

EDS30...

Portable equipment for insulation fault location for unearthed and earthed systems (IT and TN systems) to be used in conjunction with or without an equipment for insulation fault location



EDS30...

Portable insulation fault location system for unearthed and earthed systems (IT and TN systems) to be used in conjunction with or without an insulation fault location system



EDS30...

Device features

- Portable insulation fault location systems for IT systems AC 0...790 V, 42...460 Hz/ DC 0...960 V or de-energised systems
- Residual current measurement in TN/TT systems
- Use in main and control circuits
- Measuring clamps 20/52 mm (115 mm optional)
- Robust aluminium case, convenient to carry
- Locating current injectors PGH18... with variable locating current 1...25 mA
- Integrated locating voltage for de-energised systems (PGH186)

Insulation fault locator EDS195P

- Backlit LC display, 3 x 16 characters
- Measuring clamps 20/52 mm included in the scope of delivery
- Accumulator (delivered with a power supply unit)
- Response value insulation fault location 2...10 mA for main circuits
- Response value insulation fault location 0.2...1 mA for control circuits
- Response value residual current measurement 10 mA...10 A
- Selectable operating mode insulation fault location/residual current measurement

Product description

The EDS30... is a portable insulation fault location system for localising insulation faults in unearthed systems (IT systems). All essential components are housed in a robust aluminium case which is convenient to carry.

Application

IT systems **without** a permanently installed insulation fault location system

- **EDS3090PG**
for main circuits up to AC 20...575 V 42...460 Hz, DC 20...504 V with AGE185 up to AC 500...790 V 42...460 Hz, DC 400...960 V
- **EDS3091PG**
for control circuits up to AC 20...265 V 42...460 Hz, DC 20...308 V
- **EDS3092PG**
for main circuits in conjunction with PGH185 up to AC 20...575 V 42...460 Hz, DC 20...504 V with AGE185 up to AC 500...790 V 42...460 Hz, DC 400...960 V
for control circuits in conjunction with PGH183 up to AC 20...265 V 42...460 Hz, DC 20...308 V
- **EDS3096PG**
for main circuits in IT systems with all poles disconnected up to AC 0...575 V 42...460 Hz, DC 0...504 V

IT systems **with** a permanently installed insulation fault location system

- **EDS3090**
for main circuits with a permanently installed insulation fault location system with EDS460/490
- **EDS3091**
for control circuits with a permanently installed insulation fault location system with EDS460/491

Function

Locating current injector PGH18...

The PGH18... generates the relevant locating current signal. The locating current generated in this manner depends on the value of the insulation fault that is present and the system voltage.

- Depending on the switch position, the PGH185 or PGH186 limit the locating current is to a maximum of 25 mA respectively 10 mA.
- The PGH183 limits the locating current to a maximum of 2.5 mA or 1 mA respectively.

In de-energised IT systems or in IT systems with a system voltage of < 50 V, the PGH186 drives the locating current generated by an integrated voltage source (DC 50 V). In IT systems with a system voltage of > 50 V, the system voltage itself drives the locating current.

Insulation fault locator EDS195P

The insulation fault locator EDS195P provides the following measuring functions:

- Insulation fault location $I_{\Delta L}$ (EDS mode) for use in IT AC or DC systems. The response value is determined by the sensitivity of the EDS195P insulation fault locator. In DC, AC and 3AC IT systems, this is an arithmetic average value that can be set according to an arithmetic average value. System interferences and excessively high system leakage capacitances may have a negative influence on the accuracy
 - within the portable EDS309...insulation fault location system or
 - within a permanently installed insulation fault location system in conjunction with EDS15.../46.../49...
- Residual current measurement $I_{\Delta n}$ (RCM mode) for use in TN or TT AC systems. The response range for the alarm message is 10 mA...10 A.

