

**EN 60947-2 Standard**

Circuit Breaker type		FD160					FD160					FE160		
Denomination		N	H	C	E	S	N	H	L			N	H	L
Poles	Number of	1			3,4		2 ⁽¹⁾	3,4				3,4		
Rated insulation voltage	Ui (Volts)	750		500	750	750		750				750		
Rated impulse withstand voltage	Uimp (Kilovolt)	3		6	8	8		8				8		
Rated operational voltage Ue	Volts AC	240		500	690	690		690				690		
	Volts DC	250		-	-	500		500				500		
Line Protection device														
Category of use		A					A					A		
Suitable for use as a isolator	Positive ON & OFF	yes					yes					yes		
Rated current Ith = Ie	A at 40°C	160					160					160		
Ultimate breaking capacity Icu (kA)	230/240V AC	25	50	25	40	50	85	100	200			85	100	200
	400/415V AC	-	-	18	25	36	50	80	150			50	80	150
	440V AC	-	-	14	14	25	30	65	130 ⁽⁴⁾			42	65	130
	500V AC	-	-	10	12	18	22	36	50 ⁽⁴⁾			30	50	100
	690V AC	-	-	-	4,5	6	8	10	12			10	22	75
	250V DC Single pole	-	50	-	-	25	40	65	100			50	85	100
	500V DC Two Pole	-	-	-	-	25	40	65 ⁽²⁾	100 ⁽²⁾			50	85 ⁽²⁾	100 ⁽²⁾
Service breaking capacity Ics (%Icu)	≤ 500V	100%	100%	75%	75%	100%	100%	100%	100%			100%	100%	100%
	690V AC	-	-	-	-	50%	50%	50%	50%			100%	75%	25%
Making capacity Icm (kA peak)	400/415V AC	-	-	36	52,5	75	110	176	330			110	176	330
	500V AC	-	-	17	24	36	46	75	110			63	110	220
Single phase breaking capacity I _{IT} (kA)	230V AC	25	50	16	25	30	50	80	150			50	80	150
	400/415V AC	-	-	-	4,5	6	8	10	12			15	22	36
Endurance (CO operations)	Mechanical	10000					25000					40000		
	Electrical at In	5000					10000					20000		
	Electrical at In/2	10000					20000					30000		
Endurance (On-Tripped operations)	Mechanical	4000					10000					16000		
Trip Units	Interchangeable	no					no					yes		
	Thermal Magnetic line	LTM										LTM		
	Thermal Magnetic generator						GTM					GTM		
	Thermal Magnetic discriminating						LTMD					LTMD		
	Magnetic Only						Mag Break™					Mag Break™		
	Electronic discriminating											SMR1		
	Electronic enhanced													

NEMA AB-1 Standard

3 ph, Interruption rating	240V AC	-	-	-	-	50	65	100	-	100	150	200
	480V AC	-	-	-	-	25	36	50	-	50	65	130
	600V AC	-	-	-	-	6	8	10	-	25	36	42

EN 60947-3 Standard

Non Automatic Circuit Breaker/Switch type		FD160				FE160	
Denomination		Y - 63A				Y - 160A	
Rated current In (class AC23)	220V AC to 690V AC	63				160	
Rated making capacity	Icm (kA peak)	1,7				4,2	
Short-term withstand current Icw (A)	Icw eff. 1 second	1,2				3	
	Icw eff. 3 seconds	1,2				3	

EN 60947-4 Standard

Use in motor circuits		FD160				FE160	
Rated current Ith	A at 65°C					125	
Endurance (CO operations)	Mechanical					25000	
	Electrical at In class AC23					10000	
	Operations per hour					120	
Protection	Short Circuit only (separate overload device)					Mag Break™	
	Overload class 10 and Short circuit					SMR1	
	Max In (A) class 10					100	
	Max In (A) class 30					50	
	Earth fault unit (differential)					Optional FDQ type	

Installation

Circuit Breaker or Switch type		FD160				FE160	
Number of poles		1	3	4		3	4
Mounting	On symmetrical DIN Rail	yes	yes	yes		no	no
	Fixed	yes	yes	yes		yes	yes
	Plug-in	no	yes	yes		yes	yes
	Draw-out	no	no	no		yes	yes
Connection	Front	yes	yes	yes		yes	yes
	Rear	yes	yes	yes		yes	yes
Dimensions (w x h x d) mm	Fixed front connection	27x130	81x130	108x130		105x170	140x265
		x85	x85	x85		x95	x115
Weights (kg)	Fixed front connection	0,4	0,9	1,3		1,5	2

(1) N type only
(2) 3 poles are needed.

(3) 2 poles are needed
(4) The 160Amp current rating of the L type is limited to 65kA at 440v & 36kA at 500V.



	FE250				FG400			FG630			FK800			FK1250			FK1600		
	V	N	H	L	N	H	L	N	H	L	N	H	L	N	H	L	N	H	
		3,4				3,4			3,4			3,4			3,4			3,4	
	690	750				750			750			1000			1000			1000	
	8	8				8			8			8			8			8	
	500	690				690			690			690			690			690	
	250	500				500			500			500			500			500	
	A				B			B ⁽⁵⁾			B			B			B		
	yes				yes			yes			yes			yes			yes		
	250				400			630			800			1250			1600		
	65	85	100	200	90	100	200	85	100	200	85	100	170	85	100	170	85	100	
	36	50	80	150	50	80	150	50	80	150	50	80	100	50	80	100	50	80	
	25	42	65	130	42	65	130	42	65	130	42	50	80	42	50	80	42	50	
	18	30	50	100	30	50	100	30	50	100	36	42	50	36	42	50	36	42	
	-	10	15	22	10	22	75 ⁽⁷⁾	10	22	40 ⁽⁷⁾	20	25	30	20	25	30	20	25	
	25	50	85	100							50	80	100	50	80	100	-	-	
	-	50	85 ⁽²⁾	100 ⁽²⁾							36	50	65	36	50	65	-	-	
	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
	-	100%	75%	50%	100%	75%	25%	100%	75%	50%	100%	100%	75%	100%	75%	50%	100%	75%	
	75	110	176	330	110	176	330	110	176	330	110	176	220	110	176	220	110	176	
	36	63	110	220	63	110	220	63	110	220	75	110	220	75,6	110	220	75	110	
	36	50	80	150	50	80	150	50	80	150	50	80	150	50	80	150	50	80	
	-	10	15	22	10	⁽⁶⁾	⁽⁶⁾	10	⁽⁶⁾	⁽⁶⁾	20	25	30	20	25	30	20	25	
	10000	25000				20000			20000			10000			10000			10000	
	5000	10000				7500			5000			4000			3000			2000	
	10000	20000				15000			10000			8000			6000			4000	
	4000	10000				8000			8000			4000			3000			2000	
	yes				yes			yes			yes			yes			yes		
	LTM										LTM			LTM					
	GTM																		
	LTMD																		
	Mag Break™							Mag Break™											
	SMR1							SMR1						SMR1e					
	SMR2							SMR2						SMR 1s & g					

