Sensors

VOLTAGE AND CURRENT SENSORS FOR INTELLIGENT TRANSFORMER SUBSTATIONS

| www.zelisko.at |

100 ZELISKO 1918 - 2018

ZELISKO

AT THE ZELISKO ENERGY DEPARTMENT CT AND VT ARE DEVELOPED, PRODUCED AND DISTRIBUTED, for indoor and outdoor application. The range of rated values is up to 52 kV and 50 kA. By taking over AEG Instrument Transformers in the year 2004, Zelisko is able to provide the former transformer product range of AEG.

To satisfy the customer's high requirements regarding quality, flexibility, lifetime and competitive price, the engineering and production methods are improved continuously. In particular, the APG casting process for epoxy resin in connection with computer-aided design gives our customers an essential competitive advantage on the market.

High reliability, which is indispensable for products in power T&D, is guaranteed by the implementation of the state-of-the-art technologies and the long-term experience of engineers in the Zelisko Energy department. For more than 60 years, the high quality of Zelisko instrument transformers is proven by error-free operation in substations under various climatic conditions all over the world.

Zelisko´s sensors and instrument transformers are designed to be implemented in intelligent transformer substations in the medium voltage secondary distribution grid. Regarding the development, processing and production of sensors and instrument transformers, Zelisko accesses profound know-how, continuously grown over the years.

GENERAL INFORMATION ABOUT SENSOR TYPES. All current and voltage sensors are finished and routine tested according to IEC60044-7 and -8.

Due to the standardised output voltages calibration and adjustment in the power grid are not necessary anymore. The sensors are marked with a serial number and an inspection record is attached to each product. Furthermore, all the devices are maintenance-free and can be operated under extreme climatic indoor conditions, i.e. elevated temperature and humidity.

TABLE OF CONTENTS

1. CURRENT AND VOLTAGE SENSORS FOR MEDIUM VOLTAGE APPLICATIONS

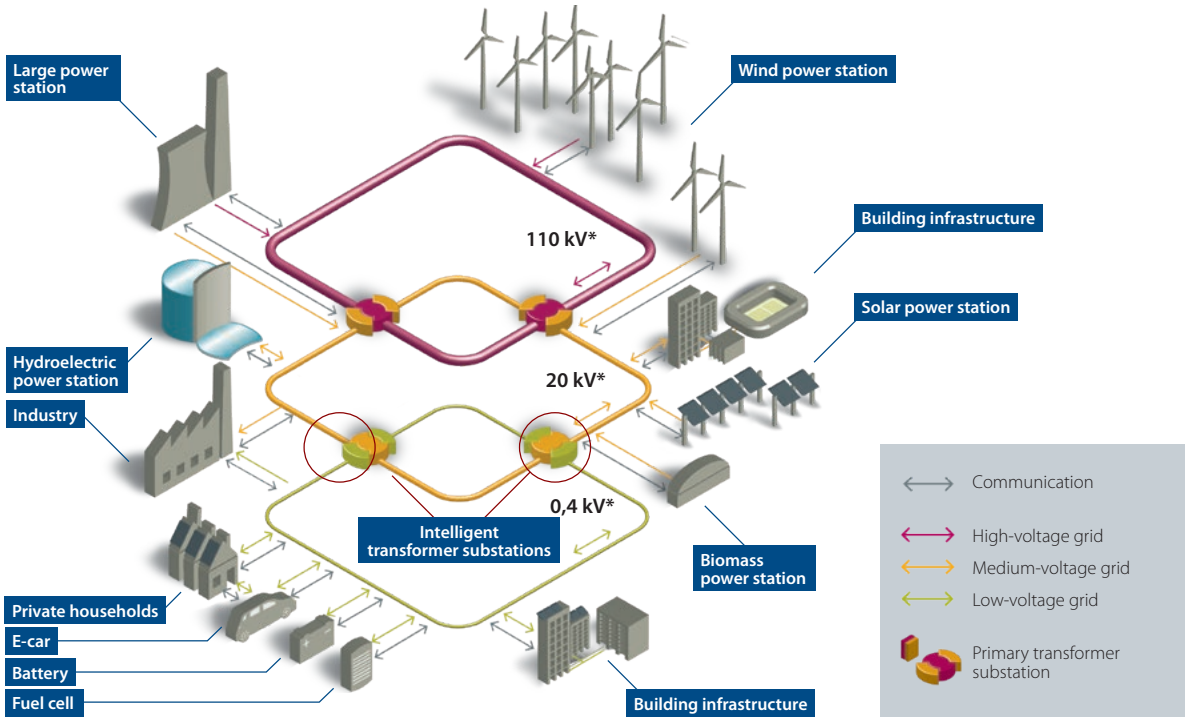
1.1 BACKGROUND AND FIELD OF APPLICATION

The increasing emergence of decentralized supply led to a destabilization of the network in the last years. Therefore the extension of a smart grid is necessary.

Today
Extension of ›renewable energy‹
▸ decentralized power generation systems
▸ fluctuating availability
▸ feeding in LV- / MV- / HV-grid
Consequently:
▸ fluctuating energy flow
▸ variable cable load
▸ increased short-circuit current
▸ difficult handling of power quality
▸ increased demand for balanced energy
▸ different network control/protection concept

Future
Grid expansion
New energy storage systems
Intelligent transformer substations
▸ remote signaling and control
▸ integration in power system management
Intelligent power grid and active load management
Current- / voltage measurement on relevant points in MV-grid

