

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

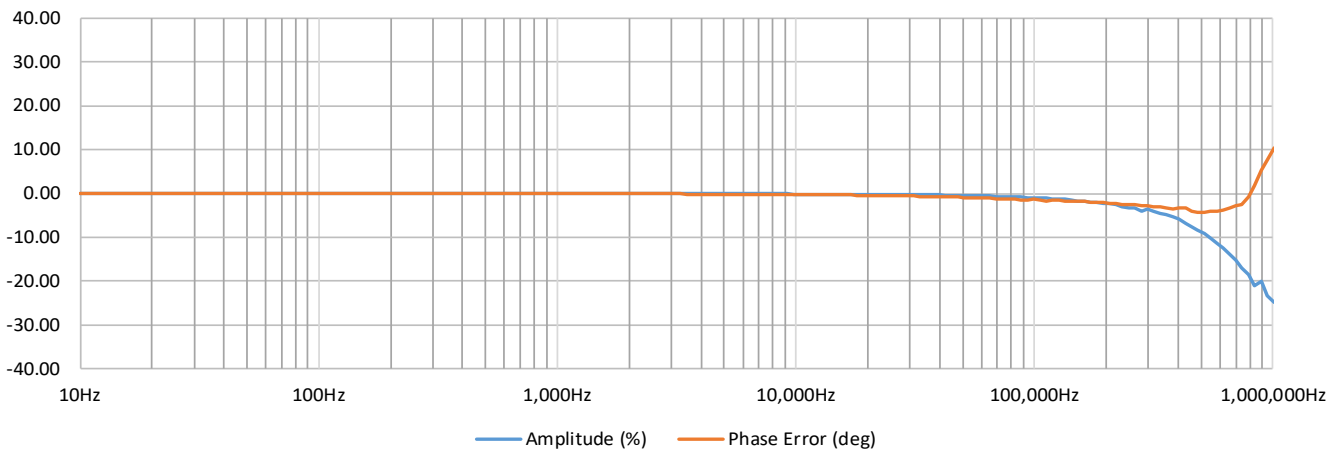
Specification highlights	Symbol	Unit	Min	Typ	Max
Linearity error	$\epsilon_L$	ppm	-10		10
Bandwidth	BW(-0.1dB) BW(-1dB) BW(-3dB)	kHz	50 300 1000		
Ambient operating temperature range	$T_a$	°C	0		55
Offset current (including earth field)	$I_{oE}$	ppm			100
Power supply voltages	$U_c$	V	±14.25		±15.75

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	$R_M$	$\Omega$	0		100		
Linearity error	$\epsilon_L$	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 $\mu A$ refers to secondary current	
DC-10Hz Overall accuracy @25°C (= $\epsilon_L + I_{OE}$ )	acc $\epsilon$	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 $\mu A$ refers to secondary current	
Amplitude error	$\epsilon_G$	%			DC-1kHz	0.01	% refers to nominal current
					1kHz-300kHz	12	% refers to nominal current
Phase shift	$\theta$	°			DC-1kHz	0.02°	
					1kHz-300kHz	6.0°	
Response time to a step current $I_{PN}$	tr @ 90%	$\mu s$		1		di/dt = 100A/ $\mu s$	
Noise	noise	ppm peak-peak			0 - 100Hz	4	Measured on secondary current
					0 - 1kHz	8	
					0 - 100kHz	100	
Noise	noise	ppm rms			0 - 100Hz	0.50	Measured on secondary current
					0 - 1kHz	7	
					0 - 100kHz	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		
<b>Stability</b>							
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

