Integrated Current Sensor GXM ANC (Version A) Industrial Only

I_{PM} From 50 to 200 A

Version A – Industrial Grade Only Description

The GXM ANC Series is a LEM integrated current transducer solution designed to measure AC and DC current in industrial applications. The differential sensing technique allows the sensor to reject an external field coming from a noisy environment. Proprietary stress and temperature compensation algorithms are implemented to achieve very good accuracy over wide temperature range. The primary conductor (pins 1 and 2) has a very low electrical resistance of 0.27 mΩ(typical), which enables excellent performance at low power losses. The GXM ANC is capable of measuring currents from 50 to 200A over a wide temperature range. Internal and external overcurrent detection circuits are implemented to provide fast, reliable flexible protection solutions. The galvanic isolation between the primary and secondary eliminates the need for any additional insulation, reducing the total footprint and the cost of the system.

Note on Version Q – Automotive Grade

The Version Q of the GXM ANC Series will be dedicated to automotive applications, with AEC-Q100 qualification and specifications tailored to meet automotive sector requirements.

Key Features & Advantages

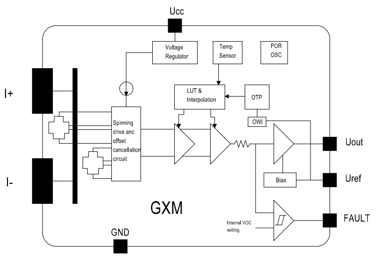
- Current Range: 50 to 200 A (multi-range)
- Primary Resistance: 0.27 mΩ (minimizing power loss and heating)
- Surge Current Capability: Up to 20 kA (IEC61000-4-5), industry-leading for industrial environments
- Bandwidth: 320 kHz, Response Time: 1.5 µs
- Galvanic Isolation: 5000 Vrms, 8.2 mm clearance and creepage distances
- Dual Supply Voltage: 3.3 V or 5 V for design flexibility
- Integrated Overcurrent Detection: Internal and external OCD circuits for fast and reliable protection
- Operating Temperature: -40 °C to +150 °C
- Compact SOIC10L Package: Optimized for PCB space
- ROHS.

Product MOQ

GXM-XXX: 1000pcs/Reel.

Applications

- Photovoltaic System
- Servo and Drive
- Automation
- HVAC.



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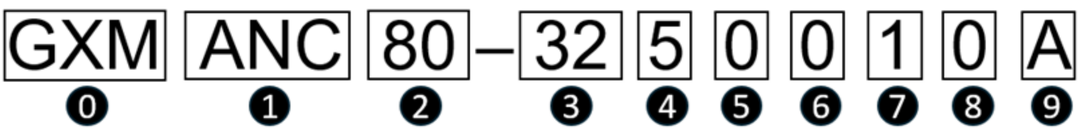
Main Order Information (Recommended the following device)

Part number	Full Scale Primary Current (A)	Nominal current (A)	Power Supply (V)	Sensitivity (mV/A)	Package
GXM ANC 50-20 30010A	50	20	3.3	26.4	SOIC 10L
GXM ANC 50-20 50010A	50	20	5	40	
GXM ANC 75-30 50030A	75	30	5	26.67	
GXM ANC 75-30 30010A	75	30	3.3	17.6	
GXM ANC 80-32 50010A	80	32	5	25	
GXM ANC 80-32 30010A	80	32	3.3	16.5	
GXM ANC 100-40 30010A	100	40	3.3	13.2	
GXM ANC 100-40 50010A	100	40	5	20	
GXM ANC 100-40 50030A	100	40	5	20	
GXM ANC 100-40 51030A	100	40	5	41.2	
GXM ANC 110-44 30010A	110	44	3.3	12	
GXM ANC 150-60 50010A	150	60	5	13.3	
GXM ANC 150-60 50030A	150	60	5	13.3	
GXM ANC 150-60 51030A	150	60	5	27.47	
GXM ANC 200-80 50010A	200	80	5	10	
GXM ANC 200-80 50020A	200	80	5	10	

For more information about LEM stock and lead time please contact us.

https://www.lem.com/en/form/contact-us?utm_source=lem&utm_medium=datasheet&utm_campaign=ds_…

Product Naming Rules



- ⓿ Integrated Current Sensor
- ❶ ASIC Version
- ❷ Full Scale Current (A)
- ❸ Nominal Current (A)
- ❹ Supply Voltage: 5 – VCC = 5 V; 3 – VCC = 3.3 V
- ❺ Output Directionality: 0 – Bipolar output ; 1 – Unipolar output
- ❻ Output mode: 0 – Fixed mode output; 1 – Ratiometric mode output
- ❼ Trimming code
- ❽ Operating Temperature Range: 0:-40~150 ℃; 1:-40~125 ℃
- ❾ Product Version