ACTIVE DISTRIBUTION GRID WITH INTELLIGENT TRANSFORMER SUBSTATIONS



* The given voltage values are exemplarly

1.2 CUSTOMER'S BENEFITS

Benefits by implementing Zelisko- I/U-sensors	This enables
High measurement accuracy without on-site calibration ("Plug and Play"-concept)	**Monitoring of network conditions**
Good transfer behaviour of current sensors for harmonics	▸ monitoring of power quality
simple installation of I/U-sensors in original equipment	▸ measurement / notification of operational characteristics
Simple retrofitting of old facilities without major modifications of the local network substations	▸ improved power quality / power system stability
High reliability even for application in harsh environmental conditions (temp./condensation/EMC)	**Exact short-circuit / earth fault detection and direction detection**
Measuring signal In accordance with international transformer standards / IEC standards	▸ faster earth fault detection/elimination
	▸ less downtime / increased availability
	▸ automatic switchovers possible
	Measuring signal for control tasks
	▸ reactive current and harmonics compensation
	▸ voltage regulation through inverters
	▸ optimized control of transformer tap switch
	Optimised management of decentralized power generation systems and of large consumer stations
	Cost savings due to:
	▸ low investment costs
	▸ cost-effective retrofitting of old facilities
	▸ no on-site calibration necessary
	▸ reduced grid losses
	▸ increased transmission power in MV grid
	▸ delay/avoidance of grid expansion

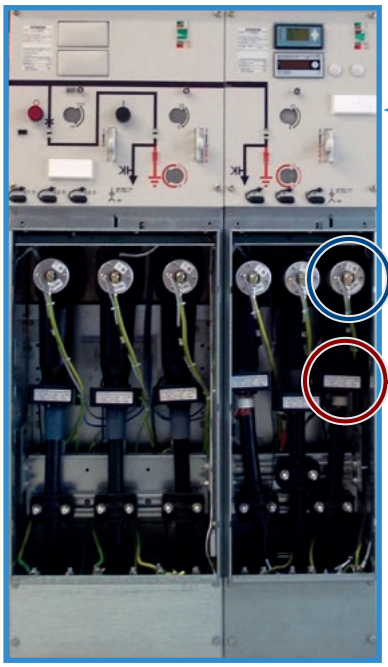
1. Current and voltage sensors for medium voltage applications

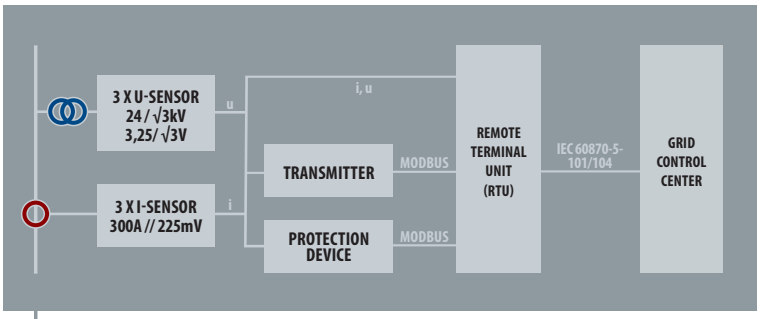
1.3 APPLICATION AND USE

The current and voltage sensors have been developed primarily for medium-voltage switchgear in local network substations in order to equip them with precision measurement technology.

The focus lies on network substations in urban, rural and industrial areas. The measuring sensors are implemented in order to measure, monitor and to detect short-circuits or earth faults and to determine their direction. The compact sensors of Zelisko enable an easy and quick retrofit without major changes in the switch-gear and in the network infrastructure.

INTELLIGENT TRANSFORMER SUBSTATION
(Source: Siemens)



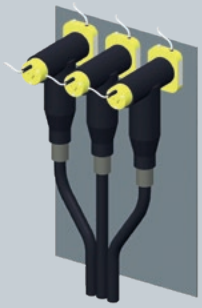
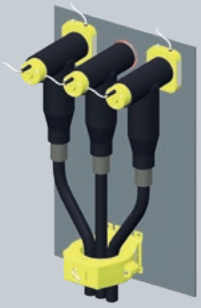
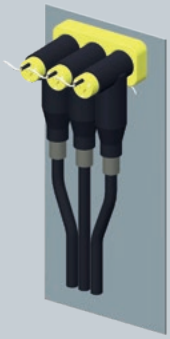


- Transmission of the instantaneous values of current and voltage transducers, protection devices or directly to analogue RTU inputs
- RTU communication to grid control center

CABLE COMPARTMENT OF MV SWITCHGEAR TYPE 8DJH SIEMENS

1.4 CONFIGURATION OPTIONS

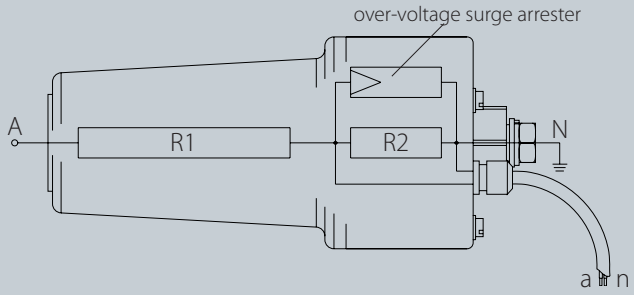
The equipment of the T-connectors with the sensors depends on the type of application, the size of the cable connection compartment in the switchgear and the local situation (i.e. original equipment or retrofit).

Original equipment	Retrofit
	
3 x SMCS-JW1001 (current sensor)	3 x SMCS/T-JW1002 (current sensor)
3 x SMVS-UW1001 (voltage sensor)	3 x SMVS-UW1001 (voltage sensor)
	
2 x SMCS-JW1001 (current sensor)	2 x SMCS/T-JW1002 (current sensor)
3 x SMVS-UW1001 (voltage sensor)	3 x SMVS-UW1001 (voltage sensor)
1 x GAE120/SENS (sensors for earth fault detection)	1 x GAE120/SENS (sensors for earth fault detection)
	
	3 x SMCS/T-JW1002 (current sensor)
1 x SMCS3-JW1004 (multifunction current sensor)	3 x SMVS-UW1001 (voltage sensor)
3 x SMVS-UW1001 (voltage sensor)	1 x GAE120/SENS (sensors for earth fault detection)

1. Current and voltage sensors for medium voltage applications

1.5 FUNCTION AND ERROR LIMITS

VOLTAGE SENSOR

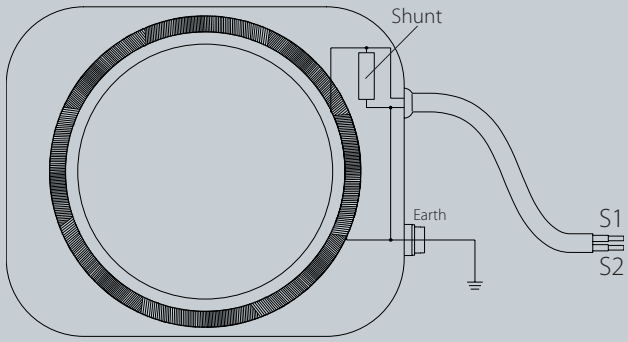


THE FUNCTION PRINCIPLE OF THE **VOLTAGE SENSOR** IS BASED ON A RESISTIVE DIVIDER.

