

RISH CON - P

POWER TRANSDUCER

Application :

The Rish CON - P transducer is used to measure and convert active, reactive and apparent power of a Single-phase or Three-phase AC system with balanced or unbalanced load into an proportional load independent DC current or voltage output signal.

Salient Features :

- ✓ True RMS measurement.
- ✓ Fully onsite programmable input voltage range & Input current range
- ✓ On Site Configurable as Active / Reactive / Apparent Transducer.
- ✓ Onsite selectable output type(DC current / DC voltage).
- ✓ Single or Dual output.
- ✓ Accuracy class 0.2 .
- ✓ Seven Segment LCD Display.
- ✓ Rs485(Modbus) Communication.
- ✓ Wide Auxiliary power supply.
Accepts any input between 60V-300V AC/DC.
- ✓ Output Response Time < 300 ms standard.
- ✓ 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 to voltage or current output onsite.

Accuracy:

Output signal accuracy class 0.2 as per International IEC/EN 60688 Standard.

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 parameter & onsite configuration of Input/output.

RS485 Communication(Optional):

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

Symbols and their meaning:

X	Input power. (Apparent /Active/Reactive)
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:

Measured Parameter

Active Power.
Reactive Power.
Apparent Power.

Network Type Support:

Single Phase
3 phase 3 wire
3 phase 4 wire

Nominal Voltage Input(U_N):

Nominal input Voltage (AC RMS)
(PT Secondary range)

$100\text{ V} \leq U_N \leq 500\text{ VL-L}$

PT Primary range

100V to 692 KVL-L

Nominal Frequency F_N

50 or 60 Hz

Nominal input Voltage burden

$< 0.6\text{ VA}$ per phase at U_N

Overload Capacity:

$1.2 * U_N$ continuously,
 $2 * U_N$ for 1 second, repeated 10 times at 10 minute intervals
 U_N But maximum 300V with power supply powered from measuring input.

Nominal Current Input(I_N):

Nominal input Current (AC RMS)
(CT Secondary range)

$1\text{ A} \leq I_N \leq 5\text{ A}$

CT Primary range

1 A to 9999 A

Nominal Frequency F_N

50 or 60 Hz

Nominal input Current burden

$< 0.6\text{ VA}$ per phase 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, repeated 1 times at 1 hour interval(But max 250 A).

Allowed measuring range end values X_2 (calibration factor X_c):

With single phase AC active/reactive/apparent power $0.75 \leq (X_2/\text{Rated Power}) \geq 1.3 * U_N / \sqrt{3} * I_N$

With 3-phase AC active/reactive/apparent power $0.75 \leq (X_2/\text{Rated Power}) \geq 1.3 * \sqrt{3} * U_N * I_N$

(For single phase Rated Power= $U_N / \sqrt{3} * I_N$)

(For Three phase Rated Power= $\sqrt{3} * U_N * I_N$)

Measuring Output Y(Single or Optional Dual):

Output type Y2

Load independent DC Voltage , DC Current
On site selectable through DIP switches.

Load independent DC output

Unipolar 0...20mA / 4...20mA OR 0...10V.
Bipolar -20mA...0...+20mA OR -10V...0...+10V

Output burden with DC current output
Signal

$0 \leq R \leq 15\text{V}/Y_2$

Output burden with DC voltage output

$Y_2/(2\text{ mA}) \leq R \leq \infty$



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Current limit under overload R=0	$\leq 1.25 * Y2$ 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	$\leq 1\%$ pk-pk
Response Time	< 300 ms

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:

$$C = \frac{1 - \frac{Y0}{Y2}}{1 - \frac{X0}{X2}} \text{ or } C=1$$

Bent characteristics:

$$C = \frac{Y1 - Y0}{X1 - X0} \cdot \frac{X2}{Y2} \text{ or } C=1$$

$$C = \frac{1 - \frac{Y1}{Y2}}{1 - \frac{X1}{X2}} \text{ or } C=1$$

Reference conditions for Accuracy :

