminals for inputs, outputs and supply
- Very fast signal transmission enables use in control systems





DIP switch settings

Input	SW1 1	2	3	4	5	6	7	8	Gain	Coarse Type
Potentiometer		■							A...D	C
0...50 mV									A...D	C
0...100 mV									4...5	5
0...250 mV									0...1	1
0...500 mV		■							7...9	8
0...1 V		■							3...4	3
0...2,5 V		■							0	0
0...5 V			■						5...7	6
0...10 V			■						2	2
1...5 V			■		■	■			7...9	8
2...10 V			■		■	■			2...4	3
-10...+10 V			■	■		■			0	0
0...125 mV									3...4	3
0...8 V			■						3...4	3
-22,5...+22,5 mV				■		■			B...F	D
-11...+11 V			■	■		■			0	0
2,5...7,5 V			■			■			5...7	6
3,33...9,99 V			■			■			3...4	4
10...0 V			■	■					2	2
100...0 mV				■					4...5	5
0...1 mA	■								A...D	B
0...20 mA	■	■							2...4	3
4...20 mA	■	■			■	■			4...5	4
10...50 mA	■	■			■	■			0...1	1
20...4 mA	■	■		■		■			4...5	4
20...0 mA	■	■		■					4...2	3
-0,45...+0,45 mA	■			■		■			B...F	D
-55...+55 mA	■		■	■		■			4...6	5
High fail safe *)							■		-	-
Low fail safe *)								■	-	-
No fail safe *)									-	-

*) Detection of input signal interruptions:

If the input signal circuit is interrupted, the output signal changes to the adjusted minimum value (low fail safe) or maximum value (high fail safe). If "No fail safe" is configured, input signal interruptions are not detected.

2CDC 282 019 F0003

Output	SW2 1	2	3	4	5	6
0...5 V			■		■	
0...10 V					■	
1...5 V	■	■	■			
2...10 V	■	■	■			
-10...+10 V				■		
-5...+5 V				■	■	
-10...0 V			■	■		
-5...0 V			■	■	■	
0...6,66 V		■			■	
-10...3,33 V		■		■		
-5...1,66 V		■		■	■	
0...8 V		■	■			
0...4 V		■	■		■	
-10...-2 V		■	■	■		
-5...-1 V		■	■	■	■	
1,25...6,25 V	■		■		■	
-7,5...2,5 V	■		■	■		
-3,75...1,25 V	■		■	■	■	
1,66...8,33 V	■	■			■	
-6,66...6,66 V	■	■		■		
-3,33...3,33 V	■	■		■	■	
-8...0 V	■	■	■	■		
-4...0 V	■	■	■	■	■	
0...1 mA					■	
0...20 mA					■	■
4...20 mA	■	■	■			■
0...10 mA			■		■	■
0...0,5 mA			■		■	
0...13,33 mA		■			■	■
0...666 µA		■			■	
0...16 mA		■	■			■
0...800 µA		■	■			
0...8 mA		■	■		■	■
0...400 µA		■	■		■	
2,5...12,5 mA	■		■		■	■
125...625 µA	■		■		■	
3,33...16,66 mA	■	■			■	■
166...833 µA	■	■			■	
0,2...1 mA	■	■	■			
2...10 mA	■	■	■		■	■
100...500 µA	■	■	■		■	

Legend: ■ ON; OFF; no influence

2CDC 282 020 F0003
2CDC 282 003 F0004

Type	Supply voltage 50/60 Hz	Order code	Pack. unit pieces	Price 1 piece
CC-U/STD	24-48 V DC / 24 V AC 110-240 V AC / 100-300 V DC	**1SVR 040 000 R1700** **1SVR 040 001 R0400**	1 1	

Packing unit: 1 piece

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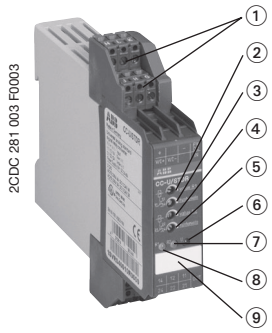
Analog standard signal converter CC-U/STDR with relay output
Ordering details



CC-U/STDR

① Plug-in connecting terminals
② Threshold value for R1
③ Hysteresis for R1
④ Threshold value for R2
⑤ Hysteresis for R2
⑥ U: green LED - supply voltage
⑦ R2: yellow LED - Relay 2 energized
⑧ R1: yellow LED - Relay 1 energized
⑨ Marker

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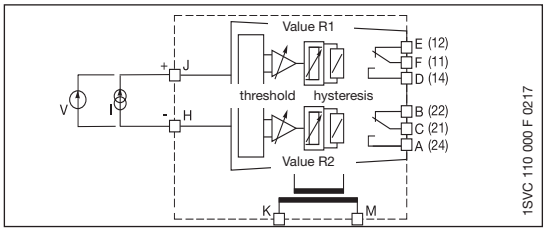
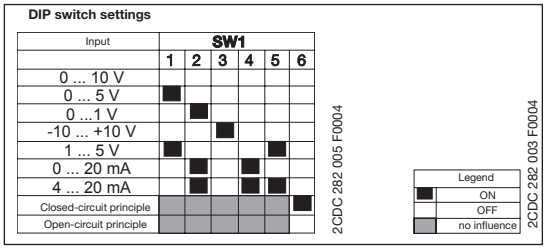
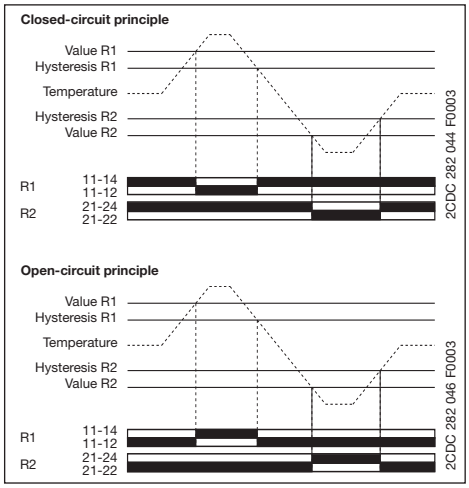
CC-U/STDR universal signal converter for standard signals, with 2 threshold relay outputs and with 3-way electrical isolation

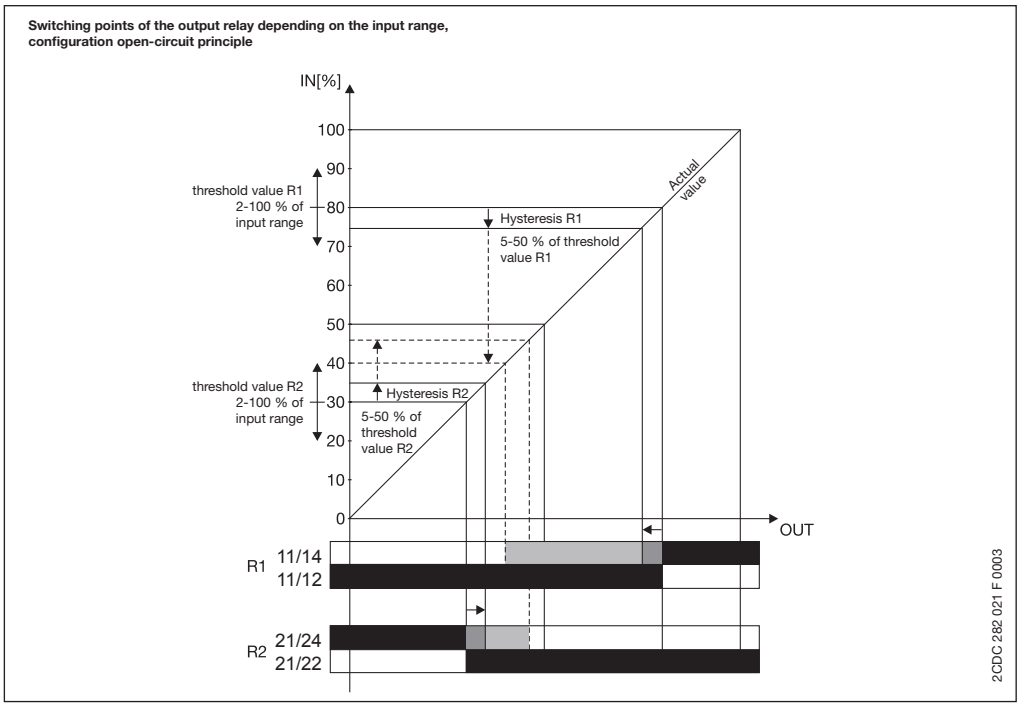
- Standard signal converter with 7 setting ranges
- 2 threshold relay outputs with one c/o contact each (threshold and respective hysteresis can be adjusted independently from each other)
- Open-circuit or closed-circuit principle configurable by means of a DIP switch
- 2 yellow LEDs for clear status indication of the output relays
- Plug-in connecting terminals for inputs, outputs and supply

Function diagrams CC-U/STDR









Type	Supply voltage 50/60 Hz	Order code	Pack. unit pieces	Price 1 piece
CC-U/STDR	24-48 V DC / 24 V AC	**1SVR 040 010 R0000**	1	
	110-240 V AC / 100-300 V DC	**1SVR 040 011 R2500**	1	

Pack. units: 1 piece

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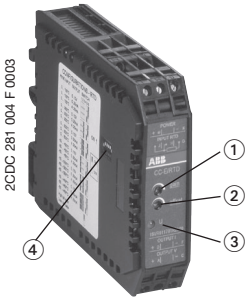
Temperature signal converter for RTD sensors CC-E/RTD
Ordering details

