GE

EntelliGuard* L Ed. 04

Power Circuit Breaker

Effective Simplicity

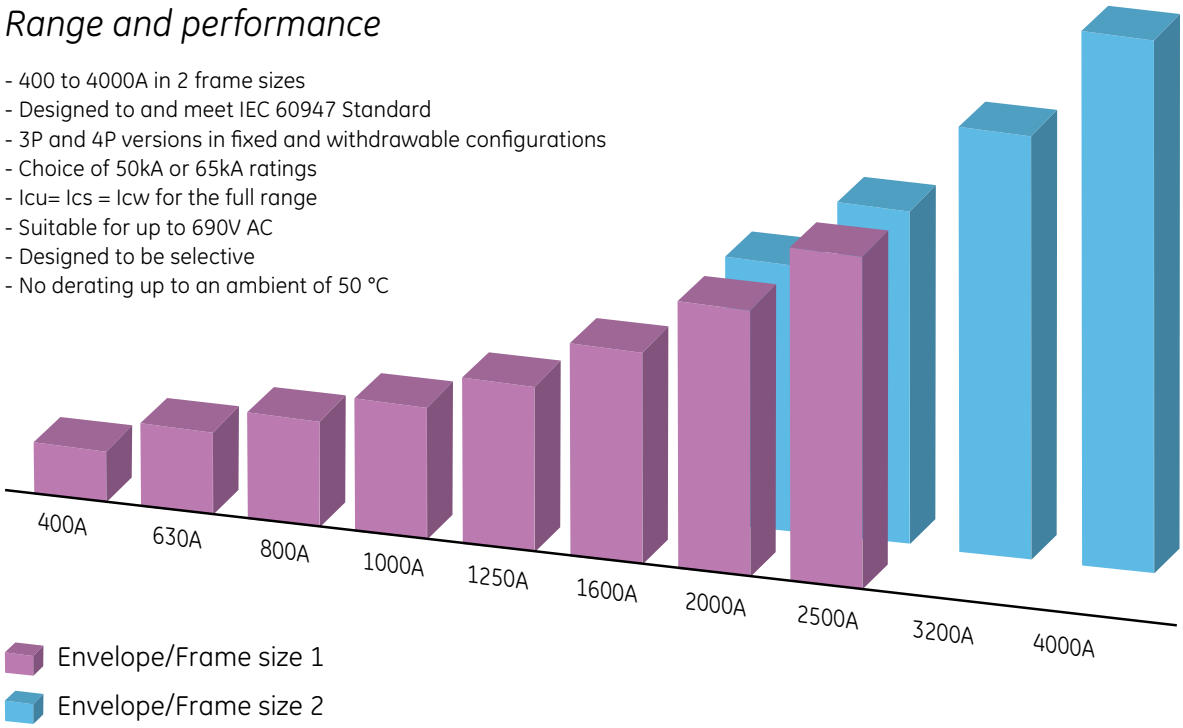
GE imagination at work

Line of Air Circuit Breakers

- Evolved from a global platform
- Designed for simplicity
- Manufactured in GE State of the Art Facility

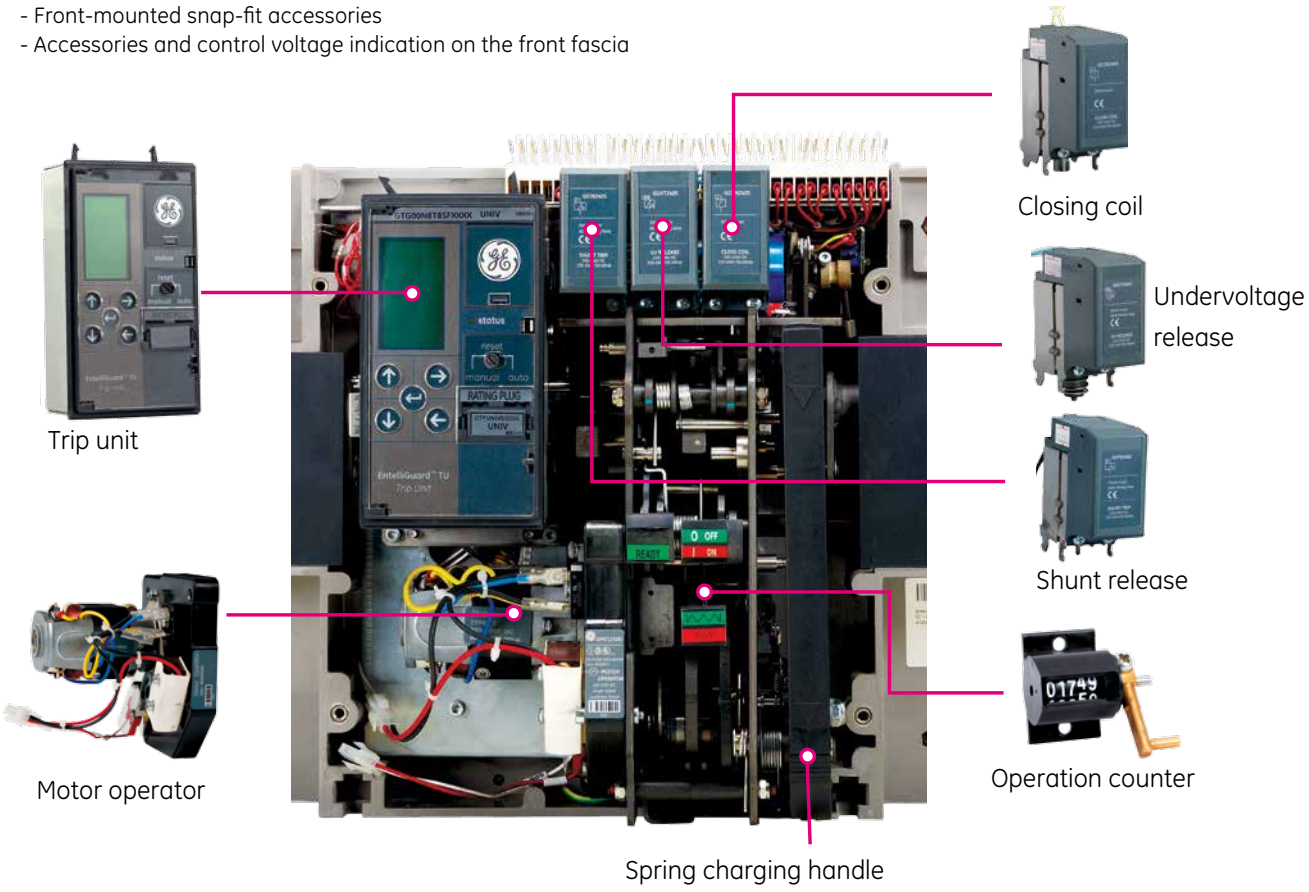
Range and performance

- 400 to 4000A in 2 frame sizes
- Designed to and meet IEC 60947 Standard
- 3P and 4P versions in fixed and withdrawable configurations
- Choice of 50kA or 65kA ratings
- Icu= Ics = Icw for the full range
- Suitable for up to 690V AC
- Designed to be selective
- No derating up to an ambient of 50 °C



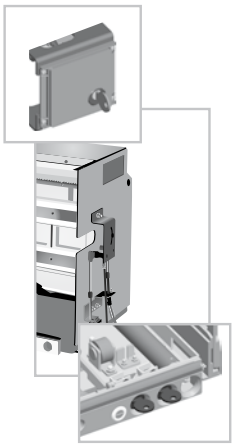
Accessories

- Compact and modular build
- Front-mounted snap-fit accessories
- Accessories and control voltage indication on the front fascia



Trip Units

- State-of-the-art micro-processor based trip unit
- TRUE-RMS sensing
- Standard large LCD display
- Touch-pad based programming and Navigation
- Micro-processor based trip units offering high accuracy
- Standard event logger and diagnostics



Common internal accessories
A large range of internal accessories as electrical operators, up to three shunt releases, closing coils or undervoltage releases, interlock coils, auxiliary and alarm contacts, carriage switches, coil indication contacts and breaker status switches are available.

The power circuit breaker front facia includes window 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 both frames.

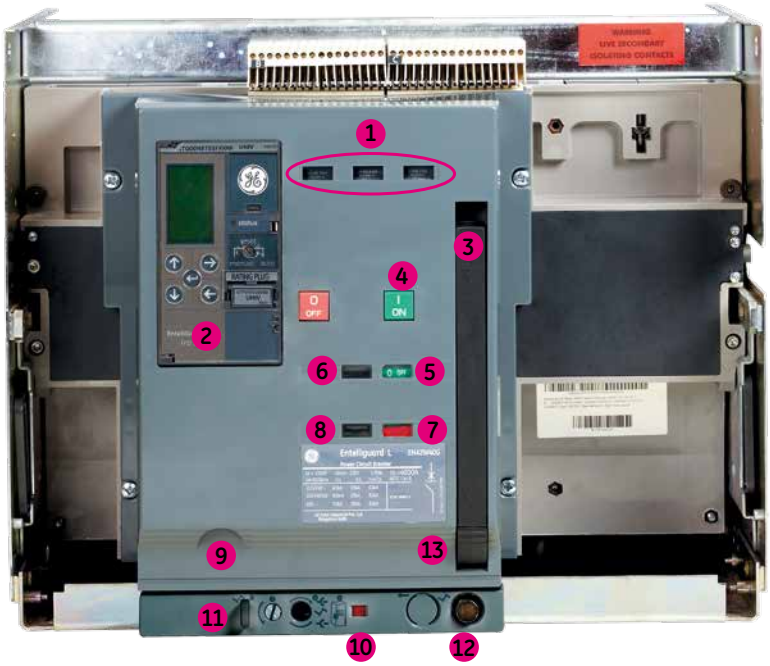
Common external accessories
Multiple common external accessories are available, a full overview of which can be found in section C of this catalogue.

On the left the key lock and breaker interlock options are portrayed. Ronis, Profalux or Castell locks can be used to lock the breaker, and/or to lock the draw-out breaker in its cassette.

