

# EDS3090 Series

Portable Ground Fault Location System  
For Ungrounded (Floating) AC/DC Systems





EDS3090PG

### Features

- Portable ground fault location system for ungrounded systems: Up to 790 VAC (42 - 460 Hz) and up to 960 VDC (may require coupler: see description for details)
- Locate ground faults with portable equipment while the system remains online
- Works on AC and DC systems
- Offline fault location also available
- Branch ground fault current measurements in grounded AC systems
- Use in both small and large ungrounded systems
- Package includes 0.8" and 2" split-core clamps (4.5" clamp also available)
- Robust aluminum carrying case
- Various types of kits available - see description for more information

### EDS195P hand-held evaluator

- Backlit LCD display
- Rechargeable battery with power supply, microUSB connection
- Read either tracer signal for fault location in ungrounded systems, or measured ground fault current in AC grounded systems

### Description

The EDS3090 series is a complete portable ground fault location solution for ungrounded AC and DC systems. The system locates ground faults down to the load level while the system remains online. EDS3090 series kits may also be used for branch ground fault current measurement in grounded and high-resistance grounded AC systems. All essential components are housed in a robust aluminum case. The EDS3090 system is perfect for large general distribution networks, utilities, ships, healthcare facilities, and more.

Various versions of the kit available, including completely standalone portable kits, as well as kits that work with installed BENDER ground fault detectors, including the IRDH575 and LIM2010.

### Kit Types and Application

Standalone portable fault location systems (no other devices required), refer to ordering information for a complete list of options:

- **EDS3090PG**

For general distribution: 20 - 575 VAC (42 - 460 Hz), 20 - 504 VDC  
With AGE185 voltage coupler: 500 - 790 VAC, 400 - 960 VDC

- **EDS3091PG**

For smaller systems, control networks, and healthcare facilities:  
20 - 265 VAC (42 - 460 Hz), 20 - 308 VDC

Kits used in conjunction with installed BENDER ground fault detectors:

