

**AC/DC current inputs from 15  $\mu$ A to 10 A**

**AC/DC voltage inputs from 10 mV to 1500 V**

**Frequency monitoring up to 5 kHz**

**Analogue or pulse outputs**

**Galvanic separation, supply - input - output**

**DC supply or AC supply voltages up to 400 VAC**

**Made in accordance with the **CE** and EMC regulations**



PCV10 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  $\mu$ A and 10 A or 15 mV and 1000VAC/1500 VDC. With DC-inputs it is possible to monitor both positive and negative signals.

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 2 different output configurations:

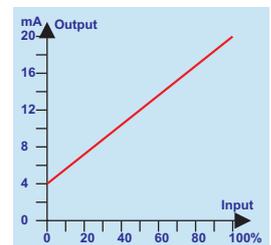
- **Type A** is supplied with analogue current output, programmable between 0 and 20 mA and analogue voltage output, programmable between -10 and +10 V.
- **Type B** has the same outputs as type A, but in addition it is also supplied with pulse output, programmable to a maximum frequency of 10 kHz.

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. In either case the potentiometers can be disabled and fixed values selected, if adjustment is not required.

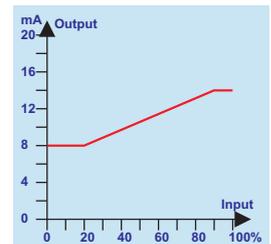
If you want, you can order the unit with specified metering ranges, or you can program it yourself, by means of the C-mac programming software for PC and a small interface to connect between the PC and the module.

All parameters in the converter are programmable within the specified limitations (min. and max. input and output levels), giving the following possibilities:

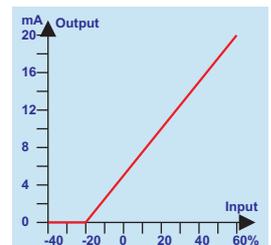
- **Basic converter, (0 to defined input range and standard output range, 0-20 mA, 4-20 mA or 0-10 V).**



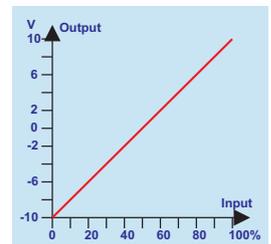
- **Converter with input and/or output offset, e.g. 12 to 50 VDC input and 8 to 15 mA output.**



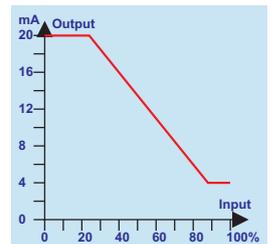
- **Bidirectional input range (only DC inputs), e.g. -50 to +300 mA.**



- **Bidirectional output range (only voltage output), e.g. -10 to +10 V.**



- **Inverted function with or without offset, f.inst 150 to 20 VAC input and 4 to 20 mA output.**



## PCV10 connections:

### Supply voltage.

terminal 15 and 16

### Inputs.

- 1: input common
- 2: 10 AAC/DC
- 3: 207 mAAC/292 mADC
- 4: 5,8 mAAC/8,2 mADC
- 5: 0,8 VAC/1,1 VDC
- 6: 27 VAC/39 VDC
- 8: 1000 VAC/1500 VDC

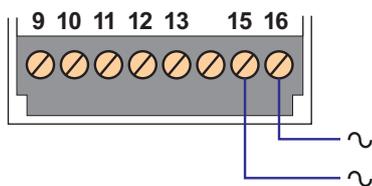
### Outputs, type PCV10-A and PCV10-B.

- 9: output common
- 10: current output
- 11: voltage output
- 12: pulse output ( type PCV10-B only)

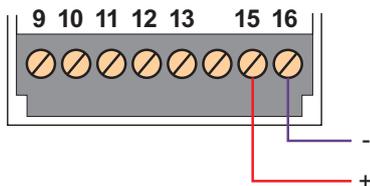


## Connection drawings:

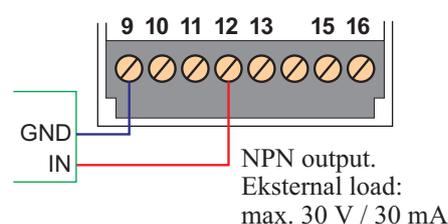
### Supply voltage, AC



### Supply voltage, DC

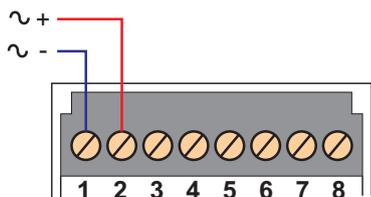


### Pulse outputs type PCV10-B only):



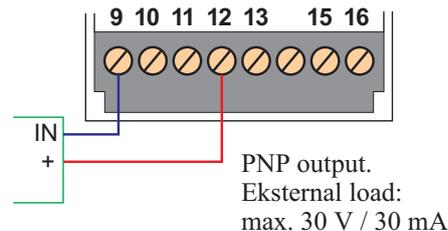
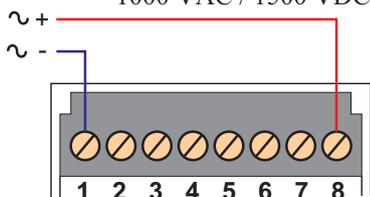
### Current inputs:

High, max. 10 A AC/DC

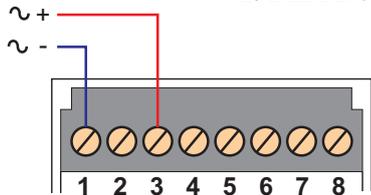


### Voltage inputs:

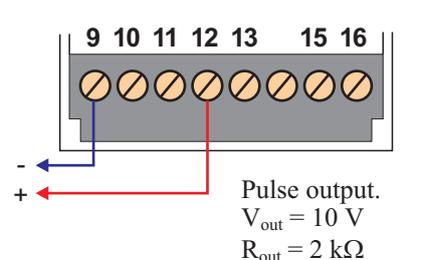
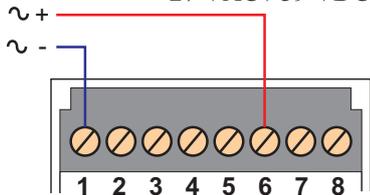
High, max. 1000 VAC / 1500 VDC



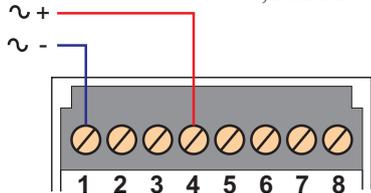
Medium, max. 207 mA AC  
292 mA DC



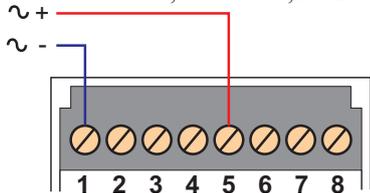
Medium, max. 27 VAC / 39 VDC



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

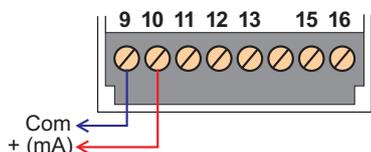


Low, max. 0,8 VAC / 1,1 VDC



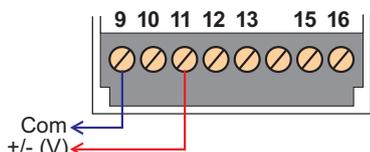
### Analog current output:

Programmable ranges  
between 0 and 20 mA

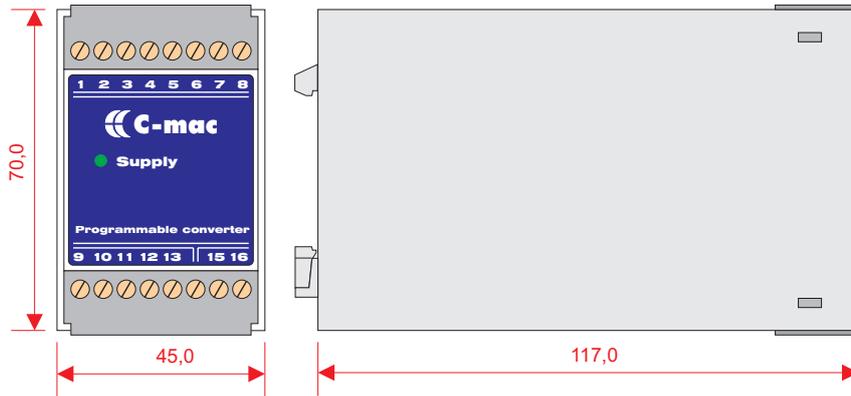


### Analog voltage output:

Programmable ranges  
between -10 and +10 V



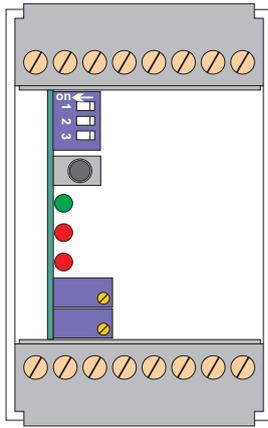
## Mechanical dimensions:



## Materials:

<b>Housing base:</b>	CYCOLOY C2100, grey
<b>Frontplate:</b>	CYCOLOY C2100, grey
<b>Terminal cover:</b>	CYCOLOY C2100, black
<b>Terminals:</b>	nickel plated brass
<b>Screws:</b>	nickel plated iron
<b>Weight:</b>	350 g

## Programming connections and adjustments:



### Programming connector CON.

Connects to the PC via C-mac interface cable.

