

Programmable Converter PCV 10

in top hat rail-case
for current / voltage, universal programmable, for general applications

Characteristics

- Current input 15 μ A...10 A AC / DC, voltage input 10 mV...1000 V AC / 1500 V DC
- PC - configurable with "DTV-Control" programming software and interface
- Current output 0...20 mA, voltage output -10...+10 V, pulse or relay output
- Supply voltage 24, 115, 230 or 400 V AC or 12...50 V DC
- Galvanic separation
- Made in accordance with the $\text{C}\epsilon$ and EMV regulations

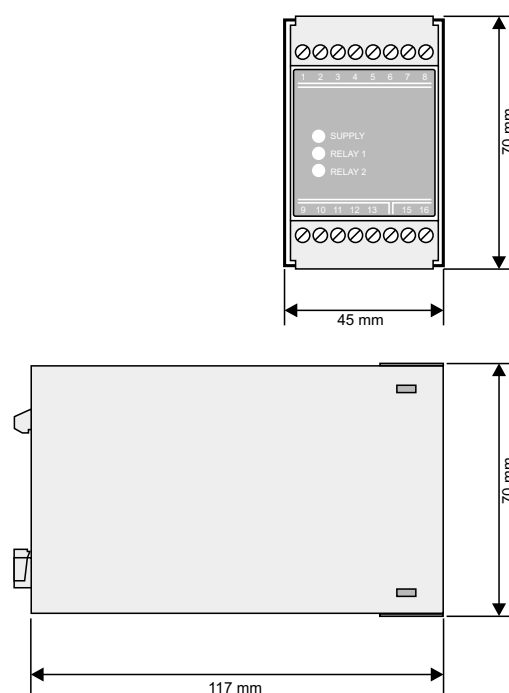


Description

The PCV 10 is a multirange converter / isolation amplifier with current, voltage and pulse inputs and current, voltage, pulse or relay outputs. The unit is supplied with 3 current and 3 voltage input connections, which makes it possible to program any input range between 15 μ A and 10 A or 10 mV and 1000 V AC / 1500 V DC. With AC inputs the converter monitors the RMS value of the signal, which means the signals are converted without any errors, no matter which shape they have. The unit can also be programmed with frequency input, where the same input connections are used. The frequency of the input signal is then monitored instead of the analogue level.

You can select between 3 different output configurations: Type A is supplied with analogue current output, programmable between 0 and 20 mA and analogue voltage output, programmable between -10 and +10 V. Type B has the same outputs as type A, but in addition it is also supplied with a programmable pulse output from 10 pph to a maximum frequency of 10 kHz. Type C has 2 relay outputs with programmable set-points and time delay.

The unit is supplied with 2 trimming potentiometers, which can be used to fine-adjust the metering range, if the unit is used with analogue outputs, or to adjust the set-point if the unit has relay outputs. In either case the potentiometers can be disabled and fixed values selected, if adjustment is not required. The converter can be ordered with specified metering ranges, or it can be programmed by means of the "DTV-Control" programming software and a small interface to connect between the PC and the module.



Technical Data

Input

Range (configurable):	Current 15 μ A...10 A AC / DC - Input frequency 5...420 kHz (AC input) - Metering range 290 mA...10 A DC, $R_{in} = 10$ mOhm, max. inrush current (10 sec.): 20 A - Metering range 8 mA...290 mA DC, $R_{in} = 2,7$ Ohm, max. inrush current (10 sec.): 1 A - Metering range 15 μ A...8 mA DC, $R_{in} = 55$ Ohm, max. inrush current (10 sec.): 130 mA Voltage 10 mV...1000 V AC / 1500 V DC - Input frequency 5...420 kHz (AC input) - Metering range 10 mV...1,1 V DC, $R_{in} = 4,2$ kOhm, max. voltage (10 sec.): 60 V - Metering range 1,1 V...38 V DC, $R_{in} = 270$ kOhm, max. voltage (10 sec.): 220 V - Metering range 38 V...1500 V DC, $R_{in} = 10$ MOhm, max. continuous voltage: 1800 V, max. voltage (10 sec.): 2000 V
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Configuration: with PC, programming software and interface

Output

Current output (configurable):	0...20 mA, programmable, ext. load max. 500 Ohm
Voltage output (configurable):	-10...+10 V, programmable, ext. load min. 1000 Ohm
Pulse output: (Option)	from 10 ppH to 10 kHz, programmable NPN, PNP or active output NPN and PNP: max. 30 V DC, max. 30 mA Collector-Emitter saturation voltage 0,1 ... 0,3 V (max.) Active output: $V_{out} = 10$ V, $R_{out} = 2$ kOhm, min. 10 kOhm
Relay output (configurable): (Option)	2 relay outputs with programmable set-points and time delay, max. load 4 A / 250 V AC

