

## EDS30...

**Portable insulation fault location systems 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 42...460 Hz 0...790 V / 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 EDS190P

- Backlit LC display, 3 x 16 characters
- Measuring clamps 20 / 52 mm included in the scope of delivery
- Supplied by an 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 designed to locate 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 42...460 Hz 20...575 V, DC 20...504 V with AGE185 up to AC 42...460 Hz 500...790 V, DC 400...960 V
- **EDS3091PG**  
for control circuits up to AC 42...460 Hz 20...265 V, DC 20...308 V
- **EDS3092PG**  
with PGH185: for main circuits up to AC 42...460 Hz 20...575 V, DC 20...504 V  
with AGE185: for main circuits up to AC 42...460 Hz 500...790 V, DC 400...960 V  
with PGH183: for control circuits up to AC 42...460 Hz 20...265 V, DC 20...308 V

- **EDS3096PG**  
for main circuits in IT systems up to AC 42...460 Hz 0...575 V, DC 20...504 V, with all poles disconnected

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

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

### Function

#### Locating current injector PGH18...

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

- Depending on the switch position of the PGH185 or PGH186, the locating current is limited to a maximum of 25 mA or 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 EDS190P

The insulation fault locator EDS190P provides the following measuring functions:

- Insulation fault location  $I_{\Delta S}$  (EDS mode) for use in IT AC or DC systems. The response value is determined by the sensitivity of the EDS190P 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 locator EDS46... / 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.