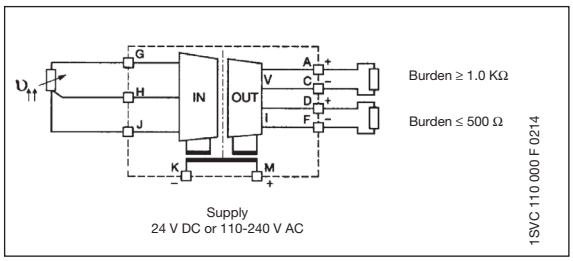


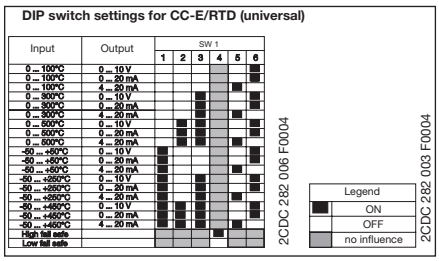
CC-E/RTD

① Gain adjustment
② Offset adjustment
③ U: green LED - supply voltage
④ DIP switch for input and output configuration (only available on universal devices)

CC-E/RTD temperature signal converter for RTD sensors, linearized with 3-way electrical isolation

- Universally configurable device (type E-RTD)
- 12 single-function devices
- "Plug and Play", no adjustment of single-function devices required
- Temperature signal converter for PT100 sensors
- 2- or 3-wire connection





Type	Input signal	Output signal	Order code	Price 1 piece
Supply voltage: 24 V DC				
universal				
CC-E/RTD	refer to table	0-10 V, 0-20 mA, 4-20 mA	**1SVR 011 701 R2500**[1)]	
single-function				
CC-E RTD/V **CC-E RTD/I** **CC-E RTD/I**	PT100 0...100 °C	0-10 V 0-20 mA 4-20 mA	**1SVR 011 730 R2500** **1SVR 011 731 R1200** **1SVR 011 732 R1300**	
CC-E RTD/V **CC-E RTD/I** **CC-E RTD/I**	PT100 -50...+50 °C	0-10 V 0-20 mA 4-20 mA	**1SVR 011 733 R1400** **1SVR 011 734 R1500** **1SVR 011 735 R1600**	
CC-E RTD/V **CC-E RTD/I** **CC-E RTD/I**	PT100 0...300 °C	0-10 V 0-20 mA 4-20 mA	**1SVR 011 736 R1700** **1SVR 011 737 R1000** **1SVR 011 738 R2100**	
CC-E RTD/V **CC-E RTD/I** **CC-E RTD/I**	PT100 -50...+250 °C	0-10 V 0-20 mA 4-20 mA	**1SVR 011 739 R2200** **1SVR 011 740 R0700** **1SVR 011 741 R2400**	
Supply voltage: 110-240 V AC				
universal				
CC-E/RTD	refer to table	0-10 V, 0-20 mA, 4-20 mA	**1SVR 011 706 R2200**	
single-function				
CC-E RTD/V **CC-E RTD/I** **CC-E RTD/I**	PT100 0...100 °C	0-10 V 0-20 mA 4-20 mA	**1SVR 011 788 R2400** **1SVR 011 789 R2500** **1SVR 011 790 R2200**	
CC-E RTD/V **CC-E RTD/I** **CC-E RTD/I**	PT100 -50...+50 °C	0-10 V 0-20 mA 4-20 mA	**1SVR 011 791 R1700** **1SVR 011 792 R1000** **1SVR 011 793 R1100**	
CC-E RTD/V **CC-E RTD/I** **CC-E RTD/I**	PT100 0...300 °C	0-10 V 0-20 mA 4-20 mA	**1SVR 011 794 R1200** **1SVR 011 795 R1300** **1SVR 011 796 R1400**	
CC-E RTD/V **CC-E RTD/I** **CC-E RTD/I**	PT100 -50...+250 °C	0-10 V 0-20 mA 4-20 mA	**1SVR 011 797 R1500** **1SVR 011 798 R2600** **1SVR 011 799 R2700**	

Pack. units: 1 piece

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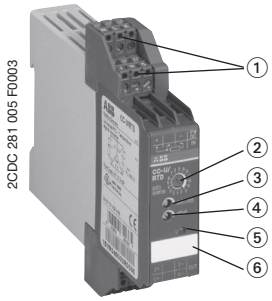
[1)] UL 1604 Class I, Div.2 (universal devices)

Temperature signal converter for RTD sensors CC-U/RTD
Ordering details

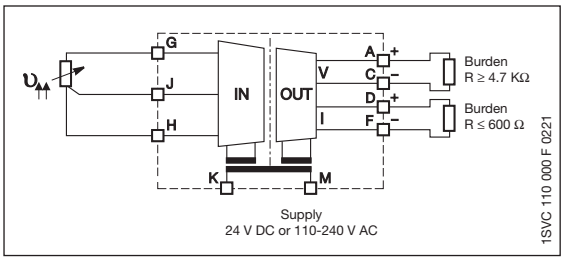


CC-U/RTD

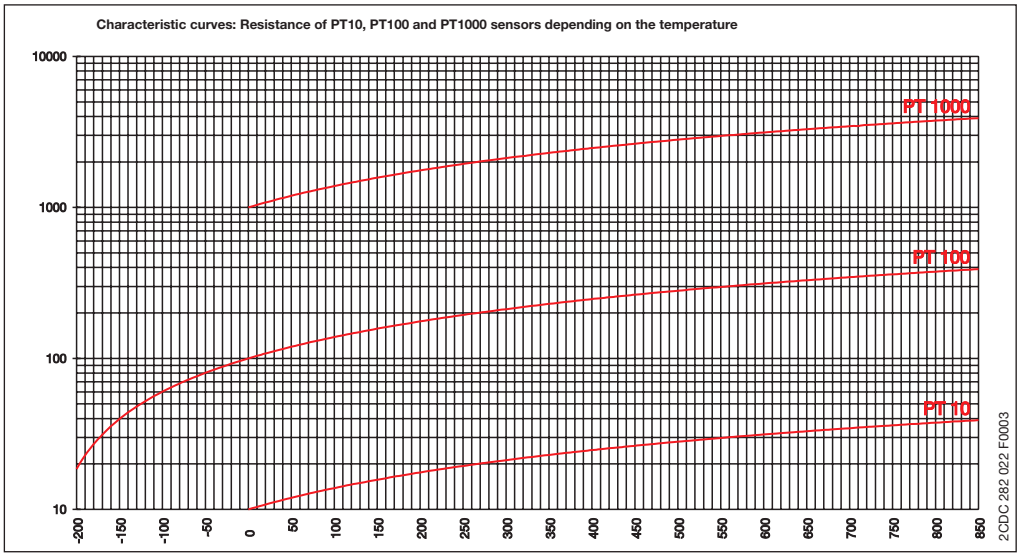
① Plug-in connecting terminals
② Gain: Coarse adjustment
③ Gain: Fine adjustment
④ Offset adjustment
⑤ U: green LED - supply voltage
⑥ Marker

CC-U/RTD universal signal converter for PT10, PT100, PT1000 temperature sensors (acc. to IEC 751 and JIS C 1604*), linearized with 3-way electrical isolation

- Configurable output signal response on input signal interruption (low fail safe / high fail safe)
- Adjustment and operating elements on the front-side
- Short-circuit proof signal outputs
- Plug-in connecting terminals for inputs, outputs and supply



*) Japanese standard



DIP switch settings

Input		SW1 1	2	3	4	5	6	SW2 1	2	3	4	5	6	Gain coarse
PT 10	0...500°C	■						■	■	■	■			F
	0...550°C	■						■	■	■				E
	0...600°C	■						■	■		■			D
	0...650°C	■						■	■					C
	0...700°C	■						■		■	■			B
	0...750°C	■						■		■				A
	0...800°C	■						■			■			9
	0...850°C	■						■						8
PT 100	0...50°C		■						■	■	■			F
	0...60°C		■						■	■				E
	0...70°C		■						■		■			B
	0...80°C		■						■					A
	0...90°C		■							■	■			9
	0...100°C		■							■				8
	0...200°C		■								■			3
	0...300°C		■											2
	0...400°C		■											1
	0...500°C		■											0
PT 1000	0...10°C			■										8
	0...20°C			■										3
	0...30°C			■										2
	0...40°C			■										1
	0...50°C			■										0
	0...60°C			■										0
	0...6°C			■										F
Low fail safe *)												■		-
High fail safe*)														-

*) Detection of input signal interruptions:
If the input signal circuit is interrupted, the output signal changes to the adjusted minimum value (low fail safe) or maximum value (high fail safe).

2CDC 282 023 F 0003

Output	SW3 1	2	3	4	5	6
0...5 V			■		■	
0...10 V			■		■	
1...5 V	■	■	■		■	
2...10 V	■	■	■			
-10...+10 V				■		
-5...+5 V				■	■	
-10...0 V			■	■		
-5...0 V			■	■	■	
0...6,66 V		■			■	
-10...3,33 V		■		■		
-5...1,66 V		■		■	■	
0...8 V		■	■			
0...4 V		■	■		■	
-10...-2 V		■	■	■		
-5...-1 V		■	■	■	■	
1,25...6,25 V	■		■		■	
-7,5...2,5 V	■		■	■		
-3,75...1,25 V	■		■	■	■	
1,66...8,33 V	■	■			■	
-6,66...6,66 V	■	■		■		
-3,33...3,33 V	■	■		■	■	
-8...0 V	■	■	■	■		
-4...0 V	■	■	■	■	■	
0...1 mA					■	
0...20 mA					■	■
4...20 mA	■	■	■			■
0...10 mA			■		■	■
0...0,5 mA			■		■	■
0...13,33 mA		■			■	
0...666 µA		■			■	
0...16 mA		■	■			■
0...800 µA		■	■			
0...8 mA		■	■		■	■
0...400 µA		■	■		■	
2,5...12,5 mA	■		■		■	■
125...625 µA	■		■		■	
3,33...16,66 mA	■	■			■	■
166...833 µA	■	■			■	
0,2...1 mA	■	■	■			
2...10 mA	■	■	■		■	■
100...500 µA	■	■	■		■	

