

ES100 ... ES2000 industry current sensors

100 to 2000 A - Closed loop technology

Frame mounting

These sensors are designed to be fixed by the case. They may be either horizontally or vertically mounted. The secondary connection is made with a connector or cable. For ES sensors the primary conductor may be a cable or a bar.



ES100C



ES300C



ES500C



ES1000S



ES2000C

Ordering details

| Nominal primary current | Secondary current at I_{PN} | Supply voltage | Secondary connection | Type | Order code |
|-------------------------|-------------------------------|-----------------------|-------------------------|-------------|-----------------|
| A r.m.s. | mA | V DC | | | |
| 100 | 100 | $\pm 12 \dots \pm 24$ | Molex type 3 pins HE 14 | ES100C | 1SBT150100R0001 |
| 100 | 100 | $\pm 12 \dots \pm 24$ | 3 wires 200 mm | ES100F | 1SBT150100R0002 |
| 300 | 150 | $\pm 12 \dots \pm 24$ | Molex type 3 pins HE 14 | ES300C | 1SBT150300R0001 |
| 300 | 150 | $\pm 12 \dots \pm 24$ | JST 3 pins | ES300S | 1SBT150300R0003 |
| 300 | 150 | $\pm 12 \dots \pm 24$ | 3 wires 200 mm | ES300F | 1SBT150300R0002 |
| 500 | 100 | $\pm 12 \dots \pm 24$ | Molex type 3 pins HE 14 | ES500C | 1SBT150500R0001 |
| 500 | 100 | $\pm 12 \dots \pm 24$ | JST 3 pins | ES500S | 1SBT150500R0003 |
| 500 | 100 | $\pm 12 \dots \pm 24$ | 3 wires 200 mm | ES500F | 1SBT150500R0002 |
| 500 | 125 | $\pm 12 \dots \pm 24$ | Molex type 3 pins HE 14 | ES500-9672 | 1SBT150500R9672 |
| 500 | 125 | $\pm 12 \dots \pm 24$ | JST 3 pins | ES500-9673 | 1SBT150500R9673 |
| 500 | 125 | $\pm 12 \dots \pm 24$ | 3 wires 200 mm | ES500-9674 | 1SBT150500R9674 |
| 1000 | 200 | $\pm 15 \dots \pm 24$ | Molex type 3 pins HE 14 | ES1000C | 1SBT151000R0001 |
| 1000 | 200 | $\pm 15 \dots \pm 24$ | JST 3 pins | ES1000S | 1SBT151000R0003 |
| 1000 | 200 | $\pm 15 \dots \pm 24$ | 3 wires 200 mm | ES1000F | 1SBT151000R0002 |
| 1000 | 250 | $\pm 15 \dots \pm 24$ | Molex type 3 pins HE 14 | ES1000-9678 | 1SBT151000R9678 |
| 1000 | 250 | $\pm 15 \dots \pm 24$ | JST 3 pins | ES1000-9679 | 1SBT151000R9679 |
| 1000 | 250 | $\pm 15 \dots \pm 24$ | 3 wires 200 mm | ES1000-9680 | 1SBT151000R9680 |
| 2000 | 400 | $\pm 15 \dots \pm 24$ | Molex type 3 pins HE 14 | ES2000C | 1SBT152000R0003 |
| 2000 | 400 | $\pm 15 \dots \pm 24$ | JST 3 pins | ES2000S | 1SBT152000R0002 |
| 2000 | 400 | $\pm 15 \dots \pm 24$ | 3 wires 200 mm | ES2000F | 1SBT152000R0001 |

ES100 ... ES2000 industry current sensors

Technical data

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Application

Sensors to measure DC, AC or pulsating currents with a galvanic insulation between primary and secondary circuits.



