



New

EntelliGuard™

Ed. 02

Power Circuit Breaker
Uncompromising, Fast & Selective



GE imagination at work

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The breaker

Intro

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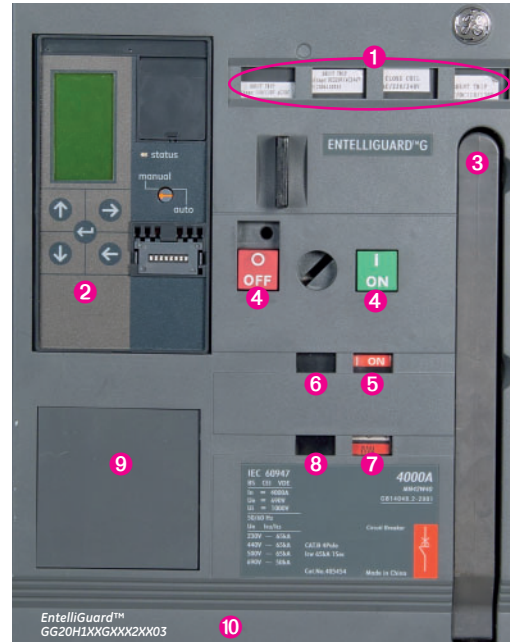
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Product Identification

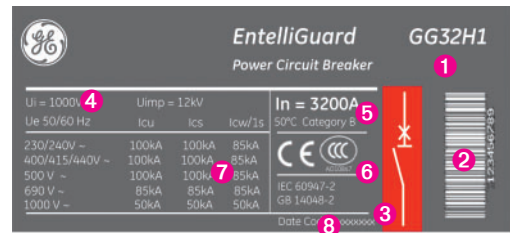
Power Circuit Breaker Front Facia

- ① Installed Accessory Indicators
- ② Electronic Trip Unit
- ③ Manual Charging Handle
- ④ ON and OFF Buttons
- ⑤ Contact Position Indicator
- ⑥ Ready to Close Indicator
- ⑦ Spring charged Indicator
- ⑧ Operation Counter
- ⑨ Prevision for Key Lock
- ⑩ Global Catalogue Number



Power Circuit Breaker label

- ① Product Type
- ② Bar code with Manufacturing data
- ③ Colour Code indicating Interruption Tier
- ④ Voltage Ratings
- ⑤ Current Ratings
- ⑥ Certification & Standards
- ⑦ Short-circuit Interruption data
- ⑧ Manufacturing Date



Advanced Electronic Trip Unit

- ① Main Screen with the following choices:
 Setup
Allows adjustment of values and setting of all Parameters
 Meter
Full measurement values are displayed
 Status
Breaker and Trip Unit position
 Events
History of Trip's with indication of fault reason and level and access to the Waveform Capture function
- ② Cursor driven setting system
- ③ Manual or Automatic Reset Choice
- ④ Full Range Rating Plug

Power Circuit breakers

Uncompromising Fast & Selective



EntelliGuard™ Power Circuit Breakers are a new line of Air Circuit Breakers evolved from the existing M-PACT & ME07 types to offer a truly global product platform meeting IEC, ANSI and UL standards.

A line of Three and Four pole devices ranging from 400 to 6400Amp in three basic envelopes with fault interruption ratings of up to 150kAmps. A design offering a unique combination of High Fault current withstand ratings, short fault interruption time and selectivity.

The device includes the new state-of-the-art EntelliGuard™ trip unit that enables the circuit breaker with the latest technology for system safety, reliability, measurement, relaying and communications using the Modbus or Profibus protocol.

Contents

Hi-Performance Complete Line

Selective and Fast

Uncompromising

*State of the Art Protection
The Global Trip Unit*

*Easy to use & Flexible
Installation options*

*Common, Field Mountable
Accessories*

*A Full Solution for
Low Voltage Distribution*

Catalogue Content

This catalogue only refers to the IEC versions of the EntelliGuard™ Power Circuit Breaker. For the ANSI and UL variants of the same design please contact GE Industrial Solutions Plainville CT U.S.A.

Hi-Performance: Complete Line



Hi-Performance: Complete Line

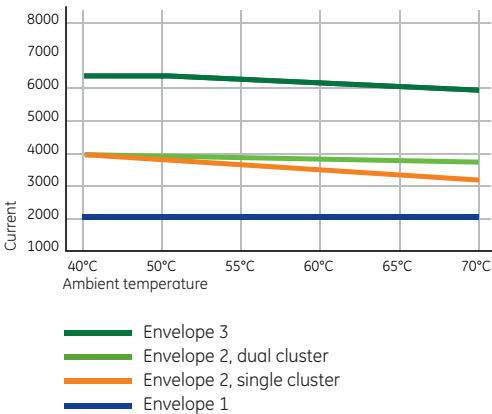
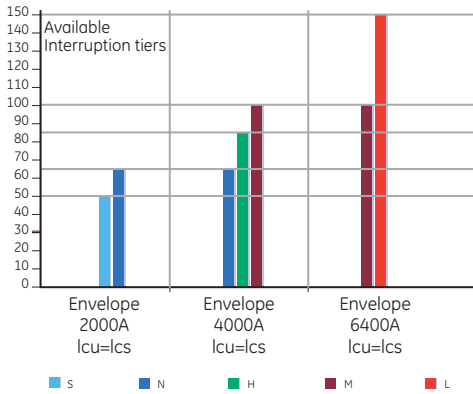
The EntelliGuard™ range of Power Circuit breakers encompasses a line of Three and Four pole Air Circuit Breakers with Nominal Currents ranging from 400 to 6400Amp in three basic envelopes.

All Power Circuit Breakers are designed to allow multiple interruptions of fault currents. Here the tested and certified Service Breaking capacity value is in all cases equal to the stated Ultimate Breaking Capacity.

Envelope 1 can be used in networks with voltages up to 1000V and can be acquired with current ratings from 400 to 2000Amps at 50°C. This type is available in interruption ratings (Ics=Icu) of 50 and 65kA. A version suitable for DC applications is available.

Envelope 2 can be used in networks with voltages up to 1000V and can be acquired with current ratings from 400 to 4000Amps at 50°C. This type is available in interruption ratings (Ics=Icu) of 50, 65, 85 and 100kA. A version suitable for DC applications is available.

Envelope 3 can be used in networks with voltages up to 1000V and can be acquired with current ratings from 3200 to 6400Amps at 50°C. This type is available in interruption ratings (Ics=Icu) of 100 and 150kA. A version suitable for DC applications is available.



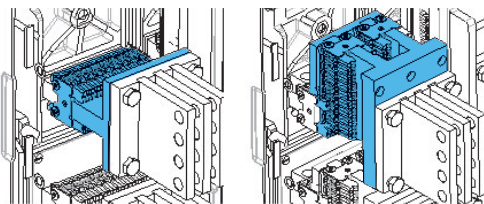
Hi-Performance: Current Ratings in Enclosures

One of the most important user parameters is not the nominal rating of an 'Air Circuit Breaker' in free air but its current Rating within a panel or enclosure.

Breakers 'enclosed ratings' are determined by the heat dissipation produced by the device and its ability to carry current at the temperature within the enclosure.

EntelliGuard™ Power Circuit breakers have been designed with low Power dissipation values and allow relatively high currents at high ambient temperatures. This is applicable for breakers in the fixed and Draw-out Pattern as indicated in the graph insert.

For extreme cases a special dual cluster draw-out version of an envelope 2 breaker is available allowing a very limited derating when the breaker is used at high ambient temperatures within an enclosure.



Standard Draw-out Construction 'Single Cluster'

'Limited de-rating' Draw-out Construction 'Dual Cluster'

Selective, Fast & Uncompromising

Selective & Fast

EntelliGuard™ has been designed to offer an uncompromising combination of a fast interruption at high fault levels attaining values of 40 Milliseconds or less whilst maintaining selectivity.

Power Circuit Breakers are designed to remain closed on a fault. This for at a user settable time value when the fault level lies within the range of the Short Time Delayed protection device AND for 15 Milliseconds when the fault level attains the Instantaneous protection range value.

This Instantaneous device includes programming that in normal circumstances waits until the downstream breaker trips.

Speed WHEN needed ... Warrantied selectivity elsewhere

The simplest, standard, Electronic Trip Unit, has a broad range of timed bands at all overcurrent levels. Thus attaining selectivity between closely rated devices and across multiple distribution levels. This strongly simplifies and economizes installation design.

Uncompromising ... Reliability

EntelliGuard™ has been designed as a Modern 'Power Circuit Breaker' without neglecting its and GE's heritage of more than 50 years in building Air Circuit Breakers.

These Power Circuit Breakers uncompromisingly combine the properties of the older M-PACT 1 and 2, ME07 and Wavepro lines with modern state of the art technology.

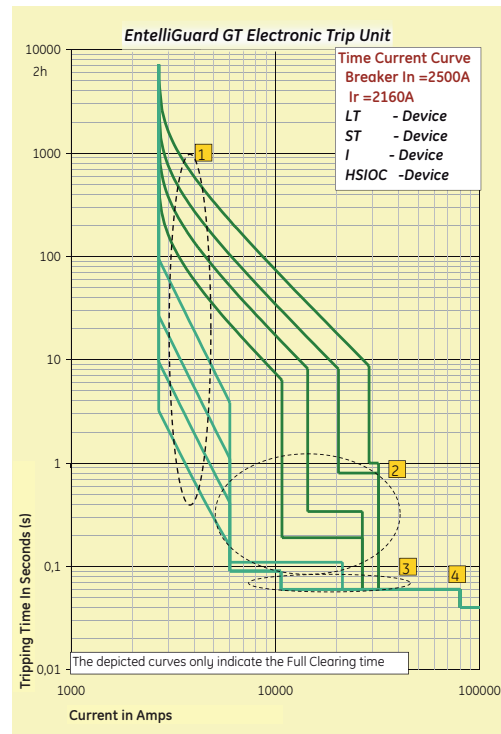
The result: a device that with a proven Electrical and Mechanical life span independent of its operation mode. Be it manual, electrical or by means of the installed Shunt and/or Undervoltage releases.

Uncompromising ... Safety

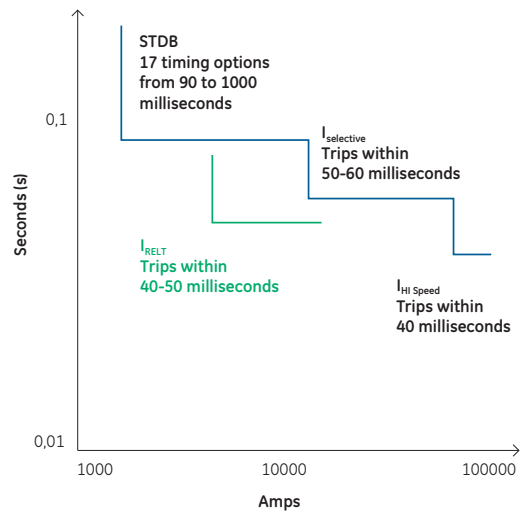
In order to protect Service Personnel against the hazards of Short Circuits whilst working on a Power Distribution system EntelliGuard™ Power Circuit breakers can be equipped with a so called RELT switch input.

This allows the breaker to be switched to its lowest Short-circuit settings on service, thus limiting the hazards concerned.

The RELT switch input (with feedback) is available on the breaker auxiliary terminals or can be accessed through the communication bus.



1. Overload Protection (LT) with 44 bands
2. Timed Short-circuit Protection (STD) with 17 bands
3. Selective Instantaneous Protection (I)
4. Hi-Speed trip (HSIOC)



Protection with State of the Art Trip Units



State of the Art Electronic Trip Unit

All EntelliGuard™ Power Circuit Breakers are equipped with a digital electronic trip unit, available in four basic versions: E, S, N and H. Each has a common design that comes with a screen providing an ammeter and allowing a simple and accurate menu-driven adjustment of the breaker parameters across a broad current range.

All functionality is menu-driven accessed by using 4 setting and one enter key thus allowing a fast and accurate setting of the device. The user can set the device to an automatic or manual reset after a fault.

After inserting the rating plug, the device can be adjusted and the installed options set. As this normally occurs when the installation is not powered up, the use of the separately available TESTER with Power Pack is advised.

Main adjustment Options

LT-LTD protection

Each device has an overload of settings or LT setting range of 0,2 to 1 times with a choice of more than 60 setting points. The Overload device has 44 time band settings allowing one to configure this device for almost any perceivable application.

ST-STD protection

A time delayed Short-circuit protection is installed with an adjustment range of 2 to 12 times the set LT current values. The Short-circuit interruption time can be set, at one of 17 bands ranging from 90 Milliseconds to 1 second.

I protection

A switchable instantaneous protection can be optionally installed. This device is adjustable from 2 to 15 or 30 times the rating of the breaker and is programmed to wait for downstream devices to trip before reacting.

Other protection features

A host of other protection devices as LT-B & LT-C, RELT, GF sum & GF source return plus the optional use of energy curves are available (see section B of this catalogue).

Measurement, Relaying & Communication

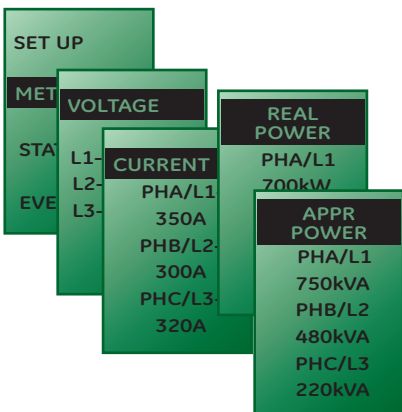
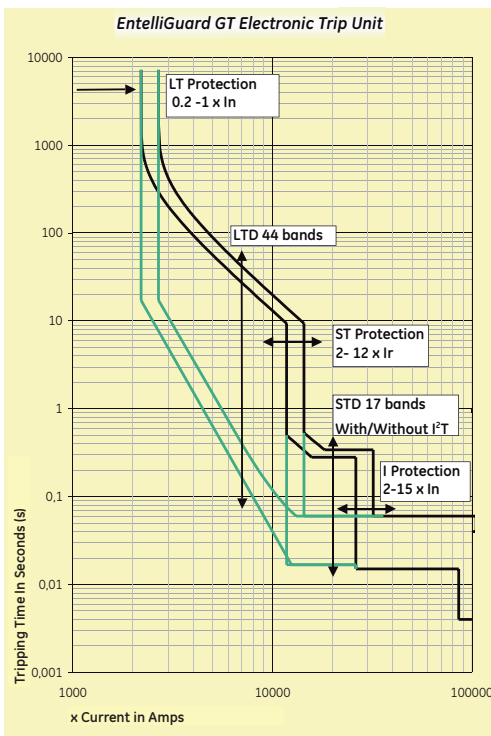
The EntelliGuard™ Trip Unit has been envisaged to provide the user with more. Optionally a full network measurement device can be installed on the device. Relays can be included to trip the breaker on Voltage Unbalance, Current Unbalance, Power reversal etc.

The device can be equipped with Communication for use with the Modbus or Profibus protocol whilst events as Overload, Short-circuit and Groundfaults can be tracked. Optionally the user can portray a Short-circuit event through the Wave Form Capture option.

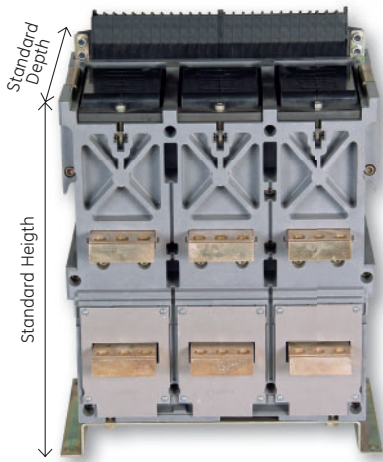
Plug 'n Play

Electronic Trip Units are normally supplied factory fitted. However spares are available that plug into the breaker, automatically read the main breaker data and adjust themselves automatically to the breaker type.

This option can be used to allow Field replacement or Upgrades of existing Trip Units OR can allow the user to acquire Breakers in kit form and customize them locally.



Power Circuit Breakers Easy to Install & Versatile



Easy to Install

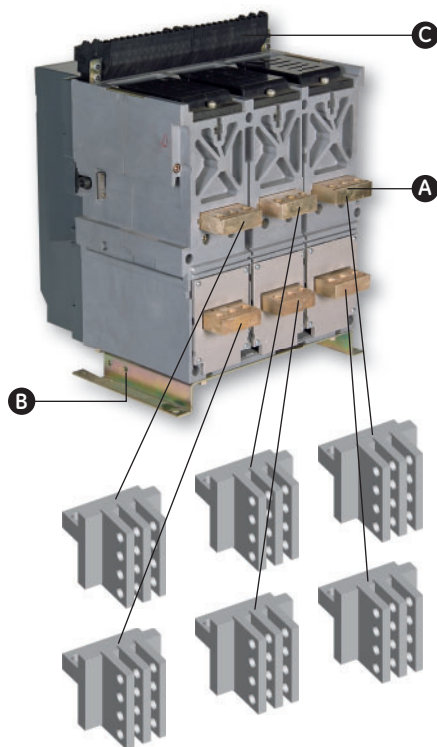
EntelliGuard™ Power Circuit Breakers are available in a Fixed and Draw-out Pattern. Each pattern offering the highest possible current rating when enclosed in a panel or equipment.

Independent of the number of poles, rated current or interruption rating, each of the two patterns has a common height, depth and cut-out dimension. This strongly simplifying the design of panels and equipment in which these devices are used⁽¹⁾.

The basic breaker width has been optimized to allow for space to connect in- and outgoing bus bars and cables. Both Fixed and Draw-out Power Circuit Breaker types are supplied with rear connections suitable for Rear Access Horizontal busbar connection.

The breakers are installed by using easily accessible mounting brackets, the drilling pattern of which exactly matches that of the previous M-PACT line⁽²⁾.

All accessories are wired out to an easy to access 39 or 78 pole terminal strip mounted on the breaker top. These terminals are amply sized to allow the use of up to 2,5 mm² cabling and can be used with standard connection materials or AMP type plug connectors.



- A** Standard Horizontal Rear Connections
- B** Mounting Bracket
- C** Terminal strip

Flexible ... Kit Form

A Power Circuit Breaker is normally supplied completely fitted OFF works. However the unique modular construction and field mountable Trip Unit and Accessories option can be used to acquire a breaker in kit form and to customize the device locally⁽³⁾.

Flexible ... Connections

Besides the standard horizontal connection options multiple other options are available.

Power Circuit Breakers supplied in a fixed pattern can be optionally supplied with Rear Vertical connections or Front access connections⁽⁴⁾.

The Cassettes of the Breakers in Draw-out pattern are supplied with T or L stubs suitable for Horizontal Busbar connection. However these stubs can be rotated 90 degrees allowing the user to change the cassette connection option from Horizontal to Vertical Busbars.

A 2nd cassette version is available allowing Front access Connection⁽⁴⁾.

(1) The width does vary
 (2) Except the new reduced size envelope 3 type
 (3) With GE training
 (4) Maximum 4000Amps

Common Field Mountable Accessories



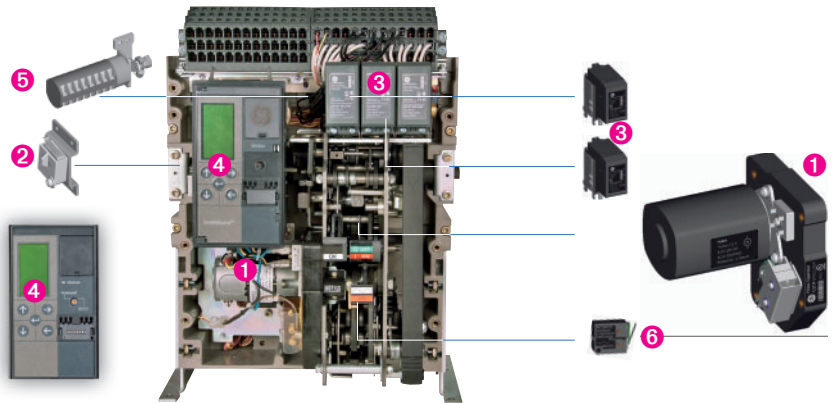
Common Internal Accessories

A large range of internal accessories as Electrical Operators⁽¹⁾, up to four Shunt Releases, Closing Coils or Undervoltage releases, Interlock Coils, Auxiliary and Alarm contacts, Carriage switches, Coil indication contacts and Breaker status switches are available.

The Power Circuit Breaker front Facia includes 'Pop up' indicators that provide the user with an overview as to which accessories are installed in the device.

Each of these devices can be acquired factory fitted or is available in a field mountable execution. The design is common to all three envelopes.

- ❶ Electrical Operator
- ❷ Bell Alarm Switch
- ❸ A max of 4 Closing Coils, Shunt or Undervoltage releases
- ❹ Electronic Trip Unit
- ❺ A maximum of 8 Auxiliary Switches
- ❻ Ready to close or Spring Charged contact



Common External Accessories

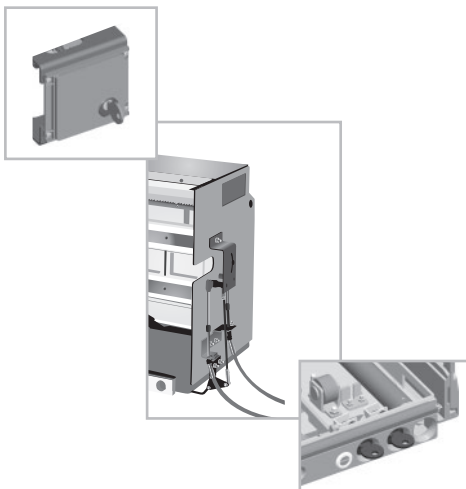
Multiple common external accessories are available, a full overview of which can be found in section C of this catalogue.

On the left the Key lock and breaker interlock options are portrayed. Here up to four Ronis, Profalux or Castell locks can be used to lock the breaker, and up to two Ronis or Profalux locks to lock the draw-out breaker in its cassette.

Optionally groups of two or three Power Circuit Breakers in Fixed or Draw-out pattern can be interlocked. This in several different configurations, allowing the user to build an incoming power supply of multiple breakers to his own requirements.

All Interlocks and Locking devices are only supplied factory fitted, the associated locks and cables are Field mountable.

(1) Electrical Operator design is equivalent, however 1 type exists for envelope 1 and 1 for envelope 2 & 3



Power Circuit Breakers
Part of a total solution



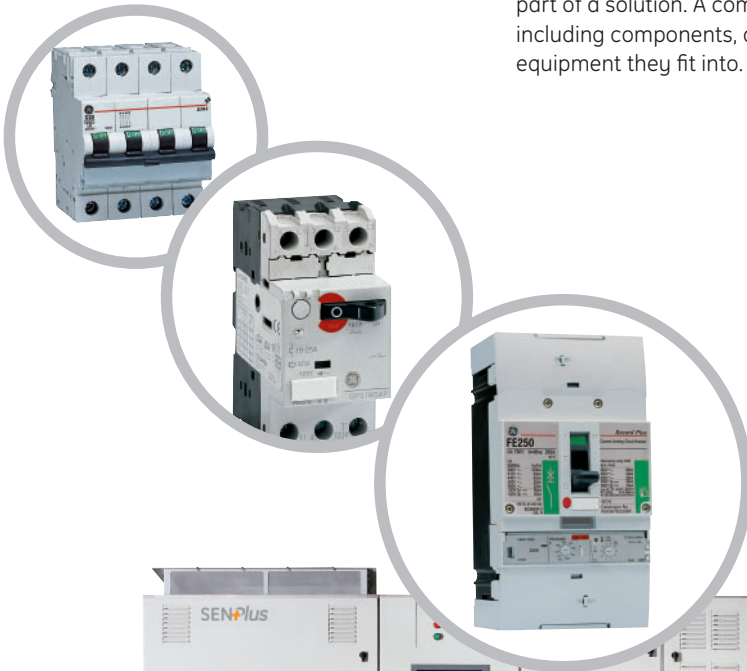
Using world class design and development tools like Six Sigma, computer simulation and Lean Manufacturing, the EntelliGuard™ is intended to meet and exceed the most stringent quality and safety standards. At GE we are proud to offer a product that will offer years of reliable and dependable protection.

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 new EntelliGuard™ and the existing Elfa Plus, Record Plus and Surion breaker and starter lines offer a full line of **high-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 fit into.



EN 60947-2 standard

Power Circuit Breaker type		GG04					GG07					GG08				
Air Circuit Breaker denomination		S	N	H	E	M	S	N	H	E	M	S	N	H	E	M
Poles	Number of	3, 4					3, 4					3, 4				
Rated insulation voltage	Ui (Volts)	1000	1250	1000	1250		1000	1250	1000	1250		1000	1250	1000	1250	
Rated impulse withstand voltage	Uimp (Kilovolt)	12					12					12				
Rated operational voltage Ue	Volts AC	690	1000	690	1000		690	1000	690	1000		690	1000	690	1000	
	Volts DC		750		750		750		750		750		750		750	
Category of use		B					B					B				
Suitable for use as an isolator	Positive ON & OFF	YES					YES					YES				
Rated current In	A at 50°C	400					630					800				
	230/240V-440V AC	50	65	85	85	100	50	65	85	85	100	50	65	85	85	100
Ultimate breaking capacity Icu (kA)	500V AC	50	65	65	85	100	50	65	65	85	100	50	65	65	85	100
	690V AC	40	50	65	85	85	40	50	65	85	85	40	50	65	85	85
	1000V AC (4)			35		50			35		50			35		50
	230/240V-440V AC	50	65	85	85	100	50	65	85	85	100	50	65	85	85	100
Service breaking capacity Ics (kA)	500V AC	50	65	65	85	100	50	65	65	85	100	50	65	65	85	100
	690V AC	40	50	65	85	85	40	50	65	85	85	40	50	65	85	85
	1000V AC (4)			35		50			35		50			35		50
	230/240V-440V AC	50	65	85	85	100	50	65	85	85	100	50	65	85	85	100
Short-circuit withstand Icw (kA)	1 second	50	65	65	85	85	50	65	65	85	85	50	65	65	85	85
	3 seconds	40	50	50	50	50	40	50	50	50	50	40	50	50	50	50
Short-circuit Making current Icm 220-500V AC	kA Peak	105	143	187	187	220	105	143	187	187	220	105	143	187	187	220
Short-circuit Making current Icm 690V AC	kA Peak	84	105	143	187	187	84	105	143	187	187	84	105	143	187	187
Mechanical endurance	With Maintenance	20000					20000					20000				
	Without Maintenance	12500					10000					12500				
Electrical endurance (CO operations at 440V AC)	Without Maintenance	10000					10000					10000				
	250V DC 1 pole ⁽¹⁾		50		65			50		65			50		65	
Ultimate breaking capacity Icu (kA) = Service breaking capacity Ics (kA) DC L/R = 15ms (nr. of poles in series) ⁽¹⁾	500V DC 2 poles ⁽¹⁾		35		50			35		50			35		50	
	750V DC 3 poles ⁽¹⁾		20		35			20		35			20		35	
	1000V DC 3 poles ⁽¹⁾		20		30			20		30			20		30	
	230/240-690V AC		32,5		50			32,5		50			32,5		50	

Electronic Trip Units ⁽¹⁾

GT -E type with Ammeter	LT & ST, - GF		X			X			X
GT -S type with Ammeter, optional communication	LT, ST, I or HI - GF		X			X			X
GT -N type with Measurement, optional communication	LT, ST, I or HI, RELT GF, ZSI		X			X			X
GT -H type with Measurement & Relaying, optional communication	LT or LT+, ST, I or HI, RELT GFsum or GFct., ZSI		X			X			X

EN 60947-3 standard

Power Circuit Breaker type		GJ04			GJ07			GJ08		
		Non Auto			Non Auto			Non Auto		
		S	N	M	S	N	M	S	N	M
Isolator denomination										
Poles	Number of	3, 4			3, 4			3, 4		
Rated insulation voltage	Ui (Volts)	1000	1000	1250	1000	1000	1250	1000	1000	1250
Rated impulse withstand voltage	Uimp (Kilovolt)	12			12			12		
Rated operational voltage Ue	Volts AC	690	690	1000	690	690	1000	690	690	1000
	Volts DC		750		750		750		750	
Category of use		B			B			B		
Suitable for use as an isolator	Positive ON & OFF	YES			YES			YES		
Rated current In	A at 50°C	400			630			800		
	1 second	50	65	85	50	65	85	50	65	85
Short-circuit withstand Icw (kA)	3 seconds	40	50	50	40	50	50	40	50	50
	Short-circuit Making current Icm 220-500V AC	kA Peak	88,2	143	187	88,2	143	187	88,2	143
Mechanical endurance (CO operations at 440V AC)	With Maintenance	20000			20000			20000		
	Without Maintenance	12500			12500			12500		
Electrical endurance (CO operations at 440V AC)	Without Maintenance	10000			10000			10000		

Installation

Fixed Pattern		GJ04		GJ07		GJ08	
Dimensions in mm	Height	442	442	442	442	442	442
	Width 3 pole	342	432	342	432	342	432
	Width 4 pole	442	562	442	562	442	562
	Depth ⁽²⁾	328	328	328	328	328	328
Available connection modes	Rear Horizontal	X	X	X	X	X	X
	Rear Vertical	X	X	X	X	X	X
	Front	X	X	X	X	X	X
Weights in Kg	3 pole	43	53	43	53	43	53
	4 pole	54	68	54	68	54	68
Draw-out pattern		GJ04		GJ07		GJ08	
Dimensions in mm	Height	444	444	444	444	444	444
	Width 3 pole	343	443	343	443	343	443
	Width 4 pole	443	573	443	573	443	573
	Depth ⁽²⁾	453	453	453	453	453	453
Available connection modes	Rear Universal ⁽³⁾	X	X	X	X	X	X
	Front	X	X	X	X	X	X
Weights in Kg	3 pole	82	131	82	131	82	131
	4 pole	100	164	100	164	100	164

- (1) For dc applications a special trip unit is required
- (2) With horizontal rear connections; indicated depth value is the required panel dimension
- (3) T stubs can be rotated and used for both vertical & horizontal rear connection
- (4) For use at 1000V phase separators are required



GG10					GG13					GG16					GG20				
S	N	H	E	M	S	N	H	E	M	S	N	H	E	M	S	N	H	E	M
3,4					3,4					3,4					3,4				
1000	1250	1000	1250		1000	1250	1000	1250		1000	1250	1000	1250		1000	1250	1000	1250	
12					12					12					12				
690	1000	690	1000		690	1000	690	1000		690	1000	690	1000		690	1000	690	1000	
750					750					750					750				
B					B					B					B				
YES					YES					YES					YES				
1000					1250					1600					2000				
50	65	85	85	100	50	65	85	85	100	50	65	85	85	100	50	65	85	85	100
50	65	65	85	100	50	65	65	85	100	50	65	65	85	100	50	65	65	85	100
40	50	65	85	85	40	50	65	85	85	40	50	65	85	85	40	50	65	85	85
35					35					35					35				
50	65	85	85	100	50	65	85	85	100	50	65	85	85	100	50	65	85	85	100
50	65	65	85	100	50	65	65	85	100	50	65	65	85	100	50	65	65	85	100
40	50	65	85	85	40	50	65	85	85	40	50	65	85	85	40	50	65	85	85
35					35					35					35				
50	65	85	85	100	50	65	85	85	100	50	65	85	85	100	50	65	85	85	100
40	50	50	50	50	40	50	50	50	50	40	50	50	50	50	40	50	50	50	50
105	143	187	187	220	105	143	187	187	220	105	143	187	187	220	105	143	187	187	220
84	105	143	187	187	84	105	143	187	187	84	105	143	187	187	84	105	143	187	187
20000					20000					20000					20000				
12500					10000					12500					10000				
10000					10000					10000					10000				
50					50					50					50				
35					35					35					35				
20					20					20					20				
20					20					20					20				
32,5					32,5					32,5					32,5				

		X				X					X					X			
		X				X					X					X			
		X				X					X					X			
		X				X					X					X			

GJ10 Non Auto				GJ13 Non Auto				GJ16 Non Auto				GJ20 Non Auto							
S	N	M		S	N	M		S	N	M		S	N	M					
3,4				3,4				3,4				3,4							
1000	1000	1250	1000	1000	1000	1250	1000	1000	1000	1250	1000	1000	1000	1250	1000				
12				12				12				12							
690	690	1000	690	690	690	1000	690	690	690	1000	690	690	690	1000	690				
750				750				750				750							
B				B				B				B							
YES				YES				YES				YES							
1000				1000				1250				1600				2000			
50	65	85	50	50	65	85	50	50	65	85	50	50	65	85	50				
40	50	50	40	40	50	50	40	40	50	50	40	40	50	50	40				
88,2	143	187	88,2	88,2	143	187	88,2	88,2	143	187	88,2	88,2	143	187	88,2				
20000				20000				20000				20000							
12500				12500				10000				12500							
10000				10000				10000				8000							
50				50				50				50							
35				35				35				35							
20				20				20				20							
20				20				20				20							
32,5				32,5				32,5				32,5							

442	442	442	442	442	442	442	442	442	442
342	432	342	432	342	432	342	432	342	432
442	562	442	562	442	562	442	562	442	562
328	328	328	328	328	328	328	328	328	328
X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X
43	53	43	53	43	53	43	53	43	53
54	68	54	68	54	68	54	68	54	68

444	444	444	444	444	444	444	444	444	444
343	443	343	443	343	443	343	443	343	443
443	573	443	573	443	573	443	573	443	573
453	453	453	453	453	453	453	453	453	453
X	X	X	X	X	X	X	X	X	X
X	X	X	X	X	X	X	X	X	X
82	131	82	131	82	131	82	131	82	131
100	164	100	164	100	164	100	164	100	164

Intro

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EN 60947-2 standard

Power Circuit Breaker type	GG25			GG32 & GH32 ⁽⁴⁾				GG40 & GH40 ⁽⁴⁾				GG50		GG64				
	N	H	M	N	H	M	G	L	N	H	M	G	L	M	L			
Air Circuit Breaker denomination																		
Poles	3, 4			3, 4				3, 4				3, 4		3, 4				
Rated insulation voltage	Ui (Volts)			1000		1250		1000		1250		1000		1250		1000		
Rated impulse withstand voltage	Uimp (Kilovolt)			12		12		12		12		12		12		12		
Rated operational voltage Ue	Volts AC			690		1000		690		1000		690		1000		690		
	Volts DC			750		750		750		750		750		750		750		
Category of use	B			B				B				B		B				
Suitable for use as an isolator	Positive ON & OFF			YES		YES		YES		YES		YES		YES		YES		
Rated current In	A at 50°C			2500		3200		4000		4000		5000		6400		6400		
Ultimate breaking capacity Icu (kA)	230/240V-440V AC			65	85	100	65	85	100	100	150	65	85	100	100	150	100	150
	500V AC			65	85	100	65	85	100	100	130	65	85	100	100	130	100	130
	690V AC			50	85	85	50	85	85	100	100	50	85	85	100	100	100	100
	1000V AC ⁽⁶⁾					50			50		80			50		80		80
Service breaking capacity Ics (kA)	230/240V-440V AC			65	85	100	65	85	100	100	150	65	85	100	100	150	100	150
	500V AC			65	85	100	65	85	100	100	130	65	85	100	100	130	100	130
	690V AC			50	85	85	50	85	85	100	100	50	85	85	100	100	100	100
	1000V AC ⁽⁶⁾					50			50		80			50		80		80
Short-circuit withstand Icw (kA)	1 second			65	85	85	65	85	85	100	100	65	85	85	100	100	100	
	3 seconds			50	50	50	50	50	50	85	85	50	50	50	85	85	85	
Short-circuit Making current Icm 220-500V AC	kA Peak			143	187	220	143	187	220	220	330	143	187	220	220	330	220	
Short-circuit Making current Icm 690V AC	kA Peak			105	187	187	105	187	187	220	220	105	187	187	220	220	220	
Mechanical endurance	With Maintenance			20000			20000			10000			20000			10000		
	Without Maintenance			10000			10000			5000			10000			5000		
Electrical endurance (CO operations at 440V AC)	Without Maintenance			6000			5000			5000			5000			1500		
Ultimate breaking capacity Icu (kA) = Service breaking capacity Ics (kA) DC L/R = 15ms (nr. of poles in series) ⁽¹⁾	250V DC 1 pole ⁽¹⁾					50			65		65			65		65		
	500V DC 2 poles ⁽¹⁾					35			50		50			50		50		
	750V DC 3 poles ⁽¹⁾					20			35		35			35		35		
	1000V DC 3 poles ⁽¹⁾					30			30		30			30		30		
Single phase breaking capacity I _{tr} (kA)	230/240-690V AC					50			65		65			65		65		

Electronic Trip Units⁽¹⁾

GT -E type with Ammeter	LT & ST, - GF	X		X		X		X		X		X		X		X
GT -S type with Ammeter, optional communication	LT, ST, I or HI - GF	X		X		X		X		X		X		X		X
GT -N type with Measurement, optional communication	LT, ST, I or HI, RELT GF, ZSI	X		X		X		X		X		X		X		X
GT -H type with Measurement & Relaying, optional communication	LT or LT+, ST, I or HI, RELT GFsum or GFct., ZSI	X		X		X		X		X		X		X		X

EN 60947-3 standard

Power Circuit Breaker type	GJ25		GJ32 & GK32 ⁽⁴⁾				GJ40 & GK40 ⁽⁴⁾				GJ50		GJ64	
	Non Auto		Non Auto		Non Auto		Non Auto		Non Auto		Non Auto		Non Auto	
Isolator denomination	N	M	N	M	N	M	N	M	N	M	L	L	L	L
Poles	3, 4		3, 4		3, 4		3, 4		3, 4		3, 4		3, 4	
Rated insulation voltage	Ui (Volts)		1250		1000		1000		1250		1250		1250	
Rated impulse withstand voltage	Uimp (Kilovolt)		12		12		12		12		12		12	
Rated operational voltage Ue	Volts AC		690		1000		690		1000		1000		1000	
	Volts DC		750		750		750		750		750		750	
Category of use	B		B		B		B		B		B		B	
Suitable for use as an isolator	Positive ON & OFF		YES		YES		YES		YES		YES		YES	
Rated current In	A at 50°C		2500		3200		3200		4000		4000		5000	
Short-circuit Withstand Icw (kA)	1 second		65		85		85		65		85		100	
	3 seconds		50		50		50		50		50		85	
Short-circuit Making current Icm 220-500V AC	kA Peak		143		187		143		187		220		220	
Mechanical Endurance (CO operations at 440V AC)	With Maintenance		20000		10000		20000		10000		10000		10000	
	Without Maintenance		10000		5000		10000		5000		5000		5000	
Electrical Endurance (CO operations at 440V AC)	Without Maintenance		6000		5000		5000		5000		1500		1500	

Installation

Fixed Pattern		GJ25		GJ32 & GK32 ⁽⁴⁾		GJ40 & GK40 ⁽⁴⁾		GJ50		GJ64	
Dimensions in mm	Height	442		442		442		442		442	
	Width 3 pole	432		432		737		432		737	
	Width 4 pole	562		562		967		562		967	
	Depth ⁽²⁾	328		328		328		328		328	
Available connection modes	Rear Horizontal	X		X		X		X		X	
	Rear Vertical	X		X		X		X		X	
Weights in Kg	3 pole	53		53		90		53		90	
	4 pole	68		68		115		68		115	
Draw-out pattern	Height	444		444		444		444		444	
	Width 3 pole	443		443		743		443		743	
	Width 4 pole	573		573		973		573		973	
	Depth ⁽²⁾	453		453		488		488		488	
Available connection modes	Rear Universal ⁽³⁾	X		X		X		X		X	
	Front	X		X		X		X		X	
Weights in Kg	3 pole	131		131		220		131		220	
	4 pole	164		164		275		164		275	

(1) For dc applications a special trip unit is required

(2) With horizontal rear connections; indicated depth value is the required panel dimension

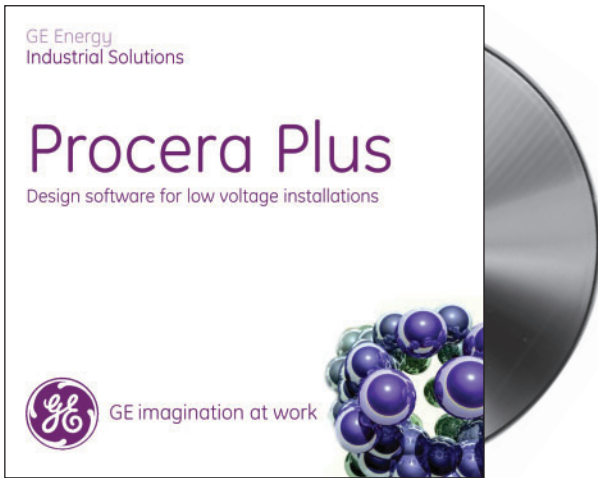
(3) T stubs can be rotated and used for both vertical & horizontal rear connection

(4) GH and GK types (100% rated types) are only available in draw-out pattern in vertical connection mode

(5) T stubs can only be used for vertical rear connections

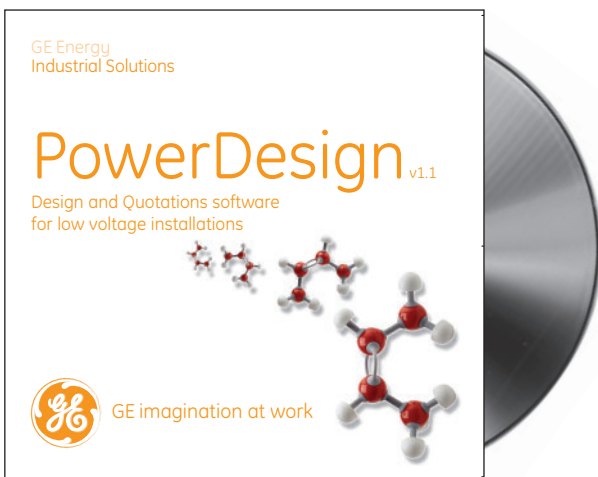
(6) For use at 1000V phase separators are required





Application Software

The new HD 384 ⁽¹⁾ and R064-03 standards require that the design of a low voltage distribution system includes the determination of all prospective short-circuit and fault currents levels. GE has developed a windows based software package to do this 'Procera Plus': A multi-standard and multi-lingual software package to accompany our new product line.



Design Software

GE provides a software package PowerDesign to configure the widely used & well known GE system enclosure ranges 'QuiXtra 630', 'ModulaPlus' and 'SEN Plus', and to use them with components as Electrical Distribution panels.

The software provides the user with a varied and simple range of user friendly tools and features to design and configure devices and enclosures following an electrical component mounting logic.

The PowerDesign package also includes a tool that allows the user to configure the new EntelliGuard™ Power Circuit Breaker, its catalogue code and defines the subcomponents of which it is built.

(1) Also available in IEC 60364 version

Notes

Power Circuit Breaker

Grid area for notes.

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Power Circuit Breakers			
A.2	EntelliGuard™: How to order in 8 steps		
A.4	Basic breakers executed in a fixed mounting pattern		
A.5	Isolators or Non Automatic Breakers in a fixed mounting pattern		
A.6	Termination sets for Breakers & Isolators in fixed mounting pattern		
A.8	Basic breakers: Draw-out Breakers; Moving Portion only		
A.10	Isolators or Non Automatic Breakers: Draw-out Patterns; Moving Portion only		
A.11	Cassettes for use with Breakers & Isolators in Draw-out Pattern; Factory mounted	The breaker	Intro
A.12	Trip Units; Factory mounted	Order Codes	A
Internal Accessories		Electronic Trip Units	B
A.17	Factory mounted		
A.20	Field mountable	Breaker Accessories	C
A.23	Installation Accessories		
A.24	Sensors for Trip Units	Application Guide	D
A.25	Cassettes for use with Breakers & Isolators in Draw-out Pattern; Field mountable		
A.26	Field Mounted (spare) Trip Units	Wiring Diagrams	E
A.28	Spare Parts		
Global Catalogue number structure		Dimensions	F
A.30	Breaker		
A.33	Cassette	Numerical index	X
Valid Catalogue number combinations			
A.34	Factory mounted: Available standard Breaker & Cassette types		
A.35	Factory mounted: Available standard Breaker, Cassette and Trip Unit types		
A.36	Factory mounted: Available standard Isolator & Cassette types		
A.38	Accessories; Factory and Field mountable		



How to order

Step 1

Step 2

Step 3

Step 4

Choose
Current
rating

Choose
required
Interruption Rating

Define if a Breaker or Isolator is needed
Proceed to establish the first 5 digits of the Catalogue
Number as indicated here

Select the required product
A - Breaker or Isolator
In Fixed Pattern
B - Breaker or Isolator
As Draw-out, Moving Portion
C - Cassette for Draw-out
Breaker or Isolator

In	Icu = Ics		Envelope	Standard		100% Rated		
	≤ 440V AC	Icw		Breaker	Isolator ⁽¹⁾	Breaker	Isolator ⁽¹⁾	
400A	50kA	50kA	1	GG04S	GJ04S			
	65kA	65kA	1	GG04N	GW04N			
	85kA	65kA	1	GG04H				
	85kA	85kA	2	GG04E	GW04M			
	100kA	85kA	2	GG04M				
630A	50kA	50kA	1	GG07S	GJ07S			
	65kA	65kA	1	GG07N	GW07N			
	85kA	65kA	1	GG07H				
	85kA	85kA	2	GG07E	GW07M			
	100kA	85kA	2	GG07M				
800A	50kA	50kA	1	GG08S	GJ08S			
	65kA	65kA	1	GG08N	GW08N			
	85kA	65kA	1	GG08H				
	85kA	85kA	2	GG08E	GW08M			
	100kA	85kA	2	GG08M				
1000A	50kA	50kA	1	GG10S	GJ10S			
	65kA	65kA	1	GG10N	GW10N			
	85kA	65kA	1	GG10H				
	85kA	85kA	2	GG10E	GW10M			
	100kA	85kA	2	GG10M				
1250A	50kA	50kA	1	GG13S	GJ13S			
	65kA	65kA	1	GG13N	GW13N			
	85kA	65kA	1	GG13H				
	85kA	85kA	2	GG13E	GW13M			
	100kA	85kA	2	GG13M				
1600A	50kA	50kA	1	GG16S	GJ16S			
	65kA	65kA	1	GG16N	GW16N			
	85kA	65kA	1	GG16H				
	85kA	85kA	2	GG16E	GJ16M			
	100kA	85kA	2	GG16M				
2000A	50kA	50kA	1	GG20S	GJ20S			
	65kA	65kA	1	GG20N	GW20N			
	85kA	65kA	1	GG20H				
	85kA	85kA	2	GG20E	GW20M			
	100kA	85kA	2	GG20M				
2500A	65kA	65kA	2	GG25N	GJ25N			
	85kA	85kA	2	GG25H	GW25H			
	100kA	85kA	2	GG25M				
	3200A	65kA	65kA	2	GG32N	GJ32N	GH32N	GK32N
		85kA	85kA	2	GG32H	GW32M	GH32H	GZ32H
100kA		85kA	2	GG32M		GH32M		
100kA		100kA	3	GG32G	GJ32L			
150kA		100kA	3	GG32L				
4000A	65kA	65kA	2	GG40N	GJ40N	GH40N	GK40N	
	85kA	85kA	2	GG40H	GW40M	GH40H	GZ40H	
	100kA	85kA	2	GG40M		GH40M		
	100kA	100kA	3	GG40G	GJ40L			
	150kA	100kA	3	GG40L				
5000A	100kA	100kA	3	GG50M	GJ50L			
	150kA	100kA	3	GG50L				
6400A	100kA	100kA	3	GG64M	GJ64L			
	150kA	100kA	3	GG64L				

Order codes

Intro

A

B

C

D

E

F

X

Defines the 6th digit in catalogue number

4 = Breaker / Isolator In Fixed Pattern 3 pole

6 = Breaker / Isolator In Fixed Pattern 4 pole⁽¹⁾

1 = Breaker / Isolator Moving Portion Only 3 pole

3 = Breaker / Isolator Moving Portion Only 4 pole⁽²⁾

2 = Cassette for Draw-out Pattern = Fixed Portion Only 3 pole

5 = Cassette for Draw-out Pattern = Fixed Portion Only 4 pole⁽³⁾

(1) On Isolators Icu and Ics values do not apply

(2) 4 pole Neutral Left

Examples

Breaker 4p 1600A- Draw-out Portion only- Icu=85kA, Ics=Icw=65kA:

GG16H3

Breaker 3p 3200A Fixed Pattern -Horizontal Rear Connections - Icu=Ics=Icw=65kA:

GG32N4



in 8 steps

Step 5

Finalize the basic Catalogue number see catalogue pages:
 A.4-A.5 - Fixed Pattern
 A.8-A.10 - Draw-out Portion
 A.6 - Connections fixed pattern
 A.11 - Cassettes, draw-out

completing the basic catalogue number

No addition
 Indicates Breaker / Isolator In Fixed Pattern has set of 3NO/3NC aux. Contacts included Breaker in fixed Pattern Are equipped with Rear Connection (Horizontal) Other options include Rear (Vertical) and Front (Flat) See page A 6 to order Field mountable Adaptation Kits
 See pages A.4, 5 & 6

No addition
 Indicates Breaker / Isolator Moving Portion Only has set of 3NO/3NC aux. Contacts included
 See pages A.7, 8 & 9

U
 = Cassette with Universal 'T stabs' suited for use as Horizontal or Vertical rear connections Safety Shutters Supplied with Cassette ⁽³⁾

V
 = Cassette with Vertical Rear Connections Safety Shutters Supplied with Cassette ⁽³⁾

F
 = Cassette with Front Flat connections Safety Shutters Supplied with Cassette ⁽³⁾
 See page A.11

Step 6

Basic Catalogue number is a Manually operated device **If a Motor Operated device is requested?**
 Please order Motor and closing coils as Indicated here ⁽³⁾

Add Catalogue number (s)

If chosen device is a Breaker or Isolator Envelope 1
 See page A.17
 Order a Motor Type1 and 1 Closing Coil or 1 Command closing coil Based on voltage Requirements and specifications

If chosen device is a Breaker or Isolator Envelope 2 or 3
 See page A.17
 Order a Motor type 2 and 1 Closing Coil or 1 Command closing coil Based on voltage Requirements and specifications

Step 7

If Universal internal Accessories⁽³⁾ are needed?
Options
 UVR or SHT release (s)
 Network Interlocks
 Auxiliary contacts
 Alarm & signal contacts

Add Catalogue number (s)

If chosen device is a Breaker or Isolator See page A.17
 To add up to 3 SHT or UVR Releases
 Or 1 Network Interlock Coils and 1 SHT or UVR Release

If chosen device is a Breaker or Isolator See page A.17
 To extend on the installed 3 NO + 3NC contacts Maximum of 8 possible

If chosen device is a Breaker or Isolator See page A.17
 To add Bell Alarm and/or Coils signalling contacts

If chosen device is a Cassette See page A.17 & A.18
 To Add Position indication Contacts in Cassette Or provisions for key interlocks

Step 8

Full Catalogue number defines: **A Breaker without Trip Unit For all Breakers ADD Trip Unit**

Add Catalogue number (s)

If chosen device is a Breaker See pages A.12 to A.16 Choose and Add a Trip Unit out of the the four basic types and 39 different options. Offering

An Extremely Large setting range covering Overload, Delayed and Instantaneous Short-circuit Protection

Groundfault Protection in Single or Dual mode suited for applications as UEF, REF & SEF or combinations thereof

Complete and sophisticated Network measurement options, Including Wave Form Capture

Multiple relaying options as Zone Selective Interlock, Undervoltage, Overvoltage, Reverse Power etc.

- Or -

A 2nd ordering method can be used in which the fully configured breaker or cassette is defined in one character string. This string comprises 19 digits when used for the breaker and 12 for when used for the cassette.

This global ordering code is referred to within GE as the:

Catalogue Number

It is used on all relevant ordering documents and printed on each EntelliGuard™ breaker front fascia. An explanation of this code and its use can be found on page A.30 of this catalogue.

When ordering with the method indicated here our CRC department will define and confirm the mentioned individual **Catalogue Number**.

(3) Devices ordered here are supplied factory fitted






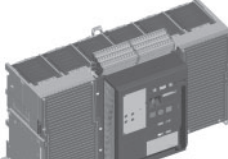
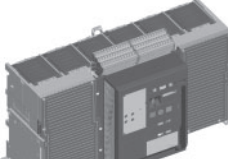
Remark: For Field Mountable Accessories see page A.21 to A.25



Basic breakers executed in a fixed mounting pattern

- With Horizontal Rear Connection (for other options, please refer to page A.6)⁽¹⁾
- With Aux. contact block equipped with 3 NO and 3 NC contacts
- Basic Breaker MUST be equipped with a Trip Unit (for options, please refer to page A.12 to A.16)
- For 1000V applications (M and L types) phase separators are required (see page A.23)

Fixed Mounting Pattern

	Rating (A)	3 pole		4 pole ⁽²⁾	
		Cat. No.	Ref. No.	Cat. No.	Ref. No.
 <p>S type Icu = Ics = Icw 50kA</p>	400	GG04S4	407019	GG04S6	407020
	630	GG07S4	407048	GG07S6	407049
	800	GG08S4	407078	GG08S6	407079
	1000	GG10S4	407108	GG10S6	407109
	1250	GG13S4	407138	GG13S6	407139
	1600	GG16S4	407168	GG16S6	407169
	2000	GG20S4	407208	GG20S6	407209
	 <p>N type Icu = Ics = Icw 65kA</p>	400	GG04N4	407015	GG04N6
630		GG07N4	407044	GG07N6	407045
800		GG08N4	407074	GG08N6	407075
1000		GG10N4	407104	GG10N6	407105
1250		GG13N4	407134	GG13N6	407135
1600		GG16N4	407164	GG16N6	407165
2000		GG20N4	407204	GG20N6	407205
2500		GG25N4	407240	GG25N6	407241
3200		GG32N4	407266	GG32N6	407267
4000		GG40N4	407292	GG40N6	407293
 <p>H type Icu = Ics = 85kA Icw = 65kA</p>		400	GG04H4	407007	GG04H6
	630	GG07H4	407036	GG07H6	407037
	800	GG08H4	407066	GG08H6	407067
	1000	GG10H4	407096	GG10H6	407097
	1250	GG13H4	407126	GG13H6	407127
	1600	GG16H4	407156	GG16H6	407157
	2000	GG20H4	407196	GG20H6	407197
	 <p>E-H type Icu = Ics = Icw 85kA</p>	400	GG04E4	407003	GG04E6
630		GG07E4	407032	GG07E6	407033
800		GG08E4	407062	GG08E6	407063
1000		GG10E	407092	GG10E6	407093
1250		GG13E4	407122	GG13E6	407123
1600		GG16E4	407152	GG16E6	407153
2000		GG20E4	407192	GG20E6	407193
2500		GG25H4	407232	GG25H6	407233
3200		GG32H4	407244	GG32H6	407245
4000 ⁽¹⁾		GG40H4	407280	GG40H6	407281
 <p>M type Icu = Ics = 100kA Icw = 85kA</p>		400	GG04M4	407011	GG04M6
	630	GG07M4	407040	GG07M6	407041
	800	GG08M4	407070	GG08M6	407071
	1000	GG10M4	407100	GG10M6	407101
	1250	GG13M4	407130	GG13M6	407131
	1600	GG16M4	407160	GG16M6	407161
	2000	GG20M4	407200	GG20M6	407201
	2500	GG25M4	407236	GG25M6	407237
	3200	GG32M4	407262	GG32M6	407263
	4000 ⁽¹⁾	GG40M4	407288	GG40M6	407289
	 <p>G-M type Icu = Ics = Icw 100kA</p>	3200	GG32G4	407252	GG32G6
4000		GG40G4	407270	GG40G6	407271
5000		GG50M4	407306	GG50M6	407307
6400		GG64M4	407326	GG64M6	407327
 <p>L type Icu = Ics = 150kA Icw = 100kA</p>	3200	GG32L4	407254	GG32L6	407255
	4000	GG40L4	407284	GG40L6	407285
	5000	GG50L4	407302	GG50L6	407303
	6400	GG64L4	407322	GG64L6	407323




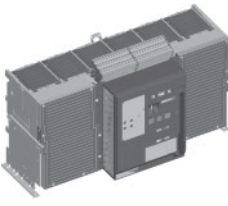
(1) Rear Vertical Connection for Indicated 4000A types

(2) 4th pole on Left, Trip Unit Field Configurable at 0,50 or 100% of phase rating

Isolators or Non Automatic breakers executed in a fixed mounting pattern

- With Horizontal Rear Connection (for other options, please refer to page A.6)⁽¹⁾
- With Aux. contact block equipped with 3 NO and 3 NC contacts
- For 1000V applications (M and L types) phase separators are required (see page A.23)

Fixed Mounting Pattern

	Rating (A)	3 pole		4 pole ⁽²⁾	
		Cat. No.	Ref. No.	Cat. No.	Ref. No.
 <p>S type Non Automatic Icw 50kA</p>	400	GJ04S4	407380	GJ04S6	407381
	630	GJ07S4	407400	GJ07S6	407401
	800	GJ08S4	407420	GJ08S6	407421
	1000	GJ10S4	407440	GJ10S6	407441
	1250	GJ13S4	407460	GJ13S6	407461
	1600	GJ16S4	407480	GJ16S6	407481
	2000	GJ20S4	407500	GJ20S6	407501
 <p>N type Non Automatic Icw 65kA</p>	400	GW04N4	407376	GW04N6	407377
	630	GW07N4	407396	GW07N6	407397
	800	GW08N4	407416	GW08N6	407417
	1000	GW10N4	407436	GW10N6	407437
	1250	GW13N4	407456	GW13N6	407457
	1600	GW16N4	407476	GW16N6	407477
	2000	GW20N4	407496	GW20N6	407497
	2500	GJ25N4	407520	GJ25N6	407521
	3200	GJ32N4	407539	GJ32N6	407540
	4000 ⁽¹⁾	GJ40N4	407560	GJ40N6	407561
 <p>M type Non Automatic Icw 85kA</p>	400	GW04M4	408350	GW04M6	408351
	630	GW07M4	408352	GW07M6	408353
	800	GW08M4	408354	GW08M6	408355
	1000	GW10M4	408356	GW10M6	408357
	1250	GW13M4	408358	GW13M6	408359
	1600	GW16M4	408360	GW16M6	408361
	2000	GW20M4	408362	GW20M6	408363
	2500	GW25M4	408364	GW25M6	408365
	3200	GW32M4	408366	GW32M6	408367
	4000 ⁽¹⁾	GW40M4	408368	GW40M6	408369
 <p>L type Non Automatic Icw 100kA</p>	3200	GJ32L4	407535	GJ32L6	407536
	4000	GJ40L4	407556	GJ40L6	407557
	5000	GJ50L4	407567	GJ50L6	407568
	6400	GJ64L4	407577	GJ64L6	407578

(1) Rear Vertical Connection for Indicated 4000A types

(2) 4th pole on Left

Termination sets for Breakers & Isolators in fixed pattern

- To modify Standard connection (Horizontal Rear) to:
- Vertical Rear
- Front flat connection
- Sets containing terminals and hardware for the line & load side of the breaker

Termination sets for Breakers & Isolators in fixed Pattern

Vertical Rear Connections		Suited for use with EntelliGuard™ types		3 pole		4 pole	
Rating (A)		Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
<i>Terminations for envelope 1</i>							
400 - 1600A	GG, GJ & GW type S, N & H	G16H4RVI	408058	G16H6RVI	408082		
2000A	GG, GJ & GW type S, N & H	G20H4RVIn	408059	G20H6RVIn	408083		
<i>Terminations for envelope 2</i>							
400 - 3200A	GG, GJ & GW type E, N, H & M	G32M4RVI	408070	G32M6RVI	408071		
4000A ⁽²⁾	GG, GJ & GW type N, H & M	G40M4RVI	408072	G40M6RVI	408074		
<i>Terminations for envelope 3</i>							
3200 - 6400A	GG & GJ type G, M & L	G64L4RVI	408073	G64L6RVI	408075		
<i>Front access Connections</i>							
<i>Terminations for envelope 1</i>							
400 - 1600A	GG, GJ & GW type S, N & H	G16H4FFI	408060	G16H6FFI	408062		
2000A	GG, GJ & GW type S, N & H	G20H4FFI	408061	G20H6FFI	408063		
<i>Terminations for envelope 2</i>							
400 - 3200A	GG, GJ & GW type E, N, H & M	G32M4FFI	408066	G32M6FFI	408068		
4000A	GG, GJ & GW type N, H & M	G40M4FFI	408067	G40M6FFI	408069		
<i>Wall mounting Brackets⁽¹⁾</i>							
	Wall Mounting Brackets for Env. 1 & 2	GFMTG	408085	GFMTG	408085		

(1) Recommended for use with Front access Connections

(2) For the 4000A types are supplied with the standard fixed breaker

Notes


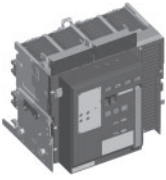
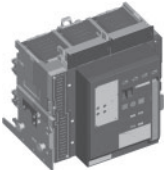


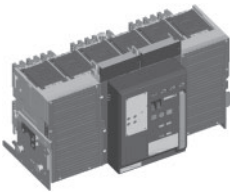
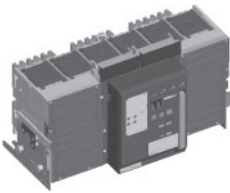
Grid area for notes.



