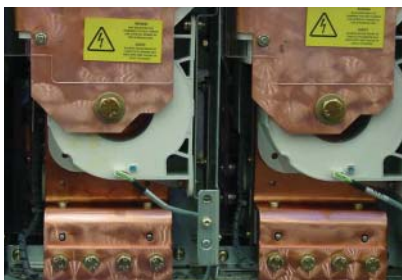


# Frame mounting



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.

Type	Nominal primary current (A r.m.s.)	Secondary current at $I_{PN}$ (mA)	Supply voltage (V)	Secondary connection	Order code
ES100C	100	100	$\pm 12 \dots \pm 24$	Molex 3 pins HE 14	ES100C
ES100F	100	100	$\pm 12 \dots \pm 24$	3 wires 200 mm	ES100F
ES300C	300	150	$\pm 12 \dots \pm 24$	Molex 3 pins HE 14	ES300C
ES300S	300	150	$\pm 12 \dots \pm 24$	JST 3 pins	ES300S
ES300F	300	150	$\pm 12 \dots \pm 24$	3 wires 200 mm	ES300F
ES500C	500	100	$\pm 12 \dots \pm 24$	Molex 3 pins HE 14	ES500C
ES500S	500	100	$\pm 12 \dots \pm 24$	JST 3 pins	ES500S
ES500F	500	100	$\pm 12 \dots \pm 24$	3 wires 200 mm	ES500F
ES500-9672	500	125	$\pm 12 \dots \pm 24$	Molex 3 pins HE 14	ES500-9672
ES500-9673	500	125	$\pm 12 \dots \pm 24$	JST 3 pins	ES500-9673
ES500-9674	500	125	$\pm 12 \dots \pm 24$	3 wires 200 mm	ES500-9674
ES1000C	1000	200	$\pm 12 \dots \pm 24$	Molex 3 pins HE 14	ES1000C
ES1000S	1000	200	$\pm 12 \dots \pm 24$	JST 3 pins	ES1000S
ES1000F	1000	200	$\pm 12 \dots \pm 24$	3 wires 200 mm	ES1000F
ES1000-9678	1000	250	$\pm 12 \dots \pm 24$	Molex 3 pins HE 14	ES1000-9678
ES1000-9679	1000	250	$\pm 12 \dots \pm 24$	JST 3 pins	ES1000-9679
ES1000-9680	1000	250	$\pm 12 \dots \pm 24$	3 wires 200 mm	ES1000-9680
ES2000C	2000	400	$\pm 15 \dots \pm 24$	Molex 3 pins HE 14	1SBT152000R0003
ES2000S	2000	400	$\pm 15 \dots \pm 24$	JST 3 pins	1SBT152000R0002
ES2000F	2000	400	$\pm 15 \dots \pm 24$	3 wires 200 mm	1SBT152000R0001
ESM1000C	1000	200	$\pm 15 \dots \pm 24$	Molex 3 pins HE 14	1SBT191000R0003
ESM1000S	1000	200	$\pm 15 \dots \pm 24$	JST 3 pins	1SBT191000R0002
ESM1000F	1000	200	$\pm 15 \dots \pm 24$	3 wires 200 mm	1SBT191000R0001
ESM1000L	1000	200	$\pm 15 \dots \pm 24$	Lockable connector	1SBT191000R0004
ESM1000-9888	1000	250	$\pm 15 \dots \pm 24$	Molex 3 pins HE 14	1SBT191000R9888
ESM1000-9887	1000	250	$\pm 15 \dots \pm 24$	JST 3 pins	1SBT191000R9887
ESM1000-9886	1000	250	$\pm 15 \dots \pm 24$	3 wires 200 mm	1SBT191000R9886
ESM1000-9935	1000	250	$\pm 15 \dots \pm 24$	Lockable connector	1SBT191000R9935

