



Data Sheet

RISH CON-V / CON-I

Programmable Transducer



Measure



Control



Record



Analyze

Application

The RISH CON - V / RISH CON - I is used to measure and convert AC Voltage or Current input into a load independent DC current or voltage output signal. Output signal generated is proportional to the root mean square value of the input Current or Voltage.

Salient Features

- True RMS measurement
- Fully onsite programmable input voltage range (for RISH CON - V) & Input current range (for RISH CON - I)
- Available in Single or Dual output type
- Onsite selectable output type (DC current / DC voltage)
- Accuracy class 0.2 (IEC/ EN 60 688)
- Seven Segment LCD Display
- RS 485 (Modbus) Communication
- Wide Auxiliary power supply
- Accept any input between 60-300VAC/DC or 24-60VAC/DC
- Output Response Time < 400 ms
- Fast and easy installation on DIN RAIL or onto a wall or in a panel using optional screw hole bracket
- Connection Terminal : Conventional Screw type



Fig. 1 RISH CON - V

Product Features

Measuring Input

AC Voltage/ Current input signal, sine wave or distorted wave form

Analog Output (Single or dual)

Isolated analog output which can be set onsite to either voltage or current output

Accuracy

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

Programmable Input/Output

The Transducer can be programmed onsite using front key & display or through programming port (COM) or through RS 485

LED Indication

LED indication for power on and output type.
(Current output : Red LED, Voltage output : Green LED)

Display Module (Optional)

Optional 7 segment LCD display with backlit & keypad. For displaying measured parameters & onsite configuration of Input/output.

RS485 Communication (Optional)

Optional RS485 communication is available. For reading measured parameters & onsite configuration of input/output.

Symbols and their meaning

| | |
|----------------|---|
| X | Input AC Voltage / AC Current |
| X0 | Start value of input |
| X1 | Elbow value of input |
| X2 | End value of input |
| Y | Output DC Voltage / DC Current |
| Y0 | Start value of output DC Voltage / DC Current |
| Y1 | Elbow value of output DC Voltage / DC Current |
| Y2 | End value of output DC Voltage / DC Current |
| R _N | Rated value of output burden |
| F _N | Nominal Frequency |



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Technical Specifications

Measuring Input X

Voltage Transducer (RISH CON - V)

Nominal input Voltage UN (AC RMS)
(PT Secondary range) $57V \leq UN \leq 500 V$

PT Primary range 57V to 400 kV

Nominal Frequency FN 45....66 Hz

Nominal input Voltage burden $< 0.6 VA$ at UN

Overload Capacity: $1.2 * UN$ continuously,
 $2 * UN$ for 1 second, repeated 10 times at 10 minute intervals
(Maximum 300V with power supply powered from measuring input)

No need of external potentiometer. User can set full scale output for desired input with the help of programmable PT secondary.

Current Transducer (RISH CON - I)

Nominal input Current IN (AC RMS)
(CT Secondary range) $1 A \leq IN \leq 5 A$

CT Primary range 1 A to 9999 A

Nominal Frequency FN 45....66 Hz

Nominal input Current burden $< 0.2 VA$ at IN

Overload Capacity $1.2 * IN$ continuously,
 $10 * IN$ for 3 second, repeated 5 times at 5 minute intervals.
 $50 * IN$ for 1 second, repeated 1 time at 1 hour interval(max 250 A).

No need of external potentiometer. User can set full scale output for desired input with the help of programmable CT secondary.

Measuring Output Y(Single or Optional Dual)

Output type Load independent DC Voltage or DC Current
(Onsite selectable through DIP switches & programming.)

Load independent DC output (Y) $0 \dots 20mA / 4 \dots 20mA$ OR $0 \dots 10V$.

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

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

Current limit under overload $R=0$ $\leq 1.25 * Y2$ with current output
 $\leq 100 mA$ with voltage output

Voltage limit under $R=\infty$ $< 1.25 * Y2$ with voltage output
 $\leq 30 V$ with current output

Residual Ripple in Output signal $\leq 1\% pk-pk$

Response Time $< 400 ms$.



