
Product overview

ISOMETER[®]

Insulation monitoring devices
for industrial applications

ISOSCAN[®]

EDS insulation fault
location systems



Design the future
of energy

 **BENDER**

Table of contents

Unearthed power supply systems	4
IT systems – information ahead of time	6
ISOMETER® insulation monitoring devices	
Main circuits	8
Control and auxiliary circuits	10
Main circuits	12
Special applications	14
Accessories	
Coupling devices	22
Measuring instruments	23
Gateways	24
EDS insulation fault location system	
Insulation monitoring devices with locating current injector	26
ISOSCAN® Insulation fault locators	28
Portable equipment for insulation fault location	30
Communication solutions	32
Retrofits	34
Service	35
POWERSCOUT®	36



+ - + - + -
- + - + - + - + - +
+ - + - + - + - + -
- + - + - + - + - +
+ - + - + - + - + -

Continuous monitoring of unearthed power supplies



Reporting critical operating states to avoid unwanted events, such as interruptions to operation, costly damage to property or even physical injuries.

Safe power supply

To ensure electrical safety for man and machine in an efficient way on a long-term basis, Bender offers insulation monitoring devices for all key industries. In particular, these devices are used anywhere where a safe power supply is an essential requirement to prevent installation failure, eliminate the risk of serious or fatal injuries and avoid damage to property.

Top-level productivity and maximum safety for man and machine

With Bender insulation monitoring devices for unearthed power supplies (IT systems) you are already using state-of-the-art technology in terms of reliability, measurement methods and design. Along with precise measurement equipment, the ISOMETER®s provide many functions for early detection and quality assurance with user-friendly and intuitive operation, reliable evaluation and diverse communication possibilities.



Fast localisation of insulation faults

Bender insulation fault location systems enable fast localisation and elimination of insulation faults even during operation. Disconnection of the installation is not required. Portable Bender solutions facilitate the use in large installations with sub-distributions.

For more than 75 years, Bender has been a name for advanced technology using the latest "Made in Germany" measurement equipment and outstanding technical expertise. Trust the technology from the inventor of the ISOMETER®!

Standard-compliant solutions for

- Photovoltaic systems
- Installations with a low-resistance insulation level
- Deenergised loads
- Mobile generators
- Railway, rolling stock



For increased operational reliability and safety of the installation: unearthed power supply systems (IT systems)

Modern power supplies require maximum availability, safety and predictive information

Given the wide variety of production processes, continuous competitive pressure, the impact of soaring costs and operational availability around the clock, the maximum possible level of electrical safety for power supplies is required. Even with careful planning, execution and maintenance, electrical installations may nevertheless be impaired by factors such as humidity, ageing, dirt, mechanical damage, to mention but a few. Undetected insulation faults can be disastrous and costly, especially when factors such as production failure, repairs, device replacement or even unplanned service work are counted.

The aim: reduce costs – increase availability

The aim of every plant operator should be to detect malfunctions at an early stage and eliminate the causes economically in order to achieve optimal installation and operational reliability and ultimately reduce costs significantly. To achieve this objective, a possible solution is the use of unearthed power supplies (IT systems) with insulation monitoring.



In IT systems, none of the active conductors is directly connected to earth. Therefore, on the occurrence of an insulation fault, only a small leakage current, essentially caused by system leakage capacitances, can flow. The upstream fuse does not trip, hence continuous power supply and operation is ensured. Prompt information about possible hazards is given by the ISOMETER®, which continuously monitors the insulation resistance between the system and earth.

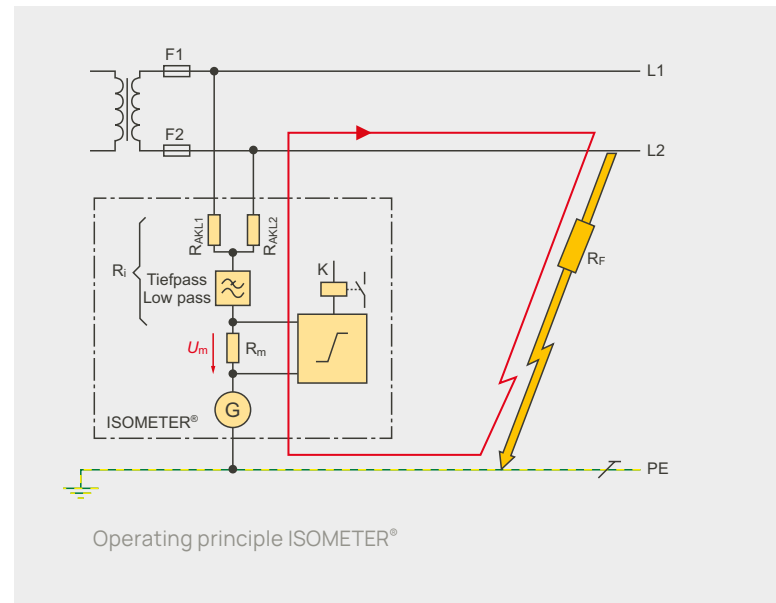


ISOMETER®:

a wide variety of solutions for all types of IT systems

For the whole range of electrical power supplies, Bender provides appropriate solutions for most applications. Taking all types of system structures and loads into account, ISOMETER®s using Bender's patented measuring principles guarantee reliable evaluation of the insulation resistance for:

- Nominal system voltages AC, DC or AC/DC up to 15.5 kV
- System types 1ph, 3ph, deenergised loads
- System leakage capacitances up to 4000 μF
- Response values in various device variants from 10 Ω to 3 G Ω



IT systems – information ahead of time

ISOMETER®s in IT systems are an effective means of damage prevention, they enable increased productivity and optimised maintenance, which in turn lead to considerable reduction in costs. Bender's wide range of products allows the implementation of individual safety solutions and safeguards your investment.



Optimised maintenance

- Early detection and reporting of insulation degradation
- Automatic localisation of faulty current paths
- Optimised use of time and personnel resources
- Centralised information about the installation status
- Remote diagnosis via Internet/Ethernet



Increased fire protection

- Early detection of gradually developing insulation faults
- Minimising fault arcs as a common cause of fire
- Separating areas prone to explosions and fire from the rest of the system via isolating transformers and monitoring these areas separately



Improved economic efficiency

- Avoiding expensive and unplanned installation shutdowns
- Reducing time and staff expenses for maintenance
- Detecting weak points in installations
- Support of investment decisions



Increased operational reliability

- No interruption to operation at the first fault
- No control malfunction in the event of insulation faults
- Electrical installations are kept at a high level of availability
- Monitoring electrical installations and loads even when not in operation



Enhanced accident prevention

- Low touch currents in small and medium-sized installations
- No malfunction in control systems of installations and machines due to an earth fault



Higher earthing resistances

- Higher earthing resistances permissible, for example, for mobile power supplies

High installation availability in main circuits

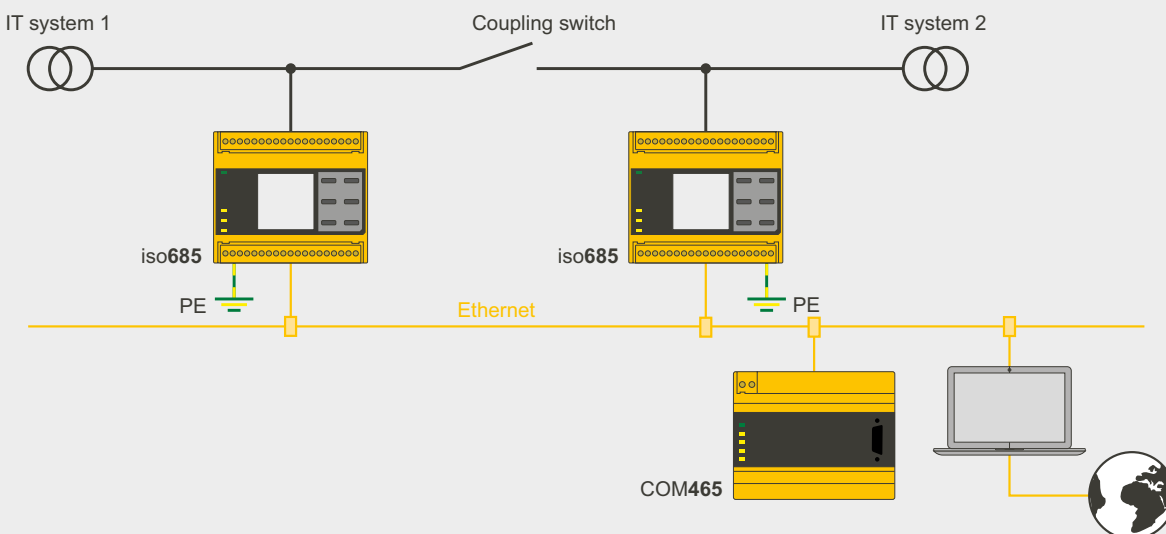
Product							
		ISOMETER® iso685-...	ISOMETER® iso685-...-B	ISOMETER® iso685-...-P	ISOMETER® isoNAV685-D	ISOMETER® isoNAV685-D-B	ISOMETER® isoHR685W-...-B
Special applications					Quick response to combined resistance and offset voltage measurement	Deenergised loads/ frequency converters	High-resistance insulation measurement
Circuits	Control circuits	✓	✓	✓	✓	✓	✓
	Auxiliary circuits	✓	✓	✓	✓	✓	✓
	Main circuits	✓	✓	✓	✓	✓	✓
Voltage system	3(N)AC	✓	✓	✓	✓	✓	✓
	AC	✓	✓	✓	✓	✓	✓
	AC/DC	✓	✓	✓	✓	✓	✓
	DC	✓	✓	✓	—	✓	✓
Nominal system voltage U_n		AC, 3(N) AC 0...690 V DC 0...1000 V	AC, 3(N) AC 0...690 V DC 0...1000 V	AC, 3(N) AC 0...690 V DC 0...1000 V	AC, 3(N) AC 0...690 V (60 Hz)	AC 0...690 V DC 0...1000 V	AC 0...1000 V3 AC 0...690 V DC 0...1300 V
Tolerance of U_n		+15 %	+15 %	+15 %	+15 %	—	+15 %
System leakage capacitance C_e μ F		≤ 1000	≤ 1000	≤ 1000	≤ 1000	≤ 1000	≤ 1000
Response value R_{an} k Ω		1...10000	1...10000	1...10000	1...10000	1...10000	1...3000000
Coupled systems		—	✓	✓	—	—	✓
Locating current injector for insulation fault location		—	—	✓	—	—	—
Mounting	DIN rail	✓	✓	✓	✓	✓	✓
	Screw mounting	✓	✓	✓	✓	✓	✓
	Panel mounting/wall fastening	✓	✓	✓	—	—	✓
Interface	Web server	✓	✓	✓	✓	✓	✓
	Modbus	TCP/RTU	TCP/RTU	TCP/RTU	TCP	TCP	TCP
	BCOM	✓	✓	✓	✓	✓	✓
	BS	✓	✓	✓	✓	✓	✓
	isoData	✓	✓	✓	—	—	✓

