

Wide bandwidth, ultra-stable, high precision (ppm class) fluxgate technology DW Series current transducer for non-intrusive, isolated DC and AC current measurement up to 500A



**Features**

- 10MHz bandwidth
- 10 ppm linearity
- 15 ppm offset
- Voltage output
- Fluxgate, closed loop compensated technology with crystal driven excitation frequency for increased stability
- Industry standard BNC connection
- Full aluminum body for superior EMI shielding and extended operating temperature range
- Low noise

**Applications:**

- High frequency applications
- Power measurement and power analysis
- Stable power supplies
- MPS for particles accelerators
- Gradient amplifiers for MRI devices
- Precision drives
- Batteries testing and evaluation systems
- Current calibration purposes

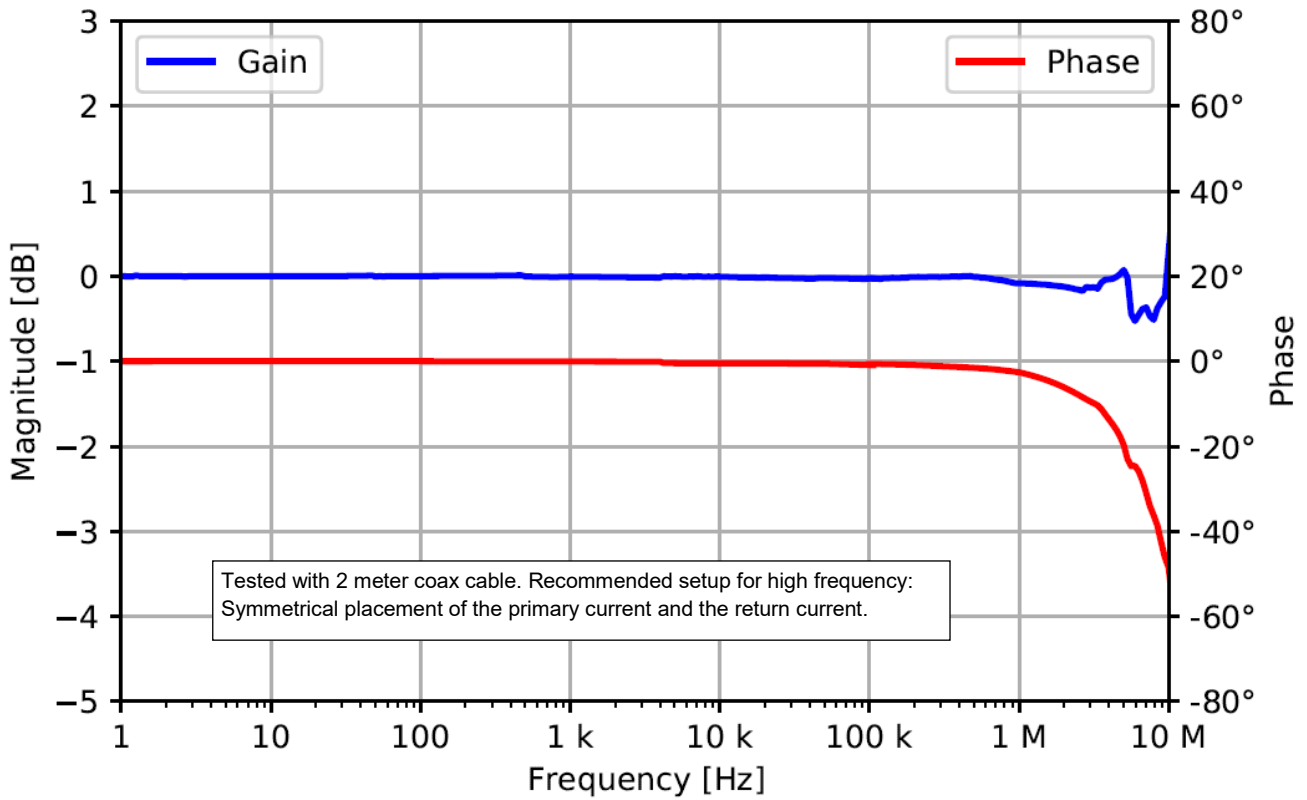
Specification highlights	Symbol	Unit	Min	Typ.	Max
Nominal primary AC current	$I_{PN AC}$	Arms			500
Nominal primary DC current	$I_{PN DC}$	A	-500		500
Measuring range	$I_{PM}$	A	-750		750
Bandwidth	$f(-3dB)$	MHz	10		
Primary / secondary ratio		V/kA	4.0000		4.0000
Linearity error	$\epsilon_L$	ppm	-15	10	15
Offset Voltage	$V_{OE}$	ppm	-15	5	15
	$V_{OE}$	$\mu V$	-30	10	30
AC input voltage	$V_{ac}$	$V_{rms}$	100		240
AC input frequency	$f$	Hz	50		60