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

Front fascia

1. Installed accessory indicators
2. Electronic trip unit
3. Manual charging handle
4. ON and OFF buttons
5. Contact position indicator ON/OFF
6. Ready to close indicator
7. Mechanical spring charge indication
8. Operation counter
9. Slot to fix breaker key interlock
10. Mechanical position indicator
11. Racking handle pad lock
12. Racking handle
13. Name plate with catalogue code



GT- L trip unit

Electronic Trip Unit

1. LCD screen with following menu options:
   - **Setup**
   Allows adjustment of values and settings of all parameters
   - **Meter**
   An ammeter is available on all 3 phases and neutral
   - **Status**
   Breaker in ON / OFF / Trip position
   - **Events**
   Trip history with the fault indication
2. 4 settings and 1 enter key to access trip unit functionality
3. Manual or automatic reset facility

GT-N and GT-H trip units

Electronic Trip Unit

1. Main screen with the following choices:
   SETUP
   Allows adjustment of values and setting of all parameters
   METER
   Full measurement values are displayed
   STATUS
   Breaker and trip unit position
   EVENTS
   History of trip's with indication of fault reason and level and access to the waveform capture function
2. Cursor driven setting system
3. Manual or automatic reset choice
4. Full range rating plug

*EntelliGuard**

EntelliGuard* is a line of Air Circuit Breakers developed as a global product meeting IEC standards.
The L version of this breaker is a line of three and four pole devices ranging from 400A to 4000A in two frame sizes, with fault interruption ratings of 50 and 65kA.

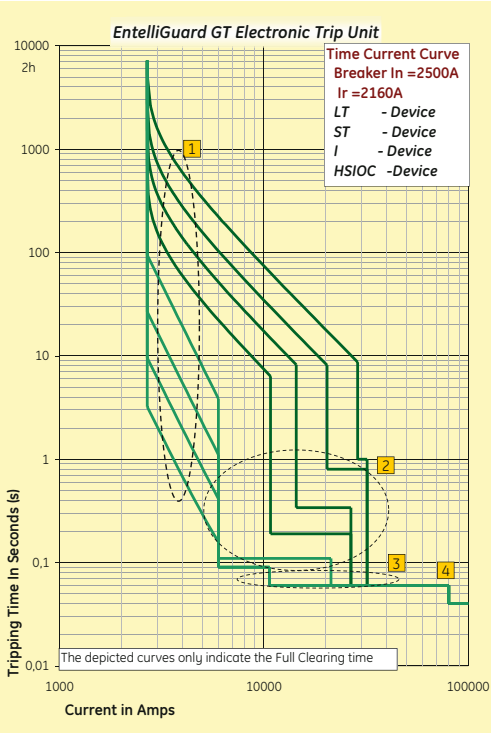
The design offers a unique combination of high-fault current withstand ratings, short-fault interruption times, and selectivity.

The device includes a new state-of-the-art highly accurate trip unit that enables the circuit breaker to reliably protect itself and its environment.

These Power Circuit Breakers are designed to allow multiple interruptions of fault currents and can be used in AC networks with voltages up to 690V.

Selective and fast

EntelliGuard* has been designed to offer an uncompromising combination of high-speed interruption at high fault levels.
The circuit breaker is designed to remain closed on a fault for a user-settable time value when the fault level lies within the range of short-time delay, and for 15 milliseconds when the fault level attains the instantaneous protection range value.
This instantaneous device includes programming that, in normal circumstances, waits until the downstream breaker trips.



1. Overload protection (LT) with 22 bands
2. Timed short-circuit protection (STD) with 17 bands
3. Selective instantaneous protection (I)
4. Hi-Speed trip (HSIOC)

Uncompromising ... Reliability

EntelliGuard* has been designed as a modern Power Circuit Breaker without neglecting GE's heritage of more than 50 years in building Air Circuit Breakers.
The result: a device 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.

Hi-Performance: complete line

EntelliGuard* breakers are designed to allow multiple interruptions of fault currents. In all cases, the certified service breaking capacity value is equal to the stated ultimate breaking capacity.

Hi-Performance: current ratings in enclosures

EntelliGuard* Air Circuit Breakers have been designed with low power dissipation values and allow relatively high currents at high ambient temperatures.

EN 60947-2 standard

Power Circuit Breaker type		LG04/LI04		LG07/LI07		LG08/LI08		LG10/LI10	
Air Circuit Breaker denomination		S	N	S	N	S	N	S	N
Poles	Number of	3,4		3,4		3,4		3,4	
Rated insulation voltage	Ui (Volts)	1000		1000		1000		1000	
Rated impulse withstand voltage	Uimp (Kilovolt)	12		12		12		12	
Rated operational voltage Ue	Volts AC	690		690		690		690	
Category of use		B		B		B		B	
Suitable for use as a isolator	Positive ON & OFF	YES		YES		YES		YES	
Rated current In	A at 50 o C	400		630		800		1000	
Ultimate breaking capacity Icu (kA)	230/240V- 440V AC	50	65	50	65	50	65	50	65
	500V AC	50	65	50	65	50	65	50	65
	690V AC	40	40	40	40	40	40	40	40
Service breaking capacity Ics (kA)	230/240V- 440V AC	50	65	50	65	50	65	50	65
	500V AC	50	65	50	65	50	65	50	65
	690V AC	40	40	40	40	40	40	40	40
Interuption time I < Icw	at 500V AC	60ms		60ms		60ms		60ms	
Interuption time I >= Icw	at 500V AC	30ms		30ms		30ms		30ms	
Closing time with closing coil		60ms		60ms		60ms		60ms	
Opening time with shunt trip		40ms		40ms		40ms		40ms	
Short-circuit withstand Icw (kA)	1 second	50	65	50	65	50	65	50	65
	3 seconds	30	50	30	50	30	50	30	50
Short-circuit making current Icm 220-500V AC	kA Peak	105	143	105	143	105	143	105	143
Mechanical endurance	With maintenance	20000		20000		20000		20000	
	Without maintenance	10000		10000		10000		10000	
Electrical endurance (CO operations at 440V AC)	Without maintenance	6000		6000		6000		6000	

Electronic Trip Unit

GT - L type	Basic	LG04	LG07	LG08	LG10
GT - N and GT - H type	Advanced	LI04	LI07	LI08	LI10

EN 60947-3 standard

Power Circuit Breaker type		LJ04	LJ07	LJ08	LJ10
		Non Auto	Non Auto	Non Auto	Non Auto
Isolator denomination		S	S	S	S
Poles	Number of	3,4	3,4	3,4	3,4
Rated insulation voltage	Ui (Volts)	1000	1000	1000	1000
Rated impulse withstand voltage	Uimp (Kilovolt)	12	12	12	12
Suitable for use as a isolator	Positive ON & OFF	YES	YES	YES	YES
Rated operational voltage Ue	Volts AC	690	690	690	690
Rated current In	A at 50° C	400	630	800	1000
Short-circuit withstand Icw (kA)	1 second	50	50	50	50
	3 seconds	50	50	50	50
Short-circuit making current Icm 220-500V AC	kA Peak	105	105	105	105
Mechanical endurance	With maintenance	20000	20000	20000	20000
	Without maintenance	10000	10000	10000	10000
Electrical endurance (CO operations at 440V AC)	Without maintenance	6000	6000	6000	6000

Installation

Fixed pattern					
Dimensions in mm	Height	438	438	438	438
	Width 3pole	338	338	338	338
	Width 4pole	438	438	438	438
	Depth[1]	328	328	328	328
Available connection modes	Rear Horizontal	X	X	X	X
	Rear Vertical	X	X	X	X
	Front	X	X	X	X
Weights in kg	3 pole	42	42	42	42
	4 pole	50	50	50	50
Draw-out pattern					
Dimensions in mm	Height	439	439	439	439
	Width 3pole	331	331	331	331
	Width 4pole	431	431	431	431
	Depth[2]	432	432	432	432
Available connection modes	Rear Horizontal	X	X	X	X
	Rear Unviersal[2]	X	X	X	X
	Front	X	X	X	X
Weights in kg	3 pole	60	60	60	60
	4 pole	72	72	72	72

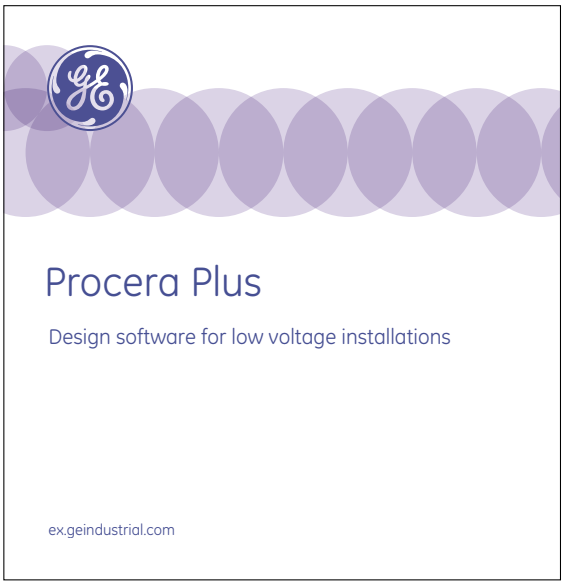
(1) With horizontal rear connections: Indicated depth value is the required panel dimension.
(2) T stubs can be rotated and used for both vertical & horizontal rear connection.
(3) The 4000A rating is only available with rear vertical connections.