Basic breakers: Draw-out Breakers; Moving portion only

- With Aux. contact block equipped with 3 NO and 3 NC contacts
- Basic Breaker MUST be equipped with a Trip Unit (please refer to page A.12 to A.16 for options)
- A cassette is needed, please refer to page A.11 for options
- For 1000V applications (M and L types) phase separators are required (see page A.23)

Draw-out Pattern; moving portion only

		3 pole			4 pole ⁽¹⁾	
		Rating (A)	Cat. No.	Ref. No.	Cat. No.	Ref. No.
	S type Icu = Ics = Icw 50kA	400	GG04S1	407017	GG04S3	407018
		630	GG07S1	407046	GG07S3	407047
		800	GG08S1	407076	GG08S3	407077
		1000	GG10S1	407106	GG10S3	407107
		1250	GG13S1	407136	GG13S3	407137
		1600	GG16S1	407166	GG16S3	407167
		2000	GG20S1	407206	GG20S3	407207
			N type Icu = Ics = Icw 65kA	400	GG04N1	407013
630	GG07N1			407042	GG07N3	407043
800	GG08N1			407072	GG08N3	407073
1000	GG10N1			407102	GG10N3	407103
1250	GG13N1			407132	GG13N3	407133
1600	GG16N1			407162	GG16N3	407163
2000	GG20N1			407202	GG20N3	407203
2500	GG25N1			407238	GG25N3	407239
3200	GG32N1			407264	GG32N3	407265
4000	GG40N1			407290	GG40N3	407291
	H type Icu = Ics = 85kA Icw = 65kA	400	GG04H1	407005	GG04H3	407006
		630	GG07H1	407034	GG07H3	407035
		800	GG08H1	407064	GG08H3	407065
		1000	GG10H1	407094	GG10H3	407095
		1250	GG13H1	407124	GG13H3	407125
		1600	GG16H1	407154	GG16H3	407155
		2000	GG20H1	407194	GG20H3	407195
	E-H type Icu = Ics = Icw 85kA	400	GG04E1	407001	GG04E3	407002
		630	GG07E1	407030	GG07E3	407031
		800	GG08E1	407060	GG08E3	407061
		1000	GG10E1	407090	GG10E3	407091
		1250	GG13E1	407120	GG13E3	407121
		1600	GG16E1	407150	GG16E3	407151
		2000	GG20E1	407190	GG20E3	407191
		2500	GG25H1	407230	GG25H3	407231
		3200	GG32H1	407242	GG32H3	407273
		4000	GG40H1	407278	GG40H3	407279
	M type Icu = Ics = 100kA Icw = 85kA	400	GG04M1	407009	GG04M3	407010
		630	GG07M1	407038	GG07M3	407039
		800	GG08M1	407068	GG08M3	407069
		1000	GG10M1	407098	GG10M3	407099
		1250	GG13M1	407128	GG13M3	407129
		1600	GG16M1	407158	GG16M3	407159
		2000	GG20M1	407198	GG20M3	407199
		2500	GG25M1	407234	GG25M3	407235
		3200	GG32M1	407260	GG32M3	407261
		4000	GG40M1	407286	GG40M3	407287
	G-M type Icu = Ics = Icw 100kA	3200	GG32G1	407250	GG32G3	407251
		4000	GG40G1	407268	GG40G3	407269
		5000	GG50M1	407304	GG50M3	407305
		6400	GG64M1	407324	GG64M3	407325
	L type Icu = Ics = 150kA Icw = 100kA	3200	GG32L1	407248	GG32L3	407249
		4000	GG40L1	407282	GG40L3	407283
		5000	GG50L1	407300	GG50L3	407301
		6400	GG64L1	407320	GG64L3	407321

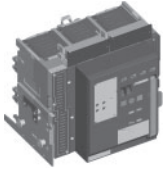
(1) 4th pole on Left, Trip Unit Field Configurable at 0,50 or 100% of phase rating



Draw-out Breakers with vertical dual clusters; Moving portion only

- Draw-out Breaker with no or very limited de-rating when used enclosed
- With Aux. contact block equipped with 3 NO and 3 NC contacts
- Basic Breaker MUST be equipped with a Trip Unit (please refer to page A.12 to A.16 for options)
- A cassette with vertical clusters is needed, please refer to page A.11 for options

Draw-out Pattern, vertical clusters; moving portion only



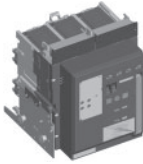

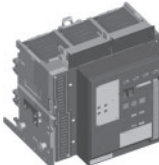
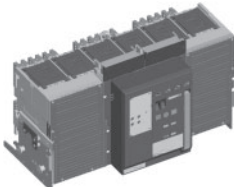
	Rating (A)	3 pole		4 pole ⁽¹⁾	
		Cat. No.	Ref. No.	Cat. No.	Ref. No.
N type Icu = Ics = Icw 65kA	3200	GH32N1	407350	GH32N3	407351
	4000	GH40N1	407356	GH40N3	407357
H type Icu = Ics = Icw 85kA	3200	GH32H1	407346	GH32H3	407347
	4000	GH40H1	407352	GH40H3	407353
M type Icu = Ics = 100kA Icw = 85kA	3200	GH32M1	407348	GH32M3	407349
	4000	GH40M1	407354	GH40M3	407355

(1) 4th pole on Left, Trip Unit Configurable at 0,50 or 100% of phase rating

Isolators or Non Automatic Breakers: Draw-out Pattern; Moving portion only

- With Aux. contact block equipped with 3 NO and 3 NC contacts
- A cassette is needed, please refer to page A.11 for options
- For 1000V applications (M and L types) phase separators are required (see page A.23)

Draw-out Pattern; moving portion only

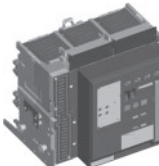
	Rating (A)	3 pole		4 pole ⁽¹⁾	
		Cat. No.	Ref. No.	Cat. No.	Ref. No.
 <p>S type Non Automatic Icw 50kA</p>	400	GJ04S1	407378	GJ04S3	407379
	630	GJ07S1	407398	GJ07S3	407399
	800	GJ08S1	407418	GJ08S3	407419
	1000	GJ10S1	407438	GJ10S3	407439
	1250	GJ13S1	407458	GJ13S3	407459
	1600	GJ16S1	407478	GJ16S3	407479
	2000	GJ20S1	407498	GJ20S3	407499
	 <p>N type Non Automatic Icw 65kA</p>	400	GW04N1	407374	GW04N3
630		GW07N1	407394	GW07N3	407395
800		GW08N1	407414	GW08N3	407415
1000		GW10N1	407434	GW10N3	407435
1250		GW13N1	407454	GW13N3	407455
1600		GW16N1	407474	GW16N3	407475
2000		GW20N1	407494	GW20N3	407495
2500		GJ25N1	407518	GJ25N3	407519
3200		GJ32N1	407537	GJ32N3	407538
4000		GJ40N1	407558	GJ40N3	407559
 <p>M type Non Automatic Icw 85kA</p>		400	GW04M1	408400	GW04M3
	630	GW07M1	408402	GW07M3	408403
	800	GW08M1	408404	GW08M3	408405
	1000	GW10M1	408406	GW10M3	408407
	1250	GW13M1	408408	GW13M3	408409
	1600	GW16M1	408410	GW16M3	408411
	2000	GW20M1	408412	GW20M3	408413
	2500	GW25M1	408414	GW25M3	408415
	3200	GW32M1	408416	GW32M3	408417
	4000	GW40M1	408418	GW40M3	408419
 <p>L type Non Automatic Icw 100kA</p>	3200	GJ32L1	407533	GJ32L3	407534
	4000	GJ40L1	407554	GJ40L3	407555
	5000	GJ50L1	407565	GJ50L3	407566
	6400	GJ64L1	407575	GJ64L3	407576

Power Circuit Breakers types with Vertical Cluster system

Isolators or Non Automatic Breakers with dual vertical clusters; Moving Portion only

- Draw-out Patterns with no or very limited de-rating when used enclosed
- With Aux. contact block equipped with 3 NO and 3 NC contacts
- A cassette with vertical clusters is needed, please refer to page A.11 for options

Draw-out Pattern, vertical clusters; moving portion only

	Rating (A)	3 pole		4 pole ⁽¹⁾	
		Cat. No.	Ref. No.	Cat. No.	Ref. No.
 <p>N type Non Automatic Icw 65kA</p>	3200	GK32N1	407591	GK32N3	407592
	4000	GK40N1	407595	GK40N3	407596
	<p>H type Non Automatic Icw 85kA</p>	3200	GZ32H1	407589	GZ32H3
4000		GZ40H1	407593	GZ40H3	407594

(1) 4th pole on Left



Cassettes for use with Breakers & Isolators in Draw-out Pattern; Factory mounted

- References apply for Cassettes supplied in one Packaging with Breakers or Isolators (for Separate Cassettes see page A.25)
- With Connection modes as indicated in left column
- Each cassette is supplied with safety shutters

Cassettes for Draw-out Pattern; fixed portion only

Universal Rear Connections		3 pole		4 pole	
Rating (A)	Suited for use with EntelliGuard™ -G types	Cat. No.	Ref. No.	Cat. No.	Ref. No.
<i>Cassette for envelope 1</i>					
400 - 1600A	GG, GJ & GW type S	GG16S2UM	407616	GG16S5UM	407618
400 - 1600A	GG, GJ & GW type N & H	GG16H2UM	408202	GG16H5UM	408205
2000A	GG, GJ & GW type S, N & H	GG20H2UM	408212	GG20H5UM	408215
<i>Cassette for envelope 2</i>					
400 - 2000A	GG, GJ & GW type N, E & M	GG20M2UM	408224	GG20M5UM	408227
2500A	GG, GJ & GW type N, H & M	GG25M2UM	408236	GG25M5UM	408239
3200A	GG, GJ & GW type N, H & M ⁽¹⁾	GG32M2UM	408247	GG32M5UM	408251
4000A	GG, GJ & GW type N, H & M ⁽¹⁾	GG40M2UM	408259	GG40M5UM	408263
<i>Remark: Each cassette is supplied with connection pads that can be rotated and used for Vertical or Horizontal connections.</i>					
<i>Cassette for envelope 3⁽²⁾</i>					
3200 - 6400A ⁽³⁾	GG & GJ type G, M & L	GG64L2UM	408281	GG64L5UM	408283
<i>Vertical rear Connections</i>					
<i>Cassette with dual vertical clusters and connection pads for limited de-rating envelope 2</i>					
3200A	GH, GK, GJ & GZ type N, H & M	GH32M2VM	408292	GH32M5VM	408293
4000A	GH, GK, GJ & GZ type N, H & M ⁽¹⁾	GH40M2VM	408294	GH40M5VM	408295
<i>Front access Connections</i>					
<i>Cassette for envelope 1</i>					
400 - 1600A	GG, GJ & GW type S	GG16S2FM	407626	GG16S5FM	407628
400 - 1600A	GG, GJ & GW type N & H	GG16H2FM	408200	GG16H5FM	408203
2000A	GG, GJ & GW type S, N & H	GG20H2FM	408210	GG20H5FM	408213
<i>Cassette for envelope 2</i>					
400 - 2000A	GG, GJ & GW type E, N, H & M	GG20M2FM	408222	GG20M5FM	408225
2500A	GG, GJ & GW type N, H & M	GG25M2FM	408234	GG25M5FM	408237
3200A	GG, GJ & GW type N, H & M	GG32M2FM	408245	GG32M5FM	408249
4000A	GG, GJ & GW type N, H & M	GG40M2FM	408257	GG40M5FM	408261

(1) Cassettes for envelope 2 are limited to a current of 3200A when connected in horizontal mode. Connected in vertical mode a 4000A rating is achieved
 (2) The Cassette for envelope 3 is limited to a current of 5000A when connected in horizontal mode. Connected in vertical mode it has a rating of 6400A. This cassette type is NOT depicted here
 (3) 4th pole on Left



Trip Units - Factory mounted

Order codes

Intro

A

B


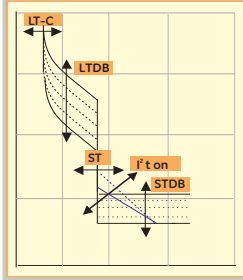

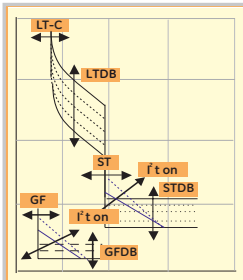

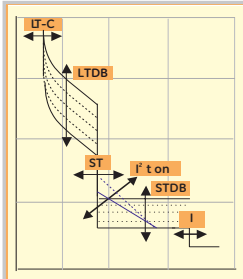

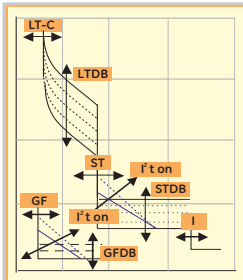

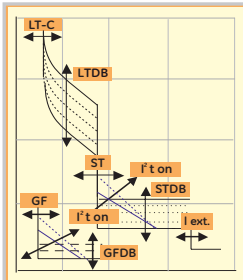
C

D

E

F

X

	GT-E	Basic functionality	Designation	Extended functionality	Cat. No.	Ref. No.
		GT-E Trip Unit with: LT-C 0,2 -1 x In = Ir LTDB ST I ² t ON or OFF STDB	None		GTG00K1-SF	408800
		GT-Rating Plug	Required for all types		GTPUNI	408860
		GT-E Trip Unit with: LT-C 0,2 -1 x In = Ir LTDB ST I ² t ON or OFF STDB GF I ² t ON or OFF GFDB	None		GTG00K2-SF	408801
		GT-Rating Plug	Required for all types		GTPUNI	408860
		GT-S Trip Unit with: LT-C 0,2 -1 x In = Ir LTDB ST I ² t ON or OFF STDB I	None		GTG00K9-SF	408803
		GT-Rating Plug	Required for all types		GTPUNI	408860
		GT-S Trip Unit with: LT-C 0,2 -1 x In = Ir LTDB ST I ² t ON or OFF STDB GF I ² t ON or OFF GFDB I	None	+ Modbus Communication	GTG00K3-SF	408805
		GT-Rating Plug	Required for all types		GTG00K3-2SF	408807
		GT-S Trip Unit with: LT-C 0,2 -1 x In = Ir LTDB ST I ² t ON or OFF STDB GF I ² t ON or OFF GFDB I ext.	None	+ Modbus Communication	GTG00K4-SF	408806
		GT-Rating Plug	Required for all types		GTG00K4-2SF	408808
		GT-Rating Plug	Required for all types		GTPUNI	408860



Trip Units - Factory mounted

GT-N		Designation	Extended functionality	Cat. No.	Ref. No.
	Basic functionality	GT-N Trip Unit with: LT-C 0,2 -1 x In = Ir LTDB ST I ² t ON or OFF STDB I RELT	Measurement unit ⁽¹⁾ RELT Instantaneous	GTG00K9-4SF	408813
	Extended functionality			GTPUNI	408860
					
	Basic functionality	GT-N Trip Unit with: LT-C 0,2 -1 x In = Ir LTDB ST I ² t ON or OFF STDB GF I ² t ON or OFF GFDB I RELT	Measurement unit ⁽¹⁾ RELT Instantaneous + Modbus Communication + Zone Selective Interlock on I, ST & GF functions	GTG00K3-4SF GTG00K3T6SF	408815 408817
	Extended functionality			GTPUNI	408860
					
	Basic functionality	GT-N Trip Unit with: LT-C 0,2 -1 x In = Ir LTDB ST I ² t ON or OFF STDB GF I ² t ON or OFF GFDB I ext. RELT	Measurement unit ⁽¹⁾ RELT Instantaneous + Modbus Communication + Zone Selective Interlock on I ext., ST & GF functions	GTG00K4-4SF GTG00K4T6SF	408816 408818
	Extended functionality			GTPUNI	408860
					

(1) An auxiliary Power Conditioner is obligatory when a fully functioning measurement is required see page A.22

Trip Units - Factory mounted

Order codes

A

B


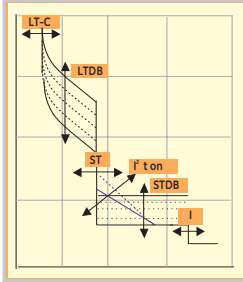
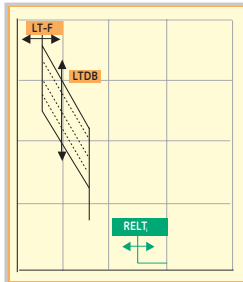
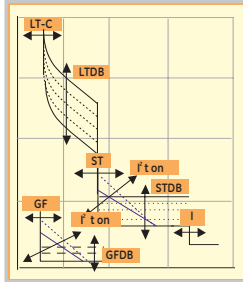
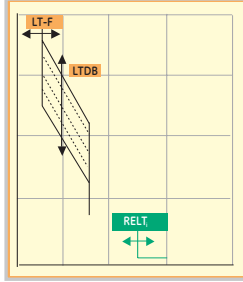

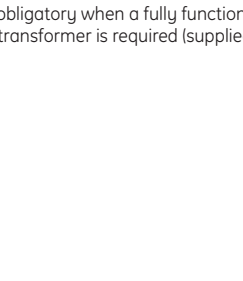
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D

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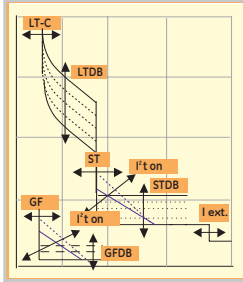
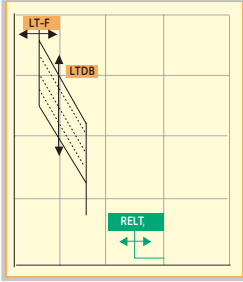
GT-H	Basic functionality	Designation	Extended functionality	Cat. No.	Ref. No.
		GT-H Trip Unit with: LT-C 0,2- 1 x In =Ir -OR- LT-F 0,2- 1 x In =Ir LTDB ST I ¹ T ON or OFF STDB I RELT	LT Band shape Choice (LTC or LTF) Measurement Unit ⁽¹⁾ Data acquisition & Relay functionality RELT Instantaneous	GTG00N9-5SF	408823
		GT-Rating Plug	Required for all types	GTPUNI	408860
		GT-H Trip Unit with: LT-C 0,2- 1 x In =Ir -OR- LT-F 0,2- 1 x In =Ir LTDB ST I ¹ T ON or OFF STDB GF sum, I ¹ T ON or OFF -AND/OR- GF CT I ¹ T ON or OFF ⁽²⁾ GFDB I RELT	LT Band shape Choice (LTC or LTF) Dual GF Protection (Res/Sum or CT) Measurement Unit ⁽¹⁾ Data acquisition & Relay functionality RELT Instantaneous	GTG00N5-5SF	408825
		LT Band shape Choice (LTC or LTF) Dual GF Protection (Res/Sum or CT) Measurement Unit ⁽¹⁾ Data acquisition & Relay functionality RELT Instantaneous Modbus Communication	GTG00N5-8SF	408833	
		LT Band shape Choice (LTC or LTF) Dual GF Protection (Res/Sum or CT) Zone Selective Interlock on ST, I & GF Measurement Unit ⁽¹⁾ Data acquisition & Relay functionality RELT Instantaneous Modbus Communication	GTG00N5-9SF	408841	
		LT Band shape Choice (LTC or LTF) Dual GF Protection (Res/Sum or CT) Zone Selective Interlock on ST, I & GF Measurement Unit ⁽¹⁾ Data acquisition & Relay functionality RELT Instantaneous Modbus Communication	GTG00N5-5SF	408829	
		LT Band shape Choice (LTC or LTF) Dual GF Protection (Res/Sum or CT) Zone Selective Interlock on ST, I & GF Measurement Unit ⁽¹⁾ Data acquisition & Relay functionality RELT Instantaneous Modbus Communication	GTG00N5T5SF	408829	
		LT Band shape Choice (LTC or LTF) Dual GF Protection (Res/Sum or CT) Zone Selective Interlock on ST, I & GF Measurement Unit ⁽¹⁾ Data acquisition & Relay functionality RELT Instantaneous Modbus Communication	GTG00N5T8SF	408837	
		LT Band shape Choice (LTC or LTF) Dual GF Protection (Res/Sum or CT) Zone Selective Interlock on ST, I & GF Measurement Unit ⁽¹⁾ Data acquisition & Relay functionality RELT Instantaneous Modbus Communication	GTG00N5T9SF	408845	
		GT-Rating Plug	Required for all types	GTPUNI	408860

(1) An auxiliary Power Conditioner is obligatory when a fully functioning measurement is required see page A.22

(2) The use of an interposing current transformer is required (supplied, mounted in device)



Trip Units - Factory mounted

GT-H Basic functionality		Designation	Extended functionality	Cat. No.	Ref. No.	
		GT-H Trip Unit with:	LT Band shape Choice (LTC or LTF)	GTG00N7-5SF	408827	
		LT-C 0,2- 1 x In =Ir	Dual GF Protection (Res./Sum or CT)			
		-OR-	Measurement Unit ⁽¹⁾			
	LT-F 0,2- 1 x In =Ir	Data acquisition & Relay functionality				
	LTDB	RELT Instantaneous				
	ST I'T ON or OFF					
	STDB	LT Band shape Choice (LTC or LTF)	GTG00N7-8SF	408835		
	GF sum. I²T ON or OFF ⁽²⁾	Dual GF Protection (Res./Sum or CT)				
		-AND/OR-	Measurement Unit ⁽¹⁾			
	GF CT I'T ON or OFF	Data acquisition & Relay functionality				
GFDB	RELT Instantaneous					
I ext.	Modbus Communication					
	RELT					
		LT Band shape Choice (LTC or LTF)	GTG00N7-9SF	408843		
		Dual GF Protection (Res./Sum or CT)				
		Measurement Unit ⁽¹⁾				
		Data acquisition & Relay functionality				
		RELT Instantaneous				
		Profibus Communication				
		LT Band shape Choice (LTC or LTF)	GTG00N7T5SF	408831		
		Dual GF Protection (Res./Sum or CT)				
		Zone Selective Interlock on ST, I & GF				
		ST & GF Measurement Unit ⁽¹⁾				
		Data acquisition & Relay functionality				
		RELT Instantaneous				
		LT Band shape Choice (LTC or LTF)	GTG00N7T8SF	408839		
		Dual GF Protection (Res./Sum or CT)				
		Zone Selective Interlock on ST, I & GF				
		ST & GF Measurement Unit ⁽¹⁾				
		Data acquisition & Relay functionality				
		RELT Instantaneous				
		Modbus Communication				
		LT Band shape Choice (LTC or LTF)	GTG00N7T9SF	408847		
		Dual GF Protection (Res./Sum or CT)				
		Zone Selective Interlock on ST, I & GF				
		ST & GF Measurement Unit ⁽¹⁾				
		Data acquisition & Relay functionality				
		RELT Instantaneous				
		Profibus Communication				
		GT-Rating Plug	Required for all types	GTPUNI	408860	

(1) An auxiliary Power Conditioner is obligatory when a fully functioning measurement is required see page A.22
 (2) The use of an interposing current transformer is required (supplied, mounted in device)

Trip Units - Factory mounted

Order codes

A

B


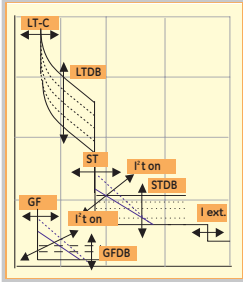
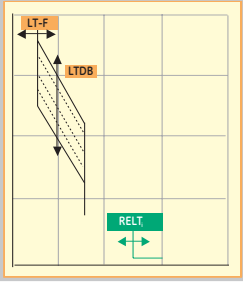
C

D

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X

GT-H	Basic functionality	Designation	Extended functionality	Cat. No.	Ref. No.
		GT-H Trip Unit with:	LT Band shape Choice (LTC or LTF)	GTG00N6-5SF	408826
		LT-C 0,2- 1 x In =Ir -OR- LT-F 0,2- 1 x In =Ir	Dual GF Protection (Res./Sum or CT) Measurement Unit ⁽¹⁾		
		LTDB	Data acquisition & Relay functionality		
		ST I ⁽²⁾ ON or OFF	RELT Instantaneous		
		STDB	With standard Instantaneous	GTG00N8-5SF	408828
		GFA ⁽²⁾ sum. I ⁽²⁾ ON or OFF	<i>Idem with Extended Instantaneous</i>		
		-AND/OR-	LT Band shape Choice (LTC or LTF)	GTG00N6-8SF	408834
		GFA ⁽²⁾ CT I ⁽²⁾ ON or OFF ⁽³⁾	Dual GF Protection (Res./Sum or CT)		
		GFDB	Measurement Unit ⁽¹⁾		
		I or I ext.	Data acquisition & Relay functionality		
		RELT	RELT Instantaneous		
			Modbus Communication		
			With standard Instantaneous	GTG00N8-8SF	408836
			<i>Idem with Extended Instantaneous</i>		
			LT Band shape Choice (LTC or LTF)	GTG00N6-9SF	408842
			Dual GF Protection (Res./Sum or CT)		
			Measurement Unit ⁽¹⁾		
			Data acquisition & Relay functionality		
			RELT Instantaneous		
			Profibus Communication		
			With standard Instantaneous	GTG00N8-9SF	408844
			<i>Idem with Extended Instantaneous</i>		
			LT Band shape Choice (LTC or LTF)	GTG00N6T5SF	408830
			Dual GF Protection (Res./Sum or CT)		
			Zone Selective Interlock on ST, I & GF		
			Measurement Unit ⁽¹⁾		
			Data acquisition & Relay functionality		
			RELT Instantaneous		
			With standard Instantaneous	GTG00N8T5SF	408832
			<i>Idem with Extended Instantaneous</i>		
			LT Band shape Choice (LTC or LTF)	GTG00N6T8SF	408838
			Dual GF Protection (Res./Sum or CT)		
			Zone Selective Interlock on ST, I & GF		
			Measurement Unit ⁽¹⁾		
			Data acquisition & Relay functionality		
			RELT Instantaneous		
			Modbus Communication		
			With standard Instantaneous	GTG00N8T8SF	408840
			<i>Idem with Extended Instantaneous</i>		
			LT Band shape Choice (LTC or LTF)	GTG00N6T9SF	408846
			Dual GF Protection (Res./Sum or CT)		
			Zone Selective Interlock on ST, I & GF		
			Measurement Unit ⁽¹⁾		
			Data acquisition & Relay functionality		
			RELT Instantaneous		
			Profibus Communication		
			With standard Instantaneous	GTG00N8T9SF	408848
			<i>Idem with Extended Instantaneous</i>		
		GT-Rating Plug	Required for all types	GTPUNI	408860

(1) An auxiliary Power Conditioner is obligatory when a fully functioning measurement is required see page A.22


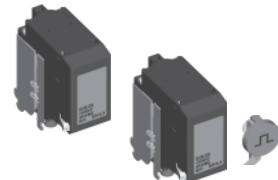
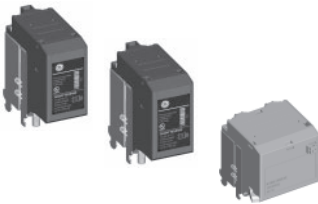


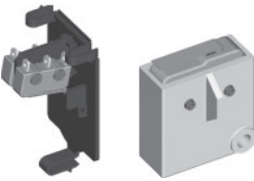

(2) Does NOT trip the associated EntelliGuard™ Breaker, BUT produces an Alarm signal

(3) The use of an interposing current transformer is required (supplied, mounted in device)



Internal Accessories - Factory mounted

For field mounted variants see page A.20 & A.21

Motor Operators and Closing Coils ⁽⁴⁾		Motor Operator Type 1		Motor Operator Type 2 & 3		Cat. No.		Ref. No.	
		Cat. No.	Ref. No.	Cat. No.	Ref. No.				
	24-30V DC	GM01024D	407700	GM02024D	407725				
	48V DC	GM01048D	407702	GM02048D	407727				
	60V DC	GM01060D	407704	GM02060D	407729				
	110-130V DC	GM01110D	407706	GM02110D	407731				
	220-250V DC	GM01250D	407708	GM02250D	407733				
	48V AC	GM01048A	407710	GM02048A	407735				
	110-130V AC	GM01120A	407712	GM02120A	407737				
	220-240V AC	GM01240A	407714	GM02240A	407739				
	380-400V AC	GM01400A	407716	GM02400A	407741				
	440V AC	GM01440A	407718	GM02440A	407743				
		Closing Coil				Comm. Closing Coil ⁽¹⁾			
	2V DC	GCCN024D	407861			GCCC024D	407836		
	48V AC-DC	GCCN048	407863			GCCC048	407838		
	60V DC	GCCN060D	407865			GCCC060D	407840		
	110-130V AC-DC	GCCN120	407867			GCCC120	407842		
	220-240V AC-DC	GCCN240	407869			GCCC240	407844		
	277V AC; 250V DC	GCCN277	407870			GCCC277	407849		
	380-415V AC	GCCN400A	407877			GCCC400A	407852		
	440V AC	GCCN440A	407878			GCCC440A	407853		
		Undervoltage				Shunt		Network Interlock	
	24V DC	GUVT024D	407795	GSTR024D	407770				
	48V AC-DC	GUVT048	407797	GSTR048	407772				
	60V DC	GUVT060D	407799	GSTR060D	407774				
	110-130V AC-DC	GUVT120	407801	GSTR120	407776	GNTK120	407753		
	220-240V AC-DC	GUVT240	407803	GSTR240	407778	GNTK240	407754		
	277V AC; 250V DC	GUVT277	407805	GSTR277	407780				
	380-415V AC	GUVT400A	407807	GSTR400A	407782				
440V AC	GUVT440A	407809	GSTR440A	407784					
Auxiliary Contacts		Power Rated 3NO & 3NC Delivered as standard option in all EntelliGuard™ breakers & Isolators ⁽³⁾							
	Power Rated 8NO & 8NC	GAS6	407887						
	Power Rated 3NO & 3NC + signal rated 2NO & 2NC	GAS5	407886						
	Power Rated 4NO & 4NC + signal rated 4NO & 4NC	GAS8	407888						
Bell Alarm Contacts		1 Changeover							
		GBAT1	407891						
Indication Contacts		Power rated wired through sec. Discon.		Signal rated wired through sec. Discon.		Signal rated wired Trip Unit (comm.)			
	CC/CCC/UVT/STR Release indicator 1NO	GCSP1	407895			GCSP2	407896		
	Breaker Ready to Close indic. ⁽²⁾ 1NO	GRTC1	407897	GRTC2	407899	GRTC3	407894		
Position Indication Contacts Cassette		Power rated on Cassette							
	1 Changeover per position	GCPS1	407922						
	2 Changeovers per position	GCPS2	407923						

(1) Designed to be accessed through the Trip Unit communication option (Modbus or Profibus).
Up to a voltage rating of 277V a extra coil operating/ON push button is mounted on the Breaker front facia.
(2) Not available as field mountable accessory
(3) Device code GAS3 407885.
(4) Motor Spring charged indication contact supplied with Motor Operator



Internal Accessories - Factory mounted

For field mounted variants see page A.20 & A.21

Order codes

Intro

A

B

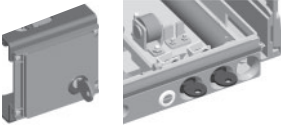

C

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Locking Mechanisms ⁽¹⁾		Ronis		Castell		Profalux		
		Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.	
	Mounted on Breaker The Ronis and Profalux devices allow 1 to 4 Locks to be placed.	GBRON	407971	GBCAS	407970	GBPRO	407978	
	The Castell device 1 Mounted on Cassette. (2 devices for 2 locks are possible)	GCRON	407976			GCPRO	407980	
Operation								
	Front Fascia of Breaker							
	Counter, number of Operations	GMCN	408035					
Pre-assembled interlocks for cables ⁽²⁾		Interlock Scheme			Fixed Pattern		Draw-out	
Type	Brk. 1	Brk. 2	Brk. 3	Cat. No.	Ref. No.	Cat. No.	Ref. No.	
A	OFF	OFF		For Each Breaker		For Each Breaker		
	ON	OFF		GI2FAD	407900	GI2WAD	407901	
B	OFF	OFF	OFF	For Each Breaker		For Each Breaker		
	ON	OFF	OFF	GI3FB	407902	GI3WB	407903	
C	OFF	OFF	OFF	For Each Breaker		For Each Breaker		
	ON	OFF	OFF	GI3FC	407904	GI3WC	407905	
D	OFF	OFF	OFF	For Brk.1 & 3		For Brk.1 & 3		
	ON	OFF	OFF	GI2FAD	407900	GI2WAD	407901	
	OFF	OFF	ON	For Brk. 2		For Brk. 2		
	ON	OFF	ON	GI3FDT	407906	GI3WDT	407907	

(1) For the separately available locks see page A.21, Kirk Lock version available on request

(2) The kits must be ordered complete with a breaker. To allow for installation and transport each kit is supplied as a field mountable unit customized for use with the ordered draw-out breaker cassette or a fixed pattern breaker. For the associated cables see page A.22

Internal Accessories - Factory mounted

Maximum amount of installable internal accessories

See page A.21.



Notes

Grid area for notes.



Internal Accessories - Field mountable

For factory mounted variants see page A.17 & A.18

Order codes

Intro

A

B


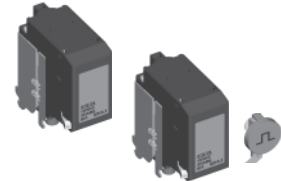





C

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X

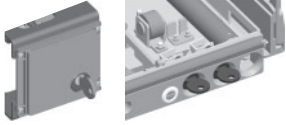
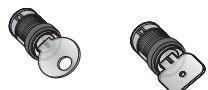

Motor Operators and Closing Coils		Motor Operator envelope 1		Motor Operator envelope 2 & 3		Cat. No.	Ref. No.
		Cat. No.	Ref. No.	Cat. No.	Ref. No.		
	24-30V DC	GM01024DR	407701	GM02024DR	407726		
	48V DC	GM01048DR	407703	GM02048DR	407728		
	60V DC	GM01060DR	407705	GM02060DR	407730		
	110-130V DC	GM01110DR	407707	GM02110DR	407732		
	220-250V DC	GM01250DR	407709	GM02250DR	407734		
	48V AC	GM01048AR	407711	GM02048AR	407736		
	110-130V AC	GM01120AR	407713	GM02120AR	407738		
	220-240V AC	GM01240AR	407715	GM02240AR	407740		
	380-400V AC	GM01400AR	407717	GM02400AR	407742		
	440V AC	GM01440AR	407719	GM02440AR	407744		
		Closing Coil		Comm. Closing Coil ⁽¹⁾			
	2V DC	GCCN024DR	407860	GCCC024DR	407835		
	48V AC-DC	GCCN048R	407862	GCCC048R	407837		
	60V DC	GCCN060DR	407864	GCCC060DR	407839		
	110-130V AC-DC	GCCN120R	407866	GCCC120R	407841		
	220-240V AC-DC	GCCN240R	407868	GCCC240R	407843		
	277V AC; 250V DC	GCCN277R	407871	GCCC277R	407850		
	380-415V AC	GCCN400AR	407876	GCCC400AR	407851		
	440V AC	GCCN440AR	407879	GCCC440AR	407854		
			Undervoltage		Shunt		
	2V DC	GUVT024DR	407796	GSTR024DR	407771		
	48V AC-DC	GUVT048R	407798	GSTR048R	407773		
	60V DC	GUVT060DR	407800	GSTR060DR	407775		
	110-130V AC-DC	GUVT120R	407802	GSTR120R	407777		
	220-240V AC-DC	GUVT240R	407804	GSTR240R	407779		
	277V AC; 250V DC	GUVT277R	407806	GSTR277R	407781		
	380-415V AC	GUVT400AR	407808	GSTR400AR	407783		
440V AC	GUVT440AR	407810	GSTR440AR	407785			
Auxiliary Contacts							
	Power Rated 3NO & 3NC (Delivered as standard option in all EntelliGuard™ breakers & Isolators)	GAS3R	407880				
	Power Rated 8NO & 8NC	GAS6R	407882				
	Power Rated 3NO & 3NC + Signal Rated 2NO & 2NC	GAS5R	407881				
	Power Rated 4NO & 4NC + Signal Rated 4NO & 4NC	GAS8R	407883				
Bell Alarm Contacts							
	1 Changeover	GBAT1R	407889				
Indication Contacts							
		Power rated wired through sec. Discon.		Signal rated wired Trip Unit (comm.)			
CC/CCC/UVT/STR Release indicator	GCSP1R	407915	GCSP2R	407916			
Position Indication Contacts Cassette							
		Power rated on Cassette					
	1 Changeover per position 2 Changeovers per position	GCPS1R GCPS2R	407924 407925				

(1) Designed to be accessed through the Trip Unit communication option (Modbus or Profibus).
Up to a voltage rating of 277V an extra coil operating/ON push button is included in the kit for mounting on the Breaker front facia.



Internal Accessories - Field mountable

For factory mounted variants see page A.17 & A.18

Locking Mechanisms ⁽¹⁾		Ronis		Castell		Profalux	
		Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
	Mounted on Breaker The Ronis and Profalux devices allow 1 to 4 Locks to be placed.	GBRONR	407968	GBCASR	407967	GBPROR	407979
	The Castell device 1 Mounted on Cassette (2 devices for 2 locks are possible)	GCRONR	407974			GCPROR	407981
Associated Locks ⁽²⁾		Ronis 1104 B Lock ⁽²⁾	GRON	407985			
		Profalux B204Y Lock ⁽²⁾ Castell FS1 lock/K4 key ⁽²⁾			GCAS	407986	GPRO
							
Operation							
	Front Fascia of Breaker Counter; number of Operations	GMCNR	408033				

(1) Kirk Lock version available on request
(2) Not available as Factory Mounted accessory

Internal Accessories - Field mountable

Maximum amount of installable internal accessories

Motor Operator Type 1 or 2	Closing Coil or Command Closing Coil	Undervoltage Release ⁽³⁾	Shunt Release	Network Interlock Release	Auxiliary Contacts Power NO + NC	Auxiliary Contacts HI-Fidelity NO+NC	Bell Alarm contacts	Signaling Contacts Releases indic. Power	Signaling Contacts Releases indic. HI.Fid.	Breaker ready to close indication	Breaker Spring Charged indication	Position Indication Contacts (per Pos.)	Earthing Device	Locking Mechanism Breaker	Locking Mechanism Cassette
1	1	2	1	0	8	0	1	0	0	1	0	2	1	1	1
1	1	1	2	0	8	0	1	0	0	1	0	2	1	1	1
1	1	1	0	1	8	0	1	0	0	1	0	2	1	1	1
1	1	2	1	0	8	0	1	0	0	0	1	2	1	1	1
1	1	1	2	0	8	0	1	0	0	0	1	2	1	1	1
1	1	1	0	1	8	0	1	0	0	0	1	2	1	1	1
1	1	2	1	0	4	4	1	0	0	1	0	2	1	1	1
1	1	1	2	0	4	4	1	0	0	1	0	2	1	1	1
1	1	1	0	1	4	4	1	0	0	1	0	2	1	1	1
1	1	2	1	0	4	4	1	0	0	0	1	2	1	1	1
1	1	1	2	0	4	4	1	0	0	0	1	2	1	1	1
1	1	1	0	1	4	4	1	0	0	0	1	2	1	1	1
1	1	2	1	0	4	4	1	0	0	0	1	2	1	1	1
1	1	1	2	0	4	4	1	0	0	0	1	2	1	1	1
1	1	1	0	1	4	4	1	0	0	0	1	2	1	1	1
1	1	2	1	0	6	0	1	1	1	1	0	2	1	1	1
1	1	1	2	0	6	0	1	1	1	1	0	2	1	1	1
1	1	1	0	1	6	0	1	1	1	1	0	2	1	1	1
1	1	0	1	1	6	0	1	1	1	1	0	2	1	1	1
1	1	2	1	0	4	0	2	2	0	0	1	2	1	1	1
1	1	1	2	0	4	0	2	2	0	0	1	2	1	1	1
1	1	1	0	1	4	0	2	2	0	0	1	2	1	1	1
1	1	0	1	1	4	0	2	2	0	0	1	2	1	1	1
1	1	2	1	0	3	3	1	1	0	1	0	2	1	1	1
1	1	1	2	0	3	3	1	1	0	1	0	2	1	1	1
1	1	1	0	1	3	3	1	1	0	1	0	2	1	1	1
1	1	0	1	1	3	3	1	1	0	1	0	2	1	1	1
1	1	2	1	0	2	2	2	2	0	0	1	2	1	1	1
1	1	1	2	0	2	2	2	2	0	0	1	2	1	1	1
1	1	1	0	1	2	2	2	2	0	0	1	2	1	1	1
1	1	0	1	1	2	2	2	2	0	0	1	2	1	1	1

(3) TDM module (Time delay module) is mounted externally to the breaker



Internal Accessories - Field mountable

Not available in a factory mounted variant

Order codes

Intro

A

B


C

D

E

F

X

Field mountable cables for interlocking of breakers ⁽¹⁾		Interlock Scheme		Cat. No.	Ref. No.	
Interlock Type	No. of Cables Needed					
	A	1 cable per breaker, choose length as indicated				
	B	1 cable per breaker, choose length as indicated	Cable length 1 metre	GCB1	407990	
	C	1 cable per breaker, choose length as indicated	Cable length 1,6 metre	GCB2	407991	
			Cable length 2 metre	GCB3	407992	
	D	Brk's 1 and 3: 1 cable per breaker, choose length as indicated	Cable length 2,5 metre	GCB4	407993	
			Cable length 3 metre	GCB5	407994	
			Cable length 3,5 metre	GCB6	407995	
Cable length 4 metre			GCB7	407996		
Brk. 2: 2 cables per breaker, choose length as indicated						
Time delay module for UVR release TDM		Cat. No.	Ref. No.	Cat. No.	Ref. No.	
	60V DC	GTDM060D	407817			
	110-130V DC	GTDM120D	407819			
	220-240V DC	GTDM240D	407821			
	250V DC	GTDM250D	407823			
	48V AC	GTDM048A	407816			
	110-130V AC	GTDM120A	407818			
	220-240V AC	GTDM240A	407820			
	250-277V AC	GTDM277A	407822			
	380-415V AC	GTDM400A	407824			
	440V AC	GTDM440A	407825			
Breaker Earthing Device for Service		3 pole		4 pole		
	EntelliGuard™ type 1					
	Maximum 1600A	G16H4ED	407930	G16H6ED	407931	
	Maximum 2000A	G20H4ED	407932	G20H6ED	407933	
	EntelliGuard™ type 2					
	Maximum 4000A	G40M4ED	407934	G40M6ED	407935	
	EntelliGuard™ type 3					
Maximum 6400A	G64M4ED	407936	G64M6ED	407937		
GT- Accessories		Designation				
	Conditioning Power Supply 1 phase 220-230V ⁽²⁾	GMPU1	408790			
	Conditioning Power Supply 1 phase 380-400V ⁽²⁾	GMPU2	408791			
	Conditioning Power Supply 1 phase 240-250/277-290/415V ⁽²⁾	GMPU3	408792			
	Conditioning Power Supply 1 phase 660-690V ⁽²⁾	GMPU4	408793			
	Power Supply - Input 100-240V AC or 100-353V DC - Output 24V DC 0.6 Amps ⁽³⁾	GAPU	408789			
	Trip unit, sealable transparent front cover	GTUS	408046			
	Trip Unit Battery Tester and Set up unit	GTUTK20	407999			
	Wall mounting Brackets	Wall Mounting Brackets for Env. 1 & 2	GFMTG	408085		

(1) See for associated breaker and or cassette mounted kits page A.18

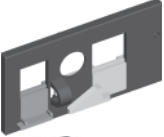


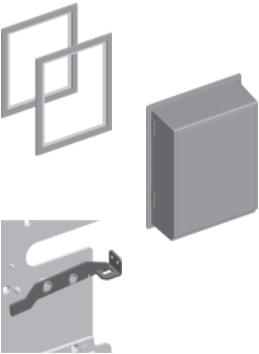


(2) Obligatory when a fully functioning measurement unit is required

(3) For GF settings below 0,2 x In this aux. supply is needed



Installation Accessories

Not available in a factory mounted variant

Operation		Cat. No.	Ref. No.
  	Front Fascia of Breaker Padlocking device for Pushbuttons	GPBD	408040
	Operation Indicators Contact Wear Indicator env. 1-3	GCNTW	408036
	Cassette Mis insertion device	GREPM	408041
	Door Flange fixed all types ⁽¹⁾	GDPRF	408025
	Door Flange draw-out all types ⁽¹⁾	GDPRW	408026
	Door Escutcheon IP54	G54DR	408038
	Door Interlock on LEFT	GLHD	408039
	Door Interlock on RIGHT	GRHD	408042
	Lifting beam suited for use with envelope 1 & 2	GLB1	408045
	Lifting beam suited for use with envelope 3	GLB3	408049
	Set of 9 phase seperators for 1000V applications ⁽³⁾	GJP	408057


(1) Is a spare, these devices are always supplied with the standard devices

(2) Designed for use with commercially available lifting equipment.

(3) Universal set including 3 pcs for envelope 1 & 2 fixed, 3 pcs. for envelope 1 & 2 draw-out and 3 pcs for envelope 3.

Sensors for Trip Units

For use with Ground fault Residual (sum) protection
Rogowski coils:




	Envelope 1		Envelope 2		Envelope 3	
	Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
400A	G04HNRC	408000	G04HNRC	408000		
630A	G07HNRC	408001	G07HNRC	408001		
800A	G08HNRC	408002	G08HNRC	408002		
1000A	G10HNRC	408003	G10HNRC	408003		
1250A	G13HNRC	408004	G13HNRC	408004		
1600A	G16HNRC	408005	G16HNRC	408005		
2000A	G20HNRC	408006	G20HNRC	408006		
2500A			G25MNRC	408162		
3200A			G32LNRC	408186	G32LNRC	408186
4000A			G40LNRC	408187	G40LNRC	408187
5000A					G50LNRC	408188
6400A					G64LNRC	408189

Sensors for Trip Units

For use with Ground fault protection, Source Ground Return method
Earth leg Current Transformers

- Kit includes 1 Current Transformer. An interposing current transformer is also required (supplied with Trip Unit)



	Envelope 1		Envelope 2		Envelope 3	
	Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
400A	G04HNCT	408300	G04HNCT	408300		
630A	G07HNCT	408301	G07HNCT	408301		
800A	G08HNCT	408302	G08HNCT	408302		
1000A	G10HNCT	408303	G10HNCT	408303		
1250A	G13HNCT	408304	G13HNCT	408304		
1600A	G16HNCT	408305	G16HNCT	408305		
2000A	G20HNCT	408006	G20HNCT	408006		
2500A			G25MNCT	408322		
3200A			G32LNCT	408331	G32LNCT	408331
4000A			G40LNCT	408332	G40LNCT	408332
5000A					G50LNCT	408333
6400A					G64LNCT	408334

Order codes

A

B

C

D

E

F

X



Cassettes for use with Breakers & Isolators in Draw-out pattern; Field mountable

- References apply for Cassettes separately supplied for use with Breakers or Isolator
- With Connection modes as indicated in left column
- Each cassette is supplied with safety shutters

Cassettes for Draw-out Pattern; fixed portion only

Universal Rear Connections		3 pole		4 pole ⁽¹⁾	
Rating (A)	Suited for use with EntelliGuard™ -G types	Cat. No.	Ref. No.	Cat. No.	Ref. No.
<i>Cassette for envelope 1</i>					
400 - 1600A	GG, GJ & GW type S	GG16S2UR	407617	GG16S5UR	407619
400 - 1600A	GG, GJ & GW type N & H	GG16H2UR	407612	GG16H5UR	407615
2000A	GG, GJ & GW type S, N & H	GG20H2UR	407622	GG20H5UR	407625
<i>Cassette for envelope 2⁽²⁾</i>					
400 - 2000A	GG, GJ & GW type N, E & M	GG20M2UR	407632	GG20M5UR	407635
2500A	GG, GJ & GW type N, H & M	GG25M2UR	407642	GG25M5UR	407645
3200A	GG, GJ & GW type N, H & M	GG32M2UR	407652	GG32M5UR	407656
4000A	GG, GJ & GW type N, H & M	GG40M2UR	407666	GG40M5UR	407670
<i>Remark: Each cassette is supplied with connection pads that can be rotated and used for Vertical or Horizontal connections.</i>					
<i>Cassette for envelope 3⁽³⁾</i>					
3200 - 6400A ⁽³⁾	GG & GJ type G, M & L	GG64L2UR	407686	GG64L5UR	407688
<i>Vertical rear Connections</i>					
<i>Cassette with dual vertical clusters and connection pads for limited de-rating envelope 2</i>					
3200A	GH, GK, GJ & GZ type N.H & M	GH32M2VR	408254	GH32M5VR	408255
4000A	GH, GK, GJ & GZ type N.H & M	GH40M2VR	408267	GH40M5VR	408268
<i>Front access Connections</i>					
<i>Cassette for envelope 1</i>					
400 - 1600A	GG, GJ & GW type S	GG16S2FR	407627	GG16S5FR	407629
400 - 1600A	GG, GJ & GW type N & H	GG16H2FR	407610	GG16H5FR	407613
2000A	GG, GJ & GW type S, N & H	GG20H2FR	407620	GG20H5FR	407623
<i>Cassette for envelope 2</i>					
400 - 2000A	GG, GJ & GW type E, N, H & M	GG20M2FR	407630	GG20M5FR	407633
2500A	GG, GJ & GW type N, H & M	GG25M2FR	407640	GG25M5FR	407643
3200A	GG, GJ & GW type N, H & M	GG32M2FR	407650	GG32M5FR	407654
4000A	GG, GJ & GW type N, H & M	GG40M2FR	407658	GG40M5FR	407668

(1) 4th pole on Left.
 (2) Cassettes for envelope 2 are limited to a current of 3200A when connected in horizontal mode
 Connected in vertical mode a 4000A rating is achieved
 (3) The Cassette for envelope 3 is limited to a current of 5000A when connected in horizontal mode
 Connected in vertical mode it has a rating of 6400A. This cassette type is NOT depicted here

Field Mounted (spare) Trip Units

Always specify Nominal current and Breaker serial Number on Ordering

Order codes

A

B


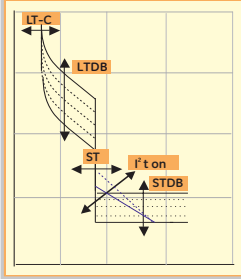

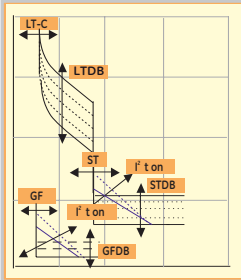

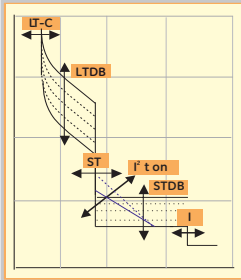

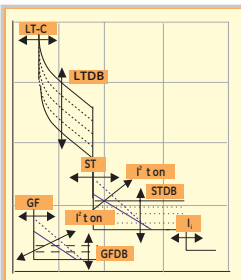

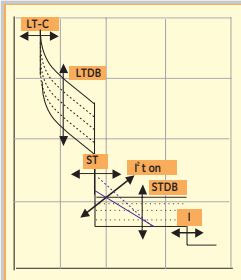
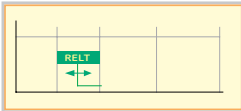
C

D

E

F

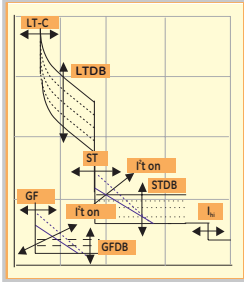

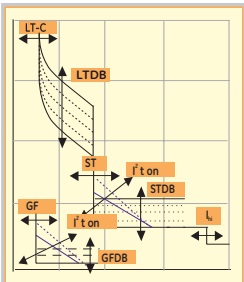
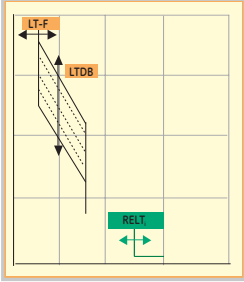
X

	Basic functionality	Designation	Extended functionality	Cat. No.	Ref. No.
		GT-E Trip Unit with: LT-C 0,2 -1 x In = Ir LTDB ST I ² t ON or OFF STDB	None	GTG00K1-SR	408798
		GT-Rating Plug	Required for all types	GTPUNI	408860
		GT-E Trip Unit with: LT-C 0,2 -1 x In = Ir LTDB ST I ² t ON or OFF STDB GF I ² t ON or OFF GFDB	None	GTG00K2-SR	408802
		GT-Rating Plug	Required for all T types	GTPUNI	408860
		GT-S Trip Unit with: LT-C 0,2 -1 x In = Ir LTDB ST I ² t ON or OFF STDB I	None	GTG00K9-SR	408811
		GT-Rating Plug	Required for all types	GTPUNI	408860
		GT-S Trip Unit LT-C 0,2 -1 x In = Ir LTDB ST I ² t ON or OFF STDB GF I ² t ON or OFF GFDB I	Modbus Communication	GTG00K4-2SR	408809
		GT-Rating Plug	Required for all types	GTPUNI	408860
		GT-N Trip Unit with: LT-C 0,2 -1 x In = Ir LTDB ST I ² t ON or OFF STDB I RELT	Measurement unit ⁽¹⁾ RELT Instantaneous	GTG00K9-4SR	408821
		GT-Rating Plug	Required for all types	GTPUNI	408860
	Extended functionality 				



Field Mounted (spare) Trip Units

Always specify Nominal current and Breaker serial Number on Ordering

GT- N (continued)		Designation	Extended functionality	Cat. No.	Ref. No.	
	Basic functionality	GT-N Trip Unit	Measurement unit ⁽¹⁾ Modbus Communication Zone Selective Interlock on ST, I & GF	GTG00K4T6SR	408819	
		LT-C 0,2 -1 x In = Ir LTDB ST I ² T ON or OFF STDB GF I ² T ON or OFF GFDB I ext.				
		GT-Rating Plug	Required for all types	GTPUNI	408860	
		GT-H Trip Unit with:	LT Band shape Choice (LTC or LTF)	GTG00N5T8SR	408849	
		LT-C 0,2 -1 x In = Ir -OR- LT-F 0,2 -1 x In = Ir LTDB ST I ² T ON or OFF STDB GF or GFA ⁽²⁾ sum. I ² T ON or OFF -AND/OR- GFA ⁽²⁾ CT I ² N ON or OFF ⁽³⁾ GFDB I or I ext.	Dual GF Protection (Res./Sum or CT) Zone Selective Interlock on ST, I & GF Measurement Unit ⁽¹⁾ Data acquisition & Relay functionality RELT Instantaneous Modbus Communication With standard Instantaneous Idem with Extended Instantaneous			
		Extended functionality		Profibus Communication With standard Instantaneous Idem with Extended Instantaneous	GTG00N7T8SR	408851
				LT Band shape Choice (LTC or LTF) Dual GF Protection (Res./Sum or CT) Zone Selective Interlock on ST, I & GFA Measurement Unit ⁽¹⁾ Data acquisition & Relay functionality RELT Instantaneous Modbus Communication With standard Instantaneous Idem with Extended Instantaneous	GTG00N5T9SR	408853
				LT Band shape Choice (LTC or LTF) Dual GF Alarm (Res./Sum or CT) Zone Selective Interlock on ST, I & GFA Measurement Unit ⁽¹⁾ Data acquisition & Relay functionality RELT Instantaneous Modbus Communication With standard Instantaneous Idem with Extended Instantaneous	GTG00N6T8SR	408850
				LT Band shape Choice (LTC or LTF) Dual GF Alarm (Res./Sum or CT) Zone Selective Interlock on ST, I & GFA Measurement Unit ⁽¹⁾ Data acquisition & Relay functionality RELT Instantaneous Profibus Communication With standard Instantaneous Idem with Extended Instantaneous	GTG00N8T8SR	408852
				LT Band shape Choice (LTC or LTF) Dual GF Alarm (Res./Sum or CT) Zone Selective Interlock on ST, I & GFA Measurement Unit ⁽¹⁾ Data acquisition & Relay functionality RELT Instantaneous Profibus Communication With standard Instantaneous Idem with Extended Instantaneous	GTG00N6T9SR	408854
				LT Band shape Choice (LTC or LTF) Dual GF Alarm (Res./Sum or CT) Zone Selective Interlock on ST, I & GFA Measurement Unit ⁽¹⁾ Data acquisition & Relay functionality RELT Instantaneous Profibus Communication With standard Instantaneous Idem with Extended Instantaneous	GTG00N8T9SR	408856
			GT-Rating Plug	Required for all types	GTPUNI	408860
			GT Trip Unit with NO protection	(For Non Automatic types)	G3G00KA-SR	408796

(1) An auxiliary Power Conditioner is obligatory when a fully functioning measurement is required see page A.22
 (2) Does NOT trip the associated EntelliGuard™ Breaker, BUT produces an Alarm signal
 (3) The use of an interposing current transformer is required (supplied with Trip Unit)

Notes

Grid area for notes.



