Data Sheet

RISH CON-V / CON-I

OUTPUT SETTING FOR DIP SWITCH

FOR CURRENT OUTPUT

ON
1 2 3 4

FOR VOLTAGE OUTPUT

ON
1 2 3 4

O/P 2

Remove Sticker for dip Selection

O/P 1

ON O/P1 O/P2　　COM
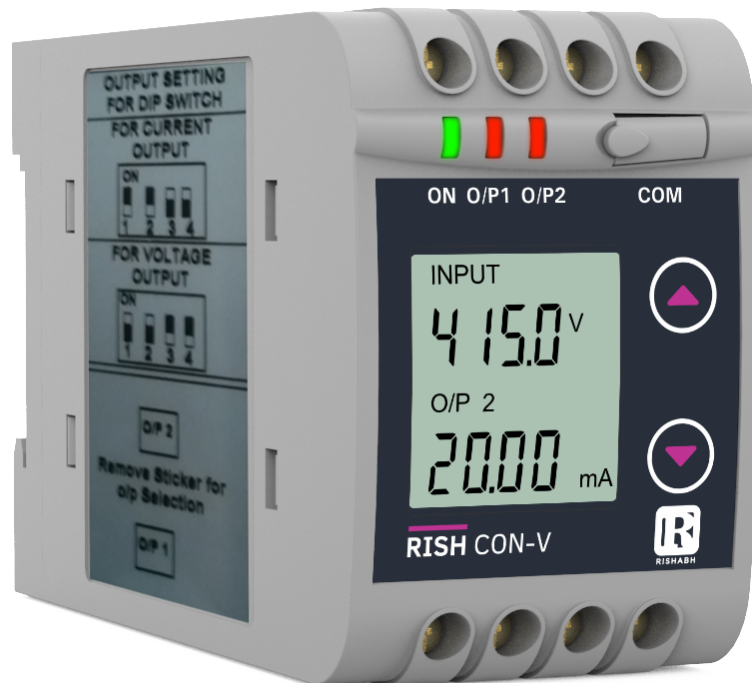
INPUT

415.0 V

O/P 2

20.00 mA

RISH CON-V

RoHS　　CE　　UL

Measure　　Control　　Record　　Analyze

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 60-300VAC/DC or 24-60VAC/DC.

✍Output Response Time < 400 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.

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.

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)

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

Measure   Control   Record   Analyze

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	45.....66 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	45.....66 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, repeated 1 time at 1 hour interval(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=∞	$< 1.25 * Y2$ with voltage output $\leq 30\ V$ with current output
Residual Ripple in Output signal	$\leq 1\%$ pk-pk
Response Time	< 400 ms.

Measure   Control   Record   Analyze

Auxiliary Power Supply:

AC/DC Auxiliary Supply   60V… 300 VAC-DC ± 5% or 24... 60 VAC-DC ± 10%

AC Auxiliary supply frequency range   40 to 65 Hz

Auxiliary supply consumption

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

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:

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

Bent characteristics:

For $X0 \leq X \leq X1$ $C = \dfrac{Y1 - Y0}{X1 - X0} \cdot \dfrac{X2}{Y2} \text{ or } C=1$

For $X1 \leq X \leq X2$ $C = \dfrac{1 - \dfrac{Y1}{Y2}}{1 - \dfrac{X1}{X2}} \text{ or } C=1$

Reference conditions for Accuracy :

Ambient temperature   23°C +/- 1°C

Pre-conditioning   30 min acc. to IEC / EN 60 688

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   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 60 688

Additional Error :

Temperature influence   ± 0.2% /10°C

Influence of Variations:

As per IEC / EN 60688 standard.

Output stability   < 30min

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.

Measure   Control   Record   Analyze

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   ± 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

IEC 61000-4-2/-3/-4/-5/-6	
EN 55 011	Electromagnetic compatibility.

Measure   Control   Record   Analyze

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.
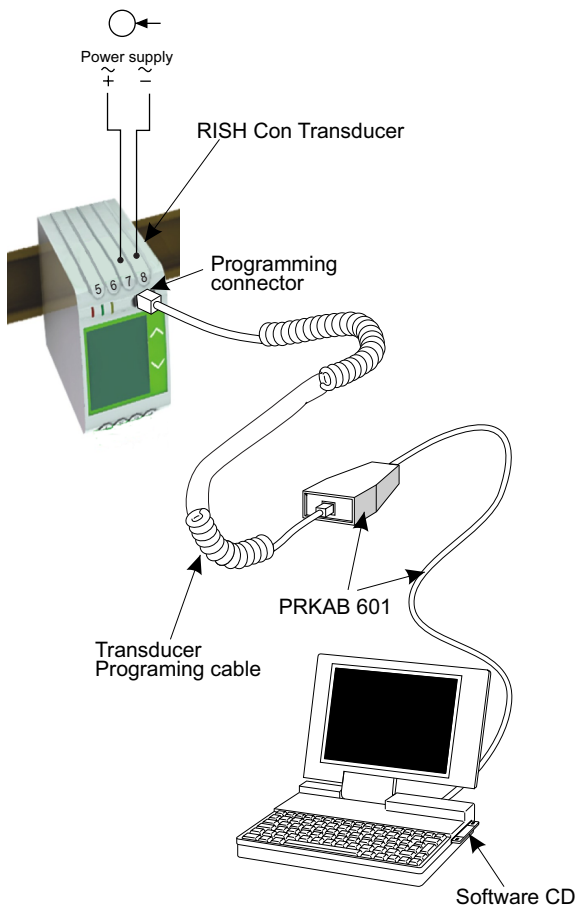
Fig. 4