It consists of two resistive elements, which divide the input signal in order to recieve a normed output value.

The surge arrester provides protection of sequentially connected measuring devices.

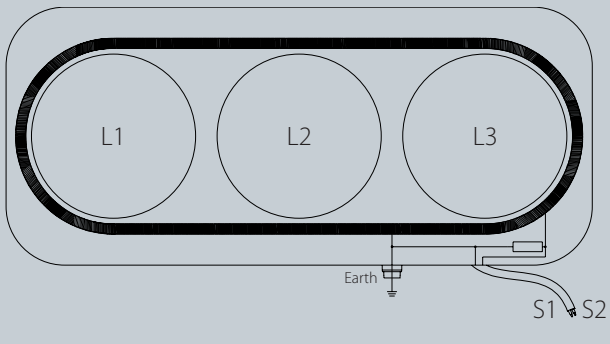
PHASE CURRENT SENSOR



THE **PHASE CURRENT SENSOR** IS BASED ON A LOW POWER INDUCTIVE CURRENT TRANSFORMER.

The current is converted into a proportional voltage by implementing a shunt resistor.

SENSORS FOR EARTH FAULT DETECTION



THE OPERATING PRINCIPLE OF THIS **SENSOR FOR EARTH FAULT DETECTION** IS BASED ON THE ZERO CURRENT TRANSFORMERS.

In case of earth fault, due to a displacement of the neutral point, an asymmetric current occurs in each phase. This current is converted into a defined ratio to the voltage output of the sensor.

Accuracy limits of voltage sensors for measurement purposes

Class		Voltage error (%)	Phase displacement (min)
Accuracy class IEC 60044-7	0,5	0,5	20
	1	1	40
	3	3	limit values are not specified

Accuracy limits of voltage sensors for protection purposes

Class		Voltage error (%)	Phase displacement (min)
Accuracy class IEC 60044-7	3P	3	120
	6P	6	240

Accuracy limits of phase current sensors for measurement purposes

Class		Current error (%)					Phase displacement (min)			
		5% I_p	20% I_p	50% I_p	100% I_p	120% I_p	5% I_p	20% I_p	100% I_p	120% I_p
Accuracy class IEC 60044-8	0,5	1,5	0,75	–	0,5	0,5	90	45	30	30
	1	3	1,5	–	1	1	180	90	60	60
	3	–	–	3	–	3	limit values are not specified			

Accuracy limits of phase current sensors for protection purposes

Class		Current error (%) 100% I_p	Phase displacement (min)	Composite error at rated accuracy-limits
Accuracy class IEC 60044-8	5P	1	60	5
	10P	3	–	10

I_p = primary rated current

2. PRODUCT OVERVIEW

Voltage Sensor		U (kV)	Application	Manufacturer	T-Connector	Page
SMVS-UW1001	Voltage sensor for symmetric plug	12 / 28 / 75 24 / 50 / 125 36 / 70 / 170	Original equipment / Retrofitting	Nexans - Euromold	(K)(M)400TB/G // (K)(M) 440TB/G // (K)(M) 440PB/G // (K)(M) 400PB-XSA // KAA4	12
				Cellpack	CTS-S 630A	
				Suedkabel	MUT 33 // SEHDT 13 // SEHDT 13 // SEHDT 23 // SEHDT 33 // SEHDT 23 // EHDT 33 // UT 33	
SMVS-UW1002-0	Voltage sensor for asymmetric plug	12 / 28 / 75 24 / 50 / 125 36 / 70 / 170	Original equipment / Retrofitting	NKT	CB 12-630 // CC 12-630 // CB 24-630 // CC 24-630 // CB 36-630 // CC 36-630	12
				TE connectivity-Raychem	RSTI 58xx // RSTI-CC 58xx	
SMVS-UW1002-1	Voltage sensor for asymmetric plug	12 / 28 / 75 24 / 50 / 125 36 / 70 / 170	Original equipment / Retrofitting	Nexans - Euromold	(K)(M) 300PB/G // (K)(M) 300SA	12
				Suedkabel	SET 24 // SEHDT 23.1 // SAT 24 // SEHDK 23.1 // SAK 24 // MUT 23 // MUT 23.1 // AD 23.1 SP // SET 36 // SAT 36 // SEHDK 36	
SMVS-UW1002-2	Voltage sensor for asymmetric plug	12 / 28 / 75 24 / 50 / 125	Original equipment / Retrofitting	Cellpack	CTS 630A // CTKS 630A	12
SMVS-UW1013	Air-insulated voltage sensor	12 / 28 / 75 24 / 50 / 125 36 / 70 / 170	Original equipment / Retrofitting			14

Phase Current Sensor		U (kV)	Application	Inside diameter	Page
SMCS/T-JW1002	Separable phase current sensor (divisible ring cores)	0,72 / 3	Retrofitting / (Original equipment)	Ø 55 mm	16
SMCS-JW1001	Not separable current sensor (closed ring cores)	0,72 / 3	Original equipment	Ø 82 mm	16

