

Interface type SV211 SinCos signal splitter with 4 SinCos outputs

Product features:

- Encoder inputs SIN+, SIN-, COS+, COS-, REF+, REF- with 1 Vpp format
- Four Sine-Cosine outputs with the same signal format
- Suitable for input frequencies up to 500 kHz
- 5 V auxiliary output for encoder supply
- 17 to 30 VDC power supply (potential separated)

Version:	Description:
SV21101a_Jan. 2013/af/nw	First edition
SV21101b_Feb. 2013/pp	Implementation of new product photo
Sv211_01c_oi/Oct-15/ag	Safety Instructions & Technical Specifications updated. Legal notices added. Chapter 3.3 (note box) „trouble-free“ deleted (sentence is generally valid).

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1. Safety Instructions and Responsibility

1.1 General Safety Instructions

This operation manual is a significant component of the unit and includes important rules and hints about the installation, function and usage. Non-observance can result in damage and/or impairment of the functions to the unit or the machine or even in injury to persons using the equipment!

Please read the following instructions carefully before operating the device and observe all safety and warning instructions! Keep the manual for later use.

A pertinent qualification of the respective staff is a fundamental requirement in order to use these manual. The unit must be installed, connected and put into operation by a qualified electrician.

Liability exclusion: The manufacturer is not liable for personal injury and/or damage to property and for consequential damage, due to incorrect handling, installation and operation. Further claims, due to errors in the operation manual as well as misinterpretations are excluded from liability.

In addition the manufacturer reserve the right to modify the hardware, software or operation manual at any time and without prior notice. Therefore, there might be minor differences between the unit and the descriptions in operation manual.

The raiser respectively positioner is exclusively responsible for the safety of the system and equipment where the unit will be integrated.

During installation or maintenance all general and also all country- and application-specific safety rules and standards must be observed.

If the device is used in processes, where a failure or faulty operation could damage the system or injure persons, appropriate precautions to avoid such consequences must be taken.

1.2 Use according to the intended purpose

The unit is intended exclusively for use in industrial machines, constructions and systems. Non-conforming usage does not correspond to the provisions and lies within the sole responsibility of the user. The manufacturer is not liable for damages which has arisen through unsuitable and improper use.

Please note that device may only be installed in proper form and used in a technically perfect condition - in accordance to the technical specifications (see chapter [6](#)). The device is not suitable for operation in explosion-proof areas or areas which are excluded by the EN 61010-1 standard.

1.3 Installation

The device is only allowed to be installed and operated within the permissible temperature range. Please ensure an adequate ventilation and avoid all direct contact between the device and hot or aggressive gases and liquids.

Before installation or maintenance, the unit must be disconnected from all voltage-sources. Further it must be ensured that no danger can arise by touching the disconnected voltage-sources.

Devices which are supplied by AC-voltages, must be connected exclusively by switches, respectively circuit-breakers with the low voltage network. The switch or circuit-breaker must be placed as near as possible to the device and further indicated as separator.

Incoming as well as outgoing wires and wires for extra low voltages (ELV) must be separated from dangerous electrical cables (SELV circuits) by using a double resp. increased isolation.

All selected wires and isolations must be conform to the provided voltage- and temperature-ranges. Further all country- and application-specific standards, which are relevant for structure, form and quality of the wires, must be ensured. Indications about the permissible wire cross-sections for wiring are described in the technical specifications (see chapter [6](#)).

Before first start-up it must be ensured that all connections and wires are firmly seated and secured in the screw terminals. All (inclusively unused) terminals must be fastened by turning the relevant screws clockwise up to the stop.

Overvoltages at the connections must be limited to values in accordance to the overvoltage category II.

For placement, wiring, environmental conditions as well as shielding and earthing/grounding of the supply lines the general standards of industrial automation industry and the specific shielding instructions of the manufacturer are valid. Please find all respective hints and rules on www.motrona.com/download.html --> "[General EMC Rules for Wiring, Screening and Earthing]".

1.4 Cleaning, Maintenance and Service Notes

To clean the front of the unit please use only a slightly damp (not wet!), soft cloth. For the rear no cleaning is necessary. For an unscheduled, individual cleaning of the rear the maintenance staff or assembler is self-responsible.