NEW

NEW



# Industry Current Sensors ES range



## The resin concept: a reference that has become a standard

Since obtaining ISO 14001 certification in 1998 ABB has integrated an essential concept into its ES current sensors : a determination to anticipate market requirements and genuine concern for the protection of the environment. This fundamental concern is the overwhelming culture that permeates the company. No wonder our competitors are jealous and find our approach an inspiration for their own efforts. With the introduction of recyclable resin, ABB were trailblazers of an innovation that has over the years become a touchstone. It was this concept that enabled ABB to obtain ISO 14001 certification for their concern for the environment. Optimized settings, waste control, minimization of losses, etc. are all factors that again ensure ABB pride of place in the field of current sensors.



## 46% smaller!

As components get smaller but more powerful, installing current sensors is becoming a real problem. But with ABB's ES range, the whole thing is child's play. By being the first in the field to offer these smaller current sensors that maintain your high-performance objectives, ABB have met the challenge of giving you the space you always needed.

## Horizontal or vertical mounting

Once again ABB lead the field by giving installers a chance to choose between two ways of fastening sensors: horizontally or vertically. This flexibility means that ES sensors can be installed in any position. This is a major breakthrough that greatly simplifies the task of systems integrators. The ES range is the ideal way of reducing the size of equipment.

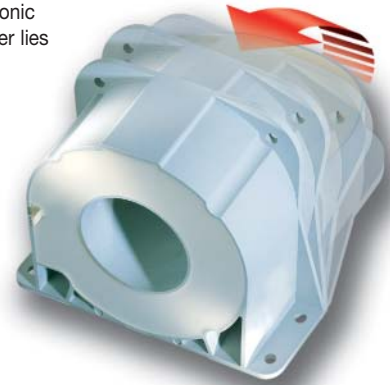
## Unbeatable reliability

Designed using the 6 sigma approach, the ES range is a model of reliability. The choice and number of optimized components, traceability of subassemblies, individually production tests... nothing is left to chance to guarantee your peace of mind.

	Sigma	Defects (PPM)	Performance
Unacceptable	2 $\sigma$	308 537	69.2 %
Average	3 $\sigma$	66 807	93.3 %
Very good	4 $\sigma$	6 210	99.4 %
Outstanding	5 $\sigma$	233	99.98 %
	6 $\sigma$	3.4	99.9996 %

## A vast range of possibilities for every type of use

Because ABB are in constant touch with their customers so that they can respond and adapt to the demands of the different sectors, they hold pride of place in their customers' list of partners. ABB are totally at home in the world of power electronics, a world made up of target sectors that range from power converters and auxiliary converters, inverters, wind-power generators, welding, robotics and active harmonic suppressors. ABB's power lies in their ability to adapt.



## Quality that goes beyond standards

ABB have been ISO 9001 certified since 1993 and our ES range of sensors bear the CE label in Europe and the UL or UR labels in the US. This ongoing striving after quality has always been the hallmark of a company where excellence and safety are part of the culture, from design right through to production. This culture is the result of continuous research to make technical progress and meet our customers' demands.

### QUALITY

The chief selling-point of ES sensors is their quality. Compliance of their high-tech electronic design with standard EN 50178 is proof of their ability to comply with the most detailed constraint as well as major demands. The fact that each individual sensor is subjected to rigorous testing is proof of the importance ABB attribute to quality.

### ENVIRONMENT-FRIENDLY

ABB have long been concerned with the protection of the environment, as proved by the ISO 14001 certification they received in 1998. This environmental approach is particularly noticeable in production of the ES range in the reduction of the number of components, in the use of a low-energy manufacturing procedure and the use of recyclable packing. The products in use are also characterized by their reduced energy consumption.

