

# › Monitoring Relays

## Frequency Control Relays

### Over and Under frequency

- › Controls frequency variations on 50 or 60 Hz AC networks
- › Controls its own supply voltage, connected between phase and neutral
- › Over and underfrequency with independant settings
- › Selectable latching (memory) function



HHZ

Selection guide					
Type	Function	Measuring range	Output	Power Supply	Part-Numbers
HHZ	Over and underfrequency with independent settings Selectable latching (memory) function Control frequency variations on 50 or 60 Hz AC voltage Coefficient upper or lower threshold: x1 or x2	40 → 70 Hz	2 x 5 A (changeover)	120 → 277 VAC	<b>84872501</b>

#### HHZ

#### Timing

Delay on threshold crossing (Tt)	0.1 → 10 s
Repetition accuracy with constant parameters (according to IEC/EN 60255-1)	± 0.5%
Power ON delay	≤ 500 ms
Reset time max	2000 ms

#### Supply

Voltage type for actuating	AC
Rated control supply voltage Un at AC	120-277 VAC
AC supply voltage frequency 50/60 HZ	± 15%
Rated control supply voltage Un at DC	N/A
Voltage supply tolerance	-15% / +10%
Operating range	102 → 305 VAC
Polarity with DC voltage	No
Galvanic isolation of power supply/Input circuit	No
Galvanic isolation of power supply/Output circuit	Yes
Galvanic isolation of Input circuit/Output circuit	Yes
Immunity from micro power cuts: typical	10 ms
Maximum Power consumption at Un	6 VA

#### Insulation

Rated Insulation voltage (according to IEC/ EN 60664-1)	400 V
Insulation coordination (according to IEC/ EN 60664-1)	Overvoltage category III; pollution degree 3
Insulation resistance supply and Output circuit (according to IEC/EN 60664-1 and IEC/EN 60255-27)	> 500 MOhm(s) (500 VDC)

HHZ	
Dielectric strength (according to IEC/EN 60664-1)	2 kV / 1 min / 1 mA / 50 Hz
Impulse voltage (according to IEC/EN 60664-1, IEC/EN 60255-1)	4 kV wave 1.2 / 50 µs
Input and measuring specifications	
Measurement range	40 → 70 Hz
Number of measuring ranges	7
Display accuracy (according to IEC/EN 60255-1)	± 10% of full scale
Measuring error with drift temperature	0.05% / °C
Measuring error with drift voltage	± 1% across the whole range
Repetition accuracy with constant parameters (according to IEC/EN 60255-1)	± 0.5%
Max. measuring cycle time	150 ms @ 40 Hz
Adjustment of upper threshold	-1, 0, +1, +2, +3, +4, +5 Hz
Adjustment of lower threshold	+1, 0, -1, -2, -3, -4, -5 Hz
Fixed hysteresis	0.3 Hz
Output specifications	
Maximum switching power (resistive)	1250 VA
Maximum rate (at max switching power)	360 operations/hour at full load
Maximum breaking current	5 A AC/DC
Minimum breaking current	10 mA / 5 VDC
Operating categories (according to IEC/EN 60947-5-1 and IEC/EN 60947-5-2)	AC 15 - 1 A @ 250V, DC 13 - 1 A @ 24V
Nominal rating	5 A
Voltage breaking capacity (according to IEC/EN 60255-1)	250 V AC / 24 V DC
Electrical life (operations)	1 x 10 <sup>4</sup>
Mechanical life (operations)	30 x 10 <sup>6</sup>
1 or 2 changeover relays, AgNi (cadmium-free)	2 C/O
Functions	
Over and underfrequency with independent settings	True
Selectable latching (memory) function	
Control frequency variations on 50 or 60 Hz AC voltage	True
Coefficient upper or lower threshold: x1 or x2	True
General characteristics	
Temperature limits use (°C) (according to IEC/EN 60068-2)	-20 → +50
Temperature limits stored (°C) (according to IEC/EN 60068-2)	-40 → +70
MTBF in hours (according to IEC/TR 62380)	1144584.6
MTTF (according to IEC/TR 62380)	130.66 years
Led status indicator	Un: Green LED (power on) R1: Yellow LED (relay status ON) OFF LED (underfrequency) Flashing LED during time delay R2: Yellow LED (relay status ON) OFF LED (overfrequency) Flashing LED during time delay Un, R1, R2: Flashing LED (Position error)