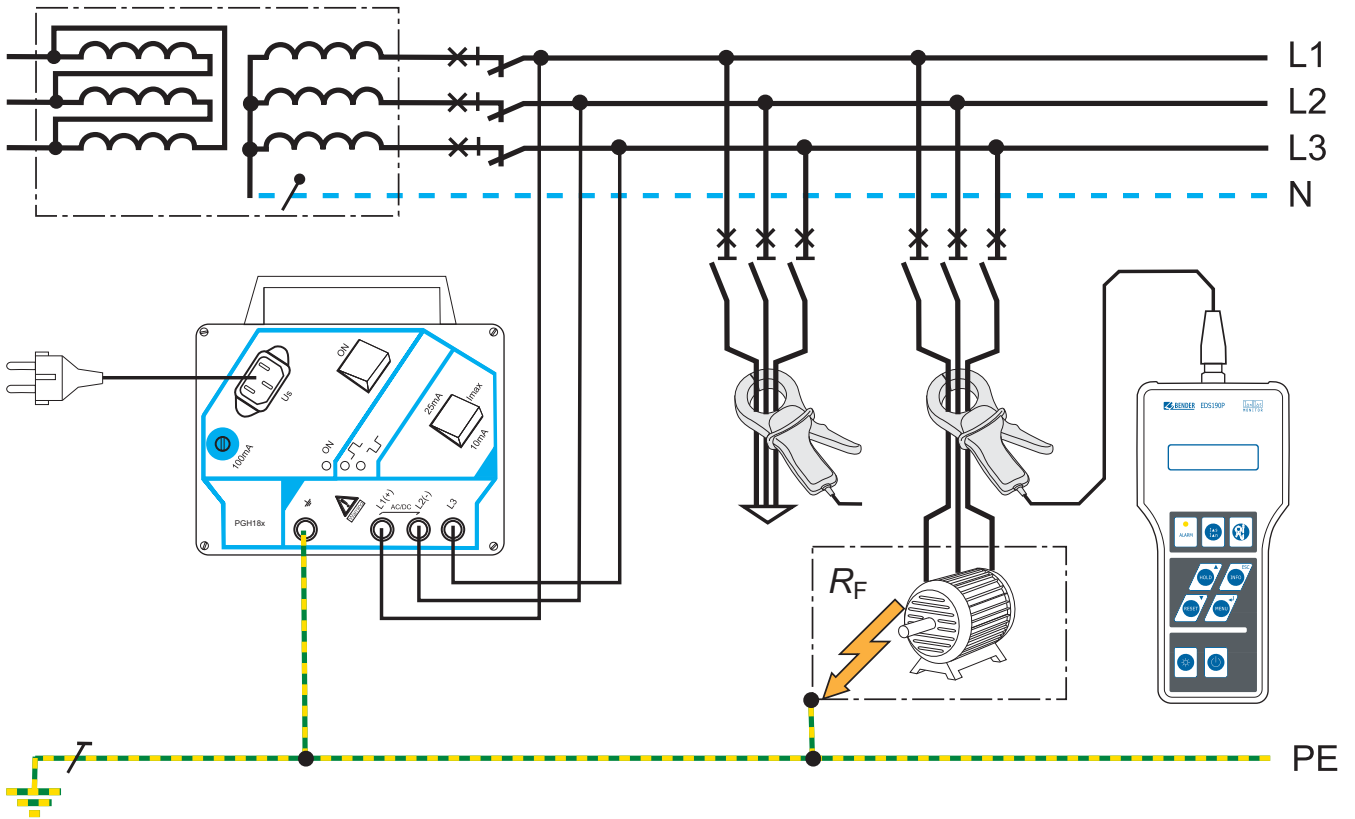
### Displays

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.

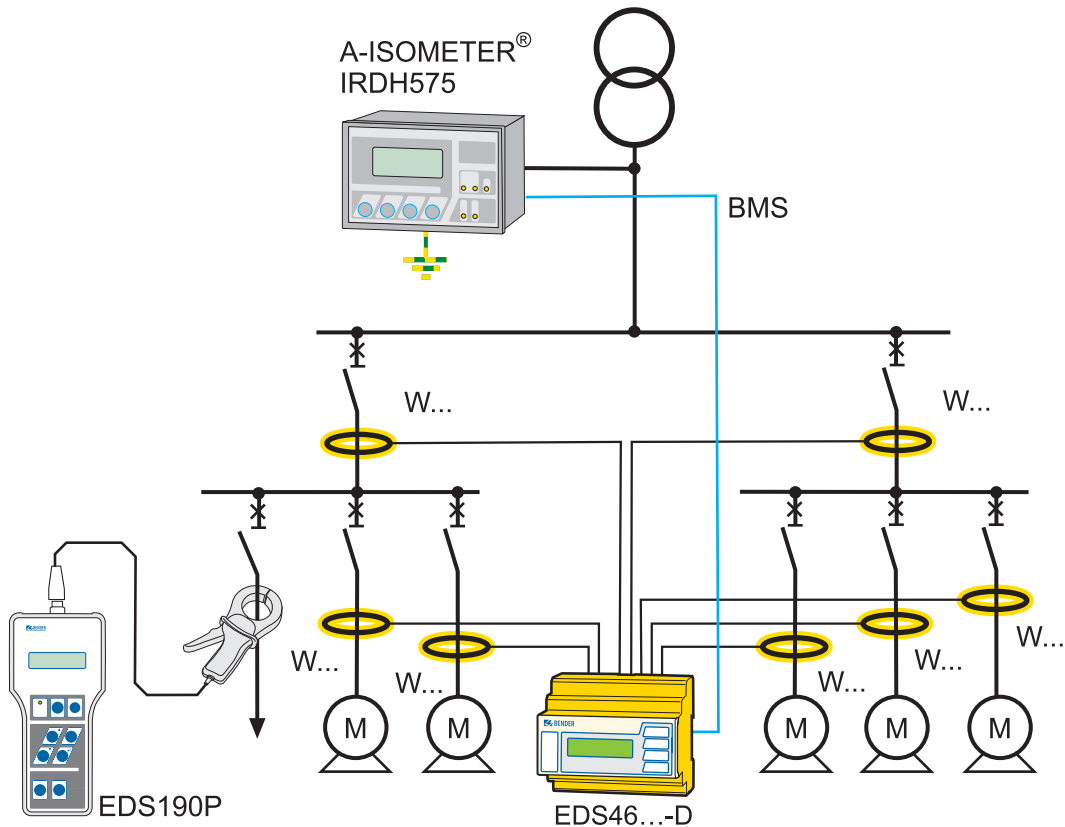
### Standards

The A-ISOMETER® was designed in accordance with the following standards: IEC 61557-8, IEC 61326-2-4, IEC 60664-1, IEC 60664-3, IEC 61557-9, ASTM F1669M-96 (2007), ASTM F1207M-96 (2007).