Ordering information




Supply voltage U_s	Nominal system voltage U_n	Panel mounting	Option "W" ¹⁾	Type	Art. No.
AC 24...240 V; 50...400 Hz/DC 24...240 V	AC, 3(N) AC 0...690 V; 1...460 Hz/ DC 0...1000 V	—	—	iso685-D	B91067010
		—	-40...+70 °C, 3K23, 3M12	iso685W-D ¹⁾	B91067010W
		✓	—	iso685-S + FP200	B91067210
		—	-40...+70 °C, 3K23, 3M12	iso685W-S + FP200W ¹⁾	B91067210W
		—	—	iso685-D-B	B91067020
		—	-40...+70 °C, 3K23, 3M12	iso685W-D-B ¹⁾	B91067020W
		✓	—	iso685-S-B + FP200	B91067220
		—	-40...+70 °C, 3K23, 3M12	iso685W-S-B + FP200W ¹⁾	B91067220W
		—	—	iso685-D-P	B91067030
		—	-40...+70 °C, 3K23, 3M12	iso685W-D-P ¹⁾	B91067030W
		✓	—	iso685-S-P + FP200	B91067230
		—	-40...+70 °C, 3K23, 3M12	iso685W-S-P + FP200W ¹⁾	B91067230W
	AC, 3(N)AC 0... 690 V (60 Hz)	—	—	isoNAV685-D	B91067014
	AC 0...690 V, DC 0...1000 V	—	—	isoNAV685-D-B	B91067024
	AC 0...1000 V, 3AC 0...690 V, DC 0...1300 V	—	-40...+70 °C, 3K23, 3M12	isoHR685W-D-I-B ¹⁾	B91067025W
		✓	-40...+70 °C, 3K23, 3M12	isoHR685W-S-I-B + FP200W ¹⁾	B91067225W

1) Increased shock and vibration resistance 3K23 and 3M12

Application example for coupled systems



Maximum operational reliability in control and auxiliary circuits

Product				
		ISOMETER® iso415R	ISOMETER® IR420-D4	ISOMETER® IR425
Circuits	Control circuits	✓	✓	✓
	Main circuits	—	—	—
Voltage system	3(N)AC	✓	—	—
	AC	✓	✓	✓
	AC/DC	✓	—	✓
	DC	✓	—	✓
Nominal system voltage U_n		3(N)AC, AC 0...415 V/DC 0...400 V	AC 0...300 V	AC/DC 0...300 V
Frequency range f_n		DC 42...460 Hz	AC 42...460 Hz	DC, AC 15...460 Hz
System leakage capacitance C_e		≤ 25 µF	≤ 20 µF	≤ 20 µF
Response value	Response value R_{an}	5...1000 kΩ	1...200 kΩ	1...200 kΩ
	Alarm contacts	1 changeover contact	2 changeover contacts	2 changeover contacts
	Operating principle	N/O or N/C operation	N/O or N/C operation	N/O or N/C operation
	Response time t_{an} (at $R_F = 0.5 \times R_{an}$ and $C_e = 1 \mu F$)	≤ 6 s	≤ 1 s	≤ 2 s
	Start-up delay t	0...1800 s	0...10 s	0...10 s
	Response delay t_{on}	0...1800 s	0...99 s	0...99 s
Display	LC display	—	✓	✓
	Power On LED	✓	✓	✓
	Alarm LEDs	✓	✓	✓
Mounting	DIN rail	✓	✓	✓
	Screw mounting	✓	✓	✓

Ordering information

Nominal voltage U_n	Supply voltage U_s ¹⁾	Type	Art. No.	
			Screw-type terminal	Push-wire terminal
3(N)AC, AC 0...415 V / DC 0...400 V / AC/DC 100 ... 240 V	DC 24 V (unearthed) AC/DC 70 ... 276 V	iso415R-24	—	B71602000
		iso415R-2	—	B71603000
AC 0...300 V, 42...460 Hz	AC 16...72 V, 42...460 Hz/DC 9.6...94 V	IR420-D4-1	B91016409	B71016409
		IR420-D4-2	B91016405	B71016405
AC/DC 0...300 V, 15...460 Hz	AC 16...72 V, 15...460 Hz/DC 9.6...94 V	IR425-D4-1	B91036403	B71036403
		IR425-D4-2	B91036402	B71036402

¹⁾ Absolute values

Accessories (for IR42x only)

Description	Art. No.
Mounting clip for screw mounting (1 piece per device)	B98060008

In localised areas, such as machine control systems or safety lighting where space is limited, control and auxiliary circuits provide additional functions, e.g. command output, interlocking, signalling and measuring. Operational reliability is the main focus of these circuits. Control circuits are restricted in terms of space, e.g. machine controls, safety lighting.

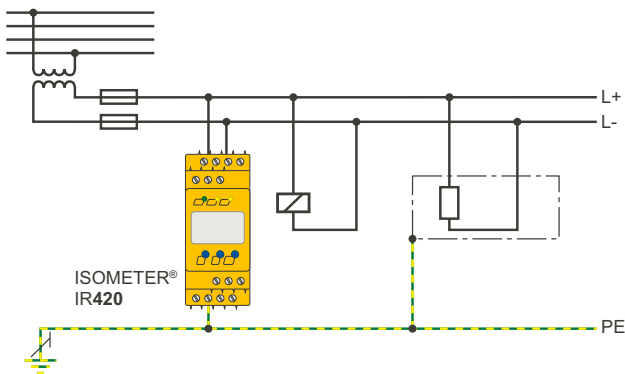


Bender Connect App

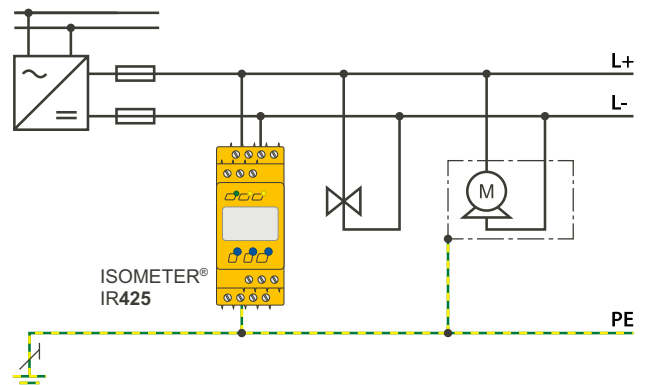
The Bender Connect App is a straightforward solution that allows you to conveniently parameterise our latest devices.

- Reading in energised state
- Parameter setting in deenergised state
- Device documentation
(PDF documentation of the set parameters)
- Backup of the devices

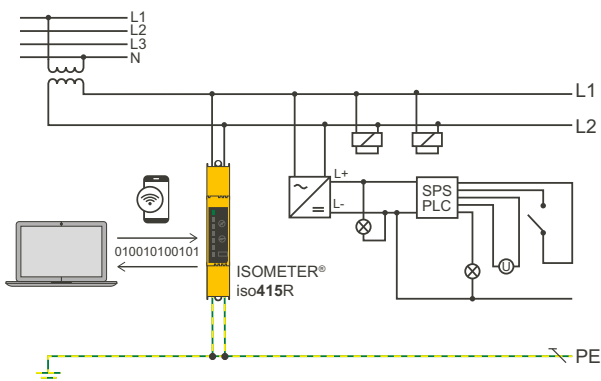
Application examples



AC control circuit with IR420






DC control circuit with IR425



AC/DC control circuit with iso415R-2

High installation availability in main circuits

Product		 ISOMETER®iso1685DP	 ISOMETER®isoHV1685D	 ISOMETER®isoLR1685DP
Circuits	Control circuits	—	—	—
	Main circuits	✓	✓	✓
Voltage system	3(N)AC	—	—	—
	AC	✓	✓	✓
	AC/DC	✓	✓	✓
	DC	✓	✓	✓
Nominal system voltage U_n		AC 0...1000 V, DC 0...1500 V	AC 0...2000 V, DC 0...3000 V	AC 0...690 V, DC 0...690 V
Tolerance of U_n		+10 %, +5%	+10 %, +5%	+10 %, +5%
System leakage capacitance C_g μ F		≤ 2000	≤ 2000	≤ 2000
Response value R_{an} k Ω		200 Ω ...1 M Ω	200...1000	20...100
Coupled systems		✓	✓	✓
Mounting	DIN rail	—	—	—
	Screw mounting	✓	✓	✓
Interface	Modbus	RTU	RTU	RTU
	BMS	✓	✓	✓
	isoData	—	—	—

Ordering information

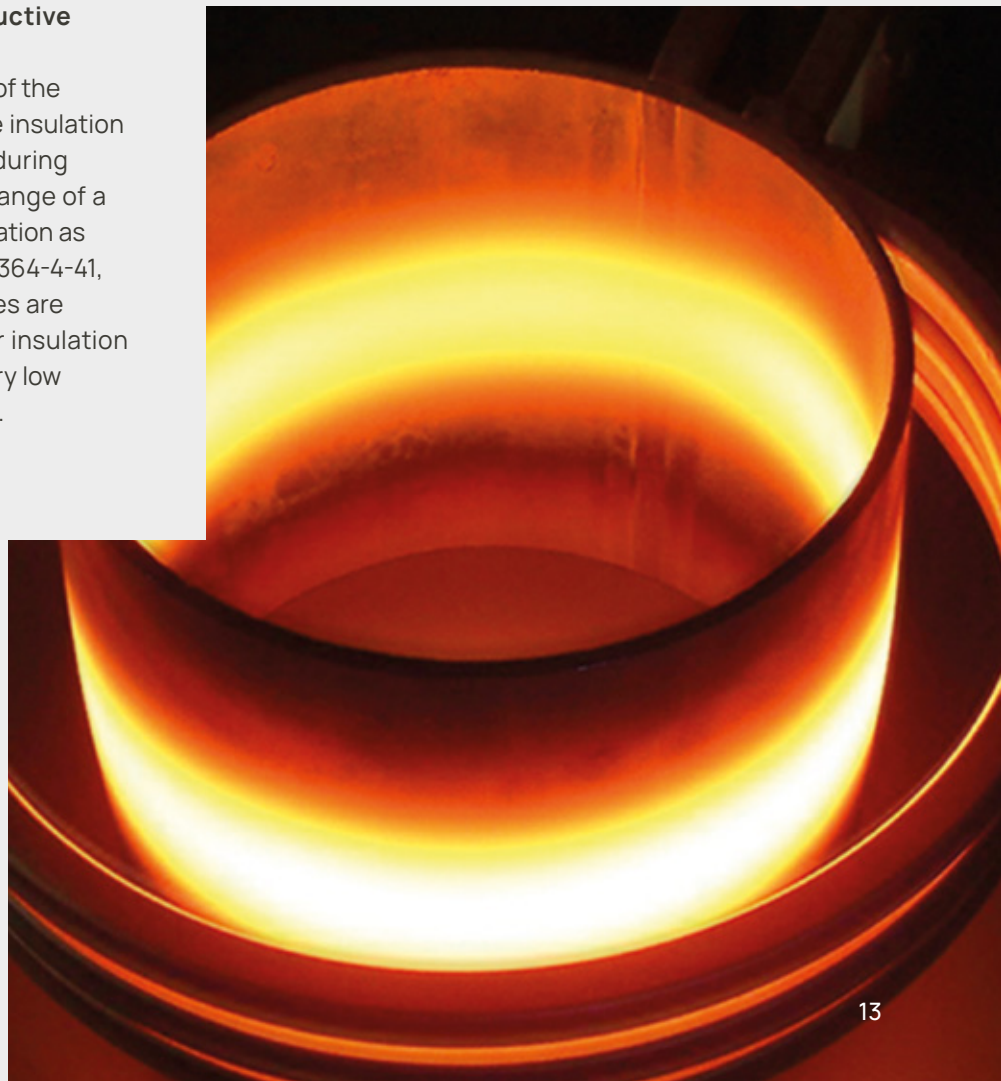
Supply voltage U_s ¹⁾	Response value range	Nominal voltage U_n	Version	Type	Art. No.
DC 18...30 V	200 Ω ...1 M Ω	AC 0...1000 V/ DC 0...1500 V	—	iso1685DP-425	B91065802
		AC 0...2000 V/ DC 0...3000 V	—	isoHV1685D-425	B91065805
	20 Ω ...100 k Ω	AC 0...690 V/ DC 0...690 V	—	isoLR1685DP-325	B91065803

¹⁾ Absolute values



Main circuits provide the power supply for electrical installations or buildings. These circuits include equipment for generating, converting, distributing, switching and consuming electrical energy. A distinction should be made between the following loads: pure AC loads (e.g. motors), AC/DC loads containing electronic components (e.g. converters) and pure DC loads (e.g. battery systems).