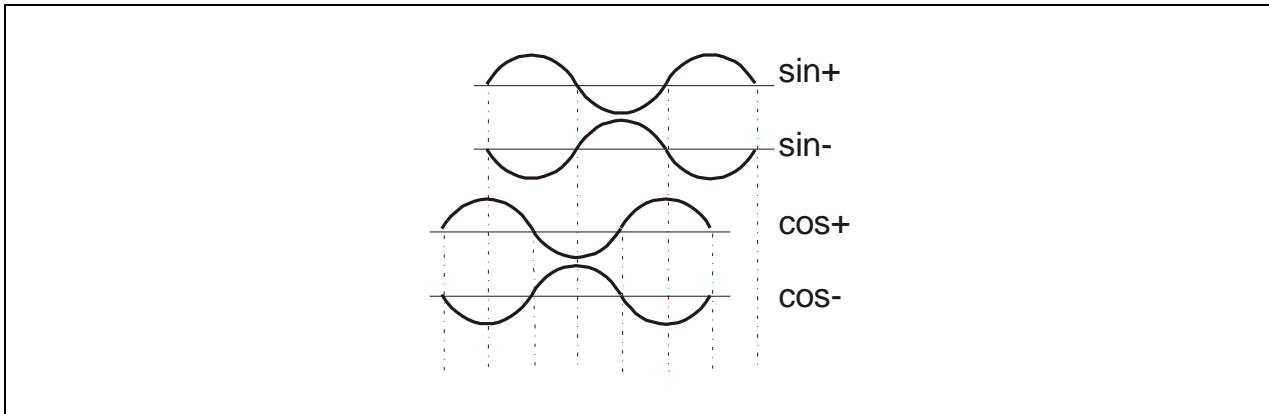
During normal operation no maintenance is necessary. In case of unexpected problems, failures or malfunctions the device must be shipped for back to the manufacturer for checking, adjustment and reparation (if necessary). Unauthorized opening and repairing can have negative effects or failures to the protection-measures of the unit.

2. Application

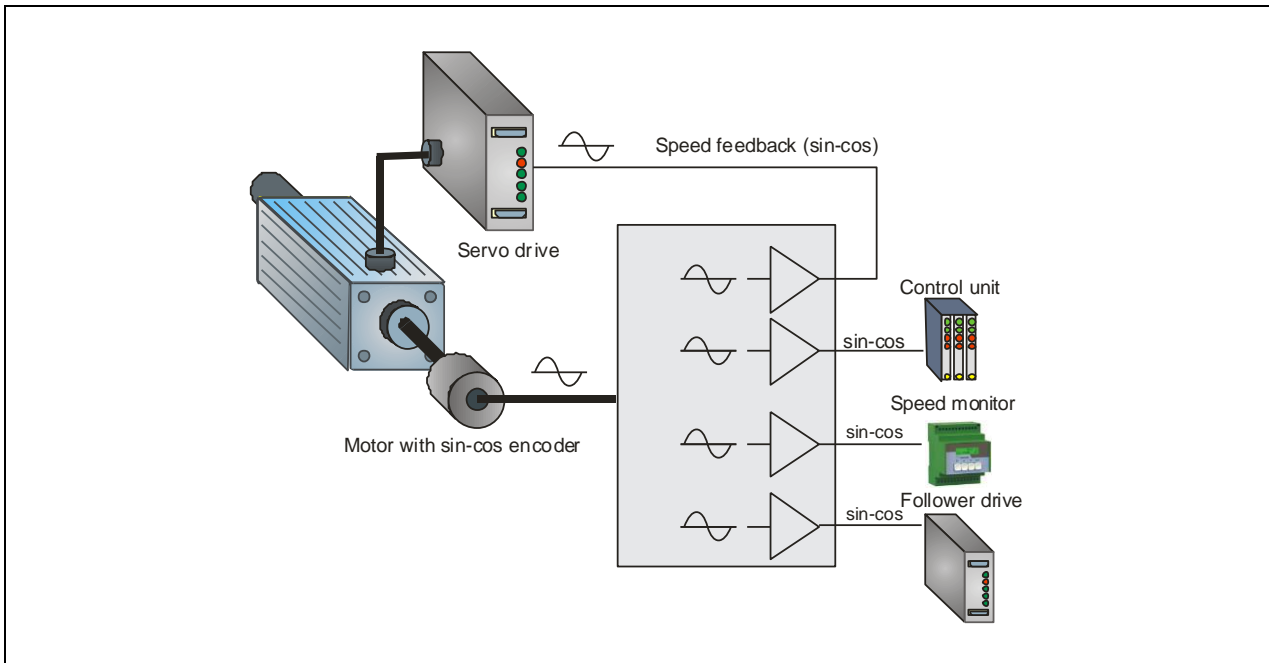
The SV 211 encoder splitter has been designed for clean and trouble-free distribution of the output signals of SinCos type encoders to several target units.