| | | Molex type HE14 connector | ES100C | ES300C | ES500C | ES500-9672 |
|---------------------------------------|-----------------------------------|---------------------------|-----------------|-------------|-------------|-------------|
| | | JST connector | - | ES300S | ES500S | ES500-9673 |
| | | Cables | ES100F | ES300F | ES500F | ES500-9674 |
| | | A r.m.s. | 100 | 300 | 500 | 500 |
| Nominal primary current | | A | 100 | 300 | 500 | 500 |
| Measuring range | @ ±15 V (±5%) | A | ±150 | ±500 | ±800 | ±800 |
| Measuring range | @ ±24 V (±5%) | A | ±150 | ±500 | ±800 | ±800 |
| Not measurable overload | 10 ms/hour | A | 300 (1 ms/hour) | 3000 | 5000 | 5000 |
| Max. measuring resistance | @ I _{PMAX} & ±15 V (±5%) | Ω | 50 | 20 | 7 | 13 |
| Max. measuring resistance | @ I _{PMAX} & ±24 V (±5%) | Ω | 107 | 54 | 60 | 56 |
| Min. measuring resistance | @ I _{PN} & ±15 V (±5%) | Ω | 12 | 0 | 0 | 0 |
| Min. measuring resistance | @ I _{PN} & ±24 V (±5%) | Ω | 8.9 | 45 | 0 | 31 |
| Turn number | | | 1000 | 2000 | 5000 | 4000 |
| Secondary current at I _{PN} | | mA | 100 | 150 | 100 | 125 |
| Accuracy at I _{PN} | @ +25 °C | % | ≤±0.5 | ≤±0.5 | ≤±0.5 | ≤±0.5 |
| Accuracy at I _{PN} | -5 ... +70 °C | % | ≤±1 | ≤±1 | ≤±1 | ≤±1 |
| Accuracy at I _{PN} | -20 ... +70 °C | % | ≤±2.5 | ≤±1.5 | ≤±1 | ≤±1 |
| Offset current | @ +25 °C | mA | ≤±0.4 | ≤±0.25 | ≤±0.25 | ≤±0.25 |
| Linearity | | % | ≤0.1 | ≤0.1 | ≤0.1 | ≤0.1 |
| Thermal drift coefficient | -5 ... +70 °C | µA/°C | ≤10 | ≤15 | ≤5 | ≤6.25 |
| Thermal drift coefficient | -20 ... +70 °C | µA/°C | ≤80 | ≤40 | ≤16 | ≤20 |
| Delay time | | µs | ≤1 | ≤1 | ≤1 | ≤1 |
| di/dt correctly followed | | A / µs | ≤50 | ≤50 | ≤100 | ≤100 |
| Bandwidth | -1 dB | kHz | ≤100 | ≤100 | ≤100 | ≤100 |
| Max. no-load consumption current | @ ±24 V (±5%) | mA | ≤12 | ≤12 | ≤12 | ≤12 |
| Secondary resistance | @ +70 °C | Ω | ≤30 | ≤33 | ≤76 | ≤53 |
| Dielectric strength Primary/Secondary | 50 Hz, 1 min | kV | 3 | 3 | 3 | 3 |
| Supply voltage | ±5% | VDC | ±12 ... ±24 | ±12 ... ±24 | ±12 ... ±24 | ±12 ... ±24 |
| Voltage drop | | V | ≤2.5 | ≤1 | ≤1 | ≤1 |
| Mass | | kg | 0.050 | 0.115 | 0.210 | 0.210 |
| Operating temperature | | °C | -20 ... +70 | -20 ... +70 | -20 ... +70 | -20 ... +70 |
| Storage temperature | | °C | -40 ... +85 | -40 ... +85 | -40 ... +85 | -40 ... +85 |

General data

- Plastic case and insulating resin are self-extinguishing
- Fixing holes in the case moulding for two positions at right angles
- Direction of the current: A primary current flowing in the direction of the arrow results in a positive secondary output current from terminal M.