Insulation monitoring devices for inductive heating

Due to the water cooling and the design of the inductor, experience has shown that the insulation resistance of the systems is rather low during inductive heating and often lies in the range of a few 10 Ω to a few k Ω . To monitor the insulation as recommended in VDE0100-410 or IEC 60364-4-41, appropriate insulation monitoring devices are required for these applications. We offer insulation monitoring devices that can measure very low resistance levels, such as the isoLR1685.



Detecting faults at an early stage in special applications

Photovoltaic systems					
		ISOMETER® isoPV	ISOMETER® isoPV425	ISOMETER® isoPV1685RTU	ISOMETER® isoPV1685DP
Circuits	Control circuits	—	—	—	—
	Main circuits	✓	✓	✓	✓
Voltage system	3(N)AC	✓	—	—	—
	AC	✓	✓	—	—
	AC/DC	✓	✓	—	—
	DC	✓	✓	✓	✓
Nominal system voltage U_n		via AGH-PV 3(N)AC 0...793 V DC 0...1000 V	DC 0...1000 V AC 0...690 V, 15...460 Hz	DC 0...1500 V	DC 0...1500 V
Tolerance of U_n		+ 10 %	+ 15 %	+ 6 %	+ 6 %
System leakage capacitance C_g μ F		≤ 2000	≤ 500	≤ 2000	≤ 2000
Response value R_{an} k Ω		0.2...100	1...990	0.2...990	0.2...990
Mounting	DIN rail	✓	✓	—	—
	Screw mounting	✓	✓	✓	✓
Interface	Modbus	—	RTU	RTU	—
	BMS	✓	✓	✓	✓
	isoData	—	✓	—	—

Ordering information

Nominal system voltage U_n	Supply voltage U_s ¹⁾	Type	Art. No.
AC 0...793 V/DC 0...1100 V	DC 19.2...72 V	isoPV-327 + AGH-PV consisting of: isoPV-327 (B9106 5130W), AGH-PV (B98039020W)	B91065132W
AC 0...793 V/DC 0...1100 V	AC 88...264 V/DC 77...286 V	isoPV-335 + AGH-PV consisting of: isoPV-335 (B91065131W), AGH-PV (B98039020W)	B91065133W
AC 0...690 V/DC 0...1000 V	AC 100...240 V, 47...63 Hz/ DC 24...240 V	isoPV425-D4-2 with AGH420	B71036303 ²⁾
DC 0...1500 V	DC 18...30 V	isoPV1685RTU-425	B91065603
		isoPV1685P-425	B91065604

¹⁾ Absolute values

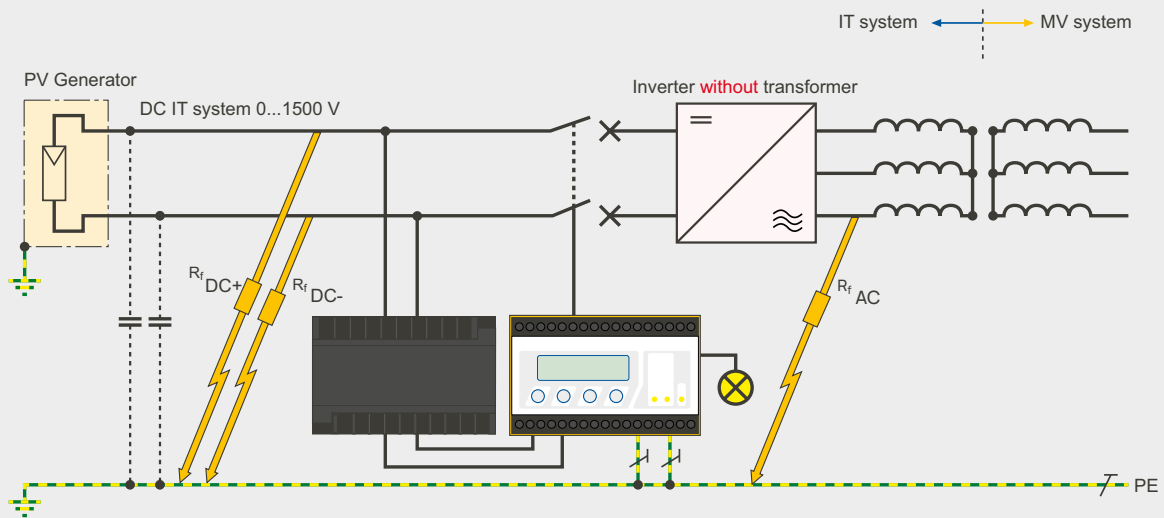
²⁾ Device version with screw-type terminals on request

The modern insulation monitoring devices of the ISOMETER® series from Bender can be used to measure and visualise insulation resistance over time. This metrological monitoring gives operators of large-scale photovoltaic systems a head start in terms of information before a critical state occurs. ISOMETER® as an adaptive measuring system for insulation monitoring thus offers a safe, standard-compliant and simple solution for detecting problems throughout the entire service life of PV systems.

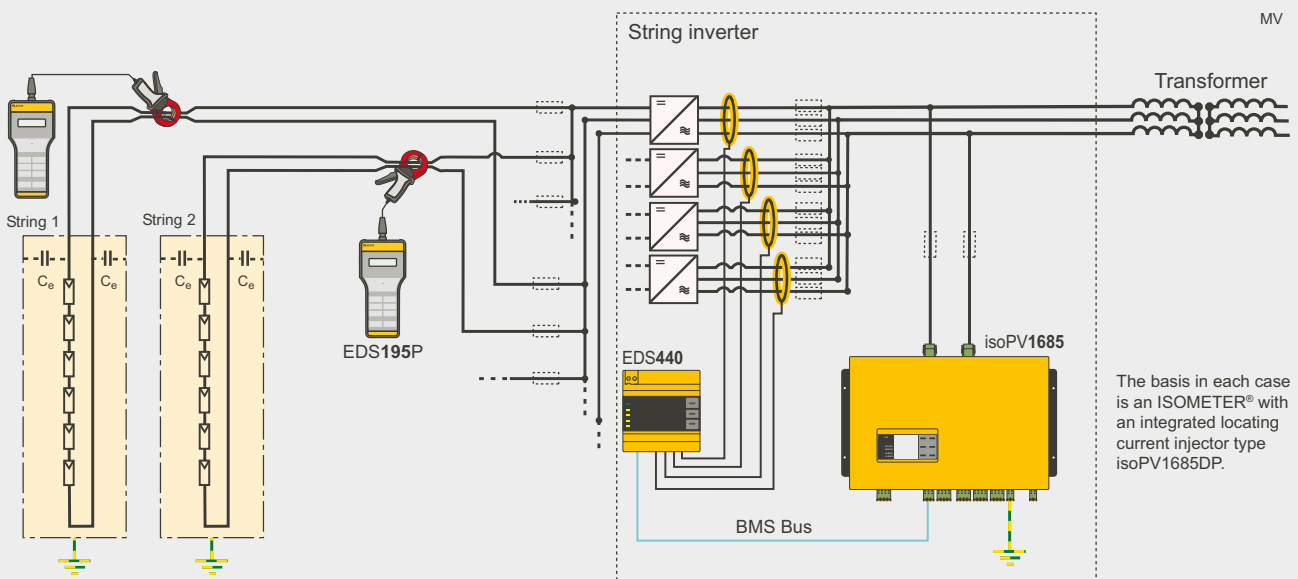
Standard-compliant solutions for renewables, such as

- Photovoltaic systems
- Wind power stations
- Hydroelectric power plants
- Pumped-storage power plants
- Hydrogen electrolysis
- and many more

Application examples







Unearthed PV generator (IT system) with nominal voltage ≤ DC 1100 V and ISOMETER® isoPV with coupling device AGH-PV



Principle of a photovoltaic system with insulation monitoring and manual/automatic insulation fault location



Special applications

Products	Insulated elevating work platforms	AC, DC or AC/DC medium voltage systems	Installations with a low-resistance insulation level	Deenergised loads
				
	ISOMETER® isoHR1685DW	ISOMETER® IRDH275BM-7	ISOMETER® isoLR275	ISOMETER® IR420-D6
Main circuits	✓	✓	✓	✓
Voltage system	3(N)AC	—	✓	✓
	AC	✓	—	✓
	AC/DC	✓	✓	—
	DC	✓	✓	—
Nominal system voltage U_n	AC 0...1000 V, DC 0...1500 V	AC, 3(N)AC, DC 0...15.5 kV (absolute)	via AGH-LR 3(N)AC 0...690 V DC 0...1000 V	AC 0...400 V
Tolerance U_n	+10 %, +5%	+ 15 %	+ 15 % + 10 %	—
System leakage capacitance C_e μ F	≤ 1	≤ 5	≤ 500	≤ 10
Response value R_{an} k Ω	100...1000	100...10000	0.2...100	100...10000
Coupled systems	✓	—	—	—
Mounting	DIN rail	—	✓	✓
	Screw mounting	✓	✓	✓
Interface	Modbus	RTU	—	—
	BMS	✓	✓	✓
	isoData	—	✓	—

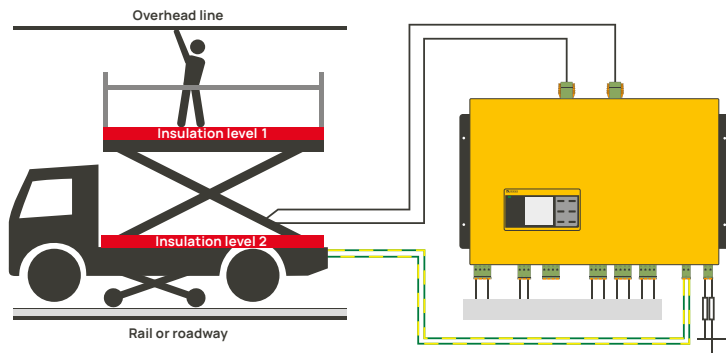
Ordering information

Nominal system voltage U_n	Supply voltage U_s ¹⁾	Type	Art. No.
AC 0...1000 V/DC 0...1500 V	DC 18...30 V	isoHR1685DW-925	B91065806W
—	AC 19.2...72 V	IRDH275BM-7	B91065120
AC 0...793 V/DC 0...1100 V	DC 19.2...72 V	isoLR275-327 + AGH-LR-3 consisting of: isoLR275-327 (B91065700W), AGH-LR-3 (B98039022W)	B91065702W
	AC 88...264 V/DC 77...286 V	isoLR275-335 + AGH-LR-3 consisting of: isoLR275-335 (B91065701W), AGH-LR-3 (B98039022W)	B91065703W
—	AC 16...72 V, 42...460 Hz/DC 9.6...94 V	IR420-D6-1	B71016415 ²⁾
	AC 70...300 V, 42...460 Hz/DC 70...300 V	IR420-D6-2	B71016407 ²⁾
		IR420-D64-2	B71016408 ²⁾
AC 24...240 V, 47...63 Hz/ DC 24...240 V	AC 12...120 V	isoUG425-D4-4	B71036320
	AC/DC 0...400 V, 15...460 Hz	isoES425-D4-4	B71037020