Ambient temperature	23°C +/- 1°C
Pre-conditioning	30 min acc. to IEC EN - 60688
Input Variable	Voltage Rated / Current Rated
Input waveform	Sinusoidal, Form Factor 1.1107
Input signal frequency	50....60Hz
Active / Reactive factor	Cos Φ =1 resp. Sin Φ = 1
Auxiliary supply voltage	Rated Value $\pm 1\%$
Auxiliary supply frequency	Rated Value $\pm 1\%$
Output Load	Rn = 7.5 V / Y2 $\pm 1\%$ With DC current output signal Rn = Y2 / 1 mA $\pm 1\%$ With DC voltage output signal
Miscellaneous	Acc. to IEC EN - 60688

Additional Error:

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

Influence of Variations:

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



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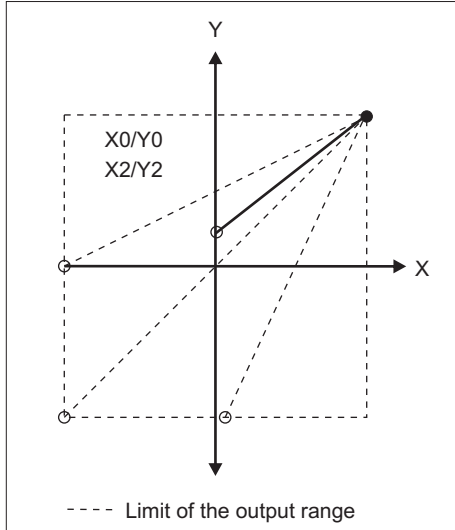
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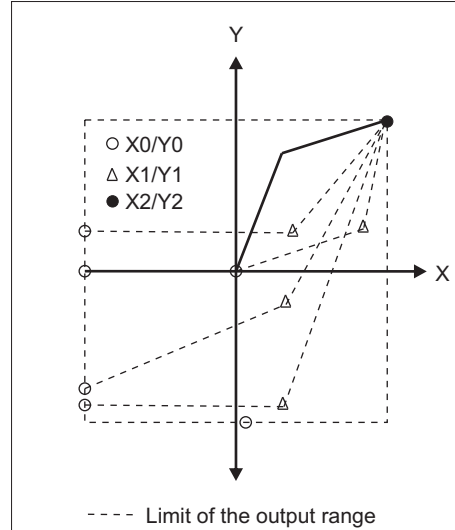
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Output Characteristics:

Example of setting with Linear Characteristics :



Example of setting with bent Characteristics :



Auxiliary Power Supply:

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

60V... 300 VAC-DC $\pm 5\%$
45 to 65 Hz
 ≤ 8 VA for one output
 ≤ 10 VA for two outputs

Safety:

Protection Class
Protection
Pollution degree
Installation Category
Insulation Voltage

II (Protection Isolated, EN 61010)
IP 40, housing according to EN 60 529
IP 20 ,terminal according to EN 60 529
2
III
50Hz,1min. (EN 61010-1)
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
Mounting position
Weight

Lexan 940 (polycarbonate)
Flammability Class V-0 acc. To UL 94, self extinguishing,
non dripping, free of halogen
Rail mounting / wall mounting
Approx. 0.4kg

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 2×2.5 mm² fine wire



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Environmental:

Operating temperature	0°C...23°C...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
EN 60 068-2-1/-2/-3	Cold, Dry, Damp heat
IEC 1000-4-2/-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:

Connection	Terminal details	
Measuring Voltage Input	VR	2
	VY	5
	VB	8
	N	11
Auxilliary Power supply	~, +	13
	~, -	14
Measuring output - 2	+	15
	-	16

Connection	Terminal details	
Measuring Current Input	IR	1
	IR'	3
	IY	4
	IY'	6
	IB	7
	IB'	9
Measuring output - 1	+	17
	-	18



