

RISH CON - CA/CV

TRUE RMS CURRENT / VOLTAGE TRANSDUCER

Application :

The transducer **RISH CON - CA/CV** (Fig.1) converts a sinusoidal or distorted AC Current or AC Voltage into a **load independent** DC Current or a **load independent** DC Voltage proportional to the measured value. Output signal generated is proportional to the root mean square value of the input Current or Voltage.

Salient Features :

- ✓ True RMS measurement.
- ✓ Accuracy class **0.2** as per International Standard **IEC/EN 60 688**.
- ✓ Auxiliary Power Supply:
1) 40 V-300 V AC/DC.
or
2) 24 V-60 V AC/DC.
- ✓ Output Response Time < 250 ms.
- ✓ Fast and easy installation on DIN RAIL or onto a wall or in panel using optional screw hole bracket.
- ✓ Connection Terminal: Conventional Screw type.
- ✓ Narrow housing, 22.5 mm / saves space and costs.

Product Features :

Measuring Input :

AC Current/ Voltage input signal , sine wave or distorted waveform.

Auxiliary Power Supply:

- 1) 40 V-300 V AC/DC.
or
- 2) 24 V-60 V AC/DC.

Analog Output :

Isolated analog output, which can be Voltage or Current.

Accuracy:

Output signal accuracy class **0.2** as per International Standard **IEC/EN 60 688**.

LED Indication:

LED indication for power ON.

Output Response Time :

< 250 ms.



Fig. 1. Transducer **RISH CON - CA/ CV**.

Symbols and their meanings:

X = Input AC Voltage / AC Current.

Y = Output DC Voltage / DC Current.

H/L = Power supply.

F_N = Nominal Frequency.

R_N = Rated value of output burden.

U_N = Nominal input voltage.

I_N = Nominal input current.

Mode of Operation :

Input signal X is separated from the mains network by using a transformer.

The following mathematical expression is formed using RMS value computer

$$Y_{eff} = \sqrt{(1/T) \int_0^T X^2 dt}$$

The transformation properties of the measuring transducer are determined in the succeeding characteristics circuit.

The output amplifiers transforms the measuring signal into an impressed output signal Y.

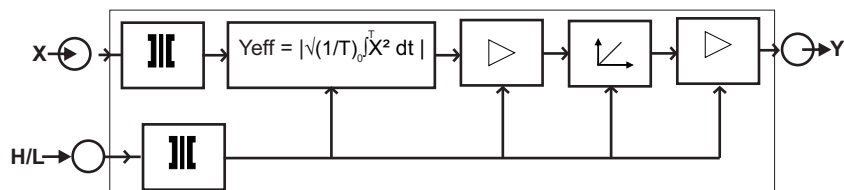


Fig. 2. Block Diagram.

RISH CON - CA/CV

TRUE RMS CURRENT / VOLTAGE TRANSDUCER

Technical Specifications :

Measuring Input X:

Voltage Transducer (RISH CON - CV) :

Final value of Nominal input Voltage U_N (X2,AC RMS) $63.5V \leq U_N \leq 500 V.$

Nominal Frequency F_N 50 or 60 Hz.

Nominal input Voltage burden $< 0.6VA$ at $U_N.$

Overload Capacity: $1.2 * U_N$ continuously,
 $2 * U_N$ for 1 second, repeated 10 times at 10 second intervals.

Current Transducer (RISH CON - CA):

Final value of Nominal input Current I_N (X2,ACRMS) 1 A, 5 A.

Nominal Frequency F_N 50 or 60 Hz.

Nominal input Current burden $< 0.2VA$ at $I_N.$

Overload Capacity: $1.2 * I_N$ continuously,
 $10 * I_N$ for 3 second, repeated 5 times at 5 minute intervals,
 $20 * I_N$ for 1 second, repeated 5 times at 5 minute intervals,
 $50 * I_N$ for 1 second.

Measuring Output Y:

Output type Load independent DC Voltage/Current.

Load independent DC output (Y2) 0...10mA, 0...20mA, 2...10mA,
4...20mA, 0...5V, 0...10V.

Output burden with DC current output Signal $0 \leq R \leq 15 V/Y2$

Output burden with DC voltage output Signal $Y2/(2 \text{ mA}) \leq R \leq \infty$

Current limit under overload $R=0$ $\leq 1.6*Y2$ with Current output.
 $\leq 25 \text{ mA}$ with Voltage output.

