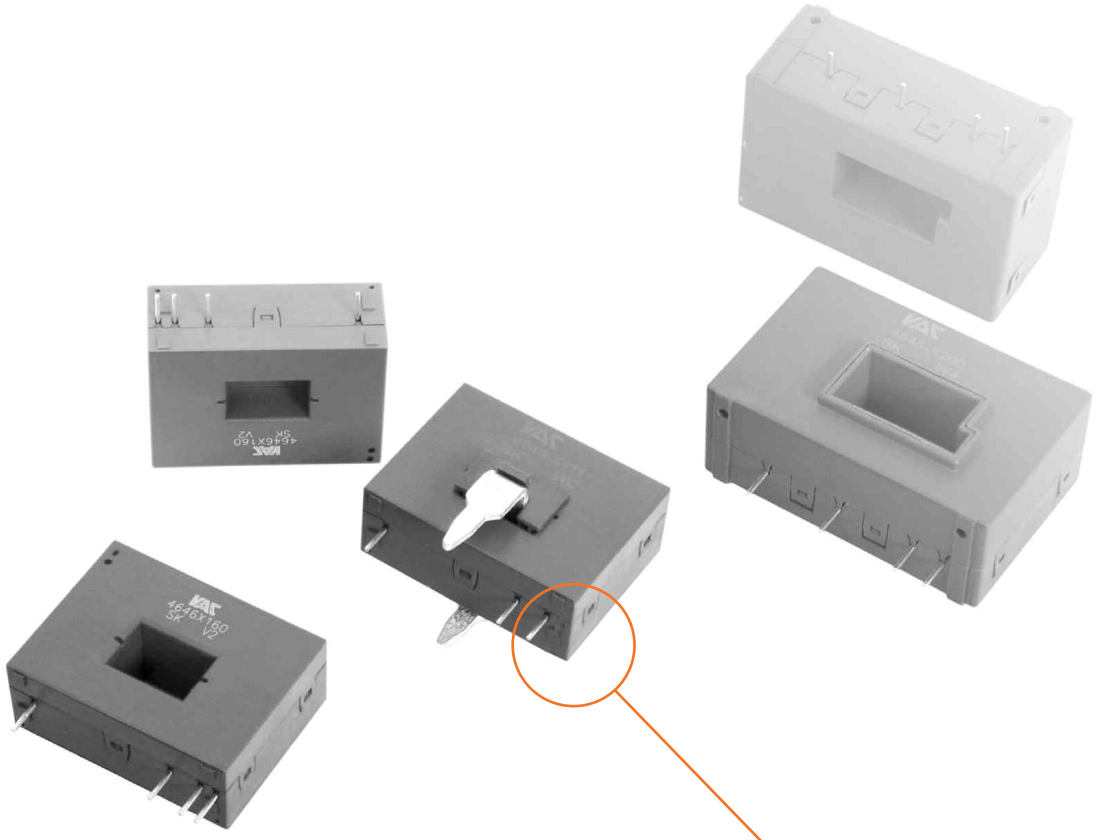
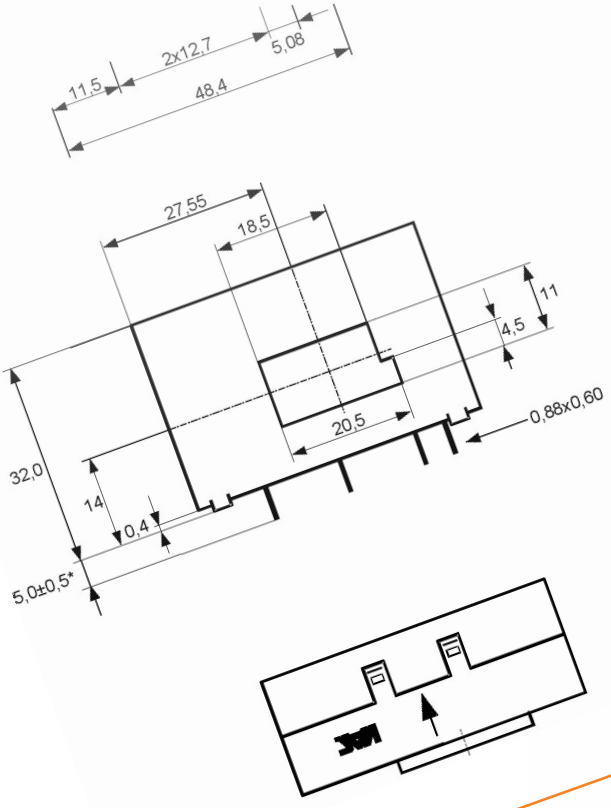


