VACUUMSCHMELZE	**Specification** **Not released for production**	**Item no.:**	**T60404-N4643-P150**

K-no.: K31122/02	**50A Open Loop Current Sensor for industrial application** DC, AC, pulsed and mixed electric current measurement with a galvanic insulation, analog voltage output, integrated primary busbar	Date 18.08.2026
Customer: Standard type	Customer part no:	Page 1 of 4

Description

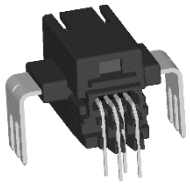
- Open Loop Current Sensor
- Hall-Effect field probe

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 (Vcc ≥ 4.6V)		125		125	A
X	Accuracy @ I_{PN} for ϑ_A= 25°C		-1		1	%
ε_G	Sensitivity error @ ϑ_A = 25°C (factory adjusted)		-0.5		0.5	%
ε_L	Linearity error @ ϑ_A = 25°C		-0.5		0.5	% of I_{PN}
$V_{OUT(0)}$-V_{REF}	Offset voltage @ ϑ_A = 25°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°C	-540		540	ppm/K
		25 to 105°C	-175		175	ppm/K
TC_0	offset drift over temperature	-40 to 25°C	-22		22	mA/K
		25 to 105°C	-10		10	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°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°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}

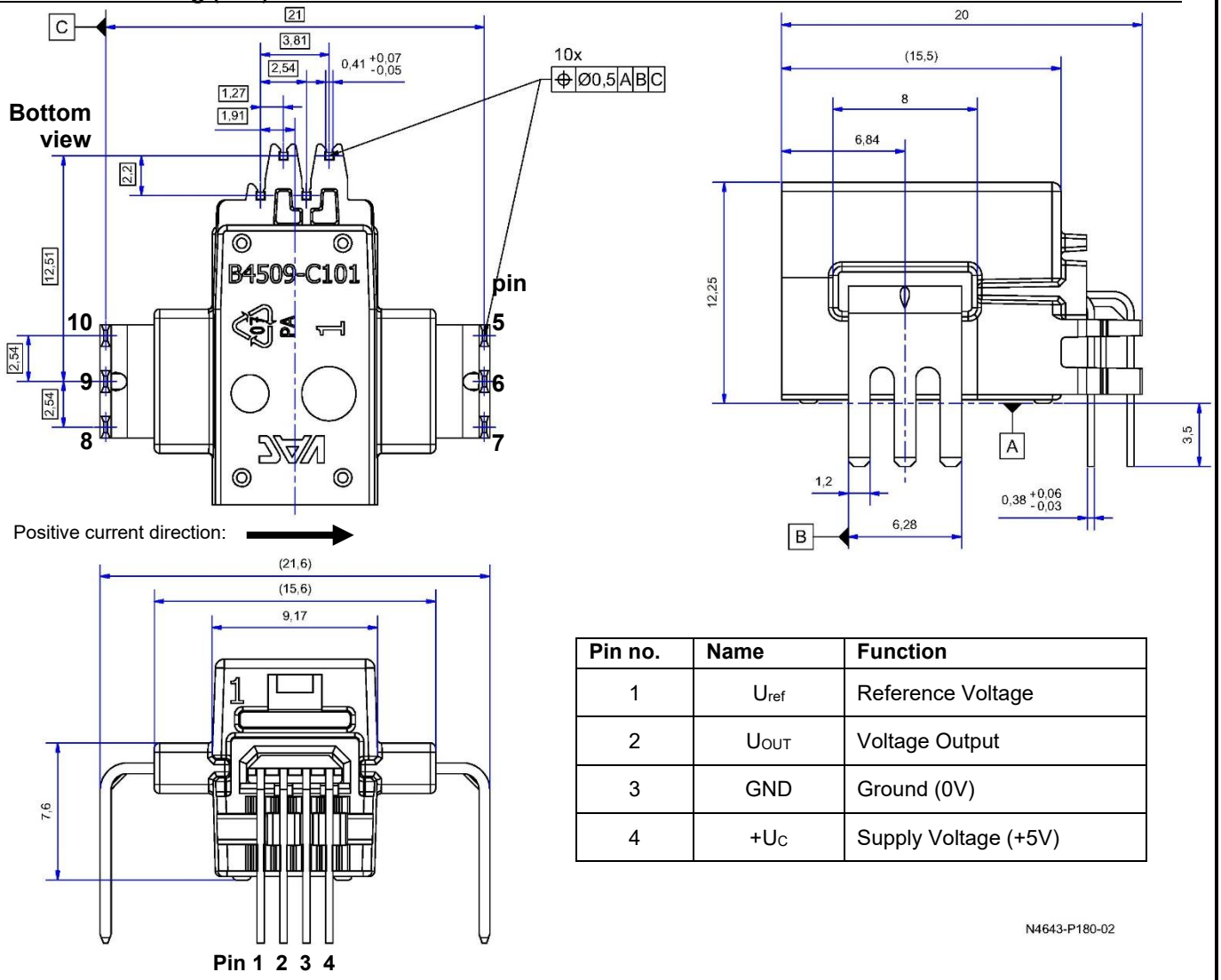
[1] Constructed, manufactured and tested in accordance with IEC 61800-5-1:2007 - Material group 1, Pollution degree 2, OVC III, altitude ≤ 2000m