The interface unit is internally battery powered, 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.

*PCV10-A and PCV10-B:*

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

## PCV10 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 C-mac 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 extinguishes 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 extinguish, 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 extinguish. 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.

## Technical data:

<b>Supply voltage AC:</b>	24, 115, 230 and 400 VAC +/- 10%
<b>Supply frequency:</b>	40-70 Hz
<b>Supply voltage DC:</b>	12-50 VDC
<b>Isolation voltages:</b>	Supply - internal electronics: 3,75 kV Input - output: 2.5 kV
<b>Power consumption:</b>	6 VA
<b>Operation temp.:</b>	-20°C to +60°C
<b>Humidity:</b>	0-90% RH, non condensing
<b>Temp. coefficient:</b>	< 0.003% /°C

### EMC data.

<b>Emission:</b>	EN 50 081 - 1
<b>Immunity:</b>	EN 50 082 - 2
<b>Safety:</b>	EN 60 730 - 1

**Approvals.** The module is produced in accordance with CE and high voltage regulations.

### Speed and accuracy.

<b>Conversion speed:</b>	
AC input (50 Hz):	in - out delay: 150 msec
DC input:	in - out delay: 20 msec.
<b>Accuracy:</b>	better than 0,2%, except at 10 A range
at $I_{in} > 5$ A:	accuracy better than 1%
<b>Linearity:</b>	better than 0.02%
<b>Resolution:</b>	Between 0,037% and 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. In either case the actual resolution is informed, when the unit is programmed.

### Indications:

Green LED:	Steady light = supply ON Flashing = programming mode
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### Outputs.

<b>Current output:</b>	Terminals 9-10, programmable from 0 to 20 mA. Max. external load: 500 $\Omega$
<b>Voltage output:</b>	Terminals 9-11, programmable from -10 to +10 V. Min. external load: 1000 $\Omega$
<b>Pulse output:</b>	Terminals 9-12, programmable NPN, PNP or active output. NPN and PNP: Max. external voltage: 30 VDC Max. load: 30 mA Active output: $V_{out} = 10$ V $R_{out} = 2$ k $\Omega$ Min. load resistance: 10 k $\Omega$
<b>Out of range:</b>	If the input signal is above or below the specified range, the output signal can move up to 5% above or below the specified output range. If wanted, this function can be disabled.

### Current inputs:

Terminals 1-2:	Metering ranges (DC) 290 mA to 10A $R_{in} = 10$ m $\Omega$ Max. inrush current (10 sec): 20 A
Terminals 1-3:	Metering ranges (DC) 8 mA to 290 mA $R_{in} = 2.7$ $\Omega$ Max. inrush current (10 sec): 1 A
Terminals 1-4:	Metering ranges (DC) 15 $\mu$ A to 8 mA $R_{in} = 55$ $\Omega$ Max. inrush current (10 sec): 130 mA

### Voltage inputs:

Terminals 1-5:	Metering ranges (DC) 15 mV to 1.1 V $R_{in} = 4.2$ k $\Omega$ Max. voltage (10 sec): 60 V
Terminals 1-6:	Metering ranges (DC) 1.1 V to 38 V $R_{in} = 270$ k $\Omega$ Max. voltage (10 sec): 220 V
Terminals 1-8:	Metering ranges (DC) 38 V to 1500 V $R_{in} = 10$ M $\Omega$ Max. continuous voltage: 1800 V Max. voltage (10 sec): 2000 V

### AC input, current or voltage:

Input frequency: 5 - 420 Hz

### Frequency inputs:

If the unit is programmed to monitor the frequency of the input signal, the normal current or voltage inputs are used. Because the pulses are detected at a level very close to zero, it is only recommended to use the frequency option, if the input signal comes from an AC source. During programming you select the input which corresponds to the actual current- or voltage level.

### Panel mounting.

If several modules are placed beside each other in a control panel, there must be a minimum distance of 5 mm between each module.

### Ordering guide.

#### 1. Basic units without range programming.

PCV10-x-yyy

x = Output configuration.

A: Current and voltage output

B: Current, voltage and pulse output

yyy = Supply voltage.

024 = 24 VAC 115 = 115 VAC

230 = 230 VAC 400 = 400 VAC

712 = 12-50 VDC

#### 2. Converters included range programming.

When the modules are ordered with programmed ranges, the same ordering numbers are used to specify the basic unit, but in addition, the wanted ranges must be specified, as shown on the examples below:

e.g. 1: PCV10-A-230 In: 0-85 VAC Out: 4-20 mA

e.g. 2: PCV10-B-024 In: 0-100 mADC Out: -10 to +10 V  
Pulse out: NPN, 0-600 p.p.m, pulse width 20 msec.