

RISH CON - Hz

FREQUENCY TRANSDUCER

Application :

The RISH CON - Hz transducer is used for frequency measurement. The output signal is proportional to measured frequency and is either load independent DC Current or load independent DC Voltage.

Salient Features :

- ✦ Fully onsite programmable input range.
- ✦ 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 60V-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.



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.

Product Features:

Measuring Input:

Sine wave or distorted wave form of nominal input voltage with fundamental wave.

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)

Symbols and their meaning:

X	Input Frequency
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
U _N	Nominal input voltage



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Technical Specifications:

Frequency Transducer (RISH CON - Hz):

Measuring Ranges	45Hz to 55Hz, 48Hz to 52Hz, 55Hz to 65Hz, 45Hz to 65Hz (min span 4Hz)
Nominal input Voltage(U_N)	$57V \leq U_N \leq 500 V$
Nominal input Voltage burden	< 0.6 VA max
Overload Capacity:	1.2 * U_N continuously, 2* U_N for 1 second, repeated 10 times at 10 minute intervals But maximum 300V with power supply powered from measuring input.

Measuring Output Y(Single or Optional Dual):

Output type Y2	Load independent DC Voltage , DC Current onsite selectable through DIP switches.
Load independent DC output	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	$\leq 1.25 * Y2$ with current output $\leq 60 \text{ mA}$ with Voltage output
Voltage limit under R= ∞	< 1.25 * Y2 with voltage output $\leq 30 \text{ V}$ with current output
Residual Ripple in Output signal	$\leq 1\% \text{ pk-pk}$
Response Time	300 ms

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	$\leq 8 \text{ VA}$ for one output $\leq 10 \text{ VA}$ for two output



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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:

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

Bent characteristics:

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

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

Reference conditions for Accuracy :

Ambient temperature	23°C +/- 1°C	
Pre-conditioning	30 min acc. to IEC EN - 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
	Acc. to IEC EN - 60688	

Miscellaneous

Additional error:

Temperature influence ±0.2% /10°C

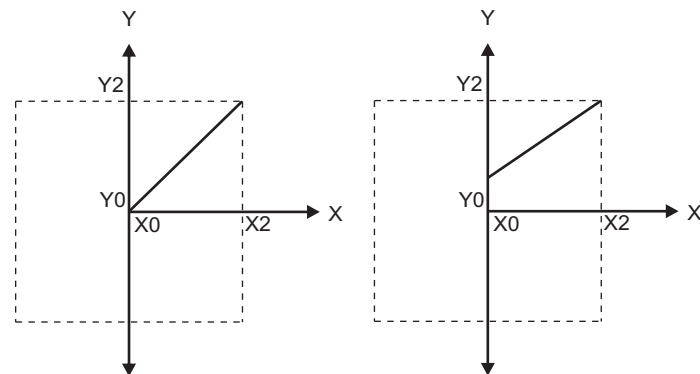
Influence of Variations:

As per IEC EN-60688 standard.

Output Stability < 30 min

Output Characteristics:

Example of setting with Linear Characteristics :



X0 = Start value of input

Y0 = Start value of output

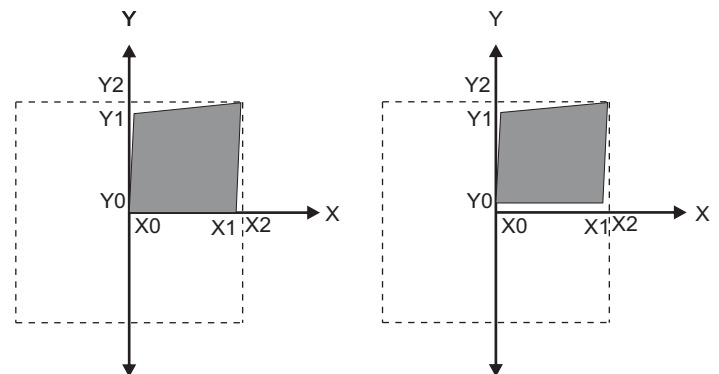
X1 = Elbow value of input

Y1 = Elbow value of output

X2 = End value of input

Y2 = End value of output

Example of setting with bent Characteristics :