**BECAUSE YOUR NEEDS ARE SPECIAL WE FIND YOU THE BEST SOLUTION**

# ES Industry Current Sensors

## Utilisation

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

## Technical data

			ES100	ES300	ES500	
			ES100C -ES100F	ES300C ES300S ES300F	ES500C ES500S ES500F	ES500-9672 ES500-9673 ES500-9674
	Molex HE14 connector JST connector Cables					
Nominal primary current		<b>A r.m.s.</b>	100	300	500	500
Measuring range	@ ±15V (±5%)	<b>A peak</b>	±150	±500	±800	±800
Measuring range	@ ±24V (±5%)	<b>A peak</b>	±150	±500	±800	±800
Not measurable overload	10ms/hour	<b>A peak</b>	300 (1ms/hour)	3000	5000	5000
Max. measuring resistance	@ I <sub>p max</sub> & ±15V (±5%)	<b>Ω</b>	48	20	7	13
Max. measuring resistance	@ I <sub>p max</sub> & ±24V (±5%)	<b>Ω</b>	105	54	60	56
Min. measuring resistance	@ I <sub>PN</sub> & ±15V (±5%)	<b>Ω</b>	10	0	0	0
Min. measuring resistance	@ I <sub>PN</sub> & ±24V (±5%)	<b>Ω</b>	82	45	0	14
Turn number			1000	2000	5000	4000
Secondary current at I <sub>PN</sub>		<b>mA</b>	100	150	100	125
Accuracy at I <sub>PN</sub>	@ +25°C	<b>%</b>	≤±0.5	≤±0.5	≤±0.5	≤±0.5
Accuracy at I <sub>PN</sub>	-5 ... +70°C	<b>%</b>	≤±1	≤±1	≤±1	≤±1
Accuracy at I <sub>PN</sub>	-20 ... +70°C	<b>%</b>	≤±2.5	≤±1.5	≤±1	≤±1
Offset current	@ +25°C	<b>mA</b>	≤±0.4	≤±0.25	≤±0.25	≤±0.25
Linearity		<b>%</b>	≤0.1	≤0.1	≤0.1	≤0.1
Thermal drift coefficient	-5 ... +70°C	<b>µA/°C</b>	≤10	≤15	≤5	≤6.25
Thermal drift coefficient	-20 ... +70°C	<b>µA/°C</b>	≤80	≤40	≤16	≤20
Delay time		<b>µs</b>	≤1	≤1	≤1	≤1
di/dt correctly followed		<b>A / µs</b>	≤50	≤50	≤100	≤100
Bandwidth	-1dB	<b>kHz</b>	≤100	≤100	≤100	≤100
Max. no-load consumption current	@ ±24V (±5%)	<b>mA</b>	≤12	≤12	≤12	≤12
Secondary resistance	@ +70°C	<b>Ω</b>	≤30	≤33	≤76	≤53
Dielectric strength Primary/Secondary	50 Hz, 1 min	<b>kV</b>	3	3	3	3
Supply voltage	±5%	<b>V dc</b>	±12 ... ±24	±12 ... ±24	±12 ... ±24	±12 ... ±24
Voltage drop		<b>V</b>	≤2.5	≤1	≤1	≤1
Mass		<b>kg</b>	0.050	0.115	0.210	0.210
Operating temperature		<b>°C</b>	-20 ... +70	-20 ... +70	-20 ... +70	-20 ... +70
Storage temperature		<b>°C</b>	-25 ... +85	-25 ... +85	-25 ... +85	-25 ... +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 HE14 connector (ref.: 22-11-10 31)
- JST connector (ref.: B3P-VH)
- 3 x 200 mm cables (cross section 0.38 mm<sup>2</sup>)