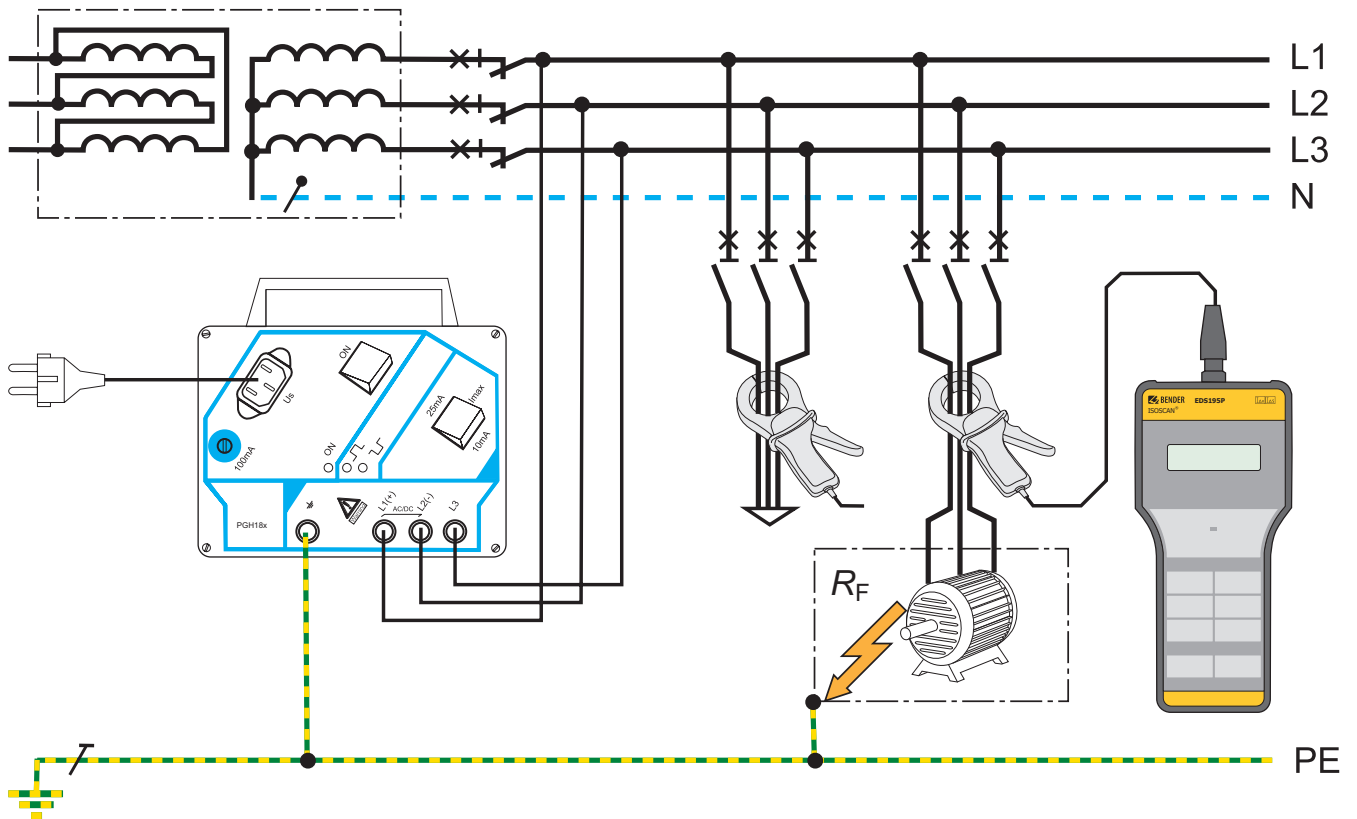
Displays

The LC display indicates the measured residual current, the type of the connected measuring clamp resp. measuring current transformer, the accumulator capacity, the activation of the alarm memory, the activation of the buzzer, and the set nominal frequency.