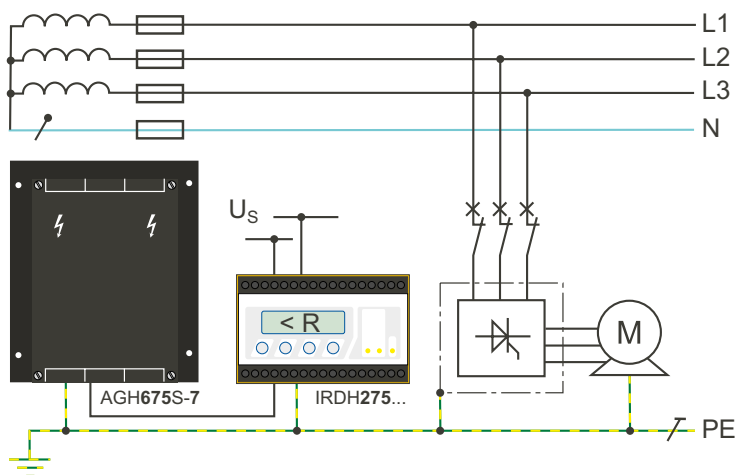
¹⁾ Absolute values ²⁾ Device version with screw-type terminals on request

Unearthed DC systems	Energy storage VDE-AR-E 2510-2
	
ISOMETER® isoUG425	ISOMETER® isoES425
✓	✓
—	—
—	✓
—	✓
✓	✓
DC 12...120 V	3 (N) AC, AC 0...400 V, DC 0...400 V
+20 %	+25 %
≤ 50	≤ 100
2...100	2...990
—	—
✓	✓
✓	✓
RTU	—
✓	✓
✓	✓

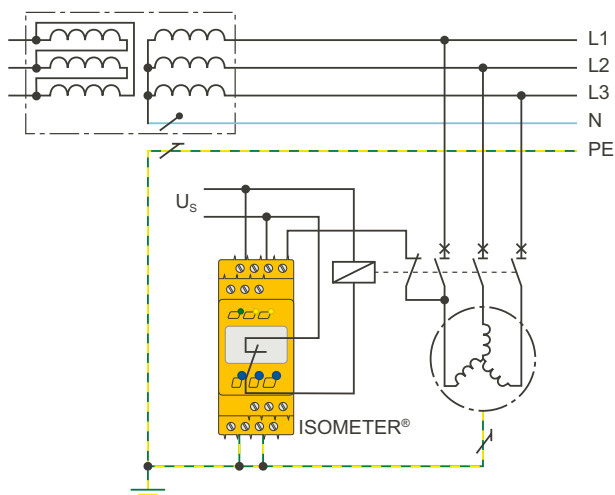
Application example



Continuous monitoring of the insulation levels of overhead catenary maintenance vehicles with isoHR1685DW






Monitoring of medium-voltage drives with IRDH275... and coupling device AGH675S-7



Monitoring of deenergised loads with IR420-D6 (offline)

Special applications

Products	Mobile generators	Mobile generators	Generators acc. to standard DIN VDE 0100-551
			
	ISOMETER® IR423	ISOMETER® IR123P	ISOMETER® isoGEN423
Main circuits	✓	✓	✓
Voltage system	3(N)AC	—	✓
	AC	✓	✓
	AC/DC	—	✓
	DC	—	✓
Nominal system voltage U_n	AC 0...300 V	AC 100...250 V	3(N)AC, AC 0...400 V, DC 0...400 V
Tolerance U_n	+ 20 %	+ 20 %	+25 %
System leakage capacitance C_e μF	≤ 5	≤ 1	≤ 5
Response value R_{an} kΩ	1...200	46/23	5...200
System isolation function	—	—	✓
Mounting	DIN rail	—	✓
	Screw mounting	✓	✓
Interface	Modbus	—	RTU
	BMS	—	✓
	isoData	—	✓

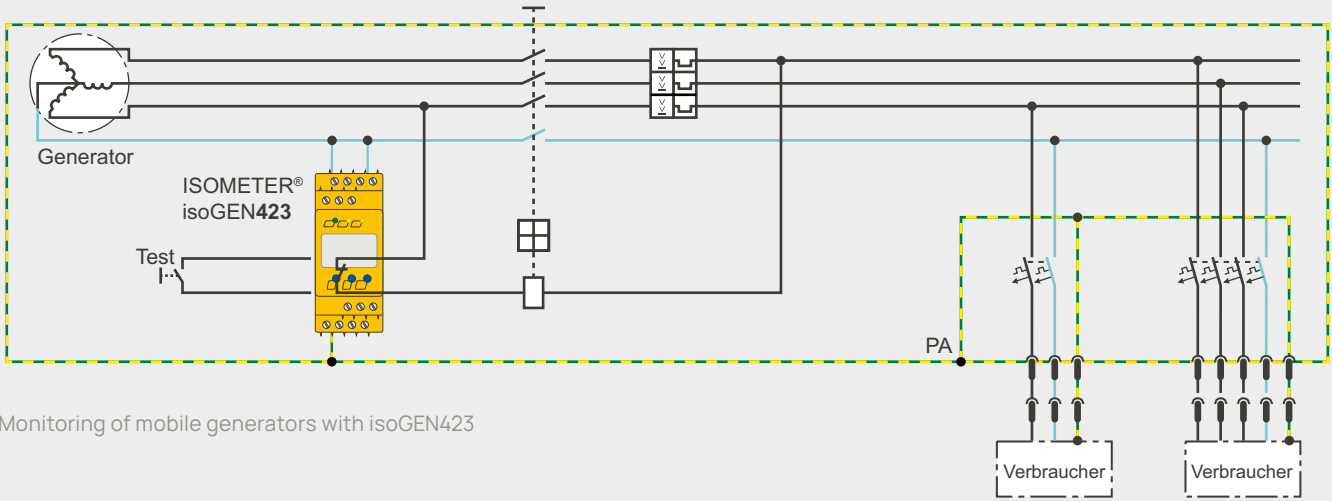
Ordering information

Nominal system voltage U_n	Supply voltage U_s ¹⁾	Type	Art. No.
AC 0...300 V	AC 16...72 V, 30...460 Hz/ DC 9.6...94 V	IR423-D4-1	B71016304 ²⁾
	AC/DC 70...300 V, 30...460 Hz	IR423-D4-2	B71016305 ²⁾
	AC 16...72 V, 30...460 Hz/ DC 9.6...94 V	IR423-D4W-1	B71016304W ²⁾
	AC/DC 70...300 V, 30...460 Hz	IR423-D4W-2	B71016305W ²⁾
AC 100...300 V, 22...460 Hz	$U_s = U_n$	IR123P-4-2	B91016308
AC 24...240 V, 47...63 Hz/ DC 24...240 V	AC 12...120 V	isoUG425-D4-4	B71036320
	AC/DC 0...400 V, 15...460 Hz	isoES425-D4-4	B71037020
AC 100...240 V/ DC 24...240 V	3(N)AC, AC 0...400 V/DC 0...400 V	isoGEN423-D4-4	B71036325

¹⁾ Absolute values

²⁾ Device version with screw-type terminals on request





Application example



Monitoring of mobile generators with isoGEN423



Special applications

Railway, rolling stock					
		ISOMETER® isoRW425	ISOMETER® isoRW685W-D	ISOMETER® isoRW685W-D-B	ISOMETER® isoHV425
Circuits	Control circuits	—	✓	✓	—
	Auxiliary circuits	—	✓	✓	—
	Main circuits	✓	✓	✓	✓
Voltage system	3(N)AC	✓	✓	✓	✓
	AC	✓	✓	✓	✓
	AC/DC	✓	✓	✓	✓
	DC	✓	✓	✓	✓
Nominal system voltage U_n		3(N)AC, AC/DC 0...440 V	3(N)AC, AC 0...690 V DC 0...1000 V	3(N)AC, AC 0...690 V DC 0...1000 V	with AGH422 AC 0...1000 V DC 0...1000 V
Tolerance U_n		+15 %	+15 %	+15 %	+10 %
System leakage capacitance C_e μ F		≤ 300	≤ 1000	≤ 1000	≤ 150
Response value R_{an} k Ω		1...990	1...10000	1...10000	10...500
System isolation function		—	—	✓	✓
Mounting	DIN rail	✓	✓	✓	✓
	Screw mounting	✓	✓	✓	✓
Interface	Web server	—	✓	✓	✓
	Modbus	RTU	TCP/RTU	TCP/RTU	RTU
	BCOM	—	✓	✓	✓
	BS	—	✓	✓	✓
	BMS	✓	—	—	✓
	isoData	✓	✓	✓	✓

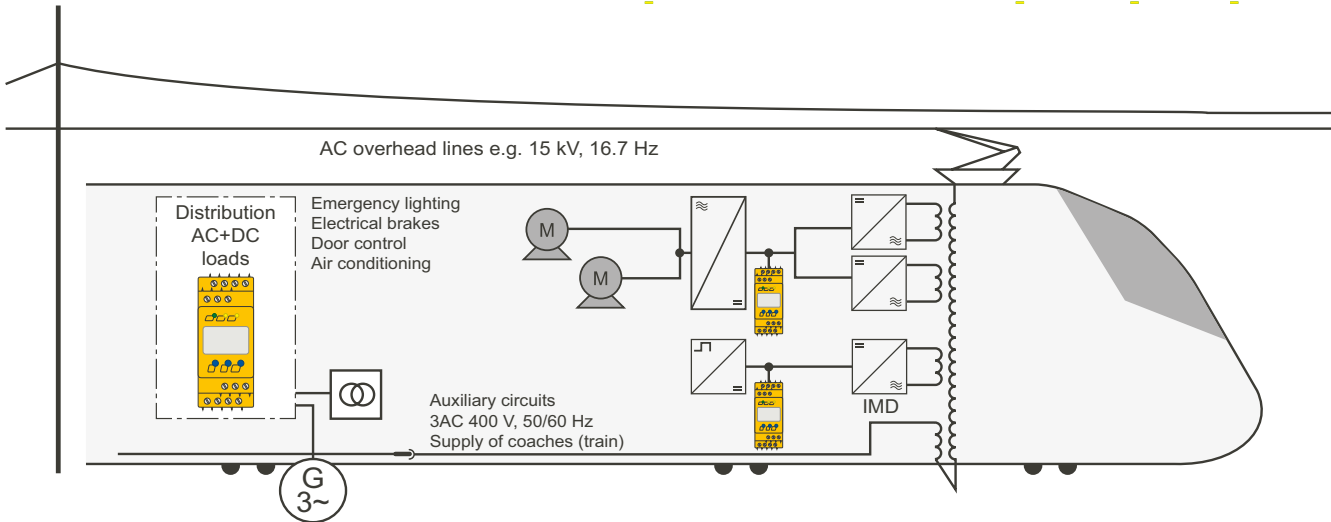
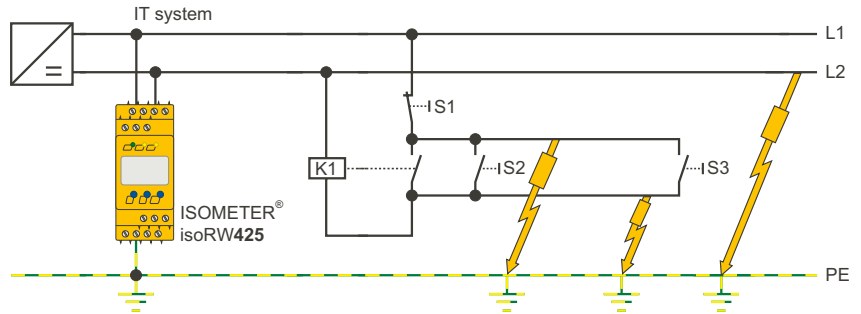
Ordering information