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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.

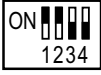The four pole DIP switch is located on the PCB in the RISH CON Transducer

DIP Switch Setting	Type of Output Signal
ON ▮▮▮ 1234	load-independent current
ON ▮▮▮▮ 1234	load-independent voltage

Fig. 5

Measure   Control   Record   Analyze

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
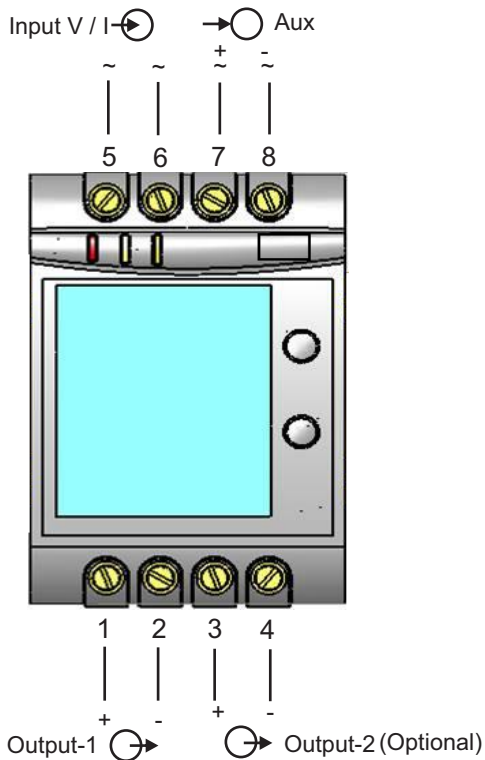
Fig 2.
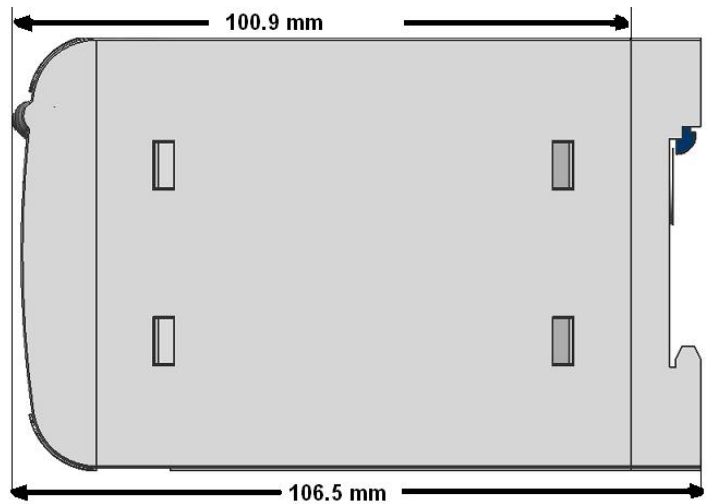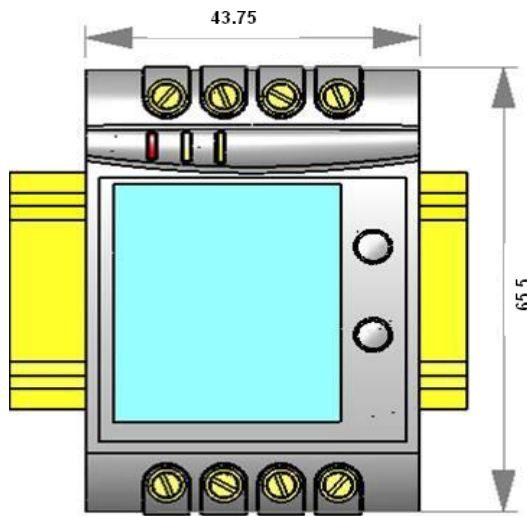
Fig 3.

Measure   Control   Record   Analyze

Ordering Information:

Product Code	CM41-		X	XX	X	X	X	X	X	00000
Product Type	Rish CON I	I								
	Rish CON V	V								
Input Range	Programmable 1…5A			74						
	Programmable 57…500V			8E						
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 – CM41-I74H1DZZ00000 – Rish CON I, Programmable 1…5A, 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.

Measure   Control   Record   Analyze

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