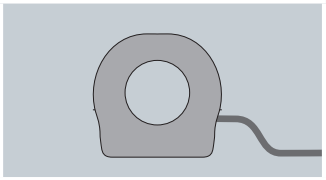
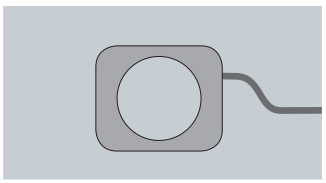
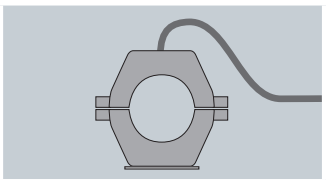
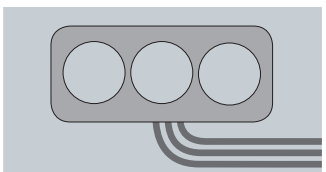
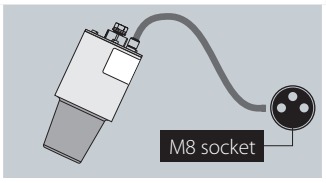
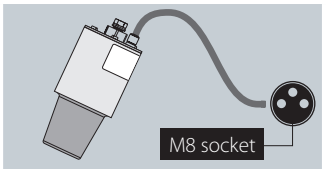
Sensor for Earth Fault Detection		U (kV)	Application	Inside diameter	Page
GAE120/ SENS-JW1003	Separable sensor for earth fault detection (divisible ring cores)	0,72 / 3	Retrofitting / (Original equipment)	Ø 120 mm	18

Multifunction Current Sensor		U (kV)	Application	Inside diameter	Page
SMCS3-JW1004	Not separable sensor for earth fault detection (closed ring cores) with phase current sensors	0,72 / 3	Original equipment	3 x Ø 84 mm	20

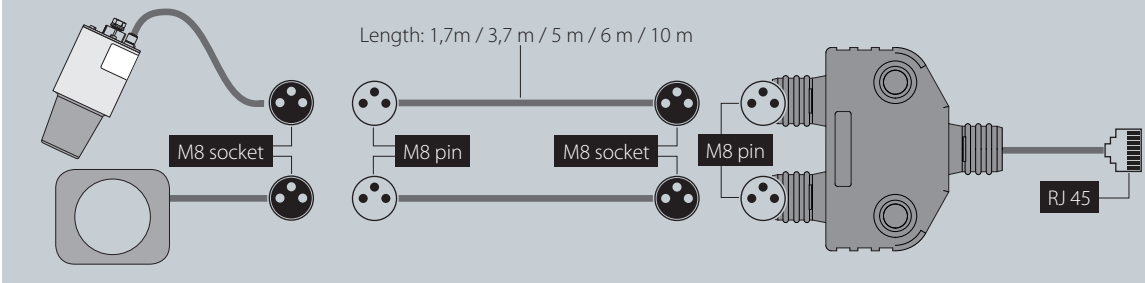
Combined Sensor		U (kV)	Application	Inside diameter	Page
SMVS-K1112	Combined outdoor sensor	12 / 28 / 75 24 / 50 / 125 36 / 70 / 170	Original equipment		22

** Alternatives on request*

CONFIGURATION TABLE/CABLE CONNECTIONS

Sensor		Cable	Connection	Length
Current		LiYCY-OB CAT5e	open, 2-pin (pref.) RJ 45	1 – 20 m
				
				
		3/4 x LiYCY-OB 1 x CAT5e	open, 2-pin (pref.) RJ 45	
Voltage		M8 pin LiYCY-OB	open, 2-pin (pref.)	1.7 m 3.7 m 6 m 10 m
		CAT5e M8 pin	RJ 45	

Combi-Y-Adapter



2. Products

2.1 VOLTAGE SENSORS

The voltage sensor is mounted on the cable outlet at the back of the T-connector. Therefore, the insulating plug is replaced by the voltage sensor. The accuracy of the sensor, i.e. the absolute value error and phase error, is constant over the lifetime and have not to be recalibrated or readjusted. The calibration to the desired nominal and secondary voltage is performed at Zelisko. Cable length in delivery condition may not be changed.

The voltage sensor is suitable for both, original equipment and retrofitting, without any reconstructions of network stations necessary.

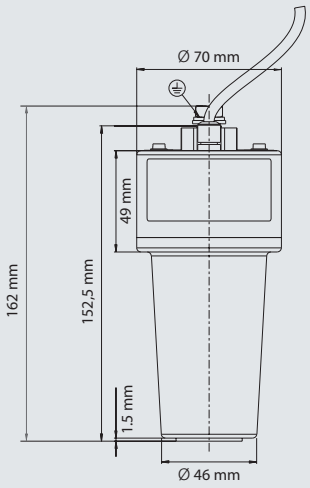
2.1.1 SMVS-UW1001 (for symmetric plug)

The cone of the voltage sensor is designed in accordance with EN50181, type C. Due to the standardized design it is possible to equip different T-connectors with this sensor.

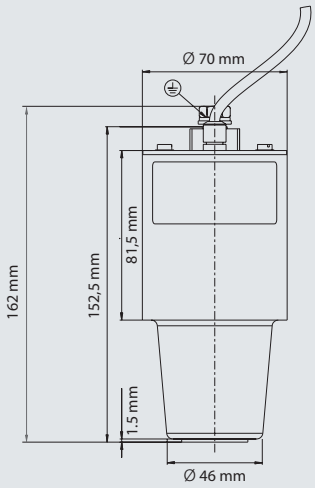
2.1.2 SMVS-UW1002-0, UW-1002-1& UW-1002-2 (for asymmetric plug)

The voltage sensor with shortened cone fits to T-cable manufacturers according table page 13.