Global Catalogue number structure - Breaker

- Codes built in the indicated manner can be used as an alternative ordering method
- The breaker and its operation mode (Manual or Electrical)

Order codes

Intro

A

B

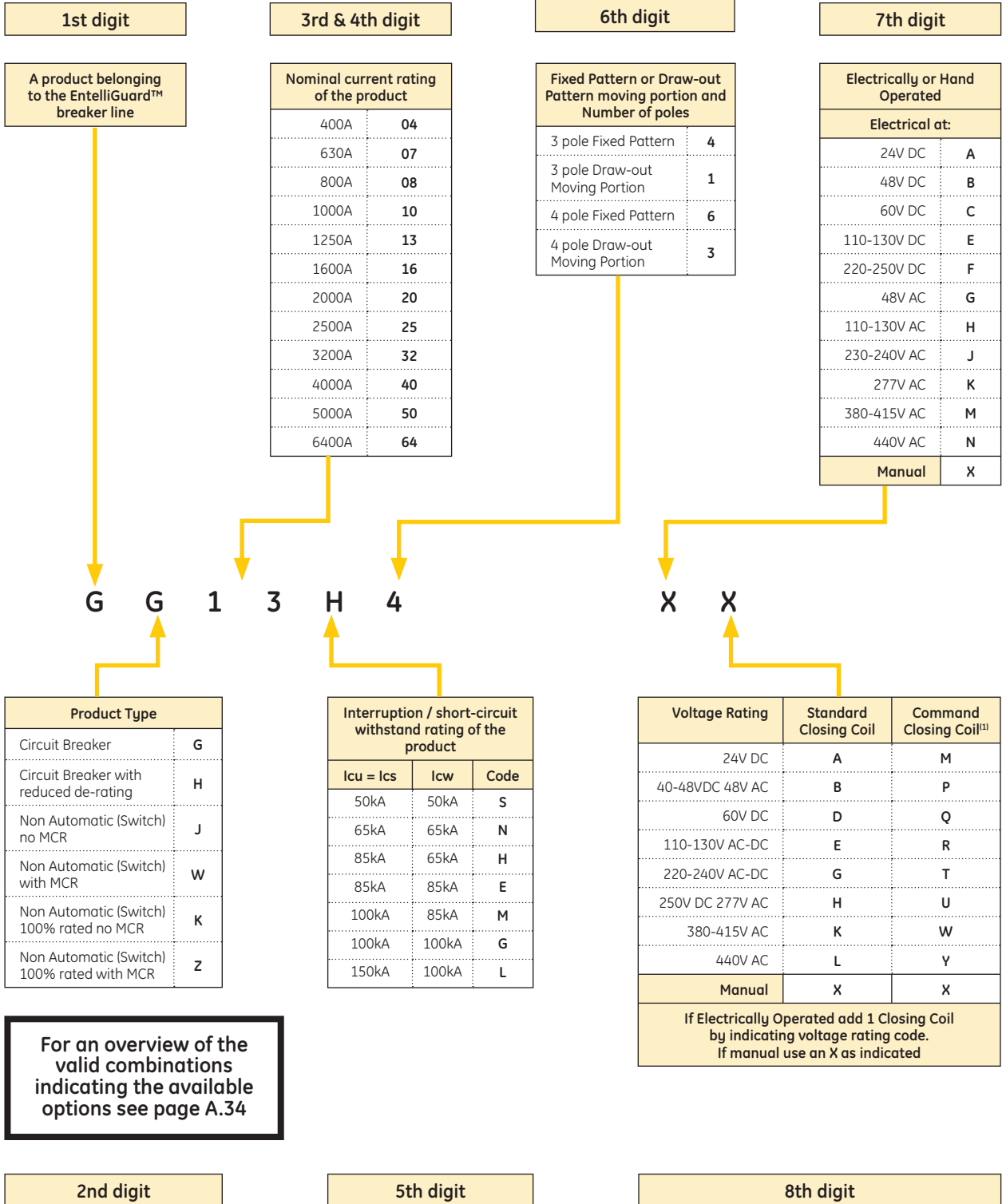
C

D

E

F

X

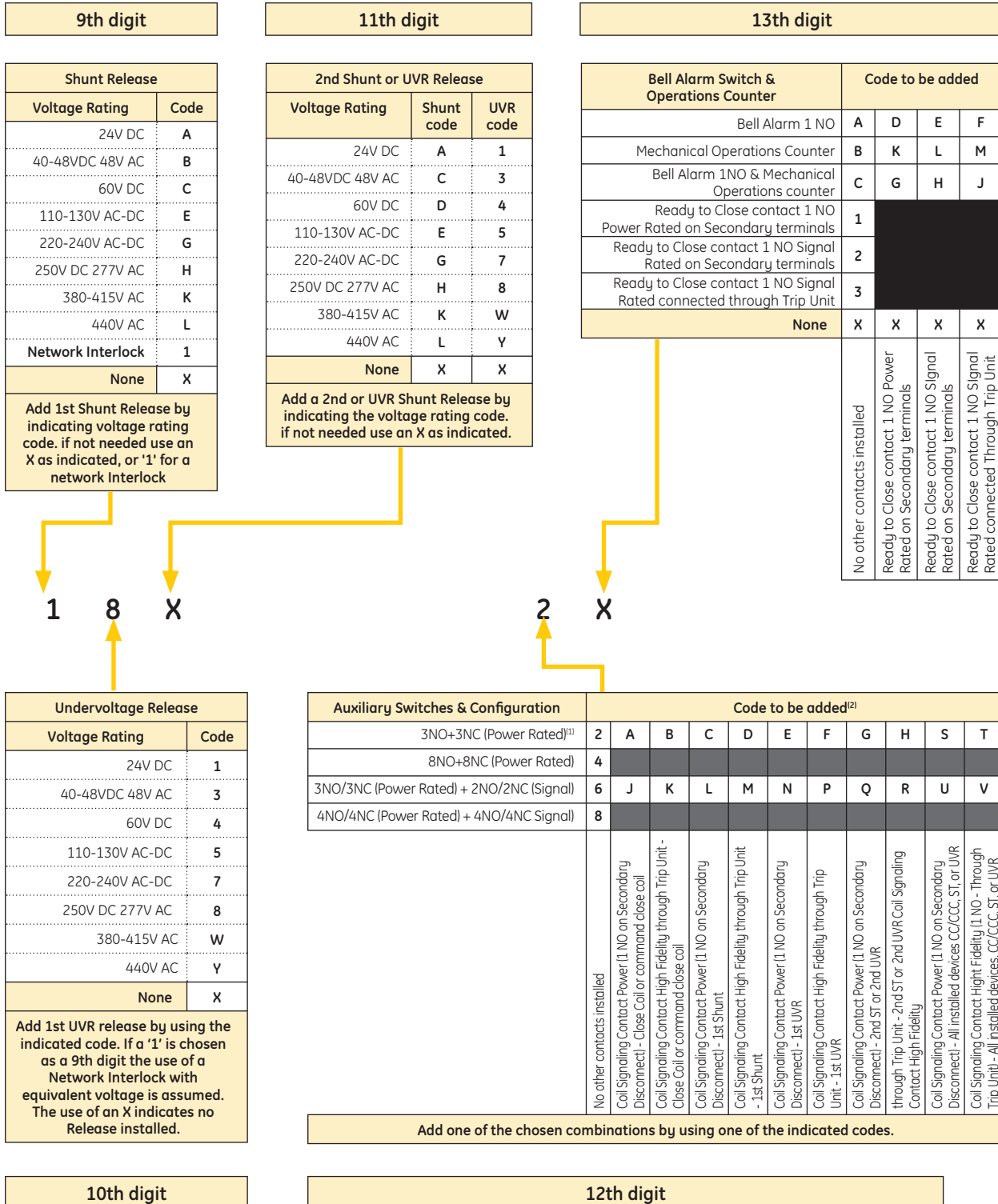


(1) Is supplied with a Push Button for Local Breaker operation (fits on breaker front facia)



Global Catalogue number structure - Breaker

- Codes built in the indicated manner can be used as an alternative ordering method
- Breaker mounted accessories and Trip Unit



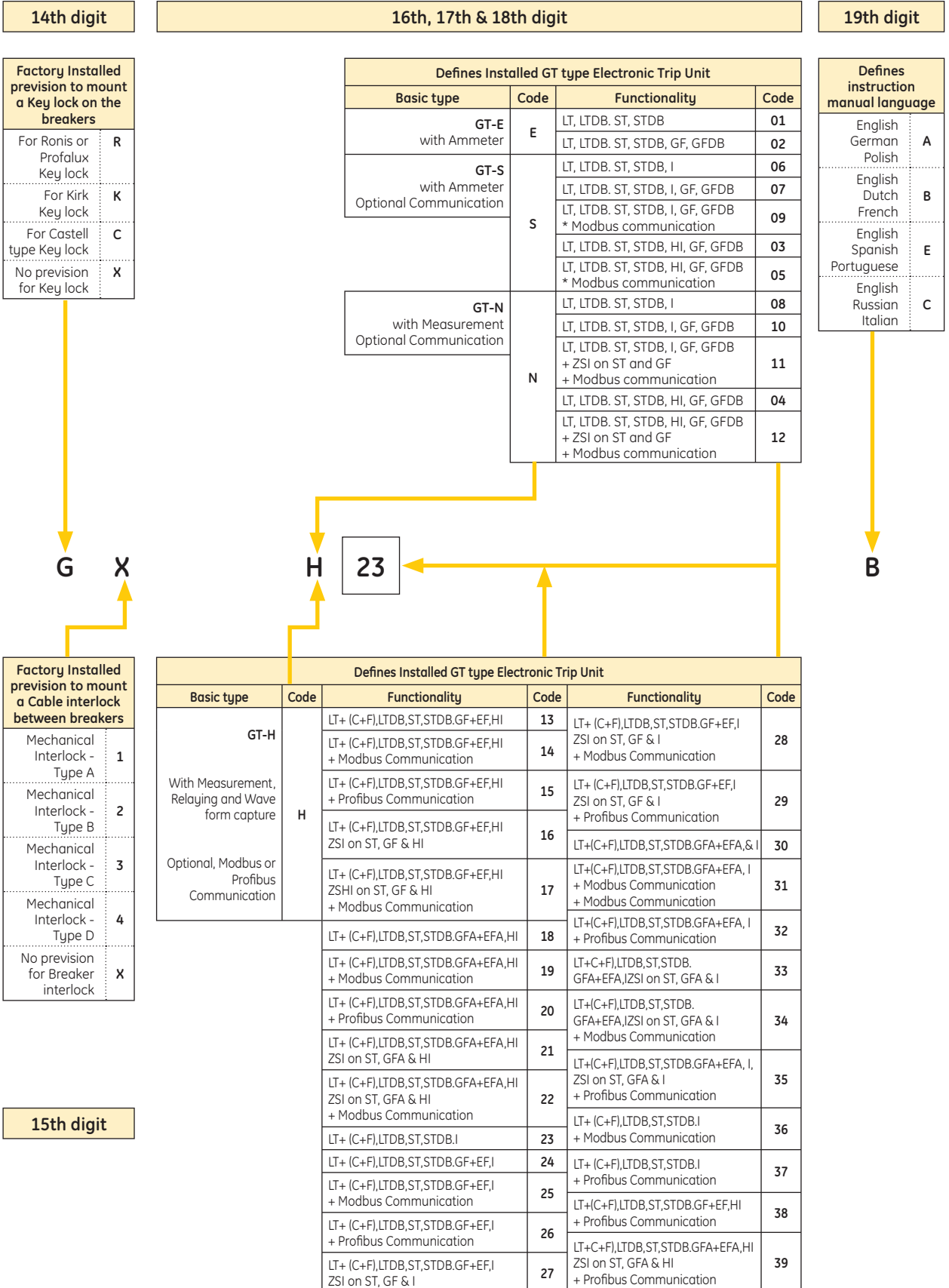
(1) Each standard breaker or Isolator is normally supplied with 3 NO+3NC Aux. contacts (option 2)



Global Catalogue number structure - Breaker

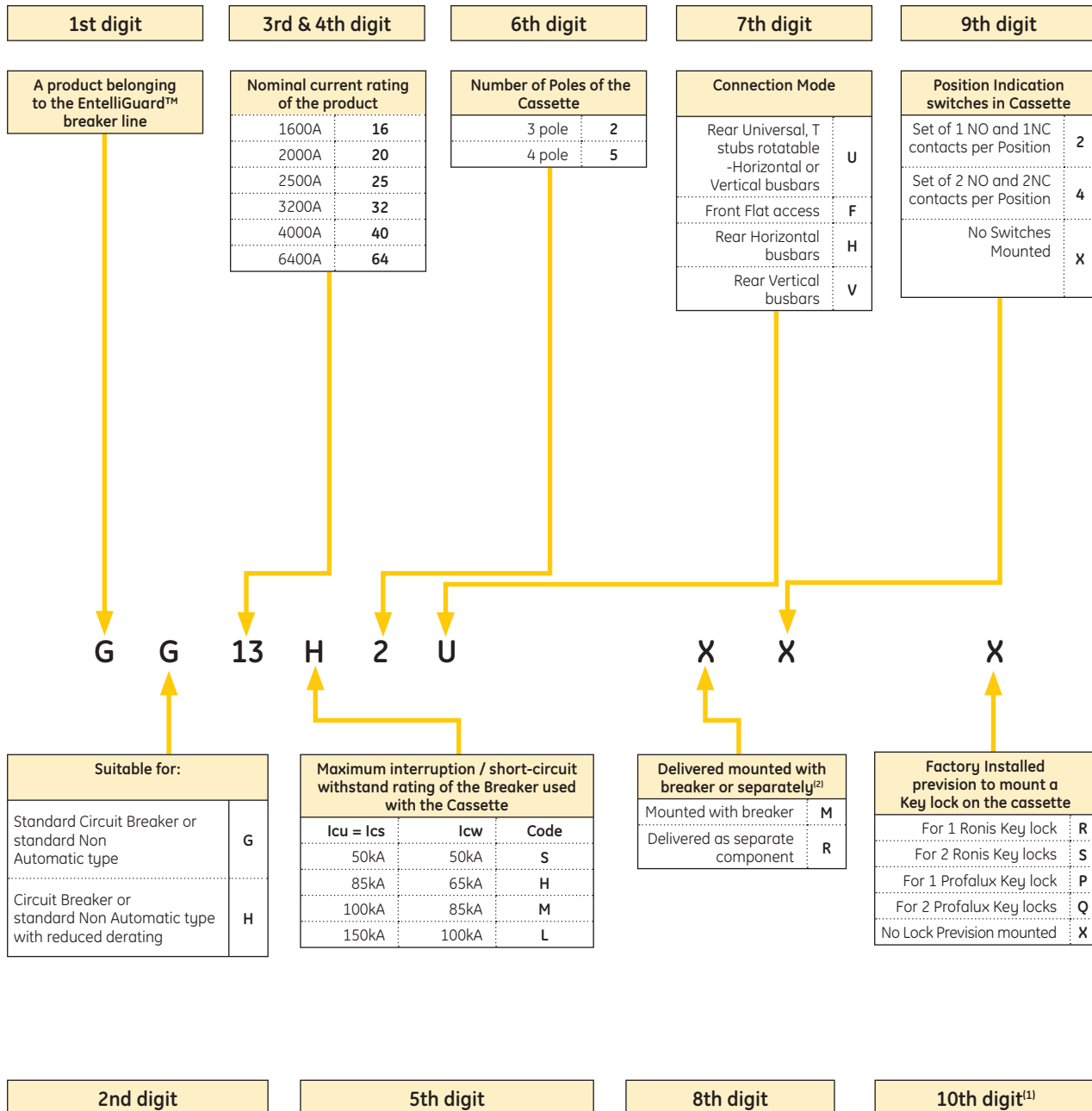
- Codes built in the indicated manner can be used as an alternative ordering method
- Breaker mounted accessories and Trip Unit

Order codes



Global Catalogue number structure - Cassette

- Codes built in the indicated manner can be used as an alternative ordering method
- Cassettes supplied together with the breaker



(1) 11 and 12th digit reserved for future use

(2) The 10th and 11th digit are reserved for future expansion of the ordering code system (An X or - is used as temporary filler)



Valid Catalogue number combinations

Factory mounted: Available standard Breaker & Cassette types

Order codes

Intro

A

B

C

D

E

F

X

3 pole Breakers in Fixed Pattern		
Cat. No	Ref. No.	Page
GG04E4	407003	A.4
GG04H4	407007	A.4
GG04M4	407011	A.4
GG04N4	407015	A.4
GG04S4	407019	A.4
GG07E4	407032	A.4
GG07H4	407036	A.4
GG07M4	407040	A.4
GG07N4	407044	A.4
GG07S4	407048	A.4
GG08E4	407062	A.4
GG08H4	407066	A.4
GG08M4	407070	A.4
GG08N4	407074	A.4
GG08S4	407078	A.4
GG10E4	407092	A.4
GG10H4	407096	A.4
GG10M4	407100	A.4
GG10N4	407104	A.4
GG10S4	407108	A.4
GG13E4	407122	A.4
GG13H4	407126	A.4
GG13M4	407130	A.4
GG13N4	407134	A.4
GG13S4	407138	A.4
GG16E4	407152	A.4
GG16H4	407156	A.4
GG16M4	407160	A.4
GG16N4	407164	A.4
GG16S4	407168	A.4
GG20E4	407192	A.4
GG20H4	407196	A.4
GG20M4	407200	A.4
GG20N4	407204	A.4
GG20S4	407208	A.4
GG25H4	407232	A.4
GG25M4	407236	A.4
GG25N4	407240	A.4
GG32G4	407252	A.4
GG32H4	407244	A.4
GG32L4	407254	A.4
GG32M4	407262	A.4
GG32N4	407266	A.4
GG40G4	407270	A.4
GG40H4	407280	A.4
GG40L4	407284	A.4
GG40M4	407288	A.4
GG40N4	407292	A.4
GG64L4	407322	A.4
GG64M4	407326	A.4
GG50L4	407302	A.4
GG50M4	407306	A.4

4 pole Breakers in Fixed Pattern		
Cat. No	Ref. No.	Page
GG04E6	407004	A.4
GG04H6	407008	A.4
GG04M6	407012	A.4
GG04N6	407016	A.4
GG04S6	407020	A.4
GG07E6	407033	A.4
GG07H6	407037	A.4
GG07M6	407041	A.4
GG07N6	407045	A.4
GG07S6	407049	A.4
GG08E6	407063	A.4
GG08H6	407067	A.4
GG08M6	407071	A.4
GG08N6	407075	A.4
GG08S6	407079	A.4
GG10E6	407093	A.4
GG10H6	407097	A.4
GG10M6	407101	A.4
GG10N6	407105	A.4
GG10S6	407109	A.4
GG13E6	407123	A.4
GG13H6	407127	A.4
GG13M6	407131	A.4
GG13N6	407135	A.4
GG13S6	407139	A.4
GG16E6	407153	A.4
GG16H6	407157	A.4
GG16M6	407161	A.4
GG16N6	407165	A.4
GG16S6	407169	A.4
GG20E6	407193	A.4
GG20H6	407197	A.4
GG20M6	407201	A.4
GG20N6	407205	A.4
GG20S6	407209	A.4
GG25H6	407233	A.4
GG25M6	407237	A.4
GG25N6	407241	A.4
GG32H6	407245	A.4
GG32G6	407253	A.4
GG32L6	407255	A.4
GG32M6	407263	A.4
GG32N6	407267	A.4
GG40G6	407271	A.4
GG40H6	407281	A.4
GG40L6	407285	A.4
GG40M6	407289	A.4
GG40N6	407293	A.4
GG50L6	407303	A.4
GG50M6	407307	A.4
GG64L6	407323	A.4
GG64M6	407327	A.4

3 pole Breakers; Draw-out Portion only		
Cat. No	Ref. No.	Page
GG04E1	407001	A.8
GG04H1	407005	A.8
GG04M1	407009	A.8
GG04N1	407013	A.8
GG04S1	407017	A.8
GG07E1	407030	A.8
GG07H1	407034	A.8
GG07M1	407038	A.8
GG07N1	407042	A.8
GG07S1	407046	A.8
GG08E1	407060	A.8
GG08H1	407064	A.8
GG08M1	407068	A.8
GG08N1	407072	A.8
GG08S1	407076	A.8
GG10E1	407090	A.8
GG10H1	407094	A.8
GG10M1	407098	A.8
GG10N1	407102	A.8
GG10S1	407106	A.8
GG13E1	407120	A.8
GG13H1	407124	A.8
GG13M1	407128	A.8
GG13N1	407132	A.8
GG13S1	407136	A.8
GG16E1	407150	A.8
GG16H1	407154	A.8
GG16M1	407158	A.8
GG16N1	407162	A.8
GG16S1	407166	A.8
GG20E1	407190	A.8
GG20H1	407194	A.8
GG20M1	407198	A.8
GG20N1	407202	A.8
GG20S1	407206	A.8
GG25H1	407230	A.8
GG25M1	407234	A.8
GG25N1	407238	A.8
GG32G1	407250	A.8
GG32H1	407242	A.8
GG32L1	407248	A.8
GG32M1	407260	A.8
GG32N1	407264	A.8
GG40G1	407268	A.8
GG40H1	407278	A.8
GG40L1	407282	A.8
GG40M1	407286	A.8
GG40N1	407290	A.8
GG50L1	407300	A.8
GG50M1	407304	A.8
GG64L1	407320	A.8
GG64M1	407324	A.8
GH32H1	407346	A.9
GH32M1	407348	A.9
GH32N1	407350	A.9
GH40H1	407352	A.9
GH40M1	407354	A.9
GH40N1	407356	A.9

3 pole Breakers; Standard Cassette for Draw-out portion		
Cat. No	Ref. No.	Page
GG16H2FM	408200	A.11
GG16H2UM	408202	A.11
GG16S2FM	407626	A.11
GG16S2UM	407616	A.11
GG20H2FM	408210	A.11
GG20H2UM	408212	A.11
GG20M2FM	408222	A.11
GG20M2UM	408224	A.11
GG25M2FM	408234	A.11
GG25M2UM	408236	A.11
GG32M2FM	408245	A.11
GG32M2UM	408247	A.11
GG40M2FM	408257	A.11
GG40M2UM	408259	A.11
GG64L2UM	408281	A.11
GH32M2VM	408292	A.11
GH40M2VM	408294	A.11



Valid Catalogue number combinations

Factory mounted: Available standard Breaker, Cassette and Trip Unit types

4 pole Breakers; Draw-out Portion only		
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GG04E3	407002	A.8
GG04H3	407006	A.8
GG04M3	407010	A.8
GG04N3	407014	A.8
GG04S3	407018	A.8
GG07E3	407031	A.8
GG07H3	407035	A.8
GG07M3	407039	A.8
GG07N3	407043	A.8
GG07S3	407047	A.8
GG08E3	407061	A.8
GG08H3	407065	A.8
GG08M3	407069	A.8
GG08N3	407073	A.8
GG08S3	407077	A.8
GG10E3	407091	A.8
GG10H3	407095	A.8
GG10M3	407099	A.8
GG10N3	407103	A.8
GG10S3	407107	A.8
GG13E3	407121	A.8
GG13H3	407125	A.8
GG13M3	407129	A.8
GG13N3	407133	A.8
GG13S3	407137	A.8
GG16E3	407151	A.8
GG16H3	407155	A.8
GG16M3	407159	A.8
GG16N3	407163	A.8
GG16S3	407167	A.8
GG20E3	407191	A.8
GG20H3	407195	A.8
GG20M3	407199	A.8
GG20N3	407203	A.8
GG20S3	407207	A.8
GG25H3	407231	A.8
GG25M3	407235	A.8
GG25N3	407239	A.8
GG32G3	407251	A.8
GG32H3	407273	A.8
GG32L3	407249	A.8
GG32N3	407265	A.8
GG40G3	407269	A.8
GG40H3	407279	A.8
GG40L3	407283	A.8
GG40M3	407287	A.8
GG40N3	407291	A.8
GG50L3	407301	A.8
GG50M3	407305	A.8
GG64L3	407321	A.8
GG64M3	407325	A.8
GGM3M3	407261	A.8
GH32H3	407347	A.9
GH32M3	407349	A.9
GH32N3	407351	A.9
GH40H3	407353	A.9
GH40M3	407355	A.9
GH40N3	407357	A.9

4 pole Breakers; Standard Cassette for Draw-out portion		
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GG16H5FM	408203	A.11
GG16H5UM	408205	A.11
GG16S5FM	407628	A.11
GG16S5UM	407618	A.11
GG20H5FM	408213	A.11
GG20H5UM	408215	A.11
GG20M5FM	408225	A.11
GG20M5UM	408227	A.11
GG25M5FM	408237	A.11
GG25M5UM	408239	A.11
GG32M5FM	408249	A.11
GG32M5UM	408251	A.11
GG40M5FM	408261	A.11
GG40M5UM	408263	A.11
GG64L5UM	408283	A.11
GH32M5VM	408293	A.11
GH40M5VM	408295	A.11

Global Trip Units		
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GTG00K1-SF	408800	A.12
GTG00K2-SF	408801	A.12
GTG00K3-2SF	408807	A.12
GTG00K3-4SF	408815	A.13
GTG00K3-SF	408805	A.12
GTG00K3T6SF	408817	A.13
GTG00K4-2SF	408808	A.12
GTG00K4-4SF	408816	A.13
GTG00K4-SF	408806	A.12
GTG00K4T6SF	408818	A.13
GTG00K9-4SF	408813	A.13
GTG00K9-SF	408803	A.12
GTG00N5-5SF	408825	A.14
GTG00N5-8SF	408833	A.14
GTG00N5-9SF	408841	A.14
GTG00N5T5SF	408829	A.14
GTG00N5T8SF	408837	A.14
GTG00N5T9SF	408845	A.14
GTG00N6-5SF	408826	A.16
GTG00N6-8SF	408834	A.16
GTG00N6-9SF	408842	A.16
GTG00N6T5SF	408830	A.16
GTG00N6T8SF	408838	A.16
GTG00N6T9SF	408846	A.16
GTG00N7-5SF	408827	A.15
GTG00N7-8SF	408835	A.15
GTG00N7-9SF	408843	A.15
GTG00N7T5SF	408831	A.15
GTG00N7T8SF	408839	A.15
GTG00N7T9SF	408847	A.15
GTG00N8-5SF	408828	A.16
GTG00N8-8SF	408836	A.16
GTG00N8-9SF	408844	A.16
GTG00N8T5SF	408832	A.16
GTG00N8T8SF	408840	A.16
GTG00N8T9SF	408848	A.16
GTG00N9-5SF	408823	A.14
GTG00N9-8SF	408863	A.14
GTG00N9-9SF	408865	A.14
GTPUNI	408860	A.12
GTPUNI	408860	A.12
GTPUNI	408860	A.12
GTPUNI	408860	A.12
GTPUNI	408860	A.12
GTPUNI	408860	A.13
GTPUNI	408860	A.13
GTPUNI	408860	A.13
GTPUNI	408860	A.13
GTPUNI	408860	A.13
GTPUNI	408860	A.14
GTPUNI	408860	A.14
GTPUNI	408860	A.14
GTPUNI	408860	A.15
GTPUNI	408860	A.16

Valid Catalogue number combinations

Factory mounted: Available standard Isolator & Cassette types

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GJ04S4	407380	A.5
GJ07S4	407400	A.5
GJ08S4	407420	A.5
GJ10S4	407440	A.5
GJ13S4	407460	A.5
GJ16S4	407480	A.5
GJ20S4	407500	A.5
GJ25N4	407520	A.5
GJ32L4	407535	A.5
GJ32N4	407539	A.5
GJ40L4	407556	A.5
GJ40N4	407560	A.5
GJ50L4	407567	A.5
GJ64L4	407577	A.5
GW04M4	408350	A.5
GW04N4	407376	A.5
GW07M4	408352	A.5
GW07N4	407396	A.5
GW08M4	408354	A.5
GW08N4	407416	A.5
GW10M4	408356	A.5
GW10N4	407436	A.5
GW13M4	408358	A.5
GW13N4	407456	A.5
GW16M4	408360	A.5
GW16N4	407476	A.5
GW20M4	408362	A.5
GW20N4	407496	A.5
GW25M4	408364	A.5
GW32M4	408366	A.5
GW40M4	408368	A.5

4 pole Isolators in Fixed Pattern		
Cat. No	Ref. No.	Page
GJ04S6	407381	A.5
GJ07S6	407401	A.5
GJ08S6	407421	A.5
GJ10S6	407441	A.5
GJ13S6	407461	A.5
GJ16S6	407481	A.5
GJ20S6	407501	A.5
GJ25N6	407521	A.5
GJ32L6	407536	A.5
GJ32N6	407540	A.5
GJ40L6	407557	A.5
GJ40N6	407561	A.5
GJ50L6	407568	A.5
GJ64L6	407578	A.5
GW04M6	408351	A.5
GW04N6	407377	A.5
GW07M6	408353	A.5
GW07N6	407397	A.5
GW08M6	408355	A.5
GW08N6	407417	A.5
GW10M6	408357	A.5
GW10N6	407437	A.5
GW13M6	408359	A.5
GW13N6	407457	A.5
GW16M6	408361	A.5
GW16N6	407477	A.5
GW20M6	408363	A.5
GW20N6	407497	A.5
GW25M6	408365	A.5
GW32M6	408367	A.5
GW40M6	408369	A.5

3 pole Isolators; Draw-out Portion only		
Cat. No	Ref. No.	Page
GJ04S1	407378	A.10
GJ07S1	407398	A.10
GJ08S1	407418	A.10
GJ10S1	407438	A.10
GJ13S1	407458	A.10
GJ16S1	407478	A.10
GJ20S1	407498	A.10
GJ25N1	407518	A.10
GJ32L1	407533	A.10
GJ32N1	407537	A.10
GJ40L1	407554	A.10
GJ40N1	407558	A.10
GJ50L1	407565	A.10
GJ64L1	407575	A.10
GK32N1	407591	A.10
GK40N1	407595	A.10
GW04M1	408400	A.10
GW04N1	407374	A.10
GW07M1	408402	A.10
GW07N1	407394	A.10
GW08M1	408404	A.10
GW08N1	407414	A.10
GW10M1	408406	A.10
GW10N1	407434	A.10
GW13M1	408408	A.10
GW13N1	407454	A.10
GW16M1	408410	A.10
GW16N1	407474	A.10
GW20M1	408412	A.10
GW20N1	407494	A.10
GW25M1	408414	A.10
GW32M1	408416	A.10
GW40M1	408418	A.10
GZ32H1	407589	A.10
GZ40H1	407593	A.10

3 pole Isolators; Standard Cassette for Draw-out portion		
Cat. No	Ref. No.	Page
GG16H2FM	408200	A.11
GG16H2UM	408202	A.11
GG16S2FM	407626	A.11
GG16S2UM	407616	A.11
GG20H2FM	408210	A.11
GG20H2UM	408212	A.11
GG20M2FM	408222	A.11
GG20M2UM	408224	A.11
GG25M2FM	408234	A.11
GG25M2UM	408236	A.11
GG32M2FM	408245	A.11
GG32M2UM	408247	A.11
GG40M2FM	408257	A.11
GG40M2UM	408259	A.11
GG64L2UM	408281	A.11
GH32M2VM	408292	A.11
GH40M2VM	408294	A.11

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Factory mounted: Available standard Isolator & Cassette types

4 pole Isolators; Draw-out Portion only		
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GJ04S3	407379	A.10
GJ07S3	407399	A.10
GJ08S3	407419	A.10
GJ10S3	407439	A.10
GJ13S3	407459	A.10
GJ16S3	407479	A.10
GJ20S3	407499	A.10
GJ25N3	407519	A.10
GJ32L3	407534	A.10
GJ32N3	407538	A.10
GJ40L3	407555	A.10
GJ40N3	407559	A.10
GJ50L3	407566	A.10
GJ64L3	407576	A.10
GK32N3	407592	A.10
GK40N3	407596	A.10
GW04M3	408401	A.10
GW04N3	407375	A.10
GW07M3	408403	A.10
GW07N3	407395	A.10
GW08M3	408405	A.10
GW08N3	407415	A.10
GW10M3	408407	A.10
GW10N3	407435	A.10
GW13M3	408409	A.10
GW13N3	407455	A.10
GW16M3	408411	A.10
GW16N3	407475	A.10
GW20M3	408413	A.10
GW20N3	407495	A.10
GW25M3	408415	A.10
GW32M3	408417	A.10
GW40M1	408418	A.10
GZ32H3	407590	A.10
GZ40H3	407594	A.10

4 pole Isolators; Standard Cassette for Draw-out portion		
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GG16H5FM	408203	A.11
GG16H5UM	408205	A.11
GG16S5FM	407628	A.11
GG16S5UM	407618	A.11
GG20H5FM	408213	A.11
GG20H5UM	408215	A.11
GG20M5FM	408225	A.11
GG20M5UM	408227	A.11
GG25M5FM	408237	A.11
GG25M5UM	408239	A.11
GG32M5FM	408249	A.11
GG32M5UM	408251	A.11
GG40M5FM	408261	A.11
GG40M5UM	408263	A.11
GG64L5UM	408283	A.11
GH32M5VM	408293	A.11
GH40M5VM	408295	A.11

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Accessories, Factory and Field mountable

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Factory Mounted Accessories		
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GAS5	407886	A.17
GAS6	407887	A.17
GAS8	407888	A.17
GBAT1	407891	A.17
GBCAS	407970	A.18
GBPRO	407978	A.18
GBRON	407971	A.18
GCCC024D	407836	A.17
GCCC048	407838	A.17
GCCC060D	407840	A.17
GCCC120	407842	A.17
GCCC240	407844	A.17
GCCC277	407849	A.17
GCCC400A	407852	A.17
GCCC440A	407853	A.17
GCCN024D	407861	A.17
GCCN048	407863	A.17
GCCN060D	407865	A.17
GCCN120	407867	A.17
GCCN240	407869	A.17
GCCN277	407870	A.17
GCCN400A	407877	A.17
GCCN440A	407878	A.17
GCPRO	407980	A.18
GCPS1	407922	A.17
GCPS2	407923	A.17
GCRON	407976	A.18
GCSP1	407895	A.17
GCSP2	407896	A.17
GM01024D	407700	A.17
GM01048A	407710	A.17
GM01048D	407702	A.17
GM01060D	407704	A.17
GM01110D	407706	A.17
GM01120A	407712	A.17
GM01240A	407714	A.17
GM01250D	407708	A.17
GM01400A	407716	A.17
GM01440A	407718	A.17
GM02024D	407725	A.17
GM02048A	407735	A.17
GM02048D	407727	A.17
GM02060D	407729	A.17
GM02110D	407731	A.17
GM02120A	407737	A.17
GM02240A	407739	A.17
GM02250D	407733	A.17
GM02400A	407741	A.17
GM02440A	407743	A.17
GMCN	408035	A.18
GSTR024D	407770	A.17
GSTR048	407772	A.17
GSTR060D	407774	A.17
GSTR120	407776	A.17
GSTR240	407778	A.17
GSTR277	407780	A.17
GSTR400A	407782	A.17
GSTR440A	407784	A.17
GUVT024D	407795	A.17
GUVT048	407797	A.17
GUVT060D	407799	A.17
GUVT120	407801	A.17
GUVT240	407803	A.17
GUVT277	407805	A.17
GUVT400A	407807	A.17
GUVT440A	407809	A.17

Field Mountable Alternative versions		
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GAS5R	407881	A.20
GAS6R	407882	A.20
GAS8R	407883	A.20
GBAT1R	407889	A.20
GBCASR	407967	A.21
GBPROR	407979	A.21
GBRONR	407968	A.21
GCCC024DR	407835	A.20
GCCC048R	407837	A.20
GCCC060DR	407839	A.20
GCCC120R	407841	A.20
GCCC240R	407843	A.20
GCCC277R	407850	A.20
GCCC400AR	407851	A.20
GCCC440AR	407854	A.20
GCCN024DR	407860	A.20
GCCN048R	407862	A.20
GCCN060DR	407864	A.20
GCCN120R	407866	A.20
GCCN240R	407868	A.20
GCCN277R	407871	A.20
GCCN400AR	407876	A.20
GCCN440AR	407879	A.20
GCPRO	407981	A.21
GCPS1R	407924	A.20
GCPS2R	407925	A.20
GCRONR	407974	A.21
GCSP1R	407915	A.20
GCSP2R	407916	A.20
GM01024DR	407701	A.20
GM01048AR	407711	A.20
GM01048DR	407703	A.20
GM01060DR	407705	A.20
GM01110DR	407707	A.20
GM01120AR	407713	A.20
GM01240AR	407715	A.20
GM01250DR	407709	A.20
GM01400AR	407717	A.20
GM01440AR	407719	A.20
GM02024DR	407726	A.20
GM02048AR	407736	A.20
GM02048DR	407728	A.20
GM02060DR	407730	A.20
GM02110DR	407732	A.20
GM02120AR	407738	A.20
GM02240AR	407740	A.20
GM02250DR	407734	A.20
GM02400AR	407742	A.20
GM02440AR	407744	A.20
GMCNR	408033	A.21
GSTR024DR	407771	A.20
GSTR048R	407773	A.20
GSTR060DR	407775	A.20
GSTR120R	407777	A.20
GSTR240R	407779	A.20
GSTR277R	407781	A.20
GSTR400AR	407783	A.20
GSTR440AR	407785	A.20
GUVT024DR	407796	A.20
GUVT048R	407798	A.20
GUVT060DR	407800	A.20
GUVT120R	407802	A.20
GUVT240R	407804	A.20
GUVT277R	407806	A.20
GUVT400AR	407808	A.20
GUVT440AR	407810	A.20

Accessories only available as Factory Mounted types		
Cat. No	Ref. No.	Page
GI2FAD	407900	A.18
GI2WAD	407901	A.18
GI3FB	407902	A.18
GI3FC	407904	A.18
GI3FDT	407906	A.18
GI3WB	407903	A.18
GI3WC	407905	A.18
GI3WDT	407907	A.18
GNTK120	407753	A.17
GNTK240	407754	A.17
GRTC1	407897	A.17
GRTC2	407899	A.17
GRTC3	407894	A.17

Accessories only available in Field Mountable versions		
Cat. No	Ref. No.	Page
G16H4ED	407930	A.22
G16H4FFI	408060	A.6
G16H6ED	407931	A.22
G16H4RVI	408058	A.6
G16H6FFI	408062	A.6
G16H6RVI	408082	A.6
G20H4ED	407932	A.22
G20H4FFI	408061	A.6
G20H4RVIn	408059	A.6
G20H6ED	407933	A.22
G20H6FFI	408063	A.6
G20H6RVIn	408083	A.6
G32M4FFI	408066	A.6
G32M4RVI	408070	A.6
G32M6FFI	408068	A.6
G32M6RVI	408071	A.6
G40M4ED	407934	A.22
G40M4FFI	408067	A.6
G40M4RVI	408072	A.6
G40M6ED	407935	A.22
G40M6FFI	408069	A.6
G40M6RVI	408074	A.6
G54DR	408038	A.23
G64L4RVI	408073	A.6
G64L6RVI	408075	A.6
G64M4ED	407936	A.22
G64M6ED	407937	A.22
GAPU	408789	A.22
GAS3R	407880	A.20
GCAS	407986	A.21
GCB1	407990	A.22
GCB2	407991	A.22
GCB3	407992	A.22
GCB4	407993	A.22
GCB5	407994	A.22
GCB6	407995	A.22
GCB7	407996	A.22
GCNTW	408036	A.23
GDPFR	408025	A.23
GDPRW	408026	A.23
GFMTG	408085	A.6
GJP	408057	A.23
GLHD	408039	A.23
GLB3	408049	A.23
GLB1	408045	A.23
GMPU1	408790	A.22
GMPU2	408791	A.22
GMPU3	408792	A.22
GPBD	408040	A.23
GPRO	407987	A.21
GREPM	408041	A.23
GRHD	408042	A.23
GRON	407985	A.21
GRONCS	407984	A.28
GTDMM048A	407816	A.22
GTDMM060D	407817	A.22
GTDMM120A	407818	A.22
GTDMM120D	407819	A.22
GTDMM240A	407820	A.22
GTDMM240D	407821	A.22
GTDMM250D	407823	A.22
GTDMM277A	407822	A.22
GTDMM400A	407824	A.22
GTDMM440A	407825	A.22
GTUS	408046	A.22
GTUTK20	407999	A.22



Valid Catalogue number combinations

Accessories, Sensors, Cassettes, Trip Units and Spares

Sensors (CT & Rogowski) for Ground & Earth fault options		
Cat. No	Ref. No.	Page
G04HNCT	408300	A.24
G04HNRC	408000	A.24
G07HNCT	408301	A.24
G07HNRC	408001	A.24
G08HNCT	408302	A.24
G08HNRC	408002	A.24
G10HNCT	408303	A.24
G10HNRC	408003	A.24
G13HNCT	408304	A.24
G13HNRC	408004	A.24
G16HNCT	408305	A.24
G16HNRC	408005	A.24
G20HNCT	408306	A.24
G20HNRC	408006	A.24
G25MNCT	408322	A.24
G25MNRC	408162	A.24
G32LNCT	408331	A.24
G32LNRC	408186	A.24
G40LNCT	408332	A.24
G40LNRC	408187	A.24
G50LNCT	408333	A.24
G50LNRC	408188	A.24
G64LNCT	408334	A.24
G64LNRC	408189	A.24

Separately available Standard Cassette for Draw-out portion		
Cat. No	Ref. No.	Page
GG16S2FR	407627	A.25
GG16S2UR	407617	A.25
GG16S5UR	407619	A.25
GG16S5FR	407629	A.25
GG16H2FR	407610	A.25
GG16H2UR	407612	A.25
GG16H5FR	407613	A.25
GG16H5UR	407615	A.25
GG20H2FR	407620	A.25
GG20H2UR	407622	A.25
GG20H5FR	407623	A.25
GG20H5UR	407625	A.25
GG20M2FR	407630	A.25
GG20M2UR	407632	A.25
GG20M5FR	407633	A.25
GG20M5UR	407635	A.25
GG25M2FR	407640	A.25
GG25M2UR	407642	A.25
GG25M5FR	407643	A.25
GG25M5UR	407645	A.25
GG32M2FR	407650	A.25
GG32M2UR	407652	A.25
GG32M5FR	407654	A.25
GG32M5UR	407656	A.25
GG40M2FR	407658	A.25
GG40M2UR	407666	A.25
GG40M5FR	407668	A.25
GG40M5UR	407670	A.25
GG64L2UR	407686	A.25
GG64L5UR	407688	A.25
GH32M2VR	408254	A.25
GH32M5VR	408255	A.25
GH40M2VR	408267	A.25
GH40M5VR	408268	A.25

Separately available 'Plug & Play' Trip Units		
Cat. No	Ref. No.	Page
GTG00K2-SR	408802	A.26
GTG00K4-2SR	408809	A.26
GTG00K4T6SR	408819	A.26
GTG00N5T8SR	408849	A.27
GTG00N5T9SR	408853	A.27
GTG00N6T8SR	408850	A.27
GTG00N6T9SR	408854	A.27
GTG00N7T8SR	408851	A.27
GTG00N7T9SR	408855	A.27
GTG00N8T8SR	408852	A.27
GTG00N8T9SR	408856	A.27
GTPUNI	408860	A.12

Separately available Spare Parts		
Cat. No	Ref. No.	Page
G13HCLS	408097	A.28
G16HCLS	408100	A.28
G20H2SSL	407606	A.28
G20H5SSL	407607	A.28
G20HARC	408098	A.28
G20HCHT	408102	A.28
G20HCLS	408103	A.28
G20MCLS	408106	A.28
G20NARC	408104	A.28
G25MCLS	408109	A.28
G32MCLS	408117	A.28
G40M2SSL	407636	A.28
G40M5SSL	407637	A.28
G40MARC	408169	A.28
G40MCHT	408131	A.28
G40MCLS	408120	A.28
G40NARC	408172	A.28
G50LCLS	408145	A.28
G64L2SSL	407679	A.28
G64L5SSL	407680	A.28
G64LARC	408193	A.28
G64LCHT	408144	A.28
G64LCLS	408148	A.28
GFA4	408028	A.28
GRHN	408043	A.28
GSPDTR1	408052	A.28
GSPDTR2	408030	A.28
GSDWTR	408054	A.28
GUNI	408047	A.28

Notes

A large grid of dotted lines for taking notes, covering the majority of the page.

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Electronic Trip Units

- B.2 Electronic Trip Units layout & main menu
- B.3 Overload Protection LT-C and LTD
- B.4 Overload Protection LT-F and LTD
- B.5 Table indicating available Long Time settings
- B.6 Short-circuit Protection ST and STDB
- B.7 Short-circuit Protection ST and I²T slope
- B.8 Short-circuit Protection; Instantaneous (I)
- B.9 Overcurrent Protection against Short-circuit: Extended range
- B.10 Short-circuit Protection temporary reduced I (RELT)
- B.11 Setting limitations of Short-circuit devices - Short-circuit Protection: HSIOC, MCR
- B.12 Ground fault Protection: GF and GFD (Residual Type)
- B.13 Ground fault Protection: GF and I²t slope
- B.14 Ground Fault Protection
- B.15 Zone Selective Interlock, Load Shedding and Trip indication
- B.16 Measurement Functions and Power Supplies
- B.17 Protective Relaying Functions; Relay and Trip Unit Inputs Wave Form Capture option
- B.18 Communications Neutral protection, Reset Choice Rating Plug and Test Kit
- B.19 Overview of GT Electronic Trip Unit functionality

The breaker

Order Codes

Electronic Trip Units**Time Current Curves (cold state)**

- B.20 LT Protection device
- B.21 LT Protection device
- B.22 LT & ST Protection device
- B.23 ST Protection device
- B.24 ST and I Protection device
- B.25 HSIOC & GF Protection device
- B.26 GF Protection device
- B.27 Terminology
- B.28 Example of Full Time Current curve

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Electronic Trip Units layout & Main menu



State of the Art Electronic Trip Unit

All EntelliGuard™ Power Circuit Breakers are equipped with a digital electronic trip unit, available in four basic versions E, S, N and H. Each has a common design that comes with a screen providing an ammeter and allowing a simple and accurate menu driven adjustment of the breaker parameters across a broad current range.

All functionality is menu driven accessed by using 4 setting and one enter key thus allowing a fast and accurate setting of the device. These have the following functionality:

- ↑ UP: Scroll up, Increment Value
- ↓ DOWN: Scroll down, Decrement value
- NEXT function, next page
- ← PREVIOUS function, previous page
- ↩ SAVE setting into memory

After inserting the Universal rating plug, the device can be adjusted and the installed options set. In situations where the installation is not yet connected to the power supply, the use of the separately available TESTER with Power Pack is advised (Cat No. GTUTK20).

Alternatively the internal Trip Unit Battery power pack can be used. Depressing any key on the face of the trip unit powers the unit from its internal battery. Battery power is maintained for 20 seconds after the last key is pressed. All normal setup, meter, and status functions can be performed with battery power. In Power On situations the Trip Unit display is only functional when the breaker is carrying at least 20% of its nominal current value (Single phase).

SET UP MENU

To enter this option begin the process by pressing the UP or DOWN key until SETUP is selected on the screen. Pressing the NEXT or PREVIOUS key allows one to enter the setup mode. After selecting this mode, all functions can be chosen by depressing the NEXT or PREVIOUS key.

Within the setup menu all breaker protection values, trip unit parameters, relaying functions in and outputs, communication and trip unit access codes are set

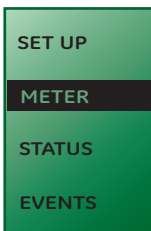
Each EntelliGuard™ Electronic trip units provides long-time over-current protection (LT), long-time delay (LTD) and some form of Short-circuit over-current protection (ST and/or I, H, RELT). Depending on the chosen Trip Unit Tier or Type and the selected options a, host of other protection, metering relaying functions and a wave form capture option are available.

In the following pages each of these functions are described in detail. A set of tabs placed below each description indicate in which Trip Unit Tier the described function is present.



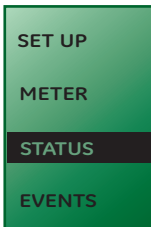
METER

To enter this option begin the process by pressing the UP or DOWN key until to METER is selected on the screen. Pressing the NEXT or PREVIOUS key allows one to view various groups of measurements as Current, Voltage, real, apparent and reactive Power for the electrical system protected by the device. Both currents and voltages are computed as true rms values. All EntelliGuard™ Trip Units are equipped with an Ammeter. The full measurement package is offered in the GT-N and GT-H variants. The ammeter and other measurement options are only available when the trip unit is powered by the distribution system, the internal Trip Unit batteries or the external Test/battery pack. The full measurement package requires the use of a separately available 3 phase instrument transformer and Power Conditioner pack.



STATUS

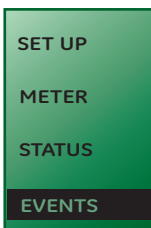
To enter this option begin the process by pressing the UP or DOWN key until STATUS is selected on the screen. The Status option indicates the present status and settings of the trip unit and circuit breaker.



EVENTS

To enter this option begin the process by pressing the UP or DOWN key until EVENTS is selected on the screen. Pressing the NEXT or PREVIOUS key allows one to access events. Here a total of 10 events with data as event type and event magnitude are stored. The connection of a 24V DC auxiliary supply to the Trip Unit will expand this option to include a time stamp of each event.

Tripping events as LT, ST, I GF, Overload Trip imminent (pre alarm) or any other, release or relay trip event are visualized with the associated levels. It is possible to clear this so called "trip register" locally. If the Trip Unit is equipped with this option, a history of up to 256 Tripping occurrences with data as event type and event magnitude are stored.



Overload Protection LT-C and LTD

Overload (LT-C) Protection

The EntelliGuard™ Electronic Trip has an extremely accurate and easy to set overload or Long Time (LT-C) Protection. It is designed to pick up overloads that exceed 112% of the set value within two hours with a tolerance of 10%⁽¹⁾.

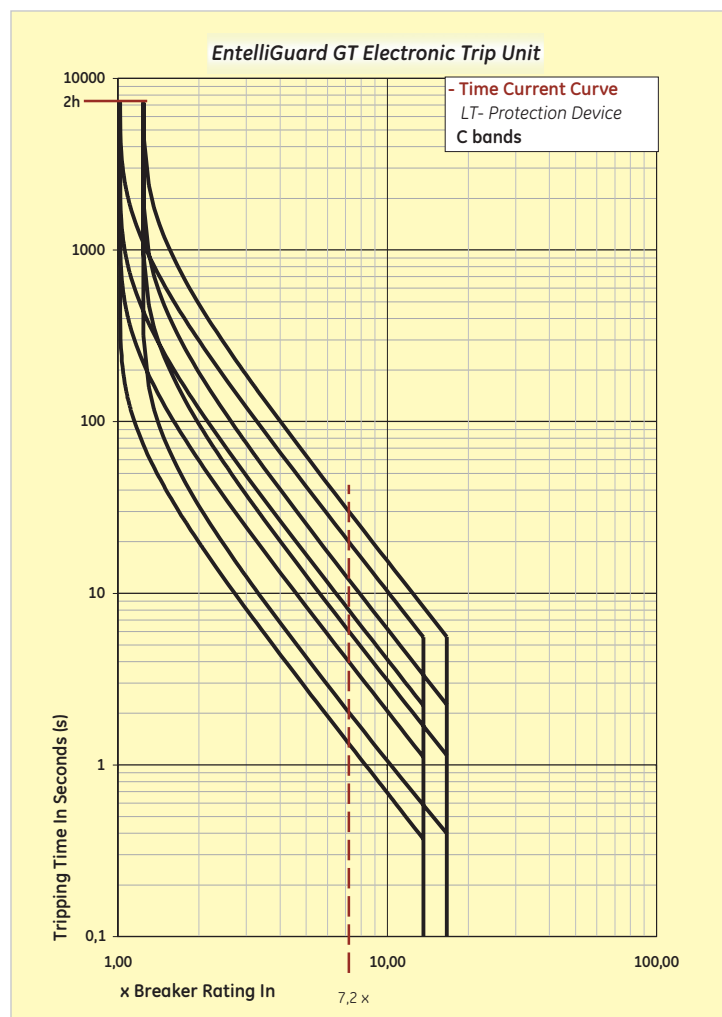
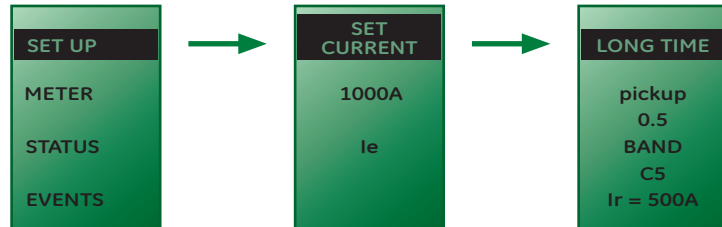
The available 66 different current adjustments (see page B.4) result in an extremely broad setting range of 0,2 to 1 times the chosen breaker rating (In).

The LT-C type is designed to be used in association with down- and upstream circuit breakers and has a so called I²t shape producing a curve form similar to standard industrial thermal magnetic protection devices.

The Time-Current protection curve depicted here is drawn in cold state. A thermal model in the device corrects for the heating of the connected lines and equipment. This device continues to track cooling even when disconnected in 'Thermal Memory'. The reconnection of power to over-heated lines and equipment thus being prevented. Thermal Memory tracks events after power disconnection for up to 12 minutes.

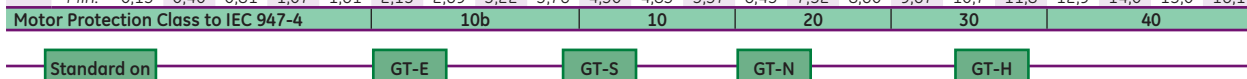
In order to allow an accurate adjustment to the thermal properties of the protected equipment and to finely match the curve with those of Upstream & Downstream devices 22 LTD time bands are available.

The table indicates the minimum delay time and maximum total interruption times for 3 frequently used reference points on the curve of each band. The graph portrays the LT behaviour for the time-current bands C-4, C-8, C-13 & C-22.