Supply voltage U_s ¹⁾	Nominal system voltage U_n	System leakage capacitance C_e	Type	Art. No.
AC 100...240 V / DC 24...240 V	3(N)AC, AC/DC 0...440 V	$< 300 \mu$ F	isoRW425-D4W-4	B71037000W ²⁾
AC 24...240 V, 50...400 Hz/DC 24...240 V	AC 0...690 V, 1...460 Hz/DC 0...1000 V	$\leq 1000 \mu$ F	isoRW685W-D	B91067012W
AC 24...240 V, 50...400 Hz/DC 24...240 V	AC 0...690 V, 0.1...460 Hz/DC 0...1000 V	$\leq 1000 \mu$ F	isoRW685W-D-B	B91067022W
AC 100...240 V, 47...63 Hz/ DC 24...240 V	3(N)AC, AC 0...1000 V	150 μ F	isoHV425W-D4-4 with AGH422W	B71036501W

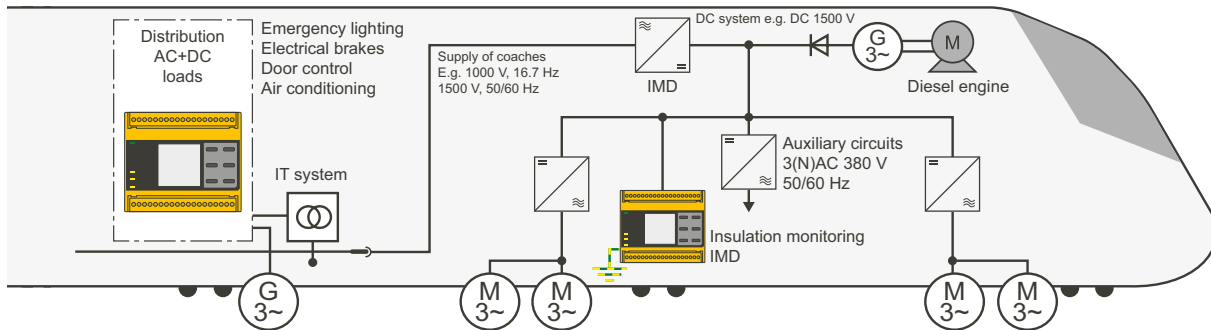
¹⁾ Absolute values ²⁾ Device version with screw-type terminals on request

Application examples

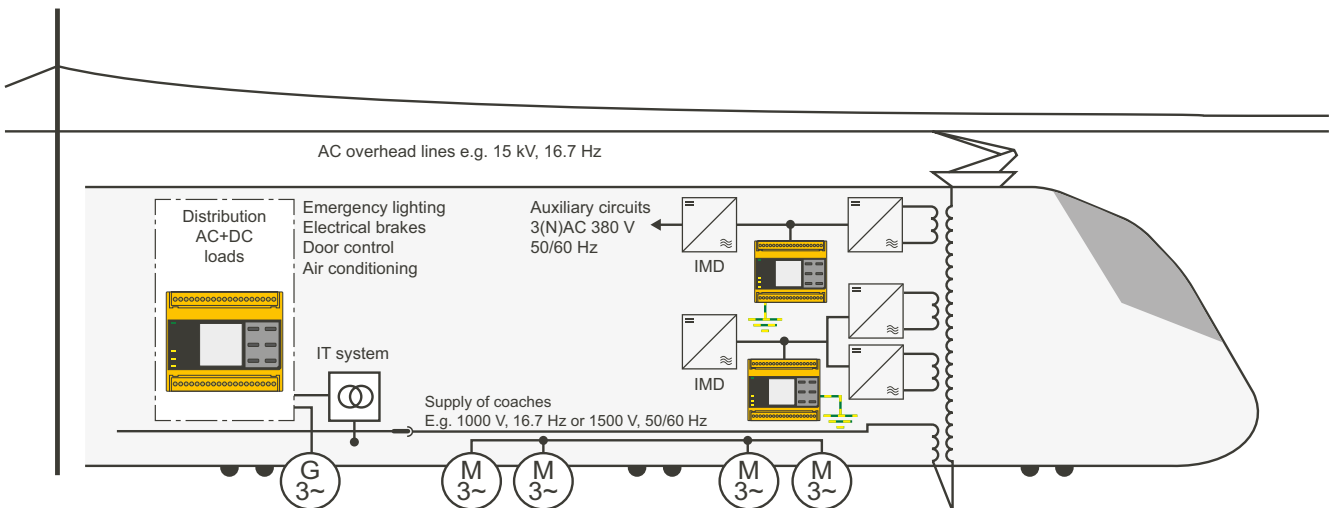
Monitoring of the complete IT system
 ≤ 400 V with isoRW425



Universal use of the isoRW425 for IT systems ≤ 400 V









Universal use of the isoRW685 for IT systems > 400 V



Universal use of the isoRW685 for IT systems > 400 V





Accessories

Coupling devices							
		AGH150W-4	AGH204S-4	AGH520S	AGH676S-4	AGH675S-7	AGH675S-7MV
Application		Nominal voltage extension for ISOMETER®s					
Nominal system voltage U_n		AC 0...1150 V, DC 0...1760 V	AC 0...1300 V/ AC 0...1650 V	AC/3(N)AC 0...7200 V	AC/3(N)AC 0...12000 V	AC, 3(N)AC, DC 0...7200 V	AC, 3(N)AC, DC 0...15500 V
For device family	IRDH275BM-7	—	—	—	—	✓	✓
	IR420-D64	—	—	—	✓	—	—
	iso685-D	✓	✓	✓	✓	—	—
	iso685-S	✓	✓	✓	✓	—	—

Ordering information

Nominal system voltage U_s	Type	Art. No.
AC 0...1150 V/DC 0...1760 V	AGH150W-4	B98018006
AC 0...1650 V/0...1300 V	AGH204S-4	B914013
3(N)AC 0...7200 V	AGH520S	B913033
AC, 3(N)AC, DC 0...7.2 kV, 0...460 Hz	AGH675S-7-500	B913060
	AGH675S-7-2000	B913061
AC, 3(N)AC, DC 0...15.5 kV, 0...460 Hz	AGH675S-7MV15-500	B913058
AC/ 3(N)AC 0...12 kV, 50...460 Hz	AGH676S-4	B913055







Measuring instruments	 7204	 7220	 9604	 9620
Input current	0...400 μ A	0...20 mA	0...400 μ A	0...20 mA
Dimensions (mm)	72 x 72	72 x 72	96 x 96	96 x 96
For device family iso685...	✓	✓	✓	✓

Ordering information

Scale	Input current	Dimensions	Midscale	Type	Art. No.
Sector	0...400 μ A	72 x 72 mm	120 k Ω	7204-1421	B986763
				7204S-1421	B986804
		96 x 96 mm	120 k Ω	9604-1421	B986764
				9604S-1421	B986784
	0...20 mA	96 x 96 mm	120 k Ω	9620-1421	B986841
				9620S-1421	B986842
0...400 μ A	96 x 96 mm	1.2 M Ω	9604-1621	B986782	
			0...20 mA	72 x 72 mm	120 k Ω
7220S-1421	B986848				

Accessories

Gateway					
		COMTRAXX® COM465IP	COMTRAXX® COM465DP	COMTRAXX® COM465ID	COMTRAXX® CP9...-I
Application		Condition monitor/ gateway	Condition Monitor/ PROFIBUS gateway	Condition Monitor/ gateway	Condition Monitor/ gateway
Functions	Protocol input	BMS / BCOM / Modbus RTU/TCP	BMS / BCOM / Modbus RTU/TCP	isoData/Modbus TCP	BMS (internal) / BCOM / Modbus RTU/TCP
	Protocol output	Ethernet / Modbus RTU/ TCP / SNMP / PROFINET	Ethernet / Modbus RTU/ TCP / SNMP / PROFINET / PROFIBUS DP	Ethernet/Modbus TCP/ OPC-UA	Ethernet / Modbus RTU/ TCP / SNMP / PROFINET
	Display	LED	LED	LED	7" or 15.6" display
	Alarm messages	✓ ^{1, 2)}	✓ ^{1, 2)}	✓ ^{1, 2)}	✓ ^{1, 2, 3)}
	Measured values	✓ ^{1, 2)}	✓ ^{1, 2)}	✓ ^{1, 2)}	✓ ^{1, 2, 3)}
	Device parameter setting	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾	✓ ^{1, 3)}
	Alarm list	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾	✓ ^{1, 3)}
	History memory	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾	✓ ^{1, 3)}
	Diagrams	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾	✓ ^{1, 3)}
	Visualisation	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾	✓ ^{1, 3)}
	E-mail notification	✓ ^{1, 4)}	✓ ^{1, 4)}	✓ ^{1, 4)}	✓ ^{1, 4)}
	Device tests	✓ ^{1, 2)}	✓ ^{1, 2)}	✓ ^{1, 2)}	✓ ^{1, 2, 3)}
	PEM... and energy meter support	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾
	SNMP	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾
	Data logger	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾	✓ ¹⁾
	Connection	BMS	Screw-type terminal	Screw-type terminal	—
Modbus RTU		Screw-type terminal	Screw-type terminal	—	Screw-type terminal
isoData		—	—	Screw-type terminal	—
Output		RJ45	RJ45, Sub-D 9-pole	RJ45	RJ45
System requirements	Supply voltage U_s	AC/DC 24...240 V	AC/DC 24...240 V	AC/DC 24...240 V	DC 24 V
	Browser	Edge, Chrome, Firefox etc.	Edge, Chrome, Firefox etc.	Edge, Chrome, Firefox etc.	Edge, Chrome, Firefox etc.