Pin Definitions

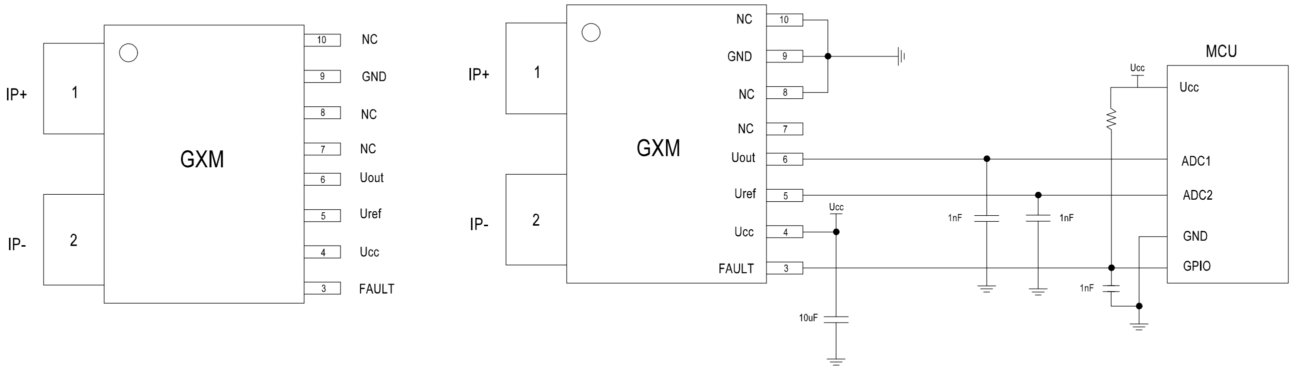


Figure 1: Pin definitions and application circuit

Pins number	Name	Function
1	I_P+	Input of the primary current
2	I_P-	Output of the primary current
3	OCD Pin	Over Current Detection
4	U_C	Supply voltage
5	U_{ref}	Reference voltage
6	U_{out}	Output voltage
7	NC	Not connected
8	NC	Not connected
9	GND	Ground
10	NC	Not connected

Absolute maximum ratings

Parameter	Symbol	Unit	Value
Maximum supply voltage @ 25 °C	$U_{C\ max}$	V	6.5
Maximum junction temperature [1)]	$T_{J\ max}$	°C	150
Electrostatic discharge voltage (HBM - Human Body Model)	$U_{ESD\ HBM}$	kV	8
Electrostatic discharge voltage (CDM - Charged Device Model)	$U_{ESD\ CDM}$	kV	2
Source sink max current		mA	±25

Note: Absolute maximum ratings apply at 25 °C unless otherwise noted.

Stresses above these ratings may cause permanent damage.

Exposure to absolute maximum ratings for extended periods may degrade reliability.

Environmental and mechanical characteristics

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Ambient operating temperature	T_A	°C	−40		150	
Ambient storage temperature	$T_{A\ st}$	°C	−40		150	
Resistance of the primary @ T_A = 25 °C	R_P	mΩ		0.27		

Insulation coordination

Parameter	Symbol	Unit	Value	Comment
RMS voltage for AC insulation test, 50 Hz, 1 min	U_d	Vrms	5000	According to IEC 62368-1
Impulse withstand voltage 1.2/50 µs	U_{Ni}	kV	10	According to IEC 61000-4-5
Surge current	I_{Surge}	kA	20	According to IEC61000-4-5
Clearance (pri. - sec.)	d_{CI}	mm	8.2	Shortest distance through air
Creepage distance (pri. - sec.)	d_{CP}	mm	8.2	Shortest path along device body
Comparative tracking index	CTI	V/ns	>=600	CTI I
Common-mode transient immunity	$CMTI$	V/ns	>100	The criterion for judging the failure is that the output peak is greater than 100 mV and the duration is longer than 1 us
Application example System voltage RMS		Vrms	1144	Basic insulation according to IEC 62368-1
Application example System voltage DC		Vdc	1618	Basic insulation according to IEC 62368-1

Note: [1)] Done on LEM evaluation board PCB.

