CIP-HZ - Transducers of Frequecy

- Onsite selectable output type (DC current/ DC voltage)
- Accuracy class 0.5 (IEC/EN60688)
- Wide Auxiliary power supply which can be accept any between 60 - 300V AC/DC or 24V - 60V AC/DC
- Output response time < 400ms
- Fast and easy installation on DIN RAIL or onto a wal or in a panel using optional screw hole bracket
- Connection terminal: Conventional screw type
- Fully onsite programmable input range
- Seven segment LCD Display

Optional

- Available in single or dual output type
- RS485 (MODBUS) Communication

Application

The CIP-Hz transducer is used for frequency measurement. The outpur signal is proportional to measured frequency and is either load independent DC current or load independent DC voltage.

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 either to voltage or current output..

Accuracy

Ouput signal accuracy class 0.5 as per International Standard IEC/EN60688.

Programmable Input/Output

Onsite transducer can be programmed using front key and display or through RS485.

LED Indication

LED Indication for power in and output type. (Current red LED, voltage green LED).

Display Module

Optional 7 segment LCD display with backlit and keypad. For displaying measured parameters and onsite configuration of input/output.

RS485 Communication (Optional)

Optional RS485 communication is available. For reading measured parameters and 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
RN	Rated value of output burden
UN	Nominal input voltage

Output characteristics:

Example of setting with Linear Characteristics
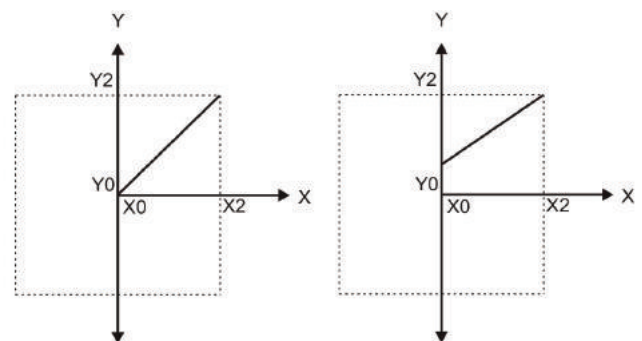
X0 =	Start value of input	Y0 =	Start value of input
X1 =	Elbow value of input	Y1 =	Elbow value of input
X2 =	End value of input	Y2 =	End value of input

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

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Technical Specifications

Measuring Input X - Frequency Transducer (CIP-Hz)

Measuring ranges	45Hz to 55Hz 48Hz to 52Hz 55Hz to 65Hz 45Hz to 65Hz (min span 4Hz)
Nominal input voltage (U_N)	$57V \leq U_N \leq 500V$
Nominal input voltage burden	< 0.6VA max
Overload capacity	$1.2*U_N$, continuously
	2* for 1 second, repeated 10 times at 10 minute intervals
	(but maximun 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 or programming)
Load independient DC output		0...20mA / 4...20mA or 0...10V
Output burden with DC current Signal		$0V \leq R \leq 15V/Y2$
Output burden with DC voltage Signal		$Y2/(2mA) \leq R \leq \infty$
Current limit under overload	R=0	$\leq 1.25*Y2$ with current output
		$\leq 60mA$ with voltage output
Voltage limit under	R=∞	$\leq 1.25*Y2$ with voltage output
		$\leq 30V$ with current output
Residual Ripple in output signal		$\leq 1\%$ pk-pk
Response time		< 400ms

Auxiliary Power Supply

AC/DC auxiliary supply	60V...300V AC/DC ± 5%	or	24V...60V AC/DC ± 105%
AC auxiliary supply frequency range	45 to 65Hz		
Auxiliary supply consumption	60V...300V AC/DC	$\leq$ 8VA for single output	$\leq$ 10VA for dual output
	24V...60V AC/DC	$\leq$ 5VA for single output	$\leq$ 6VA for dual output

Accuracy (According to IEC 60688)

Reference value	Output end value Y2 (voltage or current)
Basic accuracy	class 0.5

Factor C (the highest value applies if calculated C is less than 1, then C=1 applies)

Linear characteristics		Bent characteristics		
$C = \dfrac{1-(Y0/Y2)}{1-(X0/X2)}$ or C=1		For $X0 \leq X \leq X1$ $C = \dfrac{(Y1-Y0)}{(X1-X0)} \cdot \dfrac{X2}{Y2}$ or C=1		
		For $X1 \leq X \leq X2$ $C = \dfrac{1-(Y1/Y2)}{1-(X1/X2)}$ or C=1		