	LG13/LI13		LG16/LI16		LG20/LI20				LG25/LI25				LG32/LI32		LG40/LI40	
	S	N	S	N	S	N	C	D	S	N	C	D	C	D	C	D
	3,4		3,4		3,4				3,4				3,4		3,4	
	1000		1000		1000				1000				1000		1000	
	12		12		12				12				12		12	
	690		690		690				690				690		690	
	B		B		B				B				B		B	
	YES		YES		YES				YES				YES		YES	
	1250		1600		2000				2500				3200		4000	
	50	65	50	65	50	65	50	65	50	65	50	65	50	65	50	65
	50	65	50	65	50	65	50	65	50	65	50	65	50	65	50	65
	40	40	40	40	40	40	50	50	40	40	50	50	50	40	50	50
	50	65	50	65	50	65	50	65	50	65	50	65	50	65	50	65
	50	65	50	65	50	65	50	65	50	65	50	65	50	65	50	65
	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40	40
	60ms		60ms		60ms		60ms		60ms		60ms		60ms		60ms	
	30ms		30ms		30ms		30ms		30ms		30ms		30ms		30ms	
	60ms		60ms		60ms		60ms		60ms		60ms		60ms		60ms	
	40ms		40ms		40ms		40ms		40ms		40ms		40ms		40ms	
	50	65	50	65	50	65	50	65	50	65	50	65	50	65	50	65
	30	50	30	50	30	50	50	50	30	50	50	50	50	50	50	50
	105	143	105	143	105	143	105	143	105	143	105	143	110	143	110	143
	20000		20000		20000				20000				20000		20000	
	10000		10000		10000				10000				10000		10000	
	6000		6000		6000				6000				3000		3000	

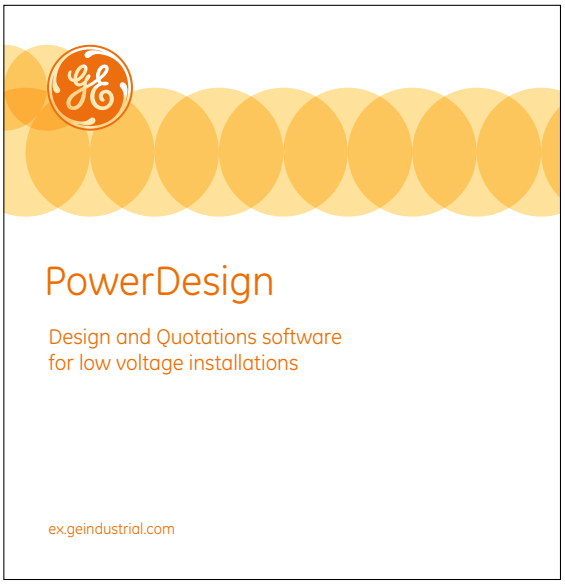
	LG13	LG16	LG20	LG25	LG32	LG40
	LI13	LI16	LI20	LI25	LI32	LI40

	LJ13	LJ16	LJ20		LJ25		LJ32	LJ40
	Non Auto	Non Auto	Non Auto		Non Auto		Non Auto	Non Auto
	S	S	S	D	S	D	D	D
	3,4	3,4	3,4	3,4	3,4	3,4	3,4	3,4
	1000	1000	1000	1000	1000	1000	1000	1000
	12	12	12	12	12	12	12	12
	YES	YES	YES	YES	YES	YES	YES	YES
	690	690	690	690	690	690	690	690
	1250	1600	2000		2500		3200	4000
	50	50	50	65	50	65	65	65
	50	50	50	50	50	50	50	50
	105	105	105	143	105	143	143	143
	20000	20000	20000		20000		20000	20000
	10000	10000	10000		10000		10000	10000
	6000	6000	6000		6000		3000	3000

	438	438	438	438	438	438	438	438
	338	338	338	432	338	432	432	432
	438	438	438	562	438	562	562	562
	328	328	328	328	328	328	328	393 [3]
	X	X	X	X	X	X	X	---
	X	X	X	X	X	X	X	Rear Vertical [3]
	X	X	X	X	X	X	X	X
	42	42	52	63	58	63	63	69
	50	50	65	76	73	76	76	84
	439	439	439	439	439	439	439	439
	331	331	331	421	421	421	421	421
	431	431	431	551	551	551	551	551
	432	432	432	432	432	432	432	534
	X	X	X	X	X	X	X	---
	X	X	X	X	X	X	X	X
	X	X	X	X	X	X	X	Rear Vertical [3]
	60	60	72	105	74	105	105	120
	72	72	88	130	91	130	130	145



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



Design software
GE provides a software package PowerDesign to configure the widely used 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.
PowerDesign package also includes a tool that allows the user to configure the new EntelliGuard power circuit breaker, its catalogue code and also defines the subcomponents of which it is built.
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. Please contact your nearest GE representative for the link.

(1) Also available in IEC 60364 version

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
- 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-and-trip-units/trip-unit-toolkit

Power Circuit Breakers

How to order

Step 1	Step 2		Step 3		Step 4
Choose Current rating	Choose required Interruption rating		Define if a Breaker or Isolator is needed. Proceed to establish the first 5 digits of the catalogue number as indicated here		Select the required product A - Breaker or Isolator *In Fixed Pattern* B - Breaker or Isolator *As Draw-out, Moving Portion* C - Cassette for Draw-out *Breaker or Isolator*

In	Icu = Ics	Icw	Envelope	Standard	
	≤ 440V AC			Breaker	Isolator(1)
400A	50kA	50kA	1	L#04S	
	65kA	65kA	1	L#04N	
		42kA	1		LJ04S
630A	50kA	50kA	1	L#07S	
	65kA	65kA	1	L#07N	
		42kA	1		LJ07S
800A	50kA	50kA	1	L#08S	
	65kA	65kA	1	L#08N	
		42kA	1		LJ08S
1000A	50kA	50kA	1	L#10S	
	65kA	65kA	1	L#10N	
		42kA	1		LJ10S
1250A	50kA	50kA	1	L#13S	
	65kA	65kA	1	L#13N	
		42kA	1		LJ13S
1600A	50kA	50kA	1	L#16S	
	65kA	65kA	1	L#16N	
		42kA	1		LJ16S
2000A	50kA	50kA	1	L#20S	
	65kA	65kA	1	L#20N	
		42kA	1		LJ20S
	50kA	50kA	2	L#20C	
	65kA	65kA	2	L#20D	
		50kA	2		LJ20D
2500A	50kA	50kA	1	L#25S	
	65kA	65kA	1	L#25N	
		42kA	1		LJ25S
	50kA	50kA	2	L#25C	
	65kA	65kA	2	L#25D	
		50kA	2		LJ25D
3200A	50kA	50kA	2	L#32C	
	65kA	65kA	2	L#32D	
		50kA	2		LJ32D
4000A	50kA	50kA	2	L#40C	
	65kA	65kA	2	L#40D	
		50kA	2		LJ40D

(1) On isolators Icu and Ics values do not apply
# denotes G or I

Defines the 6th digit on catalogue number

- **4** = Breaker / Isolator In Fixed Pattern 3 pole
- **6** = Breaker / Isolator In Fixed Pattern 4 pole(1)
- **1** = Breaker / Isolator Moving Portion Only 3 pole
- **3** = Breaker / Isolator Moving Portion Only 4 pole(1)
- **2** = Cassette for Draw-out Pattern = Fixed Portion Only 3 pole
- **5** = Cassette for Draw-out Pattern = Fixed Portion Only 4 pole

Examples

Breaker 4P 1600A - Draw-out portion only
- Icu=Ics=Icw=65kA: **LG16N3**

Breaker 3P 2500A Fixed pattern - Horizontal rear connections
- Icu=Ics=Icw=50kA: **LG25S6**

in eight simple steps

Step 5	Step 6	Step 7	Step 8
Finalize the basic catalogue number see catalogue pages: *A.4 - A.7 - Fixed Pattern* *- Draw-out Portion* *- Connections fixed pat.* *- 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*	If universal internal accessories are needed? Options *UVR or SHT release (s)* *Auxiliary contacts* *Alarm & signal contacts*	Full catalogue number defines a Breaker without trip unit. (Isolators do not need trip units) 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 Breaker in fixed pattern equipped with RearConnection (Horizontal**), a set of 3NO/3NC aux.Contacts is included Other options include Rear(Vertcal) and Front (Flat) connections See page A 6 to order Field mountable Adaptation Kits Field mountable See pages A.4 - A.7	If chosen device is a Breaker or Isolator Envelope 1 See page A.11 Order a Motor Envelope 1 and 1 Closing Coil Based on voltage Requirements and specifications If chosen device is a Breaker or Isolator Envelope 2 See page A.11 Order a Motor Envelope 2 and 1 Closing Coil Based on voltage Requirements and specifications	If chosen device is a Breaker or Isolator See page A.11 To add 1 SHT and/or 1 UVR release or two SHT releases. If chosen device is a Breaker or Isolator See page A.11 To extend on the installed 3 NO + 3NC contacts Maximum of 4 possible If chosen device is a Breaker or Isolator See page A.11 To add Bell Alarm and/or Ready to close contact If chosen device is a Cassette See page A.11 If chosen device is a Cassette See page A.11	If chosen device is a Breaker See page A.10 Choose Trip unit type Offering An Extremely Large setting range covering Overload, Delayed and Instantaneous Short Circuit Protection and or Groundfault
No addition Indicates Breaker / Isolator Moving Portion Only has set of 3NO/3NC aux. Contacts included See pages A.4 - A.7			
(U) = Cassette withUniversal 'T stabs' suited for use as Horizontal or Vertical rear connections (H) = Cassette with Horizontal Rear Connections (V) = Cassette with Vertical Rear Connections Vertical Rear Connections (F) = Cassette with Front Flat connections Safety Shutters always Supplied with Cassette See page A.4 - A.7			

- 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 can be defined with stand alone and freely available GE software , is used on all relevant ordering documents and printed on each EntelliGuard breaker front facia. An explanation of this code and it's use can be found on page A.18 of this catalogue.

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

Devices ordered here are supplied factory fitted.

Remark : For Other Field Mountable Accessories see page A.13 and further

Basic breakers executed in a fixed mounting pattern

- With Horizontal Rear Connection.(1) (For other options, please refer to page A.6)
- With auxiliary contact block equipped with 3 NO and 3 NC contacts
- Basic breaker MUST be equipped with a Trip Unit. (Please refer to page A.8 for options)

		3 pole		4 pole left		4 pole right	
	Rating (A)	Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
S type Icu = Ics = Icw 50kA	400	LG04S4	**444066**	LG04S6	**444100**	LG04S5	**444354**
	630	LG07S4	**444067**	LG07S6	**444101**	LG07S5	**444355**
	800	LG08S4	**444068**	LG08S6	**444102**	LG08S5	**444356**
	1000	LG10S4	**444069**	LG10S6	**444103**	LG10S5	**444357**
	1250	LG13S4	**444070**	LG13S6	**444104**	LG13S5	**444358**
	1600	LG16S4	**444071**	LG16S6	**444105**	LG16S5	**444359**
	2000	LG20S4	**444072**	LG20S6	**444106**	LG20S5	**444360**
	2500(1)	LG25S4	**444073**	LG25S6	**444107**	LG25S5	**444361**
N type Icu = Ics = Icw 65kA	400	LG04N4	**444078**	LG04N6	**444112**	LG04N5	**444366**
	630	LG07N4	**444079**	LG07N6	**444113**	LG07N5	**444367**
	800	LG08N4	**444080**	LG08N6	**444114**	LG08N5	**444368**
	1000	LG10N4	**444081**	LG10N6	**444115**	LG10N5	**444369**
	1250	LG13N4	**444082**	LG13N6	**444116**	LG13N5	**444370**
	1600	LG16N4	**444083**	LG16N6	**444117**	LG16N5	**444371**
	2000	LG20N4	**444084**	LG20N6	**444118**	LG20N5	**444372**
	2500(1)	LG25N4	**444085**	LG25N6	**444119**	LG25N5	**444373**
C type Icu = Ics =Icw 50kA	2000	LG20C4	**444074**	LG20C6	**444108**	LG20C5	**444362**
	2500	LG25C4	**444075**	LG25C6	**444109**	LG25C5	**444363**
	3200	LG32C4	**444076**	LG32C6	**444110**	LG32C5	**444364**
	4000(1)	LG40C4	**444077**	LG40C6	**444111**	LG40C5	**444365**
D type Icu = Ics = Icw 65kA	2000	LG20D4	**444086**	LG20D6	**444120**	LG20D5	**444374**
	2500	LG25D4	**444087**	LG25D6	**444121**	LG25D5	**444375**
	3200	LG32D4	**444088**	LG32D6	**444122**	LG32D5	**444376**
	4000(1)	LG40D4	**444089**	LG40D6	**444123**	LG40D5	**444377**