On all sine output channels the same signal format is available as on the input site, including a reference impulse (if available on the input site). All SinCos signals use the differential 1 Vpp format which is most common with industrial SinCos encoders.

The diagram below explains the sine signals:

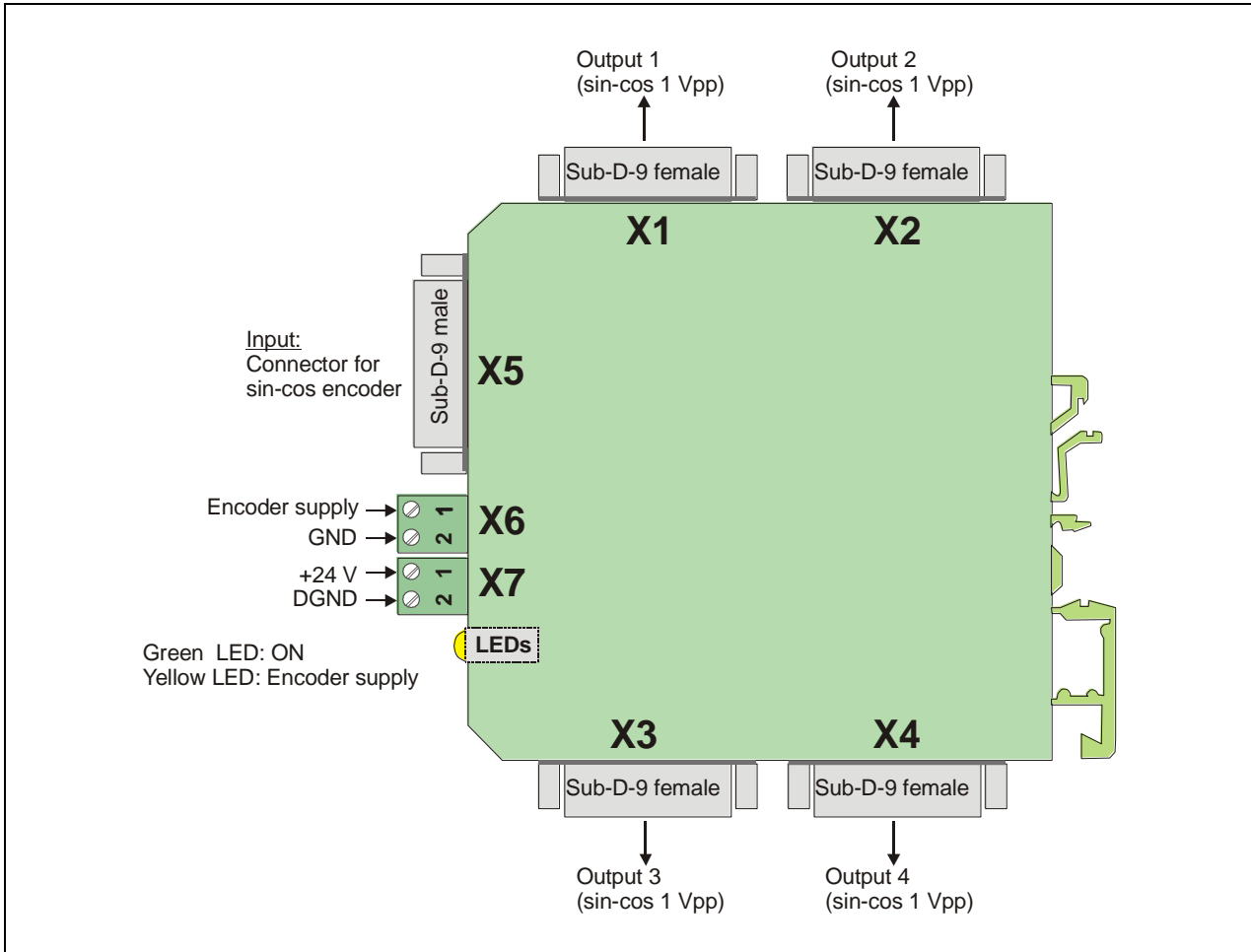


2.1. Typical application example of the SV 211 signal splitter:



3. Connection Diagram

For wiring of the sinusoidal signals the unit provides 5 SUB-D-9 connectors (X1, X2, X3, X4 and X5). For all other connections 2 screw terminal strips are available (X6 and X7). All SUB-D 9 connector housings are connected with the GND potential.



3.1. Power and Encoder Supply (X6/X7)

The unit operates from a DC power from 17 ... 30 volts which must be applied to the front terminals X7/1 (+) and X7/2 (-). The +24 V supply at the terminal X7(1,2) is a potential separated input.

