RISH *CON* - Ⅴ / RISH *CON* - Ⅰ

VOLTAGE / CURRENT TRANSDUCER

Application :

The RISH *CON* - Ⅴ / RISH *CON* - Ⅰ is used to measure and convert AC Voltage or Current input into an proportional 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 .

✍ 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 60688.

Programmable Input/Output:
Onsite transducer can be programmed using front key & display or through programming port or through RS 485. For transducer without display & RS485 programming port can be used for onsite programming.

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

Voltage Transducer (RISH *CON* - V**):**

Nominal input Voltage X2 (AC RMS) (PT Secondary range)	$57V \leq X2 \leq 500$ 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 * X2 continuously, 2*X2 for 1 second, repeated 10 times at 10 minute intervals But 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 X2 (AC RMS) (CT Secondary range)	$1 A \leqslant X2 \leqslant 5$ A
CT Primary range	1 A to 9999 A
Nominal Frequency F_N	50 or 60 Hz
Nominal input Current burden	< 0.6 VA at I_N
Overload Capacity:	1.2 * X2 continuously, 10* X2 for 3 second, repeated 5 times at 5 minute intervals. 50* X2 for 1 second, (But 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	$Y2/(2 \text{ mA}) \leq R \leq \infty$
Current limit under overload R=0	≤ 1.25 * Y2 with current output ≤ 60 mA with voltage output
Voltage limit under R=∞	< 1.25 * Y2 with voltage output ≤ 30 V with current output
Residual Ripple in Output signal	≤ 1% pk-pk
Response Time	300 ms.

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Accuracy :(Acc. to IEC 60688)

Reference Value   Output end Value Y2 (Voltage or Current)

Basic Accuracy   0.2 * C

Factor C (the highest value applies)

Linear characteristics:	Bent characteristics:
$$C = \dfrac{1 - \dfrac{Y0}{Y2}}{1 - \dfrac{X0}{X2}} \text{ or } C=1$$	$$C = \dfrac{Y1 - Y0}{X1 - X0} \cdot \dfrac{X2}{Y2} \text{ or } C=1$$ $$C = \dfrac{1 - \dfrac{Y1}{Y2}}{1 - \dfrac{X1}{X2}} \text{ or } C=1$$

Reference conditions for Accuracy :

Ambient temperature	23°C +/- 1°C
Pre-conditioning	30 min acc. to IEC EN - 60688
Input Variable	Rated Voltage / Rated Current
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	Rn = 7.5 V / Y2 ± 1% With DC current output signal
	Rn = Y2 / 1 mA ± 1% With DC voltage output signal
Miscellaneous	Acc. to IEC EN - 60688

Additional Error :
Temperature influence   ± 0.2% /10°C

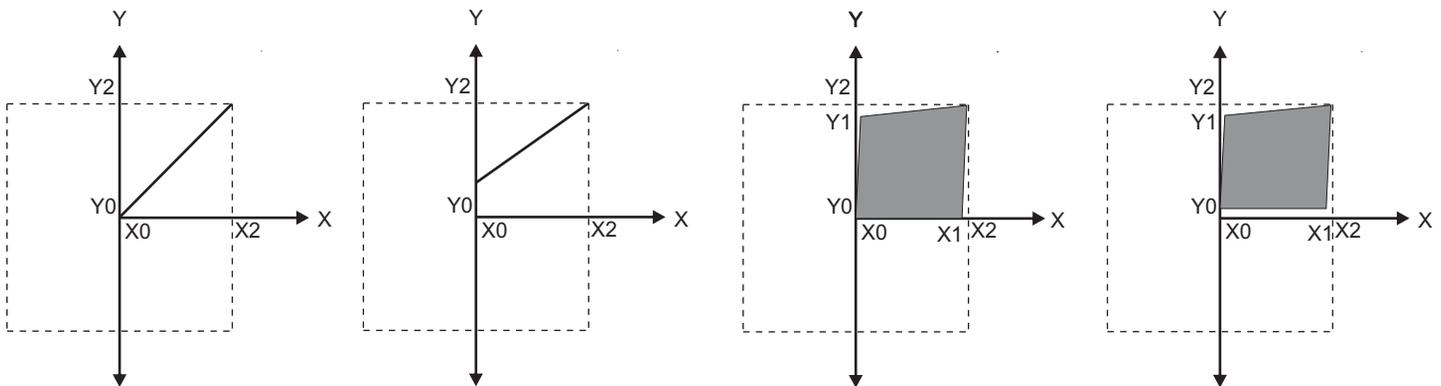**Influence of Variations:**
As per IEC EN-60688 standard.
Output stability   < 30min
Auxiliary Power Supply:
AC/DC Auxiliary Supply   60V… 300 VAC-DC ± 5%
AC Auxiliary supply frequency range   45 to 65 Hz
Auxiliary supply consumption   ≤ 8 VA for one output
                                                      ≤ 10 VA for two outputs

