Industrial Solutions

EntelliGuard* G
Air Circuit Breaker

* Trademark of General Electric Company

by ABB

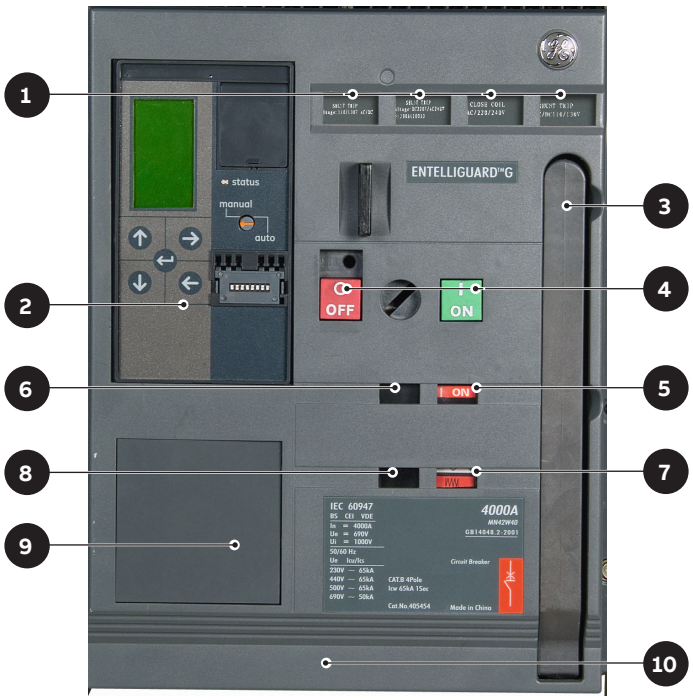
EntelliGuard* G
Index

The breaker

The breaker
Product identification

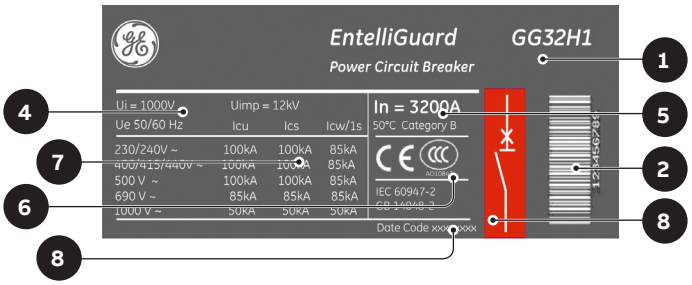
Air circuit breaker front facia

Key
1 Installed accessory indicators
2 Electronic trip unit
3 Manual charging handle
4 ON and OFF buttons
5 Contact position indicatior
6 Ready to close indicator
7 Spring charged indicator
8 Operation counter
9 Provision for key lock
10 Global catalogue number



Air 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 and 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
reaker 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

The breaker
Features

Air circuit breakers

Uncompromising, fast and selective

EntelliGuard air circuit breakers are a new line of air circuit breakers evolved from the existing M-PACT Plus and 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 four basic frames with fault interruption ratings of up to 150kA. 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.

Catalogue content
This catalogue only refers to the IEC versions of the EntelliGuard air circuit breaker. For the ANSI and UL variants of the same design please contact us

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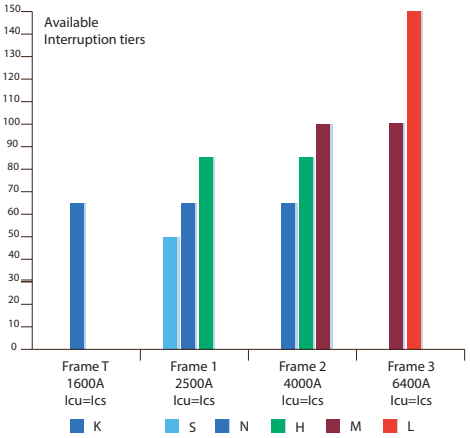
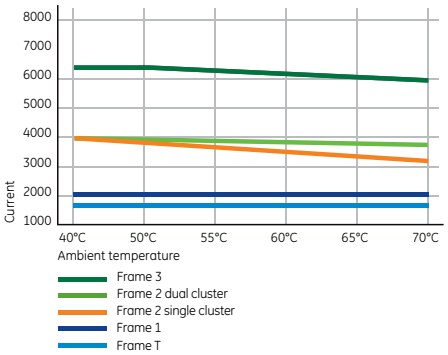
Features

Hi-performance: complete line





The EntelliGuard range of air circuit breakers encompasses a line of three and four pole air circuit breakers with nominal currents ranging from 400 to 6400Amp in four basic frames.
All air circuit breakers are designed to allow multiple interruptions of fault currents. Here the tested and certified service breaking capacity value is in almost all cases equal to the stated ultimate breaking capacity.

Frame T can be used in networks with voltage up to 690V and can be acquired with current ratings from 400A to 1600Amps at 50 °C.
This type is available in interruption ratings of 50 and 65kA.

Frame 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.

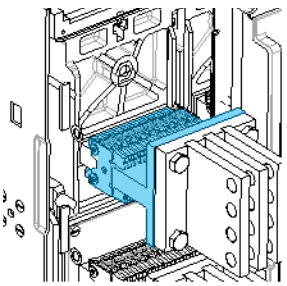
Frame 2 can be used in networks with voltages up to 1000V and can be acquired with current ratings from 400 to 4000Amps at 50 °C.
This type is available in interruption ratings (Ics=Icu) of 50, 65, 85 and 100kA.

Frame 3 can be used in networks with voltages up to 690V 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.
For 1000/1500V DC Switch Please contact your Nearest Sales office

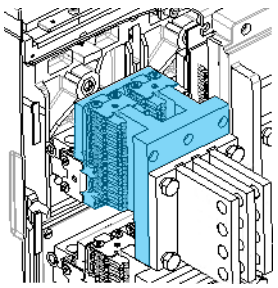
Hi-performance: current ratings in enclosures
One of the most important user parameters is not the nominal rating of an 'Air Circuit Breaker' in free air but its current rating within a panel or enclosure. Breakers 'enclosed ratings' are determined by the heat dissipation produced by the device and its ability to carry current at the temperature within the enclosure.

EntelliGuard air 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.

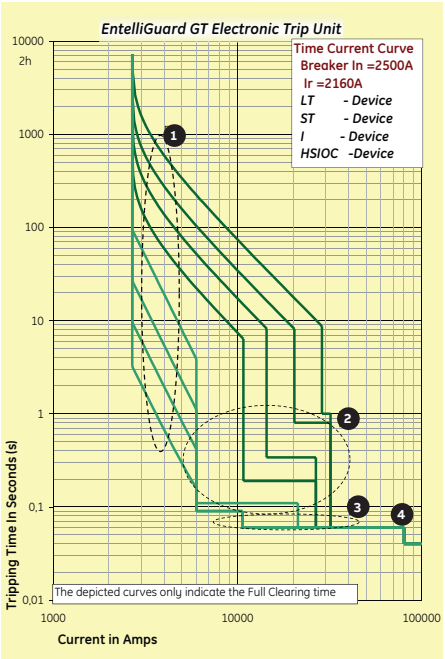
For extreme cases a special dual cluster draw-out version of an frame 2 breaker is available allowing a very limited derating when the breaker is used at high ambient temperatures within an enclosure.



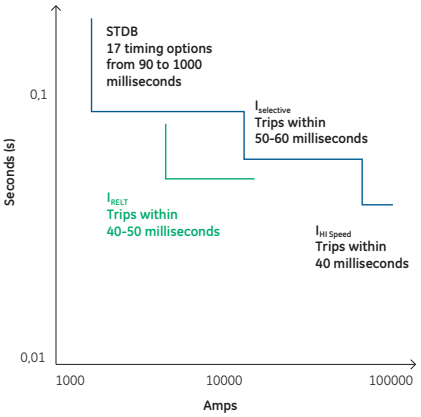
Standard draw-out construction 'Single Cluster'



'Limited derating' draw-out construction 'Dual Cluster'



Selective, fast and uncompromising



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)

Selective and 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.
Air circuit breakers are designed to remain closed on a fault.
This is for:

- user settable time value when the fault level lies within the range of short time delayed device
- 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 'Air Circuit Breaker' without neglecting GE's heritage of more than 50 years in building air circuit breakers. These air circuit breakers uncompromisingly combine the properties of the older M-PACT Plus 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.

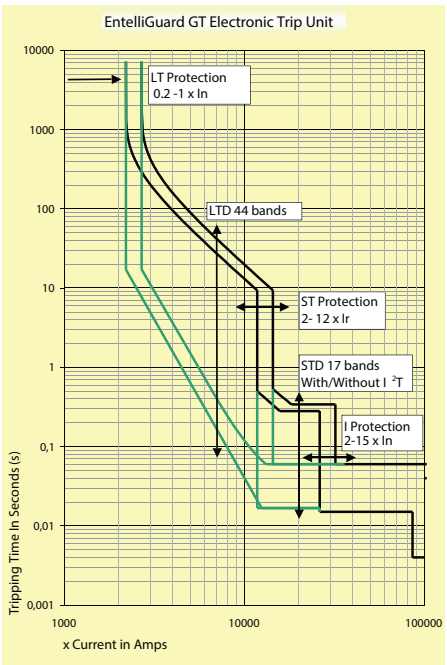
Uncompromising ... Safety

In order to protect service personnel against the hazards of short circuits whilst working on a power distribution system EntelliGuard air 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.

The breaker
Features

Protection with State of the art trip units

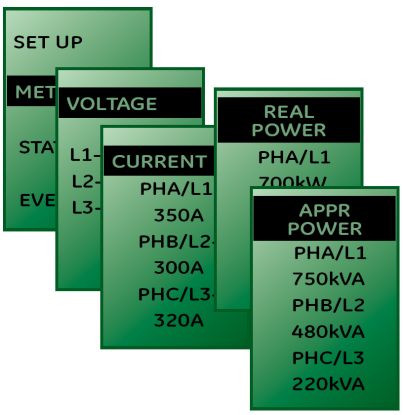
State of the art electronic trip unit
All EntelliGuard air circuit breakers are equipped with a digital electronic trip unit, available in four basic versions: E, S, N and H. Each has a common design that comes with a screen providing an ammeter and allowing a simple and accurate menu-driven adjustment 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 setting or LT setting range of 0.2 to 1 times the breaker rating with a choice of more than 60 setting points. The overload protection comes with up to 90 time band settings in 5 distinct curve models allowing the user 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, earthfault (UEF, REF & SEF), extensive protective relays options plus the optional use of energy curves are available (see section B of this catalogue).

Measurement, relaying and 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.

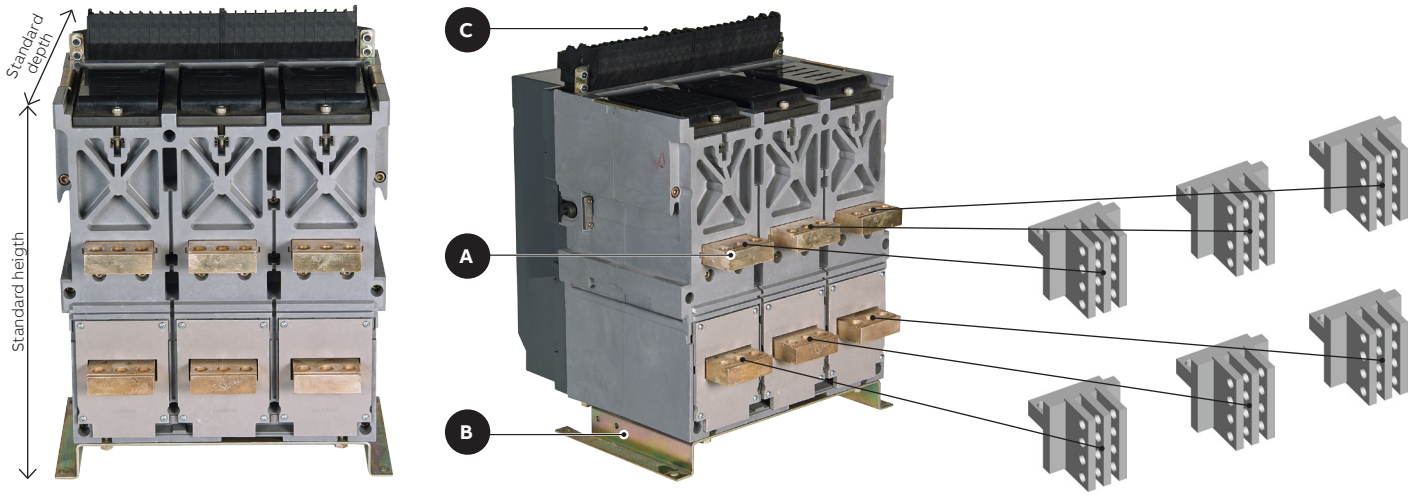
The device can be equipped with communication for use with the Modbus or Profibus protocol whilst events as overload, short-circuit and groundfaults can be tracked. Optionally the user can portray a short-circuit event through the Wave Form Capture option.

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.

Air circuit breakers

Easy to install and versatile



Easy to install
EntelliGuard air 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 air 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 Plus line.
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 mm^2 cabling and can be used with standard connection materials or AMP type plug connectors.

Flexible ... Kit form
A air 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 (2).

Flexible ... Connections
Besides the standard horizontal connection options multiple other options are available.
Air circuit breakers supplied in a fixed pattern can be optionally supplied with rear vertical connections or Pruning Flat Front Cassettes.
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 Standard horizontal rear connections
B Mounting bracket
C Terminal strip
(1) The width does vary
(2) With GE training

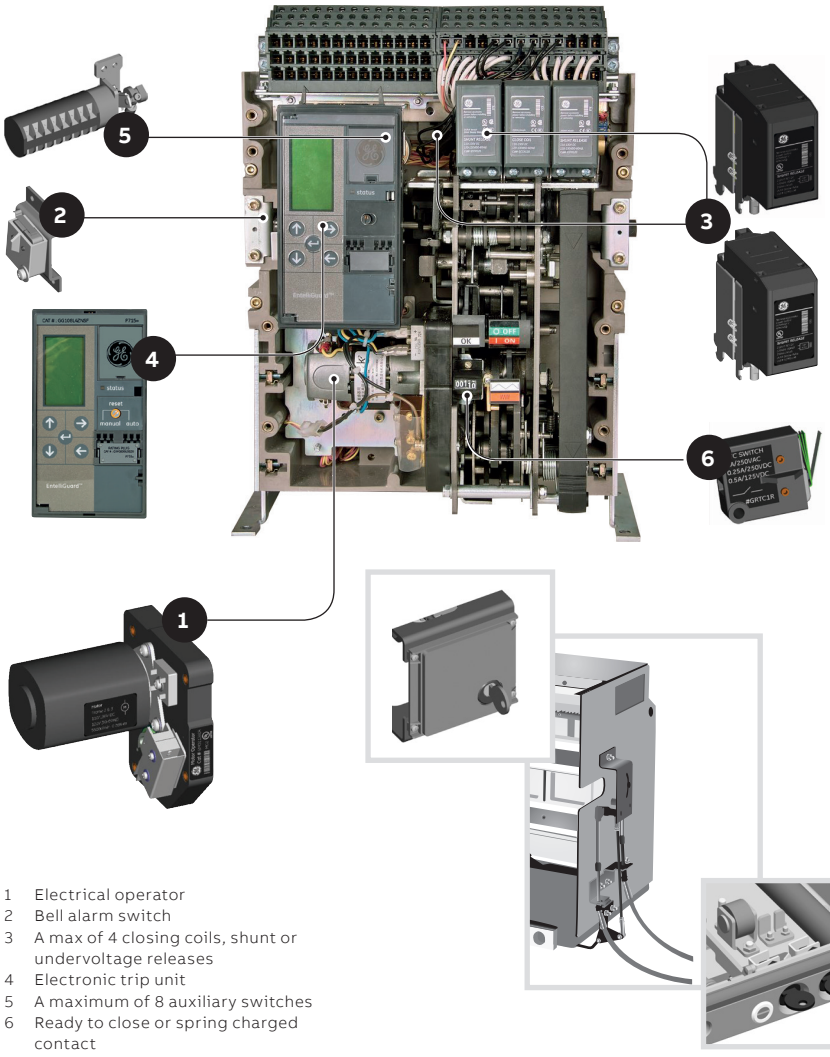
The breaker
Features

Common field mountable accessories

Common internal accessories
A large range of internal accessories as electrical operators, 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 air 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 four frames.



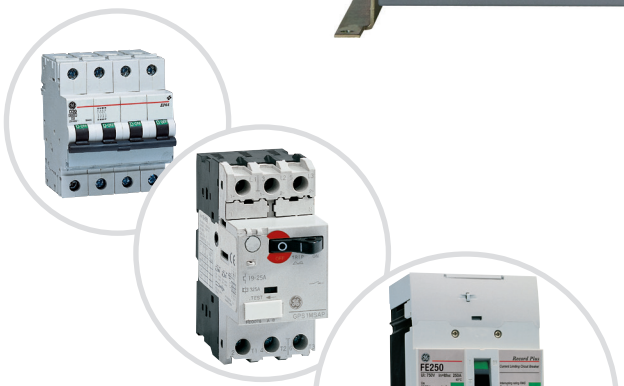
Common external accessories
Multiple common external accessories are available, a full overview of which can be found in section C of this catalogue.
On the left the key lock and breaker interlock options are portrayed. Here up to four Ronis, Profalux or Castell locks can be used to lock the breaker, and up to two Ronis / Flat shapped or Profalux / Star Shaped locks to lock the draw-out breaker in its cassette.
Optionally groups of two or three air 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
2 Bell alarm switch
3 A max of 4 closing coils, shunt or undervoltage releases
4 Electronic trip unit
5 A maximum of 8 auxiliary switches
6 Ready to close or spring charged contact

The breaker
Total solution

Air 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 ElfaPlus, 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.

The breaker
Performance ratings

EN 60947-2 standard

Air circuit breaker type		GT04	GG04			GT07	GG07		
Air circuit breaker denomination		K	S	N	H	K	S	N	H
Poles	Number of	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4
Rated insulation voltage	Ui (Volts)	1000	1000	1000	1000	1000	1000	1000	1000
Rated impulse withstand voltage	Uimp (Kilovolt)	12	12	12	12	12	12	12	12
Rated operational voltage Ue	Volts AC	690	690	690	1000	690	690	690	1000
Category of use		B	B	B	B	B	B	B	B
Suitable for use as an isolator	Positive ON & OFF	YES	YES	YES	YES	YES	YES	YES	YES
Rated current In	A at 50 °C	400	400	400	400	630			
Ultimate breaking capacity Icu (kA)	230/240V-440V AC	65	50	65	85	50	50	65	85
	500V AC	55	50	65	65	55	50	65	65
	690V AC	50	40	50	65	50	40	50	65
	1000V AC (1)				35				35
Service breaking capacity Ics (kA)	230/240V-440V AC	50	50	65	85	50	50	65	85
	500V AC	50	50	65	65	50	50	65	65
	690V AC	40	40	50	65	40	40	50	65
	1000V AC (1)				35				35
Short-circuit withstand Icw (kA)	1 second	50	50	65	65	50	50	65	65
	3 seconds	30	30	50	50	30	30	50	50
Short-circuit making current Icm 220-500V AC	kA Peak	105(2)	105	143	187	105(2)	105	143	187
Short-circuit making current Icm 690V AC	kA Peak	88.2	88.2	105	143	88.2	88.2	105	143
Mechanical endurance (CO operations at 440V AC)	With maintenance	20000	20000	20000	20000	20000	20000	20000	20000
	Without maintenance	12500	12500	12500	12500	12500	12500	12500	12500
Electrical endurance (CO operations at 440V AC)	Without maintenance	10000	6000	10000	10000	10000	6000	10000	10000
Single phase breaking capacity I_{IT} (kA)	230/240-500V AC	30			32.5	30			32.5
	690V AC	24			32.5	24			32.5

Electronic trip units

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

EN 60947-3 standard

Air Circuit Breaker type		G704	GJ04-GW04			G707	GJ07-GW07		
			Non Auto				Non Auto		
Isolator denomination		R	S	N		R	S	N	
Poles	Number of	3, 4	3, 4	3, 4		3, 4	3, 4	3, 4	
Rated insulation voltage	Ui (Volts)	1000	1000	1000		1000	1000	1000	
Rated impulse withstand voltage	Uimp (Kilovolt)	12	12	12		12	12	12	
Rated operational voltage Ue	Volts AC	690	690	690		690	690	690	
Category of use		B	B	B		B	B	B	
Suitable for use as a isolator	Positive ON & OFF	YES	YES	YES		YES	YES	YES	
Rated current In	A at 50 °C	400	400	400		400	630	400	
Short-circuit withstand Icw (kA)	1 second	42	50	50		42	50	50	
	3 seconds	30	30	30		30	30	30	
Short-circuit making current Icm 220-500V AC	kA Peak	75	88.2	88.2		75	88.2	88.2	
Mechanical endurance (CO operations at 440V AC)	With maintenance	20000	20000	20000		20000	20000	20000	
	Without maintenance	12500	12500	12500		12500	12500	12500	
Electrical endurance (CO operations at 440V AC)	Without maintenance	6000	10000	10000		6000	10000	10000	

DC-Switch -EN 60947-3 standard (5)

Switch type	
Isolator Denomination	
Poles	Number of
Rated insulation voltage	Ui Volts
Rated Operational Voltage	Volts DC
Rated Current In	
Utilisation category	

Installation

Fixed pattern

Dimensions in mm	Height	442	442	442	442	442	442	442	442
	Width 3 pole	258	342	342	342	258	342	342	432
	Width 4 pole	328	442	442	442	328	442	442	562
	Depth (3)	328	328	328	328	328	328	328	328
Available connection modes	Rear horizontal	X	X	X	X	X	X	X	X
	Rear vertical	X	X	X	X	X	X	X	X
	Front	X	X	X	X	X	X	X	X
Weights in Kg	3 pole	32	32	43	43	32	32	43	53
	4 pole	39	39	54	54	39	39	54	68

Draw-out pattern

Dimensions in mm	Height	444	444	444	444	444	444	444	444
	Width 3 pole	250	343	343	343	250	343	343	443
	Width 4 pole	320	443	443	443	320	443	443	573
	Depth (3)	453	453	453	453	453	453	453	453
Available connection modes	Rear universal h (4)	X	X	X	X	X	X	X	X
	Front	X	X	X	X	X	X	X	X
Weights in Kg	3 pole	55	55	82	82	55	55	82	131
	4 pole	66	66	100	100	66	66	100	164

(1) For use at 1000Vac phase separators are required
(2) Making capacity is 143kA peak at voltages ≤ 440V AC
(3) With horizontal rear connections; indicated depth value is the required panel dimension

GT08	GG08			GT10	GG10			GT13	GG13		
K	S	N	H	K	S	N	H	K	S	N	H
3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4
1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
12	12	12	12	12	12	12	12	12	12	12	12
690	690	690	1000	690	1000	1000	1000	690	1000	1000	1000
B	B	B	B	B	B	B	B	B	B	B	B
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
800	800	800	800	1000	1000	1000	1000	1250	1250	1250	1250
65	50	65	85	65	50	65	85	65	50	65	85
55	50	65	65	55	50	65	65	55	50	65	65
50	40	50	65	50	40	50	65	50	40	50	65
			35				35				35
50	50	65	85	50	50	65	85	50	50	65	85
50	50	65	65	50	50	65	65	50	50	65	65
40	40	50	65	40	40	50	65	40	40	50	65
			35				35				35
50	50	65	65	50	50	65	65	50	50	65	65
30	30	50	50	30	30	50	50	30	30	50	50
105([2])	105	143	187	105([2])	105	143	187	105([2])	105	143	187
88.2	88.2	105	143	88.2	88.2	105	143	88.2	88.2	105	143
20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500	12500
10000	6000	6000	10000	10000	6000	6000	10000	10000	6000	10000	10000
30			32.5	30			32.5	30			32.5
24			32.5	24			32.5	24			32.5
	X				X				X		
	X				X				X		
	X				X				X		
	X				X				X		

G708	GJ08-GW08		G710	GJ10-GW10		G713	GJ13-GW13	
	Non Auto			Non Auto			Non Auto	
R	S	N	R	S	N	R	S	N
3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4
1000	1000	1000	1000	1000	1000	1000	1000	1000
12	12	12	12	12	12	12	12	12
690	690	690	690	690	690	690	690	690
B	B	B	B	B	B	B	B	B
YES	YES	YES	YES	YES	YES	YES	YES	YES
800	800	800	800	1000	1000	1250	1250	1250
42	50	65	42	50	65	42	50	65
30	30	50	30	30	50	30	30	50
75	88.2	143	75	88.2	143	75	88.2	143
20000	20000	20000	20000	20000	20000	20000	20000	20000
12500	12500	12500	12500	12500	12500	12500	12500	12500
6000	10000	10000	6000	10000	10000	10000	10000	10000
		N T			N T			N T
		3, 4 4			3, 4 4			3, 4 4
		1000 1500			1000 1500			1000 1500
		1000 1500			1000 1500			1000 1500
		800 800			1000 1000			1250 1250
		DC-22A			DC-22A			DC-22A
442	442	442 442	442	442	442 442	442	442	442 442
258	342	342 342	258	342	342 342	258	342	342 342
328	442	442 442	328	442	442 442	328	442	442 442
328	328	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	X X	X	X	X X
32	32	43 43	32	32	43 43	32	32	43 43
39	39	54 54	39	39	54 54	39	39	54 54
444	444	444 444	444	444	444 444	444	444	444 444
250	343	343 343	250	343	343 343	250	343	343 343
320	443	443 443	320	443	443 443	320	443	443 443
453	453	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	X	X	X X
55	55	82 82	55	55	82 82	55	55	82 82
66	66	100 100	66	66	100 100	66	66	100 100

([4]) T stubs can be rotated and used for both vertical and horizontal rear connection

([5]) For More details Please refer to DC Switch Brochure

The breaker
Performance ratings

EN 60947-2 standard

Air circuit breaker type		GT16	GG16			GG20			
Air circuit breaker denomination		K	S	N	H	S	N	H	M
Poles	Number of	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4
Rated insulation voltage	Ui (Volts)	1000	1000	1000	1000	1000	1000	1000	1000
Rated impulse withstand voltage	Uimp (Kilovolt)	12	12	12	12	12	12	12	12
Rated operational voltage Ue	Volts AC	690	690	690	1000	690	690	1000	1000
Category of use		B	B	B	B	B	B	B	B
Suitable for use as an isolator	Positive ON & OFF	YES	YES	YES	YES	YES	YES	YES	YES
Rated current In	A at 50 °C	1600	1600	1600	1600	2000	2000	2000	
Ultimate breaking capacity Icu (kA)	230/240V-440V AC	65	50	65	85	50	65	85	100
	500V AC	55	50	65	65	50	65	65	100
	690V AC	50	40	50	65	40	50	65	100
	1000V AC[1]				35			35	50
Service breaking capacity Ics (kA)	230/240V-440V AC	50	50	65	85	50	65	85	100
	500V AC	50	50	65	65	50	65	65	100
	690V AC	40	40	50	65	40	50	65	100
	1000V AC [1]				35			35	50
Short-circuit withstand Icw (kA)	1 second	50	50	65	65	50	65	65	85
	3 seconds	30	30	50	50	50	50	50	50
Short-circuit making current Icm 220-500V AC	kA Peak	105[2]	105	143	187	105	143	187	220
Short-circuit making current Icm 690V AC	kA Peak	88.2	88.2	105	143	84	105	143	187
Mechanical endurance (CO operations at 440V AC)	With maintenance	20000	20000	20000	20000	20000	20000	20000	10000
	Without maintenance	12500	12500	12500	12500	12500	12500	12500	5000
Electrical endurance (CO operations at 440V AC)	Without maintenance	10000	6000	10000	10000	8000	8000	8000	5000
Single phase breaking capacity I_{IT} (kA)	230/240-500V AC	30			32.5			32.5	50
	690V AC	24			32.5			32.5	50

Electronic trip units

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

Air circuit breaker type		G716	GJ16-GW16			GJ20-GW20			
		Non Auto				Non Auto			
Isolator denomination		R	S	N		S	N		M
Poles	Number of	3, 4	3, 4	3, 4		3, 4	3, 4		3, 4
Rated insulation voltage	Ui (Volts)	1000	1000	1000		1000	1000		1000
Rated impulse withstand voltage	Uimp (Kilovolt)	12	12	12		12	12		12
Rated operational voltage Ue	Volts AC	690	690	690		690	690		1000
	Volts DC								1000
Category of use		B	B	B		B	B		B
Suitable for use as a isolator	Positive ON & OFF	YES	YES	YES		YES	YES		YES
Rated current In	A at 50 °C	1600	1600	1600		2000	2000		2000
Short-circuit withstand Icw (kA)	1 second	42	50	65		50	65		85
	3 seconds	30	30	50		50	50		50
Short-circuit Making current Icm 220-500V AC	kA Peak	75	88.2	143		88.2	143		187
Mechanical endurance (CO operations at 440V AC)	With maintenance	20000	20000	20000		20000	20000		10000
	Without maintenance	12500	12500	12500		12500	12500		5000
Electrical endurance (CO operations at 440V AC)	Without maintenance	6000	10000	10000		8000	8000		5000

DC-Switch -EN 60947-3 standard (8)

Switch type				GJ16			GJ20		
Isolator Denomination				N	T		N	T	
Poles	Number of			3, 4	4		3, 4	4	
Rated insulation voltage	Ui Volts			1000	1500		1000	1500	
Rated Operational Voltage	Volts DC			1000	1500		1000	1500	
Rated Current In				1600	1600		2000	2000	
Utilisation category				DC-22A	DC-22A		DC-22A	DC-22A	

Installation

Fixed pattern									
Dimensions in mm	Height	442	442	442	442	442	442	442	442
	Width 3 pole	258	342	342	342	342	342	342	432
	Width 4 pole	328	442	442	442	442	442	442	562
	Depth[5]	328	328	328	328	328	328	328	328
Available connection modes	Rear horizontal	X	X	X	X	X	X	X	X
	Rear vertical	X	X	X	X	X	X	X	X
	Front	X	X	X	X	X	X	X	X
Weights in Kg	3 pole	32	32	43	43	43	43	43	53
	4 pole	39	39	54	54	54	54	54	68
Draw-out pattern									
Dimensions in mm	Height	444	444	444	444	444	444	444	444
	Width 3 pole	250	342	343	343	343	343	343	443
	Width 4 pole	320	443	443	443	443	443	443	573
	Depth (5)	453	453	453	453	453	453	453	453
Available connection modes	Rear universal (6)	X	X	X	X	X	X	X	X
	Front	X	X	X	X	X	X	X	X
Weights in Kg	3 pole	55	55	82	82	82	82	82	131
	4 pole	66	66	100	100	100	100	100	164

(1) For use at 1000V AC phase separators are required
(2) Making capacity is 143kA peak at voltages ≤ 440V AC
(3) GH and GK types ("Limited derating types") are only available in draw-out pattern in vertical connection mode draw-out pattern in vertical connection mode
(4) Rated for 3000A

GG25					GG32 and GH32 [3]			GG40 and GH40 [3]			GG50		GG64	
S	N	F	H	M	N	H	M	N	H	M	M	L	M	L
3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4	3, 4		3, 4	3, 4	3, 4	3, 4
1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
690	690	690	690	1000	690	690	1000	690	1000	1000	690	690	690	690
B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
2500	2500	2500	2500	2500	3200			4000	4000	4000	5000	5000	6400	6400
50	65	85	85	100	65	85	100	65	85	100	100	150	100	150
50	65	65	85	100	65	85	100	65	85	100	100	150	100	150
40	50	65	85	100	50	85	100	50	85	100	100	100	100	100
		35		50			50			50				
50	65	85	85	100	65	85	100	65	85	100	100	150	100	150
50	65	65	85	100	65	85	100	65	85	100	100	150	100	150
40	50	65	85	100	50	85	100	50	85	100	100	100	100	100
		35		50			50			50				
50	65	65	85	85	65	85	85	65	85	85	100	100	100	100
50	50	50	50	50	50	50	50	50	50	50	85	85	85	85
105	143	187	187	220	143	187	220	143	187	220	220	330	220	330
84	105	143	187	187	105	187	187	105	187	187	220	220	220	220
20000				10000	20000		10000	20000		10000	10000	10000	10000	10000
12500				5000	10000		5000	10000		5000	5000	5000	5000	5000
8000				5000	5000		5000	5000		5000	1500	1500	1500	1500
		32,5		50			50			50		65		65
		32,5		50			50			50		65		65

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

GJ25-GW25				GJ32-GW32-GK32-GZ32 [3]			GJ40-GW40-GK40-GZ40 [3]			GJ50		GJ64	
Non Auto				Non Auto			Non Auto			Non Auto		Non Auto	
S	N		M	N		M	N		M		L		L
3, 4	3, 4		3, 4	3, 4		3, 4	3, 4		3, 4		3, 4		3, 4
1000	1000		1000	1000		1000	1000		1000		1000		1000
12	12		12	12		12	12		12		12		12
690	690		1000	690		1000	690		1000		690		690
			1000			1000			1000				
B	B		B	B		B	B		B		B		B
YES	YES		YES	YES		YES	YES		YES		YES		YES
2500	2500		2500	3200		3200	4000		4000		5000		6400
50	65		85	65		85	65		85		100		100
50	50		50	50		50	50		50		85		85
88,2	143		187	143		187	143		187		220		220
20000	20000		10000	20000		10000	20000		10000		10000		10000
12500	10000		5000	10000		5000	10000		5000		5000		5000
8000	6000		5000	5000		5000	5000		5000		1500		1500

GJ25		GJ32	
N	T	N	T
3, 4	4	3, 4	4
1000	1500	1000	1500
1000	1500	1000	1500
2500	2500	3200	3200
DC-22A	DC-22A	DC-22A	DC-22A

442	442	442	442	442	442	442	442	442	442	442	442	442	442	442
342	432	342	432	432	432	432	432	432	432	432	737	737	737	737
442	562	442	562	562	562	562	562	562	562	562	967	967	967	967
328	328	328	328	328	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	X	X	X	X	X	X				
43	53	43	53	53	53	53	53	53	53	53	90	90	90	90
54	68	54	68	68	68	68	68	68	68	68	115	115	115	115
444	444	444	444	444	444	444	444	444	444	444	444	444	444	444
434	443	343	443	443	443	443	443	443	443	443	743	743	743	743
443	573	443	573	573	573	573	573	573	573	573	973	973	973	973
453	453	453	453	453	453	453	453	488	488	488	488	488	488	488
X	X	X	X	X	X	X	X	X([7])	X([7])	X([7])	X	X	X([7])	X([7])
X	X	X	X	X	X	X	X	X	X	X				
82	131	82	131	131	131	131	131	131	131	131	220	220	220	220
100	164	100	164	164	164	164	164	164	164	164	275	275	275	275

([5]) With indicated depth value is the required panel dimension (breaker dimension indicated with horizontal rear connections)
([6]) T stubs can be rotated and used for both vertical and horizontal rear connection
([7]) T stubs can only be used for vertical rear connections
([8]) For More details Please refer to DC Switch Brochure

The breaker
Performance ratings

Design software and configurator
We provide a software package PowerDesign to configure the widely used and well known GE system enclosure ranges ‘QuiXtra* 630’, ‘QuiXtra* 4000’ and ‘SEN Plus’, and to use them with components as electrical distribution panels.
This 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.
A New **EntelliGuard Global Configurator** is also available which allows the user to easily configure catalog numbers and obtain price. This tool can be accessed by using a laptop or mobile device. Visit http://empower.abb.com/

Trip Unit Toolkit
EntelliGuard manager toolkit
- Compatible with GTU, PremEon S, and MET trip units
- One-to-one connection with trip unit
- WaveForm capture/test available on standard version only
- 407999/GTUTK20 (testkit) is required for interfacing with EntelliGuard trip unit.
- Software free and could be downloaded from this website: http://www.geindustrial.com/products/conversion-kits-andtrip-units/trip-unit-toolkit

Order codes

Order codes
Air circuit breakers

How to order in 8 steps

Step 1 — Choose current rating

Step 2 — Choose required interruption rating

Step 3 — Define if a breaker or isolator is needed. Proceed to establish the first 5 digits of the catalogue number as indicated here

In	Icu	Ics	Icw	Frame	Standard		Limited derating	
	≤ 440V AC				Breaker	Isolator(1)	Breaker	Isolator(1)
400A	50kA	50kA	42kA	T		G704R		
	65kA	50kA	50kA	T	GT04K			
	50kA	50kA	50kA	1	GG04S	GJ04S		
	65kA	65kA	65kA	1	GG04N	GW04N		
	85kA	85kA	65kA	1	GG04H			
630A	50kA	50kA	42kA	T		G707R		
	65kA	50kA	50kA	T	GT07K			
	50kA	50kA	50kA	1	GG07S	GJ07S		
	65kA	65kA	65kA	1	GG07N	GW07N		
	85kA	85kA	65kA	1	GG07H			
800A	50kA	50kA	42kA	T		G707R		
	65kA	50kA	50kA	T	GT08K			
	50kA	50kA	50kA	1	GG08S	GJ08S		
	65kA	65kA	65kA	1	GG08N	GW08N		
	85kA	85kA	65kA	1	GG08H			
1000A	50kA	50kA	42kA	T		G710R		
	65kA	50kA	50kA	T	GT10K			
	50kA	50kA	50kA	1	GG10S	GJ10S		
	65kA	65kA	65kA	1	GG10N	GW10N		
	85kA	85kA	65kA	1	GG10H			
1250A	50kA	50kA	42kA	T		G713R		
	65kA	50kA	50kA	T	GT13K			
	50kA	50kA	50kA	1	GG13S	GJ13S		
	65kA	65kA	65kA	1	GG13N	GW13N		
	85kA	85kA	65kA	1	GG13H			
1600A	50kA	50kA	42kA	T		G716R		
	65kA	50kA	50kA	T	GT16K			
	50kA	50kA	50kA	1	GG16S	GJ16S		
	65kA	65kA	65kA	1	GG16N	GW16N		
	85kA	85kA	65kA	1	GG16H			
2000A	50kA	50kA	50kA	1	GG20S	GJ20S		
	65kA	65kA	65kA	1	GG20N	GW20N		
	85kA	85kA	65kA	1	GG20H			
	85kA	85kA	85kA	2		GW20M		
	100kA	100kA	85kA	2	GG20M			
2500A	50kA	50kA	50kA	1	GG25S	GJ25S		
	85kA	85kA	65kA	1	GG25F	GW25F		
	65kA	65kA	65kA	2	GG25N	GJ25N		
	85kA	85kA	85kA	2	GG25H	GW25M		
	100kA	100kA	85kA	2	GG25M			
3200A	65kA	65kA	65kA	2	GG32N	GJ32N	GH32N	GK32N
	85kA	85kA	85kA	2	GG32H	GW32M	GH32H	GZ32H
	100kA	100kA	85kA	2	GG32M		GH32M	
4000A	65kA	65kA	65kA	2	GG40N	GJ40N	GH40N	GK40N
	85kA	85kA	85kA	2	GG40H	GW40M	GH40H	GZ40H
	100kA	100kA	85kA	2	GG40M		GH40M	
5000A	100kA	100kA	100kA	3	GG50M	GJ50L		
	150kA	150kA	100kA	3	GG50L			
6400A	100kA	100kA	100kA	3	GG64M	GJ64L		
	150kA	150kA	100kA	3	GG64L			

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

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**

Step 4

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

Defines the 6th digit In catalogue number

4 = Breaker / Isolator in fixed pattern 3 pole

6 = Breaker / Isolator in fixed pattern 4 pole

1 = Breaker / Isolator Moving Portion Only 3 pole

3 = Breaker / Isolator Moving portion only 4 pole

2 = Cassette for draw-out pattern = fixed portion only 3 pole

5 = Cassette for draw-out pattern = fixed portion only 4 pole

Step 5	Step 6	Step 7	Step 8
Finalize the basic catalogue number see catalogue pages: 2/5 - Fixed pattern 2/8-2/10 - Draw-out portion 2/7 - Connections fixed pattern 2/14 - Cassettes, draw-out	**Basic catalogue number is a manually operated device** **If a motor operated device is requested?** Please order Motor and closing coils as indicated here(2)	**If universal internal accessories(2) are needed?** **Options** UVR or SHT release(s) Network interlocks Auxiliary contacts Alarm and signal contacts	**Full catalogue number defines: a breaker without trip unit** **For all breakers ADD** **Trip unit**
Completing the basic catalogue number	**Add catalogue number(s)**	**Add catalogue number(s)**	**Add catalogue number(s)**
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 2/7 to order** **field mountable** **adaptation kits**	If chosen device is a breaker or isolator frame T		
See pages 2/4, 5 & 6	See page 2/23 Order a motor Type T and 1 closing coil or 1 command closing coil based on voltage requirements and specifications	If chosen device is a breaker or isolator See page 2/23	If chosen device is a Breaker See pages 2/33 & 34 Choose and add a trip unit out of the the four basic types and 39 different options.
No addition **Indicates breaker / isolator** **Moving portion only** **has set of 3NO/3NC aux.** **Contacts included**	If chosen device is a breaker or isolator frame 1	To add up to 3 SHT or UVR releases or 1 network interlock coils and 1 SHT or UVR release	Offering
See pages 2/9 & 10	See page 2/23 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 See page 2/23	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 and 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.
U **= Cassette with universal 'T stabs' suited for use as horizontal or vertical rear connections** **Safety Shutters** **Supplied with cassette(2)**	If chosen device is a breaker or isolator frame 2 or 3	To extend on the installed 3 NO + 3NC contacts Maximum of 8 possible	
V **= Cassette with vertical rear connections** **Safety Shutters** **Supplied with cassette(2)**	See page 2/23 Order a motor type 2 and 1 closing coil or 1 command closing coil based on voltage requirements and specifications	If chosen device is a breaker or isolator See page 2/23	
See page 2/14		To add bell alarm and/or coils signalling contacts	
		If chosen device is a cassette See page 2/23 & 2/24	
		To add position indication contacts in cassette or provisions for key interlocks	

- 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 18 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 facia. An explanation of this code and its use can be found on page 2/34 of this catalogue.

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

(2) Devices ordered here are supplied factory fitted

Remark: for field mountable accessories see page 2/23 to 2/33

Order codes
Air circuit breakers

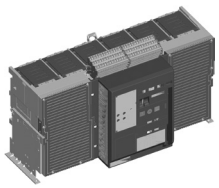
Basic breakers executed in a fixed mounting pattern

- With horizontal rear connection (for other options, please refer to page 2/7)(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 2/15 to 2/19)
- For 1000V applications (M type under 5000A) phase separators are required (see page 2/29)

Fixed mounting pattern

			3 pole		4 pole Left Neutral		4 pole Right Neutral	
		Rating (A)	Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
	**S type** **Icu = Ics = Icw** **50kA**	400	GG04S4	**407019**	GG04S6	**407020**	GG04S5	408379
		630	GG07S4	**407048**	GG07S6	**407049**	GG07S5	**408399**
		800	GG08S4	**407078**	GG08S6	**407079**	GG08S5	**408439**
		1000	GG10S4	**407108**	GG10S6	**407109**	GG10S5	**408449**
		1250	GG13S4	**407138**	GG13S6	**407139**	GG13S5	**408459**
		1600	GG16S4	**407168**	GG16S6	**407169**	GG16S5	**408499**
		2000	GG20S4	**407208**	GG20S6	**407209**	GG20S5	**408519**
		2500 (1)	GG25S4	**410655**	GG25S6	**410657**	GG25S5	**410656**
	**K type** **Icu = 65kA** **Ics = Icw = 50kA**	400	GT04K4	**444548**	GT04K6	**444569**	GT04K5	**444746**
		630	GT07K4	**444549**	GT07K6	**444570**	GT07K5	**444747**
		800	GT08K4	**444550**	GT08K6	**444571**	GT08K5	**444748**
		1000	GT10K4	**444551**	GT10K6	**444572**	GT10K5	**444749**
		1250	GT13K4	**444552**	GT13K6	**444573**	GT13K5	**444750**
		1600	GT16K4	**444553**	GT16K6	**444574**	GT16K5	**444751**
	**N type** **Icu = Ics = Icw** **65kA**	400	GG04N4	**407015**	GG04N6	**407016**	GG04N5	**408377**
		630	GG07N4	**407044**	GG07N6	**407045**	GG07N5	**408397**
		800	GG08N4	**407074**	GG08N6	**407075**	GG08N5	**408437**
		1000	GG10N4	**407104**	GG10N6	**407105**	GG10N5	**408447**
		1250	GG13N4	**407134**	GG13N6	**407135**	GG13N5	**408457**
		1600	GG16N4	**407164**	GG16N6	**407165**	GG16N5	**408497**
		2000	GG20N4	**407204**	GG20N6	**407205**	GG20N5	**408517**
		2500	GG25N4	**407240**	GG25N6	**407241**	GG25N5	**408530**
		3200	GG32N4	**407266**	GG32N6	**407267**	GG32N5	**408549**
		4000 (1)	GG40N4	**407292**	GG40N6	**407293**	GG40N5	**408569**
	**F type** **Icu = Ics = 85kA** **Icw = 65kA**	2500 (1)	GG25F4	**410658**	GG25F6	**410660**	GG25F5	**410659**

(1) Rear vertical connection for indicated 2500A and 4000A types.

