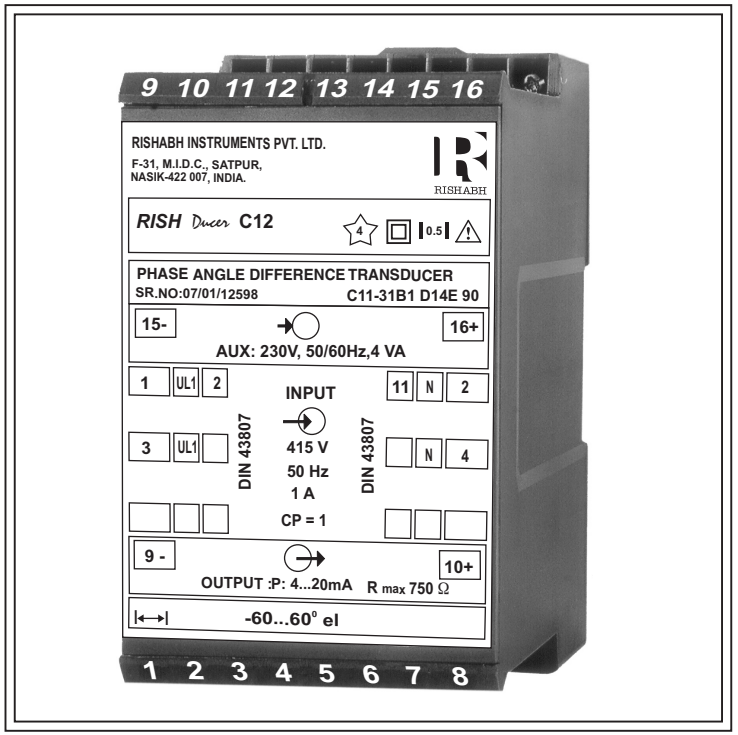
Operating Instructions Transducer for Phase angle difference *Rish Ducer* C12



RISHABH INSTRUMENTS

Measure, Control & Record with a Difference

RISHABH INSTRUMENTS PVT. LTD.
F-31, M.I.D.C., Satpur, Nashik 422 007, India.
Tel. : +91 253 2202160, 2202202,
Fax : +91 253 2351064
Email : marketing@rishabh.co.in
www.rishabh.co.in

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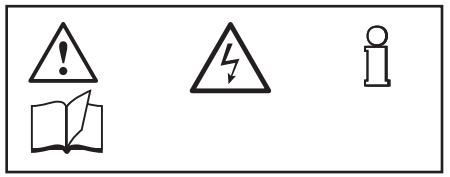
Operating Instructions
Transducer for Phase Angle Difference RishDucer C12

Safety precautions to be strictly observed are marked with following symbols in the operating instructions :



Contents

1. Read first and then

The proper and safe operation of the device assumes that the operating instructions are read and the safety warning given in the various sections
5. Mounting
6. Electrical Connections
are observed.

The device should only be handled by appropriately trained personnel who are familiar with it and authorised to work in electrical installations.

2. Scope of supply (Fig. 1)

Fig.1

3. Brief Description :

The RishDucer C12 measuring transducer is used to measure phase angle difference between two synchronised single phase balanced network having sine wave form. The output signal is proportional load independent DC voltage or current.
The transducer is available in AC or DC auxiliary supply and also in self power version.

4. Technical Data (Refer Fig.5)

Measuring Input

Measuring Range $\Delta\measuredangle$: ±120° el
Nominal Frequency : 50 or 60 Hz
Nominal Input Voltage : For both inputs
100/√3, 110/√3, 100, 110, 200, 230, 400 or 500 V

Measuring Output

DC Voltage : 0....10 / 1....5 / -10....0....10 V.
Load capacity 20 mA
External resistance -
R_{ext} (KΩ) > $\frac{U_{AN}\,[V]}{20mA}$
U_{AN} = full output value

DC Current : 0....1mA to 0....20mA / 4.....20 mA
-1...0...1 mA to -20...0...20 mA
Burden Voltage ±15 V
External Resistance -
R_{ext} max. [KΩ] = $\frac{15V}{I_{AN}\,[mA]}$
I_{AN} = Full output value

Power Supply

AC Voltage : 24, 115, 120, 230 V or 240 V ±20%
42 to70 Hz
Power consumption approx. 4VA

DC Voltage : 24....90 V or 90....240 V
-15 /+33%
Power Consumption approx. 4W

Accuracy

Reference value : Output span
Basic accuracy : Class 0.5

Electrical Safety

Installation Category : CAT III, Max. voltage to ground 500 V
Pollution degree : 2
Test Voltage : 4 KV between electrically isolated circuits and versus housing

Environmental conditions

Climatic range : Climate class 3Z acc. to VDI/VDE 3540
Operating Temperature : -25°C to +55°C
Storage Temperature : -40 to +70°C
Relative humidity of annual mean : ≤75%

9.Dimensional drawings

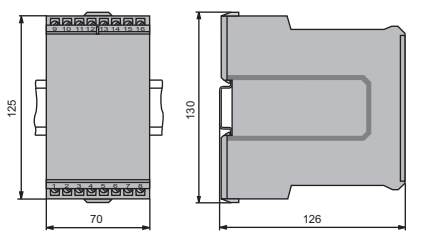


Fig.7 RISH Ducer C12 in housing E16 clipped onto a top hat rail (35 x 15 mm or 35 x 7.5 mm, acc. to EN 50 022).

