

# AC Current Transducer AKR-C420L

Transducer for the electronic measurement AC current, with galvanic separation between the primary circuit and the secondary circuit. Jumper selectable ranges and True RMS 4-20 mA current output.



## Electrical data

Primary nominal current $I_{PN}$ (At RMS)	Analog output voltage <sup>1)</sup> $I_{out}$ (mA)	Types
2, 5	4-20	<b>AKR 5 C420L</b>
10, 20, 50	4-20	<b>AKR 50 C420L</b>
100, 150, 200	4-20	<b>AKR 200 C420L</b>

$U_C$ Supply voltage (Loop powered)	24	V DC
$R_L$ Load resistance	see power supply diagram	

## Accuracy - Dynamic performance data

$\epsilon_{tot}$ Accuracy @ $I_{PN}, T_A = 25\text{ }^\circ\text{C}$	$\pm 1$	%
$t_{D90}$ Delay time to 90 % of the final output value for $I_{PN}$ step < 600		ms
$BW$ Frequency bandwidth	10-400	Hz

## General data

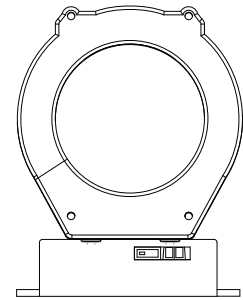
$T_A$ Ambient operating temperature (0-95 % RH)	-20 ... +50	$^\circ\text{C}$
$T_{A, st}$ Ambient storage temperature	-20 ... +85	$^\circ\text{C}$
$m$ Mass	90	g
Sandards	Safety IEC 61010-1: 2001 EMC EN 61326-1: 2005	

**Note:** <sup>1)</sup> For 4-20 mA output model, no saturation output up to 23 mA.

### Selecting the transducer

VFD (Variable Frequency Drive) and SCR (Semi Conductor Rectifier) output waveforms are rough approximations of a sine wave. There are numerous spikes and dips in each cycle. AKR transducers use a mathematical algorithm called "True RMS", which integrates the actual waveform over time. True RMS is the only way to accurately measure distorted AC waveforms. *Select AKR transducers for nonlinear loads or in "noisy" power environments.*

$$I_{PN} = 2 \dots 200 \text{ A}$$



### Features

- VFD and SCR waveforms current measurement
- True RMS responding
- 4-20 mA current output
- Loop powered transducers
- Panel mounting
- Accurate
- Jumper selectable ranges.

### Advantages

- Large aperture
- High insulation between primary and secondary circuits
- Easy to mount.

### Applications

- **VFD Controlled Loads**  
VFD output indicates how the motor and attached load are operating.
- **SCR Silicon Controlled Loads**  
Accurate measurement of phase angle fired or burst fired (time proportioned) SCRs.
- **Switching Power Supplies and Electronic Ballasts**  
True RMS sensing is the most accurate way to measure power supply or ballast input power.

### Options on request

- DIN mounting.

### Application domain

- Renewable Energies and Power Supplies.

## AC current Transducer AKR-C420L

### Insulation coordination

$U_d$	RMS voltage for AC insulation test <sup>1)</sup> , 50 Hz, 1 min	3	kV AC
$U_{Nm}$	Rated insulation RMS voltage <sup>2)</sup> , reinforced or basic insulation, CAT III, PD2	150	V AC

**Notes:** <sup>1)</sup> Between primary (completely filling the primary aperture) and secondary

<sup>2)</sup> If insulated cable is used for the primary circuit, the voltage category could be improved according to the insulation coordination given by the cable manufacturer. For example:

Cable insulation (primary):	Category:
HAR 05	600 V CAT III
HAR 07	1000 V CAT III

### Safety and warning notes

In order to guarantee safe operation of the transducer and to be able to make proper use of all features and functions, please read these instructions thoroughly! Safe operation can only be guaranteed if the transducer is used for the purpose it has been designed for and within the limits of the technical specifications. Ensure you get up-to-date technical information that can be found in the latest associated datasheet under [www.lem.com](http://www.lem.com).



#### Caution! Risk of danger

Ignoring the warnings can lead to serious injury and/or cause damage! The electric measuring transducer may only be installed and put into operation by qualified personnel that have received an appropriate training. The corresponding national regulations shall be observed during installation and operation of the transducer and any electrical conductor. The transducer shall be used in electric/electronic equipment with respect to applicable standards and safety requirements and in accordance with all the related systems and components manufacturer's operating instructions.

