

Electrical data

 At $T_A = 25^\circ\text{C}$, $V_C = +5\text{ V}$, output voltage referred to V_{REF} unless otherwise noted.

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal residual current rms	I_{PRN}	A		1		
Primary residual current, measuring range	I_{PRM}	A	-1.7		1.7	
Supply voltage	V_C	V	4.75	5	5.25	
Current consumption	I_C	mA	16	17.5	21.6	+ I_p (mA)/ N_s With $N_s = 1000$ turns - $40^\circ\text{C} \dots 105^\circ\text{C}$
Reference voltage @ $I_p = 0$	V_{REF}	V	2.495	2.5	2.505	Internal reference
External reference voltage	V_{REF}	V	2.3		4	Internal resistance of V_{REF} input = $499\ \Omega$ Note 1
Electrical offset current referred to primary (Note 2)	I_{OE}	mA	-24	+7	24	
Temperature coefficient of V_{REF}	TCV_{REF}	ppm/K			± 50	
Temperature coefficient of V_{OE} @ $I_p = 0$	TCV_{OE}	ppm/K		± 50	± 500	ppm/K of 2.5 V - $40^\circ\text{C} \dots 105^\circ\text{C}$
Theoretical sensitivity	G_{th}	V/A		1.2		
Sensitivity error (Note 2)	ϵ_G	%	-1.6	0.5	1.6	$R_L > 500\ \text{k}\Omega$
Temperature coefficient of G	TCG	ppm/K			± 200	- $40^\circ\text{C} \dots 105^\circ\text{C}$
Linearity error	ϵ_L	% of I_{PRM}		0.5	1	
Reaction time @ 10 % of I_{PRN}	t_{ra}	μs		7		$R_L > 500\ \text{k}\Omega$, $di/dt > 5\ \text{A}/\mu\text{s}$
Response time @ 90 % of I_{PRN}	t_r	μs		50		$R_L > 500\ \text{k}\Omega$, $di/dt > 5\ \text{A}/\mu\text{s}$
Frequency bandwidth (- 1 dB)	BW	kHz		9.5		$R_L > 500\ \text{k}\Omega$
Output voltage noise (1 Hz .. 10 kHz)	V_{no}	mV rms		6		$R_L > 500\ \text{k}\Omega$
Magnetic offset current referred to primary ($1000 \times I_{PRN}$)	I_{OM}	mA		57		
Accuracy (Note 3)	X	%			1.9	$= (\epsilon_G^2 + \epsilon_L^2)^{1/2}$
Output voltage referred to GND (during Degauss cycle)		V		0.3	0.5	Note 1
Output voltage referred to V_{REF} (Test current)		V	V_{OE}^+ 0.2	V_{OE}^+ 0.35	V_{OE}^+ 0.5	Note 1

Notes: 1) See "Application information" section.

2) Only with a primary nominal residual current, see paragraph "Primary nominal residual current and primary nominal current".

 3) Accuracy @ T_A and I_p : $X_{TA} = (X^2 + (TCG \cdot 100 \cdot (T_A - 25))^2 + (TCV_{OE} \cdot 2.5 \cdot (T_A - 25) / G_{th} \cdot 100 / I_p)^2)^{1/2}$

Application information

Filtering, decoupling CTSR transducer

Supply voltage Vc (5 V):

The CTSR transducers have internal decoupling capacitors, but in the case of a power supply track on the application PCB having a high impedance, it is advised to provide local decoupling, 100 nF or more, located close to the transducer.

Reference Vref:

Ripple present on the Vref pin can be filtered with a low value of capacitance because of the internal 499 ohm series resistance. The CTSR transducers have an internal capacitor of 22 nF between Vref pin and Gnd pin and the maximum filter capacitance value which could be added is 1 µF. Adding a larger decoupling capacitor will increase the activation delay of degauss.

Output Vout:

The CTSR transducers have an internal low pass filter 470 ohm/22 nF; if a decoupling capacitor is added on Vout pin, the bandwidth and the response time will be affected. In case of short circuit, the transducer CTSR can source or sink up to a maximum of 10 mA on its output Vout.

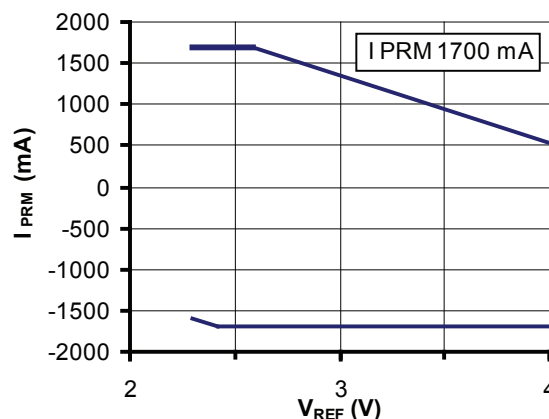
Using an external reference voltage

If the Vref pin of the transducer is not used it could be either left unconnected or filtered according to the previous paragraph "Reference Vref".

The Vref pin has two modes Ref Out and Ref In:

- In the Ref Out mode the 2.5 V internal precision reference is used by the transducer as the reference point for bipolar measurements; this internal reference is connected to the Vref pin of the transducer through a 499 ohms resistor. It tolerates sink or source currents up to ±5 mA, but the 499 ohms resistor prevents this current to exceed these limits.
- In the Ref In mode, an external reference voltage is connected to the Vref pin; this voltage is specified in the range 2.3 to 4 V and is directly used by the transducer as the reference point for measurements. The external reference voltage Vref must be able:
 - o either to source a typical current of $\frac{V_{ref} - 2.5}{499}$, the maximum value will be 3 mA when Vref = 4 V.
 - o or to sink a typical current of $\frac{2.5 - V_{ref}}{499}$, the maximum value will be 0.4 mA when Vref = 2.3 V.

The following graphs show how the measuring range of the transducer depends on the external reference voltage value Vref (Vc = 5 V).



Upper limit: I_p = 1700 mA (Vref = 2.3..2.625 V)

Upper limit: I_p = -833.3*Vref+3854.2 (Vref = 2.625..4 V)

Lower limit: I_p = -833.3*Vref+312.5 (Vref = 2.3..2.375 V)

Lower limit: I_p = -1700 mA (Vref = 2.375..4 V)