Voltage limit under $R=\infty$ $\leq 1.6*Y2$ with Voltage output.
 $\leq 25 \text{ V}$ with Current output.

Residual Ripple in Output signal $\leq 1\% \text{ pk-pk.}$

Response Time $< 250 \text{ ms.}$

Auxiliary Supply H:

Rated operating voltage(for high Aux. supply H) 40...300 V AC/DC
Rated operating range of frequency(for high Aux. supply H) 45...50...60...65 Hz
Power consumption(for high Aux. supply H) $< 4 \text{ VA}$
Rated operating voltage(for low Aux supply L) 24...60 V AC/DC $\pm 10\%$
Rated operating range of frequency(for low Aux. supply L) 40...50...60...400 Hz
Power consumption(for low Aux. supply L) $< 3 \text{ VA}$



RISHABH
INSTRUMENTS
Measure, Control & Record with a Difference

RISHABH INSTRUMENTS PVT.LTD.
F-31, MIDC, Satpur, Nashik-422 007, India.
Tel.: +91 253 2202160, 2202202 Fax : +91 253 2351064
E-mail : India :- marketing@rishabh.co.in
International :- exp.marketing@rishabh.co.in
www.rishabh.co.in

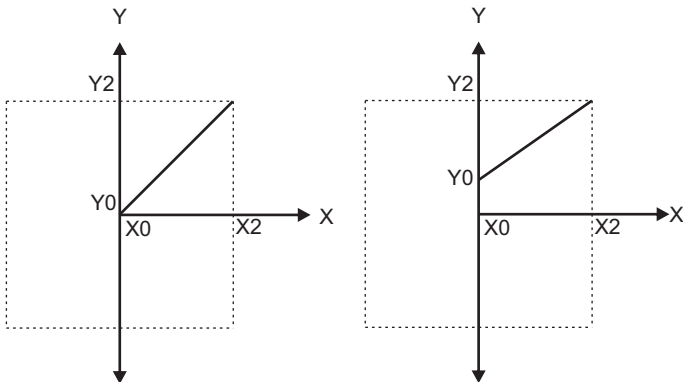
RISH CON - CA/CV

TRUE RMS CURRENT / VOLTAGE TRANSDUCER

Accuracy: (Acc. to IEC/EN 60 688)

| | |
|--|---|
| Reference Value | Output End Value Y2 (Voltage or Current) |
| Accuracy class | 0.2 |
| Reference conditions for Accuracy : | |
| Ambient temperature | 23°C +/- 1°C |
| Pre-conditioning | 30 min acc. to IEC/EN 60 688 |
| Input Variable | Rated Voltage Range / Rated Current Range. |
| Input waveform | Sinusoidal, Form Factor 1.1107 |
| Input signal frequency | 50...60Hz |
| Auxiliary supply voltage | Rated Value ±1% |
| Auxiliary supply frequency | Rated Value ±1% |
| Output Load | $R_N = 7.5 \text{ V} / Y2 \pm 1\%$ With DC Current output signal. $R_N = Y2 / 1 \text{ mA} \pm 1\%$ With DC Voltage output signal. |
| Miscellaneous | Acc. to IEC/EN 60 688 |
| Additional Error : Temperature influence | ± 0.2% /10°C |
| Influence of Variations: | As per IEC/EN 60 688 standard. |

Output characteristics:



X0 = Start value of input

Y0 = Start value of output

X2 = End value of input= U_N/I_N

Y2 = End value of output

U_N = Nominal input voltage

I_N = Nominal input current



RISHABH
INSTRUMENTS
Measure, Control & Record with a Difference

RISHABH INSTRUMENTS PVT.LTD.

F-31, MIDC, Satpur, Nashik-422 007, India.