			3 pole		4 pole Left Neutral		4 pole Right Neutral	
		Rating (A)	Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
	**H type** **Icu = Ics = 85kA** **Icw = 65kA**	400	GG04H4	**407007**	GG04H6	**407008**	GG04H5	**408373**
		630	GG07H4	**407036**	GG07H6	**407037**	GG07H5	**408393**
		800	GG08H4	**407066**	GG08H6	**407067**	GG08H5	**408433**
		1000	GG10H4	**407096**	GG10H6	**407097**	GG10H5	**408443**
		1250	GG13H4	**407126**	GG13H6	**407127**	GG13H5	**408453**
		1600	GG16H4	**407156**	GG16H6	**407157**	GG16H5	**408493**
		2000	GG20H4	**407196**	GG20H6	**407197**	GG20H5	**408513**
	**H type** **Icu = Ics = Icw** **85kA**	2500	GG25H4	**407232**	GG25H6	**407233**	GG25H5	**408526**
		3200	GG32H4	**407244**	GG32H6	**407245**	GG32H5	**408543**
		4000 (1)	GG40H4	**407280**	GG40H6	**407281**	GG40H5	**408563**
	**M type** **Icu = Ics = 100kA** **Icw = 85kA**	2000	GG20M4	**407200**	GG20M6	**407201**	GG20M5	**408515**
		2500	GG25M4	**407236**	GG25M6	**407237**	GG25M5	**408528**
		3200	GG32M4	**407262**	GG32M6	**407263**	GG32M5	**408547**
		4000 (1)	GG40M4	**407288**	GG40M6	**407289**	GG40M5	**408567**
	**M type** **Icu = Ics = Icw** **100kA**	5000	GG50M4	**407306**	GG50M6	**407307**	GG50M5	**408583**
		6400	GG64M4	**407326**	GG64M6	**407327**	GG64M5	**408587**
	L type **Icu = Ics = 150kA** **Icw = 100kA**	5000	GG50L4	**407302**	GG50L6	**407303**	GG50L5	**408581**
		6400	GG64L4	**407322**	GG64L6	**407323**	GG64L5	**408585**

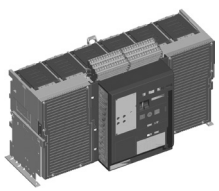
(1) Rear vertical connection for indicated 4000A types
Trip unit field configurable at 0.50 or 100% of phase rating

Order codes
Air circuit breakers

Isolators or non automatic breakers executed in a fixed mounting pattern

- With horizontal rear connection (for other options, please refer to page 2/7)[1]
- With Aux. contact block equipped with 3 NO and 3 NC contacts
- For 1000V applications (M type under 5000A) phase separators are required (see page 2/29)

Fixed mounting pattern

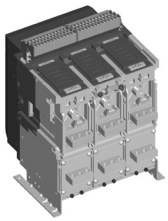
			3 pole		4 pole Left Neutral		4 pole Right Neutral	
		Rating (A)	Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
	**R type** **Non automatic** **Icw 42kA**	400	G704R4	**444616**	G704R6	**444632**		
		630	G707R4	**444617**	G707R6	**444633**		
		800	G708R4	**444618**	G708R6	**444634**		
		1000	G710R4	**444619**	G710R6	**444635**		
		1250	G713R4	**444620**	G713R6	**444636**		
		1600	G716R4	**444621**	G716R6	**444637**		
	**S type** **Non automatic** **Icw 50kA**	400	GJ04S4	**407380**	GJ04S6	**407381**	GJ04S5	**408612**
		630	GJ07S4	**407400**	GJ07S6	**407401**	GJ07S5	**408616**
		800	GJ08S4	**407420**	GJ08S6	**407421**	GJ08S5	**408620**
		1000	GJ10S4	**407440**	GJ10S6	**407441**	GJ10S5	**408627**
		1250	GJ13S4	**407460**	GJ13S6	**407461**	GJ13S5	**408635**
		1600	GJ16S4	**407480**	GJ16S6	**407481**	GJ16S5	**408639**
		2000	GJ20S4	**407500**	GJ20S6	**407501**	GJ20S5	**408643**
		2500[1]	GJ25S4	**410673**	GJ25S6	**410662**	GJ25S5	**410688**
	**N type** **Non automatic** **Icw 65kA**	400	GW04N4	**407376**	GW04N6	**407377**	GW04N5	**408613**
		630	GW07N4	**407396**	GW07N6	**407397**	GW07N5	**408617**
		800	GW08N4	**407416**	GW08N6	**407417**	GW08N5	**408621**
		1000	GW10N4	**407436**	GW10N6	**407437**	GW10N5	**408628**
		1250	GW13N4	**407456**	GW13N6	**407457**	GW13N5	**408636**
		1600	GW16N4	**407476**	GW16N6	**407477**	GW16N5	**408640**
		2000	GW20N4	**407496**	GW20N6	**407497**	GW20N5	**408644**
		2500	GJ25N4	**407520**	GJ25N6	**407521**	GJ25N5	**408683**
		3200	GJ32N4	**407539**	GJ32N6	**407540**	GJ32N5	**408689**
		4000[1]	GJ40N4	**407560**	GJ40N6	**407561**	GJ40N5	**408695**
	**F type** **Icw = 65kA**	2500[1]	GW25F4	**410661**	GW25F6	**410663**	GW25F5	**410690**
	**M type** **Non automatic** **Icw 85kA**	400	GW04M4	**408350**	GW04M6	**408351**	GW04M5	**408712**
		630	GW07M4	**408352**	GW07M6	**408353**	GW07M5	**408651**
		800	GW08M4	**408354**	GW08M6	**408355**	GW08M5	**408655**
		1000	GW10M4	**408356**	GW10M6	**408357**	GW10M5	**408659**
		1250	GW13M4	**408358**	GW13M6	**408359**	GW13M5	**408668**
		1600	GW16M4	**408360**	GW16M6	**408361**	GW16M5	**408672**
		2000	GW20M4	**408362**	GW20M6	**408363**	GW20M5	**408676**
		2500	GW25M4	**408364**	GW25M6	**408365**	GW25M5	**408685**
		3200	GW32M4	**408366**	GW32M6	**408367**	GW32M5	**408691**
		4000[1]	GW40M4	**408368**	GW40M6	**408369**	GW40M5	**408697**
	**L type** **Non automatic** **Icw 100kA**	5000	GJ50L4	**407567**	GJ50L6	**407568**	GJ50L5	**408725**
		6400	GJ64L4	**407577**	GJ64L6	**407578**	GJ64L5	**408727**

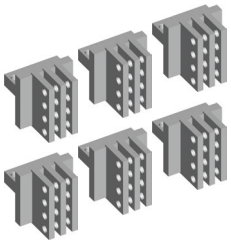
[1] Rear vertical connection for indicated 2500A and 4000A types.

Termination sets for breakers and isolators in fixed pattern

- To modify standard connection (horizontal rear) to:
- Vertical rear
- Front flat connection
- Sets containing terminals and hardware for the line and load side of the breaker

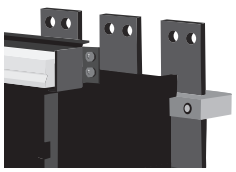
Vertical rear connections





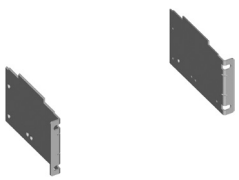
Rating (A)		Suited for use with EntelliGuard G types	3 pole(1)		4 pole(1)	
			Cat. No.	Ref. No.	Cat. No.	Ref. No.
Terminations for frame T						
400 -	1600A	GT type K and G7 type R	GT16H4RVI	**444626**	GT16H6RVI	**444628**
		Terminations for frame 1				
400 -	1600A	GG, GJ & GW type S, N & H	G16H4RVI	**408058**	G16H6RVI	**408082**
	2000A	GG, GJ & GW type S, N & H	G20H4RVI	**408059**	G20H6RVI	**408083**
	2500A	GG, GW type F & S	will be dispatched as factory assembled			
Terminations for frame 2						
2000 -	3200A(2)	GG, GJ & GW type N, H & M	G32M4RVI	**408070**	G32M6RVI	**408071**
	4000A(3)	GG, GJ & GW type N, H & M	G40M4RVI	**408072**	G40M6RVI	**408074**
Terminations for frame 3						
5000 -	6400A	GG & GJ type M & L	G64L4RVI	**408073**	G64L6RVI	**408075**

Front access connections



Terminations for frame T						
400 -	1600A	GT type K and G7 type R	GT16H4FFI	**444625**	GT16H6FFI	**444627**
Terminations for frame 1						
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**
	2500A	GG, GJ & GW type S, N & H	will be dispatched as factory assembled			
Terminations for frame 2						
2000 -	3200A	GG, GJ & GW type N, H & M	G32M4FFI	**408066**	G32M6FFI	**408068**
	4000A	GG, GJ & GW type N, H & M	G40M4FFI	**408067**	G40M6FFI	**408069**

Wall mounting brackets(4)



Wall mounting brackets for frame T, 1 & 2	GFMTG	**408085**	GFMTG	**408085**

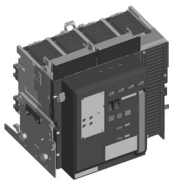
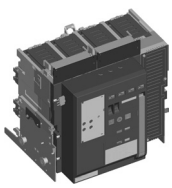
(1) Sets are made up of 6pcs for 3pole and 8pcs for 4 pole.
(2) For 400-2500A an alternative type is available in a set of 3 Cat. G25M3RVI **Ref. 408076.**
(3) Normally supplied with the standard 4000A breaker.
(4) Pruning flat front cassettes.

Order codes
Air circuit breakers

Basic breakers in a draw-out pattern

- 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 2/15 to 2/19 for options)
- A cassette is needed, please refer to page 2/14 for options
- For 1000V applications (M type under 5000A) phase separators are required (see page 2/29)

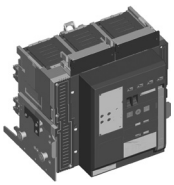
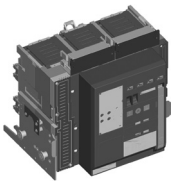
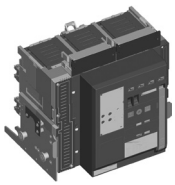
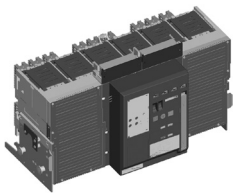
Draw-out pattern; moving portion only

		Rating (A)	3 pole		4 pole Left Neutral		4 pole Right Neutral	
			Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
	**S type** Icu = Ics = Icw 50kA	400	GG04S1	**407017**	GG04S3	**407018**	GG04S2	**408378**
		630	GG07S1	**407046**	GG07S3	**407047**	GG07S2	**408398**
		800	GG08S1	**407076**	GG08S3	**407077**	GG08S2	**408438**
		1000	GG10S1	**407106**	GG10S3	**407107**	GG10S2	**408448**
		1250	GG13S1	**407136**	GG13S3	**407137**	GG13S2	**408458**
		1600	GG16S1	**407166**	GG16S3	**407167**	GG16S2	**408498**
		2000	GG20S1	**407206**	GG20S3	**407207**	GG20S2	**408518**
		2500	GG25S1	**410664**	GG25S3	**410666**	GG25S2	**410665**
	**K type** Icu = 65kA Ics = Icw = 50kA	400	GT04K1	**444506**	GT04K3	**444526**	GT04K2	**444726**
		630	GT07K1	**444507**	GT07K3	**444527**	GT07K2	**444727**
		800	GT08K1	**444508**	GT08K3	**444528**	GT08K2	**444728**
		1000	GT10K1	**444509**	GT10K3	**444529**	GT10K2	**444729**
		1250	GT13K1	**444510**	GT13K3	**444530**	GT13K2	**444730**
		1600	GT16K1	**444511**	GT16K3	**444531**	GT16K2	**444731**
	**N type** Icu = Ics = Icw 65kA	400	GG04N1	**407013**	GG04N3	**407014**	GG04N2	**408376**
		630	GG07N1	**407042**	GG07N3	**407043**	GG07N2	**408396**
		800	GG08N1	**407072**	GG08N3	**407073**	GG08N2	**408436**
		1000	GG10N1	**407102**	GG10N3	**407103**	GG10N2	**408446**
		1250	GG13N1	**407132**	GG13N3	**407133**	GG13N2	**408456**
		1600	GG16N1	**407162**	GG16N3	**407163**	GG16N2	**408496**
		2000	GG20N1	**407202**	GG20N3	**407203**	GG20N2	**408516**
		2500	GG25N1	**407238**	GG25N3	**407239**	GG25N2	**408529**
		3200	GG32N1	**407264**	GG32N3	**407265**	GG32N2	**408548**
		4000	GG40N1	**407290**	GG40N3	**407291**	GG40N2	**408568**
	**F type** Icu = Ics = 85kA Icw = 65kA	2500	GG25F1	**410667**	GG25F3	**410669**	GG25F2	**410668**

Basic breakers in a draw-out pattern

- 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 2/15 to 2/19 for options)
- A cassette is needed, please refer to page 2/14 for options
- For 1000V applications (M type under 5000A) phase separators are required (see page 2/29)

Draw-out pattern; moving portion only

		Rating (A)	3 pole		4 pole Left Neutral		4 pole Right Neutral	
			Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
	**H type** **Icu = Ics = 85kA** **Icw = 65kA**	400	GG04H1	**407005**	GG04H3	**407006**	GG04H2	**408372**
		630	GG07H1	**407034**	GG07H3	**407035**	GG07H2	**408392**
		800	GG08H1	**407064**	GG08H3	**407065**	GG08H2	**408432**
		1000	GG10H1	**407094**	GG10H3	**407095**	GG10H2	**408442**
		1250	GG13H1	**407124**	GG13H3	**407125**	GG13H2	**408452**
		1600	GG16H1	**407154**	GG16H3	**407155**	GG16H2	**408492**
		2000	GG20H1	**407194**	GG20H3	**407195**	GG20H2	**408512**
	**H type** **Icu = Ics = Icw** **85kA**	2500	GG25H1	**407230**	GG25H3	**407231**	GG25H2	-
		3200	GG32H1	**407242**	GG32H3	**407273**	GG32H2	-
		4000	GG40H1	**407278**	GG40H3	**407279**	GG40H2	-
	**M type** **Icu = Ics = 100kA** **Icw = 85kA**	2000	GG20M1	**407198**	GG20M3	**407199**	GG20M2	**408514**
		2500	GG25M1	**407234**	GG25M3	**407235**	GG25M2	**408527**
		3200	GG32M1	**407260**	GG32M3	**407261**	GG32M2	**408546**
		4000	GG40M1	**407286**	GG40M3	**407287**	GG40M2	**408566**
	**M type** **Icu = Ics = Icw** **100kA**	5000	GG50M1	**407304**	GG50M3	**407305**	GG50M2	**408582**
		6400	GG64M1	**407324**	GG64M3	**407325**	GG64M2	**408586**
	L type **Icu = Ics = 150kA** **Icw = 100kA**	5000	GG50L1	**407300**	GG50L3	**407301**	GG50L2	**408580**
		6400	GG64L1	**407320**	GG64L3	**407321**	GG64L2	**408584**

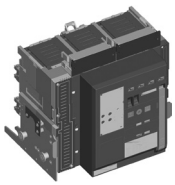
Trip unit field configurable at 0.50 or 100% of phase rating

Order codes
Air circuit breakers

Draw-out breakers: “limited derating types”

- Draw-out breaker with no or very limited derating 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 2/15 to 2/19 for options)
- A cassette with vertical clusters is needed, please refer to page 2/14 for options

Draw-out breakers pattern: moving portion only



N type
Icu = Ics = Icw 65kA

H type
Icu = Ics = Icw 85kA

M type
Icu = Ics = 100kA
Icw = 85kA

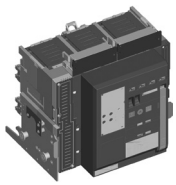
Frame 2 only

Rating (A)	3 pole		4 pole Left Neutral		4 pole Right Neutral	
	Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
3200	GH32N1	**407350**	GH32N3	**407351**	GG20M2	**408514**
4000	GH40N1	**407356**	GH40N3	**407357**	GG25M2	**408527**
3200	GH32H1	**407346**	GH32H3	**407347**	GG50M2	**408582**
4000	GH40H1	**407352**	GH40H3	**407353**	GG64M2	**408586**
3200	GH32M1	**407348**	GH32M3	**407349**	GG50L2	**408580**
4000	GH40M1	**407354**	GH40M3	**407355**	GG64L2	**408584**

Isolators or non automatic breakers in a draw-out pattern

- With aux. contact block equipped with 3 NO and 3 NC contacts
- A cassette is needed, please refer to page 2/14 for options
- For 1000V applications (M type under 5000A) phase separators are required (see page 2/29)

Draw-out pattern; moving portion only

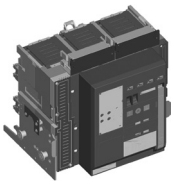
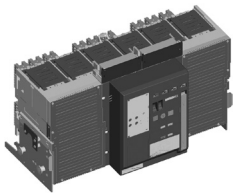
		Rating (A)	3 pole		4 pole Left Neutral		4 pole Right Neutral	
			Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
	**R type Non automatic Icw 42kA**	400	G704R1	**444585**	G704R3	**444600**		
		630	G707R1	**444586**	G707R3	**444601**		
		800	G708R1	**444587**	G708R3	**444602**		
		1000	G710R1	**444588**	G710R3	**444603**		
		1250	G713R1	**444589**	G713R3	**444604**		
		1600	G716R1	**444590**	G716R3	**444605**		
	**S type Non automatic Icw 50kA**	400	GJ04S1	**407378**	GJ04S3	**407379**	GJ04S2	**408610**
		630	GJ07S1	**407398**	GJ07S3	**407399**	GJ07S2	**408614**
		800	GJ08S1	**407418**	GJ08S3	**407419**	GJ08S2	**408618**
		1000	GJ10S1	**407438**	GJ10S3	**407439**	GJ10S2	**408625**
		1250	GJ13S1	**407458**	GJ13S3	**407459**	GJ13S2	**408629**
		1600	GJ16S1	**407478**	GJ16S3	**407479**	GJ16S2	**408637**
		2000	GJ20S1	**407498**	GJ20S3	**407499**	GJ20S2	**408641**
		2500	GJ25S1	**410674**	GJ25S3	**410672**	GJ25S2	**410687**
	**N type Non automatic Icw 65kA**	400	GW04N1	**407374**	GW04N3	**407375**	GW04N2	**408611**
		630	GW07N1	**407394**	GW07N3	**407395**	GW07N2	**408615**
		800	GW08N1	**407414**	GW08N3	**407415**	GW08N2	**408619**
		1000	GW10N1	**407434**	GW10N3	**407435**	GW10N2	**408626**
		1250	GW13N1	**407454**	GW13N3	**407455**	GW13N2	**408630**
		1600	GW16N1	**407474**	GW16N3	**407475**	GW16N2	**408638**
		2000	GW20N1	**407494**	GW20N3	**407495**	GW20N2	**408642**
		2500	GW25F1	**410670**	GW25F3	**410671**	GW25N2	**??????**
		2500	GJ25N1	**407518**	GJ25N3	**407519**	GJ25N2	**408680**
		3200	GJ32N1	**407537**	GJ32N3	**407538**	GJ32N2	**408686**
		4000	GJ40N1	**407558**	GJ40N3	**407559**	GJ40N2	**408692**
	**F type Non automatic Icw 65kA**	2500	GW25F1	**410670**	GW25F3	**410671**	GW25F2	**410689**

Order codes
Air circuit breakers

Isolators or non automatic breakers in a draw-out pattern

- With aux. contact block equipped with 3 NO and 3 NC contacts
- A cassette is needed, please refer to page 2/14 for options
- For 1000V applications (M type under 5000A) phase separators are required (see page 2/29)

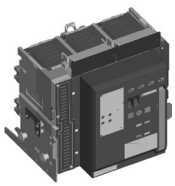
Draw-out pattern; moving portion only

		Rating (A)	3 pole		4 pole Left Neutral		4 pole Right Neutral	
			Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
	**M type Non automatic Icw 85kA**	400	GW04M1	**408400**	GW04M3	**408401**	GW04M2	**408710**
		630	GW07M1	**408402**	GW07M3	**408403**	GW07M2	**408714**
		800	GW08M1	**408404**	GW08M3	**408405**	GW08M2	**408653**
		1000	GW10M1	**408406**	GW10M3	**408407**	GW10M2	**408657**
		1250	GW13M1	**408408**	GW13M3	**408409**	GW13M2	**408666**
		1600	GW16M1	**408410**	GW16M3	**408411**	GW16M2	**408670**
		2000	GW20M1	**408412**	GW20M3	**408413**	GW20M2	**408674**
		2500	GW25M1	**408414**	GW25M3	**408415**	GW25M2	**408682**
		3200	GW32M1	**408416**	GW32M3	**408417**	GW32M2	**408688**
		4000	GW40M1	**408418**	GW40M3	**408419**	GW40M2	**408694**
	**L type Non automatic Icw 100kA**	5000	GJ50L1	**407565**	GJ50L3	**407566**	GJ50L2	**408724**
		6400	GJ64L1	**407575**	GJ64L3	**407576**	GJ64L2	**408726**

Isolators or non automatic breakers in a draw-out pattern: “limited derating types”

- Draw-out patterns with no or very limited derating 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 2/14 for options

Draw-out pattern, vertical clusters; moving portion only



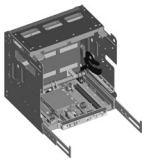
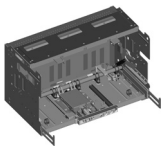
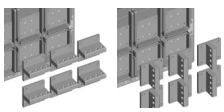
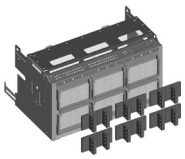
		Rating (A)	3 pole		4 pole left neutral	
			Cat. No.	Ref. No.	Cat. No.	Ref. No.
N type Non automatic Icw 65kA	**Frame 2 only**	3200	GK32N1	**407591**	GK32N3	**407592**
		4000	GK40N1	**407595**	GK40N3	**407596**
H type Non automatic Icw 85kA		3200	GZ32H1	**407589**	GZ32H3	**407590**
		4000	GZ40H1	**407593**	GZ40H3	**407594**

Order codes
Air circuit breakers

Cassettes for use with breakers and Isolators in draw-out pattern - Factory mounted

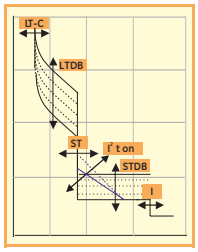
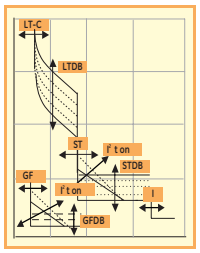
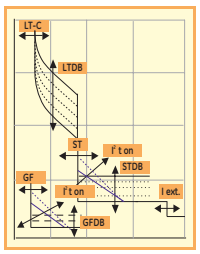
- References apply for cassettes supplied in one packaging with breakers or isolators (for separate cassettes see page 2/32)
- With connection modes as indicated in left column
- Each cassette is supplied with safety shutters

Cassettes for draw-out pattern; fixed portion only

	Rating (A)	Suited for use with EntelliGuard G types	3 pole		4 pole	
			Cat. No.	Ref. No.	Cat. No.	Ref. No.
Universal rear connections						
		Cassette for frame T				
	400 - 1600A	GT type K and G7 type R	GT16K2UXXXXM	**444691**	GT16K5UXXXXM	**444694**
		Cassette for frame 1				
	400 - 1600A	GG & GJ type S	GG16S2UXXXXM	**407616**	GG16S5UXXXXM	**407618**
	1600A	GG, GJ & GW type N & H	GG16H2UXXXXM	**408202**	GG16H5UXXXXM	**408205**
	2000A	GG, GJ & GW type S, N & H	GG20H2UXXXXM	**408212**	GG20H5UXXXXM	**408215**
	2500A([1])	GG, GJ & GW type S & F	GG25H2UXXXXM	**410677**	GG25H5UXXXXM	**410678**
		Cassette for frame 2				
	2000A	GG, GJ & GW type M	GG20M2UXXXXM	**408224**	GG20M5UXXXXM	**408227**
	2500A	GG, GJ & GW type N, H & M	GG25M2UXXXXM	**408236**	GG25M5UXXXXM	**408239**
	3200A([2])	GG, GJ & GW type N, H & M	GG32M2UXXXXM	**408247**	GG32M5UXXXXM	**408251**
	4000A([2])	GG, GJ & GW type N, H & M	GG40M2UXXXXM	**408259**	GG40M5UXXXXM	**408263**
	Remark: each cassette is supplied with connection pads that can be rotated and used for vertical or horizontal connections.					
		Cassette for frame 3([3])				
	5000 - 6400A([4])	GG & GJ type M & L	GG64L2UXXXXM	**408281**	GG64L5UXXXXM	**408283**
Horizontal rear connections						
		Cassette for frame T				
	400 - 1600A	GT type K and G7 type R	GT16K2HXXXXM	**444692**	GT16K5HXXXXM	**444695**
Vertical rear connections	**Connection pad for limited derating frame 1**					
	2500A	GG, GJ & GW type S & F	GG25F2VXXXXM	**410675**	GG25F5VXXXXM	**407676**
						
	Cassette with dual vertical clusters and connection pads for limited derating frame 2					
	3200A	GH, GK, GJ & GZ type N, H & M	GH32M2VXXXXM	**408292**	GH32M5VXXXXM	**408293**
	4000A([2])	GH, GK, GJ & GZ type N, H & M	GH40M2VXXXXM	**408294**	GH40M5VXXXXM	**408295**

([1]) Cassettes for frame 1 are limited to a current of **2000A when connected in vertical mode.** Connected in vertical mode a 2500A rating is achieved
([2]) Cassettes for frame 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 frame 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
([4]) 4th pole on left

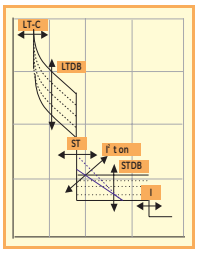
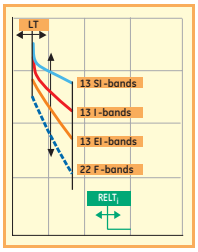
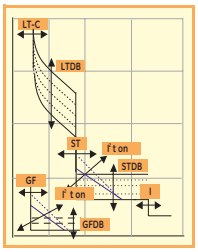
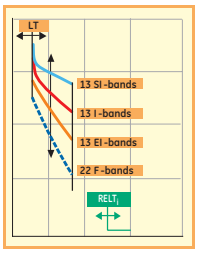
Trip units - Factory mounted

GT-S	Basic functionality	Designation	Extended functionality	Cat. No.	Ref. No.
		**GT-S trip unit with:**	None	GTG00K9XXSFXXXX	**408803**
		LT-C 0.2 -1 x In = Ir			
		LTDB			
		ST I²T ON or OFF			
		STDB			
		I			
		GT-rating plug	Required for all types	GTPUNI	**408860**
		**GT-S trip unit with:**	None	GTG00K3XXSFXXXX	**408805**
		LT-C 0.2 -1 x In = Ir			
		LTDB			
		ST I²T ON or OFF	+ Modbus communication	GTG00K3X2SFXXXX	**408807**
		STDB			
		GF I²T ON or OFF			
		GFDB			
		I			
		GT-rating plug	Required for all types	GTPUNI	**408860**
		**GT-S trip unit with:**	None	GTG00K4XXSFXXXX	**408806**
		LT-C 0.2 -1 x In = Ir			
		LTDB			
		ST I²T ON or OFF	+ Modbus communication	GTG00K4X2SFXXXX	**408808**
		STDB			
		GF I²T ON or OFF			
		GFDB			
		I ext.			
		GT-rating plug	Required for all types	GTPUNI	**408860**

A special version of trip unit with magnetic protection only (ST). Version available with ordering code 407899 GTG00KSXXSFXXXX.

Order codes
Air circuit breakers

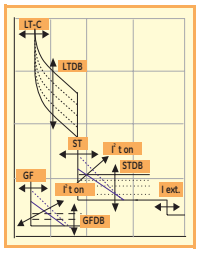
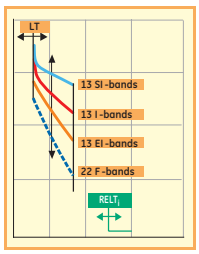
Trip units - Factory mounted

GT- H	Basic functionality	Designation	Extended functionality	Cat. No.	Ref. No.
		**GT-H trip unit with:**	A choice of FIVE LT band shapes	GTG00N9X5SFXXXX	**408823**
		LT 0.2 - 1 x In =Ir	Measurement unit(1)		
		Curve shapes: LT-C, LT-F,	Relay functionality		
		LT-I, LT-EI & LT-XI	RELT instantaneous		
		LTDB			
		ST I²T ON (3 bands) or OFF	A choice of FIVE LT band shapes	GTG00N9X8SFXXXX	**408863**
		STDB	Measurement unit(1)		
		I_i	Data aquisition & Relay functionality		
		RELT	RELT instantaneous		
		LT, ST and I functions can	Modbus communication		
		be switched ON or OFF	Relay functionality & Wave form cap.		
			A choice of FIVE LT band shapes	GTG00N9X9SFXXXX	**408865**
			Measurement unit(1)		
			Relay functionality		
			RELT instantaneous		
			Profibus communication		
		GT-rating plug	Required for all types	GTPUNI	**408860**
	Extended functionality				
					
	Basic functionality				
		**GT-H trip unit with:**	A choice of FIVE LT band shapes	GTG00N5X5SFXXXX	**408825**
		LT 0.2 - 1 x In =Ir	Dual GF protection (Res./Sum or CT)		
		Curve shapes: LT-C, LT-F,	Measurement unit(1)		
		LT-I, LT-EI & LT-XI	Relay functionality		
		LTDB	RELT instantaneous		
		ST I²T ON (3 bands) or OFF			
		STDB	A choice of FIVE LT band shapes	GTG00N5X8SFXXXX	**408833**
		GF sum I²T ON	Dual GF protection (Res./Sum or CT)		
		(3 bands) or OFF	Measurement unit(1)		
		GF CT I²T ON	Relay functionality & Wave form cap.		
		(3 bands) or OFF	RELT instantaneous		
		GFDB (on CT & Sum)	Modbus communication		
		I_i			
		RELT	A choice of FIVE LT band shapes	GTG00N5X9SFXXXX	**408841**
		LT, ST, I and GF functions	Dual GF protection (Res./Sum or CT)		
		can be switched ON or OFF	Measurement unit(1)		
			Relay functionality		
			RELT instantaneous		
			Profibus communication		
	Extended functionality				
			A choice of FIVE LT band shapes	GTG00N5T5SFXXXX	**408829**
			Dual GF protection (Res./Sum or CT)		
			Zone selective interlock on ST, I & GF		
			Measurement unit(1)		
			Relay functionality		
			RELT instantaneous		
			A choice of FIVE LT band shapes	GTG00N5T8SFXXXX	**408837**
			Dual GF protection (Res./Sum or CT)		
			Zone selective interlock on ST, I & GF		
			Measurement unit(1)		
			Relay functionality & Wave form cap.		
			RELT instantaneous		
			Modbus communication		
			A choice of FIVE LT band shapes	GTG00N5T9SFXXXX	**408845**
			Dual GF protection (Res./Sum or CT)		
			Zone selective interlock on ST, I & GF		
			Measurement unit(1)		
			Relay functionality		
			RELT instantaneous		
			Profibus communication		
		GT-rating plug	Required for all types	GTPUNI	**408860**

Remark:
The GT-H type offers five overload (LT) band choices:
1) **LTC** (Bimetal equivelant shape)
2) **LTF** (Fuse equivelant shape)
3) **I** (Inverse shape)
4) **VI** (Very inverse shape)
5) **XI** (Extremly inverse shape)

(1) An auxiliary power conditioner is obligatory when a fully functioning measurement is required see page 2/29

Trip units - Factory mounted

GT- H	Basic functionality	Designation	Extended functionality	Cat. No.	Ref. No.
		**GT-H trip unit with:**	A choice of FIVE LT band shapes	GTG00N7X5SFXXXX	**408827**
		LT 0.2 - 1 x In =Ir	Dual GF protection (Res./Sum or CT)		
		Curve shapes: LT-C, LT-F,	Measurement unit(1)		
		LT-I, LT-EI & LT-XI	Relay functionality		
		LTDB	RELT instantaneous		
		ST I^2T ON (3 bands) or OFF			
		STDB	A choice of FIVE LT band shapes	GTG00N7X8SFXXXX	**408835**
		GF sum I^2T ON	Dual GF protection (Res./Sum or CT)		
		(3 bands) or OFF	Measurement Unit(1)		
		GF CT I^2T ON	Relay functionality & Wave form cap.		
		(3 bands) or OFF	RELT instantaneous		
		GFDB (on CT & Sum)	Modbus communication		
		I ext.			
	Extended functionality	RELT	A choice of FIVE LT band shapes	GTG00N7X9SFXXXX	**408843**
		LT, ST, I and GF functions	Dual GF protection (Res./Sum or CT)		
		can be switched ON or OFF	Measurement unit(1)		
			Relay functionality		
			RELT instantaneous		
			Profibus communication		
			A choice of FIVE LT band shapes	GTG00N7T5SFXXXX	**408831**
			Dual GF protection (Res./Sum or CT)		
			Zone selective interlock on ST, I & GF		
			Measurement unit(1)		
			Relay functionality		
			RELT instantaneous		
			A choice of FIVE LT band shapes	GTG00N7T8SFXXXX	**408839**
			Dual GF protection (Res./Sum or CT)		
			Zone selective interlock on ST, I & GF		
			Measurement unit(1)		
			Relay functionality & Wave form cap.		
			RELT instantaneous		
			Modbus communication		
			A choice of FIVE LT band shapes	GTG00N7T9SFXXXX	**408847**
			Dual GF protection (Res./Sum or CT)		
			Zone selective interlock on ST, I & GF		
			Measurement unit(1)		
			Relay functionality		
			RELT instantaneous		
			Profibus communication		
		GT-rating plug	Required for all types	GTPUNI	**408860**

Remark:
The GT-H type offers five overload (LT) band choices:
1) **LTC** (Bimetal equivelant shape)
2) **LTF** (Fuse equivelant shape)
3) **I** (Inverse shape)
4) **VI** (Very inverse shape)
5) **XI** (Extremly inverse shape)

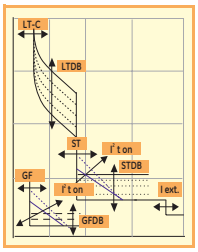
(1) An auxiliary power conditioner is obligatory when a fully functioning measurement is required see page 2/29

Order codes
Air circuit breakers

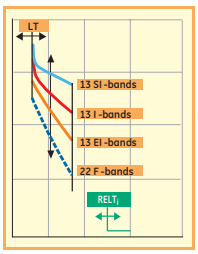
Trip units - Factory mounted

Remark:
The GT-H type offers five overload (LT) band choices:
1) **LTC** (Bimetal equivelant shape)
2) **LTF** (Fuse equivelant shape)
3) **I** (Inverse shape)
4) **VI** (Very inverse shape)
5) **XI** (Extremly inverse shape)

Basic functionality



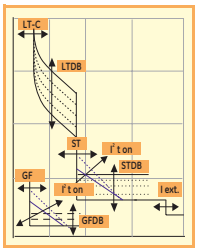
Extended functionality



GT- H	Designation	Extended functionality	Cat. No.	Ref. No.
	GT-H trip unit with:	A choice of FIVE LT band shapes	GTG00N6X5SFXXXX	**408826**
	LT 0.2 - 1 x In =Ir	GFsum(+A) and GFct (+A) protection		
	Curve shapes: LT-C, LT-F,	Measurement unit(1)		
	LT-I, LT-EI & LT-XI	Relay functionality		
	LTDB	RELT instantaneous		
	ST I^2T ON (3 bands) or OFF	With standard instaneous		
	STDB	Idem with extended instananeous	GTG00N8X5SFXXXX	**408828**
	GF sum I^2T ON (3 bands) or OFF			
	With alarm function(2)	A choice of FIVE LT band shapes	GTG00N6X8SFXXXX	**408834**
	GF CT I^2T ON (3 bands) or OFF	GFsum(+A) and GFct (+A) protection		
	With alarm function(2)	Measurement unit(1)		
	GFDB (on CT & Sum)	Relay functionality & Wave form cap.		
	I_i or I ext.	RELT instantaneous		
	RELT	Modbus communication		
	LT, ST, I, Gfsum, GFct and	With standard instaneous		
	the alarm functions can	Idem with extended instananeous	GTG00N8X8SFXXXX	**408836**
	be switched ON or OFF			
		A choice of FIVE LT band shapes	GTG00N6X9SFXXXX	**408842**
		GFsum(+A) and GFct (+A) protection		
		Measurement unit(1)		
		Relay functionality		
		RELT instantaneous		
		Profibus communication		
		With standard instaneous		
		Idem with extended instananeous	GTG00N8X9SFXXXX	**408844**
		A choice of FIVE LT band shapes	GTG00N6T5SFXXXX	**408830**
		GFsum(+A) and GFct (+A) protection		
		Zone selective interlock on ST, I & GF		
		Measurement unit(1)		
		Relay functionality		
		RELT instantaneous		
		With standard instaneous		
		Idem with extended instananeous	GTG00N8T5SFXXXX	**408832**
		A choice of FIVE LT band shapes	GTG00N6T8SFXXXX	**408838**
		GFsum(+A) and GFct (+A) protection		
		Zone selective interlock on ST, I & GF		
		Measurement unit(1)		
		Relay functionality & Wave form cap.		
		RELT instantaneous		
		Modbus communication		
		With standard instaneous		
		Idem with extended instananeous	GTG00N8T8SFXXXX	**408840**
		A choice of FIVE LT band shapes	GTG00N6T9SFXXXX	**408846**
		GFsum(+A) and GFct (+A) protection		
		Zone selective interlock on ST, I & GF		
		Measurement unit(1)		
		Relay functionality		
		RELT instantaneous		
		Profibus communication		
		With standard instaneous		
		Idem with extended instananeous	GTG00N8T9SFXXXX	**408848**
	GT-rating plug	Required for all types	GTPUNI	**408860**

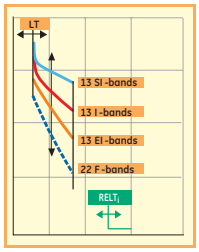
(1) An auxiliary power conditioner is obligatory when a fully functioning measurement is required see page 2/29
(2) Closes a contact for use as an alarm signal

Trip units - Factory mounted

GT- HE	Basic functionality	Designation	Extended functionality	Cat. No.	Ref. No.
		**GT-HE trip unit with:**	A choice of FIVE LT band shapes	GTG00NDX5SFXXXX	**408755**
		LT 0.2 - 1 x In =Ir	EF protection (UEF, SEF & REF)		
		Curve shapes: LT-C, LT-F,	Measurement unit(1)		
		LT-I, LT-EI & LT-XI	Relay functionality		
		LTDB	RELT instantaneous		
		ST I²T ON or OFF	With standard instaneous		
		STDB	Idem with Extended Instananeous	GTG00NFX5SFXXXX	**408763**
		EF-(UEF & SEF) I²T ON or OFF			
		EFDB on UEF & SEF	A choice of FIVE LT band shapes	GTG00NDX8SFXXXX	**408756**
		EF-REF (instantaneous only)	EF protection (UEF, SEF & REF)		
		I or I ext.	Measurement unit(1)		
		RELT	Relay functionality & Wave form cap.		
		LT, ST, I and EF functions	RELT instantaneous		
		can be switched ON or OFF.	Modbus communication		
		Multiple UEF, REF and SEF	With standard instaneous		
		combinations possible.	Idem with Extended Instananeous	GTG00NFX8SFXXXX	**408764**
			A choice of FIVE LT band shapes	GTG00NDX9SFXXXX	**408757**
			EF protection (UEF, SEF & REF)		
			Measurement unit(1)		
			Relay functionality		
			RELT instantaneous		
			Profibus communication		
			With standard instaneous		
			Idem with extended instananeous	GTG00NFX9SFXXXX	**408765**
			LT Band shape Choice (LTC or LTF)	GTG00NDT5SFXXXX	**408750**
			Dual GF protection (Res./Sum or CT)		
			Zone selective interlock on ST, I & GF		
			Measurement unit(1)		
			Relay functionality		
			RELT instantaneous		
			With standard instaneous		
			Idem with extended instananeous	GTG00NFT5SFXXXX	**408758**
			A choice of FIVE LT band shapes	GTG00NDT8SFXXXX	**408751**
			EF protection (UEF, SEF & REF)		
			Zone selective interlock on ST, I & GF		
			Measurement unit(1)		
			Relay functionality & Wave form cap.		
			RELT instantaneous		
			Modbus communication		
			With standard instaneous		
			Idem with extended instananeous	GTG00NFT8SFXXXX	**408759**
			A choice of FIVE LT band shapes	GTG00NDT9SFXXXX	**408753**
			EF protection (UEF, SEF & REF)		
			Zone selective interlock on ST, I & GF		
			Measurement unit(1)		
			Relay functionality		
			RELT instantaneous		
			Profibus communication		
			With standard instaneous		
			Idem with extended instananeous	GTG00NFT9SFXXXX	**408761**
		GT-rating plug	Required for all types	GTPUNI	**408860**

Remark:
The GT-HE type offers five overload (LT) band choices:
1) **LTC** (Bimetal equivelant shape)
2) **LTF** (Fuse equivelant shape)
3) **I** (Inverse shape)
4) **VI** (Very inverse shape)
5) **XI** (Extremly inverse shape)

Extended functionality



(1) An auxiliary power conditioner is obligatory when a fully functioning measurement is required see page 2/29

Order codes
Accessories

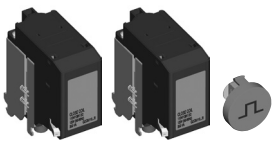
Internal accessories - Factory mounted

For field mounted variants see page 2/23 and 2/24

Motor operators[1]

	Motor operator Type T		Motor operator Type 1		Motor operator Type 2 & 3	
	Cat. No.	**Ref. No.**	Cat. No.	**Ref. No.**	Cat. No.	**Ref. No.**
24V DC	GMT0024D	**444630**	GM01024D	**407700**	GM02024D	**407725**
48V DC	GMT0048D	**444631**	GM01048D	**407702**	GM02048D	**407727**
60V DC	GMT0060D	**444248**	GM01060D	**407704**	GM02060D	**407729**
110-130V DC	GMT0110D	**444249**	GM01110D	**407706**	GM02110D	**407731**
220V DC	GMT0220D	**444251**	GM01220D	**407720**	GM02220D	**407722**
250V DC	GMT0250D	**444252**	GM01250D	**407708**	GM02250D	**407733**
48V AC	GMT0048A	**444247**	GM01048A	**407710**	GM02048A	**407735**
110-130V AC	GMT0120A	**444250**	GM01120A	**407712**	GM02120A	**407737**
220-240V AC	GMT0240A	**444638**	GM01240A	**407714**	GM02240A	**407739**
380-415V AC	GMT0400A	**444639**	GM01400A	**407716**	GM02400A	**407741**
440V AC	GMT0440A	**444640**	GM01440A	**407718**	GM02440A	**407743**

Closing coils



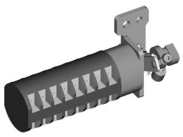
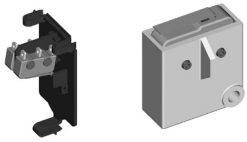
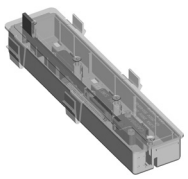
	Closing coil				Comm. closing coil[2]	
24V DC	GCCN024D	**407861**			GCCC024D	**407836**
48V AC-DC	GCCN048	**407863**			GCCC048	**407838**
60V DC	GCCN060D	**407865**			GCCC060D	**407840**
110-130V AC-DC	GCCN120	**407867**			GCCC120	**407842**
220-240V AC-DC	GCCN240	**407869**			GCCC240	**407844**
277V AC; 250V DC	GCCN277	**407870**			GCCC277	**407849**
380-415V AC	GCCN400A	**407877**			GCCC400A	**407852**
440V AC	GCCN440A	**407878**			GCCC440A	**407853**

Releases

	Undervoltage		Continously rated/Shunt		Comm. Oper. Shunt	Impulse rated Shunt[3]	
24V DC	GUVT024D	**407795**	GSTR024D	**407770**	GCST024D	GSST024	407789
30V DC			GSTR030D	**407786**	GCST030D		
48V AC-DC	GUVT048	**407797**	GSTR048	**407772**	GCST048		
60V DC	GUVT060D	**407799**	GSTR060D	**407774**			
110-130V AC-DC	GUVT120	**407801**	GSTR120	**407776**	GCST120	GSST120	407791
220-240V AC-DC (std)	GUVT240	**407803**	GSTR240	**407778**	GCST240	GSST240	407793
220-240V AC-DC (60ms)	GUVR240	**407811**					
277V AC; 250V DC	GUVT277	**407805**	GSTR277	**407780**	GCST277		
380-415V AC	GUVT400A	**407807**	GSTR400A	**407782**			
440V AC	GUVT440A	**407809**	GSTR440A	**407784**			

Other coils

	Remote reset coil[4]				Network interlock[3] [5]	
24V DC	GRRC024D	**407760**				
110V AC-DC	GRRC110	**407762**			GNTK120	**407753**
230V AC-DC	GRRC230	**407764**			GNTK240	**407754**

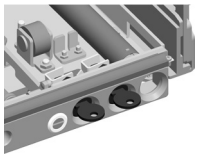
Auxiliary contacts		**Auxiliary contacts Type T**		**Auxiliary contacts Type 1/2/3**			
	Power rated 3NO & 3NC	GTAS3	**444655**	GAS3	**407885**		
	Delivered as standard option in all EntelliGuard breakers and isolators						
	Power rated 4NO & 4NC	GTAS4	**444656**				
	Power rated 8NO & 8NC			GAS6	**407887**		
	Power rated 3NO & 3NC			GAS5	**407886**		
	+ signal rated 2NO & 2NC						
	Power rated 4NO & 4NC			GAS8	**407888**		
	+ signal rated 4NO & 4NC						
Bell alarm contacts		**Bell alarm Type T**		**Bell alarm Type 1/2/3**			
	Power rated 1 changeover	GTBAT1	**444660**	GBAT1	**407891**		
	Signal rated 1 changeover	GTBATS1	**444661**	GBATS1	**407890**		
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.(6) 1NO	GRTC1	**407897**	GRTC2	**407899**	GRTC3	**407894**
	Breaker ready to close indic.(6) 1NC	GRTC4	**407908**	GRTC5	**407909**	GRTC6	**407910**
Position indication contacts cassette		**Cassette indication Type T**		**Cassette indication Type 1/2/3**			
	1 changeover power rated 1NO/1NC	GTCPS1	**444790**	GCPS1	**407922**		
	2 changeover power rated 2NO/2NC	GTCPS2	**444792**	GCPS2	**407923**		
	2 changeover power rated 1NO/1NC & signal rated 1NO/1NC	GTCPSA	**444794**	GCPSA	**407055**		

(1) Motor spring charged indication contact supplied with motor operator
(2) The command closing coil is only available in the combination with 3NO and 3NC auxiliary contacts for frame T
Optionally the command closing coil can be accessed via the trip unit (communication bus)
(3) Must be used with an auxiliary contact
(4) The remote reset coil is not available in frame T, and not available as field mountable accessory for frames 1/2/3
(5) The network interlock is not available in frame T
(6) Not available as field mountable accessory

Order codes
Accessories

Internal accessories - Factory mounted

For field mounted variants see page 2/23 and 2/24



		Ronis/flat-shaped		Castell		Profalux/star-shaped	
	Frame	Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
only provision	**Mechanism mounted on Cassette**						
	T	GTCRON	**444669**			**GTCPRO**	**444668**
	1	GCRON	**407976**			**GCPRO**	**407980**
	2						
	3						
	Mechanism mounted on Breaker						
	T	GTBRON	**444666**			**GTBPRO**	**444665**
	1	GBRON	**407971**	GBCAS	407970	**GBPRO**	**407978**
	2						
	3						
provision + cylinder	**Mechanism mounted on Cassette**						
	T						
	1	**Please use Global configurator since this will be a part of 18 digit Smart code**					
	2						
	3						
	Mechanism mounted on Breaker						
	T						
	1	GBRON + GRON	**407971 + 410609**			GBPRO + GPRO	**407978 + 407987**
	2						
	3						
Locks with keys having random numbers (to be ordered separately)		GRON	**410609**	GCAS	407986	GPRO	**407987**

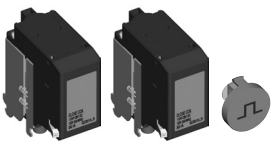
Internal accessories - Field mountable

For factory mounted variants see page 2/20 and 2/21

Motor operators(1)

	Motor operator Type T		Motor operator Type 1		Motor operator Type 2 & 3	
	Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
24V DC	GMT0024DR	**444641**	GM01024DR	**407701**	GM02024D	**407726**
48V DC	GMT0048DR	**444642**	GM01048DR	**407703**	GM02048D	**407728**
60V DC	GMT0060DR	**444643**	GM01060DR	**407705**	GM02060D	**407730**
110-130V DC	GMT0110DR	**444644**	GM01110DR	**407707**	GM02110D	**407732**
220V DC	GMT0220DR	**444645**	GM01220DR	**407721**	GM02220D	**407723**
250V DC	GMT0250DR	**444646**	GM01250DR	**407709**	GM02250D	**407734**
48V AC	GMT0048AR	**444647**	GM01048DR	**407711**	GM02048A	**407736**
110-130V AC	GMT0120AR	**444648**	GM01120AR	**407713**	GM02120A	**407738**
220-240V AC	GMT0240AR	**444649**	GM01240AR	**407715**	GM02240A	**407740**
380-415V AC	GMT0400AR	**444650**	GM01400AR	**407717**	GM02400A	**407742**
440V AC	GMT0440AR	**444651**	GM01440AR	**407719**	GM02440A	**407744**

Closing coils

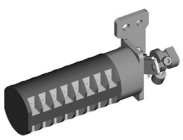


	Closing coil				Comm. closing coil(2)	
24V DC	GCCN024DR	**407860**			GCCC024DR	**407835**
48V AC-DC	GCCN048R	**407862**			GCCC048R	**407837**
60V DC	GCCN060DR	**407864**			GCCC060DR	**407839**
110-130V AC-DC	GCCN120R	**407866**			GCCC120R	**407841**
220-240V AC-DC	GCCN240R	**407868**			GCCC240R	**407843**
277V AC; 250V DC	GCCN277R	**407871**			GCCC277R	**407850**
380-415V AC	GCCN400AR	**407876**			GCCC400AR	**407851**
440V AC	GCCN440AR	**407879**			GCCC440AR	**407854**

Releases

	Undervoltage		Continously rated/Shunt		Comm.Oper. Shunt	Impulse rated Shunt(3)	
24V DC	GUVT024DR	**407796**	GSTR024DR	**407771**	GCST030DR	GSST024R	**407790**
30V DC			GSTR030DR	**407787**	GCST030DR		
48V AC-DC	GUVT048R	**407798**	GSTR048R	**407773**	GCST048R		
60V DC	GUVT060DR	**407800**	GSTR060DR	**407775**			
110-130V AC-DC	GUVT120R	**407802**	GSTR120R	**407777**	GCST120R	GSST120R	**407792**
220-240V AC-DC (std)	GUVT240R	**407804**	GSTR240R	**407779**	GCST240R	GSST240R	**407794**
220-240V AC-DC (60ms)	GUVR240R	**407812**					
277V AC; 250V DC	GUVT277R	**407806**	GSTR277R	**407781**	GCST277R		
380-415V AC	GUVT400AR	**407808**	GSTR400AR	**407783**			
440V AC	GUVT440AR	**407810**	GSTR440AR	**407785**			