# ES Industry Current Sensors

## Technical data



			ES1000		ES2000
			ES1000C	ES1000-9678	ES2000C
			ES1000S	ES1000-9679	ES2000S
			ES1000F	ES1000-9680	ES2000F
Nominal primary current		<b>A r.m.s.</b>	1000	1000	2000
Measuring range	@ ±15V (±5%)	<b>A peak</b>	±1500	±1500	-
Measuring range	@ ±24V (±5%)	<b>A peak</b>	±1500	±1500	±3000
Not measurable overload	10ms/hour	<b>A peak</b>	10000	10000	20000
Max. measuring resistance	@ I <sub>p max</sub> & ±15V (±5%)	<b>Ω</b>	4	7	-
Max. measuring resistance	@ I <sub>p max</sub> & ±24V (±5%)	<b>Ω</b>	33	30	11
Min. measuring resistance	@ I <sub>PN</sub> & ±15V (±5%)	<b>Ω</b>	0	0	0
Min. measuring resistance	@ I <sub>PN</sub> & ±24V (±5%)	<b>Ω</b>	0	0	0
Turn number			5000	4000	5000
Secondary current at I <sub>PN</sub>		<b>mA</b>	200	250	400
Accuracy at I <sub>PN</sub>	@ +25°C	<b>%</b>	≤±0.5	≤±0.5	≤±0.5
Accuracy at I <sub>PN</sub>	-5 ... +70°C	<b>%</b>	≤±1	≤±1	≤±1
Accuracy at I <sub>PN</sub>	-20 ... +70°C	<b>%</b>	≤±1	≤±1	≤±1
Offset current	@ +25°C	<b>mA</b>	≤±0.25	≤±0.25	≤±0.25
Linearity		<b>%</b>	≤0.1	≤0.1	≤0.1
Thermal drift coefficient	-5 ... +70°C	<b>μA/°C</b>	≤5	≤6.25	≤10
Thermal drift coefficient	-20 ... +70°C	<b>μA/°C</b>	≤20	≤20	≤10
Delay time		<b>μs</b>	≤1	≤1	≤1
di/dt correctly followed		<b>A / μs</b>	≤100	≤100	≤100
Bandwidth	-1dB	<b>kHz</b>	≤100	≤100	≤100
Max. no-load consumption current	@ ±24V (±5%)	<b>mA</b>	≤12	≤12	≤25
Secondary resistance	@ +70°C	<b>Ω</b>	≤40	≤28	≤25
Dielectric strength Primary/Secondary	50 Hz, 1 min	<b>kV</b>	3	3	4
Supply voltage	±5%	<b>V dc</b>	±12 ... ±24	±12 ... ±24	±15 ... ±24
Voltage drop		<b>V</b>	≤1	≤1	≤1
Mass		<b>kg</b>	0.460	0.460	1.5
Operating temperature		<b>°C</b>	-20 ... +70	-20 ... +70	-20 ... +70
Storage temperature		<b>°C</b>	-25 ... +85	-25 ... +85	-25 ... +85

## Accessories and options

### Female Molex connector

- ABB order code: **FPTN 440 032 R0003** 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

- ABB order code: **FPTN 440 032 R0002** including 10 socket housings and 30 crimp socket contacts
- JST order code: socket housing: VHR-3N; crimp socket contacts: SVH-21T-1.1.

For other options, please contact us.

## Conformity

**EN50178**

**EN61000-6-2**



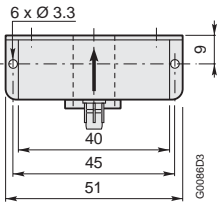
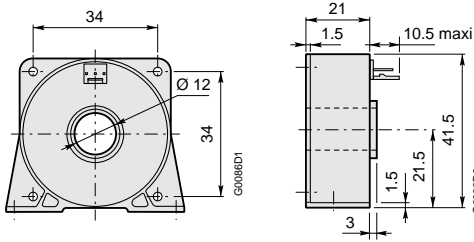
: ES sensors with cables.  
File number: E166814 Vol 1