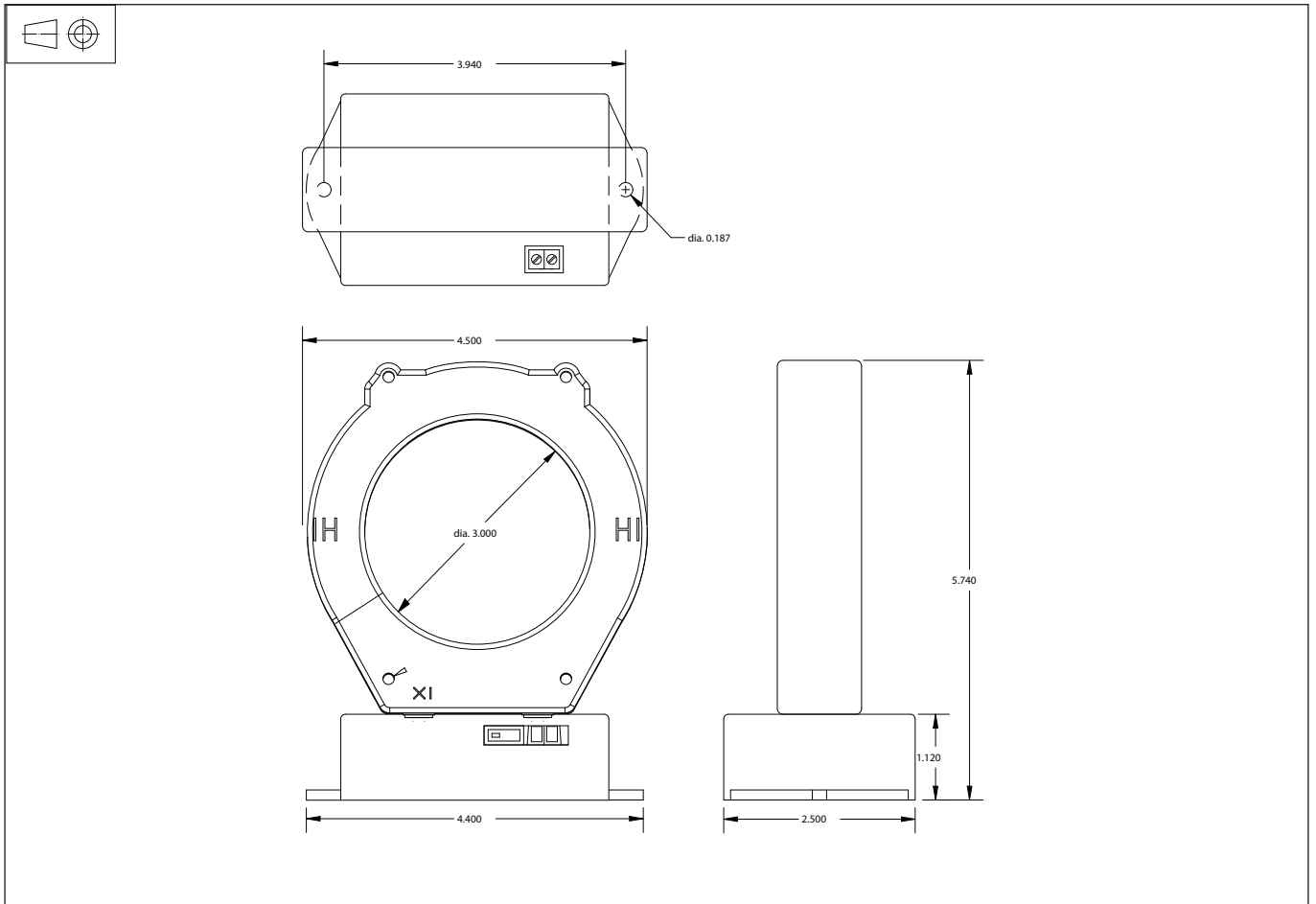


#### Caution, Risk of electrical shock

When operating the transducer, certain parts of the module may carry hazardous live voltage (eg. primary conductor, power supply). The user shall ensure to take all measures necessary to protect against electrical shock. The transducer is a build-in device containing conducting parts that shall not be accessible after installation. A protective enclosure or additional insulation barrier may be necessary. The transducer shall not be put into operation if the jaw opening is open (split core version) or the installation is not completed. Installation and maintenance shall be done with the main power supply disconnected except if there are no hazardous live parts in or in close proximity to the system and if the applicable national regulations are fully observed.

Safe and trouble-free operation of this transducer can only be guaranteed if transport, storage and installation are carried out correctly and operation and maintenance are carried out with care.

## Dimensions AKR-C420L (in mm)



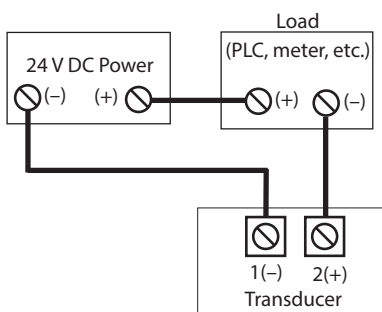
### Mechanical characteristics

- General tolerance  $\pm 1$  mm
- Primary aperture  $\varnothing 19$  mm
- Panel mounting 2 holes  $\varnothing 4.8$  mm  
Distance between holes centers 76.9 mm

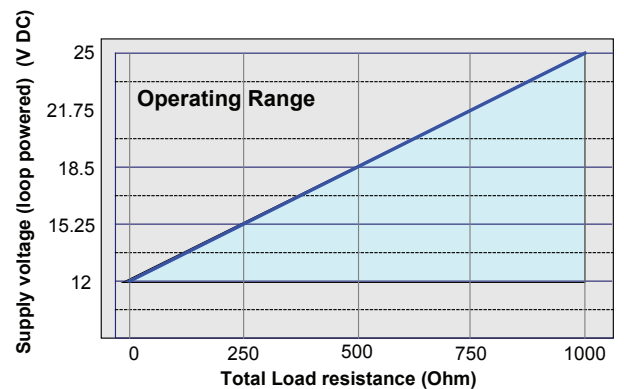
### Connections

- 2 × UNC8 Cylindric head

#### Standard Connection (4 - 20 mA)



### Power Supply diagram



$$U_c = 12 \text{ V DC} + (R_t \times 0.02 \text{ A}) \text{ Where } U_c = \text{Minimum supply voltage (Loop powered)}$$

$$R_t = \text{Total load resistance (Ohm)}$$

### Remark

- Temperature of the primary conductor should not exceed 60° C.