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

Basic breakers: Draw-out Breakers; Moving portion only

- With auxiliary contact block equipped with 3 NO and 3 NC contacts
- Basic Breaker MUST be equipped with a Trip Unit. (Please refer to page A.8 for options)
- A cassette is needed, please refer to page A.6 for options

		3 pole		4 pole left		4 pole right	
	Rating (A)	Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
S type Icu = Ics = Icw 50kA	400	LG04S1	**444000**	LG04S3	**444033**	LG04S2	**444330**
	630	LG07S1	**444001**	LG07S3	**444034**	LG07S2	**444331**
	800	LG08S1	**444002**	LG08S3	**444035**	LG08S2	**444332**
	1000	LG10S1	**444003**	LG10S3	**444036**	LG10S2	**444333**
	1250	LG13S1	**444004**	LG13S3	**444037**	LG13S2	**444334**
	1600	LG16S1	**444005**	LG16S3	**444038**	LG16S2	**444335**
	2000	LG20S1	**444006**	LG20S3	**444039**	LG20S2	**444336**
	2500	LG25S1	**444007**	LG25S3	**444040**	LG25S2	**444337**
N type Icu = Ics = Icw 65kA	400	LG04N1	**444012**	LG04N3	**444045**	LG04N2	**444342**
	630	LG07N1	**444013**	LG07N3	**444046**	LG07N2	**444343**
	800	LG08N1	**444014**	LG08N3	**444047**	LG08N2	**444344**
	1000	LG10N1	**444015**	LG10N3	**444048**	LG10N2	**444345**
	1250	LG13N1	**444016**	LG13N3	**444049**	LG13N2	**444346**
	1600	LG16N1	**444017**	LG16N3	**444050**	LG16N2	**444347**
	2000	LG20N1	**444018**	LG20N3	**444051**	LG20N2	**444348**
	2500	LG25N1	**444019**	LG25N3	**444052**	LG25N2	**444349**
C type Icu = Ics =Icw 50kA	2000	LG20C1	**444008**	LG20C3	**444041**	LG20C2	**444338**
	2500	LG25C1	**444009**	LG25C3	**444042**	LG25C2	**444339**
	3200	LG32C1	**444010**	LG32C3	**444043**	LG32C2	**444340**
	4000	LG40C1	**444011**	LG40C3	**444044**	LG40C2	**444341**
D type Icu = Ics = Icw 65kA	2000	LG20D1	**444020**	LG20D3	**444053**	LG20D2	**444350**
	2500	LG25D1	**444021**	LG25D3	**444054**	LG25D2	**444351**
	3200	LG32D1	**444022**	LG32D3	**444055**	LG32D2	**444352**
	4000	LG40D1	**444023**	LG40D3	**444056**	LG40D2	**444353**

For 4 Pole Breakers Trip Unit configurable at 0,50 or 100% of Phase rating

Advanced breakers executed in a fixed mounting pattern

- With Horizontal Rear Connection.(1) (For other options, please refer to page A.6)
- With auxiliary contact block equipped with 3 NO and 3 NC contacts
- Advanced breaker MUST be equipped with a Trip Unit. (Please refer to page A.8 for options)

		3 pole		4 pole left		4 pole right	
	Rating (A)	Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
S type Icu = Ics = Icw 50kA	400	LI04S4		LI04S6		LI04S5	
	630	LI07S4		LI07S6		LI07S5	
	800	LI08S4		LI08S6		LI08S5	
	1000	LI10S4		LI10S6		LI10S5	
	1250	LI13S4		LI13S6		LI13S5	
	1600	LI16S4		LI16S6		LI16S5	
	2000	LI20S4		LI20S6		LI20S5	
	2500(1)	LI25S4		LI25S6		LI25S5	
N type Icu = Ics = Icw 65kA	400	LI04N4		LI04N6		LI04N5	
	630	LI07N4		LI07N6		LI07N5	
	800	LI08N4		LI08N6		LI08N5	
	1000	LI10N4		LI10N6		LI10N5	
	1250	LI13N4		LI13N6		LI13N5	
	1600	LI16N4		LI16N6		LI16N5	
	2000	LI20N4		LI20N6		LI20N5	
	2500(1)	LI25N4		LI25N6		LI25N5	
C type Icu = Ics =Icw 50kA	2000	LI20C4		LI20C6		LI20C5	
	2500	LI25C4		LI25C6		LI25C5	
	3200	LI32C4		LI32C6		LI32C5	
	4000(1)	LI40C4		LI40C6		LI40C5	
D type Icu = Ics = Icw 65kA	2000	LI20D4		LI20D6		LI20D5	
	2500	LI25D4		LI25D6		LI25D5	
	3200	LI32D4		LI32D6		LI32D5	
	4000(1)	LI40D4		LI40D6		LI40D5	

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

Advanced breakers: Drawout Breakers; Moving portion only

- With auxiliary contact block equipped with 3 NO and 3 NC contacts
- Advanced Breaker MUST be equipped with a Trip Unit. (Please refer to page A.8 for options)
- A cassette is needed, please refer to page A.6 for options

		3 pole		4 pole left		4 pole right	
	Rating (A)	Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
S type Icu = Ics = Icw 50kA	400	LI04S1		LI04S3		LI04S2	
	630	LI07S1		LI07S3		LI07S2	
	800	LI08S1		LI08S3		LI08S2	
	1000	LI10S1		LI10S3		LI10S2	
	1250	LI13S1		LI13S3		LI13S2	
	1600	LI16S1		LI16S3		LI16S2	
	2000	LI20S1		LI20S3		LI20S2	
	2500	LI25S1		LI25S3		LI25S2	
N type Icu = Ics = Icw 65kA	400	LI04N1		LI04N3		LI04N2	
	630	LI07N1		LI07N3		LI07N2	
	800	LI08N1		LI08N3		LI08N2	
	1000	LI10N1		LI10N3		LI10N2	
	1250	LI13N1		LI13N3		LI13N2	
	1600	LI16N1		LI16N3		LI16N2	
	2000	LI20N1		LI20N3		LI20N2	
	2500	LI25N1		LI25N3		LI25N2	
C type Icu = Ics =Icw 50kA	2000	LI20C1		LI20C3		LI20C2	
	2500	LI25C1		LI25C3		LI25C2	
	3200	LI32C1		LI32C3		LI32C2	
	4000	LI40C1		LI40C3		LI40C2	
D type Icu = Ics = Icw 65kA	2000	LI20D1		LI20D3		LI20D2	
	2500	LI25D1		LI25D3		LI25D2	
	3200	LI32D1		LI32D3		LI32D2	
	4000	LI40D1		LI40D3		LI40D2	

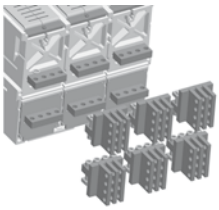
For 4 Pole Breakers Trip Unit configurable at 0,50 or 100% of Phase rating

Termination sets for Breakers & Isolators in fixed pattern

To modify standard connection (horizontal rear) to:
- Vertical rear
- Front flat connection

Sets containing terminals and hardware for the line & load side of the breaker

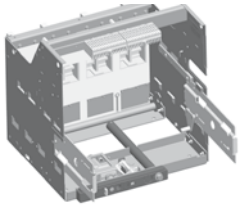
Vertical rear connections



Rating (A)	Suited for use with EntelliGuard -L types	3 pole Cat. No.	3 pole Ref. No.	4 pole Cat. No.	4 pole Ref. No.
Terminations for envelope 1					
400 - 1600A	LG & LI version S	L16H4RVI	**444441**	L16H6RVI	**444443**
2000 -2500A	LG & LI version S	L25H4RVI	**444445**	L25H6RVI	**444447**
400 - 2500A	LG, LI & LJ versions N & R				
Terminations for envelope 2					
2000 - 3200A	LG, LI & LJ versions C & D	G32M4RVI	**408070**	G32M6RVI	**408071**
4000A	LG, LI & LJ versions C & D	G40M4RVI	**408072**	G40M6RVI	**408074**

Front access connections

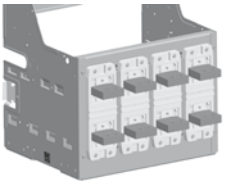
Terminations for envelope 1					
400 - 1600A	LG & LI version S	L16H4FFI	**444440**	L16H6FFI	**444442**
2000 - 2500A	LG & LI version S	L25H4FFI	**444444**	L25H6FFI	**444446**
400 - 2500A	LG, LI & LJ versions N & R				
Terminations for envelope 2					
2000 - 3200A	LG, LI & LJ versions C & D	G32M4FFI	**408066**	G32M6FFI	**408068**
4000A	LG, LI & LJ versions C & D	G40M4FFI	**408067**	G40M6FFI	**408069**



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

References apply for cassettes supplied in one packaging with Breakers or Isolators
(For separate cassettes see page A.14)
- With connection modes as indicated in left column
- Each cassette is supplied with safety shutters

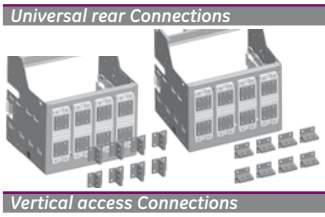
Horizontal Rear Connections



Rating (A)	Suited for use with EntelliGuard -L types	3 pole Cat. No.	3 pole Ref. No.	4 pole Cat. No.	4 pole Ref. No.
Cassette for envelope 1					
1600A	LG & LI version S \ LJ version R	LG16S2HXXXXM	**444278**	LG16S5HXXXXM	**444281**
2000A	LG & LI version S \ LJ version R	LG20N2HXXXXM	**444284**	LG20N5HXXXXM	**444287**
400 - 2000A	LG & LI version N & R \ LJ version N				
Cassette for envelope 2					
2000 - 3200A	LG, LI & LJ versions C & D	LG32D2HXXXXM	**444289**	LG32D5HXXXXM	**444291**

Each cassette is supplied with connection pads for Horizontal connections.