Overload Tripping times at indicated overload levels per selected LTD band, in Seconds

x Ir	Cmin	C-2	C-3	C-4	C-5	C-6	C-7	C-8	C-9	C-10	C-11	C-12	C-13	C-14	C-15	C-16	C-17	C-18	C-19	C-20	C-21	Cmax	
1.5	Max	7,8	23,4	46,7	62,3	93,4	125	156	187	218	249	280	311	374	436	498	560	623	685	747	810	872	934
	Min	4,0	12,0	24,0	32,0	48,0	64,1	80,1	96,1	112	128	144	160	192	224	256	288	320	352	384	416	448	480
3	Max	1,3	3,86	7,73	10,3	15,5	20,6	25,8	30,9	36,1	41,2	46,4	51,5	61,8	72,1	82,4	92,7	103	113	124	134	144	155
	Min	0,80	2,41	4,82	6,43	9,64	12,9	16,1	19,3	22,5	25,7	28,9	32,1	38,6	45,0	51,4	57,8	64,3	70,7	77,1	83,6	90,0	96,4
7.2	Max	0,21	0,62	1,24	1,66	2,49	3,32	4,15	4,98	5,81	6,64	7,47	8,30	9,96	11,6	13,3	14,9	16,6	18,3	19,9	21,6	23,2	24,9
	Min	0,13	0,40	0,81	1,07	1,61	2,15	2,69	3,22	3,76	4,30	4,83	5,37	6,45	7,52	8,60	9,67	10,7	11,8	12,9	14,0	15,0	16,1



(1) Meeting the requirements of IEC 90647-2 and IEC 90647-4



Overload Protection LT-F and LTD

Overload (LT-F) Protection

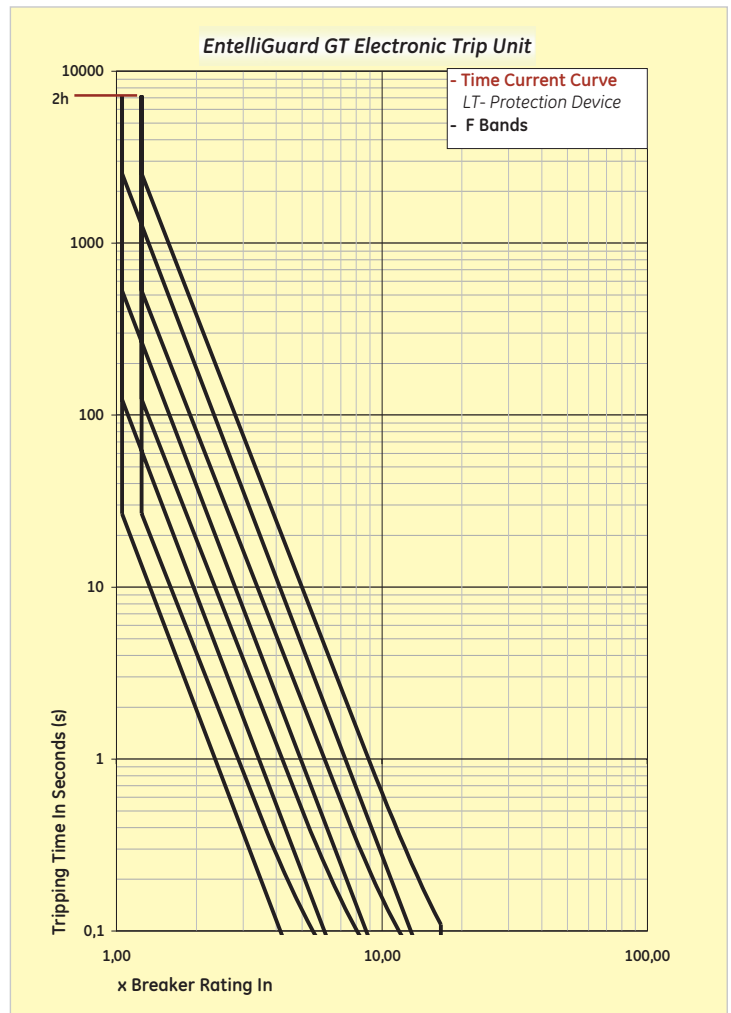
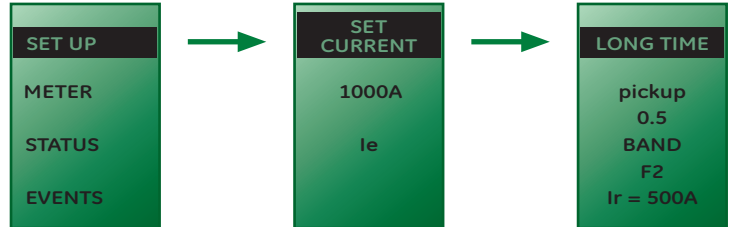
Optionally a second type of overload protection is available. Designed to pick up overloads that exceed 112% of the set value within two hours, with a tolerance of 10%^[1], it has the same 66 different current adjustments as the standard type thus offering an extremely broad setting range of 0,2 to 1 times the chosen breaker rating.

The Time-Current protection curve depicted here is drawn in cold state. A thermal model in the device corrects for the heating of the connected lines and equipment. This device continues to track cooling even when disconnected in 'Thermal Memory'.

The reconnection of power to over-heated lines and equipment thus being prevented. Thermal Memory tracks events after power disconnection for up to 12 minutes.

The LT-F device is designed to be used in association with down- and upstream Fuses and produces a curve form similar to those of standard industrial fuses. A total of 22 LTD time bands are available, thus extending the total number of bands to 44. The table indicates the minimum delay time and maximum total interruption times for 3 frequently used reference points on the curve of each band.

The graph portrays the LT behaviour for the time-current bands F-4, F-9, F-15 and F-22.



Overload Tripping times at indicated overload levels per selected LTD band. in Seconds

x Ir	Fmin	F-2	F-3	F-4	F-5	F-6	F-7	F-8	F-9	F-10	F-11	F-12	F-13	F-14	F-15	F-16	F-17	F-18	F-19	F-20	F-21	Fmax	
1,5	Max.	1,44	4,19	7,62	11,9	17,2	23,9	32,3	42,8	56	72	93	118	150	190	239	302	380	477	600	752	942	1153
	Min.	0,64	1,87	3,39	5,30	7,67	10,7	14,4	19,0	25	32	41	53	67	85	107	135	169	213	267	335	419	514
3	Max.	0,09	0,26	0,48	0,74	1,08	1,50	2,01	2,67	3,49	4,51	5,80	7,39	9,39	11,9	15,0	18,9	23,8	29,9	37,5	47,0	58,9	72,1
	Min.	0,04	0,12	0,21	0,33	0,48	0,67	0,90	1,19	1,55	2,01	2,57	3,29	4,18	5,29	6,68	8,41	10,6	13,3	16,7	20,9	26,2	32,1
7,2	Max.				0,03	0,05	0,06	0,08	0,11	0,14	0,18	0,22	0,28	0,36	0,45	0,57	0,72	0,90	1,13	1,42	1,78	2,18	
	Min.				0,01	0,02	0,03	0,04	0,05	0,06	0,08	0,10	0,13	0,16	0,20	0,25	0,32	0,40	0,50	0,63	0,79	1,03	

Standard on

GT-H



Table indicating available Long Time settings

Per chosen Breaker Rating (In) 66 Current values (Ir) can be set

Breaker Rating	Multip.	Primary Setting Ie values in Amps					
		Secondary Setting Ir values in Amps					
400	1	400	390	385	380	180	160
	0,95	380	371	366	361	171	152
	0,9	360	351	347	342	162	144
	0,85	340	332	327	323	153	136
	0,8	320	312	308	304	144	128
	0,75	300	293	289	285	135	120
	0,7	280	273	270	266	126	112
	0,65	260	254	250	247	117	104
	0,6	240	234	231	228	108	96
	0,55	220	215	212	209	99	88
630	0,5	200	195	193	190	90	80
	1	630	615	610	605	280	250
	0,95	599	584	580	575	266	238
	0,9	567	554	549	545	252	225
	0,85	536	523	519	514	238	213
	0,8	504	492	488	484	224	200
	0,75	473	461	458	454	210	188
	0,7	441	431	427	424	196	175
	0,65	410	400	397	393	182	163
	0,6	378	369	366	363	168	150
800	0,55	347	338	336	333	154	138
	0,5	315	308	305	303	140	125
	1	800	784	776	768	350	315
	0,95	760	745	737	730	333	299
	0,9	720	706	698	691	315	284
	0,85	680	666	660	653	298	268
	0,8	640	627	621	614	280	252
	0,75	600	588	582	576	263	236
	0,7	560	549	543	538	245	221
	0,65	520	510	504	499	228	205
1000	0,6	480	470	466	461	210	189
	0,55	440	431	427	422	193	173
	0,5	400	392	388	384	175	158
	1	1000	980	970	960	450	400
	0,95	950	931	922	912	428	380
	0,9	900	882	873	864	405	360
	0,85	850	833	825	816	383	340
	0,8	800	784	776	768	360	320
	0,75	750	735	728	720	338	300
	0,7	700	686	679	672	315	280
1250	0,65	650	637	631	624	293	260
	0,6	600	588	582	576	270	240
	0,55	550	539	534	528	248	220
	0,5	500	490	485	480	225	200
	1	1250	1225	1210	1196	560	500
	0,95	1188	1164	1150	1136	532	475
	0,9	1125	1103	1089	1076	504	450
	0,85	1063	1041	1029	1017	476	425
	0,8	1000	980	968	957	448	400
	0,75	938	919	908	897	420	375
1600	0,7	875	858	847	837	392	350
	0,65	813	796	787	777	364	325
	0,6	750	735	726	718	336	300
	0,55	688	674	666	658	308	275
	0,5	625	613	605	598	280	250
	1	1600	1568	1552	1536	720	630
	0,95	1520	1490	1474	1459	684	599
	0,9	1440	1411	1397	1382	648	567
	0,85	1360	1333	1319	1306	612	536
	0,8	1280	1254	1242	1229	576	504
0,75	1200	1176	1164	1152	540	473	
6400	0,7	1120	1098	1086	1075	504	441
	0,65	1040	1019	1009	998	468	410
	0,6	960	941	931	922	432	378
	0,55	880	862	854	845	396	347
	0,5	800	784	776	768	360	315

Breaker Rating	Multip.	Primary Setting Ie values in Amps					
		Secondary Setting Ir values in Amps					
2000	1	2000	1960	1940	1920	900	800
	0,95	1900	1862	1843	1824	855	760
	0,9	1800	1764	1746	1728	810	720
	0,85	1700	1666	1649	1632	765	680
	0,8	1600	1568	1552	1536	720	640
	0,75	1500	1470	1455	1440	675	600
	0,7	1400	1372	1358	1344	630	560
	0,65	1300	1274	1261	1248	585	520
	0,6	1200	1176	1164	1152	540	480
	0,55	1100	1078	1067	1056	495	440
2500	0,5	1000	980	970	960	450	400
	1	2500	2450	2425	2400	1125	1000
	0,95	2375	2328	2304	2280	1069	950
	0,9	2250	2205	2183	2160	1013	900
	0,85	2125	2083	2061	2040	956	850
	0,8	2000	1960	1940	1920	900	800
	0,75	1875	1838	1819	1800	844	750
	0,7	1750	1715	1698	1680	788	700
	0,65	1625	1593	1576	1560	731	650
	0,6	1500	1470	1455	1440	675	600
3200	0,55	1375	1348	1334	1320	619	550
	0,5	1250	1225	1213	1200	563	500
	1	3200	3136	3104	3072	1440	1280
	0,95	3040	2979	2949	2918	1368	1216
	0,9	2880	2822	2794	2765	1296	1152
	0,85	2720	2666	2638	2611	1224	1088
	0,8	2560	2509	2483	2458	1152	1024
	0,75	2400	2352	2328	2304	1080	960
	0,7	2240	2195	2173	2150	1008	896
	0,65	2080	2038	2018	1997	936	832
4000	0,6	1920	1882	1862	1843	864	768
	0,55	1760	1725	1707	1690	792	704
	0,5	1600	1568	1552	1536	720	640
	1	4000	3920	3880	3840	1800	1600
	0,95	3800	3724	3686	3648	1710	1520
	0,9	3600	3528	3492	3456	1620	1440
	0,85	3400	3332	3298	3264	1530	1360
	0,8	3200	3136	3104	3072	1440	1280
	0,75	3000	2940	2910	2880	1350	1200
	0,7	2800	2744	2716	2688	1260	1120
5000	0,65	2600	2548	2522	2496	1170	1040
	0,6	2400	2352	2328	2304	1080	960
	0,55	2200	2156	2134	2112	990	880
	0,5	2000	1960	1940	1920	900	800
	1	5000	4900	4850	4800	2250	2000
	0,95	4750	4655	4608	4560	2138	1900
	0,9	4500	4410	4365	4320	2025	1800
	0,85	4250	4165	4123	4080	1913	1700
	0,8	4000	3920	3880	3840	1800	1600
	0,75	3750	3675	3638	3600	1688	1500
6400	0,7	3500	3430	3395	3360	1575	1400
	0,65	3250	3185	3153	3120	1463	1300
	0,6	3000	2940	2910	2880	1350	1200
	0,55	2750	2695	2668	2640	1238	1100
	0,5	2500	2450	2425	2400	1125	1000
	1	6400	6272	6208	6144	2880	2560
	0,95	6080	5958	5898	5837	2736	2432
	0,9	5760	5645	5587	5530	2592	2304
	0,85	5440	5331	5277	5222	2448	2176
	0,8	5120	5018	4966	4915	2304	2048
0,75	4800	4704	4656	4608	2160	1920	
6400	0,7	4480	4390	4346	4301	2016	1792
	0,65	4160	4077	4035	3994	1872	1664
	0,6	3840	3763	3725	3686	1728	1536
	0,55	3520	3450	3414	3379	1584	1408
	0,5	3200	3136	3104	3072	1440	1280



Short-circuit Protection ST and STDB

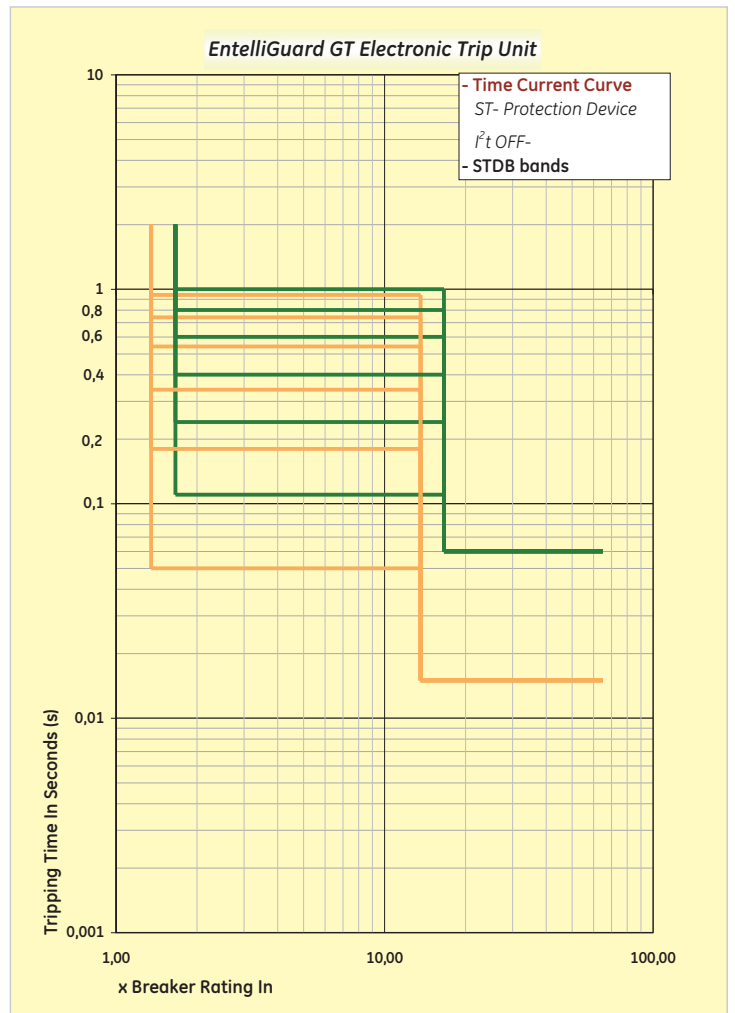
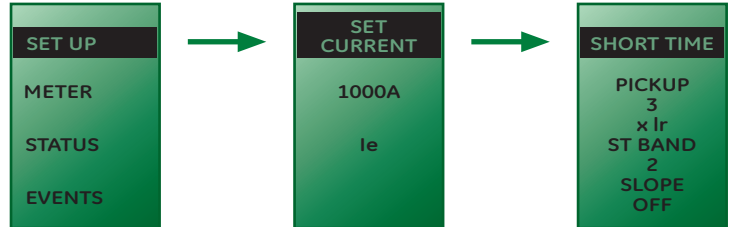
Overcurrent Protection against Short-circuit: ST, STDB

The EntelliGuard™ Electronic Trip Unit and breaker combination can be equipped with a number of different Short-circuit protection devices each with their own distinctive properties and field of application.

The Timed Short-circuit Protection Device is designed to offer selectivity over a defined current range and offers a unique combination of multiple time bands and current settings.

To allow selectivity with a wide range of different downstream devices whilst not unnecessarily sacrificing clearing time, 17 different time bands are available. The device has an adjustment range of 1,5 to 12⁽¹⁾ (+/-10%) times the chosen Long Time current value (I_r) in steps of 0,5 (pick up setting).

The graph indicates 6 of the available 17 time bands across the full adjustment range. The table contains the minimum delay time and the maximum total interruption times for all time band settings.



Short Time tripping times at indicated levels per selected STDB band - I²t OFF, in Milliseconds

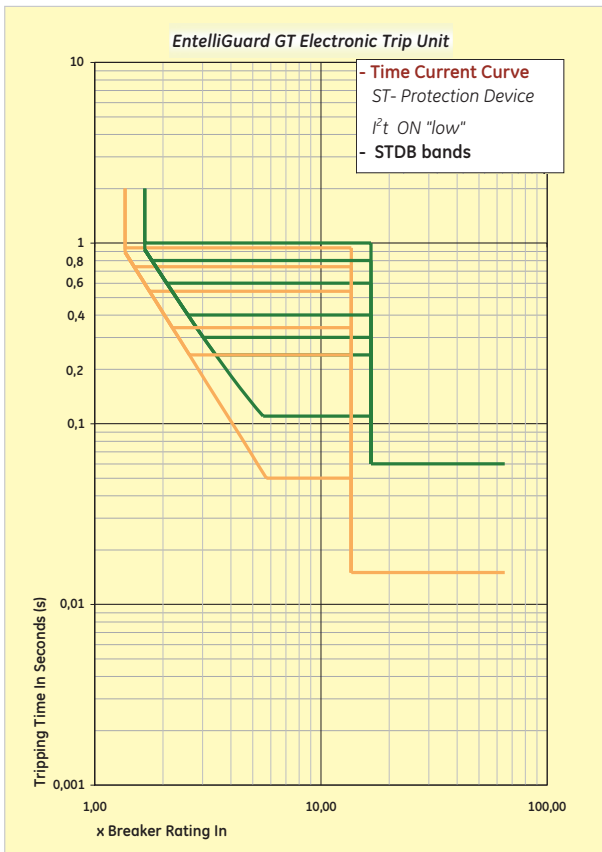
	x I _r	Min	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Max
1,5 x	Tripping	90	100	110	120	170	190	240	270	300	340	400	450	600	700	800	900	1000
±10%	Non Tripping	30	40	50	60	110	130	180	210	240	280	340	390	540	640	740	840	940
12 x	Tripping	90	100	110	120	170	190	240	270	300	340	400	450	600	700	800	900	1000
±10%	Non Tripping	30	40	50	60	110	130	180	210	240	280	340	390	540	640	740	840	940



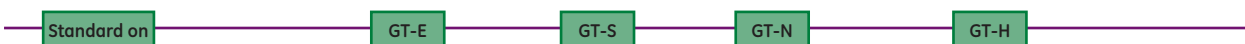
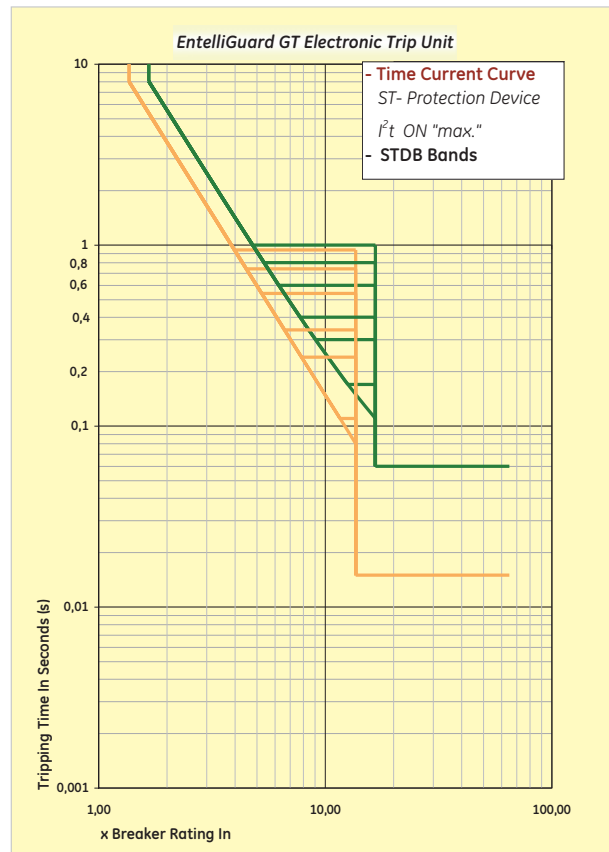
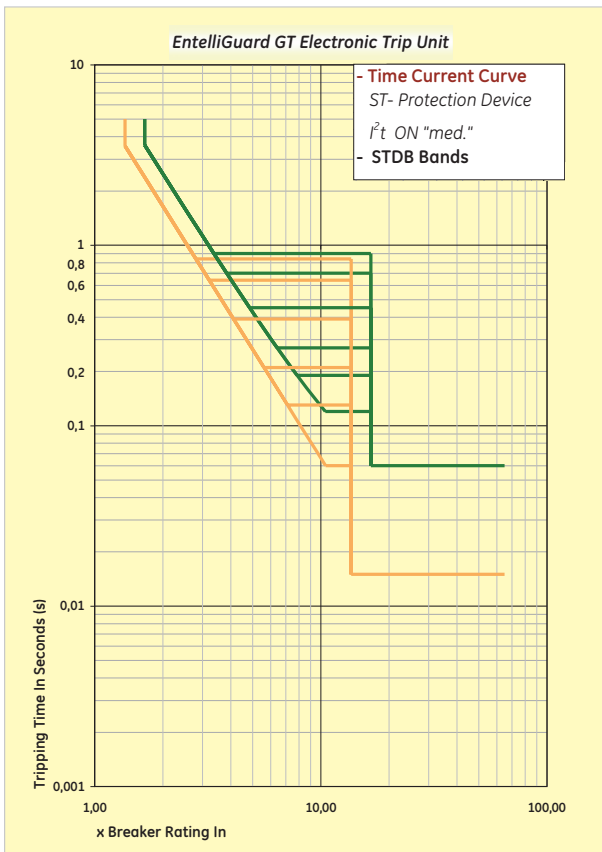
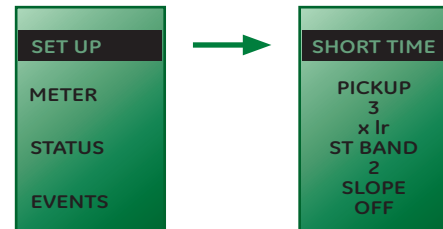
(1) Is limited to lower values in certain cases, please refer to page B.11



Short-circuit Protection ST and I²T slope



Timed Short-circuit (ST) Protection I²T Bands (slope)⁽¹⁾
 The ST device can also be set to a I²T slope value. The available multiple I²t slopes are normally used to achieve selectivity with downstream fuses or to improve selectivity with downstream circuit breakers. The device has an adjustment range of 1,5 to 12⁽¹⁾ (±10%) times the chosen Long Time current value (I_r) in steps of 0,5 (pick up setting) and 17 time bands. The three graphs depict the available I²t slopes (Low, Med. or High) and their intersection with a selection of the available 17 time bands across the full adjustment range.



(1) When the LT Fuse band option is selected (22 F Bands) the I²T slope functions of this device are disabled

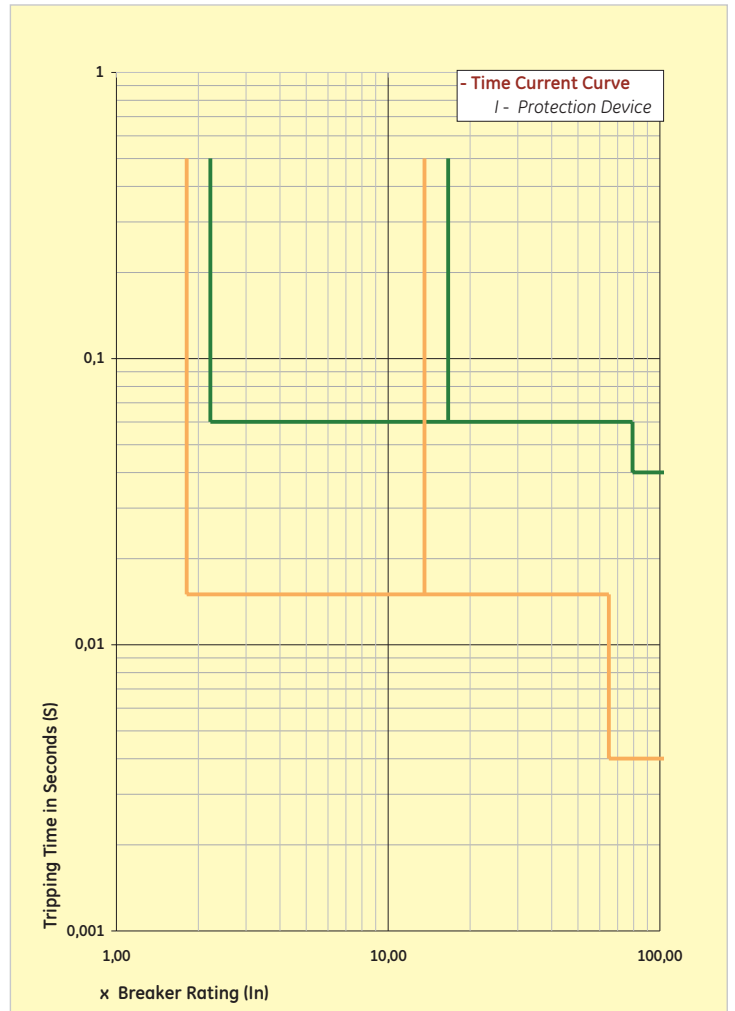
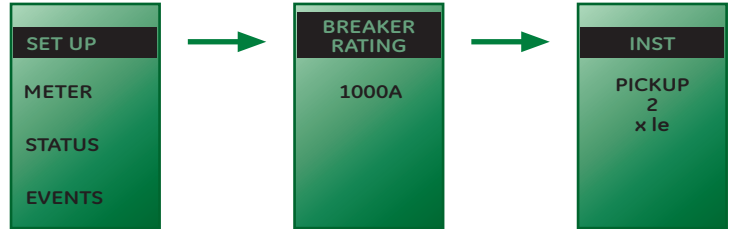


Short-circuit Protection; Instantaneous (I)

Instantaneous Short-circuit (I) Protection

A user settable device that allows a high speed fault interruption at a pre-determined current level. This device can be used with the short time delayed (ST) Short-circuit protection device or as replacement thereof. The device has a current adjustment of 2 to 15 ($\pm 10\%$) times the chosen Primary Current Value (I_e) in steps of 0,5. The device can also be switched OFF. On breakers with a rating of more than 4000A the maximum setting of 15 x is in some cases limited to a lower value due to the breaker current rating and its Short-circuit withstand value (see page B.11). The Instantaneous tripping system used in the EntelliGuard™ Electronic Trip Unit has a unique programming feature that waits for the downstream device to trip before reacting to an overcurrent fault. This providing the user with a unique combination of **Speed** and **Selectivity**.

The graph indicates the Maximum interruption time and non tripping time across the full current setting band and the transition to the HSIOC protection device (see page B.11).



Standard on

GT-S

GT-N

GT-H



Short-circuit Protection; Instantaneous (I)

Extended Range Instantaneous Protection

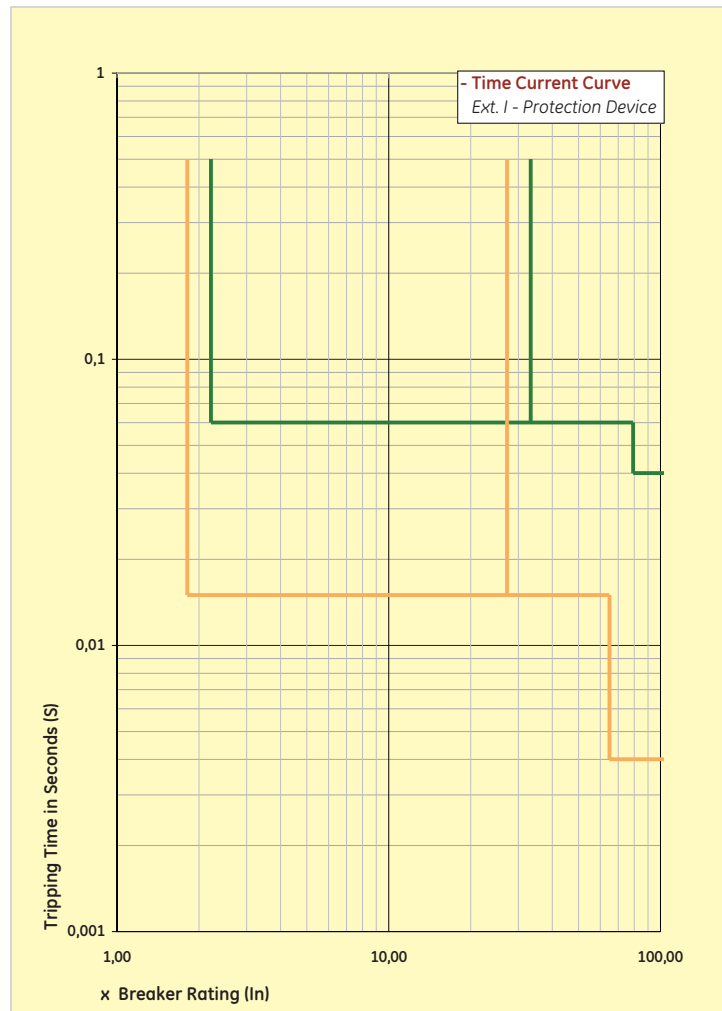
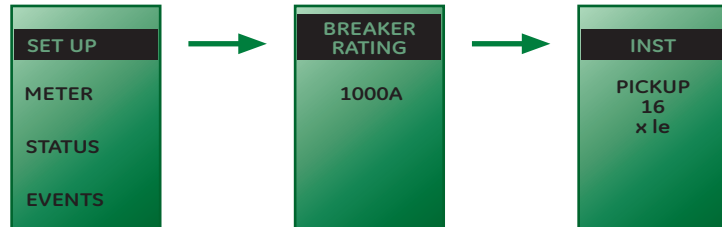
Derived from, and based on the same principles as the standard Instantaneous protection but with an extended current adjustment range.

This high-level instantaneous device extends the standard range from 2 - 15 to 2 - 30 ($\pm 10\%$) times the chosen Primary Current Value (I_e). Until $15 \times I_e$ in steps of 0,5 and for the extended setting (above $15 \times I_e$) in steps of 1. The device can also be switched OFF.

On breakers with a rating of more than 2000A the maximum setting of $30 \times I_e$ is in some cases limited to a lower value due to the breaker current rating and its Short-circuit withstand value (see page B.11).

As with the standard Instantaneous tripping system the device has a unique programming feature that waits for the downstream device to trip before reacting to an overcurrent fault. This provides the user with a unique combination of **Speed** and **Selectivity**.

The graph indicates the Maximum interruption time and non tripping time across the full current setting band and the transition to the HSIOC protection device (see page B.11).



Optional on

GT-S

GT-N

GT-H



Short-circuit Protection temporary reduced I (RELT)

Temporary reduced setting of Instantaneous Short-circuit Device (RELT)

When a Short-circuit event takes place, large amount of electrical energy is released that can be hazardous to users in the direct vicinity of such an occurrence.

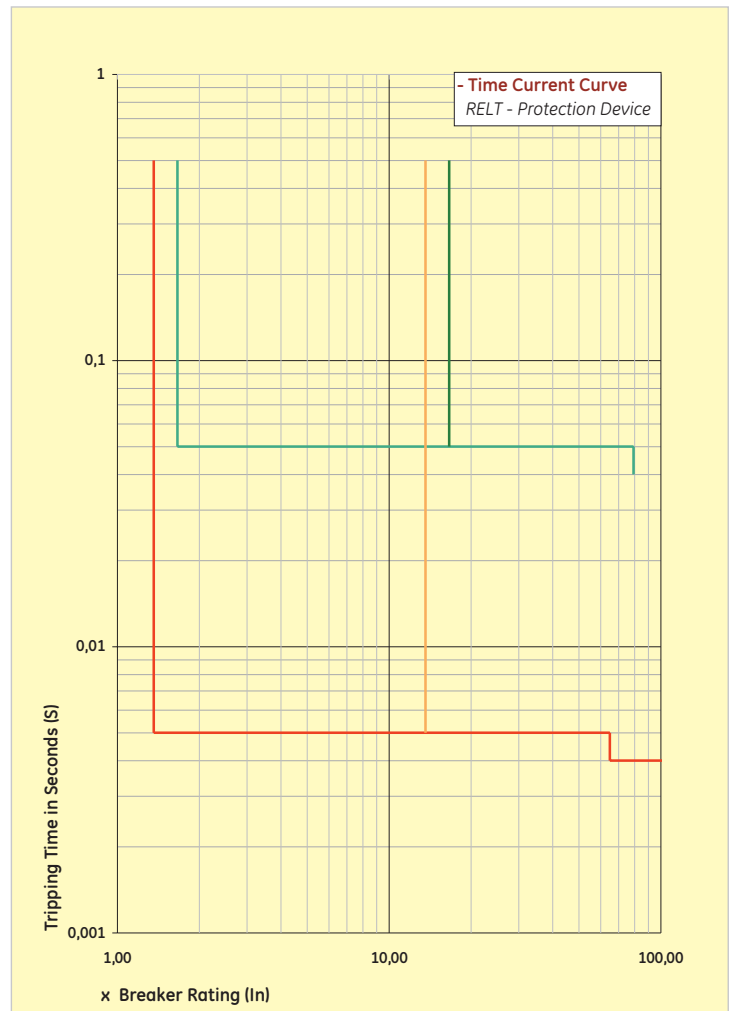
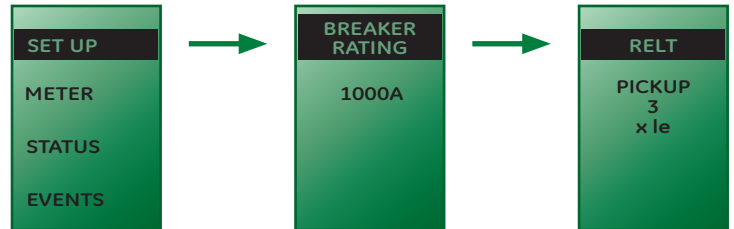
In order to limit the current levels during such events and to reduce their time span, the EntelliGuard™ G Electronic Trip Unit can be equipped with a temporary Reduced Instantaneous Device.

The RELT device can be turned ON by accessing input one of the trip unit ⁽¹⁾. When the device is switched ON Relay output one ⁽¹⁾ changes position and reverts to it's standard position when RELT is OFF.

The RELT device can be adjusted from 1,5 to 15 ($\pm 10\%$) times the Chosen Primary Current Value (I_e) in steps of 0,5 (pick up setting). The device will trip the breaker within 50 Milliseconds.

The graph indicates the Maximum interruption time and non tripping time across the full current setting band and the transition to the HSIOC protection device (see page B.11). Information on how to set this device can be found in IEEE standard 1548.

(1) See section on electronic inputs and Relay outputs on page B.17



Standard on

GT-N

GT-H



Setting limitations of Short-circuit devices Short-circuit Protection: HSIOC, MCR

Setting Limitations of Short-circuit devices.

To prevent damage to the EntelliGuard™ breaker due to currents that exceed its design parameters, the maximum setting values of the ST & I devices are in some cases limited to a lower level.

These values are indicated in the adjacent table.

Breaker Rating In	Primary setting current Ie	Breaker Icw rating			
		50kA	65kA	85kA	100kA
5000A	5000A			10x	10x
6400A	6400A			10x	10x
		Maximum ST setting (x Ie) ⁽¹⁾			
2000A	2000A	24x	30x	30x	30x
2500A	2500A		25x	30x	30x
3200A	3200A		19x	25x	30x
4000A	4000A		15x	20x	24x
5000A	5000A			15x	19x
6400A	6400A			13x	15x

Breaker type is not available

HSIOC Protection device

To prevent very high level Short-circuit currents causing damage to their electrical installation and their components EntelliGuard™ Power Circuit Breaker are equipped with a HSIOC protection device.

This high-level Short-circuit device is installed in all EntelliGuard™ Breakers and is designed to trip the breaker at the specified Icw value of the device⁽³⁾. The device interrupts and thus limits the duration of these high level Short-circuits to 40 Milliseconds.

The HSIOC device is normally set at a value that is slightly higher than the specified 1 second Icw of the breaker in which it is installed. This to warranty selectivity at the specified 1 second level taking system tolerances into account⁽²⁾.

Making Current (MCR) Protection device

If a breaker is closed onto a Short-circuit current it is mandatory that the device interrupts before the electrical installation and its components incur any damage.

An MCR device is present in all EntelliGuard™ Power Circuit Breakers⁽³⁾ specifically designed to trip the breaker when closing onto a fault.

Overview of installed HSIOC devices in Automatic types:	Set value (rms)
<i>Envelope 1</i>	
GG04S to GG20S	50000 A
GG04N to GG20N	65000 A
GG04H to GG20H	65000 A
<i>Envelope 2</i>	
GG25N to GG40N	65000 A
GH32N & GH40N	65000 A
GG04E to GG20E	85000 A
GG25H to GG40H	85000 A
GH32H & GH40H	85000 A
GH32M & GH40M	85000 A
<i>Envelope 3</i>	
GG32G to GG40G	100000 A
GG40M to GG64M	100000 A
GG40L to GG64L	100000 A

Overview of installed MCR devices in Automatic types:	Set value (rms)
<i>Envelope 1</i>	
GG04S to GG20S	42000 A
GG04N to GG20N	50000 A
GG04H to GG20H	65000 A
<i>Envelope 2</i>	
GG25N to GG40N	65000 A
GH32N & GH40N	65000 A
GG04E to GG20E	85000 A
GG25H to GG40H	85000 A
GH32H & GH40H	85000 A
GH32M & GH40M	85000 A
<i>Envelope 3</i>	
GG32G to GG40G	100000 A
GG40M to GG64M	100000 A
GG40L to GG64L	100000 A

Overview of installed MCR devices in Non Automatic types:	Set value (rms)
<i>Envelope 1</i>	
GW04N to GW20N	65000 A
<i>Envelope 2</i>	
GW04M to GW40M	85000 A
GZ32H & GZ40H	85000 A
<i>Envelope 3</i>	
GJ40L to GJ64L	100000 A

(1) If the Short Time Device (ST) is turned OFF the highest instantaneous or extended instantaneous setting is reduced to 15 x Ie for all types ≤ 4000A and to 10 x Ie for the 5000 and 6400A types

(2) If the breaker is not equipped with an Instantaneous protection device (I or Hi) or in cases where device is set to off the HSIOC device current threshold is automatically reduced by 10%

(3) Only included in selected NON Automatic types



Ground fault Protection: GF and GFD (Residual Type)

Ground Fault (GF) Protection

To protect an installation or a part thereof against indirect contact, Protection Devices can be used to automatically disconnect the power supply when a fault to earth is detected. The HD384 installation standard requires that the mentioned device senses the fault and then interrupts the supply within a specified time frame.

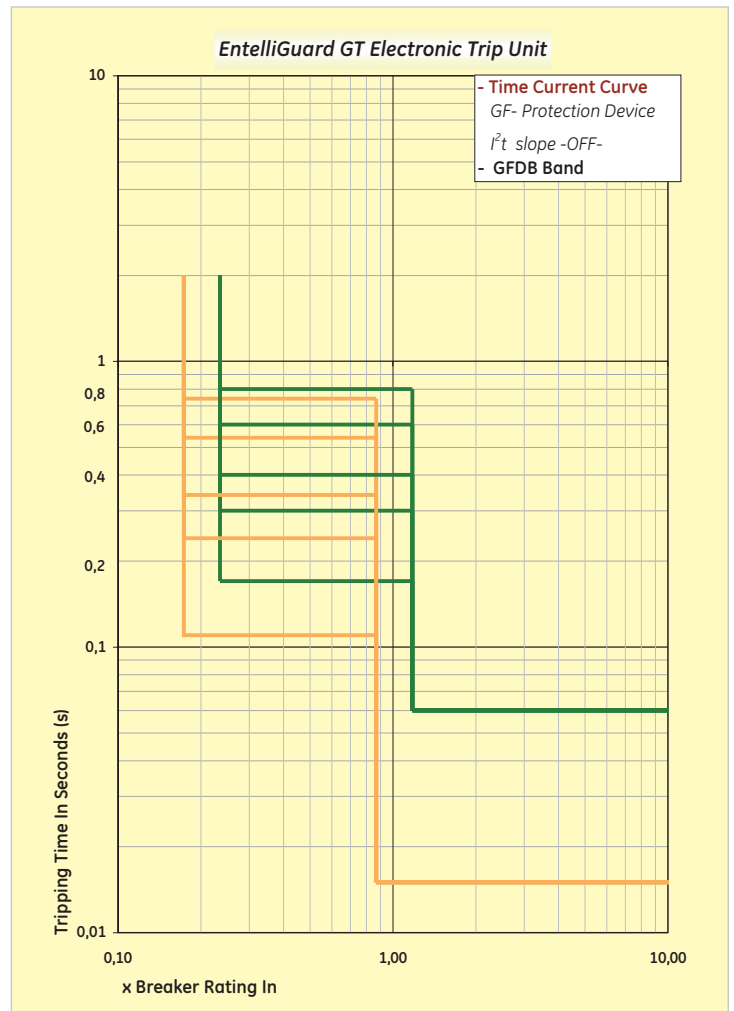
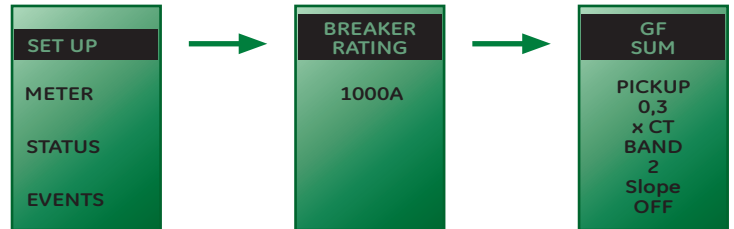
A Short-circuit device as an EntelliGuard™ Power Circuit Breaker can be used to meet this requirement. However these Short-circuit Protection devices are normally set at values that are too high to detect normally occurring faults to Earth.

The optionally available Ground Fault protection feature is specifically designed to detect lower currents than a standard Short-circuit Device and operate by residually summing the current in the Phases and Neutral. When a fault to Earth creates an unbalance in the system the resulting Fault Current is detected by the device that produces an alarm signal or trips the associated Circuit breaker thus disconnecting the circuit.

The EntelliGuard™ Ground fault device has an adjustment range of 0,2 to 1⁽¹⁾ (±15%) times the chosen breaker rating (In) and can be set in steps of 0,01 (pick up setting). To allow selectivity with other downstream Protection Devices there are 14 different time band settings available.

The graph indicates a number of the available 14 time bands across the full adjustment range. The table contains the minimum delay time and the maximum total interruption times for all time band settings.

The Ground fault device must monitor the current in all Phases and the Neutral. When a 3 pole device is used in a 4 wire (3phase + Neutral) system a 4th sensor must be placed in the Neutral⁽²⁾. On use of a 4 pole EntelliGuard™ breaker the sensor is already present in the Neutral pole.



Ground Fault tripping times at indicated levels per selected GFDB band -I²t slope OFF, in Milliseconds

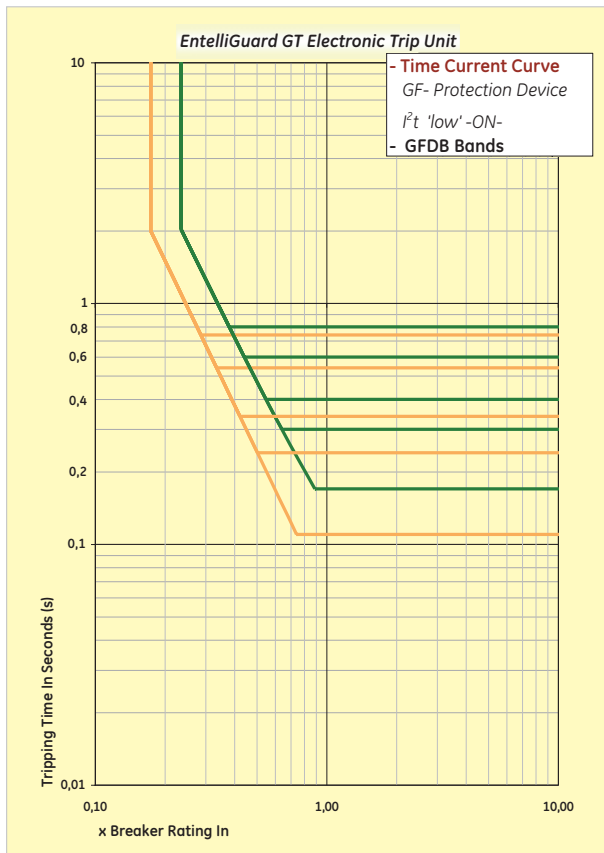
x Ir		1	2	3	4	5	6	7	8	9	10	11	12	13	14
0,2 x	Tripping	110	120	140	170	190	240	270	340	400	450	600	700	800	900
±10%	Non Tripping	50	60	80	110	130	180	210	280	340	390	540	640	740	840
0,6 x	Tripping	110	120	140	170	190	240	270	340	400	450	600	700	800	900
±10%	Non Tripping	50	60	80	110	130	180	210	280	340	390	540	640	740	840

(1) When an auxiliary supply is connected (24V DC) an extra setting range of 0,1 to 0,2 becomes available

(2) Use a Rogowski coil of the appropriate rating



Ground fault Protection: GF and I²t slope

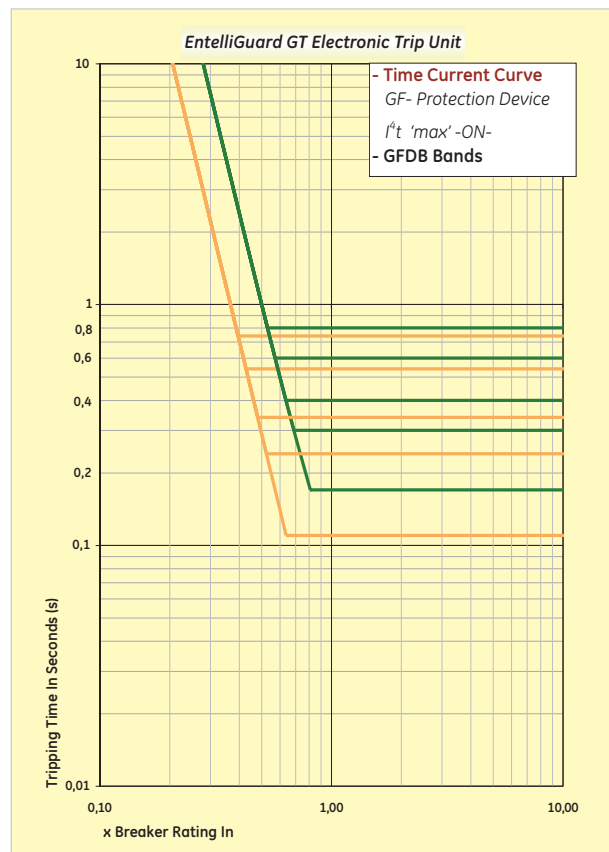
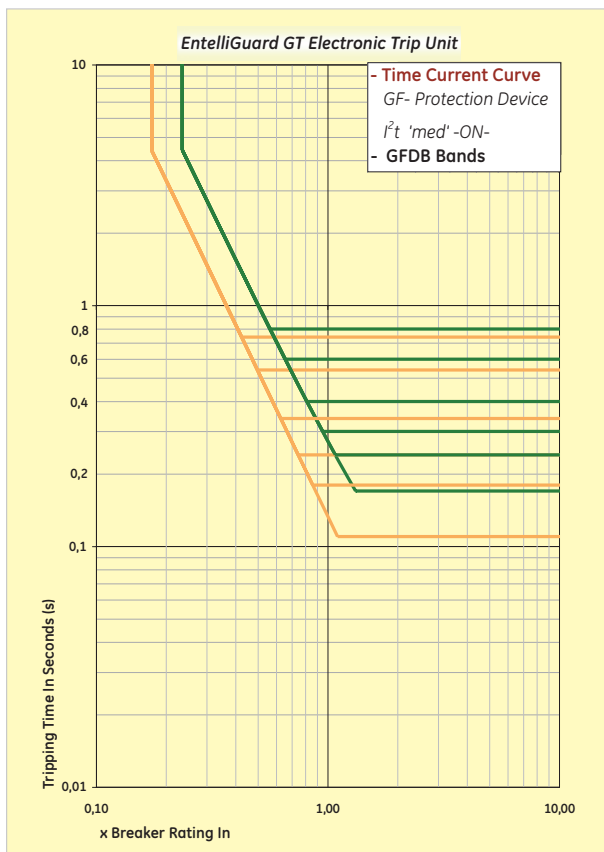
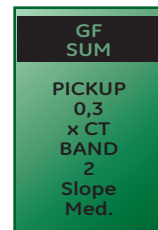


Ground Fault Protection I²T Bands (slope)

The GF device can also be set to a slope value. The available multiple I²t slopes are normally used to achieve selectivity with downstream fuses or to improve selectivity with downstream circuit breakers.

The user has the possibility to choose a current adjustment of 0,2 to 1⁽¹⁾ times the chosen breaker rating (In) in steps of 0,01 (pick up setting) and one of 14 time bands.

The three graphs depict the available I²t slopes (Set at position Low, Med. or High) and their intersection with several of the available 14 time bands across the full adjustment range.



Optional on

GT-E

GT-S

GT-N

GT-H

(1) When an auxiliary supply is connected (24V DC) an extra setting range of 0,1 to 0,2 becomes available



Ground fault Protection

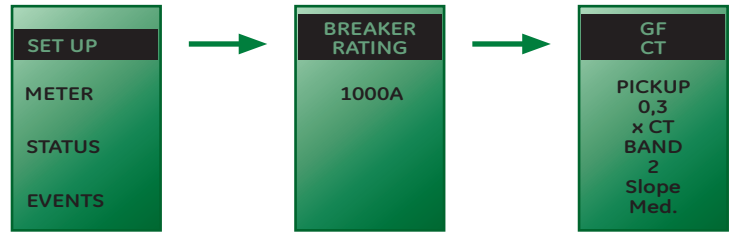
Ground Return Method, Source Ground Return Method
Restricted Earth Fault Applications (REF)

Ground Fault Protection (EGF) 'Source Ground Return' method

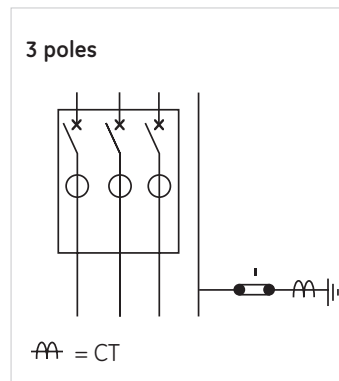
Optionally the EntelliGuard™ Electronic Trip unit can be used with an alternative groundfault protection scheme in which the Neutral to Earth Current is measured by an 'Earthleakage Leg Sensor' placed in the Neutral and Earth link of the system.

This option requires the use of an auxiliary supply of 24VDC and the Electronic Trip Unit needs to be set to the option CT input. An Earth leg C needs to be placed in the near vicinity of the break⁽¹⁾ and an interposing CT needs to be mounted in breaker. When the sensor detects a fault current the EntelliGuard™ trip trips the associated Circuit breaker thus disconnecting the circuit or optionally, produces an alarm signal.

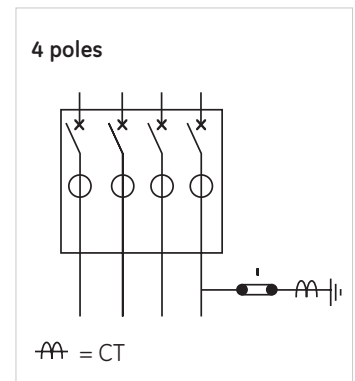
The EntelliGuard™ device has an adjustment range of 0,2 to 1⁽²⁾ (+/-15%) times the chosen breaker rating (In) and can be set in steps of 0,01 (pick up setting). To allow selectivity with other downstream Protection Devices there are 14 different time band settings available and three I²T slope settings (Same setting data and curves apply as on the standard GF residual (sum) protection).



4 Wire system



4 Wire system



Optional on

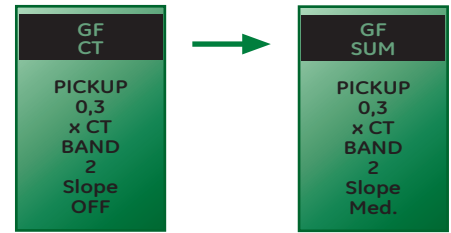
GT-H

Dual Groundfault Protection (Residual or Sum & Source Ground Return or CT)

The EntelliGuard™ Electronic Trip Unit allows the user to combine the functionality of both the GF sum and GF CT systems thus creating a sophisticated Dual Ground Fault protection system.

Based on the chosen breaker configuration and the network configuration in which the device is used devices as indicated in the adjacent table are required.

An interposing current transformer (CT) is required. When a dual function ground fault is ordered off works, this device is supplied as a part of the factory mounted assembly. If a GT-H type trip unit with a dual groundfault function is ordered as a separate item the device is included in the trip unit packaging.



Network	EntelliGuard™ nr. of Poles	GF Residual (SUM)	GF Source Return (CT)	GF sum PLUS GF CT
3 wire (3 phase)	3		4th CT Int. CT	4th CT Int. CT
4 wire (3 phase + Neutral)	3	4th Rg	4th CT Int. CT	4th CT Int. CT 4th Rg
	4		4th CT Int. CT	4th CT Int. CT

Optional on

GT-H

(1) Limited to 10 meters

(2) When an auxiliary supply is connected (24V DC) an extra setting range of 0,1 to 0,2 becomes available



Zone Selective Interlock, Load Shedding and Trip Indication

Zone Selective Interlock
Load Shedding Function
Trip Reason Indicators (Event Logging) & Trip
Operation counter (Data acquisition package)



Zone selective Interlock (ZSI)

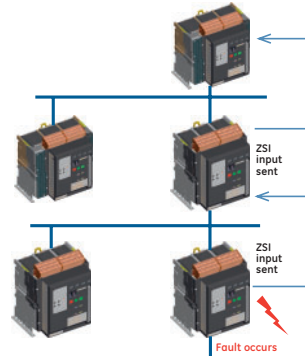
This optional device has been specifically designed to combine **Speed** and **Selectivity**. It requires one or two simple 2 core wire to connect the ZSI in and output between two or more Electronic Trip Units⁽¹⁾. If a breaker detects a fault it will send a signal to the upstream breaker to move its present time setting to another predefined higher level. If the Short-circuit protection device has NO time setting band (Instantaneous), it simply gets a signal to wait another 5 half cycles before tripping. The breaker that originally detects the faults only trips after transmitting the indicated signals.



The EntelliGuard™ Electronic Trip Unit uniquely offers this function on the following protection devices:

Time delayed Short-circuit Protection (ST..STDB)
Standard and Source Return Ground Fault protection (GF, GFDB)
Instantaneous (I_i and I_{hi})

When a ZSI input is received the breaker changes its time band from the standard device setting to the ZSI setting. Both of these settings are user definable and can be set independently.



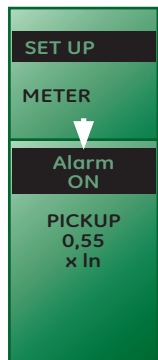
Optional on

GT-N

GT-H

Load shedding alarm output

The load shedding device has been designed to allow the user to switch off NON priority loads before the LT functions trips the breaker due to an overload.



It can also be used to verify the current consumption in the circuit which the EntelliGuard™ breaker protects. This to verify that the current running in the circuit does not exceed a certain pre-determined value.

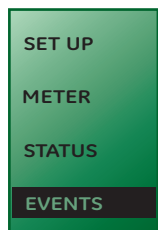
The device monitors the current in the circuit and provides an alarm signal if the load in one phase of the protected circuit exceeds a pre-defined value. The associated channel can be set ON or OFF and be adjusted in current values from 0.5 to 1 x the breaker rating In) in steps of 0.05.

When the highest measured phase current exceeds the 'ON' value set for longer than 60 seconds an output is provided to indicate that 'load shedding' may prevent an overload tripping event. When the highest measured phase current drops below the 'OFF' setting for longer than 60 seconds, the output is stopped⁽²⁾.

This function is part of the data acquisition and relaying package available on the GT-H trip unit type.

Optional on

GT-H



Trip Reason Indicators (event logging) Trip Operations counter

The Electronic Trip Unit keeps track of data indicating why the associated breaker has tripped and on how many occurrences have taken place. Accessible under the 'EVENTS' menu the Trip Reason Indicator keeps track of a maximum of 10 events that have caused the EntelliGuard™ breaker to trip. The device stores the voltage, the phase's involved, the current value, the reason of the trip and the trip number (see counter). When an auxiliary voltage is connected, the time and date of the event are also stored. The Trip Reason Indicator registers events for the following devices.



Overcurrent (LT, ST, I GF)
Relaying Functions (see page B.13)
Shunt or Undervoltage Release (If the associated contacts are connected via the trip unit)

Accessible under the 'STATUS' menu the Trip Operations Counter registers a maximum of 255 overcurrent faults with their reason (LT, ST, I or GF-EF). The data can be viewed and reset through the STATUS menu Pickup Status option.