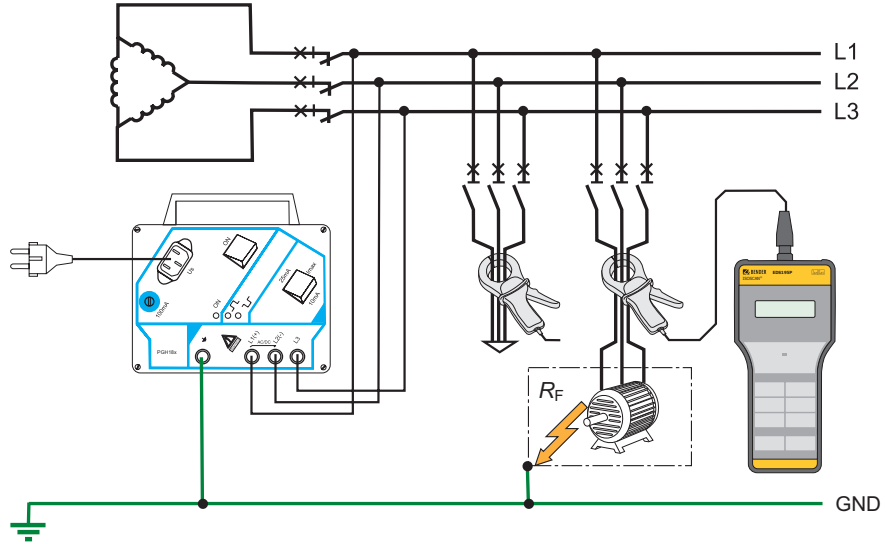
- **EDS3090**

For general distribution

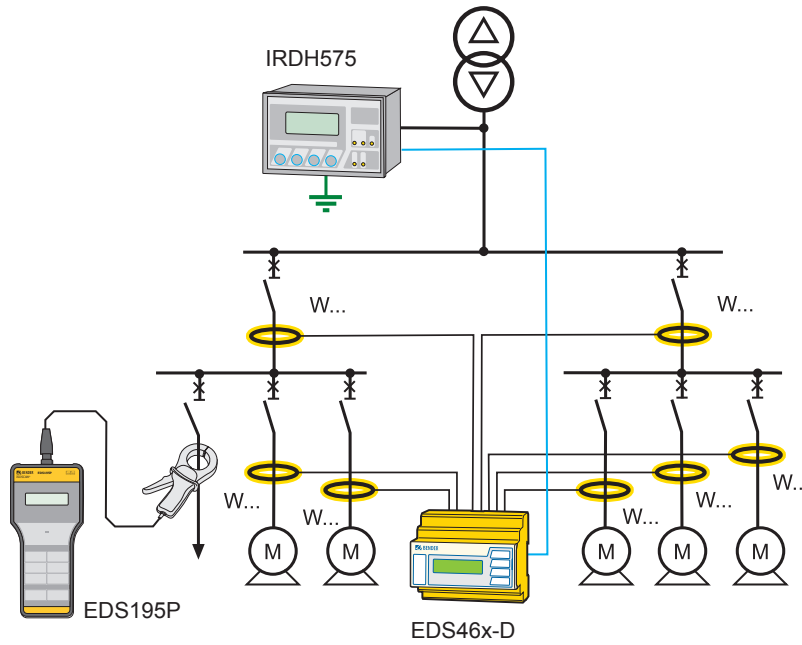
- **EDS3091**

For smaller systems, control networks, and healthcare facilities:

**Application Examples**

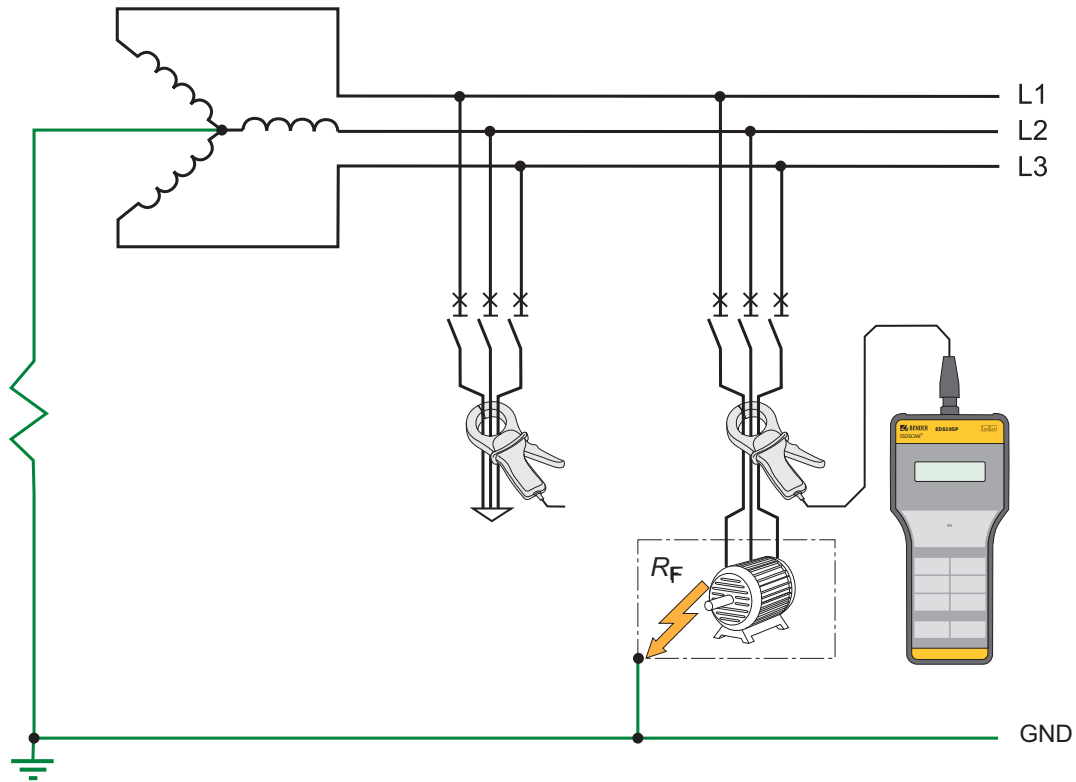


**Application example: Standalone portable ground fault location (no installed ground fault detectors) with EDS3090PG and EDS3091PG series kits, system online and energized**





**Application example: Combining EDS3090 / EDS3091 series kits with installed ground fault location equipment, system online and energized**