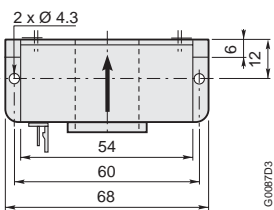
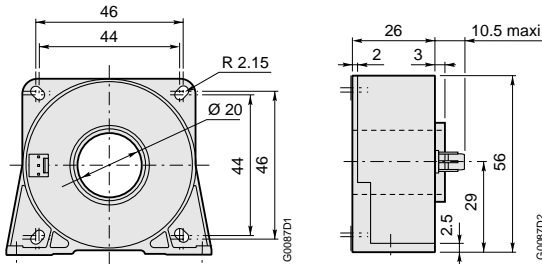
: ES sensors with connectors.  
File number: E166814 Vol 2

# ES Industry Current Sensors

## Dimensions (in mm)



ES100C / ES100F



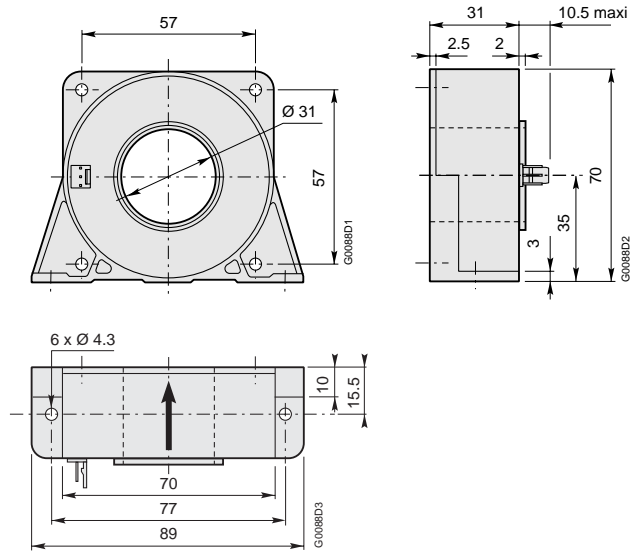
ES300C / ES300S / ES300F

**Standard ES100... sensor secondary connection**

G008BD Molex connector (with 2.54 mm pitch)

Cable : - Red ..... +V<sub>A</sub>  
 - Green ..... M  
 - Black ..... -V<sub>A</sub>

L = 200



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

**Standard ES300... and ES500... sensor secondary connection**

G008BD Molex connector (with 2.54 mm pitch)

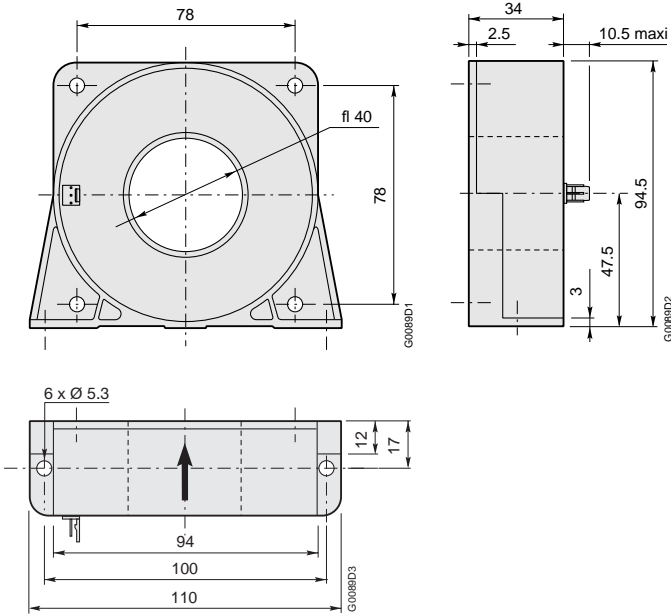
G0081D JST connector (with 3.81 mm pitch)

Cable : - Red ..... +V<sub>A</sub>  
 - Green ..... M  
 - Black ..... -V<sub>A</sub>

