# CIP-HZ - Transducers of Frequecy


- Onsite selectable output type (DC current/ DC voltage)
- Accuracy class 0.2 (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 independient DC current or load independient 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 0.2 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)**

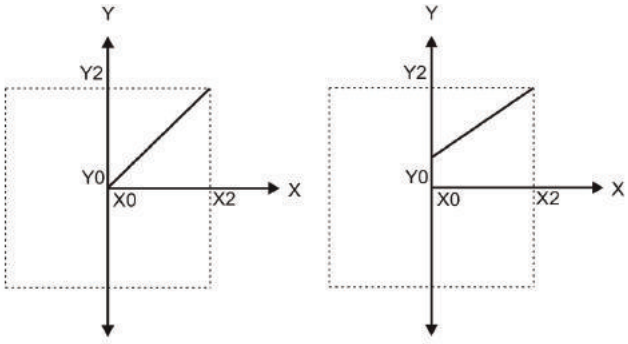
Optional RS485 communication is available. For reading measured parameters and onsite configuration of input/output.

**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

## 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 ≤ $U_N$ ≤ 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 ≤ R ≤ 15V/Y2 |
| Output burden with DC voltage Signal | | Y2/(2mA) ≤ R ≤ ∞ |
| Current limit under overload | R=0 | ≤ 1.25*Y2 with current output |
| | | ≤ 60mA with voltage output |
| Voltage limit under | R=∞ | ≤ 1.25*Y2 with voltage output |
| | | ≤ 30V with current output |
| Residual Ripple in output signal | | ≤ 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 | ≤ 8VA for single output | ≤ 10VA for dual output |
| | 24V...60V AC/DC | ≤ 5VA for single output | ≤ 6VA for dual output |

### Accuracy (According to IEC 60688)

Reference value: Output end value Y2 (voltage or current)

Basic accuracy: class 0.2*C

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

| Linear characteristics | | Bent characteristics | | |
|---|---|---|---|---|
| $C = \frac{1-(Y0/Y2)}{1-(X0/X2)}$ | or C=1 | For X0≤ X ≤ X1 | $C = \frac{(Y1-Y0)}{(X1-X0)} \cdot \frac{X2}{Y2}$ | or C=1 |
| | | For X1≤ X ≤ X2 | $C = \frac{1-(Y1/Y2)}{1-(X1/X2)}$ | 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 | ≤ 75% |
| Altitude | 2000m max. |



Celsa Messgerate España S.L.
www.celsamessgerate-spain.com
info@celsaspain.com / +34 96 130 93 78

| | |
|---|---|
| **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<br>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 | ≤ 4.0mm² single wire or 2x2.5mm² 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 | ~<br>~ | 5<br>6 |
| Auxiliary power supply | ~, +<br>~, - | 7<br>8 |
| Measuring output-1 | +<br>- | 1<br>2 |
| Measuring output-2 | +<br>- | 3<br>4 |

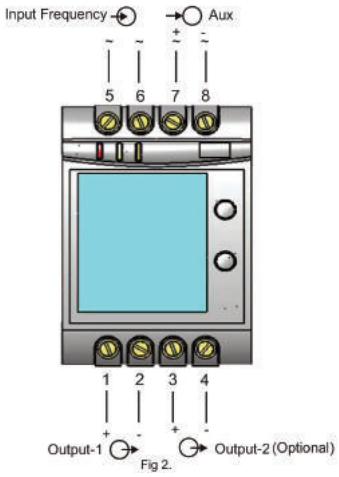
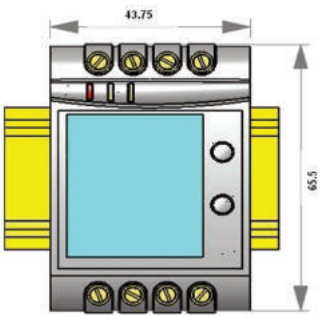
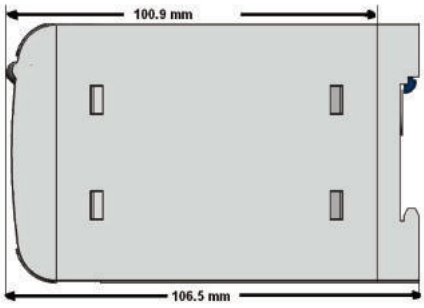


Fig 2.

## Dimensions




Celsa Messgerate España S.L.
www.celsamessgerate-spain.com
info@celsaspain.com / +34 96 130 93 78

## 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 |
|---|---|
|  | load-independent current |
|  | load-independent voltage |

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



Celsa Messgerate España S.L.
www.celsamessgerate-spain.com
info@celsaspain.com / +34 96 130 93 78