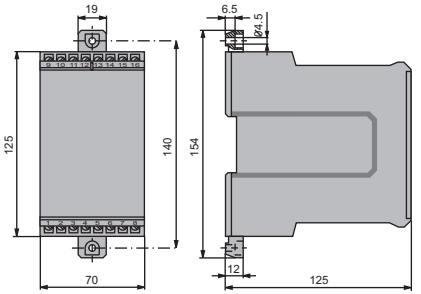


Fig.8 Fig.7 RISH Ducer C12 in housing E16 with the screw hole brackets pulled out for wall mounting.

10. Special Features

Measuring range $\Delta\measuredangle$

① between ±60° el. and ± 175° el.,
but for angle < ±120° el.,
additional error 0.5%

Nominal Frequency f_N

② between 16 and 400 Hz
apart from the standard ranges 50 or 60 Hz
Limitation at f_N > 100 Hz :
addtional error 0.2%

Limitations at 16 ≤ f_N < 50 Hz :
posssible only with measuring ranges >± 60° el.
additional error 0.3 %
response time t_{90} < 2 s
Power supply derived from measuring input not possible

Nominal Input voltage U_N

③ between 10 and 600 V, other than the standard values 100/√3, 110/√3, 100, 110, 200, 230, 400 or 500 V
Limitation :
with U_N > 500 V overload capacity 2000 V, 2s

Output signal A (measuring output A)

④ Unipolar load-independent DC voltage*
Ranges between 0...1 and 0....15 V, other than the standard range 0.....10 V

⑤ Live-zero*
Ranges between 0.2...1 and 3...15 V, other than the standard range 1...5 V
*Limitation with U_{AN} < 4 V
Additional error :
Dependence on external resistance
ΔR_{ext} max. = 0.2%, reference conditions:
External resistance 2 x R_{ext} min. ±20%

⑥ Bipolar-symmetrical load-independent DC Voltage*
Ranges between -1..0...1 and -15...0...15 V, other than the standard range -10...0...10 V

⑦ Unipolar load-independent DC Current
Ranges between 0...1 and 0...20 mA, other than the standard ranges 0...1/0...5/0...10 & 0...20 mA

⑧ Live-zero
Ranges between 1..5 and 4...20 mA, other than the standard range 4...20 mA

⑨ Bipolar-symmetrical load-independent DC current
Ranges between -1...0...1 and -20...0...20 mA, other than the standard ranges -1...0...1/-2.5...0...2.5/ -5...0...5/-10...0...10 & -20...0...20mA

Residual ripple in output current

⑩ ≤ 0.5% p.p. instead of ≤ 2% p.p.
Limitations :
possible only with nominal frequency ≥ 50
response time < 1 s
(not suitable for synchronising operations)

Power supply

⑪ without separate power supply connection
Power supply from voltage input signal
(≥24 V to 500, f_N 50 or 60 Hz)
Limitations :
Reference condition :
Input voltage U_N ± 15%
with U_N ≥ 170 V
Impulse withstand voltage acc. to IEC 255-4, Cl. II : 1 kV,1.2/50 µs, 0.5 Ws or
overload capacity of the voltage input max. 680 V~, 2 s
The additional power taken from the input voltage signal is approx. 4 VA

⑫ with AC Voltage
any voltage between 24 and 500 V, ± 20 %, 42 to 70 Hz.
Power consumption approx. 4 VA
apart from the standard voltages 24, 115, 120, 230 and 240 V

Climatic

⑬ Climate class 3Z acc. to VDI/VDE 3540, but temperature continuously -25 to +55° C.
Relative humidity ≤ **90%** annual mean
(application class HVR acc. to DIN 40 040)

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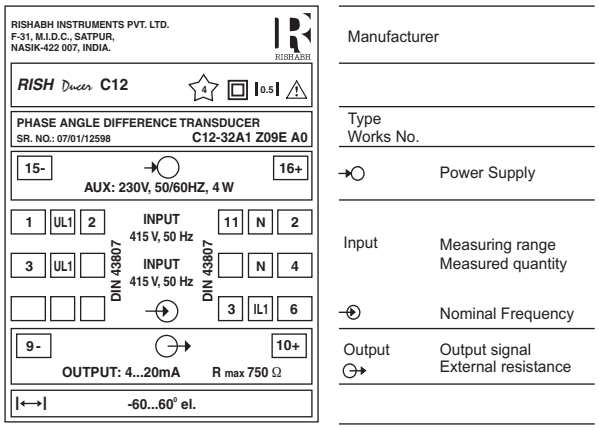


Manufacturer	
Type Works No.	
→	Power Supply
Input	Measuring range Measured quantity
→	Nominal Frequency
Output →	Output signal External resistance

Fig.5. Declaration of type label

Meaning of symbols on device

⚠ Warning of danger (Caution, see documentation)

Double insulation Class II device

☆ Test voltage 4 KV

7. Commissioning and maintenance

Switch on the power supply and the measuring input. During the operating, you can disconnect the output and connect a test epuipment e.g. For a functional test.
No maintenance is required.