Date	Name	Issue	Amendment
		81	

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

Weitergabe sowie Vervielfältigung dieser Unterlage, Verwertung und Mitteilung ihres Inhalts nicht gestattet, soweit nicht ausdrücklich zugestanden. Zuwiderhandlungen verpflichten zu Schadenersatz. Alle Rechte für den Fall der Patenterteilung oder GM-Eintragung vorbehalten

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



Pin no.	Name	Function
1	U_{ref}	Reference Voltage
2	U_{OUT}	Voltage Output
3	GND	Ground (0V)
4	$+U_C$	Supply Voltage (+5V)

N4643-P180-02

Connection diagram

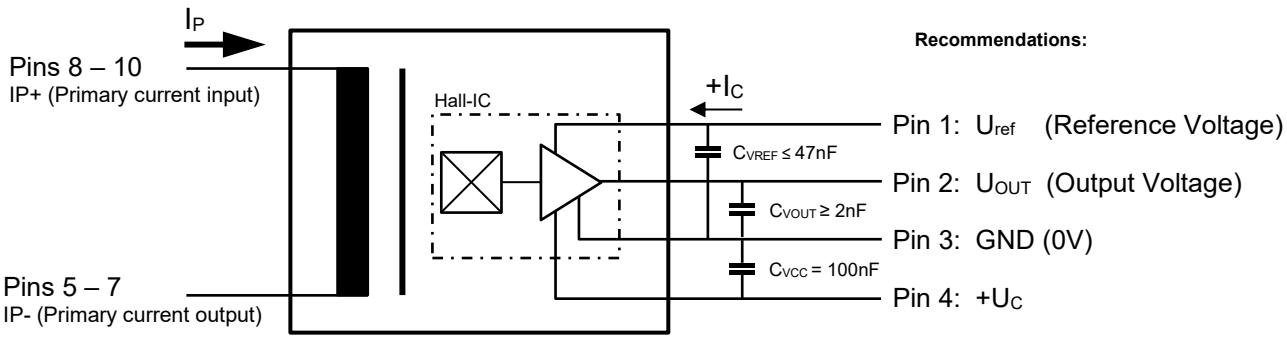
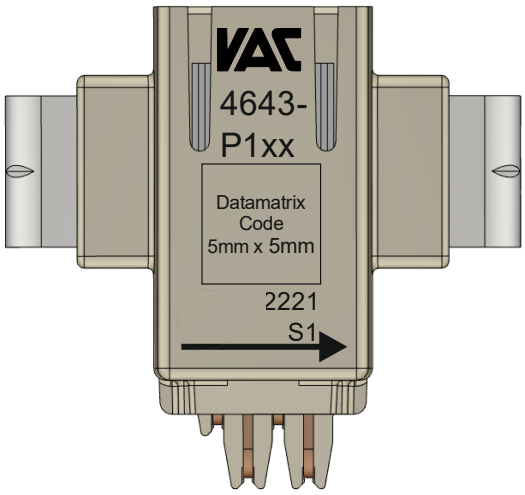


Fig. 6: functional block diagram of the sensor

Weitergabe sowie Vervielfältigung dieser Unterlage, Verwertung und Mitteilung ihres Inhalts nicht gestattet, soweit nicht ausdrücklich zugestanden. Zuwiderhandlungen verpflichten zu Schadenersatz. Alle Rechte für den Fall der Patenterteilung oder GM-Eintragung vorbehalten

Marking

Readable text: Item-number "xxxxxxxx"
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)
$I_{0M\ (IPN)}$	(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}
$U_{PD(rms)}$ ·1.875		*acc. table 24	1.5	kV_{rms}

Type Test (Preconditioning acc. VAC M3236)

(Pins to primary opening)

$\hat{U}_W$	M3064	HV transient test (1.2µs / 50µs, 5 pulses ➔ polarity +, 5 pulses ➔ 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}
$U_{PD(rms)}$ ·1.875		*acc. table 24	1.5	kV_{rms}

*** IEC61800-5-1:2007**

Weitergabe sowie Vervielfältigung dieser Unterlage, Verwertung und Mitteilung ihres Inhalts nicht gestattet, soweit nicht ausdrücklich zugestanden. Zuwiderhandlungen verpflichten zu Schadenersatz. Alle Rechte für den Fall der Patenterteilung oder GM-Eintragung vorbehalten

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

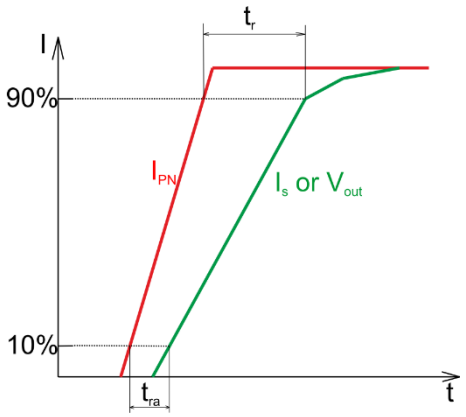
I_{SO}: Offset current

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 $I_P = 0.1 * I_{PN}$

$t_{r80/90}$: 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

Weitergabe sowie Vervielfältigung dieser Unterlage, Verwertung und Mitteilung ihres Inhalts nicht gestattet, soweit nicht ausdrücklich zugestanden. Zuwiderhandlungen verpflichten zu Schadenersatz. Alle Rechte für den Fall der Patenterteilung oder GM-Eintragung vorbehalten