¹⁾ Available functions on the web server – accessible via a PC with a browser

²⁾ Available via the protocol

³⁾ On the device-internal LC display

⁴⁾ TLS/SSL support




Ordering information

Supply voltage/frequency range U _s	Power consumption	Type	Art. No.
AC/DC 24...240 V, 50...60 Hz	≤ 6.5 VA, ≤ 4W	COM465IP-230V	B95061065
AC/DC 24...240 V, 50...60 Hz	≤ 6.5 VA, ≤ 4W	COM465DP-230V	B95061060
AC/DC 24...240 V, 50...60 Hz	≤ 6.5 VA/≤ 4 W	COM465ID-230 V	B95061070
DC 24	≤ 15 W	CP907-I	B95061031
AC 100...240 V	≤ 30 W	CP915-I (white)	B95061033
		CP915-I (grey)	B95061034

Function modules for COM465IP and COM465DP

Application	Function module (software licence)	Art. No.
Individual text messages for all devices/ channels, device failure monitoring, e-mail in case of an alarm, device documentation	Function module A	B75061011
Data is provided via Modbus TCP and Modbus RTU, SNMP server with trap function	Function module B	B75061012
Parameter setting of all integrated devices, device backups	Function module C	B75061013
Visualisation application	Function module D	B75061014
Virtual devices	Function module E	B75061015
Integration of third-party devices	Function module F	B75061016

ISOMETER® insulation monitoring devices with locating current injector for insulation fault location

Insulation fault location systems				
		ISOMETER® iso685-...-P	ISOMETER® iso1685DP	ISOMETER® isoLR1685DP
Circuits	Control circuits	✓	—	—
	Auxiliary circuits	✓	—	—
	Main circuits	✓	✓	✓
Voltage system	3(N)AC	✓	—	—
	AC	✓	✓	✓
	AC/DC	✓	✓	✓
	DC	✓	✓	✓
Nominal system voltage U_n		AC, 3(N)AC 0...690 V DC 0...1000 V	AC 0...1000 V DC 0...1500 V	AC 0...690 V DC 0...690 V
Tolerance of U_n		+ 15 %	+10 %, +5%	+10 %, +5%
System leakage capacitance C_e μ F		≤ 1000	≤ 2000	≤ 2000
Response value R_{an} k Ω		1...10000 k Ω	200 Ω ...1 M Ω	20 Ω ...100 k Ω
Coupled systems		✓	✓	✓
Locating current injector for insulation fault location		✓	✓	✓
Mounting	DIN rail	✓	—	—
	Screw mounting	✓	✓	✓
	Panel mounting/ wall fastening	✓	—	—
Interface	Web server	✓	—	—
	Modbus	TCP	RTU	RTU
	BCOM	✓	—	—
	BS	✓	—	—
	BMS	—	✓	✓

Ordering information

Supply voltage U_s	Nominal system voltage U_n	Type	Art. No.
AC 100...240 V; 47...460 Hz / DC 24 V, 100...240 V	AC, 3(N)AC 0...690 V, DC 0...1000 V	iso685-D-P ¹⁾	B91067030
		iso685-S-P + FP200 ¹⁾	B91067230
DC 18...30 V	AC 0...1000 V/DC 0...1500 V	iso1685DP-425	B91065802
	AC 0...690 V/DC 0...690 V	isoLR1685DP-325	B91065803

¹⁾ Device variant "option W" with increased shock and vibration resistance: specify order number with "W" at the end

EDS insulation fault location systems

Fast localisation of insulation faults

Fast localisation and elimination of insulation faults is required by DIN VDE 0100-410 (VDE 0100-410). The iso685-...-P in combination with the EDS system is a modular system that solves this problem. The application areas for EDS systems are very diverse.

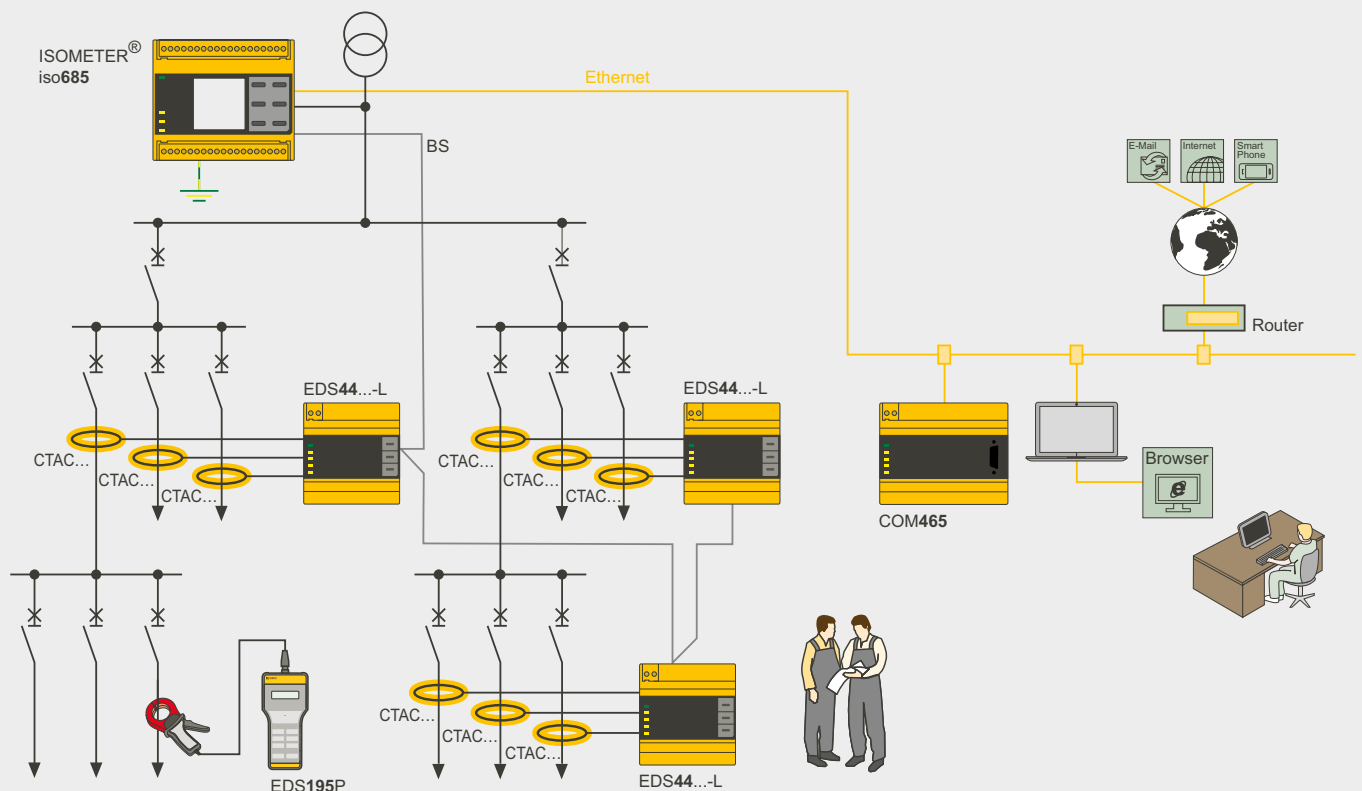
They are operated/used for **main and control circuits** e.g. in:

- Power plants
- Shipbuilding
- Traffic engineering
- Industrial plants
- Paper industry and many other areas.
- Oil and natural gas industry
- Mining, open-cast mining
- Rolling mills
- Mechanical engineering







Advantages of EDS insulation fault location systems

- Disconnection of the electrical installation is not required, insulation fault location takes place during operation
- Fast localisation of faulty circuits
- Information about the location of the fault is centrally displayed
- Combination with portable insulation fault location systems EDS3090/3090PG and EDS3091/3091PG
- Reduced maintenance and repair costs

Application example



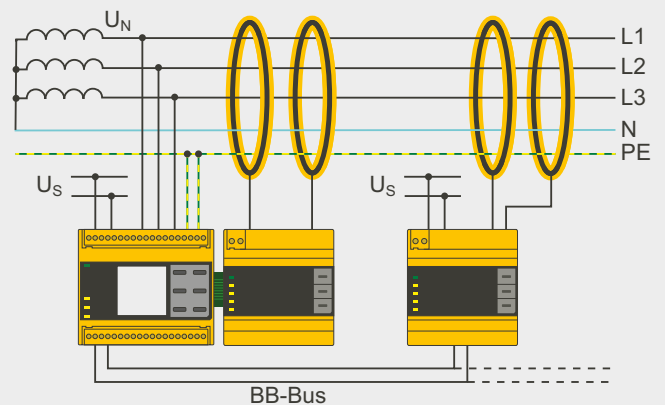
ISOSCAN® insulation fault locators

Products							
		ISOSCAN® EDS440-S	ISOSCAN® EDS440-L	ISOSCAN® EDS441-S	ISOSCAN® EDS441-L	ISOSCAN® EDS441-LAB	ISOSCAN® EDS440-LAF
Special applications		—	—	—	—	High-resistance insulation faults for high system leakage capacitance and low locating current value	Use with flexible CTAF strap current transformers
Circuits	Control circuits	—	—	✓	✓	✓	—
	Main circuits	✓	✓	—	—	—	✓
Voltage system	3(N)AC	✓	✓	—	—	—	—
	AC	✓	✓	✓	✓	✓	✓
	AC/DC	✓	✓	✓	✓	✓	✓
	DC	✓	✓	✓	✓	✓	✓
Nominal voltage U_n max		see locating current injector (e.g. iso685-D-P)	see locating current injector (e.g. iso685-D-P)	AC 20...276 V, DC 20...308 V	AC 20...276 V, DC 20...308 V	AC 20...276 V, DC 20...308 V	see locating current injector (e.g. iso685-D-P)
System leakage capacitance C_e μ F		acc. to characteristic curve	acc. to characteristic curve	acc. to characteristic curve	acc. to characteristic curve	acc. to characteristic curve	acc. to characteristic curve
Response value R_{an} k Ω		acc. to characteristic curve	acc. to characteristic curve	acc. to characteristic curve	acc. to characteristic curve	acc. to characteristic curve	acc. to characteristic curve
LED display		—	✓	—	✓	✓	✓
Mounting	DIN rail	✓	✓	✓	✓	✓	✓
	Screw mounting	✓	✓	✓	✓	✓	✓
Interface		BB	BS	BB	BS	BS	BS



Ordering information

Supply voltage U_s	Response value	LED display	Type	Art. No.
AC/DC 24...240 V	2...10 mA	—	EDS440-S-1	B91080201
		✓	EDS440-L-4	B91080202
	0.2...1 mA	—	EDS441-S	B91080204
		✓	EDS441-L-4	B91080205
		✓	EDS441-LAB-4	B91080207
		✓	EDS441-LAF-4	B91080209

Application example



ISOSCAN® insulation fault locators with integrated current transformer


Products		 ISOSCAN® EDS150	 ISOSCAN® EDS151
Application		stationary	stationary
Main circuit		✓	—
Control circuit		—	✓
Voltage system	3(N)AC	—	—
	AC	✓	✓
	AC/DC	✓	✓
	DC	✓	✓
Nominal voltage U_n max		—	—
System leakage capacitance C_g μF		acc. to characteristic curve	acc. to characteristic curve
Response value R_{an} kΩ		acc. to characteristic curve	acc. to characteristic curve
Mounting	DIN rail	—	—
	Screw mounting	✓	✓


Ordering information


Circuits	Measuring range	Response value		Supply voltage U_s ¹⁾	Type	Art. No.
		EDS function	RCM function			
Control circuit	0.5...2.5 mA	0.5 mA	1 A	AC 17...24 V, 50...60 Hz/ DC 14...28 V	EDS151	B91080101
Main circuit	5...25 mA	5 mA	10 A		EDS150	B91080103