8. Releasing the transducer

Release the transducer from a top-hat rail as shown in Fig. 6

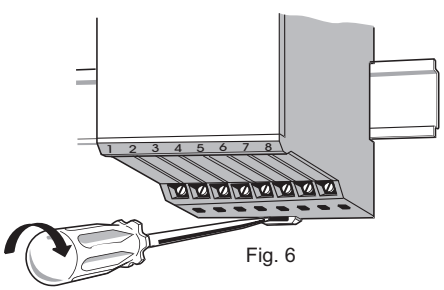
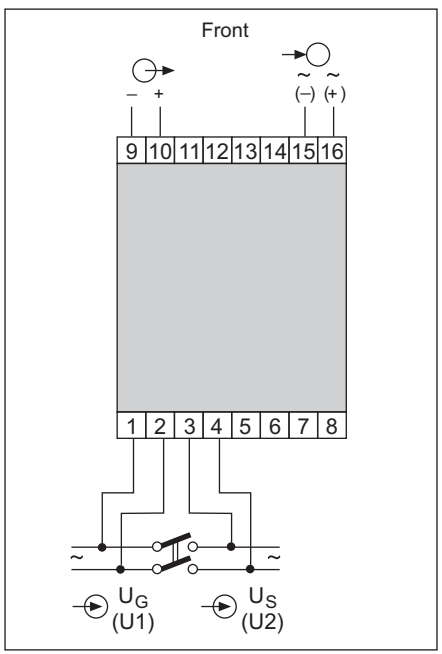


Fig. 6

Electrical Connections



UG = Measuring input, generator voltage

US = Measuring input, bus voltage

= Measuring output

= Power supply

5. Mounting

The RISHDucer C 12 can be mounted either on a top-hat rail or directly onto a wall or mounting plate.

Note "Environmental conditions" in section "4.Technical Data" while deciding the place of installation!

5.1 Top-hat rail mounting

Simply clip the device onto the Top-hat rail (EN 50 022) (See Fig. 2)

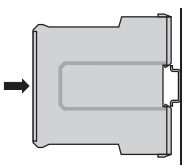


Fig.2 Mounting onto top-hat rail 35 x 15 or 35 x 7.5 mm.

5.2 Wall mounting

The screw hole brackets (1) can be released and pulled out by pressing on the latch (4). They can be pushed in after pressing the latch (5).

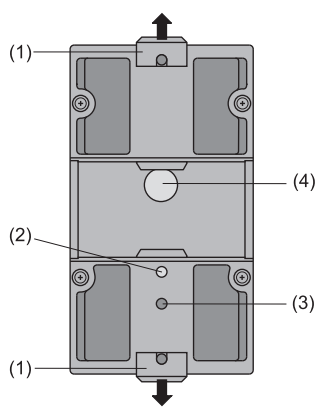
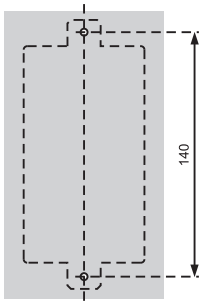


Fig.3. Rear at device

(1) Screw hole brackets
(2) Latch for pulling the screw hole brackets out
(3) Latch for pushing the screw hole bracket in
(4) Rubber buffer



Fixing the housing to a wall or mounting plate using two 4 mm diameter screws. Drill holes as shown in the drilling pattern (Fig.4)

Fig.4. Drilling Pattern

6. Electrical connections

Make connection as per printed label on transducer (Fig.5,example of a nameplate)

Impending danger by high input voltage or high mains voltage.
Be aware of danger of open Current transformer secondary. Make sure that the measuring input cables are not live(potential-free) when making the connections !

Note : It is strongly recommended to employ a circuit breaker in building installation to make provision for disconnection of the power supply to device and to provide protection in case of short circuit. The circuit breaker should be close to device, easily reachable and appropriately identified.

Note that,.....
... the data required to carry out the prescribed measurement must correspond to those marked on the nameplate of the RISHDucer C12 (→ measuring input, → measuring output and → power supply. See Fig.5)

... the total loop resistance connected to the output (receiver plus leads) does not exceed the maximum permissible value R_{ext}! See **"Measuring output"** in section "4.Technical data" for maximum values of R_{ext}!

... the measurement output cables should be twisted pairs and run as far as possible away from heavy current cables !

In all other respects, observe all local regulations when selecting the type of electrical cable and installing them!

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