Tel.: +91 253 2202160, 2202202 Fax : +91 253 2351064

E-mail : India :- marketing@rishabh.co.in

International :- exp.marketing@rishabh.co.in

www.rishabh.co.in

RISH CON - CA/CV

TRUE RMS CURRENT / VOLTAGE TRANSDUCER

Safety:

| | |
|-----------------------|---|
| Protection Class | II (Protection Isolated, EN 61 010) |
| Protection | IP 40, housing according to EN 60 529 IP 20 ,terminal according to EN 60 529 |
| Pollution degree | 2 |
| Installation Category | III |
| Insulation Voltage | 50Hz,1min. (EN 61 010-1) 5500V, Input versus outer surface. 3700V, Input versus all other circuits. 3700V, Auxiliary supply versus input and output circuits. |

Installation Data:

| | |
|--------------------|--|
| Mechanical Housing | Lexan 940 (polycarbonate) Flammability Class V-0 acc. To UL 94, self extinguishing, non dripping, free of halogen. |
| Mounting position | Rail mounting / wall mounting. |
| Weight | Approx. 0.12kg |

Connection Terminal:

| | |
|--|--|
| Connection Element | Conventional Screw type terminal with indirect wire pressure |
| Permissible cross section of the connection lead | ≤ 4.0 mm ² single wire or 2 x 2.5 mm ² fine wire |

Environmental:

| | |
|----------------------------------|---|
| Nominal range of use | 0 °C... <u>23 °C</u> ... 45 °C (usage Group II) |
| Storage temperature | -40 °C to 70 °C |
| Relative humidity of annual mean | ≤ 75% |
| Altitude | up to 2000 m |

Ambient tests:

| | |
|---|---|
| IEC 60 068-2-6 | Vibration |
| Acceleration | ± 2 g |
| Frequency range | 10....150...10Hz, |
| Rate of frequency sweep | 1 octave/minute |
| Number of cycles | 10, in each of the three axes |
| IEC 60 068-2-27 | Shock |
| Acceleration | 3 x 50g 3 shocks in each in 6 directions |
| EN 60 068-2-1/-2/-3 | Cold, Dry heat, Damp heat |
| IEC 61 000-4-2/-3/-4/-5/-6 EN 55 011 | Electromagnetic compatibility. |



RISHABH
INSTRUMENTS
Measure, Control & Record with a Difference

RISHABH INSTRUMENTS PVT.LTD.
F-31, MIDC, Satpur, Nashik-422 007, India.
Tel.: +91 253 2202160, 2202202 Fax : +91 253 2351064
E-mail : India :- marketing@rishabh.co.in
International :- exp.marketing@rishabh.co.in
www.rishabh.co.in

RISH CON - CA/CV

TRUE RMS CURRENT / VOLTAGE TRANSDUCER

Electrical Connections :

| Connection | Terminal details | |
|-------------------------|------------------|--------|
| Measuring input | ~ | 3 4 |
| Auxilliary Power supply | ~ , + ~ , - | 5 6 |
| Measuring output | + - | 1 2 |

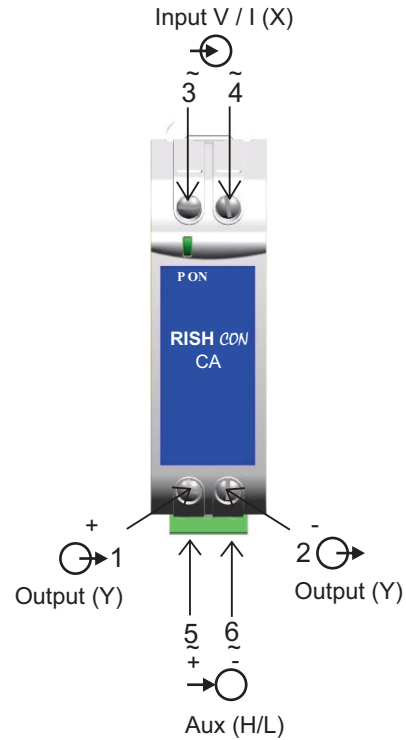
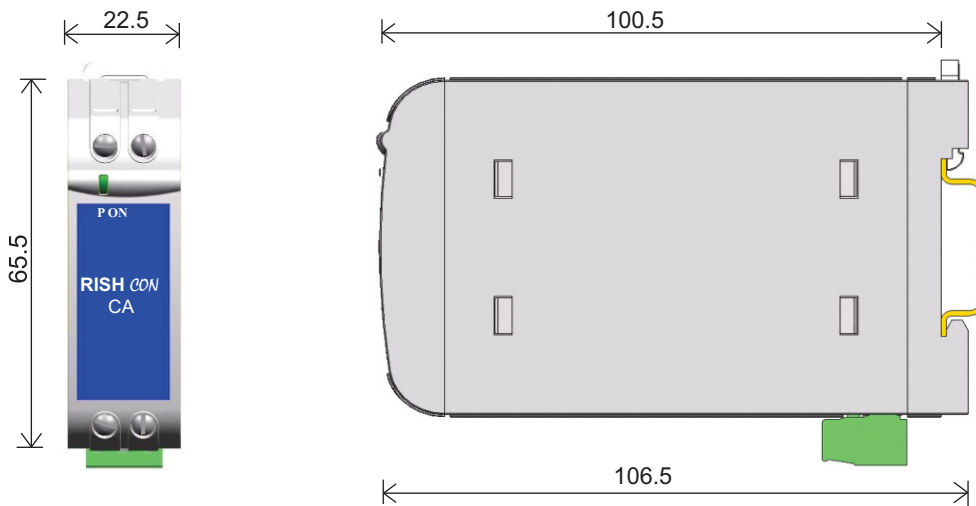


