

RISH CON - V / RISH CON - I

VOLTAGE / CURRENT TRANSDUCER

(Preliminary Datasheet)

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 60-300V AC/DC.
- ✓ Output Response Time < 300 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.

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)



Fig. 1 RISH CON - V

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 U_N (AC RMS)
(PT Secondary range) $57V \leq U_N \leq 500 V$

PT Primary range 57V to 400 kV

Nominal Frequency F_N 50 or 60 Hz

Nominal input Voltage burden $< 0.6 VA$ at U_N

Overload Capacity: $1.2 * U_N$ continuously,
 $2 * U_N$ 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 I_N (AC RMS)
(CT Secondary range) $1 A \leq I_N \leq 5 A$

CT Primary range 1 A to 9999 A

Nominal Frequency F_N 50 or 60 Hz

Nominal input Current burden $< 0.2 VA$ at I_N

Overload Capacity: $1.2 * I_N$ continuously,
 $10 * I_N$ for 3 second, repeated 5 times at 5 minute intervals.
 $50 * I_N$ for 1 second, (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 300 ms.



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Auxiliary Power Supply:

AC/DC Auxiliary Supply	60V... 300 VAC-DC $\pm 5\%$
AC Auxiliary supply frequency range	45 to 65 Hz
Auxiliary supply consumption	≤ 8 VA for one output ≤ 10 VA for two outputs

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:

$$C = \frac{1 - \frac{Y_0}{Y_2}}{1 - \frac{X_0}{X_2}} \text{ or } C=1$$

Bent characteristics:

For $X_0 \leq X \leq X_1$

$$C = \frac{Y_1 - Y_0}{X_1 - X_0} \cdot \frac{X_2}{Y_2} \text{ or } C=1$$

For $X_1 \leq X \leq X_2$

$$C = \frac{1 - \frac{Y_1}{Y_2}}{1 - \frac{X_1}{X_2}} \text{ or } C=1$$

Reference conditions for Accuracy :

Ambient temperature	23°C +/- 1°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....60Hz
Auxiliary supply voltage	Rated Value $\pm 1\%$
Auxiliary supply frequency	Rated Value $\pm 1\%$
Output Load	$R_n = 7.5 \text{ V} / Y_2 \pm 1\%$ $R_n = Y_2 / 1 \text{ mA} \pm 1\%$
Miscellaneous	Acc. to IEC / EN 60 688

With DC current output signal
With DC voltage output signal

Additional Error :

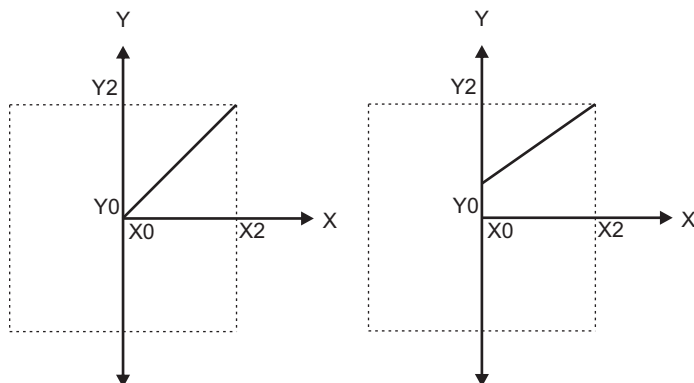
Temperature influence	$\pm 0.2\% / 10^\circ\text{C}$
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Influence of Variations:

As per IEC / EN 60688 standard.	
Output stability	< 30min

Output Characteristics:

Example of setting with Linear Characteristics :



X0 = Start value of input

Y0 = Start value of output

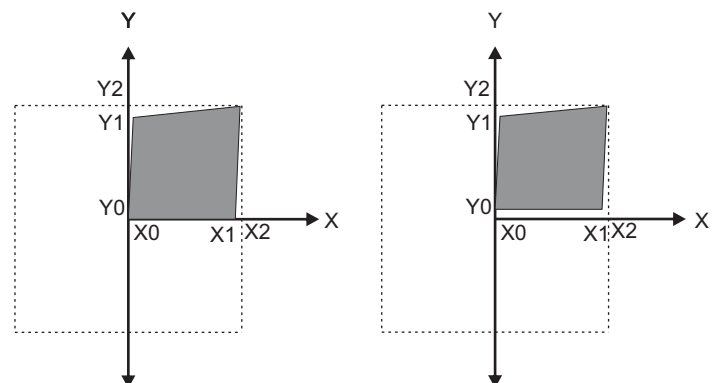
X1 = Elbow value of input

Y1 = Elbow value of output

X2 = End value of input

Y2 = End value of output

Example of setting with bent Characteristics :



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

Environmental:

Nominal range of use	0 °C... <u>23 °C</u> ... 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
EN 60 068-2-1/-2/-3	Cold, Dry, Damp heat
IEC 61000-4-2/-3/-4/-5/-6 EN 55 011	Electromagnetic compatibility.