65	100	150	200	100	150	200	100	150	200	85	-	-	85	-	-	85	-
36	50	65	130	50	65	130	50	65	130	42	-	-	42	-	-	42	-
22	25	36	42	25	36	42	25	36	42	25	-	-	25	-	-	25	-

FE250				FG400				FG630				FK800				FK1250				FK1600			
V	N	H	L	V	N	H	L	V	N	H	L	V	N	H	L	V	N	H	L	V	N	H	L
250				400				630				800				1250				1600			
5,7				7,1				9,2				14,1				21,2				28,3			
4				5				6,5				10				15				20			
4				5				6,5				10				15				20			

230	400	500	720	1000	
25000	20000	20000	10000	10000	
10000	7500	5000	4000	3000	
120	120	60	60	60	
Mag Break™	Mag Break™	Mag Break™	Mag Break™	Mag Break™	
SMR1	SMR1 or SMR2	SMR1 or SMR2			
225	400	500	720	1000	
225	400	500	720	1000	
Optional FEQ type	Optional FGQ type	Optional FGQ type			

FE250				FG400				FG630				FK800				FK1250				FK1600			
3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4
no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no	no
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
105x170	140x265	140x265	185x265	140x265	185x265	140x265	185x265	210x320	280x320	210x320	280x320	210x320	280x320	210x320	280x320	210x320	280x320	210x320	280x320	210x320	280x320	210x320	280x320
x95	x115	x115	x115	x115	x115	x115	x115	x160	x160	x160	x160	x160	x160	x160	x160	x160	x160	x160	x160	x160	x160	x160	x160
1,5	2,0	4,5	6,0	4,5	6,0	4,5	6,0	12,2	15,1	18,0	23,4	18,0	23,4	18,0	23,4	18,0	23,4	18,0	23,4	18,0	23,4	18,0	23,4

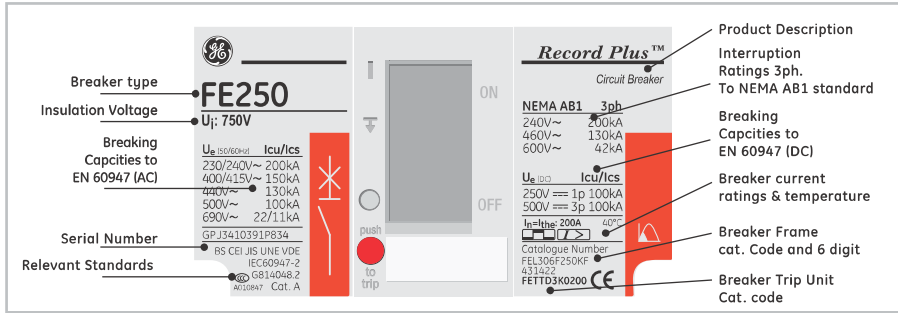
(5) Limited to 500Amp

(6) Please contact your nearest GE Sales Office

(7) At a voltage of 690V the uses of a long widened

Shield is mandatory (see page D.9)





Certification

The **Record Plus™** line of circuit breakers has been designed to comply with the following standards:

EN 60947 Low-voltage switchgear and controlgear

- EN 60947-1: General rules
- EN 60947-2: Circuit-breakers
- EN 60947-3: Switches, disconnectors, switch-disconnectors and fuse-combination units
- EN 60947-4-1: Contactors and motor-starters
- Section One: Electromechanical contactors and motorstarters
- EN 60947-5-1: Control circuit devices and switching elements
- Section One: Electromechanical control circuit devices

This compliance has been verified by three authorities; the Kema, the CCC organization and Lovag.
 (Appropriate certificates can be made available on request)

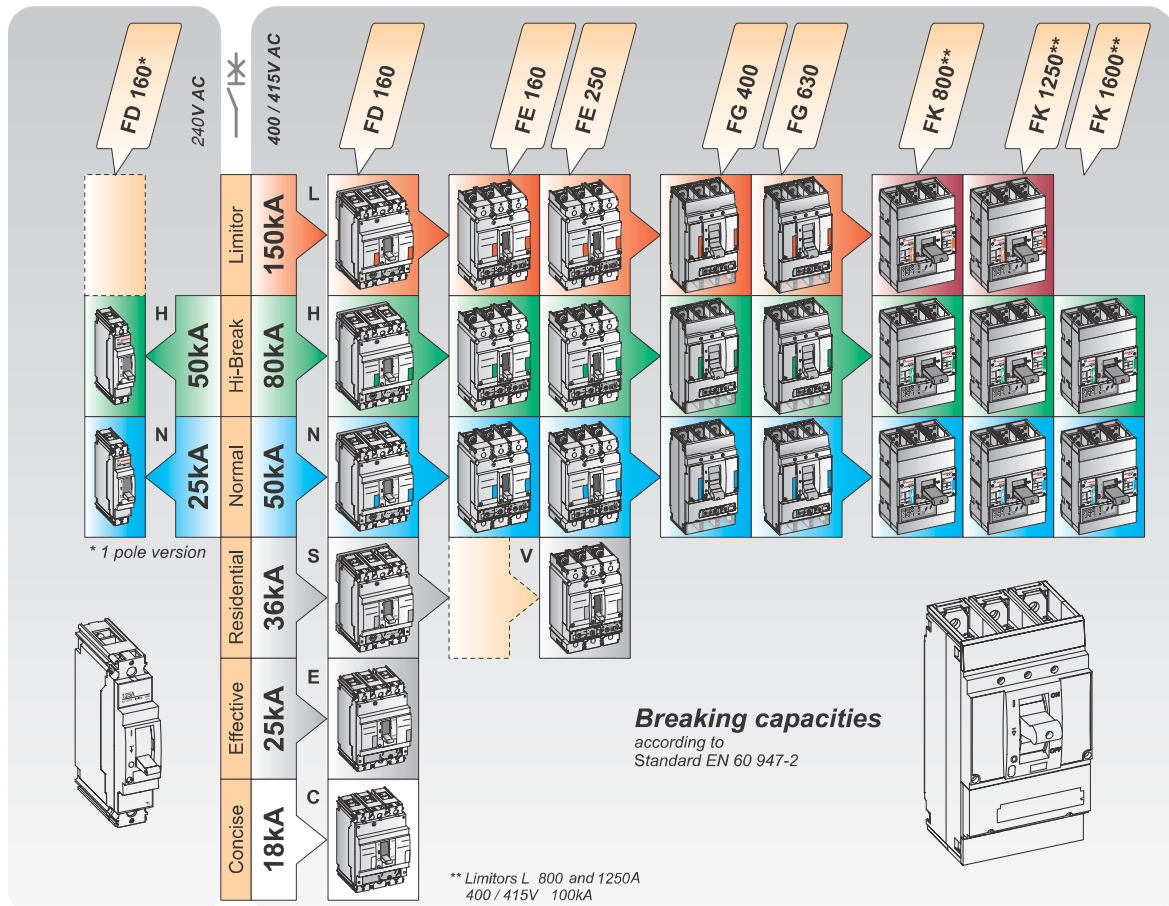
Meeting the international standards. The requirements are met of **BS, VDE, UTE, KEMA, CEI**. Record Plus breakers have been tested in accordance with the NEMA standards

For the Record Plus product certificates are available from the following regulatory bodies:

- Germanische Lloyds - RINA
- Lloyds Register of Shipping - CCC (China)
- Further tests are being undertaken to meet the requirements of the following regulatory bodies:
- Bureau Veritas - Det Norske Veritas

Please contact us to check the availability of individual certificates.

