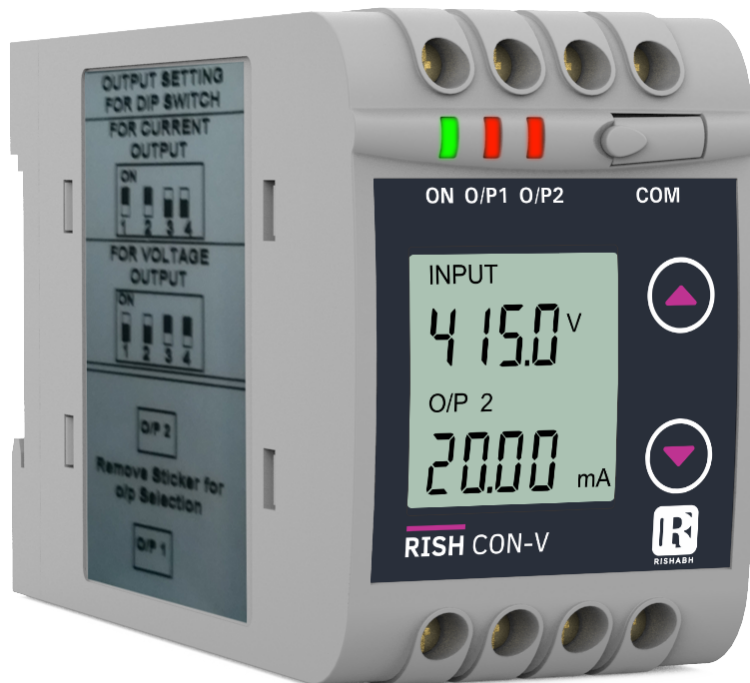




# Data Sheet

## RISH CON-V / CON-I



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
- RS485 (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
RN	Rated value of output burden
FN	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)  $0...20mA / 4...20mA$  OR  $0...10V$ .

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  $\pm 5\%$  or 24... 60 VAC-DC  $\pm 10\%$   
40 to 65 Hz

60V...300 VAC-DC	$\leq 8\text{VA}$ for Single output
	$\leq 10\text{VA}$ for Dual output
24V...60 VAC-DC	$\leq 5\text{VA}$ for Single output
	$\leq 6\text{VA}$ 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 <math>X_0 \leq X \leq X_1</math></p> $C = \frac{Y_1 - Y_0}{X_1 - X_0} \cdot \frac{X_2}{Y_2} \text{ or } C=1$ <p>For <math>X_1 \leq X \leq X_2</math></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

$23^\circ\text{C} \pm 1^\circ\text{C}$

Pre-conditioning

30 min acc. to IEC / EN 60 688

Input Variable

Rated Voltage / Rated Current

Input waveform

Sinusoidal, Form Factor 1.1107

Input signal frequency

50 or 60Hz

Auxiliary supply voltage

At nominal range

Output Load

$R_n = 7.5\text{V} / Y_2 \pm 1\%$

With DC current output signal

$R_n = Y_2 / 1\text{mA} \pm 1\%$

With DC voltage output signal

Acc. to IEC / EN 60 688

Miscellaneous

### Additional Error

Temperature influence

$\pm 0.2\% / 10^\circ\text{C}$

### Influence of Variations

As per IEC / EN 60688 standard.