Universal rear Connections



Cassette for envelope 1					
1600A	LG & LI version S	LG16S2UXXXXM	**444277**	LG16S5UXXXXM	**444280**
2000 -2500A	LG & LI version S	LG25N2UXXXXM	**444283**	LG25N5UXXXXM	**444286**
400 - 2500A	LG, LI & LJ versions N & R				
Cassette for envelope 2					
2000 - 3200A	LG, LI & LJ versions C & D	LG32D2UXXXXM	**444288**	LG32D5UXXXXM	**444290**

Each cassette is supplied with connection pads that be rotated and used for Vertical or Horizontal connections.

Vertical access Connections

Cassettes for Envelope 2					
4000A	LG, LI & LJ versions C & D	LG40D2VXXXXM	**444292**	LG40D5VXXXXM	**444293**

Each cassette is supplied with Vertical connections.

Front Connections

Cassettes for Envelope 1					
1600A	LG & LI version S	LG16S2FXXXXM	**444276**	LG16S5FXXXXM	**444279**
2000 - 2500A	LG & LI version S	LG25N2FXXXXM	**444282**	LG25N5FXXXXM	**444285**
400 - 2500A	LG, LI & LJ versions N & R				

Each cassette is supplied with connection pads for front connections.

No Rear Terminals - Breaker Mounted in Cassette

Cassettes for Frame-1					
1600A	LG & LI version S	LG16S2XXXXXM	**444030**	LG16S5XXXXXM	**444031**
2000 - 2500A	LG & LI version for S > 1600A, N ≤ 2500A	LG25N2XXXXXM	**444032**	LG25N5XXXXXM	**444058**
Cassettes for Frame-2					
2000 - 3200A	3200A LG & LI version C-D	LG32D2XXXXXM	**444060**	LG32D5XXXXXM	**444062**
4000A	LG & LI version C-D (VER VERSION)	LG40D2XXXXXM	**444128**	LG40D5XXXXXM	**444130**

Terminals for no rear copper cassettes

Terminals

Rating (A)	Suited for use with EntelliGuard -L types	Cat. No.	Ref. No.[1]
Adapter connection			
400 - 1600A	Frame 1 - 3P/4P S-N-R	L16H1UNIR	**444124**
2000 - 2500A	Frame 1 - 3P/4P S-N-R	L25H1UNIR	**444125**
3200A	Frame 2 - 3P/4P C-D	L32M1UNIR	**444126**
4000A	frame 2 - 3P/4P C-D	L40M1RVIR	**444127**

(1) For 3 pole order 3 sets, for 4 pole order 4 sets

Isolators or Non Automatic breakers executed in a fixed mounting pattern

- With horizontal rear connection.[1] (For other options, please refer to page A.6)
- With auxiliary contact block equipped with 3 NO and 3 NC contacts

		3 pole		4 pole left		4 pole right	
	Rating (A)	Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
S type Icw=50kA	400	LJ04S4	**444161**	LJ04S6	**444173**	LJ04S5	**444390**
	630	LJ07S4	**444162**	LJ07S6	**444174**	LJ07S5	**444391**
	800	LJ08S4	**444163**	LJ08S6	**444175**	LJ08S5	**444392**
	1000	LJ10S4	**444164**	LJ10S6	**444176**	LJ10S5	**444393**
	1250	LJ13S4	**444165**	LJ13S6	**444177**	LJ13S5	**444394**
	1600	LJ16S4	**444166**	LJ16S6	**444178**	LJ16S5	**444395**
	2000	LJ20S4	**444167**	LJ20S6	**444179**	LJ20S5	**444396**
	2500[1]	LJ25S4	**444168**	LJ25S6	**444180**	LJ25S5	**444397**
D type Icw=65kA	2000	LJ20D4	**444169**	LJ20D6	**444181**	LJ20D5	**444398**
	2500	LJ25D4	**444170**	LJ25D6	**444182**	LJ25D5	**444399**
	3200	LJ32D4	**444171**	LJ32D6	**444183**	LJ32D5	**444400**
	4000[1]	LJ40D4	**444172**	LJ40D6	**444184**	LJ40D5	**444401**

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

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

- With auxiliary contact block equipped with 3 NO and 3 NC contacts
- A cassette is needed, please refer to page A.6 for options

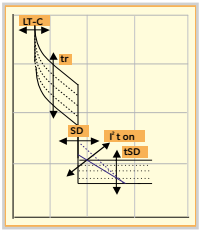
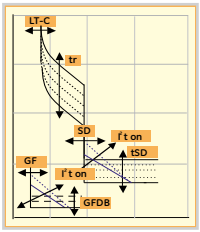
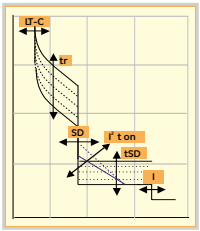
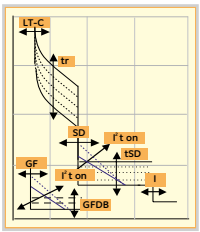
		3 pole		4 pole left		4 pole right	
	Rating (A)	Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
S type Icw=50kA	400	LJ04S1	**444135**	LJ04S3	**444147**	LJ04S2	**444378**
	630	LJ07S1	**444136**	LJ07S3	**444148**	LJ07S2	**444379**
	800	LJ08S1	**444137**	LJ08S3	**444149**	LJ08S2	**444380**
	1000	LJ10S1	**444138**	LJ10S3	**444150**	LJ10S2	**444381**
	1250	LJ13S1	**444139**	LJ13S3	**444151**	LJ13S2	**444382**
	1600	LJ16S1	**444140**	LJ16S3	**444152**	LJ16S2	**444383**
	2000	LJ20S1	**444141**	LJ20S3	**444153**	LJ20S2	**444384**
	2500	LJ25S1	**444142**	LJ25S3	**444154**	LJ25S2	**444385**
D type Icw=65kA	2000	LJ20D1	**444143**	LJ20D3	**444155**	LJ20D2	**444386**
	2500	LJ25D1	**444144**	LJ25D3	**444156**	LJ25D2	**444387**
	3200	LJ32D1	**444145**	LJ32D3	**444157**	LJ32D2	**444388**
	4000	LJ40D1	**444146**	LJ40D3	**444158**	LJ40D2	**444389**

Trip Unit Configurable at 0.50 or 100% of phase rating

Trip Units

Factory Mounted Trip Units

GT- L

Basic functionality	Designation	Cat. No.	Ref. No.
	**GT-L Trip Unit with:** LT-C 0.4 -1 x In = Ir tr (22 C type curves) SD I2T ON or OFF tSD (90ms to 1 sec.)	LTG00K1XXSFXXXX	**444260**
	**GT-L Trip Unit with:** LT-C 0.4 -1 x In = Ir tr (22 C type curves) SD I2T ON or OFF tSD (90ms to 1 sec.) GF I2T ON or OFF tg (100 ms to 0.9 sec))	LTG00K2XXSFXXXX	**444261**
	**GT-L Trip Unit with:** LT-C 0.4 -1 x In = Ir tr (22 C type curves) SD I2T ON or OFF tSD (90ms to 1 sec.) Ii	LTG00K9XXSFXXXX	**444262**
	**GT-L Trip Unit with:** LT-C 0.4 -1 x In = Ir tr (22 C type curves) SD I2T ON or OFF tSD (90ms to 1 sec.) GF I2T ON or OFF tg (100 ms to 0.9 sec)) Ii	LTG00K3XXSFXXXX	**444263**

Field Mounted Trip units

Rating	Cat. No.	Ref. No.
EG L GT-L LT, ST	LTG00K1XXSRXXXX	**444786**
EG L GT-L LT, ST & GF	LTG00K2XXSRXXXX	**444787**
EG L GT-L LT, ST, I	LTG00K9XXSRXXXX	**444788**
EG L GT-L LT, ST, I & GF	LTG00K3XXSRXXXX	**444789**

Rogowski coils

For groundfault protection with 3pole breaker in 4 wire networks with GT-L Trip Units

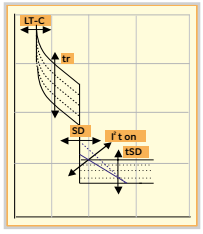
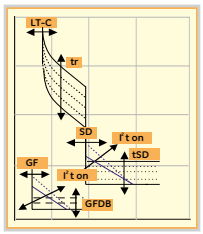
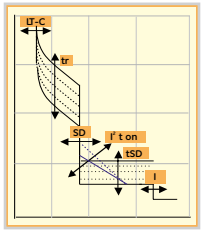
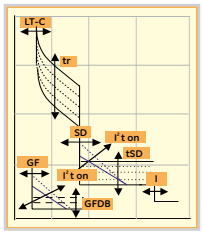
Sensors

	Envelope 1		Envelope 2	
Rating	Cat. No.	Ref. No.	Cat. No.	Ref. No.
400A	L104NRC	**444420**		
630A	L106NRC	**444421**		
800A	L108NRC	**444422**		
1000A	L110NRC	**444423**		
1250A	L113NRC	**444424**		
1600A	L116NRC	**444425**		
2000A	L120NRC	**444426**	L220NRC	**444427**
2500A	L125NRC	**444428**	L225NRC	**444429**
3200A			L232NRC	**444430**
4000A			L240NRC	**444432**

Trip Units

Factory Mounted Trip Units

GT- N

Basic functionality	Designation	Extended Funcationality	Cat. No.	Ref. No.
	**GT-N Trip Unit with:** LT-C 0.2-1xIn = Ir LTDB ST I2T STDB I, can be switched ON or OFF RELT	Modbus Communication RELT	LIG00K9X2SFXXXX	-
	**GT-N Trip Unit with:** LT-C 0.2-1xIn = Ir LTDB ST I2T STDB I, can be switched ON or OFF RELT	Measurement unit RELT	LIG00K9X4SFXXXX	-
	**GT-N Trip Unit with:** "LT-C 0.2-1xIn = Ir LTDB ST I2T STDB I, can be switched ON or OFF RELT	Measurement unit RELT Relay functionality	LIG00K9X5SFXXXX	-
	**GT-N Trip Unit with:** LT-C 0.2-1xIn = Ir LTDB ST I2T STDB GF I2T ON or OFF GFDB I, can be switched ON or OFF RELT	"Measurement unit RELT Relay functionality"	LIG00K3X5SFXXXX	-

Note: For field replacement trip units, please replace digit 11 of the trip unit catalog number from "F" to "R".