With unloaded state the current consumption is about 50 mA (encoder supply line and output channels unconnected).

Terminals X6 (1,2) selects the level of the auxiliary encoder supply output (24 V). More details are explained in section [3.2](#) "Connection of the SinCos Encoder".

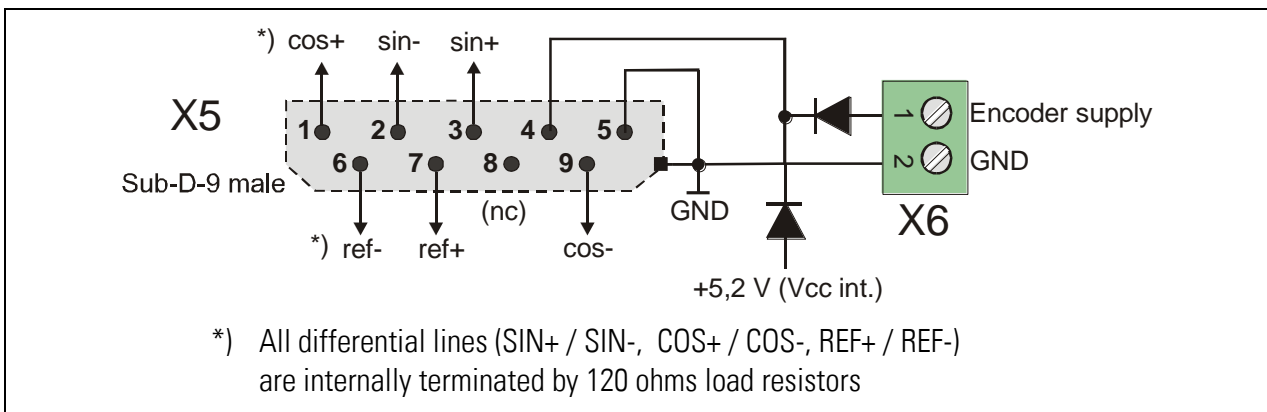
The terminals X6 and X7 are encoded to avoid an inverted connection between both!

3.2. Connection of the SinCos Encoder (X5)

The encoder can be connected via the front SUB-D-9 connector marked X5 (male connector on unit side, female connector on the encoder cable). Only encoders with differential SinCos signals of 1 Vpp can be used (0.8 Vpp - 1.2 Vpp). At any time the signals SIN+ / SIN- and COS+ / COS- must be available. Where an additional reference marker pulse is used, also the signals REF+ / REF- must be applied.