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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

Dimensions

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

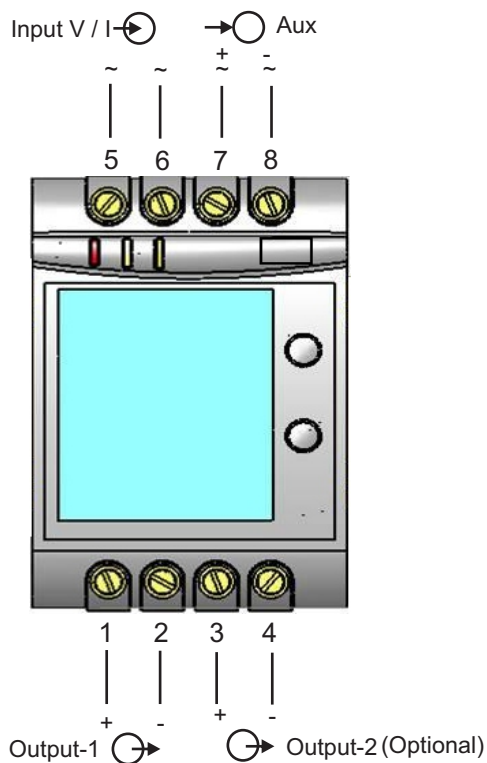


Fig 2.

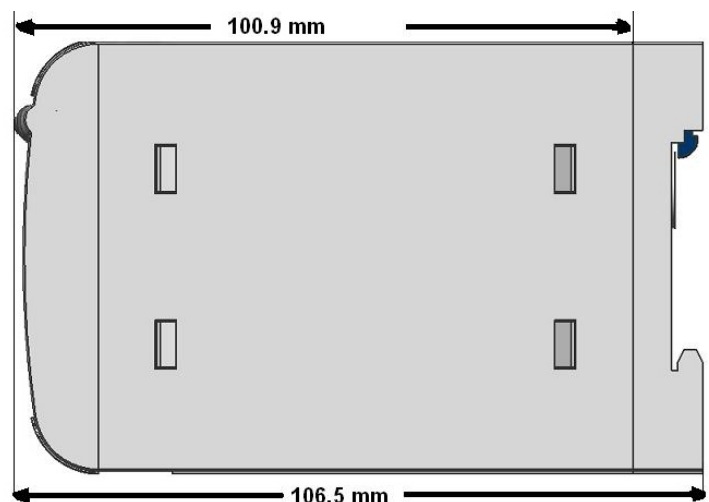
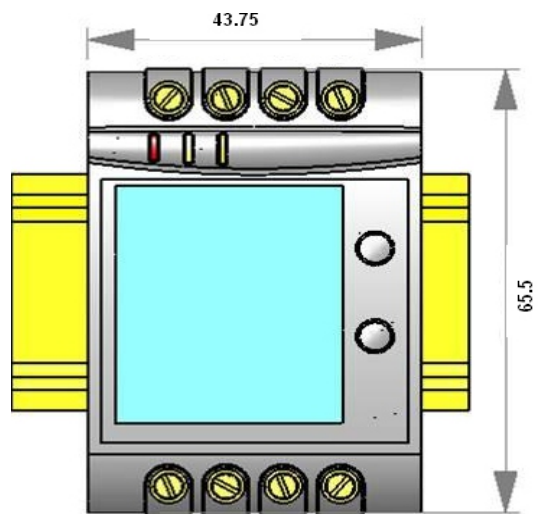


Fig 3.



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Programming

(Figs. 4 and 5)

Programming of transducer can be done in three ways :

- 1) Programming Via Front LCD & two keys.
- 2) Programming Via optional RS485(MODBUS) communication port.
(Device address,PT Ratio,CT Ratio,Password,communication parameter,Output Type & simulation mode can be programmed).
- 3) 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 PRKAB 601 Rish CON Transducer.

The power supply must be applied to Transducer before it can be programmed.