SMVS-UW1001



SMVS-UW1002-0



Datasheet
SMVS-UW1001, SMVS-UW1002-0, SMVS-UW1002-1 & SMVS - UW1002-2

Insulation level	max. 36 / 70 / 170 kV
Rated frequency	50 Hz / 60 Hz
Rated voltages	max. 30/√3 kV
Voltage factor	1,2 U_N and 1,9 U_N 8h
Accuracy class / Protection class	0,2 / 0,5 / 1 / 3 // 3P / 6P
Rated secondary voltage	3,25/√3 V (or on request)
Standard	IEC 60044-7 // IEC 61869-11
External conditions	Operation: -25°C to +40°C or -40°C to +40°C *
	Storage: -40°C to +80°C (or on request)
Rated burden (Standard)	200kΩ ±1% Accuracy, 350 pF ±10% *
Connection cable & interface	See configuration table page 11
Overvoltage protection	Internal surge arrester
Cable connector type	**UW1001:** Nexans (K) 440TB / Cellpack: CTS-S / Südkabel SEHDT 13 & SEHDT23 *
	UW1002-0: Nkt CB-24, CC-24 / Raychem RSTI-58xx / RSTI-CC-58xx* **UW1002-1:** Südkabel SEHDT 36 / Nexans 430TB **UW1002-2:** Cellpack CTS 630A

* Alternatives on request

2. Products

2.1 VOLTAGE SENSORS

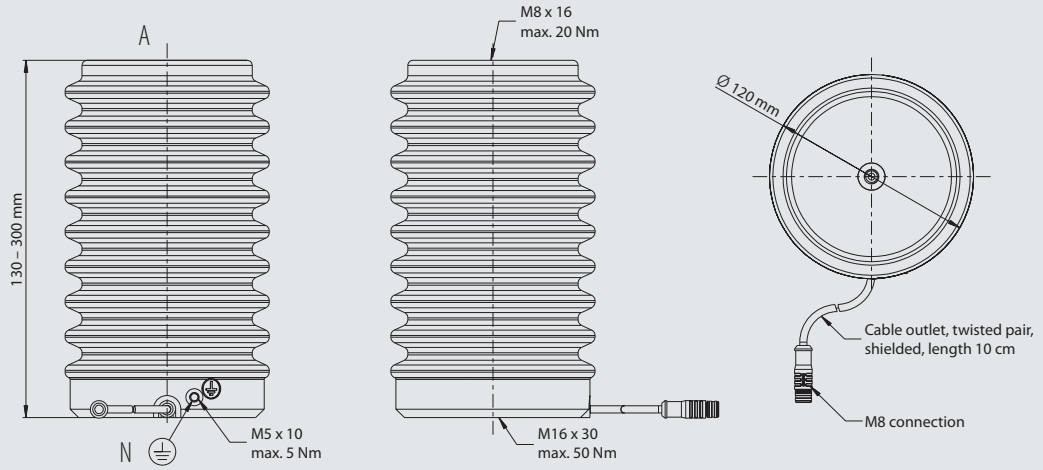
2.1.3 SMVS-UW1013

This air-insulated voltage sensor is suitable as original equipment and for retrofitting of air-insulated switchgears. The sensors don't have to be calibrated because the output signal (acc. to IEC60044-7) is guaranteed over the lifetime. Innovative design eliminates ambient influences from electrical and magnetical fields.

On the customer's request, this sensor can be used with supporting function (post insulator function). Technical details are provided in the specific data sheet on request.

The voltage sensors are originally equipped with shielded 2-pole connection cable with a M8-industrial socket. The connection to the electronic device will be realized with an additional extension cable with open ends or on customer request.

SMVS-UW1013



Datasheet
SMVS-UW1013

Insulation level	12 / 28 / 75 24 / 50 / 125 36 / 70 / 170
Rated frequency	50 Hz / 60 Hz
Rated voltages	max. 30/√3 kV
Voltage factor	1,2 U_N and 1,9 U_N 8h
Accuracy class / Protection class	0,2 / 0,5 / 1 / 3 // 3P / 6P
Rated secondary voltage	3,25/√3
Standard	IEC 60044-7 // IEC 61869-11
External conditions	Operation: -25°C to +40°C or -40°C to +40°C * Storage: -40°C to +80°C
Rated burden (Standard)	200kΩ ±1% Accuracy, 350 pF ±10% *
Connection cable & interface	See configuration table page 11
Overvoltage protection	Internal surge arrester
Height	12/28/75kV… 130mm 24/50/125kV… 210mm 36/70/170kV… 300mm
Max. bending strength	on request

* Alternatives on request

2. Products

2.2 PHASE CURRENT SENSORS

The phase current sensors are available in different versions. The first version has a dividable ring core for retrofit purposes whereas the second one is available with closed ring cores for original equipment.

2.2.1 SMCS-JW1001 (closed core)

This type is designed for simple original equipment in switchgears. It is slide on the not mounted output T-connector in the substation. When the connector is screwed on the feed through, its sheathing expands. Thus, the sheathing presses against the inner surface of the current sensor and fixes it. Consequently, additional fixations of the sensor in the substation are not necessary.

Due to a stable production process, it is possible to provide sensors in a set of three with a standard deviation in absolute value and phase error of 0,05% and 0,05°, respectively. Consequently, a set of three sensors enables earth fault current detection in addition to the current measurement, without using earth fault detection transformers.

Due to their small size, up to three sensors can be mounted in a cable compartment with a width of 300mm and a phase distance of 95mm.

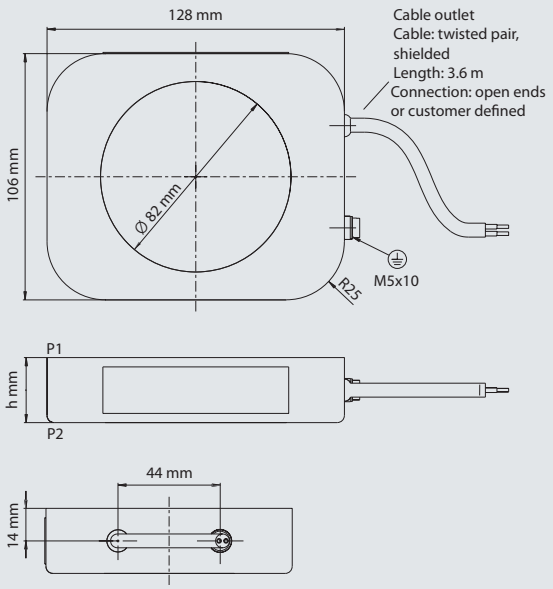
2.2.2 SMCS/T-JW1002 (split core)

The retrofit application in existing installations is the primary field of application for this type. The click system enables a tool-free mounting of the sensor on site. Dismounting of the T-connector is not necessary, since the sensor is enclosing the cable.

