

Insulation coordination

| Parameter | Symbol | Unit | Value | Comment |
|---|-------------|------|-----------------------|--|
| RMS voltage for AC insulation test 50/60 Hz/1 min | U_d | kV | 5.4 | |
| Impulse withstand voltage 1.2/50 μ s | \hat{U}_w | kV | 9.6 | |
| Partial discharge test voltage ($q_m < 10$ pC) | U_t | V | 1650 | Busbar/secondary. According to: IEC 61800-5-1 IEC 62109-1 |
| Clearance (pri. - sec.) | d_{Cl} | mm | > 10.5 | Shortest distance through air |
| Creepage distance (pri. - sec.) | d_{Cp} | mm | > 10.5 | Shortest path along device body |
| Case material | - | - | V0 according to UL 94 | |
| Comparative tracking index | <i>CTI</i> | | 600 | |
| Application example | - | - | 600 V CAT III PD2 | Reinforced insulation according to IEC 61800-5-1 |
| Application example | - | - | 1000 V CAT III PD2 | Basic insulation, non uniform field according to IEC 61800-5-1 |
| Application example | - | - | 600 V CAT III PD2 | According to UL 508 |

Environmental and mechanical characteristics

| Parameter | Symbol | Unit | Min | Typ | Max | Comment |
|-------------------------------|--------|--------------|-----|-----|-----|---------|
| Ambient operating temperature | T_A | $^{\circ}$ C | -40 | | 105 | |
| Ambient storage temperature | T_S | $^{\circ}$ C | -40 | | 105 | |
| Mass | m | g | | 101 | | |

Electrical data HOYS 100-S-0100

 At $T_A = 25^\circ\text{C}$, $U_C = +5\text{V}$, $R_L = 10\text{ k}\Omega$ unless otherwise noted (see Min, Max, typ. definition paragraph in page 13).

| Parameter | Symbol | Unit | Min | Typ | Max | Comment |
|---|---------------------|--------------------------------|----------------------|----------------------|----------------------|---|
| Primary nominal RMS current | I_{PN} | A | | 100 | | |
| Primary current, measuring range | I_{PM} | A | -250 | | 250 | $2.5 \times I_{PN} @ U_C \geq 4.6\text{ V}$ |
| Number of primary turns | N_P | - | | 1 | | Bus bar |
| Supply voltage ¹⁾ | U_C | V | 4.5 | 5 | 5.5 | |
| Current consumption | I_C | mA | | 19 | 25 | |
| Reference voltage (output) | V_{ref} | V | 2.48 | 2.5 | 2.52 | Internal reference |
| Reference voltage (input) | V_{ref} | V | 0.5 | | 2.65 | External reference |
| Output voltage range @ I_{PM} | $V_{out} - V_{ref}$ | V | -2 | | 2 | Over operating temperature range |
| V_{ref} output resistance | R_{ref} | Ω | 130 | 200 | 300 | Series |
| V_{out} output resistance | R_{out} | Ω | | 2 | 5 | Series |
| Allowed capacitive load | C_L | nF | 0 | | 6 | |
| Overcurrent detection output on resistance | R_{on} | Ω | 70 | 95 | 150 | Open drain, active low Over operating temperature range |
| Overcurrent detection hold | t_{hold} | ms | 0.7 | 1 | 1.4 | Additional time after threshold has released |
| EEPROM control | V_{out} | mV | 0 | | 50 | V_{out} forced to GND when EEPROM in an error state ²⁾ |
| Electrical offset voltage @ $I_P = 0\text{ A}$ | V_{OE} | mV | -5 | | 5 | $V_{out} - V_{ref} @ V_{ref} = 2.5\text{ V}$ |
| Electrical offset current Referred to primary | I_{OE} | A | -0.625 | | 0.625 | |
| Temperature coefficient of V_{ref} | TCV_{ref} | ppm/K | -170 | | 170 | -40 °C ... 105 °C |
| Temperature coefficient of V_{OE} | TCV_{OE} | mV/K | -0.075 | | 0.075 | -40 °C ... 105 °C |
| Temperature coefficient of I_{OE} @ $I_P = 0\text{ A}$ | TCI_{OE} | mA/K | -9.375 | | 9.375 | -40 °C ... 105 °C |
| Theoretical sensitivity | G_{th} | mV/A | | 8 | | 800 mV @ I_{PN} |
| Sensitivity error @ I_{PN} | ϵ_G | % | -0.5 | | 0.5 | Factory adjustment |
| Temperature coefficient of G | TCG | ppm/K | -250 | | 250 | -40 °C ... 105 °C |
| Linearity error 0 ... I_{PN} | ϵ_L | % of I_{PN} | -0.75 | | 0.75 | |
| Linearity error 0 ... I_{PM} | ϵ_L | % of I_{PM} | -0.5 | | 0.5 | |
| Magnetic offset current (@ $10 \times I_{PN}$) referred to primary | I_{OM} | A | -1.27 | | 1.27 | One turn |
| Reaction time @ 10 % of I_{PN} | t_{ra} | μs | | 3 | 3.5 | @ 100 A/ μs |
| Response time @ 90 % of I_{PN} | t_r | μs | | 3 | 3.5 | @ 100 A/ μs |
| Frequency bandwidth (-3 dB) | BW | kHz | | 180 | | Small signal |
| Output RMS noise voltage spectral density 100 Hz ... 100 kHz | e_{no} | $\mu\text{V}/\sqrt{\text{Hz}}$ | | 8.3 | | |
| Output RMS noise voltage (DC ... 10 kHz) (DC ... 100 kHz) (DC ... 1 MHz) | V_{no} | mVpp | | 4.6 8.6 14.4 | | |
| Primary current, detection threshold | I_{PTH} | A | $2.64 \times I_{PN}$ | $2.93 \times I_{PN}$ | $3.22 \times I_{PN}$ | Peak value $\pm 10\%$, overcurrent detection OCD |
| Accuracy @ I_{PN} | X | % of I_{PN} | -1.25 | | 1.25 | |
| Accuracy @ I_{PN} @ $T_A = +105^\circ\text{C}$ | X | % of I_{PN} | -4 | | 4 | |
| Accuracy @ I_{PN} @ $T_A = +85^\circ\text{C}$ | X | % of I_{PN} | -3.3 | | 3.3 | See formula note ³⁾ |

 Notes: ¹⁾ 3.3 V SP version available

²⁾ EEPROM in an error state makes the transducer behave like a reverse current saturation. Use of the OCD may help to differentiate the two cases

³⁾ Accuracy @ T_A (% of I_{PN}) = $X + \left(\frac{TCG}{10000} \times (T_A - 25) + \frac{TCI_{OE}}{1000 \times I_{PN}} \times 100 \times (T_A - 25) \right)$.