2CDC 282 024 F 0003

Legend
■ ON
OFF
no influence

2CDC 282 003 F0004

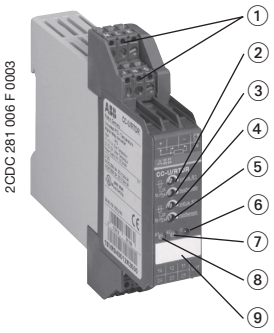
Type	Supply voltage 50/60 Hz	Order code	Pack. unit pieces	Price 1 piece
CC-U/RTD	24-48 V DC / 24 V AC	**1SVR 040 002 R0500**	1	
	110-240 V AC / 100-300 V DC	**1SVR 040 003 R0600**	1	

Pack. units: 1 piece

• Technical data ..... 207 • Dimensional drawings 211

Temperature signal converter for RTD sensors CC-U/RTDR with relay output

Ordering details

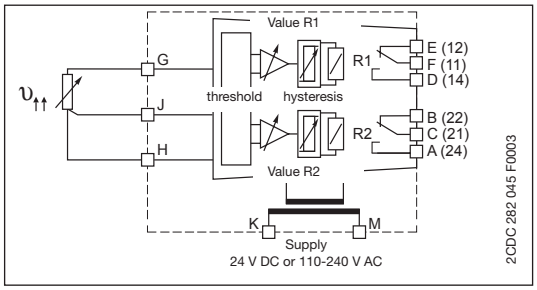


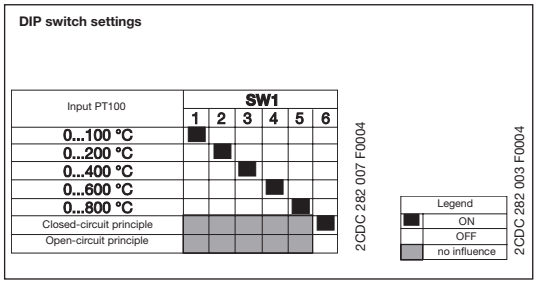
CC-U/RTDR

① Plug-in connecting terminals
② Threshold value for R1
③ Hysteresis for R1
④ Threshold value for R2
⑤ Hysteresis for R2
⑥ U: green LED - supply voltage
⑦ R2: yellow LED - Relay 2 energized
⑧ R1: yellow LED - Relay 1 energized
⑨ Marker

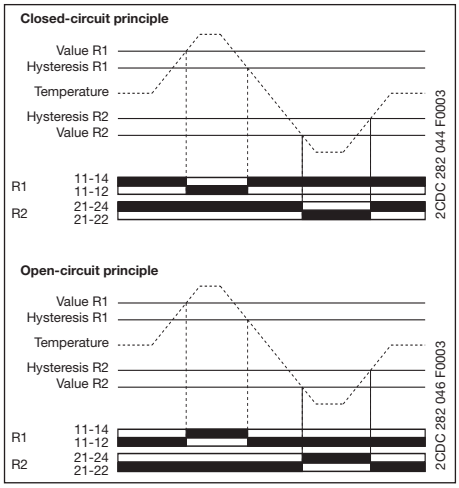
CC-U/RTDR universal signal converter for temperature and resistance signals, with 2 threshold relay outputs and 3-way electrical isolation

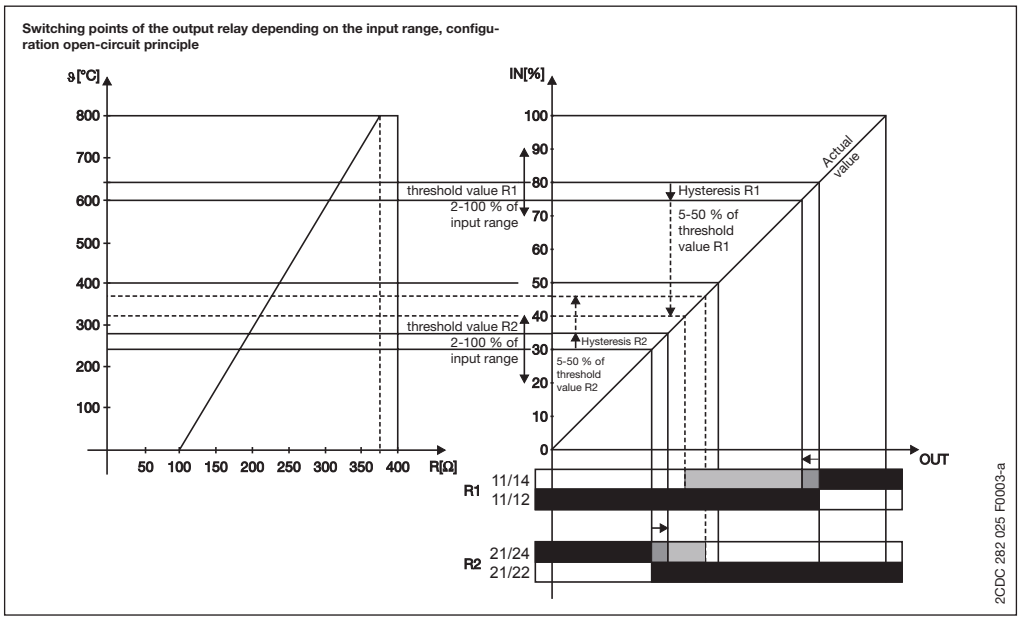
- Temperature signal converter for PT100 signals (5 ranges up to 800 °C) and variable resistances from 0-380 Ω
- 2 threshold relay outputs with one c/o contact each (threshold and respective hysteresis can be adjusted independently from each other)
- Open-circuit or closed-circuit principle configurable by means of a DIP switch
- 2 yellow LEDs for clear status indication of the output relays
- Plug-in connecting terminals for inputs, outputs and supply





Function diagrams CC-U/RTDR



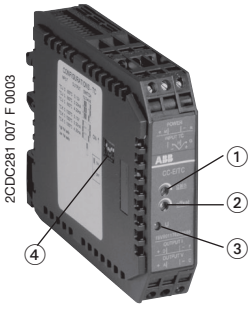


Type	Supply voltage 50/60 Hz	Order code	Pack. unit pieces	Price 1 piece
CC-U/RTDR	24-48 V DC / 24 V AC	**1SVR 040 012 R2600**	1	
	110-240 V AC / 100-300 V DC	**1SVR 040 013 R2700**	1	

Pack. units: 1 piece

• Technical data ..... 208 • Dimensional drawings 211

Temperature signal converter for thermocouples CC-E/TC
Ordering details

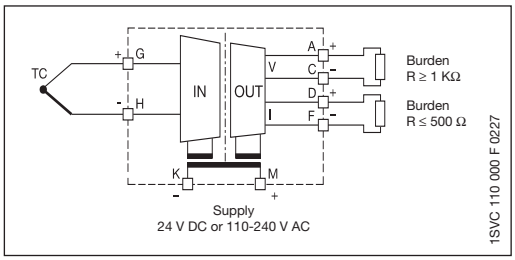


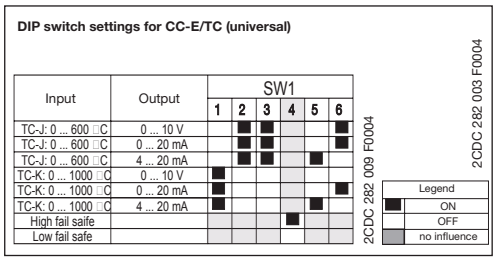
CC-E/TC

① Gain adjustment
② Offset adjustment
③ U: green LED - supply voltage
④ DIP switch for input and output configuration (only available on universal devices)

CC-E/TC analog signal converter for thermocouple signals of the types J and K with 3-way electrical isolation

- Universally configurable device (type E/TC)
- 6 single-function devices
- "Plug and Play", no adjustment of single-function devices required





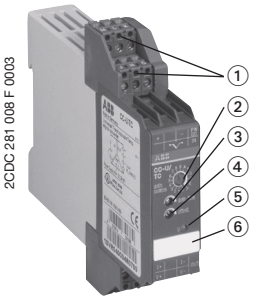
Type	Input signal	Output signal	Order code	Price 1 piece
Supply voltage: 24 V DC				
universal				
CC-E/TC	thermocouple types J and K	0-10 V, 0-20 mA, 4-20 mA	**1SVR 011 702 R2600**[1)]	
single-function				
CC-E TC/V **CC-E TC/I** **CC-E TC/I**	type J 0-600 °C	0-10 V 0-20 mA 4-20 mA	**1SVR 011 750 R0100** **1SVR 011 751 R2600** **1SVR 011 752 R2700**	
CC-E TC/V **CC-E TC/I** **CC-E TC/I**	type K 0-1000 °C	0-10 V 0-20 mA 4-20 mA	**1SVR 011 753 R2000** **1SVR 011 754 R2100** **1SVR 011 755 R2200**	
Supply voltage: 110-240 V AC				
universal				
CC-E/TC	thermocouple types J and K	0-10 V, 0-20 mA, 4-20 mA	**1SVR 011 707 R2300**	
single-function				
CC-E TC/V **CC-E TC/I** **CC-E TC/I**	type J 0-600 °C	0-10 V 0-20 mA 4-20 mA	**1SVR 011 760 R0300** **1SVR 011 761 R2000** **1SVR 011 762 R2100**	
CC-E TC/V **CC-E TC/I** **CC-E TC/I**	type K 0-1000 °C	0-10 V 0-20 mA 4-20 mA	**1SVR 011 763 R2200** **1SVR 011 764 R2300** **1SVR 011 765 R2400**	

[1)] UL 1604 Class I, Div.2 (universal devices)