Auxiliary contacts

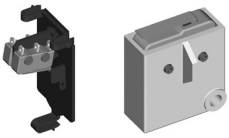
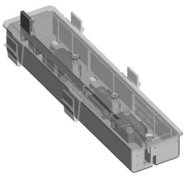


	Auxiliary contacts Type T		Auxiliary contacts Type 1/2/3	
Power rated 3NO & 3NC	GTAS3R	**444658**	GAS3R	**407880**
Delivered as standard option in all EntelliGuard breakers and isolators				
Power rated 4NO & 4NC	GTAS4R	**444659**		
Power rated 8NO & 8NC			GAS6R	**407882**
Power rated 3NO & 3NC			GAS5R	**407881**
+ signal rated 2NO & 2NC				
Power rated 4NO & 4NC			GAS8R	**407883**
+ signal rated 4NO & 4NC				

Order codes
Accessories

Internal accessories - Field mountable

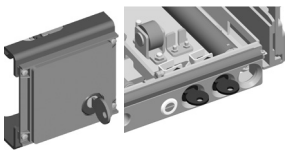
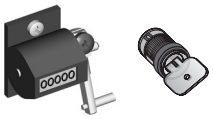
For factory mounted variants see page 2/20 and 2/21

Bell alarm contacts		**Bell alarm Type T**		**Bell alarm Type 1/2/3**			
	Power rated 1 changeover	GTBAT1R	**444672**	GBAT1R	**407889**		
	Signal rated 1 changeover	GTBATS1R	**444673**				
	Power rated 2 changeover			GBAT2R	-		
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	GCSP1R	**407915**			GCSP2R	**407916**
Position indication contacts cassette		**Cassette indication Type T**		**Cassette indication Type 1/2/3**			
	1 changeover power rated 1NO/1NC	GTCPS1R	**444790**	GCPS1	**407922**		
	2 changeover power rated 2NO/2NC	GTCPS2R	**444792**	GCPS2	**407923**		
	2 changeover power rated 1NO/1NC & signal rated 1NO/1NC	GTCPSAR	**444794**	GCPSA	**407055**		
	4NO+4NC power rated			GCPS5R	**407088**		

(1) Motor spring charged indication contact supplied with motor operator
(2) The command closing coil is only available in the combination with 3NO and 3NC auxiliary contacts for frame T
The command closing coil does not come with push-button for EntelliGuard T frame
Optionally the command closing coil can be accessed via the trip unit (communication bus)
(3) Must be used with an auxiliary contact
NOTE: front fascia of breaker for frame 1/2/3 GPBD = 408040

Internal accessories - Field mountable

For factory mounted variants see page 2/22

			Ronis/flat-shaped		Castell		Profalux/star-shaped	
Locking mechanisms(1)		**Frame**	**Cat. No.**	**Ref. No.**	**Cat. No.**	**Ref. No.**	**Cat. No.**	**Ref. No.**
		Mechanism mounted on Cassette						
		T						
		1	GCRONR	**407974**			GCPROR	**407981**
		2						
		3						
		Mechanism mounted on Breaker						
		T	GTBRONR	**444683**				
		1	GBRONR	**407968**	GBCASR	**407967**	GBPROR	**407979**
		2						
		3						
	Locks with keys having random numbers (to be ordered separately)		GRONR	**407985**	GCASR		GPROR	
	Set of 4 spare Lock cams for use with Ronis 1104 locks	T						
		1	GRONCS	**407984**				
		2	GRONCS	**407984**				
		3	GRONCS	**407984**				
Associated locks(2)	Ronis ABA90DEL5000 lock(2)		GRON	**410609**				
	Profalux HBA90DPS5000 lock(2)						GPRO	**407987**
	Castell FS1 lock/K4 key(2)				GCAS	**407986**		
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

Order codes
Accessories

Internal accessories - Frames 1, 2 and 3

Maximum amount of installable internal accessories

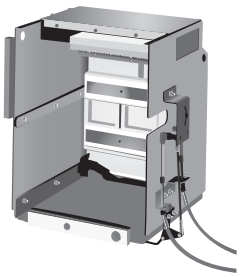
Motor Operator type 1 or 2	Closing coil or command closing coil	Undervoltage release[3]	Shunt release	Network interlock release	Auxiliary Contacts Power NO + NC	Auxiliary contacts Hi-fidelity NO+NC	Bell alarm contacts	Signaling contacts releases indic. power	Signaling Contacts Releases indic. HI.Fid.	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	0	1	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	0	1	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	0	1	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	0	1	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

External accessories - Field mountable

Not available in a factory mounted variant

Cable interlocks (1)



Frame T (3)

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		GTI2FAD	**444675**	GTI2WAD	**444676**
	OFF	ON					
B	OFF	OFF	OFF	For each breaker		For each breaker	
	ON	OFF	OFF	GTI3FB	**444677**	GTI3WB	**444678**
	OFF	ON	OFF				
	OFF	OFF	ON				
C	OFF	OFF	OFF				
	ON	OFF	OFF				
	OFF	OFF	ON	For each breaker		For each breaker	
	OFF	ON	OFF	GTI3FC	**444679**	GTI3WC	**444680**
	ON	ON	OFF				
	OFF	ON	ON				
	ON	OFF	ON				
D	OFF	OFF	OFF	For Brk. 1 & 3		For Brk. 1 & 3	
	ON	OFF	OFF	GTI2FAD	**444675**	GTI2WAD	**444676**
	OFF	OFF	ON				
	ON	OFF	ON	For Brk. 2		For Brk. 2	
	OFF	ON	OFF	GTI3FDT	**444681**	GTI3WDT	**444682**

Frames 1/2/3

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**
	OFF	ON					
B	OFF	OFF	OFF	For each breaker		For each breaker	
	ON	OFF	OFF	GI3FB	**407902**	GI3WB	**407903**
	OFF	ON	OFF				
	OFF	OFF	ON				
C	OFF	OFF	OFF				
	ON	OFF	OFF				
	OFF	OFF	ON	For each breaker		For each breaker	
	OFF	ON	OFF	GI3FC	**407904**	GI3WC	**407905**
	ON	ON	OFF				
	OFF	ON	ON				
	ON	OFF	ON				
D	OFF	OFF	OFF	For Brk. 1 & 3		For Brk. 1 & 3	
	ON	OFF	OFF	GI2FAD	**407900**	GI2WAD	**407901**
	OFF	OFF	ON				
	ON	OFF	ON	For Brk. 2		For Brk. 2	
	OFF	ON	OFF	GI3FDT	**407906**	GI3WDT	**407907**

(1) 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 2/28

(2) For frame T, only the combination in the same frame size can be interlocked

NOTE: front fascia of breaker for frame 1/2/3 GPBD = **408040** (FIELD MOUNTED), **444782** = FACTORY MOUNTED

Order codes
Accessories

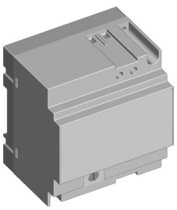
External accessories - Field mountable

Not available in a factory mounted variant

Cables for interlocking of breakers (1)

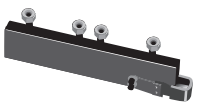
	Interlock Scheme No. of Cables Needed		Cat. No.	Ref. No.
A	1 cable per breaker, choose length as indicated			
B	2 cables per breaker, choose length as indicated	Cable length 1 meter	GCB1	**407990**
		Cable length 1.5 meter	GCB2	**407991**
C	2 cables per breaker, choose length as indicated	Cable length 2 meter	GCB3	**407992**
		Cable length 2.5 meter	GCB4	**407993**
D	Brk's 1 and 3: 1 cable per breaker, choose length as indicated	Cable length 3 meter	GCB5	**407994**
		Cable length 3.5 meter	GCB6	**407995**
		Cable length 4 meter	GCB7	**407996**
	Brk. 2: 2 cables per breaker, choose length as indicated			

Time delay module for UVR release (TDM)



	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**

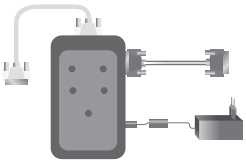
Breaker earthing device for service



EntelliGuard type 1	3 pole		4 pole	
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

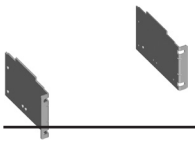
(1) See previous page for associated interlock kit for breaker or cassette.

GT- Accessories



Designation			Cat. No.	Ref. No.
Voltage conditioning unit 1 phase 220-230V			GMPU1	**408790**
Voltage conditioning unit 1 phase 380-400V			GMPU2	**408791**
Voltage conditioning unit 1 phase 240-250/277-290/415V(1)			GMPU3	**408792**
Voltage conditioning unit 690V(1)			GMPU4	**408793**
Catalog source voltage				
Position 1	**Position 2**	**Position 3**		
230	208	120	GMPU5	
340	277	240	GMPU6	
600	480	400	GMPU7	
Power Supply - Input 100-240V AC(1) or 100-353V DC - Output 24V DC 0.6 Amps			GAPU	**408789**
Trip unit, sealable transparent front cover			GTUS	**408046**
Trip unit battery tester			GTUTK20	**407999**
RELT switch			GTURSK	**408780**
Conversion kit to switch to manual reset TU lockout kit			GLKMR	-
Conversion kit to switch to automatic reset TU lockout kit			GLKAR	-

Wall mounting brackets



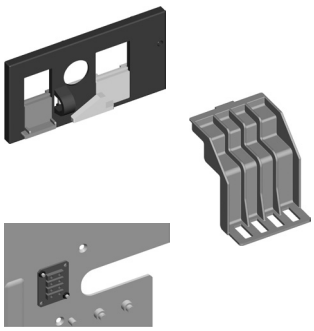
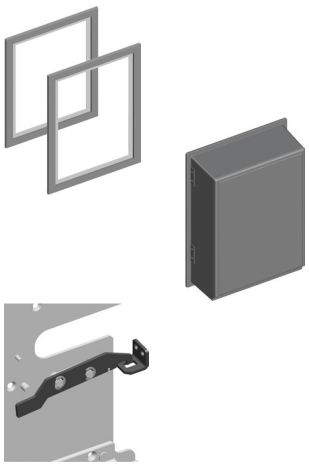
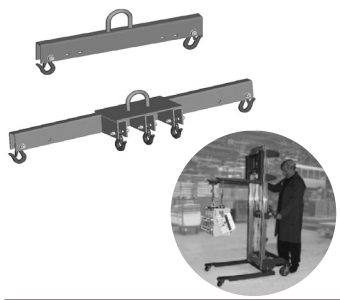
Wall mounting brackets for Env. 1 & 2	GFMTG	**408085**

(1) Trip units require a 24V DC Power Supply for communications, earth fault, extended GF, GF settings below 0.2xIn, date and time added to event log, RELT, and display turning on below 20% load.

Order codes
Accessories

Installation accessories

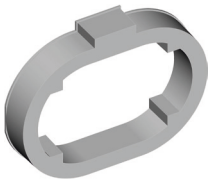
Not available in a factory mounted variant

		Cat. No.	Ref. No.
Operation 	**Front fascia of breaker**		
	Padlocking device for push-buttons frame T	GTPBD	**444667**
	Operation indicators		
	Contact wear indicator env. 1-3	GCNTW	**408036**
	Cassette		
	Mis insertion device frame T	GTREPM	**444674**
	Mis insertion device frames 1/2/3	GREPM	**408041**
Door flanges & interlocks 	Door flange fixed frame T([1])	GTDPRF	**444805**
	Door flange fixed frames 1/2/3([1])	GDPRF	**408025**
	Door flange draw-out frame T([1])	GTPRW	**444806**
	Door flange draw-out frames 1/2/3([1])	GDPRW	**408026**
	Door escutcheon IP54		
	EntelliGuard G fixed and draw-out frames 1/2/3	GGDEFD	**287030**
	EntelliGuard G draw-out frame T	GTDEDT	**287031**
	EntelliGuard G fixed frame T	GTDEFD	**287032**
	Door interlock		
	Door interlock frames 1/2/3	GLHDR	**408039**
	Door interlock frames 1/2/3	GRHDR	**408042**
	Door interlock on LEFT frame T	GTLHDR	**444256**
	Door interlock on RIGHT frame T	GTRHDR	**444257**
Lifting beams([2]) 	Breaker lifting beams suitable for 3P frame T, 1 & 2	GLD3F12	-
	Breaker lifting beams suitable for 3P frame 3	GLD3F3	-
	Breaker lifting beams suitable for 4P frame T, 1 & 2	GLD4F12	-
	Breaker lifting beams suitable for 4P frame 3	GLD4F3	-
	Lifting truck	GE-1000([3])	-
Phase separators 	Set of 9 phase separators for frames 1 & 2 (Needed for 1000V applications)	GJP	**408057**
	Set of 9 phase separators for frame T	GTJP	**444255**

([1]) Is a spare, these devices are always supplied with the standard devices
([2]) Designed for use with commercially available lifting equipment The frame T is supplied with lifting handles
([3]) To be procured from Burlington Plant

Sensors for all GT type trip units

For use with ground fault residual (sum) protection Rogowski coils:



	Frames T & 1		Frame 2		Frame 3	
	Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
400A	G04HNRC	**408000**	G04MNRC			
630A	G07HNRC	**408001**	G07MNRC			
800A	G08HNRC	**408002**	G08MNRC			
1000A	G10HNRC	**408003**	G10MNRC			
1250A	G13HNRC	**408004**	G13MNRC			
1600A	G16HNRC	**408005**	G16MNRC			
2000A	G20HNRC	**408006**	G20MNRC			
2500A	G25HNRC	**408007**	G25MNRC	**408162**		
3200A			G32MNRC		G32LNRC	**408186**
4000A			G40MNRC		G40LNRC	**408187**
5000A					G50LNRC	**408188**
6400A					G64LNRC	**408189**

Sensors for GT-H and GT-HE type 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)

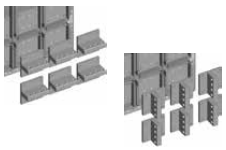
	Frames T & 1		Frame 2		Frame 3	
	Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
400A	G04HNCT	**408300**	G04HNCT	**408300**		
630A	G07HNCT	**408301**	G07HNCT	**408301**		
800A	G08HNCT	**408302**	G08HNCT	**408302**		
1000A	G10HNCT	**408303**	G10HNCT	**408303**		
1250A	G13HNCT	**408304**	G13HNCT	**408304**		
1600A	G16HNCT	**408305**	G16HNCT	**408305**		
2000A	G20HNCT	**408306**	G20HNCT	**408306**		
2500A			G25MNCT	**408322**		
3200A			G32LNCT	**408331**	G32LNCT	**408331**
4000A			G40LNCT	**408332**	G40LNCT	**408332**
5000A					G50LNCT	**408333**
6400A					G64LNCT	**408334**

Order codes
Accessories

Cassettes for use with breakers and Isolators in draw-out pattern - Field mountable

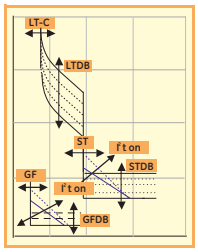
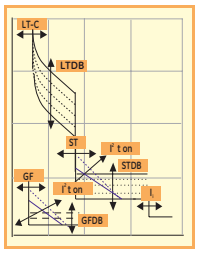
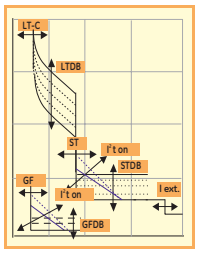
- References apply for cassettes separately supplied for use with breakers or isolator
- With connection modes as indicated in left column
- Each cassette is supplied with safety shutters

Cassettes for draw-out pattern; fixed portion only (continued)

	Rating (A)	Suited for use with EntelliGuard G types	3 pole		4 pole(1)	
			Cat. No.	Ref. No.	Cat. No.	Ref. No.
Universal rear connections	**Cassette for frame T**					
	**400 -1600A**	GT type K and G7 type R	GT16K2UXXXXR	**444701**	GT16K5UXXXXR	**444704**
	Cassette for frame 1					
	400 -1600A	GG, GJ & GW type S	GG16S2UXXXXR	**407617**	GG16S5UXXXXR	**407619**
	1600A	GG, GJ & GW type N & H	GG16H2UXXXXR	**407612**	GG16H5UXXXXR	407615
	2000A	GG, GJ & GW type S, N & H	GG20H2UXXXXR	**407622**	GG20H5UXXXXR	**407625**
	2500A	GG, GJ & GW type S & F (2)	GG25H2UXXXXR	**410681**	GG25H5UXXXXR	**410682**
	**Cassette for frame 2(3)**					
	2000A	GG, GJ & GW type M	GG20M2UXXXXR	**407632**	GG20M5UXXXXR	407635
	2500A	GG, GJ & GW type N, H & M	GG25M2UXXXXR	**407642**	GG25M5UXXXXR	**407645**
	3200A	GG, GJ & GW type N, H & M	GG32M2UXXXXR	**407652**	GG32M5UXXXXR	**407656**
	4000A	GG, GJ & GW type N, H & M	GG40M2UXXXXR	**407666**	GG40M5UXXXXR	**407670**
	**Remark: each cassette is supplied with connection pads that can be rotated and used for vertical or horizontal connections.**					
	Cassette for frame 3(4)					
	5000 - 6400A(1)	GG & GJ type M & L	GG64L2UXXXXR	**407686**	GG64L5UXXXXR	**407688**
Horizontal rear connections	**Cassette for frame T**					
	400 -1600A	GT type K and G7 type R	GT16K2HXXXXR	**444702**	GT16K5HXXXXR	**444705**
Vertical rear connections	**Cassette with dual vertical clusters and connection pads for limited derating frame 2**					
	**2500A**	GG type F	GG25F2VXXXXR	**410685**	GG25F5VXXXXR	**410686**
	3200A	GH, GK, GJ & GZ type N, H & M	GH32M2VXXXXR	**408254**	GH32M5VXXXXR	**408255**
	4000A	GH, GK, GJ & GZ type N, H & M	GH40M2VXXXXR	**408267**	GH40M5VXXXXR	**408268**

(1) 4th pole on left
(2) Only connected in vertical mode, 2500A rating achieved
(3) Cassettes for frame 2 are limited to a current of **3200A when connected in horizontal mode**. Connected in vertical mode a 4000A rating is achieved
(4) The cassette for frame 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. In Order to achieve temperature rise according to IEC standards, please ensure adequate size of busbar is used and a temperature rise test as per IEC standards is conducted inside Equipment

Electronic trip units - Field mounted

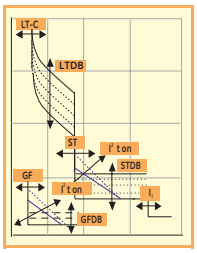
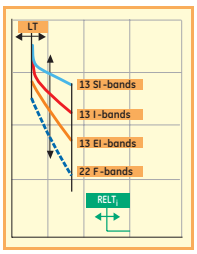
	Basic functionality	Designation	Extended functionality	Cat. No.	Ref. No.
GT- E		**GT-E trip unit with:**	None	GTG00K2XXSRXXXX	**408802**
		LT 0.2 - 1 x In = Ir			
		LTDB			
		ST I^2T ON (3 bands) or OFF			
		STDB			
		GF sumI^2T ON (3 bands) or OFF			
		GFDB (on CT & Sum)			
		GT-rating plug	Required for all T types	GTPUNI	**408860**
GT- S		**GT-S trip unit**	Modbus communication	GTG00K4XX2XXXSR	**408809**
		LT 0.2 - 1 x In = Ir			
		LTDB			
		ST I^2T ON (3 bands) or OFF			
		STDB			
		GF sumI^2T ON (3 bands) or OFF			
		GFDB (on CT & Sum)			
		I_i			
		GT-rating plug	Required for all types	GTPUNIVU0000	**408860**
GT- N		**GT-N trip unit**	Measurement unit(1) Modbus communication Zone selective interlock on ST, I & GF	GTG00K4T6XXXXSR	**408819**
		LT 0.2 - 1 x In = Ir			
		LTDB			
		ST I^2T ON (3 bands) or OFF			
		STDB			
		GF sumI^2T ON (3 bands) or OFF			
		GFDB (on CT & Sum)			
		$I_{i\ ext}$			
		RELT			
		GT-rating plug	Required for all types	GTPUNIVU0000	**408860**

(1) An auxiliary power conditioner is obligatory when a fully functioning measurement is required see page 2-29

Note: GT-rating Plug required for all types GTPUNIR

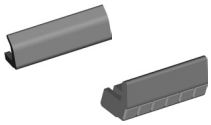
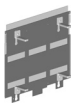
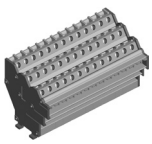
Order codes
Accessories

Electronic trip units - Field mounted

GT- H	Basic functionality	Designation	Extended functionality	Cat. No.	Ref. No.
		**GT-H trip unit with:**	A choice of FIVE LT band shapes	GTG00N5T8XXXXSR	**408849**
		LT 0.2 - 1 x In = Ir	Dual GF protection (Res./Sum or CT)		
		Curve shapes: LT-C, LT-F,	Zone selective interlock on ST, I & GF		
		LT-I, LT-EI & LT-XI	Measurement unit(1)		
		LTDB	Relay functionality & Wave form cap.		
		ST I^2T ON (3 bands) or OFF	RELT instantaneous		
		STDB	Modbus communication		
		GF sum I^2T ON (3 bands)	With standard instaneous		
		or OFF	Idem with extended instananeous	GTG00N7T8XXXXSR	**408851**
		With/without alarm function(2)			
		GF CT I^2T ON (3 bands)	A choice of FIVE LT band shapes	GTG00N5T9XXXXSR	**408853**
		or OFF	Dual GF protection (Res./Sum or CT)		
		With/without alarm function(2)	Zone selective interlock on ST, I & GF		
		GFDB (on CT & Sum)	Measurement unit(1)		
	Extended functionality	I_i or I ext.	Relay functionality		
		RELT	RELT instantaneous		
		LT, ST, I, Gfsum, GFct and	Profibus communication		
		the alarm functions can	With standard instaneous		
		be switched ON or OFF	Idem with extended instananeous	GTG00N7T9XXXXSR	**408855**
			A choice of FIVE LT band shapes	GTG00N6T8XXXXSR	**408850**
			GFsum(+A) and GFct (+A) protection		
			Zone selective interlock on ST, I & GF		
			Measurement unit(1)		
			Relay functionality & Wave form cap.		
			RELT instantaneous		
			Modbus communication		
			With standard instaneous		
			Idem with extended instananeous	GTG00N8T8XXXXSR	**408852**
			A choice of FIVE LT band shapes	GTG00N6T9XXXXSR	**408854**
			GFsum(+A) and GFct (+A) protection		
			Zone selective interlock on ST, I & GF		
			Measurement unit(1)		
			Relay functionality		
			RELT instantaneous		
			Profibus communication		
			With standard instaneous		
			Idem with extended instananeous	GTG00N8T9XXXXSR	**408856**
		GT-rating plug	Required for all types	GTPUNIVU0000	**408860**
		GT trip unit with NO protection	For use with non automatic types	G3G00KAXXXXXXSR	**408796**
			with MCR		
		NOTE: GT-rating Plug Required for all types GTPUNIR			

(1) An auxiliary power conditioner is obligatory when a fully functioning measurement is required see page 2-29
(2) Closes a contact for use as an alarm signal
Note: GT-rating Plug required for all types GTPUNIR

Spare parts - Shutter Interlocks

		Frame T		Frame 1		Frame 2		Frame 3	
Breaker arc chutes 		**Cat. No.**	**Ref. No.**	**Cat. No.**	**Ref. No.**	**Cat. No.**	**Ref. No.**	**Cat. No.**	**Ref. No.**
	Arc chute for 1 pole	GT16KCHT	**444801**	G20HCHT	**408102**	G40MCHT	**408131**	G64LCHT	**408144**
Breaker fixed arcing contacts 	Set for 1 pole R & K types	GT16KARC	**444802**						
	Set for 1 pole S & N types			G20NARC	**408104**				
	Set for 1 pole H type			G20HARC	**408098**				
	Set for 1 pole E & N types					G40NARC	**408172**		
	Set for 1 pole H & M types					G40MARC	**408169**		
	Set for 1 pole L type							G64LARC	**408193**
Cassette shutters 	System with interlock 3 pole	GT16N2SSL	**444253**	G20H2SSL	**407606**	G40M2SSL	**407636**	G64L2SSL	**407679**
	System with interlock 4 pole	GT16N5SSL	**444254**	G20H5SSL	**407607**	G40M5SSL	**407637**	G64L5SSL	**407680**
Cassette racking handle 	Spare racking handle	GTRHN	**444803**	GRHN	**408043**	GRHN	**408043**	GRHN	**408043**
Breaker front facia part[1] 	Front facia	GTFAL	**444804**	GFA4	**408028**	GFA4	**408028**	GFA4	**408028**
	Set of 4 spare lock cams for use with Ronis 1104 locks			GRONCS	**407984**	GRONCS	**407984**	GRONCS	**407984**
Cassette cluster contacts  	**Sets per pole**								
	Current rating 400-1600A	GT16KCLS	**444800**						
	Current rating 400-1250A								
	Current rating 400-1600A			G16HCLS	**408100**				
	Current rating 2000-2500A			G20HCLS	**408103**				
	Current rating ≥2000A								
	Current rating 2500A								
	Current rating 3200A								
	Current rating 400-4000A					G40MCLS	**408120**		
	Current rating 3200-4000A LTD Derating								
	Current rating 4000-5000A								
	Current rating 5000-6400A							G64LCLS	**408148**
	Set of universal cluster pliers	GUNI	**408047**	GUNI	**408047**	GUNI	**408047**	GUNI	**408047**
Breakers and cassette spare auxiliary disconnect plugs 	For fixed breaker 1 39 pole "Block A"	GTSDFTR	**444258**	GSDFTR1	**408052**	GSDFTR1	**408052**	GSDFTR1	**408052**
	For fixed Breaker 1 78 pole "Block A and B"			GSDFTR2	**408030**	GSDFTR2	**408030**	GSDFTR2	**408030**
	For draw-out breaker 1 39 pole set "Block A or B"[2]	GTSDWTR	**444259**	GSDWTR	**408054**	GSDWTR	**408054**	GSDWTR	**408054**
	For fixed breaker 1 16 pole "Block C"	GTHDTUF	**444710**						
	For draw-out breaker 1 16 pole "Block C"	GTHDTUD	**444711**						

(1) The original breaker serial number must be indicated on ordering
(2) Frames 1, 2 and 3 - two can be mounted
Frame T - one can be mounted
For a factory test report, please add Ref. No. 408733 to the order.

Order codes
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)

1st digit

Product line definition	
EntelliGuard G breaker & switch line	**G**

3rd and 4th digit

Nominal current rating of the product	
400A	**04**
630A	**07**
800A	**08**
1000A	**10**
1250A	**13**
1600A	**16**
2000A	**20**
2500A	**25**
3200A	**32**
4000A	**40**
5000A	**50**
6400A	**64**

6th digit

Fixed pattern or draw-out pattern moving portion and number of poles	
3 pole draw-out moving portion	**1**
4 pole draw-out moving portion neutral left (standard)	**3**
3 pole fixed pattern	**4**
4 pole fixed pattern neutral Left (standard)	**6**
4 pole draw-out moving portion neutral right (not common)	**2**
4 pole fixed pattern neutral right (not common)	**5**

7th digit

Electrically or hand operated Electrical at:	
24-30V DC	**A**
48V DC	**B**
60V DC	**C**
110-130V DC	**E**
220V DC	**6**
250V DC	**F**
48V AC	**G**
110-130V AC	**H**
220-240V AC	**J**
380-415V AC	**M**
440V AC	**N**
Manual	**X**

G G 1 3 H 4 X X

2nd digit

Product Type	
Circuit breaker EntelliGuard G frame 1, 2 or 3	**G**
Circuit breaker EntelliGuard G frame T	**T**
Circuit breaker EntelliGuard G with “limited derating”	**H**
Non automatic (switch) EntelliGuard G frame 1, 2 or 3 with **NO** MCR(2)	**J**
Non automatic (switch) EntelliGuard G frame T with **NO** MCR(2)	**7**
Non automatic (switch) EntelliGuard G frame 1, 2 or 3 **WITH** MCR(2)	**K**
Non automatic (switch) EntelliGuard G with “limited derating” frame 1, 2 or 3 **WITH** MCR(2)	**W**
Non automatic (switch) EntelliGuard G with “limited derating” frame 1, 2 or 3 **WITH** MCR(2)	**Z**

5th digit

Interruption / short-circuit withstand rating of the product			
Icu = Ics	**Icw**	**Code**	**Remarks**
50kA	50kA	**S**	Env. 1
65kA	50kA	**K**	Env. T
65kA	65kA	**N**	Env. 1 & 2
85kA	65kA	**H**	Env. 1
85kA	85kA	**H**(3)	Env. 2
100kA	85kA	**M**	Env. 2
150kA	100kA	**L**	Env. 3

Frame 1/2/3 only

Frame T only

8th digit

Voltage Rating	Standard closing coil	Command Closing coil(1)
24V DC	**A**	**M**
30V DC	**B**	**N**
48V AC-DC	**C**	**P**
60V DC	**D**	**Q**
110-130V AC-DC	**E**	**R**
220-240V AC-DC	**G**	**T**
250V DC 240-277V AC	**H**	**U**
380-415V AC	**K**	**W**
440V AC	**L**	**Y**
None	**X**	**X**

If electrically operated add 1 closing coil by indicating voltage rating code.
If manual use an X as indicated.

(1) Is supplied with a push-button for local breaker operation (fits on breaker front facia)
(2) MCR = Making Current Release; device that enhances the switches performance

Breaker

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

9nd digit

Shunt release with continuous rating	
Voltage rating	**Code**
24V DC	**A**
30V DC	**B**
48V AC-DC	**C**
60V DC	**D**
110-130V AC-DC	**E**
220-240V AC-DC	**G**
250V DC, 240-277V AC	**H**
380-415V AC	**K**
440V AC	**L**
Shunt release impulse rated	
24V AC ou DC	**F**
110-130V AC ou DC	**J**
220-240V AC ou DC	**U**
Remote reset coil[1]	
Voltage rating	**code**
24V DC	**Z**
110-130V AC-DC	**5**
220-240V AC-DC	**7**
Command Shunt Trip	
Voltage rating	**code**
24V DC	**2**
Network interlock[1]	
Network interlock	**1**
None	**X**

Add 1st shunt release or remote rest coil by indicating voltage rating code. If not needed use an X as indicated, or '1' for a network Interlock

10th digit

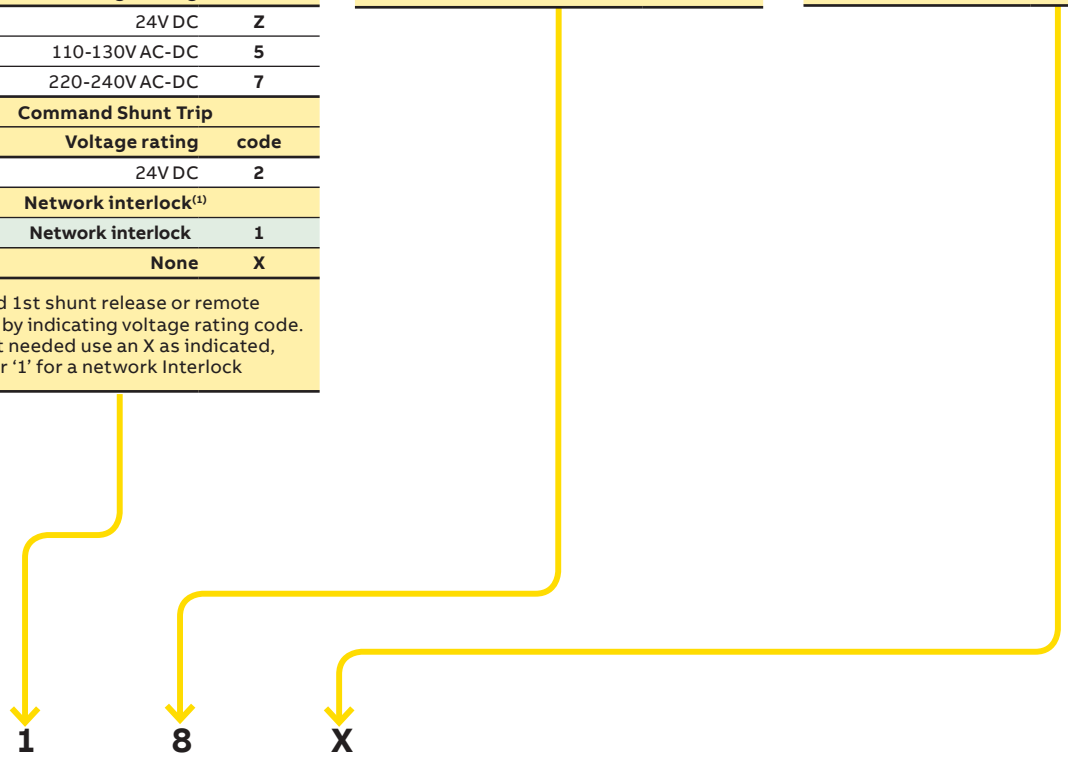
Undervoltage release	
Voltage rating	**Code**
24V DC	**1**
30V DC	**2**
48V AC-DC	**3**
60V DC	**4**
110-130V AC-DC	**5**
220-240V AC-DC	**7**
250V DC, 240-277V AC	**8**
220-240V AC-DC 60 ms	**9**
380-415V AC	**W**
440V AC	**Y**
None	**X**

Add 1st UVR release by using the indicated code. If a '1' is chosen as a 9th digit the use of a network interlock with equivalent voltage is assumed. The use of an X indicates no release installed.

11th digit

2nd shunt or undervoltage release			
Voltage rating	**Shunt codes**		**UVR codes**
	Cont.	**Imp.**	
24V DC	**A**	**F**	**1**
30V DC	**B**		**2**
48V AC-DC	**C**		**3**
60V DC	**D**		**4**
110-130V AC-DC	**E**	**J**	**5**
220-240V AC-DC	**G**	**U**	**7**
220-240V AC-DC 60 ms			**9**
250V DC, 240-277V AC	**H**		**8**
380-415V AC	**K**		**W**
440V AC	**L**		**Y**
None		**X**	

Add a 2nd or UVR shunt release by indicating the voltage rating code. If not needed use an X as indicated. In the EntelliGuard G frame T this digit is always an X.



Order codes
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)

12th digit

Auxiliary switches & configuration												
Type	**Code to be added(1)**											
3NO+3NC (power rated)(1)	2	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**S**	**T**
4NO+4NC (power rated)	3										
8NO+8NC (power rated)	4										
3NO/3NC (power rated) + 2NO/2NC (signal)	6	**J**	**K**	**L**	**M**	**N**	**P**	**Q**	**R**	**U**	**V**
4NO/4NC (power rated) + 4NO/4NC signal)	8										
	No other contacts installed	Coil signaling contact power (1 NO on secondary Disconnect) - Close coil or command close coil	Coil signaling contact high fidelity through trip unit - Close coil or command close coil	Coil signaling contact power (1 NO on secondary disconnect) - 1st Shunt	Coil signaling contact high fidelity through trip unit - 1st Shunt	Coil signaling contact power (1 NO on secondary disconnect) - 1st UVR	Coil signaling contact high fidelity through trip unit - 1st UVR	Coil signaling contact power (1 NO on secondary disconnect) - 2nd ST or 2nd UVR	Coil signaling contact high fidelity through trip unit - 2nd ST or 2nd UVR	Coil signaling contact power (1 NO on secondary disconnect) - All installed devices CC/CCC, ST, or UVR)	Coil signaling contact high fidelity (1 NO - Through trip unit) - All installed devices. CC/CCC, ST, or UVR)

14th digit

Factoryinstalled provision to mount a key lock on the breakers	
For Profalux key lock	**P**
For Ronis key lock	**R**
For large Castell type key lock	**C**
Push-button padlock device	**L**
Large Castell key interlock and push-button padlock device	**1**
Ronis key interlock and push-button padlock device	**3**
Profalux key interlock and push-button padlock device	**4**
Factory mounted single key lock mounted on the breaker	
For Profalux key lock	**Q**
For Ronis key lock	**S**
Ronis key interlock and push-button padlock device	**6**
Profalux key interlock and push-button padlock device	**7**
No key lock or provision for one	**X**

Designation	Code to be added(1)			
Bell alarm 1 NO power rated	**A**	**D**	**E**	**F**
Bell alarm 1 NO signal rated	**N**	**P**	**R**	**S**
Mechanical operations counter	**B**	**K**	**L**	**M**
Bell alarm 1NO power rated & mechanical operations counter	**C**	**G**	**H**	**J**
Bell alarm 1NO signal rated & mechanical operations counter	**T**	**U**	**V**	**Y**
Ready to close contact 1 NO power rated on secondary terminals	**1**			
Ready to close contact 1 NO signal rated on secondary terminals	**2**			
Ready to close contact 1 NO signal rated connected through trip unit	**3**			
Ready to close contact 1 NC power rated on secondary terminals	**4**			
Ready to close contact 1 NC signal rated on secondary terminals	**5**			
Ready to close contact 1 NC signal rated connected through trip unit	**6**			
None	**X**			
	No other contacts installed	Ready to close contact 1 NO power rated on secondary terminals	Ready to close contact 1 NO signal rated on Secondary terminals	Ready to close contact 1 NO signal rated connected through trip unit

Frame 1/2/3 only

Frame T only

13th digit

2 A X X

Factory installed provision to mount a cable interlock between breakers	
No provision for breaker interlock	**X**
Cable interlocks between breakers are field mountable only.	

15th digit

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

Breaker

- Codes built in the indicated manner can be used as an alternative ordering method
- Breaker mounted accessories and trip unitBreaker mounted accessories and trip unit

16th, 17th and 18th digit

Defines installed GT type electronic trip unit			
Basic type	**Code**	**Functionality**	**Code**
GT-E with Ammeter	**E**	ST & STDB only	**00**
GT-S with Ammeter and Optional Modbus communication	**S**	LT, LTDB. ST, STDB, I	**06**
		LT, LTDB. ST, STDB, I, GF, GFDB	**07**
		LT, LTDB. ST, STDB, I, GF, GFDB + Modbus rtu communication	**09**
		LT, LTDB. ST, STDB, Iext., GF, GFDB	**03**
		LT, LTDB. ST, STDB, Iext., GF, GFDB + Modbus rtu communication	**05**
GT-H With measurement[1] RELT, Relaying and optional Modbus or Profibus communication	**H**	LT (CFI), LTDB. ST, STDB, Iext, GFsum, Gfct, GFDB	**13**
		LT (CFI), LTDB. ST, STDB, Iext, GFsum, Gfct, GFDB + waveform capture + Modus rtu comm.	**14**
		LT (CFI), LTDB. ST, STDB, Iext, GFsum, Gfct, GFDB + Profibus DP communication	**15**
		LT (CFI), LTDB. ST, STDB, Iext, GFsum, Gfct, GFDB + ZSI on ST, Iext. GFsum & GFct.	**16**
		LT (CFI), LTDB. ST, STDB, Iext, GFsum, Gfct, GFDB + ZSI on ST, Iext. GFsum & GFct. + waveform capture + Modus rtu comm.	**17**
		LT (CFI), LTDB. ST, STDB, Iext, GFsum (+A) , Gfct (+A), GFDB	**18**
		LT (CFI), LTDB. ST, STDB, Iext, GFsum (+A), Gfct (A), GFDB + waveform capture + Modus rtu comm.	**19**
		LT (CFI), LTDB. ST, STDB, Iext, GFsum (+A), Gfct (+A), GFDB + Profibus DP commun.	**20**
		LT (CFI), LTDB. ST, STDB , Iext, GFsum (+A), Gfct (+A), GFDB + ZSI on ST, Iext. GFsum & GFct.	**21**
		LT (CFI), LTDB. ST, STDB , Iext, GFsum (+A), Gfct (+A), GFDB + ZSI on ST, Iext. GFsum & GFct. + waveform capture + Modus rtu comm.	**22**
		LT (CFI), LTDB. ST, STDB, I	**23**
		LT (CFI), LTDB. ST, STDB, I GFsum, Gfct, GFDB	**24**
		LT (CFI), LTDB. ST, STDB, I, GFsum, Gfct, GFDB + waveform capture + Modus rtu comm.	**25**
		LT (CFI), LTDB. ST, STDB, I, GFsum, Gfct, GFDB + Profibus DP communication	**26**
		LT (CFI), LTDB. ST, STDB, I, GFsum, Gfct, GFDB + ZSI on ST, I, GFsum & GFct.	**27**

Defines installed GT type electronic trip unit			
Basic type	**Code**	**Functionality**	**Code**
GT-H With measurement[1] RELT, Relaying and optional Modbus or Profibus communication	**H**	LT (CFI), LTDB. ST, STDB, I, GFsum, Gfct, GFDB + ZSI on ST, I, GFsum & GFct. + waveform capture +Modus rtu comm.	**28**
		LT (CFI), LTDB. ST, STDB, I, GFsum, Gfct, GFDB + ZSI on ST, I, GFsum & GFct. + Profibus DP communication.	**29**
		LT (CFI), LTDB. ST, STDB, I. GFsum (+A), Gfct (+A), GFDB	**30**
		LT (CFI), LTDB. ST, STDB, I GFsum (+A), Gfct (+A), GFDB + waveform capture + Modus rtu comm.	**31**
		LT (CFI), LTDB. ST, STDB, I, GFsum (+A), Gfct (+A), GFDB + Profibus DP Commun.	**32**
		LT (CFI), LTDB. ST, STDB , I, GFsum (+A), Gfct (+A), GFDB + ZSI on ST, I, GFsum & GFct.	**33**
		LT (CFI), LTDB. ST, STDB, I, GFsum (+A), Gfct (+A), GFDB + ZSI on ST , I, GFsum & GFct. + waveform capture + Modus rtu comm.	**34**
		LT (CFI), LTDB. ST, STDB, I, GFsum (+A), Gfct (+A), GFDB + ZSI on ST, I, GFsum & GFct. + Profibus DP communication	**35**
		LT (CFI), LTDB. ST, STDB, I. + waveform capture + Modus rtu comm.	**36**
		LT (CFI), LTDB. ST, STDB, I. + Profibus DP communication	**37**
		LT (CFI), LTDB. ST, STDB, I, GFsum, Gfct, GFDB + Profibus DP communication.	**38**
		LT (CFI), LTDB. ST, STDB, I, GFsum, Gfct, GFDB + ZSI on ST, I, GFsum & GFct.+ Profibus DP communication	**39**
GT-HE With measurement[1] UEF, REF & SEF, Relaying and optional Modbus or Profibus communication	**HE**	LT (CFI), LTDB. ST, STDB, I, UEF, SEF & REF	**51**
		LT (CFI), LTDB. ST, STDB, I, UEF, SEF & REF + waveform capture + Modus rtu comm.	**55**
		LT (CFI), LTDB. ST, STDB, I, UEF, SEF & REF + Profibus DP communication	**59**
		LT (CFI), LTDB. ST, STDB, I, UEF, REF & SEF + ZSI on ST, I. UEF	**52**
		LT (CFI), LTDB. ST, STDB, I. UEF, SEF & REF + ZSI on ST, I., UEF + waveform capture + Modus rtu comm.	**56**
		LT (CFI), LTDB. ST, STDB, I. UEF, SEF & REF + ZSI on ST, I., UEF + Profibus DP communication	**60**
		LT (CFI), LTDB. ST, STDB , Iext, UEF, SEF & REF	**53**
		LT (CFI), LTDB. ST, STDB, Iext, UEF, SEF & REF + waveform capture + Modus rtu comm.	**57**
		LT (CFI), LTDB. ST, STDB, Iext, UEF, SEF & REF + Profibus DP communication.	**61**
		LT (CFI), LTDB. ST, STDB, I,ext UEF, REF & SEF + ZSI on ST, Iext. UEF	**54**
		LT (CFI), LTDB. ST, STDB, I.ext UEF, SEF & REF + ZSI on ST, I.ext, UEF + waveform capture + Modus rtu comm.	**58**
		LT (CFI), LTDB. ST, STDB, Iext. UEF, SEF & REF + ZSI on ST, I.ext, UEF + Profibus DP communication	**62**

Remarks on global catalogue number: the 18 digit cataloge number covers an assembled and packed Power Circuit Breaker with a tri lingual User Manual.
For more information, you can visit our website.
United Kingdom: uk.geindustrial.com
Middle East: ex.geindustrial.com

Remarks on installed trip unit types:
- when instantaneous (I) or extended instantaneous (HI) is present in any of the trip unit variants it is always switchable (can be switched off)
- in the Trip unit variants GT-L, GT-S all other protection devices (LT, ST, GF) are non switchable (cannot be switched off)
- in the Trip unit variants GT-H and GT-HE and extended LT protection device is included (Breaker, Fuse and three Inverse curve shapes)
- all protection devices (LT+,ST.Gfsum, GFsumA, GFct, GFctA, I, HI) are switchable (can be switched off)

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

1st digit

Product line definition

Cassettes for use with the EntelliGuard G breaker and switch line	**G**

3rd and 4th digit

Nominal current rating of the product

1250A	**13**
1600A	**16**
2000A	**20**
2500A	**25**
3200A	**32**
4000A	**40**
6400A	**64**

6th digit

Number of poles of the cassette

3 pole	2
4 pole	5

7th digit

Product line definition

Rear universal, T stubs rotatable - horizontal or vertical busbars.	**U**
Rear horizontal busbars	**H**
Rear vertical busbars	**V**

9th digit

Factory installed provision to mount a key lock on the cassette

For 1 Ronis key lock	**R**
For 2 Ronis key locks	**S**
For 1 Profalux key lock	**P**
For 2 Profalux key locks	**Q**
No provision for lock	**X**

Factory installed key lock with random key lock cylinder number

1 Ronis key lock mounted	**G**
2 Ronis key locks mounted	**H**
1 Profalux key lock mounted	**J**
2 Profalux key locks mounted	**K**
1 Ronis key lock shutter interlock	**M**
1 Profalux key lockshutter interlock	**N**

G G 16 S 2 U X X # # M

2st digit

Suitable for:

Standard circuit breaker or non automatic type. Frame 1, 2 or 3	**G**
Standard circuit breaker or non automatic type. Frame T	**T**
Circuit breaker or non automatic type with “limited derating”. Frame 2 only	**H**
SEN Plus EVO Standard circuit breaker or non automatic type Frame 1, 2 or 3	**J**
SEN Plus EVO circuit breaker or non automatic type with “limited derating”. Frame 2 only	**K**

5rd digit

Interruption / short-circuit withstand rating of the breaker used with the cassette

Icu = Ics	Icw	Code
65kA	50kA	K
50kA	50kA	S
85kA	65kA	H
100kA	85kA	M
150kA	100kA	L

Frame 1/2/3 only

Frame T only

8th digit

Position indication switches in cassette

Set of 1 NO and 1 NC contacts per position	**2**
Set of 2 NO and 2 NC contacts per position	**4**
Carriage position switch - 1 NO/NC power rated 1 NO/NC signal rated	**5**
No switches mounted	**X**

10th digit

11th digit

12th digit

Delivered mounted with breaker or separatley

Mounted with breaker	**M**
Deliverd as a separate component	**R**

Electronic trip units

Electronic trip units

Electronic trip units layout and main menu

State of the art electronic trip unit
All EntelliGuard air 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:

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).
During normal operation the trip unit is powered either from current flow in the circuit breaker's internal current transformers or from an external DC supply. When neither of these sources is available it is still possible to review and modify settings or view events in the trip unit using power from the internal battery. 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.

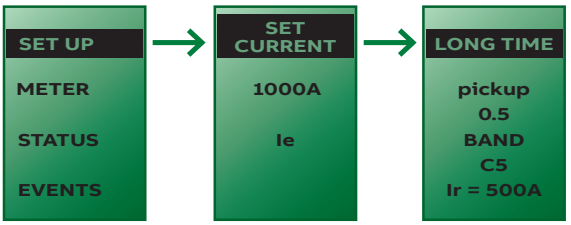
Meter
To enter this option begin the process by pressing the UP or DOWN key until to METER is selected on the screen. Pressing the NEXT or PREVIOUS key allows one to view various groups of measurements as current, voltage, real, apparent and reactive power for the electrical system protected by the device. 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-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.