Optional on

GT-E

GT-S

GT-N

GT-H

(1) See schematics on page E.4
(2) See section on Relay Outputs on page B.17



Measurement Functions and Power Supplies

Ammeter
An Ammeter is supplied with each EntelliGuard™ Electronic Trip Unit. The current in each of the three phases and the Neutral can be viewed.

Standard on

GT-E

GT-S

GT-N

GT-H

The device has an accuracy of 2% when viewed at the nominal current of the breaker and an accuracy of 5% when viewed when the breaker is running at 50 - 85% of its full load.

Parameter	Measured	Units	Resolution	Accuracy at 100% of breaker rating
Current	L1, L2, L3, N	A	0000	2%

Full Measurement Package
GT-N & GT-H type Electronic Trip Units have an advanced measurement facility that provides the user with a comprehensive overview of all relevant electrical parameters and their values. The adjacent table indicates the available parameters, the units used and their accuracy.

A Peak Power Demand calculation is available for Real Power(KW) only. Here the data is stored and when necessary renewed at a user definable pre-set time interval.

When the new Peak Demand value exceeds the previous stored value the new value replaces the old in Memory.

The Electronic Trip Unit has an option to reset this value.

When the option for display (Meter) is opened, a calculation is initiated that calculates each value based on a one second time frame.

The device also calculates the sum of the used power in kWh, KVAh and KVArh as a total for all 3 phases. These values are kept and re-calculated every second. The Electronic Trip Unit has an option to allow these summations to be reset.

Based on the same one second calculation method, a Power demand value is determined for Real (KW), Apparent (KVA) and Reactive (KVAR) power. If the Power supply has a neutral the values are calculated per phase and as a total of all three phases.

Parameter	Measured	Units	Resolution	Accuracy at 100% of breaker rating
Current	L1, L2, L3, N	A	0000	2%
Voltage	L1, L2, L3	V	0000	2%
Power Factor	L1, L2, L3	%	00	4%
Frequency	L1, L2, L3, N	Hz	00	1 cycle
Apparent Power	L1, L2, L3	kVA	000,000	4%
Real Power	L1, L2, L3	KW	000,000	4%
Reactive Power	L1, L2, L3	KVAR	000,000	4%
Average Power demand	L1, L2, L3	kW	000,000	4%
	L1, L2, L3	KVAh	000,000	4%
Energy	L1, L2, L3	KWh	000,000	4%
Peak Power Demand	L1, L2, L3	KW	000,000	4%



Power Conditioners and Auxiliary Power Supply

To use the above mentioned comprehensive measurement facilities, it is necessary to track the 3phase and Neutral network voltages and to input these values into the Electronic Trip Unit. For this purpose the EntelliGuard™ line includes a number of 'Power Conditioners' that transform and condition a standard network power supply to a signal that the trip unit can safely use and read. When optioning the measurement facility for the 1st time, the Electronic Trip Unit will require the user to set the primary voltage values.

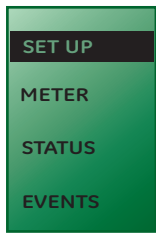
A number of advanced Trip Unit options require an auxiliary supply of 24V DC. A unit that transforms and conditions a standard network power supply to 24V DC is available for this purpose. The auxiliary supply also improves the speed of the trip unit setup function at low circuit loads (<20%) and when no standard power supply is present.

A separately available Test Box Kit can also be used as a temporary power supply.

This device has a battery pack and includes a 24 V DC auxiliary power supply.



Protective Relaying Functions; Relay and Trip Unit Inputs Wave Form Capture Option



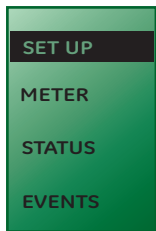
Protective Relaying Functions

The GT-H Electronic trip unit has five protective relay functions. These can be switched ON or OFF and when active produce an alarm signal that is added to the Event Log and transmitted through the communication bus. Each relay function can be configured to trip the breaker or/ and to send an alarm signal via a Relay Output.

Protective Relay	Adjustability	Steps	Accur.	Trips Breaker
Oversvoltage	110% -115% of line voltage	1%	2%	ON or OFF
Oversvoltage Delay	1 to 15 seconds	1sec	± 0,1 s	
Undersvoltage	30% - 85% of line voltage	1%	2%	ON or OFF
Undersvoltage Delay	1 to 15 seconds	1sec	± 0,1 s	
Voltage Unbalance	10% -50% difference between highest & lowest phase when compared to average	1%	2%	ON or OFF
Voltage Unbal. Delay	1 to 15 seconds	1sec	± 0,1 s	
Power Direc. Reversal	Line- to-Load OR Load to Line			ON or OFF
Power Reversal setting	From 10 to 990kW	10kW	2%	
Current Unbalance	10% -50% difference between highest & lowest phase when compared to average	1%	2%	ON or OFF
Current Unbal. Delay	1 to 15 seconds	1sec	± 0,1 s	

Standard on

GT-H



Relay Outputs

There are two programmable relay outputs available rated at 1A 30V AC or DC. The first is dedicated to the Reduced Instantaneous Device whilst the second can be assigned to single functions, a group of functions or to the protective relays functions mentioned above. Accessible under the 'SETUP' the output is wired out through the secondary terminals of the breaker as indicated on page E.7.

Relay Output Reset (Group 1, 4, 5 & 6)

If the reason of the contact closure is removed the contact will re-open. This typically occurring when a health status warning is produced or when a current alarm drops below it's threshold. If the breaker trips whilst the relay contacts are activated the contacts will be reset and revert to their original open position.

Relay Output reset (Group 2, 3, & 8)

If a 24 V DC power supply is present and the event associated with the relay closure causes the breaker to trip the contacts will not change position. A breaker re-set & re-closure will reset the contacts to their original open position.

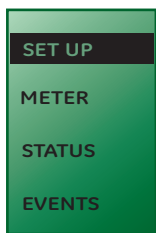
Function	Group
GF Alarm ⁽¹⁾	Assigned to group 1
Over-current Trips (LT, ST, INST, GF)	Assigned to group 2
Protective Relays	Assigned to group 3
Current Alarm 1	Assigned to group 4
Current Alarm 2	Assigned to group 5
Health status	Assigned to group 6
GF Alarm and GF trip indication	Assigned to group 8

(1) Only works when a trip unit has the Ground fault alarm installed (GFA).

Standard on

GT-N

GT-H



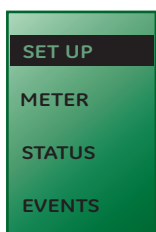
Electronic Trip unit INPUTS

There is a total of 2 programmable inputs available. The first is dedicated to switch the Reduced Instantaneous ON. The second can be used to trip the breaker. The inputs are suitable for voltages up to 24V AC or 30V DC. Accessible under the 'SETUP' the outputs are wired out through the secondary terminals of the breaker as indicated on page E.7.

Standard on

GT-N

GT-H



Wave Form Capture option

When a fault has taken place, it can be of importance to visualize the event. The Wave form Capture option included in the GT-H type Electronic Trip Unit can track and visualize any fault event. The device tracks 8 cycles, 4 before and 4 after the event with resolution of 48 samples per cycle at 50Hz and stores the results in memory. It registers

events in all three phases and the Neutral. After the event, the waveform event is stored and can be accessed by using the waveform client module of the Enervitsa software. When the upload into this software is complete, the Trip Unit will reset this function and be available to register the next event.

Standard on

GT-H



Communications

Neutral protection, Reset Choice, Rating Plug and Test Kit



Communications

A number of the GT Electronic trip unit types can be optioned to allow the Breaker & Trip Unit combination to communicate data bi-directionally through Modbus or Profibus. The communication option needs a 24 V auxiliary voltage input capable of supplying 90mA for the Modbus option and 240mA for the Profibus option.

Modbus and Profibus can be directly connected to the Trip Unit without the use of any interfaces. In combination with communications the use of the specifically designed Command Closing Coil and auxiliary contacts with signal ratings are required.

Trip unit parameters as over current settings, protective relay functions, alarm settings etc. can be accessed through communications. A locking

password is provided that prevents unauthorized changes through communication or the keypad.

The Modbus variant is fully compliant with the Modbus Protocol and uses 2 a wire 485 connection. The device is configured to stay on one fixed baud rate, or to cycle through the baud rates until communication is established. The link host can operate at baud rates between 300 and 19,200.

The Profibus protocol is integrated in specific models of the GT-H Trip Unit and uses a four wire RS 485 connection. Profibus DP is supported in A-Cyclic and Cyclic mode. For the cyclic mode the associated gsd file is available on request.

A communication register can be supplied for both versions.



Neutral Protection

When inserted into a 4 pole breaker the EntelliGuard™ Electronic Trip Unit senses that the breaker in which the device is installed has a Neutral Pole. Via the set Up menu, a Neutral Setting option then becomes available in which the LT, ST and I protection device can be jointly set to

one of the following values:

0%, 50%, 63% or 100%. x the values set for the phase protection device.

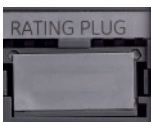


Reset Choice Function

When a fault has occurred the Trip Unit trips the associated breaker. It is then deemed normal installation practise to verify the reason of the fault before reconnecting power by resetting and switching the breaker on. The advanced options included in the EntelliGuard™ Trip Unit provide the user with the fault reason, magnitude and location, thus allowing the user to easily establish the

required corrective actions. To follow this procedure Trip Unit reset function should be set to MANUAL. However, in some cases it is required that the breaker resets itself automatically. If this functionality is required, the reset function should be set to AUTOMATIC.

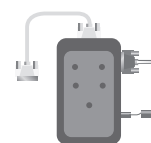
A selector switch on the Trip Unit front face allows the user this choice.



Full Range Rating Plug

Each EntelliGuard™ Electronic Trip Unit must be equipped with a separately available Rating Plug to allow it to function correctly. The Full Range Rating Plug is plugged in to a jack on the trip Unit Front Face. When this device is not installed, the

Trip Unit will revert to its minimum setting, which has as value of 16-18% of the breaker rating In.



Test Kit

To verify that the Electronic Trip Unit is interfacing correctly with the Breaker and to establish if the circuitry in the Trip Unit is functioning correctly, a test kit is available. The device has a battery pack

and a 24V auxiliary supply to allow its use in a secondary function as power supply of the Trip unit when no network power supply is available.

The device can be plugged into a jack on the trip Unit Front face.



Overview of GT Electronic Trip Unit Functionality

		GT-E	GT-S	GT-N	GT-H	Remarks	
Setting Interface	LCD Screen allowing access to 4 distinct Menu's	X	X	X	X	--	
	Touch pad adjustments	X	X	X	X	--	
	Multilingual	X	X	X	X	--	
	Adjustable Manual or Automatic RESET option	X	X	X	X	--	
Long Time or Overload Current Protection	6 primary current settings with FULL RANGE Rating Plug 1; 0,975; 0,9625; 0,95; 0,45 & 0,4 x Breaker rating In	X	X	X	X	--	
	11 secondary current settings Ir 1; 0,95; 0,9; 0,85; 0,8; 0,75; 0,7; 0,65; 0,6; 0,55; 0,5 x Primary setting Ie	X	X	X	X	--	
	Resulting setting Range 0,2 to 1 with 66 set points	X	X	X	X	--	
	22 Thermal Protection (C type) time bands available Ranging from class 0.5 to 40 (bands at 7.2 x Ir)	X	X	X	X	--	
	22 F type (fuse) time bands available	-	-	-	X	--	
	Neutral Protection 0-50%-63%-100%	X	X	X	X	--	
Short Time Short-circuit Current Protection	Cooling function and Thermal memory	X	X	X	X	--	
	Setting RANGE from 1,5 to 12 x Ir (LT setting)	X	X	X	X	--	
	Steps of 0,5 (A total of 22 settings)	X	X	X	X	--	
	Possibility to Switch OFF	-	-	-	X	--	
	17 Time delay settings (STDB) ranging from 30 to 940 Milliseconds delay setting result in a 90 to 1000 Milliseconds Clearing time	X	X	X	X	--	
	Clearance times to IEC 40979-1 and IEC 60364	X	X	X	X	--	
Instantaneous Short-circuit Current Protection	3 I ² t Protection time bands available	X	X	X	X	--	
	Standard range	I _n Setting RANGE from 2 to 15 x Ie (Primary Setting)	-	X	X	X	--
		Steps of 0,5 (A total of 28 settings)	-	X	X	X	--
		Possibility to Switch OFF	-	X	X	X	--
	Extended range	Selective Execution	-	X	X	X	--
		Fixed Instantaneous or HSI0C protection	X	X	X	X	--
		I _{in} Setting RANGE from 2 to 30 x Ie (Primary Setting)	-	O	O	O	--
	Reduced range	2-15 Steps of 0.5; 15-30x steps of 1 (A total of 43 settings)	-	O	O	O	--
		Possibility to Switch OFF	-	O	O	O	--
		Selective Execution	-	O	O	O	--
	Ground or Earth Fault Protection	Fixed Instantaneous or HSI0C protection	X	X	X	X	--
		I _n Setting RANGE from 1,5 to 15 x Ie (Primary Setting)	-	-	X	X	--
Steps of 0,5 (A total of 29 settings)		-	-	X	X	--	
Possibility to Switch OFF		-	-	X	X	--	
Remote and Local ON and OFF with position indication signal		-	-	X	X	--	
Measurement package		Setting RANGE from 0,1 to 1 x In (Breaker Rating) ⁽¹⁾	O	O	O	O	--
		Steps of 0,01 (A total of 92 settings)	O	O	O	O	--
		Possibility to Switch OFF	-	-	-	O	--
		14 Time delay settings (GFDB) ranging from 50 to 840 Milliseconds delay setting resulting in a 110 to 900 Milliseconds Clearing time	O	O	O	O	--
		Clearance times to IEC 40979-1 and IEC 60364	O	O	O	O	--
		3 I ² t Protection time bands available	O	O	O	O	--
Protective Relaying		Residual Principle	O	O	O	O	--
	Source Ground Return Principle	-	-	-	O	N	
	UEF, REF and SEF applications possible	-	-	-	O	N	
	Combinations of UEF, REF and SEF applications possible	-	-	-	O	N	
	Current (L1, L2, L3, N)	X	X	X	X	--	
	Voltage (L1, L2, L3)	-	-	X	X	--	
	Energy (kWh) Total Real	-	-	X	X	C	
	Real Power (L1, L2, L3, total)	-	-	X	X	C	
	Apparent Power (L1, L2, L3, total)	-	-	X	X	C	
	Reactive Power (L1, L2, L3, Total)	-	-	X	X	C	
	Total Power (L1, L2, L3, total)	-	-	X	X	C	
	Power (kW) Peak (total)	-	-	X	X	C	
Data Acquisition & Diagnostics	Demand Power (kW) (total)	-	-	X	X	C	
	Frequency (L1, L2, L3)	-	-	X	X	--	
	Voltage Unbalance	-	-	-	X	N	
	Undervoltage	-	-	-	X	N	
	Overvoltage	-	-	-	X	N	
	Current Unbalance	-	-	-	X	N	
Other	Power Reversal	-	-	-	X	N	
	Trip Target (trip reason indication)	X	X	X	X	--	
	Trip Info (Magnitude / Phase)	-	-	-	X	--	
	Waveform capture	-	-	-	X	N	
	Trip Counter	X	X	X	X	--	
	Event Logger (trip events)	X	X	X	X	--	
	Relay based on current level (load shedding)	-	-	-	X	--	
	Good & Bad Health Indicator	-	-	-	X	--	
	Watchdog	X	X	X	X	--	
	Zone Selective Interlock on ST, GF and I	-	-	O	O	--	
Shunt trip status input (2 inputs)	-	-	-	O	--		
UVR trip status input (2 inputs)	-	-	-	O	--		
General relay outputs (2) and electronic inputs (2)	-	-	X	X	--		
Communication 2 way	-	O	O	X	N		
Modbus	-	O	O	O	N		
Profibus	-	-	-	O	N		
24V DC Auxiliary Power supply	O	O	O	O	--		
Text kit with Power support function	O	O	O	O	--		

Key
X - Present; O = Optional, - = Not Possible

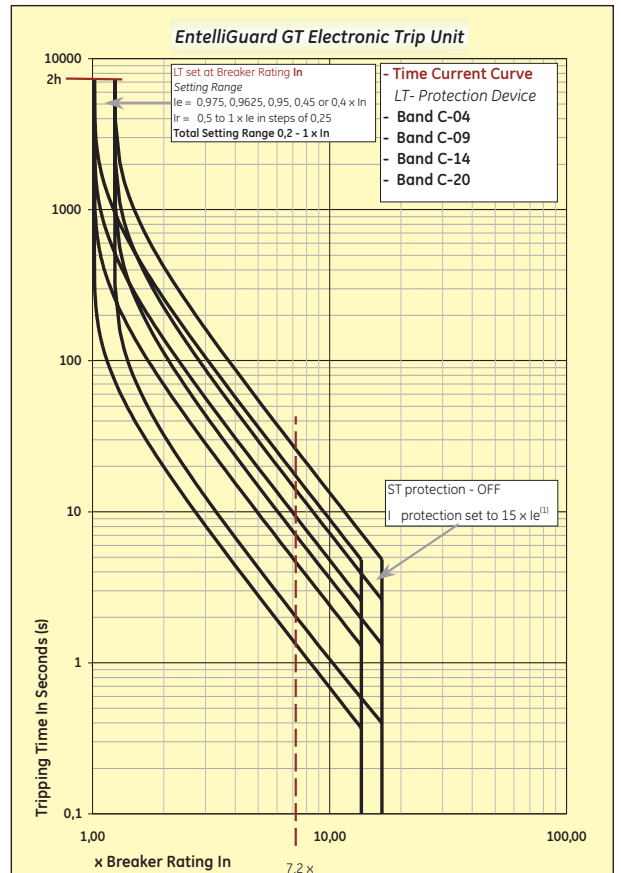
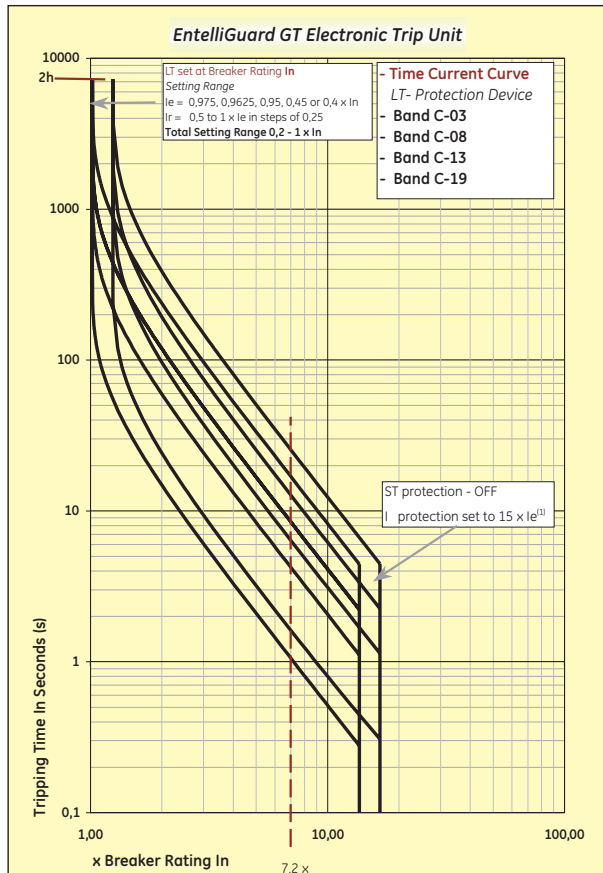
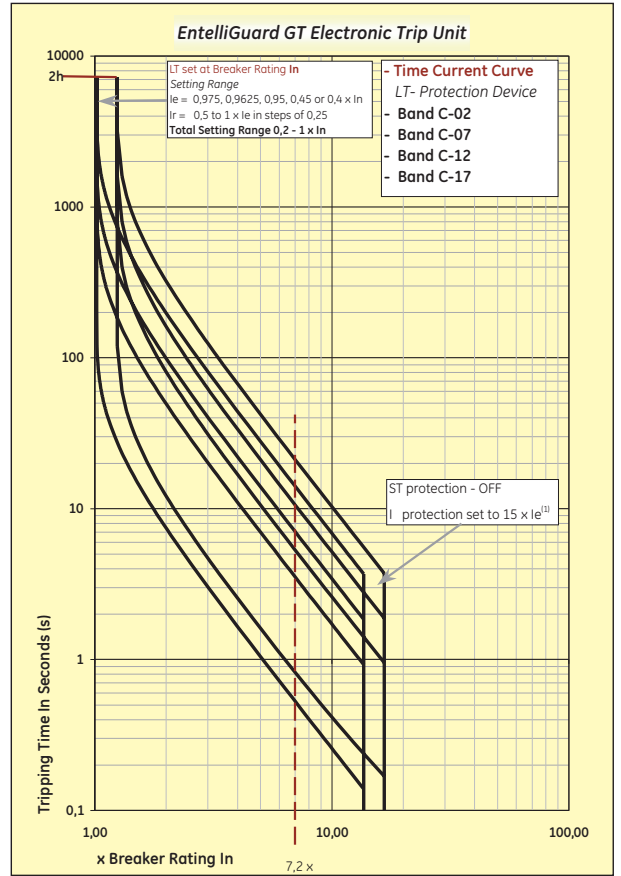
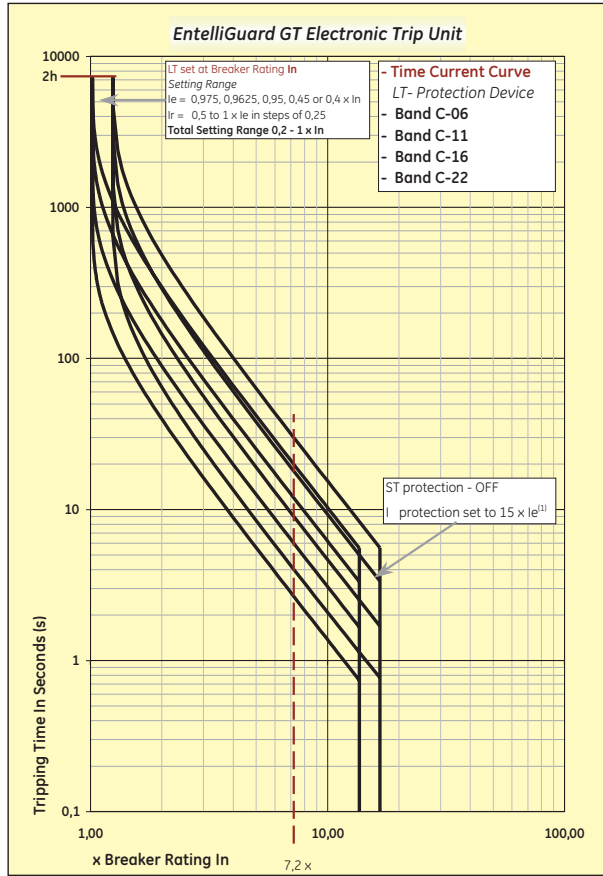
Remarks
N indicates that a 24V auxiliary power supply is required, a C indicates the need of a Power Conditioner

(1) Without a 24V auxiliary power supply, the lowest setting is 0.2



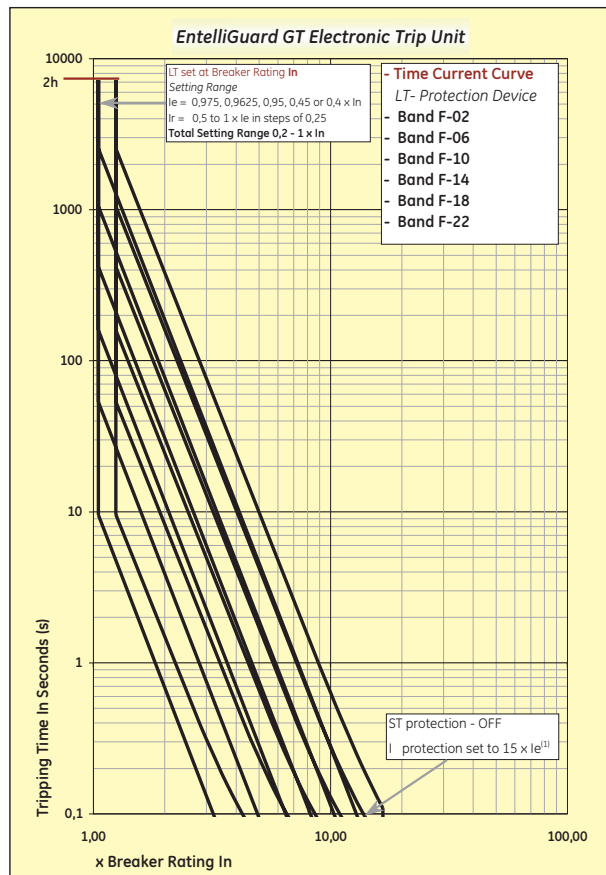
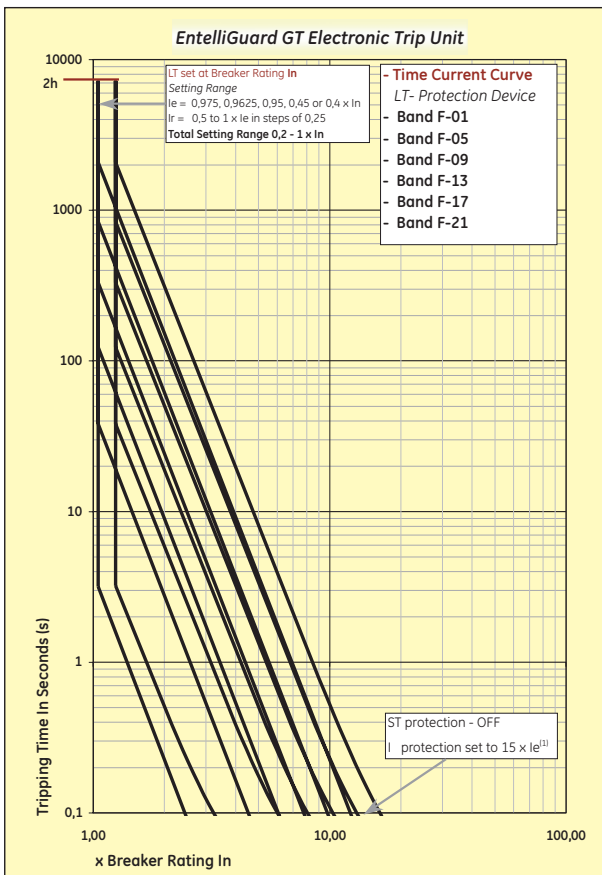
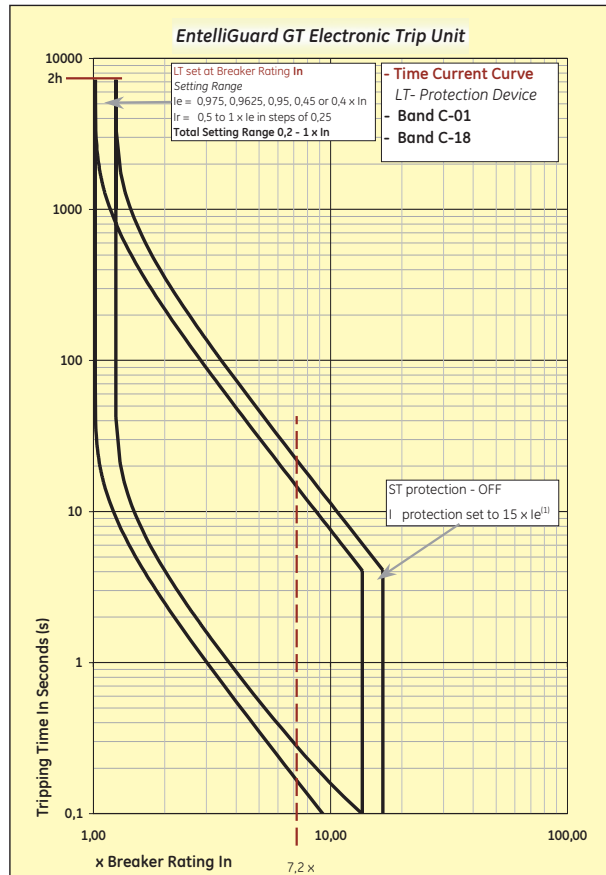
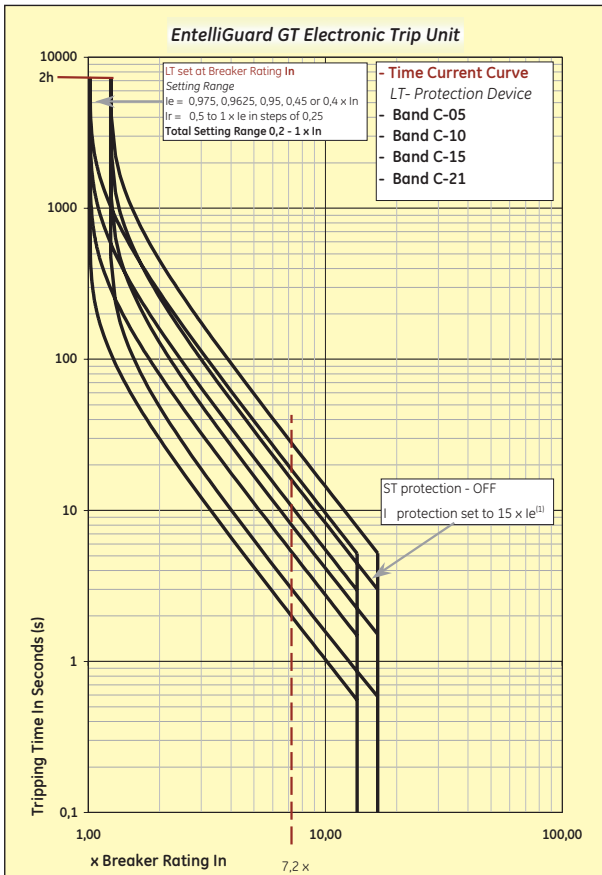
Time Current Curves (cold state)

LT Protection Device



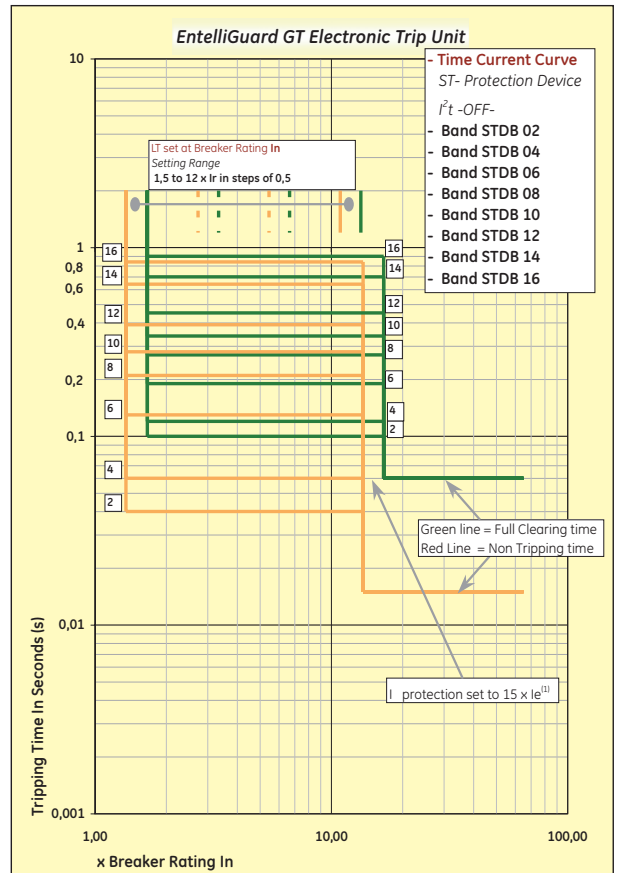
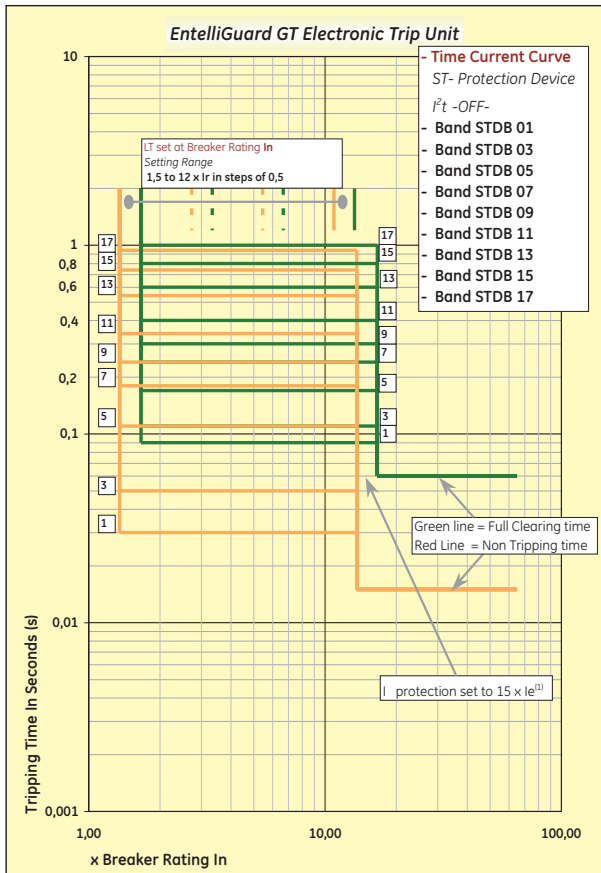
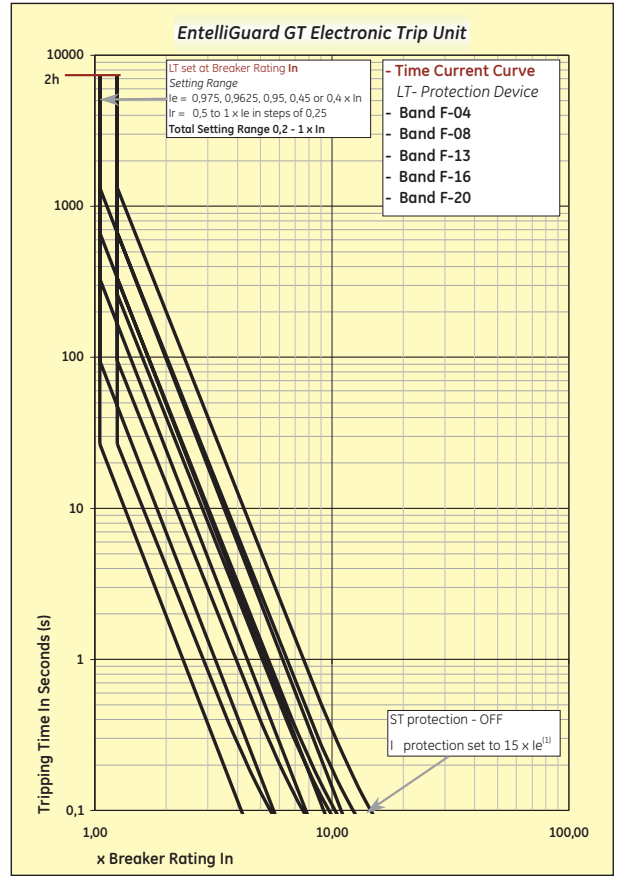
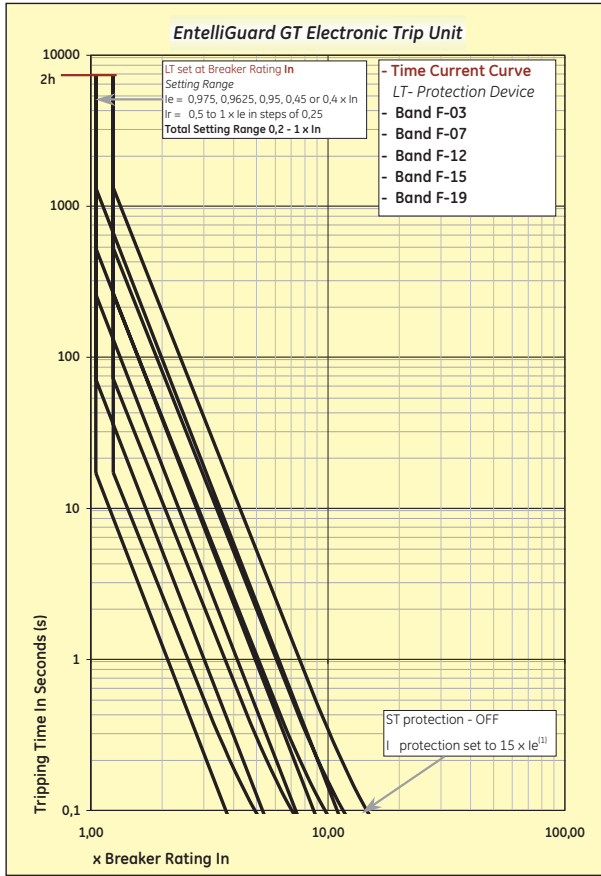
Time Current Curves (cold state)

LT Protection Device



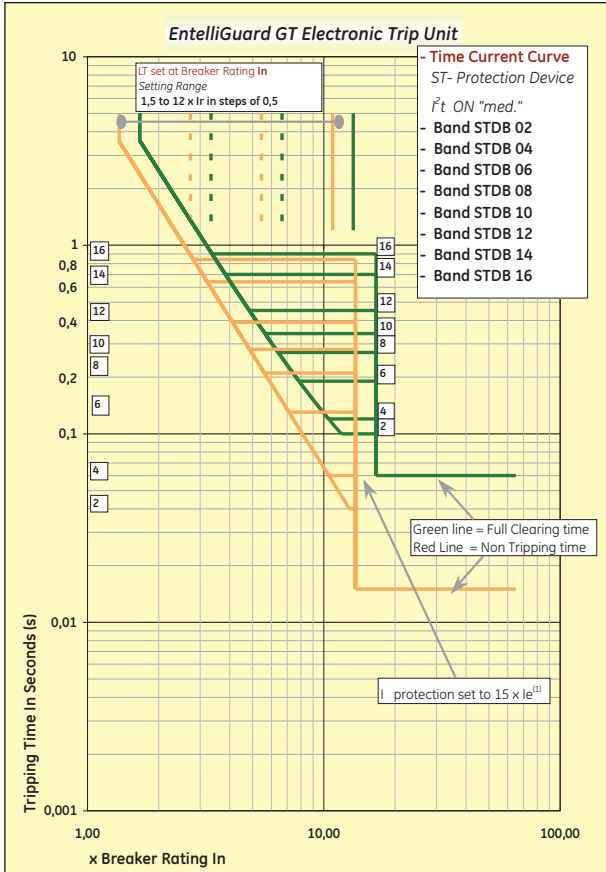
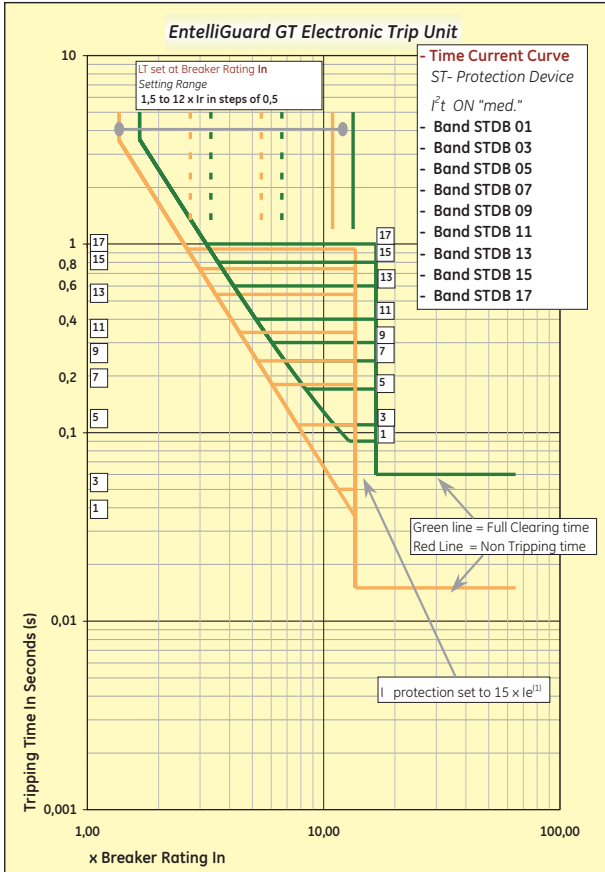
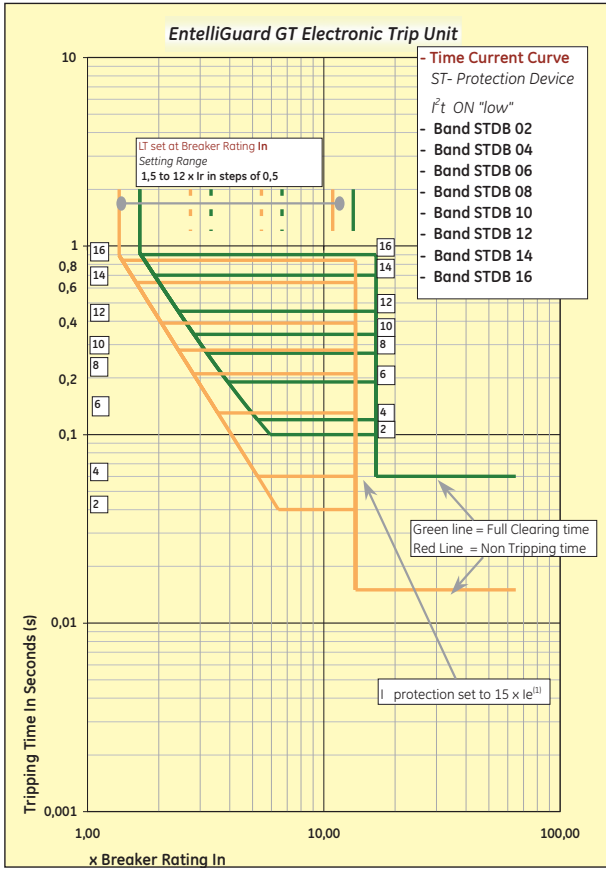
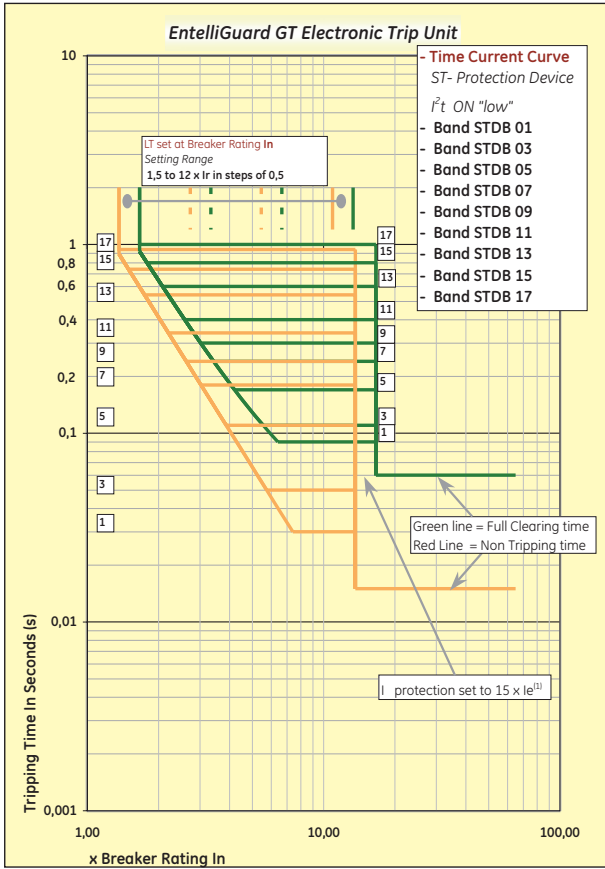
Time Current Curves (cold state)

LT & ST Protection Device



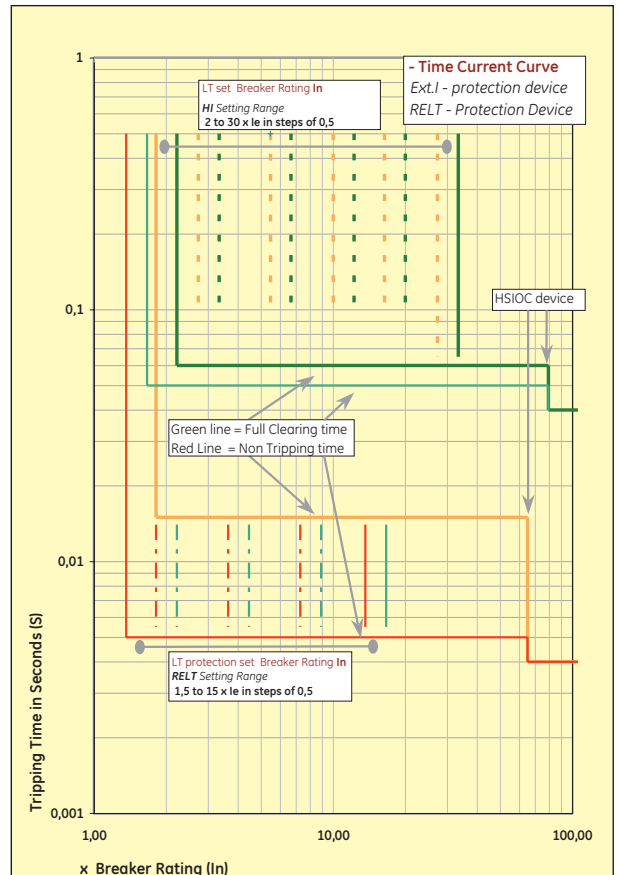
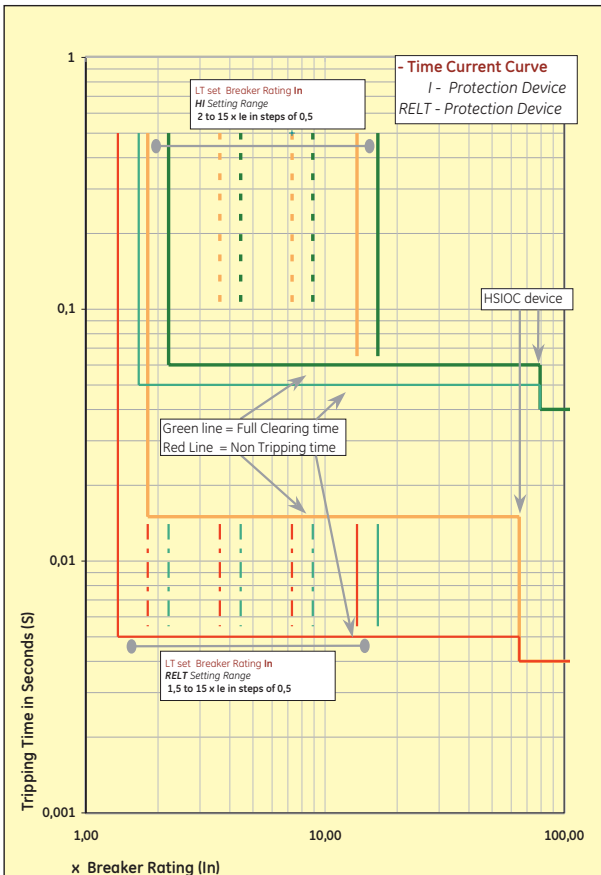
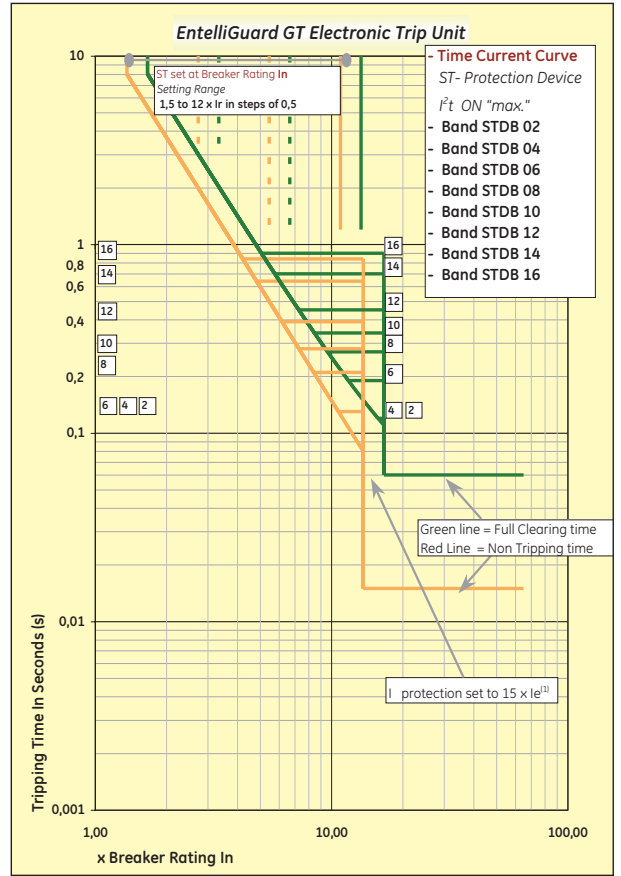
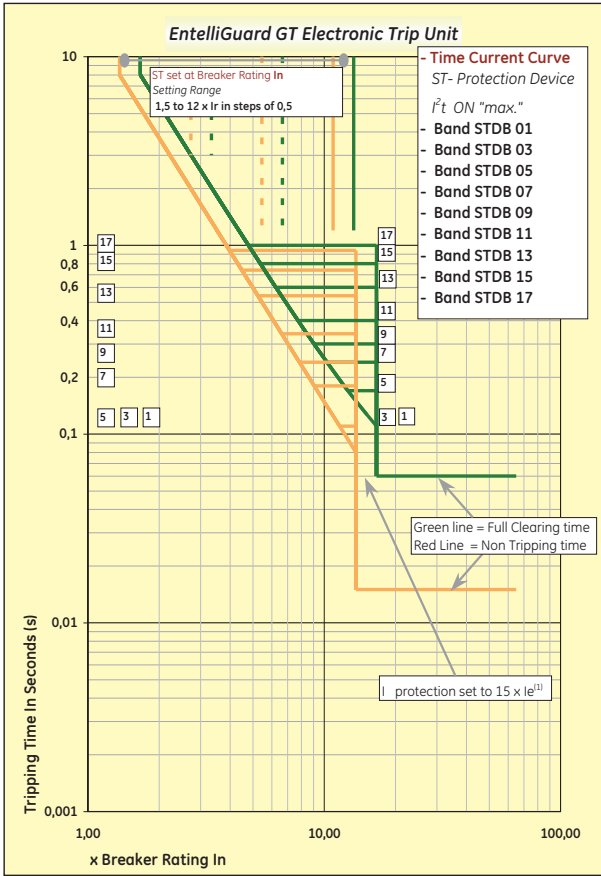
Time Current Curves (cold state)

ST Protection Device



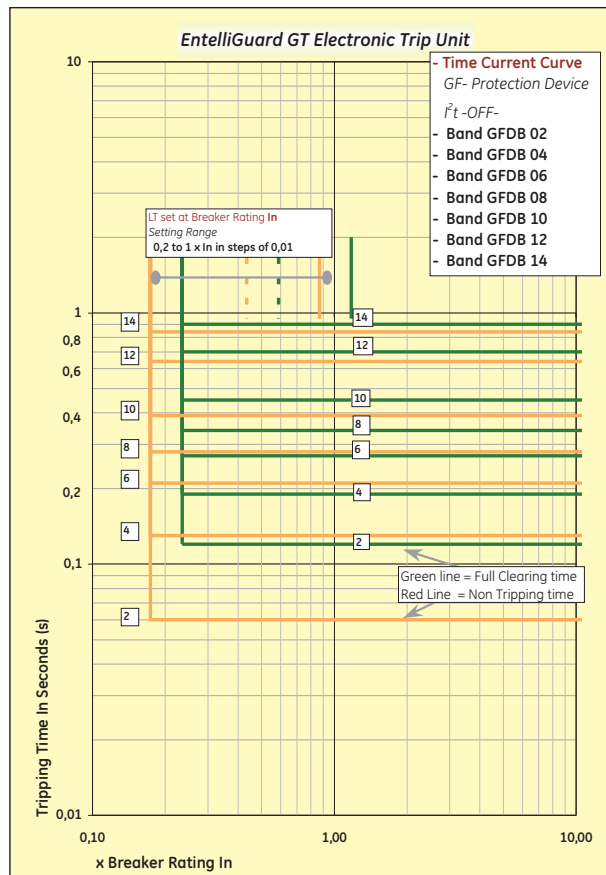
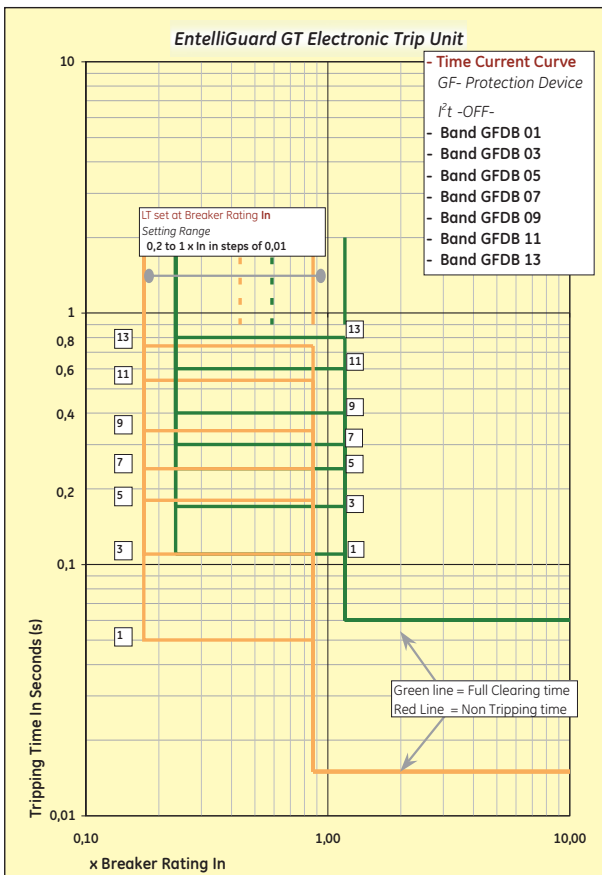
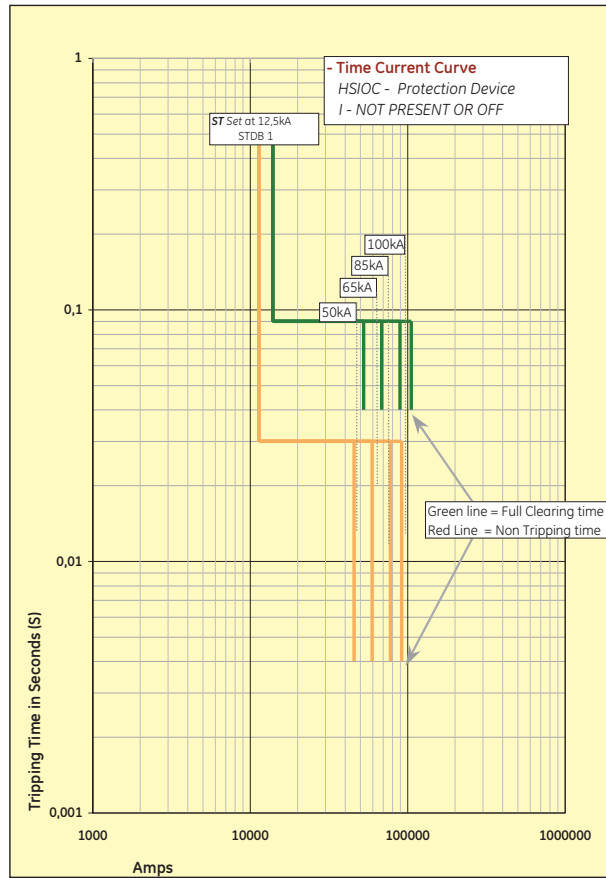
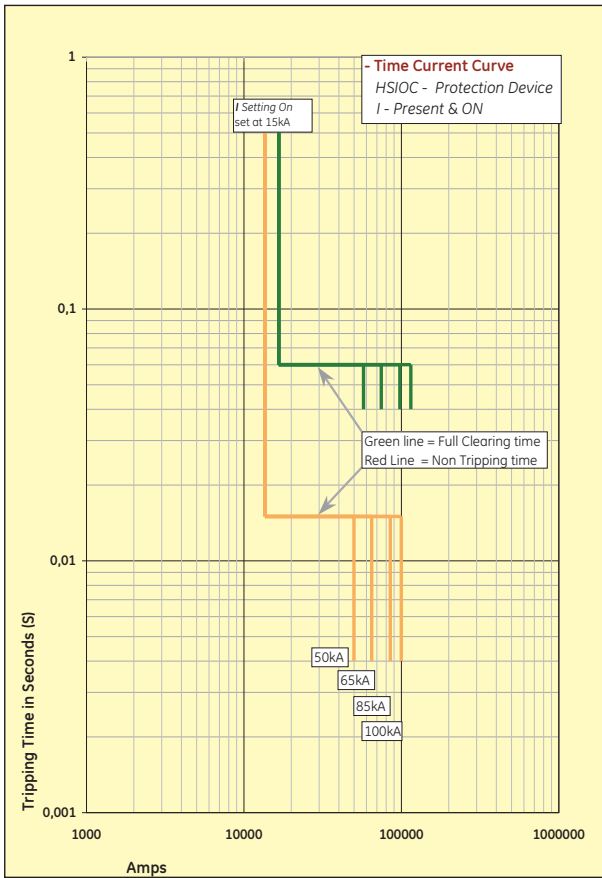
Time Current Curves (cold state)