GT-rating plug *(Required for Extended Funcationality)*

Cat. No.	Ref. No.
GTPUNI	408860

Rogowski coils

For groundfault protection with 3pole breaker in 4 wire networks with GT-N & GT-H Trip Units

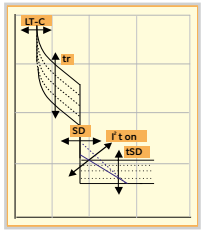
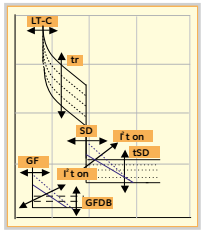
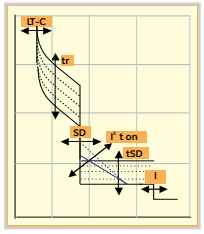
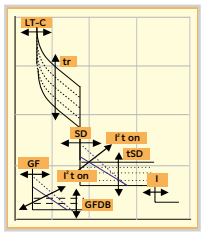
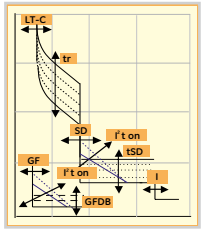
Sensors

Rating	Envelope 1		Envelope 2	
	Cat. No.	Ref. No.	Cat. No.	Ref. No.
400A	G04HNRC	**408000**		
630A	G07HNRC	**408001**		
800A	G08HNRC	**408002**		
1000A	G10HNRC	**408003**		
1250A	G13HNRC	**408004**		
1600A	G16HNRC	**408005**		
2000A	G20HNRC	**408006**	G20MNRC	-
2500A	G25HNRC	**408007**	G25MNRC	**408162**
3200A			G32MNRC	-
4000A			G40MNRC	-

Trip Units

Factory Mounted Trip Units

GT- H

Basic functionality	Designation	Extended Funcationality	Cat. No.	Ref. No.
	**GT-H Trip Unit with:** LT-C 0.2-1xIn = Ir LTDB ST I2T STDB I, can be switched ON or OFF RELT	Measurement unit Modbus communication Data acquisition RELT	LIG00K9X6SFXXXX	-
	**GT-H Trip Unit with:** LT-C 0.2-1xIn = Ir LTDB ST I2T STDB I, can be switched ON or OFF RELT	Measurement unit Modbus communication Data acquisition Relay functionality RELT	LIG00K9X8SFXXXX	-
	**GT-H Trip Unit with:** LT-C 0.2-1xIn = Ir LTDB ST I2T STDB GF I2T ON or OFF GFDB I, can be switched ON or OFF RELT	Measurement unit Modbus communication Data acquisition RELT	LIG00K3X6SFXXXX	-
	**GT-H Trip Unit with:** LT-C 0.2-1xIn = Ir LTDB ST I2T STDB GF I2T ON or OFF GFDB I, can be switched ON or OFF RELT	Zone Selective Interlock on I, ST & GF funcions	LIG00K3TXSFXXXX	-
	**GT-H Trip Unit with:** LT-C 0.2-1xIn = Ir LTDB ST I2T STDB GF I2T ON or OFF GFDB I, can be switched ON or OFF RELT	Zone Selective Interlock on ST & GF funcions	LIG00K3ZXSFXXXX	-

Note: For field replacement trip units, please replace digit 11 of the trip unit catalog number from "F" to "R".

GT-rating plug *(Required for Extended Funcationality)*

Cat. No.	Ref. No.
GTPUNI	**408860**

Internal Accessories - Factory mounted

For field mounted variants see page A.13

Motor Operators[1] & Closing Coils

	Motor Operator Envelope 1		Motor Operator Envelope 2		Closing Coil	
	Cat. No.	**Ref. No.**	**Cat. No.**	**Ref. No.**	**Cat. No.**	**Ref. No.**
24-30V DC	LM01024D	**444190**	GM01024D	**407700**	GCCN024D	**407861**
110-130V DC	LM01110D	**444191**	GM01110D	**407706**	GCCN120	**407867**
220V DC	LM01220D	**444192**	GM01220D	**407720**	GCCN240	**407869**
110-130V AC	LM01120A	**444193**	GM01120A	**407712**	GCCN120	**407867**
220-240V AC	LM01240A	**444194**	GM01240A	**407714**	GCCN240	**407869**
380-415V AC					GCCN400A	**407877**

Releases

	Undervoltage		Shunt	
24V DC	GUVT024D	**407795**	GSTR024D	**407770**
48V DC; 40-48V AC	GUVT048	**407797**	GSTR048	**407772**
110-130V AC-DC	GUVT120	**407801**	GSTR120	**407776**
220-240V AC-DC	GUVT240	**407803**	GSTR240	**407778**
380- 415V AC	GUVT400A	**407807**	GSTR400A	**407782**

Auxiliary Contacts

Power Rated 3NO & 3NC	LAS3	**444205**
(Delivered as standard option in all EntelliGuard L breakers & Isolators)		
Power Rated 4NO & 4NC	LAS4	**444206**

Indication Contacts

Bell Alarm Contact	LBAT1	**444207**
1 Change over contact		
Ready to Closes Contact	GRTC1	**407897**
1 NO contact		

Locking Mechanisms[2]

	Ronis		Profalux		Castell 19mm type	
Mounted on Breaker	LBRON	**444212**	LBPRO	**444211**	LBCA9	**444214**
One Lock can be mounted						
Mounted on cassette	LCRON	**444216**	LCPRO	**444215**		
One Lock can be mounted						

Operation Counter

On Front Fascia of Breaker		
Counter; number of Operations	GMCN	**408035**

Cassette Position Switch

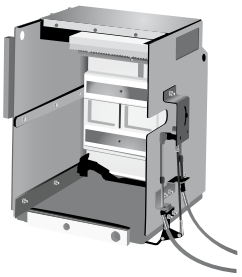
Cassette Position Switch		
2 NO and 2 NC-Frame 1	LCPS1	**444230**
2 NO and 2 NC-Frame 1	LCPS2	**444232**

(1) Supplied with spring charged contact
(2) See page A.13 for locks

Internal Accessories - Factory mounted

For field mounted variants see page A.13

Mounted Interlocks for Cables



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		L12FAD	**444221**	L12WAD	**444222**
	OFF	ON					
B	OFF	OFF	OFF	For each Breaker		For each Breaker	
	ON	OFF	OFF	L13FB	**444223**	L13WB	**444224**
	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	L13FC	**444225**	L13WC	**444226**
	ON	ON	OFF				
	OFF	ON	ON				
	ON	OFF	ON				
D	OFF	OFF	OFF	For Brk.1 & 3		For Brk.1 & 3	
	ON	OFF	OFF	L12FAD	**444221**	L12WAD	**444222**
	OFF	OFF	ON				
	ON	OFF	ON	For Brk. 2		For Brk. 2	
	OFF	ON	OFF	L13FDT	**444227**	L13WDT	**444228**

Internal Accessories - Field mountable

For factory mounted variants see page A.11

Motor operators & closing Coils [1]

	Motor operator envelope 1		Motor operator envelope 2		Closing coil	
	Cat. No.	Ref. No.	Cat. No.	Ref. No.	Cat. No.	Ref. No.
24-30V DC	LM01024DR	**444195**	GM01024DR	**407701**	GCCN024DR	**407860**
110-130V DC	LM01110DR	**444196**	GM01110DR	**407707**	GCCN120R	**407866**
220V DC	LM01220DR	**444197**	GM01220DR	**407721**	GCCN240R	**407868**
110-130V AC	LM01120AR	**444198**	GM01120AR	**407713**	GCCN120R	**407866**
220-240V AC	LM01240AR	**444199**	GM01240AR	**407715**	GCCN240R	**407868**
380-415V AC					GCCN400AR	**407876**

Releases

	Undervoltage		Shunt	
24V DC	GUVT024DR	**407796**	GSTR024DR	**407771**
48V DC; 40-48V AC	GUVT048R	**407798**	GSTR048R	**407773**
110-130V AC-DC	GUVT120R	**407802**	GSTR120R	**407777**
220-240V AC-DC	GUVT240R	**407804**	GSTR240R	**407779**
380- 415V AC	GUVT400AR	**407808**	GSTR400AR	**407783**

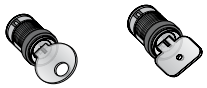
Auxiliary contacts

Power rated 3NO & 3NC	LAS3R	**444208**
(Delivered as standard option in all EntelliGuard L breakers & Isolators)		
Power Rated 4NO & 4NC	LAS4R	**444209**

Indication contacts

Bell alarm contact	LBAT1R	**444210**
1 Change over contact		

Locks with random key nr.



	Ronis		Castell	
	Cat. No.	Ref. No.	Cat. No.	Ref. No.
Ronis 1104 B Lock[2]	GRON	**407985**		
Profalux B204Y Lock[2]			GPRO	-

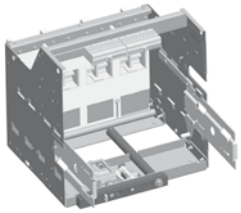
Operation counter

On Front Fascia of breaker		
Counter; number of Operations	GMCNR	**408033**

Cassette Position Switch

Cassette Position Switch		
2 NO and 2 NC-Frame 1	LCPS1R	**444231**
2 NO and 2 NC-Frame 1	LCPS2R	**444233**

(1) Supplied with spring charged contact
(2) See page A.11 for lock mechanisms

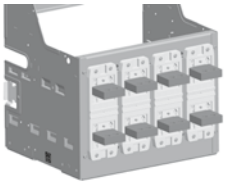


Cassettes for use with Breakers & Isolators in Draw-out pattern

- References apply for separately suppllied cassettes for breakers or isolators
  (For cassettes supplied with breaker see page A.6)
- With connection modes as indicated in left column
- Each cassette is supplied with safety shutters

Cassettes for Draw-out Pattern; fixed portion only

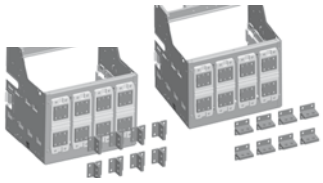
Horizontal rear connections



Rating (A)	Suited for use with EntelliGuard* -L types	3 pole Cat. No.	3 pole Ref. No.	4 pole Cat. No.	4 pole Ref. No.
Cassettes for Envelope 1					
1600A	LG version S	LG16S2HXXXXR	**444308**	LG16S5HXXXXR	**444311**
2000A	LG version S	LG20N2HXXXXR	**444314**	LG20N5HXXXXR	**444317**
400 - 2500A	LG & LJ versions N & R				
Cassettes for Envelope 2					
2000 - 3200A	LG & LJ versions C & D	LG32D2HXXXXR	**444319**	LG32D5HXXXXR	**444321**

Remark: Each cassette is supplied with connection pads for Horizontal connections.

