KELE AC CURRENT TRANSDUCER

4CTV, 4CMA

DESCRIPTION

The **Kele Models 4CTV** and **4CMA** are AC amperage-to-analog DC transducers that can be used to directly monitor loads of up to 20A. For loads of 20-5000A, an external current transformer can be used. Developed for building automation and energy management, the **Model 4CTV** converts an AC current to a 0-5 VDC voltage and the **Model 4CMA** converts an AC current to a 4-20 mA current that can be monitored by any processor that accepts analog DC voltage or current.

4CTV

FEATURES

- ***4CTV requires no external power supply***
- ***Rugged design to withstand momentary AC inrushes of 120A (6x rating)***
- ***Easy to install, only two connections***
- ***50/60 Hz operation***

APPLICATION

- ***AC current input to DC voltage or milliamp output***
- ***Monitoring of AC current of motors, lighting, heating, industrial processes, etc.***
- ***Monitoring of chiller loads using existing current transformers***

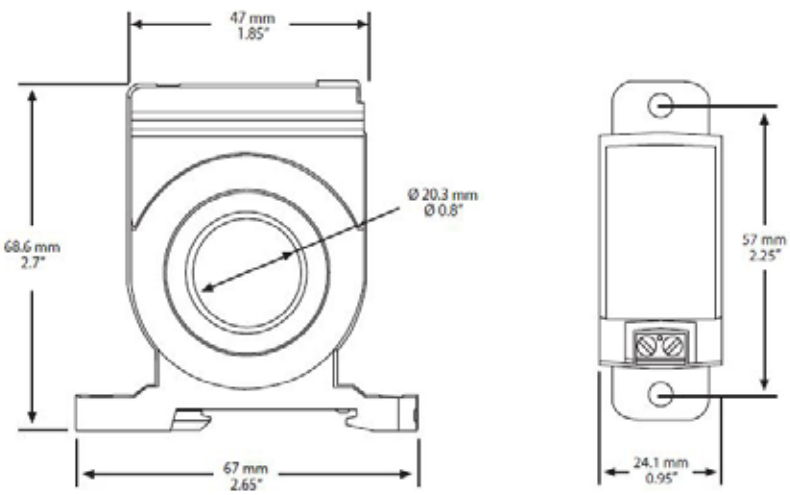
SPECIFICATIONS

Signal Output	
4CMA	4-20mA
4CTV	0-5 VDC
Sensor Power	
4CMA	15-30 VDC (loop powered)
4CTV	Self-powered
Measurement Range	0-20 Amps
Max Input Current	120 Amps Continuous
Insulation Class	600V, insulated conductors
Frequency	50/60 Hz
Response Time	
4CMA	200 ms Typical, 0-90%
4CTV	250 ms Typical, 0-90%

Output Load	
4CMA	1 MΩ Typical
4CTV	250Ω Typical
Accuracy	±2% FSO (5-100% of range)
Operating Temperature	5 to 140°F (-15 to 60°C)
Operating Humidity	5 to 90% RH non-condensing
Terminal Block	14 to 22 AWG
Enclosure Rating	NEMA 1
Dimensions	2.65" x 2.7" x 0.95" (67 x 68.6 x 24.1mm)
Sensor Aperture	0.8" (20.3 mm)
Enclosure Material	ABS/PC, UL94 V-0
Approvals	cULus Listed
Warranty	1 year

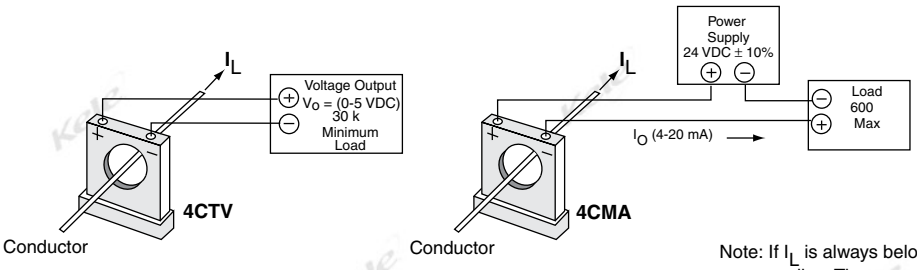
DIMENSIONS

in
(cm)



WIRING

APPLICATION #1. Monitoring Loads Under 20A



4CTV Formula:

I_L (load amps) = $\frac{20}{\text{turns}} \times \left(\frac{V_O}{5}\right)$

V_O= VDC from 4CTV
turns= number of times conductor passes through 4CTV

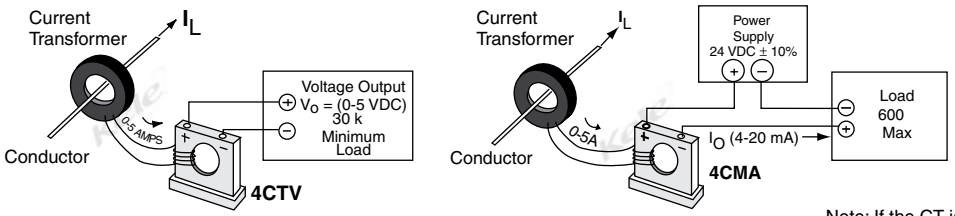
4CMA Formula:

I_L (load amps) = $\frac{20}{\text{turns}} \times \left(\frac{I_O - 4}{16}\right)$

I_O= mA DC from 4CMA
turns= number of times conductor passes through 4CMA

Note: If I_L is always below 10A, multiple passes of the conductor will improve scaling. The sum of these amperages must remain below 20A.

APPLICATION #2. Monitoring Loads Over 20A with a Current Transformer



4 turns for CTs with 5A secondaries
20 turns for CTs with 1A secondaries

4 turns for CTs with 5A secondaries
20 turns for CTs with 1A secondaries

4CTV Formula:

I_L (load amps) = $\frac{\text{CT primary}}{\text{rating}} \times \left(\frac{V_O}{5}\right)$

V_O= VDC from 4CTV

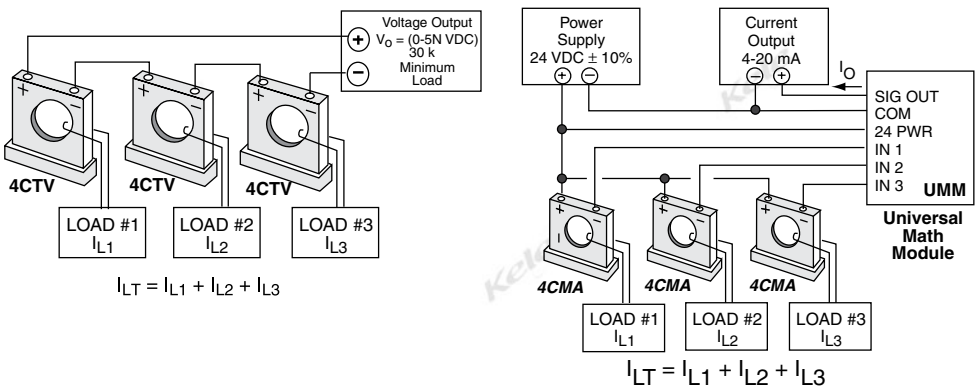
4CMA Formula:

I_L (load amps) = $\frac{\text{CT primary}}{\text{rating}} \times \left(\frac{I_O - 4}{16}\right)$

I_O= mA DC from 4CMA

Note: If the CT is oversized, multiple conductor passes or more secondary turns through the **4CTV** or **4CMA** will improve scaling. The CT output should not exceed 5A or the CT secondary turns should not total more than 20A.

APPLICATION #3. Monitoring and Summing Multiple Loads



4CTV Formula: For loads **under 20 amps**

I_{LT} (load amps) = $\frac{20 \times N}{\text{turns}} \times \left(\frac{V_O}{5 \times N}\right)$

4CTV Formula: For loads **over 20 amps**

I_{LT} (load amps) = $\frac{\text{CT primary}}{\text{rating total}} \times \left(\frac{V_O}{5 \times N}\right)$

V_O= VDC from **4CTVs**
turns = number of times conductor passes through **4CTV**
N = number of loads monitored

4CMA Formula: For loads **under 20 amps**

I_{LT} (load amps) = $\frac{20 \times N}{\text{turns}} \times \left(\frac{I_O - 4}{16}\right)$

4CMA Formula: For loads **over 20 amps**

I_{LT} (load amps) = $\frac{\text{CT Primary}}{\text{rating total}} \times \left(\frac{I_O - 4}{16}\right)$

N= number of loads monitored

turns = number of times conductor passes through **4CMA**

I_O= mA from UMM

Note: If the loads are from secondaries of current transformers, the CT ratios and the turns on the **4CTVs** and **4CMA** must all be the same. If CTs are used, the CT primary amps would be the total for all CTs used.

ORDERING INFORMATION

MODEL	DESCRIPTION
4CTV	Current transducer, 0-5 VDC voltage output
4CMA	Current transducer, 4-20 mA current output

	RELATED PRODUCTS	PAGE
500T/501T	Split-core current transformers	**935**
600T/601T	Split-core current transformers	**936**
AL/RL	Solid-core current transformers	**937**