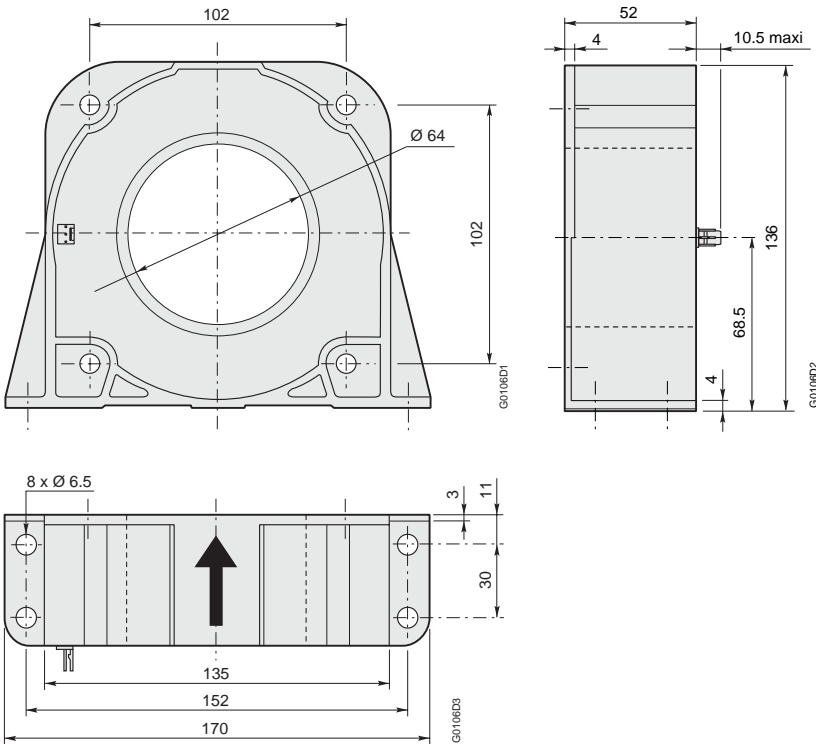
L = 200

# ES Industry Current Sensors

## Dimensions (in mm)





**ES1000C / ES1000S / ES1000F**  
**ES1000-9678 / ES1000-9679 / ES1000-9680**

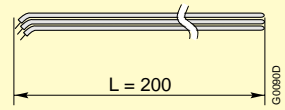


**ES2000C / ES2000S / ES2000F**

### Standard ES1000... and ES2000... sensor secondary connection

G0088D2  M  
 -  
 +  
 Molex connector (with 2.54 mm pitch)

G0088D1  M  
 -  
 +  
 JST connector (with 3.81 mm pitch)



Cable : - Red ..... +V<sub>A</sub>  
 - Green ..... M  
 - Black ..... -V<sub>A</sub>



# Industry Current Sensors ESM range

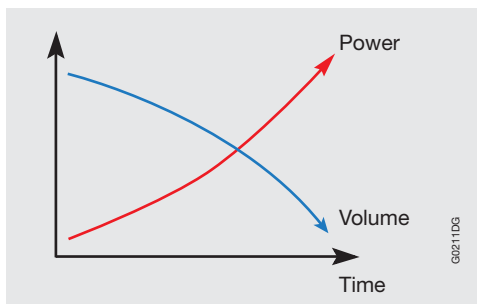
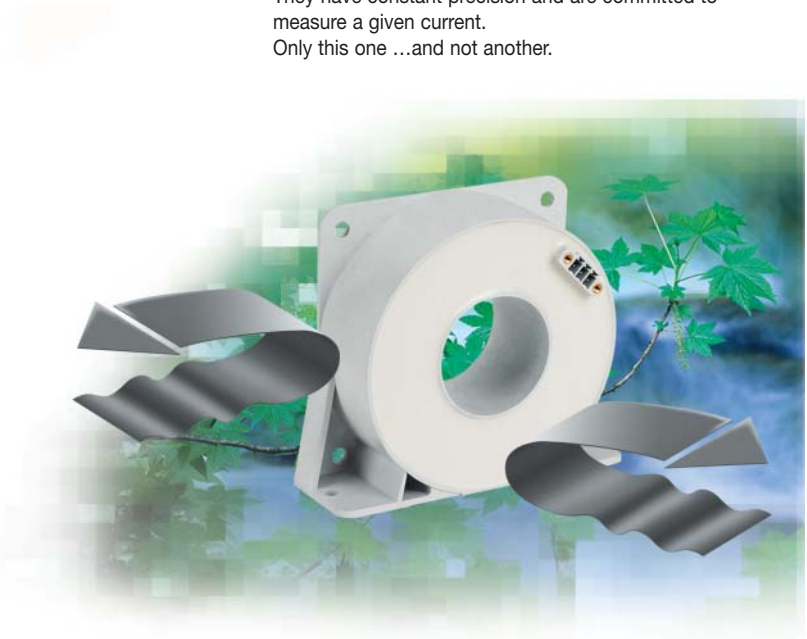