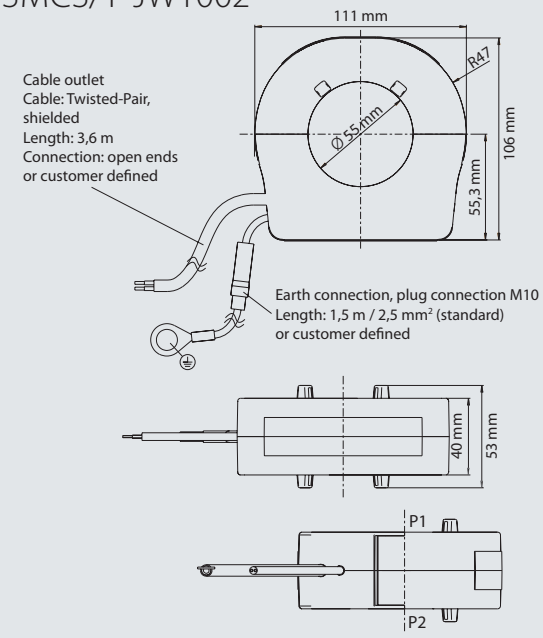
The sensor is delivered with two cable straps to fix it directly on the output cable. The cut surface of the iron core and a sophisticated spring system in the sensor housing ensure that the measurement precision of the sensor is guaranteed after assembly on the output cable.

The accuracy of this sensor, more precisely the absolute value error and the phase error is in class 1 according to IEC 60044-8.

SMCS-JW1001



SMCS/T-JW1002



Datasheet
SMCS/T-JW1002 & SMCS-JW1001

Insulation level	0,72 kV		
Rated frequency	50 Hz / 60 Hz		
Rated short time thermal current	25 kA / 1 s		
Primary current	300 A; Ext. 200% *		
Accuracy class	SMCS/T - JW1002		0,5 / 1 & 5P10 … 5P20
			3 & 5P10 … 5P20
	SMCS - JW1001	28 mm	0,2s / 0,25 / 0,5 & 5P20
			1 & 5P10
			3 & 5P10
		50 mm	0,2s / 0,25 / 0,5 & 5P20
			1 & 5P20
			3 & 5P20
Output signal	225 mV according to IEC 60044-8		
Standard	IEC 60044-8 // IEC 61869-11		
External conditions	Operation: -25°C to +40°C or -40°C to +40°C, on request		
	Storage: -40°C to +80°C, on request		
Rated burden	≥ 20 kΩ		
Connection cable & interface	See configuration table page 11		

* Alternatives on request

2. Products

2.3 SENSORS FOR EARTH FAULT DETECTION

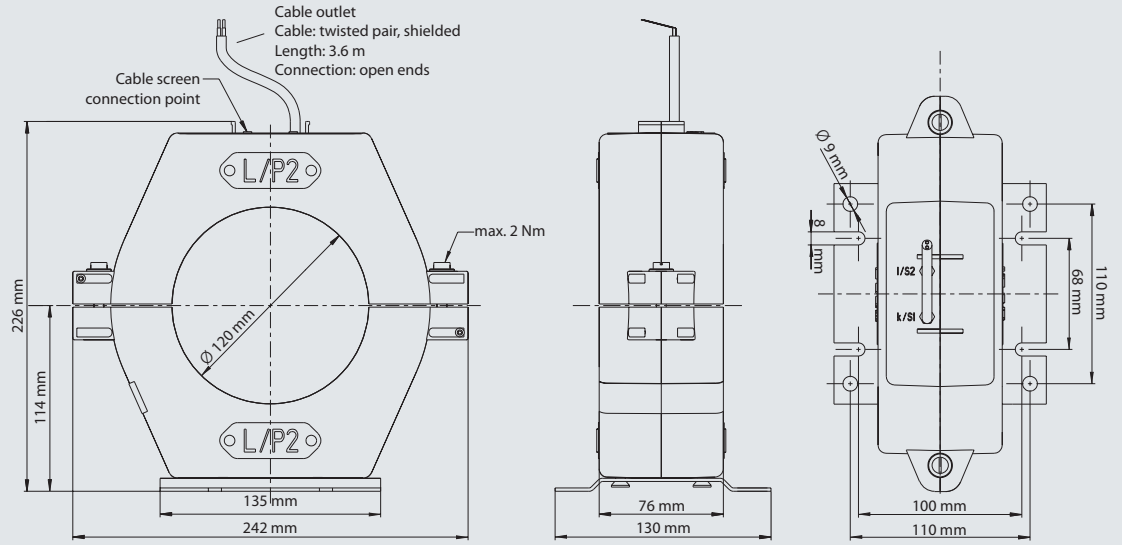
2.3.1. GAE120/SENS-JW1003 (split core)

The sensor for earth fault detection of type GAE120/SENS is based on a market proven and established product. All output cables of the substation are conducted through this transformer.

In case of earth fault in a three-phase network, a current occurs due to the displacement of the neutral point. This current is implemented with a specific ratio in the output of the sensor. Therefore the system enables to detect fault and short-circuit currents.

In this sensor inductive transformer principles are combined with sophisticated sensor technology. The high finished cut surfaces of the iron core ensure a constant and high accuracy of the measurement after assembling.

