

Ultra-stable, high precision (ppm class) fluxgate technology DP Series current transducer for isolated DC and AC current measurement on PCB up to 72A



Features

- Linearity error maximum 10 ppm
- Measurement resistor up to 100Ω at full scale
- Fluxgate, closed loop compensated technology with fixed excitation frequency and second harmonic zero flux detection for best in class accuracy and stability
- PCB mount
- Height 32mm - Suitable for 1U power supplies
- Programmable for 12.5A, 25A, or 50A via PCB layout
- 250g weight and compact size - ideal for PCB-mounted applications with space constraints

Applications:

- MPS for particles accelerators
- Stable power supplies
- Precision drives
- Batteries testing and evaluation systems
- Power measurement and power analysis

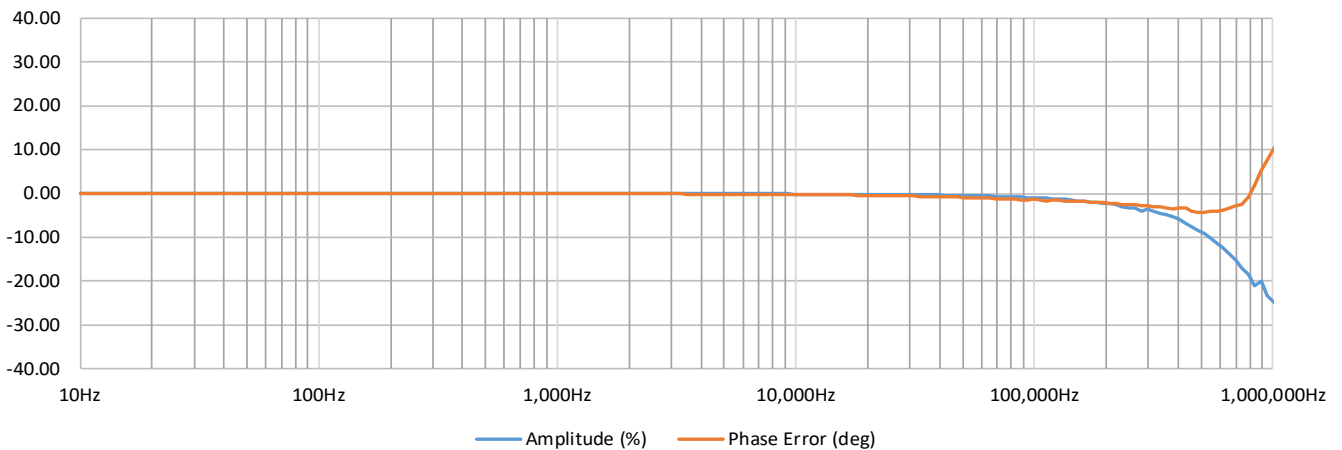
Specification highlights	Symbol	Unit	Min	Typ	Max
Linearity error	ϵ_L	ppm	-10		10
Bandwidth	BW(-0.1dB) BW(-1dB) BW(-3dB)	kHz	50 300 1000		
Ambient operating temperature range	T_a	°C	0		55
Offset current (including earth field)	I_{oE}	ppm			100
Power supply voltages	U_c	V	±14.25		±15.75

Transducer programming options		Unit	4 turns	2 turns	1 turn
Ratio			1:250	1:500	1:1000
Nominal primary AC current	I_{PN} AC	Arms	12.5	25	50
Nominal primary DC current	I_{PN} DC	±A	12.5	25	50

