



# Data Sheet

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## RISH CON-Hz

Frequency transducer



Measure



Control



Record



Analyze

### 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 ( IEC / EN 60688)
- Seven Segment LCD Display
- RS 485(Modbus) Communication
- Wide Auxiliary power supply. Accept any input 60V - 300V AC/DC or 24V - 60V AC/DC
- Output Response Time < 400ms
- 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 - Hz

### 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

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

#### RS 485 Communication(Optional)

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

#### 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 <sub>N</sub>	Rated value of output burden
U <sub>N</sub>	Nominal input voltage



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## Technical Specifications

### Measuring Input X

#### 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(UN)	$57V \leq UN \leq 500 V$
Nominal input Voltage burden	$< 0.6 VA \text{ max}$
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).

### Measuring Output Y( Single or Optional Dual)

Output type	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 $\leq 100 \text{ mA}$ 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	$\leq 1\% \text{ pk-pk}$
Response Time	$< 400 \text{ ms}$
Measurement TRMS	Up to the 15th harmonic

#### Auxiliary Power Supply

AC/DC Auxiliary Supply	60V... 300 VAC-DC $\pm 5\%$ or 24V... 60VAC-DC $\pm 10\%$
AC Auxiliary supply frequency range	40 to 65 Hz
Auxiliary supply consumption	

60V...300 VAC-DC	$\leq 8VA$ for Single output
	$\leq 10VA$ for Dual output
24V...60 VAC-DC	$\leq 5 VA$ for Single output
	$\leq 6 VA$ for Dual output



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### 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 60688

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

Miscellaneous

Acc. to IEC / EN 60688

### Additional error

Temperature influence

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

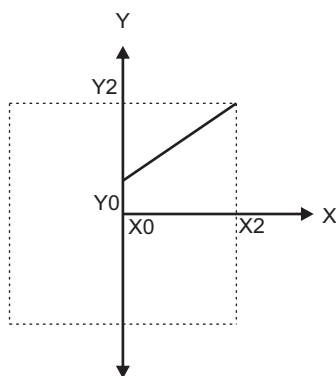
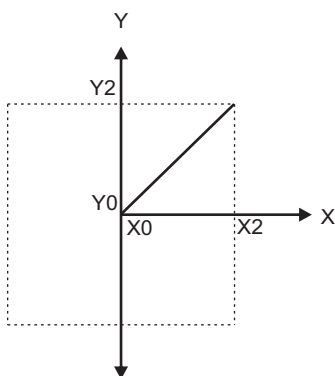
### Influence of Variations

As per IEC / EN 60688 standard Output Stability

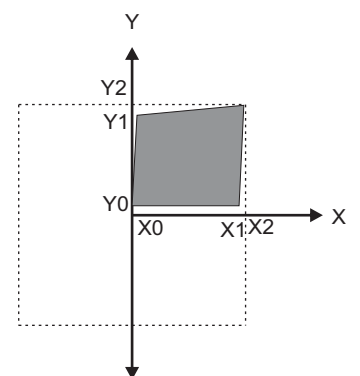
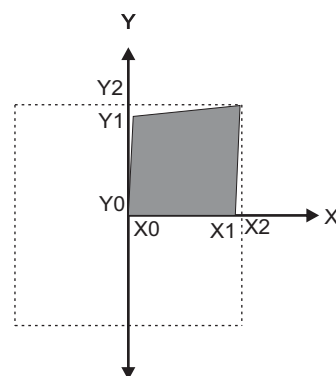
< 30 min

### Output Characteristics

Example of setting with Linear Characteristics :



Example of setting with bent 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

**Note:** End value(Y2) of output cannot be changed onsite.



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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	1min. ( EN 61010-1) 7700V DC, Input versus outer surface 5200V DC, Input versus all other circuits 5200V DC, Auxiliary supply versus outer surface and output 690V DC, 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
IEC 61000-4-2/-3/-4/-5/-6 EN 55 011	Electromagnetic compatibility



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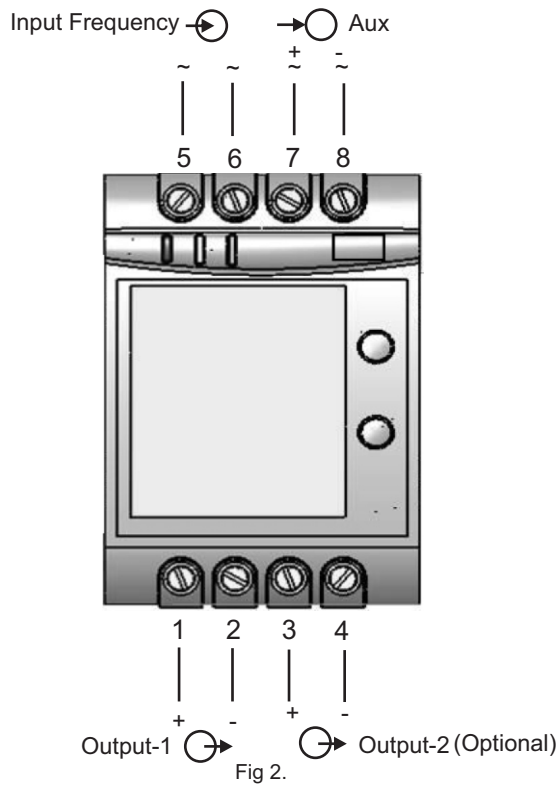


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ON LED	Aux.supply healthy condition	Green LED continuous ON
O/P1 LED	Output1 voltage selection	Green LED continuous ON
	Output1 Current selection	Red LED continuous ON
O/P2 LED	Output2 voltage selection	Green LED continuous ON
	Output2 Current selection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