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GXM Common Characteries (T_A = −40 °C ... 150 °C, U_C = 5 V or 3.3 V, unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
DC supply voltage	U_C	V	3	3.3	3.6	U_C = 3.3 V
			4.5	5	5.5	U_C = 5 V
DC current consumption	I_C	mA		12	15	No load, U_C = 5 V, T_A = 25 °C
Internal reference voltage @ I_P = 0 A	$U_{I\,ref}$	V	2.49	2.5	2.51	U_C = 5 V, Bipolar&Fixed version, T_A = 25 °C
			1.64	1.65	1.66	U_C = 3.3 V, Bipolar&Fixed version, T_A = 25 °C
			0.49	0.5	0.51	U_C = 5 V, Unipolar&Fixed version, T_A = 25 °C
			0.32	0.33	0.34	U_C = 3.3 V, Unipolar&Fixed version, T_A = 25 °C
Load capacitance [1]	C_L	nF			10	
Load resistance [1]	R_L	kΩ	10			
Primary conductor resistance	R_P	mΩ		0.27		T_A = 25 °C
Power On Time	t_{PO}	ms		1		T_A = 25 °C, before OTP is loading
Linearity error 0 ... ± $I_{P\,M}$	ε_L	%	/	±0.2	/	Linearity error 0 ... ± $I_{P\,M}$
Output voltage range @ $I_{P\,M}$	$U_{out}-U_{ref}$	V	0.1		U_C − 0.1	T_A = 25 °C, C_L = 1 nF, R_L = 10 kΩ, to U_C or GND
Frequency bandwidth (−3 dB)	BW	kHz		320		T_A = 25 °C, U_C = 5 V, −3dB bandwidth, C_L = 1 nF
Noise density	N_d	uArms/√Hz		260		T_A = 25 °C, U_C = 5 V, C_L = 1 nF
				370		T_A = 25 °C, U_C = 3.3 V, C_L = 1 nF
Internal OCD threshold error	$\varepsilon_{I\,OCD\,Th}$	%		±8		Referred to $I_{P\,M}$ T_A = 25 °C, C_L = 1 nF
OCD detection threshold	$I_{I\,OCD\,Th}$	A		$I_{P\,M}$		25 °C ... 150 °C
OCD output on resistance	$R_{on\,I\,OCD}$	kΩ	4.7		100	
Delay time @ 10 % of the final output value $I_{P\,N}$ step	$t_{D\,10}$	µs		1.2		T_A = 25 °C, C_L = 1 nF, U_C = 5 V
Delay time @ 90 % of the final output value $I_{P\,N}$ step	$t_{D\,90}$	µs		1.5		T_A = 25 °C, C_L = 1 nF, U_C = 5 V
OCD delay time	$t_{D\,I\,OCD}$	µs		1.5		T_A = 25 °C, C_L = 1 nF, U_C = 5 V

Note: [1] Guaranteed by design.

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Electrical data GXM ANC 50-20 30010A, (At T_A = −40 °C ... 150 °C, U_C = 3.3 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		20		
Primary current, measuring range	I_{PM}	A	−50		50	
Internal reference voltage @ I_P = 0 A	$U_{I\,ref}$	V		1.65		
Nominal sensitivity	S_N	mV/A		26.4		
Sensitivity error	ε_S	%	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−10		10	$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 1.65 V T_A = 25 °C ... 150 °C
				±15		$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 1.65 V T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA				
Total output error [1]	E_{total}	% of I_{PN}	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Total output error over lifetime drift	E_{total_drift}	%		±2 %		T_A = 25 °C

Electrical data GXM ANC 50-20 50010A, (At T_A = −40 °C ... 150 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		20		
Primary current, measuring range	I_{PM}	A	−50		50	
Internal reference voltage @ I_P = 0 A	$U_{I\,ref}$	V		2.5		
Nominal sensitivity	S_N	mV/A		40		
Sensitivity error	ε_S	%	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−10		10	$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 2.5 V T_A = 25 °C ... 150 °C
				±15		$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 2.5 V T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA				
Total output error [1]	E_{total}	% of I_{PN}	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Total output error over lifetime drift	E_{total_drift}	%		2 %		T_A = 25 °C

Note: [1] In production, total output error and sensitivity error are measured and calculated at 30 A.

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Electrical data GXM ANC 75-30 30010A, (At T_A = −40 °C ... 150 °C, U_C = 3.3 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		30		
Primary current, measuring range	I_{PM}	A	−75		75	
Internal reference voltage @ I_P = 0 A	$U_{I\,ref}$	V		1.65		
Nominal sensitivity	S_N	mV/A		17.6		
Sensitivity error	ε_S	%	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−10		10	$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 1.65 V T_A = 25 °C ... 150 °C
				±15		$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 1.65 V T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA				
Total output error [1)]	E_{total}	% of I_{PN}	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Total output error over lifetime drift	E_{total_drift}	%		2 %		T_A = 25 °C

Electrical data GXM ANC 75-30 50030A, (At T_A = −40 °C ... 150 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		30		
Primary current, measuring range	I_{PM}	A	−75		75	
Internal reference voltage @ I_P = 0 A	$U_{I\,ref}$	V		2.5		
Nominal sensitivity	S_N	mV/A		26.67		
Sensitivity error	ε_S	%	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−10		10	$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 2.5 V T_A = 25 °C ... 150 °C
				±15		$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 2.5 V T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA				
Total output error [1)]	E_{total}	% of I_{PN}	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Total output error over lifetime drift	E_{total_drift}	%		2 %		T_A = 25 °C

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Electrical data GXM ANC 80-32 30010A, (At T_A = −40 °C ... 150 °C, U_C = 3.3 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		32		
Primary current, measuring range	I_{PM}	A	−80		80	
Internal reference voltage @ I_P = 0 A	$U_{I\,ref}$	V		1.65		
Nominal sensitivity	S_N	mV/A		16.5		
Sensitivity error	ε_S	%	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−10		10	$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 1.65 V T_A = 25 °C ... 150 °C
				±15		$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 1.65 V T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA				
Total output error [1)]	E_{total}	% of I_{PN}	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Total output error over lifetime drift	E_{total_drift}	%		2 %		T_A = 25 °C