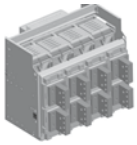
Universal rear connections



Cassettes for Envelope 1					
1600A	LG version S	LG16S2UXXXXR	**444307**	LG16S5UXXXXR	**444310**
2500A	LG version S	LG25N2UXXXXR	**444313**	LG25N5UXXXXR	**444316**
400 - 2500A	LG & LJ versions N & R				
Cassettes for Envelope 2					
2000 - 3200A	LG & LJ versions C & D	LG32D2UXXXXR	**444318**	LG32D5UXXXXR	**444320**

Remark: Each cassette is supplied with connection pads that be rotated and used for Vertical or Horizontal connections.

Vertical access connections



Cassettes for Envelope 2					
4000A	LG & LJ versions C & D	LG40D2VXXXXR	**444322**	LG40D5VXXXXR	**444323**

Remark: Each cassette is supplied with Vertical connections.

Front connections

Cassettes for Envelope 1					
1600A	LG version S	LG16S2FXXXXR	**444306**	LG16S5FXXXXR	**444309**
2000 - 2500A	LG version S	LG25N2FXXXXR	**444312**	LG25N5FXXXXR	**444315**
400 - 2500A	LG & LJ versions N & R				

Remark: Each cassette is supplied with connection pads for front connections.

Casssette top covers	*Insulating top covers*[1]				
	Cassette for Envelope 1	L1CTC1	**444450**	L1CTC3	**444451**
	Cassette for Envelope 2	L2CTC1	**444452**	L2CTC3	**444453**

No Rear Terminals

Cassettes for Frame-1					
1600A	LG version S	LG16N2XXXXXR	**444028**	LG16N5XXXXXR	**444029**
1600A	LG Version S >1600A, N ≤2 500A	LG25N2XXXXXR	**444057**	LG25N5XXXXXR	**444059**
Cassettes for Frame-2					
2000 - 3200A	LG Version C-D	LG32D2XXXXXR	**444061**	LG32D5XXXXXR	**444063**
4000A	LG Version C-D	LG40D2XXXXXR	**444129**	LG40D5XXXXXR	**444131**

(1) Factory mounted only

Terminals for no rear copper cassettes

Terminals

Rating (A)	Suited for use with EntelliGuard -L types	Cat. No.	Ref. No.[1]
Adapter connection			
400 - 1600A	Frame 1 - 3P/4P S-N-R	L16H1UNIR	**444124**
2000 - 2500A	Frame 1 - 3P/4P S-N-R	L25H1UNIR	**444125**
3200A	Frame 2 - 3P/4P C-D	L32M1UNIR	**444126**
4000A	frame 2 - 3P/4P C-D	L40M1RVIR	**444127**

(1) For 3 pole order 3 sets, for 4 pole order 4 sets
Screw Sizes for Universal Rear Terminals to cassette: LG16S = M10x24 - LG25N = M10x30 - LG32D = M10x35
Torque Required = 40±2Nm

Accessories - Other

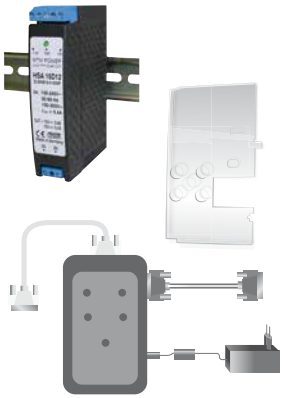
Field mountable cables for interlocking of breakers (1)

Interlock Type	Interlock scheme No. of Cables Needed		Cat. No.	Ref. No.
A	1 cable per breaker, choose length as indicated			
B	1 cable per breaker, choose length as indicated	Cable length 1 metre	GCB1	**407990**
		Cable length 1,6 metre	GCB2	**407991**
C	1 cable per breaker, choose length as indicated	Cable length 2 metre	GCB3	**407992**
		Cable length 2,5 metre	GCB4	**407993**
D	Breaker's 1 and 3: 1 cable per breaker, choose length as indicated Breaker 2: 2 cables choose length as indicated	Cable length 3 metre	GCB5	**407994**
		Cable length 3,5 metre	GCB6	**407995**
		Cable length 4 metre	GCB7	**407996**

Time delay module for UVR release (2) type: TDM

	Cat. No.	Ref. No.
48V AC	GTDM048A	**407816**
110-130V DC	GTDM120A	**407818**
220-240V DC	GTDM120D	**407819**
110-130V AC	GTDM240A	**407820**
220-240V AC	GTDM240D	**407821**
380- 415V AC	GTDM400A	**407825**

GT- Accessories



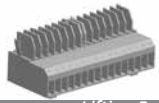
Designation	Cat. No.	Ref. No.
Power supply 222-265V- AC-24VDC 0.22Amps	GAPU	**408789**
Trip unit, sealable transparent front cover	GTUS	**408046**
Trip unit tester & No Voltage setup unit	GTUTK20	-
Voltage Conditioners		
3 phase: 120, 208, or 230 VAC	GMPU5	-
3 phase: 240, 277, or 320 VAC	GMPU6	-
3 phase: 400, 480, or 600 VAC	GMPU7	-
1 phase: 690 VAC	GMPU4	**408793**

Locking and Interlocking

Designation		
Front Fascia of Breaker (Factory Mounted)		
Padlocking device for Pushbuttons	GPBD	**408040**
Cassette (Factory Mounted)		
Mis insertion device	LREPM	**444246**
Door Interlock		
Interlock on LEFT envelope 1	L1LHD	**444240**
Interlock on RIGHT envelope 1	L1RHD	**444241**
Interlock on LEFT envelope 2	L2LHD	**444242**
Interlock on RIGHT envelope 2	L2RHD	**444243**

(1) Refer Page A.12 for associated breaker and or cassette mounted kits
(2) TDM (Time Delay Module) is mounted external to the breaker/switch