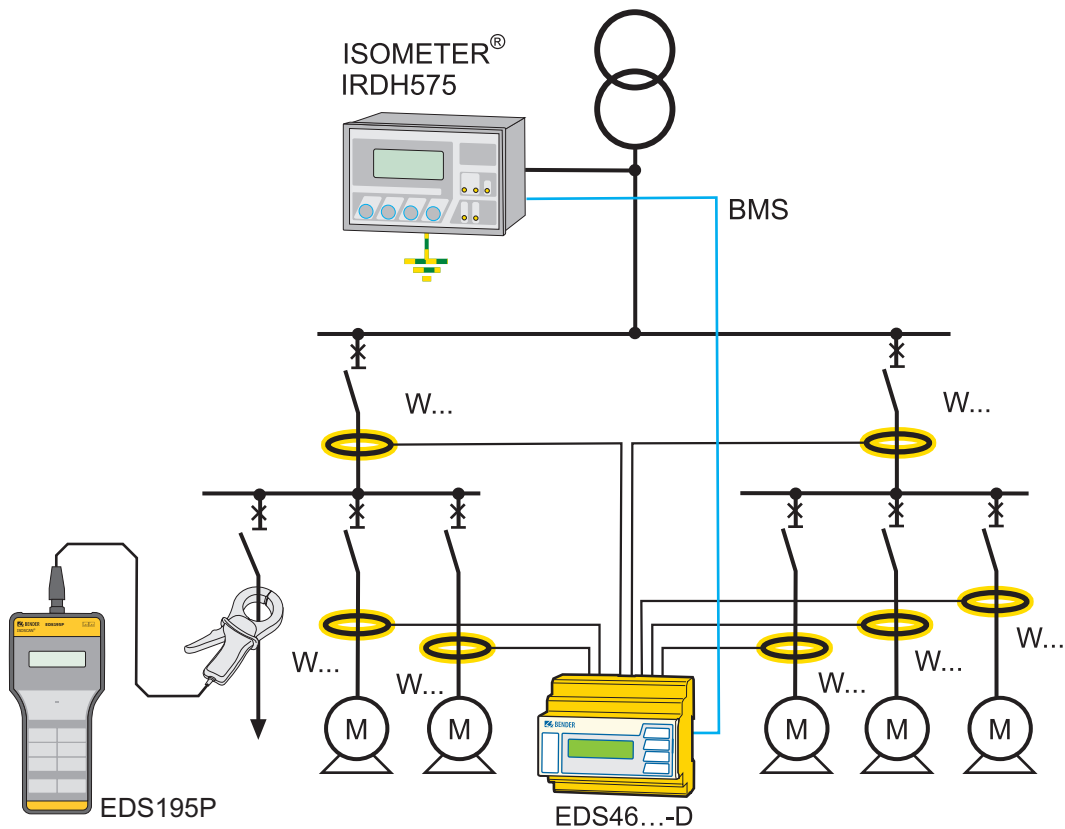
Standards

The portable insulation fault location systems have been designed in accordance with the following standards: DIN EN 61557-8 (VDE 0413-8), EN 61557-8, IEC 61557-8, IEC 61326-2-4, DIN EN 60664-1 (VDE 0110-1), DIN EN 60664-3, DIN EN 61557-9, VDE 0413-9, IEC 61557-9, ASTM F1669M-96 (2007), ASTM F1207M-96 (2007)

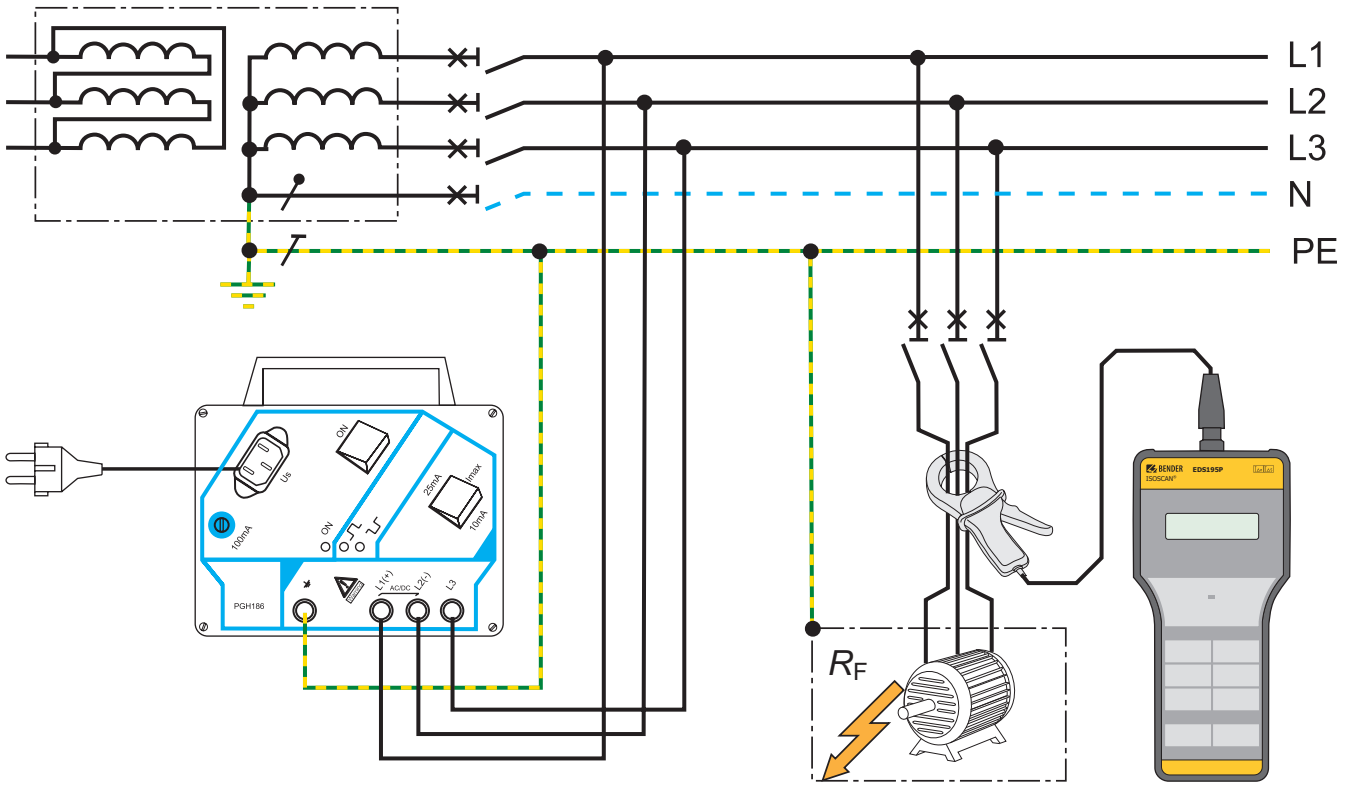
Note: Electrical interferences during operation may result in false tripping and indication errors.