Electrical data GXM ANC 80-32 50010A, (At T_A = −40 °C ... 150 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		32		
Primary current, measuring range	I_{PM}	A	−80		80	
Internal reference voltage @ I_P = 0 A	$U_{I\,ref}$	V		2.5		
Nominal sensitivity	S_N	mV/A		25		
Sensitivity error	ε_S	%	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−10		10	$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 2.5 V T_A = 25 °C ... 150 °C
				±15		$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 2.5 V T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA				
Total output error [1)]	E_{total}	% of I_{PN}	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Total output error over lifetime drift	E_{total_drift}	%		2 %		T_A = 25 °C

Electrical data GXM ANC 100-40 30010A, (At T_A = −40 °C ... 150 °C, U_C = 3.3 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		40		
Primary current, measuring range	I_{PM}	A	−100		100	
Internal reference voltage @ I_P = 0 A	$U_{I\,ref}$	V		1.65		
Nominal sensitivity	S_N	mV/A		13.2		
Sensitivity error	ε_S	%	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−10		10	$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 1.65 V T_A = 25 °C ... 150 °C
				±15		$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 1.65 V T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA				
Total output error [1)]	E_{total}	% of I_{PN}	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Total output error over lifetime drift	E_{total_drift}	%		2 %		T_A = 25 °C

Electrical data GXM ANC 100-40 50010A, (At T_A = −40 °C ... 150 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		40		
Primary current, measuring range	I_{PM}	A	−100		100	
Internal reference voltage @ I_P = 0 A	$U_{I\,ref}$	V		2.5		
Nominal sensitivity	S_N	mV/A		20		
Sensitivity error	ε_S	%	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−10		10	$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 2.5 V T_A = 25 °C ... 150 °C
				±15		$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 2.5 V T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA				
Total output error [1)]	E_{total}	% of I_{PN}	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Total output error over lifetime drift	E_{total_drift}	%		2 %		T_A = 25 °C

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Electrical data GXM ANC 100-40 50030A, (At T_A = −40 °C ... 150 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		40		
Primary current, measuring range	I_{PM}	A	−100		100	
Internal reference voltage @ I_P = 0 A	$U_{I\,ref}$	V		2.5		
Nominal sensitivity	S_N	mV/A		20		
Sensitivity error	ε_S	%	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−10		10	$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 2.5 V T_A = 25 °C ... 150 °C
				±15		$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 2.5 V T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA				
Total output error [1)]	E_{total}	% of I_{PN}	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Total output error over lifetime drift	E_{total_drift}	%		2 %		T_A = 25 °C

Electrical data GXM ANC 100-40 51030A, (At T_A = −40 °C ... 150 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		40		
Primary current, measuring range	I_{PM}	A	−100		100	
Internal reference voltage @ I_P = 0 A	$U_{I\,ref}$	V		0.5		
Nominal sensitivity	S_N	mV/A		41.2		
Sensitivity error	ε_S	%	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−10		10	$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 2.5 V T_A = 25 °C ... 150 °C
				±15		$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 2.5 V T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA				
Total output error [1)]	E_{total}	% of I_{PN}	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Total output error over lifetime drift	E_{total_drift}	%		2 %		T_A = 25 °C

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Electrical data GXM ANC 110-44 30010A, (At T_A = −40 °C ... 150 °C, U_C = 3.3 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	$I_{P N}$	A		44		
Primary current, measuring range	$I_{P M}$	A	−110		110	
Internal reference voltage @ I_P = 0 A	$U_{I ref}$	V		1.65		
Nominal sensitivity	S_N	mV/A		12		
Sensitivity error	ε_S	%	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S L 25}$	% of $I_{P N}$	/	2	/	
Electrical offset voltage referred to primary	$U_{O E}$	mV	−10		10	$U_{out}-U_{I ref}$ @ $U_{I ref}$ = 1.65 V T_A = 25 °C ... 150 °C
				±15		$U_{out}-U_{I ref}$ @ $U_{I ref}$ = 1.65 V T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	$I_{O E}$	mA				
Total output error [1)]	E_{total}	% of $I_{P N}$	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Total output error over lifetime drift	E_{total_drift}	%		2 %		T_A = 25 °C

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Electrical data GXM ANC 150-60 50010A, (At T_A = −40 °C ... 150 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	$I_{P N}$	A		60		
Primary current, measuring range	$I_{P M}$	A	−150		150	
Internal reference voltage @ I_P = 0 A	$U_{I ref}$	V		2.5		
Nominal sensitivity	S_N	mV/A		13.3		
Sensitivity error	ε_S	%	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S L 25}$	% of $I_{P N}$	/	2	/	
Electrical offset voltage referred to primary	$U_{O E}$	mV	−10		10	$U_{out}-U_{I ref}$ @ $U_{I ref}$ = 2.5 V T_A = 25 °C ... 150 °C
				±15		$U_{out}-U_{I ref}$ @ $U_{I ref}$ = 2.5 V T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	$I_{O E}$	mA				
Total output error [1)]	E_{total}	% of $I_{P N}$	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Total output error over lifetime drift	E_{total_drift}	%		2 %		T_A = 25 °C