Output 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

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Safety:

Protection Class	II (Protection Isolated, EN 61010)
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

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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 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.

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:

Dimensions

Connection	Terminal details	
Measuring input	~	5
	~	6
Auxilliary Power supply	~ , +	7
	~ , -	8
Measuring output - 1	+	1
	-	2
Measuring output - 2	+	3
	-	4
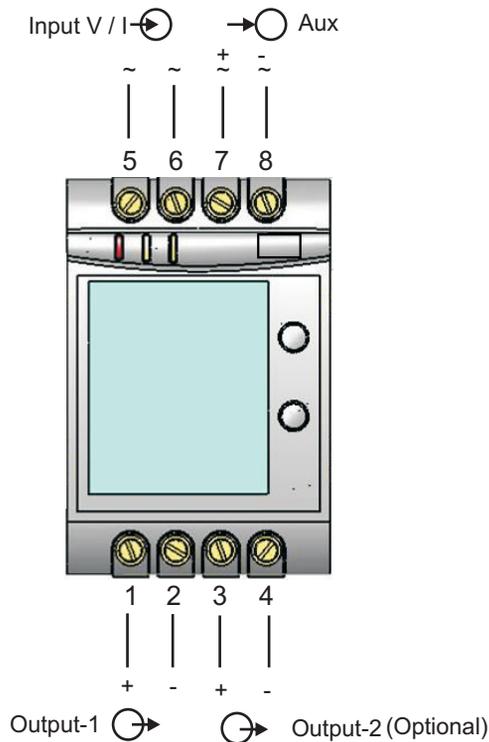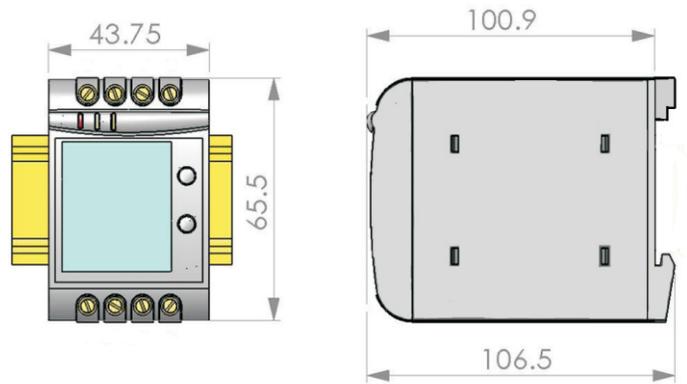
RISHABH INSTRUMENTS PVT.LTD.
F-31, MIDC, Satpur, Nashik-422 007,India.
Tel.: +91 253 2202160, 2202202 Fax : +91 253 2351064
E-mail : India :- marketing@rishabh.co.in
        International :- exp.marketing@rishabh.co.in
www.rishabh.co.in

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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.