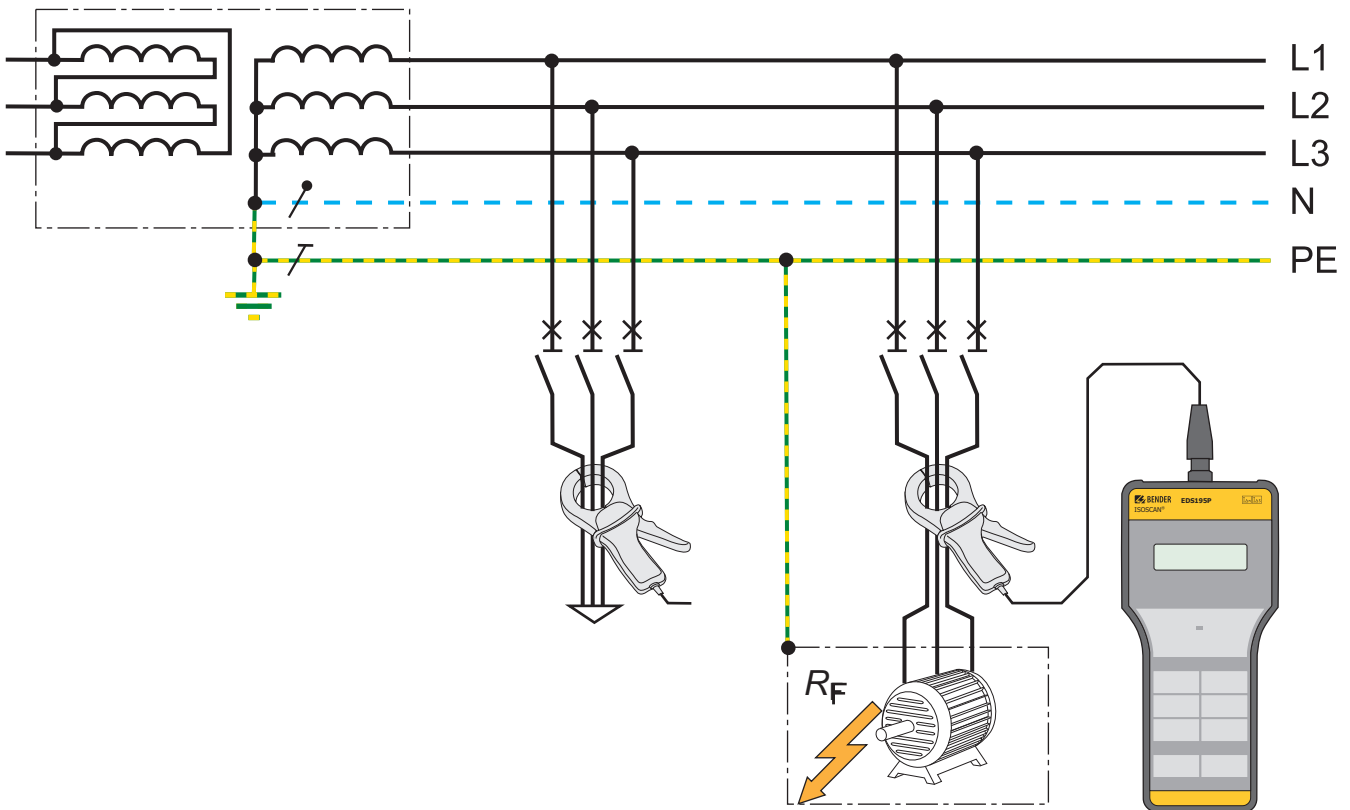
Application example: Equipment for insulation fault location EDS3090/3091PG for use in unearthed systems (IT systems) without a permanently installed equipment for insulation fault location



Application example: Equipment for insulation fault location EDS3090/3091 in unearthed systems (IT systems) with permanently installed equipment for insulation fault location EDS





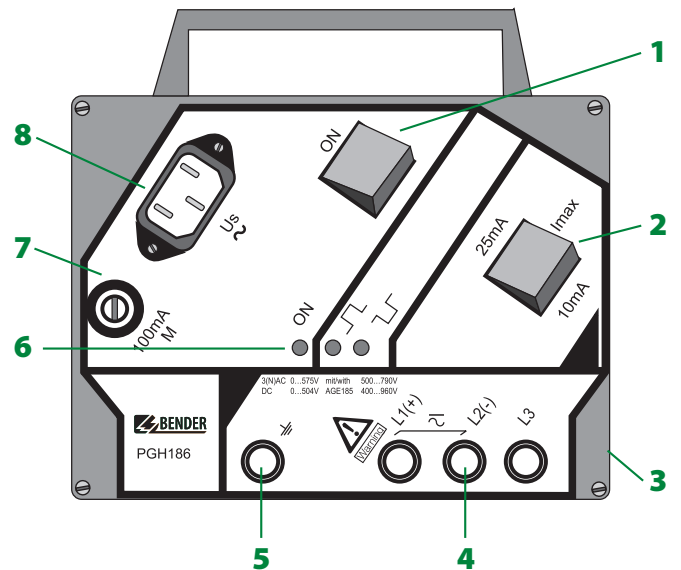
Application example: Equipment for insulation fault location EDS3096PG in de-energised systems (IT systems) (Note: TN-S system with all poles disconnected)



Application example: Residual current measurement with EDS309... in earthed systems (TN-S systems)