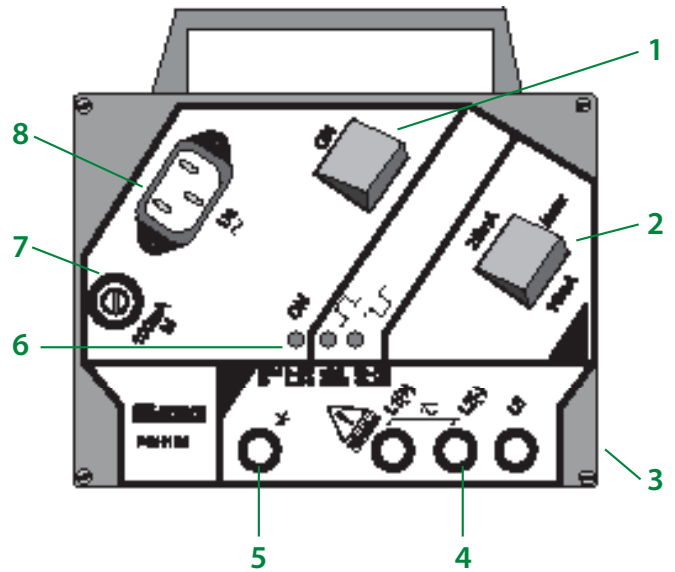
Application Examples (continued)



Application example: Using EDS3090 series kit for branch ground fault current measurement in grounded and HRG systems

**Displays and Controls: PGH183 / PGH185 / PGH186 Test Generator**

- 1 - ON/OFF switch to activate the test current
- 2 - Selector switch for maximum test current 25/10 mA or 2.5 / 1 mA
- 3 - Not visible: Magnetic adhesive strip at the back of the enclosure for affixing to metal parts (ex. switchgear cabinet)
- 4 - 3 sockets for system connections
- 5 - Socket for ground connection
- 6 - LED indicators:
  - Power ON LED
  -  Indication of the positive test cycle of the test current
  -  Indication of the negative test cycle of the test current
- 7 - Microfuse, 100 mA
- 8 - Panel plug for supply voltage



**Displays and Controls: EDS195P Hand-held Evaluator**

- 1 - MicroUSB connection for battery charger
- 2 - BNC connector for clamp
- 3 - LCD display, backlit
- 4 - ALARM LED, illuminates when alarm value is exceeded
- 5 - Button for selection of operation mode:
  - $I_{\Delta s}$ : Fault location in ungrounded systems
  - $I_{\Delta n}$ : Ground fault current measurement in grounded systems
- 6 - Button for selection of clamp type:
 

	For $t_{max} = 50 \text{ mA}$	For $t_{max} = 5 \text{ mA}$
P20	PSA3020	PSA3320
P52	PSA3052	PSA3352
P165	PSA3165	
W/WR	W and WR series	W-8000 series
WS	WS series	W-8000 series
- 7 - INFO button, queries device information
- 8 - MENU button: toggles between main screen and menu
- 9 - Power button
- 10 - HOLD button: stores currently measured value
  - Arrow UP button: Moves up in main menu
- 11 - RESET button: resets held value
  - Arrow DOWN button: Moves down in main menu
- 12 - Toggles display backlight



## Ordering Information

Application	Kit type	Nominal voltage $U_n$		Supply voltage $U_S$	Supports AGE185 coupler	Type	Ordering No.
		AC	DC	AC			
Main distribution	Works with installed equipment	20 - 575 V (42 - 460 Hz)	20 - 504 V	–		EDS3090	B 9108 2026
	Standalone	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
Offline systems	Standalone	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
				–		EDS3091	B 9108 2027
Small systems, healthcare facilities	Works with installed equipment	20 - 265 V (42 - 460 Hz)	20 - 308 V	–		EDS3091	B 9108 2027
	Standalone	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

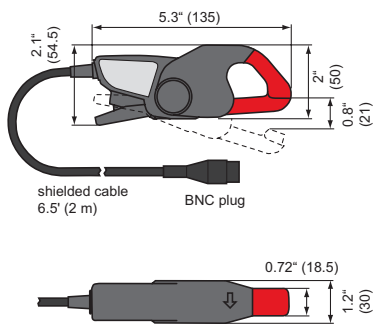
## Accessories

Description	Nominal voltage $U_n$		Type
	AC	DC	
115 mm measuring clamp	–	–	PSA3165
Voltage coupler to extend range of PGH185 and PGH186	500 - 790 V (42 - 460 Hz)	400 - 960 V	AGE185
Accessories for fault location in diode-decoupled systems	–	–	EDS165-SET