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Auxiliary Power Supply

AC/DC Auxiliary Supply
AC Auxiliary supply frequency range
Auxiliary supply consumption

60V... 300 VAC-DC ± 5% or 24... 60 VAC-DC ± 10%
40 to 65 Hz

| | |
|------------------|--------------------------|
| 60V...300 VAC-DC | ≤ 8VA for Single output |
| | ≤ 10VA for Dual output |
| 24V...60 VAC-DC | ≤ 5 VA for Single output |
| | ≤ 6 VA for Dual output |

Accuracy (Acc. to IEC / EN 60688)

Reference Value

Output end Value Y2 (Voltage or Current)

Basic Accuracy

0.2 * C

Factor C (The highest value applies if calculated C is less than 1, then C=1 applies)

| Linear characteristics | Bent characteristics |
|---|---|
| $C = \frac{1 - \frac{Y_0}{Y_2}}{1 - \frac{X_0}{X_2}} \text{ or } C=1$ | <p>For $X_0 \leq X \leq X_1$</p> $C = \frac{Y_1 - Y_0}{X_1 - X_0} \cdot \frac{X_2}{Y_2} \text{ or } C=1$ <p>For $X_1 \leq X \leq X_2$</p> $C = \frac{1 - \frac{Y_1}{Y_2}}{1 - \frac{X_1}{X_2}} \text{ or } C=1$ |

Reference conditions for Accuracy

Ambient temperature
Pre-conditioning
Input Variable
Input waveform
Input signal frequency
Auxiliary supply voltage
Output Load

23°C +/- 1°C
30 min acc. to IEC / EN 60 688
Rated Voltage / Rated Current
Sinusoidal, Form Factor 1.1107
50 or 60Hz
At nominal range
Rn = 7.5 V / Y2 ± 1% With DC current output signal
Rn = Y2 / 1 mA ± 1% With DC voltage output signal
Acc. to IEC / EN 60 688

Miscellaneous

Additional Error

Temperature influence

± 0.2% /10°C

Influence of Variations

As per IEC / EN 60688 standard.

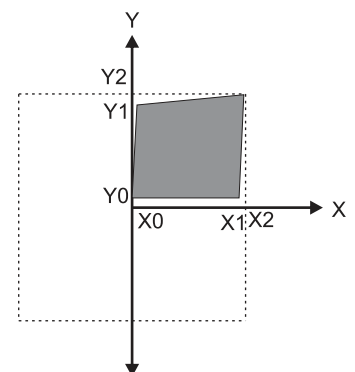
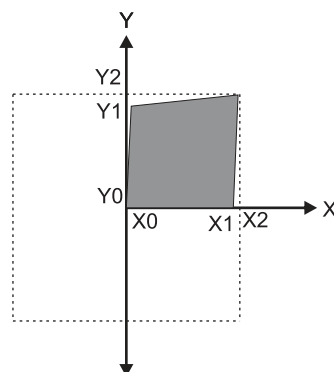
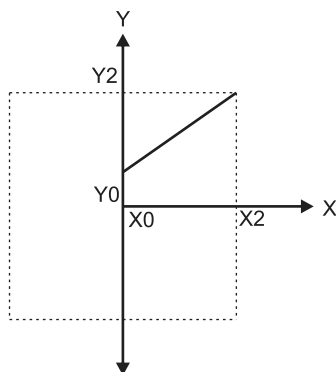
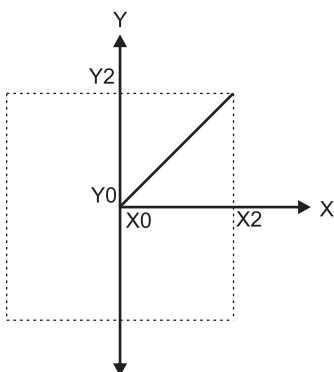
Output stability

< 30min

Output Characteristics

Example of setting with Linear Characteristics :

Example of setting with bent Characteristics :



X0 = Start value of input

Y0 = Start value of output

X1 = Elbow value of input

Y1 = Elbow value of output

X2 = End value of input

Y2 = End value of output

Note: End value(Y2) of output cannot be changed onsite.



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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 outer surface and output 490V, Output versus output versus each other versus outer surface. |

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. 0.4kg |

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 | 2000m max |

Ambient tests

| | |
|--|--|
| EN 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 |
| EN 60 068-2-7 | Shock |
| Acceleration | 3 x 50g 3 shocks in each direction |
| IEC 61000-4-2/-3/-4/-5/-6 EN 55 011 | Electromagnetic compatibility |



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Programming (Figs.4 and 5)

Programming of transducer can be done in three ways

- Programming Via Front LCD & two keys.
- Programming Via optional RS485(MODBUS) communication port. (Device address,PT Ratio,CT Ratio, Password, communication parameter, Output Type & simulation mode can be programmed)
- Programming Via Programming port available at front of RISH CON Transducers using optional PRKAB601 Adapter

Programming via Programming port (COM)

A PC with RS 232 C interface along with the programming cable PRKAB 601 and the configuration software are required to Program the transducer.