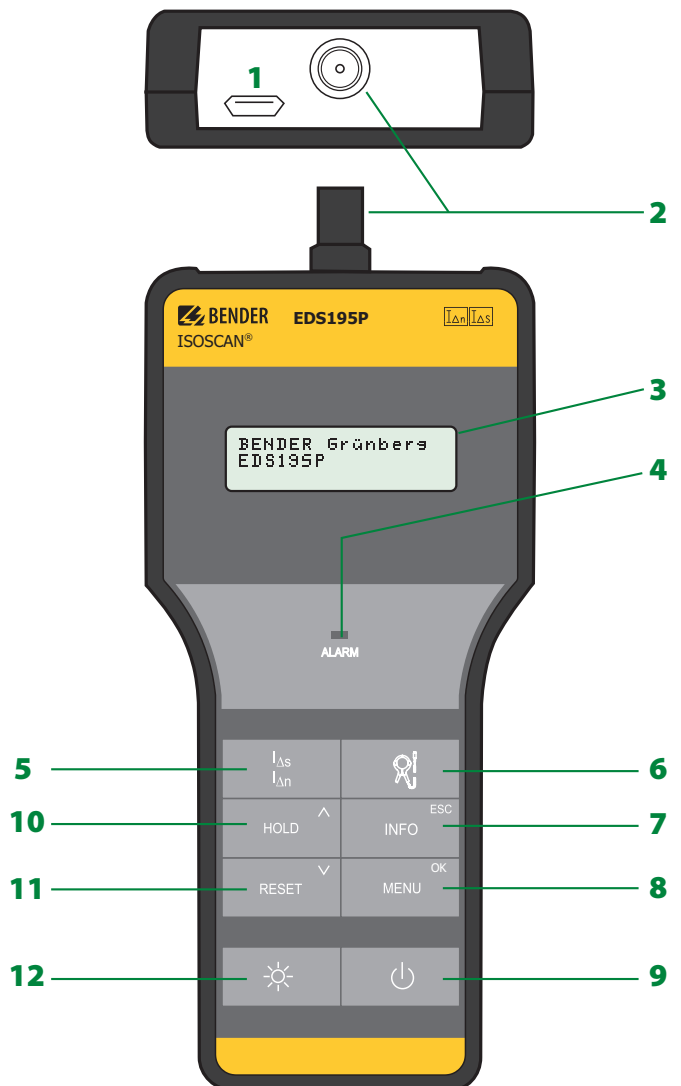
Operating elements of the PGH18...

- 1 - On/off switch "ON" to activate the locating current
- 2 - Selector switch for the maximum locating current 25/10 mA or 2.5/1 mA
- 3 - Not visible: Magnetic adhesive strip at the back of the enclosure for fixing to metal parts (e.g. switchboard cabinet)
- 4 - 3 sockets for system coupling
- 5 - Socket for PE connection
- 6 - LED indicators:
 Power On LED "ON"
 Indication of the positive test pulse of the locating current
 Indication of the negative test pulse of the locating current
- 7 - Microfuse 100 mA
- 8 - Panel plug for supply voltage



Display and operating elements of the EDS195P

- 1 - Micro USB connection for charging the device's rechargeable battery
- 2 - BNC connection for the measuring clamp
- 3 - LC display, backlit
3 lines à 16 characters
- 4 - LED "ALARM", lights when the response value is exceeded
- 5 - Button for the selection of the operating mode:
 $I_{\Delta L}$ = Insulation fault location in IT systems (EDS mode)
 $I_{\Delta n}$ = Residual current measurement in TN-S systems (RCM mode)
- 6 - Button for transformer selection
 for $I_{Tmax} = 50 \text{ mA}$: for $I_{Tmax} = 5 \text{ mA}$:
 P20 = PSA3020 = PSA3320
 P52 = PSA3052 = PSA3352
 P165 = PSA3165 -----
 W/WR = W.../WR... = W...-8000
 WS = WS... = W...-8000
- 7 - "INFO" button:
 - Device type
 - Software version
 - Current response values $I_{\Delta L}$ and $I_{\Delta n}$
 - Setup status
 ESC button:
 to exit the menu function without changing parameters
- 8 - "MENU" button
to toggle between the standard display and the menu selection
- 9 - On/Off switch
- 10 - "HOLD" button
to store the currently indicated measured value
Arrow up button: Parameter changes, scroll
- 11 - "RESET" button
fault memory acknowledgement
Arrow down button: Parameter changes, scroll
- 12 - Illumination button:
to switch on the display lighting



Technical data EDS309...system

The technical data listed in this chapter apply to the components: PGH18..., EDS195P, AGH185.

Environment/EMC

EMC	IEC 61326-2-4
Operating temperature	-10...+ 55 °C
Classification of climatic conditions acc. to IEC 60721:	
Stationary use (IEC 60721-3-3)	3K5 (except condensation and formation of ice)
Transport (IEC 60721-3-2)	2K3 (except condensation and formation of ice)
Storage (IEC 60721-3-1)	1K4 (except condensation and formation of ice)
Classification of mechanical conditions acc. to IEC 60721:	
Stationary use (IEC 60721-3-3)	3M4
Transport (IEC 60721-3-2)	2M2
Long-term storage (IEC 60721-3-1)	1M3

Other

Operating mode	continuous operation
Position of normal use	any
Weight EDS309...	≤ 7000 g
Weight EDS309... with PSA3165	≤ 8500 g
Weight EDS3092	≤ 9000 g
Dimensions, case W x H x D	430 x 340 x 155 mm

Technical data PGH18...