All ppm (or %) values refer to nominal current

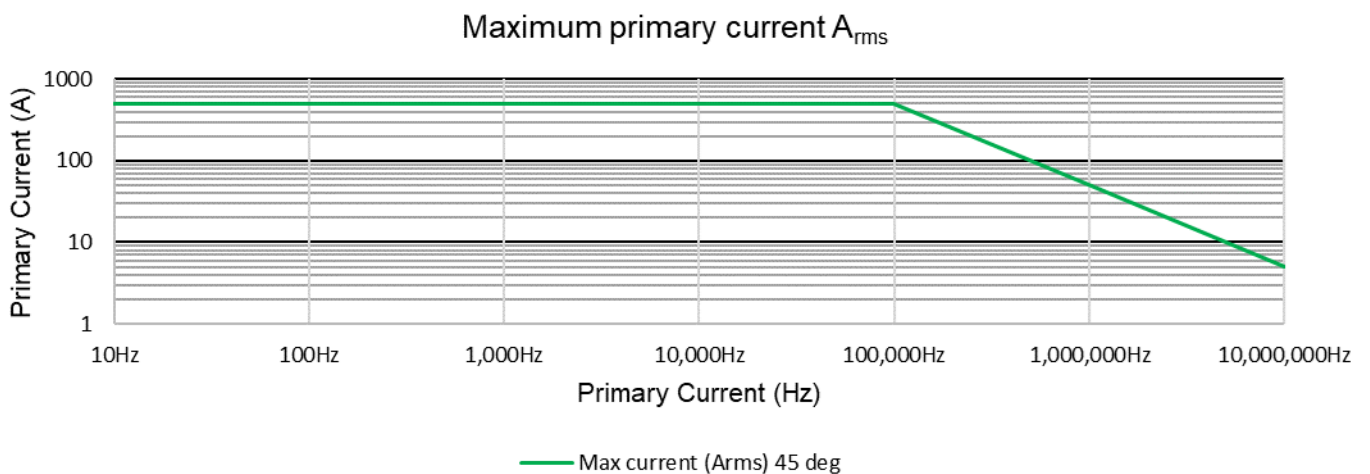
**Electrical specifications at Ta=23°C, supply voltage = ± 15V unless otherwise stated**

Parameter	Symbol	Unit	Min	Typ.	Max	Comment	
Nominal primary AC current	$I_{PN AC}$	Arms			500	Refer to fig. 2 for derating	
Nominal primary DC current	$I_{PN DC}$	A	-500		500	Refer to fig. 2 for derating	
Measuring range	$I_{PM}$	A	-750		750	Refer to fig. 2 for derating	
Overload capacity	$\hat{I}_{OL}$	A			1500	Non-measured, 100ms	
Nominal voltage output	$V_O$	V	-2		2	At nominal primary DC current	
Primary / secondary ratio		V/100A	0.4		0.4		
Linearity error	$\epsilon_L$	ppm $\mu V$	-15	10	15	ppm refers to nominal current $\mu A$ refers to secondary current	
			-30		30		
Response time to a step current IPN	$tr@90\%$	$\mu s$		1			
Amplitude error	$\epsilon_G$				0.01%	See notes in fig. 1 % refers to nominal current	
					1kHz -100kHz		0.5%
					100kHz -1MHz		2%
					1MHz - 10MHz		30%
Phase error	$\theta$				0.01	See notes in fig. 1 % refers to nominal current	
					1kHz -100kHz		1
					100kHz -1MHz		10
					1MHz - 10MHz		60
Noise	noise	ppm rms			0.05	See notes in fig. 1 % refers to nominal current	
					0.1Hz - 100Hz		0.4
					0.1Hz - 1kHz		0.5
					0.1Hz - 10kHz		0.6
					0.1Hz - 100kHz		2
Fluxgate excitation frequency	$f_{Exc}$	kHz		31.25			
Power supply voltages	$V_C$	V	100		240		
Power supply AC input frequency	$f$	Hz	50		60		
Power supply AC nominal current	$I_{AC}$	A			0.3		
Operating temperature range	$T_a$	°C	-40		60		
<b>Offset error</b>							
Initial	$V_{OE}$	ppm	-15	5	15	ppm refers to nominal current	
Versus temperature	$TC_{VOE}$	ppm/K	-0.2	0.1	0.2	ppm refers to nominal current	
Versus time	$V_{OE}/time$	ppm/month	-0.3		0.3	ppm refers to nominal current	
<b>Ratio Error</b>							
Initial @23°C	$\epsilon_C$	ppm	-50	10	50	ppm refers to nominal current	
Versus temperature	$TC\epsilon_C$	ppm/K	-2	1	2	ppm refers to nominal current	
Versus time	$\epsilon_C/time$	ppm/month	-5		5	ppm refers to nominal current	
DC-10Hz Overall accuracy @ 23°C ( $\epsilon_L + V_{OE} + \epsilon_C$ )	$acc_\epsilon$	ppm	-80	25	80	ppm refers to nominal current	

