

K-no.: K31122/02

**50A Open Loop Current Sensor
for industrial application**

Date 18.08.2026

DC, AC, pulsed and mixed electric current measurement
with a galvanic insulation, analog voltage output, integrated primary busbar

Customer: Standard type

Customer part no:

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Description

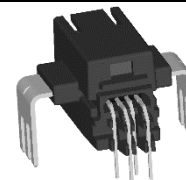
- Open Loop Current Sensor
- Hall-Effect field probe

Characteristics

- Wide frequency bandwidth
- Short response time
- Compact design

Applications

Mainly used for stationary operation in industrial applications and PV Inverter


Electrical Data – Ratings
Unit

I_{PN}	Primary nominal current value	50	A
V_{OUT}	Output Voltage @ I_P against V_{REF}	$V_{REF} \pm G \cdot I_P$	V
V_{REF}	External Reference voltage range	0.5 ... 2.65	V
	Internal Reference voltage	2.5 ± 0.02	V
G	Sensitivity	16.0	mV / A

Accuracy & Dynamic performance data

min.

typ.

max.

Unit

$I_{P,max}$	Max. Measuring range ($V_{CC} \geq 4.6V$)	125	125	A
X	Accuracy @ I_{PN} for $\vartheta_A = 25^\circ C$	-1	1	%
ϵ_G	Sensitivity error @ $\vartheta_A = 25^\circ C$ (factory adjusted)	-0.5	0.5	%
ϵ_L	Linearity error @ $\vartheta_A = 25^\circ C$	-0.5	0.5	% of I_{PN}
$V_{OUT(0)} - V_{REF}$	Offset voltage @ $\vartheta_A = 25^\circ C$, $I_P = 0A$	-10	10	mV
I_{OM}	Magnetic offset (hysteresis after 3 x I_{PN} calc. to primary)	-0.4	0.1	A
TC_G	sensitivity drift over temperature	-40 to $25^\circ C$ 25 to $105^\circ C$	-540 175	ppm/K ppm/K
TC_0	offset drift over temperature	-40 to $25^\circ C$ 25 to $105^\circ C$	-22 10	mA/K mA/K
t_{r80}	Response time @ 80% of I_{PN} (200A/ μs)		1.2	μs
t_{r90}	Response time @ 90% of I_{PN} (200A/ μs)		1.3	μs
f	Frequency bandwidth (-3dB)	400		kHz

General data

min.

typ.

max.

Unit

ϑ_A	Ambient operating temperature	-40	+105	°C
$\vartheta_{Storage}$	Ambient storage temperature acc. VAC M3101	-45	+105	°C
m	Mass	5.0		g
V _{CC}	Supply voltage	4.5	5.5	V
I _{C0}	Current consumption for I _P = 0A	16	23	mA

REMARK: The temperature of the primary conductor must not exceed $140^\circ C$ * (hottest point in the middle of the sensor)
for verification: the measured temperature at the kink of the primary conductor should not exceed $125^\circ C$ *

$S_{clear}^{[1]}$	Clearance distance	8	mm	
$S_{creep}^{[1]}$	Creepage distance	8	mm	
$U_{sys}^{[1]}$	System voltage	basic insulation	1000	$V_{RMS/DC}$
		reinforced insulation	600	V_{RMS}
$U_{work}^{[1]}$	Working voltage	basic insulation	1600	$V_{RMS/DC}$
		reinforced insulation	800	V_{RMS}
$U_{PD}^{[1]}$	Rated discharge voltage		1131	V_{PEAK}
UL508	max. potential difference according UL 508		600	V_{AC}

^[1] Constructed, manufactured and tested in accordance with IEC 61800-5-1:2007 - Material group 1, Pollution degree 2, OVC III, altitude $\leq 2000m$

Date	Name	Issue	Amendment
		81	
Hrg R&D-PD-CS editor	Bearb: SF designer		MC-PM: NSch. check
			freig.: SB released