Electrical data GXM ANC 150-60 50030A, (At T_A = −40 °C ... 150 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	$I_{P N}$	A		60		
Primary current, measuring range	$I_{P M}$	A	−150		150	
Internal reference voltage @ I_P = 0 A	$U_{I ref}$	V		2.5		
Nominal sensitivity	S_N	mV/A		13.3		
Sensitivity error	ε_S	%	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S L 25}$	% of $I_{P N}$	/	2	/	
Electrical offset voltage referred to primary	$U_{O E}$	mV	−10		10	$U_{out}-U_{I ref}$ @ $U_{I ref}$ = 2.5 V T_A = 25 °C ... 150 °C
				±15		$U_{out}-U_{I ref}$ @ $U_{I ref}$ = 2.5 V T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	$I_{O E}$	mA				
Total output error [1)]	E_{total}	% of $I_{P N}$	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Total output error over lifetime drift	E_{total_drift}	%		2 %		T_A = 25 °C

Electrical data GXM ANC 150-60 51030A, (At T_A = −40 °C ... 150 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		60		
Primary current, measuring range	I_{PM}	A	−150		150	
Internal reference voltage @ I_P = 0 A	$U_{I\,ref}$	V		0.5		
Nominal sensitivity	S_N	mV/A		27.47		
Sensitivity error	ε_S	%	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−10		10	$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 2.5 V T_A = 25 °C ... 150 °C
				±15		$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 2.5 V T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA				
Total output error [1)]	E_{total}	% of I_{PN}	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Total output error over lifetime drift	E_{total_drift}	%		2 %		T_A = 25 °C

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Electrical data GXM ANC 200-80 50010A, (At T_A = −40 °C ... 150 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		80		
Primary current, measuring range	I_{PM}	A	−200		200	
Internal reference voltage @ I_P = 0 A	$U_{I\,ref}$	V		2.5		
Nominal sensitivity	S_N	mV/A		10		
Sensitivity error	ε_S	%	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−10		10	$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 2.5 V T_A = 25 °C ... 150 °C
				±15		$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 2.5 V T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA				
Total output error [1)]	E_{total}	% of I_{PN}	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Total output error over lifetime drift	E_{total_drift}	%		2 %		T_A = 25 °C

Electrical data GXM ANC 200-80 50020A, (At T_A = −40 °C ... 150 °C, U_C = 5 V , unless otherwise noted)

Parameter	Symbol	Unit	Min	Typ	Max	Comment
Primary nominal current	I_{PN}	A		80		
Primary current, measuring range	I_{PM}	A	−200		200	
Internal reference voltage @ I_P = 0 A	$U_{I\,ref}$	V		2.5		
Nominal sensitivity	S_N	mV/A		10		
Sensitivity error	ε_S	%	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Sum of sensitivity and linearity error @ T_A = 25 °C	$\varepsilon_{S\,L\,25}$	% of I_{PN}	/	2	/	
Electrical offset voltage referred to primary	U_{OE}	mV	−10		10	$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 2.5 V T_A = 25 °C ... 150 °C
				±15		$U_{out}-U_{I\,ref}$ @ $U_{I\,ref}$ = 2.5 V T_A = −40 °C ... 25 °C
Electrical offset current referred to primary	I_{OE}	mA				
Total output error [1)]	E_{total}	% of I_{PN}	−2		2	T_A = 25 °C ... 150 °C
				±3.5		T_A = −40 °C ... 25 °C
Total output error over lifetime drift	E_{total_drift}	%		2 %		T_A = 25 °C

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Definition of typical, minimum and maximum values

Minimum and maximum values for specified limiting and safety conditions have to be understood as such as well as values shown in “typical” graphs.
On the other hand, measured values are part of a statistical distribution that can be specified by an interval with upper and lower limits and a probability for measured values to lie within this interval.
Unless otherwise stated (e.g. “100 % tested”), the LEM definition for such intervals designated with “min” and “max” is that the probability for values of samples to lie in this interval is 99.73 %.
For a normal (Gaussian) distribution, this corresponds to an interval between −3 sigma and +3 sigma. If “typical” values are not obviously mean or average values, those values are defined to delimit intervals with a probability of 68.27 %, corresponding to an interval between −sigma and +sigma for a normal distribution.
Typical, maximal and minimal values are determined during the initial characterization of the product.