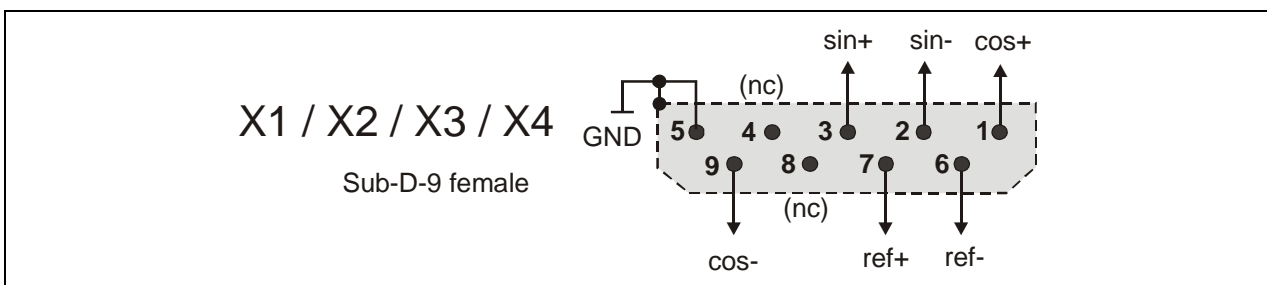
Pins 4 (+) and 5 (-) of the SUB-D-connector provide an auxiliary power output for the encoder supply. When terminals 1, 2 of the front X6 connector is unconnected, the aux. output voltage is automatically about 5.2 V (max. 150 mA). Where the encoder requires another supply voltage (e.g. 24 V), an appropriate voltage can be applied remotely to terminal X6 (1,2).

Please note that the metallic housing of the SUB-D input connector is internally connected to the common GND potential of the unit.



3.3. The Sine-Cosine Outputs (X1, X2, X3 und X4)

All SUB-D-outputs provide an image of the SinCos input signals, however with a fixed offset voltage of 2.5 V with respect to GND. This allows a clean and trouble-free distribution of the input signal to four target units.

