

K-No.: 30057

### 75A Current Sensor

For the electronic measurement of currents:  
DC, AC, pulsed, mixed with a galvanic isolation  
between the primary circuit (high power) and the  
secondary circuit (electronic circuit)



Date: 25.09.2020

Customer: Standard type

Customers Part no:

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#### Description

- Closed loop (compensation) Current Sensor with magnetic probe
- Printed circuit board mounting
- Casing and materials UL-listed

#### Characteristics

- excellent accuracy
- very low offset current
- very low temperature dependency and offset current drift
- very low hysteresis of offset current
- short response time
- wide frequency bandwidth
- compact design
- reduced offset ripple

#### Applications

Mainly used for stationary operation in industrial applications:

- AC variable speed drives and servo motor drives
- static converters for DC motor drives
- Battery supplied applications
- Switched Mode Power Supplies (SMPS)
- Power supplies for welding applications
- Uninterruptable Power Supplies (UPS)

#### Electrical data - Ratings

$I_{PN}$	Primary nominal RMS current	75	A
$V_{OUT}$	Output voltage	$V_{REF} \pm (0.4685 \cdot I_P / I_{PN})$	V
$V_{OUT}$	Output voltage @ $I_P=0A$ , $\vartheta_A=25^\circ C$	$V_{REF} \pm 0.000725$	V
$V_{REF}$	External Reference voltage range	0 ... 4	V
	Internal Reference voltage	$2.5 \pm 0.005$	V
$K_N$	Transformation ratio	1...5 : 1100	

#### Accuracy – Dynamic performance data

		min.	typ.	max.	Unit
$I_{P,max}$	Max. measuring range	$\pm 182$			A
X	Accuracy @ $I_{PN}$ , $\vartheta_A = 25^\circ C$			0.7	%
$\epsilon_L$	Linearity			0.1	%
$V_{OUT}-V_{REF}$	Offset voltage @ $I_P = 0A$ , $\vartheta_A = 25^\circ C$			$\pm 0.725$	mV
$\Delta V_O / V_{REF} / \Delta T$	Temperature drift of $V_{OUT}$ @ $I_P=0A$ , $V_{REF}=2.5V$ , $\vartheta_A$			4	ppm/ $^\circ C$
$t_r$	Response time		0.3		$\mu s$
$t_{ra}$	Reaction time		0.2		$\mu s$
$f_{BW}$	Frequency bandwidth	DC..200			kHz

#### General data

$\vartheta_A$	Ambient operation temperature	-40		105	$^\circ C$
$\vartheta_S$	Ambient storage temperature (acc. M3101)	-40		105	$^\circ C$
m	Mass		12		g
$V_C$	Supply voltage	4.75	5	5.25	V
$I_C$	Supply current at $I_P = 0A$ and RT		15		mA

$^1)S_{clear}$	Clearance (component without solder pad)	7.5			mm
$^1)S_{creep}$	Creepage (component without solder pad)	7.5			mm
$^1)U_{sys, re}$	System voltage (reinforced insulation)			300	$V_{RMS}$
$^1)U_{work, re}$	Working voltage (reinforced insulation)			750	$V_{RMS}$
$^1)U_{PD}$	Rated discharge voltage			1060	$V_{PEAK}$
$^1)U_{sys, basic}$	System voltage (basic insulation)			600	$V_{RMS}$
$^1)U_{work, basic}$	Working voltage (basic insulation)			1500	$V_{RMS}$
	max. Potential Difference acc. to UL 508			600	$V_{RMS}$

<sup>1)</sup> Constructed and manufactured and tested in accordance with IEC 61800-5-1:2007 (primary to secondary)  
Insulation material group 1, Pollution degree 2, Overvoltage category III

Date	Name	Issue	Amendment
25.09.2020	DJ	81	Approval received. Marking with UL-sign and other standards changed. Minor change

Editor: R&D-PD NPI D	Designer: MB	MC-PM: NSch.	Release: SB
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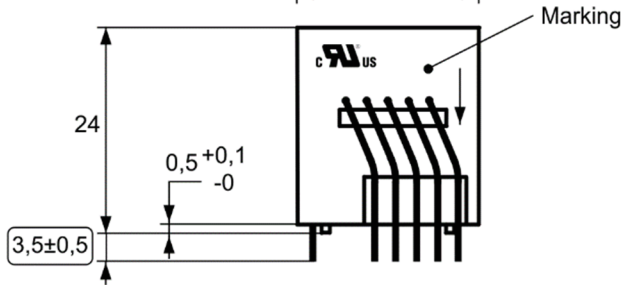
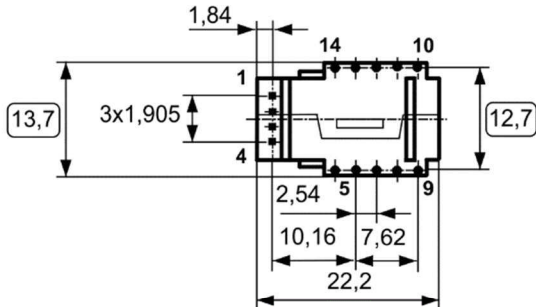
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#### Mechanical outline (mm):

General tolerances DIN ISO 2768-c

Connections:

Pin No. 5-14:  $\varnothing 1\text{mm}$   
Pin No. 1-4: 0.46 x 0.46mm



Marking

○ Test dimension

Tolerance of pin distances  $\pm 0,25\text{mm}$

DC= Date Code  
F = Factory

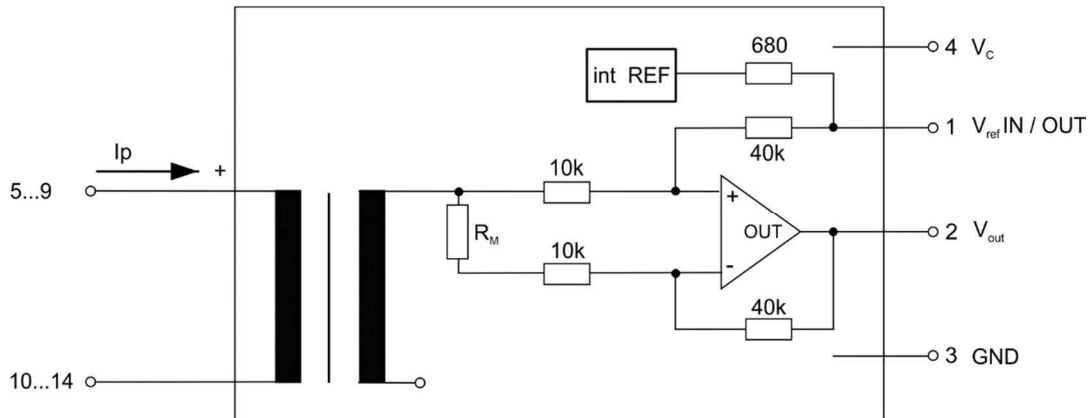
Marking:

**VAC** UL-sign  
4647-P765  
F DC

Format DC:  
YYWW

Example: 1947  
Year 2019, Week 47

#### Schematic diagram:



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#### Electrical data: (investigate by a type checking)

		min.	typ.	max.	Unit
$V_{C,tot}$	maximum supply voltage (without function)			7	V
$I_C$	Supply Current with primary current		$15mA + I_P \cdot K_N + V_{OUT}/R_L$		mA
$I_{OUT,SC}$	Short circuit output current		$\pm 20$		mA
$R_P$	Resistance per primary winding @ $\vartheta_A = 25^\circ C$		1		m $\Omega$
$R_S$	Secondary coil resistance @ $\vartheta_A = 85^\circ C$			22	$\Omega$
$R_{i,REF}$	Internal resistance of Reference output		680		$\Omega$
$R_{i,Vout}$	Output resistance of $V_{OUT}$		10		$\Omega$
$R_L$	External recommended resistance of $V_{OUT}$	1			k $\Omega$
$C_L$	External recommended capacitance of $V_{OUT}$			0.5	nF
$X_{Ti} / \Delta T$	Temperature drift of X @ $\vartheta_A = -40^\circ C \dots 85^\circ C$			40	ppm/K
$\Delta V_O = \Delta(V_{OUT} - V_{REF})$	Sum of any offset drift including:		1.5	3	mV
$V_{Ot}$	Long term drift of $V_O$		0.2		mV
$V_{OT}$	Temperature drift of $V_O$ @ $\vartheta_A = -40^\circ C \dots 85^\circ C$		0.2		mV
$V_{OH}$	Hysteresis of $V_{OUT}$ @ $I_P = 0A$ (caused by $I_P = 10 \times I_{PN}$ )		0.6		mV
$\Delta V_O / \Delta V_C$	Supply voltage rejection ratio		0.15		mV/V
$V_{OSS}$	Offsetripple (with 1 MHz-Filter, first order)		13		mV <sub>PP</sub>
$V_{OSS}$	Offsetripple (with 100 kHz-Filter, first order)		3.5		mV <sub>PP</sub>
$V_{OSS}$	Offsetripple (with 20 kHz-Filter, first order)		1.2		mV <sub>PP</sub>
$C_k$	Maximum possible coupling capacity (primary - secondary)			10	pF
	Mechanical stress according to M3209/3 Settings: 10-2000Hz, 1min/oct., 2 hours			2	g

#### Routine Tests: (Measurement after temperature balance of the samples at room temperature, SC=significant characteristic)

$V_{OUT} (SC)$	(100%) M3011/6:	Output voltage	$468.5 \pm 0.7\%$	mV
$V_O$	(100%) M3226:	Offset voltage	$\pm 0.725$	mV
$U_d$	(100%) M3014:	Test voltage, 1s	1.5	kV <sub>RMS</sub>
$U_{PDE}$	(AQL 1/S4)	Partial discharge voltage (extinction)	1.13	kV <sub>RMS</sub>
$U_{PD} * 1.875$	M3024:		1.41	

#### Type testing: (Precondition acc. to M3236)

$\hat{U}_W$	M3064	HV transient test 1.2 $\mu s$ / 50 $\mu s$ -Waveform 5 pulses -> polarity +, 5 pulses -> polarity -	6	kV
$U_d$	M3014	Test voltage, 60s	3	kV <sub>RMS</sub>
$U_{PDE}$	M3024	Partial discharge voltage (extinction)	1.13	kV <sub>RMS</sub>
$U_{PD} * 1.875$			1.41	

#### Other instructions:

- A positive output voltage vs.  $V_{REF}$  appears at point  $V_{OUT}$ , if primary current flows in direction of the arrow.
- Constructed, manufactured and tested in accordance with IEC 61800-5-1:2007.
- Temperature of the primary conductor should not exceed 105°C.
- Housing and bobbin material UL-listed: Flammability class 94V-0.
- Further standards: UL 508, file E317483, category NMTR2 / NMTR8

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