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Overcurrent Detection (OCD)

Overcurrent detection is a feature included in GXM product to detect high peaks of currents happening during operation. When the primary current exceeds the overcurrent threshold, the internal error comparator reverses, driving Open Drain Output to work, and the Fault pin is pulled down. The default OCD threshold for GXM is 100% $I_{P\,M}$.
Overcurrent Detection is triggered when the primary current (positive or negative current) exceeds the overcurrent threshold set.
Fault is cleared when the absolute value of the primary current is less than the current threshold set minus current hysteresis.
Tfr is Fault Response time: the time from the primary current meets the overcurrent condition to Fault pin is pulled down. The timing of overcurrent protection is as follows:

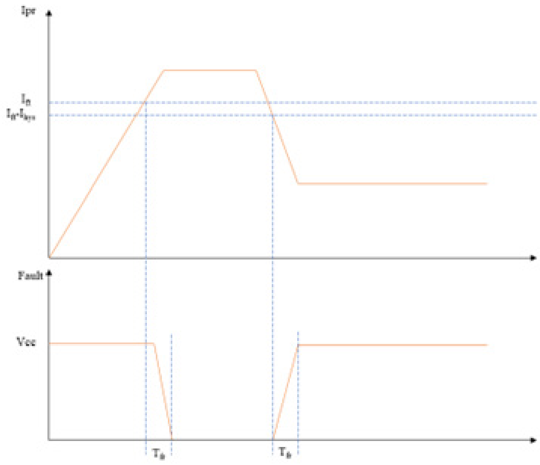

Figure 2: Overcurrent Performance

Overcurrent Threshold:

The setting of the overcurrent threshold magnitude is represented by the “trimming code” in the product name.
0-75 %FS;1-100 %FS;2-125 %;3-150 %;(FS, full scale)
The default overcurrent threshold is 1, which means that when the current reaches 100 % of the full scale (FS) , overcurrent protection will be activated.

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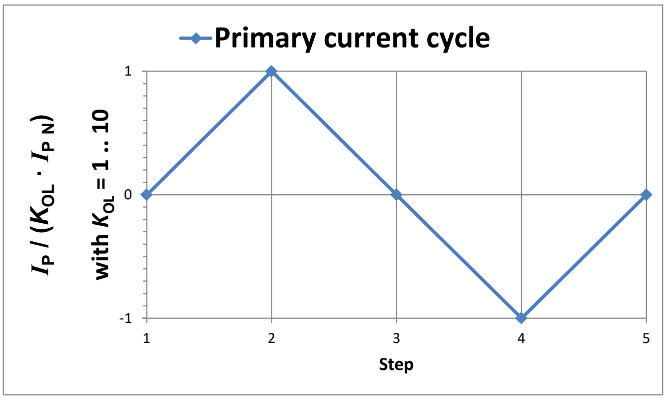
Performance parameters definition



K_{OL}: Overload factor

Figure 1: Current cycle used to measure electrical offset (transducer supplied)

Electrical offset referred to primary

Using the current cycle shown in figure 1, the electrical offset voltage $U_{O E}$ is the residual output referred to primary when the input current is zero.

$$U_{O E} = \frac{U_{P(3)} + U_{P(5)}}{2}$$

The temperature variation $U_{O T}$ of the electrical offset voltage $U_{O E}$ is the variation of the electrical offset from 25 °C to the considered temperature.

$$U_{O T}(T) = U_{O E}(T) - U_{O E}(25\ °C)$$

Delay times

The delay time $t_{D 10}$ @ 10 % and the delay time $t_{D 90}$ @ 90 % with respect to the primary are shown in the next figure.
Both slightly depend on the primary current di/dt.
They are measured at nominal current.

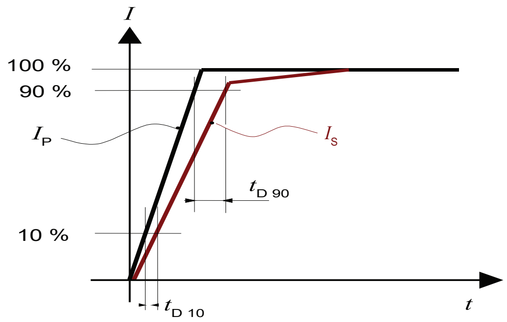


Figure 2: $t_{D 10}$ (delay time @ 10 %) and $t_{D 90}$ (delay time @ 90 %)

Total error referred to primary

The total error ε_{tot} is the error at $\pm I_{P N}$, relative to the rated value $I_{P N}$.
It includes all errors mentioned above

- the electrical offset $I_{O E}$
- the magnetic offset $I_{O M}$
- the sensitivity error ε_S
- the linearity error ε_L (to $I_{P N}$).

