**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.
  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.
  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.

**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

\[ Y_{eff} = \frac{1}{(1/T)} \int X^2 \, dt \]

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.

**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.

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

**Fig. 2. Block Diagram.**
RISH \textit{CON} - CA/CV
TRUE RMS CURRENT / VOLTAGE TRANSDUCER

Technical Specifications :

Measuring Input X:

Voltage Transducer (RISH \textit{CON} - CV):
Final value of Nominal input Voltage $U_N$ (X2, AC RMS)

$63.5 \leq U_N \leq 500$ V.

Nominal Frequency $F_N$

50 or 60 Hz.

Nominal input Voltage burden

$< 0.6$ VA at $U_N$.

Overload Capacity:

$1.2 \times U_N$ continuously,

$2 \times U_N$ for 1 second, repeated 10 times at 10 second intervals.

Current Transducer (RISH \textit{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

$< 0.2$ VA at $I_N$.

Overload Capacity:

$1.2 \times I_N$ continuously,

$10 \times I_N$ for 3 second, repeated 5 times at 5 minute intervals,

$20 \times I_N$ for 1 second, repeated 5 times at 5 minute intervals,

$50 \times I_N$ for 1 second.

Measuring Output Y:

Output type

Load independent DC Voltage/Current.

Load independent DC output (Y2)

$0...10$ mA, $0...20$ mA, $2...10$ mA,

$4...20$ mA, $0...5$ V, $0...10$ V.

Output burden with DC current output

$0 \leq R \leq 15$ V/Y2.

Output burden with DC voltage output

$Y2/(2$ mA) $\leq R \leq \infty$.

Current limit under overload R=0

$\leq 1.6 \times Y2$ with Current output.

$\leq 25$ mA with Voltage output.

Voltage limit under R=\infty

$\leq 1.6 \times Y2$ with Voltage output.

$\leq 25$ V with Current output.

Residual Ripple in Output signal

$\leq 1\%$ pk-pk.

Response Time

$< 250$ 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)

$< 4$ 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)

$< 3$ VA
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 V / Y2 ± 1% With DC Current output signal.
  - R_N = Y2 / 1 mA ± 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
X2 = End value of input=U_N/I_N
U_N = Nominal input voltage
Y0 = Start value of output
Y2 = End value of output
I_N = Nominal input current
TRUE RMS CURRENT / VOLTAGE TRANSCLUDER

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 mm² single wire or 2 x 2.5 mm² fine wire

Environmental:

Nominal range of use 0 °C...23 °C... 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 Electromagnetic compatibility.
EN 55 011
**RISH CON - CA/CV**

TRUE RMS CURRENT / VOLTAGE TRANSDUCER

### Electrical Connections:

<table>
<thead>
<tr>
<th>Connection</th>
<th>Terminal details</th>
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<tbody>
<tr>
<td>Measuring input</td>
<td>3 _ 4</td>
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<tr>
<td>Auxiliary Power supply</td>
<td>5 _ 6</td>
</tr>
<tr>
<td>Measuring output</td>
<td>1 _ 2</td>
</tr>
</tbody>
</table>

![Connection Diagram](image)

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

### Dimensions:

![Dimensions](image)

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

**Note:** All Dimensions are in mm.
## RISH CON - CA/CV

TRUE RMS CURRENT / VOLTAGE TRANSUDER

### Ordering Information:

<table>
<thead>
<tr>
<th>Sr.No.</th>
<th>Transducer parameter</th>
<th>Ordering Code</th>
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<tbody>
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<td>1</td>
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<td>0...110V</td>
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<td>0...150V</td>
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<td>40...300 V AC/DC</td>
<td>H</td>
</tr>
<tr>
<td></td>
<td>24...60 V AC/DC</td>
<td>L</td>
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</tbody>
</table>

**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.