¹⁾ Absolute values

Portable equipment for insulation fault location

Locating current injector			
	PGH185	PGH186	PGH183
Application	Main circuit energised	offline	Control circuit energised
Nominal system voltage U_n	3AC, AC 20...575 V DC 20...504 V	3AC, AC 0...575 V DC 0...504 V	AC 20...265 V, DC 20...308 V
U_s AC 230 V	(PGH185)	(PGH186)	(PGH183)
U_s AC 90...132 V	(PGH185-13)	(PGH186-13)	(PGH183-13)
Locating current I_L max.	10/25 mA	10/25 mA	1/2.5 mA

Insulation fault locator	
	EDS195PM
LC display	3 x 16 characters
Evaluating current $I_{\Delta L}$	0.2...50 mA
Response value	0.2 ... 1/2...10 mA selectable

Measuring clamps					
	PSA3020	PSA3052	PSA3165 (optional)	PSA3320	PSA3352
20 mm	✓	—	—	✓	—
52 mm	—	✓	—	—	✓
115 mm	—	—	✓	—	✓

Strap current transformers		
	CTAF500	CTAF1000
Strap 500 mm	✓	—
Strap 1000 mm	—	✓

Complete systems



EDS3090

EDS3091

Application area

Main circuits

Control circuits

EDS309... components

Device type	Aluminium case with carrying strap	Operating manual	EDS195PM with accessories					PGH18... with accessories for						Measuring clamps				
			Insulation fault locator	Terminal connector to 4 mm	Adapter BNC/4mm plug for current transformer	Adapter BNC-PS2 for WF current transformer, optional	Plug-in power supply unit for EDS195PM	Locating current injector	Power supply cable for PGH18...	Safety measuring lead, black	Safety measuring lead, green/yellow	Safety claw grip, black	Safety claw grip, green/yellow	Coupling device, optional (for EDS3096PV only; included in the scope of delivery)	Measuring clamps 20 mm	Measuring clamps 52 mm	Measuring clamps 115 mm, optional	EDS set, optional
EDS3090	1	1	EDS195PM	1	1	1	1	—	—	—	—	—	—	PSA3020	PSA3052	PSA3165	1	
EDS3090PG	1	1	EDS195PM	1	1	1	1	PGH185	1	3	1	3	1	AGE185	PSA3020	PSA3052	PSA3165	1
EDS3090PG-13	1	1	EDS195PM	1	1	1	1	PGH185-13	1	3	1	3	1	AGE185	PSA3020	PSA3052	PSA3165	1
EDS3091	1	1	EDS195PM	1	1	1	1	—	—	—	—	—	—	PSA3320	PSA3352	—	1	
EDS3091PG	1	1	EDS195PM	1	1	1	1	PGH183	1	3	1	3	1	—	PSA3320	PSA3352	—	1
EDS3091PG-13	1	1	EDS195PM	1	1	1	1	PGH183-13	1	3	1	3	1	—	PSA3320	PSA3352	—	1
EDS3092PG	1	1	EDS195PM	1	1	1	1	PGH183 PGH185	2	6	2	6	2	—	PSA3320 PSA3020	PSA3352 PSA3052	—	1
EDS3096PG	1	1	EDS195PM	1	1	1	1	PGH186	1	3	1	3	1	AGE185	PSA3020	PSA3052	PSA3165	1
EDS3096PG-13	1	1	EDS195PM	1	1	1	1	PGH186-13	1	3	1	3	1	AGE185	PSA3020	PSA3052	PSA3165	1
EDS3096PV	1	1	EDS195PM	—	—	—	1	PGH186	1	3	1	3	1	AGE185	—	2x PSA3052	—	—

Ordering information

Main circuits		Control circuits		Nominal voltage U_n	Supply voltage U_s	Type	Art. No.
with EDS	without EDS	with EDS	without EDS				
EDS440	—	—	—	AC 20...575 V, 42...460 Hz/DC 20...504 V	—	EDS3090	B91082026
—	✓	—	—	AC 20...575 V, 42...460 Hz/DC 20...504 V	AC 230 V, 50...60 Hz	EDS3090PG	B91082021
—	—	—	—	AC 20...575 V, 42...460 Hz/DC 20...504 V	AC 90...132 V, 50...60 Hz	EDS3090PG-13	B91082022
—	—	—	—	AC 0...575 V, 42...460 Hz/DC 0...504 V	AC 230 V, 50...60 Hz	EDS3096PG	B91082025
—	—	—	—	AC 0...575 V, 42...460 Hz/DC 0...504 V	AC 90...132 V, 50...60 Hz	EDS3096PG-13	B91082029
—	—	EDS441	—	AC 20...265 V, 42...460 Hz/DC 20...308 V	—	EDS3091	B91082027
—	—	—	✓	AC 20...265 V, 42...460 Hz/DC 20...308 V	AC 230 V, 50...60 Hz	EDS3091PG	B91082023
—	—	—	—	AC 20...265 V, 42...460 Hz/DC 20...308 V	AC 90...132 V, 50...60 Hz	EDS3091PG-13	B91082024
—	✓	—	✓	AC 20...265 V, 42...460 Hz/DC 20...308 V	AC 230 V, 50...60 Hz	EDS3092PG	B91082030
—	✓	—	✓	AC 20...575 V, 42...460 Hz/DC 20...504 V	AC 230 V, 50...60 Hz	—	—
—	✓	—	—	AC 20...575 V, 42...460 Hz/DC 20...504 V	—	EDS3096PV	B91082031

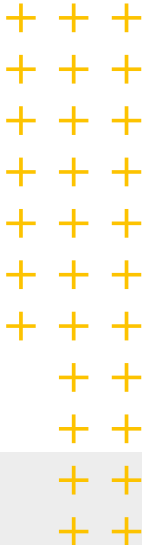
Bender monitoring systems seamless communication

Modern communication

Since increasing demands are placed on communication capability, data transparency, and flexibility, the use of modern field bus and network technologies has become a must in the field of automation of electrical installations. For instance, operating, alarm and fault messages via the web or a network substantially contribute to increasing the transparency of power supply systems. At the same time, they allow fast responses to critical operating states. In addition, important messages can be transferred via text message or e-mail to the mobile phones or laptops of service personnel. Early information about the location and cause of a fault allows time and cost-efficient deployment of service personnel and helps avoid a possible installation failure or damage to expensive devices.

Electrical Safety Management

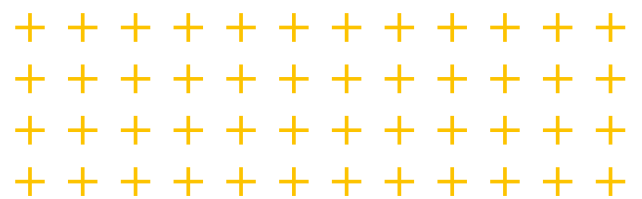
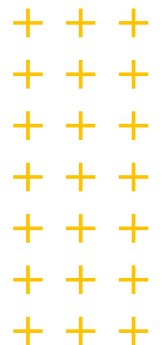
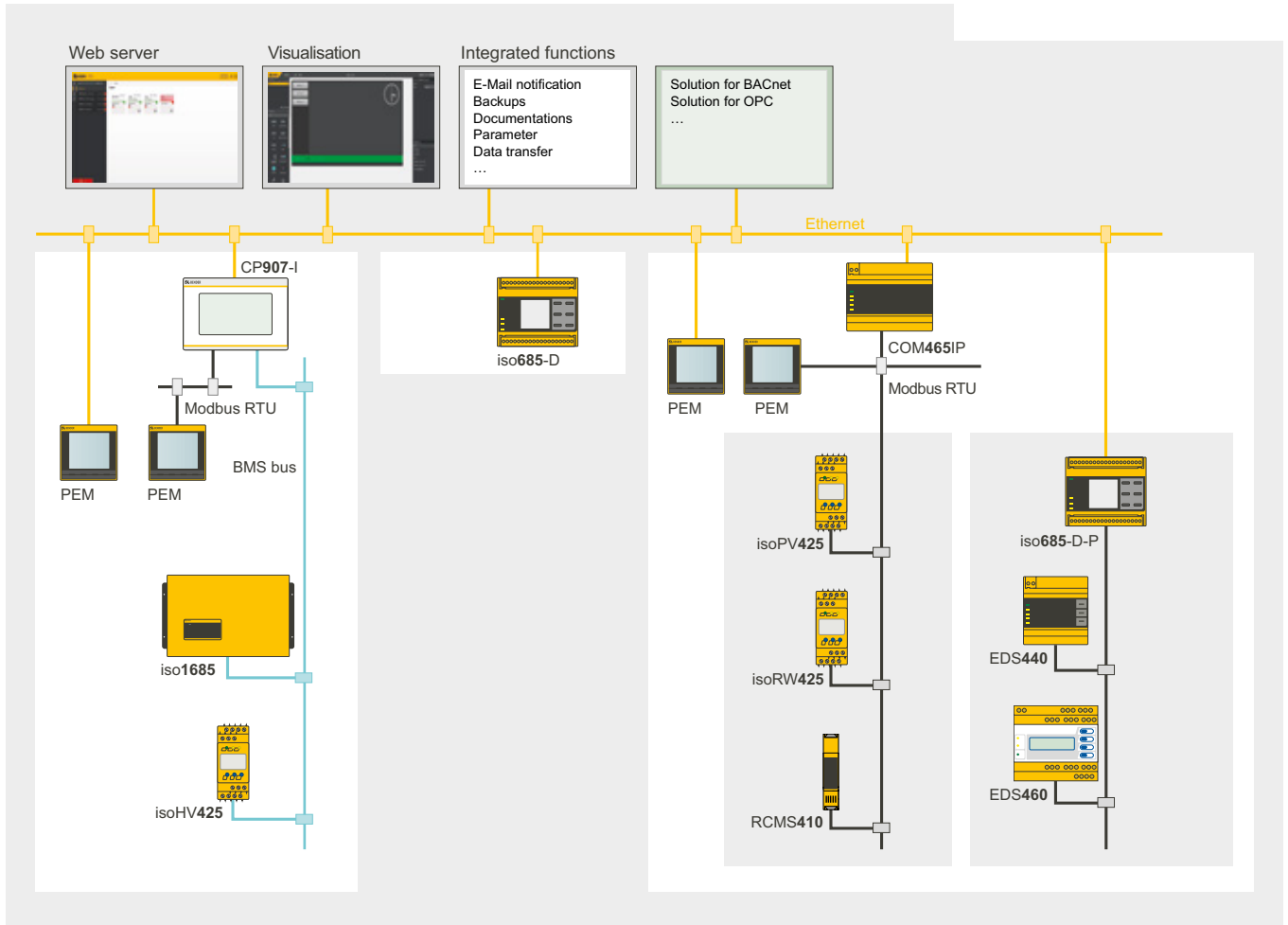
Under the heading "Electrical Safety Management" Bender offers comprehensive solutions for the electrical safety of power supply systems in all areas. Carefully matched products and systems with innovative measuring instruments, communication solutions for the visualisation of data from Bender monitoring systems as well as the easy connection to field bus and SCADA systems (Supervisory Control and Data Acquisition systems) provide the highest level of safety, economic efficiency and transparency. The range of products is completed by comprehensive services, which are provided for the entire service life of the products.



