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AC100 & AC420

HIGH ACCURACY MILLIVOLT AMPLIFIERS

AC100 and AC420 are high accuracy amplifiers that are specially designed for use with thermopile sensors. The primary application is with heat flux sensors, pyranometers, net-radiometers and pyrheliometers.

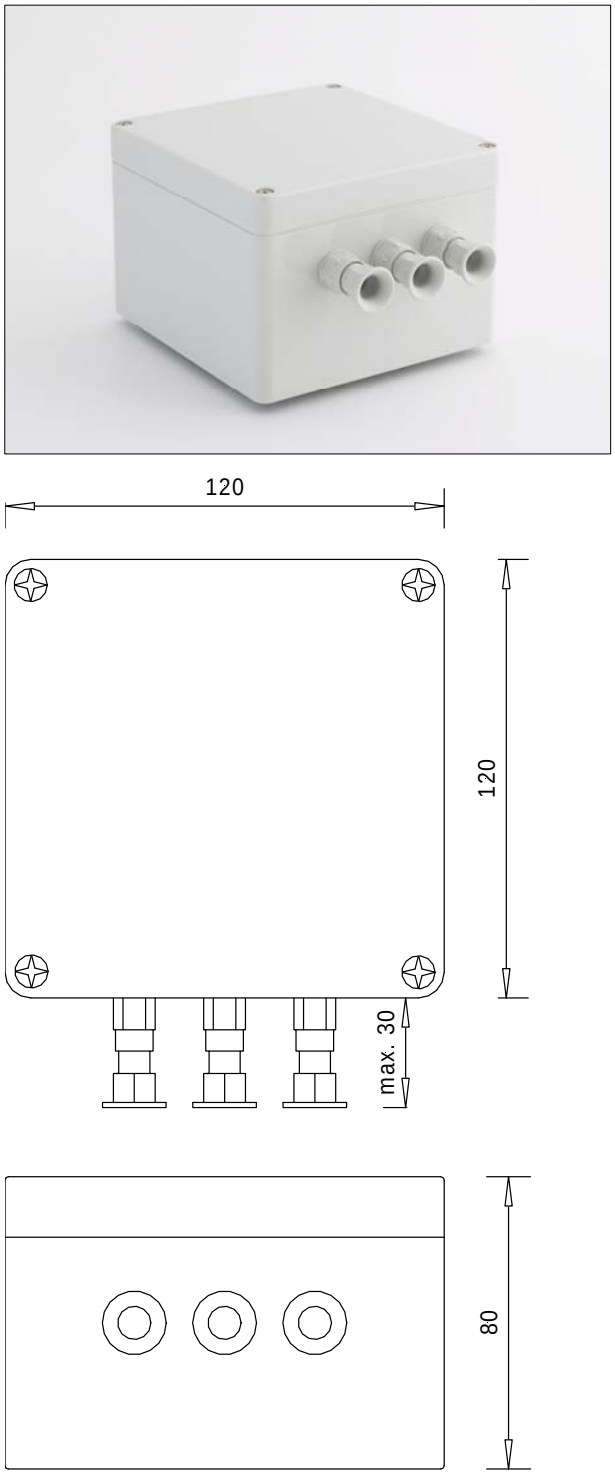

Figure 1
AC100 and AC 420 dimensions. all dimensions are in millimetres.

INTRODUCTION

The specifications of both amplifiers are such that they can be used with the highest class of this type of instruments, while ensuring that no accuracy is lost. Also the amplifiers contain protection against transients (useful in meteorological applications). In this sense, AC100 and AC420 are unique. AC100 has a voltage output, AC420 has a 4 to 20 mA current output.
While the current output in some applications has the advantage of extra quality assurance for cable breaks (current will go to zero), it has the disadvantage that it cannot be used with negative input signals; so use with sensors that produce signals that are both positive and negative, such as net-radiometers and heat flux sensors in meteorological situations, is not possible.

AC100 & AC420 FEATURES & BENEFITS

- Extremely low zero offset and range drift over the entire temperature range.
- Adaptable sensitivity, by do-it-yourself mounting of ordinary metal film resistors
- Possibility of feeding through extra wires, e.g. from temperature sensors or more voltage signals that are led through the same cable as the signal that must be amplified.
- Can be used with the highest accuracy lowest signal sensors without loss of accuracy.
- Suitable for outdoor installation.

MORE INFORMATION / OPTIONS

MA 220 mains adapter for 110/ 220 VAC
See also NAM01 nanovolt amplifier

AC100 & AC420 SPECIFICATIONS

	AC100	AC420
Typical sensors:	Heat flux plates, pyranometers net –radiometers, pyrgeometers pyrheliometers, albedometers. Connectors for wiring of additional temperature sensors are available inside AC100 housing	Pyranometers, pyrheliometers albedometers, heat flux plates in applications with only one-way heat flux. Connectors for wiring of additional temperature sensors are available inside AC420 housing
Minimal full scale input:	+/- 3 mV	0 to + 3 mV
Maximum full scale input:	1000 mV	1200 mV
Output:	Voltage between +3 and –3 Volt	4 –20 mA current loop (to 3.5 mA)
Standard Amplification (A):	200	1 mA/mV
Do-it –yourself adjustment of A by resistor R:	A = (2*(50.000/R)+1 A from 1 to 1000. R can be composed of 1 to 3 separate resistors in series.	10 mV full scale, using 4 to 14 mA range R = 100* full scale input A from 16 mA/5 mV to 16 mA/1200 mV. R can be composed of 1 to 3 separate resistors in series.
Example of R calculation:	R of 1000 ohm plus 10 ohm gives an A of 100.	Heat flux sensor UT03 delivers 4.56 mV an 1000 W/m2 heat flux. R of 456 ohms delivers 4 mA at zero input and 14 mA at 1000 W/m^2. AC 420 is only to be used if the input voltage does not reverse / change sign.
Specifications of R:	1%, 50 ppm metal film resistor	1%, 50 ppm metal film resistor
Input impedance:	1 Mohm	1 Mohm
Ambient temperature range:	-20 to + 50 °C	-20 to + 50 °C
Temperature range for storage:	-30 to + 70 °C	-30 to + 70 °C
Zero drift at output:	< 0.05 mV/°C	< 0.25 m A/°C
Range drift at output:	< 20 ppm/°C	< 20 ppm/°C
Initial accuracy:	0.1%	0.1%
Power supply:	8 – 24 VDC	10 – 24 VDC
Supply current:	< 20 mA	n.a.
Loop voltage to output ratio:	n.a.	< 10 mA / V
Output impedance:	< 10 ohm	n.a.
Maximum load:	< 1 mA	n.a.
Response time:	< 1 s	< 1 s
Connection:	Swivels for cables from 4 to 6 mm diameter	Swivels for cables from 4 to 6 mm diameter
Input protection:	Protected against static discharge, reverse power	Protected against static discharge, reverse power