Pack. units: 1 piece

• Technical data ..... 2005 • Dimensional drawings 211

Temperature signal converter for thermocouples CC-U/TC
Ordering details

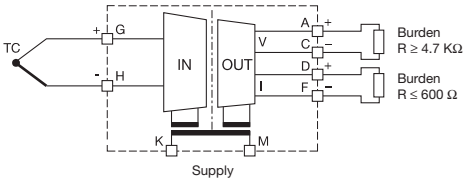


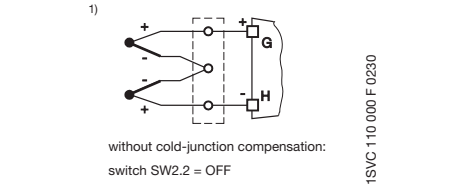
CC-U/TC

① Plug-in connecting terminals
② Gain: Coarse adjustment
③ Gain: Fine adjustment
④ Offset adjustment
⑤ U: green LED - supply voltage
⑥ Marker

CC-U/TC universal signal converter for thermocouples with 3-way electrical isolation

- Temperature signal converter for thermocouples of the types K, J, T, S, E, N, R, B
- Continuously adjustable voltage signal input 0-10 mV and 0-50 mV
- Differential temperature meas. possible [1)]
- Configurable output signal response on input signal interruption (low fail safe / high fail safe)
- Adjustment and operating elements on the front-side
- Short-circuit proof signal outputs
- Plug-in connecting terminals for inputs, outputs and supply





DIP switch settings

Input		SW1						SW2					
Typ	Temperature range	1	2	3	4	5	6	1	2	3	4	5	6
K	0-100...900 °C		■		■			■	■				
K	0-250...1350 °C		■		■			■	■			■	
J	0-100...750 °C	■						■	■				
T	0-100...400 °C		■	■				■	■	■			
T	-150-0...400 °C		■	■				■	■	■	■		
S	0-250...1550 °C		■	■		■	■		■				
E	0-100...700 °C							■	■				
E	0-200...1000 °C							■	■			■	
N	0-100...650 °C		■			■		■	■				
N	0-200...1300 °C		■			■		■	■			■	
R	0-250...1350 °C		■	■	■	■	■		■				
R	0-450...1700 °C		■	■	■	■	■		■			■	
B	0-700...1750 °C		■	■	■	■	■						
mV	0-2...10 mV		■	■	■	■	■						
mV	0-10...50 mV												
LOW FAIL SAFE *)													■
HIGH FAIL SAFE *)													

2CDC 282 010 F0004

*) Detection of input signal interruptions:

If the input signal circuit is interrupted, the output signal changes to the adjusted minimum value (low fail safe) or maximum value (high fail safe).

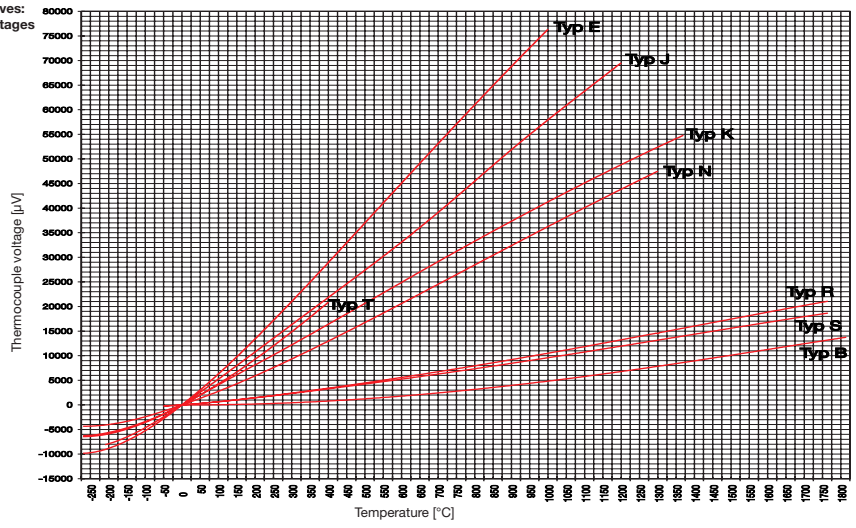
Output	SW2 1	2	3	4	5	6
0...5 V			■		■	
0...10 V					■	
1...5 V	■		■		■	
2...10 V	■		■			
-10...+10 V				■		
-5...+5 V				■	■	
-10...0 V			■	■		
-5...0 V			■	■	■	
0...6,66 V		■				
-10...3,33 V		■			■	
-5...1,66 V		■			■	■
0...8 V		■	■			
0...4 V		■	■		■	
-10...-2 V		■	■	■		
-5...-1 V		■	■	■	■	
1,25...6,25 V	■		■		■	
-7,5...2,5 V	■		■	■		
-3,75...1,25 V	■		■	■	■	
1,66...8,33 V	■	■			■	
-6,66...6,66 V	■	■		■		
-3,33...3,33 V	■	■		■	■	
-8...0 V	■	■	■	■		
-4...0 V	■	■	■	■	■	
0...1 mA					■	■
0...20 mA					■	■
4...20 mA	■	■	■		■	■
0...10 mA			■		■	■
0...0,5 mA			■		■	■
0...13,33 mA		■			■	■
0...666 µA		■			■	
0...16 mA		■	■			■
0...800 µA		■	■			
0...8 mA		■	■		■	■
0...400 µA		■	■		■	■
2,5...12,5 mA	■		■		■	■
125...625 µA	■		■		■	
3,33...16,66 mA	■	■			■	■
166...833 µA	■	■			■	
0,2...1 mA	■	■	■			
2...10 mA	■	■	■		■	■
100...500 µA	■	■	■		■	

2CDC 282 020 F0003

Legend: ■ ON; OFF; no influence

2CDC 282 003 F0004

Characteristic curves: Thermocouple voltages depending on the temperature



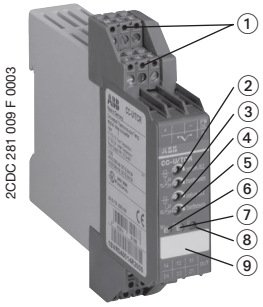
2CDC 282 026 F0003

Type	Supply voltage 50/60 Hz	Order code	Pack. unit pieces	Price 1 piece
CC-U/TC	24-48 V DC / 24 V AC	**1SVR 040 004 R0700**	1	
	110-240 V AC / 100-300 V DC	**1SVR 040 005 R0000**	1	

Pack. units: 1 piece

• Technical data ..... 207 • Dimensional drawings 211

Temperature signal converter for thermocouples CC-U/TCR with relay output
Ordering details

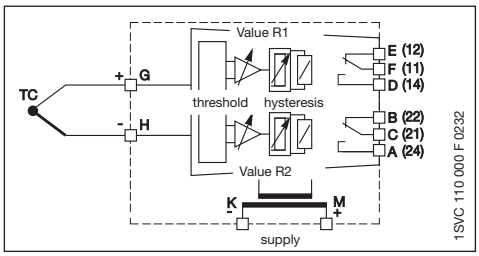


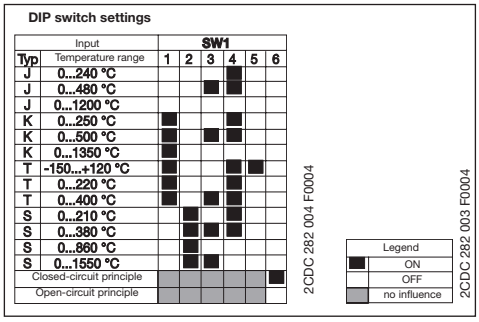
CC-U/TCR

① Plug-in connecting terminals
② Threshold value for R1
③ Hysteresis for R1
④ Threshold value for R2
⑤ Hysteresis for R2
⑥ U: green LED - supply voltage
⑦ R2: yellow LED - Relay 2 energized
⑧ R1: yellow LED - Relay 1 energized
⑨ Marker

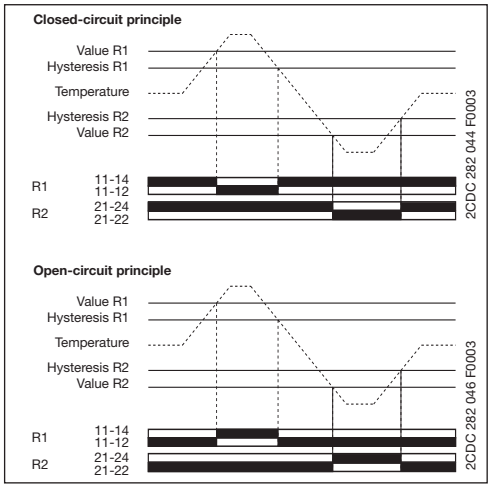
CC-U/TCR universal signal converter for thermocouples, with 2 threshold relay outputs and 3-way electrical isolation

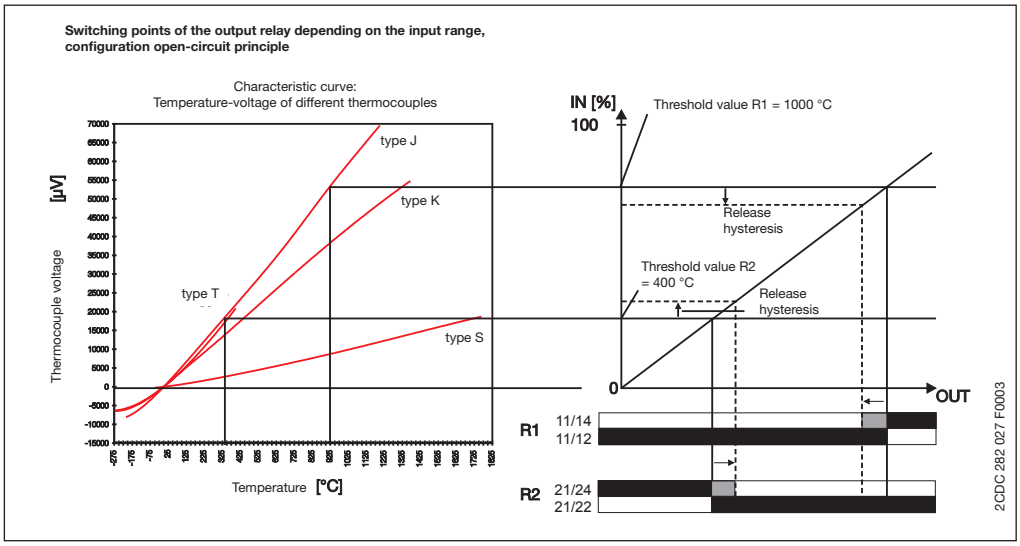
- Temperature signal converter for thermocouples of the types K, J, T, S
- 2 threshold relay outputs with one change-over contact each (threshold and respective hysteresis can be adjusted independently from each other)
- Open-circuit or closed-circuit principle configurable by means of a DIP switch
- 2 yellow LEDs for clear status indication of the output relays
- Plug-in connecting terminals for inputs, outputs and supply