A UL489 certified variant of the Record Plus line of Molded Case Circuit Breakers is also available. The line covers three frame sizes with current ratings of 3 to 600Amps. Please contact our GE sales offices in the U.S.A for further details.



Moulded Case Circuit Breakers designed for global applications



Contents

A complete line of selective & current limiting breakers

Protection with flexible & interchangeable trip units

Common accessories safe & easy to mount

Wide range of electrical & mechanical operators

Versatile installation options

A full solution for low voltage distribution

Record Plus

The **Record Plus™** family of circuit breakers has been developed as a line of aesthetically and technically coordinated protection devices for low voltage distribution and control applications. The circuit breakers are available in four sizes, each of which is tailored to the individual requirements associated with its application.

The line offers a current range running from 3A to 1600A in single, 3 and 4 pole ratings. Numerous versions as fixed, plug-in and draw-out are available and the line is completed with a full range of accessories.

FD160

Rated at 160A, the FD160 frame size is designed for use in both a DIN-rail environment with modular equipment and in industrial applications. It is supplied with IPXXB terminals suitable for direct connection of one or two conductors totalling up to 95 mm² and is available as a thermal-magnetic breaker, a moulded case switch, and as a magnetic-only motor circuit protector.

The FD160 bridges the gap between residential miniature circuit breakers and industrial moulded case circuit breakers.

FE160 and FE250

Rated at 160 and 250A, the FE frame sizes are designed for side-by-side mounting with FD160 types in panels. FE sizes are equipped with an easily accessible busbar connection and can also be supplied with cable lugs for use with copper or aluminum conductors. The design allows the use of interchangeable thermal-magnetic, magnetic-only, and electronic trip units.



A complete line of selective & current limiting breakers

FG400 and FG 630

Rated at 400 and 630A, the FG frame size includes all of the advanced features of the FD and FE frame sizes.

The FG connection area features easy-to-access busbar connections. Cable lugs for use with single or multiple copper or aluminum conductors are optionally available. The breaker is designed for use with interchangeable electronic units that can be easily adapted to multiple levels of protection.



FK 800, 1250 and 1600

Rated at 800, 1250 and 1600A, the FK frame sizes are designed for use with the FG400 and 630 frame sizes. The design uses electronic trips units available in a number of performance ranges and allowing a wide variety of setting options and groundfault protection. If needed thermal-magnetic and magnetic only trip units are also available. The FK connection area features easy-to-access busbar connections or cable lugs for use with single or multiple copper or aluminum conductors.



Record Plus

Record Plus™ circuit breakers are designed to protect, isolate and switch circuits in low voltage distribution networks. Circuit protection is provided by a combination of the devices unique current limiting properties and integrated protection devices commonly referred to as trip units.

The trip units are designed to protect circuits and/or the equipment connected to these circuits and exist as electromechanical or electronic devices. Numerous electromechanical types are available as thermal magnetic devices with overload and short-circuit protection or magnetic-only types providing short-circuit protection. Electronic devices offering wide setting ranges and a more sophisticated level of protection are available in several versions. Each trip unit has a setting area finished with a sealable transparent trip unit door.

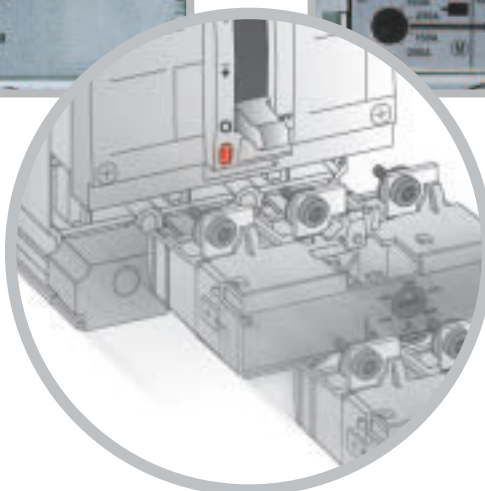
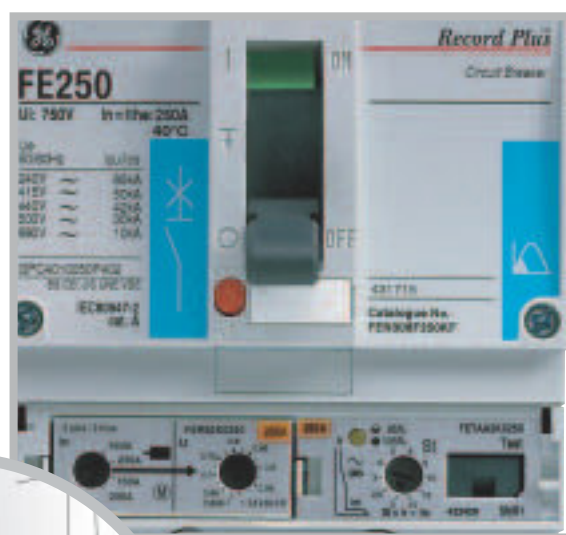
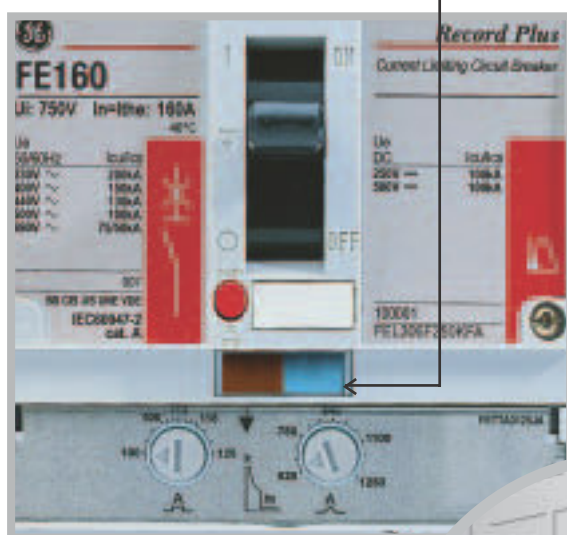
Electromechanical devices

Devices available in a current range of 16 to 1250A as single, two, three or four pole devices. The electromechanical trip units exist as thermal magnetic, magnetic-only and generator protection models. The high-performance thermal magnetic trip units exist as selective and non-selective versions and are equipped with a fault indicator that distinguishes between overload and short-circuit events in accordance with HD 384⁽¹⁾. This patented safety feature allows users to reduce downtime by resetting the breaker directly after an overload event.