## High precision for all situations

With two mounting positions, the ABB sensor sets itself apart in the market. It is the first to offer a major innovation with the option of vertical or horizontal mounting. Recently other sensor manufacturers have been influenced by this arrangement. A way to considerably simplify the work of integrators! The ABB sensor also allows for reduced dimensions for the equipment into which it is being integrated, whilst meeting the requirements of the latest standards. So many essential advantages to better satisfy your aspirations. Between professionals, we understand each other.

## An incomparable immunity against magnetic fields

ESM sensors are thought out, designed and recognised for having an incomparable immunity against surrounding magnetic fields. Being constantly in the presence of strong currents can potentially disturb and produce measurement errors, but this is not the case. They have constant precision and are committed to measure a given current. Only this one ...and not another.



## An unavoidable requirement: reduce the volume and increase the power

The improvements in performance of the components used in electronic power systems and the requirement to reduce costs leads constructors to an irreversible tendency: produce smaller, more powerful and cheaper systems. The sensors, following this tendency, are subject to more and more magnetic interference. The ESM range replies well to this requirement by offering an improved immunity to this interference.

**BECAUSE YOU SEARCH FOR PERFORMANCE  
WE MAKE THE DIFFERENCE.**



# ESM Industry Current Sensor

## Utilisation

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

## Technical data

			ESM1000	
			ESM1000C ESM1000S ESM1000F ESM1000L	ESM1000-9888 ESM1000-9887 ESM1000-9886 ESM1000-9935
Molex HE14 connector				
JST connector				
Cables				
<b>NEW</b> Lockable connector				
Nominal primary current		<b>A r.m.s.</b>	1000	1000
Measuring range	@ ±15V (±5%)	<b>A peak</b>	±1500	±1500
Measuring range	@ ±24V (±5%)	<b>A peak</b>	±1500	±1500
Not measurable overload	10ms/hour	<b>A peak</b>	10000	10000
Max. measuring resistance	@ I <sub>p max</sub> & ±15V (±5%)	Ω	-	-
Max. measuring resistance	@ I <sub>p max</sub> & ±24V (±5%)	Ω	25	22
Min. measuring resistance	@ I <sub>PN</sub> & ±15V (±5%)	Ω	0	0
Min. measuring resistance	@ I <sub>PN</sub> & ±24V (±5%)	Ω	0	11
Turn number			5000	4000
Secondary current at I <sub>PN</sub>		<b>mA</b>	200	250
Accuracy at I <sub>PN</sub>	@ +25°C	%	≤±0.5	≤±0.5
Accuracy at I <sub>PN</sub>	-20 ... +70°C	%	≤±1	≤±1
Offset current	@ +25°C	<b>mA</b>	≤±0.25	≤±0.25
Linearity		%	≤0.1	≤0.1
Thermal drift coefficient	-20 ... +70°C	<b>µA/°C</b>	≤10	≤12.5
Delay time		<b>µs</b>	≤1	≤1
di/dt correctly followed		<b>A / µs</b>	≤100	≤100
Bandwidth	-1dB	<b>kHz</b>	≤100	≤100
Max. no-load consumption current	@ ±24V (±5%)	<b>mA</b>	≤15	≤15
Secondary resistance	@ +70°C	Ω	≤44	≤33
Dielectric strength Primary/Secondary	50 Hz, 1 min	<b>kV</b>	3	3
Supply voltage	±5%	<b>V dc</b>	±15 ... ±24	±15 ... ±24
Voltage drop		<b>V</b>	≤2	≤2
Mass		<b>kg</b>	0.600	0.600
Operating temperature		<b>°C</b>	-20 ... +70	-20 ... +70
Storage temperature		<b>°C</b>	-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 HE14 connector (ref.: 22-11-10 31)
- JST connector (ref.: B3P-VH)
- 3 x 200 mm cables (cross section 0.38 mm<sup>2</sup>)
- Lockable connector (ref. ABB Entelec: L253 103 31 000)