Overload protection LT-C and LTD

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 (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).

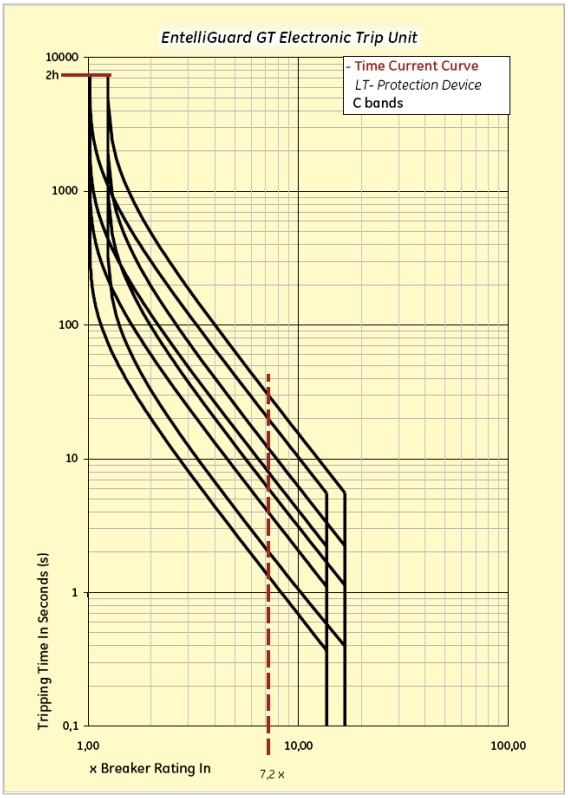
The available 66 different current adjustments (see page 3/4) result in an extremely broad setting range of 0.2 to 1 times the chosen breaker rating (In).

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 and 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 and C-22.



Overload tripping times at indicated overload levels per selected LTD band, in seconds

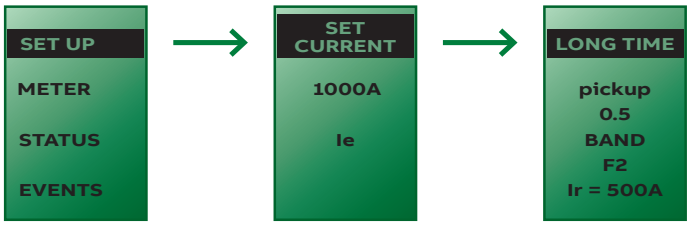
x Ir		Cmin	C-2	C-3	C-4	C-5	C-6	C-7	C-8	C-9	C-10	C-11	C-12	C-13	C-14	C-15	C-16	C-17	C-18	C-19	C-20	C-21	Cmax
1.5	Max.	7.8	23.4	46.7	62.3	93.4	125	156	187	218	249	280	311	374	436	498	560	623	685	747	810	872	934
	Min.	4.0	12.0	24.0	32.0	48.0	64.1	80.1	96.1	112	128	144	160	192	224	256	288	320	352	384	416	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
Motor protection class to IEC 947-4								**10b**				**10**			**20**			**30**				**40**	

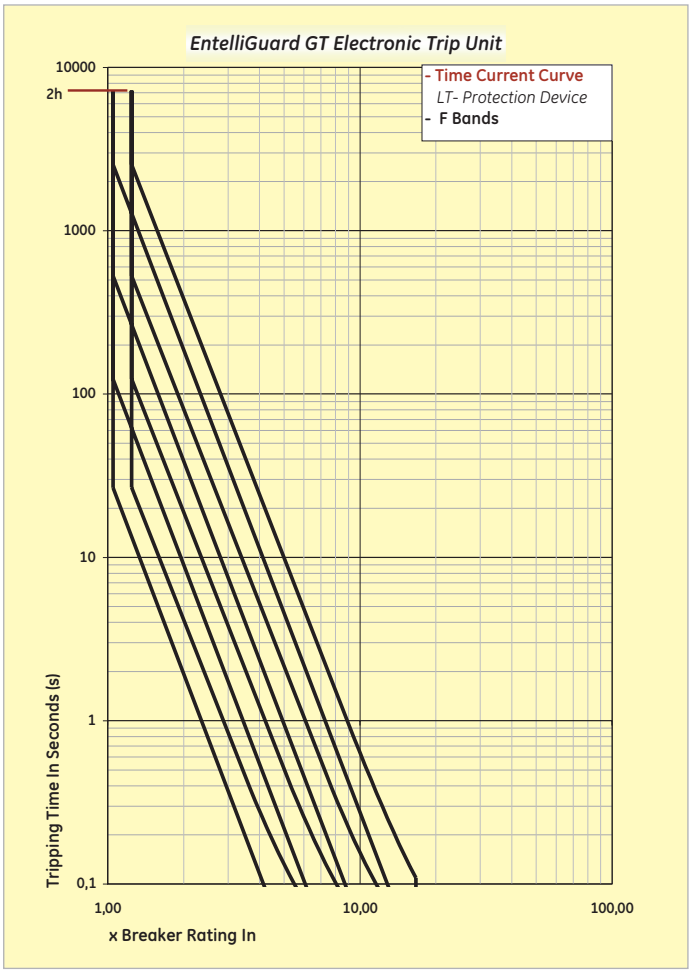
Standard on **GT-S** **GT-H**

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

Electronic trip units

Overload protection LT-F and LTD





Overload (LT-F) protection
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 a 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.

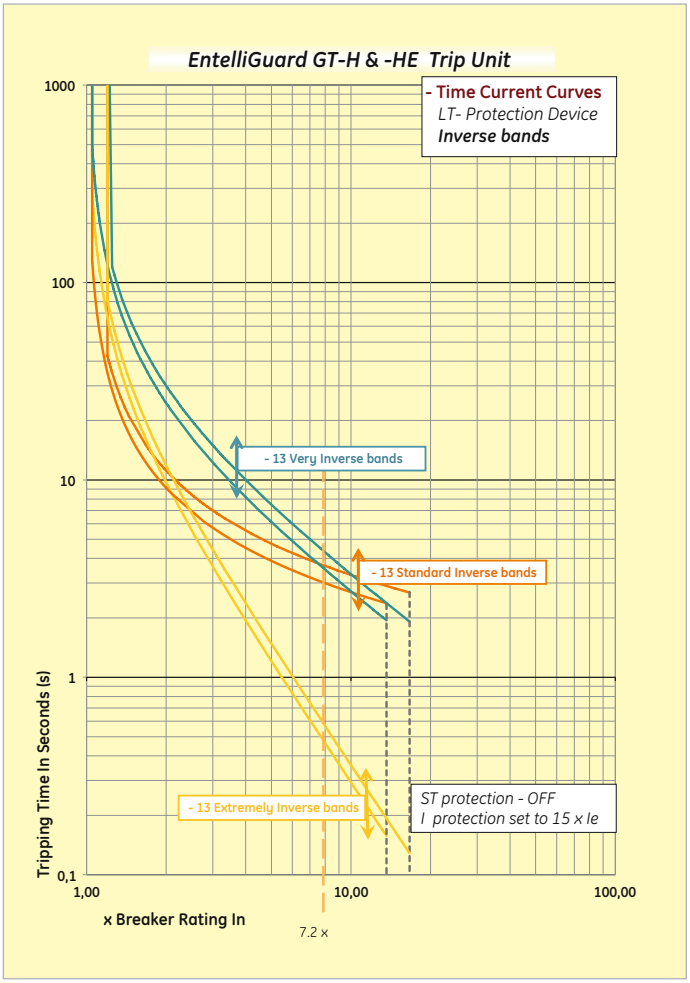
Overload tripping times at indicated overload levels per selected LTD band. in seconds

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-S | GT-H

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

LT-Inverse, very inverse and extremely inverse protection



Overload (LT-inverse) protection

The EntelliGuard electronic trip has an extremely accurate and easy to set overload or Long Time (LT-inverse) 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 3/6) result in an extremely broad setting range of 0.2 to 1 times the chosen breaker rating (In).

The LT-inverses band types are designed to be used in association with down- and upstream devices meeting the industrial IEC 60255 standard. The time-current protection curves depicted here are 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 13 LTD time bands are available in three standaised shapes (inverse, very inverse & extremly inverse).

The tables 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 inverse, very inverse & extremly inverse band shapes.

Inverse curves

x Ir		L-0.5	L-1	L-2	L-3	L-4	L-5	L-6	L-7	L-8	L-9	L-10	L-15	L-20
1.5	Max.	1.02	2.05	4.09	6.14	8.18	10.23	12.27	14.32	16.36	18.41	20.45	30.7	40.9
	Min.	0.76	1.51	3.03	4.54	6.06	7.57	9.09	10.60	12.12	13.63	15.15	22.72	30.3
3	Max.	0.32	0.64	1.28	1.91	2.55	3.19	3.83	4.47	5.11	5.74	6.38	9.6	12.8
	Min.	0.31	0.63	1.26	1.88	2.51	3.14	3.77	4.40	5.02	5.65	6.28	9.42	12.6
7.2	Max.	0.18	0.37	0.73	1.10	1.47	1.83	2.20	2.56	2.93	3.30	3.66	5.49	7.33
	Min.	0.17	0.33	0.66	1.00	1.33	1.66	1.99	2.33	2.66	2.99	3.32	4.99	6.65

Very inverse curves

x Ir		L-0.5	L-1	L-2	L-3	L-4	L-5	L-6	L-7	L-8	L-9	L-10	L-15	L-20
1.5	Max.	1.69	3.38	6.75	10.13	13.50	16.88	3.38	23.63	27.00	30.38	33.75	50.6	67.5
	Min.	1.13	2.25	4.50	6.75	9.00	11.25	2.25	15.75	18.00	20.25	22.50	33.75	45.0
3	Max.	0.36	0.71	1.42	2.13	2.84	3.55	0.71	4.97	5.68	6.39	7.11	10.7	14.2
	Min.	0.32	0.64	1.29	1.93	2.57	3.21	0.64	4.50	5.14	5.79	6.43	9.64	12.9
7.2	Max.	0.11	0.22	0.44	0.66	0.89	1.11	0.22	1.55	1.77	1.99	2.21	3.32	4.43
	Min.	0.11	0.21	0.43	0.64	0.86	1.07	0.21	1.50	1.71	1.93	2.14	3.21	4.29

Extremely inverse curves

x Ir		L-0.5	L-1	L-2	L-3	L-4	L-5	L-6	L-7	L-8	L-9	L-10	L-15	L-20
1.5	Max.	4.23	8.46	16.92	25.38	33.85	42.31	50.77	59.23	67.69	76.15	84.62	126.9	169.2
	Min.	2.50	5.00	10.00	15.00	20.00	25.00	30.00	35.00	40.00	45.00	50.00	75.00	100.0
3	Max.	0.56	1.13	2.26	3.39	4.52	5.65	6.78	7.91	9.04	10.17	11.30	16.9	22.6
	Min.	0.44	0.88	1.76	2.64	3.52	4.40	5.27	6.15	7.03	7.91	8.79	13.19	17.6
7.2	Max.	0.09	0.17	0.35	0.52	0.70	0.87	1.04	1.22	1.39	1.56	1.74	2.61	3.48
	Min.	0.07	0.14	0.28	0.42	0.56	0.71	0.85	0.99	1.13	1.27	1.41	2.12	2.82

Standard on

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

Electronic trip units

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 Secundary 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
	0.5	200	195	193	190	90	80
630	**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
	0.55	347	338	336	333	154	138
	0.5	315	308	305	303	140	125
800	**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
	0.6	480	470	466	461	210	189
	0.55	440	431	427	422	193	173
	0.5	400	392	388	384	175	158
1000	**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
	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
1250	**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
	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
1600	**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
	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 Secundary 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
	0.5	1000	980	970	960	450	400
2500	**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
	0.55	1375	1348	1334	1320	619	550
	0.5	1250	1225	1213	1200	563	500
3200	**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
	0.6	1920	1882	1862	1843	864	768
	0.55	1760	1725	1707	1690	792	704
	0.5	1600	1568	1552	1536	720	640
4000	**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
	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
5000	**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
	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
6400	**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
	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

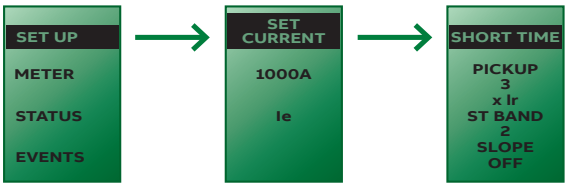
Overcurrent protection against short-circuit: ST, STDB

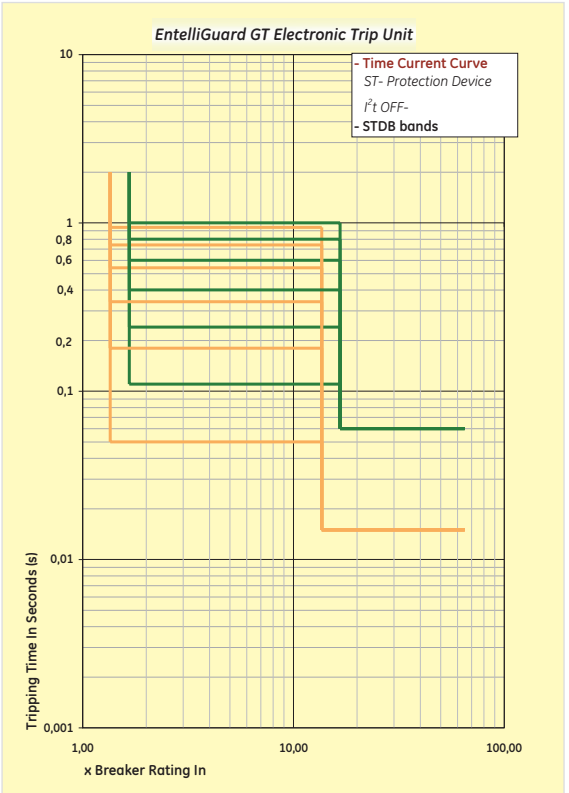
The EntelliGuard electronic trip unit and breaker combination can be equipped with a number of different Short-circuit protection devices each with their own distinctive properties and field of application.

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 (Ir) 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

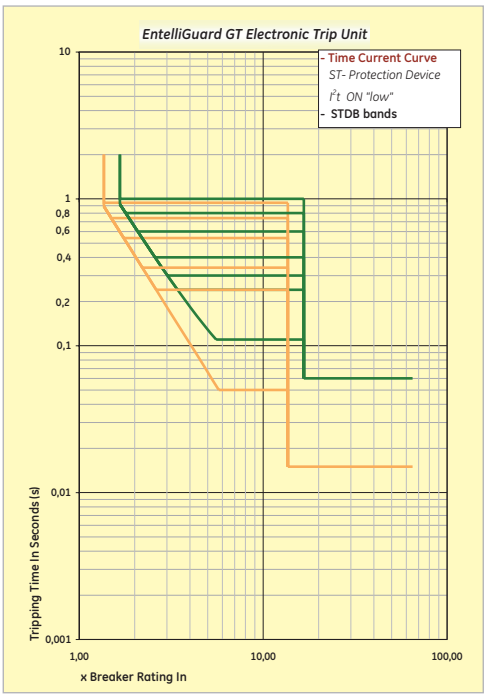
x Ir		Min	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Max
1.5 x ±10%	Max	90	100	110	120	170	190	240	270	300	340	400	450	600	700	800	900	1000
	Min	30	40	50	60	110	130	180	210	240	280	340	390	540	640	740	840	940
12 x ±10%	Max	90	100	110	120	170	190	240	270	300	340	400	450	600	700	800	900	1000
	Min	30	40	50	60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

Standard on | GT-S | GT-H

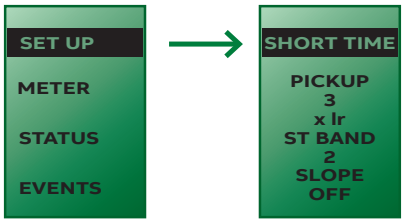
(1) Is limited to lower values in certain cases, please refer to page 3/12

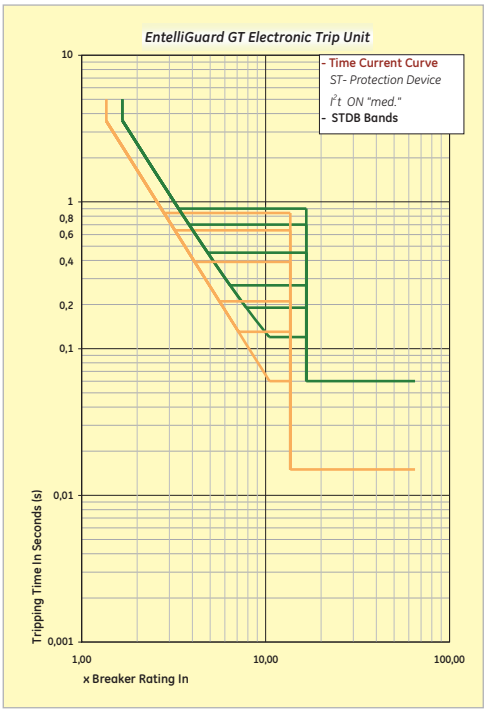
Electronic trip units

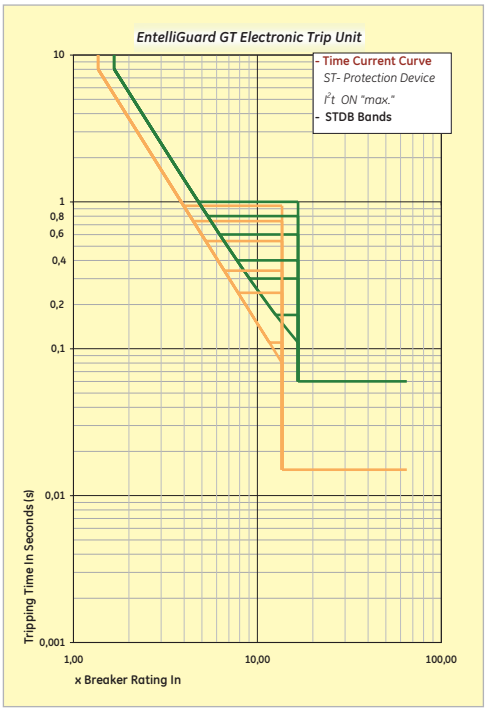
Short-circuit protection ST and I²T slope



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 (Ir) 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.





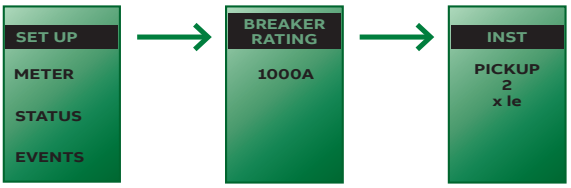


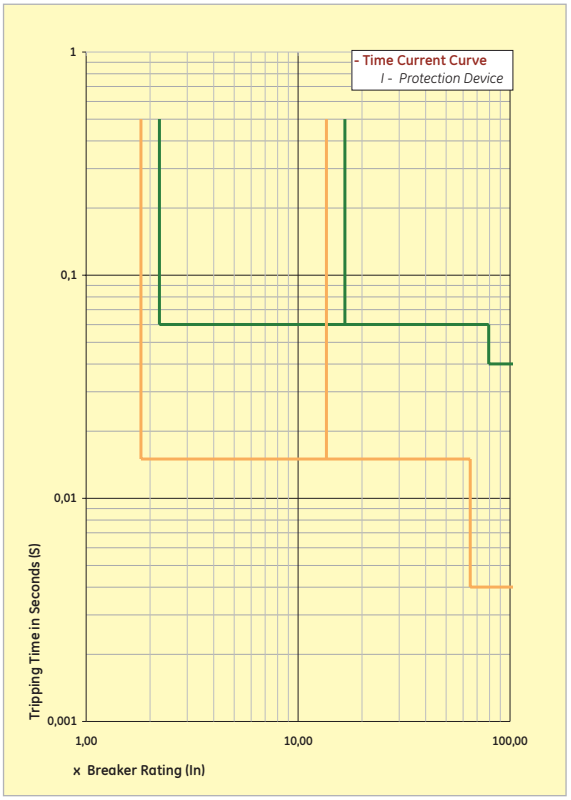
Standard on — **GT-E** — **GT-S** — **GT-N** — **GT-H**

(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 (±10%) times the chosen primary current value (Ie) 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 3/12).
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**.



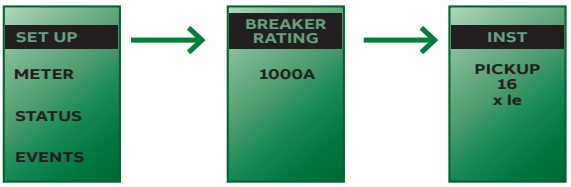


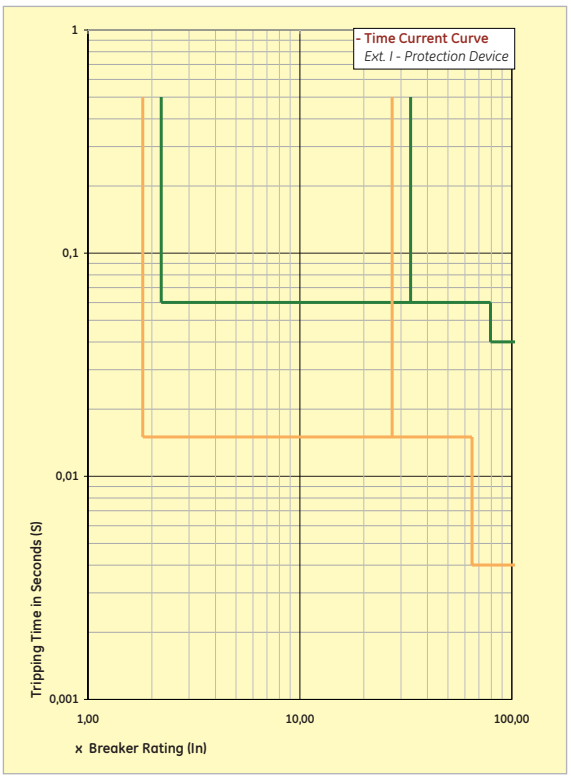
The graph indicates the maximum interruption time and non tripping time across the full current setting band and the transition to the HSIOC protection device (see page 3/12).

Electronic trip units

Short-circuit protection; instantaneous (I ext.)

Extended range instantaneous protection
Derived from, and based on the same principles as the standard Instantaneous protection but with and extended current adjustment range.
This high-level instantaneous device extends the standard range from 2 - 15 to 2 - 30 (±10%) times the chosen primary current value (Ie). Until 15 x Ie in steps of 0.5 and for the extended setting (above 15 x Ie) 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 x is in some cases limited to a lower value due to the breaker current rating and its short-circuit withstand value (see page 3/12).
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 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 3/12).

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.
Reducing the levels of arc flash incident energy during such events is possible by limiting both the events current level and time span.
The EntelliGuard G electronic trip unit can be equipped with a device that temporarily limits both the events current level and time span: **RELT**

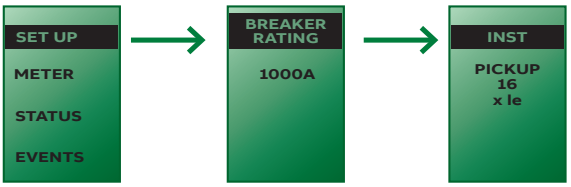
The RELT device can be turned ON by accessing input one of the trip unit(1). When the device is switched ON relay output one(1) changes position and reverts to it's standard position when RELT is OFF.
The RELT device can be adjusted from 1.5 to 15 (±10%) times the chosen primary current value (Ie) in steps of 0.5 (pick up setting). The device will trip the breaker within 50 milliseconds.

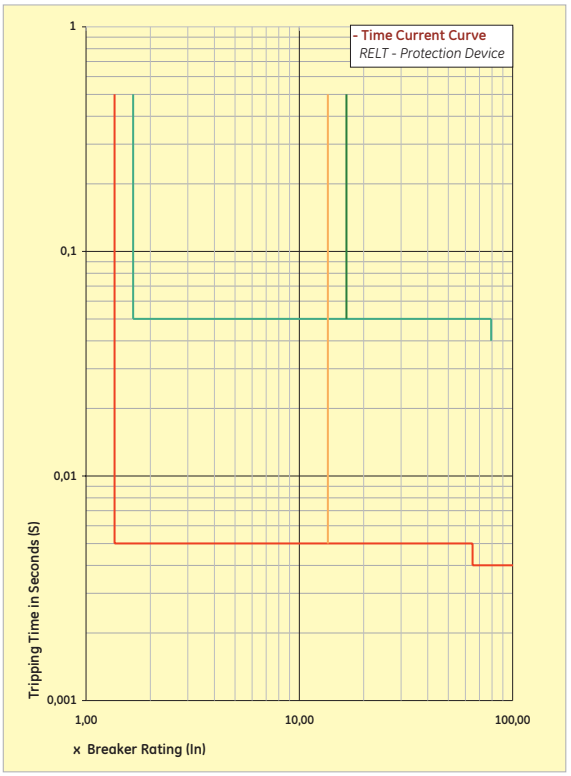
An optional accessory, GTURSK, can be ordered which has a LED illuminated 3 position selector switch. This accessory can be mounted on the front of switchgear and wired to the secondary disconnect of the breaker.
A user then has the ability to select either ON, OFF or TEST.

ON Activates RELT, and selector switch is illuminated indicating that RELT is active

OFF RELT is inactive and selector switch is not illuminated

TEST RELT is not activated, but selector switch is illuminated to indicate positive connection





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 Information on how to set this device can be found in IEEE standard 1548

Standard on **GT-H**

(1) See section on electronic inputs and relay ouputs on page B.18

Electronic trip units

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				
		42kA	50kA	65kA	85kA	100kA
		Maximum ST setting (x Ir)				
5000A	5000A				10x	10x
6400A	6400A				10x	10x
		Maximum I or Ext. I setting (x Ie)(1)				
1600A	1600A	15x				
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 air 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).

Overview of installed HSIOC devices in automatic types:		Set value (rms)
Frame T	GT04K to GT16K	50000A
Frame 1	GG04S to GG25S	50000A
	GG04N to GG20N	65000A
	GG04H to GG20H	65000A
	GG25F	65000A
Frame 2	GG25N to GG40N	65000A
	GH32N and GH40N	65000A
	GG25H to GG40H	85000A
	GH32H and GH40H	85000A
	GH32M and GH40M	85000A
Frame 3	GG50M to GG64M	100000A
	GG50L to GG64L	100000A

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 air circuit breakers(3) specifically designed to trip the breaker when closing onto a fault.

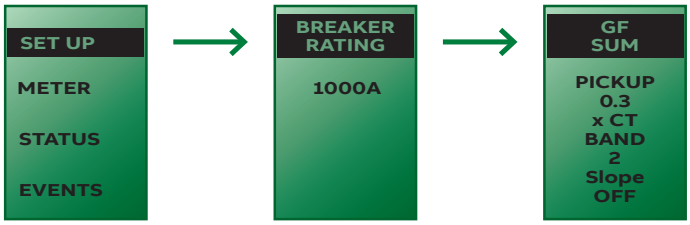
Overview of installed MCR devices in automatic types:		Set value (rms)
Frame T	GT04K to GT16K	32800A
Frame 1	GG04S to GG20S	42000A
	GG20S to GG25S	50000A
	GG04N to GG20N	65000A
	GG04H to GG20H	65000A
	GG25F	65000A
Frame 2	GG25N to GG40N	65000A
	GH32N and GH40N	65000A
	GG25H to GG40H	85000A
	GH32H and GH40H	85000A
	GH32M and GH40M	85000A
Frame 3	GG50M to GG64M	100000A
	GG50L to GG64L	100000A

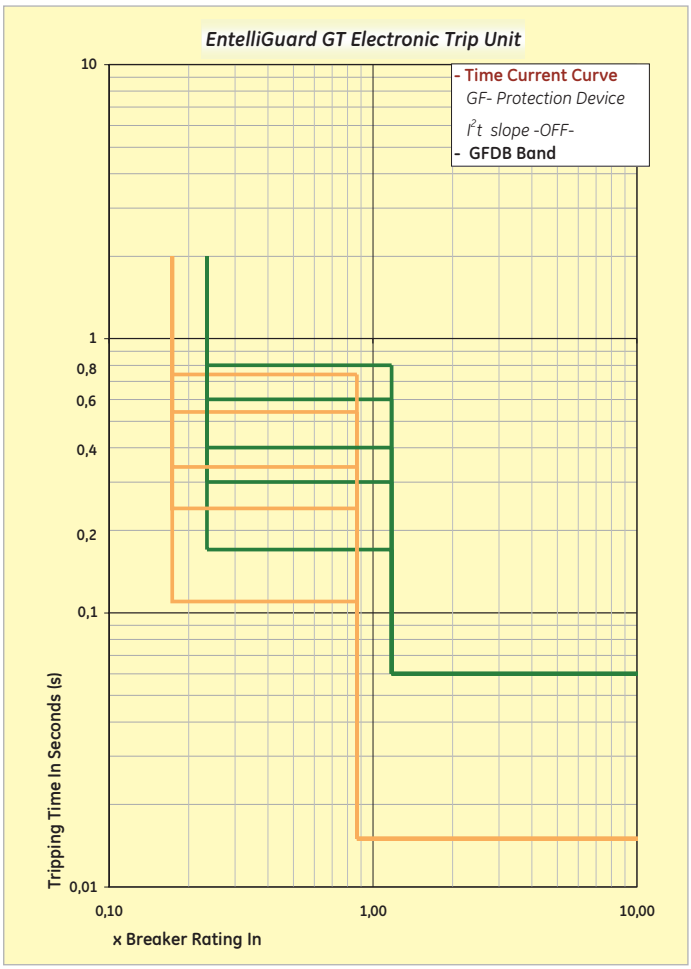
Overview of installed MCR devices in non automatic types:		Set value (rms)
Frame 1	GW04N to GW20N	65000A
	GW25F	50000A
Frame 2	GW04M to GW40M	85000A
	GZ32H and GZ40H	85000A

Note: GJ & G7 non automatic types do not have MCR.

(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





Ground fault protection (GFsum)

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 air 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 operates by residually summing the current in the phases and neutral. When a fault to Earth creates an unbalance in the system the resulting Fault is detected and the associated circuit breaker tripped, thus disconnecting the circuit. Variants with or without alarm contact option exist.

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.

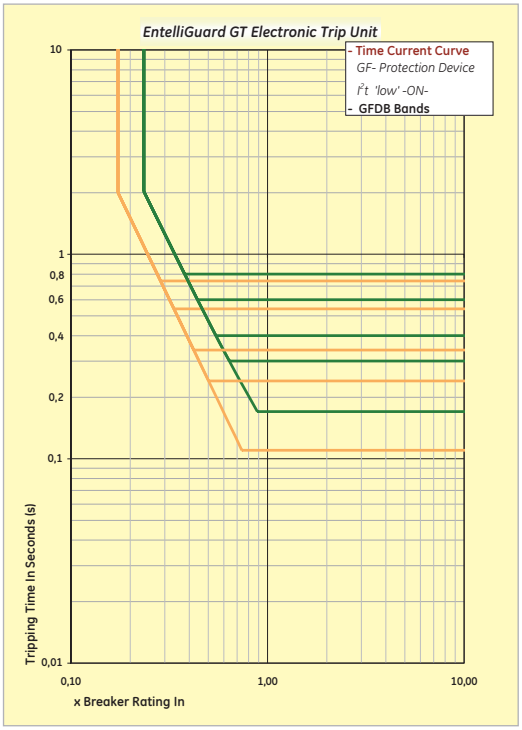
The ground fault device must monitor the current in all phases and the neutral. When a 3 pole device is used in a 4 wire (3 phase + neutral) system a 4th sensor must be placed in the neutral(2). On use of a 4 pole EntelliGuard breaker the sensor is already present in the neutral pole.

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	Max	110	120	140	170	190	240	270	340	400	450	600	700	800	900
±10%	Min	50	60	80	110	130	180	210	280	340	390	540	640	740	840
0.6 x	Max	110	120	140	170	190	240	270	340	400	450	600	700	800	900
±10%	Min	50	60	80	110	130	180	210	280	340	390	540	640	740	840

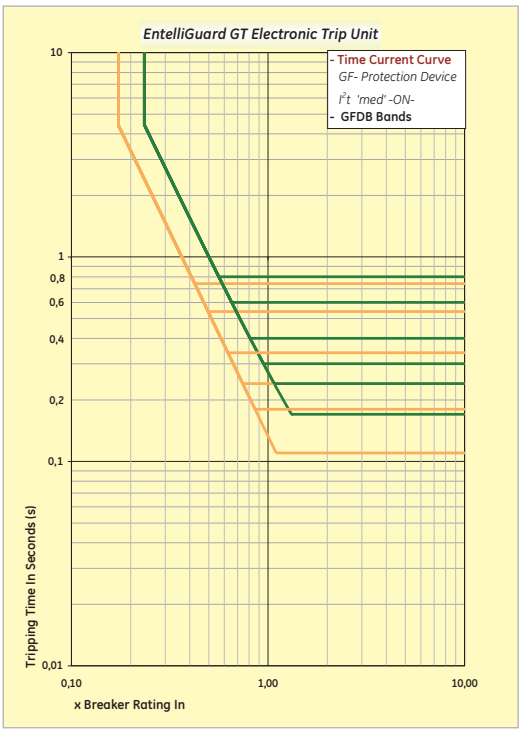
(1) When an auxiliary supply is connected (24V DC) an extra setting range of 0.1 to 0.2 becomes available.
(2) Use a Rogowksi coil of the appropriate rating, distance to breaker limited to 10 meters.

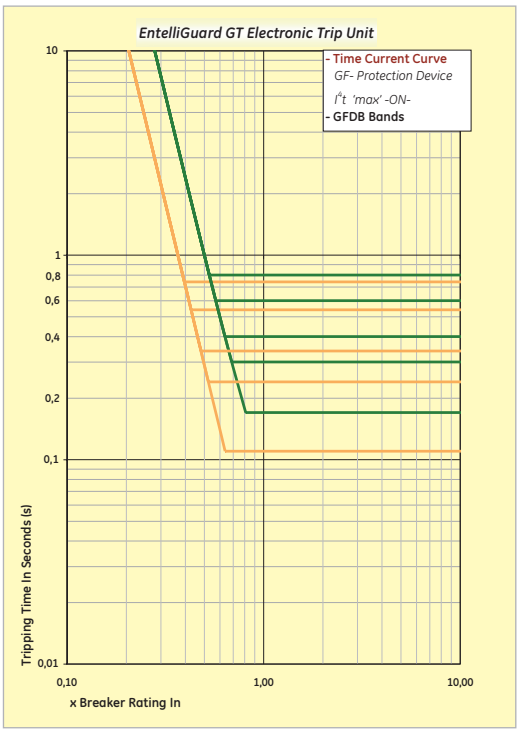
Electronic trip units



Ground fault protection

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 positon Low, Med. or High) and their intersection with several of the available 14 time bands across the full adjustment range.

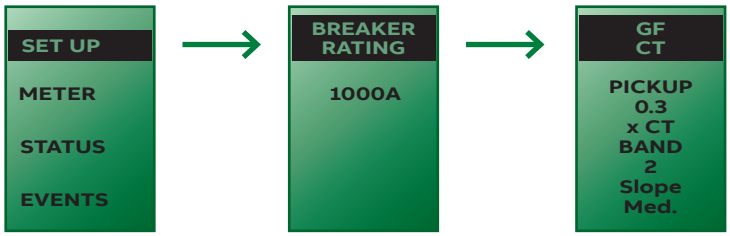




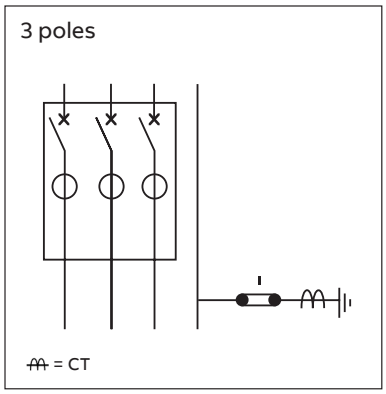
Standard on | **GT-S** | **GT-H**

(¹) When an auxiliary supply is connected (24V DC) an extra setting range of 0.1 to 0.2 becomes available

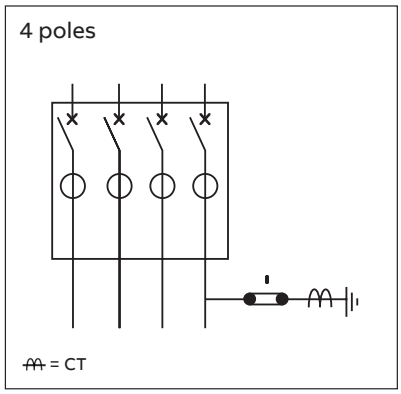
Ground fault protection



4 wire system



4 wire system

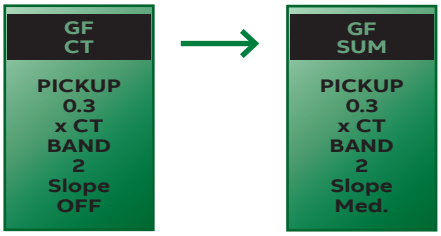


Ground fault protection (GF CT)
Optionally the EntelliGuard electronic trip unit can be used with an alternative groundfault protection scheme in which the neutral to earth current is measured by an 'Earthleakage Leg Sensor' placed in the neutral and earth link of the system.

This option requires the use of an auxiliary power supply of 24V DC and the electronic trip unit needs to be set to the option CT input. An earth leg C must be placed in the near vicinity of the breaker(1) and an interposing CT needs to be mounted within the breaker. When the sensor detects a fault current the EntelliGuard trip unit trips the associated circuit breaker thus disconnecting the circuit. Variants with or without alarm contact option exist.

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 I^2T slope settings (same setting data and curves apply as on the standard GF residual (sum) protection).

Optional on — GT-H



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	4th CT
			Int. CT	Int. CT

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. In all configurations a breaker mounted interposing current transformer is required. It is supplied as a part of the standard factory mounted assembly.
A variant of the dual ground fault protection system, trip unit types allowing unrestricted, restricted and standby earthfault protection is also available
These GT-HE trip units have an option allowing the user to choose between:
UEF, UEF+REF, UEF+SEF, UEF+SEF+REF or SEF+REF

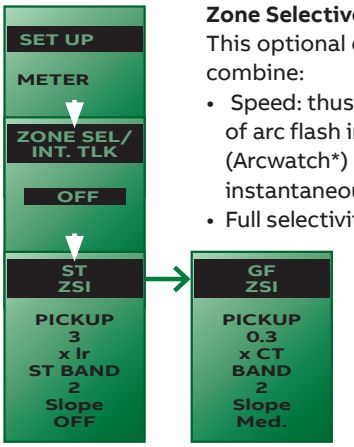
Optional on — GT-H

(1) Distance to breaker limited to 50 meters
(2) When an auxiliary supply is connected (24V DC) an extra setting range of 0.1 to 0.2 becomes available

Electronic trip units

Zone selective interlock, load shedding and trip indication

Zone selective interlock
Load shedding function (current alarm)
Trip reason indicators (event logging) & trip operation counter.



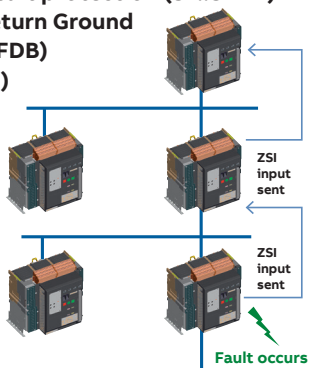
Zone Selective Interlock (ZSI)
This optional device has been specifically designed to combine:

- Speed: thus enhancing safety by reducing the hazards of arc flash incident energy. GE's instantaneous ZSI (Arcwatch*) allows the use of the standard instantaneous switched "ON" to achieve Speed.
- Full selectivity: thus enhancing reliability. GE's instantaneous ZSI (Arcwatch) allows for full selectivity without switching the standard instantaneous device "OFF" ArcWatch enabled solutions resolve the contradiction between the speed required for safety puroposes (Arc Flash Incidents) and the timing required for full selectivity. It requires one or two simple 2 core wire to connect the ZSI inputs and outputs between two or more Electronic trip units.

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-H

Load shedding alarm output
(Current alarm 1 & 2, see relay ouputs on 3/18)
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 and preventing it exceeding 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([1]).

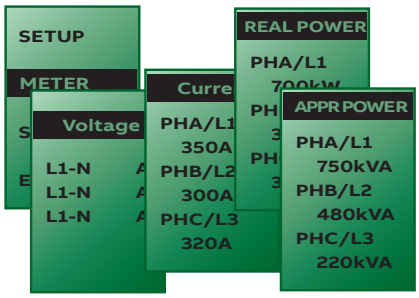
([1]) See section on relay outputs on page B.18

Standard 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 may 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 3/13)
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.

Standard on — GT-S — GT-H

Measurement functions and power supplies



An Ammeter is supplied with each EntelliGuard electronic trip unit. The current in each of the three phases and the neutral can be viewed.

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%

Standard on GT-S GT-H

Full measurement package (Power conditioners needed)

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.

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.

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.

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	kVA	000.000	4%
	L1, L2, L3	kW	000.000	4%
	L1, L2, L3	KVAr	000.000	4%
Energy	L1, L2, L3	KWh	000.000	4%
Peak Power Demand	L1, L2, L3	KW	000.000	4%

Standard on GT-H

Power conditioners and auxiliary power supply

To use the above mentioned comprehensive measurement facilities, it is necessary to track the 3 phase 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 24V DC auxiliary power supply.

Accessory for GT-S GT-H

Electronic trip units

Protective relaying functions; relay and trip unit inputs
Wave form capture option

SET UP
METER
STATUS
EVENTS

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
Overvoltage	110% -115% of line voltage	1%	2%	ON or OFF
Overvoltage delay	1 to 15 seconds	1sec	± 0.1 s	
Undervoltage	30% - 85% of line voltage	1%	2%	ON or OFF
Undervoltage delay	1 to 15 seconds	1sec	± 0.1 s	
Voltage unbalance	10% -50% difference between highest and 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 and 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

SET UP
METER
STATUS
EVENTS

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 6/7.

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 and 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.

Optional — GT-S — GT-H

SET UP
METER
STATUS
EVENTS

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 page6/7.

Optional — GT-S — GT-H

SET UP
METER
STATUS
EVENTS

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 Enervista software. When the upload into this software is complete, the Trip Unit will reset this function and be available to register the next event.
The trip unit toolkit software can also be used to access the Waveform capture feature.

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.
For frame T, the Modbus and Profibus need to be connected with the communication modular for operation. In frame 1/2/3, Modbus and Profibus can be directly connected to the trip unit without the use of any interfaces. In combinatioin 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.

Optional — **GT-S** — **GT-H**

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.

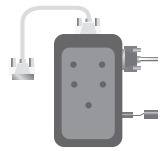
Standard on — **GT-S** — **GT-H**

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. Or if the reset function needs to be controlled from remote location, the selector switch on the trip unit front shall be chosen to manual reset mode, and the remote reset coil is required together for functionality.
A selector switch on the trip unit front face allows the user this choice([1]).

Standard on — **GT-S** — **GT-H**

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 jock 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.