All ppm (or %) values refer to nominal current

Parameter	Symbol	Unit	Min	Typ.	Max	Comment
Measuring resistance	R_M	Ω	0		100	
Linearity error	ϵ_L	ppm	-10		10	ppm refers to nominal current
Offset current (including earth field)	I_{OE}	ppm	-100 -5		100 5	ppm refers to nominal current μA refers to secondary current
DC-10Hz Overall accuracy @25°C (= $\epsilon_L + I_{OE}$)	acc ϵ	ppm	-110		110	ppm refers to nominal DC current
Offset temperature coefficient	TC_{IOE}	ppm/K	-1 -0.05		1 0.05	ppm refers to nominal current μA refers to secondary current
Amplitude error	ϵ_G	%			0.01	% refers to nominal current
DC-1kHz 1kHz-300kHz					12	% refers to nominal current
Phase shift	θ	°			0.02°	
DC-1kHz 1kHz-300kHz					6.0°	
Response time to a step current I_{PN}	tr @ 90%	μs		1		di/dt = 100A/ μs
Noise	noise	ppm peak-peak			4	Measured on secondary current
0 - 100Hz					8	
0 - 1kHz					100	
Noise	noise	ppm rms			0.50	Measured on secondary current
0 - 100Hz					7	
0 - 1kHz					50	
dV/dt influence	dv/dt	ppm			10	@230V and 50/60Hz
Positive current consumption	I_{PS}	mA			42	Add I_S (if I_S is positive)
Negative current consumption	I_{NS}	mA			28	Add I_S (if I_S is negative)
Operating temperature range	T_a	°C	0		55	
Stability						
Offset stability over time		ppm / 24h	-0.1		0.1	ppm refers to nominal current
Offset stability over time		ppm/month	-1		1	ppm refers to nominal current
Offset stability over time		ppm / year	-2		2	ppm refers to nominal current

Typical Amplitude / Phase



Isolation specifications

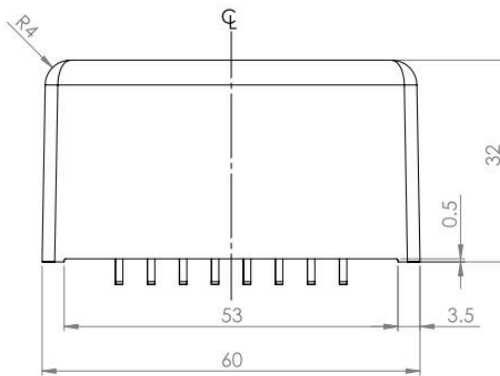
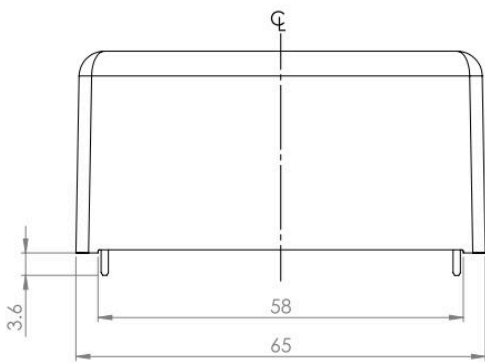
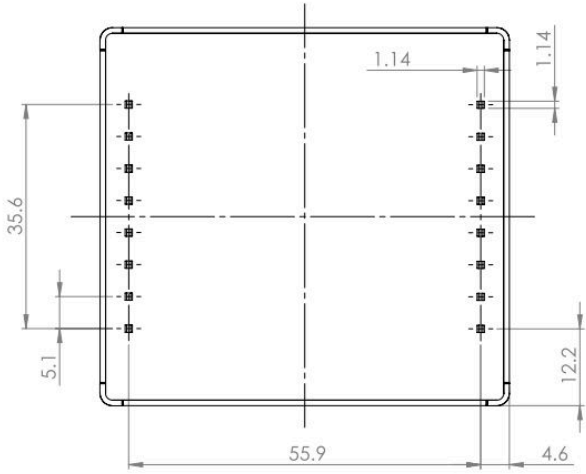
Parameter	Unit	Value
Clearance	mm	3.3
Creepage distance	mm	4.7
CTI		600
Rms voltage for AC isolation test, 50/60 Hz, 1 min - Between primary and (secondary and shield)	kV	2.4
Impulse withstand voltage (1.2/50µs)	kV	4.4
Rated rms isolation voltage reinforced isolation, overvoltage category II, Pollution degree 2 according to IEC61010-1	V	300

Absolute maximum ratings

Parameter	Unit	Max	Comment
Primary	A	200%	Programmed nominal DC. Maximum 100ms
Power supply	V	±16.5	