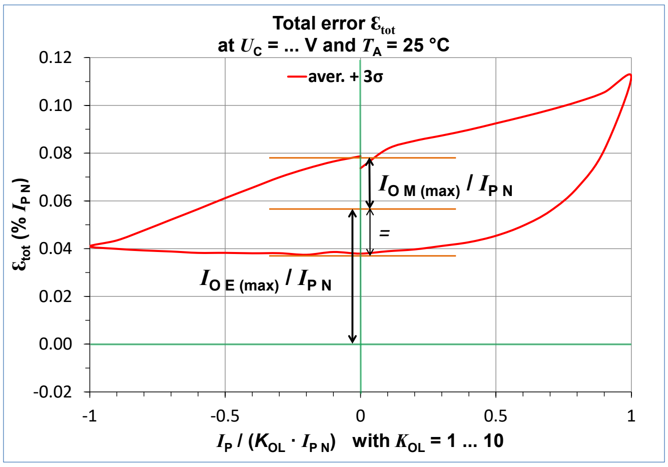


Figure 3: Total error ε_{tot}

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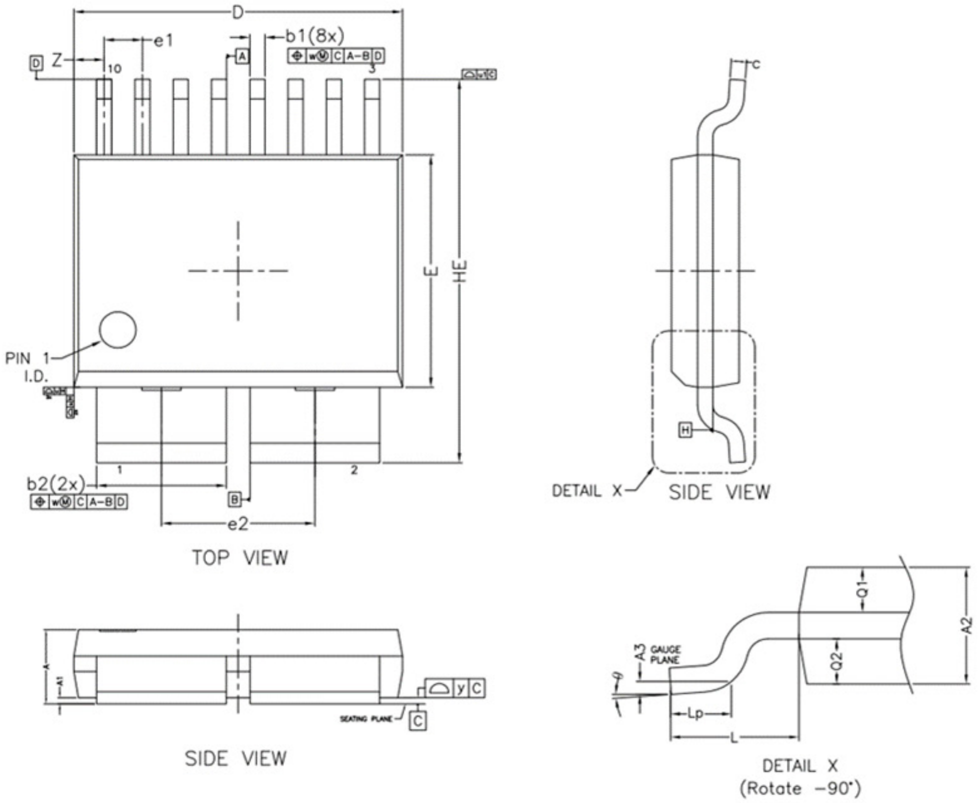
Dimensions (in mm)



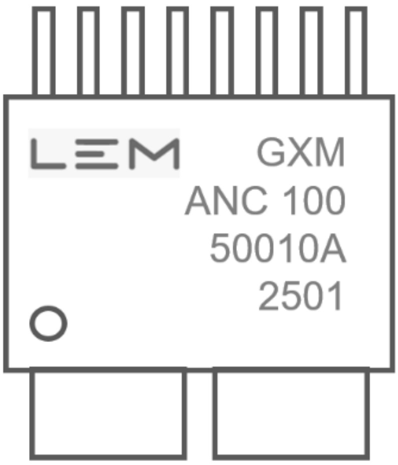
* CONTROLLING DIMENSION : MM

SYMBOL	MM		
	MIN.	NOM.	MAX.
A	--	--	2.65
A1	0.10	--	0.30
A2	2.18	2.25	2.32
b1	0.45	--	0.55
b2	4.25	--	4.35
c	0.508 REF.		
D	10.8	10.9	11.0
E	7.60	7.70	7.80
HE	12.5	12.7	12.9
Q1	0.845	0.87	0.895
Q2	0.845	0.87	0.895
e1	1.27 BSC		
e2	5.09 BSC		
A3	0.25 REF		
L	2.50 REF		
Lp	0.40	--	2.00
y	0.15		
u	0.10		
u1	0.20		
w	0.15		
Z	1.005		
θ	0°	--	8°

NOTES:
1.0 COPLANARITY APPLIES TO LEADS, CORNER LEADS AND DIE ATTACH PAD.
2.0 PLASTIC OR METAL PROTRUSIONS OF 0.15MM MAXIMUM PER SIDE ARE NOT INCLUDED