Accessory for — **GT-S** — **GT-H**



Test and set-up 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.
The device can be plugged into a jack on the trip unit front face. For more advanced functionality a FREE software is available for download that allows users to customize, set, monitor, and test trip units using the comfort of a laptop. Downloadable from: ex.geindustrial.com

Accessory for — **GT-S** — **GT-H**

Electronic trip units

Overview of GT electronic trip unit functionality

			GT-S	GT-H	Remarks
Setting interface		LCD screen allowing access to 4 distinct menus	X	X	--
		Touch pad adjustments	X	X	--
		Multilingual	X	X	--
		Adjustable manual or automatic RESET option	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	--
		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	--
		Resulting setting Range **0.2 to 1** with **66** set points	X	X	--
		Possibility to switch **OFF**	-	X	--
		22 thermal protection (C type) time bands available ranging from class 0.5 to 40 (bands at 7.2 x Ir)	X	X	--
		22 F type (fuse) time bands available	-	X	--
		13 standard inverse shape protection bands available (L = 0.5-20)	-	X	--
		13 very inverse shape protection bands available (L = 0.5-20)	-	X	--
		13 extremely inverse shape protection bands available (L = 0.5-20)	-	X	--
		Neutral protection 0-50%-63%-100%	X	X	--
		Cooling function and thermal memory	X	X	--
Short time short-circuit current protection		Setting RANGE from **1.5 to 12** x Ir (LT setting)	X	X	--
		Steps of 0.5 (A total of 22 settings)	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	--
		Clearance times to IEC 40979-1 and IEC 60364	X	X	--
		3 I^2t protection time bands available	X	X	--
Instantaneous short-circuit current protection	Standard	I_i setting RANGE from **2 to 15** x Ie (primary setting)	X	X	--
		Steps of 0.5 (a total of 28 settings)	X	X	--
		Possibility to switch **OFF**	X	X	--
		Selective execution	X	X	--
		Fixed instantaneous or HSIOC protection	X	X	--
	Extended range	I_{ext} setting RANGE from **2 to 30** x Ie (primary setting)	O	O	--
		Possibility to switch **OFF**	O	O	--
		Selective execution	O	O	--
		Fixed instantaneous or HSIOC protection	X	X	--
	Reduced RELT	I_i setting RANGE from **1.5 to 15** x Ie (primary setting)	-	X	--
		Steps of 0.5 (A total of 29 settings)	-	X	--
		Possibility to switch **OFF**	-	X	--
		Remote and local ON and OFF with position indication signal	-	X	--
Ground or earth fault protection		Setting RANGE from **0.1 to 1** x In (breaker rating)(1)	O	O	--
		Steps of 0.01 (A total of 92 settings)	O	O	--
		Possibility to switch **OFF**	O	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	--
		Clearance times to IEC 40979-1 and IEC 60364	O	O	--
		3 I^2t protection time bands available	O	O	--
		Residual principle	O	O	--
		Source ground return principle(2)	-	O	N
		UEF, REF and SEF applications possible	-	O	N
		Combinations of UEF, REF and SEF applications possible	-	O	N
Measurement package (for measurements using voltage power conditioners are needed)		Current (L1, L2, L3, N)	X	X	--
		Voltage (L1, L2, L3)	-	X	C
		Energy (kWh) total real	-	X	C
		Real power (L1, L2, L3, total)	-	X	C
		Apparent power (L1, L2, L3, total)	-	X	C
		Reactive power (L1, L2, L3, total)	-	X	C
		Total power (L1, L2, L3, total)	-	X	C
		Power (kW) peak (total)	-	X	C
		Demand power (kW) (total)	-	X	C
		Frequency (L1, L2, L3)	-	X	--
Protective relaying		Voltage unbalance	-	X	N
		Undervoltage	-	X	N
		Overvoltage	-	X	N
		Profibus	-	X	N
		Load shedding (current alarm 1 & 2)	-	X	--
		Current unbalance	-	X	N
		Power reversal	-	X	N
Diagnostiscs & wave form captiure		Trip target (trip reason indication)	X	X	--
		Trip info (magnitude / phase)	X	X	--
		Waveform capture	-	O	N
		Trip counter	X	X	--
		Event logger (trip events)	X	X	--
		Good and bad health indicator	X	X	--
		Watchdog	X	X	--
Other		Zone selective interlock on ST, GF and I	-	O	--
		Shunt trip status input (2 inputs)	-	O	--
		UVR trip status input (2 inputs)	-	O	--
		General relay outputs and electronic inputs	X	X	--
		Communication 2 way(2)	O	O	N
		Modbus(3)	O	O	N
		Profibus(3)	-	O	N
		24V DC auxiliary power supply	O	O	--
		Text kit with power support function	O	O	--

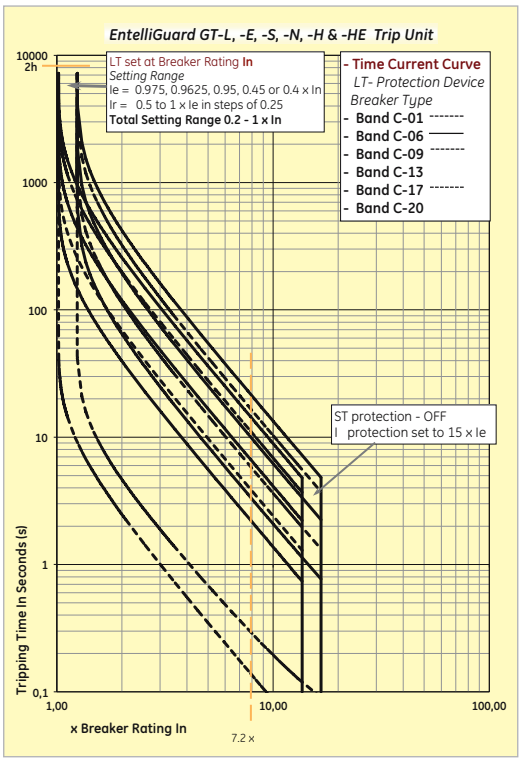
Remarks
N indicates that a 24V auxiliary voltage supply is required
C indicates the need of a power conditioner
(1) Without a 24V auxiliary power supply, the lowest setting is 0.2
(2) With a UEF, SEF & REF option installed, RELT is unavailable
(3) Communication module is required for frame T breaker (extra plug & harnas)

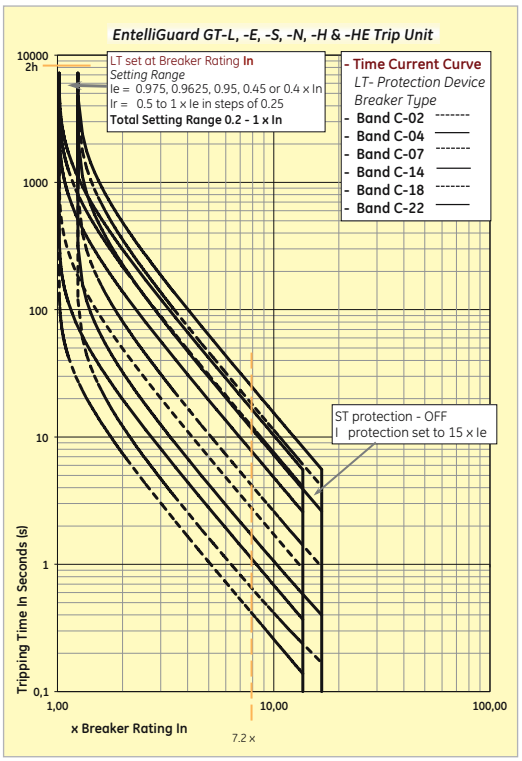
Key
X - Present; **O** = Optional; **-** = Not possible

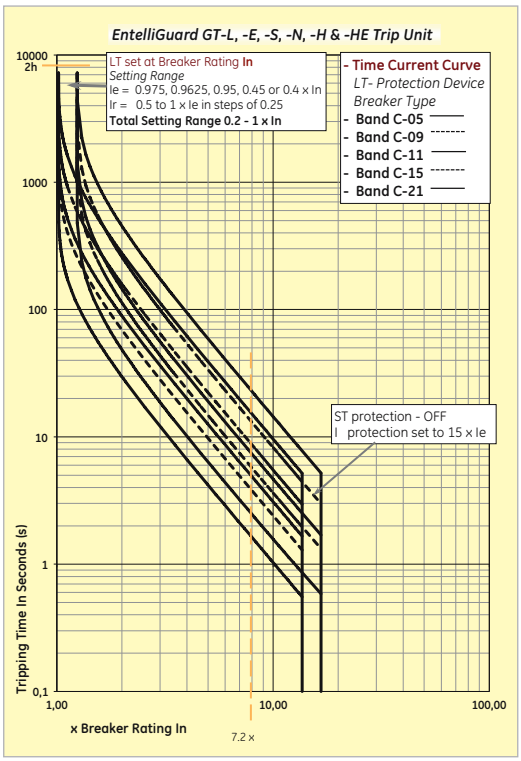
Electronic trip units

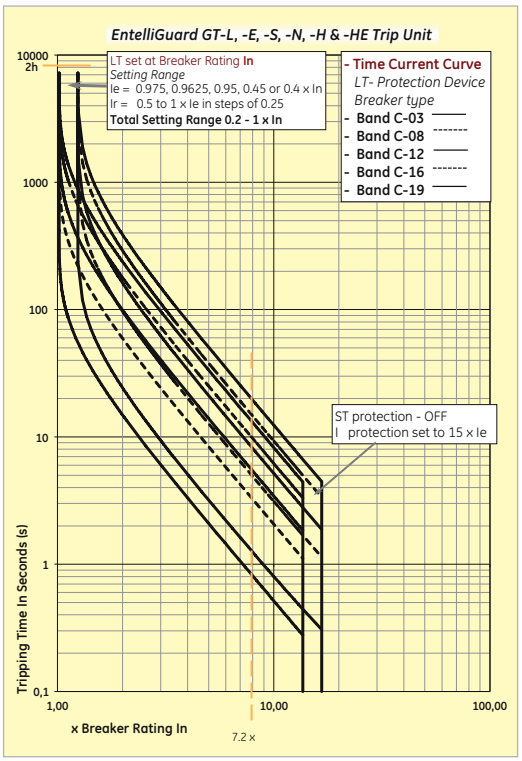
Time current curves (cold state)

LT protection device





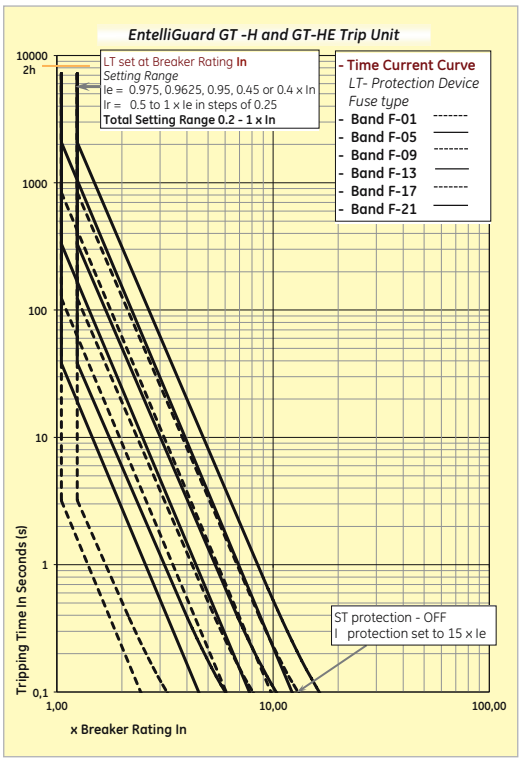


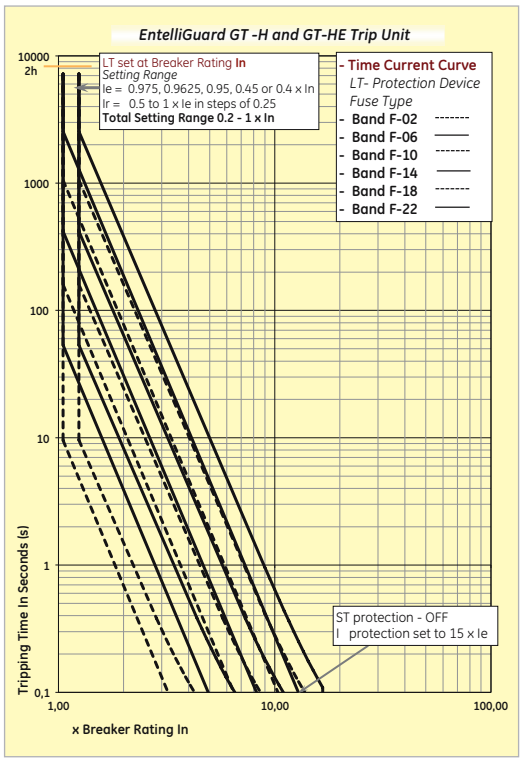


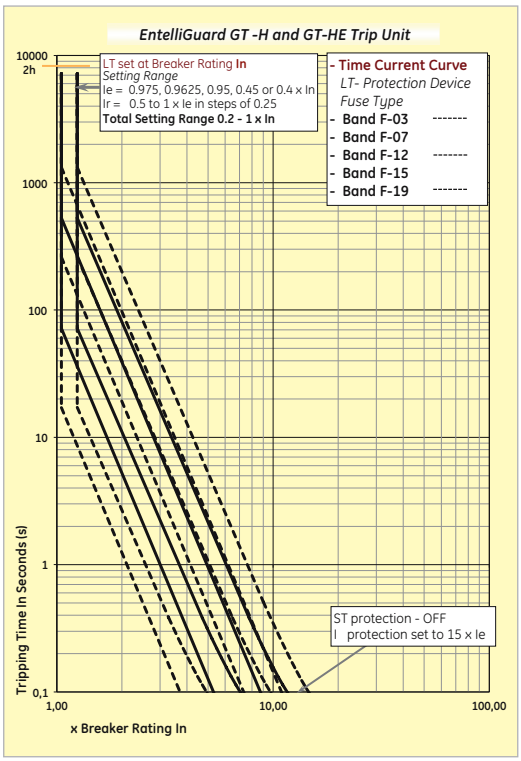
Electronic trip units

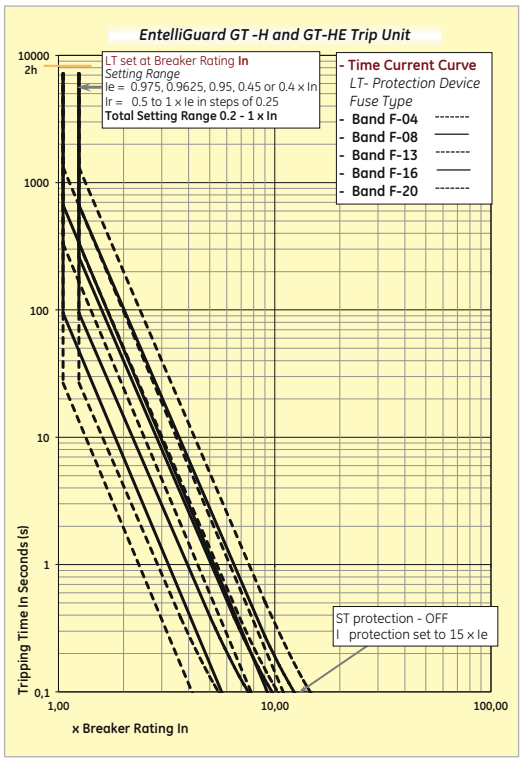
Time current curves (cold state)

LT protection device

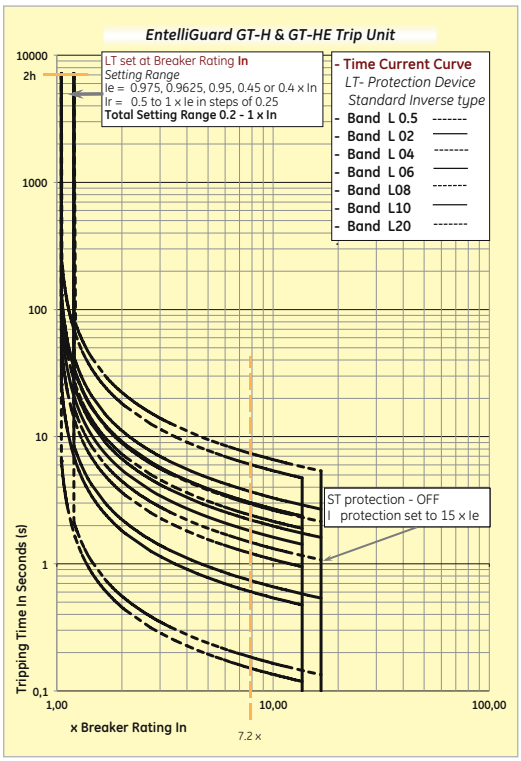


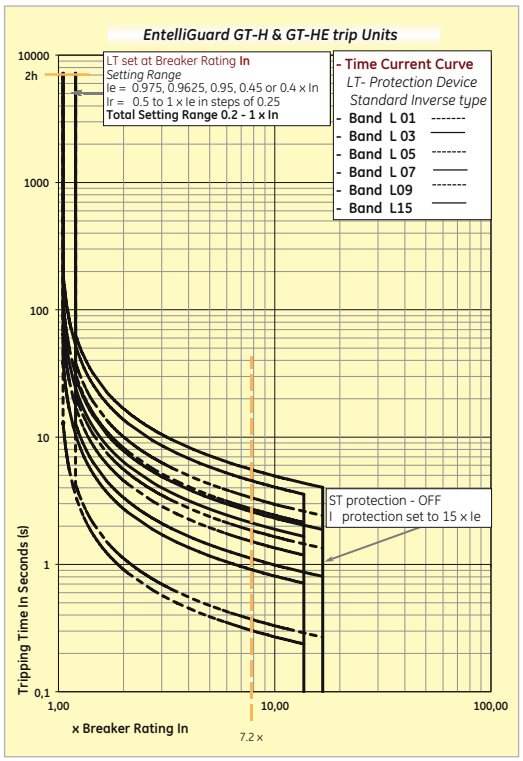


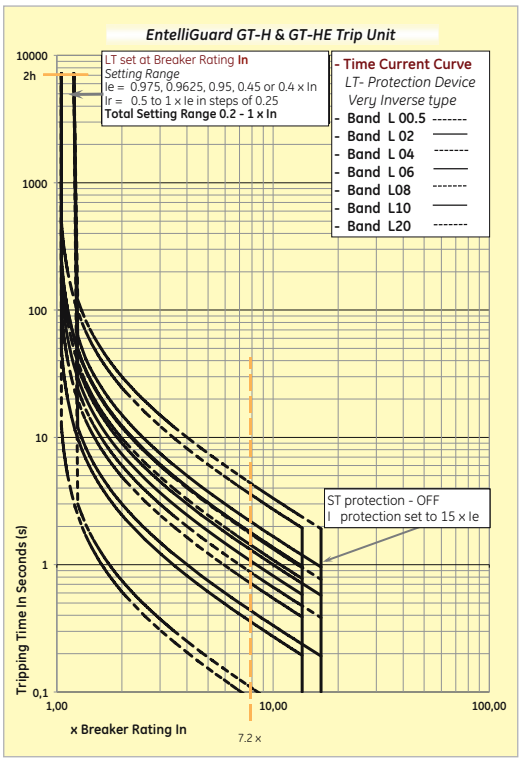


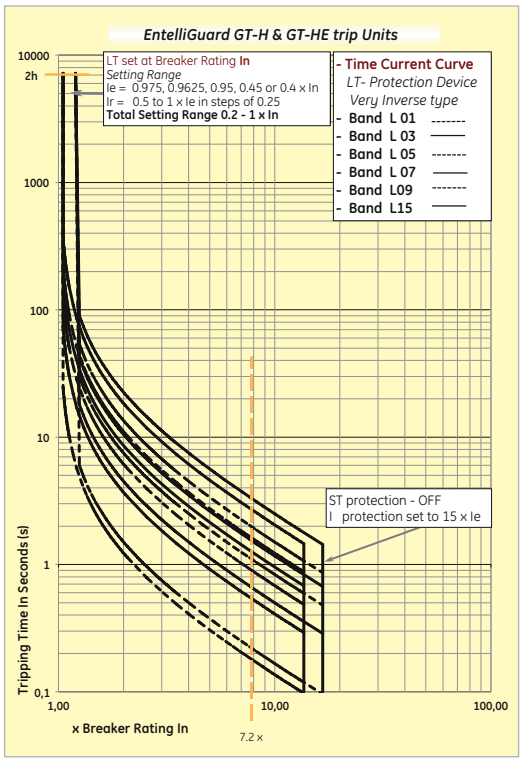


LT & ST protection device



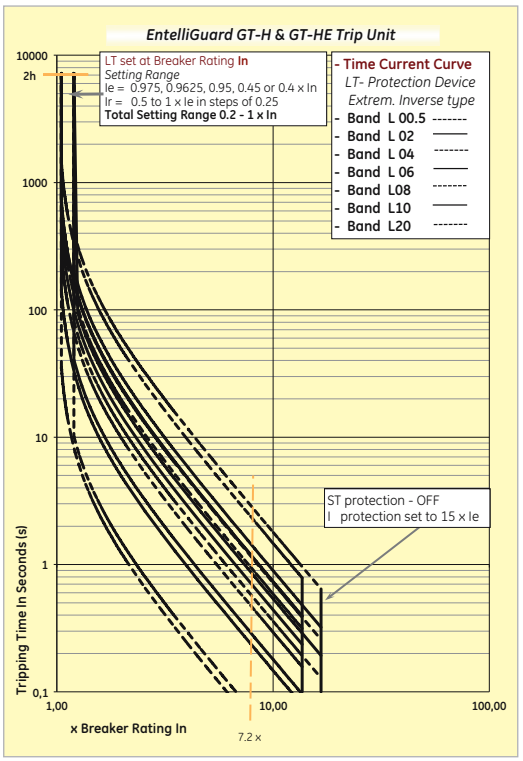


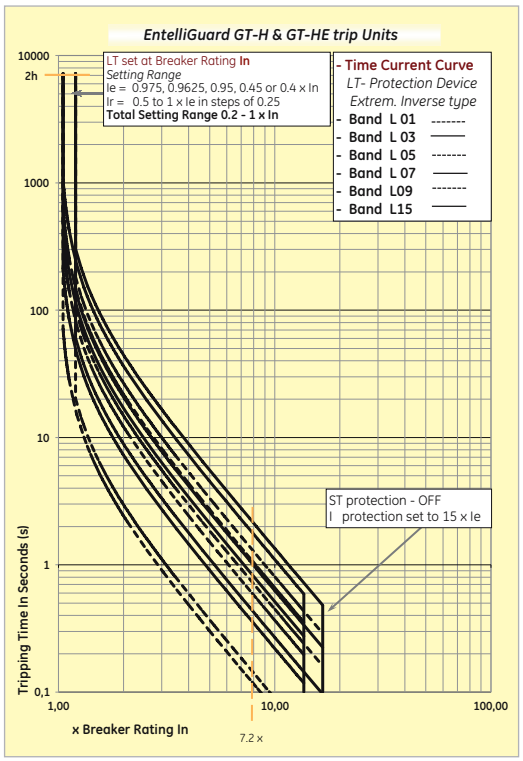


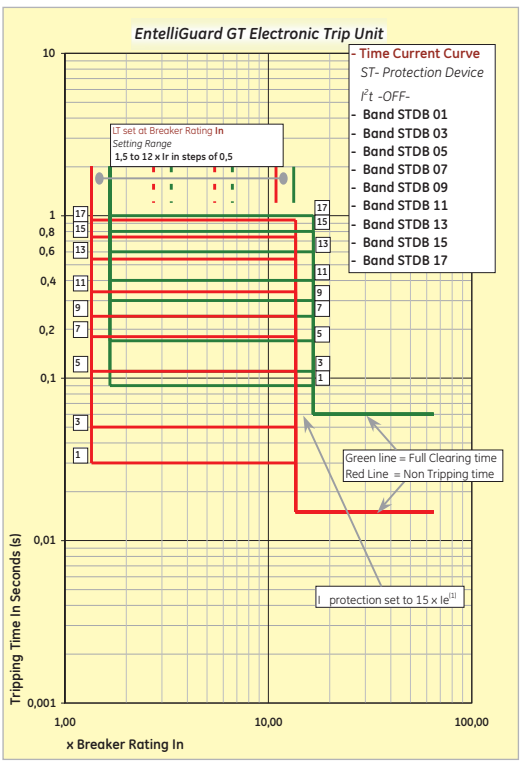


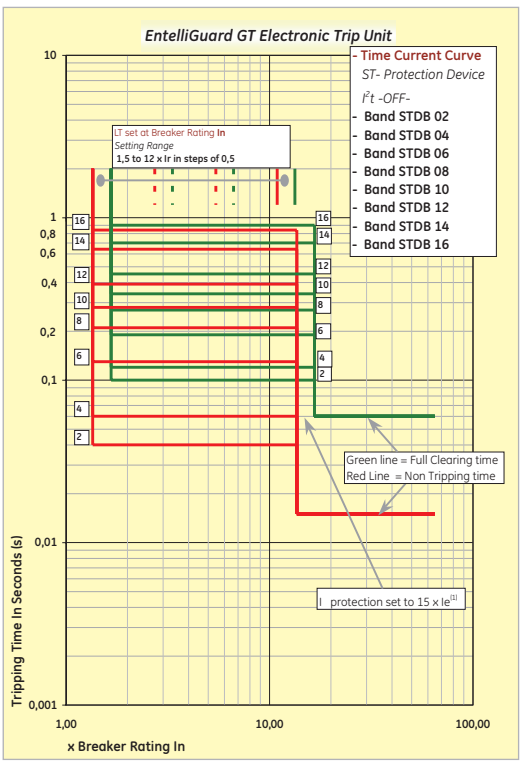
Electronic trip units
Time current curves (cold state)

ST protection device

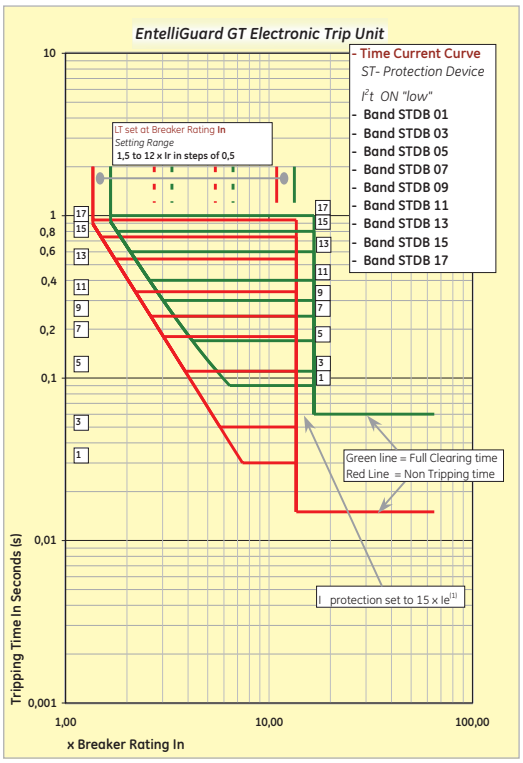


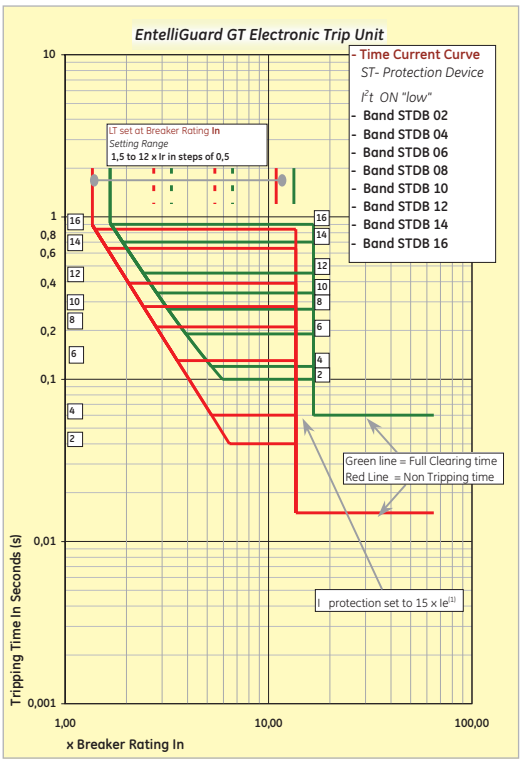


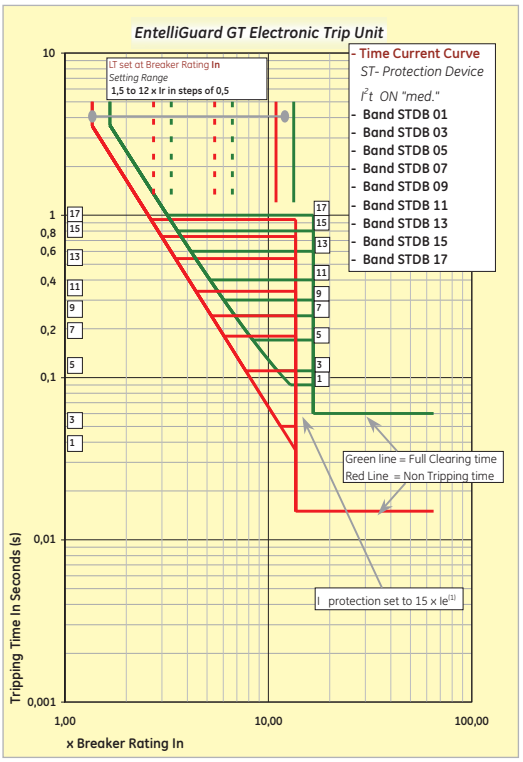


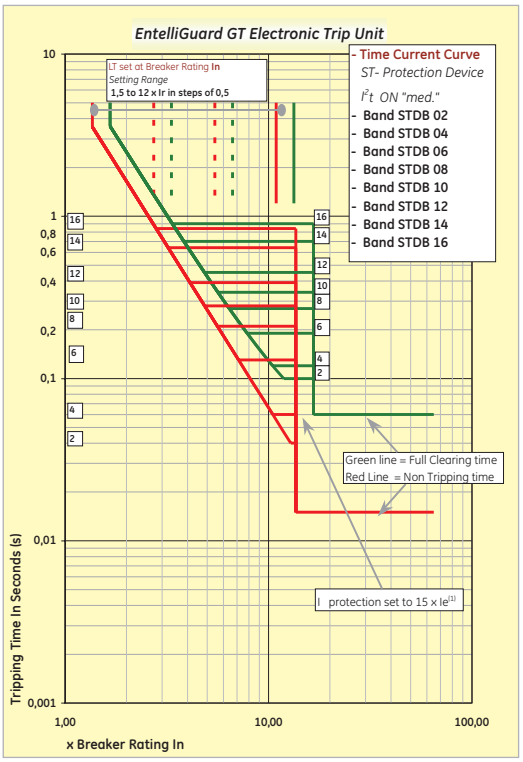


ST protection device





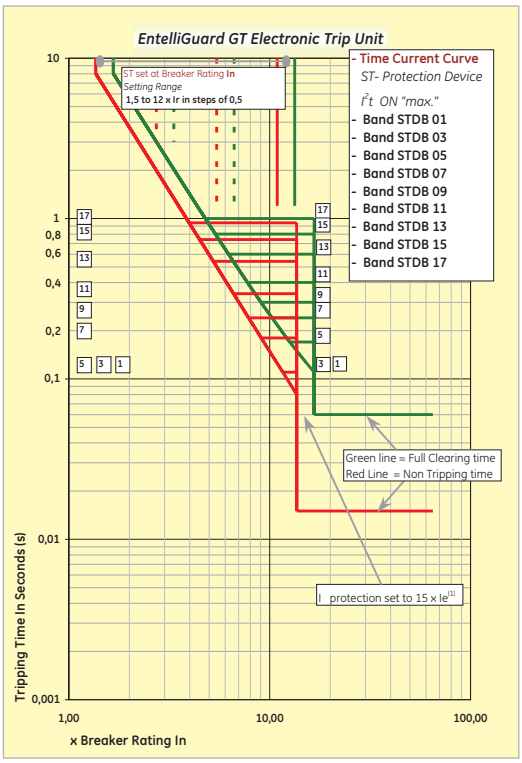


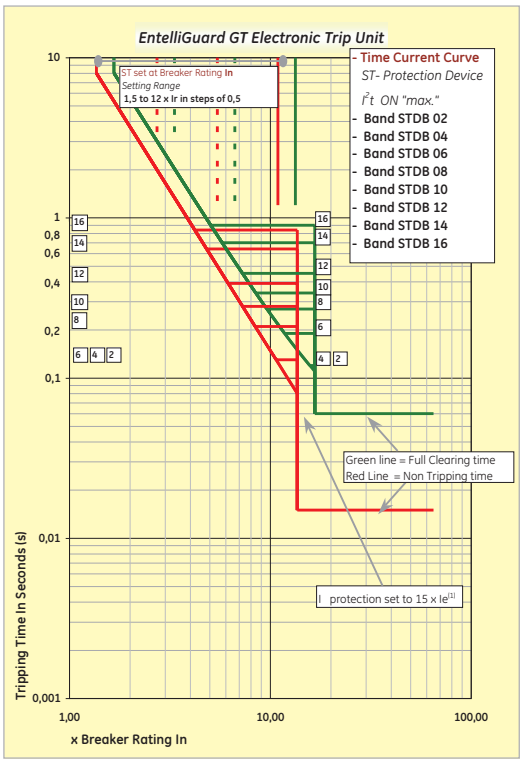


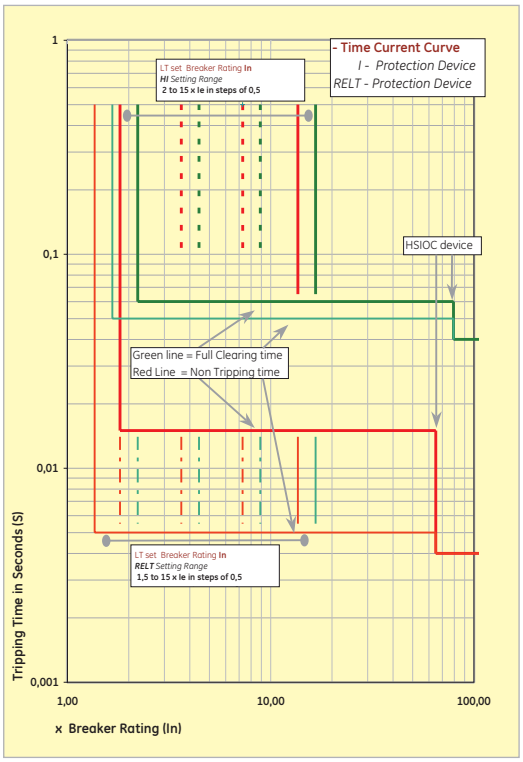
Electronic trip units

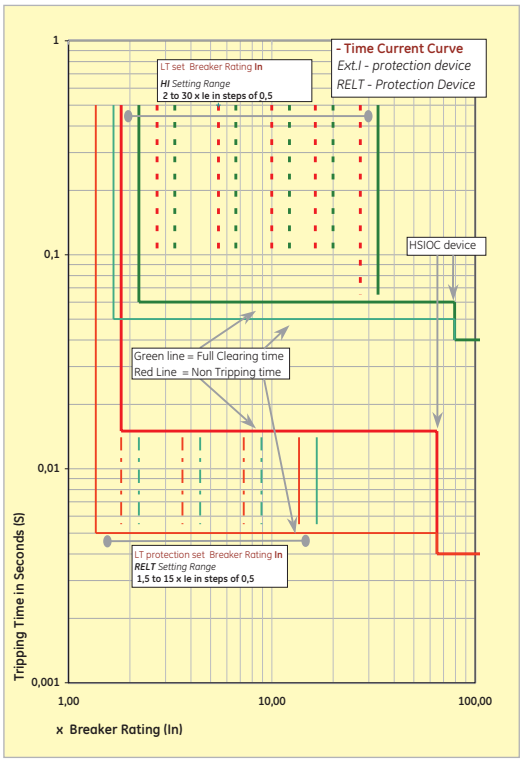
Time current curves (cold state)

ST and I protection device

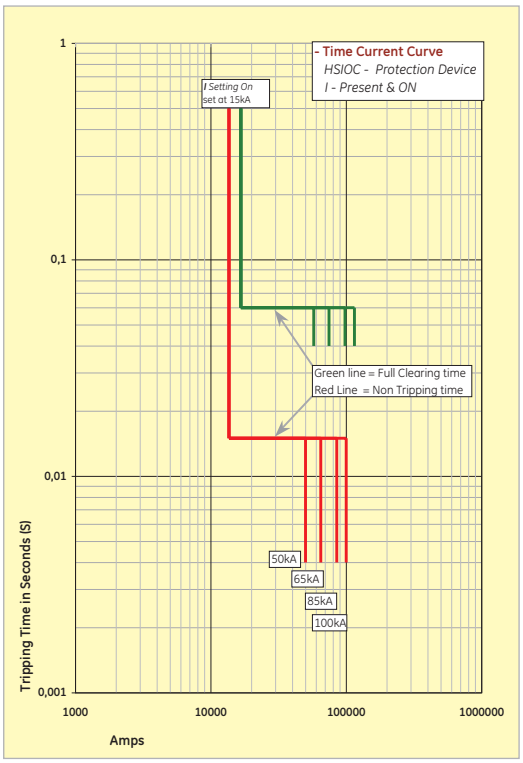


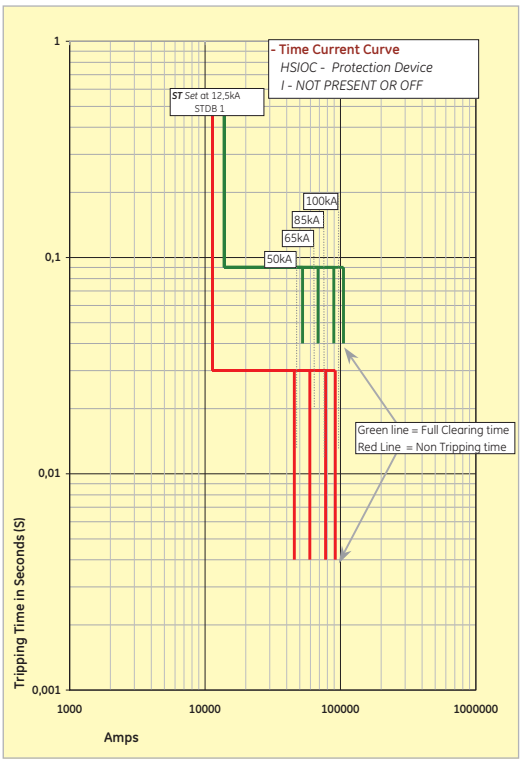


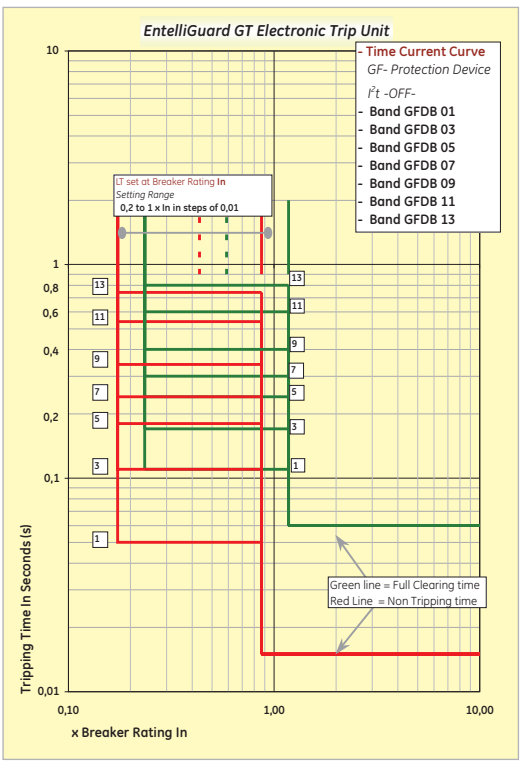


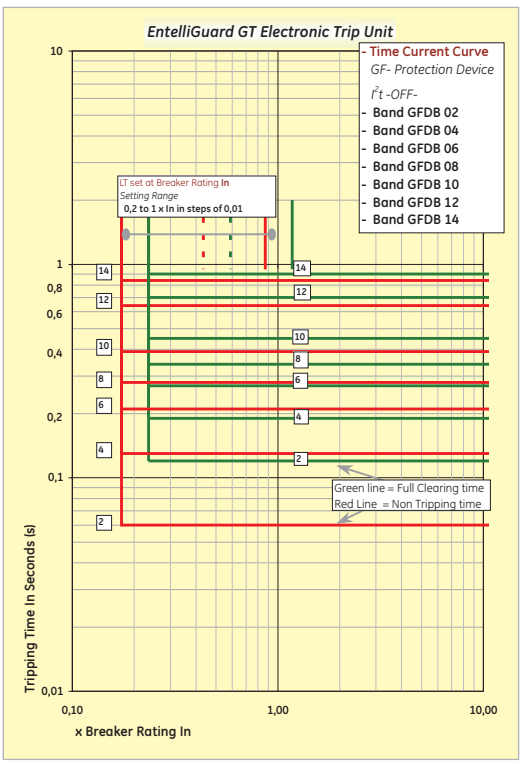


HSIOC and GF protection device





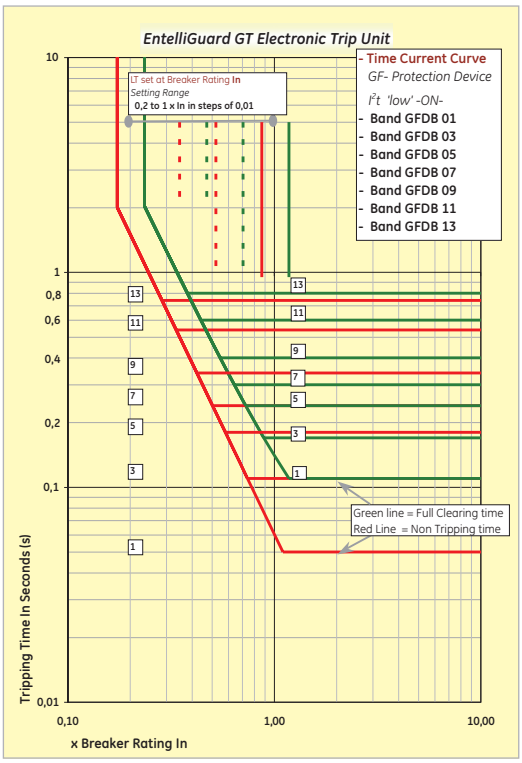


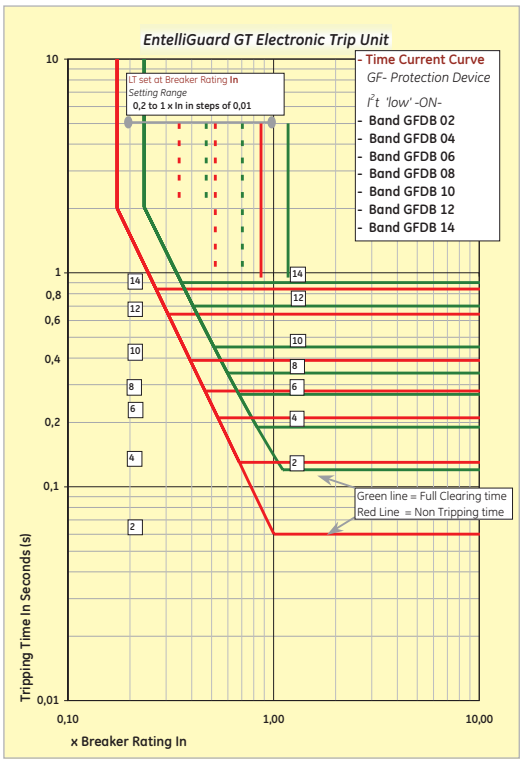


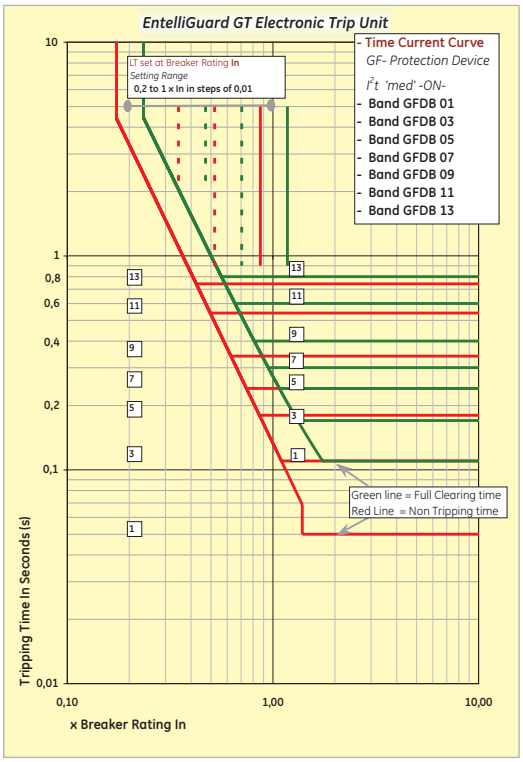
Electronic trip units

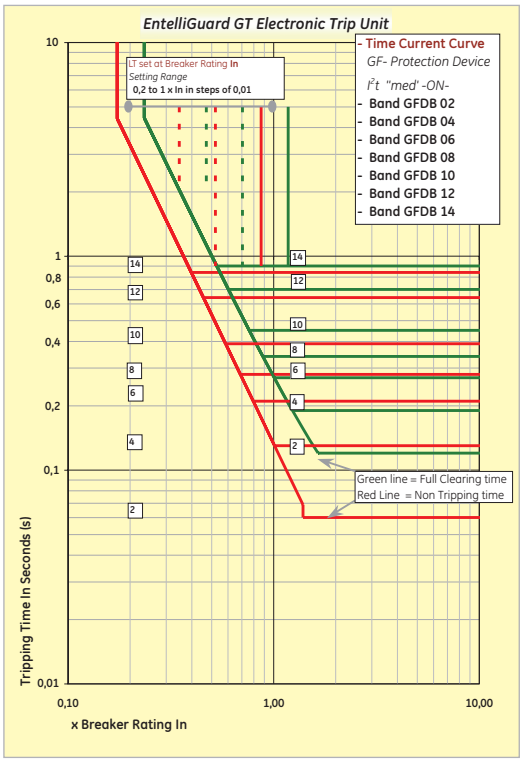
Time current curves (cold state)

GF protection device

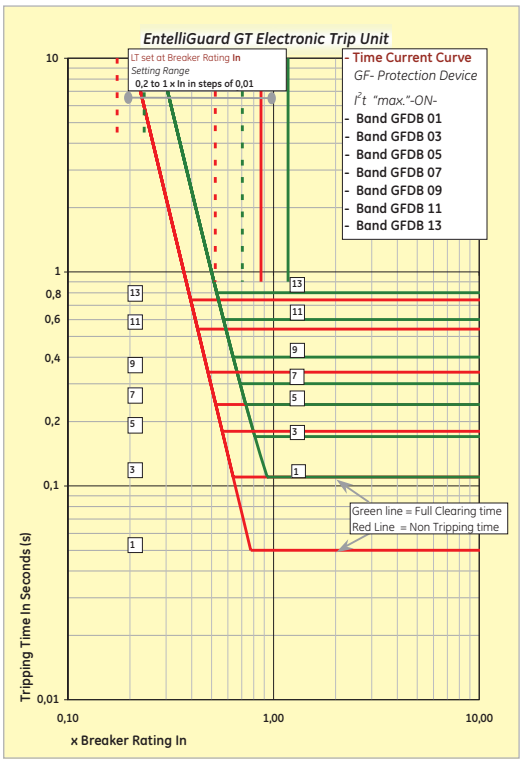


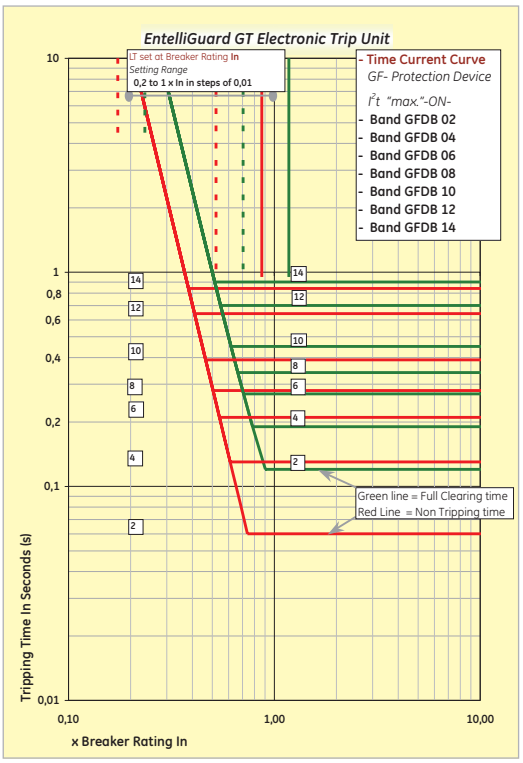






Terminology



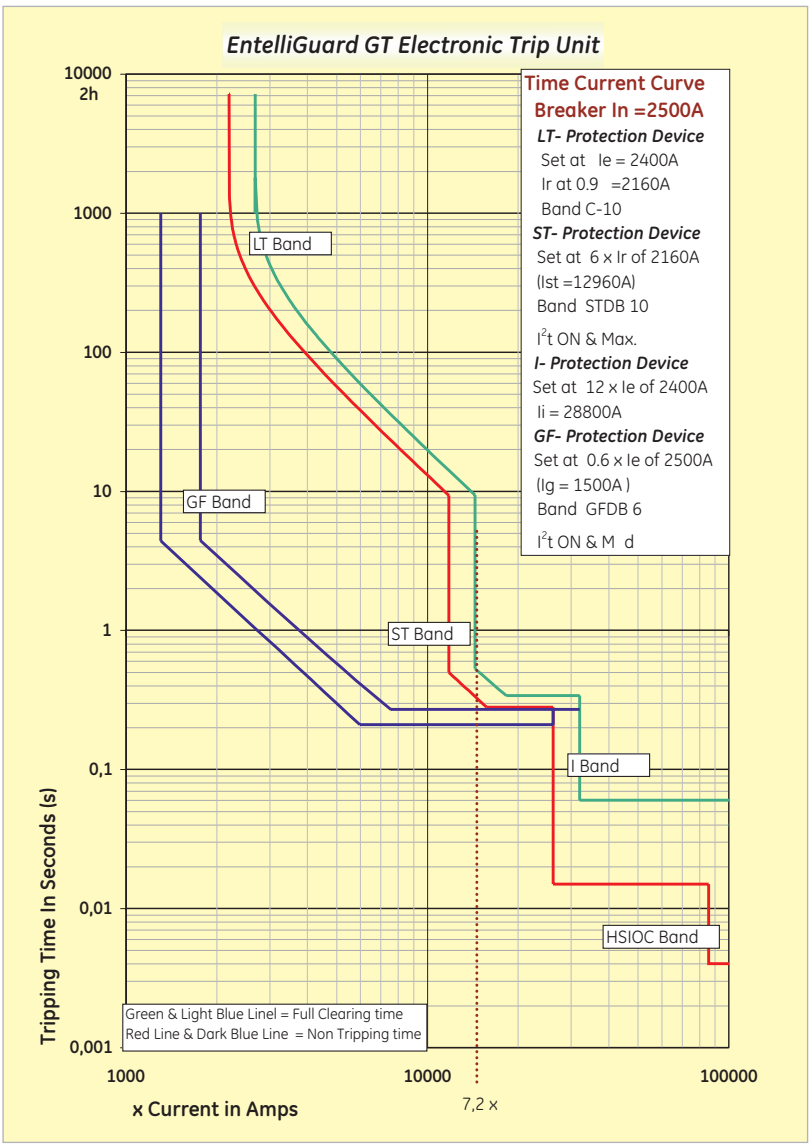


Denonimation	Description
In	Current rating of breaker
Ie	Primary current setting
Iu	Maximum breaker user current (see section D)
LT	Long time or overload protection
ST	Short time or timed short-circuit current setting
I	Standard or extended instantaneous setting
GF	Groundfault
EF	Earthfault
Ir	LT or 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
I²t	'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 CTv	Multiple of installed sensor rating (In IEC EntelliGuard types =In)
RELT	Reduced instantaneous
MCR	Making current release
HSIOC	Hi set instantaneous protection

Electronic trip units
Time current curves (cold state)

Example of full time current curve

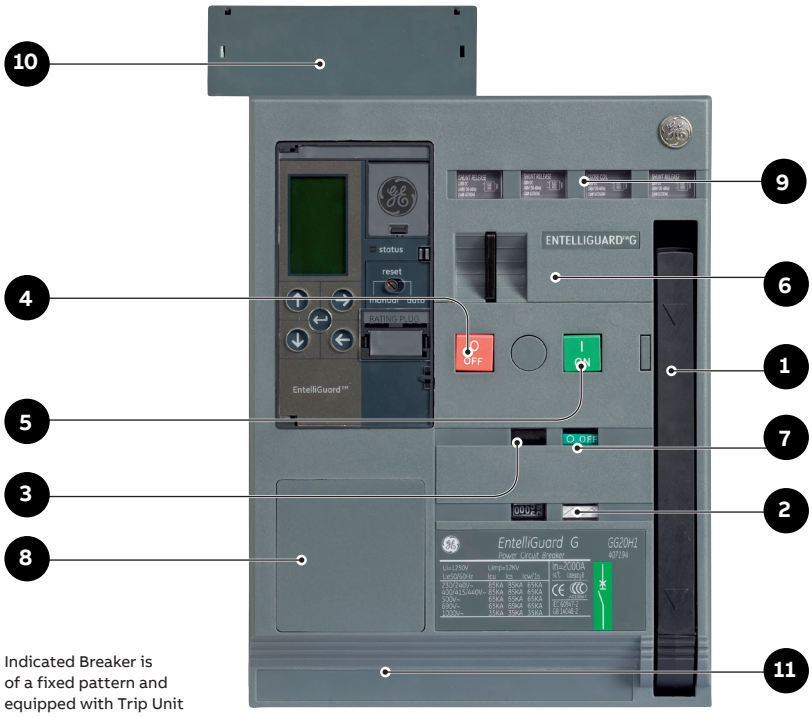
Time current curve
The EntelliGuard electronic trip unit has many sophisticated setting features and an extremely broad setting range.
On request we can provide complete time current curves covering all installed protection devices. The curves can be produced for any current setting within the range of the installed protection devices, for one or for a combination of two breakers.
Please contact our local sales office for more information.