Primary connection

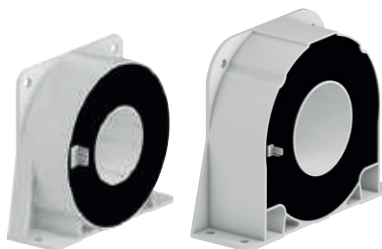
Hole for primary conductor.
The temperature of the primary conductor in contact with the case must not exceed 100 °C.

Secondary connection

- Molex type HE14 connector
- JST connector (ref.: B3P-VH)
- 3 x 200 mm cables (cross section 0.38 mm²).

ES100 ... ES2000 industry current sensors

Technical data



| | Molex type HE14 connector | ES1000C | ES1000-9678 | ES2000C |
|---------------------------------------|-----------------------------------|-----------------|-------------|-------------|
| | JST connector | ES1000S | ES1000-9679 | ES2000S |
| | Cables | ES1000F | ES1000-9680 | ES2000F |
| | A r.m.s. | 1000 | 1000 | 2000 |
| Nominal primary current | | | | |
| Measuring range | @ ±15 V (±5%) | A ±1500 | ±1500 | ±2200 |
| Measuring range | @ ±24 V (±5%) | A ±1500 | ±1500 | ±3000 |
| Not measurable overload | 10 ms/hour | A 10000 | 10000 | 20000 |
| Max. measuring resistance | @ I _{PMAX} & ±15 V (±5%) | Ω 2 | 8 | 5 |
| Max. measuring resistance | @ I _{PMAX} & ±24 V (±5%) | Ω 30 | 30 | 11 |
| Min. measuring resistance | @ I _{PN} & ±15 V (±5%) | Ω 0 | 0 | 0 |
| Min. measuring resistance | @ I _{PN} & ±24 V (±5%) | Ω 0 | 0 | 0 |
| Turn number | | 5000 | 4000 | 5000 |
| Secondary current at I _{PN} | | mA 200 | 250 | 400 |
| Accuracy at I _{PN} | @ +25 °C | % ≤±0.5 | ≤±0.5 | ≤±0.5 |
| Accuracy at I _{PN} | -5 ... +70 °C | % ≤±1 | ≤±1 | ≤±1 |
| Accuracy at I _{PN} | -20 ... +70 °C | % ≤±1 | ≤±1 | ≤±1 |
| Offset current | @ +25 °C | mA ≤± 0.25 | ≤± 0.5 | ≤±0.25 |
| Linearity | | % ≤0.1 | ≤0.1 | ≤0.1 |
| Thermal drift coefficient | -5 ... +70 °C | μA/°C ≤5 | ≤6.25 | ≤10 |
| Thermal drift coefficient | -20 ... +70 °C | μA/°C ≤20 | ≤20 | ≤10 |
| Delay time | | μs ≤1 | ≤1 | ≤1 |
| di/dt correctly followed | | A / μs ≤100 | ≤100 | ≤100 |
| Bandwidth | -1 dB | kHz ≤100 | ≤100 | ≤100 |
| Max. no-load consumption current | @ ±24 V (±5%) | mA ≤15 | ≤15 | ≤25 |
| Secondary resistance | @ +70 °C | Ω ≤39 | ≤24 | ≤25 |
| Dielectric strength Primary/Secondary | 50 Hz, 1 min | kV 3 | 3 | 4 |
| Supply voltage | ±5% | VDC ±15 ... ±24 | ±15 ... ±24 | ±15 ... ±24 |
| Voltage drop | | V ≤ 2 | ≤ 2 | ≤1 |
| Mass | | kg 0.550 | 0.610 | 1.5 |
| Operating temperature | | °C -20 ... +70 | -20 ... +70 | -20 ... +70 |
| Storage temperature | | °C -40 ... +85 | -40 ... +85 | -40 ... +85 |

Accessories and options

Female Molex connector

- PETERCEM order code: **FPTN440032R0003** including 10 socket housings and 30 crimp socket contacts
- Molex order code: socket housing: 22-01-1034; crimp socket contacts: 08-70-0057.