Function diagrams CC-U/TCR



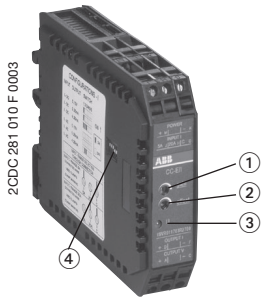


Type	Supply voltage 50/60 Hz	Order code	Pack. unit pieces	Price 1 piece
CC-U/TCR	24-48 V DC / 24 V AC 110-240 V AC / 100-300 V DC	**1SVR 040 014 R2000** **1SVR 040 015 R2100**	1 1	

Pack. units: 1 piece

• Technical data ..... 208 • Dimensional drawings 211

Measuring converter for sinusoidal and DC currents CC-E/I
Ordering details

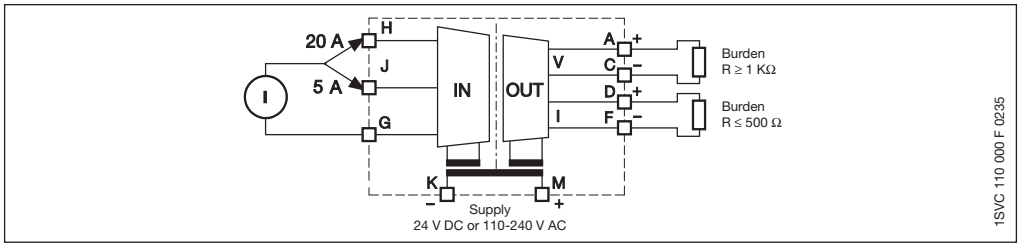


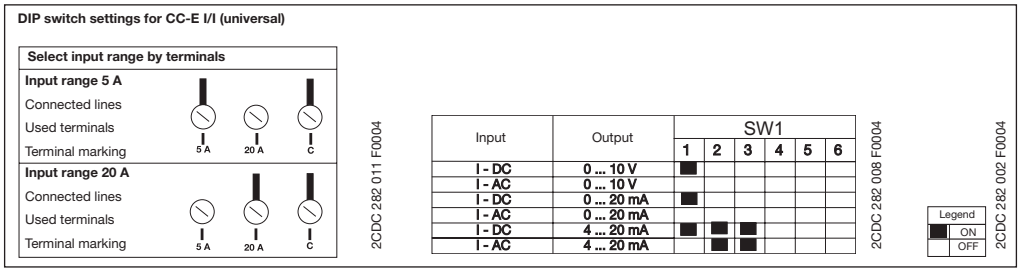
CC-E/I

① Gain adjustment
② Offset adjustment
③ U: green LED - supply voltage
④ DIP switch for input and output configuration (only available on universal devices)

CC-E/I current measuring converter for current signals 0-5 A, 0-20 A, AC/DC with 3-way electrical isolation

- Universally configurable device (type E/I)
- 6 single-function devices
- "Plug and Play", no adjustment of single-function devices required





Type	Input signal	Output signal	Order code	Price 1 piece
Supply voltage: 24 V DC				
universal				
CC-E/I	0-5 A, 0-20 A, AC/DC	0-10 V, 0-20 mA, 4-20 mA	**1SVR 011 703 R2700**[1)]	
single-function				
CC-E I_{AC}/V	0-5 A, 0-20 A, AC	0-10 V	**1SVR 011 770 R0500**	
CC-E I_{AC}/I		0-20 mA	**1SVR 011 771 R2200**	
CC-E I_{AC}/I		4-20 mA	**1SVR 011 772 R2300**	
CC-E I_{DC}/V	0-5 A, 0-20 A, DC	0-10 V	**1SVR 011 773 R2400**	
CC-E I_{DC}/I		0-20 mA	**1SVR 011 774 R2500**	
CC-E I_{DC}/I		4-20 mA	**1SVR 011 775 R2600**	
Supply voltage: 110-240 V AC				
universal				
CC-E/I	0-5 A, 0-20 A, AC/DC	0-10 V, 0-20 mA, 4-20 mA	**1SVR 011 708 R0400**	
single-function				
CC-E I_{AC}/V	0-5 A, 0-20 A, AC	0-10 V	**1SVR 011 780 R1100**	
CC-E I_{AC}/I		0-20 mA	**1SVR 011 781 R0600**	
CC-E I_{AC}/I		4-20 mA	**1SVR 011 782 R0700**	
CC-E I_{DC}/V	0-5 A, 0-20 A, DC	0-10 V	**1SVR 011 783 R0000**	
CC-E I_{DC}/I		0-20 mA	**1SVR 011 784 R0100**	
CC-E I_{DC}/I		4-20 mA	**1SVR 011 785 R1100**	

[1)] UL 1604 Class I, Div.2 (universal devices)

Pack. units: 1 piece

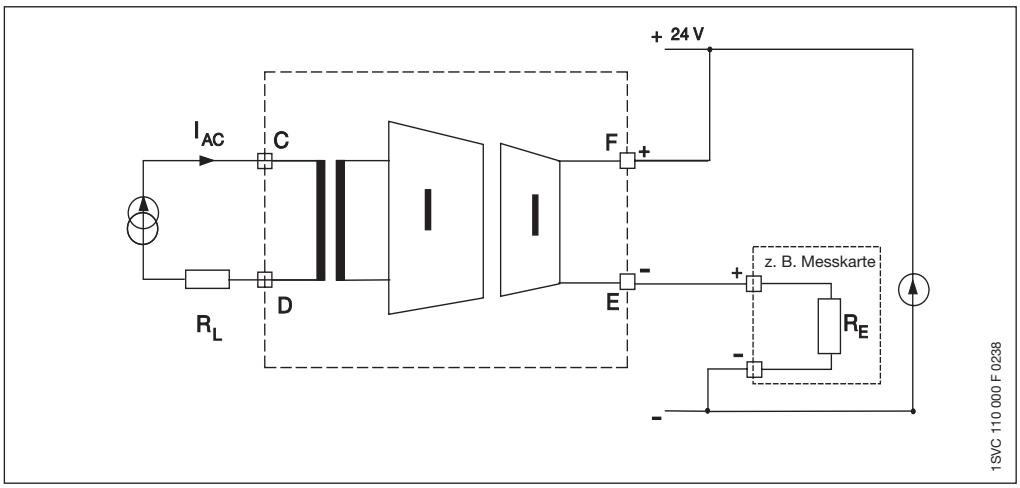
• Technical data ..... 209 • Dimensional drawings 211

Measuring converter for sinusoidal currents CC-E I_{AC}/ILPO
Ordering details

CC-E I_{AC}/ILPO

CC-E I_{AC}/ILPO current measuring without auxiliary power for sinusoidal currents 0-1 A, 0-5 A, output 4 - 20 mA

- Measuring converter for sinusoidal AC currents (0-1 A, 0-5 A)
- Measuring range selection by front-face sliding switch
- 4-20 mA output current in propotion to input current
- no additional power supply required

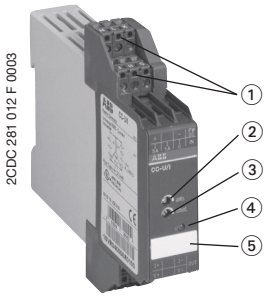


Type	Input signal	Order code	Pack. unit pieces	Price 1 piece
CC-E I_{AC}/ILPO	0-1 A, 0-5 A, AC	**1SVR 010 203 R0500**	1	

Pack. units: 1 piece

• Technical data ..... 209 • Dimensional drawings 211

Measuring converter for current RMS values CC-U/I
Ordering details

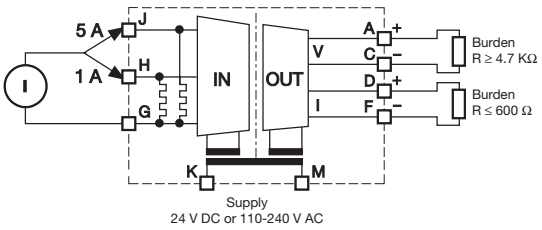


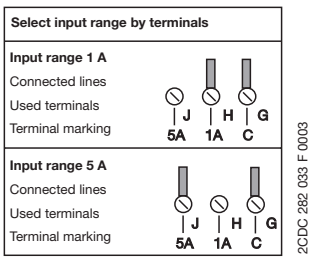
CC-U/I

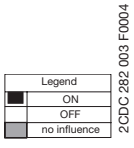
① Plug-in connecting terminals
② Gain adjustment
③ Offset adjustment
④ U: green LED - supply voltage
⑤ Marker

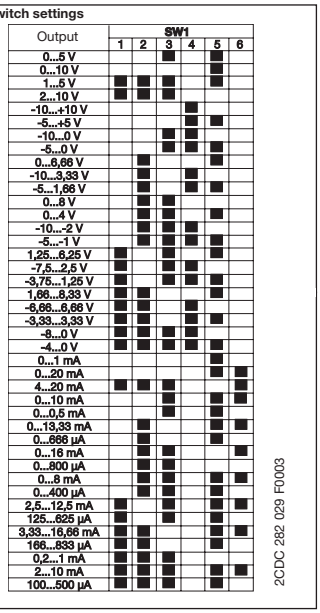
CC-U/I universal current measuring converter for RMS values of 0-1 A and 0-5 A, with 3-way electrical isolation