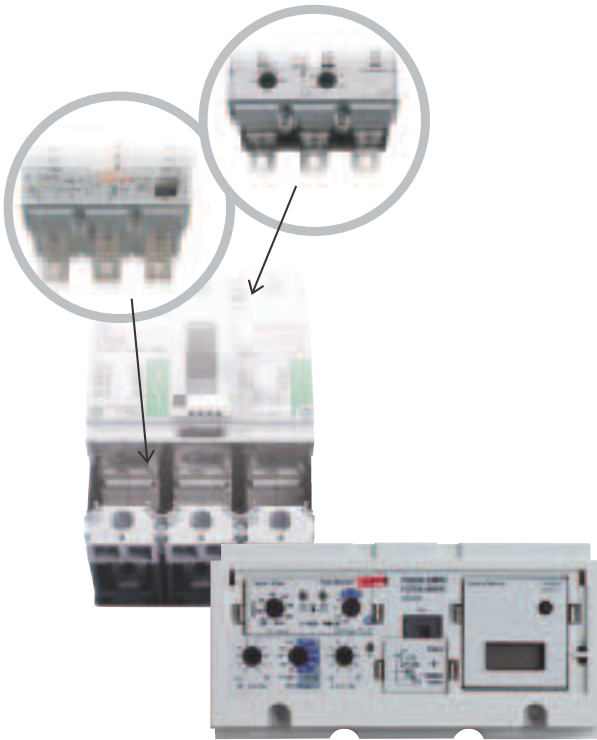
Electronic devices SMR1

The **Record Plus™** FE, FG and FK sizes can be equipped with rigorously designed and tested interchangeable electronic trip units available in three and four pole units in currents ranging from 25 to 1600A.

The SMR1 and SMR2 types offer adjustable overload and selective short-circuit protection. The SMR1 range is designed for simplicity and includes numerous exciting features such as an overload signalling option, a built-in temperature sensor and rating plugs suitable for both line and motor protection.



(1) Only applicable for the FE frame type.



Protection with flexible & interchangeable trip units

Personnel protection

A line of three and four pole add-on residual current devices are available as side or bottom mounted units with ratings up to 630A and sensitivities of 30mA to 10A. The devices slide on to the breaker easily and are fixed by simply tightening the main electrical connections. Designed to meet the latest standards, they each have a mechanical and electrical test option and share a common cut out.

A de-electric disconnect plug unit and setting areas with transparent, tamper-free cover are standard for the whole line.

For ratings above 630A, separate sensors and relays are available, or an integrated ground fault protection can be used.

Electronic devices SMR2

Designed to provide a flexible solution for all protection scenarios the standard device provides an extensive set of protection features as:

- Long Time Protection adjustable from 0.4 to 1 x In.
- A choice of up to five Long Time Delay Bands.
- Short Time protection adjustable from 2 to 12 x In
- A choice of up to five Short Time Delay Bands with a set of optional I²T bands.
- Instantaneous Short Circuit Protection adjustable from 2 to 13 x In.
- Zone selective interlock on ST and GF functions (When a GF module is added)
- A Battery that supplies the Thermal Memory function.

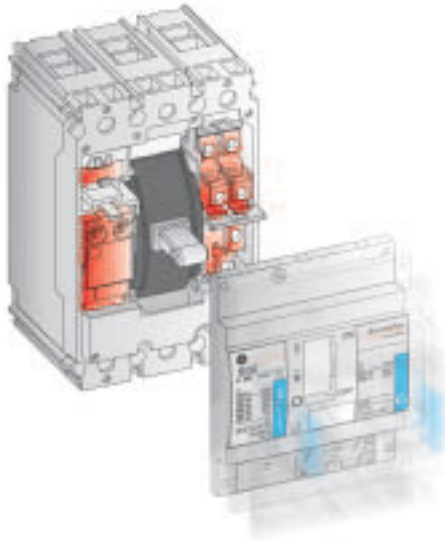
An SMR2 can be equipped with unique Field mountable Plug-in modules that extend the Trip Units functionality to include:

- Modbus Communication
- Ground Fault Protection (GF)
- A two Channel Load Shedding Option.
- Trip Reason Indication module (LT, ST & I)
- Current measurement by Ammeter

An external Contact/Communication module allows the user to monitor the SMR2 via Modbus rtu communication or by using the available 1A relay contacts.



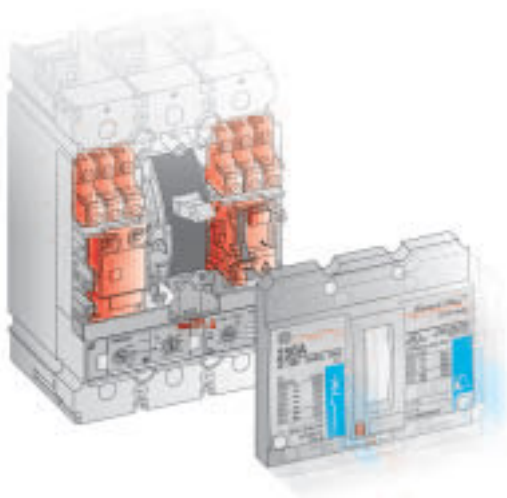
Common accessories safe & easy to mount



Safe and easy to mount

The internal accessories are designed for safe and easy mounting. The breaker trips upon cover removal and remains tripped until the cover is replaced. Cover removal provides access to a specifically designed, isolated compartment into which the accessories can be mounted easily and safely in conveniently marked areas.

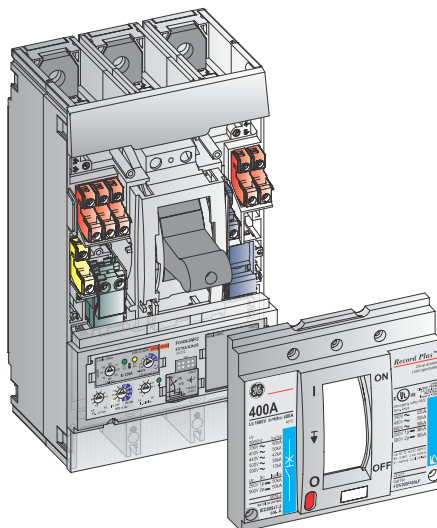
The advanced design includes routing channels for external wiring that allows access to internal terminals, making it easier to connect accessories. Particular attention has been paid to the design of these terminals that allow the connection of wiring from 0.5 to 2.5 mm².