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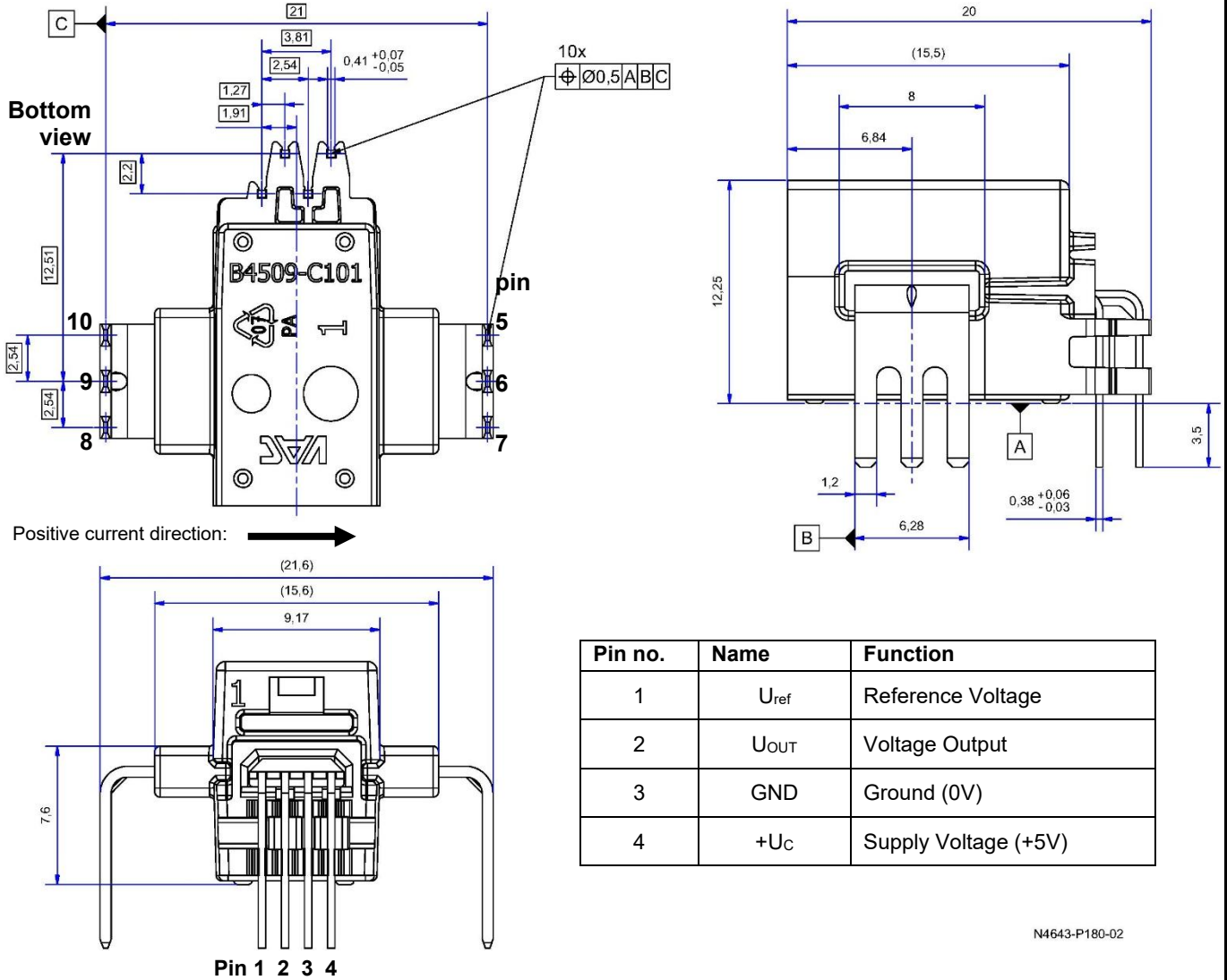
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Mechanical drawing (mm): General tolerance DIN ISO 2768-c