	HHZ
Creepage distance and clearance (according to IEC/EN 60664-1)	4 kV / 9.4 mm Pollution degree 3
IP degree of protection Terminal block (according to IEC/EN 60529)	IP20
IP degree of protection Housing (according to IEC/EN 60529)	IP30
IP degree of protection Front face (according to IEC/EN 60529)	IP50
Vibration resistance (according to IEC/EN 60255-21-1)	20 m/s <sup>2</sup> 10 Hz → 150 Hz
Relative humidity no condensation (according to IEC/EN 60068-2-30)	2 x 24 hr cycle 95% RH max. without condensation 55 °C
Electromagnetic compatibility - Immunity to electrostatic discharges (according to IEC/EN 61000-4-2)	Level III (Air 8 kV / Contact 6 kV)
Immunity to radiated, radio-frequency, electromagnetic field (according to IEC/EN 61000-4-3)	Level I (1 V/m: 2.0 GHz → 2.7 GHz) Level II (3 V/m: 1.4 GHz → 2.0 GHz) Level III (10 V/m: 80 MHz → 1 GHz)
Immunity to rapid transient bursts (according to IEC/EN 61000-4-4)	Level III (direct 2 kV / Capacitive coupling clamp 1 kV)
Immunity to shock waves on power supply (according to IEC/EN 61000-4-5)	Level III (2 kV / common mode 2 kV/residual current mode 1 kV)
Immunity to radio frequency in common mode (according to IEC/EN 61000-4-6)	Level III (10V rms: 0.15 MHz to 80 MHz)
Immunity to voltage dips and breaks (according to IEC/EN 61000-4-11)	0% residual voltage, 1 cycle 70% residual voltage, 25/30 cycles
Mains-borne and radiated emissions (according to EN55032 (CISPR22), EN55011 (CISPR11))	Class B
Fixing: Symmetrical DIN rail (according to IEC/EN 60715)	35 mm
Mounting position	All positions
Drop to concrete floor (according to IEC/EN IEC 60068-2-31)	High: 1 m
Rigid connecting capacity without ferrule	1 x 4 <sup>2</sup> - 2 x 2,5 <sup>2</sup> mm <sup>2</sup> 1 x AWG11 - 2 x AWG14
Flexible connecting capacity with ferrule	1 x 2,5 <sup>2</sup> - 2 x 1,5 <sup>2</sup> mm <sup>2</sup> 1 x AWG14 - 2 x AWG16
Tightening torque (according to IEC 60947-1)	0.5...0.6 N.m
Housing material (according to IEC/EN 60695-2-11)	Self-extinguishing Incandescent wire test
Shock and bump tests (according to IEC/EN 60255-21-2)	15 g - 11 ms
Short interruption on power line (according to IEC/EN 61000-4-11)	0% residual voltage, 250/300 cycles
Delivery: open terminals	True
Type of electric connection	Screw connection
Packaging	Compact carton recycled and recyclable No plastic

## HHZ

### Outline Dimensions

Depth (mm)	69
Height (mm)	90
Weight (g)	130
Width (mm) according to DIN 43880	35

### International Directives & Conformity Certification

RoHS 2015/863/UE	Yes
REACH regulation N°1907/2006/CE	Yes
UK REACH regulation 2023 N°722	Yes
LVD 2014/35/UE	Yes
Directive 2012/19/EU	Yes
European Directive 2005/20/CE	Yes
ISO 14001: 2015	Yes
Certification CE	Yes
Certification UL	Yes
Certification UKCA	Yes
Certification CCC	Yes

### Principles

The HHZ control relay controls frequency variations on 50 or 60 Hz networks.

It can be used to monitor under and overfrequency, by setting two independent thresholds. It has two relay outputs : one per threshold.

Operating principle

HHZ - Over and underfrequency controller

Function selector switch:

Set the selector switch to the 50 or 60 Hz frequency of the network being monitored, select with or without memory mode. The switch position, and hence the operating mode, is read by the product on energisation.

If the switch is set to a non-conforming position on energisation, the product goes into fault mode, the output relay stays open and the LEDs flash to signal the position error.

If the switch position changes while the unit is operating, all the LEDs flash but the product continues to work normally with the function selected on energisation prior to the change of position.

The LEDs return to their normal state if the switch is reset to its initial position defined before the last energisation.

The relay monitors its own supply voltage.

The over and underfrequency threshold values are set using two potentiometers, graduated with the drift value of the frequency to be monitored.

A x1/x2 switch can be used to double the control scale. The hysteresis is set at 0.3 Hz.

When the unit is powered up with a measured fault, the relay stays open.

### Operating principles

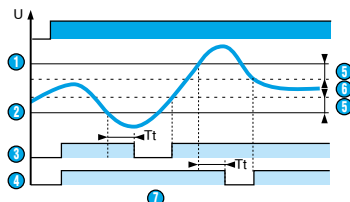
#### HHZ: over and under frequency function without memory

If the frequency of the controlled voltage exceeds the preset overfrequency threshold for longer than the time set on the front face (0.1 to 10 s), the corresponding output relay opens and its LED is extinguished. During the time delay, this LED flashes.