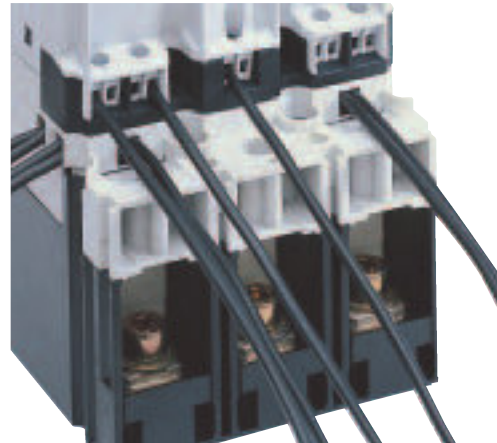


Common and adaptable

The same internal accessories are used in the FD, FE and FG frame sizes. The mounting system and wiring access methodology remains the same: simple and effective. The FK frame has equivalent accessories and the same connection options.

For plug-in and draw-out breakers 6, 8 and 10 pole plug/socket combinations are available. These are equipped with wiring that can be led through specific openings in the breaker rear.



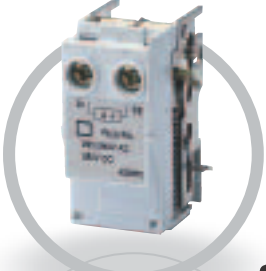
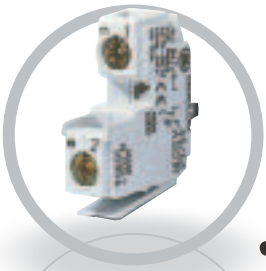


Mounting

Internal accessories can be easily clicked into conveniently marked areas in the isolated compartment. Clearly marked indication of the accessory position and a mechanical interchange prevention system assure an error-proof and solid mounting of the accessory.

Wiring

External wiring is routed through the top or the side of the breaker lid through break out openings. The wiring can then be connected to the accessory terminals. These cage terminals allow for cross sections from 0.75 to 2.5 mm² and even allow the connection of two wires. All contact points are coded in accordance with the EN 60947 standard thus allowing for universal wiring diagrams.



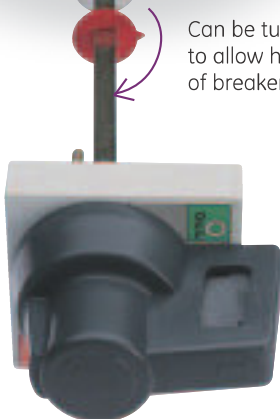
Auxiliary and Bell Alarm contacts

The internal accessories are common to **Record Plus**™ FD, FE and FG circuit breakers. They offer a unique, patented, auxiliary contact block with normally open and normally closed contacts which are suitable for use in high current and high fidelity applications. Selective Fault Indication is possible by using one or a combination of the two Bell Alarm contact types.

Releases

The shunt and undervoltage releases are a totally new design combining the best in electromechanical and electronic engineering. Most releases are common for AC and DC voltages and are available in a wide voltage range. They combine low power consumption, a kiss-free, lock-out design and the ease of use common to all **Record Plus**™ internal accessories.

Wide range of electrical & mechanical operators



Can be turned 90° to allow horizontal mounting of breaker.

Easy-to-mount rotary handles

Fitted onto the breaker front the device allows the vertical handle movement to be changed into a rotary operation with the OFF position at 3 o'clock and the OFF position at 6 o'clock. An accurate position indication of the three breaker positions ON-OFF and TRIPPED is provided by a totally new internal design that also allows the user to install one or two early closing and late opening contact blocks which are the same as the standard internal accessory types.

Easy to install

The handles are available as a breaker mounted device, a type that can be mounted through a door or a panel and a version where the operator is mounted on the door or panel front. The door and/or panel mounted units are equipped with (bypassable) interlocks to prevent the door from opening or the panel being removed whilst the breaker is ON. The door/panel mounted operators use a drilling common across the line. Each breaker size and breaking capacity rating has its own escutcheon and handle that can be equipped with padlocks and/or a keylock.



Safe to operate

Locking/Interlocking devices

To allow users to safely work on the installations or installation segments protected by the **Record Plus™** moulded case circuit breakers it is possible to padlock the devices in their OFF position. A padlocking facility can be attached to the breaker front allowing the breaker to be equipped with up to three padlocks of 5 to 8 mm.

A second type (depicted in the photo) is only firmly attached to the breaker when it is padlocked and can be removed for use on another breaker when not in use. Key locking devices allow the creation of multiple key interlocking configurations. A walking beam system is available for interlocking two or three breakers. The system can be upgraded to a fully automatic power transfer system.

Easy to operate

Electrical operators

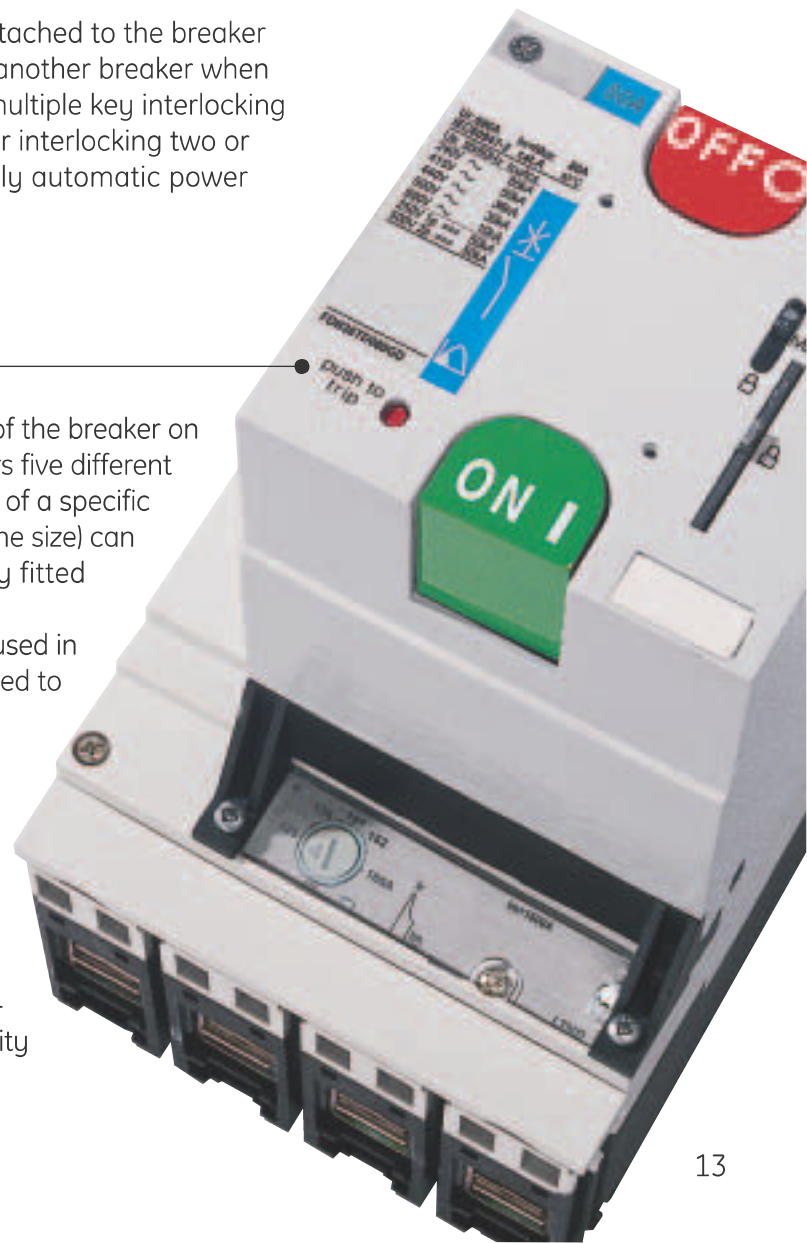
Front mounted devices that allow electrical operation of the breaker on which the device is mounted. The Record Plus line offers five different electrical operators each tailored to the characteristics of a specific frame size. Four of these devices (one for each frame size) can be mounted in the field. An additional Hi speed factory fitted operator is available for the FK frame size.