ST and I Protection Device



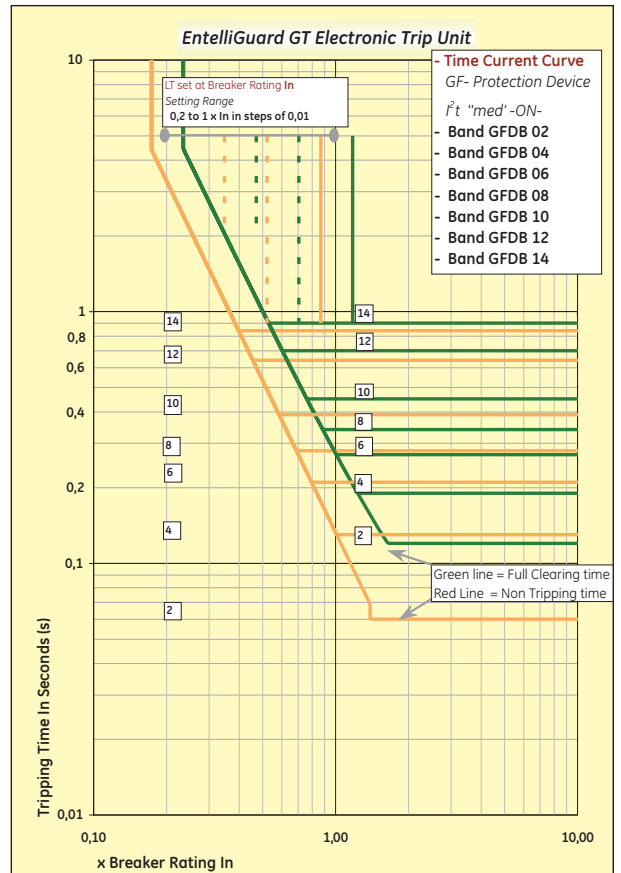
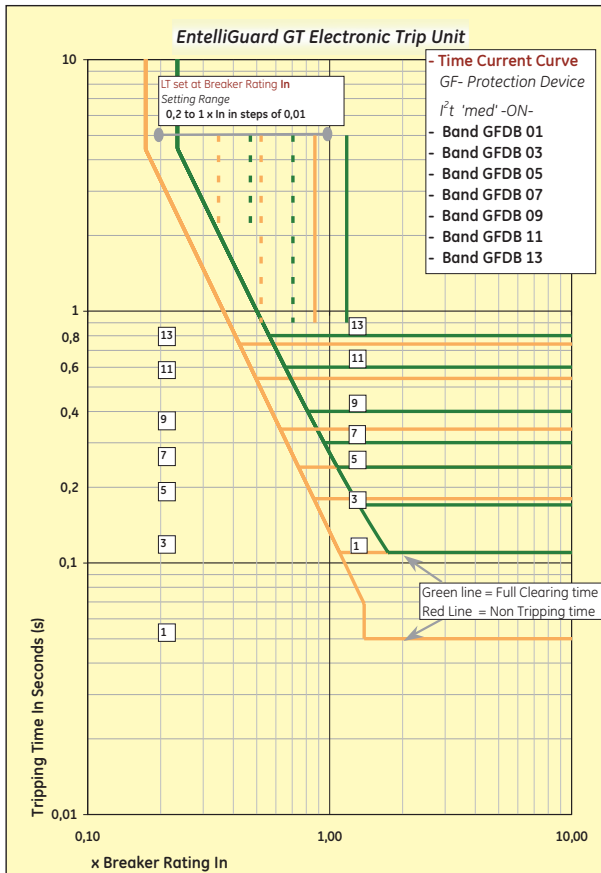
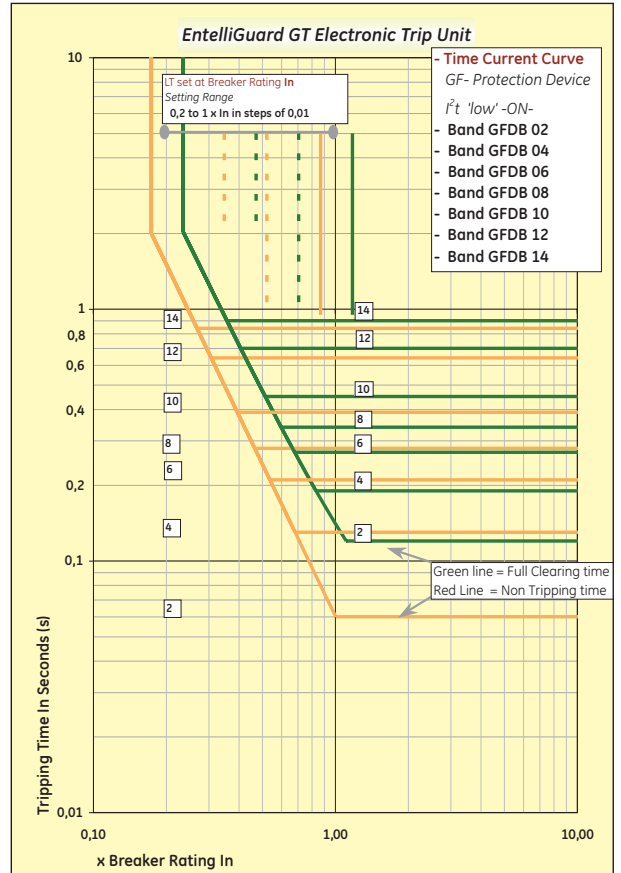
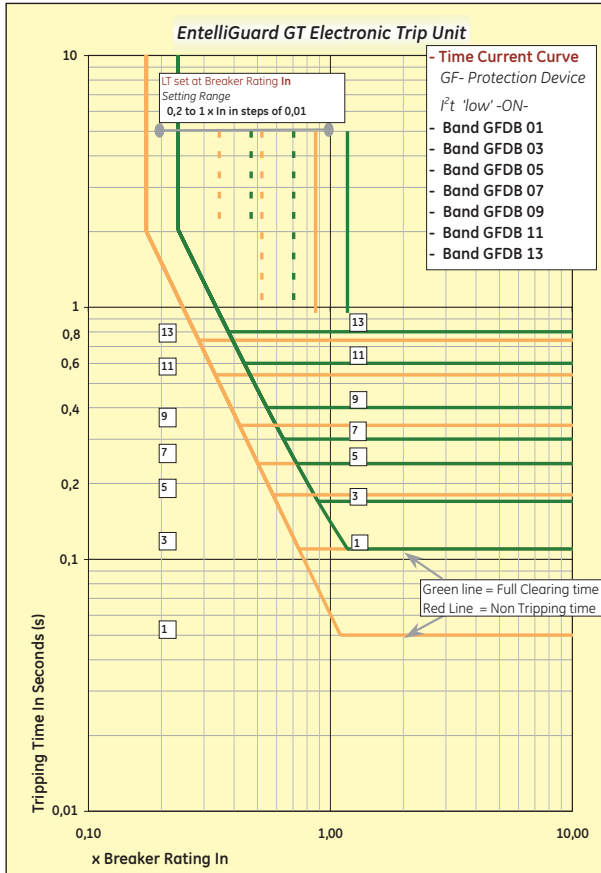
Time Current Curves (cold state)

HSIOC & GF Protection Device



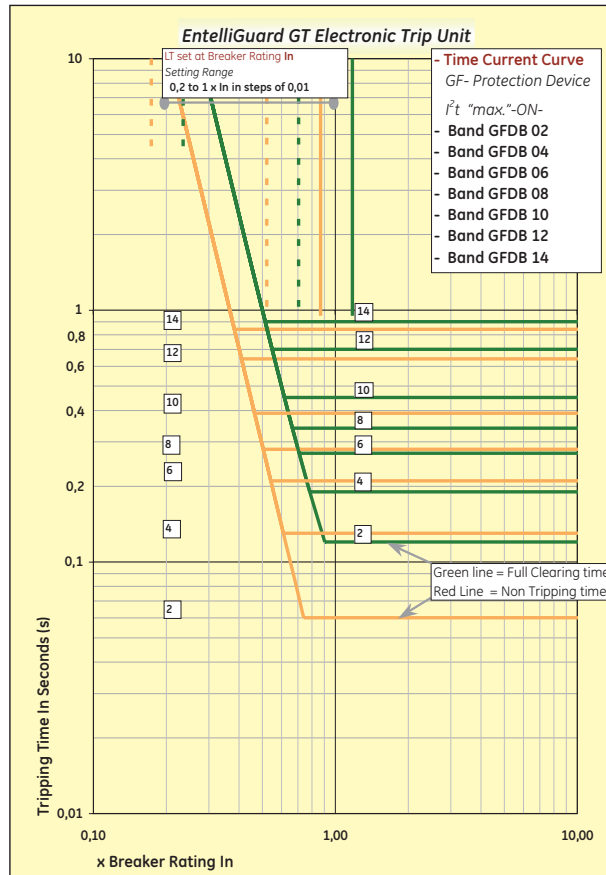
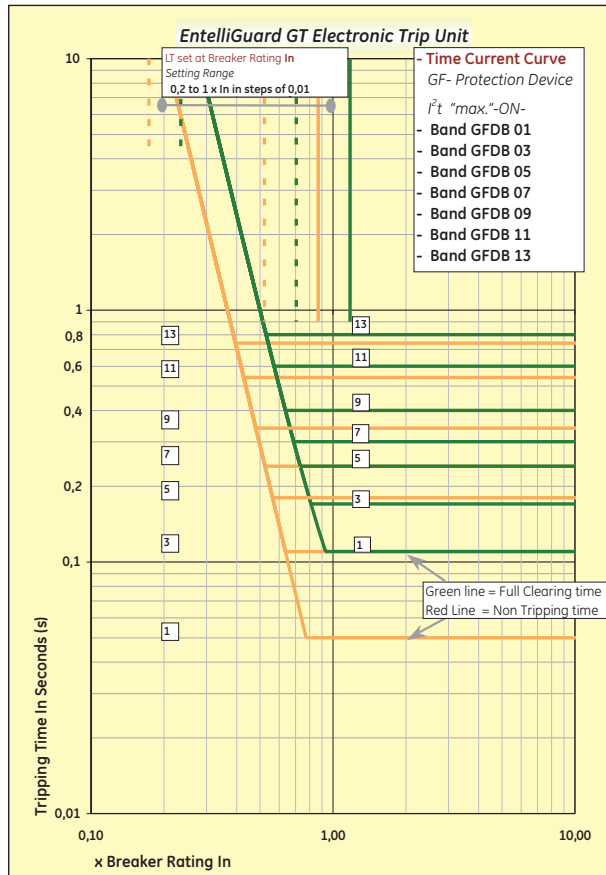
Time Current Curves (cold state)

GF Protection Device



Time Current Curves (cold state)

Terminology



Denomination	Description
In	Current rating of Breaker
Ie	Primary Current setting
Iu	Maximum Breaker User current (see section D)
LT	Long Time or Overload protection
ST	Short Time or Timed Short-circuit Current setting
I	Standard or Extended Instantaneous setting
GF	Groundfault
EF	Earthfault
Ir	LT or overload Current setting
Ist	ST or Timed Short-circuit Current setting
Ii	Instantaneous Short-circuit Current setting
Ig	Ground, or Earthfault Current setting
LTDB	LT or overload time delay band (C = breaker type, F = fuse type)
STDB	ST or Short-circuit time delay band
I ² t	'Slope' setting on ST or GF device
x LT	Multiple of LT or overload Current setting
x Ie	Multiple of ST or Timed Short-circuit Current setting
x In	Multiple of Breaker Current rating
x CT	Multiple of installed sensor rating (In IEC EntelliGuard™ types =In)
REL	Reduced Instantaneous
MCR	Making Current Release
HSIOC	HI set Instantaneous protection

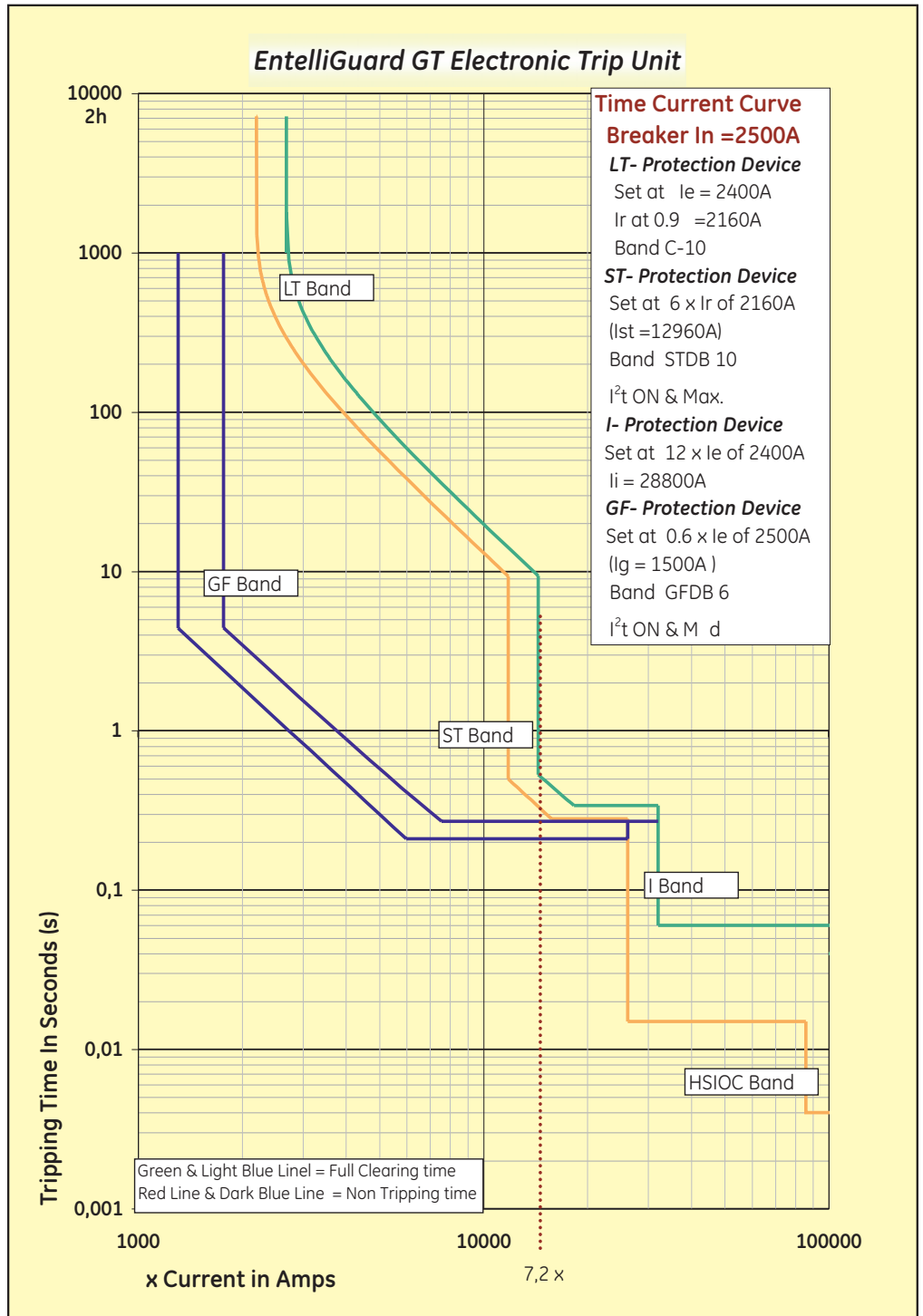


Time Current Curves (cold state)

Example of Full Time Current Curve

Time Current Curve

The EntelliGuard™ Electronic trip unit has many sophisticated setting features and an extremely broad setting range. On request we can provide complete Time Current Curves covering all installed protection devices. The curves can be produced for any current setting within the range of the installed protection devices, for one or for a combination of two breakers. Please contact your local GE Sales Office for more information.



Breaker Accessories

- C.2 Breaker Use & Operation
- C.3 Electrical Operation of Breaker (Motor Operator)
- C.4 Shunt & Undervoltage Releases; Time Delay Module for Undervoltage Release
- C.5 Interlock Devices, Indication Contacts and Number of devices
- C.6 Auxiliary Contacts
- C.7 Bell Alarm, Cassette position, Spring charged and Ready to Close indication contacts
- C.8 Mechanical Interlocking of Multiple Breakers
- C.9 Locking provisions for Breaker and Cassette Door-Interlock systems; Mis insertion device
- C.10 Installation Accessories
- C.11 Earthing device (maintenance accessory) Spare Parts

The breaker

Order Codes

Electronic Trip Units

Breaker Accessories

Application Guide

Wiring Diagrams

Dimensions

Numerical index

Intro

A

B

C

D

E

F

X



Breaker Use & Operation

A Power Circuit Breaker



Indicated Breaker is of a Fixed Pattern and equipped with Trip Unit

EntelliGuard™ is operated by a stored energy mechanism that can be charged either manually or electrically. To charge manually a handle ① is used to 'load' the springs in the mechanism, 10 pumping movements being required. During charging a spring status indicator ② clearly indicates if the breaker is CHARGED (Red), CHARGING (Yellow), or DIS-CHARGED (Green).

After charging is complete, the ready to close indicator ③ indicates that the device can be turned ON and OFF⁽¹⁾ by the ON/OFF buttons (④ & ⑤) on the breaker front facia. A padlocking mechanism ⑥ is present for up to three locks that can prevent un-authorized pushbutton operation.

An electrical charging mechanism negates the need for loading the springs manually and allows remotely located pushbuttons to be used to switch ON & OFF (see page C.3). The contact position indicator ⑦ on the Breaker front provides the user with the correct status of the breaker be it OFF or ON. This indicator is linked to the mechanism and contact system in a manner that allows the device to be used as a Disconnecter and

to meet the 'Positive Contact Indication' requirements. The Breaker Mechanism is of the trip free type and has an integrated anti-pumping system. The front facia also includes room for an optional key interlock device ⑧ that prevents the breaker from being closed if the key is not inserted and the keylock turned to 'free'. The interlock device allows a maximum of 4 keylocks to be placed.

The breaker can be equipped with up to four factory or fieldMountable releases, 1 x closing coil and a combination of shunt and undervoltage releases being possible. The presence of these releases is made visible on the facia by the use of 4 indicator windows ⑨.

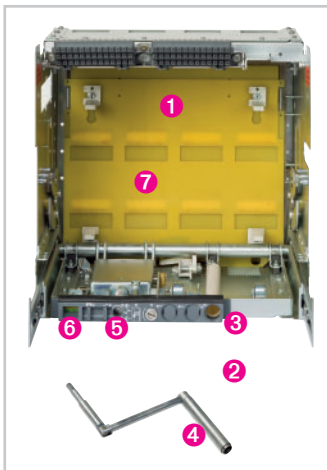
EntelliGuard™ Power Circuit Breakers are available in two patterns, Fixed and Draw-out. A Fixed device is bolted to a substructure or wall and the power connections are directly fixed to the breaker. A draw-out device has a cassette that is mounted and connected separately.

A fixed breaker requires the connection and fixation to be removed to replace the breaker.

A breaker in draw-out pattern is supplied as a moving portion, that easily slides in and out of the separately fixed and connected cassette.

Each standard device is supplied with 3 NO and 3 NC potential free auxiliary contacts. A IP31 front panel with door escutcheon seal and a IP20 terminal strip or plug ⑩ with 39 connection points to wire out accessories.

Draw-out Pattern Cassette



To dismantle a EntelliGuard™ in the Fixed pattern it is required that the power supply is turned off and the connections are removed. A breaker in the Draw-out pattern can be quickly and efficiently removed from the system without disconnecting the Power Supply or removing the connections. The Draw-out system allows easy and simple access to the breaker and its components and enables the user to fully

disconnect the power from the installation for maintenance purposes. Access to the breaker being required for periodic checks and some very limited maintenance allowing the device to be used over its full life span.

The cassette ① is mounted and connected separately and the EntelliGuard™ breaker is supplied as a moving portion that is easily inserted into the cassette. A racking handle ② is stored within an aperture ③ in the cassette. After removing and unfolding the racking handle and disengaging the blocking mechanism ④, the handle can be inserted into the 'racking' aperture ⑤.

By rotating the racking handle clockwise to move the moving portion inwards (connect) and anti-clockwise to move outwards, (disconnect) the breaker can be racked into one of three positions:

CONNECTED	Breaker and cassette are fully operational all contacts are connected.
TEST	The maincontacts are not connected . The Auxiliary contacts are connected .
DISCONNECTED	The main and auxiliary contacts are not connected. The breaker is still inside the cassette.

To remove the breaker from the cassette, the racking handle must be removed from the 'racking' aperture.

A Position indicator ⑥ provides a positive mechanical indication of the indicated Connected, Test and Disconnected positions. Each EntelliGuard™ cassette has integrated Safety Shutters ⑦ that automatically isolate the user from live parts when the moving portion is in disconnect or test position.

Multiple accessories as carriage position switches, mechanical interlocks, a miss-insertion device, IP54 front protection covers and key lock devices are available (please refer to the relevant sections in this chapter).

Each standard cassette is supplied with standard main connections, racking handle, safety shutters and a IP20 terminal socket system with 39 connection points to wire out accessories.

(1) Independent of the breaker position (tripped or ON) the device always provides sufficient energy to switch the breaker 'OFF'

Electrical Operation of Breaker

Electrical Charging mechanism (motor)

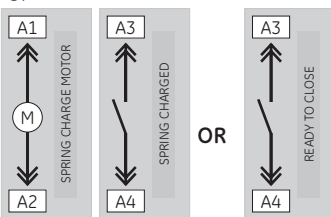
In order to charge the stored energy mechanism electrically a motor mechanism is available. The design allows factory or field mounting and is available for the full range of EntelliGuard™ breakers. It is easily fitted with just three bolts. When the circuit breaker is opened, the mechanism automatically recharges the springs and prepares the breaker for an almost instantaneous reclosure should the need arise. High speed recharging ensures that the springs are fully charged within four seconds. A “Spring Charged” contact that indicates the status of this device is always present. A 2nd ‘ready to close’ contact is available that indicates that the springs have been recharged and that the breaker can be closed.

The device is available in multiple AC & DC voltages and can be used in a operating frequency of up to two operations per minute. it has a life span equivalent to that of the breaker without maintenance. To switch the EntelliGuard™ Breaker ON & OFF remotely a Closing Coil and Shunt Release is also necessary.



Connections

The Charging mechanism connection points can be found on terminal A of both the Fixed Pattern & Draw-out Breaker types.



Electrical characteristics

Control Voltage	Motor Operator Envelope 1	Motor Operator Envelope 2 & 3
Power Consumption		
24-30V DC, 48V DC, 60V DC, 110-130V DC, 220 - 250V DC	300W	480W
48V AC, 110-130V AC, 220-240V AC, 380-400V AC, 440V AC	350VA	560VA

Closing Coil

To switch the Power Circuit Breaker ON remotely a closing coil is available that when energized releases the spring charged closing mechanism.

The device is available as a factory mounted component or as a field mountable device. It is an extremely easy-to-fit, clip-on unit, with simple plug-in connectors.

The coils have a life span equivalent to that of the full breaker life span.

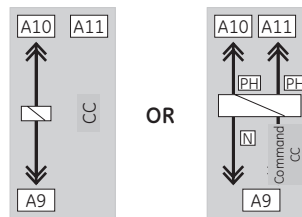


Command Closing Coil

A second closing coil type is available replacing the standard type. This device offers an extended functionality with all the features of the standard device. Additional connections allow this type to be wired out through the trip unit and to be accessed electrically through the communications bus. It is supplied with an extra ‘ON’ push button that fits onto the breaker front fascia. Fitting between the two existing ON and OFF buttons gives the user an extra electrical ‘ON’ option locally. The coils can be used in an operating frequency of up to two operations per minute and have a life span equivalent to that of the full breaker life span.

Connections

The Closing coils & Command closing coils connection points can be found on terminal A of both the Fixed Pattern & Draw-out Breaker types.



Electrical characteristics

AC	DC	Power Consumption
--	24V	350 VA Inrush
48V	48V	
--	60V	
110-130V	110-130V	
220-240V	220-240V	
277V	250V	
380-415V	--	
440V	--	



Shunt & Undervoltage Releases

Shunt Release

A device designed to switch the Power Circuit Breaker OFF remotely. When energized a Shunt Release instantaneously activates the circuit breaker mechanism thus ensuring a rapid disconnection of the main contacts (50msec).

All EntelliGuard™ Shunt Release are suitable for a continuous power supply and are designed to be used as a closure prevention device when energized. Two Shunt Releases can be mounted in each Power Circuit Breaker.

The device is available as a factory mounted component or as a field mountable device. It is an extremely easy-to-fit, clip-on unit, with simple plug-in connectors.

The individual devices have a wide voltage range, thus limiting the number of devices needed and have a life span equivalent to that of the full breaker life span.



Undervoltage Release

A device designed to open the breaker contacts and to prevent the breaker from closing when in a 'No volt' condition. On a de-energization the Undervoltage release activates the circuit breaker mechanism and ensures a rapid disconnection of the main contacts (50 Milliseconds). When not re-energized in accordance to the conditions stated in the IEC 60947 the device prevents the Power Circuit Breaker from closing. The EntelliGuard™ Undervoltage releases are designed to react within a pre-defined Voltage band, only reacting when the voltage supplying drops below the limits of this band. To prevent nuisance tripping due to short power interruptions or 'Brown Outs' the device has a built in delay of 50 Milliseconds. Two Undervoltage Releases can be mounted in each Power Circuit Breaker.

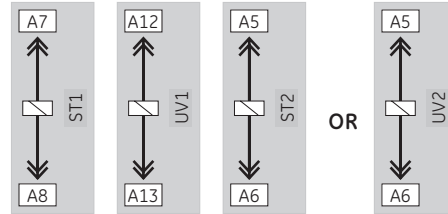
The device is available as a factory mounted component or as a field mountable device. It is an extremely easy-to-fit, clip-on unit, with simple plug-in connectors.

The individual devices have a wide voltage range, thus limiting the number of devices needed and can be used in a operating frequency of up to two operations per minute. The releases can have a life span equivalent to that of the full breakers life span.



Connections

The connection points of both releases can be found on terminal A of both the Fixed Pattern & Draw-out Breaker types. As it is possible to mount a total of three of these releases, the connection scheme also includes a 2nd optional UVR or Shunt release.



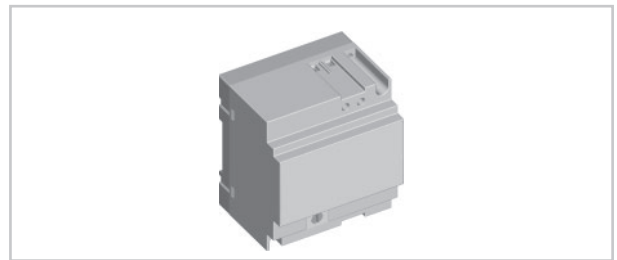
Electrical characteristics releases

AC	DC	Power Consumption
--	24V	350 VA / 350 W Inrush 60 VA / 50W Holding
48V	48V	
--	60V	
110-130V	110-130V	
220-240V	220-240V	
277V	250V	
380-415V	--	
440V	--	

Time Delay Module

The de-energizing operation of the Undervoltage release can be delayed. This optional, externally mounted module has an adjustable time delay of zero to three seconds. The device can be implemented to prevent undesired Breaker tripping due to momentary voltage interruptions and is connected in series with the Undervoltage release.

Optionally, the EntelliGuard™ Trip Unit can be supplied with a three phase plus neutral Undervoltage protection device that can provide a power interruption alarm and/or initiate a breaker 'trip'.



Electrical characteristics releases

AC	DC	Power Consumption
48V	--	350 VA Inrush 60 VA Hold
--	48V	
--	60V	
110-130V	--	
--	110-130V	
220-240V	--	
--	250V	
250-277V	--	
380-415V	--	
440V	--	

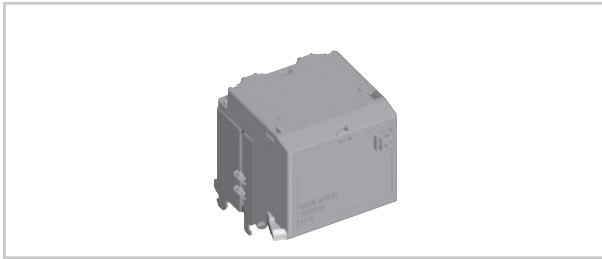
Interlock Devices, Indication Contacts and Number of devices

Network Interlock Device

When devices as the EntelliGuard™ Power Circuit Breaker are used in Automatic or Manual Power Transfer systems, local access and operation of the device can be undesirable. The Network Interlock Device is an optional mechanical lockout device that can be added to electrically operated circuit breakers. It is a logic driven interlock with two positions, LOCKOUT and RESET. The Network Interlock is locked out and reset by means of voltage pulse applied across respective terminals.⁽¹⁾

Setting the Network Interlock to LOCKOUT when the breaker is closed causes the breaker to trip. In the LOCKOUT position, the Network Interlock holds the breaker mechanically trip free and also inhibits electrical closing. A command to reset the Network Interlock must be provided before the breaker can be closed manually or by control logic. Loss of control power does not cause the Network Interlock to reset. The Network Interlock can also RESET by pushing the reset button provided on the front face of accessory.

The device is available as a factory mounted component and has the volume of two releases (Shunt/Undervoltage).



Connections

The device replaces 1 Shunt and 1 Undervoltage release and is wired out to the same connection points located on terminal A of both the Fixed Pattern & Draw-out Breaker types.

Number of devices

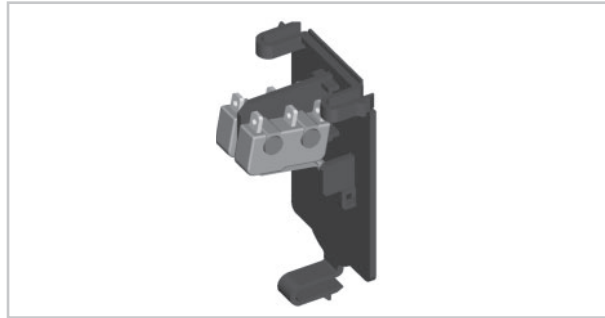
The EntelliGuard™ Power Circuit Breaker can be equipped with up to 4 of the releases mentioned on pages C2 and C3. Shunt Release (Shunt), Closing & Command closing coils (CC/CCC) and Undervoltage Releases (UVR) can be mounted in the following combinations. The Network Interlock device as described above takes 2 of the indicated 4 spaces.

Combination	Coil position on front face, from left			
	1	2	3	4
A	Network	Interlock	CC/CCC	UVR
B	Shunt	Shunt	CC/CCC	UVR
C	Shunt	UVR	CC/CCC	UVR
D	Network	Interlock	CC/CCC	Shunt

Release Indication Contacts

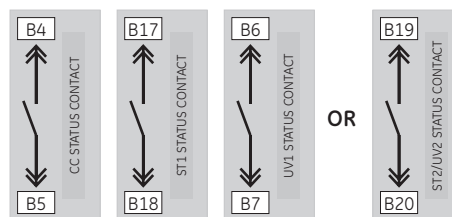
To indicate, if a Shunt or an Undervoltage release initiation has resulted in a breaker, OFF or TRIP, a contact can be fitted to the releases. The contacts are available in two versions; one power rated for use in standard Circuits and a second signal rated type for use with the Electronic Trip Unit communication option.

The contacts are available as a factory mounted component or as a field mountable device. They are extremely easy-to-fit, clip-on units, with simple plug-in connectors.



Connections

The connection points of the power rated contacts can be found on terminal B of both the Fixed Pattern & Draw-out Breaker types⁽²⁾. The Signal rated types are connected to the Electronic Trip Unit and are only accessible through the optional Communication option.



Electrical characteristics

Power Rated types

AC Ratings		DC Ratings	
Voltage	Amps	Voltage	Amps
250V	AC21-6A	125V	DC21-0,4A
		250V	DC21-0,2A

Minimum Operating Current 0.16 A at 5V DC

Signal Rated, gold plated contact types

AC Ratings		DC Ratings	
Voltage	Amps	Voltage	Amps
125V	AC21-0,1A	8-30V	DC21-0,1A

Minimum Operating Current 1mA at 5V DC

(1) Both Coils are not rated for continuous power supply. If needed, the use of a breaker auxiliary contact can be considered to interrupt the lock out coil after operation. The reset coil is equipped with an appropriate contact (see section E)

(2) The use of these devices limits the wiring out of some auxiliary contacts (see section E for full schematics)

Auxiliary Contacts

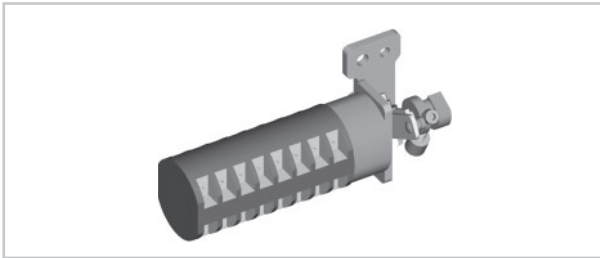
Auxiliary Contacts

Auxiliary contacts are designed to indicate the position of the Power Circuit Breaker main contacts. Each EntelliGuard™ device is supplied with a standard package of 3 Normally open (NO) and 3 normally closed (NC) contacts that operate simultaneously with the breakers main contacts. Optionally other packages are available that can be used to increase the number of available contacts by replacing the standard auxiliary contact block.

Auxiliary Contact packages

- Power rated contacts 8 NO & 8 NC⁽¹⁾
- Power rated contacts 3 NO & 3 NC plus
Signal rated contacts 2 NO & 2 NC
- Power rated contacts 4 NO & 4 NC plus
Signal rated contacts 4 NO & 4 NC⁽¹⁾

The devices are available as factory mounted components or as a field mountable device. Auxiliary contact packages are easy-to-fit, and have simple plug-in connectors.

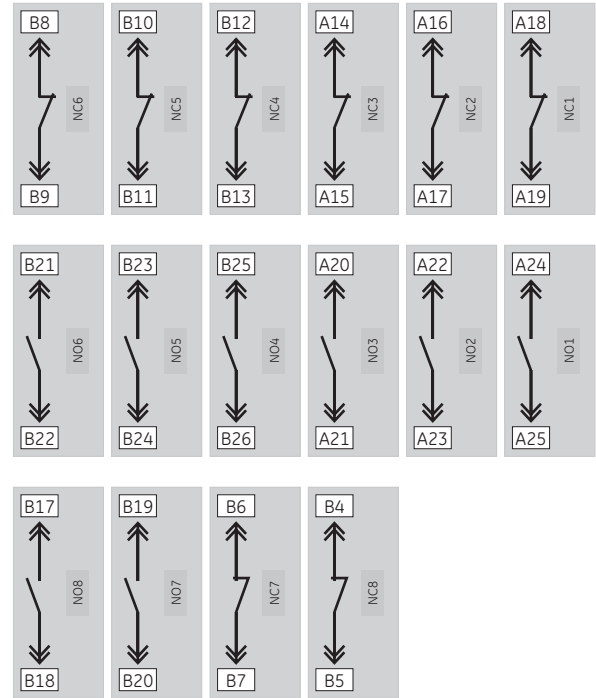


Connections

The connection points of the auxiliary contacts can be found on the two terminals (A & B) of both the Fixed Pattern & Draw-out Breaker types.

Connections⁽¹⁾

The connection points of the Auxiliary contacts can be found on terminal A and of both the Fixed Pattern & Draw-out Breaker types. When the standard 3 NO & 3 NC is required only the standard terminal A is used.



Electrical characteristics Auxiliary Contacts

Power Rated types

AC Ratings		DC Ratings	
Voltage	Amps	Voltage	Amps
110-130V	AC21 - 15A	24V	DC21 -15A
	AC23 - 10A		
220-240V	AC21 - 10A	110-130V ⁽²⁾	DC21 -10A
	AC23 - 5A		
380-440V	AC21 - 5A	250V ⁽³⁾	DC21 -5A
	AC23 - 2.5A		

Minimum Operating Current 0,1A at 8V DC

Signal Rated, gold plated contact types

AC Ratings		DC Ratings	
Voltage	Amps	Voltage	Amps
250V	AC21-0,1A	8-30V	DC21-0,1A

Minimum Operating Current 10 mA at 5V DC

(1) The use of these devices limits the wiring out of some auxiliary contacts (see section E for full schematics)

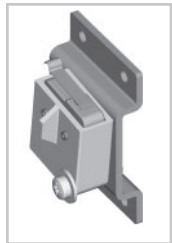
(2) Three contacts in series

(3) Six contacts in series

Bell Alarm, Cassette position indication, Spring Charged & Ready to close contacts

Bell Alarm Contact

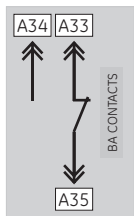
When an EntelliGuard™ Power Circuit Breaker has tripped due to a fault detected by the tripunit, a Bell Alarm Changeover contact is available to indicate this. The Electronic Trip Units trip reason indicators and the optional release indication contacts providing the reason of the 'trip'.



The device is available as a factory mounted component or as a field mountable device. The Bell Alarm contact is easy-to-fit, and has simple plug-in connectors. The contact can only be used when the breaker is adjusted to "manual reset".

Connections

The connection points of the Bell Alarm contact can be found on terminal A of both the Fixed Pattern & Draw-out Breaker types.



Electrical characteristics Bell Alarm Contact

AC Ratings		DC Ratings	
Voltage	Amps	Voltage	Amps
250V	AC21-6A	125V	DC21-0.4A
		250V	DC21-0.2A

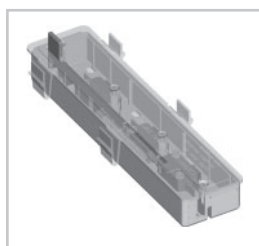
Minimum Operating Current 0,1A at 8V DC

Cassette Position Indication Contacts

A breaker in draw-out mode has a cassette that is used for mounting and connecting. The breaker, in its moving portion mode, can be inserted into the cassette and by use of the racking handle and it can be moved to one of three positions:

Connected, Test, Disconnected or Withdrawn

To indicate in which position the EntelliGuard™ Breaker is located within the Cassette position is Indication contacts are available. The disconnected position is only being indicated when minimum isolating distances between contacts on both



the main and auxiliary circuits have been achieved. The devices are available in two packages with 1 or 2 changeover contacts per position. Commonly referred to as Carriage switches they are available as a factory mounted component or as a field mountable device.

Connections

The device is located in the left side of the cassette substructure and can be accessed and connected directly.

Electrical characteristics Position Indication Contacts

AC Ratings		DC Ratings	
Voltage	Amps	Voltage	Amps
250V	AC21-10A	125V	DC21-0,5A
		250V	DC21-0,25A

Spring Charged and Ready to Close Contacts

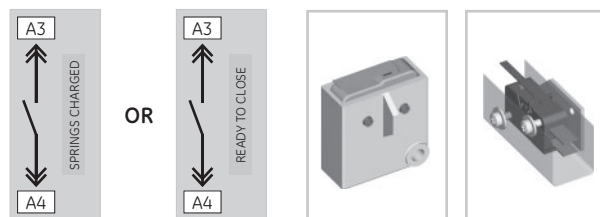
A breaker with electrical charging mechanism can be optionally equipped with one or two indication contacts. The first the Spring Charged Contact simply does as indicated and is supplied with the standard Motor Operating Mechanism. The second, the ready to close indication, optionally replaces the Spring Charged Contact. It only moves position when the following conditions are met:

- > The circuit breaker is open
- > The closing springs are charged
- > The circuit breaker is not locked/interlocked in open position
- > There is no standing closing order
- > There is no standing opening order

Both contacts are available in a 1NO configuration.

Connections

The connection points of these contacts can be found on terminal A of both the Fixed Pattern & Draw-out Breaker types



Electrical characteristics

Power Rated types

AC Ratings		DC Ratings	
Voltage	Amps	Voltage	Amps
250V	AC21-6A	125V	DC21-0.4A
		250V	DC21-0.2A

Minimum Operating Current 0.16A at 5V DC

Signal Rated, gold plated contact types⁽¹⁾

AC Ratings		DC Ratings	
Voltage	Amps	Voltage	Amps
125V	AC21-0,1A	8-30V	DC21-0,1A

Minimum Operating Current 1mA at 5V DC

(1) Spring Charged contact NOT available in signal rated version



Mechanical Interlocking of Multiple Breakers

Mechanically Interlocked Breakers

Many Low Voltage Installations have multiple power sources that are used in many different configurations. The power sources are required to supply the installation simultaneously, alternatively or in a certain logical combinations of both.

The EntelliGuard™ Power Circuit Breaker can be used to protect these Power supplies and be electrically and mechanically interlocked to provide the necessary logic. The mechanical interlocks are available for fixed and draw-out circuit breakers, enabling the direct interlocking of the breakers, mounted side by side or stacked.

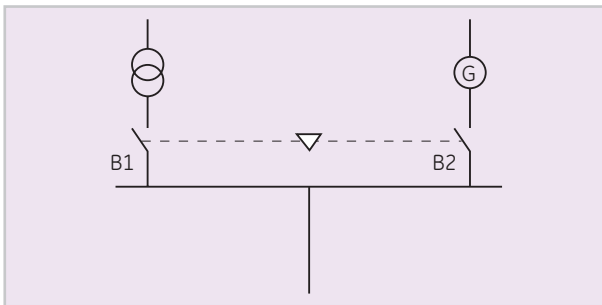
The device has two parts; the first a kit customized for use with the breaker in fixed pattern or the cassette when a draw-out pattern is required (field mountable). Two or more specially designed field mountable cables available in lengths of 1,0; 1,6; 2,0; 2,5; 3,0; 3,5 and 4,0 meters being the second.



Any combination mode (fixed or draw-out), current rating, number of poles or envelope size can be interlocked. The interlocking systems are available in one configuration for 2 breakers and in three others for 3 breakers.

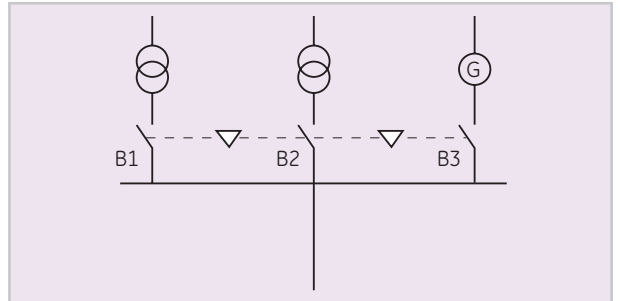
Two Breaker Interlock

Interlock type A in which one of the two breakers (B1 or B2) can be switched ON. Each breaker must be equipped with a factory mounted interlock type A. Two cables are needed.



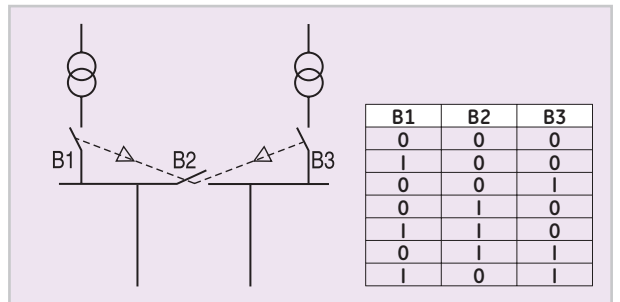
Three Breaker Interlock type B

Interlock type B in which one of the three breakers (B1, B2 or B3) can be switched ON. Each breaker must be equipped with a factory mounted interlock type B. Six cables are needed.



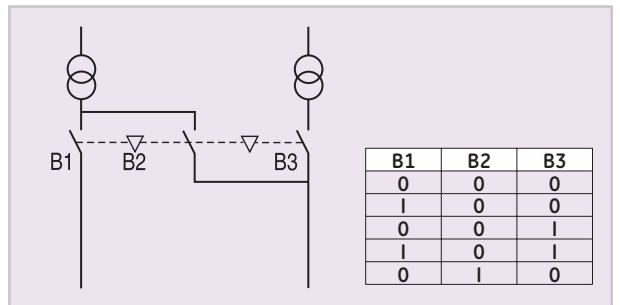
Three Breaker Interlock type C

Interlock type C in which one or two of the three breakers can be switched ON in accordance with the inserted diagram. Each breaker must be equipped with a factory mounted interlock type C. Six cables are needed.



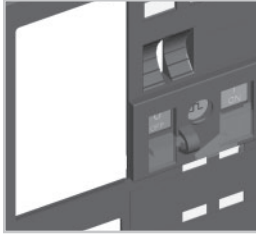
Three Breaker Interlock type D

Interlock type D in which one or two of the three breakers can be switched ON in accordance with the inserted diagram. Breakers B1 & B3 must be equipped with a factory mounted interlock type A and B2 with a interlock type D. Four cables are needed.

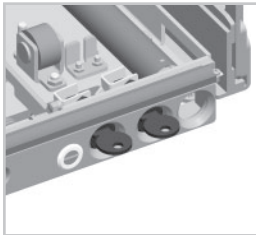


Locking provisions for Breaker and Cassette Door-Interlock systems; Mis insertion device

Standard Padlocking Facilities Breaker & Cassette



EntelliGuard™ Power Circuit Breakers are supplied with two standard padlocking devices. The breaker in Fixed and Draw-out pattern have a padlocking facility for one padlock of 5-8mm allowing the breaker to be locked in its OFF position.



The cassette supplied with the breakers in draw-out mode has three facilities for up to 3 padlocks⁽¹⁾ of 5-8mm. Two of these can be found on the cassette euchenon and can be used for locking the shutters in closed position or closing and locking the racking handle aperture. The third option is located on the breaker draw-out support slides and can be used to lock breaker & chassis combination in disconnected position.

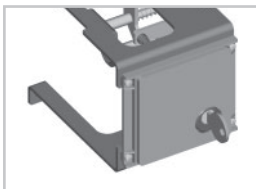
Facia Pushbutton Padlocking Facilities



To prevent un-authorized access to both the ON and OFF push buttons on the breakers front facia, a padlockable push button cover can be fixed to the breaker front facia. 1 padlock of 5-8mm can be used.

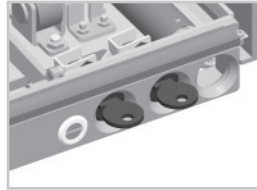
Breaker Key lock facilities

A Power Circuit breaker can be equipped with up to four key locks. The key lock system encompasses a device fitted in the front facia allowing the locks to be fitted and the separate locks. These devices ensure that a circuit breaker cannot be closed unless the key has been inserted and secured within the lock.



Devices are available for 1 Castell or Kirk lock and 4 Ronis 1104 or Profalux locks. The separate Ronis and ProfAux.locks are part of the EntelliGuard™ product offering the Castell and Kirk locks must be acquired elsewhere.

Cassette Key lock facilities



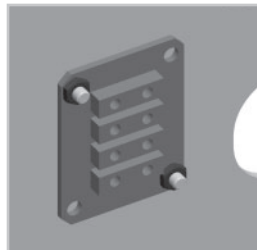
The Cassette of a Power Circuit breaker can be equipped with up to two Ronis or Profalux key locks. The key lock system encompasses a device fitted to the cassette allowing the locks and the separate locks to be fitted. The device ensures that a draw-out circuit breaker cannot be moved from the TEST or DISCONNECT position unless the key has been inserted and secured within the lock. The locks also prevent the breaker from (all positions) being switched on. The device allows up to 2 Ronis 1104 or Profalux locks. The locks must be purchased as separate items.

Door Interlock



A device designed to prevent the door of the equipment in which the breaker is installed to be opened when the Power Circuit breaker is in connected position. It is available in two executions; one for a door opening to the left and one to the right.

Mis Insertion Device



By incorporating this optional security interlock device into the draw-out cassette, an inadvertent insertion of an incorrect rated moving portion is prevented. Before using the interlocking system, the misinsertion logic needs to be set on both the breaker and the device.

(1) Shutter lock, maximum 1 padlock of 3-8 mm.

Installation Accessories

Operations Counter

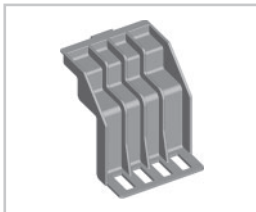
A simple and easy to install mechanical device that displays an accurate and cumulative record of the number of closing operation of the EntelliGuard™ Power Circuit Breaker in which it is installed.



The mechanical and electrical life span of the breaker can be extended by limited periodic maintenance. The counter contains information that can assist in determining when.

Contact Wear Indicator

A second simple and easy to install mechanical device that can be used to ascertain when breaker maintenance is needed. Mounted above the contacts of a breaker in draw-out mode it allows the user to physically see the contacts and contains markers to determine their wear.



Sensors, Rogowski coils

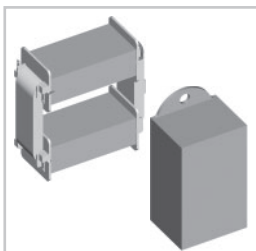
If the EntelliGuard™ Electronic Trip Unit is configured to allow Earth/Ground fault protection an external Neutral sensor can be required. Rogowski coils for this application are available as separate items and are supplied with a mounting kit.



For the correct sensor choice and application details see page B.14 of this catalogue.

Sensors, Current transformers

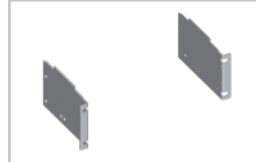
If the EntelliGuard™ Electronic Trip Unit is configured to allow Earth/Ground fault protection an external Neutral sensor can be required. In most standard applications a Rogowski coil suffices, however in some cases other Sensors are needed. Current Transformer are used for 'Source Ground' return Earthfault applications. If combinations of earthfault options as UEF, REF & SEF are required multiple sensors could be required.



Current Transformers for these application are available as separate item and are supplied with a mounting kit and an extra interposing Current Transformer needed in some specific cases. For the correct sensor(s) choice and application details see page B.14 of this catalogue.

Wall Mounting Brackets

EntelliGuard™ Power Circuit Breakers are designed to be mounted within a frame inside a low voltage Distribution or Control panel. In some cases, specifically when the front connection option is used, wall mounting can be more expedient.



For this purpose wall mounting brackets are available for the breakers in Fixed Pattern, envelope 1 and 2.

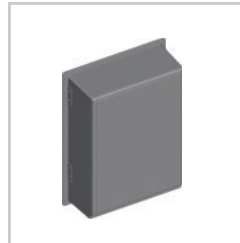
Terminal Block

Breakers in Fixed Pattern, cassettes and breakers in Draw-out mode are always supplied with an auxiliary connection block suitable for 39 connection points (terminal A). When the number of factory installed accessories exceeds the available number of connection points needed, a 2nd connection block is automatically added (terminal B).



For cases where the accessories are mounted in the field, separate auxiliary connection block are available; two types suited for the breakers in fixed pattern (39 or 78 pole) and one for breakers in draw-out mode (adding 39 poles).

IP54 Cover



All Power Circuit Breakers are supplied with a door flange/door frame that allows the user to finish the door cut-out professionally, simultaneously providing a protection degree of IP31. If a higher protection degree is required, an additional cover is available allowing IP54.

Hoisting/Lifting accessories



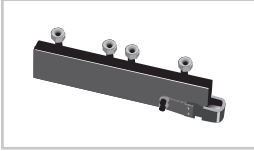
All EntelliGuard protection devices are equipped with a set of hoisting eyes (see page D.2). To use these hoisting eyes with standard lifting equipment specifically designed adaptors are available.

One adaptor or beam is available for use with breakers up to 4000Amps (envelope 1 & envelope 2 types - GLB1) and a second for use with the larger envelope 3 breaker with ratings up to 6400A (GLB3).

Earthing device (maintenance accessory) Spare Parts

Earthing Device

To allow either the incoming cables or the busbar to be safely held at earthed potential and locked during system maintenance, all EntelliGuard™ Power Circuit Breakers can be fitted with an earthing device. The device is available as a separate field mountable accessory and has a Short-circuit rating equal to the short time withstand (I_{cw}) of the breaker.



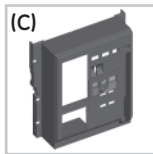
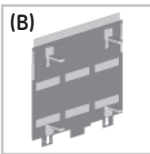
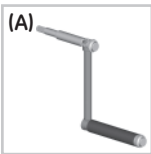
Spare parts for general use

The EntelliGuard™ Power Circuit breaker uses components that are designed to last the full life span of the device. However, certain components can be damaged or break during operational use. For these specific cases, the following spare parts are available:

Cassette: moving portion Racking Handle **(A)**
Shutters **(B)**

Breaker **(C)**: Front cover

Locking devices: Set of 4 Ronis key interlock cams



Spare part for maintenance purposes

Air Circuit Breakers as the Entelliguard Power Circuit Breakers require periodic maintenance. Here, in some cases certain components critical to the devices functionality could need replacement.

Please contact our service department for specialist assistance in establishing which components need replacement and the physical replacement activities.

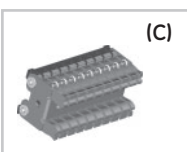
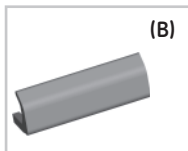
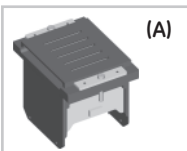
The following items are available:

Arc Chutes **(A)**

Fixed arcing Contacts **(B)**

Cassette cluster contacts **(C)**

Pliers to remove Cassette cluster contacts **(D)**



Intro

A

B

C

D

E

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X

Notes

Grid area for notes.

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D.4	Heat Dissipation, Watt loss & Current Ratings at temperatures >50°C
D.6	Selectivity/Discrimination
D.7	Selectivity with downstream devices, tables
D.8	Protection of standard circuits
D.9	Applications
D.10	Environmental considerations

The breaker

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Handling, Mounting and Connecting

Clearance distances

A modern circuit breaker is designed to interrupt high Short-circuit currents in a very limited time frame. In doing so the breaker vents gas and a limited amount of conductive fragments.

EntelliGuard™ Power Circuit Breakers have been designed to limit the venting phenomenon to a minimum, but certain clearances do need to be taken into account as indicated in the front and side views.

The maintenance of the fixed pattern devices requires access to the contacts and the removal of the Arc Chutes. A certain distance needs to be left above the breaker to allow for this as indicated in the front and side views.

Minimum Clearance distances on Fixed Pattern breaker from housing to:		
	Metal Parts	Insulated parts
A ⁽¹⁾	160	160
B1	30	30
B2	30	30

Minimum Clearance distances from Draw-out cassette housing to:		
	Metal Parts	Insulated parts
A	0	0
B1	0	0
B2	0	0

(1) Dimension allows for field Arc Chute replacements

Handling

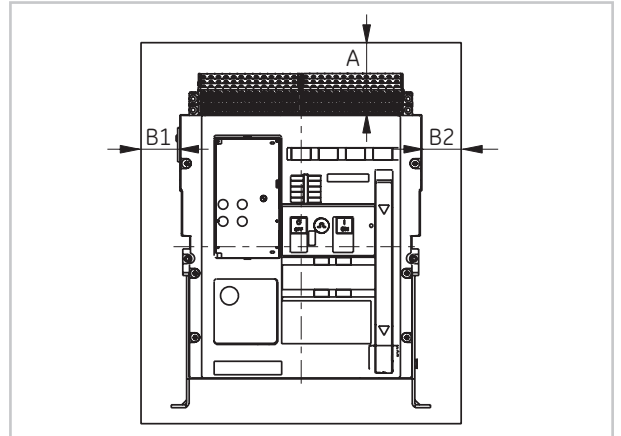
EntelliGuard™ Breakers in the fixed pattern & as draw-out portion have two retractable lifting eyes. One of these is located on the breaker right hand side and a 2nd on the left (see sketch).

The cassettes have four re-enforced tilting points with M10 screw thread.

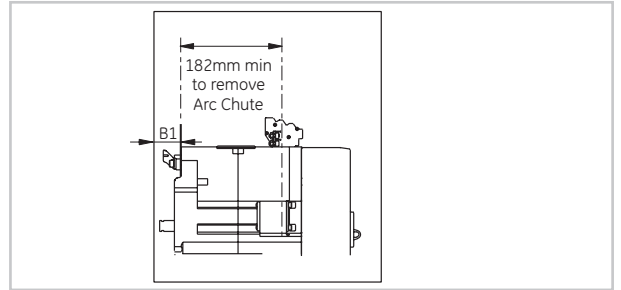
Recommended Connection Cross sections

The adjacent table indicates the recommended bus bar dimensions to be used in connecting the EntelliGuard™ Power Circuit Breaker. The current ratings of the devices with these recommended bus bar connection sizes are indicated on page D3 & D4.