**Note:** If electrical interferences occur during operation, the device may trip incorrectly and may indicate incorrect values on the display.

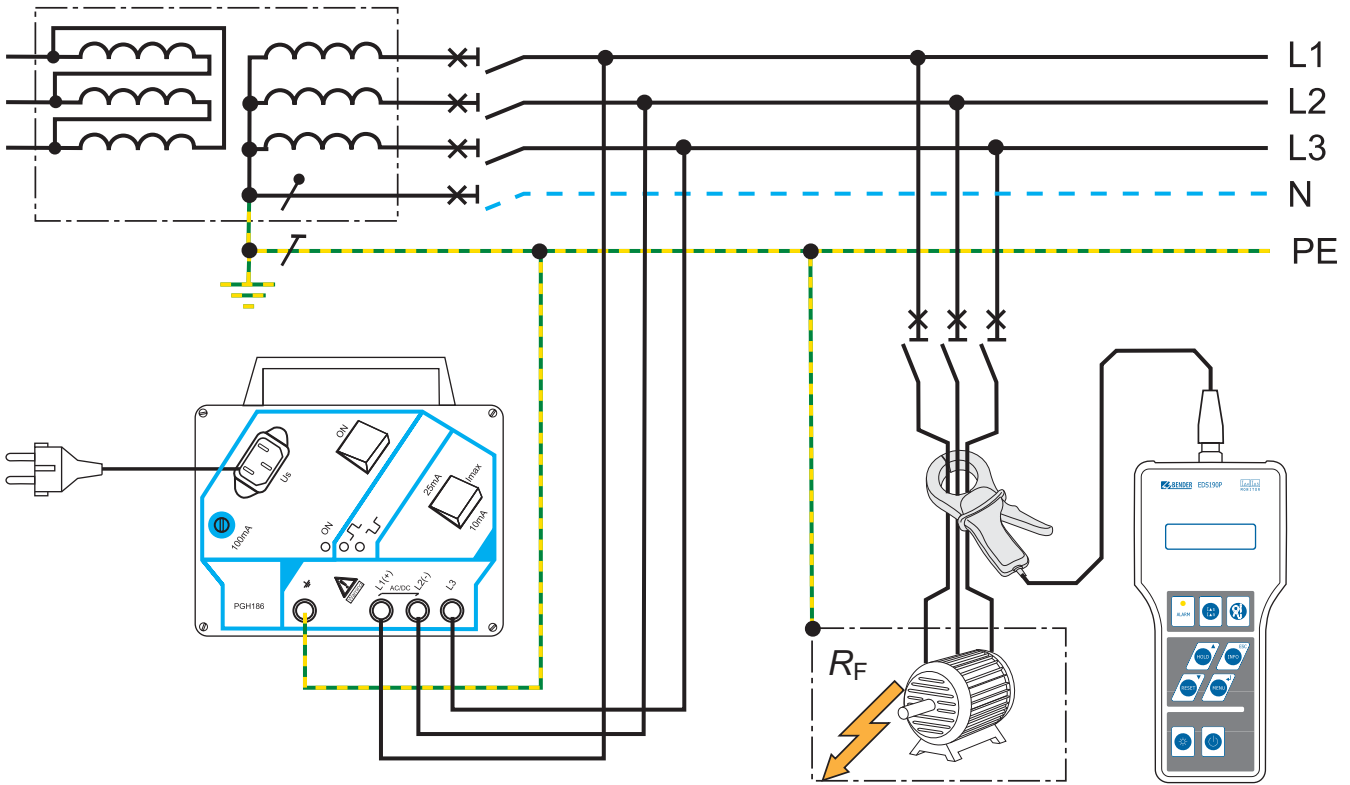


**Application example:** Insulation fault location system EDS3090 / 3091PG for use in unearthed systems (IT systems) without a permanently installed insulation fault location system