GAE120/SENS-JW1003



Datasheet GAE120/SENS-JW1003

Insulation level	0,72 kV	
Rated frequency	50 Hz / 60 Hz	
Rated short time thermal current	25 kA / 3 s	
Ratio earth fault detection	60 A // 225 mV *	
Accuracy class	Primary current: from 1 to 60 A	Phase displacement: ±120 minutes
	0,5 / 1	
Output signal	225 mV	
Standard	IEC 60044-8 // IEC 61869-11	
External conditions	Operation: -25°C to +40°C or -40°C to +40°C *	
	Storage: -40°C to +80°C *	
Rated burden	≥ 20 kΩ	
Connection cable & interface	See configuration table page 11	

* Alternatives on request

2. Products

2.4 MULTIFUNCTIONAL CURRENT SENSORS (phase current- and earth fault detection)

2.4.1. SMCS3-JW1004 (closed core)

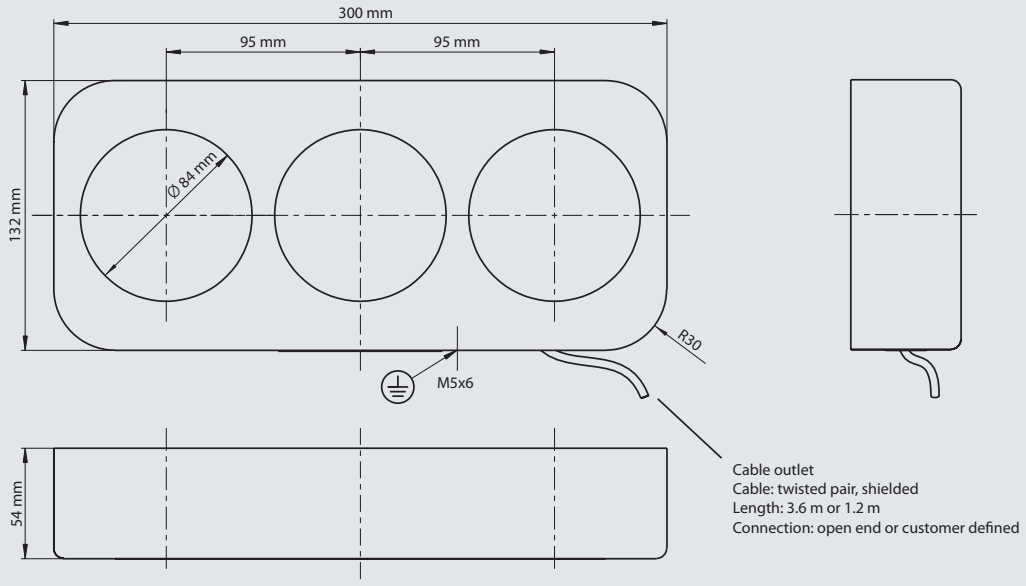
The current sensor in 3-phase design combines maximal flexibility with maximal functionality. It is possible to add the earth fault detection to the three single phase converter in the sensor.

In addition to the extended version, consisting in three current sensors and a sensor for the earth fault detection, different simpler layouts can be provided in accordance with customers´ requirements. This sensor is designed for original equipment in switchgears.

An advantage of this system is a simple and easy assembling of a single sensor, which takes over the tasks of up to four different sensors.

The size of the device is always the same, regardless of the configuration chosen by the customer. Due to the closed design of the sensor core, significantly higher accuracies, than with cut iron cores, are achieved. The design of the sensor can be adapted to the customer´s request regarding the distance between the poles and the external dimensions.

SMCS3-JW1004



Datasheet
SMCS3-JW1004

Insulation level	0,72 / 3 kV	
Rated frequency	50 Hz / 60 Hz	
Rated short time thermal current	25 kA / 1 s	
Ratio phase current sensor	300 A // 225 mV Ext. 200% *	
Ratio earth fault detection	60 A // 225 mV *	
Accuracy class phase current	0,5 & 5P10	
	1 & 5P10	
	3 & 5P10	
Accuracy class earth fault detection	Primary current: from 1 to 60 A	Phase displacement: ±120 minutes
	1	
Output signal at rated current	225 mV	
Integrable sensor options	3x phase	
	2x phase + 1 earth fault	
	3x phase + 1 earth fault	
Standard	IEC 60044-8 // IEC 61869-10	
External conditions	Operation: -25°C to +40°C or -40°C to +40°C *	
	Storage: -40°C to +80°C *	
Rated burden	≥ 20 kΩ	
Connection cable & interface	See configuration table page 11	
Phase distance	95 mm; other phase distances possible on request	

* Alternatives on request

2. Products

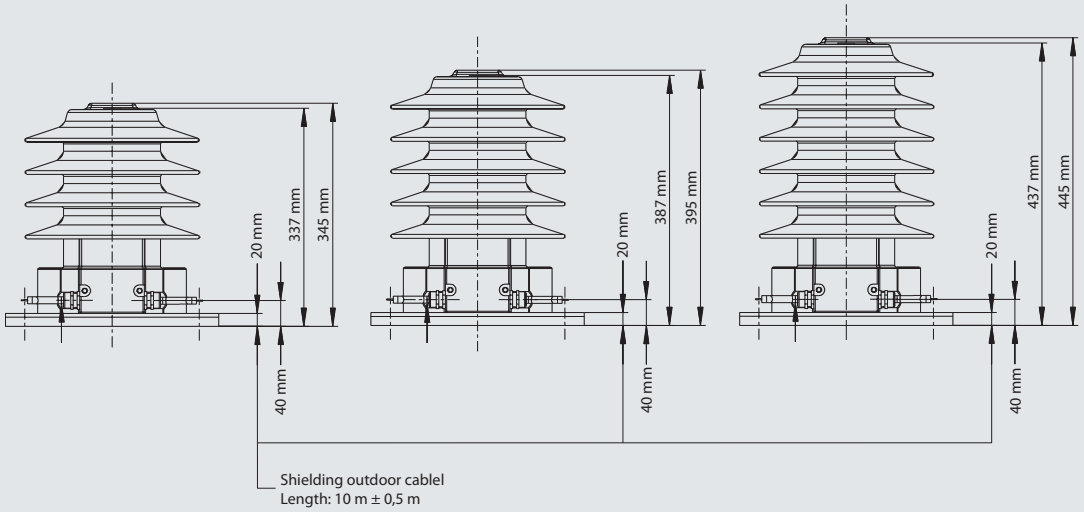
2.3 COMBINED SENSORS

2.2.1 SMVS-K1112

This outdoor sensor combines functions of a voltage and a current sensor in one design. Due to the structural shape and use of cycloaliphatic epoxy resin, it is adapted for outdoor application. The combined sensor is available with an insulation level up to 36 kV.