Accuracy

Accuracy:	< 0,2 % (except 10 A range) < 1 % (10 A range at $I_{in} > 5$ A)
Linearity:	< 0,02 %
Resolution:	0,037 to 0,1 %, dependent on the programmed metering range. If the unit is programmed with input and / or output offset, the resolution will be reduced proportionally.
Temp. coefficient:	< 0,003 % / °C

Power Supply

Supply voltage AC:	24, 115, 230 and 400 V AC (+/- 10 %)
Supply frequency:	40... 70 Hz
Supply voltage DC:	12...50 V DC
Isolation voltage:	Supply - internal electronics: 3,75 kV Input - output: 2,5 kV
Power consumption:	6 VA

Ambient Conditions

Operation temperature: -20 °C...+60 °C

Humidity: 0-90 % rF, non condensing

Dimensions

Case:	16-terminal top hat rail-case with terminal cover plate
Dimensions:	70 x 45 x 117 mm
Fixing:	snap-in fixing on top hat rail
Case material:	plastic CYCOLOY C2100
Colour:	grey (terminal cover black)
Weight:	approx. 360 g
Connection:	Screw terminals for max. 2,5 mm ²

Operating, Adjustment hints

Connections

Power supply:
terminal 15 and 16

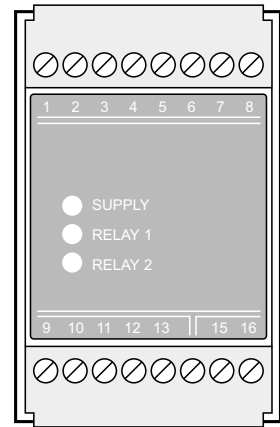
Inputs:
1: input common
2: 10 A AC/DC
3: 207 mA AC / 292 mA DC
4: 5,8 mA AC / 8,2 mA DC
5: 0,8 V AC / 1,1 V DC
6: 27 V AC / 39 V DC
8: 1000 V AC / 1500 V DC

Outputs, type PCV 10-A and PCV 10-B:

9: output common
10: current output
11: voltage output
12: pulse output (only type PCV 10-B)

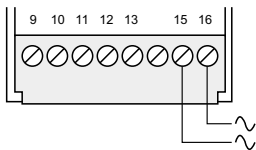
Outputs, type PCV 10-C:

9: relay 1, NC
10: relay 1, common
11: relay 1, NO
12: relay 2, common
13: relay 2, NO

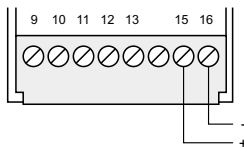


Connection drawings

AC supply voltage

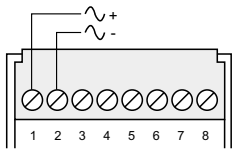


DC supply voltage

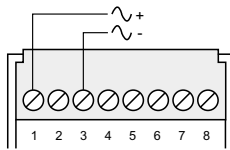


Current metering inputs

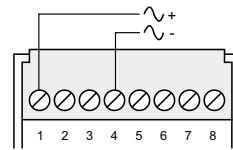
High, max. 10 A AC 7 DC



Medium, max. 207 mA AC / 292 mA DC

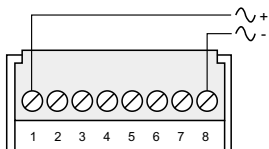


Low, max. 5,8 mA AC / 8,2 mA DC

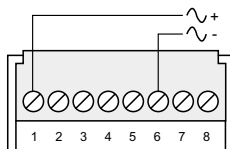


Voltage metering inputs

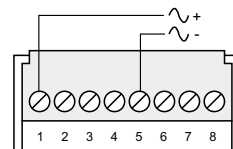
High, max. 1000 V AC / 1500 V DC



Medium, max. 27 V AC / 39 V DC

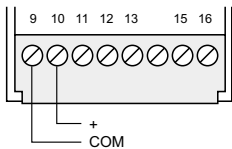


Low, max. 0,8 V AC / 1,1 V DC



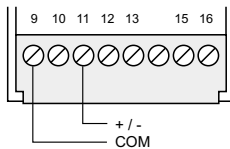
Analogue current output

Programmable range
between 0 and 20 mA



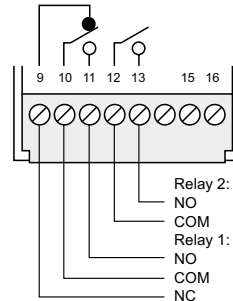
Analogue voltage output

Programmable range
between -10 and +10 V



Relay outputs

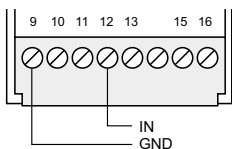
(only type PVC 10-C)
Relay outputs: max. load
4 A, 250 V AC