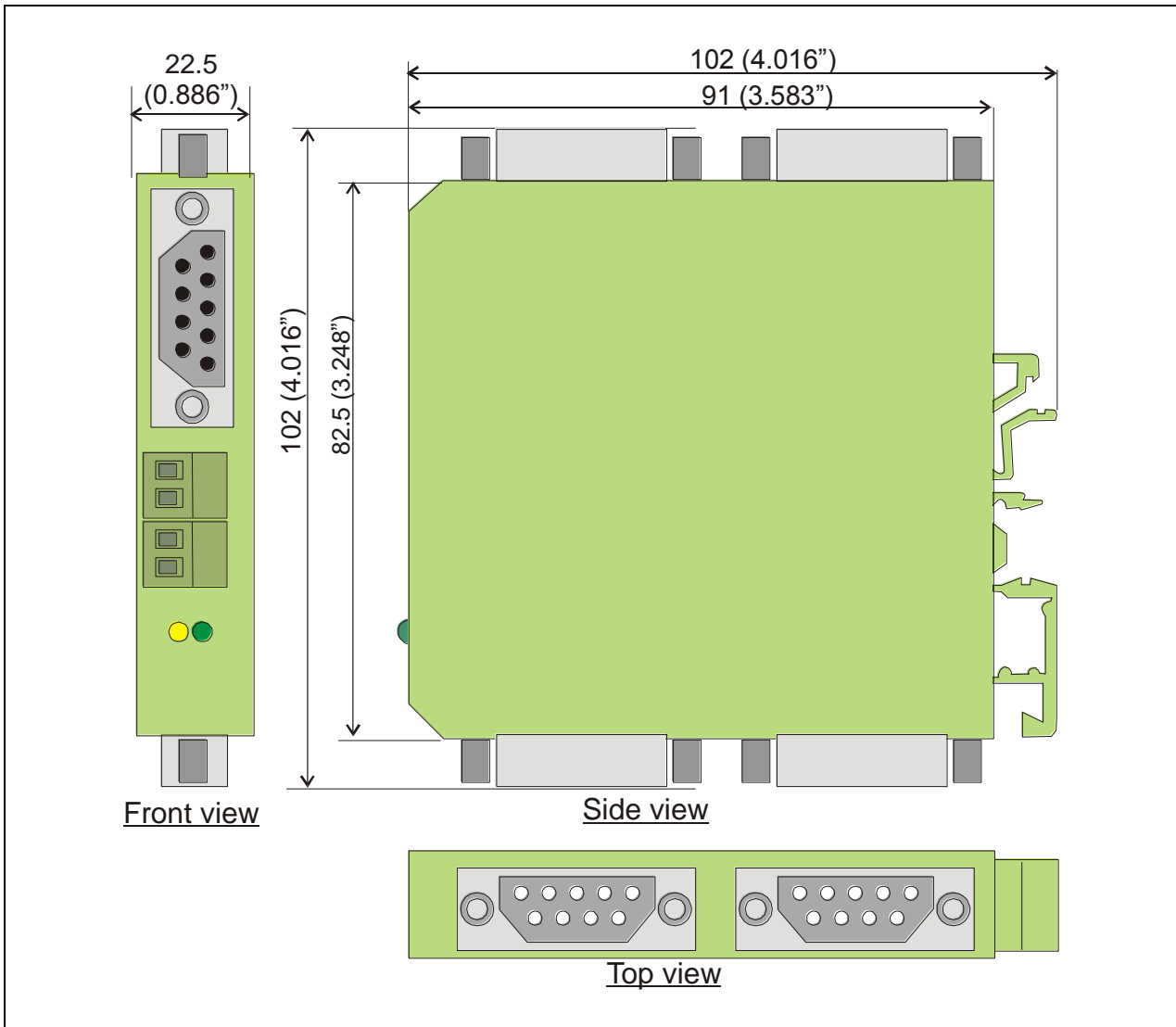


- It is mandatory to use cables with pairwise twisted wires for all sinusoidal signals SIN+ / SIN-, COS+ / COS- and REF+ / REF-.
- For signal transmission the target unit must provide terminating resistors at the end of the signal line (in each case 120 ohms between signal+ and signal-)
- Since on the inputs the unit already uses in-built termination resistors, no further measures must be taken on the encoder side.
- It is recommendable to connect the cable shield directly to the metal housing of the associated counterpart connector. This ensures that the cable is connected with the GND potential in any case via SV211.

4. Front LEDs

- The green LED is lit whenever the power supply of the unit is on.
- The yellow LED indicates the availability of the encoder supply +5 V. The yellow LED is lit whenever the supply is available.

5. Dimensions



6. Technical Specifications

Power supply:	Input voltage:	17 ... 30 VDC, galvanically isolated
	Protection:	reverse polarity protection
	Ripple:	≤ 10 % at 24 VDC
	Consumption:	approx. 70 mA (unloaded)
	Connections:	screw terminal, 1.5 mm ² / AWG 16
Encoder supply:	Output voltage:	5.2 VDC (or according to external input voltage)
	Output current:	max. 150 mA
	Connections:	screw terminal, 1.5 mm ² / AWG 16
SinCos inputs:	Amplitude:	min. 0.8 Vpp ... max.1.2 Vpp
	Offset:	approx. 2 ... 3 V
	Channels:	SIN+, SIN-, COS+, COS-, REF+, REF-
	Frequency:	max. 500 kHz
	Terminating resistors:	120 Ohm (already integrated in the unit)
	Connections:	SUB-D connector (male), 9-pin
SinCos outputs:	Number of outputs:	4
	Amplitude:	min. 0.8 Vpp ... max.1.2 Vpp
	Offset:	approx. 2.5 V
	Channels:	SIN+, SIN-, COS+, COS-, REF+, REF-
	Terminating resistors:	120 Ohm (must be equipped with the target device)
	Connections:	SUB-D connector (female), 9-pin
Housing:	Material:	plastic
	Mounting:	35 mm top hat rail (according to EN 60715)
	Dimensions (w x h x d):	22.5 x 102 x 102 mm / 0.886 x 4.016 x 4.016 inch
	Protection class:	IP20
	Weight:	approx. 100 g
Ambient temperature:	Operation:	0 °C ... +45 °C / +32 ... +113 °F (not condensing)
	Storage:	-25 °C ... +70 °C / -13 ... +158 °F (not condensing)
Failure rate:	MTBF in years:	94.2 a (long-term usage at 60 °C / 140 °F)
Conformity & standards:	EMC 2004/108/EC:	EN 61000-6-2, EN 61000-6-3, EN 61000-6-4
	Guideline 2011/65/EU:	RoHS-conform