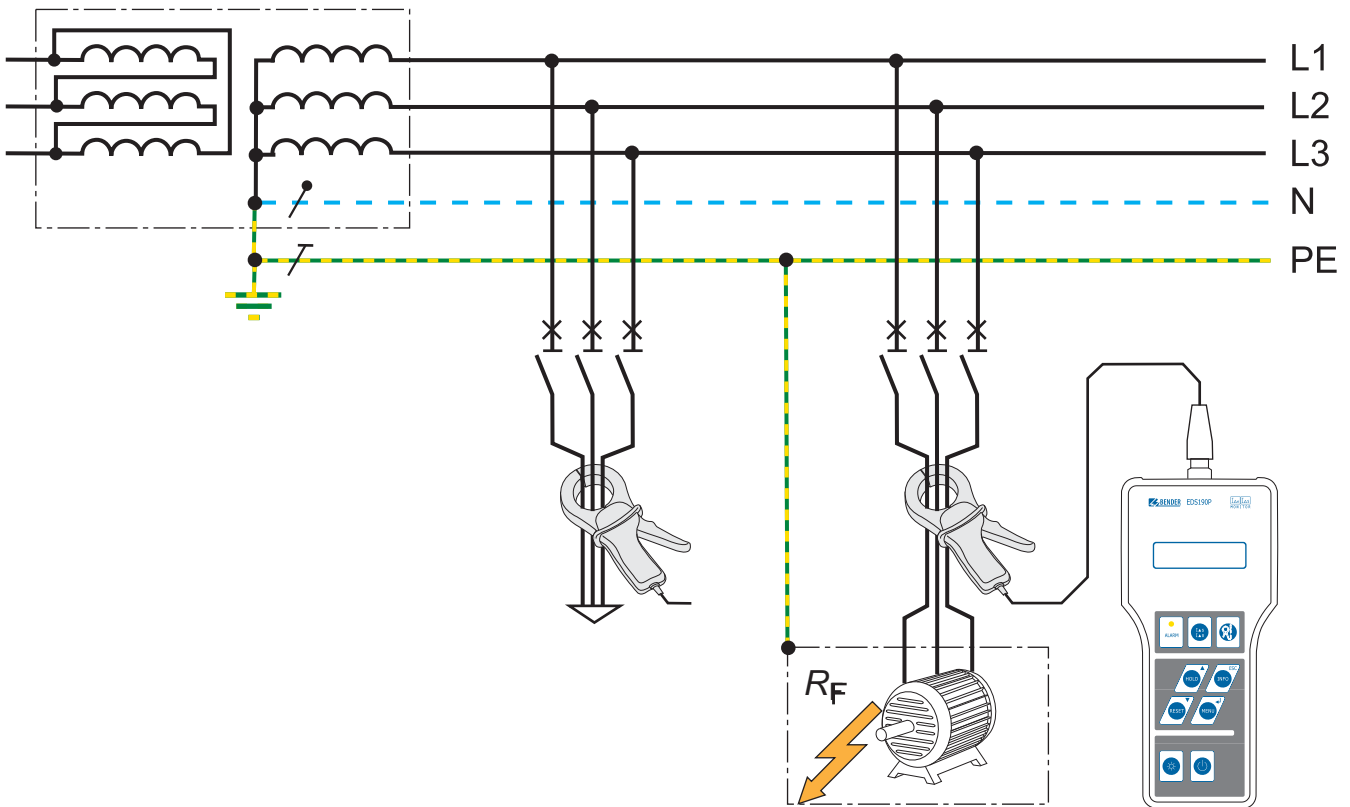


**Application example:** Insulation fault location system EDS3090 / 3091PG in unearthed systems (IT systems) with a permanently installed insulation fault location system