- RMS converter for current signals up to 1 A and up to 5 A of any wave form (DC, DC with superimposed AC components, pure sinusoidal, triangular, phase-angle controlled, etc. in a measuring range of 0-600 Hz)
- Adjustment and operating elements on the front
- Short-circuit proof signal outputs
- Plug-in connecting terminals for inputs, outputs and supply

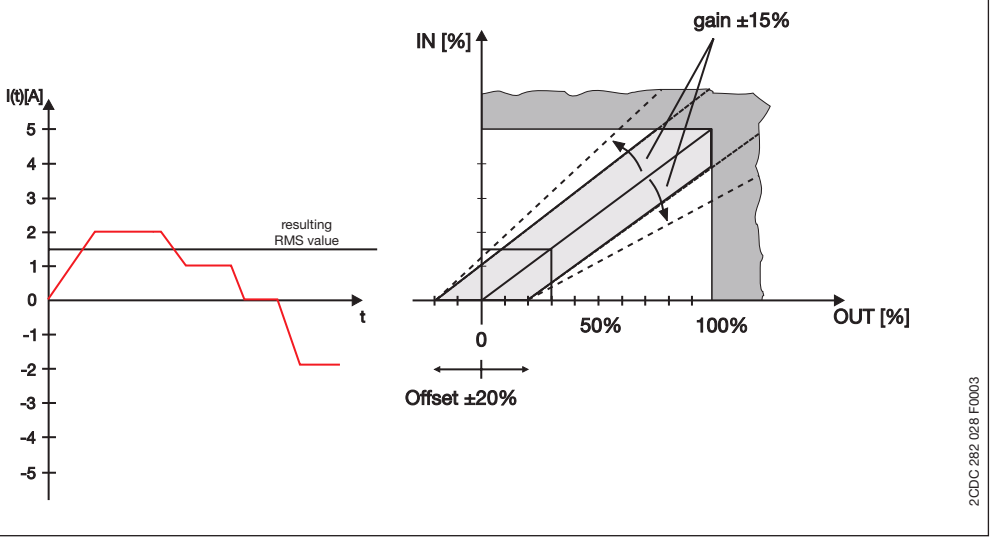








Example of application:
RMS measurement and conversion of a current signal

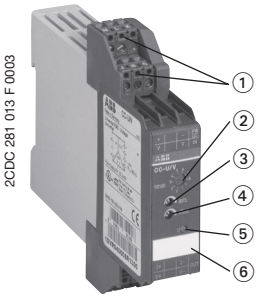


Type	Supply voltage 50/60 Hz	Order code	Pack. unit pieces	Price 1 piece
CC-U/I	24-48 V DC / 24 V AC	**1SVR 040 006 R0100**	1	
	110-240 V AC / 100-300 V DC	**1SVR 040 007 R0200**	1	

Pack. units: 1 piece

• Technical data ..... 210 • Dimensional drawings 211

Measuring converter for voltage RMS values CC-U/V
Ordering details

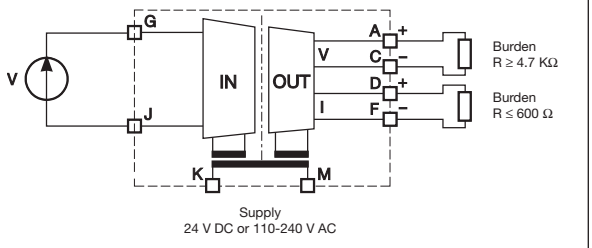


CC-U/V

① Plug-in connecting terminals
② Input voltage range selection
③ Gain adjustment
④ Offset adjustment
⑤ U: green LED - supply voltage
⑥ Marker

CC-U/V universal voltage measuring converter for RMS values of 0-600 V, with 3-way electrical isolation

- RMS converter for voltage signals up to 600 V of any wave form (DC, DC with superimposed AC components, pure sinusoidal, triangular, phase-angle controlled, etc. in a measuring range of 0-600 Hz)
- Adjustment and operating elements on the front
- Short-circuit proof signal outputs
- Plug-in connecting terminals for inputs, outputs and supply



DIP switch settings

Output	SW1 1	2	3	4	5	6
0...5 V			■		■	
0...10 V					■	
1...5 V	■	■	■		■	
2...10 V	■	■	■			
-10...+10 V				■		
-5...+5 V				■	■	
-10...0 V			■	■		
-5...0 V			■	■	■	
0...6,66 V		■			■	
-10...3,33 V		■		■		
-5...1,66 V		■		■	■	
0...8 V		■	■			
0...4 V		■	■		■	
-10...-2 V		■	■	■		
-5...-1 V		■	■	■	■	
1,25...6,25 V	■		■		■	
-7,5...2,5 V	■		■	■		
-3,75...1,25 V	■		■	■	■	
1,66...8,33 V	■	■			■	
-6,66...6,66 V	■	■		■		
-3,33...3,33 V	■	■		■	■	
-8...0 V	■	■	■	■		
-4...0 V	■	■	■	■	■	
0...1 mA					■	
0...20 mA					■	■
4...20 mA	■	■	■			■
0...10 mA			■		■	■
0...0,5 mA			■		■	
0...13,33 mA		■			■	■
0...666 µA		■			■	
0...16 mA		■	■			■
0...800 µA		■	■			
0...8 mA		■	■		■	■
0...400 µA		■	■		■	
2,5...12,5 mA	■		■		■	■
125...625 µA	■		■		■	
3,33...16,66 mA	■	■			■	■
166...833 µA	■	■			■	
0,2...1 mA	■	■	■			
2...10 mA	■	■	■		■	■
100...500 µA	■	■	■		■	

2CDC 282 029 F0003

Measuring voltage ranges

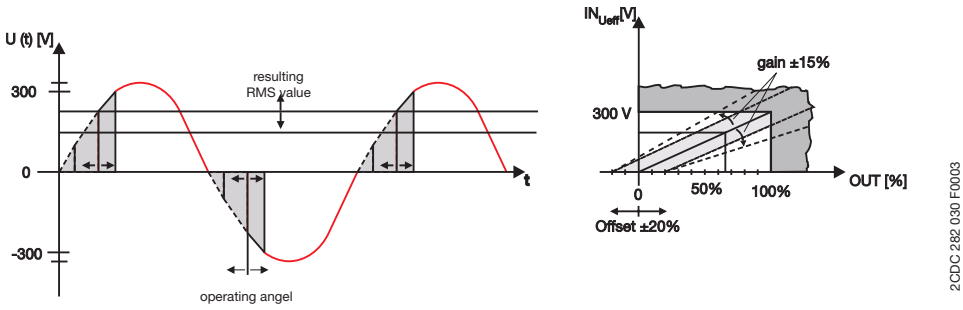
Selecting input range by front-face rotary switch	Switch position
0...100 V	1
0...150 V	2
0...250 V	3
0...300 V	4
0...400 V	5
0...450 V	6
0...550 V	7
0...600 V	8

2CDC 282 012 F0004

Legend	
■	ON
	OFF
	no influence

2CDC 282 003 F0004

Example of application:
RMS measurement and conversion of a phase-angle controlled voltage signal L1 = 230 V



Type	Supply voltage 50/60 Hz	Order code	Pack. unit pieces	Price 1 piece
CC-U/V	24-48 V DC / 24 V AC 110-240 V AC / 100-300 V DC	**1SVR 040 008 R1300** **1SVR 040 009 R1400**	1 1	

Pack. units: 1 piece

• Technical data ..... 210 • Dimensional drawings 211

Analog signal converters
CC-E/STD, CC-E/RTD, CC-E/TC
Technical data

Input circuits J-G-H	CC-E/STD Current	CC-E/STD Voltage	CC-E/RTD Temperature sensors	CC-E/TC Thermocouples (IEC 584-1 and 2)
Input signal	0-20 mA / 4-20 mA	0-5 V / 0-10 V / -10...+10 V	PT100	TC.K, TC.J
Input measuring range			-50 ... +500 °C	TC.K 0-1000 °C, TC.J 0-600 °C
Limitation of input signals	+55 mA	± 11 V		
Influence of line resistance			<0.01 %/Ω	> 0.5 % / 100 Ω
Gain adjustment range	± 5 % (universal devices)			
Offset adjustment range	± 5 % (universal devices)			
Input impedance	50 Ω	1 MΩ		
Suppression at 50 Hz				> 35 dB
Common-mode rejection			100 dB	

Output circuits D-F A-C	Current	Voltage
Output signal	0-20 mA, 4-20 mA	0-5 V, 0-10 V
Output burden	≥ 500 Ω	≥ 1.0 KΩ
Accuracy [1]	± 0.5 % of full-scale	
Temperature coefficient	± 500 ppm/°C	
Residual ripple	< 0.5 %	
Response time	200 µs	10 ms
Transmission frequency	2 kHz	80 Hz / 2 Hz (bis -3 dB)
Response to input circuit interruption	Low Fail Safe: Output voltage > 15 % of measuring range [2] Low Fail Safe: Output voltage < -0.6 V, output current = 0 mA	

Supply circuits K - M	DC versions	AC versions
Supply voltage	24 V DC	110-240 V AC - 50/60 Hz
Supply voltage tolerance	-15 % ... + 15 %	-15 % ... + 10 %
Power consumption	1.5 W typ.	1.5 VA typ.