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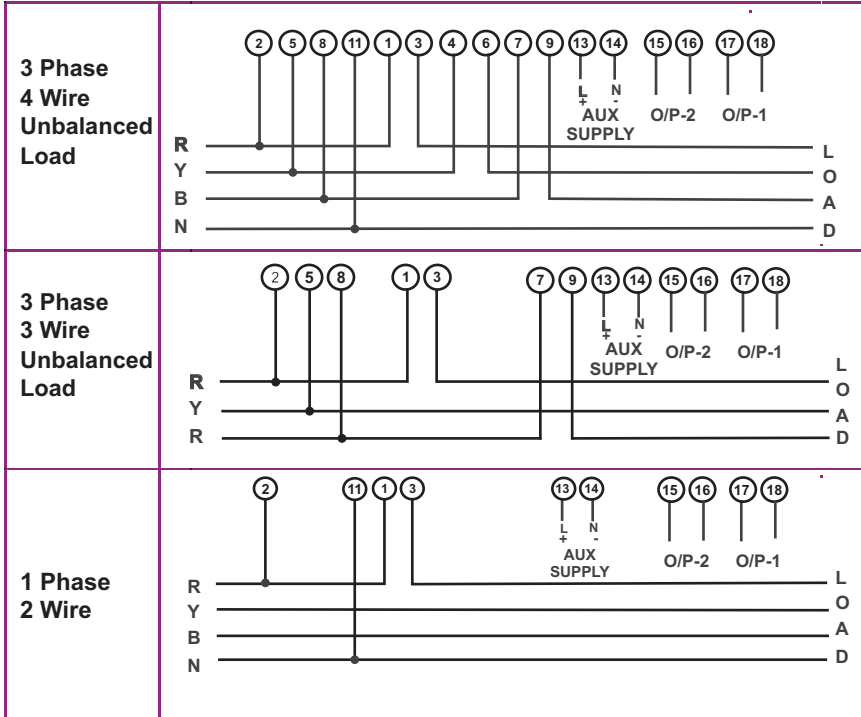
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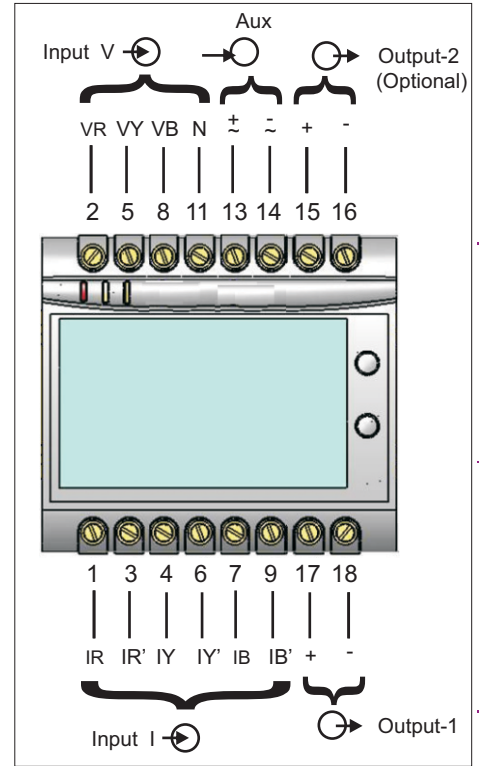
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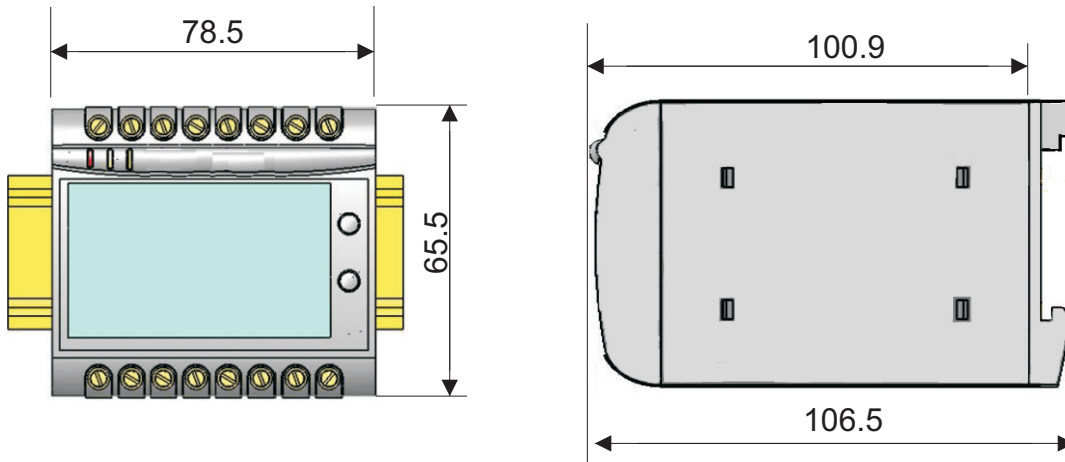
Electrical Networks :