Connection diagram

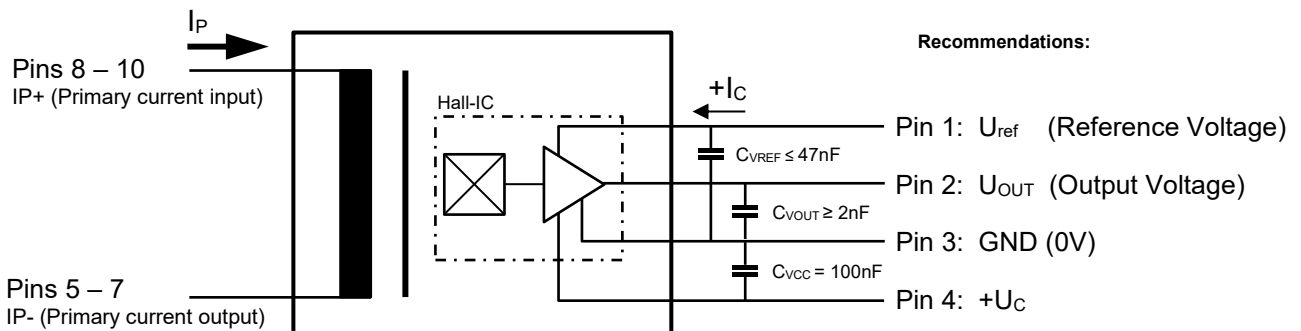


Fig. 6: functional block diagram of the sensor

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Marking

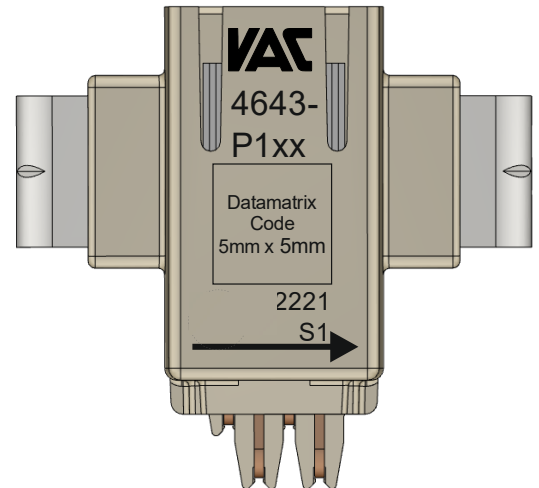
Readable text: Item-number "xxxxxxx"
 F = Factory code, e.g. "S4"
 DC = Date code (YYWW) e.g. "2138"

Datamatrix code (ECC200):


code size: 5.0mm x 5.0mm
 symbol size: 16 x 16 modules
 data region: 14 x 14 modules

data content:

1. Item number	IN	4 digits
2. Reserved (std=1)	R1	1 digit
3. Factory Code	FC	2 digits
4. Reserved 2	R2	4 digits
5. Serial no. (hex)	SN	5 digits



Format: "IN,R1,FC,R2,SN" example: P1801S42403C8FB3

- For a factory code of only 1 digit an underscore character "_" is added

Routine Test

(Measurement after temperature balance of the samples at room temperature; SC = significant characteristic)

G	(100%) M3011/6	Sensitivity ($I_{PN}=50A_{DC}$)	± 0.5	% (SC)
I_{OM} (IPN)	(100%) M3226	Magnetic Offset voltage ($I_{PN}=50A_{DC}$)	1.6	mV
U_P	(100%) M3014	Test voltage (1s) Pin 1,3,5 to primary opening	2.2	kV _{rms}
U_{PDE}	(AQL 1/S4)	Partial discharge voltage (extinction)	1.2	kV _{rms}
$U_{PD(rms)} \cdot 1.875$		*acc. table 24	1.5	kV _{rms}

Type Test (Preconditioning acc. VAC M3236)

(Pins to primary opening)

$\dot{U}_W$	M3064	HV transient test (1.2 μ s / 50 μ s, 5 pulses $\rightarrow$ polarity +, 5 pulses $\rightarrow$ polarity -)	8.0	kV
U_P	M3014	Test voltage (5s)	3.6	kV _{rms}
U_{PDE}	M3024	Partial discharge voltage (extinction)	1.2	kV _{rms}
$U_{PD(rms)} \cdot 1.875$		*acc. table 24	1.5	kV _{rms}

* IEC61800-5-1:2007

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Explanation to parameters used in this datasheet

Accuracy

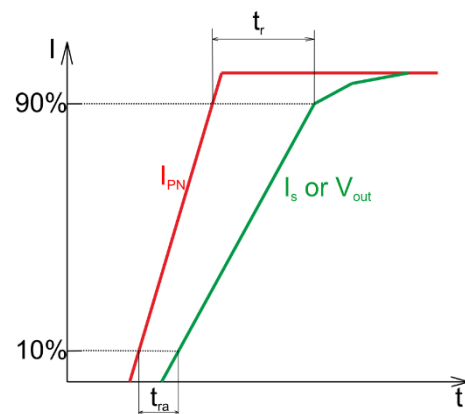
- X: The sum of all errors at 25°C at nominal primary current I_{PN}
- ε_S : Sensitivity error at factory adjustment.
- ε_L : Linearity error where I_P is any input DC and $V_{OUT}(I_P)$ the corresponding output term.

Offset, hysteresis and drift

- I_{SO} : Offset current
- I_{SOH} : magnetic offset variation after overloading with a DC of threefold the rated value

Dynamic properties

- t_{ra} Reaction time, measured as a delay time between a rectangular primary current and the output current I_S at $I_P = 0.1 * I_{PN}$
- $t_{80/90}$: Response time, measured as a delay time between a rectangular primary current and the output current I_S at $I_P = 0.8 * I_{PN}$ (respectively $0.9 * I_{PN}$)



Voltage ratings (according to IEC 61800-5-1:2007)

- U_{PD} Rated discharge voltage (recurring peak voltage separated by the insulation)
- U_{sys} System voltage: RMS value of rated voltage
- U_{AC} Working voltage: RMS voltage which occurs by design in a circuit or across an insulation

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