Fig. 3. RISH CON - CV/CA Connection Diagram.

Dimensions :



Note : All Dimensions are in mm.

Fig. 4. RISH CON - CV/CA Dimensions.



RISHABH
INSTRUMENTS
Measure, Control & Record with a Difference

RISHABH INSTRUMENTS PVT.LTD.
F-31, MIDC, Satpur, Nashik-422 007, India.
Tel.: +91 253 2202160, 2202202 Fax : +91 253 2351064
E-mail : India :- marketing@rishabh.co.in
International :- exp.marketing@rishabh.co.in
www.rishabh.co.in

RISH CON - CA/CV

TRUE RMS CURRENT / VOLTAGE TRANSDUCER

Ordering Information :

| Sr.No. | Transducer parameter | Ordering Code |
|-------------------|-------------------------------|----------------------|
| 1 | Input Signal | |
| | Voltage | RISH CON - CV |
| | Input Range : | |
| | Standard Ranges : | |
| | 0...63.5V | 01 |
| | 0...100V | 02 |
| | 0...110V | 03 |
| | 0...150V | 04 |
| | 0...220V | 05 |
| | 0...230V | 06 |
| | 0...240V | 07 |
| | 0...250V | 08 |
| | 0...300V | 09 |
| | 0...330V | 10 |
| | 0...415V | 11 |
| | 0...440V | 12 |
| | 0...450V | 13 |
| | 0...500V | 14 |
| | | |
| | Current | RISH CON - CA |
| Input Range : | | |
| Standard Ranges : | | |
| 0...1A | 01 | |
| 0...5A | 05 | |
| | | |
| | Input Signal Frequency | F |
| 50/60 Hz | | |
| 2 | Output Signal | |
| | Voltage | V |
| | Output Ranges | |
| | 0...10V | 01 |
| | 0...5V | 02 |
| | Current | I |
| | Output Ranges | |
| | 0...20mA | 01 |
| | 4...20mA | 02 |
| | 0...10mA | 03 |
| 2...10mA | 04 | |
| 3 | Power Supply | |
| | 40...300 V AC/DC | H |
| | 24...60 V AC/DC | L |

Examples:

RISH CON - CV - 14 - F - V - 01- H

RISH CON - CV is Voltage transducer, input range is 0... 500V, output is Voltage with range 0...10V, Power supply is 40...300 V AC/DC.

RISH CON - CA - 05 - F - I - 02- L

RISH CON - CA is Current transducer, input range is 0... 5A, output is Current with range 4...20 mA, Power supply is 24...60 V AC/DC.

RISH CON - CV - 06 - F - I - 01- L

RISH CON - CV is Voltage transducer, input range is 0... 230V, output is Current with range 0...20mA, Power supply is 24...60 V AC/DC.



RISHABH
INSTRUMENTS
Measure, Control & Record with a Difference

RISHABH INSTRUMENTS PVT.LTD.

F-31, MIDC, Satpur, Nashik-422 007, India.

Tel.: +91 253 2202160, 2202202 Fax : +91 253 2351064

E-mail : India :- marketing@rishabh.co.in

International :- exp.marketing@rishabh.co.in

www.rishabh.co.in