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

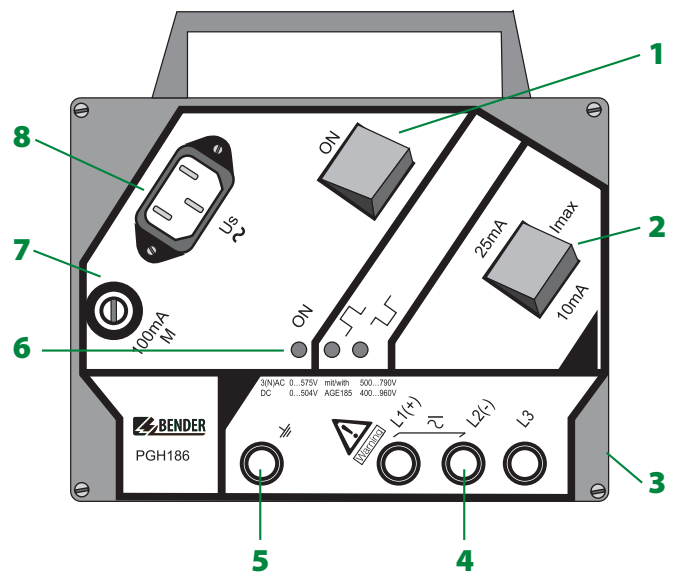


**Application example: Residual current measurement with EDS309... in earthed systems (TN-S systems)**

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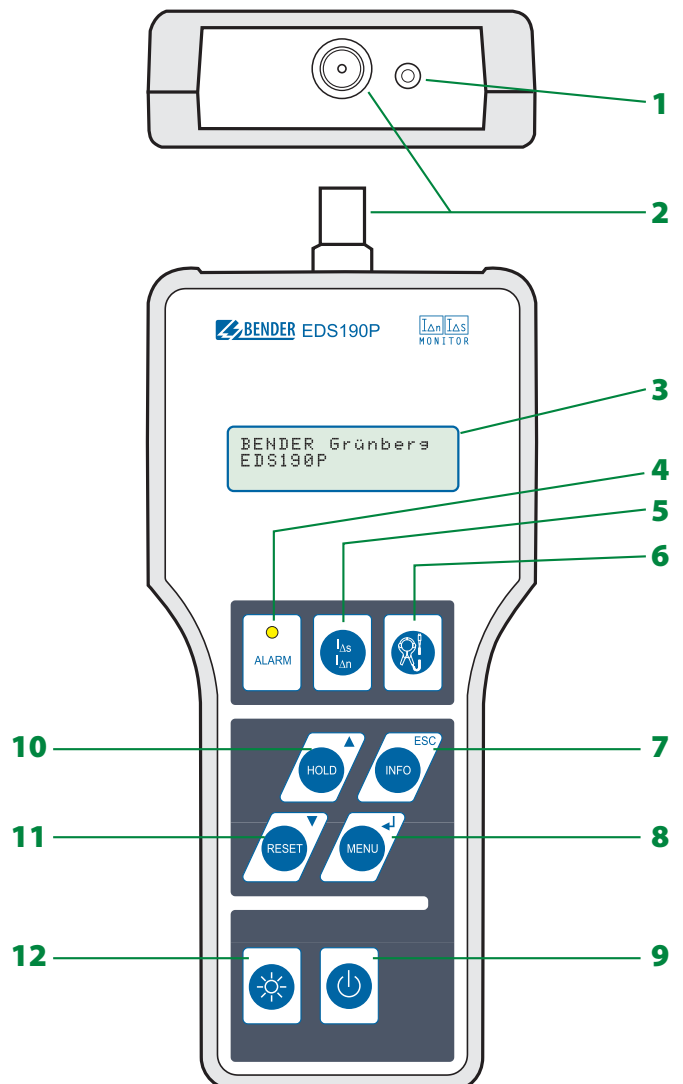
**Operating elements of the PGH18...**

- 1 - "On/off switch "ON" to activate the locating current
- 2 - Selector switch to select 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 clock pulse of the locating current  
 Indication of the negative clock pulse of the locating current
- 7 - Microfuse 100 mA
- 8 - Panel plug for supply voltage connection



**Display and operating elements of the EDS190P**

- 1 - Connection for external power supply unit DC 6 V
- 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:  
 $I_{\Delta S}$  = insulation fault location in IT systems (EDS mode)  
 $I_{\Delta n}$  = residual current measurement in TN-S systems in (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  $I_{\Delta S}$  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 change, scroll
- 11 - "RESET" button  
fault memory acknowledgement  
Arrow down button: parameter change, scroll
- 12 - Illumination button:  
to switch on the display lighting



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### Technical data EDS309...system

The technical data listed in this chapter apply to the components: PGH18..., EDS190P, AGH185.