## Accessories and options

The same as the ES range (see page 15)

## Conformity

EN50178

EN61000-6-2



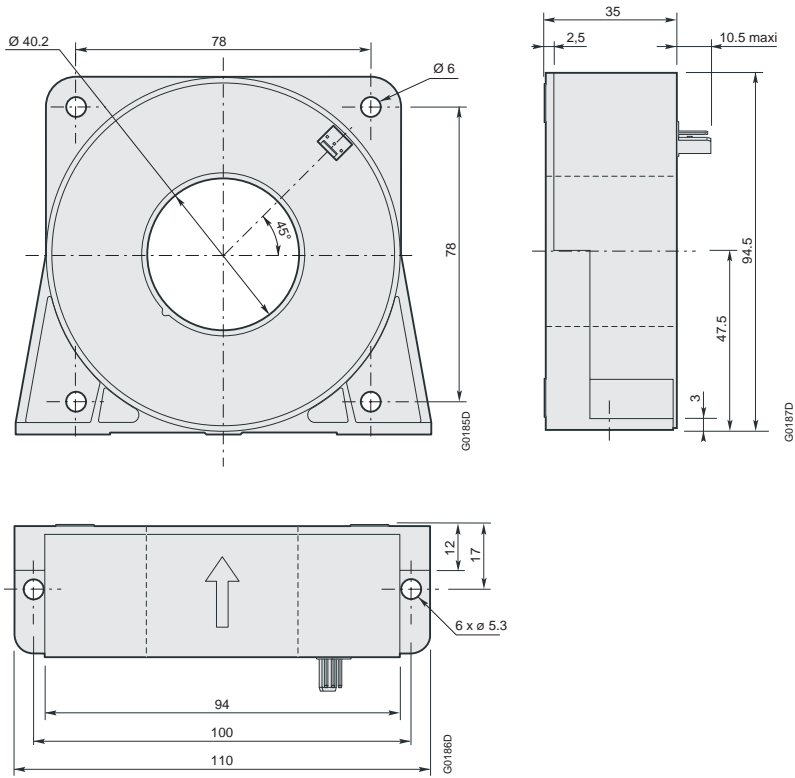
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File number: E166814 Vol 1



: ESM sensors with connectors.  
File number: E166814 Vol 2


# ESM Industry Current Sensor


## Dimensions (in mm)




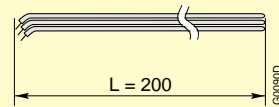
ESM1000C / ESM1000S / ESM1000F / ESM1000L / ESM1000-9888  
 ESM1000-9887 / ESM1000-9886 / ESM1000-9935

## Standard ESM1000... sensor secondary connection

G0092D  - M +  
 Molex connector  
 (with 2.54 mm pitch)

G0091D  - M +  
 JST connector  
 (with 3.81 mm pitch)

G0188D  - M +  
 Lockable connector  
 (with 3.81 mm pitch)



Cable : - Red ..... +V<sub>A</sub>  
 - Green ..... M  
 - Black ..... -V<sub>A</sub>