Breaker accessories

Breaker accessories

Breaker use and operation



Indicated Breaker is of a fixed pattern and equipped with Trip Unit

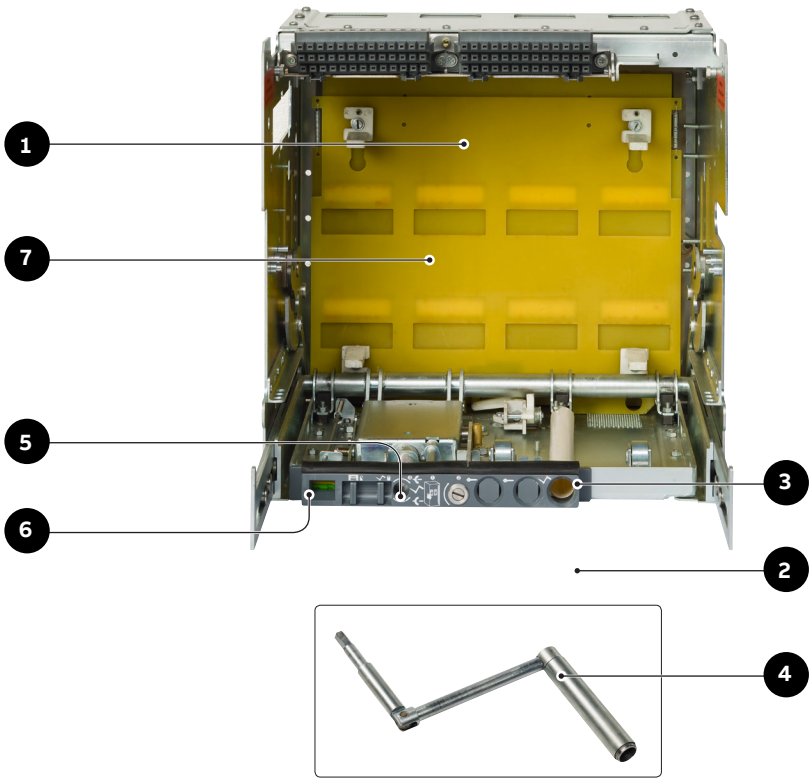
A air circuit breaker
EntelliGuard is operated by a stored energy mechanism that can be charged either manually or electrically. To charge manually a handle (1) is used to 'load' the springs in the mechanism, 10 pumping movements being required. During charging a spring status indicator (2) clearly indicates 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. On the frames 1, 2 & 3 a padlocking mechanism (6) is present for up to three locks to lock the breaker in "OFF" position.
On the frame T an accessory (11) is available that, when used, allows the of uses of two kinds of keylock or a padlock to lock the device in its 'OFF" position.

An electrical charging mechanism negates the need for loading the springs manually and allows remotely located push-buttons to be used to switch ON & OFF (see page 3/3).
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 disconnector and to meet the 'Positive Contact Indication' requirements.
The breaker mechanism is of the trip free type and has an integrated anti-pumping system.
On the frames 1, 2 & 3 the front facia alos includes room for an optional key interlock device (8) that prevents the breaker from being closed.
On the frame T an accessory (11) is available that, when used, allows the of uses of two kinds of keylock or a padlock to lock the device in its 'OFF" position.

The breaker can be equipped with up to four factory or field mountable 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).([2])
EntelliGuard air 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.

([1]) Independent of the breaker position (tripped or ON) the device always provides sufficient energy to switch the breaker 'OFF'
([2]) Four is applicable for the frames 1, 2 & 3, frame T: Three.
([3]) Not available on frame T



Draw-out pattern cassette

To dismount 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 auxilary 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' aperature.

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 ([3]) 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.

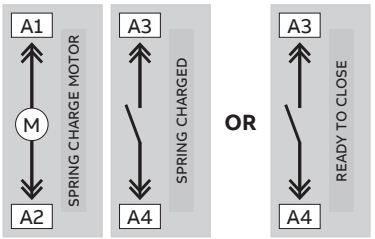
([1]) Independent of the breaker position (tripped or ON) the device always provides sufficient energy to switch the breaker 'OFF'
([2]) Four is applicable for the frames 1, 2 & 3, frame T: Three.
([3]) Not available on frame T

Breaker accessories

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 necessary.

Connections
The charging mechanism connection points can be found on terminal A of both the fixed pattern and draw-out breaker types.

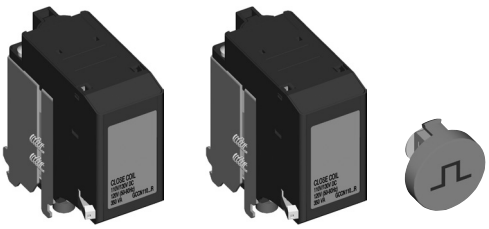


Electrical characteristics

Control voltage	Motor operator Frame T	Motor operator Frame 1	Motor operator Frames 2 & 3
	Power Consumption		
24-30V DC, 48V DC, 60V DC, 110-130V DC, 220 - 250V DC	300W	300W	480W
48V AC, 110-130V AC, 220-240V AC, 380-400V AC, 440V AC	350VA	350VA	560VA

Closing coil

To switch the air 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.

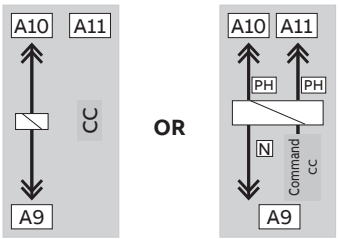


Command closing coil([1])

Alternatively a command 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 facia. 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 and command closing coils connection points can be found on terminal A of both the fixed pattern and 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	--	

([1]) The command closing coil is only available with 3NO and 3NC auxiliary contacts for frame T (4NO and 4NC not possible).

Breaker accessories

Shunt and undervoltage releases

Shunt release
A device designed to switch the air 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).
EntelliGuard shunt releases are available as an impulse or as a continously rated type. The continously rated types are designed to be used as a closure prevention device when energized.
The impulse rated types must always be used with a breaker auxiliary contact.
It is possible to fit:

a) 2 shunt releases in frame 1/2/3
b) 1 shunt release in frame T

A third variant, the command shunt trip, allows operation via communications.
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.

Remote reset coil
The remote reset coil is a standard continously rated shunt release device mechnically linked to the reset mechanism of the breaker. (PMU base)
For resetting remotely using this accessory the knob on the front the trip unit should be set to the manual position. The device is only available as a factory mounted component.

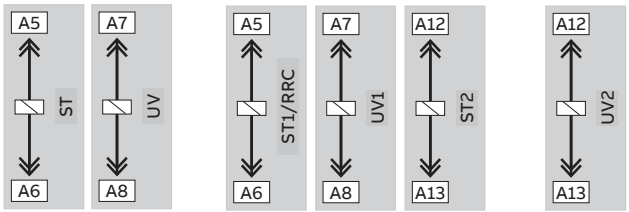
Undervoltage release
A device designed to open the breaker contacts and to prevent the breaker from closing when in a ‘no volt’ condition. On a de-energization the undervoltage release activates the circuit breaker mechanism and ensures a rapid disconnection of the main contacts (50 milliseconds). When not re-energized in accordance to the conditions stated in the IEC 60947 the device prevents the air 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.
In the frames 1, 2 & 3 two undervoltage releases can be fitted in the frame T one. A special version with no intentional delay is also available (GUVR240 & GUVR240R).
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 and draw-out breaker types.

In frame T it is possible to mount 1 UVR and 1 ST release.

In frames 1, 2 & 3 it is possible to mount a total of three releases, the third being a UVR **OR** shunt release.



Electrical characteristics releases
Continously rated shunt releases and undervoltage releases

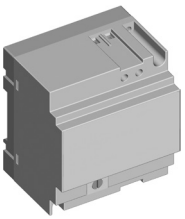
AC	DC	Power consumption
--	24V	350 VA / 350 W Inrush 60 VA / 50W Holding
48V	48V	
--	60V	
110-130V	110-130V	
220-240V	220-240V	
277V	250V	
380-415V	--	
440V	--	

Impulse rated shunt releases

AC	DC	Power consumption
24V	24V	480 VA / 480 W Inrush
110-130V	110-130V	
220-240V	220-240V	

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	--	

Breaker accessories

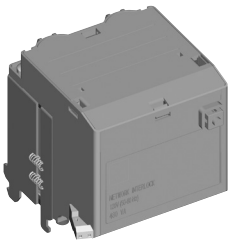
Interlock devices, indication contacts and number of devices

Network interlock device([1])

When devices as the EntelliGuard air circuit breaker are used in automatic or manaul 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 and draw-out breaker types.

Number of devices

In frame T it is possible to mount 1 UVR and 1 ST release and one closing coil (in three locations).

In frames 1, 2 & 3 it is possible to mount a total of three releases, the third being a UVR **OR** shunt release, and one closing coil (in four locations).

Shunt release (shunt), closing and 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.

Frame T

	Coil position on front facia, from left			
Combination	**1**	**2**	**3**	
A	Shunt	CC/CCC	UVR	

Frames 1, 2 and 3

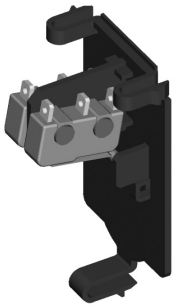
	Coil position on front facia, from left			
Combination	**1**	**2**	**3**	**4**
A	Network	Interlock	CC/CCC	UVR
B	Shunt/RRC	UVR	CC/CCC	Shunt
C	Shunt/RRC	UVR	CC/CCC	UVR
D	Network	Interlock	CC/CCC	Shunt

([1]) The network interlock device is only available in frames 1, 2 & 3

Release indication contacts ([2])

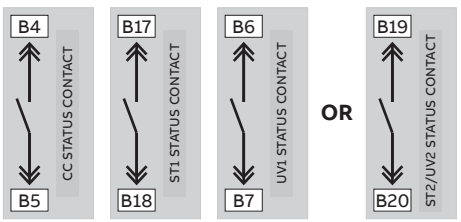
To indicate, if a shunt or an undervoltage release initiation has resulted in a breaker, OFF or TRIP, a contact can be fitted to the releases. The contacts are available in two versions; one power rated for use in standard circuits and a second signal rated type for use with the electronic trip unit 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 and draw-out breaker types[3]. 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

([2]) The release indication contacts are only available in frames 1, 2 & 3

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

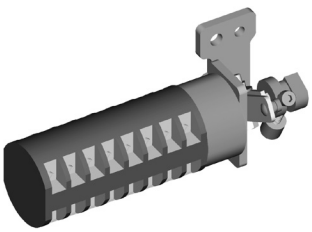
Breaker accessories

Auxiliary contacts

Auxiliary contacts
Auxiliary contacts are designed to indicate the position of the air circuit breaker main contacts. Each EntelliGuard device is supplied with a standard package of 3 normaly 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 4 NO & 4 NC([1])
- Power rated contacts 8 NO & 8 NC([2])
- Power rated contacts 3 NO & 3 NC plus Signal rated contacts 2 NO & 2 NC([2])
- Power rated contacts 4 NO & 4 NC plus Signal rated contacts 4 NO & 4 NC([2])

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 and draw-out breaker types.

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([3])	DC21 -10A
	AC23 - 5A		
380-440V	AC21 - 5A	250V([4])	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

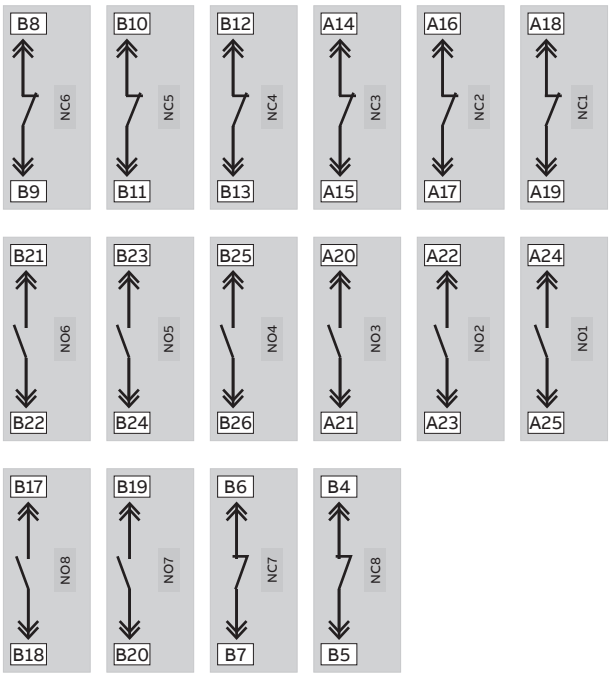
([1]) The 4NO & 4NC auxiliary contacts are only available in frame T
([2]) These devices are only available in frames 1, 2 & 3, and limits the wiring
([3]) Three contacts in series
([4]) Six contacts in series

Connections

The connection points of auxiliary contacts can be found on the auxiliary disconnect terminal of both the fixed pattern and draw-out breaker types.

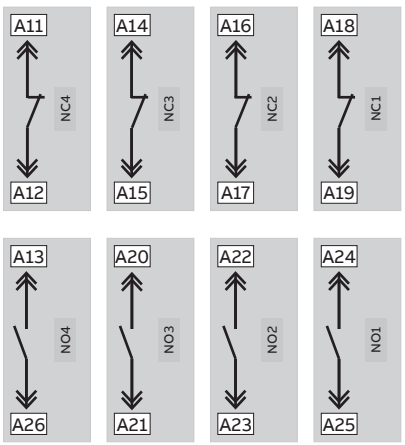
Frames 1, 2 & 3

- Power rated contacts 3NO & 3NC
- Power rated contacts 8NO & 8NC
- Power rated contacts 3NO & 3NC [NO (or C) 1,2 & 3] plus signal rated contacts 2NO & 2NC [NO (or C) 4 & 5]
- Power rated contacts 4NO & 4NC [NO (or C) 1,2,3 & 4] plus signal rated contacts 4NO & 4NC [NO (or C) 5,6,7 & 8]



Frame T

- Power rated contacts 3NO & 3NC
- Power rated contacts 4NO & 4NC (5)

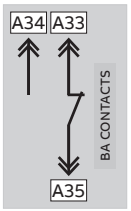


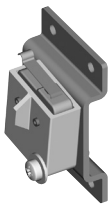
(5) Cannot be used in combination with a command close coil

Breaker accessories

Bell alarm, cassette position indication, spring charged and ready to close contacts

Bell alarm contact
When an EntelliGuard air 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 then providing the reason of the 'trip'.
The device is available with power rated or signal rated contacts and are 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 knob on front of the trip unit is set to the manual position.





Connections
The connection points of the bell alarm contact can be found on terminal A of both the fixed pattern and 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

Signal rated, gold plated contact types ([1])

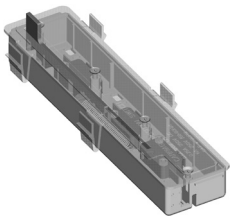
AC ratings		DC ratings	
Voltage	**Amps**	**Voltage**	**Amps**
125V	AC21-0.1A	8-30V	DC21-0.1A

Minimum operating current 0.1mA at 5V DC

([1]) Spring charged contact NOT available in signal rated version

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

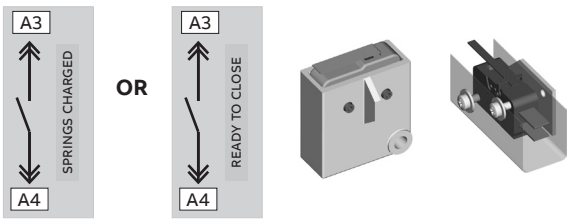
AC ratings		DC ratings	
Voltage	**Amps**	**Voltage**	**Amps**
250V	AC21-10A	125V	DC21-0.5A
		250V	DC21-0.25A

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 availble in a 1NO configuration.

Connections
The connection points of these contacts can be found on terminal A of both the fixed pattern and 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 0.1A at 8V 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

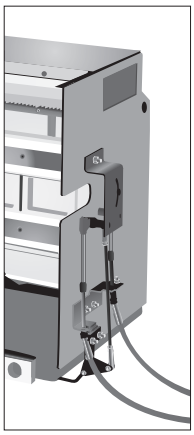
Minimum operating current 1mA at 5V DC

([1]) Spring charged contact NOT available in signal rated version

Breaker accessories

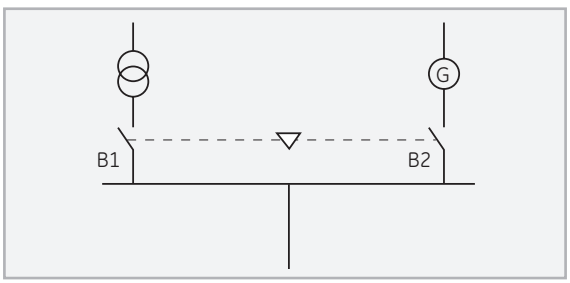
Mechanical interlocking of multiple breakers

Mechanically interlocked breakers([1])
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 air 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.



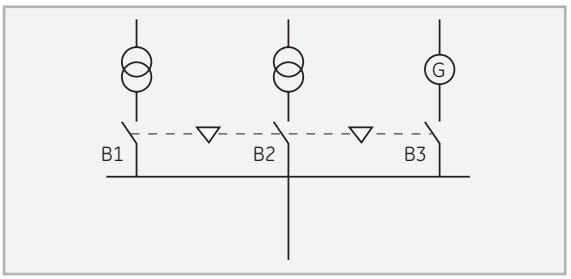
Any combination mode (fixed or draw-out), current rating, number of poles or frame size([1]) can be interlocked. The interlocking systems are available in one configuration for 2 breakers and in three others for 3 breakers.

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.

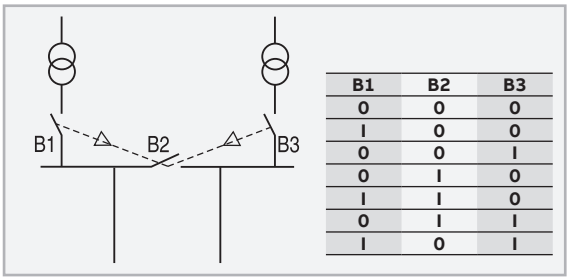


([1]) For frame T, only the combination in the same frame size can be interlocked.

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.

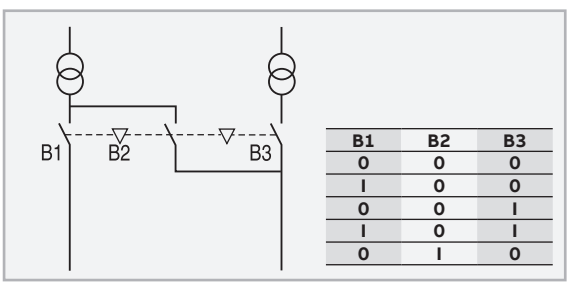


Three breaker interlock type C
Interlock type C in which one or two of the three breakers can be switched ON in accordance with the inserted diagram. Each breaker must be equipped with a factory mounted interlock type C. Six cables are needed.



B1	B2	B3
0	0	0
I	0	0
0	0	I
0	I	0
I	I	0
0	I	I
I	0	I

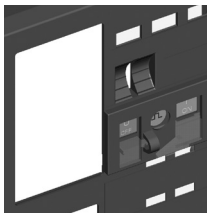
Three Breaker Interlock type D
Interlock type D in which one or two of the three breakers can be switched ON in accordance with the inserted diagram. Breakers B1 & B3 must be equipped with a factory mounted interlock type A and B2 with a interlock type D. Four cables are needed.



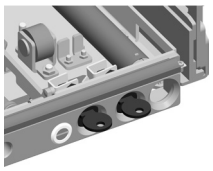
B1	B2	B3
0	0	0
I	0	0
0	0	I
I	0	I
0	I	0

Locking provisions for breaker and cassette door-interlock systems; misinsertion device

Standard padlocking facilities Breaker and cassette

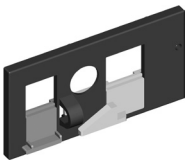


EntelliGuard power circuit EntelliGuard frames 1, 2 & 3 breakers in fixed and draw-out pattern have a standard padlocking facility.
For one padlock of 5-8mm allowing the breaker to be locked in it's "OFF" position.
For the frame T an acessory is available allowing the breaker to be locked in it's "OFF" position.
This by a keylock or padlock of 5-8mm.



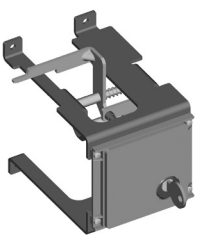
For all frames, the cassette supplied with the breakers in draw-out mode has three facilities for up to 3 padlocks([1]) of 5-8 mm. Two of these can be found on the cassette euchenon and can be used for locking the shutters in closed position or closing and locking the racking handle aperture. The third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

Facia push-button 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.

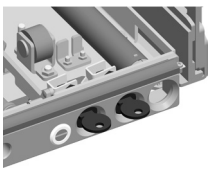
Breaker key lock facilities



A power circuit breaker can be equipped with 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.

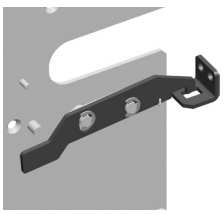
For frames 1, 2 & 3 devices are available for 1 Castell or Kirk lock or 4 Ronis 1104 or 4 Profalux locks.
For frame T, devices are available for 1 padlock and one Ronis 1104 or Profalux lock.
The separate Ronis and Profalux locks are part of the EntelliGuard product offering, but padlocks and the Castell and Kirk locks must be acquired elsewhere.

Cassette key lock facilities ([2])



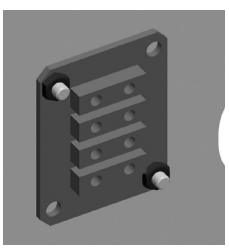
The cassette of a power circuit breaker can be equipped with up to two Ronis or Profalux key locks. The key lock system encompasses a device fitted to the cassette allowing the locks and the separate locks to be fitted. The device ensures that a draw-out circuit breaker cannot be moved from the TEST 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.

Misinsertion device



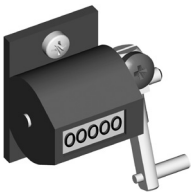
By incorporating this optional security interlock device into the draw-out cassette, an inadvertent insertion of an incorrect rated moving portion is prevented.
Before using the interlocking system, the misinsertion logic needs to be set on both the breaker and the device.

([1]) Shutter lock, maximum 1 padlock of 3-8 mm.
([2]) The frame T cassette can be equipped with maximum one Ronis or Profalux key locks

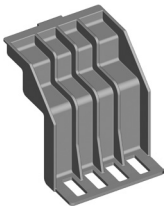
Breaker accessories

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 air circuit breaker in which it is installed.
The mechnical and electrical life span of the breaker can be extended by limited periodic maintenance. The counter contains information that can assist in determening when.

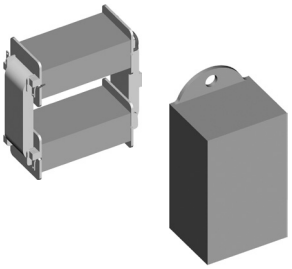


Contact wear indicator (1)
A second simple and easy to install mechanical device that can be used to ascertain when breaker maintenance is needed. Mounted above the contacts of a breaker in draw-out mode it allows the user to physically see the contacts and contains markers to determine their wear.

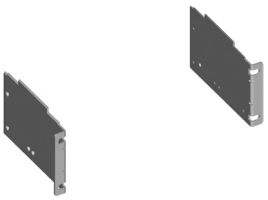


Sensors, Rogowski coils
If the EntelliGuard electronic trip unit is configured to allow earth/ground fault protection an external neutral sensor can be required. Rogowski coils for this application are available as separate items and are supplied with a mounting kit.
For the correct sensor choice and application details see page 2/31 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 2/31 of this catalogue.



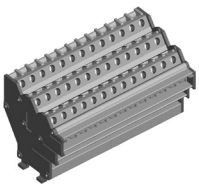
Wall mounting brackets(1)
EntelliGuard air circuit breakers are designed to be mounted within a frame inside a low voltage distribution or control panel. In some cases, specifically when the front connection option is used, wall mounting can be more expedient.
For this purpose wall mounting brackets are available for the breakers in fixed pattern, frames 1 and 2.



(1) Not available in frame T.

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.
- Frames 1, 2 & 3: 39 pole Block B
- Frame T: 16 pole Block C

For cases where the accessories are mounted in the field, separate auxiliary connection block are available.
- Frames 1, 2 & 3: A 78 block A plus B terminal for the fixed pattern and a 39 pole extra block B for breakers in draw-out pattern.
- Frame T: A 16 pole Block C for all patterns



IP54 cover(1)
All air 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.

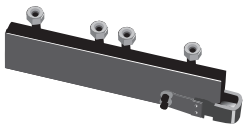
Hoisting/lifting accessories
All EntelliGuard protection devices are equipped with a set of hoisting eyes (see page 4/2). To use these hoisting eyes with standard lifting equipment specifically designed adaptors are available.
All EntelliGaurd frame T types are supplied with handling racks (see page 4/2).
For the frames 1, 2 & 3 lifting beams are available. One adaptor or beam is available for use with frames 1 & 2 (GLB1) and a second for use with the larger frame 3 breaker (GLB3).

(1) Not available in frame T.

Breaker accessories

Earthing device (maintenance accessory) spare parts

Earthing device([1])
To allow either the incoming cables or the busbar to be safely held at earthed potential and locked during system
maintenance, all EntelliGuard air 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 (Icw) of the breaker.

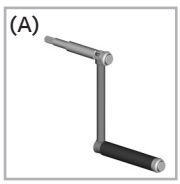


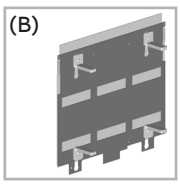
Spare parts for general use
The EntelliGuard air circuit breaker uses components that are designed to last the full life span of the device. However, certain components can be damaged or break during operational use. For these specific cases, the following spare parts are available:

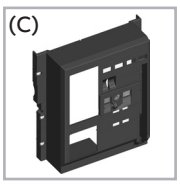
Cassette: moving portion racking handle **(A)**
shutters **(B)**

Breaker **(C)**: front cover

Locking devices: set of 4 Ronis key interlock cams

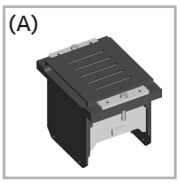


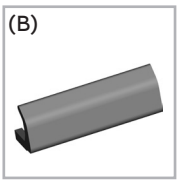


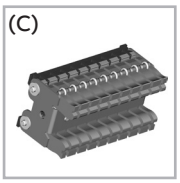


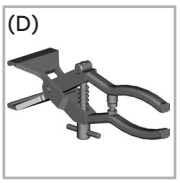
Spare part for maintenace purposes
Air circuit breakers as the EntellliGuard air circuit breakers require periodic maintenance. Here, in some cases certain components critical to the devices functionality could need replacement. Please contact our service department for specialist assistance in establishing 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)**









([1]) Not available in frame T.

Application guide

Application guide

Application guide

Handling, mounting and connecting

Clearance distances

A modern circuiit breaker is designed to interrupt high short-circuit currents in a very limted time frame. In doing so the breaker vents gas and a limited amount of conductive fragments.
EntelliGuard air 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	30	30
B2	30	30

(1) Dimension allows for field arc chute replacements

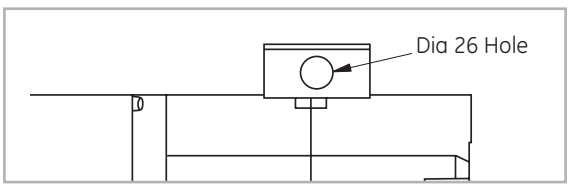
Handling

EntelliGuard frame T breakers in the fixed pattern and draw-out patterns are provided with the lifting racks.
To handle the breaker attach the racks between the 2 holes lifting eyes.
EntelliGuard frames 1, 2 & 3 breakers in the fixed pattern and 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.

Frame T

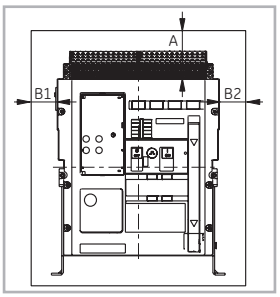
Side view fixed or draw-out type

Frames 1 & 2 & 3

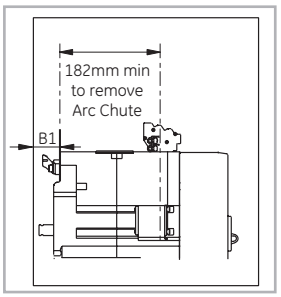


Side view fixed or draw-out type

Front view fixed or draw-out pattern



Side view fixed pattern



Recommended connection cross sections

The table below indicates the recommended bus bar dimensions to be used in connecting the EntelliGuard air circuit breaker. The current ratings of the devices with these recommended bus bar connection sizes are indicated on page 5/3 & 5/4.

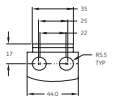
Breaker type 'automatic'	Switch type 'non automatic'	Frame	In in A	Recommended copper busbar sizes
GT04R & K	G704R	T		2 x 30 x 5
GG04, S N & H	GJ04S & GW04N	1 or 2	400	1 x 40 x 10 or 1 x 80 x 5 or 2 x 40 x 5
GG04 E and M	GJ04H			
GT07R & K	G707R	T	630	2 x 40 x 5
GG07S, N & H	GJ07S & GW07N	1 or 2		1 x 50 x 10 or 1 x 100 x 5 or 2 x 50 x 5
GG07 E and M	GJ07H			
GT08R & K	G708R	T	800	2 x 40 x 5
GG08S N & H	GJ08S & GW08N	1 or 2		1 x 50 x 10 or 1 x 100 x 5 or 2 x 50 x 5
GG08 E and M	GJ08H			
GT10R & K	G710R	T	1000	3 x 40 x 5
GG10S, N & H	GJ10S & GW10N	1 or 2		1 x 60 x 10 or 2 x 60 x 5
GG10 E and M	GJ10H			
GT13R & K	G713, R & K	T	1250	4 x 40 x 5
GG13S N & H	GJ13S & GW13N	1 or 2		2 x 40 x 10 or 2 x 80 x 5
GG13 E and M	GJ13H			
GT16R & K	G716R	T	1600	4 x 50 x 5
GG16S, N & H	GJ16S & GW16N	1		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
GG25S & GG25F	GW25F & GJ25S	1	2500	4 x 50 x 10 / 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 Plus 1 x 100 x 5
GH40N, H & M	GK40N & GZ40H			
GG40G & L	GJ40G	3	4000	4 x 100 x 10
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

Some configurations are listed for reference only

Handling, mounting and connecting

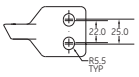
Frame T connection modes and application

Fixed pattern
R&K type 400-1600A Rear horizontal



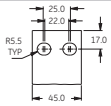
	38-42 Nm
A	2 x M10 x 60 - 8.8
B	4 x M10
C	4 x M10
D	2 x M10 - 8.8

Fixed pattern
R&K type 400-1600A Rear vertical



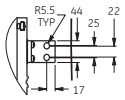
	38-42 Nm
A	2 x M10 x 60 - 8.8
B	4 x M10
C	4 x M10
D	2 x M10 -8.8

Fixed pattern
R&K type 400-1600A Front



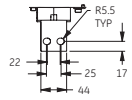
	38-42 Nm
A	2 x M10 x 60 - 8.8
B	4 x M10
C	4 x M10
D	2 x M10 -8.8

Draw-out pattern
R&K type 400-1600A Rear horizontal or vertical



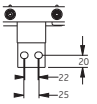
	38-42 Nm
A	2 x M10 x 60 - 8.8
B	4 x M10
C	4 x M10
D	2 x M10 - 8.8

Draw-out pattern
R&K type 400-1600A Rear horizontal



	38-42 Nm
A	2 x M10 x 60 - 8.8
B	4 x M10
C	4 x M10
D	2 x M10 - 8.8

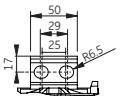
Draw-out pattern
R&K type 400-1600A Front



	38-42 Nm
A	2 x M10 x 60 - 8.8
B	4 x M10
C	4 x M10
D	2 x M10 - 8.8

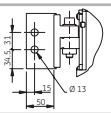
Frame 1 connection modes and application

Fixed pattern
S type 400-1600A Rear horizontal



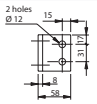
	38-42 Nm
A	2 x M10 x 60 - 8.8
B	4 x M10
C	4 x M10
D	2 x M10 - 8.8

Fixed pattern
400-2000A Rear vertical



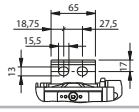
	38-42 Nm
A	2 x M10 x 60 - 8.8
B	4 x M10
C	4 x M10
D	2 x M10 - 8.8

Draw-out pattern
S type 2000A, N & H 400-2000A



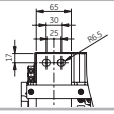
	38-42 Nm
A	2 x M10 x 60 - 8.8
B	4 x M10
C	4 x M10
D	2 x M10 - 8.8

Fixed pattern
N & H type 400-1600A Rear horizontal



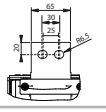
	38-42 Nm
A	2 x M10 x 60 - 8.8
B	4 x M10
C	4 x M10
D	2 x M10 - 8.8

Fixed pattern
400-2000A Front



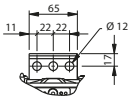
	38-42 Nm
A	2 x M10 x 60 - 8.8
B	4 x M10
C	4 x M10
D	2 x M10 - 8.8

Draw-out pattern
400-1600A Front



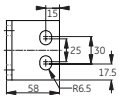
	38-42 Nm
A	2 x M10 x 60 - 8.8
B	4 x M10
C	4 x M10
D	2 x M10 - 8.8

Fixed pattern
2000A Rear horizontal



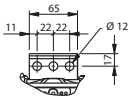
	38-42 Nm
A	3 x M10 x 60 - 8.8
B	6 x M10
C	6 x M10
D	3 x M10 - 8.8

Draw-out pattern
S type 400-1600A Rear vertical or horizontal



	38-42 Nm
A	3 x M10 x 60 - 8.8
B	6 x M10
C	6 x M10
D	3 x M10 - 8.8

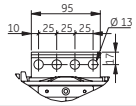
Draw-out pattern
2000A Front



	38-42 Nm
A	3 x M10 x 60 - 8.8
B	6 x M10
C	6 x M10
D	3 x M10 - 8.8

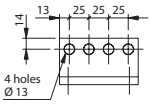
Frame 2 connection modes and application

Fixed pattern
400-4000A Rear horizontal or vertical



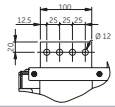
	50-60 Nm
A	4 x M12 x 60/90 - 8.8
B	8 x M12
C	8 x M12
D	4 x M12 - 8.8

Draw-out pattern
400-3200A Rear vertical or horizontal



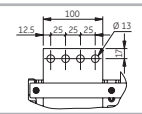
	50-60 Nm
A	4 x M12 x 60/90 - 8.8
B	8 x M12
C	8 x M12
D	4 x M12 - 8.8

Draw-out pattern
400-4000A Front



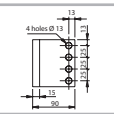
	50-60 Nm
A	4 x M12 x 60/90 - 8.8
B	8 x M12
C	8 x M12
D	4 x M12 - 8.8

Fixed pattern
400-4000A Front



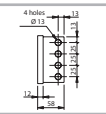
	50-60 Nm
A	4 x M12 x 60/90 - 8.8
B	8 x M12
C	8 x M12
D	4 x M12 - 8.8

Draw-out pattern
4000A Rear vertical ONLY



	50-60 Nm
A	4 x M12 x 60/90 - 8.8
B	8 x M12
C	8 x M12
D	4 x M12 - 8.8

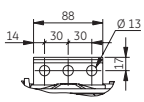
Draw-out pattern - enhanced thermal rated version
3200 & 4000A Rear vertical ONLY



	50-60 Nm
A	4 x M12 x 60/90 - 8.8
B	8 x M12
C	8 x M12
D	4 x M12 - 8.8

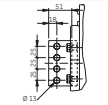
Frame 3 connection modes and application

Fixed pattern
4000-5000A Rear horizontal



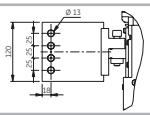
	50-60 Nm
A	3 x M12 x 60/80 - 8.8
B	6 x M12
C	6 x M12
D	3 x M12 - 8.8

Draw-out pattern 4000-5000A Rear horizontal
-OR- 4000 -6400A Rear vertical[1]

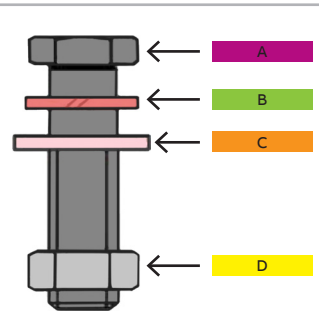


	50-60 Nm
A	3 x M12 x 60/80 - 8.8
B	6 x M12
C	6 x M12
D	3 x M12 - 8.8

Fixed pattern
4000-6400A Rear vertical



	50-60 Nm
A	4 x M12 x 60/90 - 8.8
B	8 x M12
C	8 x M12
D	4 x M12 - 8.8



(1) The frame 3 draw-out pattern construction has two connection pads per connection point.
Use a torque of 40 Nm when putting terminals on rear of cassette

Some configurations are listed for reference only

Application guide

Heat dissipation, Watt loss and current ratings at temperatures >50°C

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 air 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 vicinty 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 5/2.

Breaker type automatic	Switch type non automatic	Frame	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				
GT04R & K	G704R	T	400	4.6	400	400	400	400	400
GG04S 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
GT07R &K	G707R	T	630	11.8	630	630	630	630	630
GG07S 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
GT08K & R	G708R	T	800	19.2	800	800	800	800	800
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
GT10R & K	G710R	T	1000	30	1000	1000	1000	1000	1000
GG10S 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
GT13R & K	G713R	T	1250	46.9	1250	1250	1250	1250	1250
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
GT16R & K	G716R	T	1600	66.6	1600	1600	1600	1600	1600
GG16S 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

Some configurations are listed for reference only

Breaker type automatic	Switch type non automatic	Frame	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: draw-out types				
GT04R & K	G704R	T	400	8.8	400	400	400	400	400
GG04S 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
GT07R & K	G707R	T	630	21.8	630	630	630	630	630
GG07S 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
GT08R & K	G708R	T	800	35.2	800	800	800	800	800
GG08S 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
GT10R & K	G710R	T	1000	55	1000	1000	1000	1000	1000
GG10S 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
GT13R & K	G713R	T	1250	85.9	1250	1250	1250	1250	1250
GG13S 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
GT16R & K	G716R	T	1600	128	1600	1500	1450	1400	1350
GG16S 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
GG20S 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

Some configurations are listed for reference only

Application guide

Heat dissipation, Watt loss and current ratings at temperatures >50 °C

EntelliGuard air 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 vicinty 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 5/2.

Breaker type automatic	Switch type non automatic	Frame	In in A	Power loss at In per pole (W)	Maximum user current Ie in A Horizontal or front([2]) connection mode: fixed pattern				
					≤50 °C	55 °C	60 °C	65 °C	70 °C
					Temperature in the direct environment of the EntelliGuard				
GT04R & K	G704R	T	400	4.6	400	400	400	400	400
GG04S 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
GT07R & K	G707R	T	630	11.8	630	630	630	630	630
GG07S 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
GT08R & K	G708R	T	800	19.2	800	800	800	800	800
GG08S 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
GT10R & K	G710R	T	1000	30	1000	1000	1000	1000	1000
GG10S 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
GT13R & K	G713R	T	1250	46.9	1250	1250	1250	1250	1250
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
GT16R & K	G716R	T	1600	66.6	1600	1500	1450	1400	1350
GG16S 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])

([1]) Rear horizontal connections cannot be used at this current rating
([2]) Front connections are available for the standard frame 1 and frame 2 types (not available for GH,GK and GZ types)

Some configurations are listed for reference only

Breaker type 'automatic'	Switch type 'non automatic'	Frame	In in A	Power loss at In per pole (W)	Maximum user current Ie in A Horizontal or front(2) connection mode: draw-out types				
					≤50 °C	55 °C	60 °C	65 °C	70 °C
					Temperature in the direct environment of the EntelliGuard				
GT04R & K	G704R	T	400	8.8	400	400	400	400	400
GG04S 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
GT07K	G707R	T	630	21.8	630	630	630	630	630
GG07S 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
GT08R & K	G708R	T	800	35.2	800	800	800	800	800
GG08S 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
GT10R & K	G710R	T	1000	55	1000	1000	1000	1000	1000
GG10S 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
GT13R & K	G713R	T	1250	85.9	1250	1250	1250	1250	1250
GG13S 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
GT16R & K	G716R	T	1600	128	1600	1500	1400	1350	1250
GG16S 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
GG20S 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 frame 1 and frame 2 types (not available for GH,GK and GZ types)

Some configurations are listed for reference only

Application guide

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 air 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 5/9 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 Record Plus	Trip unit	Setting denomination	Settings determining selectivity	Recommended EntelliGuard settings				
				Ir or Ie setting Ratio	LTDB setting band	Ist setting Ratio	STDB setting band	I setting
FD & FE frame	LTMD	Ir	Ratio & Band	1.6 x	C22			Minimum setting 5kA -FD160, 7kA - FE160, 9kA - FE250 or I = 'OFF'
		Im	Ratio & Band			1.6 x	Band 2	
FD & FE frame	GTM	Ir	Ratio & Band	1.6 x	C22			
		Im	Ratio & Band			1.6 x	Band 2	
FE frame	PremEon	Ir	Ratio & Band	1.3 x				
		LTD line	Band		C8			
		LTD Motor	Band		C14			
		Ist	Ratio & Band			1.35 x	Band 2	
FG frame	PremEon	Ir	Ratio & Band	1.3 x				Minimum setting 14kA -FG400, 18kA - FG630 or use ZSI or I = 'OFF'
		LTD line	Band		C8			
		LTD Motor	Band		C14			
		Ist	Ratio & Band			1.35 x	Band 3	
FG frame	SMR2	Ir	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			
		Ist	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	Ir	Ratio & Band	1.4 x	C8			Minimum setting 18kA -FK800 20kA - FK1000 20kA - FK1250 28kA - FK1600 or use ZSI or I = 'OFF'
		Ist	Ratio			1.35 x		
		STD	Band				Band 7	
FK frame	SMR1s	Ir	Ratio	1.4 x				
		LTD cl. 5	Band		C8			
		LTD cl. 10	Band		C12			
		LTD cl. 20	Band		C19			
		LTD cl. 30	Band		C22			
		Ist	Ratio					
		STD = 300ms	Band				Band 12	
		STD = 200ms	Band				Band 10	
		STD = 100ms	Band				Band 7	
EntelliGuard	GT-S & H	Ir	Ratio	1.25 x				Use ZSI or I = 'OFF'
		LTD class	Band		2 higher			
		Ist	Ratio			1.25 x		
		STD band min. until 11	Band				2 higher	
		STD band ≤12					1 higher	
Industrial fuses GL/Gg type	----	Current rating	Ratio & Band	2 x	F20	ST = 8 x Ir, STDB band 5 and I = 12 x Ie		

Some configurations are listed for reference only

Selectivity with downstream devices, tables

Downstream device	Upstream EntelliGuard device and selectivity limit Is(1)							
	GT04R to GT16R	GT04K to GT16K	GG04S to GG20S	GG04N to GG20N	GG25N to GG40N	GG(H)25H to GG(H)40H	GG32G to GG40G	GG40L to GG64L
ElfaPlus MCBs EP30, 45, 60, 100 & 250, CP30, 45 & 60, DME60, DPE100, DP(A)60, DP(A)100 & DPT100	T	T	T	T	T	T	T	T
ElfaPlus MCBs HTI & S90 C curve	T	T	T	T	T	T	T	T
Surion manual motor starters GPS1BS ≤ 10A GPS1MH ≤ 12.5A GPS2BS 10A, GPS2MH 10A	T	T	T	T	T	T	T	T
Surion manual motor starters GPS1BS, GPS1MS 12.5kA, GPS1MH > 12.5A GPS2MH >10A	T	T	T	T	T	T	T	T
Surion manual motor starters GPS1BS, GPS1MS ≥16A, GPS2BS >10A	T	T	T	T	T	T	T	T
Record Plus								
FD & FE frame C, E, V, S tiers	T	T	T	T	T	T	T	T
FD & FE frame N tier	T	T	T	T	T	T	T	T
FD & FE frame H tier	T	T	T	T	T	T	T	T
FD & FE frame L tier	T	T	T	T	T	T	T	T
FG frame N tier	T	T	T	T	T	T	T	T
FG frame H tier	T	T	T	T	T	T	T	T
FG frame L tier	T	T	T	T	T	T	T	T
FK frame N tier	T	T	T	T	T	T	T	T
FK frame H tier	T	T	T	T	T	T	T	T
FK frame L tier	T	T	T	T	T	T	T	T
EntelliGuard								
GT04R to GT16R	42kA(2)	T						
GT04K to GT16K	42kA(2)	50kA(2)						
GG04S to GG20S	--	--	42kA(2)	T	T	T	T	T
GG04N to GG20N	--	--	50kA(2)	65kA(2)	65kA(2)	T	T	T
GG04E to GG20E	--	--	50kA(2)	65kA(2)	65kA(2)	85kA(2)	T	T
GG(H)25H to GG(H)40H	--	--	--	--	65kA(2)	85kA(2)	T	T
GG(H)25M to GG(H)40M	--	--	--	--	65kA(2)	85kA(2)	T	T
GG(H)40M to GG(H)64M	--	--	--	--	--	--	--	100kA(2)
GG(H)40L to GG(H)64L	--	--	--	--	--	--	--	100kA(2)
Industrial fuses GL/Gg type	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%

Some configurations are listed for reference only

Application guide

Protection of standard circuits (1)

Protection of standard circuits
Protection devices as the EntelliGuard air 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 5/12 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 1/10 to 1/13 of this catalogue.

Design current of a circuit
The equipment and devices in an electrical circuit determine its current load or design current (Ib).
A circuit breaker's overload or Ir setting is normally adjusted to a value equal to the design current.

Weakest chort-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 air 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 (Ie) are available. Each have a sub setting (Ir) of 0.5 to 1 times the chosen Ie rating. This device is normally set to a value that is equal or closely matches the design current (Ib).

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

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:
- inrush characteristics of the protected devices
- protection against the weakest short-circuit current
- and fault currents to earth.

17 narrow and accurate time bands allow the EntelliGuard air 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 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 times the breaker rating (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 air circuit breaker to interrupt a fault within the timing required by the standards and offer selectivity across multiple levels.

Instantaneous chort-circuit protection
Set as a multiple of the primary overload adjustment Ie 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 air 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).

Application guide

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 air 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 air 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 x Ir) 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 x In	1.5 x In	7.2 x In
10A	t < 2 hours	t < 2 min.	2 ≤ t < 10 sec.
10	t < 2 hours	t < 4 min.	4 ≤ t ≤ 10 sec.
20	t < 2 hours	t < 8 min.	6 ≤ t ≤ 20 sec.
30	t < 2 hours	t < 12 min.	9 ≤ t ≤ 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 x In).
On a air circuit breaker, use of the 'slower' protection bands that closely match the indicated classes is recommended (LTDB set between the C-8 to the C-22 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 air circuit breaker must be set to at least 12 x Ir 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 x Ie 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 3/29.

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 3 phase undervoltage relay and current unbalance device thus providing comprehensive motor protection.