3) Programming Via Programming port available at front of RISH CON Transducers using optional PRKAB600 Adapter.
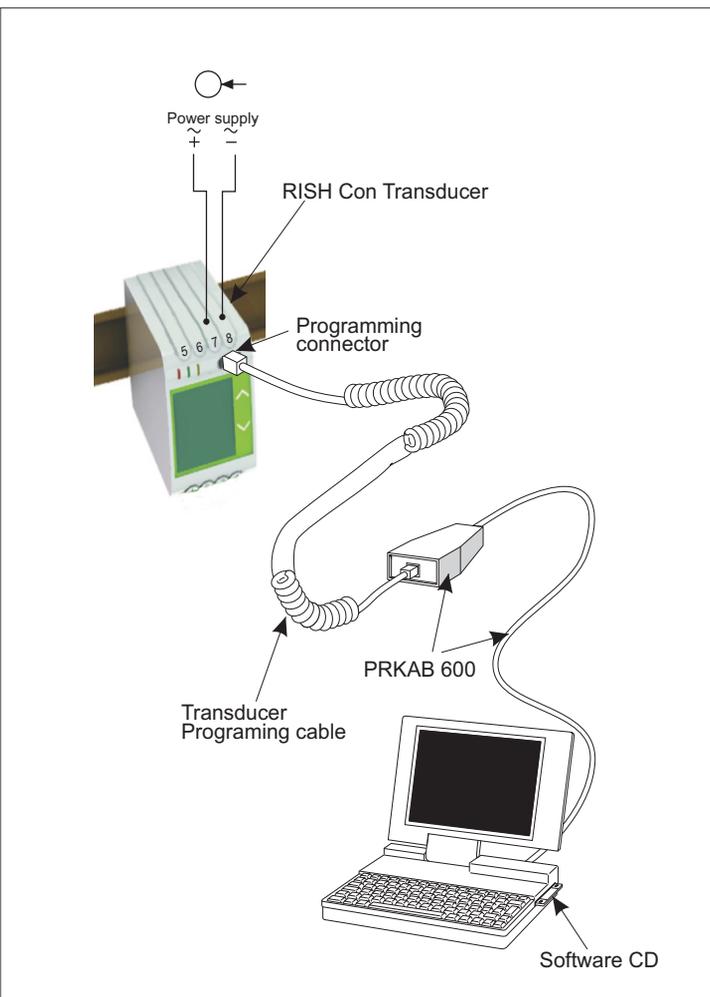
Programming Via Programming port

A PC with RS 232 C interface along with the programming cable PRKAB600 and the configuration software are required to program the transducer.
(Details of t he programming cable and the software are to be found in the separate Data sheet: PRKAB 600 Te.)

The connections between
"PC ⟷ PRKAB 600 ⟷ Rish CON Transducer.
The powersupply mustbe applied to Rish CON Transducer before it can be programmed.

Power supply
RISH Con Transducer
5 6 7 8
Programming connector
Transducer Programing cable
PRKAB 600
Software CD

.
The Configuration software is supplied on a CD.
The programming cable PRKAB600 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 to 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

Ordering Information:

Sr.No.	Transducer parameter	Ordering Code
1	Input Signal	
	Voltage	RISH *CON* - V
	Current	RISH *CON* - I
3	Frequency of Input	
	50 Hz	50
	60 Hz	60
4	**Output 1**	O100 = Without output1
	Standard Ranges :	
	Current = 0.....20 mA = O1A1	O1A1
	Current = 4.....20 mA = O1A2	O1A2
	Voltage = 0.....10 V = O1V1	O1V1
	Optional factory set ranges	
	Current = 0.....10 mA = O1A3	O1A3
	Current = 0.....5 mA = O1A4	O1A4
	Current = 0.....2.5 mA = O1A5	O1A5
	Current = 0.....1 mA = O1A6	O1A6
	Voltage = 0.....5 V = O1V2	O1V2
	Voltage = 0.....2.5 V = O1V3	O1V3
	Voltage = 0.....1 V = O1V4	O1V4
5	**Output2** (Optional)	O200 = Without output2
	Standard Ranges :	
	Current = 0.....20 mA = O2A1	O2A1
	Current = 4.....20 mA = O2A2	O2A2
	Voltage = 0.....10 V = O2V1	O2V1
	Optional factory set ranges	
	Current = 0.....10 mA = O2A3	O2A3
	Current = 0.....5 mA = O2A4	O2A4
	Current = 0.....2.5 mA = O2A5	O2A5
	Current = 0.....1 mA = O2A6	O2A6
	Voltage = 0.....5 V = O2V2	O2V2
	Voltage = 0.....2.5 V = O2V3	O2V3
	Voltage = 0.....1 V = O2V4	O2V4
6	Optional LCD display module	
	Without Display	Z
	With Display	D
7	Optional RS-485 module	
	Without RS-485	Z
	With RS-485	R
8	Optional PRKAB 600	PR

Example:
RISH *CON*-V- 50 - O1A1 - O1V1 - O2V1- O2A1 - D - R-PR

RISH *CON*-V is Voltage transducer, 50Hz nominal input signal frequency,
Output1 = 0…20 mA, Output2= 0…10 VDC, with LCD display module , with RS-485 with PRKAB 600 cable.

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