Frequency characteristics (Fig. 1)



Frequency and ambient temperature derating (Fig. 2)



**Isolation specifications**

Parameter	Unit	Value
Clearance	mm	12
Creepage distance	mm	12
Comparative tracking index (CTI)		> 600
Rms voltage for AC isolation test, 50/60 Hz, 1 min - Between primary and (secondary and shield) - Between secondary and shield	kV	5.7 0.2
Impulse withstand voltage (1.2/50µs)	kV	10.4
Continous working voltage with uninsulated wire • Non mains • CAT II (DC and rms) • CAT III (DC and rms) Insulated wire • Non mains • CAT II (DC and rms) • CAT III (DC and rms)	V	1000 600 300  2000 1000 1000
Transient voltage with uninsulated wire • Non mains • CAT II • CAT III Insulated wire • Non mains • CAT II • CAT III	V	4500 6000 6000  6000 6000 8000

**Caution:** Do not connect the transducer to signals or use for measurements within Measurement Category IV, or for measurements on MAINS circuits or on circuits derived from Overvoltage Category IV which may have transient overvoltages above what the product can withstand. The product must not be connected to circuits that have a maximum voltage above the continuous working voltage, relative to earth or to other channels, or this could damage and defeat the insulation. The product can only withstand transients up to the transient overvoltage rating without breakdown or damage to the insulation. An analysis of the working voltages, loop impedances, temporary overvoltages, and transient overvoltages in the system must be conducted prior to making measurements.



**Caution:** When using insulated wires all wiring must be insulated for the highest voltage used.



**Absolute maximum ratings**

Parameter	Unit	Max	Comment
Primary	kA	4.5	Maximum 100ms
AC input voltage	V	240	50-60Hz

## Environmental, safety and mechanical specifications

Parameter	Unit	Min	Typ	Max	Comment
Altitude	m			2000	
Usage					Designed for indoor use
Transient voltages					Up to overvoltage category III
Poution Degree				2	
Ambient operating temperature range	°C	-40		45	
Storage temperature range	°C	-40		85	
Relative humidity	%	20		80	Non-condensing
Mass	kg		1.5		
Connections	Main AC cable and BNC connector				
Standards	IEC61010-2-30, IEC61326-1 EMC and EC61010-1:2010 3rd Edition				
External devices	External devices connected to current transducers must comply with the standards IEC61010-1, IEC60950 or IEC62368-1 and be energy-limited circuitry				
Cleaning	The transducer should only be cleaned with a damp cloth. No detergent or chemicals should be used.				
Temperature	<p>When multiple primary turns are used or high primary currents are applied the temperature around the transducer will increase, please monitor to ensure that the maximum ratings are not exceeded.</p> <p>It is recommended to have minimum 1mm<sup>2</sup> per ampere in the primary busbar.</p>				