By usage of proven Zelisko sensor-technology, specified accuracy class can be guaranteed for the complete lifetime without calibration on site.

SMVS-K1112



Datasheet SMVS-K1112

	Voltage sensor	Current sensor
Insulation level	max. 36/70/170 kV	
Rated frequency	50 Hz / 60 Hz	
Rated voltages / Rated current	max. 30/√3 kV	300 A *
Voltage factor / Ith	1,2 U_N und 1,9 U_N 8h	25 kA, 1 s
Accuracy class	0,5 / 1 / 3 & 3P, 6P	0,2 / 0,5 / 1 / 3 & P10, P20
Secondary	3,25 / √3 V *	225 mV or 1 A
Standard	IEC 60044-7	IEC 60044-8
External conditions	Operation: -25°C to +55°C or -40°C to +40°C *	
	Storage: -40°C to +80°C	
Rated burden	200 kΩ ±1%, 350 pF ±10%	≥20 kΩ
Connection cable & interface	2 x 2 pin shielded or 1 x 4 pin shielded	
Overvoltage protection	Internal surge arrester 12/28/75kV… 345mm	
Construction heights	12/28/75kV… 345mm 24/50/125kV… 398mm 36/70/170kV… 448mm	

* Alternatives on request

2. Products

2.6 GRID INTELLIGENT MONITOR

2.6.1 GIM (Digital short-circuit indicator with measuring function)

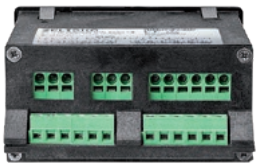
More transparency in the distribution system. The key to continuously improving power supply is essentially in-depth knowledge of the relevant conditions of the local power supply network. This is supported with smart devices which ensure unprecedented transparency.

Zelisko offers a complete portfolio for network monitoring, power quality recording, fault recording, phasor measurement and system software application for this requirement.

Zelisko GIM – the finger on the pulse of your distribution network

Zelisko GIM (Grid Intelligent Monitor) is a short-circuit and ground fault indicator with direction indication which uses protection algorithms and Zelisko low-power sensor technology in accordance with IEC 60044. Additionally the integrated Modbus RTU Interface can provide up-to-date measured values for a precise evaluation of the distribution grid.

The GIM was specially designed for Zelisko current and voltage sensors and can be used without any additional calibration on site.



Benefits

Usable in grounded, isolated and compensated networks	Facilitate minimum loss of network fees/end consumer fees
Integrated load flow direction indicator	Up-to-date measured values for operation management and planning support targeted use of investment resources in network planning and network expansion
Directional short-circuit and ground fault detection	Direct voltage measurement in the low-voltage network
Cost savings thanks to precise and fast fault localization	Direct connection of Zelisko low-power sensors with a high measuring quality and accuracy
Selective fault information with direction indication used as a basis for „self-healing“ applications	Flexible ground current measurement down to 0.4 A
Service restoration times in the range of minutes or seconds (depending on the primary equipment)	Self-testing function of communication connection

Zelisko GIM is the first short-circuit indicator which uses sensors in line with the IEC 60044-7 /-8 standard.
This enables high-precision measurements without calibration and adjustment to the primary variables.

Device characteristics

Communication:	**Auxiliary voltage:**
Interface RS485 incl. Modbus RTU communication for all data and remote configuration	AC 230 V
Signalization:	DC 24 - 110 V
Display for visualization of current measured values or fault information in the distribution network, 4 function keys	Battery with service life > 15 years
3 LEDs to signal the operating mode	**Inputs:**
2 binary outputs	3 inputs for alternating voltage, settable for either 100V/√3 or Zelisko voltage sensors (e.g. UW 1002) (in accordance with IEC 60044-7)
Measured variables:	3 inputs for Zelisko current low-power sensors e.g. JW 1002 (as per IEC 60044-8). The nominal primary current can be configured from 50 A to 1000 A in Zelisko GIM. Optional configuration of current input L2 for sensitive ground fault detection with Zelisko current sensor GAE 120/Sens-JW 1003 (as per IEC 60044-8). The nominal primary current can be configured in Zelisko GIM
RMS measured values	Alternatively: Inputs for conventional transducers
Phase voltages and currents, ground current, power system frequency and cos φ phase angle, active power, reactive power and apparent power	1 A / 5 A via adapter
Energy meters	1 binary input
Minimum and maximum values for all phase currents from 15 minutes to one year as a slave pointer function	**Housing:**
Time synchronization:	Polycarbonate, for panel flush mounting
Time synchronization via Modbus RTU	Dimensions: 96 x 48 x 109.5 mm (W / H / D)
Temperature range:	Protection class: Front IP40, rear IP20
From -40 °C to +70 °C	

Notes

Notes

1012_19 Printed in Austria 03.2019

Dr. techn. J. Zelisko GmbH
Beethovengasse 43-45
2340 Mödling, Österreich
Tel.: +43 2236 409 - 0
Fax: +43 2236 409 - 2322

WWW.ZELISKO.AT

Distribution Germany:
Georg-Knorr-Straße 4
12681 Berlin, Deutschland
Tel.: +49 30 9392 - 2865 / 2866 / 2869
Fax: +49 30 9392 - 2899

KNORR-BREMSE
IFE Innovations For Entrance Systems
merak
Microelettrica Scientifica
KiepeElectric
PowerTech
WESTINGHOUSE platform screen doors
NEW YORK AIR BRAKE
Selectron
ZELISKO
EKA
RAILSERVICES

Knorr-Bremse Group