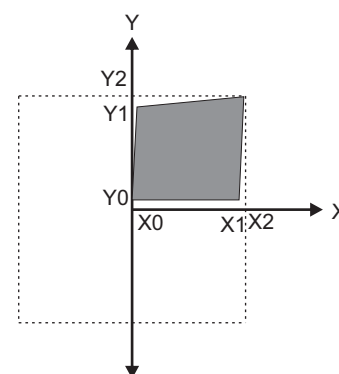
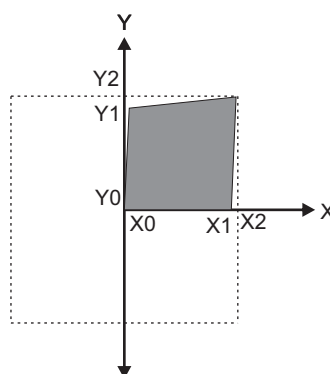
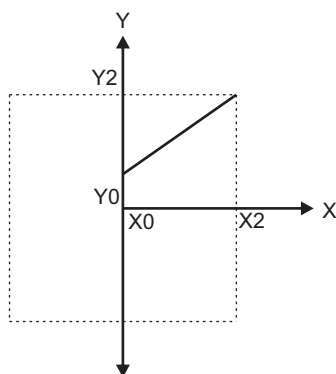
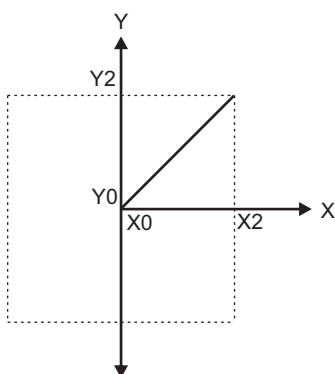
Output stability

$< 30\text{min}$

### Output Characteristics

Example of setting with Linear Characteristics :

Example of setting with bent Characteristics :



$X_0$  = Start value of input

$Y_0$  = Start value of output

$X_1$  = Elbow value of input

$Y_1$  = Elbow value of output

$X_2$  = End value of input

$Y_2$  = End value of output

Note: End value( $Y_2$ ) of output cannot be changed onsite.



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### Safety

Protection Class  
Protection

II (Protection Isolated, EN 61 010)  
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  
Rail mounting / wall mounting

Mounting position

Weight

Approx. 0.4kg

### Connection Terminal

Connection Element

Conventional Screw type terminal with indirect wire pressure

Permissible cross section  
of the connection lead

$\leq 4.0 \text{ mm}^2$  single wire or  $2 \times 2.5 \text{ mm}^2$  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

$\leq 75\%$

Altitude

2000m max

### Ambient tests

EN 60 068-2-6

Vibration

Acceleration

$\pm 2 \text{ g}$

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.

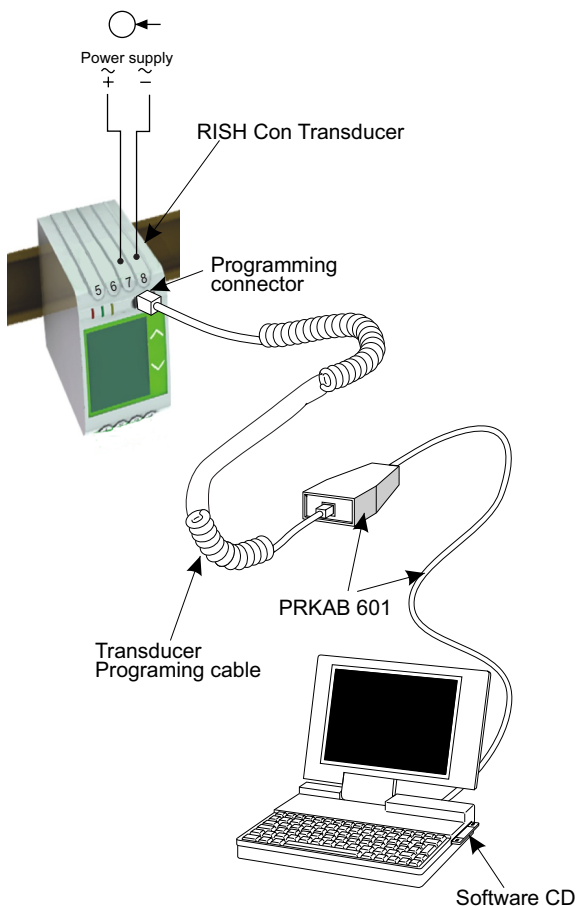


Fig. 4

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
ON  1234	load-independent current
ON  1234	load-independent voltage

Fig. 5



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## 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