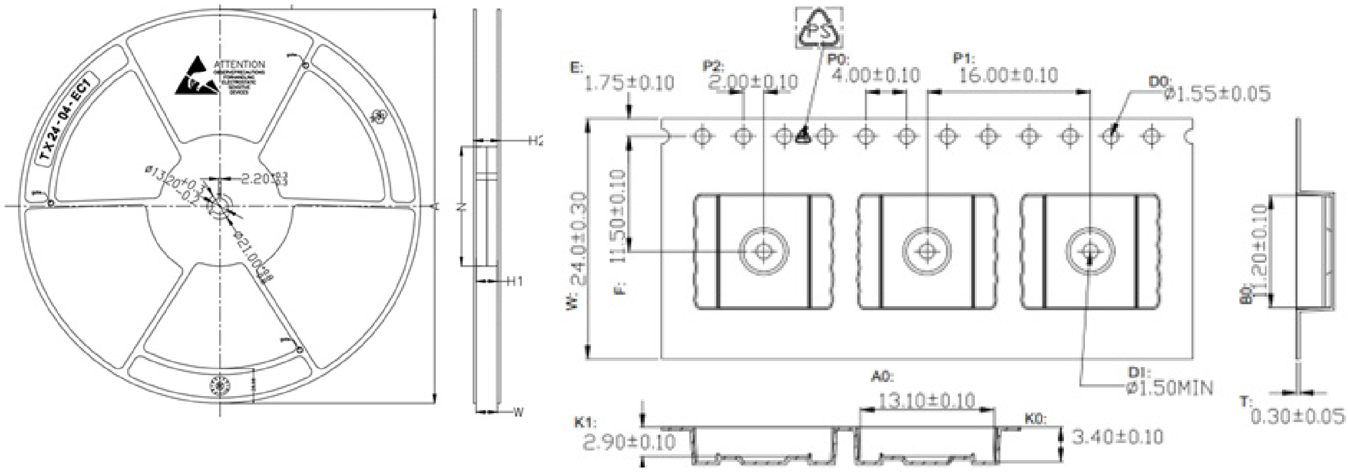
Product Marks:

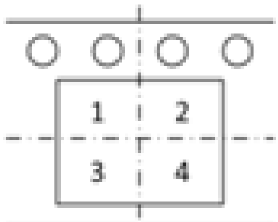
The example of the top mark is as follows (not to scale).



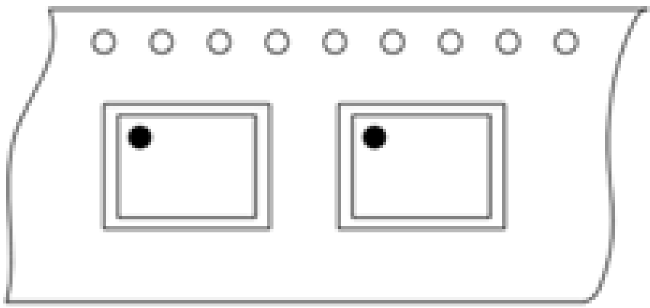
Line 1...3 device part number (The meaning refers to the product naming rules on page 15)
Line 4 Product Date code

Tape and Reel (in mm)





Quadrant Designations



Safety

Caution

If the device is used in a way that is not specified by the manufacturer, the protection provided by the device may be compromised.
Always inspect the electronics unit and connecting cable before using this product and do not use it if damaged.
Mounting assembly shall guarantee the maximum primary conductor temperature, fulfill clearance and creepage distance, minimize electric and magnetic coupling, and unless otherwise specified can be mounted in any orientation.

Caution, risk of electrical shock

This transducer must be used in limited-energy secondary circuits SELV according to IEC 61010-1, in electric/electronic equipment with respect to applicable standards and safety requirements in accordance with the manufacturer's operating specifications.

Use caution during installation and use of this product; certain parts of the module can carry hazardous voltages and high currents (e.g. power supply, primary conductor).
Ignoring this warning can lead to injury and or/or cause serious damage.

This transducer is a build-in device, whose hazardous live parts must be inaccessible after installation.
This transducer must be mounted in a suitable end-enclosure.
Besides make sure to have a distance of minimum 30 mm between the primary terminals of the transducer and other neighboring components.

This transducer is a built-in device, not intended to be cleaned with any product. Nevertheless if the user must implement cleaning or washing process, validation of the cleaning program has to be done by himself.

ESD susceptibility
The product is susceptible to be damaged from an ESD event and the personnel should be grounded when handling it.

Do not dispose of this product as unsorted municipal waste. Contact a qualified recycler for disposal.
Although LEM applies utmost care to facilitate compliance of end products with applicable regulations during LEM product design, use of this part may need additional measures on the application side for compliance with regulations regarding EMC and protection against electric shock. Therefore LEM cannot be held liable for any potential hazards, damages, injuries or loss of life resulting from the use of this product.

c UL US

Underwriters Laboratory Inc. recognized component

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