Common to each of these devices is that they can be used in a simple 3 wire connection scheme that can be extended to include a more complex functionality.

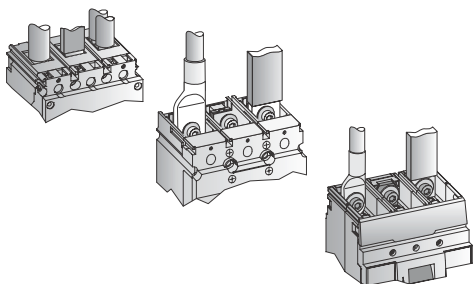
All Electrical Operators have a user interface that includes a CLEAR and ACCURATE ON, OFF and TRIPPED indication and offer the option to operate locally (Manual) or remotely (Auto).

All devices can be padlocked or keylocked in OFF position.

Easy connection is achieved by locating the terminals in the immediate vicinity of those of the internal accessories and by using terminals with a connection capacity of 0.5 to 2.5 mm².



Versatile installation options

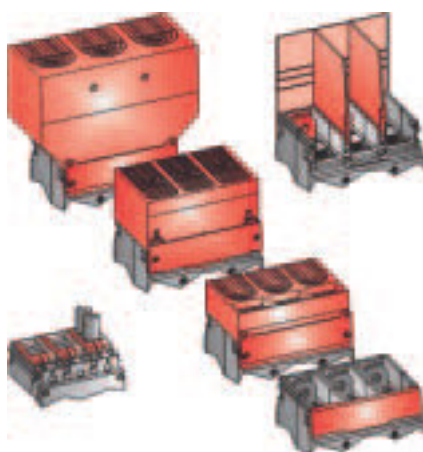
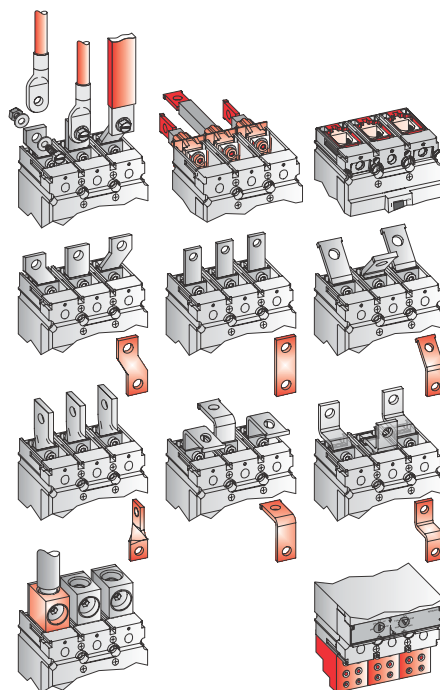


Standard connection options

The breakers are equipped with front access terminals designed to allow the user to quickly and easily connect standard conductors. The FD160 frame has box clamps suited for one or two cable cores or busbars while the FE, FG and FK frame sizes are configured to allow for easy busbar connection.

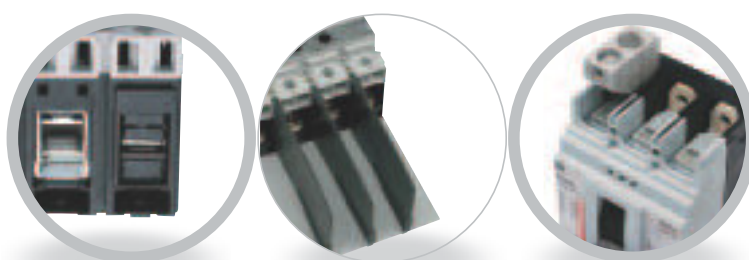
Configurable connection options

A wide range of alternatives are available in kit form with rear and angular connectors, spreaders, customised ring terminal connectors and extenders. Single and multiple box clamps can be directly fitted to the breaker terminals or in combination with extenders and spreaders. This flexibility allows the user to adapt **Record Plus™** circuit breakers to almost all standard connection configurations while at the same time allowing for the use of over-dimensioned and/or multiple conductors.



Terminal shields

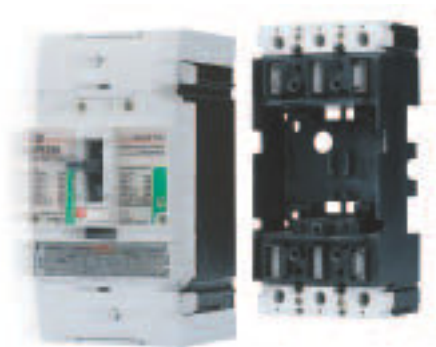
Each breaker can be fitted with tamper resistant, short or long, terminal shields that allow a IP30 finishing of the product. Backplates and phase separators complete this line and consistently enable the user to connect the products safely. Additionally, frame specific accessories as the IPXXB terminal cover for the FD160 and the widened and elongated terminal shield for the FG frame are available.



Plug-in systems

Plug-in mounting systems are available for current ratings through 630A in both kit and assembled options. The plug-in system consists of a single-piece moulded base in an IPXXB configuration. The mounting system features a safety interlock which ensures that the breaker is mechanically tripped before it is fully withdrawn or re-inserted in the ON position.

An optional set of plug-in terminal block(s) are available for use with internal accessory connections. Plug-in mounting bases are normally supplied with exactly the same front access terminal configuration as the standard fixed breaker. This allows the use of the same wide range of connection accessories that are available in kit form on the fixed version. These include rear and angular connectors, spreaders, customised ring terminal connectors and extenders. Internal accessories can be easily clicked into conveniently marked areas in the isolated compartment. Clearly marked indication of the accessory position and a mechanical interchange prevention system assures an error-proof and solid mounting of the accessory.