#### Environment/EMC

EMC	IEC 61326-2-4
Operating temperature	-25 °C...+55 °C
Climatic class 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
Operating manual	TGH1420
Weight approx.	≤ 7000 g (8500 g incl. PSA3165) EDS3092 ≤ 9000 g
Dimensions W x H x D	160 x 148 x 81 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 $U_n$

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

#### Measuring voltage $U_m$

PGH186	DC 50 V
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#### Supply voltage

Supply voltage $U_S$	AC 50...60 Hz 230 V
Operating range of $U_S$	0.85...1.15 x $U_S$
Supply voltage $U_S$ version -13	AC 50...60 Hz 90...132 V
Power consumption	≤ 3 VA

#### Locating current

<b>PGH185/186</b>	
Max. locating current, selectable	10 / 25 mA

<b>PGH183</b>	
Max. locating current, selectable	1 / 2.5 mA

<b>PGH183/185/186</b>	
Clock pulse	2 s
Idle time	4 s

#### Other

Degree of protection, internal components IEC 60529	IP40
Enclosure material	ABS plastic
Flammability class	UL94 V-0
Weight	≤ 700 g
Dimensions W x H x D	430 x 340 x 155 mm

### Technical data EDS190P

#### 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 $U_S$	DC 6 V +/- 10 %, external power supply unit
Batteries	3 x LR6 AA – 1.5 V
Accumulators	3 x NiMH ≥ 2000 mAh
Size	AA R6
Power consumption	≤ 0.5 W
Hours of operation (without display illumination)	60 h

#### Measuring circuit insulation fault location

Nominal system voltage	conductors uninsulated, including measuring clamp up to 600 V
Rated frequency	42...2000 Hz

#### Main circuit

Measuring clamps	PSA3020, PSA3052, PSA3165
Response value, adjustable	2...10 mA (5 mA)*
Relative uncertainty	± 30 % / ± 2 mA of the reference value

#### Control circuit:

Measuring clamps	PSA3320, PSA3352
Response value, adjustable	0.2...1 mA (0.5 mA)*
Relative uncertainty	± 30 % / ± 0.1 mA of the reference value

#### Measuring circuit residual current

with measuring clamps	PSA3320, PSA3352
Measuring range	2 mA ... 2 A (crest factor up to 3)
Response value, adjustable	5 mA...1 A
with measuring clamps	PSA3020, PSA3052, PSA3165
Measuring range	5 mA ... 10 A (crest factor up to 3)
Response value, adjustable	10 mA...10 A
Frequency range	42...2000 Hz
Relative uncertainty	0...-35 %
Operating uncertainty	± 17.5 %
Hysteresis	20 %
Harmonics, adjustable	2.-9. harmonics

#### Connection

Type of connection measuring clamp	BNC plug
Power supply unit	DC 6 V

#### Displays

LCD	3 x 16 characters
LED	Alarm

#### Other

Degree of protection, internal components IEC 60529	IP40
Protection class acc. to IEC 60947-1, IEC 60947-1	Class III
Enclosure material	ABS plastic
Flammability class	UL94 V-0
Operating manual	TGH1420
Weight	≤ 400 g
Software version	D316 V1.0
Operating manual	TGH1420
Dimensions W x H x D	84 x 197 x 30 mm

( ) \* = Factory settings

### Technical data measuring clamps

#### Electrical safety

Pollution degree	2
Installation category	III
Operating voltage	600 V
Nominal insulation voltage	AC 600 V CAT III bzw. AC 300 V CAT IV

#### Other

Degree of protection, internal components IEC 60529	IP40
Protection class acc. to IEC 60947-1, IEC 60947-1	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 / III
Nominal system voltage $U_n$	3AC/AC 42...460 Hz, 500...790 V, DC 400...960 V