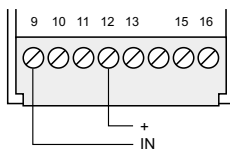
Pulse outputs

(only type PVC 10-B)

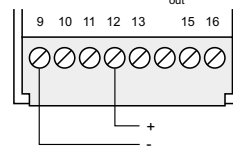
NPN output: external load
max. 30 V / 30 mA



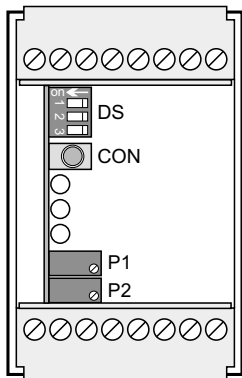
PNP output: external load
max. 30 V / 30 mA



Pulse output: $V_{out} = 10 V$
 $R_{out} = 2 k\Omega$



Programming connections and adjustments



Programming connector CON:

Connects to the PC via interface cable. The interface unit is powered from the mains, which means it is not necessary to connect any external supply voltage to the PCV unit during programming.

Function selector switch DS:

- 1 OFF: Normal mode
- 1 ON: Programming mode
- 2 OFF: Disable P1 adjustment
- 2 ON: Enable P1 adjustment
- 3 OFF: Disable P2 adjustment
- 3 ON: Enable P2 adjustment

Potentiometers P1 and P2:

PCV 10-A and PCV 10-B:

- P1 = Offset fine adjust +/- 5 %
- P2 = Span fine adjust +/- 5 %

PCV 10-C:

- P1 = Fine adjust set-point 1 or time-delay 1 (range and function programmable)
- P2 = Fine adjust set-point 2 or time-delay 2 (range and function programmable)

PCV 10 programming:

It is possible to program and reprogram the unit at any time, no matter if the supply voltage is connected or not. If the program is modified while the unit is installed and in operation, all input signal conversions are disabled and the output will not update as long as DS 1 is ON.

Programming of the unit is made by following the instructions in the "DTV-Control" programming software.

The unit starts with the modified program as soon as DS 1 is switched back to OFF position.

Fine adjustments with potentiometer 1 and 2:

In order to avoid unwanted modifications of the programmed ranges and to ensure a good temperature stability it is only possible to fine-adjust the programmed metering ranges if you use the following procedure:

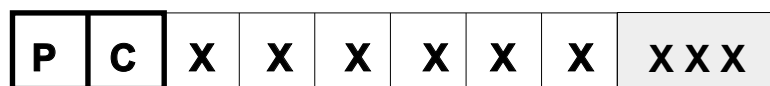
When you have a known and stable input signal, you set switch 2 or 3 ON, for P1 or P2 adjustment, respectively. When the switch has been activated for minimum 2 seconds, the supply LED flashes quickly and the output signal changes to the value, which corresponds to the actual position of the potentiometer. Now you adjust the output signal to the wanted value, and then you set the switch back in OFF position. The modified range is now programmed, and the power LED is ON again. If you want to adjust the ranges again, you set the switch back in ON position, wait for the LED to flash, adjust on the potentiometer, and set the switch back in OFF position.

Please notice, that it is only possible to adjust on one of the potentiometers at a time, i.e. you cannot set both switch 2 and 3 ON simultaneously.

Reset to the programmed settings:

If you have fine-adjusted the programmed ranges, and you want to reset to the original settings, you use the following procedure: Set switch 2 or 3 ON, depending on which of the ranges you want to reset. Wait for the supply LED to flash. Set switch 1 ON, and reset switch 2 or 3 to OFF position. Set switch 1 OFF again. Now the selected range has been reset, and you can repeat the procedure on the other range, if you want.

Ordering key



Number	Type	Input	Output	Output configuration	Supply voltage		
0	without Programming	non	non	Current and voltage (A)	24 V AC		
1	with Programming	please signalize	please signalize	Current, voltage and pulse (B)	115 V AC		
2				Relay (C)	230 V AC		
3					400 V AC		
4					12-50 V DC		