Indication of operational states		
Supply voltage	U: green LED	
Isolation data		
Test voltage between all isolated circuits	2.5 kV AC	
Rated insulation voltage	-	- / -
General data		
Temperature range	operation	0...+60 °C
	storage	-20...+80 °C
Degree of protection	acc. to DIN 40050	IP20
Mounting position	ventilation slots on top and bottom	
Mounting on DIN rail	snap-on mounting	
Wire size	solid wire	4 mm² (10 AWG)
	stranded wire	2.5 mm² (14 AWG)
Electromagnetic compatibility		
Interference immunity	acc. to EN 61000-6-2	
electrostatic discharge (ESD)	acc. to IEC/EN 61000-4-2	level 3 ±6 kV / ±8 kV
electromagnetic field	acc. to IEC/EN 61000-4-3	10 V/m
fast transients (Burst)	acc. to IEC/EN 61000-4-4	level 3 ±2 kV / 5 kH
powerful impulses (Surge)	acc. to IEC/EN 61000-4-5	±2 kV / ±1 kV
HF line emission	acc. to IEC/EN 61000-4-6	10 V
Interference emission	acc. to EN 61000-6-4	class B

[1] includes: non-linearity, factory setting, drift of temperature, supply voltage and output load
[2] Only -/RTD and -/TC: Single-function devices respond with LOW FAIL SAFE to input signal interruptions

NEW

Analogsignal converter CC-E I/I
Technical data

Input circuits	**channel 1: A (+), B (-), channel 2: C (+), D (-)**	
Input current I_{IN}		0-20 mA, 4-20 mA
Input current minimum		< 100 µA
Input current maximum		50 mA[1] (V_{IN} < 18 V)
Input voltage V_{IN}		V_{IN} < 2.5 V + (I_{IN} x R_L)
Input voltage drop V_i		< 2.5 V (20 mA, R_L = 0Ω)
Input voltage maximum		18 V[1] (I_{IN} < 50 mA)
Output circuits	**channel 1: H (+), G (-), channel 2: F (+), E (-)**	
Output current I_{OUT}		0-20 mA, 4-20 mA
Output load R_L		0-500 Ω
Output voltage V_{OUT}		V_{OUT} = I_{OUT} x R_L
Residual ripple		< 20 mV_{pp} (500 Ω, 20 mA)
Response time (0-100 %)		< 15 ms (0-500 Ω, 20 mA), < 5 ms (500 Ω, 20 mA, 25 °C)
Accuracy output to input current		≤ 0.1 % of full-scale (20 mA)
Temperature coefficient		< ± 50 ppm / °C
Load influence (0-500 Ω)		≤ ± 0.05 % / 100 Ω, ≤ - 0.1 % / 100 Ω (25 °C)
General data		
Width of the enclosure		18 mm
Wire size		max. 2.5 mm² (14 AWG)
Weight	1 channel	approx. 0.037 kg / 0.082 lb
	2 channel	approx. 0.044 kg / 0.097 lb
Mounting position		any
Degree of protection	enclosure / terminals	IP 20 / IP 20
Temperature range	operation	-25...+60 °C
	storage	-40...+85 °C
Mounting		DIN rail (EN 50022)
Standards		
Product standard		EN 50178
Low Voltage Directive		73/23/EEC
EMC Directive		89/336/EEC
Electromagnetic compatibility		
Interference immunity	acc. to EN 61000-6-2	
electrostatic discharge (ESD)	acc. to EN 61000-4-2	level 3 ±6 kV / ±8 kV
electromagnetic field	acc. to EN 61000-4-3	10 V/m
fast transients (Burst)	acc. to EN 61000-4-4	level 3 ±2 kV / 5 kH
powerful impulses (Surge)	acc. to EN 61000-4-5	±2 kV / ±1 kV
HF line emission	acc. to EN 61000-4-6	10 V
magnetisches Feld	acc. to EN 61000-4-8	30 A/m
Interference emission	acc. to EN 61000-6-4	
Radiated noise	acc. to EN 55011	class B
Operational reliability	acc. to EN 68-2-6	4 g
Mechanical resistance	acc. to EN 68-2-6	10 g
Environmental testing	acc. to IEC 68-2-30 Db	24 h cycle, 55 °C, 93 % rel., 96 h
Isolation data		
Insulation voltage input / output		500 V_{eff} / 50 Hz
Insulation voltage between channels	(device with 2 channels)	5 kV_{eff} / 50 Hz
Pollution category		II
Overvoltage category		II

[1] The input parameters have to be limited to the indicated maximum values.

Analog signal converters
CC-U/STD, CC-U/RTD, CC-U/TC
Technical data

Input circuits J-G-H	**CC-U/STD**			**CC-U/RTD**	**CC-U/TC**	
	Current	**Voltage**	**Potentio-meter**	**Temperature sensors**	**Thermocouples (IEC 584-1 and 2)**	
Input signal	0-20 mA 4-20 mA 10-50 mA 0-1 mA	0-100 mV 0-1 V 0-5 V 1-5 V 0-10 V 2-10 V ± 10 V	470 Ω - 1 MΩ	PT10, PT100, PT1000 (IEL 751 and JICC 1604)	TC.K TC.T TC.E TC.R	TC.J TC.S TC.N TC.B
Limitation of input signals	± 55 mA	± 11 V	10 kΩ	-	-	
Temperature range	-	-	-	Max. Temperature adjustable: 6-60 °C for PT1000 50-500 °C for PT100 500-850 °C for PT10	refer to temperature specs. of individual thermocouples	
Influence of line resistance	-	-	-	0.015 °C/Ω	< 0.01 % / 100 Ω	
Gain adjustment range (universal devices)	0.9-110 mA	45 mV - 22 V	-	-	-	
Offset adjustment range (universal devices)	-137.5 % ... +62.5 %			± 5 %	± 10 %	
Input impedance	for different ranges			-	-	
without detection of input signal interruption	51 Ω	6 MΩ	3 GΩ	-	-	
with detection of input signal interruption	51 Ω	3.5 MΩ	9.5 GΩ	-	-	
Suppression at 50 Hz	-	-	-	-	> 40 dB	
Common-mode rejection	-	-	-	120 dB	105 dB	

Output circuits D-F A-C	**Current**	**Voltage**	
Output signal	0-20 mA, 4-20 mA	0-5 V, 1-5 V, 0-10 V, 2-10 V, ± 10 V	
Output burden	≤ 600 Ω	≥ 4.7 KΩ	
Accuracy [1]	±0.1 % of full-scale	±0.2 % of full-scale	±0.1 % of full-scale
Temperature coefficient	±150 ppm/°C	±250 ppm/°C	±200 ppm/°C at min offset ±400 ppm/°C at max. offset
Residual ripple	-	< 0.15 %	-
Response time	200 µs	10 ms	200 ms
Transmission frequency	1 kHz	80 Hz	2 Hz (to -3 dB)

Supply circuits K - M		
Supply voltage	24-48 V DC / 24 V AC	110-240 V AC / 100-300 V DC
Supply voltage tolerance	DC: -15 % ... + 15 %	AC: -15 % ... + 10 %
Power consumption	2 W at 24 V DC	4.5 VA at 230 V AC

Indication of operational states	
Supply voltage	U: green LED

Isolation data (between all isolated circuits)	
Isolation test	1.5 kV
Test voltage	1.5 kV / 50 Hz

General data		
Temperature range	operation	-20...+60 °C
	storage	-40...+80 °C
Mounting position		any
Mounting on DIN rail		snap-on mounting / screw mounting with adapter
Wire size	solid wire	plug-connector with screw terminals 1.5 mm² (16 AWG)
	stranded wire	plug-connector with screw terminals 2.5 mm² (14 AWG)

Electromagnetic compatibility			
Interference immunity	acc. to EN 61000-6-2		
electrostatic discharge (ESD)	acc. to IEC/EN 61000-4-2	level 3	±6 kV / ±8 kV
electromagnetic field	acc. to IEC/EN 61000-4-3		10 V/m
fast transients (Burst)	acc. to IEC/EN 61000-4-4	level 3	±2 kV / 5 kH
powerful impulses (Surge)	acc. to IEC/EN 61000-4-5		±2 kV / ±1 kV
HF line emission	acc. to IEC/EN 61000-4-6		10 V
Interference emission	acc. to EN 61000-6-4		class B

[1] includes: non-linearity, factory setting, drift of temperature, supply voltage and output load

Analog signal converters with relay output
CC-U/STDR, CC-U/RTDR, CC-U/TCR
Technical data

Input circuits J - H		CC-U/STDR Current	CC-U/STDR Voltage	CC-U/RTDR Temperature sensors	CC-U/TCR Thermocouples (IEC 584-1 and 2)
Measuring signal / input range		0-20 mA 4-20 mA	0-1 V / 1-5 V 0-10 / ±10 V	PT100	TC.K, TC.J TC.T, TC.S
Input burden		50 Ω	> 5 mΩ		
Adjustable threshold		2-100 % of selected input range			
Adjustable hysteresis		5-50 % of threshold			
Repeat accuracy of settings		±0.5 % of full-scale			
Temperature coefficient		±300 ppm/°C			
Output circuits E - D - F, B - C - A		**Relay, 2 c/o contacts**			
Rated switching voltage		250 V AC			
Rated switching current					
	AC-12 (resistive) 230 V	4 A			
	AC-15 (inductive) 230 V	3 A			
	DC-12 (resistive) 24 V	4 A			
	DC-13 (inductive) 24 V	2 A			
Min. switching voltage		12 V			
Min. switching current / power		10 mA / 0.6 VA (W)			
Response time		10 ms			
Max. lifetime	mechanical	30 x 10^6 switching cycles			
	electrical (AC-12, 230 V, 4 A)	0.1 Mio. switching cycles			
Supply circuits K - M					
Supply voltage		24-48 V DC / 24 V AC		110-240 V AC / 100-300 V DC	
Supply voltage tolerance		DC: -15 % ... + 15 %		AC: -15 % ... + 10 %	
Power consumption		2 W at 24 V DC		4.5 VA at 230 V AC	
Indication of operational states					
Supply voltage		U: green LED			
1st / 2nd output relay energized		R1: yellow LED / R2: yellow LED			
Isolation data (between all isolated circuits)					
Insulation voltage		2.5 kV			
Test voltage		2.5 kV			
General data					
Temperature range	operation	-20...+60 °C			
	storage	-40...+80 °C			
Mounting position		any			
Mounting on DIN rail (EN 50 022)		snap-on mounting / screw mounting with adapter			
Wire size	solid wire	plug-connector with screw terminals 1.5 mm² (16 AWG)			
	stranded wire	plug-connector with screw terminals 2.5 mm² (14 AWG			
Electromagnetic compatibility					
Interference immunity	acc. to EN 61000-6-2				
electrostatic discharge (ESD)	acc. to IEC/EN 61000-4-2	level 3	±6 kV / ±8 kV		
electromagnetic field	acc. to IEC/EN 61000-4-3	10 V/m			
fast transients (Burst)	acc. to IEC/EN 61000-4-4	level 3	±2 kV / 5 kH		
powerful impulses (Surge)	acc. to IEC/EN 61000-4-5	±2 kV / ±1 kV			
HF line emission	acc. to IEC/EN 61000-4-6	10 V			
Interference emission	acc. to EN 61000-6-4	class B			