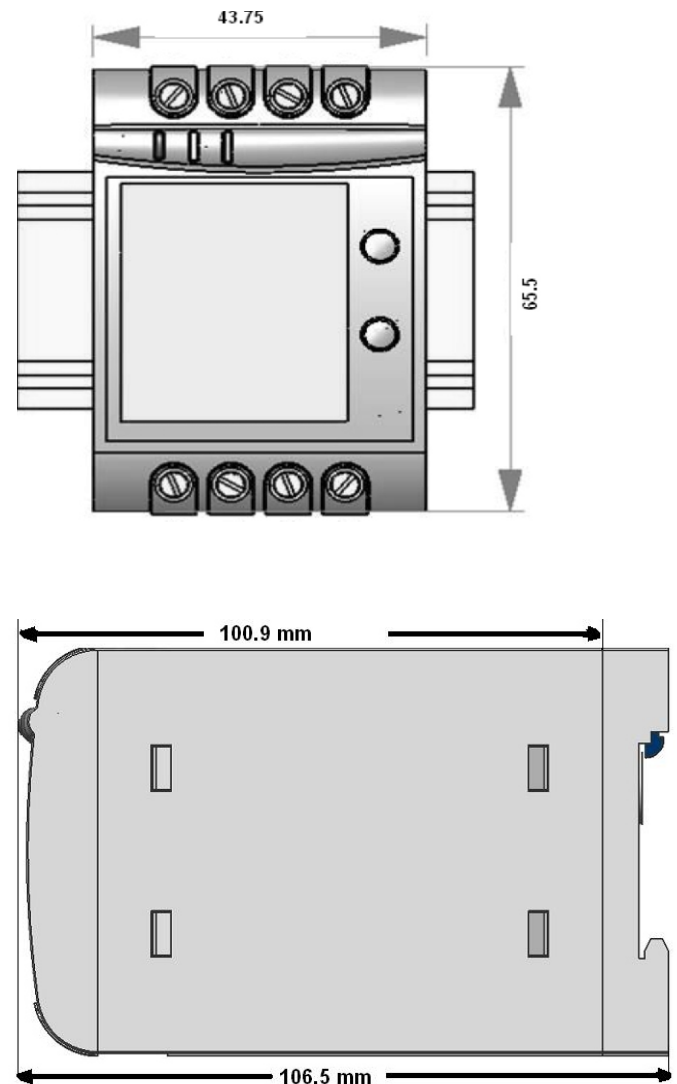


Fig 3.



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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, 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 PRKAB601 and the configuration software are required to program the transducer.

#### The connections between

"PC ↔ PRKAB 601 ↔ Rish CON Transducer..

The powersupply mustbe applied to Transducer before it can be programmed.

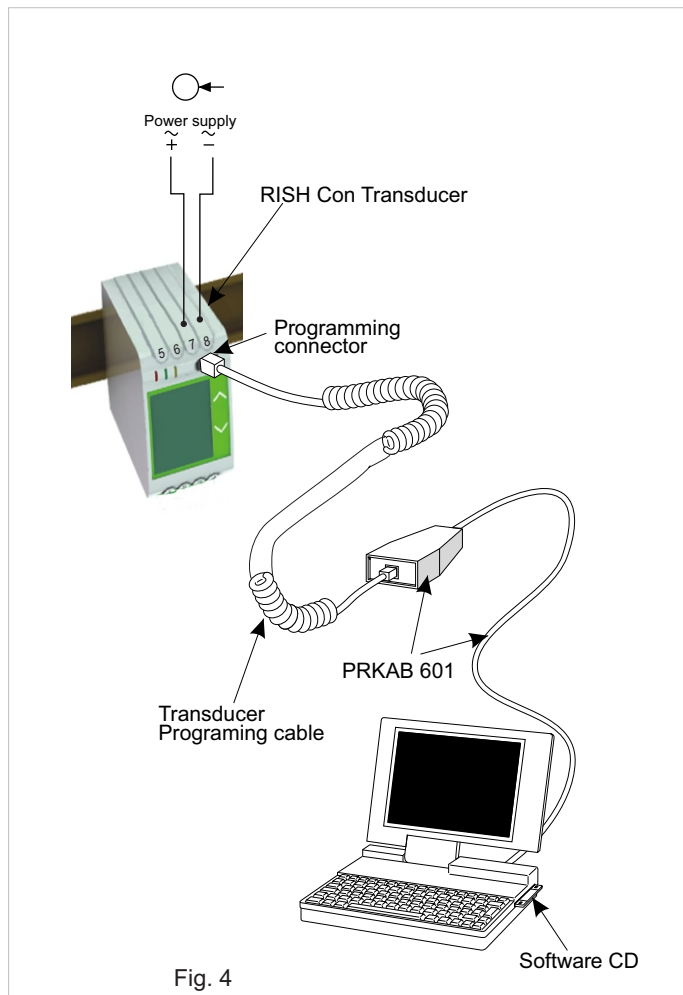


Fig. 4

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

Fig. 5



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## Ordering Information

Product Code	CF41-	X	XX	X	X	X	X	X	00000
Input Range	45-55Hz	6							
	55-65Hz	B							
	45-65Hz	7							
	48-52Hz	A							
Input Voltage	100-500V		8F						
Power Supply	60-300 VAC/DC			H					
	24-60 VAC/DC			F					
Output	1 O/P				1				
	2 O/P				2				
Display Module	With Display					D			
	Without Display					Z			
RS485 Module	With RS-485						R		
	Without RS-485						Z		
Programming Cable	With - PRKAB 601							C	
	Without - PRKAB 601							Z	

**Ordering Example** – CF41-B8FH1DZZ00000 – 55-65Hz, 100-500V, 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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All specifications are subject to change without notice



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## RISHABH INSTRUMENTS LIMITED

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)