Female JST connector

- PETERCEM order code: **FPTN440032R0002** including 10 socket housings and 30 crimp socket contacts
- JST order code: socket housing: VHR-3N; crimp socket contacts: SVH-21T-1.1.

Conformity

- EN 50178
- EN 61000-6-2, EN 61000-6-4



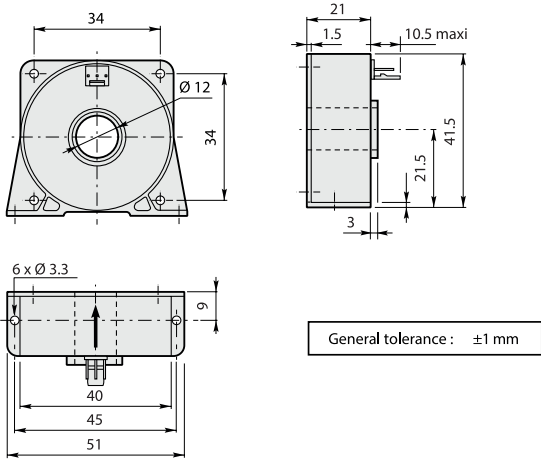
- : ES sensors with cables. File number: E166814 Vol 1
- : ES sensors with connectors. File number: E166814 Vol 2



RoHS

ES100 ... ES500 industry current sensors

Dimensions (mm)



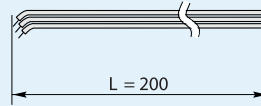
ES100C / ES100F

General tolerance : ±1 mm

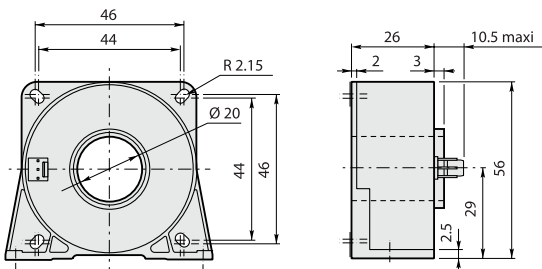
Standard ES100... sensors secondary connection



Molex type connector
(with 2.54 mm pitch)

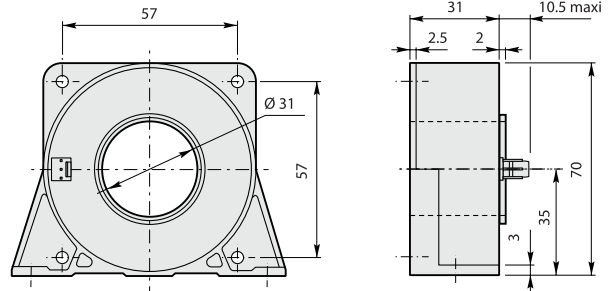


Cable: - Red +V_A
- Green M
- Black -V_A



ES300C / ES300S / ES300F

General tolerance : ±1 mm



ES500C / ES500S / ES500F
ES500-9672 / ES500-9673 / ES500-9674

General tolerance : ±1 mm

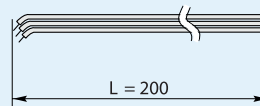
Standard ES300... and ES500... sensors secondary connection



Molex type connector
(with 2.54 mm pitch)