Environmental and mechanical characteristics

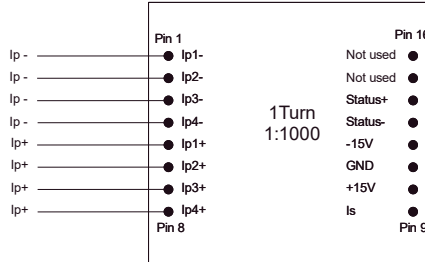
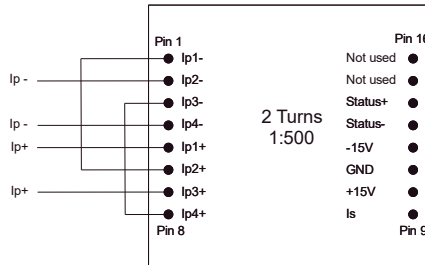
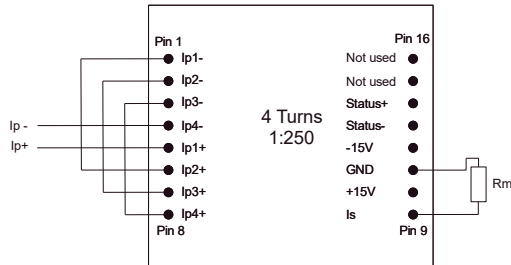
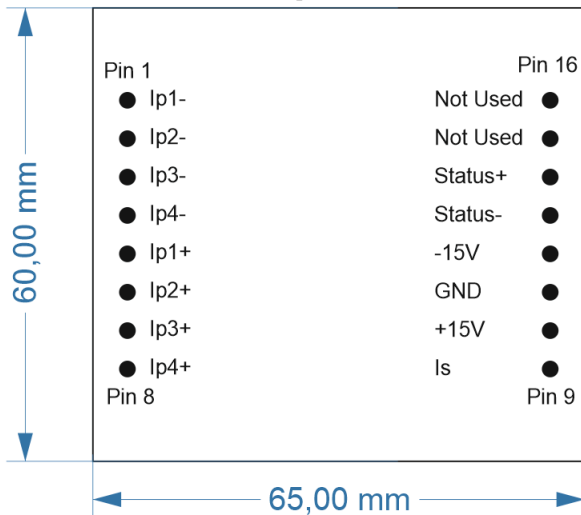
Parameter	Unit	Min	Typ	Max	Comment
Altitude	m			2000	
Usage					Designed for indoor use
Polution Degree				2	
Ambient operating temperature range	°C	0		55	
Storage temperature range	°C	0		85	
Relative humidity	%	20		80	Non-condensing
Mass	kg		0.250		
Connections	16 pin PCB mount				
Standards	IEC61010-2-30 IEC61326-1 EMC IEC61010-1:2010 3rd Edition				



(general tolerance 0.2mm unless otherwise stated)

Pinout and programming

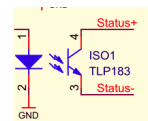
Top view



Status usage:
When sensor is operating in normal condition the status pins are shorted.

Status pin properties.
- Forward direction pin 14 to pin 13
- Maximum forward current 10mA
- Maximum forward voltage 60V
- Maximum reverse voltage 5V

Typical usage: 10kOhm pullup resistor from Status+ to 15V.
Status- to GND
When transducer is operating normally the Status+ will be 0V, else 15V.



Declaration of Conformity

Danisense A/S
Malervej 10
DK-2630 Taastrup
Denmark

Declares that under our sole responsibility that this product is in conformity with the provisions of the following EC Directives, including all amendments, and with national legislation implementing these directives:

Directive 2014/30/EU

Directive 2014/35/EU

And that the following harmonized standards have been applied

EN 61010-1 (Third Edition):2010, EN 61010-1:2010/A1:2019

EN 61010-2-030:2021/A11:2021

EN 61326-1:2013

All DANISENSE products are manufactured in accordance with RoHS directive 2011/65/EU. Annex II of the RoHS directive was amended by directive 2015/863 in force since 2015, expanding the list of 6 restricted substances (Lead, Hexavalent Chromium, PBB, PBDE and Cadmium)

Danisense follows the provision in EN 63000:2018



Place

Taastrup, Denmark

Henrik Elbæk

Date

2022-03-15