Protection of capacitor banks
Air 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 air 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	Mimum crest inrush values		
	1st period	2nd period	After 3 periods
< 50 kvA	25 x In	12 x In	5 x In
≥ 50 kvA	15 x In	8 x In	3.5 x In

It is recommended that the timed short-circuit device of a air circuit breaker is set to at least 8 x Ir 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 x Ie is advisable (=15 x In plus tolerances).

Automatic transfer systems
EntelliGuard air 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.

Application guide

Environmental considerations

Ambient temperature
EntelliGuard air 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, derating factors must be applied when the device is used in ambient temperatures higher than 50 °C.

Storage temperature
Air 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 derating of breaker current or rated voltage is applicable. For altitudes above 2000m the following derating factors apply:

	Altitude correction factors		
Altitude	**≤ 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
Air 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 air 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

Electronic trip units

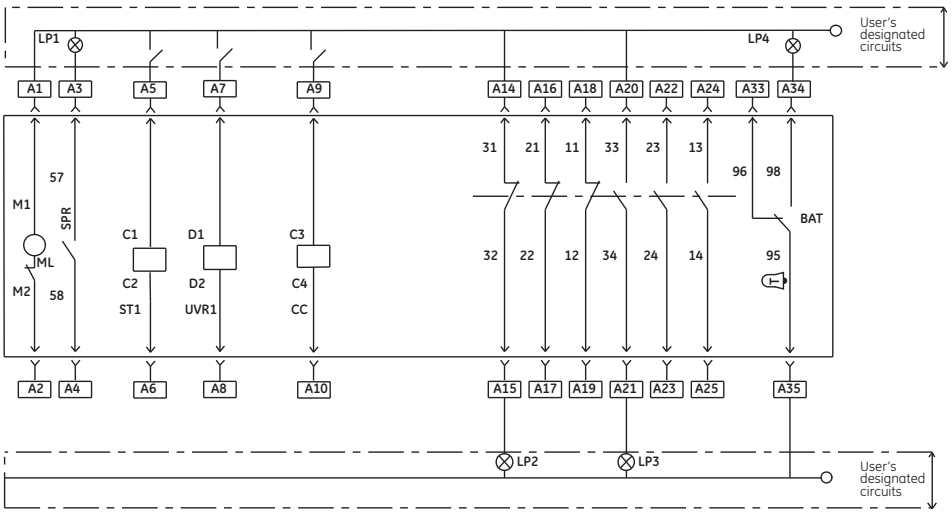
Wiring diagrams

Wiring diagrams

Breaker connection schemes

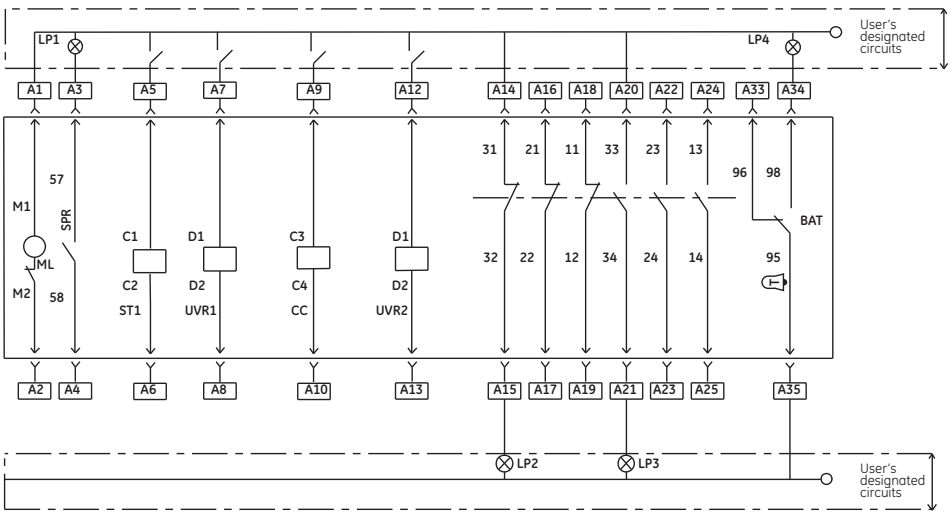
Standard use of Terminal block A on frame T

One Terminal block A is supplied with each breaker



Standard use of Terminal block A on frames 1, 2 & 3

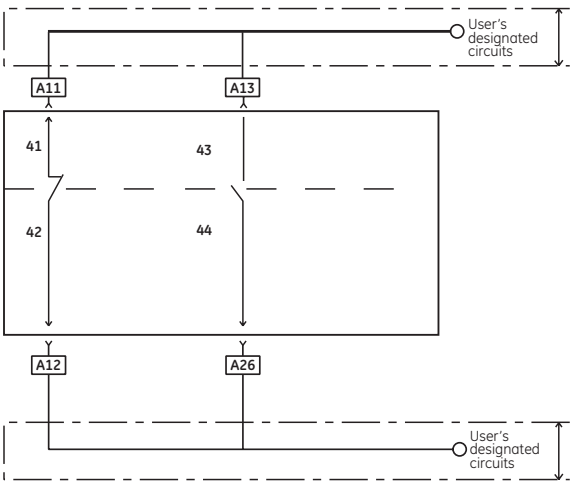
One Terminal block A is supplied with each breaker



Breaker connection schemes

Extended use of Terminal block A on frame T

Used with 4NO & 4NC auxiliary contacts



User designated circuits; indicators

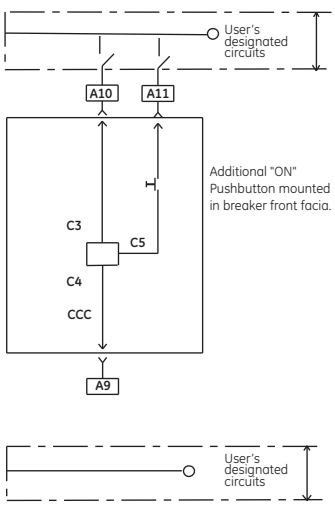
LP1: Spring charge status
LP2: Breaker open
LP3: Breaker closed
LP4: Fault
LP5: Breaker ready to close

Terminology

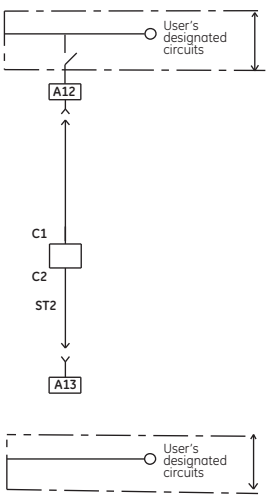
CC: Close coil
ST: Shunt release
UVR: Undervoltage release
SPR: Spring change status
RTC: Ready to close status
M: Motor operator
BAT: Bell alarm trip
CCC: Comand close coil
NI: Network interlock

Optional use of Terminal block A on ALL frames

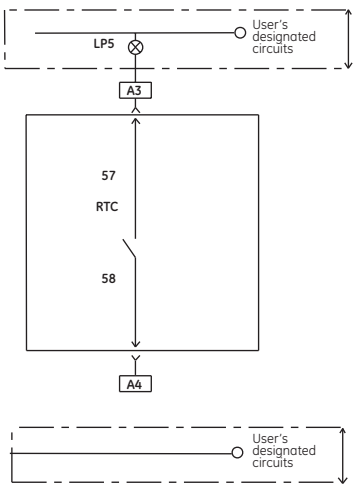
Used with a command closing coil (CCC)



Used with a 2nd shunt release (Replacing 2nd UVR release)



Used with a RTC contact (Replacing SPR contact)



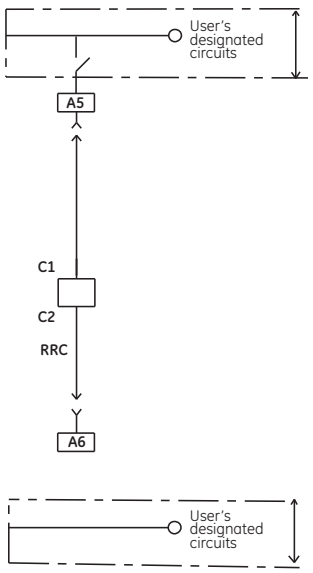
(1) Only possible on frame T with a set of 3NO plus 3NC auxiliary contacts
(2) Only possible on frames 1, 2 & 3 (Not on frame T)

Wiring diagrams

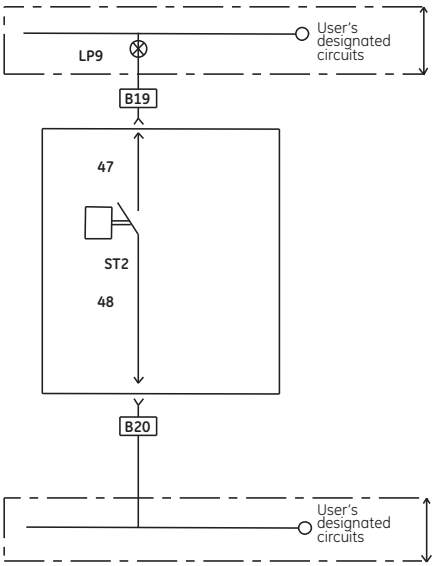
Breaker connection schemes

Optional use of Terminal block A on frames 1, 2 & 3

Used with a remote reset coil (replacing shunt release coil)

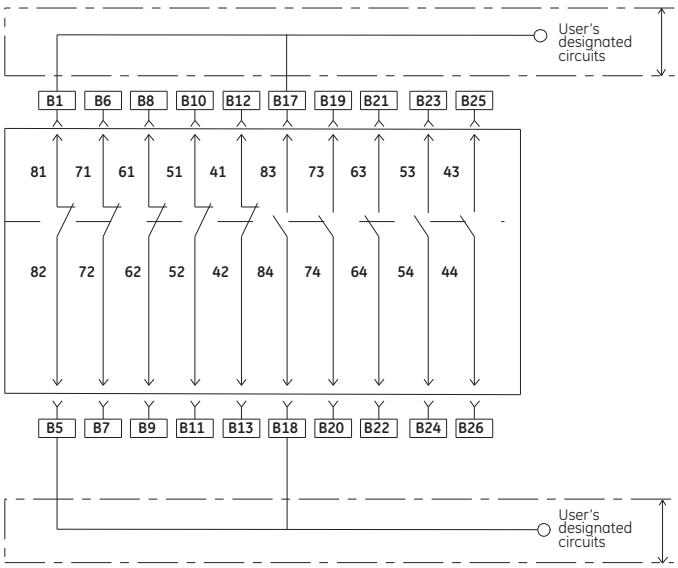


Used with a network interlock (NI) (replacing 1 UVR and 1 ST)



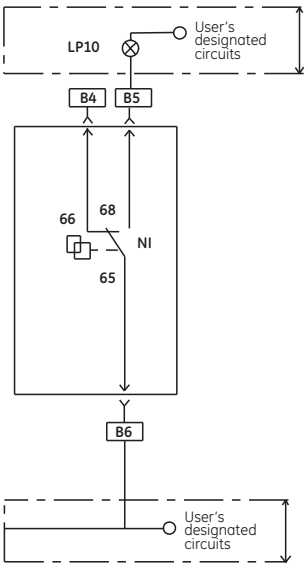
Standard use of Terminal block B on frames 1, 2 & 3

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



Optional use of Terminal block B on frames 1, 2 & 3

Used with a network interlock (NI) (replacing 2 NO aux. contacts)

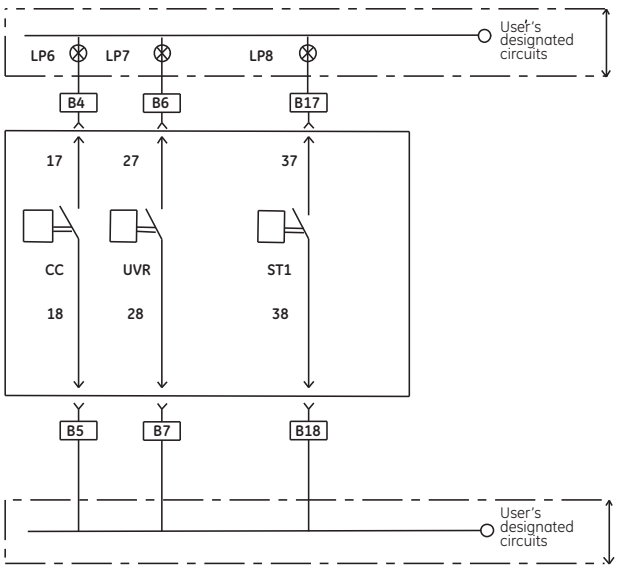


Remark:
When the auxiliary contact set contains TWO signal rated types these are connected to terminals: B10-B11, B12-B13, B23- B24 & B25-B26
When the auxiliary contact set contains FOUR signal rated types these are connected to terminals: B4-B5, B6-B7, B8-B9, B10-B11, B17-B18, B19-B20, B21-B22 & B23-B24

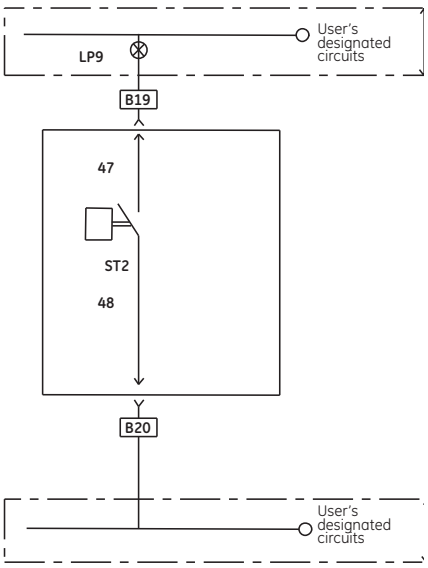
Breaker connection schemes

Optional use of Terminal block B on frames 1, 2 & 3

Used with coil indication contacts (replacing 2 NC and 1 NO aux. contact)

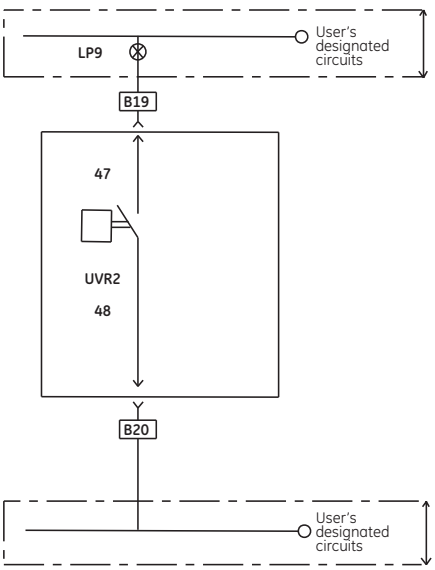


Used with coil indication contact (replacing 1 NO aux. contact)



Optional use of Terminal block B on frames 1, 2 & 3

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

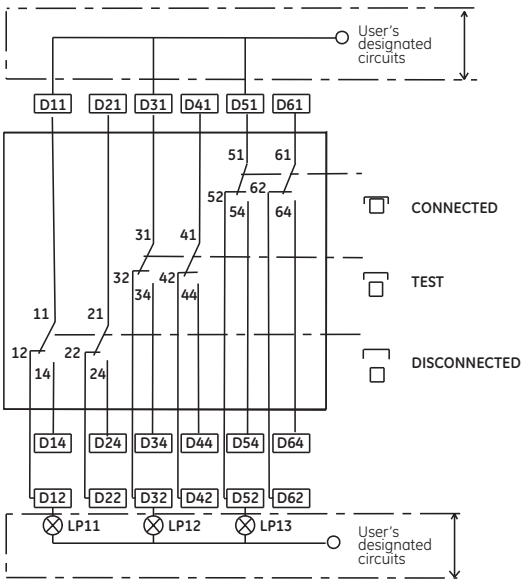
CC: Close coil
ST: Shunt release
UVR: Undervoltage release
SPR: Spring change status
NI: Network interlock

Wiring diagrams

Cassette & trip unit connection schemes

Optional cassette indication switches valid for ALL frames

One Terminal block A is supplied with each breaker

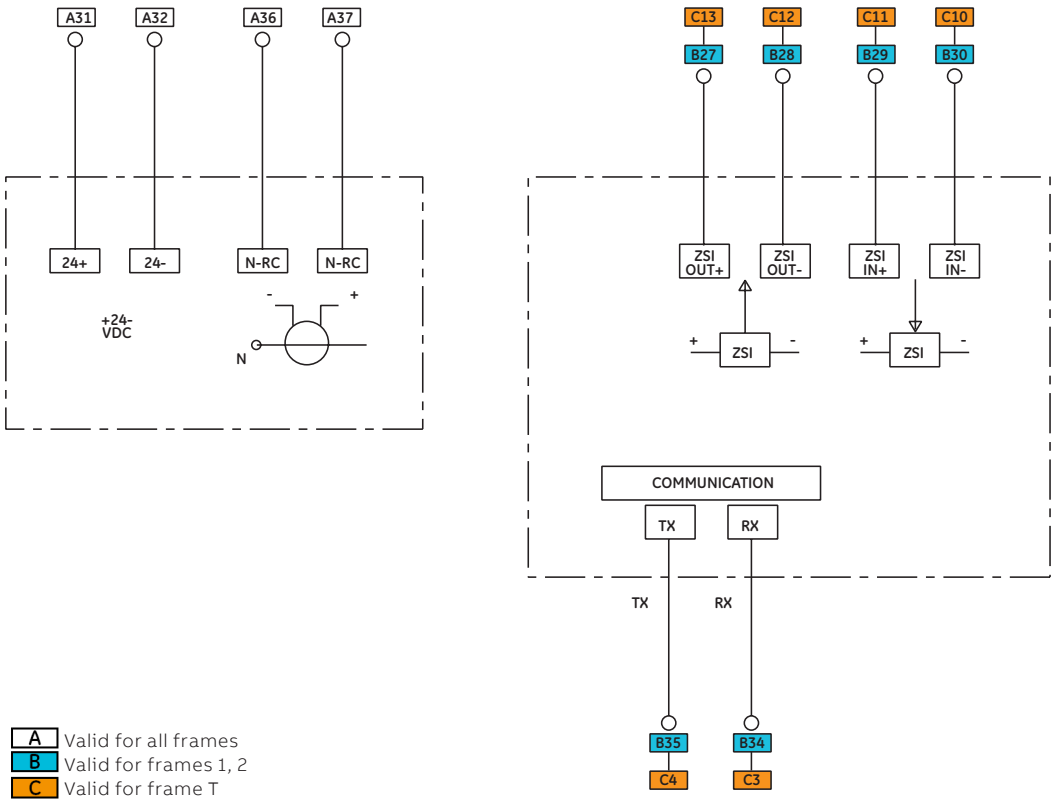


User designated circuits; indicators

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

Trip unit connection schemes

Trip unit type GT-S, valid for ALL frames

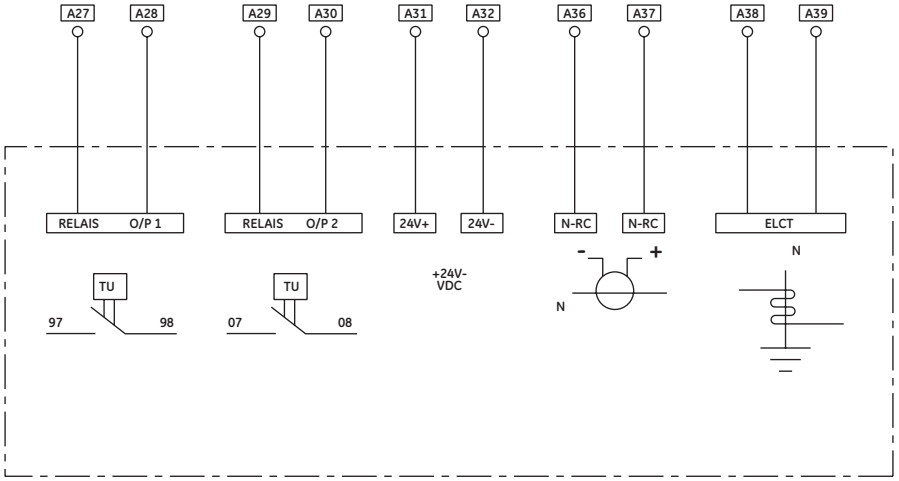


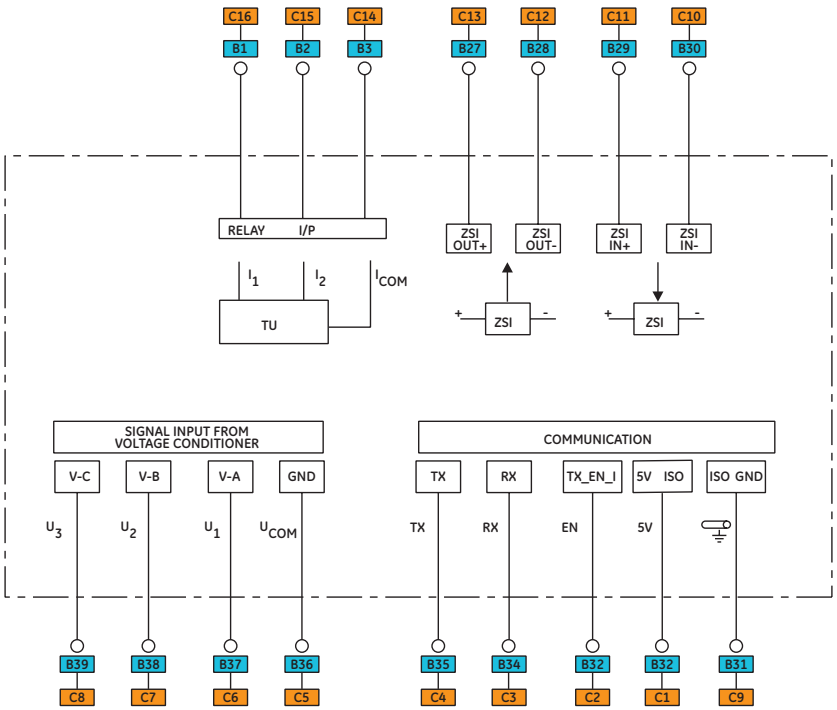
A Valid for all frames
B Valid for frames 1, 2
C Valid for frame T

Wiring diagrams

Trip unit connection schemes

Trip unit type GT-H, valid for ALL frames





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

A Valid for all frames
B Valid for frames 1, 2
C Valid for frame T

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

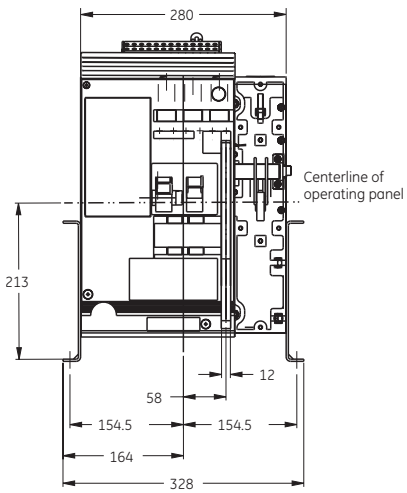
Electronic trip units

Dimensions

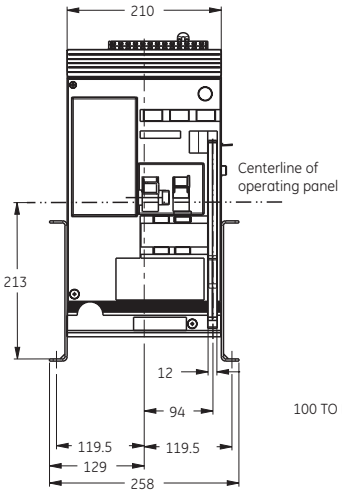
Dimensions

Frame T – Fixed pattern

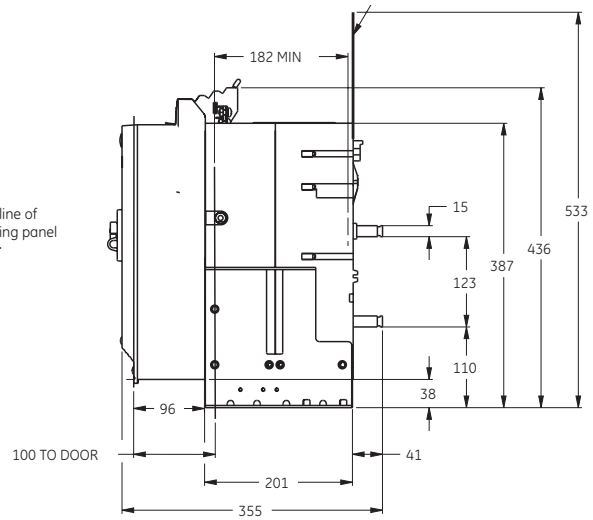
Front view 4 pole



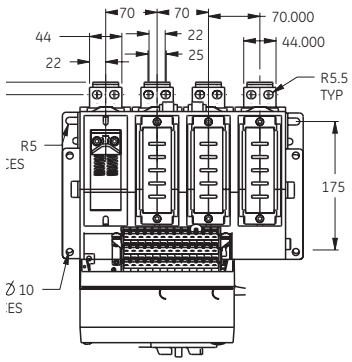
Front view 3 pole



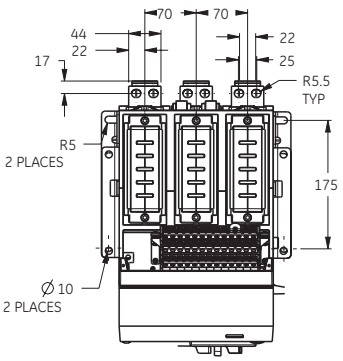
Side view



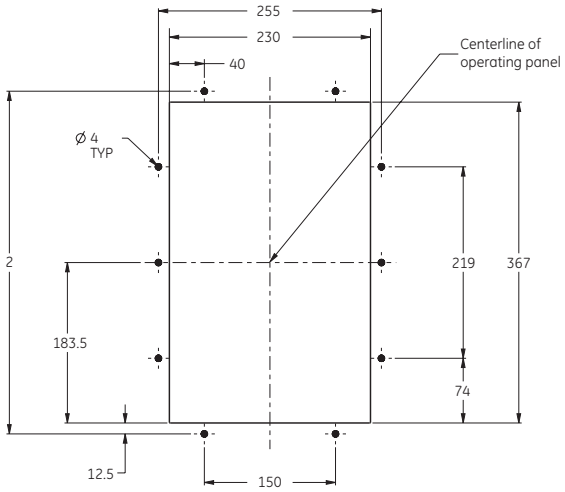
Top view 4 pole



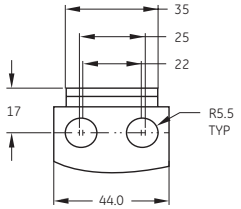
Top view 3 pole



Door cut-out



Standard connection Pads



Remarks:

B – Minimum space to earth metal and for insulated metal or insulate sheet (30mm). The 182 min dimension is to allow for Arc Chute removal.

Note:

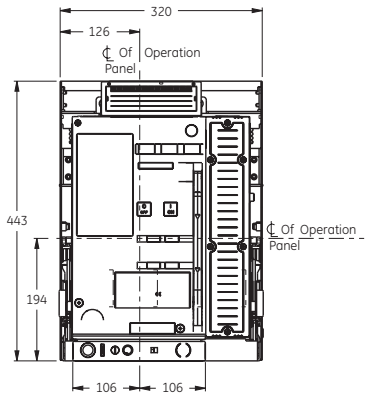
Copper work used to connect must be supported within 200mm of the breaker connections.

Applicable for: busbar or cables.

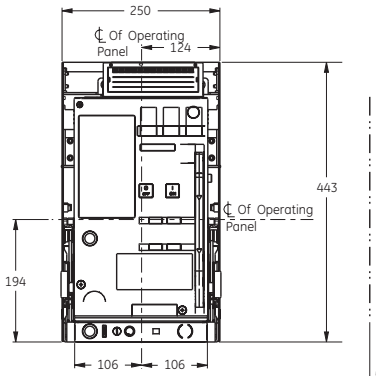
All busbar connections to be tightened to 50Nm torque.

Frame T – Draw-out pattern (universal)

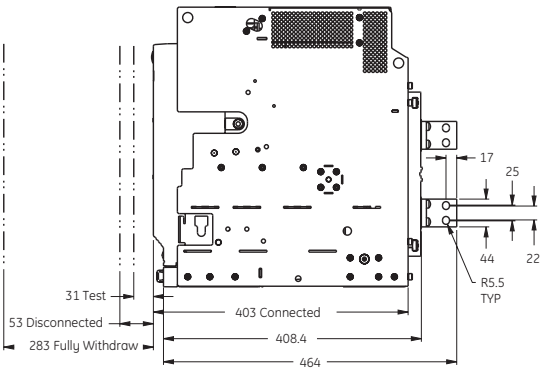
Front view 4 pole



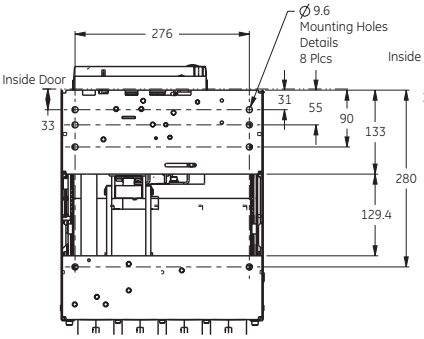
Front view 3 pole



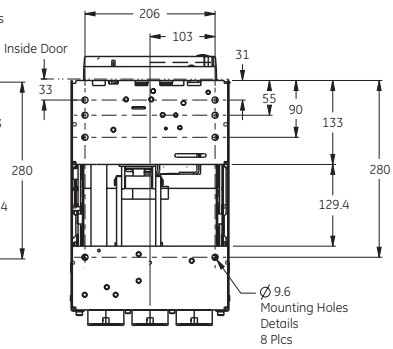
Side view



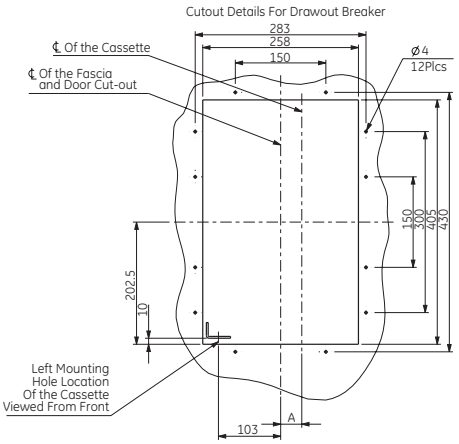
Bottom view 4 pole



Bottom view 3 pole

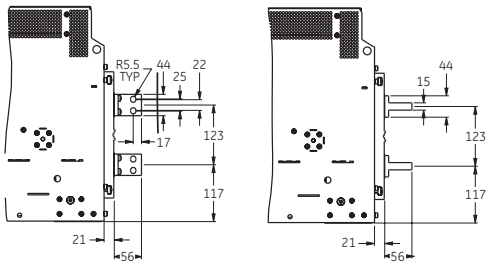


Door cut-out



Breaker type	DIM "A"
Frame T 3 pole	0.0
Frame T 4 pole	35.0

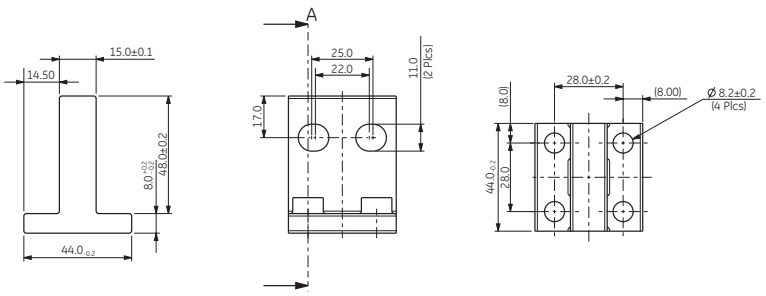
Universal connection pads
Mounted horizontally or vertically



Remarks:
A – 6 mounting holes of 9.5mm

Note:
Copper work used to connect must be supported within 200mm of the breaker connections.
Applicable for: busbar or cables.
All busbar connections to be tightened to 50Nm torque.

Universal connection pads - Details

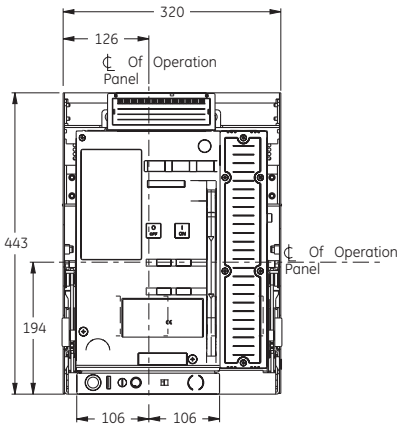


07

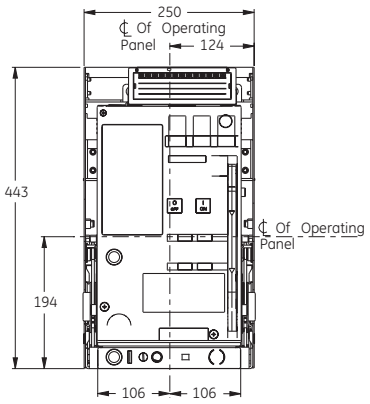
Dimensions

Frame T – Draw-out pattern (direct horizontal)

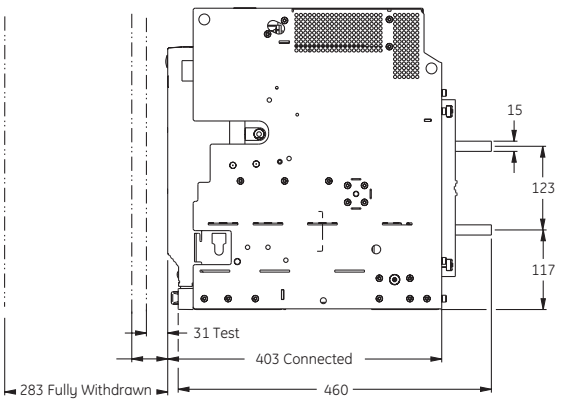
Front view 4 pole



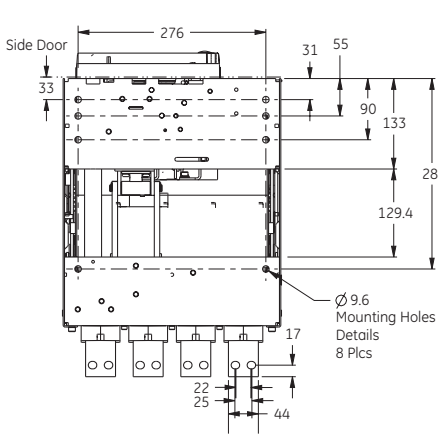
Front view 3 pole



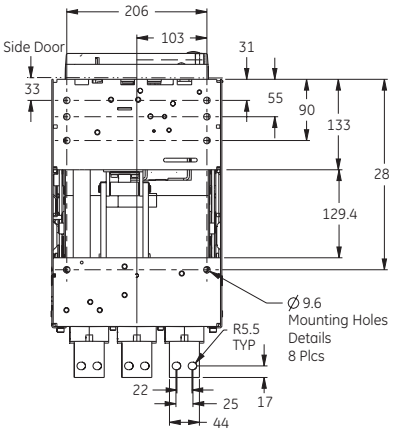
Side view



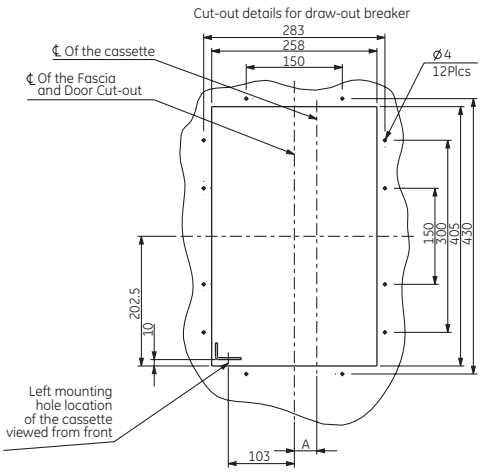
Bottom view 4 pole



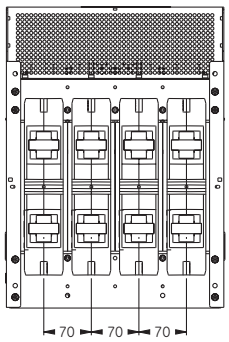
Bottom view 3 pole



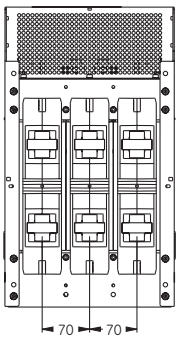
Door cut-out



Back view 4 pole



Back view 3 pole



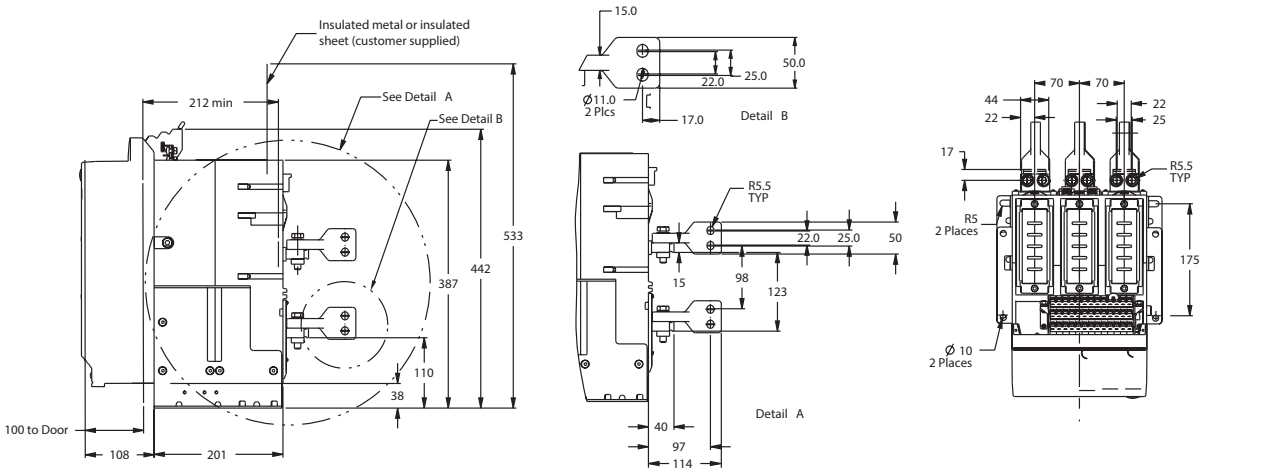
Breaker type	DIM "A"
Frame T 3 pole	0.0
Frame T 4 pole	35.0

Remarks:
A – 6 mounting holes of 9.5mm

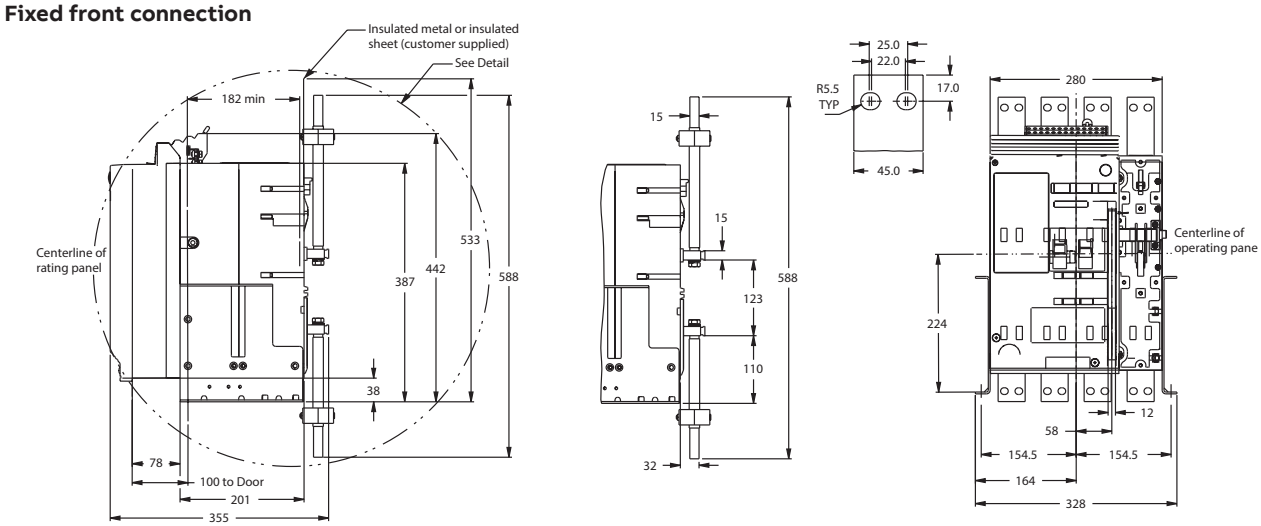
Note:
Copper work used to connect must be supported within 200mm of the breaker connections.
Applicable for: busbar or cables.
All busbar connections to be tightened to 50Nm torque.

Frame T – Alternate connection modes

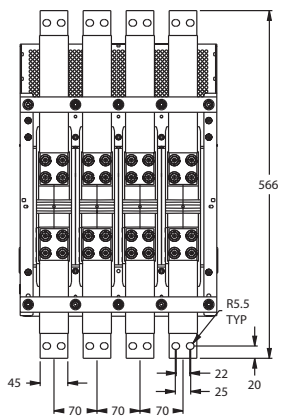
Fixed vertical rear connection



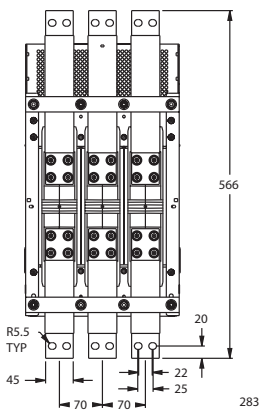
Fixed front connection



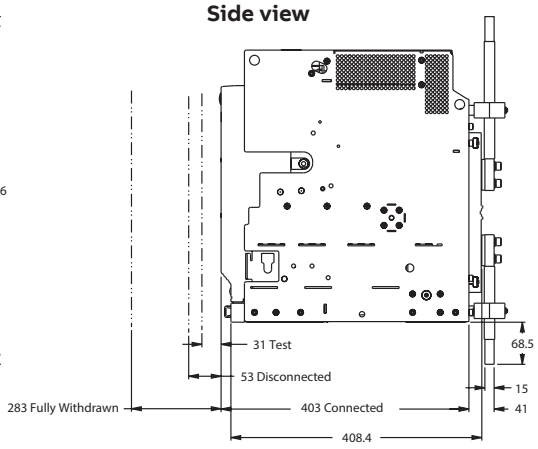
Draw-out front connection 4 pole



Draw-out front connection 3 pole



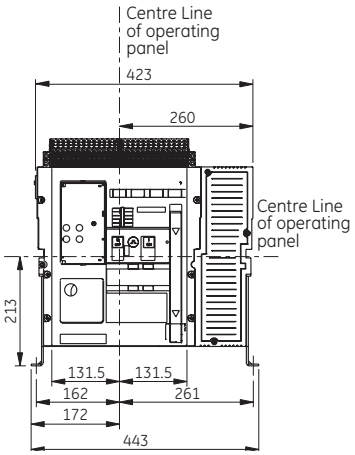
Draw-out front connection Side view



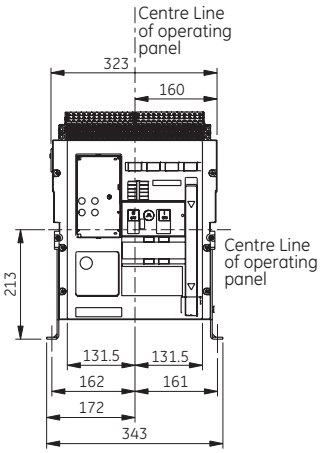
Dimensions

Frame 1 - Fixed pattern

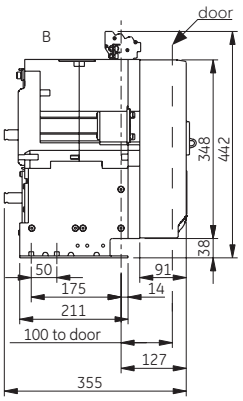
Front view 4 pole



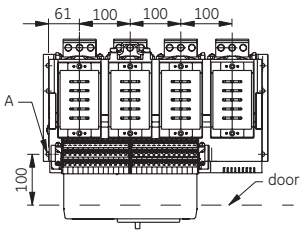
Front view 3 pole



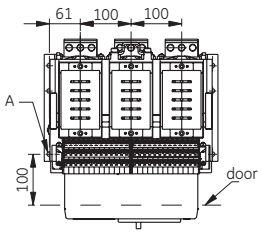
Side view



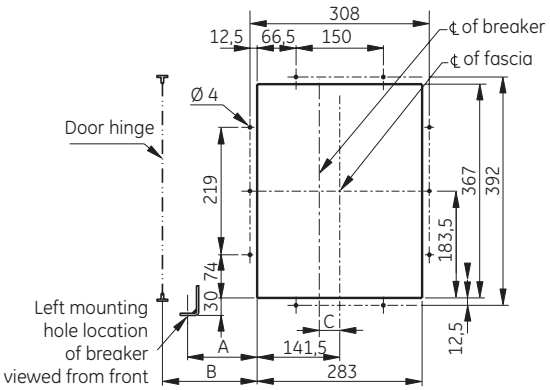
Top view 4 pole



Top view 3 pole

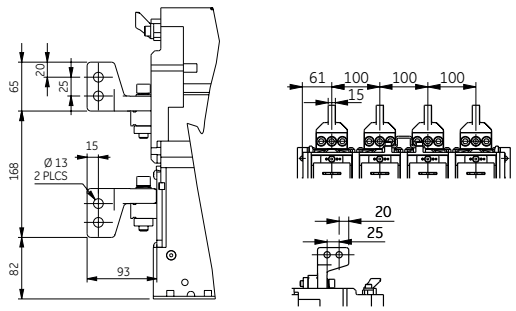


Door cut-out

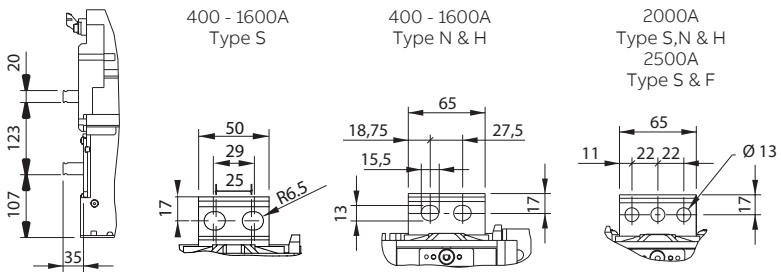


Breaker type	DIM "A"	DIM "B" minimum	DIM "C"
Frame T 3 pole	20.5	55.0	1.5
Frame T 4 pole	20.5	55.0	-48.5

Standard connection pads Vertical maximum 2500A



Standard connection pads Horizontal maximum 2000A



Remarks

A – 6 mounting holes of 9.5mm

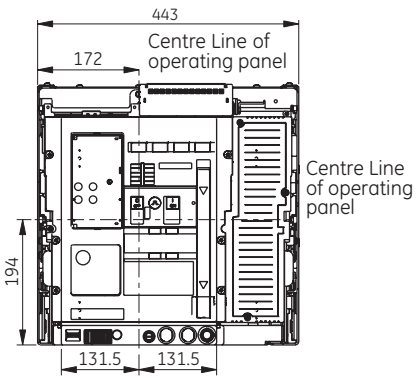
B – Minimum space to earth metal and for insulated metal or insulate sheet (30mm).
The 182 min dimension is to allow for Arc Chute removal.