The connections between

“PC ↔ PRKAB601 ↔ Rish CON Transducer..
The powersupply mustbe applied to Transducer before it can be programmed.

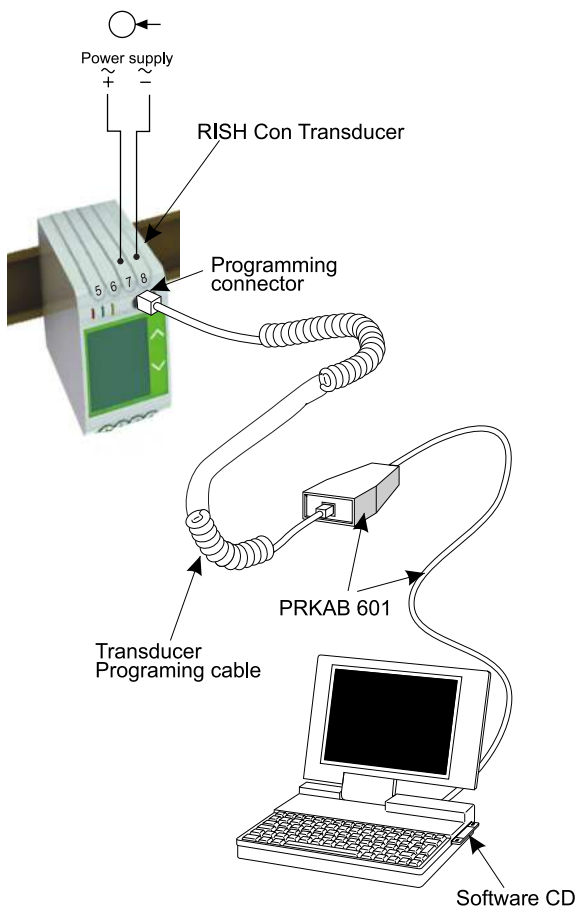


Fig. 4

The Configuration software is supplied on a CD. The programming cable PRKAB601 adjusts the signal level and provides the electrical insulation between the PC and RISH CON Transducers.

Configuring Rish Con Transducer

To configure RISH CON Transducer Input / output one of the three programming methods can be adapted along with mechanical switch setting (DIP switch setting on PCB)

DIP Switch Setting for OUTPUT

Type of output (current or voltage signal) has to be set by DIP switch (see Fig.5).

For programming of DIP switch the user needs to open the transducer housing & set the DIP switch located on PCB to the desired output type Voltage or Current. Output range changing is not possible with DIP switch setting.

Refer below Fig. 5 for DIP switch setting.

The four pole DIP switch is located on the PCB in the RISH CON Transducer

| DIP Switch Setting | Type of Output Signal |
|--------------------|--------------------------|
| | load-independent current |
| | load-independent voltage |

Fig. 5



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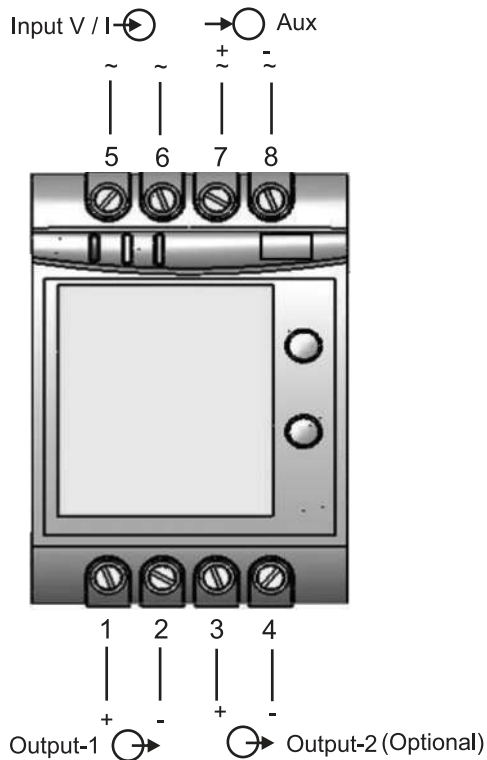
Analyze

