



sifam tinsley
PRECISION INSTRUMENTATION

TRANSducers & ISOLATORS
www.sifamtinsley.co.uk



DATASHEET

Issue 1



Multifunction Meters

Transducers & Isolators

Temperature Controllers

Converters & Recorders

Digital Panel Meters

Current Transformers

kWh Energy Meters

Analogue Panel Meters

Shunts

Digital Bargraphs

Digital Multimeters

Protection Relays

Synchroscope Series

Rotary Switches

Power Supplies

Test & Measurement



THETA HZ FREQUENCY TRANSDUCER

SUBJECT TO CHANGE WITHOUT NOTICE

This datasheet superseded all previous versions – please keep for future reference

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 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

→ RS485 Communication (Optional)

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

THETA Hz Frequency Transducer



Fig. 1

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 (Optional)
- RS 485(Modbus) Communication (Optional)
- 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.

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	End 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

Technical Specifications

Measuring Input X

Frequency Transducer (Theta 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	$< 0.6 VA \text{ max}$
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).

Measuring Output Y(Single or Optional Dual)

Output type	Load independent DC Voltage or DC Current (Onsite selectable through DIP switches)
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	$Y2/(2 \text{ mA}) \leq R \leq \infty$
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 ± 5% or 24... 60 VAC-DC ± 10%	
AC Auxiliary supply frequency	40 to 65 Hz	
range 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:

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

Bent characteristics:

For $X_0 \leq X \leq X_1$:

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

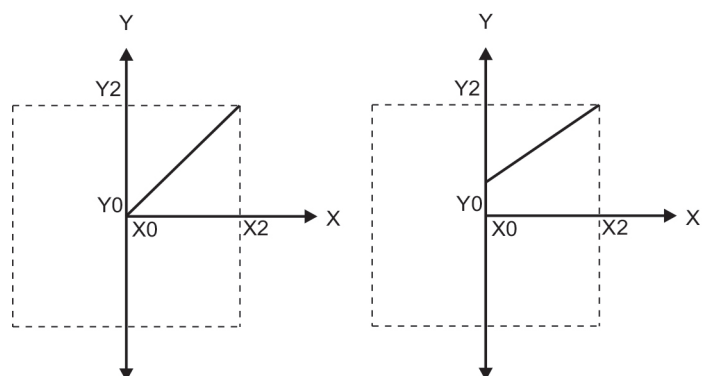
For $X_1 \leq X \leq X_2$:

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

Reference conditions for Accuracy	
Ambient temperature	23°C +/- 1°C
Pre-conditioning	30 min acc. to IEC I 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 =7.5V / Y ₂ $\pm 1\%$ With DC current output signal R _n = Y ₂ / 1 mA $\pm 1\%$ With DC voltage output signal Acc. to IEC I EN 60688
Miscellaneous	Acc. to IEC I EN 60688
Additional Error	
Temperature influence	$\pm 0.2\% / 10^\circ\text{C}$
Influence of Variations	
As per IEC I EN 60688 standard. Output stability	< 30min

Output Characteristics

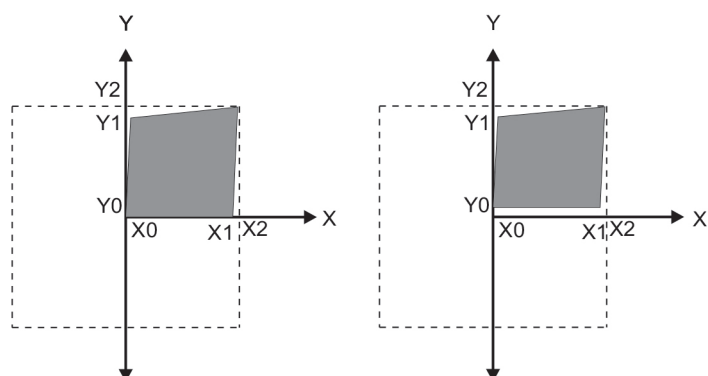
Example of setting with Linear Characteristics :



X0 = Start value of input
X1 = Elbow value of input
X2 = End value of input

Y0 = Start value of output
Y1 = Elbow value of output
Y2 = End value of output

Example of setting with bent Characteristics :



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

Safety	
Protection Class	II (Protection Isolated, EN 61010)
Protection	IP 40, housing according to EN 60529 IP 20, terminal according to EN 60529
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	≤ 4.0 mm ² single wire or 2 x 2.5 mm ² fine wire
Environmental	
Nominal range of use	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	±2g
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

Proramming (Fig4)

Programming of transducer can be done in two ways

- Programming Via Front LCD & two keys for with display model.
- Programming Via optional RS485(MODBUS) communication port.