Insulation coordination acc. to IEC 60664-1/IEC 60664-3

Rated insulation voltage	AC 500 V
Rated impulse voltage/pollution degree	4 kV/3

Nominal system voltage U_n

PGH183	AC 20...265 V 42...460 Hz, DC 20...308 V
PGH185	3AC/AC 20...575 V 42...460 Hz, DC 20...504 V
PGH186	3AC/AC 0...575 V 42...460 Hz, DC 0...504 V

Supply voltage

Supply voltage U_S	AC 230 V 50...60 Hz
Operating range of U_S	0.85...1.15 x U_S
Supply voltage U_S version -13	AC 90...132 V 50...60 Hz

PGH 183, PGH 185:

Power consumption	≤ 3 VA
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PGH 186:

Power consumption	≤ 6 VA
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Locating current

PGH183:	
Locating current, selectable, max.	1/2,5 mA

PGH185/186:	
Locating current, selectable, max.	10/25 mA

PGH183/185/186	
Test pulse	2 s
Idle time	4 s

Locating voltage

PGH186	DC 50 V
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Other

Degree of protection, internal components DIN EN 60529 (VDE 0470-1)	IP40
Enclosure material	ABS plastic
Flammability class	UL94V-0
Weight	≤ 700 g
Dimensions	160 x 148 x 81 mm

Technical data EDS195P

Insulation coordination acc. to IEC 60664-1/IEC 60664-3

Rated insulation voltage	50 V
Rated impulse withstand voltage/pollution degree	0.8 kV/3

Supply voltage

Supply voltage U_S	accumulators, batteries or USB power supply unit
Accumulators	3 x NiMH ≥ 2000 mAh
Hours of operation (without display illumination)	≥ 150 h
Charging time	≤ 5 h
Size	AA R6
Batteries	3 x LR6 AA – 1.5 V
USB power supply unit:	
Primary :	100...240 V, 50...60 Hz
Secondary:	DC 5 V, +/- 10 %,
Power consumption	≤ 0.5 W

Measuring circuit insulation fault location

Nominal system voltage	conductors uninsulated, including measuring clamp up to 600 V
Rated frequency	DC, 42...2000 Hz
Main circuit ($I_{Lmax} = 50$ mA):	
Measuring range	2 mA...50 mA
Measuring clamps	PSA3020, PSA3052, PSA3165
Response sensitivity ΔI_L adjustable	2...10 mA (5 mA)*
Relative uncertainty	±30 %/±2 mA of the reference value
Control circuit: ($I_{Lmax} = 5$ mA)	
Measuring range	0.2 mA...5 mA
Measuring clamps	PSA3320, PSA3352
Response sensitivity ΔI_L adjustable	0.2...1.0 mA (0.5 mA)*
Relative uncertainty 0.2...0.9 mA	±30 %/± 0.2 mA of the reference value
Relative uncertainty 1...5 mA	±30 %/± 2 mA of the reference value

Measuring circuit residual current

with measuring clamps	PSA3020, PSA3052, PSA3165
Measuring range	5 mA ... 10 A (crest factor up to 3)
Response sensitivity ΔI_n adjustable	10 mA...10 A (100 mA)*
Measuring clamps	PSA3320, PSA3352
Measuring range	2 mA ... 2 A (crest factor up to 3)
Response sensitivity ΔI_n adjustable	5 mA...1 A (100 mA)*
Frequency range	42...1000 Hz
Relative uncertainty, 42...60 Hz	±5 %
Relative uncertainty, 61...1000 Hz	±20 %
Hysteresis	20%
Harmonics, indication can be switched off	1st to 8th harmonic

Inputs

Connection for measuring clamp	BNC socket
Connection for power supply unit (DC 5 V)	µUSB socket

Displays

LCD 3 x 16 characters, selectable illumination	
LED	alarm

Other

Degree of protection, internal components DIN EN 60529 (VDE 0470-1)	IP40
Protection class acc. to IEC 60947-1, DIN EN 60947-1 (VDE 0660-100)	Class III
Enclosure material	ABS plastic
Flammability class	UL94V-0
Operating manual	TGH1420
Weight	≤ 350 g
Software version	D399 V1.2
Dimensions WxHxD	84x197x30 mm

()* = Factory settings

Technical data measuring clamps
Electrical safety

Standard	IEC 61010-2-030
Pollution degree	2
Installation category	III
Operating voltage	600 V
Nominal insulation voltage	AC 600 V CAT III bzw. AC 300 V CAT IV