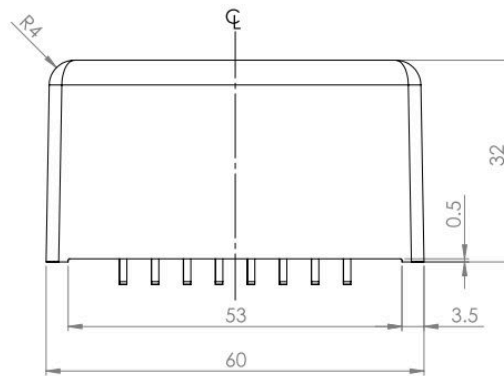
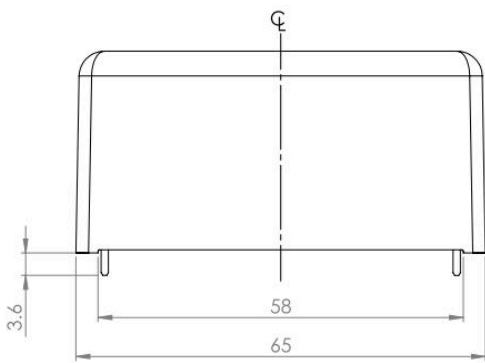
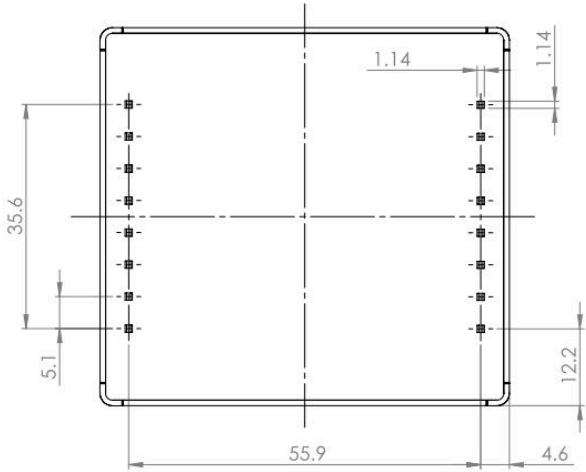
Parameter	Unit	Value
Clearance	mm	3.3
Creepage distance	mm	4.7
CTI		600
Rms voltage for AC isolation test, 50/60 Hz, 1 min - Between primary and (secondary and shield)	kV	2.4
Impulse withstand voltage (1.2/50µs)	kV	4.4
Rated rms isolation voltage reinforced isolation, overvoltage category II, Pollution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

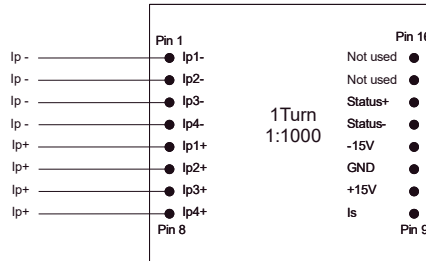
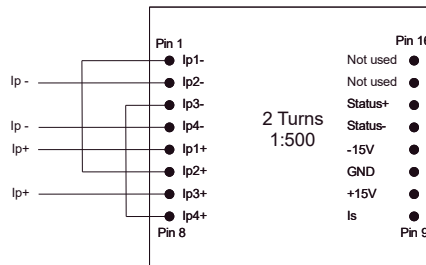
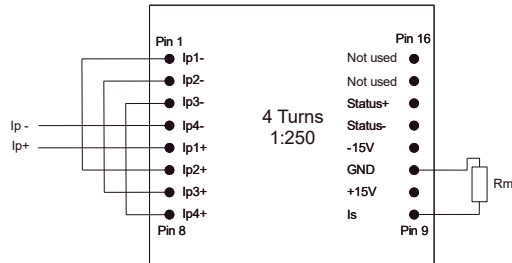
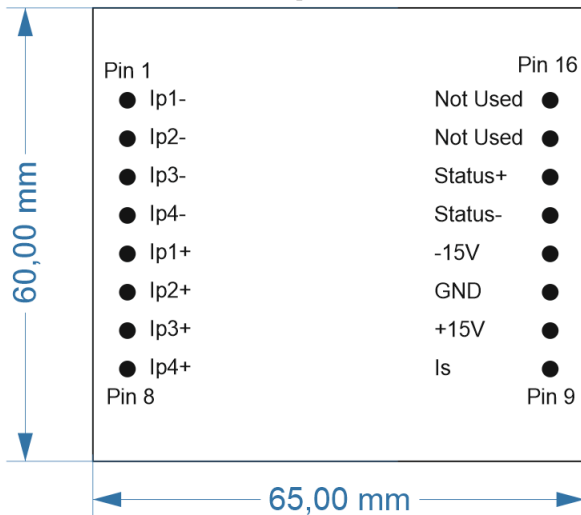
Parameter	Unit	Min	Typ	Max	Comment
Altitude	m			2000	
Usage					Designed for indoor use
Polution Degree				2	
Ambient operating temperature range	°C	0		55	
Storage temperature range	°C	0		85	
Relative humidity	%	20		80	Non-condensing
Mass	kg		0.250		
Connections	16 pin PCB mount				
Standards	IEC61010-2-30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



(general tolerance 0.2mm unless otherwise stated)

Pinout and programming

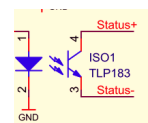
Top view



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 the products listed in Appendix A are 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

EN 61010-2-030:2010

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

Appendix A describes the products covered by this Declaration of Conformity.

Place

Taastrup, Denmark



Henrik Elbæk

Date

2021-03-10