Configuring Theta Hz Transducer

To configure Theta 20A-20V Transducer Input/ output one of the two 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.4).

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.4 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 	load-independent current
ON 	load-independent voltage

Fig.4

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

Dimensions

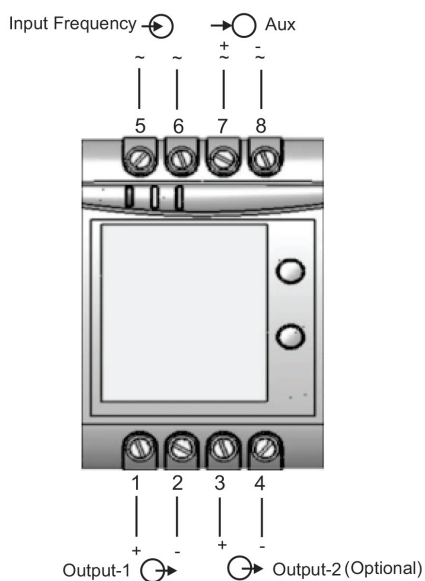


Fig. 2

Electrical Connections

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

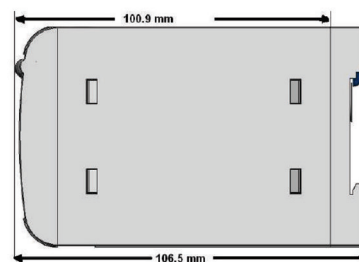
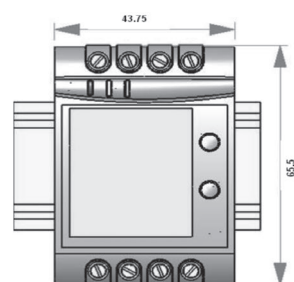
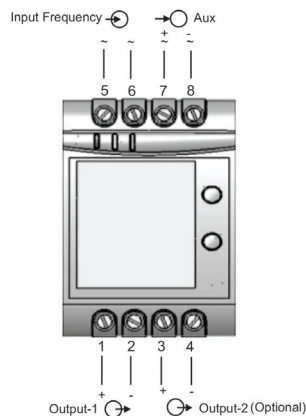


Fig. 3

Ordering Information

Product Code	CM41-	X	XX	X	X	X	X	Z	00000	
Input Range	45-55Hz	6								
	55-65Hz	B								
	45-65Hz	7								
	48-52Hz	A								
Input Voltage			8F							
Power Supply	60-300 VAC/DC				H					
	24-60 VAC/DC				F					
Output	1 O/P				1					
	1 O/P				2					
Module options	With Display, without RS-485					D	Z			
	Without Display, with RS-485					Z	R			
	With Display. with RS-485					D	R			

Ordering Example: CF41-B8FH1DZZ00000 – 55-65Hz, 100-500V, Aux 60-300VAC/DC, With display, without RS485.

Analogue DC output options as below, to be specified while ordering only

Current Output	Voltage Output	DIP Option
Standard Ranges		
0/4...20 mA	0.....V	Yes
Optional factory set ranges		
0...10 mA	0...V	No
0...5 mA	0...V	No
0...2.5 mA	0...V	No
0...1 mA		

Note: End value of output cannot be changed onsite.

Contact



Sifam Tinsley Instrumentation Ltd

1 Warner Drive
Springwood Industrial Estate
Braintree
Essex
CM7 2YW

Tel: 01376 335271
Email: sales@sifamtinsley.com

www.sifamtinsley.co.uk