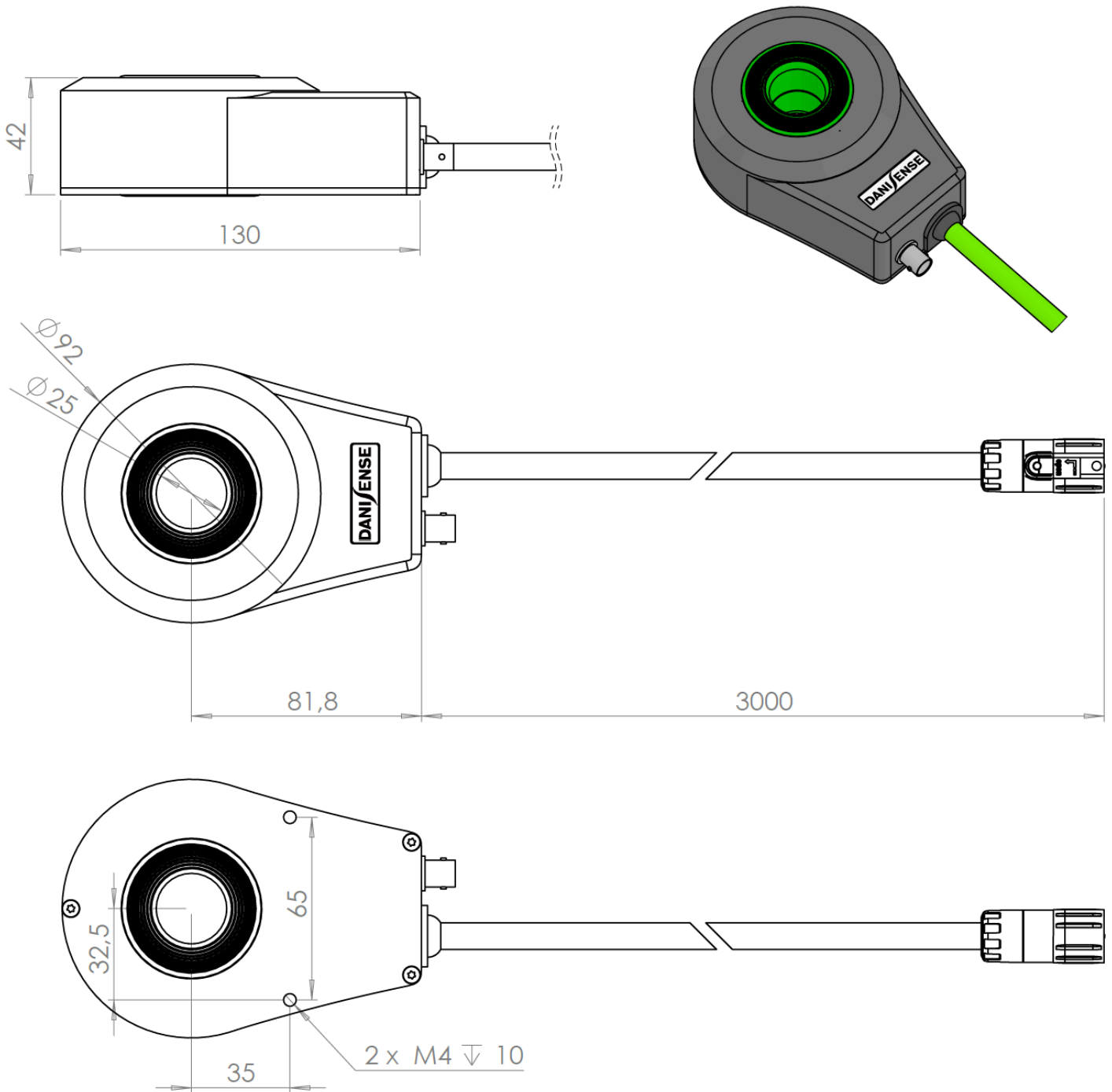
## Advanced Sensor Protection Circuits “ASPC”

Developed to protect the current transducer from typical fault conditions:

- Unit is un-powered and secondary circuit is open or closed
- Unit is powered and secondary circuit is open or interrupted

Both DC and AC primary current up to 100% of nominal value can be applied to the current transducers in the above situations without damage to the electronics.

Please notice that the transducer core can be magnetized in all above cases, leading to a small change in output offset current (less than 10ppm)



Dimension in mm (general tolerance 0.3mm unless otherwise stated)

**Positive current direction**

Is identified by an arrow on the transducer body

**Mounting option**

Two M4 holes.