COM465IP
Condition monitor with an integrated gateway for the connection of Bender devices to Ethernet TCP/IP networks



CP9...-I
Condition monitor with an integrated gateway and touch screen for the connection of Bender devices to Ethernet TCP/IP networks



Retrofits

Untested devices and installations pose a safety risk

Is your installation still state-of-the-art?

Even the most modern electrotechnical installations are not immune to the effects of time. Whether it is decreasing operational reliability, changing legal conditions or rising energy costs: Adapting to the current state of the art is indispensable. Typically, products for monitoring energy quality and fault search are retrofitted.

Risk assessment according to Directive 2009/104/EC and its implementations in national law: Does your currently installed monitoring system detect symmetrical and asymmetrical insulation faults?

Symmetrical and asymmetrical insulation faults pose a high risk potential. With Bender insulation monitors, your installations are continuously monitored, insulation faults are detected and reported. Bender insulation monitors comply with IEC 61557-8.



Let us check your electrical installations and provide you with suggestions for the next steps.

Bender provides flexible solutions for retrofitting projects

Modern monitoring methods can also be integrated in old installations even during ongoing operation. Retrofitting is made possible by devices such as split-core current transformers, as the power supplies do not have to be switched off and cable systems do not have to be disconnected for the retrofit.

Successor devices from Bender can easily replace old devices.

Your advantages

- Well prepared for the standards of tomorrow
- Compliance with legal requirements
- Increased availability
- Update to the latest safety standard
- Cut costs and reduce energy consumption
- Ensure spare parts supply in the long term

Systematic and efficient modernisation at low cost!

Support during all stages remote, by phone, on site

From planning to modernisation – Our extensive know-how is at your disposal during all project phases.

Furthermore, with our first-class service we guarantee maximum safety for your electrical installations.

We offer services ranging from support over telephone to repairs and on-site service – with modern measuring devices and competent employees.

Be on the safe side:

- High availability of your installation thanks to fast reaction to fault messages
- Increased return on your capital expenditure (CAPEX) via optimised maintenance processes
- Targeted reduction of the operating expenditure (OPEX) due to reduced downtimes and shorter service visits
- Support for your predictive installation monitoring and regular tests of your installation/power quality/ monitoring devices

- Automatic checks, analysis, correction, new settings/updates
- Competent assistance with parameter changes and updates

Bender Remote Assist

Bender Remote Assist offers you support via remote access, high-quality service and advice for your challenging task of ensuring consistent high safety in your installations.

For, in many cases service visits, fault clearance but also analysis and controls can be carried out remotely – without the expenses of time and money that an on-site visit of a technician implies.

This fast, efficient help and advice by our expert network allows the highest possible availability of your installation.



Competent service for maximum safety and high availability of your installation

Fault location – made easy

With portable insulation fault location systems, existing insulation faults can be located quickly. They are the best alternative if no stationary insulation fault location systems are available.

POWERSCOUT®

Maximum transparency with minimum expenditure

Moisture, deterioration, dirt, mechanical damage or faults due to the impact of current, voltage and temperature cause malfunctions in every electrical installation. The web-based software solution POWERSCOUT® helps you detect malfunctions at an early stage and eliminate the causes in an economically reasonable way. This guarantees a high safety level for the installation as well as high operational reliability, and it reduces costs.

Analysis – as individual as your installation – as simple as possible

Predictive maintenance prevents downtimes, reduces costs and personnel expenditure. POWERSCOUT® informs you about the condition of your electrical installation at all times, since the informative visualisations with flexible dashboards can be retrieved via any display device, be it a smartphone, a laptop or a PC. On request, POWERSCOUT® sends you these graphically processed reports at specified intervals.

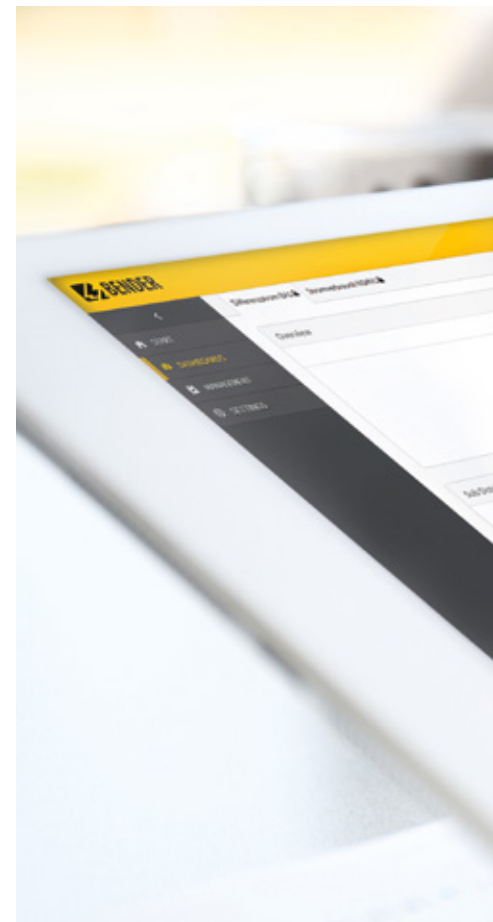
Continuous monitoring instead of random tests

Manual data acquisition is time consuming, error-prone and only provides random results. With POWERSCOUT® you have the complete data of your installation at your disposal at any time since all measured values are automatically and continuously saved. Your data is stored reliably and remains available for years.

Basis for periodic verification as per IEC 60364-6

The automated POWERSCOUT® report on residual currents forms the basis for measuring without switch-off by means of periodic verification as per IEC 60364-6. In order to maintain the correct status for electrical installations and stationary electrical equipment, periodic verification must be carried out.

This can be ensured, for example, when the installation is monitored continuously by qualified personnel. In this case, it is a smart move to rely on continuous monitoring with multi-channel residual current monitoring systems (RCMS) and an evaluation adapted to the installation (COMTRAXX® series). The automatic POWERSCOUT® reports based on this monitoring enable the qualified person in charge to adjust the times when the insulation test shall be performed as part of the periodic verification.



POWERSCOUT®: The web-based software solution for analysis, predictive maintenance, and reporting.

Analysis

- Continuously recording insulation values
- Recognising correlations and optimising processes
- Cross-plant evaluation options
- Access from any location
- Support for investment decisions

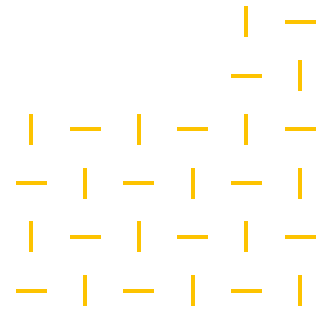
Predictive maintenance

- Higher availability
- Continuous monitoring

- Early detection of gradually developing insulation faults
- Early detection and reporting of short-time insulation degradation
- Lower costs incurred due to unexpected malfunctions and shutdowns

Report

- Historical comparisons
- Reliable storage of measured values
- Event and alarm statistics





Bender. Making your world safe.

Our world is networked on a global scale; it is digital, mobile and highly automated. And no matter whether in hospitals, in industry, inside or outside buildings, in power stations, in trains, underwater or underground: it never stands still and it is more dependent than ever on a reliable and, above all, safe electrical power supply.

And exactly that is our mission: We make electricity safe. With our technologies, we ensure that electricity is permanently available and guarantee faultless protection against the hazards of electric shock. We protect buildings, installations and devices, and therefore your investments and plans. But what we primarily protect are the lives of the people behind the electrical installations.



Mechanical and plant engineering



Oil, gas



Renewable energy



Healthcare



Public power supply network



Mobile power generation



Ships and ports



Railway



eMobility



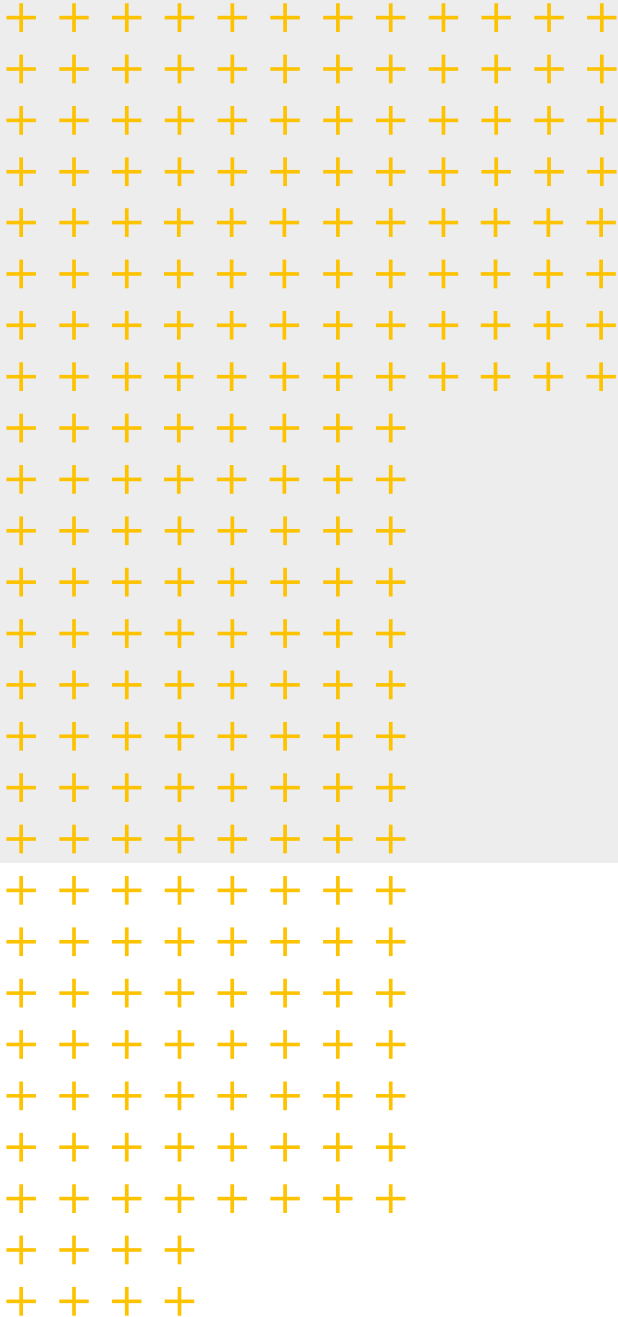
Data centres



Mining



Battery energy storage systems (BESS)



Bender GmbH & Co. KG

Londorfer Straße 65
35305 Grünberg
Germany

Tel.: +49 6401 807-707
info@bender.de
www.bender.de

Photos: AdobeStock (@Ramona Heim, @savantermedia, @GRAFStock, @WADII, @soonthorn, @Gorodenkoff, @visoot, @sommersby, @Ewald Fröch, @LizFoster, @elen31, @Yeti Studio, @Ignacio Ferrándiz, @Jose Luis Stephens, @koldunova, @totojang1977, @kbarzycki, @stefan77, @Nancy Pauwels, @TeacherPhoto, @Southworks, @2ragon, @agnormark, @malp), photovoltalkbuero Ternus & Diehl GbR and Bender Archive.

2123en / 11.2023 / © Bender GmbH & Co. KG, Germany – subject to change! The specified standards take into account the version that was valid at the time of printing.