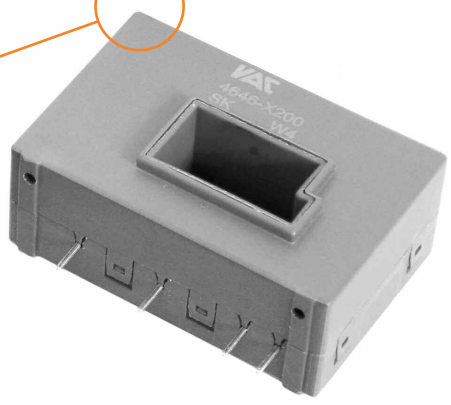
# NEW ACTIVE CURRENT SENSORS WITH PRIMARY CONDUCTOR OPENING

ADVANCED MATERIALS – THE KEY TO PROGRESS

VACUUMSCHMELZE

# NEW ACTIVE
# CURRENT SENSORS
## WITH PRIMARY CONDUCTOR OPENING



- closed-loop sensor with magnetic probe developed by VAC as a zero field detector
- two new type series for rated currents of 50 A to 200 A and peak currents up to ± 390 A in compact designs
- types for + 5 Volt power supply with voltage output. optionally internal or external reference voltage
- types for +/- 12 … 15 Volt power supply with current output
- very good measuring accuracy, minimum DC - offset with very low hysteresis
- negligible output noise or periodic signal at zero input
- very low temperature dependence and long-term drift of the output variable
- low rise time, wide frequency range
- low-cost constructions
- compatible dimensions and pinning

**TWO NEW VAC CURRENT SENSOR SERIES**

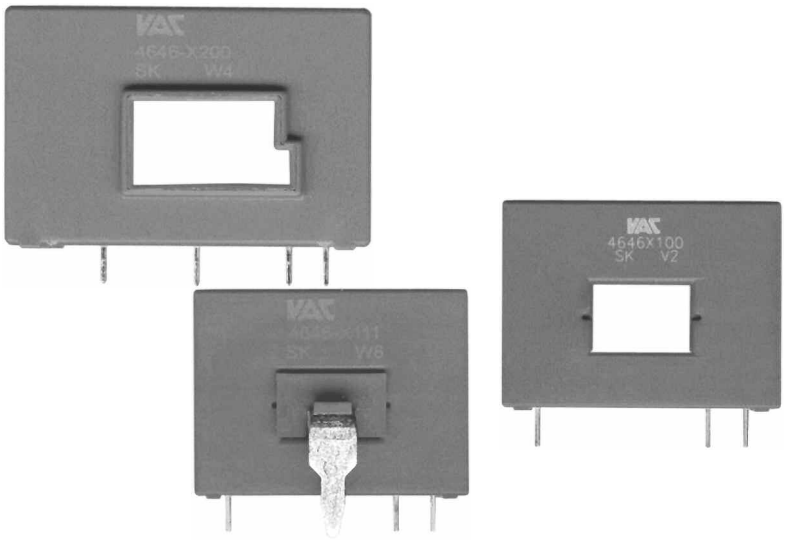
VAC offers 2 new current sensor series for PCB mounting with integrated electronics and with an opening for the primary conductor. Thus they supplement the already introduced new active current sensor series for maximum accuracy with integrated primary conductor.

The new types apply the principle, developed by VAC, of the closed-loop sensor with magnetic probe as a zero field detector, and use the IC developed together with a leading semiconductor manufacturer.

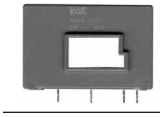
All new types offer the detection of high maximum and continuous currents. The new VAC sensors can be used in many customer applications without adaptations.

**Detecting highest currents with a unipolar +5 V – supply**

The types T60404-N4646-X160 and -X161 detect maximum rms continuous currents up to 100 A and peak currents up to ± 230 A and require nevertheless only a unipolar 5 V – supply.