#### Other

Degree of protection, internal components IEC 60529	IP30
Type of connection/cable:	safety plug with green-yellow connecting wire 1 mm <sup>2</sup>
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

Type	Scope of delivery				Supply voltage	Nominal voltage	Art. No.
	Insulation fault locator	Locating current injector	Measuring clamps 20 mm	Measuring clamps 52 mm			
EDS3090	EDS190P		PSA3020	PSA3052		AC 42...460 Hz, 20...575 V und DC 20...504 V	B 9108 2026
EDS3090PG	EDS190P	PGH185	PSA3020	PSA3052	AC 50...60 Hz, 230 V	AC 42...460 Hz, 20...575 V und DC 20...504 V	B 9108 2021
EDS3090PG-13	EDS190P	PGH185-13	PSA3020	PSA3052	AC 50...60 Hz, 90...132 V	AC 42...460 Hz, 20...575 V und DC 20...504 V	B 9108 2022
EDS3096PG	EDS190P	PGH186	PSA3020	PSA3052	AC 50...60 Hz, 230 V	AC 42...460 Hz, 0...575 V und DC 0...504 V	B 9108 2025
EDS3096PG-13	EDS190P	PGH186-13	PSA3020	PSA3052	AC 50...60 Hz, 90...132 V	AC 42...460 Hz, 0...575 V und DC 0...504 V	B 9108 2029
EDS3091	EDS190P		PSA3320	PSA3352		AC 42...460 Hz, 20...265 V und DC 20...308 V	B 9108 2027
EDS3091PG	EDS190P	PGH183	PSA3320	PSA3352	AC 50...60 Hz, 230 V	AC 42...460 Hz, 20...265 V und DC 20...308 V	B 9108 2023
EDS3091PG-13	EDS190P	PGH183-13	PSA3320	PSA3352	AC 50...60 Hz, 90...132 V	AC 42...460 Hz, 20...265 V und DC 20...308 V	B 9108 2024
EDS3092PG		PGH183	PSA3320	PSA3352	AC 50...60 Hz, 230 V	AC 42...460 Hz, 20...265 V und DC 20...308 V	B 9108 2030
		PGH185	PSA3020	PSA3052	AC 50...60 Hz, 230 V	AC 42...460 Hz, 20...575 V und DC 20...504 V	B 9108 2030

### Optional accessories

PSA3165	Measuring clamp 115 mm for EDS3090... and EDS3096...	B 980 852
AGE185	Coupling device to extend the voltage range of the PGH185/186	AC 42...460 Hz 500...790 V, DC 400...960 V B 980 305
EDS165-SET	Accessories for fault location in diode-decoupled systems	B 9108 2007

### 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  
Low-voltage electrical installations - Part 4-41: Protection for safety – Protection against electric shock

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

- 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
- IEC 61010-1:2010  
Safety requirements for electrical equipment for measurement, control, and laboratory use – Part 1: General requirements.

## Device selection for IT systems with a permanently installed insulation fault location system

System configuration ▶	AC, DC, AC / DC (mixed systems)	AC, DC, AC / DC (mixed systems)
	Main circuits	Control circuits
	Insulation monitoring device A-ISOMETER® / locating current injector PGH	
Application range ▶		
Function ▶		
Nominal system voltage $U_n$ (B1) ▶	3AC / AC 20...575 V DC 20...504 V	3 AC / AC 20...150 V DC 20...150 V
Nominal system voltage $U_n$ (B2) ▶	3AC / AC 340...760 V DC 340...575 V	--
$U_s$ DC 19.2-72 V ▶	IRDH575B1-427	IRDH575B1-4227
$U_s$ AC 88-264 V DC 77-286 V ▶	IRDH575B1-435	IRDH575B1-4235
$U_s$ AC 88-264 V DC 77-286 V ▶	IRDH575B2-435	--
Test current ▶	10 / 25 / 50 mA	1 / 2.5 mA
Response values ▶	1 k $\Omega$ ... 10 M $\Omega$	1 k $\Omega$ ... 10 M $\Omega$
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 ▶	EDS190P
LC display ▶	3 x 16 characters
Locating current max. ▶	1...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, EDS190P, PSA3020, PSA3052, power supply unit	Aluminium case, EDS190P, PSA3020, PSA3052, power supply unit
		Aluminium case, EDS190P, PSA3320, PSA3352, power supply unit