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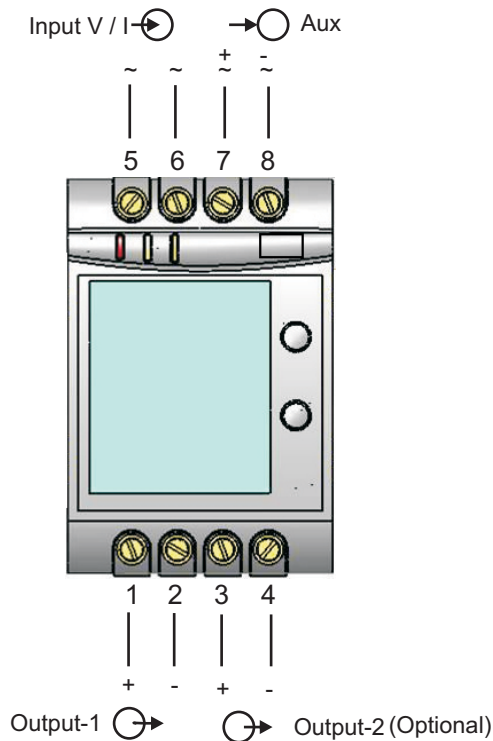
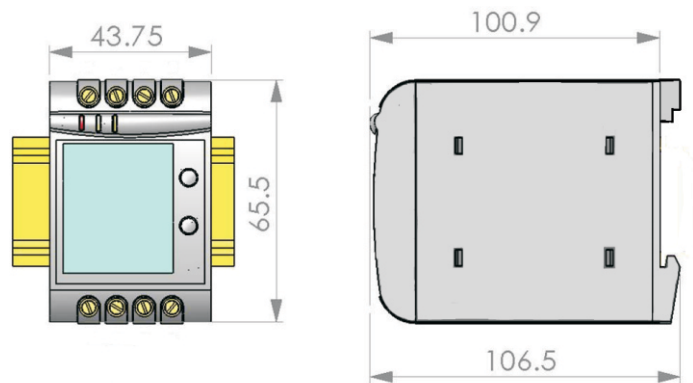
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ON LED	Aux.supply healthy condition	Green LED continuous ON
O/P1 LED	Output1 voltage selection	Green LED continuous ON
	Output1 Current selection	Red LED continuous ON
O/P2 LED	Output2 voltage selection	Green LED continuous ON
	Output2 Current selection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

Electrical Connections:

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

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

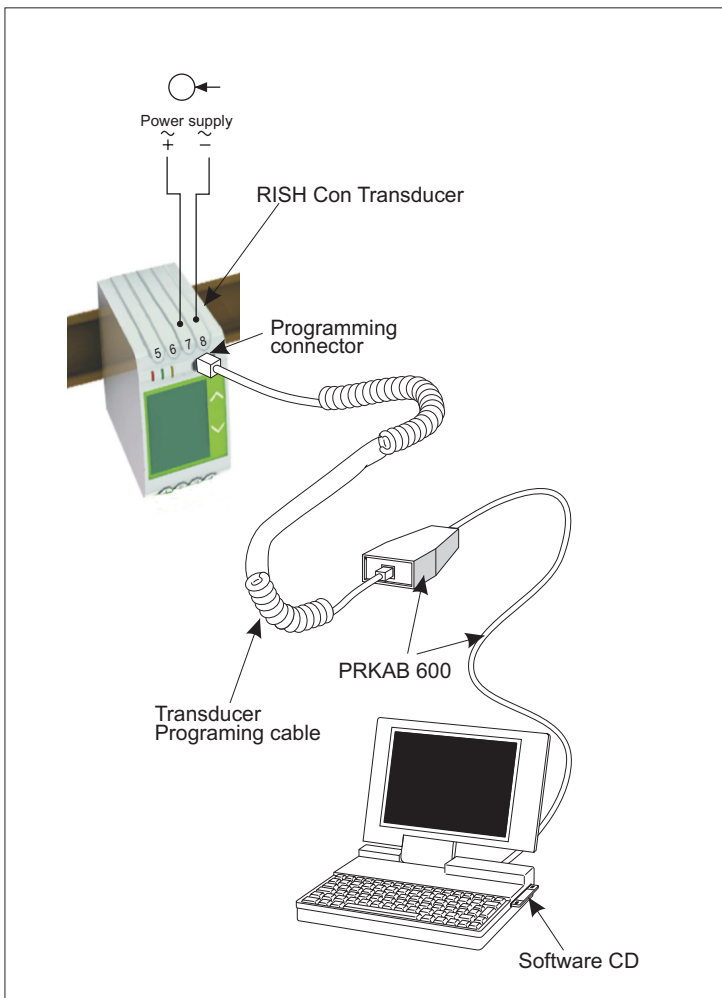
A PC with RS 232 C interface along with the programming cable PRKAB600 and the configuration software are required to program the transducer.

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

The connections between

PC ↔ PRKAB 600 ↔ Rish CON Transducer.

The powersupply mustbe applied to Rish CON Transducer 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 for output).

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	Frequency	RISH CON - Hz
2	Frequency of Input	
	45 - 55 Hz	F1
	55 - 65 Hz	F2
	45 - 65 Hz	F3
	48 - 52 Hz	F4
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	
	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	
	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:

Order Code : RISH CON - Hz - F3 - O1A1- O1V1 - O2V1- O2A1 - D - R - PR

RISH CON - Hz is Frequency transducer, Input signal frequency range 45 Hz to 65 Hz,
Output1 = 0...20 mA, Output2= 0...10 VDC, with LCD display module , with RS-485with PRKAB 600 cable.



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