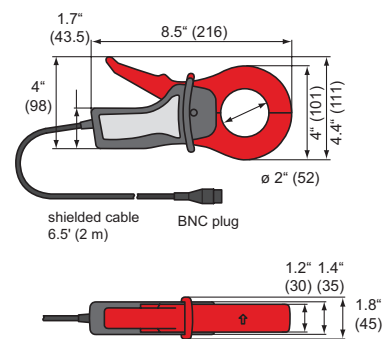
## Scope of Delivery

Hand-held evaluator	Current injector	20 mm clamp	52 mm clamp	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

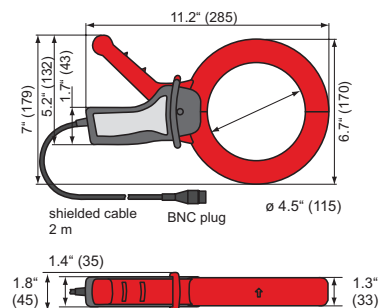
## Dimensions: PSA3020 / PSA3320



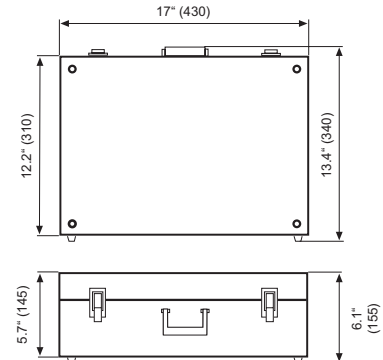
## Dimensions: PSA3052 / PSA3352



## Dimensions: PSA3165



## Dimensions: Aluminum carrying case



## Technical Data: EDS3090 System (General)

### 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)
Climatic class acc. to IEC 60721	
Stationary use (IEC 60721-3-3)	3M4
Transport (IEC 60721-3-2)	2M2
Long-time storage (IEC 60721-3-1)	1M3

### Other

Operating mode	continuous operation
Position of normal use	any
Operating manual	TGH1420
Weight EDS309 -	≤ 7000 g
Weight EDS309 - with PSA3165	≤ 8500 g
Weight EDS3092	≤ 9000 g
Dimensions W x H x D	430 x 340 x 155 mm

## Technical Data: PGH183 / PGH185 / PGH186

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

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

### Nominal system voltage $U_n$

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

### Voltage supply

Supply voltage $U_S$	AC 230 V/50 - 60 Hz
Operating range of $U_S$	0.85 - 1.15 x $U_S$
Supply voltage $U_S$ (-13 models)	AC 90 - 132 V/50 - 60 Hz

### PGH183, PGH185:

Power consumption	≤ 3 VA
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### PGH186:

Power consumption	≤ 6 VA
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### Locating current

PGH183	
Test current, selectable, max.	1/2,5 mA

### PGH185/186

Locating current $I_L$ , selectable, max.	10/25 mA
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### PGH183/185/186

Clock pulse	2 s
Idle time	4 s

### Measuring voltage $U_m$

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	UL94 V-0

## 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

### Voltage supply

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	DC, 42 - 2000 Hz

### Main circuit ( $I_{Lmax} = 50$ mA)

Measuring range	2 mA - 50 mA
Measuring clamps	PSA3020, PSA3052, PSA3165
Response value $I_{\Delta L}$ , adjustable	2 - 10 mA (5 mA)*
Relative uncertainty	±30 %/±2 mA of the reference value

### Control circuit

Measuring range	0,2 mA - 5 mA
Measuring clamps	PSA3320, PSA3352
Response value $I_{\Delta L}$ , 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 value $I_{\Delta L}$ , adjustable	10 mA - 10 A (100 mA)*
with measuring clamps	PSA3320, PSA3352
Measuring range	2 mA - 2 A (crest factor up to 3)
Response value $I_{\Delta L}$ , 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, adjustable	1st to 8th harmonic component

### Connection

Type of connection measuring clamp	BNC plug
Power supply unit (DC 5 V)	µUSB plug

### Indication

LCD	3 x 16 characters
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	UL94 V-0
Operating manual	TGH1420
Weight	≤ 350 g
Software version	D399 V1.2
Dimensions W x H x D	84 x 197 x 30 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 resp. 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

### Technical Data: AGE185 Voltage Coupler

#### 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 <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





USA • Coatesville, PA  
Toll-Free: 800-356-4266 • Main: 610-383-9200  
Fax: 610-383-7100 • E-mail: info@bender.org



Canada • Mississauga, ON  
Toll-Free: 800-243-2438 • Main: 905-602-9990  
Fax: 905-602-9960 • E-mail: info@bender-ca.com

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