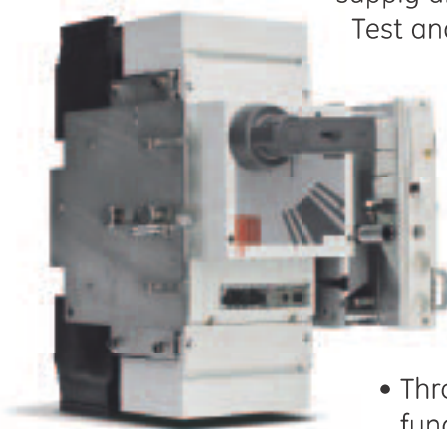


Draw-out system

A simple, hand operated draw-out system is available for the FE, FG and FK frame sizes. The draw-out system enables **Record Plus™** breakers with rating from 3A to 1600A to be configured as devices that can be fully insulated from the power supply and installation. Each device has three positions inserted and connected, Test and isolated, and withdrawn.

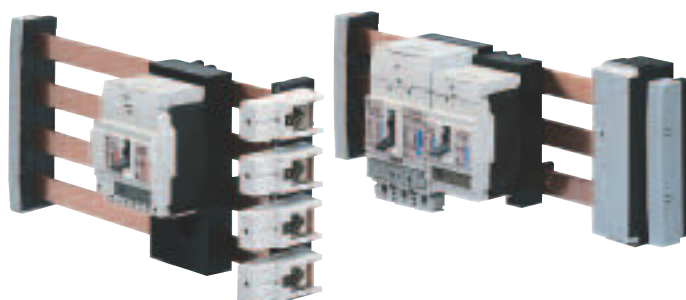
A design modelled on our ACB constructions and incorporating a standard plug-in base encapsulated in a sturdy metal cradle. The devices have a protection degree of IP40 in withdrawn or inserted position and offer a major step forward in MCCB draw-out construction. A system offering a host of features as:

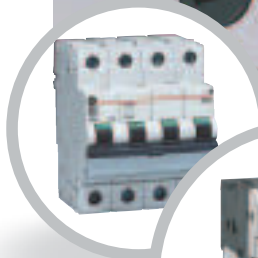
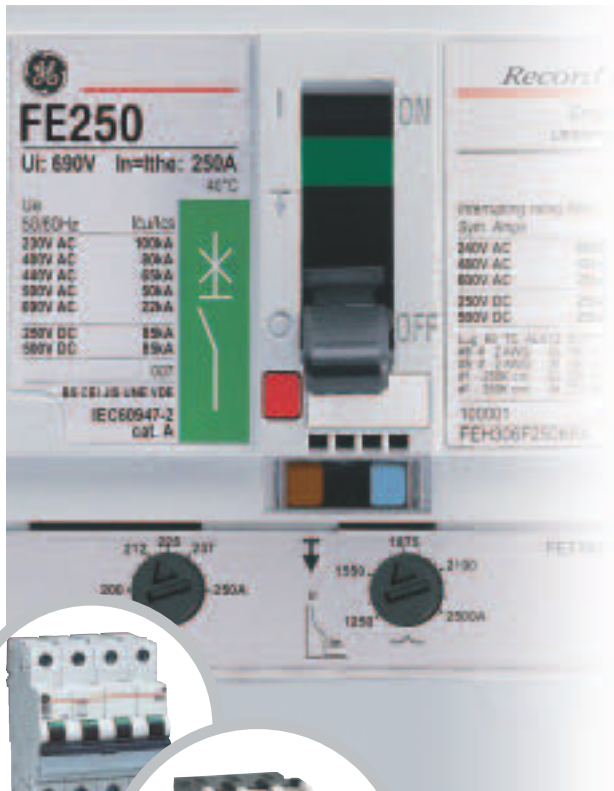
- Use behind door.
- Trip functionality on insertion and withdrawal.
- With MCCB style test position.
- Easily accessible earthing point.
- Through door version allowing accessibility of all draw-out and/or breaker functions from the door front.
- A locking option for multiple padlocks and/or multiple key locks.
- Multiple carriage indication switches for each position.
- Optional ACB style TEST position.



Connectivity

The installation of a breaker is much easier and more cost effective when the mounting and connecting of the breaker can be reduced to a few simple, automateable tasks. Based on these principles GE have devised a unique system that allows the user to mount and connect the breaker before installation. An adaptor plate, specifically designed for the **Record Plus™** breaker line and incorporating all the connection hardware, is fitted to the breaker using 5 to 6 simple screws. Once mounted the adaptor is then simply plugged onto a three or four pole busbar system already installed in the equipment.





Using world class design and development tools like Six Sigma, Computer Simulation and Lean Manufacturing, **Record Plus™** is intended to meet and exceed the most stringent quality and safety standards. At GE we are proud to offer a product that will offer years of reliable and dependable protection.

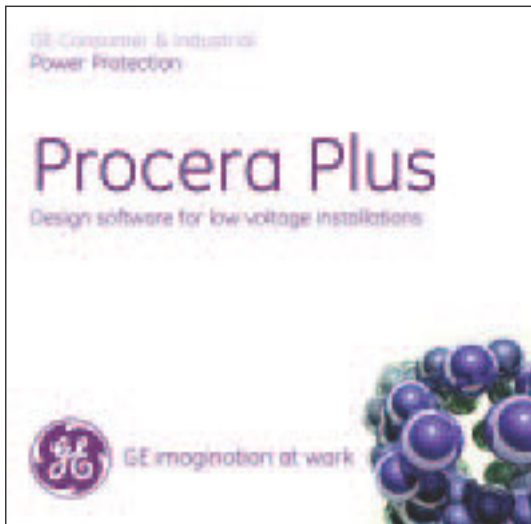
GE's name is synonymous with a broad range of products designed to meet our customer's changing and competitive environment. Our drive to exceed our customer's expectations is the foundation for continual renewal of our commitment to provide innovative low voltage solutions.

The **Record Plus™** MCCB, Elfa Plus MCB, Surion Breaker and Motor starter line and the new EntelliGuard™ G Power Circuit Breaker lines combine to offer a full line of hi-performance protection devices. They Provide a Fully co-ordinated approach to circuit and device protection for use in the Domestic, Commercial and Industrial environment.

GE's new lines meet the latest technical standards and regulations and have been certified by authorities as Lovag, the KEMA and Lloyd's. The components in these lines have been designed to be an integral part of a solution. A complete low voltage distribution and control range including components, accessories and the distribution and controls equipment they go into.