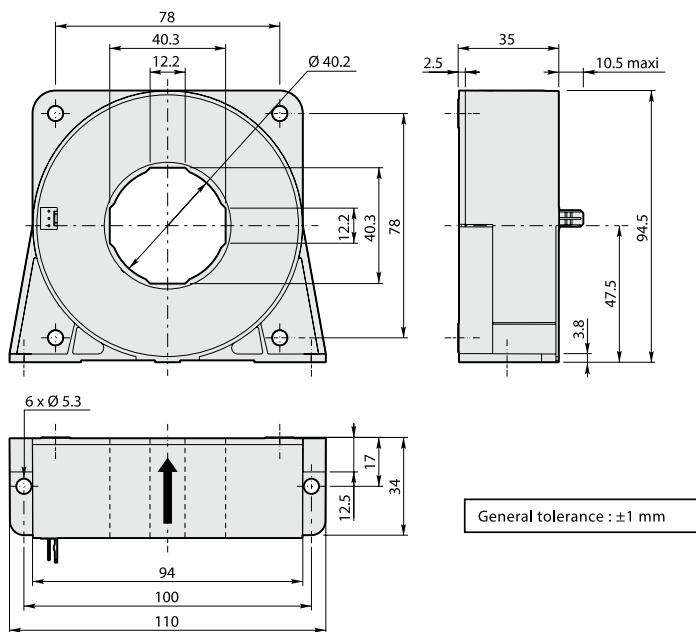
JST connector
(with 3.96 mm pitch)



Cable: - Red +V_A
- Green M
- Black -V_A

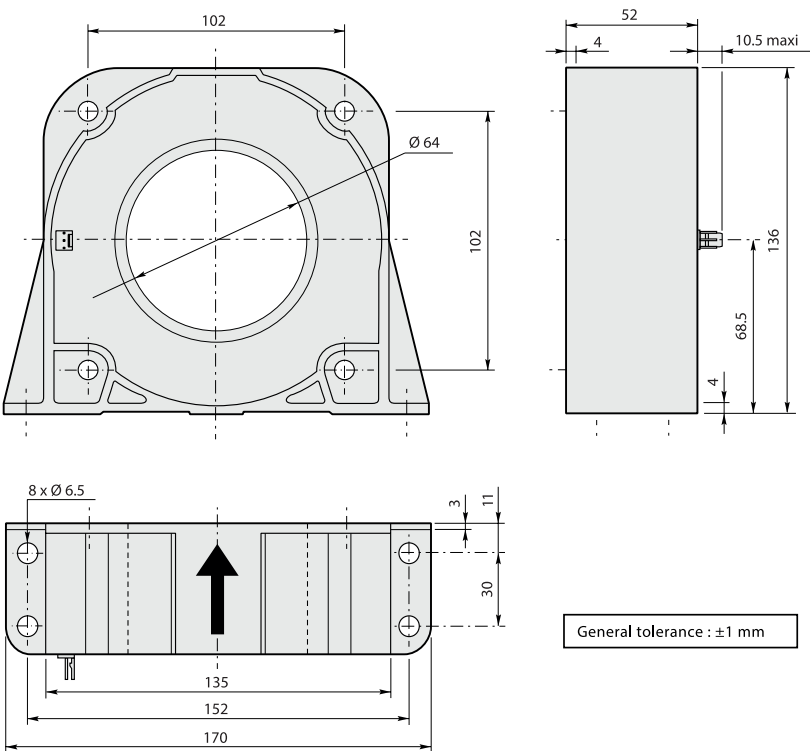
ES1000 ... ES2000, HRS1000-I ... HRS2500-I industry current sensors

Dimensions (mm)



General tolerance : ± 1 mm


ES1000C / ES1000S / ES1000F
 ES1000-9678 / ES1000-9679 / ES1000-9680
 HRS1000-I / HRS1500-I




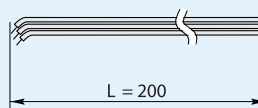
General tolerance : ± 1 mm

ES2000C / ES2000S / ES2000F
 HRS2000-I / HRS2500-I


Standard ES1000... and ES2000... sensors secondary connection


 Molex type connector (with 2.54 mm pitch)

 JST connector (with 3.96 mm pitch)



Cable: - Red $+V_A$
 - Green M
 - Black $-V_A$

 Molex Minifit Jr5566 (with 4.20 mm pitch)

 Phoenix contact type connector (with 3.80 mm pitch)