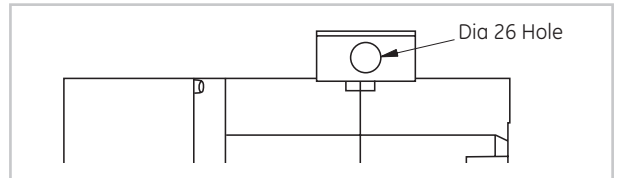
Front View Fixed or Draw-out Pattern



Side View Fixed Pattern



Side View Fixed or Draw-out Type



Breaker type 'Automatic'	Switch Type 'Non Automatic'	Envelope	In in A	Recommended Copper Bus Bar sizes
GG04, S N & H	GJ04S & GW04N	1 or 2	400	1 x 40 x 10 or 1 x 80 x 5 or 2 x 40 x 5
GG04 E and M	GJ04H			
GG07, S N & H	GJ07S & GW07N	1 or 2	630	1 x 50 x 10 or 1 x 100 x 5 or 2 x 50 x 5
GG07 E and M	GJ07H			
GG08, S N & H	GJ08S & GW08N	1 or 2	800	1 x 50 x 10 or 1 x 100 x 5 or 2 x 50 x 5
GG08 E and M	GJ08H			
GG10, S N & H	GJ10S & GW10N	1 or 2	1000	1 x 60 x 10 or 2 x 60 x 5
GG10 E and M	GJ10H			
GG13, S N & H	GJ13S & GW13N	1 or 2	1250	2 x 40 x 10 or 2 x 80 x 5
GG13 E and M	GJ13H			
GG16, S N & H	GJ16S & GW16N	1	1600	2 x 50 x 10 or 2 x 100 x 5
GG16 E and M	GJ16H	2		
GG20, S N & H	GJ20S & GW20N	1	2000	3 x 50 x 10 or 3 x 100 x 5
GG20 E and M	GJ20H	2		
GG25N, H & M	GJ25N & GW25H	2	2500	4 x 50 x 10 or 4 x 100 x 5
GG32N, H & M	GJ32N & GW32H	2 or 3	3200	4 x 100 x 10
GH32N, H & M	GK32N & GZ32H			
GG32G & L	GJ32G			
GG40N, H & M	GJ40N & GW40H	2	4000	4 x 100 x 10
GH40N, H & M	GK40N & GZ40H	3	4000	Plus 1 x 100 x 5 4 x 100 x 10
GG40G & L	GJ40G			
GG50M & L	CJ50L	3	5000	5 x 120 x 10 or 6 x 100 x 10
GG64M & L	CJ64L	3	6400	7 x 120 x 10 or 8 x 100 x 10

Handling, Mounting and Connecting

Envelope 1 connection modes and application

Fixed pattern

S type 400-1600A Rear Horizontal

38-42 Nm

- A 2x M10 x 60 - 8.8
- B 4x M10
- C 4x M10
- D 2x M10 - 8.8

Fixed pattern

400-2000A Rear Vertical

38-42 Nm

- A 2x M10 x 60 - 8.8
- B 4x M10
- C 4x M10
- D 2x M10 - 8.8

Draw-out pattern

S type 2000A, N & H 400-2000A

38-42 Nm

- A 2x M10 x 60 - 8.8
- B 4x M10
- C 4x M10
- D 2x M10 - 8.8

Fixed pattern

N & H type 400-1600A Rear Horizontal

38-42 Nm

- A 2x M10 x 60 - 8.8
- B 4x M10
- C 4x M10
- D 2x M10 - 8.8

Fixed pattern

400-2000A Front

38-42 Nm

- A 2x M10 x 60 - 8.8
- B 4x M10
- C 4x M10
- D 2x M10 - 8.8

Draw-out pattern

400-1600A Front

38-42 Nm

- A 2x M10 x 60 - 8.8
- B 4x M10
- C 4x M10
- D 2x M10 - 8.8

Fixed pattern

2000A Rear Horizontal

38-42 Nm

- A 3x M10x60 - 8.8
- B 6x M10
- C 6x M10
- D 3x M10 - 8.8

Draw-out pattern

S type 400-1600A Rear Vertical or Horizontal

38-42 Nm

- A 3x M10x60 - 8.8
- B 6x M10
- C 6x M10
- D 3x M10 - 8.8

Draw-out pattern

2000A Front

38-42 Nm

- A 3x M10x60 - 8.8
- B 6x M10
- C 6x M10
- D 3x M10 - 8.8

Envelope 2 connection modes and application

Fixed pattern

400-4000A Rear Horizontal or Vertical

50-60 Nm

- A 4x M12x60/90 - 8.8
- B 8x M12
- C 8x M12
- D 4x M12 - 8.8

Draw-out pattern

400-3200A Rear Vertical or Horizontal

50-60 Nm

- A 4x M12x60/90 - 8.8
- B 8x M12
- C 8x M12
- D 4x M12 - 8.8

Draw-out pattern

400-4000A Front

50-60 Nm

- A 4x M12x60/90 - 8.8
- B 8x M12
- C 8x M12
- D 4x M12 - 8.8

Fixed pattern

400-4000A Front

50-60 Nm

- A 4x M12x60/90 - 8.8
- B 8x M12
- C 8x M12
- D 4x M12 - 8.8

Draw-out pattern

4000A Rear Vertical ONLY

50-60 Nm

- A 4x M12x60/90 - 8.8
- B 8x M12
- C 8x M12
- D 4x M12 - 8.8

Draw-out pattern - 100% rated version

3200 & 4000A Rear Vertical ONLY

50-60 Nm

- A 4x M12x60/90 - 8.8
- B 8x M12
- C 8x M12
- D 4x M12 - 8.8

Envelope 3 connection modes and application

Fixed pattern

4000-5000A Rear Horizontal

50-60 Nm

- A 3x M12x60/80 - 8.8
- B 6x M12
- C 6x M12
- D 3x M12 - 8.8

Draw-out pattern 4000-5000A Rear Horizontal
-OR- 4000 -6400A Rear Vertical (1)

50-60 Nm

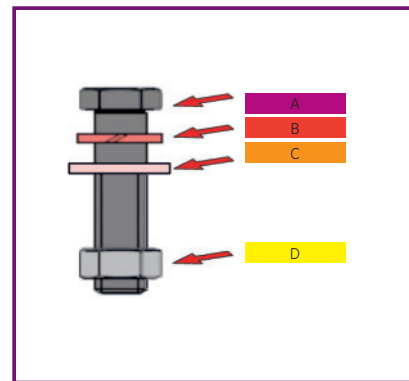
- A 3x M12x60/80 - 8.8
- B 6x M12
- C 6x M12
- D 3x M12 - 8.8

Fixed pattern

4000-6400A Rear Vertical

50-60 Nm

- A 4x M12x60/90 - 8.8
- B 8x M12
- C 8x M12
- D 4x M12 - 8.8



(1) The envelope 3 draw-out pattern construction has two connection pads per connection point.

Heat Dissipation, Watt loss & Current Ratings at temperatures >50°C

Standards

The standard for low voltage equipment is defined in the EN 60439-1, the EN 50298 and the IEC 60890. These provide a theoretical method to calculate the temperature rise within an enclosure. The main element in these calculations is the power dissipation of the equipment installed. By totaling this value for all the installed devices, connections, cables and busbars it is possible to calculate the temperature rise within the enclosure. For normal applications a temperature rise within the enclosure of 50 Kelvin is assumed.

Use

An enclosure manufacturer can provide the exact data on the allowable power dissipation within a certain enclosure. The values depend on the enclosure type, the ventilation it offers and where the components are located within this enclosure.

EntelliGuard™ Power Circuit breakers

The devices have been designed to offer the lowest, feasible heat dissipation value and the highest possible current ratings when enclosed. The tables here indicate the heat dissipation values and current ratings at temperatures within the direct vicinity of the breaker in free air.

The values apply for breakers used with rear connections and the preferred vertical busbars. The recommended connection cross sections and busbar sizes can be found on page D.2.

Breaker type 'Automatic'	Switch Type 'Non Automatic'	Envelope	In in A	Power loss at In per pole (W)	Temperature in the direct environment of the EntelliGuard				
					≤50°C	55°C	60°C	65°C	70°C
Maximum user Current Ie in A Vertical connection mode: Fixed pattern									
GG04, S N & H	GJ04S & GW04N	1	400	2,29	400	400	400	400	400
GG04 E and M	GJ04H	2	400	1,66	400	400	400	400	400
GG07, S N & H	GJ07S & GW07N	1	630	5,68	630	630	630	630	630
GG07 E and M	GJ07H	2	630	4,13	630	630	630	630	630
GG08, S N & H	GJ08S & GW08N	1	800	9,15	800	800	800	800	800
GG08 E and M	GJ08H	2	800	6,66	800	800	800	800	800
GG10, S N & H	GJ10S & GW10N	1	1000	14,3	1000	1000	1000	1000	1000
GG10 E and M	GJ10H	2	1000	10,4	1000	1000	1000	1000	1000
GG13, S N & H	GJ13S & GW13N	1	1250	22,3	1250	1250	1250	1250	1250
GG13 E and M	GJ13H	2	1250	16,3	1250	1250	1250	1250	1250
GG16, S N & H	GJ16S & GW16N	1	1600	36,6	1600	1600	1600	1600	1600
GG16 E and M	GJ16H	2	1600	26,6	1600	1600	1600	1600	1600
GG20, S N & H	GJ20S & GW20N	1	2000	57,2	2000	2000	2000	2000	2000
GG20 E and M	GJ20H	2	2000	41,6	2000	2000	2000	2000	2000
GG25N, H & M	GJ25N & GW25H	2	2500	65,0	2500	2500	2500	2500	2500
GG32N, H & M	GJ32N & GW32H	2	3200	106	3200	3200	3200	3150	3100
GG32G & L	GJ32G	3	3200	66,6	3200	3200	3200	3200	3200
GG40N, H & M	GJ40N & GW40H	2	4000	166	4000	3750	3600	3500	3400
GG40G & L	GJ40G	3	4000	104	4000	4000	4000	4000	4000
GG50M & L	GJ50L	3	5000	163	5000	5000	5000	4900	4800
GG64M & L	GJ64L	3	6400	266	6400	6300	6200	6100	6000
Maximum user Current Ie in A Vertical connection mode: Draw-out types									
GG04, S N & H	GJ04S & GW04N	1	400	4,78	400	400	400	400	400
GG04 E and M	GJ04H	2	400	3,74	400	400	400	400	400
GG07, S N & H	GJ07S & GW07N	1	630	11,9	630	630	630	630	630
GG07 E and M	GJ07H	2	630	9,29	630	630	630	630	630
GG08, S N & H	GJ08S & GW08N	1	800	19,1	800	800	800	800	800
GG08 E and M	GJ08H	2	800	15,0	800	800	800	800	800
GG10, S N & H	GJ10S & GW10N	1	1000	29,9	1000	1000	1000	1000	1000
GG10 E and M	GJ10H	2	1000	23,4	1000	1000	1000	1000	1000
GG13, S N & H	GJ13S & GW13N	1	1250	46,7	1250	1250	1250	1250	1250
GG13 E and M	GJ13H	2	1250	36,6	1250	1250	1250	1250	1250
GG16, S N & H	GJ16S & GW16N	1	1600	76,5	1600	1600	1600	1600	1600
GG16 E and M	GJ16H	2	1600	59,9	1600	1600	1600	1600	1600
GG20, S N & H	GJ20S & GW20N	1	2000	120	2000	2000	2000	2000	2000
GG20 E and M	GJ20H	2	2000	93,6	2000	2000	2000	2000	2000
GG25N, H & M	GJ25N & GW25H	2	2500	146	2500	2500	2500	2500	2500
GG32N, H & M	GJ32N & GW32H	2	3200	240	3200	3200	3200	3100	3000
GH32N, H & M	GK32N & GZ32H	2	3200	186	3200	3200	3200	3200	3200
GG32G & L	GJ32G	3	3200	106	3200	3200	3200	3200	3200
GG40N, H & M	GJ40N & GW40H	2	4000	374	3800	3700	3600	3500	3400
GH40N, H & M	GK40N & GZ40H	2	4000	291	4000	3950	3900	3835	3750
GG40G & L	GJ40G	3	4000	166	4000	4000	4000	4000	4000
GG50M & L	GJ50L	3	5000	260	5000	5000	5000	4900	4800
GG64M & L	GJ64L	3	6400	426	6400	6300	6200	6100	6000



Heat Dissipation, Watt loss & Current Ratings at temperatures >50°C

EntelliGuard™ Power Circuit breakers

Other connection modes as rear connection with horizontal busbars and connection from the breaker front are possible. The tables here indicate the heat dissipation values and current ratings at temperatures within the direct vicinity of the breaker in free air.

The values apply for breakers used in rear connection mode with horizontal busbar connection and for devices with front connection.

The recommended connection cross sections and busbar sizes can be found on page D.2.

Breaker type 'Automatic'	Switch Type 'Non Automatic'	Envelope	In in A	Power loss at In per pole (W)	Temperature in the direct environment of the EntelliGuard				
					≤50°C	55°C	60°C	65°C	70°C
Maximum user Current Ie in A Horizontal or Front ⁽²⁾ connection mode: Fixed pattern									
GG04, S N & H	GJ04S & GW04N	1	400	2,29	400	400	400	400	400
GG04 E and M	GJ04H	2	400	1,66	400	400	400	400	400
GG07, S N & H	GJ07S & GW07N	1	630	5,68	630	630	630	630	630
GG07 E and M	GJ07H	2	630	4,13	630	630	630	630	630
GG08, S N & H	GJ08S & GW08N	1	800	9,15	800	800	800	800	800
GG08 E and M	GJ08H	2	800	6,66	800	800	800	800	800
GG10, S N & H	GJ10S & GW10N	1	1000	14,3	1000	1000	1000	1000	1000
GG10 E and M	GJ10H	2	1000	10,4	1000	1000	1000	1000	1000
GG13, S N & H	GJ13S & GW13N	1	1250	22,3	1250	1250	1250	1250	1250
GG13 E and M	GJ13H	2	1250	16,3	1250	1250	1250	1250	1250
GG16, S N & H	GJ16S & GW16N	1	1600	36,6	1600	1600	1600	1600	1600
GG16 E and M	GJ16H	2	1600	26,6	1600	1600	1600	1600	1600
GG20, S N & H	GJ20S & GW20N	1	2000	57,2	2000	2000	2000	2000	2000
GG20 E and M	GJ20H	2	2000	41,6	2000	2000	2000	2000	2000
GG25N, H & M	GJ25N & GW25H	2	2500	65,0	2500	2500	2500	2500	2500
GG32N, H & M	GJ32N & GW32H	2	3200	106	3200	3200	3100	3050	3000
GG32G & L	GJ32G	3	3200	66,6	3200	3200	3200	3200	3200
GG40N, H & M -RH	GJ40N & GW40H-RH	2	(1)	(1)	(1)	(1)	(1)	(1)	(1)
GG40N, H & M-FC	GJ40N & GW40H-FC	2	4000	166	4000	3700	3400	3200	3000
GG40G & L	GJ40G	3	4000	104	4000	4000	4000	4000	4000
GG50M & L	GJ50L	3	5000	163	5000	5000	5000	4875	4750
GG64M & L	GJ64L	3	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Maximum user Current Ie in A Horizontal or Front ⁽²⁾ connection mode: Draw-out types									
GG04, S N & H	GJ04S & GW04N	1	400	4,8	400	400	400	400	400
GG04 E and M	GJ04H	2	400	3,74	400	400	400	400	400
GG07, S N & H	GJ07S & GW07N	1	630	11,9	630	630	630	630	630
GG07 E and M	GJ07H	2	630	9,3	630	630	630	630	630
GG08, S N & H	GJ08S & GW08N	1	800	19,1	800	800	800	800	800
GG08 E and M	GJ08H	2	800	15,0	800	800	800	800	800
GG10, S N & H	GJ10S & GW10N	1	1000	29,9	1000	1000	1000	1000	1000
GG10 E and M	GJ10H	2	1000	23,4	1000	1000	1000	1000	1000
GG13, S N & H	GJ13S & GW13N	1	1250	47	1250	1250	1250	1250	1250
GG13 E and M	GJ13H	2	1250	36,6	1250	1250	1250	1250	1250
GG16, S N & H	GJ16S & GW16N	1	1600	77	1600	1600	1600	1600	1600
GG16 E and M	GJ16H	2	1600	60	1600	1600	1600	1600	1600
GG20, S N & H	GJ20S & GW20N	1	2000	120	2000	2000	2000	2000	2000
GG20 E and M	GJ20H	2	2000	94	2000	2000	2000	2000	2000
GG25N, H & M	GJ25N & GW25H	2	2500	146	2500	2500	2500	2500	2500
GG32N, H & M	GJ32N & GW32H	2	3200	240	3200	3200	3200	3200	2900
GH32N, H & M	GK32N & GZ32H	2	3200	186	3200	3200	3200	3200	3000
GG32G & L	GJ32G	3	3200	106	3200	3200	3200	3200	3200
GG40N, H & M -RH	GJ40N & GW40H-RH	2	(1)	(1)	(1)	(1)	(1)	(1)	(1)
GG40N, H & M-FC	GJ40N & GW40H-FC	2	4000	374	4000	3700	3400	3200	3000
GH40N, H & M	GK40N & GZ40H	2	(1)	(1)	(1)	(1)	(1)	(1)	(1)
GG40G & L	GJ40G	3	4000	166	4000	4000	4000	4000	4000
GG50M & L	GJ50L	3	5000	260	5000	5000	5000	4850	4700
GG64M & L	GJ64L	3	(1)	(1)	(1)	(1)	(1)	(1)	(1)

(1) Rear horizontal connections cannot be used at this current rating

(2) Front connections are available for the standard envelope 1 and envelope 2 types (not available for GH,GK and GZ types)



Selectivity/Discrimination

Selectivity - Discrimination

In a low voltage distribution network it is necessary that on a fault the protection device nearest to the fault reacts whilst all others remain closed.

This capability is called discrimination (UK) or Selectivity (USA and Europe).

If this requirement is not met a fault in one arm of the distribution system could cause a number of upstream protection devices to react and open. A relatively minor fault in one arm of a complete distribution will then cause a power interruption across a major part of the installation.

EntelliGuard™ Power Circuit breakers

A combination of the high precision and multiple bands of the EntelliGuard™ Electronic Trip Unit allow full selectivity to be achieved between closely rated devices over multiple levels. The table included here indicates the recommended settings of the downstream protection devices and the upstream EntelliGuard™ breaker.

A second table on page D.6 indicates the discrimination / selectivity that can be achieved with these settings.

The tables can replace the Complex and Time consuming method of comparing multiple Time Current curves across many levels.

Downstream Device	Trip Unit	Setting Denomination	Settings determining selectivity	Recommended EntelliGuard™ settings					
				I _r or I _e setting Ratio	LTDB setting band	I _{st} setting Ratio	STDB setting band	I setting	
<i>Record Plus</i>									
FD& FE frame	LTMD	I _r	Ratio & Band	1,6 x	C22				
		I _m	Ratio & Band			1,6 x	Band 2		
FD& FE frame	GTM	I _r	Ratio & Band	1,6 x	C22			Minimum setting 5kA - FD160, 7kA - FE160, 9kA - FE250 or I = 'OFF'	
		I _m	Ratio & Band			1,6 x	Band 2		
FE frame	SMR1	I _r	Ratio & Band	1,3 x					
		LTD line	Band		C8				
		LTD Motor	Band		C14				
		I _{st}	Ratio & Band			1,35 x	Band 2		
FG frame	SMR1	I _r	Ratio & Band	1,3 x					
		LTD line	Band		C8				
		LTD Motor	Band		C14				
		I _{st}	Ratio & Band			1,35 x	Band 3		
FG frame	SMR2	I _r	Ratio	1,3 x					
		LTD cl.1.25	Band		C3				
		LTD cl. 2.5	Band		C5				
		LTD cl. 5	Band		C8				
		LTD cl.10	Band		C12				
		LTD cl.20	Band		C16				
		LTD cl.30	Band		C18				
		I _{st}	Ratio			1,35 x			
		STD=420ms	Band				Band 13		
		STD=310ms	Band				Band 11		
STD=210ms	Band				Band 9				
STD=120ms	Band				Band 6				
STD=40ms	Band				Band 3				
FK frame	SMR1e	I _r	Ratio & Band	1,4 x	C8				
		I _{st}	Ratio			1,35 x			
		STD	Band				Band 7		
FK frame	SMR1s	I _r	Ratio	1,4 x				Minimum setting 18kA - FK800 20kA - FK1000 20kA - FK1250 28kA - FK1600 or use ZSI or I = 'OFF'	
		LTD cl. 5	Band		C8				
		LTD cl.10	Band		C12				
		LTD cl.20	Band		C19				
		LTD cl.30	Band		C22				
		I _{st}	Ratio						
		STD=300ms	Band				Band 12		
STD=200ms	Band				Band 10				
STD=100ms	Band				Band 7				
EntelliGuard	GT-E	I _r	Ratio	1,25 x				Use ZSI or I = 'OFF'	
		LTD class	Band		2 higher				
		I _{st}	Ratio			1,25 x			
		STD band min. until 11	Band				2 higher		
		STD band ≤12	Band				1 higher		
EntelliGuard	GT-S, N & H	I _r	Ratio	1,25 x				Use ZSI or I = 'OFF'	
		LTD class	Band		2 higher				
		I _{st}	Ratio			1,25 x			
		STD band min. until 11	Band				2 higher		
		STD band ≤12	Band				1 higher		
Industrial fuses GL/Gg type	----	Current rating	Ratio & Band	2 x	F20	ST = 8 x I _r , STDB band 5 and I = 12 x I _e			



Selectivity with downstream devices, tables

Downstream Device	Trip Unit	Upstream EntelliGuard™ device and Selectivity limit Is ⁽¹⁾								
		GG04S to GG20S	GG04N to GG20N	GG25N to GG40N	GG04E to GG20E	GG(H)25H to GG(H)40H	GG(H)25M to GG(H)40M	GG32G to GG40G	GG40M to GG64M	GG40L to GG64L
Elfa Plus MCB's EP30, 45, 60, 100 & 250, CP30, 45 & 60, DME60, DPE100, DPA160, DPA100 & DPT100	All	T	T	T	T	T	T	T	T	T
Elfa Plus MCB's HTI & S90 C curve	All	T	T	T	T	T	T	T	T	T
Surion Manual Motor starters GPS1BS, GPS1MS & GPS1MH GPS2BS, & GPS2MH	All	T	T	T	T	T	T	T	T	T
Record Plus FD& FE frame C, E, V, S tiers	All	T	T	T	T	T	T	T	T	T
FD& FE frame N tier	All	T	T	T	T	T	T	T	T	T
FD& FE frame H tier	All	T	T	T	T	T	T	T	T	T
FD& FE frame L tier	All	T	T	T	T	T	T	T	T	T
FG frame N tier	All	T	T	T	T	T	T	T	T	T
FG frame H tier	All	T	T	T	T	T	T	T	T	T
FG frame L tier	All	T	T	T	T	T	T	T	T	T
FK frame N tier	All	T	T	T	T	T	T	T	T	T
FK frame H tier	All	T	T	T	T	T	T	T	T	T
FK frame L tier	All	T	T	T	T	T	T	T	T	T
EntelliGuard GG04S to GG20S	All	50kA ⁽²⁾	T	T	T	T	T	T	T	T
GG04N to GG20N	All	50kA ⁽²⁾	65kA ⁽²⁾	65kA ⁽²⁾	T	T	T	T	T	T
GG04E to GG20E	All	50kA ⁽²⁾	65kA ⁽²⁾	65kA ⁽²⁾	85kA ⁽²⁾	85kA ⁽²⁾	85kA ⁽²⁾	T	T	T
GG(H)25H to GG(H)40H	All	--	--	65kA ⁽²⁾	--	85kA ⁽²⁾	85kA ⁽²⁾	T	T	T
GG(H)25M to GG(H)40M	All	--	--	65kA ⁽²⁾	--	85kA ⁽²⁾	85kA ⁽²⁾	T	T	T
GG(H)40M to GG(H)64M	All	--	--	--	--	--	--	100kA ⁽²⁾	100kA ⁽²⁾	100kA ⁽²⁾
GG(H)40L to GG(H)64L	All	--	--	--	--	--	--	100kA ⁽²⁾	100kA ⁽²⁾	100kA ⁽²⁾
Industrial fuses GL/Gg type	----	T	T	T	T	T	T	T	T	T

(1) T = Full selectivity until the Icu of the downstream or upstream device (the lowest of the two)
 (2) Indicated values apply with I (Instantaneous) ON, If Off reduce by 10%

Selectivity

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Protection of standard Circuits⁽¹⁾

Protection of Standard Circuits

Protection devices as the EntelliGuard™ Power Circuit breaker are used in a wide variety of environments to protect conductors, equipment and devices in low voltage distribution circuits. To use this product to its full potential it is necessary to verify that it functions correctly in the environment in which it is used, and that it meets the Electrotechnical requirements of the circuit it protects.

Environment

EntelliGuard™ will function well in almost any industrial environment and fully complies with the environmental requirements of the relevant EN 60 947-2 standard. For conditions other than the above mentioned, please refer to page D.9 of this section.

Maximum Short-Circuit Current

Each protective device must be capable of interrupting the maximum Short-circuit current at the point where it is installed (see HD 384 standard). The interruption ratings (Breaking Capacities) of the EntelliGuard™ circuit breaker can be found on pages 2, 3 & 4 of this catalogue.

Design Current of a circuit

The equipment and devices in an electrical circuit determine its current load or design current I_b . A circuit breaker's overload or I_r setting is normally adjusted to a value equal to the design current.

Weakest Short-circuit current in a circuit

On a Short-circuit event the total circuit impedance determines both the MAXIMUM and WEAKEST Short-circuit current that can flow in the circuit. For the weakest short circuit current it is necessary to establish if the protection device trips before the electrical conductors reach their maximum temperature, this for operating times of 0,1 to 5 seconds.

Fault Currents

In the 2005 edition of the IEC 60364-4-41 the general terminology 'Protection against Electrical shock' has been adapted whilst two new terms have been introduced:

- 1) Protection under normal conditions now designated:
Basic Protection
- 2) Protection under fault conditions now designated:
Fault protection

Fault protection being provided by protective equipotential bonding and automatic disconnection of the supply. Under fault conditions, depending on the network an interruption time of 5 seconds (TN) or 1 second is required (TT) for circuits with a rating $>32A$. Depending on the configuration of the earthing system the 1 and 5 second disconnection time is also required for interruption of a second fault in IT systems.

EntelliGuard™ Power Circuit breakers

To protect standard circuits, the breakers are equipped with a number of protection devices.

Overload Protection device

The first is a highly accurate menu driven overload protection device that has an adjustment range of 0,2 to 1 x the breaker rating. Six main current ratings (I_e) are available. Each have a sub setting (I_r) of 0,5 to 1 times the chosen I_e rating. This device is normally set to a value that is equal or closely matches the design current (I_b).

Timed Short-circuit Protection Device

Set as a multiple of the overload adjustment. this device offers a broad adjustment range of 2 to 12. The setting of this device depends on several parameters as the inrush characteristics of the protected devices. a protection against the **weakest Short-circuit current** and in some cases against fault currents to earth. 17 narrow and accurate time bands allow the EntelliGuard™ Power Circuit Breaker to interrupt a fault within the timing required by the standards. to offer selectivity across multiple levels and allow the user to take inrush currents into account.

Ground Fault Protection

It is possible to combine two devices in one. both designed to detect **Fault Currents** to earth. They can be set as a multiple of the value of the Current Sensors mounted in the breaker and have a broad adjustment range of 0,2 to 1 (0,1 -1 with an auxiliary power supply). The first is a residual device that takes the sum of the current in the three phases and neutral. If this is no longer equal to zero it sends an alarm or trips the breaker. The second allows the user to measure the return current running between the Earth leg and neutral. On detecting a fault to earth the device sends an alarm, or trips the breaker. 14 narrow and accurate time bands allow the EntelliGuard™ G Power Circuit Breaker to interrupt a fault within the timing required by the standards and offer selectivity across multiple levels.

Instantaneous Short-circuit Protection

Set as a multiple of the primary overload adjustment I_e this device offers a broad adjustment range of 2 to 15 (2-30 on request). This device is normally used to limit the time that higher Short-circuit currents can run in the protected circuit. Whilst the timed Short-circuit protection device waits for a set time, the instantaneous device immediately trips the breaker once the set value is reached. The device used in the EntelliGuard™ Power Circuit Breaker maintains selectivity by only reacting to the 2nd half wave of a Short-circuit current and uniquely allows the use of the 'Zone Selective Interlock' feature (see section B).

(1) For more details see section E of the 2010 edition of the Record Plus catalogue.

Applications

Protection of Generator sets, Motors, Capacitor banks and Transformers

Use of EntelliGuard™ Breakers in Automatic Power Transfer Systems (ATS)

Introduction

The Electronic Trip Unit used in the EntelliGuard™ Power circuit breaker offers many additional protection devices, a full description of which can be found in section B. Here a number of the possible applications of these devices is described briefly.

Protection of Generator sets

The overload and Short-circuit devices used to protect a generator need to react quicker and at lower current levels than those used to protect other devices.

After establishing the capabilities of the generator set under overload and Short-circuit conditions, the protection devices need to be adjusted accordingly.

On a Power Circuit breaker use of the 'faster' overload protection bands (LTDB set between Minimum and the C6 band) and a low setting of the timed Short-circuit protection ($2.5 \times I_r$) is recommended. The optional 3 phase Undervoltage protection available in the GT-H trip unit can also be considered.

Protection of Motors

On starting electrical Motors draw more current than when running under normal conditions. These starting currents differ strongly per type and should not cause tripping of the device protecting the circuit.

The IEC 60947-4 has defined four different 'operational' or 'Trip' classes:

Trip class	Required tripping times at		
	$1.2 \times I_n$	$1.5 \times I_n$	$7.2 \times I_n$
10A	$t < 2$ hours	$t < 2$ min.	$2 \leq t < 10$ sec.
10	$t < 2$ hours	$t < 4$ min.	$4 \leq t \leq 10$ sec.
20	$t < 2$ hours	$t < 8$ min.	$6 \leq t \leq 20$ sec.
30	$t < 2$ hours	$t < 12$ min.	$9 \leq t \leq 30$ sec.

This table is in some cases extended to include a 'trip class 40' (assumed to be a 15-40 second band at $7.2 \times I_n$).

On a Power Circuit breaker, use of the 'slower' protection bands that closely match the indicated classes is recommended (LTDB set between the C8 to the C22 band).

Switching on a Motor also produces a high but very short inrush peak current which could activate the Short-circuit protection of a breaker and cause unexpected tripping. Here the timed Short-circuit device of a Power Circuit Breaker must be set to at least $12 \times I_r$ with a time delay of 50 Milliseconds (STDB band 3). If an instantaneous protection device is present and switched on, a setting of at least $12 \times I_e$ is recommended.

After an overload event the Motor and wiring are still warm, immediate re-energization of the electrical circuit could result in damage of the electrical circuit and the motor. The overload protection device must incorporate a thermal memory device that prevents re-energization before a certain cooling time has elapsed.

Remark

For an overview of the used abbreviations (as LTDB and STDB) see page B.22.

Furthermore, the prevention of anomalies as the motor losing a phase or a motor with blocked rotor need to be prevented and require additional protection devices.

Next to the 'standard' protection devices the EntelliGuard™ Electronic Trip Unit has a thermal memory function, an optional 3phase Undervoltage relay and current unbalance device thus providing comprehensive motor protection.

Protection of Capacitor banks

Power Circuit breakers are designed to offer high making and breaking capacities under adverse conditions: The switching of capacitor banks has little to no effect on the breaker, its characteristics as a protective device or on its lifespan.

However the current flowing in the circuit can trip a circuit breaker and a capacitor load does display certain anomalies. Here the current flowing in the circuit cannot be assumed to be the calculated capacitor current only. The effective current value is higher due to harmonic content (normally assumed as 30%) and an allowance must be made for tolerances in the capacitance of the units (10%). The protection devices of the Power Circuit Breaker must be set accordingly.

Protection of LV/LV Transformers.

Transformers generally produce a very high inrush current. The crest values of the first half cycle may reach values of 15 to 25 time the normal rated current.

Manufactures data and tests have indicated that a protection device feeding a transformer must be capable of carrying the following current values without tripping.

Transformer value	imum crest inrush values		
	1st period	2nd period	After 3 periods
< 50 kVA	$25 \times I_n$	$12 \times I_n$	$5 \times I_n$
≥ 50 kVA	$15 \times I_n$	$8 \times I_n$	$3.5 \times I_n$

It is recommended that the timed Short-circuit device of a Power Circuit Breaker is set to at least $8 \times I_r$ with a time delay of 30 Milliseconds (STDB band 1). If an instantaneous protection device is present, the use of the extended adjustment range with setting of $20 \times I_e$ is advisable ($= 15 \times I_n$ plus tolerances).

Automatic Transfer Systems

EntelliGuard™ Power Circuit breakers are available with mechanical interlocks for 2 to 3 breakers and have a unique electrical network interlocking system allowing the user to completely lock out one of more breakers.

The logical transfer of power from one source to another is thus strongly simplified whilst the high speed electrical closing and opening of the device allows their use in synchronization applications.

Here, numerous other EntelliGuard™ protection features can be used, one of which being the Electronic Trip units 3 phase Undervoltage release. This to establish if voltage on a certain power source is present and if a generator set has reached its nominal voltage.



Environmental Considerations

Ambient temperature

EntelliGuard™ Power Circuit Breakers are designed to operate normally at temperatures of -5 degrees to +70°C. They can be used at temperatures down to -20°C with a reduced electrical and mechanical life span.

To prevent materials from reaching temperatures that have an adverse effect on their electrical and/or mechanical properties, de-rating factors must be applied when the device is used in ambient temperatures higher than 50°C.

Storage temperature

Power Circuit Breakers can be stored at non operational temperatures of -40 degrees up to +70°C.

Influence of Altitude

Up to an altitude of 2000m above sea level no de-rating of breaker current or rated voltage is applicable. For altitudes above 2000m the following de-rating factors apply:

Altitude	Altitude Correction factors		
	≤ 2000M	2500M	4000M
Voltage (Ue)	1	0,95	0,8
Current (In)	1	0,99	0,96

Other atmospheric conditions

The EntelliGuard™ breaker line has been designed to operate at the temperatures and relative humidities defined in the EN 60947 clause 6.1.3.1.

They also meet the requirements of the following standards:

IEC 68-2-1	Cold
IEC 68-2-2	Dry Heat
IEC 68-2-3	Damp Heat
IEC 68-2-11	Salt
IEC 68-2-14	Change of Temperature
IEC 68-2-30	Damp Heat cyclic
IEC 721	Climatic

Shock and Vibration

Power Circuit Breakers meet the shock and vibration requirements of the Lloyd's Register of Shipping, the Germanischer Lloyd and the American Board of shipping.

They also meet the requirements of the following standards:

IEC 68-2-6	Vibration
IEC 68-2-27	Shock test
IEC 68-2-29	Bump
IEC 68-2-31	Drop test

Other

All EntelliGuard™ devices meet the existing European ROHS directive and carry the CE mark.

Electromagnetic compatibility

The EntelliGuard™ Power Circuit Breaker and its electronic trip unit meet the most stringent requirements off the EN60947-2 and IEC 1004 standard. The following tests have been successfully completed.

Harmonics, current dips, interruptions and power frequency variations

All EN 60947 Annex F, Sub-clause F4.1 through 3 requirements covering non sinusoidal currents resulting from harmonics are met. Testing covering the following elements:

- Wave forms consisting of a fundamental + 3rd harmonic component at 50 and 60Hz
- Wave forms consisting of a fundamental + 5th harmonic component at 50 and 60Hz
- Composite wave forms with a fundamental component + a 3rd, 5th and 7th harmonic at 50 and 60Hz
- Current dips and current interruptions
- Frequency variations from 45 to 65Hz in 1 Hz steps

Electrostatic discharge

En 60947 Annex F, Sub-clause F and the IEC 1004-2

- Passed level 4, air discharge 15kV

Radiated, radio frequency, electromagnetic field immunity test

EN 60947-2 Annex F, Sub-clause F7 and the IEC 1000-4-3 (basic standard)

- Passed higher than level 4 Field strength 30V/m

Electrical fast transient/burst

EN 60947-2 Annex F, Sub-clause F5 and the IEC 1000-4-4 (basic standard)

- Passed level 4 burst peak voltage 4kV

Surge immunity test

EN 60947-2 Annex F, Sub-clause F5 and the IEC 1000-4-5 (basic standard)

- Passed level 4 Voltage 1,2µs/50µs 6kV; current 8µs/20µs 3kA

Dry heat test

EN 60947-2 Annex F, Sub-clause F8

- Passed all test requirements

Thermal shock test

EN 60947-2 Annex F, Sub-clause F9

- No nuisance tripping within the 28-day temperature cycles

- Wiring Diagrams**
- E.2 Breaker connection schemes Terminal A
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 - E.6 Cassette & Trip Unit connection schemes
 - E.7 Trip Unit connection schemes

The breaker

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Breaker Accessories

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Wiring Diagrams

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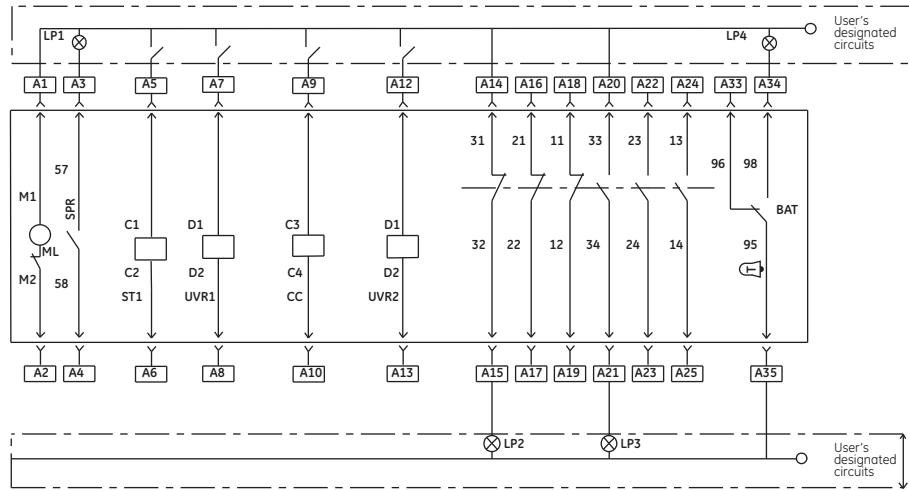
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Breaker Connection Schemes

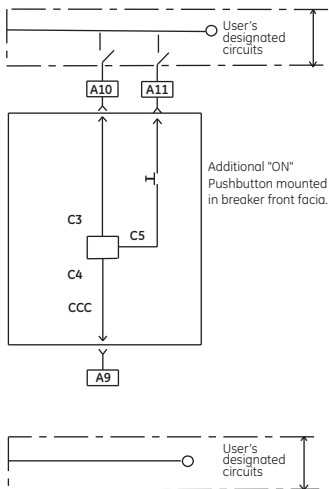
Standard use of Terminal block A

One Terminal block A is supplied with each breaker

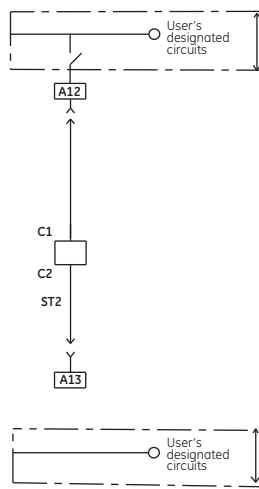


Optional use of Terminal block A

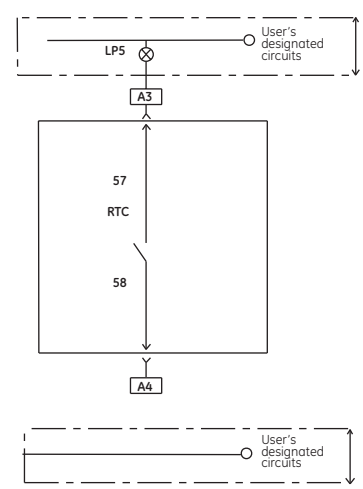
Optional use of Terminal block A
Used with a Command Closing Coil (CCC)



Used with a 2nd Shunt Release
(Replacing 2nd UVR release)

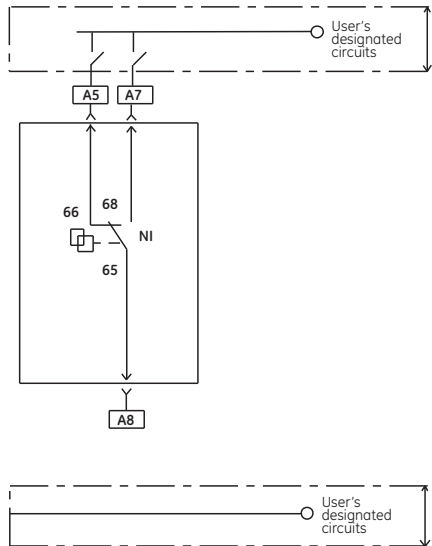


Used with a RTC contact
(Replacing SPR contact)



Optional use of Terminal block A

Used with a Network Interlock (NI) (Replacing 1 UVR and 1 ST)



User designated circuits; indicators

- LP1: Spring charge status
- LP2: Breaker open
- LP3: Breaker closed
- LP4: Fault
- LP5: Breaker ready to close

Terminology

- CC: Close coil
- ST: Shunt release
- UVR: Undervoltage release
- SPR: Spring change status
- RTC: Ready to close status
- M: Motor operator
- BAT: Bell alarm trip
- CCC: Comand close coil
- NI: Network interlock

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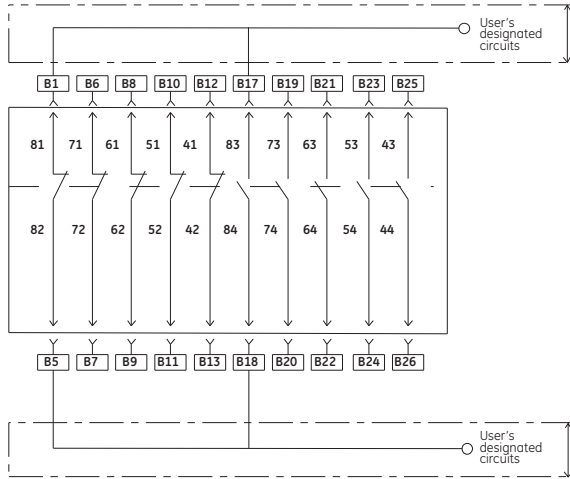
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Breaker Connection Schemes

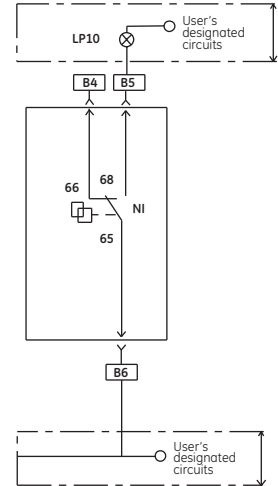
Standard use of Terminal block B

Terminal block B is supplied with factory mounted breakers, when needed.



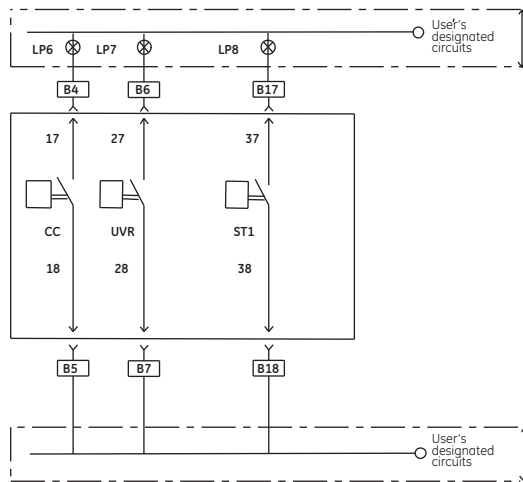
Optional use of Terminal block

Used with a Network Interlock (NI) (Replacing 2 NO Aux. Contacts)

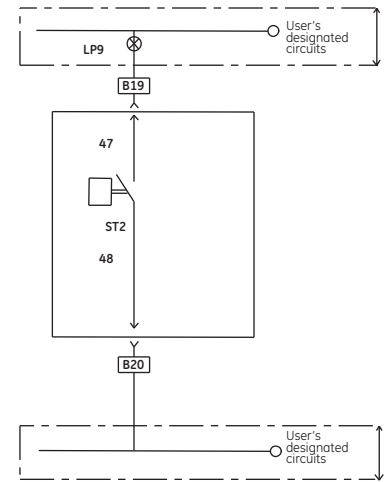


Optional use of Terminal block B

Used with Coil indication contacts (Replacing 2 NC and 1 NO Aux. contact)

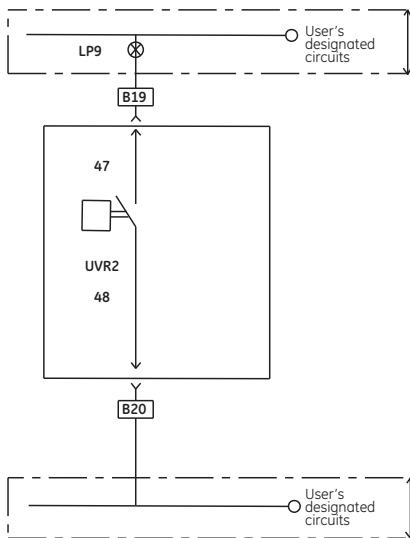


Used with Coil Indication contact (Replacing 1NO Aux. contact)



Optional use of Terminal block B

Used with Coil Indication contact (Replacing 1 NO Aux. Contact)



User designated circuits; indicators

- LP6: CC powered
- LP7: UVR not powered
- LP8: ST powered
- LP9: ST2 powered/UVR2 not powered
- LP10: Network interlock lockout

Terminology

- CC: Close coil
- ST: Shunt release
- UVR: Undervoltage release
- SPR: Spring change status
- NI: Network interlock

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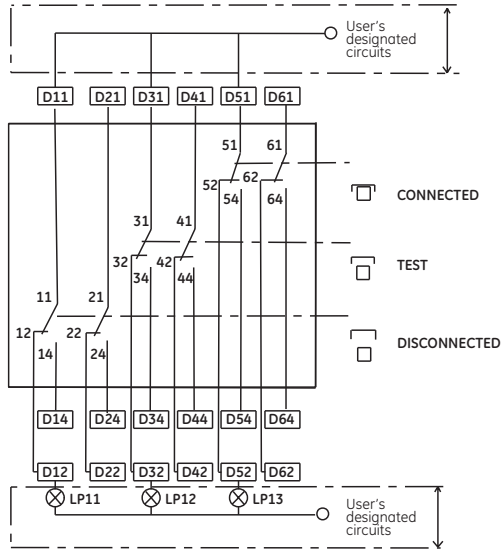
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X



Cassette & Trip Unit Connection Schemes

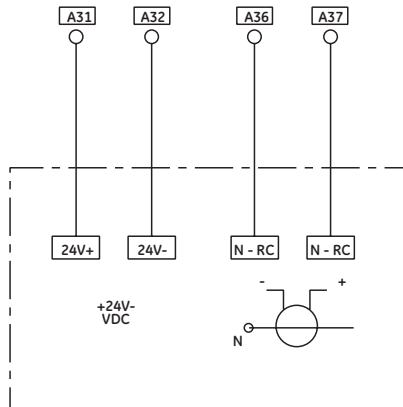
Optional Cassette Position Indication Switches



User designated circuits; indicators

- LP11: Breaker in disconnected position
- LP12: Breaker in test position
- LP13: Breaker in connected position

Trip Unit - Type GT-E

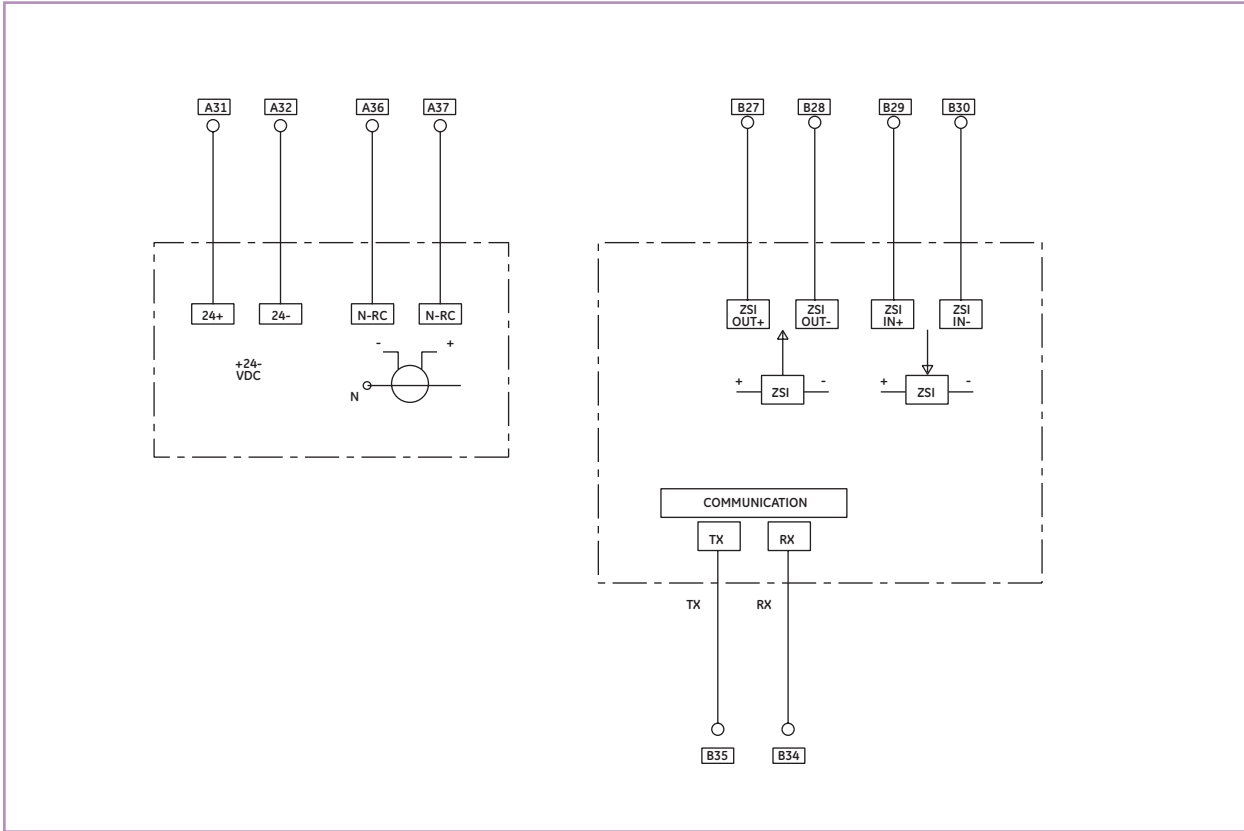


Terminology

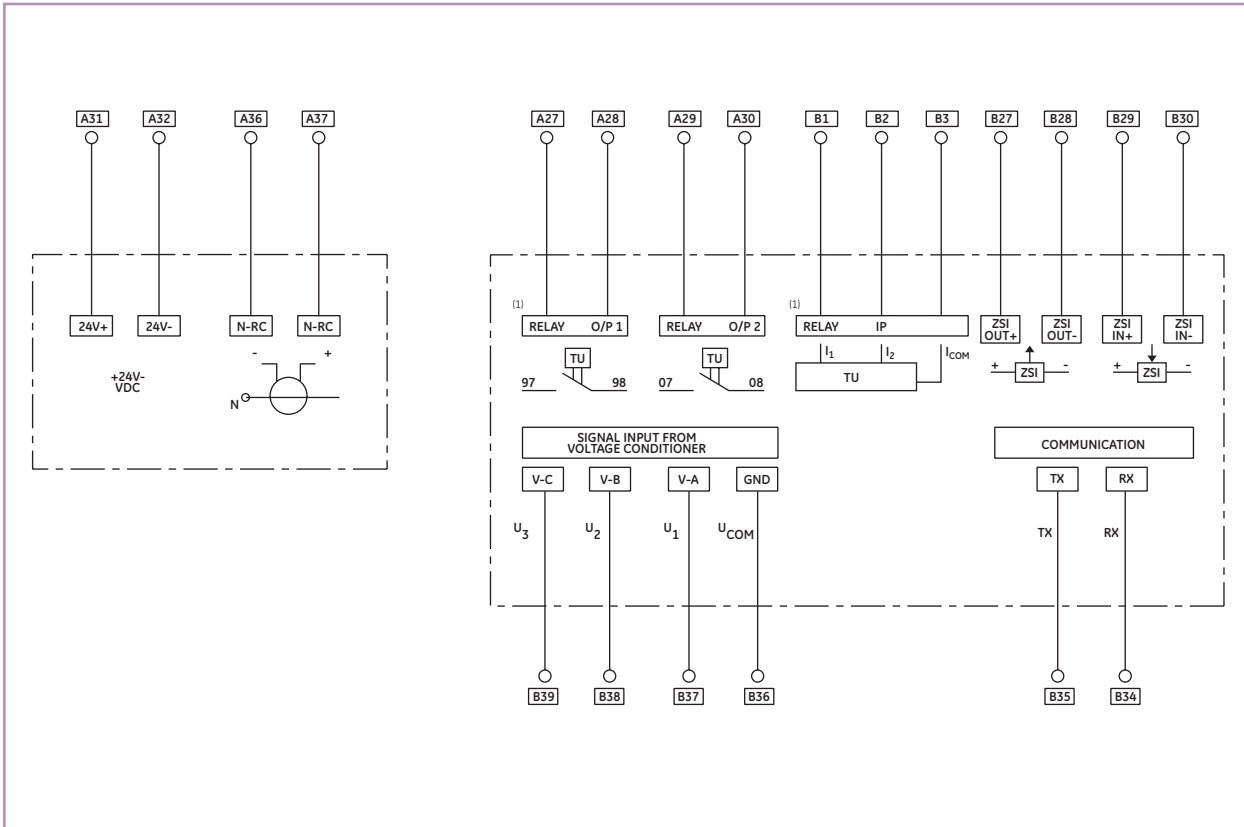
- 24V+/24V-: Auxiliary power supply to trip unit
- N-RC: Neutral Rogowski coil
- RXD: Modbus/Profibus communication
- TXD: Modbus/Profibus communication
- TX_EN_I: Profibus communication
- 5V ISO: Profibus communication
- ISO GND: Profibus communication
- ELCT: Earth leg ct
- RELAY O/P: Relay OUT PUT
- RELAY I/P: Relay IN PUT
- V-A/V - B/V-C: Signal input from voltage conditioner
- GND: Ground for voltage
- ZSI OUT: Zone selective interlock OUT
- ZSI IN: Zone selective interlock IN

Trip Unit Connection Schemes

Trip Unit - Type GT-S



Trip Unit - Type GT-N

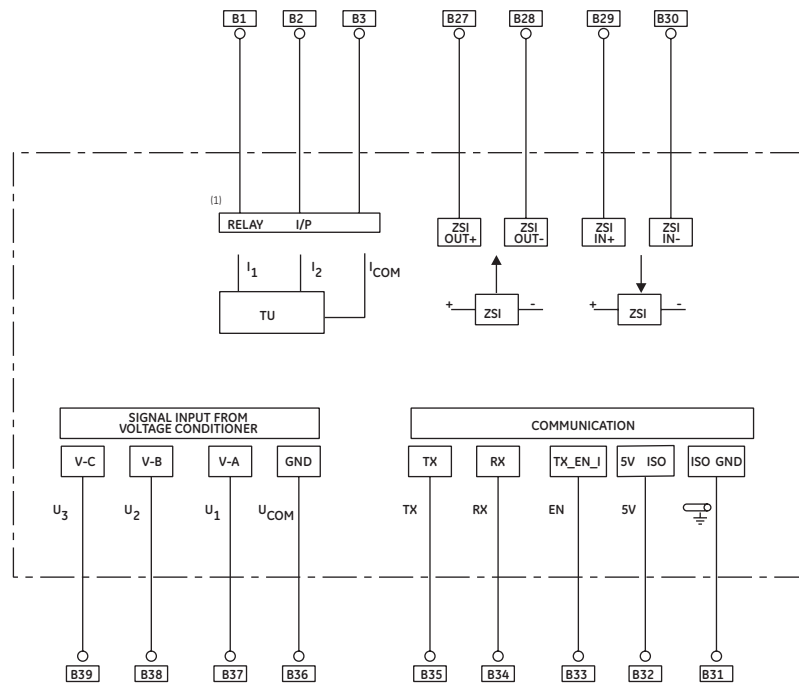
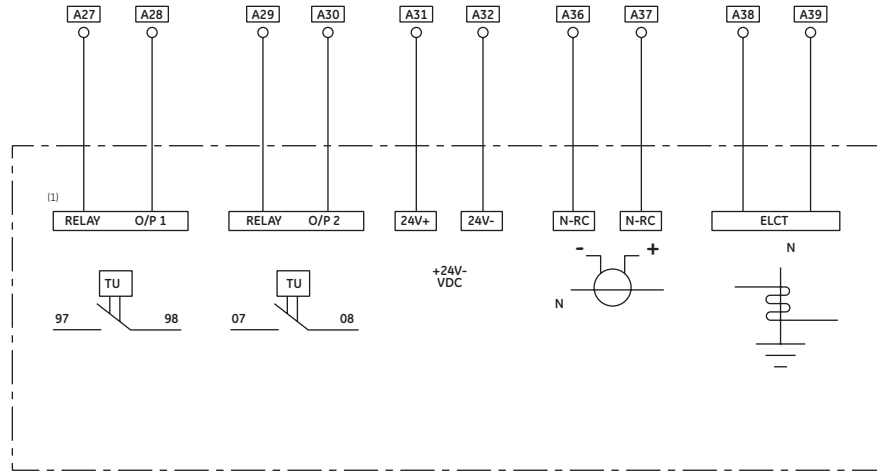


(1) Relay output one and electronic input one are assigned to RELT function.



Trip Unit Connection Schemes

Trip Unit - Type GT-H



Terminology

- 24V+/24V-: Auxiliary power supply to trip unit
- N-RC: Neutral Rogowski coil
- RXD: Modbus/Profibus communication
- TXD: Modbus/Profibus communication
- TX_EN_I: Profibus communication
- 5V ISO: Profibus communication
- ISO GND: Profibus communication
- ELCT: Earth leg CT
- RELAY O/P: Relay OUT PUT
- RELAY I/P: Relay IN PUT
- V-A/V - B/V-C: Signal input from voltage conditioner
- GND: Ground for voltage
- ZSI OUT: Zone selective interlock OUT
- ZSI IN: Zone selective interlock IN

(1) Relay output one and electronic input one are assigned to RELT function.