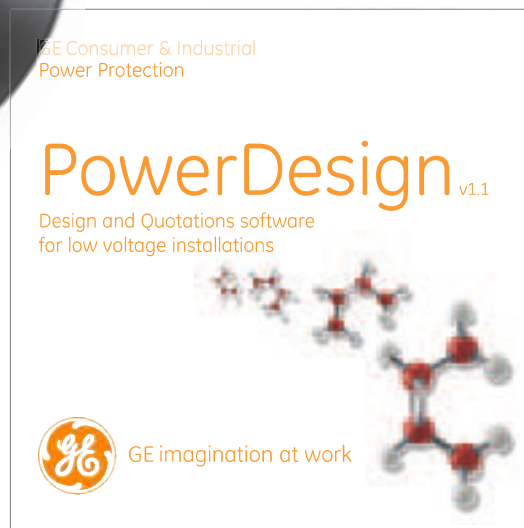
Full solution for low voltage distribution



Application Software

The new HD 384 and R064-03 standards require that the design of a low voltage distribution system includes the determination of all perspective short-circuit and fault currents levels. GE has developed a windows based software package to do this:

Procera Plus offers a multi standard and multi lingual software package to accompany our new product line.

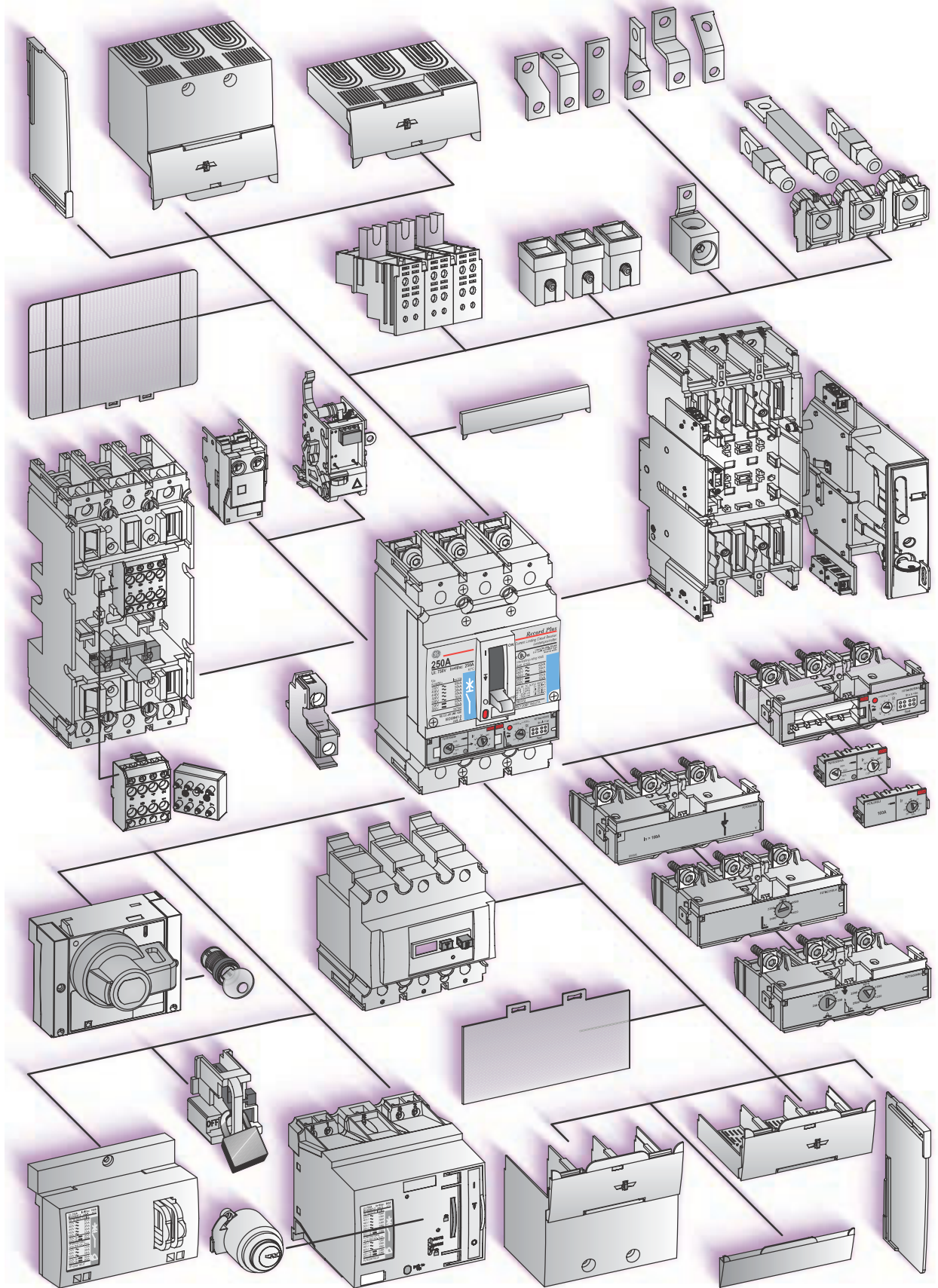


Implementation Software

Two ranges of software are designed to allow a user to select the correct protection devices, the associated components needed to install it, and a distribution system in which they can be installed.

The software **PowerDesign** can be linked with Procera Plus and automatically produces drawings and ordering details.





How to order a standard breaker

To determine the basic breaker, the required current rating, the short circuit breaking capacity and the number of switched and protected poles must be defined. This information can be found on page 2 and 3 of this catalogue and is repeated in short-form within the ordering code part of each breaker size.

After selecting the basic device the circuit protection element or trip unit needs to be defined. Numerous different types are available, each briefly described in the ordering code section of each breaker size. A full functional description is included in section B of this catalogue.

With the above mentioned information the correct code for the required moulded case circuit breaker can be found in the order code pages. Here the selected product is a version suited for fixed mounting and front access connection.

Internal accessories

Common internal accessories are available for the FD160, FE160, FE250, FG400 and FG630 frame sizes. Taking the maximum breaker content into account as indicated in section E the procedure just requires a correct code selection.

The FK800, 1250 and 1600 types have equivalent accessories.

Operators

The breakers are normally supplied with an elongated toggle operator. Other operators, as rotary handles and electrical operators, can be ordered separately.

Residual Current devices (RCD)

Available as add-on devices for side mounting (FD160) or mounting below the trip unit area of the breaker (FD160, FE160, FE250, FG400 and FG630 frame sizes). For breakers large than 630A separate RCD relays and sensors are available.

Alternatively the FG400, FG630, FK800, FK1250 and FK1600 types can be equipped with a fully integrated Ground Fault protection device.

Breakers in Plug-in or Draw-out version

A breaker in fixed rating can easily be converted to a breaker in plug-in or draw-out rating. The plug-in device is supplied in two parts, one set for mounting on the breaker and one multipole base. The draw-out unit is ordered as one complete conversion kit for the required breaker. On ordering plug-in or draw-out breakers with accessories, please take into account that the auxiliary wiring also needs to be executed as such (6, 8 or 10 pole socket system required).

Connection options

If the standard connection options do not meet the requirements a wide variety of others is available.

The connection options are supplied in kit form for mounting on one side (load or line) of a breaker and can be used for the fixed, plug-in or draw-out version of the breaker.

Installation accessories

Additional requirements, as to the protection degree of the connection area, the locking or padlocking of the breaker and finishing of cut-outs for operators can be met by the use of these parts.