Terminal Details



Dimensions



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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

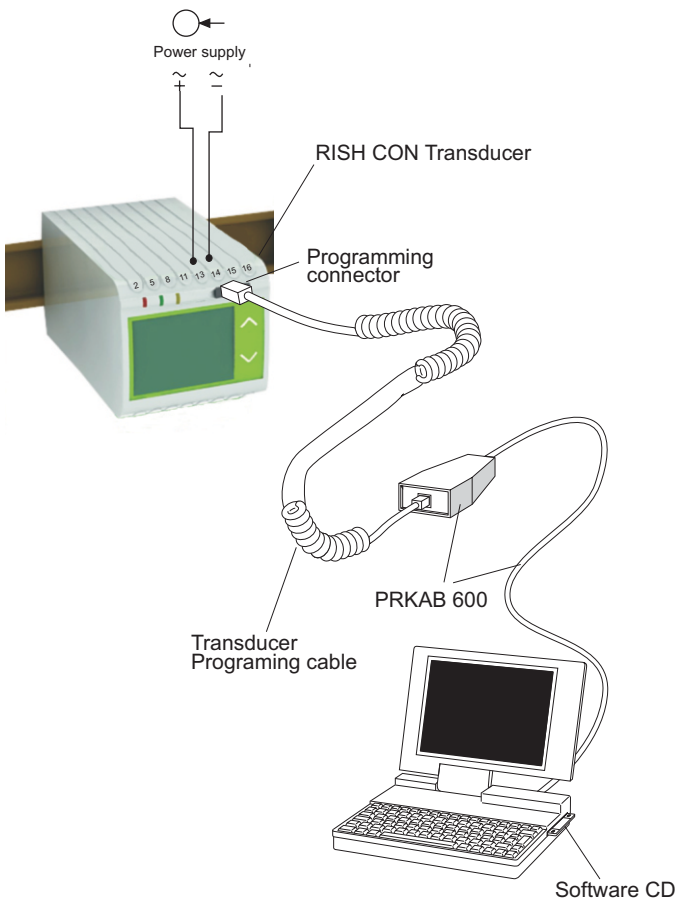
A PC with RS 232 C interface along with the programming cable PRKAB600 and the configuration software are required to program the transducer.

(Details of the programming cable and the software are to be found in the separate Data sheet: PRKAB 600 Le.)

The connections between

PC ↔ PRKAB 600 ↔ Rish CON Transducer.

The powersupply mustbe applied to before it can be programmed.



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
	load-independent current
	load-independent voltage

Fig. 5



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Ordering Information:

Sr.No.	Transducer parameter	Ordering Code
1	Input Signal	
	Power	RISH CON - P
2	Frequency of Input	
	50 Hz	50
	60 Hz	60
3	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 to be specified while ordering)	
	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
4	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 to be specified while ordering)	
	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
5	Optional LCD display module	
	Without Display	Z
	With Display	D
6	Optional RS-485 module	
	Without RS-485	Z
	With RS-485	R
7	Optional PRKAB 600	PR

Example:

Rish CON - P - 50 - O1A1- O1V1 - O2V1- O2A1 - D - R-PR

Rish CON - P is Power transducer, 50Hz nominal input signal frequency,

Output1 = 0...20 mA, Output2= 0...10 VDC, with LCD display module and with RS-485 with PRKAB 600 cable.



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