Once the frequency falls below the value of the threshold minus the hysteresis, the relay closes instantly.

If the frequency of the controlled voltage falls below the underfrequency threshold for longer than the time set on the front face (0.1 to 10 s), the corresponding output relay opens and its LED is extinguished. During the time delay, this LED flashes.

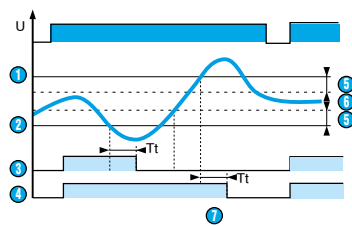
Once the frequency rises above the threshold value plus the hysteresis, the relay closes instantly.



- |                  |                                    |
|------------------|------------------------------------|
| ① High threshold | ⑤ Hysteresis                       |
| ② Low threshold  | ⑥ Frequency                        |
| ③ Relay R2       | ⑦ Delay on threshold crossing (Tt) |
| ④ Relay R1       |                                    |

## HHZ: over and under frequency function with memory

If "with memory" mode has been selected, the relay opens and stays in this position when threshold crossing is detected. The power supply must be disconnected to reset the product.

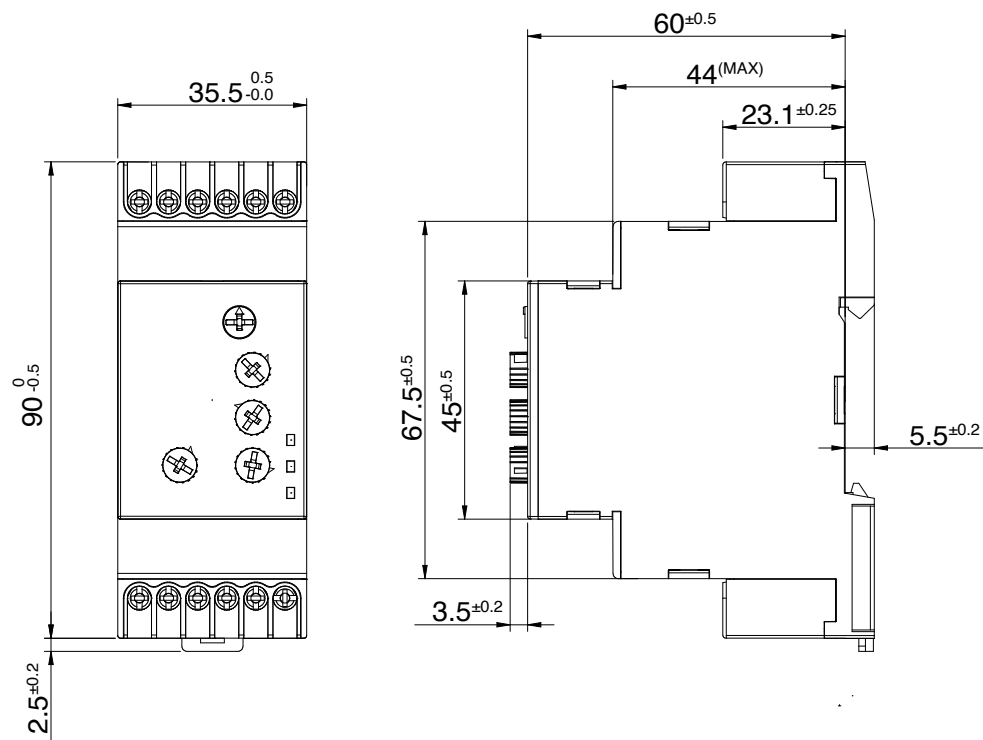


- |   |                |   |                                  |
|---|----------------|---|----------------------------------|
| 1 | High threshold | 5 | Hysteresis                       |
| 2 | Low threshold  | 6 | Frequency                        |
| 3 | Relay R2       | 7 | Delay on threshold crossing (Tt) |
| 4 | Relay R1       |   |                                  |

## Product Dimensions

### Front and Side

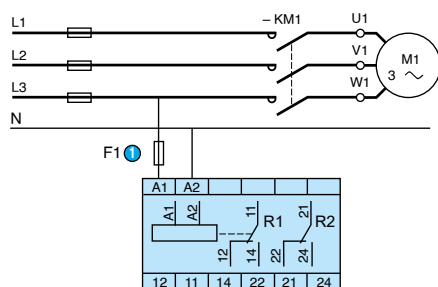
HHZ



## Electronic & Wiring Diagrams

### Connections

HHZ



A fast-blow fuse or cut-out

#### Warning:

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