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

Application	Main circuit		Control circuit
	energised	offline	energised
Function	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	10 / 25 mA	10 / 25 mA	1 / 2.5 mA

Insulation fault locator	
Type	EDS190P
	
LC display	3 x 16 characters
Locating current max.	1...50 mA
Response value	0.2...1 / 2...10 mA selectable

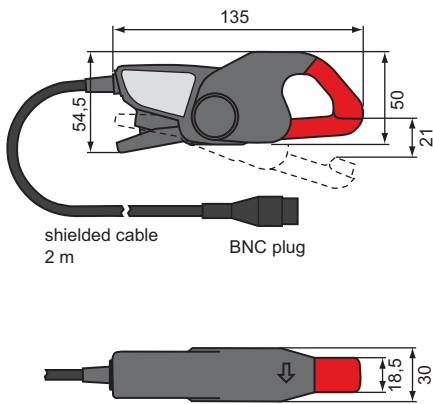
Measuring clamps					
Type	PSA3020	PSA3052	PSA3165 (optional)	PSA3320	PSA3352
					
20 mm	×			×	
52 mm		×			×
115 mm			×		

Complete system			
Type	EDS3090PG (-13)	EDS3096PG (-13)	EDS3091PG (-13)
	EDS3090PG for $U_S =$ AC 50...60 Hz 230 V EDS3090-13 for $U_S =$ AC 50...60 Hz 90...132 V	EDS3096PG for $U_S =$ AC 50...60 Hz 230 V EDS3096PG-13 for $U_S =$ AC 50...60 Hz 90...132 V	EDS3091PG for $U_S =$ AC 50...60 Hz 230 V EDS3091PG-13 for $U_S =$ AC 50...60 Hz 90...132 V
Comprising	Aluminium case, PGH185, EDS190, PSA3020, PSA3052, power supply unit, cable set	Aluminium case, PGH186, EDS190, PSA3020, PSA3052, power supply unit, cable set	Aluminium case, PGH183, EDS190, PSA3320, PSA3352, power supply unit, cable set
Type	EDS3092PG		
Comprising	Aluminium case, PGH185, EDS190, PSA3020, PSA3052, power supply unit, cable set		Aluminium case, PGH183, EDS190, PSA3320, PSA3352, power supply unit, cable set

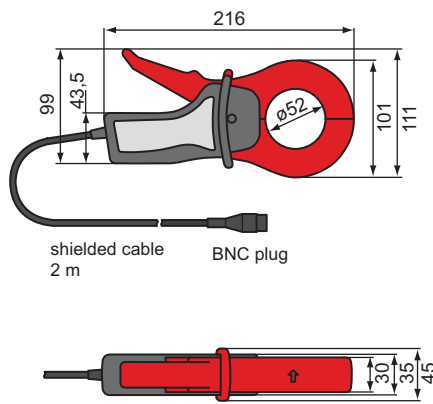
Accessories	
Type	AGE185
	
Extension	AC 45...400 Hz, 500...790 V
Nominal voltage range	DC 400...960 V



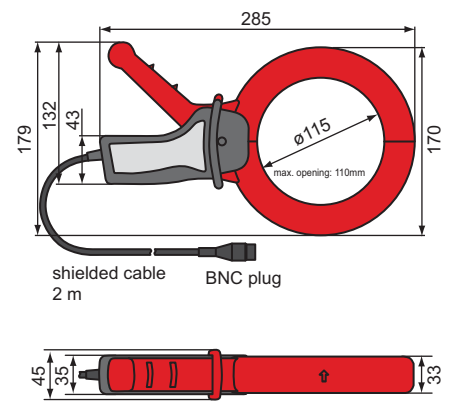
**Dimension diagram PSA3020/3320**



**Dimension diagram PSA3052/3352**



**Dimension diagram PSA3165**



**Dimension diagram aluminium case**