## TYPE SERIES OF NEW CURRENT SENSORS WITH PRIMARY CONDUCTOR OPENING

| Item no. Type T60404-N… | | Rated current $I_{PN, eff}$ @ $K_N$ = 1:N [A] | Max. meas. range $I_{P, max.}$ @ $V_C$ = + 5 V or $V_C$ = ± 12...15 V [A] | Ambient temp. range $T_{amb}$ [° C] -40 … | Supply voltage $V_C$ [V] | Turns ratio $K_{N = 1:}$ | Output variable | Frequency range f [kHz] DC to | Max. error X @ $I_{PN}$ ; $T_{amb}$ = 25 °C [%] | Primary-connection Pins | Primary-connection Opening | Secondary conn. Pins | Integrated Electronics | Encapsulated | Dimensional diagrams |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
|  | 4646-X100 | 100 | ± 235[1] ± 180[2] | + 85 | ± 12… 15 | 1000 | I | 200 | 0,5 | | • | • | • | • | 1 |
|  | 4646-X111 | 100 | ± 235[1] ± 180[2] | + 85 | ± 12… 15 | 2000 | I | 200 | 0,5 | • | | • | • | • | 1 |
|  | 4646-X101 | 100 | ± 210[1] ± 180[2] | + 85 | ± 12… 15 | 2000 | I | 200 | 0,5 | | • | • | • | • | 1 |
|  | 4646-X112 | 100 | ± 210[1] ± 180[2] | + 85 | ± 12… 15 | 1000 | I | 200 | 0,5 | • | | • | • | • | 1 |
|  | 4646-X160[3] | 100 | ± 230 | + 85 | + 5 | 1000 | U[4] | 100 | 1.0 | | • | • | • | • | 2 |
|  | 4646-X161[3] | 50 | ± 172 | + 85 | + 5 | 1000 | U[4] | 100 | 1,0 | | • | • | • | • | 2 |
|  | 4646-X200 | 125 | ± 201[1] ± 214[2] | + 85 | ± 12… 15 | 1000 | I | 100 | 0,5 | | • | • | • | • | 3 |
|  | 4646-X201 | 200 | ± 305[1] ± 390[2] | + 85 | ± 12… 15 | 2000 | I | 100 | 0,5 | | • | • | • | • | 3 |

Abbreviations and terms

[1] for supply voltage ± 12 V
[2] for supply voltage ± 15 V
[3] reference voltage input 0 … 4 V, which also can be used as reference voltage output 2,5 ±0,005 V. Source resistance Ri = 670 Ohm
[4] $V_{out} = V_{ref} \pm (0{,}625 \times {}^{IP}/_{IPN})$

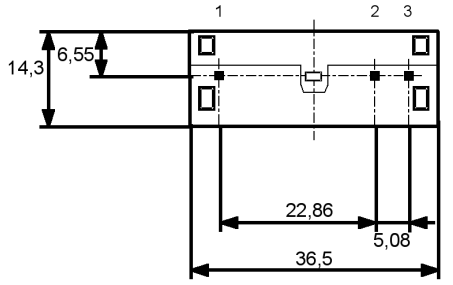
| | | |
|---|---|---|
| $I_{PN, eff}$ | [A] | primary rated current |
| $I_{P, max.}$ | [A] | maximum measuring range |
| $T_A$ | [° C] | ambient temperature |
| $V_c$ | [V] | supply voltage |
| $K_N$ | | turns ratio |
| f | [kHz] | frequency range |
| X | [%] | accuracy |

## DIMENSIONAL DIAGRAMS

### Diagram No. 1

Type

**T60404-N4646-X100 und …X101**




Tolerances grid distance ± 0,2 mm

Marking:

Excerpt from item no. F DC

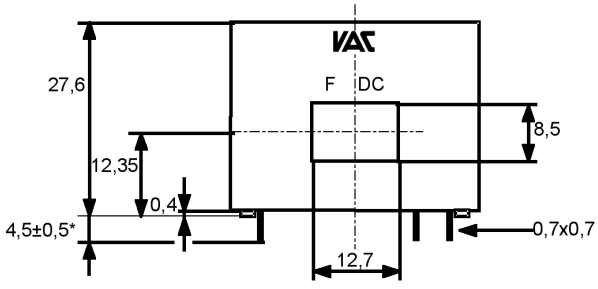
F = Factory
DC = Date Code

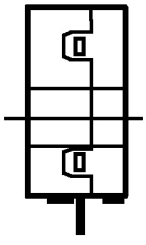
Connections:

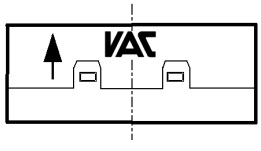
1 ... 3: 0,7 x 0,7 mm

Pin Assignments:

1: $+V_C$
2: $-V_C$
3: $I_S$



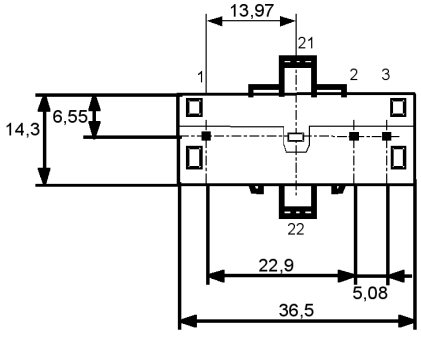





### Diagram No. 2

Type

**T60404-N4646-X111 und …X112**




Tolerances grid distance ± 0,2 mm

Marking:

Excerpt from item no. F DC

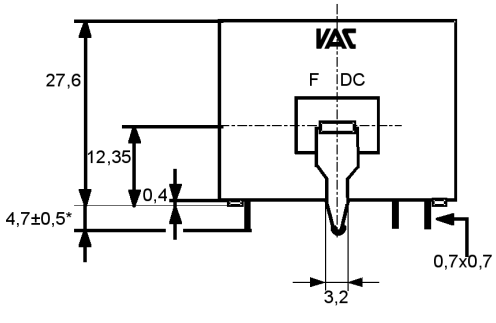
F = Factory
DC = Date Code

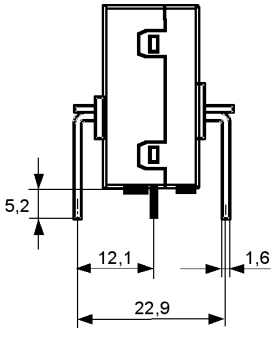
Connections:

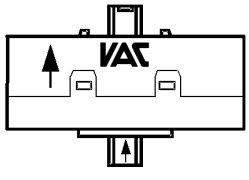
1 ... 3: 0,7 x 0,7 mm
21, 22: 3,2 x 1,6 mm

Pin Assignments:

1: $+V_C$
2: $-V_C$
3: $I_S$
21, 22: $I_P$



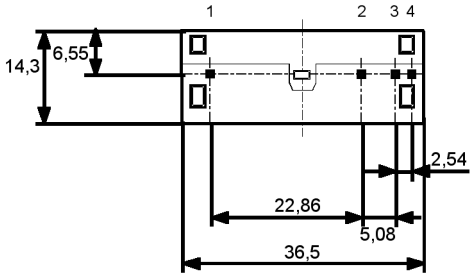



## Diagram No. 3

Type

**T60404-N4646-X160 und …X161**




Tolerances grid distance ± 0,2 mm

Marking:

Excerpt from item no. F DC

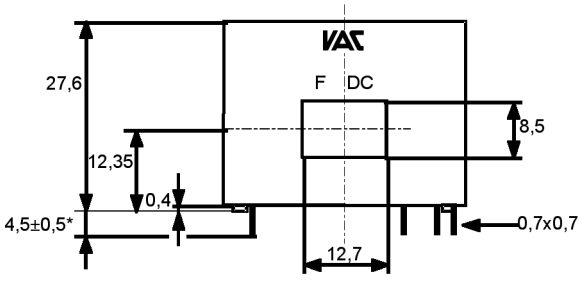
F = Factory
DC = Date Code

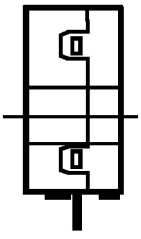
Connections:

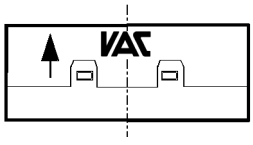
1 ... 4: 0,7 x 0,7 mm

Pin Assignments:

1: $V_C$
2: earth
3: $V_{OUT}$
4: $V_{REF}$ in/out



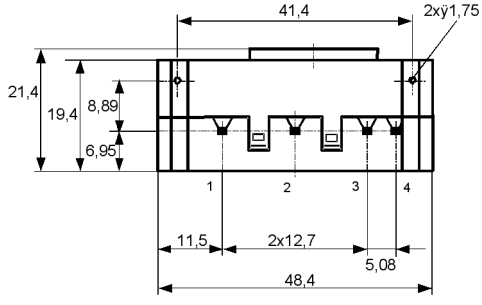





## Diagram No. 4

Type

**T60404-N4646-X200 und …X201**




Tolerances grid distance ± 0,2 mm

Marking:

Excerpt from item no. F DC

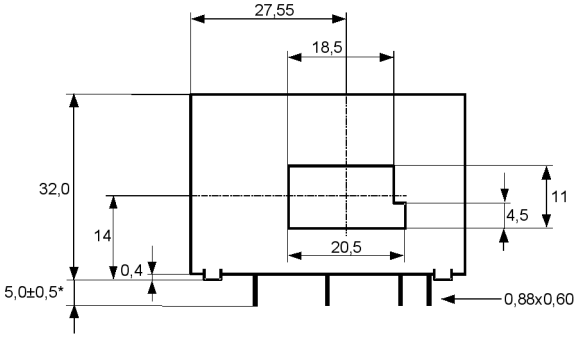
F = Factory
DC = Date Code

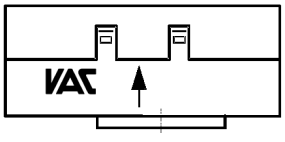
Connections:

1 ... 3: 0,6 x 0,88 mm

Pin Assignments:

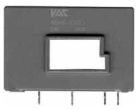
1: -$V_C$
2: $I_S$
3: +$V_C$
4: n/c



## CROSS-REFERENCE LIST

The sensors of the new VAC type series can replace competing products in many cases and usually offer superior technical properties regarding accuracy, temperature drift and quality of the quiescent signal. The following table lists competition types with which the new VAC types are as far as possible compatible electrically and concerning their pinning, according to a data sheet comparison. Slightly deviating housing dimensions have been accepted thereby. The user still remains responsible for the actual suitability in his specific application.

| VAC item number Type T6040-N… | | LEM | Honeywell | ABB | F. W. Bell | Telcon | Remarks |
|---|---|---|---|---|---|---|---|
|  | 4646-X100 | LA 55-P<br>LA 55-P/SP23<br>LA 100-P/SP13 | CSNA 111[1]<br>CSNA 111-009[1]<br>CSNA 111-040[1]<br>CSNC 241[1]<br>CSNF 141[2]<br>CSNF 661[2]<br>CSNP 661[2]<br>CSNP 661-003[2]<br>CSNP 661-006[2]<br>CSNR 161-004[1] | EL25P1<br>EL50P1 | CLN-50<br>CLN-100<br>CLSM-50<br>CLSM-50S<br>CLSM-100<br>CLSM-100S | HTP 25[3] [4]<br>HTP 50[3] [4]<br>HTP 100S[3] [4]<br>HTP 25C[3] [4]<br>HTP 50C[3] [4]<br>HTP 100C[3] [4] | (1) Honeywell pins 0,63 x 0,63 mm, VAC pins 0,7 x 0,7 mm<br>(2) Honeywell pins Ø 0,80 mm, VAC pins 0,7 x 0,7 mm<br>(3) Telcon pins 0,60 x 0,70 mm, VAC pins 0,7 x 0,7 mm<br>(4) Telcon opening Ø 10 mm , VAC opening 12,7 x 8,5 mm |
|  | 4646-X111 | LA 55-TP | | EL25P1BB<br>EL50P1BB | CLN-50 SP1<br>CLN-100 SP1 | HTP 50 BB | (1) Honeywell pins 0,63 x 0,63 mm, VAC pins 0,7 x 0,7 mm<br>(3) Telcon pins 0,60 x 0,70 mm, VAC pins 0,7 x 0,7 mm |
|  | 4646-X101 | LA 55-P/SP1<br>LA 55-TP/SP27<br>LA 100-P<br>LA 100-TP[1] | CSNB 121[1]<br>CSNB 131[1]<br>CSNF 651[2]<br>CSNG 251[2]<br>CSNT 651[2]<br>CSNT 651-005[2] | EL55P2<br>EL100P2 | | HTP 50C/2K[3] [4]<br>HTP 100S/2K[3] [4]<br>HTP 100C/2K[3] [4] | (1) Honeywell pins 0,63 x 0,63 mm, VAC pins 0,7 x 0,7 mm<br>(2) Honeywell pins Ø 0,80 mm, VAC pins 0,7 x 0,7 mm<br>(3) Telcon pins 0,60 x 0,70 mm, VAC pins 0,7 x 0,7 mm<br>(4) Telcon opening Ø 10 mm , VAC opening 12,7 x 8,5 mm |
|  | 4646-X112 | LA 55-TP/SP1<br>LA 55-TP/SP27 | | EL55P2BB<br>EL100P2BB | | | |
|  | 4646-X200 | LA 125-P | | | | | |
|  | 4646-X201 | LA 125-P/SP1<br>LA 125 P/SP4<br>LA 200-P | | | | | |

A large number of other competitive types can be replaced functionally, but the user needs to make adaptations, e.g. change the circuit board layout. Please ask about these.

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