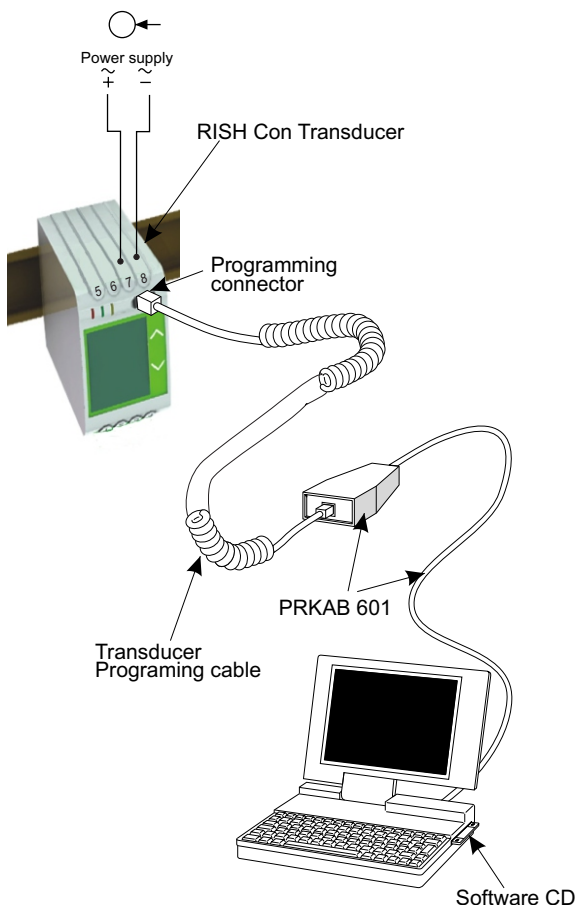


Fig. 4

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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Ordering Information: Standard Version :

Dual Output : **RISH CON - V (500V) - F - O1A1 - O2V1 - D - Z - Z**
RISH CON - I (5A) - F - O1A1 - O2V1 - D - Z - Z

Single Output : **RISH CON - V (500V) - F - O1A1 - D - Z - Z**
RISH CON - I (5A) - F - O1A1 - D - Z - Z

Sr.No.	Transducer parameter	Ordering Code
1	Input Signal	
	Voltage (Range: 57V to 500V)	RISH CON - V (500V)
	Current (Range: 1A to 5A)	RISH CON - I (5A)
	Note : Input Ranges are onsite programmable.	
2	Frequency of Input (50 Hz / 60 Hz)	F
3	Output 1 (Standard Ranges)	
	Current = 0.....20 mA	O1A1
4	Output 2 (Standard Ranges)	
	Voltage = 0.....10 V	O2V1
5	With Display	D
6	Without RS-485	Z
7	Without PRKAB 601	Z

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



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Ordering Information: Optional Versions :

Sr.No.	Transducer parameter	Ordering Code
1	Input Signal	
	Voltage (Range: 57V to 500V)	RISH CON - V (User specified: XXXV)
	Current (Range: 1A to 5A)	RISH CON - I (User specified: XA)
	Note : Input Ranges are onsite programmable.	
2	Frequency of Input (50 Hz / 60 Hz)	F
3	Output 1	
	Current = 0.....20 mA	O1A1
	Current = 4.....20 mA	O1A2
	Voltage = 0.....10 V	O1V1
	Optional factory set ranges	
	Current = 0.....10 mA	O1A3
	Current = 0.....5 mA	O1A4
	Current = 0.....2.5 mA	O1A5
	Current = 0.....1 mA	O1A6
	Voltage = 0.....5 V	O1V2
	Voltage = 0.....2.5 V	O1V3
	Voltage = 0.....1 V	O1V4
4	Output 2	
	Without output 2	O200
	Current = 0.....20 mA	O2A1
	Current = 4.....20 mA	O2A2
	Voltage = 0.....10 V	O2V1
	Optional factory set ranges	
	Current = 0.....10 mA	O2A3
	Current = 0.....5 mA	O2A4
	Current = 0.....2.5 mA	O2A5
	Current = 0.....1 mA	O2A6
	Voltage = 0.....5 V	O2V2
	Voltage = 0.....2.5 V	O2V3
	Voltage = 0.....1 V	O2V4
5	LCD display module	
	With Display	D
	Without Display	Z
6	RS-485 module	
	With RS-485	R
	Without RS-485	Z
7	PRKAB 601 module	
	With PRKAB 601	PR
	Without PRKAB 601	Z

Optional Version Example:

RISH CON-I - XA - F - O1A1 - O1V1 - O2V1- O2A1 - D - R - PR

RISH CON-I is Current transducer, XA ,50/60 Hz nominal input signal,
Output1 = 0...20mA or 0...10V , Output2= 0...10V or 0...20mA,
with LCD display module , with RS-485 & with PRKAB 601 cable.

RISH CON-V - XXXV - F - O1A1 - O1V1 - O2V1- O2A1 - Z - R - Z

RISH CON-V is Voltage transducer, XXXV,50/60 Hz nominal input signal,
Output1 = 0...20mA or 0...10V , Output2= 0...10V or 0...20mA,
Without LCD display module , with RS-485 & without PRKAB 601 cable.

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



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