Note

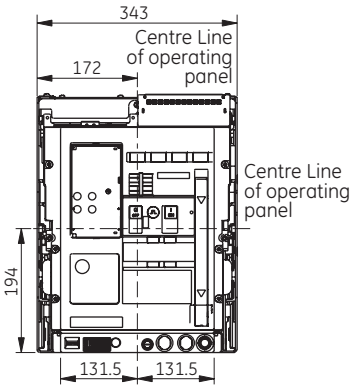
Copper work used to connect must be supported within 200mm of the breaker connections.
Applicable for: busbar or cables.
All busbar connections to be tightened to 50Nm torque

Frame 1 - Draw-out pattern

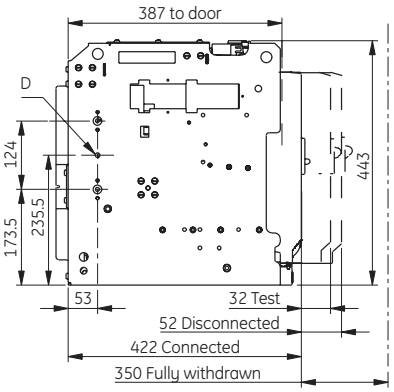
Front view 4 pole



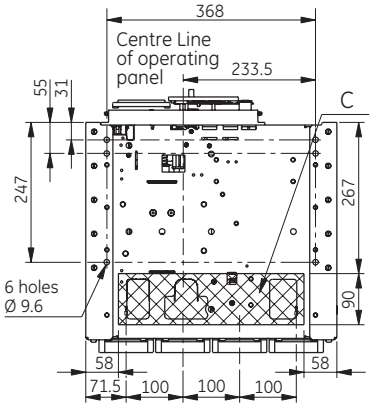
Front view 3 pole



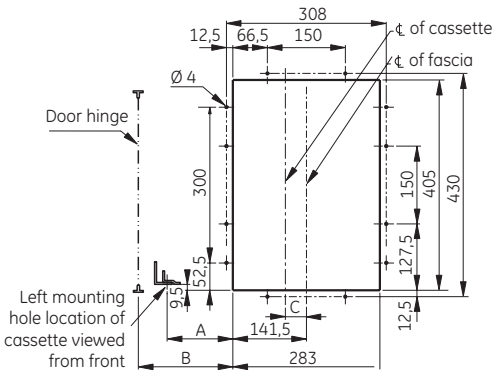
Side view



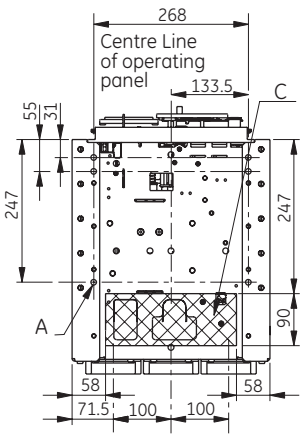
Bottom view 4 pole



Door cut-out



Bottom view 3 pole



Breaker type	DIM "A"	DIM "B" minimum	DIM "C"
Frame 1 3 pole	-7.0	60.0	0.5
Frame 1 4 pole	-7.0	60.0	-49.5

Remarks:

A – 6 mounting holes of 9.5mm

C – Please leave unobstructed; required for ventilation

D - 1 hole M6 on left hand side for earthing

Note:

Copper work used to connect must be supported within 200mm of the breaker connections.

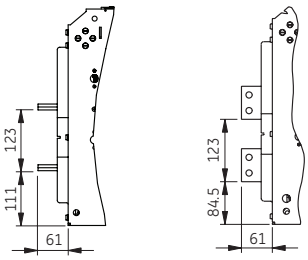
Applicable for: busbar or cables.

All busbar connections to be tightened to 50Nm torque.

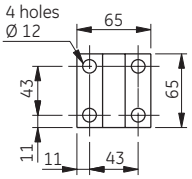
Dimensions

Frame 1 - Draw-out pattern

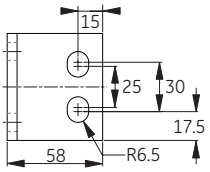
Universal connection pads
Vertical or horizontal max. 1600A



S type

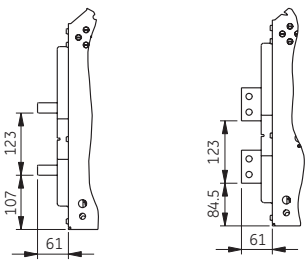


S, N & H type

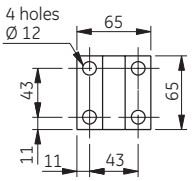


S type - 12mm thick

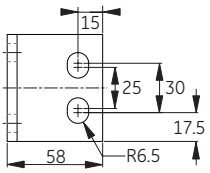
Universal connection pads
Vertical or horizontal max. 2000A



S, N & H type

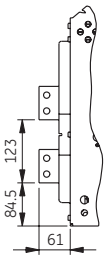


S, N & H type

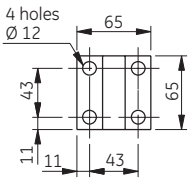


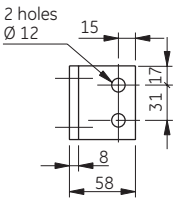
S, N & H type

Universal connection pads
Only vertical max. 2500A



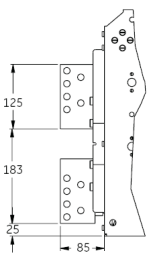
S & F type

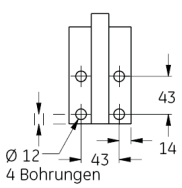




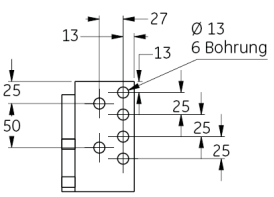
Frame 1 - Draw-out pattern - Special vertical terminal

Vertical connection pad, 2500A - S & F type





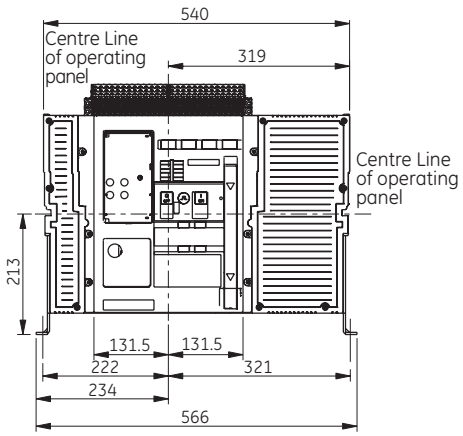
4 holes



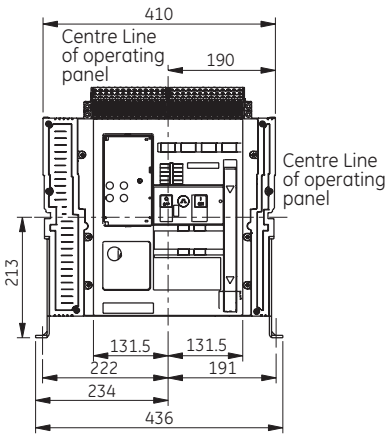
6 holes

Frame 2 - Fixed pattern

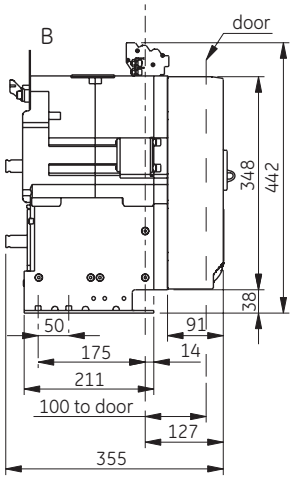
Front view 4 pole



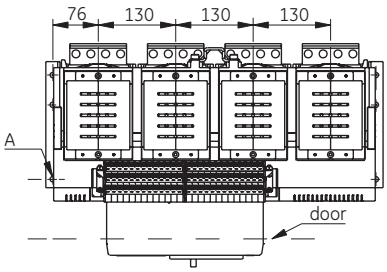
Front view 3 pole



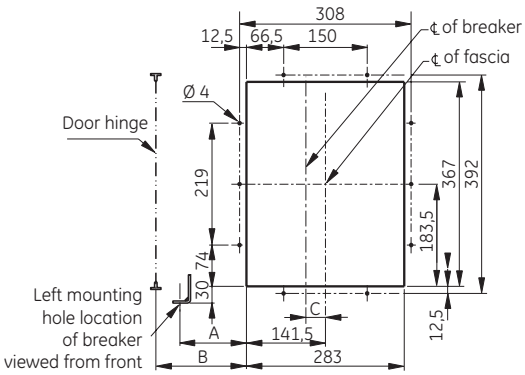
Side view



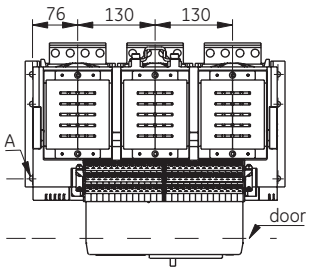
Top view 4 pole



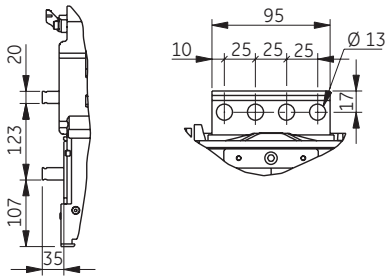
Door cut-out



Top view 3 pole



Standard connection pads



Breaker type	DIM "A"	DIM "B" minimum	DIM "C"
Frame 2 3 pole	80.5	115.0	15.0
Frame 2 4 pole	80.5	115.0	-49.0

Remarks

A – 6 mounting holes of 9.5mm

B – Minimum space to earth metal and for insulated metal or insulate sheet (30mm). The 182 min dimension is to allow for Arc Chute removal.

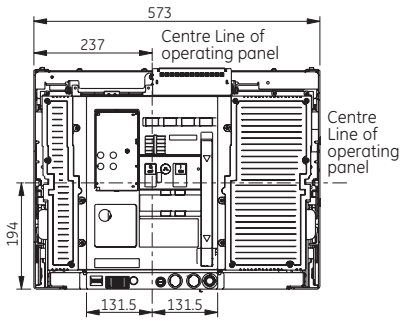
Note

Copper work used to connect must be supported within 200mm of the breaker connections.
Applicable for: busbar or cables.
All busbar connections to be tightened to 50Nm torque.

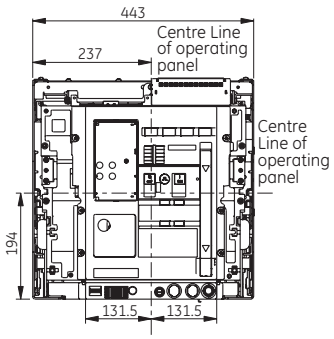
Dimensions

Frame 2 - Draw-out pattern

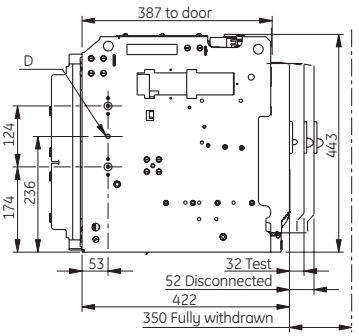
Front view 4 pole



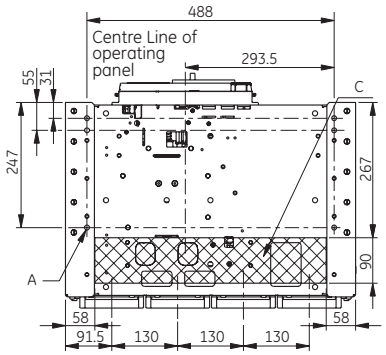
Front view 3 pole



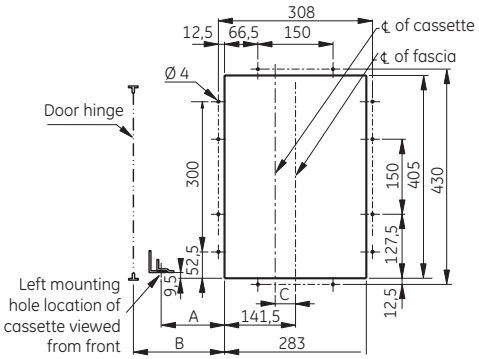
Side view



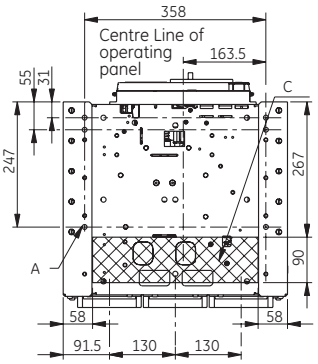
Bottom view 4 pole



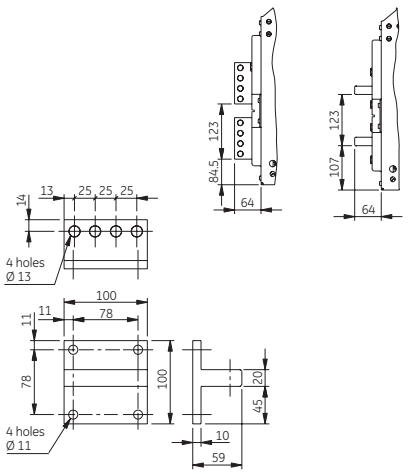
Door cut-out



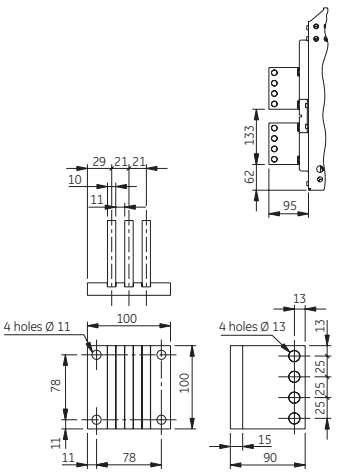
Bottom view 3 pole



Universal connection pads vertical or horizontal max. 3200A



Universal connection pads Only vertical max. 4000A



Breaker type	DIM “A”	DIM “B” minimum	DIM “C”
Frame 2 3 pole	53.0	125.0	15.5
Frame 2 4 pole	53.0	125.0	-49.5

Remarks

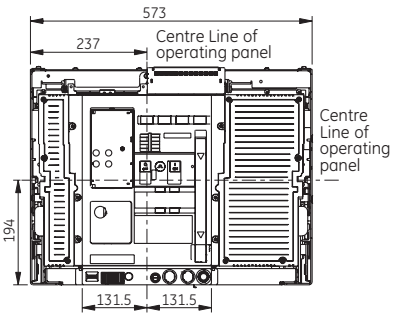
A – 6 mounting holes of 9.5mm
C – Please leave unobstructed; required for ventilation
D – 1 hole M6 on left hand side for earthing

Note

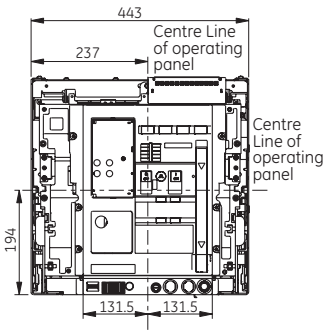
Copper work used to connect must be supported within 200mm of the breaker connections.
Applicable for: busbar or cables.
All busbar connections to be tightened to 50Nm torque.

Frame 2 - “Limited derating” draw-out type

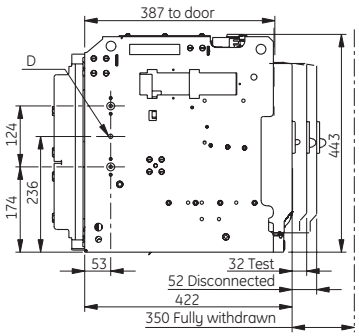
Front view 4 pole



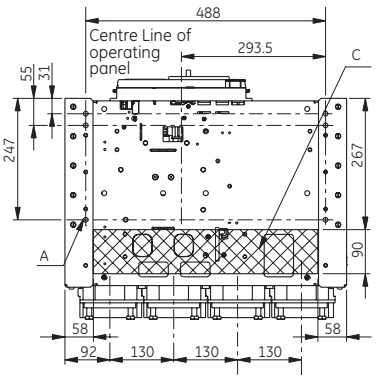
Front view 3 pole



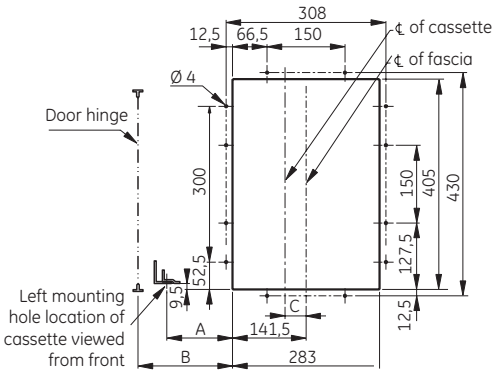
Side view



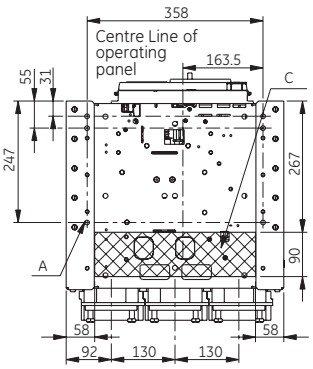
Bottom view 4 pole



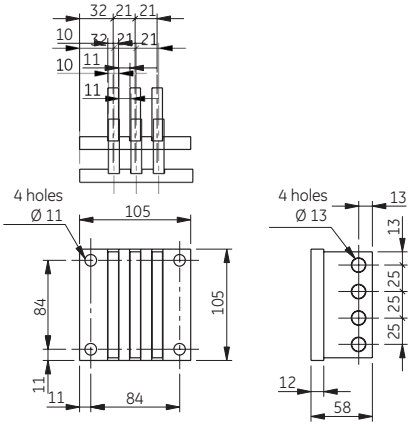
Door cut-out



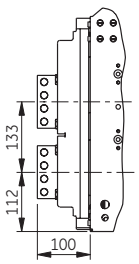
Bottom view 3 pole



Universal connection pads
Vertical max. 4000A



Breaker type	DIM “A”	DIM “B” minimum	DIM “C”
Frame 2 3 pole	53.0	125.0	15.5
Frame 2 4 pole	53.0	125.0	-49.5



Remarks

A – 6 mounting holes of 9.5mm
C – Please leave unobstructed; required for ventilation
D – 1 hole M6 on left hand side for earthing

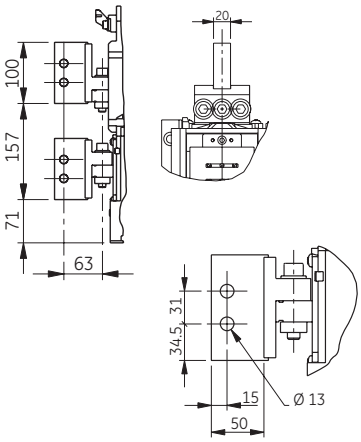
Note

Copper work used to connect must be supported within 200mm of the breaker connections.
Applicable for: busbar or cables.
All busbar connections to be tightened to 50Nm torque.

Dimensions

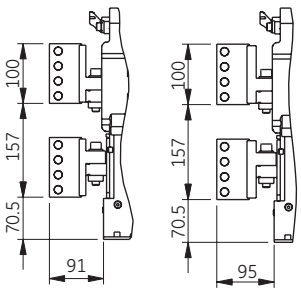
Frames 1 and 2 - Alternate connection modes

Fixed vertical rear connection
Frame 1 max. 2500A

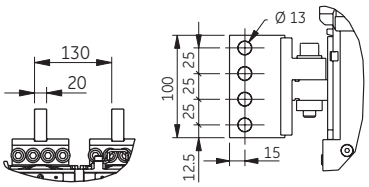


Fixed vertical rear connection
Frame 2

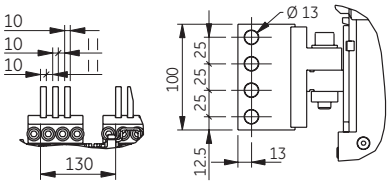
MAX. 3200A 4000A



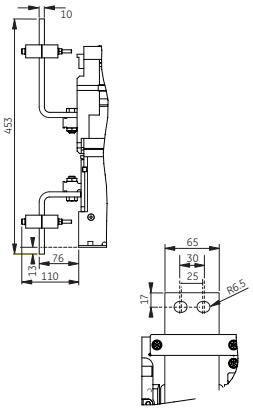
Details max. 3200A



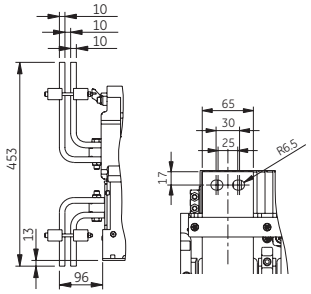
Details max. 4000A



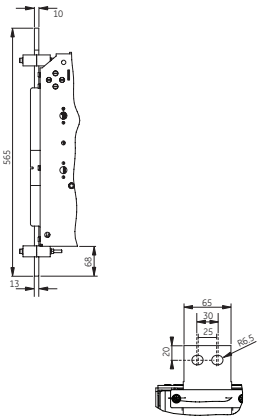
Fixed front connection
Frame 1 ≤1600A



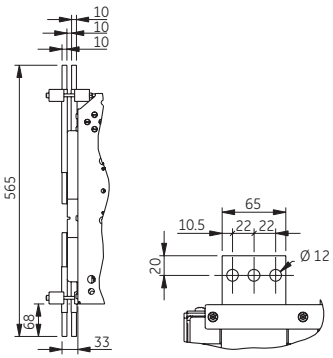
Fixed front connection
Frame 1 2500A



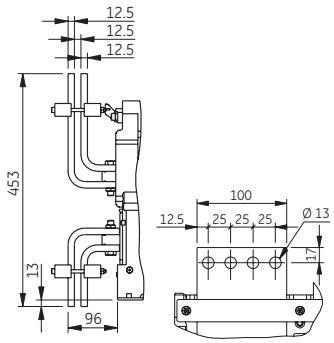
Draw-out front connection
Frame 1 ≤1600A - S type



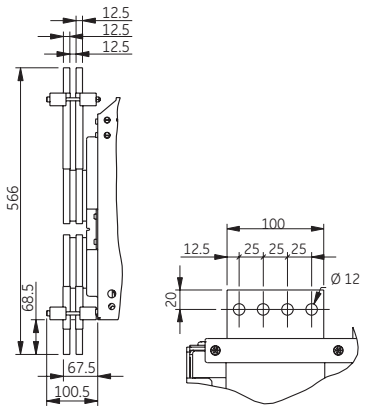
Draw-out front connection
Frame 1, 2000A - S, N & H type and
2500A - S & F type



Fixed front connection
Frame 2

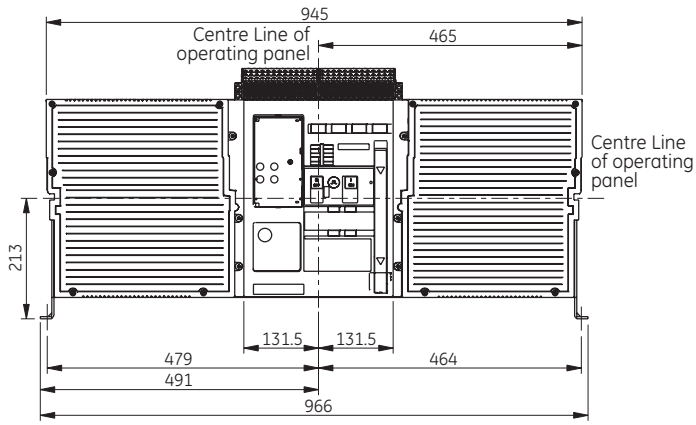


Draw-out front connection
Frame 2

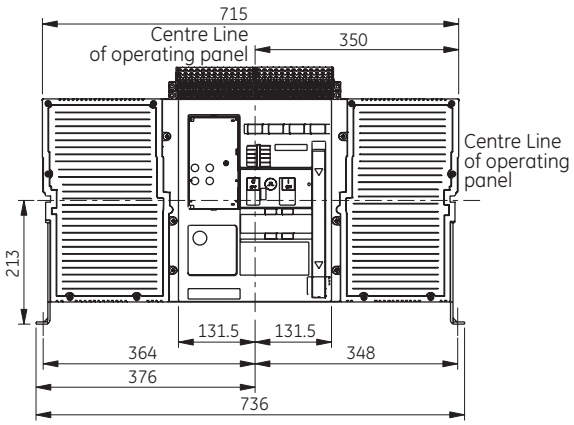


Frame 3 - Fixed type

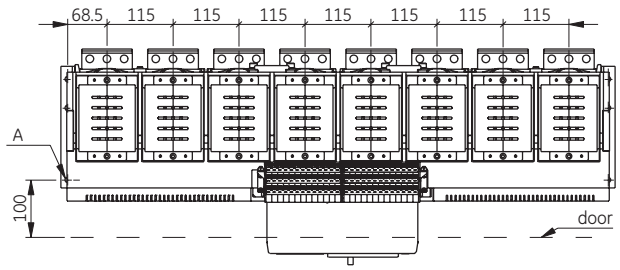
Front view 4 pole



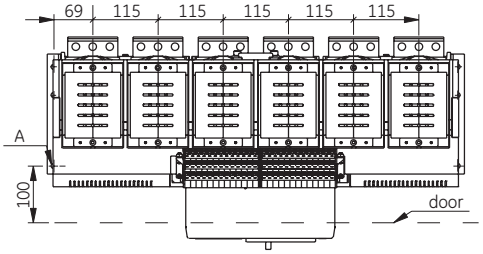
Front view 3 pole



Top view 4 pole



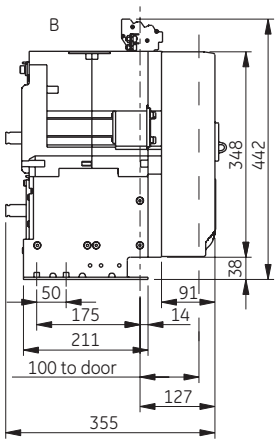
Top view 3 pole



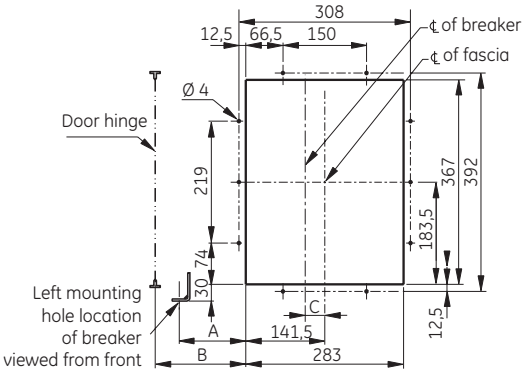
Dimensions

Frame 3 - Fixed type

Side view

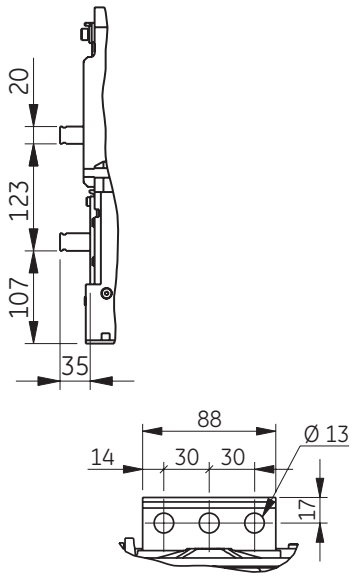


Door cut-out

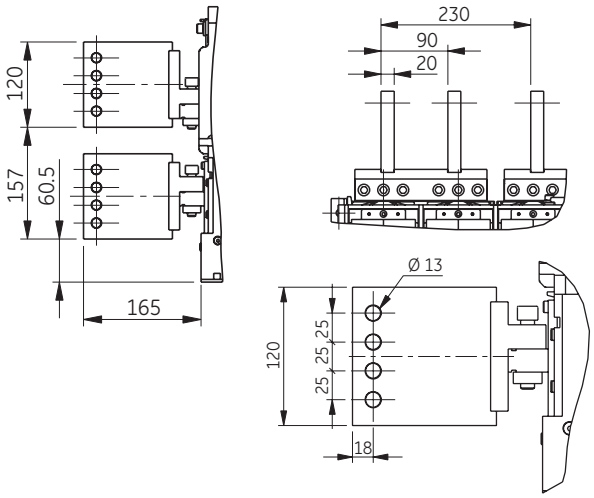


Breaker type	DIM "A"	DIM "B" minimum	DIM "C"
Frame 3 3 pole	222.5	259.5	7.5
Frame 3 4 pole	337.5	374.5	7.5

Standard connection pads Horizontal maximum 5000A



Standard connection pads Vertical maximum 6400A



Remarks

A – 6 mounting holes of 9.5mm

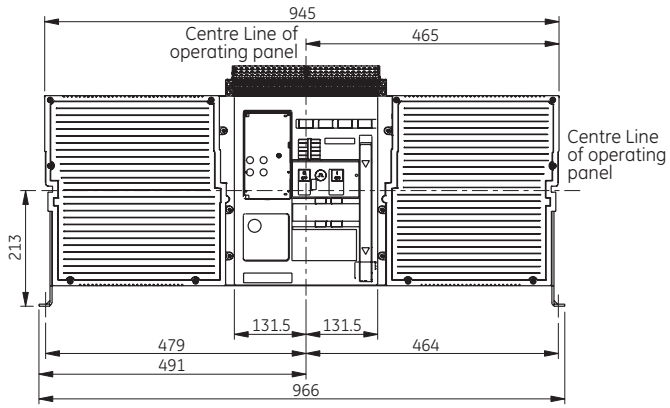
B – Minimum space to earth metal and for insulated metal or insulate sheet (30mm).
The 182 min dimension is to allow for Arc Chute removal.

Note

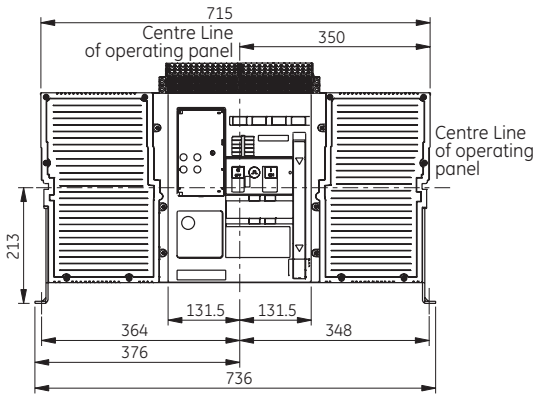
Copper work used to connect must be supported within 200mm of the breaker connections.
Applicable for: busbar or cables.
All busbar connections to be tightened to 50Nm torque.

Frame 3 - Draw-out pattern

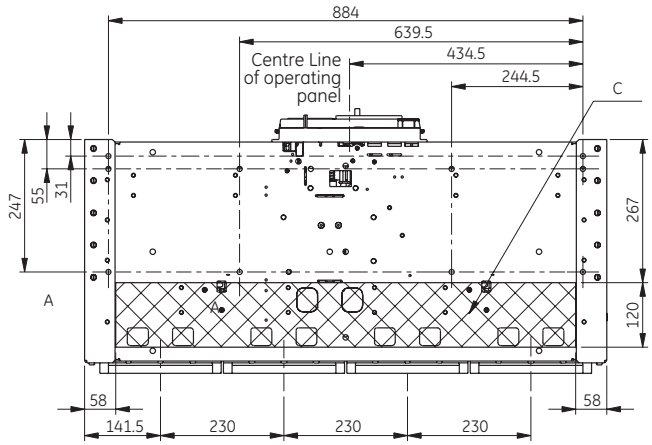
Front view 4 pole



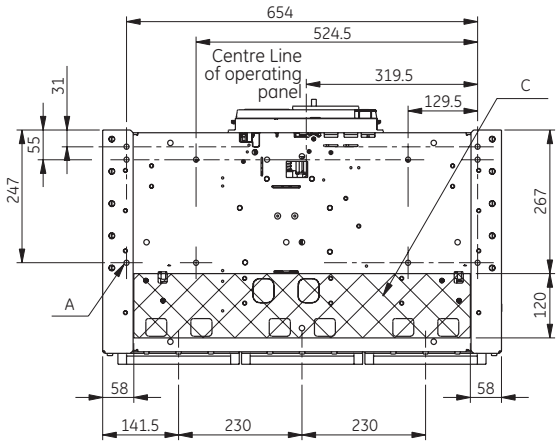
Front view 3 pole



Bottom view 4 pole



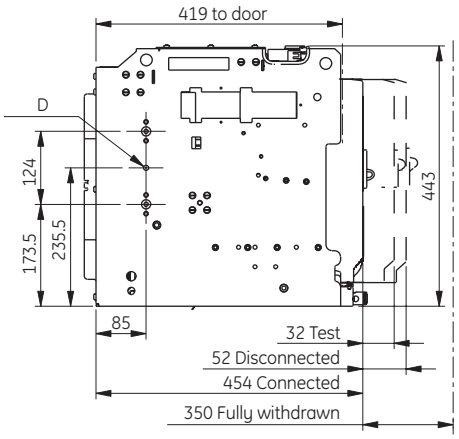
Bottom view 3 pole



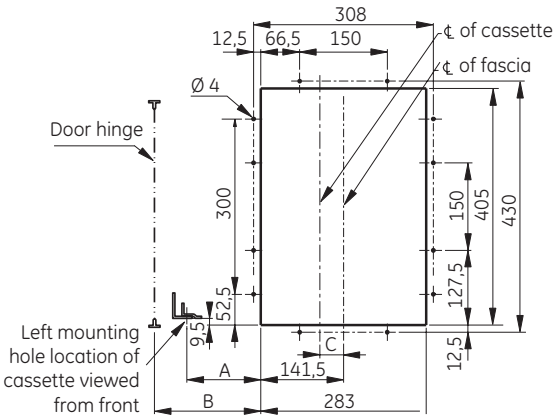
Dimensions

Frame 3 - Draw-out pattern

Side view

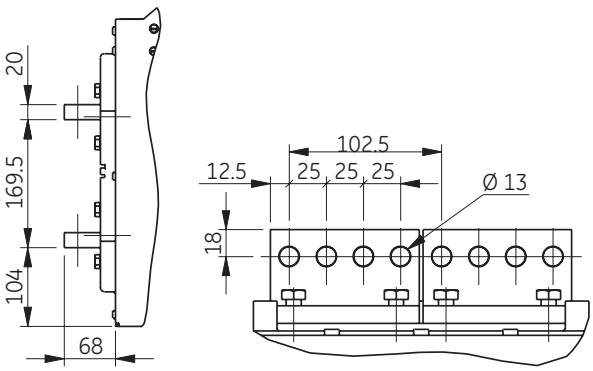


Door cut-out

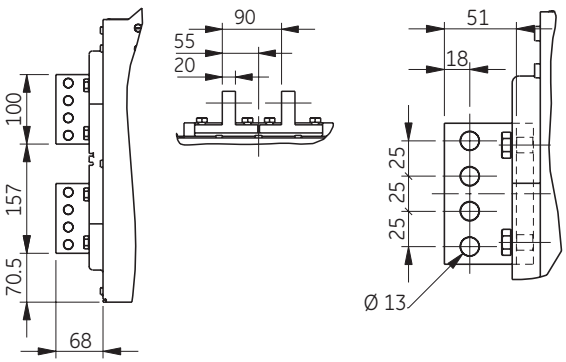


Breaker type	DIM "A"	DIM "B" minimum	DIM "C"
Frame 3 3 pole	193.0	267.0	7.5
Frame 3 4 pole	308.0	382.0	7.5

Standard connection pads
Horizontal maximum 5000A



Standard connection pads
Vertical maximum 6400A



Remarks
A – 6 mounting holes of 9.5mm
C – Please leave unobstructed; required for ventilation
D – 1 hole M6 on left hand side for earthing

Note
Copper work used to connect must be supported within 200mm of the breaker connections.
Applicable for: busbar or cables.
All busbar connections to be tightened to 50Nm torque.

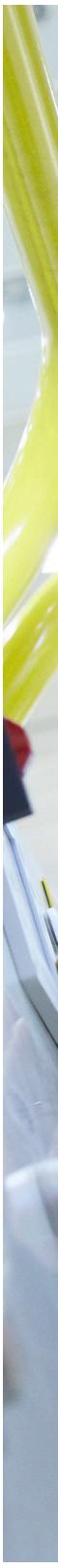
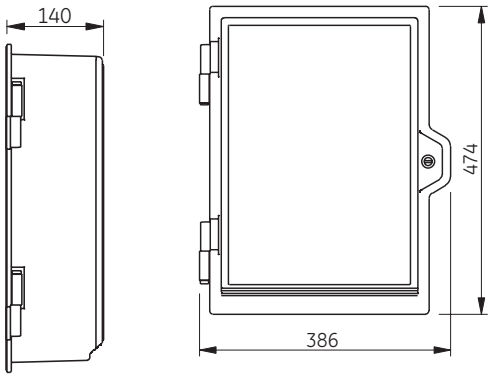



ABB
ABB

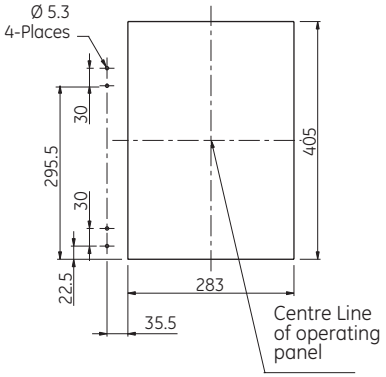
Dimensions

IP54 Flange, time delay module UVR

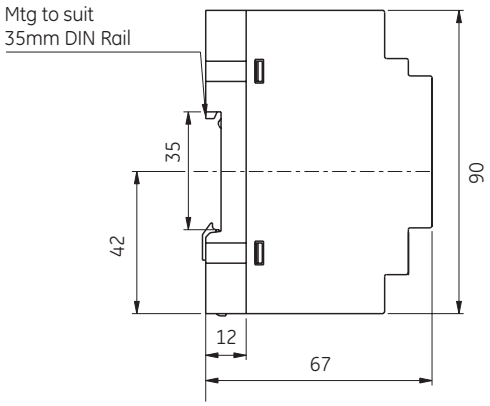
IP54 Flange

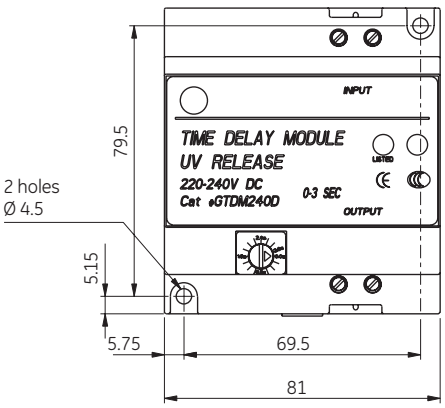


IP54 Flange drilling



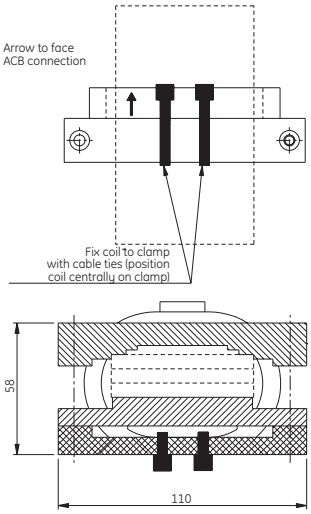
Time delay module (UVR)





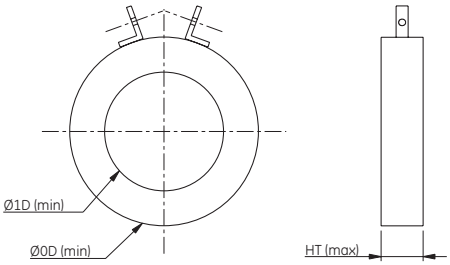
Rogowski's, current transformers, door interlock system and mounting brackets

Rogowski coil external



Remark: for ratings > 4000A two coils are used

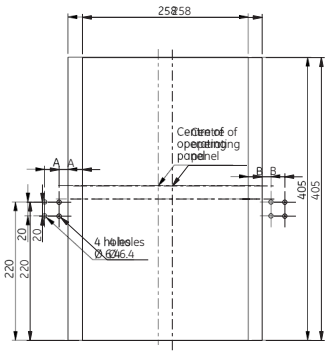
Current transformer external



Rating	1D	0D	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

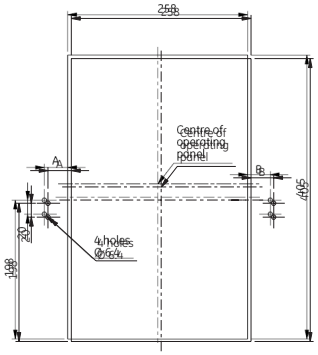
Door interlock system

Frame T



Frame	A & B
3P	30
4P	100

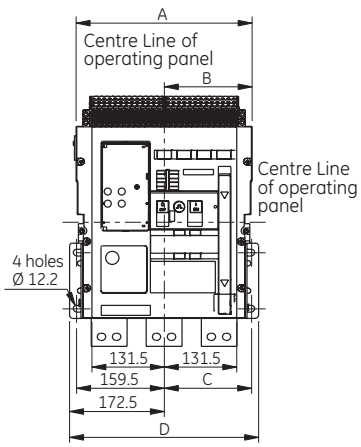
Frame 1/2/3



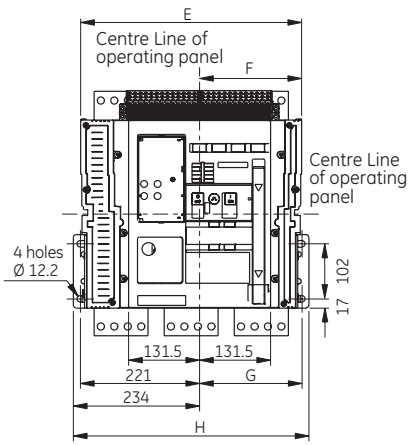
Frame	A	B
F1-3P	33.5	32.5
F1-4P	33.5	132.5
F2-3P	98.5	67.5
F2-4P	98.5	197.5
F3-3P	240.5	225.5
F3-4P	355.5	340.5

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

Frame 1



Frame 2

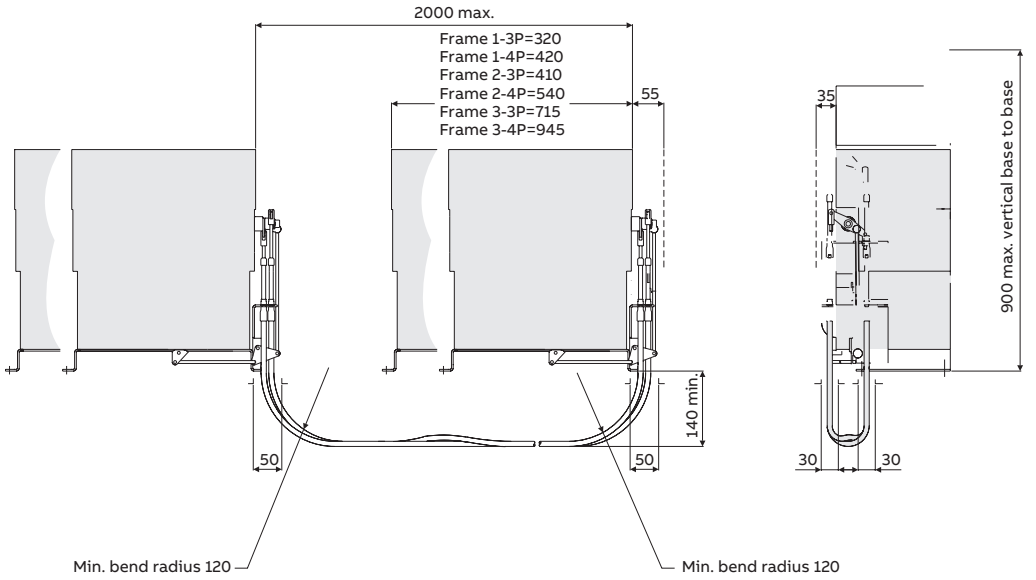


	3 pole	4 pole
A	320	420
B	159.5	259.5
C	158.5	258.5
D	344	444
E	410	540
F	189.5	319.5
G	190	320
H	437	567

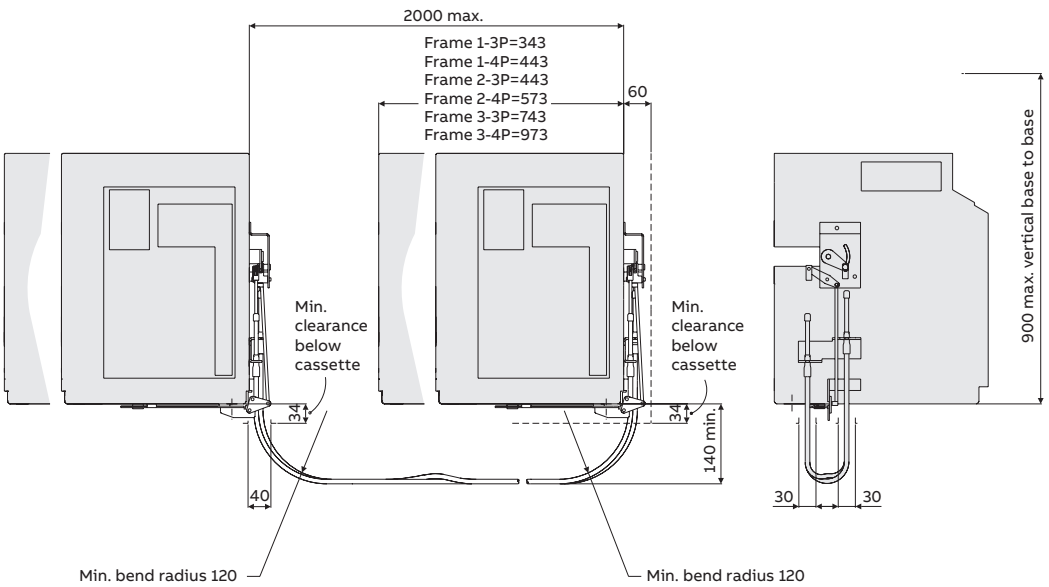
Dimensions

Interlocking with cable systems; 2-way

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

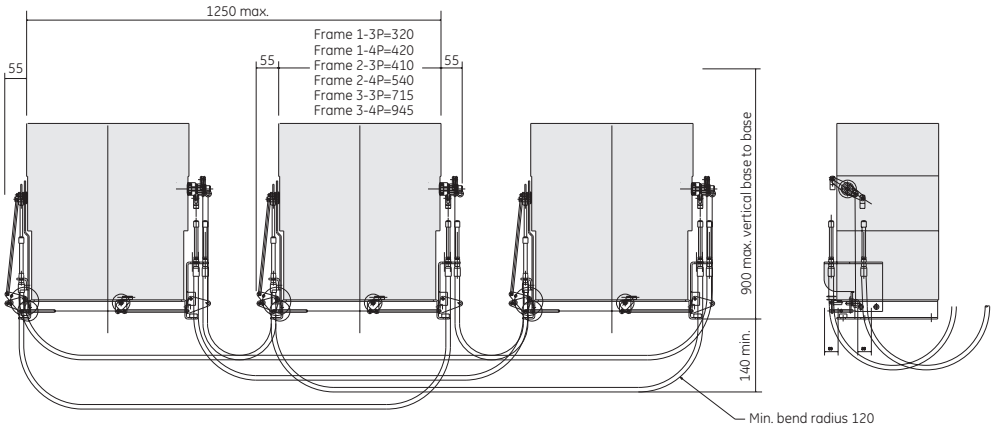


Draw-out 2-way cable interlock / Withdrawable pattern - Front/rear access

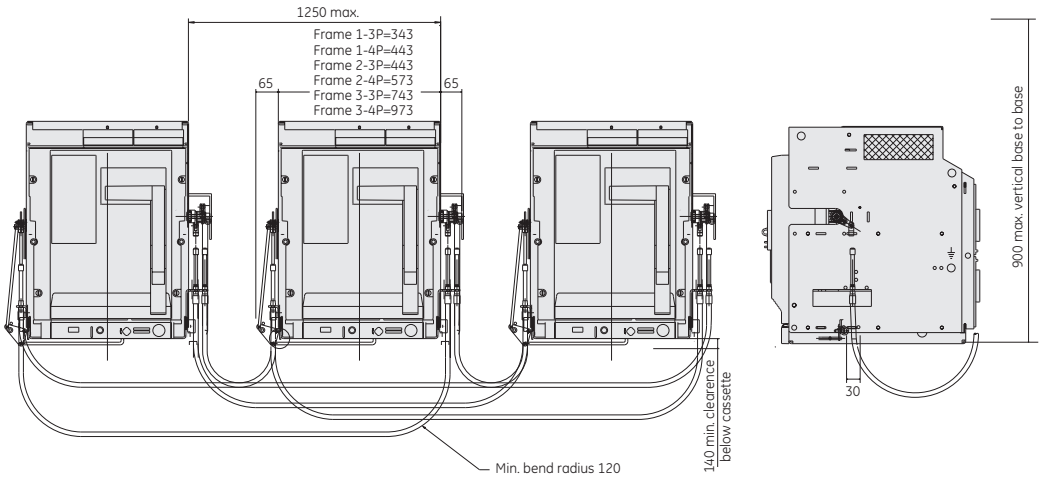


Interlocking with cable systems; 3-way

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



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



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