

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 μ s	$\hat{U}_w$	kV	8	
Partial discharge extinction rms voltage @ 10 pC	U_e	V	> 930	Primary / 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	CTI		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		31		

Electrical data HO 40-NP-0100

At $T_A = 25\text{ }^{\circ}\text{C}$, $U_C = +5\text{ V}$, $R_L = 10\text{ k}\Omega$ unless otherwise noted (see Min, Max, typ. definition paragraph in page 11).

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal rms current	I_{PN}	A		40		
Primary current, measuring range	I_{PM}	A	-100		100	@ $U_C \geq 4.6\text{ V}$
Number of primary turns	N_p			1,2,4		See application information
Primary jumper resistance @ $+25\text{ }^{\circ}\text{C}$	R_p	m Ω		0.09		4 jumpers in parallel
Primary jumper resistance @ $+120\text{ }^{\circ}\text{C}$	R_p	m Ω		0.12		4 jumpers in parallel
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	
OCD output: On resistance	R_{on}	Ω	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 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	-0.25		0.25	
Temperature coefficient of V_{ref}	TCV_{ref}	ppm/K	-170		170	-40 $^{\circ}\text{C}$... 105 $^{\circ}\text{C}$
Temperature coefficient of V_{OE}	TCV_{OE}	mV/K	-0.075		0.075	-40 $^{\circ}\text{C}$... 105 $^{\circ}\text{C}$
Offset drift referred to primary @ $I_p = 0\text{ A}$	TCI_{OE}	mA/K	-3.75		3.75	-40 $^{\circ}\text{C}$... 105 $^{\circ}\text{C}$
Theoretical sensitivity	G_{th}	mV/A		20		800 mV @ I_{PN}
Sensitivity error @ I_{PN}	ϵ_G	%	-0.75		0.75	Factory adjustment, 1 turn configuration, 4 jumpers in parallel
Temperature coefficient of G	TCG	ppm/K	-200		200	-40 $^{\circ}\text{C}$... 105 $^{\circ}\text{C}$
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	-0.8		0.8	One turn
Reaction time @ 10 % of I_{PN}	t_{ra}	μs			2	@ 50 A/ μs
Response time @ 90 % of I_{PN}	t_r	μs			2.5	@ 50 A/ μs
Frequency bandwidth (-3 dB)	BW	kHz		350		
Output rms voltage noise (spectral density) (100 Hz ... 100 kHz)	e_{no}	$\mu\text{V}/\sqrt{\text{Hz}}$			16	
Output voltage noise (DC ... 10 kHz) (DC ... 100 kHz) (DC ... 1 MHz)	V_{no}	mVpp		8 25 46.2		
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}	-1.5		1.5	
Accuracy @ I_{PN} @ $T_A = +105\text{ }^{\circ}\text{C}$	X	% of I_{PN}	-3.85		3.85	See formula note ³⁾
Accuracy @ I_{PN} @ $T_A = +85\text{ }^{\circ}\text{C}$	X	% of I_{PN}	-3.26		3.26	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 @ X_{TA} (% of I_{PN}) = $X + (\frac{TCG}{10000} \times (T_A - 25) + \frac{TCI_{OE}}{1000 \times I_p} \times 100 \times (T_A - 25))$.