Reference conditions for Accuracy

Ambient temperature	23°C +/- 1°C
Pre-conditioning	30min according to IEC EN 60688
Imput variable	Rated voltage / Rated current
Input waveform	Sinusoidal, form factor 1.1107
Input signal frequency	50..60Hz
Auxiliary supply voltage	at nominal range
Output load	Rn = 7.5V / Y2 ± 1%, with DC current output signal
	Rn = Y2 / 1mA ± 1%, with DC voltage output signal
Miscellaneous	according to IEC EN 60688

Additional Error

Temperature influence	± 0.2% / 10°C

Influence of Variations

As per IEC EN 60688 Standard	Output Stability	< 30min

Safety

Protection class	II (Protection isolated, EN 61010)
Protection	IP40, housing according to EN 60 529
	IP20, terminal according to EN 60 529
Pollution degree	2
Installation category	III
Installation voltage	1m (EN 61 010-1)
	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

Environmental

|	
Nominal range of use	0°C...23°C...45°C (usage group II)
Storage temperature	-40 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	Schock
Acceleration	3x50g
	3 shocks in each direction
EN 60 068-2-1/-2/-3	Cold, dry, damp heat
IEC 61000-4-2/-3/-4/-5/-6	Electromagnetic compatibility
Installation data	
Mechanical housing	Lexan 940, polycarbonate, flammability class V-0 according to UL94, self xtinguishing, non dripping, free of halogen
Mounting position	Rail mounting/ wall mounting
Weight	approx. 0.4kg
Connection Terminal	
Connection elemet	Convetional screw type terminal with indirect wire pressure
Permissible cross section of the connection lead	$\leq$ 4.0mm^2 single wire or 2x2.5mm^2 fine wire

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

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

Fig 2.

Dimensions

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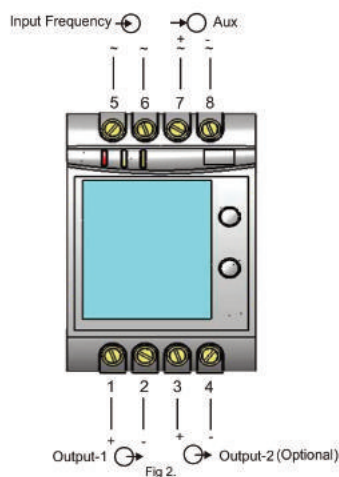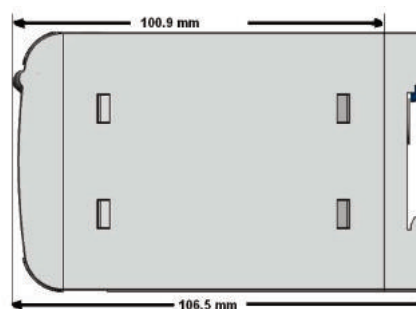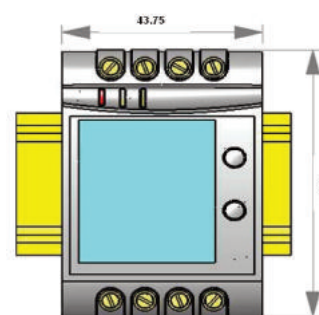
Programming

Can be done in two ways:

1. Programming via front LCD and two keys
2. Programming via optional RS485 (MODBUS) communication port (Device address,Password,communication parameter,Output Type and simulation mode can be programmed).

Configuration CIP Transducer

To configure CIP Transducers Input/Output one of the two programming methods to be adapted along with mechanical switch setting (DIP switch setting on PCB)

DIP Switch Setting for Output

Type of output (current to voltage signal) has to be set by DIP swicth.For programming of DIP switch the user needs to open the transducer housing and 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.

The four pole DIP switch is located on the PCB on the CIP Transducers

DIP Swicth Setting	Type of output signal
ON ▮▮▮▮ 1234	load-independent current
ON ▮▮▮▮ 1234	load-independent voltage

Type	Description	Output (to indicate)	Auxiliary supply (to indicate)
CIP-CA	Compact 1 output Current	0 - 20 mA 4 - 20 mA 0 - 10V	40 - 300V AC/DC 24 - 60V AC/DC
CIP-CV	Compact 1 output Voltage	0 - 20 mA 4 - 20 mA 0 - 10V	40 - 300V AC/DC 24 - 60V AC/DC