Transformation ratio

PSA30...	10 A/10 mA
PSA33...	1 A/0.1 mA
PSA3165	10 A/10 mA

Other

Degree of protection, internal components DIN EN 60529 (VDE 0470-1)	IP40
Protection class acc. to IEC 60947-1, DIN EN 60947-1 (VDE 0660-100)	Class III
Test port	BNC plug
Dimensions PSA3052/3352	216 x 111 x 45 mm
Dimensions PSA3020/3320	135 x 65 x 30 mm
Dimensions PSA3165	285 x 179 x 45 mm
Permissible cable diameter PSA3052/3352	52 mm
Permissible cable diameter PSA3052/3320	20 mm
Permissible cable diameter PSA3165	115 mm
Weight PSA3052/3352	≤ 700 g
PSA3020/3320	≤ 300 g
PSA3165	≤ 1300 g

Technical data AGE185
Insulation coordination acc. to IEC 60664-1

Rated insulation voltage	AC 1000 V
Rated impulse voltage/pollution degree	4 kV/3
Nominal system voltage U_n	3AC/AC 500...790 V, DC 400...960 V, 42...460 Hz

Other

Degree of protection, internal components DIN EN 60529 (VDE 0470-1)	IP30
Type of connection/cable:	safety plug with green-yellow connecting wire 1 mm ²
Weight	≤ 400 g
Dimensions W x H x D	84 x 197 x 30 mm
Weight	≤ 200 g
Dimensions W x H x D	88.5 x 42 x 21 mm

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	AC	DC	AC		
EDS460/490	–	–	–	20...575 V/42...460 Hz	20...504 V	–	EDS3090	B 9108 2026
–	■	–	–	20...575 V/42...460 Hz	20...504 V	230 V/50...60 Hz	EDS3090PG	B 9108 2021
						90...132 V/50...60 Hz	EDS3090PG-13	B 9108 2022
				0...575 V/42...460 Hz	0...504 V	230 V/50...60 Hz	EDS3096PG	B 9108 2025
						90...132 V/50...60 Hz	EDS3096PG-13	B 9108 2029
–	–	EDS461/491	–	20...265 V/42...460 Hz	20...308 V	–	EDS3091	B 9108 2027
–	–	–	■	20...265 V/42...460 Hz	20...308 V	230 V/50...60 Hz	EDS3091PG	B 9108 2023
						90...132 V/50...60 Hz	EDS3091PG-13	B 9108 2024
–	–	–	■	20...265 V/42...460 Hz	20...308 V	230 V/50...60 Hz	EDS3092PG	B 9108 2030
–	■	–	■	20...575 V/42...460 Hz	20...504 V	230 V/50...60 Hz		

Suitable system components

Designation	Nominal voltage U_n		Type	Art. No.
	AC	DC		
Measuring clamp 115 mm for EDS3090... and EDS3096...	–	–	PSA3165	B 980 852
Coupling device to extend the voltage range of the PGH185/186	500...790 V/ 42...460 Hz	400...960 V	AGE185	B 980 305
Accessories for fault location in diode-decoupled systems	–	–	EDS165-SET	B 9108 2007

Scope of delivery

Insulation fault locator	Locating current injector	Measuring clamps 20 mm	Measuring clamps 52 mm	Type
EDS195P	–	PSA3020	PSA3052	EDS3090
EDS195P	PGH185	PSA3020	PSA3052	EDS3090PG
EDS195P	PGH185-13	PSA3020	PSA3052	EDS3090PG-13
EDS195P	PGH186	PSA3020	PSA3052	EDS3096PG
EDS195P	PGH186-13	PSA3020	PSA3052	EDS3096PG-13
EDS195P	–	PSA3320	PSA3352	EDS3091
EDS195P	PGH183	PSA3320	PSA3352	EDS3091PG
EDS195P	PGH183-13	PSA3320	PSA3352	EDS3091PG-13
EDS195P	PGH183	PSA3320	PSA3352	EDS3092PG
	PGH185	PSA3020	PSA3052	

Standards

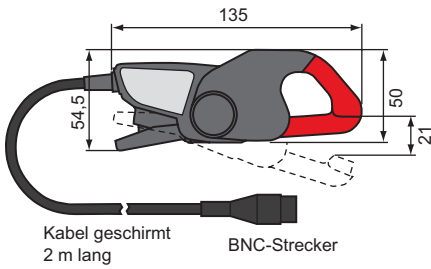
Observe the applicable national and international standards. The EDS309... series meets the requirements of the following standards for the erection of electrical installations:

- IEC 60364-4-41 (modified): Low-voltage electrical installations - Part 4-41: Protection for safety - Protection against electric shock; German implementation HD 60364-4-41

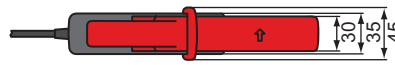
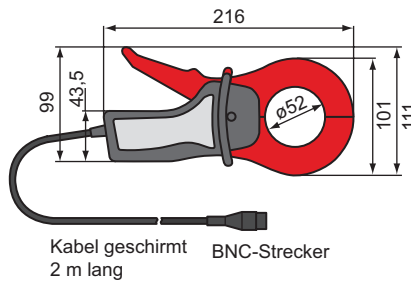
The EDS309... type range complies with the device standards:

- DIN EN 61557-9 (VDE 0413-9); IEC 61557-9: Electrical safety in low-voltage distribution systems up to 1000 V a.c. and 1500 V d.c. - Equipment for testing, measuring or monitoring of protective measures - Part 9: Equipment for insulation fault location in IT systems; German version EN 61557-9
- IEC 61010-1:2001 Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements German version EN 61010-1

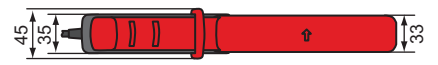
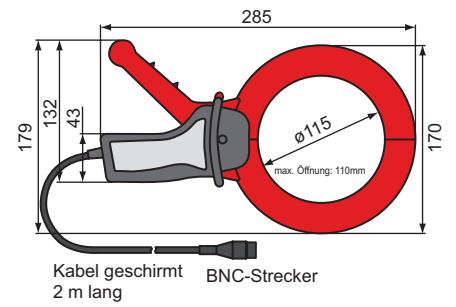
Dimension diagram PSA3020/3320



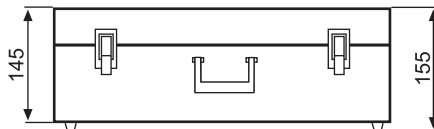
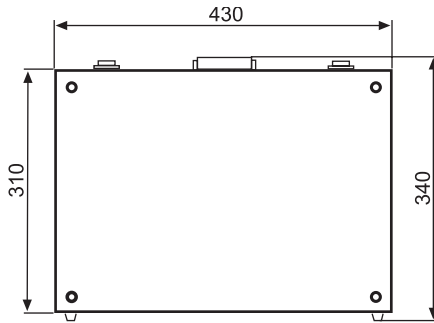
Dimension diagram PSA3052/3352



Dimension diagram PSA3165



Dimension diagram aluminium case



Device selection for IT systems with integrated equipment for insulation fault location

Type of distribution system	AC, DC, AC/DC (mixed systems)	AC, DC, AC/DC (mixed systems)
Application range	Main circuits	Control circuits

Insulation monitoring device ISOMETER®/Locating current injector PGH



Nominal system voltage U_n (B1)	3AC, AC 20...575 V, DC 20...504 V	3AC, AC 20...150 V, DC 20...150 V
Nominal system voltage U_n (B2)	3AC, AC 340...760 V, DC 340...575 V	—
U_5 DC 19.2-72 V	IRDH575B1-427	IRDH575B1-4227
U_5 AC 88-264 V, DC 77-286 V	IRDH575B1-435	IRDH575B1-4235
U_5 AC 88-264 V DC 77-286 V	IRDH575B2-435	—
Locating current I_L	10/25/50 mA	1/2.5 mA
Response values	1 k Ω ...10 M Ω	1 k Ω ...10 M Ω
LC display	4 x 20 characters	4 x 20 characters
Alarm relay	3 changeover contacts	3 changeover contacts
Interface/protocol	RS-485 (BMS)	RS-485 (BMS)
Address range	1...30	1...30

Insulation fault locator



Type	EDS195P
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



Type	PSA3020	PSA3052	PSA3165 (optional)	PSA3320	PSA3352
20 mm	■			■	
52 mm		■			■
115 mm			■		

Complete systems

Type	EDS3090		EDS3091
Comprising	Aluminium case, EDS195P, PSA3020, PSA3052, power supply unit	Aluminium case, EDS195P, PSA3020, PSA3052, power supply unit	Aluminium case, EDS195P, PSA3320, PSA3352, power supply unit

Device selection for IT systems without a permanently installed equipment for insulation fault location

Application	Main circuit		Control circuit
	energised	offline	energised

Locating current injector PGH



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



Type	EDS195P
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



Type	PSA3020	PSA3052	PSA3165 (optional)	PSA3320	PSA3352
20 mm	■			■	
52 mm		■			■
115 mm			■		

Complete system

Type	EDS3090PG (-13)	EDS3096PG (-13)	EDS3091PG (-13)
	EDS3090PG for $U_S =$ AC 230 V, 50...60 Hz EDS3090-13 for $U_S =$ AC 90...132 V, 50...60 Hz	EDS3096PG for $U_S =$ AC 230 V, 50...60 Hz EDS3096PG-13 for $U_S =$ AC 90...132 V, 50...60 Hz	EDS3091PG for $U_S =$ AC 230 V, 50...60 Hz EDS3091PG-13 for $U_S =$ AC 90...132 V, 50...60 Hz
Comprising	Aluminium case, PGH185, EDS195, PSA3020, PSA3052, power supply unit, cable set	Aluminium case, PGH186, EDS195, PSA3020, PSA3052, power supply unit, cable set	Aluminium case, PGH183, EDS195, PSA3320, PSA3352, power supply unit, cable set
Type	EDS3092PG		
Comprising	Aluminium case, PGH185, EDS195, PSA3020, PSA3052, power supply unit, cable set		Aluminium case, PGH183, EDS195, PSA3320, PSA3352, power supply unit, cable set

Accessories

Type	AGE185
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Extension	AC 500...790 V, 45...400 Hz
Nominal voltage range	DC 400...960 V



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