LED Indication

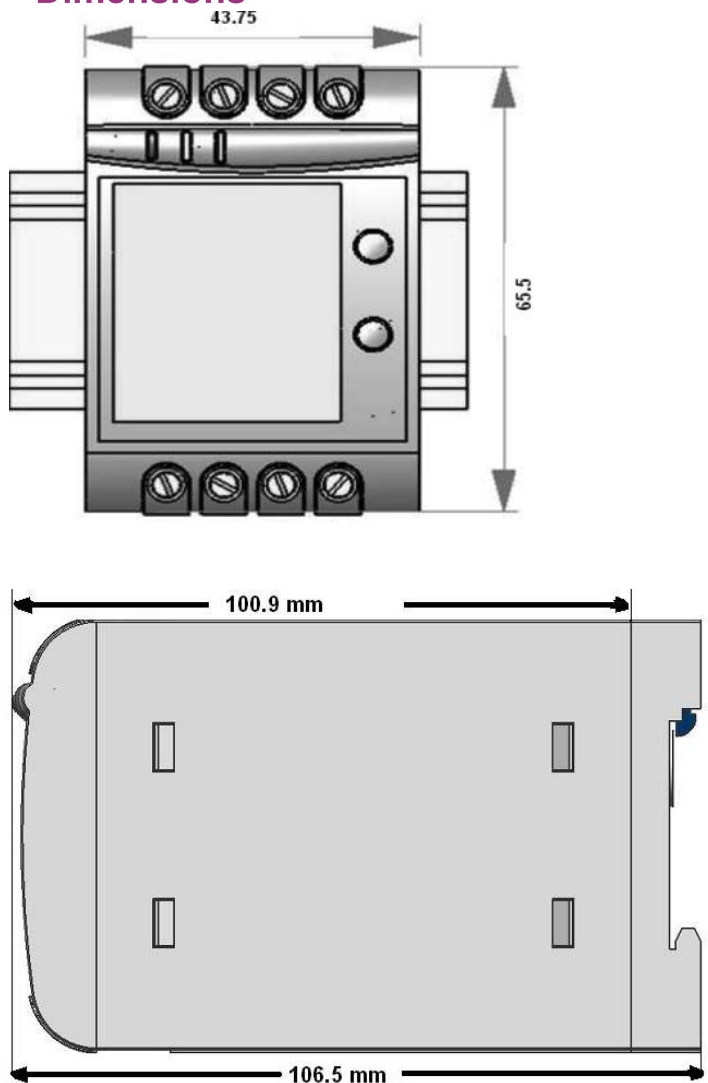
| | | |
|----------|------------------------------|-------------------------|
| ON LED | Aux.supply healthy condition | Green LED continuous ON |
| O/P1 LED | Output1 voltage selection | Green LED continuous ON |
| | Output1 Current selection | Red LED continuous ON |
| O/P2 LED | Output2 voltage selection | Green LED continuous ON |
| | Output2 Current selection | Red LED continuous ON |

Electrical Connections

| Connection | Terminal details | |
|-------------------------|------------------|---|
| Measuring input | ~ | 5 |
| | ~ | 6 |
| Auxilliary Power supply | ~ , + | 7 |
| | ~ , - | 8 |
| Measuring output - 1 | + | 1 |
| | - | 2 |
| Measuring output - 2 | + | 3 |
| | - | 4 |



Dimensions



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Ordering Information

| | | | | | | | | | |
|-------------------|------------------------|---|----|---|---|---|---|---|-------|
| Product Code | CM41- | X | XX | X | X | X | X | X | 00000 |
| Product Type | Rish CON I | I | | | | | | | |
| | Rish CON V | V | | | | | | | |
| Input Range | Programmable 1...5A | | 74 | | | | | | |
| | Programmable 57...500V | | 8E | | | | | | |
| Power Supply | 60-300 VAC/DC | | | H | | | | | |
| | 24-60 VAC/DC | | | F | | | | | |
| Output | 1 O/P | | | | 1 | | | | |
| | 2 O/P | | | | 2 | | | | |
| Display Module | With Display | | | | | D | | | |
| | Without Display | | | | | Z | | | |
| RS485 Module | With RS-485 | | | | | | R | | |
| | Without RS-485 | | | | | | Z | | |
| Programming Cable | With - PRKAB 601 | | | | | | | C | |
| | Without - PRKAB 601 | | | | | | | Z | |

Ordering Example – CM41-I74H1DZZ00000 – Rish CON I, Programmable 1...5A, Aux 60-300 VAC/DC, With display, 1 Output, without RS485, Without - PRKAB 601

Analog DC output options as below, to be specified while ordering only

| Current Output | Voltage Output | DIP Option |
|-----------------------------|----------------|------------|
| Standard Ranges | | |
| 0/4.....20 mA | 0.....10 V | Yes |
| Optional factory set ranges | | |
| 0.....10 mA | 0.....5 V | No |
| 0.....5 mA | 0.....2.5 V | No |
| 0.....2.5 mA | 0.....1 V | No |
| 0.....1 mA | | |

Note: End value of output can not be changed onsite.



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