Dimensions	
F.2	Envelope 1 - Fixed type
F.3	Envelope 1 - Draw-out type
F.4	Envelope 2 - Fixed type
F.5	Envelope 2 - Draw-out type
F.6	Envelope 2 - 100% rated Draw-out type
F.7	Envelope 1 & 2 - Optional Connection modes
F.8	Envelope 3 - Fixed type
F.10	Envelope 3 - Draw-out type
F.12	IP54 Flange, Time Delay Module UVR, 24V Power Supply
F.13	Rogowski's, Current Transformers, Door interlock system & wall mounting brackets
F.14	Interlocking with cable systems, 2 way
F.15	Interlocking with cable systems, 3 way

The breaker

Order Codes

Electronic Trip Units

Breaker Accessories

Application Guide

Wiring Diagrams

Dimensions

Numerical index

Intro

A

B

C

D

E

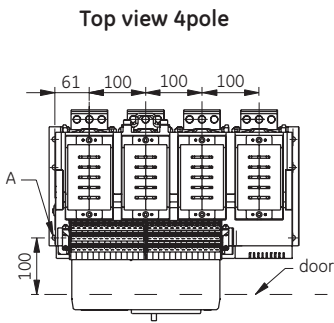
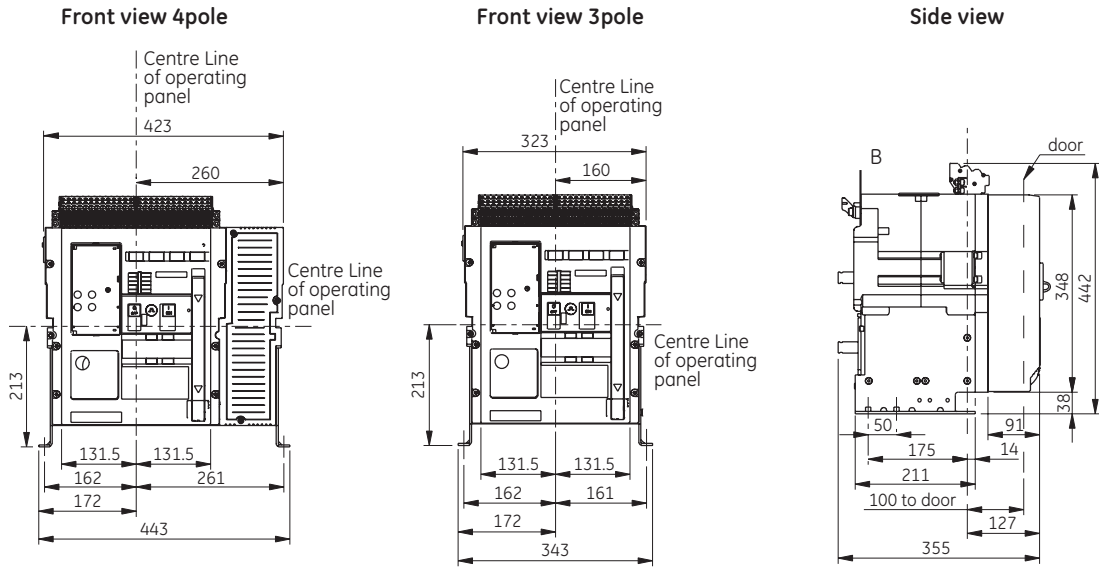
F

X

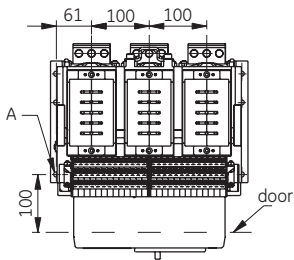


Envelope 1 - Fixed Pattern

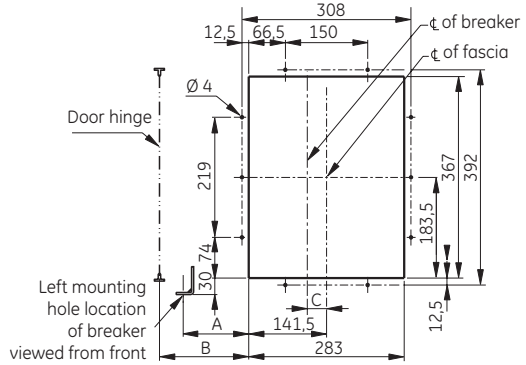
Dimensions



Top view 3-pole

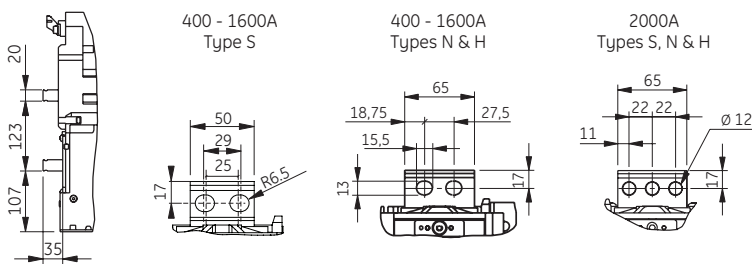


Door Cut-out



Breaker type	DIM "A"	DIM "B" minimum	DIM "C"
Envelope 1 3 pole	20,0	55,0	0,0
Envelope 1 4 pole	20,0	55,0	-49,5

Standard Connection pads⁽¹⁾



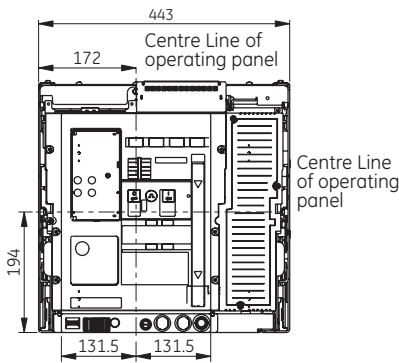
Remarks

- A - 6 mounting holes of $\varnothing 9,5\text{mm}$
- B - Please refer to section D for clearance distances

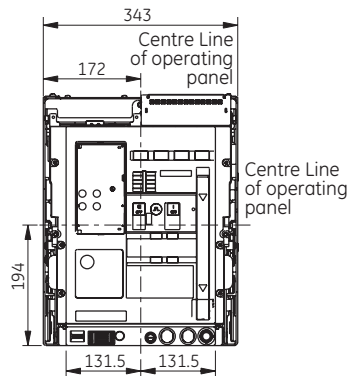


Envelope 1 - Draw-out Pattern

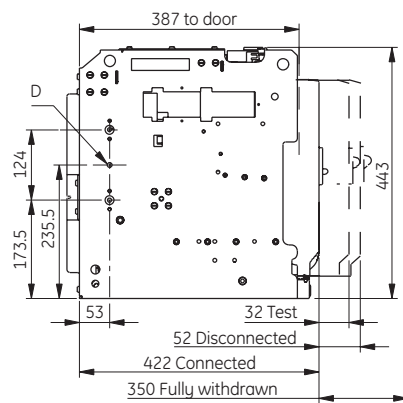
Front view 4pole



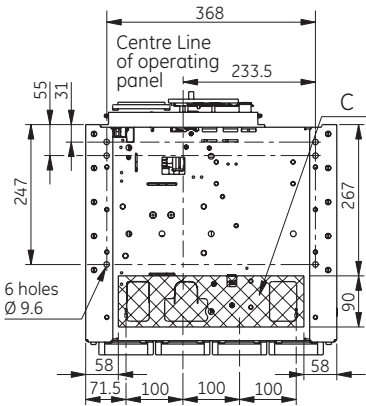
Front view 3pole



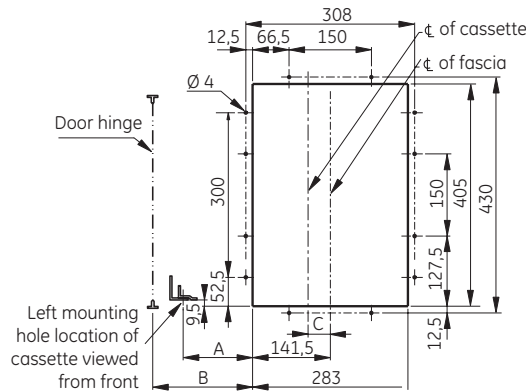
Side view



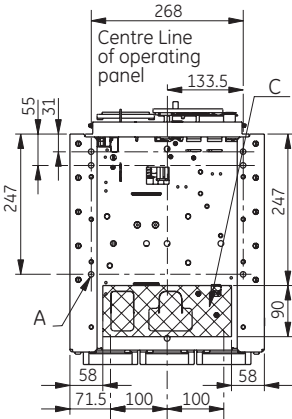
Top view 4pole



Door Cut-out



Top view 3pole

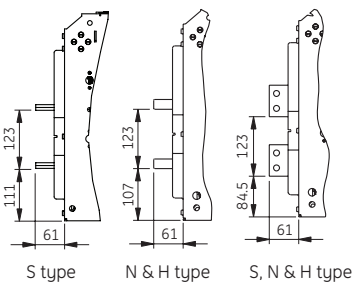


Breaker type	DIM "A"	DIM "B" minimum	DIM "C"
Envelope 1 3 pole	-7.0	60.0	0.0
Envelope 1 4 pole	-7.0	60.0	-49.5

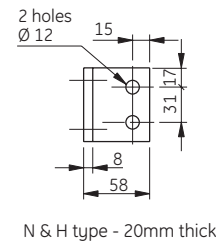
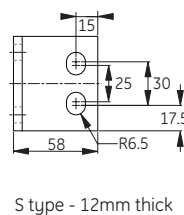
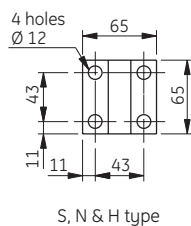
Remarks

- A - 6 mounting holes of Ø 9,5mm
- C - Please leave unobstructed; Required for ventilation
- D - 1 hole M6 Left & Right for earthing

Universal Connection pads Mounted Horizontally or Vertically



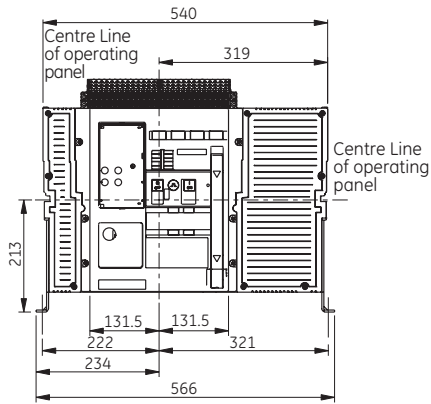
Universal Connection pads Details



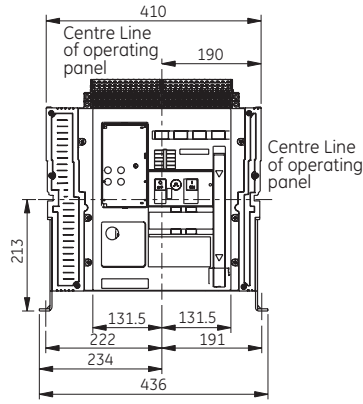
Envelope 2 - Fixed Pattern

Dimensions

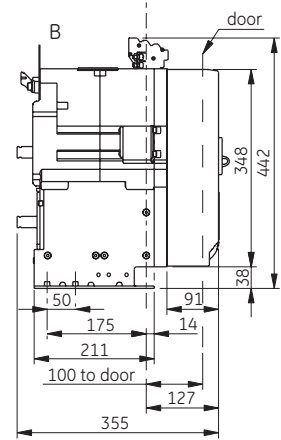
Front view 4pole



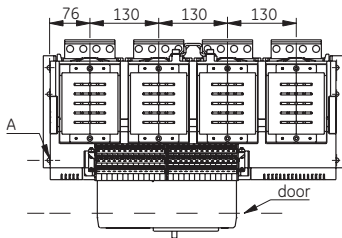
Front view 3pole



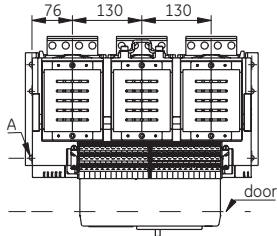
Side view



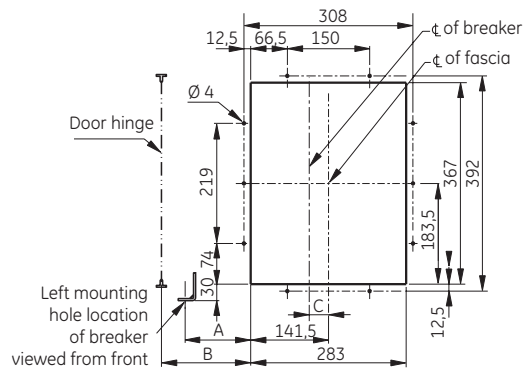
Top view 4pole



Top view 3pole

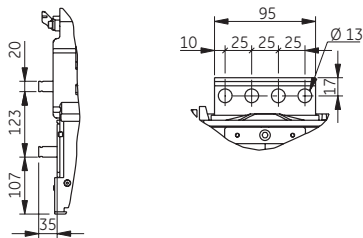


Door Cut-out



Breaker type	DIM "A"	DIM "B" minimum	DIM "C"
Envelope 2 3 pole	80,0	115,0	15,5
Envelope 2 4 pole	80,0	115,0	-49,5

Standard Connection pads

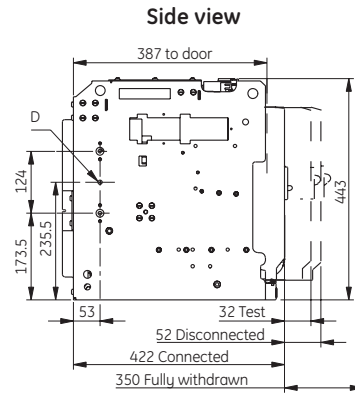
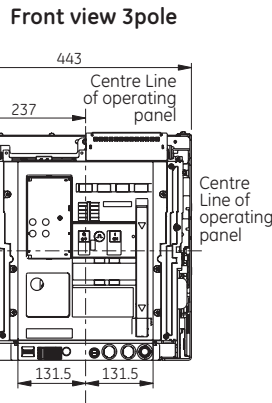
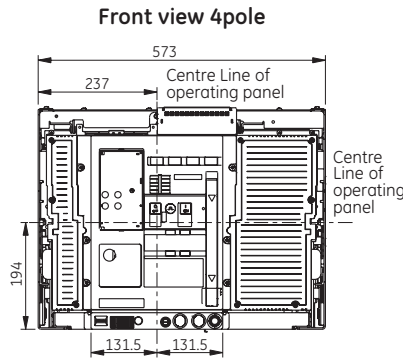


Remarks

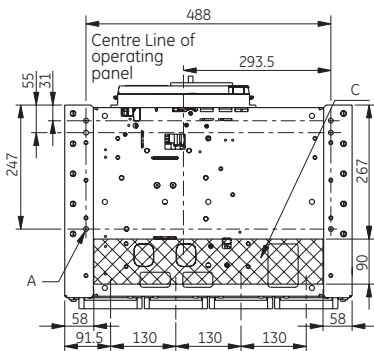
- A - 6 mounting holes of Ø 9,5mm
- B - Please refer to section D for clearance distances



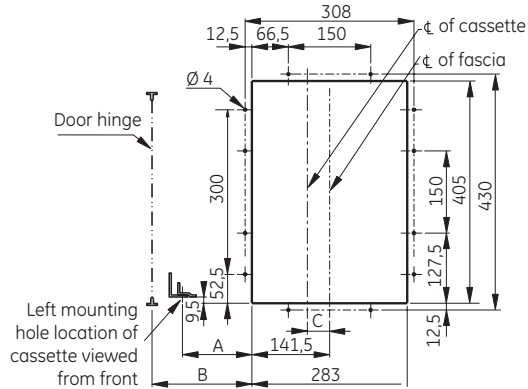
Envelope 2 - Draw-out Pattern



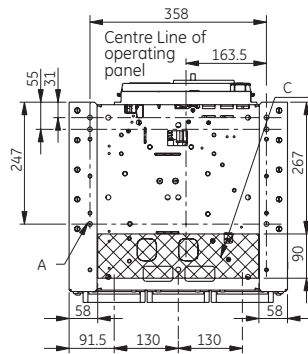
Top view 4pole



Door Cut-out

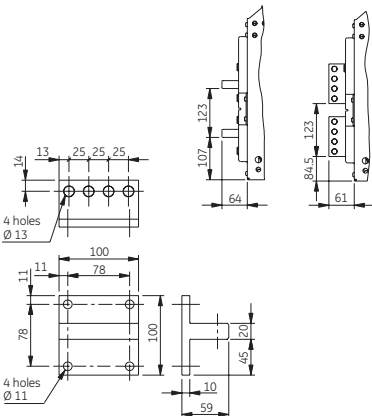


Top view 3pole

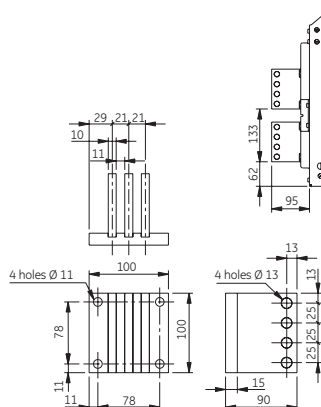


Breaker type	DIM "A"	DIM "B" minimum	DIM "C"
Envelope 2 3 pole	53,0	125,0	15,5
Envelope 2 4 pole	53,0	125,0	-49,5

Universal Connection pads
Vertical or Horizontal max. 3200A



Universal Connection pads
Only Vertical max. 4000A



Remarks

- A - 6 mounting holes of Ø 9,5mm
- C - Please leave unobstructed; Required for ventilation
- D - 1 hole M6 Left & Right for earthing



Envelope 2 - 100% rated Draw-out Pattern

Dimensions

Intro

A

B

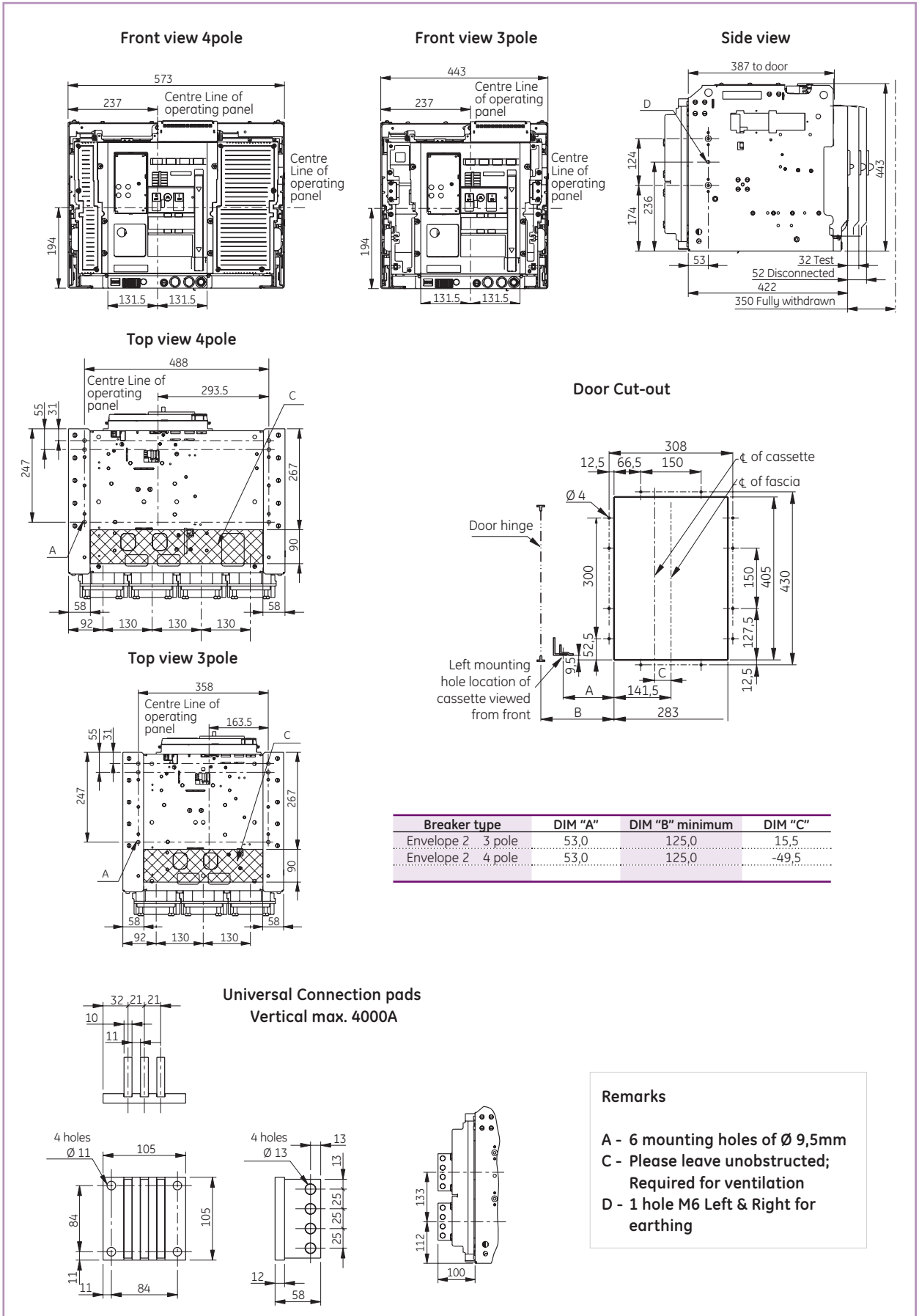
C

D

E

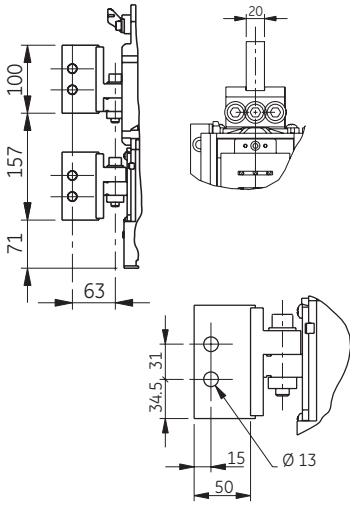
F

X

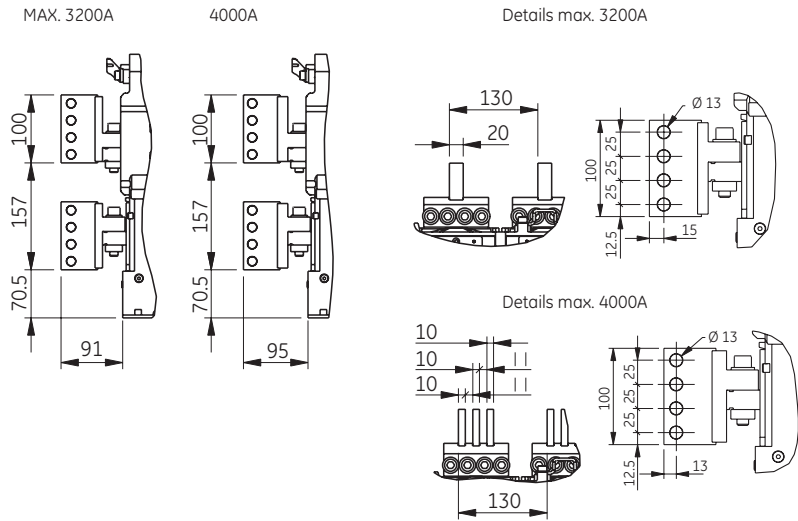


Envelope 1 & 2 - Alternate Connection Modes

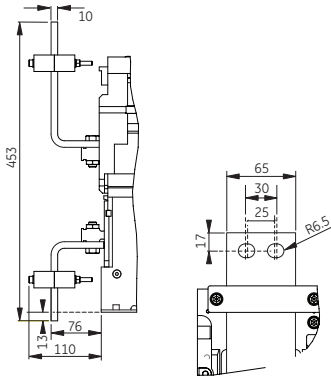
Fixed Vertical Rear Connection
Envelope 1



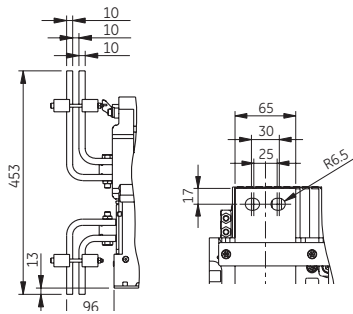
Fixed Vertical Rear Connection
Envelope 2



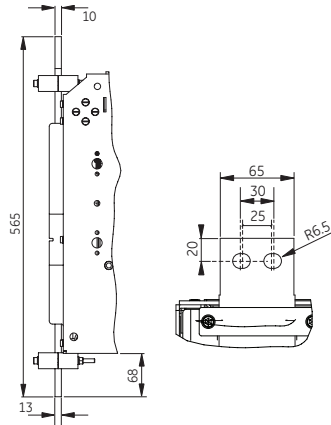
Fixed Front Connection
Envelope 1 ≤1600A



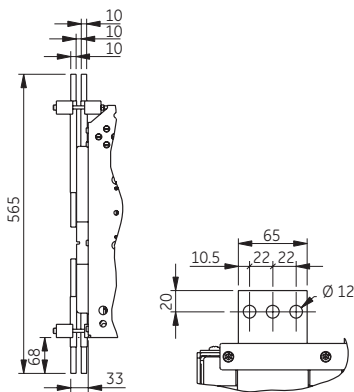
Fixed Front Connection
Envelope 1 2000A



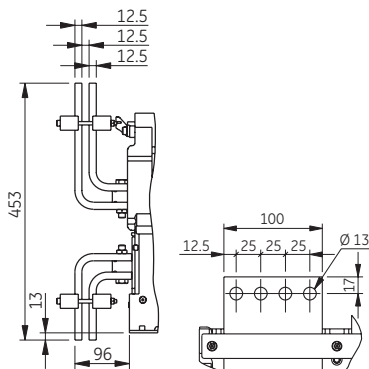
Draw-out Front Connection
Envelope 1 ≤1600A



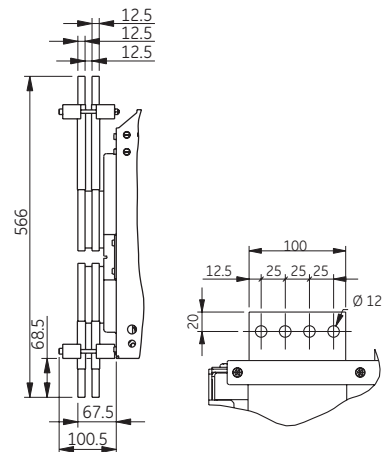
Draw-out Front Connection
Envelope 1 2000A



Fixed Front Connection
Envelope 2



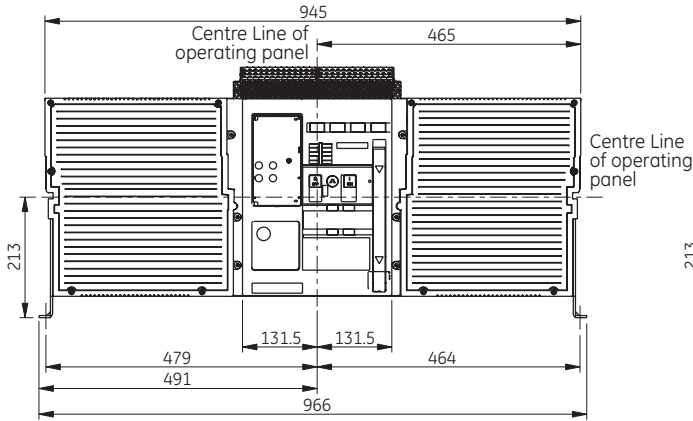
Draw-out Front Connection
Envelope 2



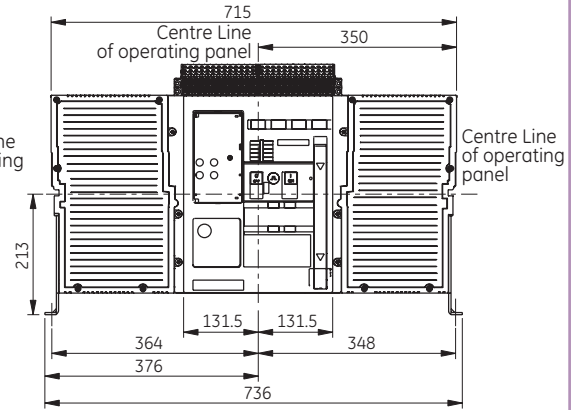
Envelope 3 - Fixed Type

Dimensions

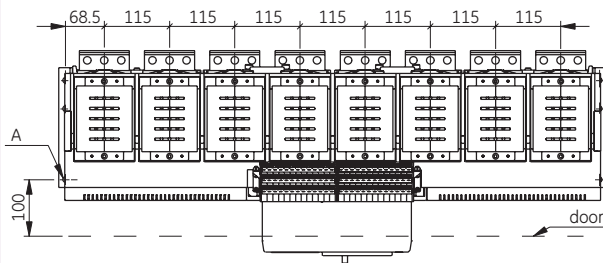
Front view 4pole



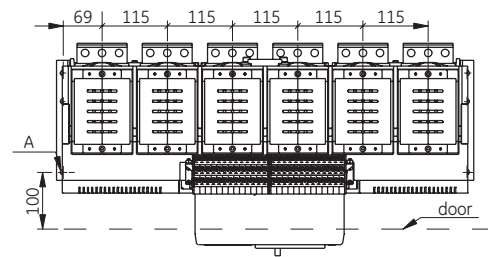
Front view 3pole



Top view 4pole



Top view 3pole



Intro

A

B

C

D

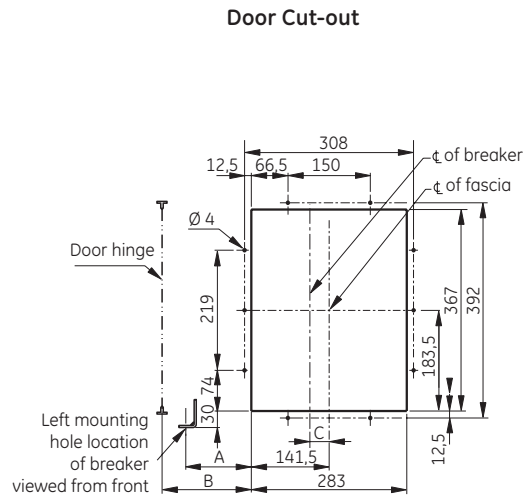
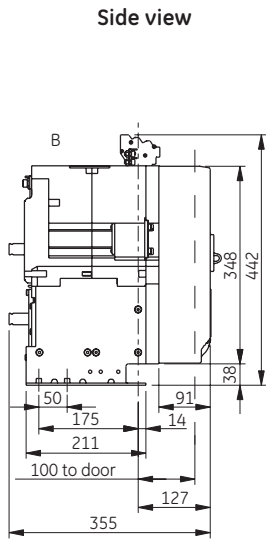
E

F

X

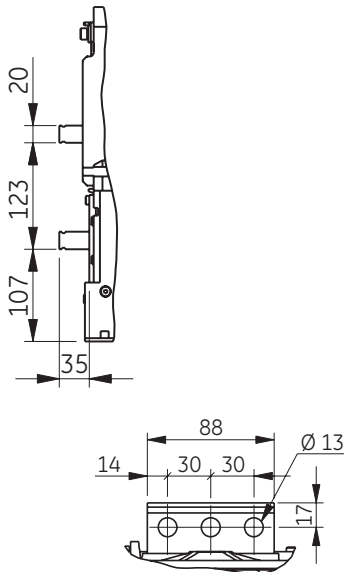


Envelope 3 - Fixed Type

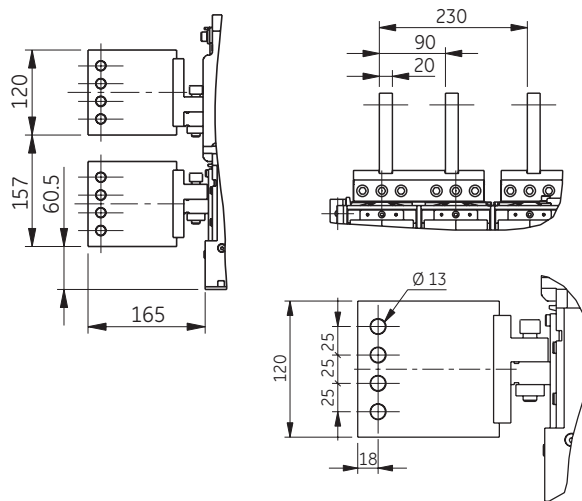


Breaker type	DIM "A"	DIM "B" minimum	DIM "C"
Envelope 3 3 pole	222,5	259,5	8,0
Envelope 3 4 pole	337,5	374,5	8,0

Standard Connection pads
Horizontal maximum 5000A



Standard Connection pads
Vertical maximum 6400A



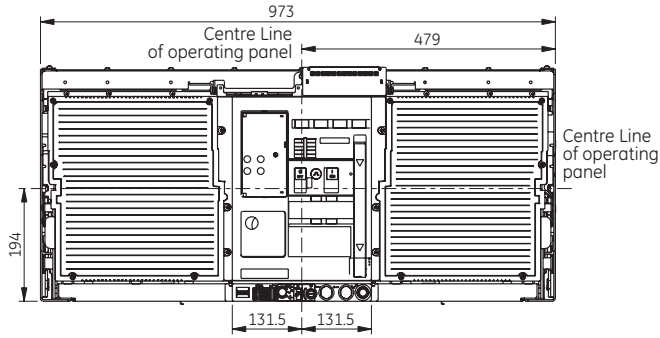
Remarks

- A - 6 mounting holes of Ø 9,5mm
- B - Please refer to section D for clearance distances

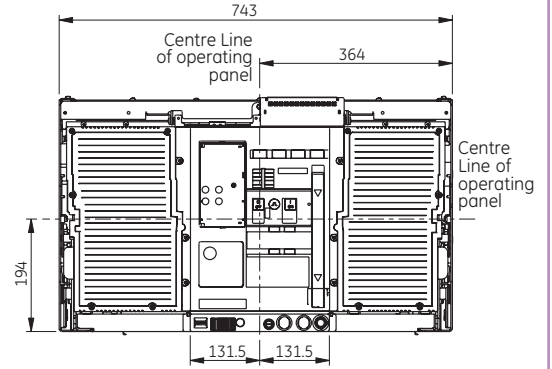
Envelope 3 - Draw-out Pattern

Dimensions

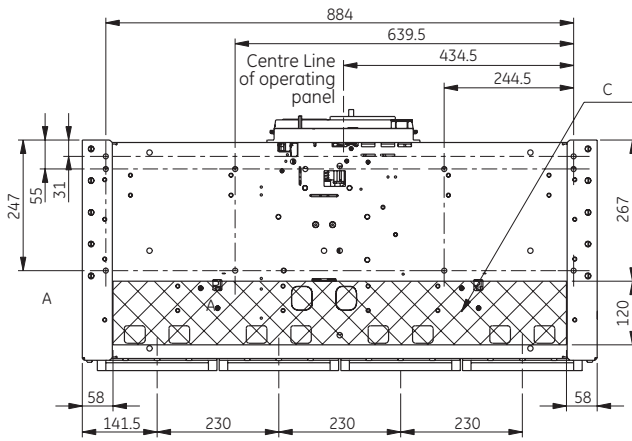
Front view 4pole



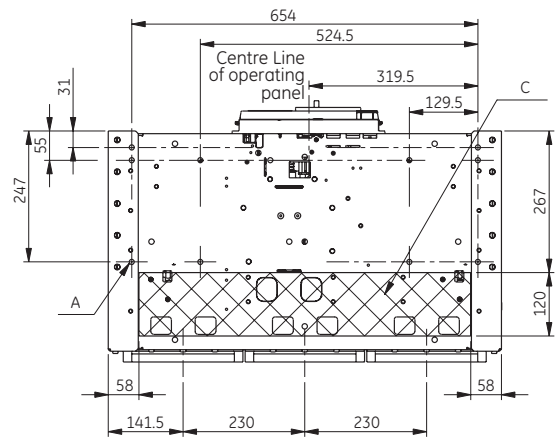
Front view 3pole



Top view 4pole



Top view 3pole



Intro

A

B

C

D

E

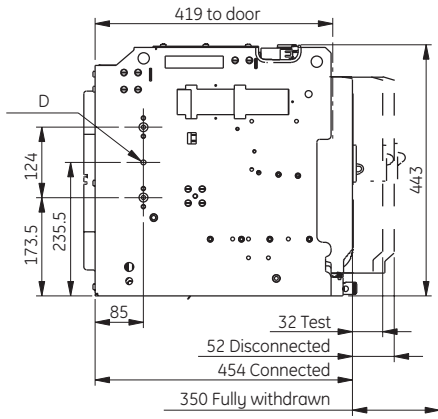
F

X

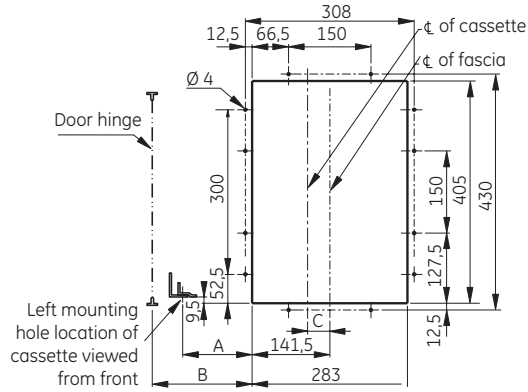


Envelope 3 - Draw-out Pattern

Side view

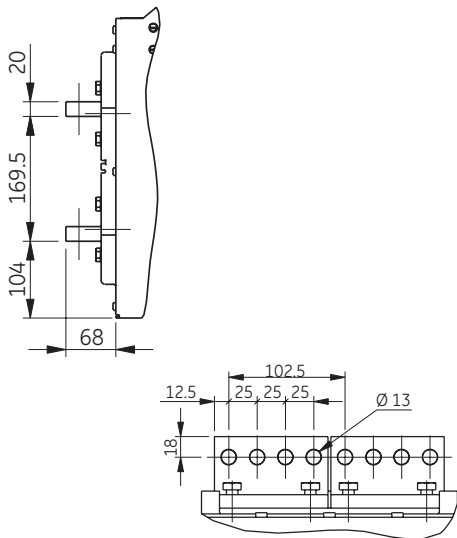


Door Cut-out

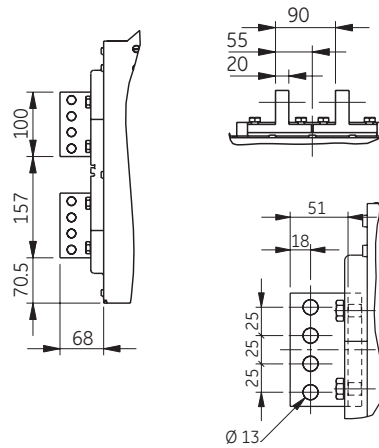


Breaker type	DIM "A"	DIM "B" minimum	DIM "C"
Envelope 3 3 pole	193,5	267,0	8,0
Envelope 3 4 pole	308,5	382,0	8,0

Standard Connection pads
Horizontal maximum 5000A



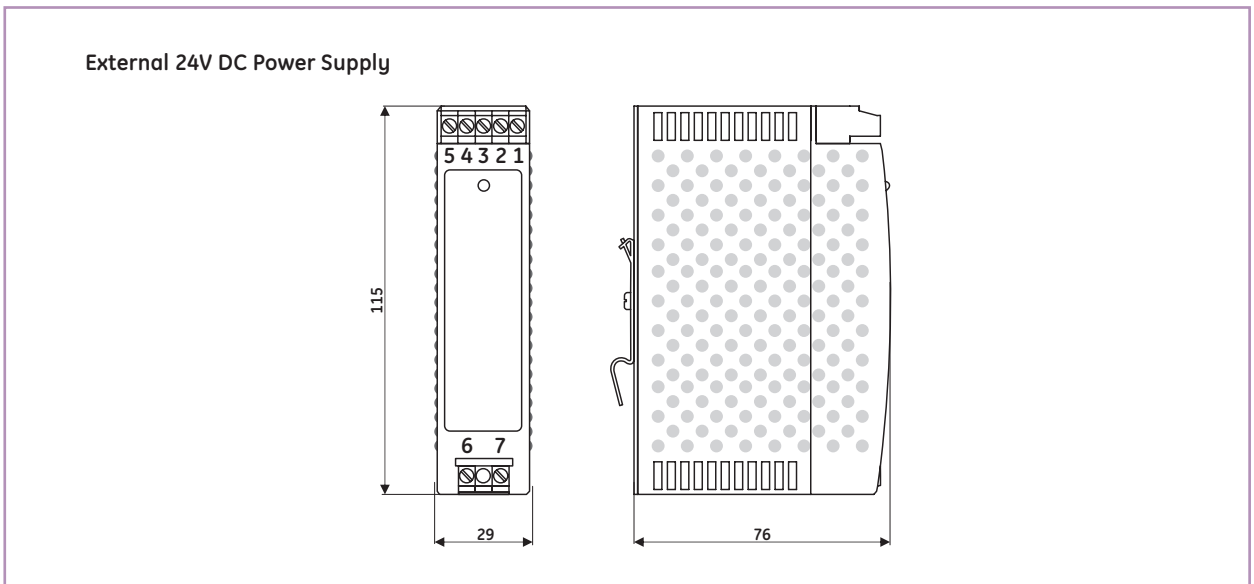
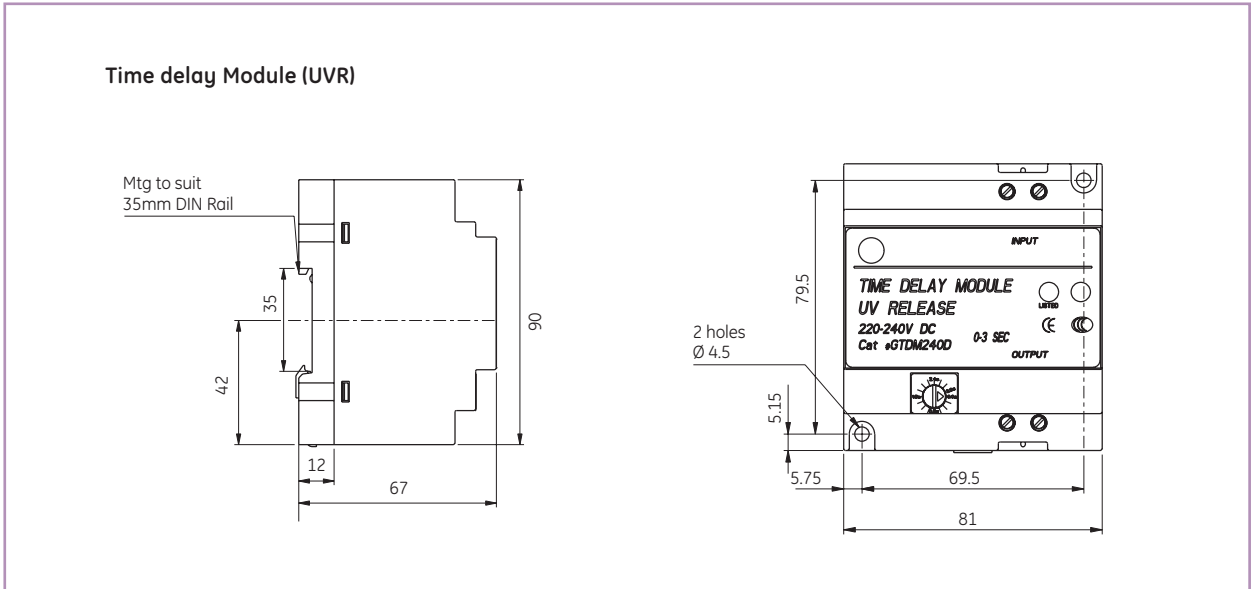
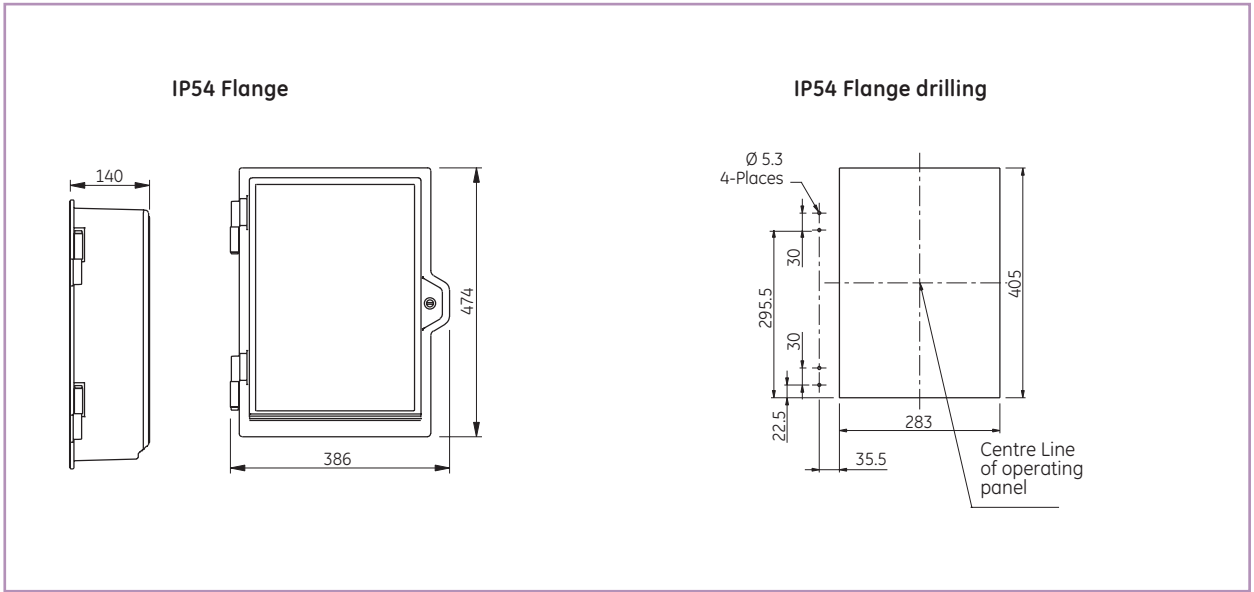
Standard Connection pads
Vertical maximum 6400A



Remarks

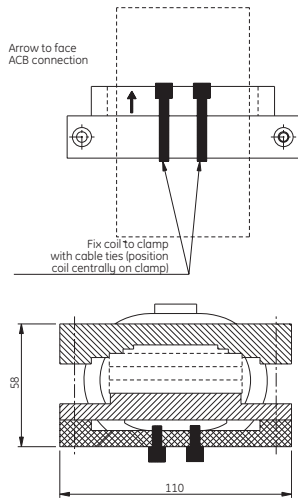
- A - 6 mounting holes of Ø 9,5mm
- C - Please leave unobstructed;
Required for ventilation
- D - 1 hole M6 Left & Right for earthing

IP54 Flange, Time Delay Module UVR, 24V Power Supply



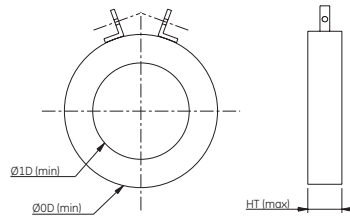
Rogowski's, Current Transformers, Door Interlock system and Mounting Brackets

Rogowski Coil external



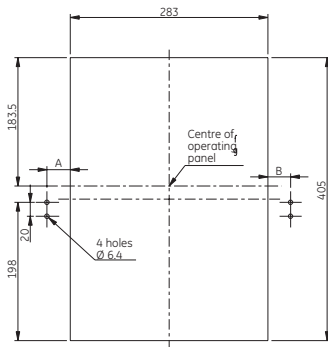
Remark: for ratings > 4000A two coils are used

Current Transformer external



Rating	1D	OD	HT
400A	94	144	24
630A	85	135	30
2000A	87	151	31
3200A	84	154	34
4000A	81	154	57
5000A	85	198	58
6400A	85	210	65

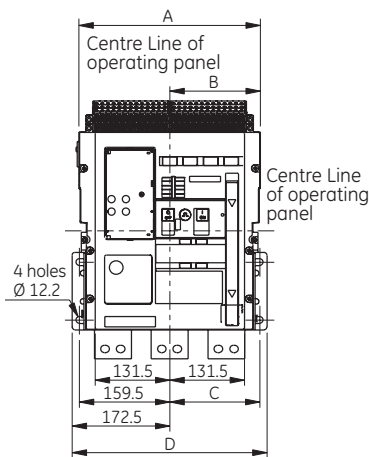
Door Interlock system



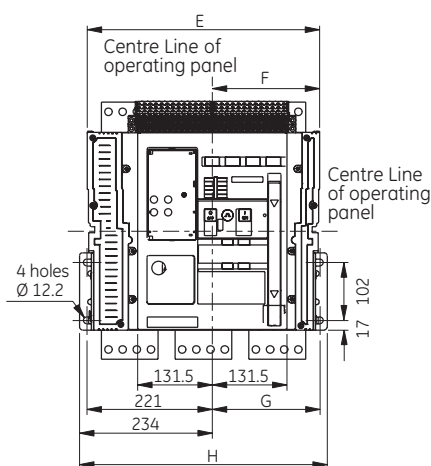
Frame	A	B
F1-3P	33.5	32.5
F1-4P	33.5	132.5
F2-3P	98.5	67.5
F2-4P	98.5	197.5
F3-3P	240.5	225.5
F3-4P	355.5	340.5

Front mounting brackets (fixed pattern, drawings include front connection option)

Envelope 1



Envelope 2



	3 pole	4 pole
A	320	420
B	159.5	259.5
C	158.5	258.5
D	344	444
E	410	540
F	189.5	319.5
G	190	320
H	437	567

Interlocking with Cable systems; 2 way

Dimensions

Intro

A

B

C

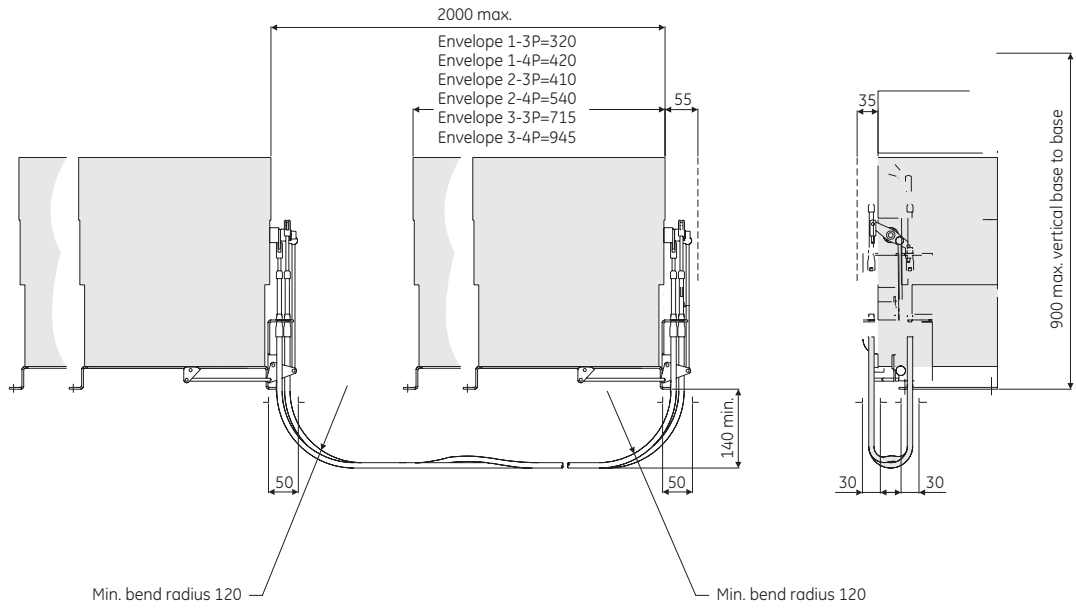
D

E

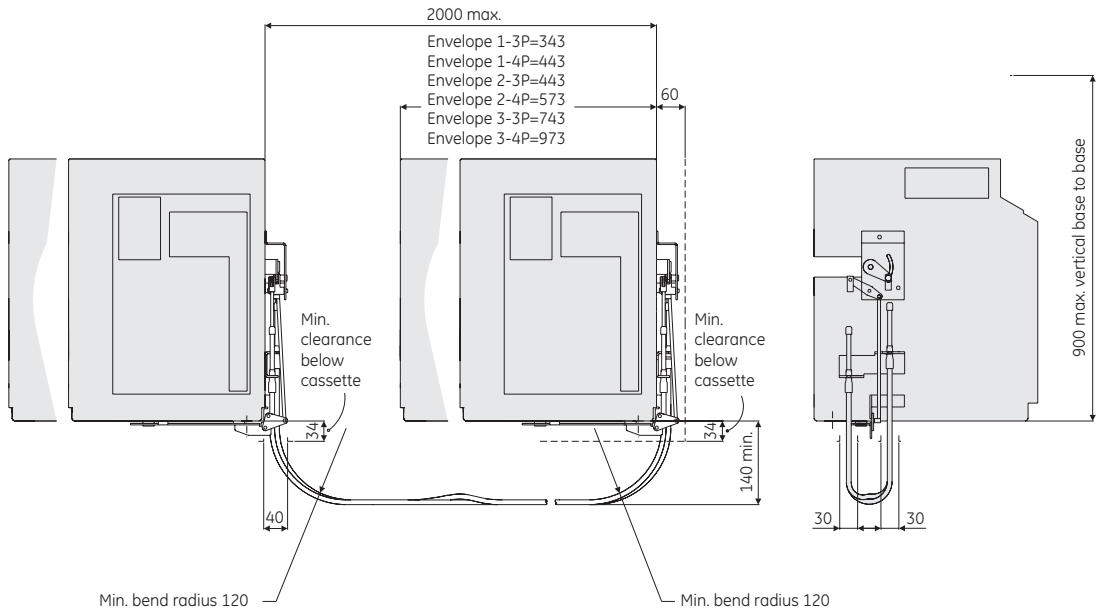
F

X

Fixed pattern 2-way cable interlock / Fixed pattern - Front/rear access

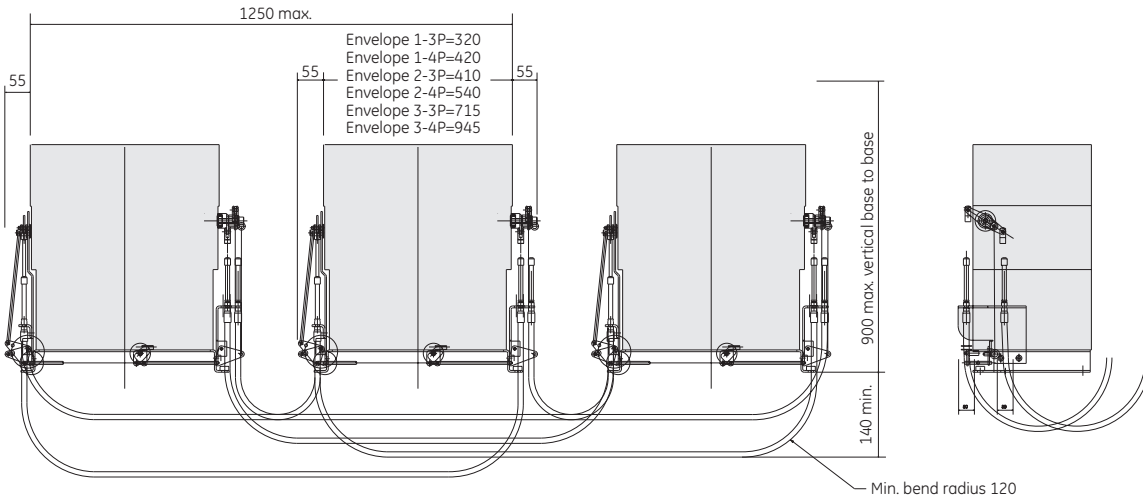


Draw-out 2-way cable interlock / Withdrawable pattern - Front/rear access

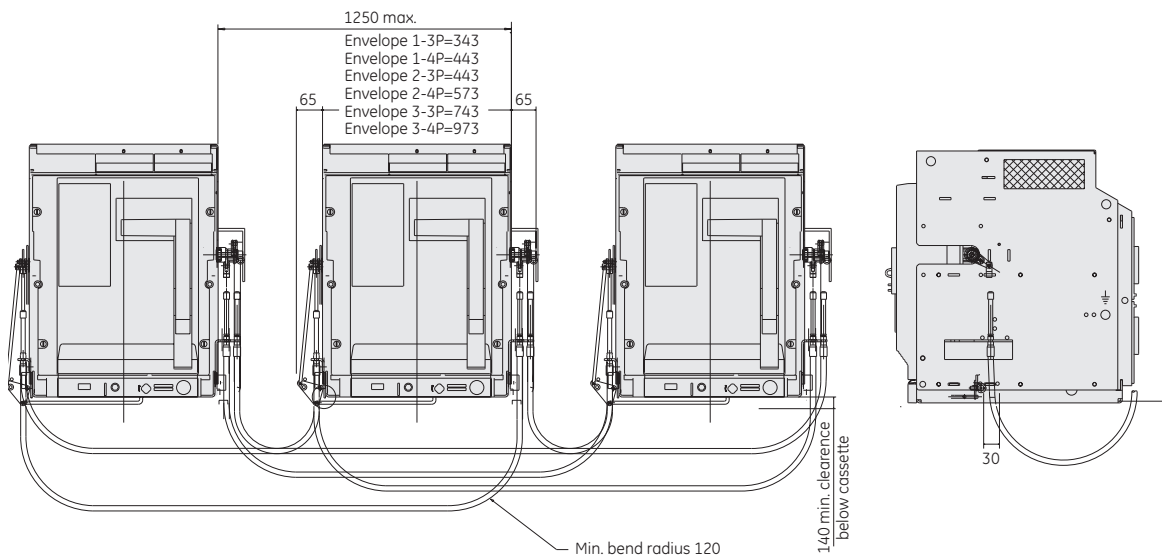


Interlocking with Cable systems; 3 way

Fixed pattern 3-way cable interlock / Fixed pattern - Front/rear access



Draw-out 3-way cable interlock / Withdrawable pattern - Front/rear access



Ref. No.	Cat. No.	Page
407000		
407001	GG04E1	A.8
407002	GG04E3	A.8
407003	GG04E4	A.4
407004	GG04E6	A.4
407005	GG04H1	A.8
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