Analog signal converters
CC-E/I, CC-E I_{AC}/ILPO
Technical data

Input circuits		**CC-E/I J-G-H**		**CC-E IAC/ILPO C-D**
		AC current meas.	**DC current meas.**	**2 meas. ranges selectable**
Input signal		0-5 A / 0-20 A	0-5 A / 0-20 A	0-1 A / 0-5 A / sinusförmig
Measuring frequency				50/60 Hz
Overload capacity of inputs		10 x I_{Nom} für max. 1 s		10 x I_{Nom} für max. 2 s
Gain adjustment range		± 5 % (universal devices)		-
Offset adjustment range		± 5 % (universal devices)		-
Input impedance / resistance		5A : 65 mΩ	20 A : 2.5 mΩ	5 mΩ
Output circuits		**D-F Current**	**A-C Voltage**	**F-E passive current output in proportion to input current**
Output signal		0-20 mA / 4-20 mA	0-10 V	4-20 mA
Output burden / load		≤ 500 Ω	≥ 1.0 Ω	12 V DC - 150 Ω, 24 V DC - 750 Ω 30 V DC - 1050 Ω
Accuracy [1]		± 2 % of full-scale		
Offset adjustment range		-		± 5 %
Gain adjustment range		-		± 20 %
Temperature coefficient		± 500 ppm/°C		300 ppm/°C
Residual ripple		< 0.5 %		-
Response time		0.5 s		-
Transmission frequency		DC or 50/60 Hz		-
Response to input circuit interruption		Low Fail Safe: output voltage < 200 mA, output current < 400 µA		-
Supply circuits K - M		**DC versions**	**AC versions**	
Supply voltage		24 V DC	110-240 V AC 50/60 Hz	12-30 V DC
Supply voltage tolerance		-15 % ... + 15 %	-15 % ... + 10 %	-
Power consumption		typ 1.5 W	typ 1.5 VA	-
Indication of operational states				
Supply voltage		U: green LED		-
Isolation data				
Test voltage between all isolated circuits		2.5 kV AC		
Rated insulation voltage		-		250 V AC
General data				
Temperature range	operation	0...+60 °C		-20...+60 °C
	storage	-20...+80 °C		-40...+80 °C
Degree of protection	acc. to DIN 40050	IP20		
Mounting position		ventilation slots on top and bottom		
Mounting on DIN rail		snap-on mounting		
Wire size	solid wire	4 mm² (10 AWG)		1x2.5 mm² (14 AWG)
	stranded wire	2.5 mm² (14 AWG)		
Electromagnetic compatibility				
Interference immunity	acc. to EN 61000-6-2			
electrostatic discharge (ESD)	acc. to IEC/EN 61000-4-2	level 3	±6 kV / ±8 kV	
electromagnetic field	acc. to IEC/EN 61000-4-3	10 V/m		
fast transients (Burst)	acc. to IEC/EN 61000-4-4	level 3	±2 kV / 5 kH	
powerful impulses (Surge)	acc. to IEC/EN 61000-4-5	±2 kV / ±1 kV		
HF line emission	acc. to IEC/EN 61000-4-6	10 V		
Interference emission	acc. to EN 61000-6-4	class B		

[1] includes: non-linearity, factory setting, drift of temperature, supply voltage and output load

Analog signal converters
CC-U/I, CC-U/V
Technical data

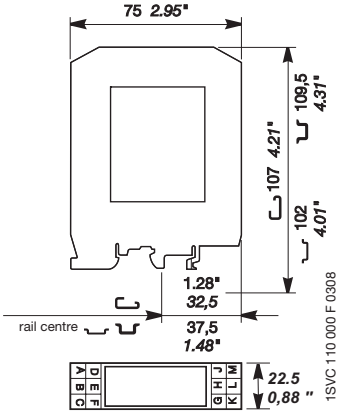
Input circuits J-G-H		**CC-U/I any current signals, RMS measurement**	**CC-U/V any voltage signals, RMS measurement**
Measuring signals		0-1 A 0-5 A	0-100 V, 0-200 V 0-300 V, 0-400 V 0-500 V, 0-600 V
Measuring frequency		0-600 Hz	
Overload capacity of inputs		10 x I_{Nom} for max. 2 s	-
Gain adjustment range		±20 %	
Offset adjustment range		±15 %	
Input impedance / resistance		60 mΩ / 12 mΩ	> 800 kΩ
Output circuits D-F A-C		**Current**	**Voltage**
Output signal		0-20 mA, 4-20 mA	0-5 V, 1-5 V, 0-10 V, 2-10 V, ± 10 V
Output load		≤ 600 Ω	≥ 4.7 KΩ
Accuracy[1)]		±0.5 % of full-scale	
Temperature coefficient		±250 ppm/°C max.	±300 ppm/°C max.
Residual ripple		< 0.15 %	
Response time		150 ms	
Supply circuits K - M			
Supply voltage		24-48 V DC / 24 V AC	110-240 V AC / 100-300 V DC
Supply voltage tolerance		DC: -15 % ... + 15 %	AC: -15 % ... + 10 %
Power consumption		2 W at 24 V DC	4.5 VA at 230 V AC
Indication of operational states			
Supply voltage		U: green LED	
Isolation data (between all isolated circuits)			
Insulation voltage		1.5 kV	
Test voltage		1.5 kV / 50 Hz	
General data			
Temperature range	operation	-20...+60 °C	
	storage	-40...+80 °C	
Mounting position		any	
Mounting on DIN rail (EN 50022)		snap-on mounting / screw mounting with adapter	
Wire size	solid wire	plug-connector with screw terminals 1.5 mm² (16 AWG)	
	stranded wire	plug-connector with screw terminals 2.5 mm² (14 AWG)	
Electromagnetic compatibility			
Interference immunity	acc. to EN 61000-6-2		
electrostatic discharge (ESD)	acc. to IEC/EN 61000-4-2	level 3 ±6 kV / ±8 kV	
electromagnetic field	acc. to IEC/EN 61000-4-3	10 V/m	
fast transients (Burst)	acc. to IEC/EN 61000-4-4	level 3 ±2 kV / 5 kH	
powerful impulses (Surge)	acc. to IEC/EN 61000-4-5	±2 kV / ±1 kV	
HF line emission	acc. to IEC/EN 61000-4-6	10 V	
Interference emission	acc. to EN 61000-6-4	class B	

[1)] includes: non-linearity, factory setting, drift of temperature, supply voltage and output load

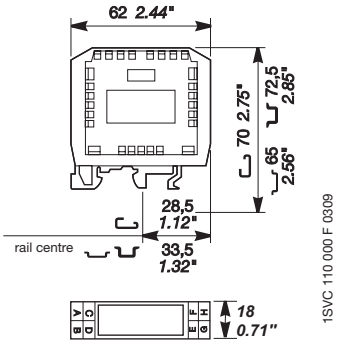
Analog signal converters
CC-E, CC-U
Dimensional drawings, Connecting terminals

Dimensions in mm

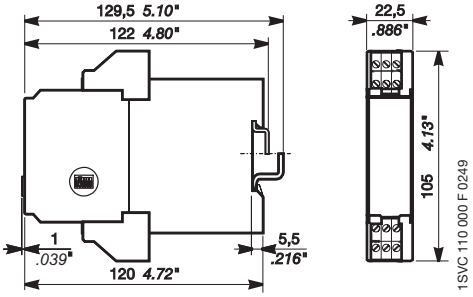
CC-E/x



CC-E I_{AC}/ILPO, CC-E I/I

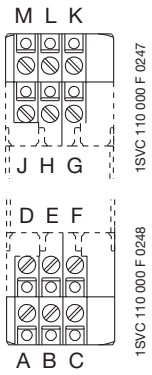


CC-U/x , CC-U/xR



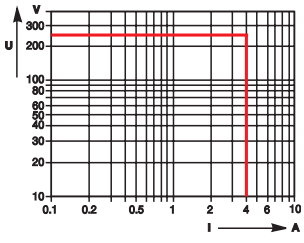
Connecting terminals CC-U/x

Width 22.5 mm / .886 "

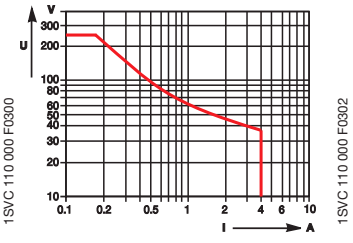


Load limit curves CC-U/xxR

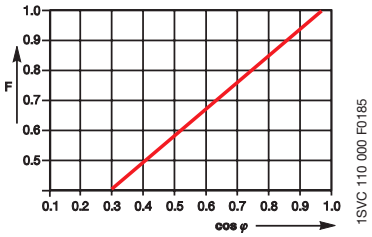
Resistive AC load



Resistive DC load



Derating curve



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Notes