

**Insulation coordination**

Parameter	Symbol	Unit	Value	Comment
Rms voltage for AC insulation test 50/60 Hz/1 min	$U_d$	kV	4.3	
Impulse withstand voltage 1.2/50 $\mu$ s	$\dot{U}_w$	kV	8	
Partial discharge extinction rms voltage @ 10 pC	$U_e$	V	> 1200	Busbar / Secondary
Clearance (pri. - sec.)	$d_{Cl}$	mm	> 8	Shortest distance through air
Creepage distance (pri. - sec.)	$d_{cp}$	mm	> 8	Shortest path along device body
Clearance (pri. - sec.)	-	mm	> 8	When mounted on PCB with recommended layout
Case material	-	-	V0 according to UL 94	
Comparative tracking index	<i>CTI</i>		600	
Application example	-	-	600 V CAT III PD2	Reinforced insulation, non uniform field according to EN 50178, EN 61010
Application example	-	-	1000 V CAT III PD2	Based insulation, non uniform field according to EN 50178, EN 61010
Application example	-	-	600 V CAT III PD2	Simple insulation, non uniform field according to UL 508

**Environmental and mechanical characteristics**

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Ambient operating temperature	$T_A$	°C	-40		105	
Ambient storage temperature	$T_s$	°C	-40		105	
Mass	$m$	g		32		

**Electrical data HO 50-S/SP30-0100**

At  $T_A = 25\text{ °C}$ ,  $U_C = +5\text{ V}$ ,  $R_L = 10\text{ k}\Omega$  unless otherwise noted (see Min, Max, typ. definition paragraph in page 12).

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	$I_{PN}$	A		50		
Primary current, measuring range	$I_{PM}$	A	-125		125	@ $U_C \geq 4.6\text{ V}$
Number of primary turns	$N_P$	-		1		See application information
Supply voltage	$U_C$	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	$R_{ref}$	$\Omega$	130	200	300	Series
$V_{out}$ output resistance	$R_{out}$	$\Omega$		2	5	Series
Allowed capacitive load	$C_L$	nF	0		6	
OCD output: On resistance	$R_{on}$	$\Omega$	70	95	150	Open drain, active low Over operating temperature range
OCD output: Hold time	$t_{hold}$	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 <sup>1)</sup>
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	-0.3125		0.3125	
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
Offset drift referred to primary @ $I_P = 0\text{ A}$	$TCI_{OE}$	mA/K	-4.69		4.69	-40 °C ... 105 °C
Theoretical sensitivity	$G_{th}$	mV/A		16		800 mV @ $I_{PN}$
Sensitivity error @ $I_{PN}$	$\epsilon_G$	%	-0.5		0.5	Factory adjustment (straight bus-bar)
Temperature coefficient of $G$	$TCG$	ppm/K	-350		350	-40 °C ... 105 °C
Linearity error 0 ... $I_{PN}$	$\epsilon_L$	% of $I_{PN}$	-0.75		0.75	
Linearity error 0 ... $I_{PM}$	$\epsilon_L$	% of $I_{PM}$	-0.5		0.5	
Magnetic offset current (@ $10 \times I_{PN}$ ) referred to primary	$I_{OM}$	A	-0.92		0.92	One turn
Reaction time @ 10 % of $I_{PN}$	$t_{ra}$	$\mu\text{s}$			2.5	@ 50 A/ $\mu\text{s}$
Response time @ 90 % of $I_{PN}$	$t_r$	$\mu\text{s}$			3.5	@ 50 A/ $\mu\text{s}$
Frequency bandwidth (-3 dB)	$BW$	kHz		100		Small signals
Output rms voltage noise (spectral density) (100 Hz ... 100 kHz)	$e_{no}$	$\mu\text{V}/\sqrt{\text{Hz}}$			10.2	
Output voltage noise (DC ... 10 kHz) (DC ... 100 kHz) (DC ... 1 MHz)	$V_{no}$	mVpp		5.6 16.3 30.6		
Over-current detect		A	$2.64 \times I_{PN}$	$2.93 \times I_{PN}$	$3.22 \times I_{PN}$	Peak value $\pm 10\%$
Accuracy @ $I_{PN}$	X	% of $I_{PN}$	-1.25		1.25	
Accuracy @ $I_{PN}$ @ $T_A = +105\text{ °C}$	X	% of $I_{PN}$	-4.80		4.80	See formula note <sup>2)</sup>
Accuracy @ $I_{PN}$ @ $T_A = +85\text{ °C}$	X	% of $I_{PN}$	-3.91		3.91	See formula note <sup>2)</sup>

Notes: <sup>1)</sup> 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.

$$\sup>2) Accuracy @  $X_{TA}$  (% of  $I_{PN}$ ) =  $X + \left( \frac{TCG}{10000} \times (T_A - 25) + \frac{TCI_{OE}}{1000 \times I_P} \times 100 \times (T_A - 25) \right)$$$