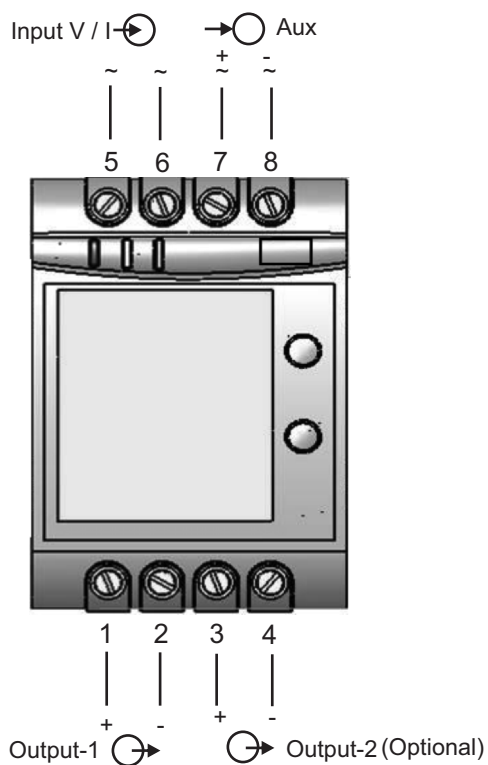


Fig 2.

## Dimensions

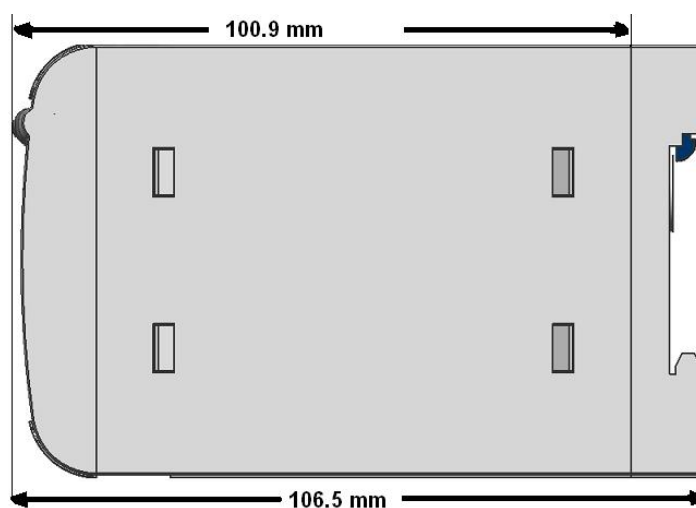
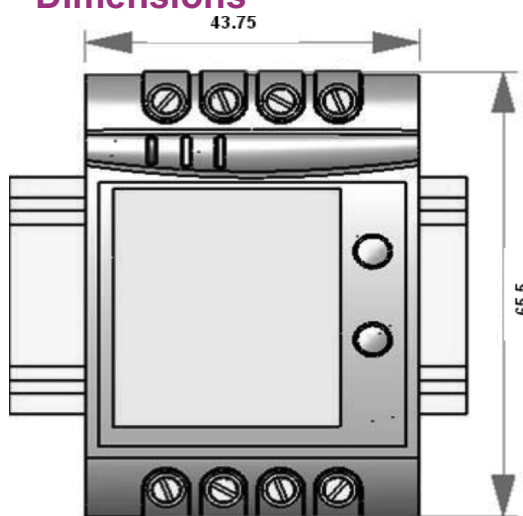


Fig 3.



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## Ordering Information

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

Ordering Example – CM41-I74H1DZZ00000 – Rish CON I, Programmable 1...5A, Aux 60-300 VAC/DC, With display, 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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## **RISHABH INSTRUMENTS PVT. LTD.**

**Domestic (India):** +91 253 2202028/99 | [marketing@rishabh.co.in](mailto:marketing@rishabh.co.in)

**International:** +91 253 2202004/06/08/99 | [global@rishabh.co.in](mailto:global@rishabh.co.in)

[www.rishabh.co.in](http://www.rishabh.co.in)