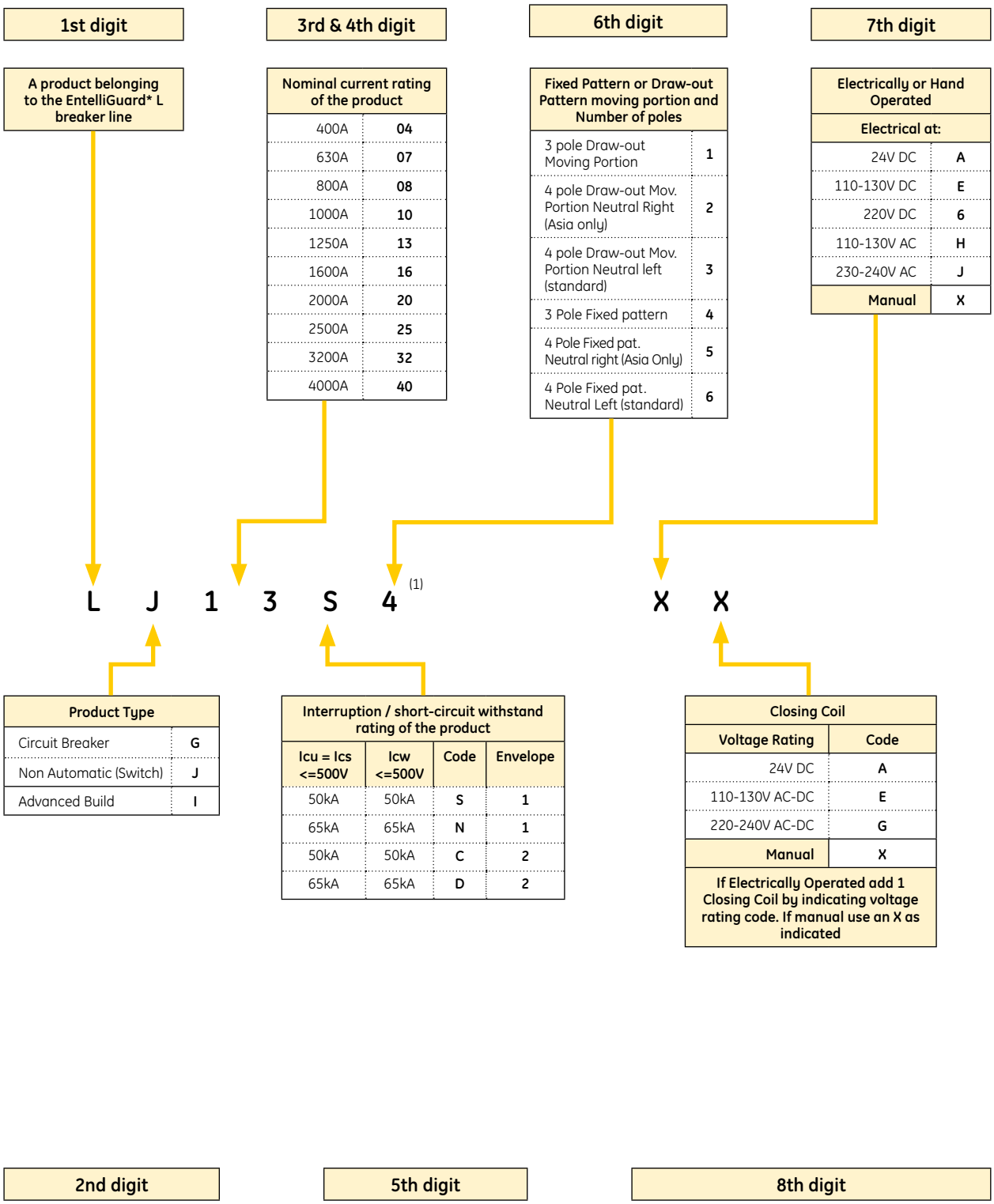
Spare Parts for Power Circuit Breakers

		Envelope 1		Envelope 2	
		Cat. No.	**Ref. No.**	**Cat. No.**	**Ref. No.**
Breaker arc chutes					
	Arc chute for 1 pole	L25NCHT	**444407**	L40DCHT	**444411**
Breaker fixed arcing contacts					
	Set for 1pole all tiers [1]	L25NARC	**444404**	L40DARC	**444410**
Breaker: Door flanges					
	Door flange fixed [1]	LDPRF	**444200**	LDPRF	**444200**
	Door flange draw-out [1]	GDPRW	**408026**	GDPRW	**408026**
IP54 cover					
	Front facia cover IP54	GGDEFD	**408038**	GGDEFD	**408038**
Cassette racking handle					
	Racking handle [1]	LRHN	**444412**	LRHN	**444412**
Breaker front fascia part[2]					
	Front fascia 3 or 4 pole [2]	LFAL1	**444413**	LFAL2	**444414**
Cassette cluster contacts					
	**Sets per pole** [1]				
	Current rating 400-1250A	L13NCLS	**444405**		
	Current rating 1600A	L16NCLS	**444406**		
	Current rating 2000-2500A	L25NCLS	**444408**		
	Current rating 2000-4000A			L40DCLS	**444409**
	Set of universal cluster pliers	GUNI	**408047**	GUNI	**408047**
Disconnect terminals					
	For fixed or draw-out breaker (B & C block 32 pole) (1)	LSDT	**444415**	LSDT	**444415**
	For fixed or draw-out breaker (A block 39 pole)[3]	LSDFTR	-	LSDFTR	-
Lifting Beam & Lifting Truck					
	**Lifting beam**				
	for use with 3P breakers	GLD3F12	-	GLD3F12	-
	for use with 4P breakers	GLD4F12	-	GLD4F12	-
	Lifting truck	GE-1000	-	GE-1000	-

(1) These Parts are supplied as standard along with breakers. (Can also be ordered as Spare).
(2) The original breaker serial number must be indicated on ordering
For a factory test report, please add Ref. No. 408733 to the order.
(3) These parts are supplied standard along with breaker. However, you will need to purchase one if upgrading old GT-L cassette with new LI breaker.

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)



(1) For an overview of the valid combinations indicating the available options see page A.20

Global Catalogue number structure - Breaker

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

9th digit

Shunt Release	
Voltage Rating	Code
24V DC	A
40-48VDC 48V AC	B
110-130V AC-DC	E
220-240V AC-DC	G
380-415V AC	K
None	X

Add Shunt Release by indicating voltage rating code. if not needed use an X as indicated.

11th digit

Reserved for Future use	Code
	X

13th digit

Bell Alarm Contact,Operations Counter & Ready to Close Contact		
Bell Alarm 1 NO	A	D
Mechanical Operations Counter	B	K
Bell Alarm 1NO & Mecha-nical Operations counter	C	G
Ready to Close contact 1 NO	1	
None	X	X
	No other contacts installed	Ready to Close contact 1 NO Power Rated on Secondary terminals

15th digit

Factory Installed prevision to mount a Cable interlock beween breakers.	
Mechanical Interlock - Type A	1
Mechanical Interlock - Type B	2
Mechanical Interlock - Type C	3
Mechanical Interlock - Type D	4
No Provision for Breaker Interlock	x

A X X 2 X X X XX

10th digit

Undervoltage Release	
Voltage Rating	Code
24V DC	1
40-48VDC 48V AC	3
110-130V AC-DC	5
220-240V AC-DC	7
380-415V AC	W
None	X

Add UVR release by using the indicated code. The use of an X indictates no Release installed.

12th digit

Auxiliary Switches	
Type	Code
3NO+3NC (Power Rated)[2]	2
4NO+4NC (Power Rated)	3

14th digit

Factory Installed prevision to mount a Key lock on the breakers	
Profalux lock Provision	P
Ronis Lock Provision	R
Push button Padlock device	L
Ronis Lock Provision & Push button Padlock device	3
Profalux lock Provision & Push button padlock device	4
Profalux lock mounted type	Q
Ronis Lock mounted type	S
Profalux lock mounted type & Push button padlock device	6
Ronis lock mounted type & Push button padlock device	7
None	X

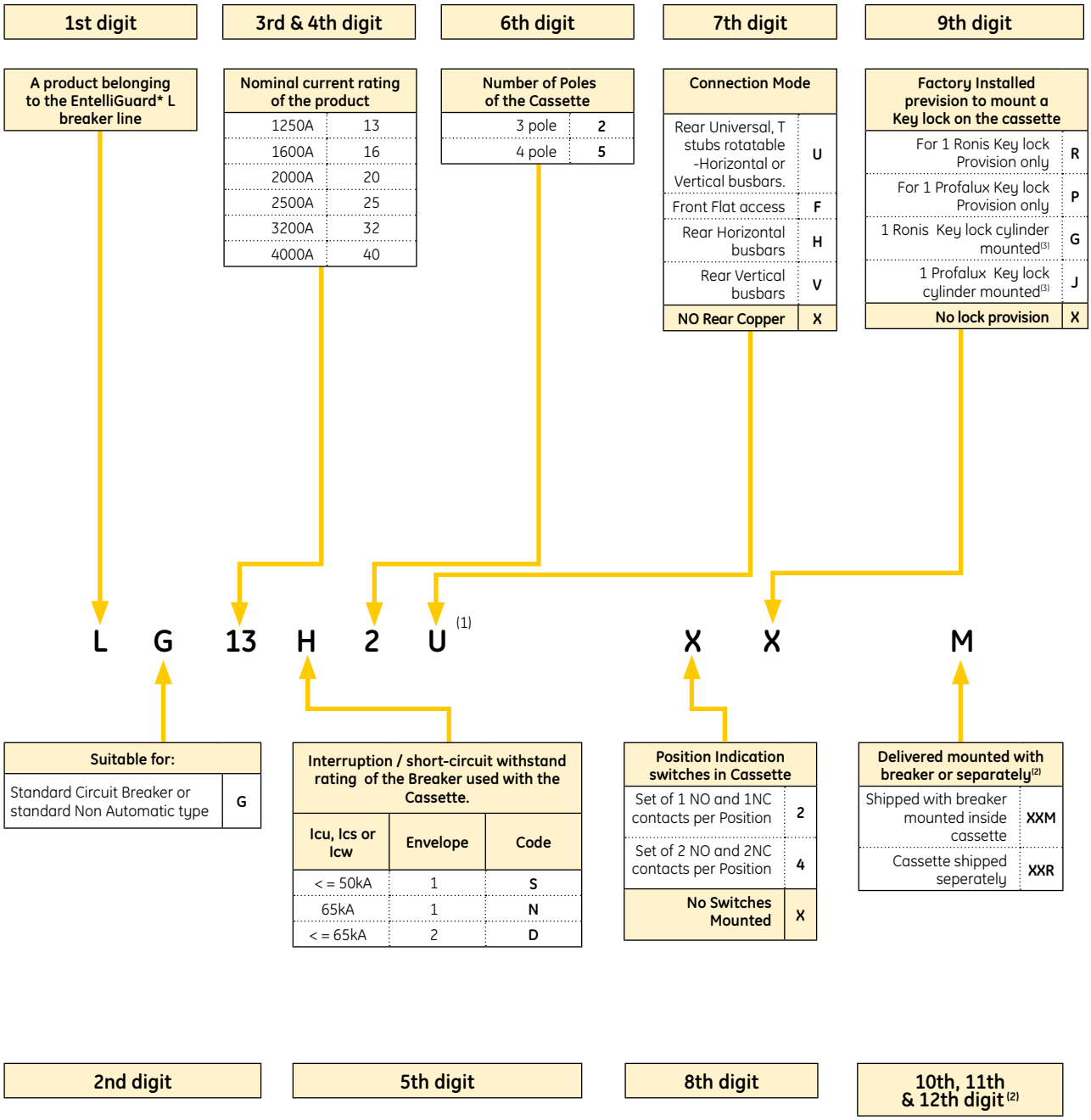
16, 17th & 18th digit

Defines Installed GT type Electronic Trip Unit			
Basic Type	Code	Functionality	Code
GT-L with Ammeter	L	LT, LTD. ST, STD	01
		LT, LTD. ST, STD, GF & GFD	02
		LT, LTD. ST, STD & I	06
		LT, LTD. ST, STD, I, GF & GFD	07
GT-N with Ammeter + Optional Communi-cation	N	LT, LTD, ST, STD, I, RELT & Modbus	03
		LT, LTD, ST, STD, I, Monitoring & RELT	05
		LT, LTD, ST, STD, I, Monitoring, RELT & Relaying	06
		LT, LTD, ST, STD, I, G, Monitoring, RELT & Relaying	07
GT-H with Mea-surement + Relaying + Waveform Capture + Optional Com-munications	H	LT, LTD, ST, STD, I, G, GF, GFD, ZSI (ST, GF)	04
		LT, LTD, ST, STD, I, G, GF, GFD, ZSI (ST, GF, I)	08
		LT, LTD, ST, STD, I, Monitoring, RELT, Data Acquisition & Modbus	10
		LT, LTD, ST, STD, I, Monitoring, RELT, Data Acquisition, Relaying & Modbus	11
		LT, LTD, ST, STD, I, G, GF, GFD, Monitoring, RELT, Data Acquisition & Modbus	12
No prevision for Trip Unit			
	L		00

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

Global Catalogue number structure - Cassettes

- Codes built in the indicated manner can be used as an alternative ordering method
- Cassettes for uses with draw-out breakers



(1) For an overview of the valid combinations indicating the available options see page A.21
(2) Digit 10 and 11 are reserved for future use, a filler "XX" is used
(3) Lock will have random lock cylinder number. Cannot be coordinated

Power Circuit Breakers, Valid Catalogue number combinations

Available standard Breakers, Cassette types and Trip Units

3 & 4 pole Breakers and Isolators in Fixed Pattern

Cat. No	Sef. No.	Page
LG04N4	**444078**	A.4
LG04N5	**444366**	A.4
LG04N6	**444112**	A.4
LG04S4	**444066**	A.4
LG04S5	**444354**	A.4
LG04S6	**444100**	A.4
LG07N4	**444079**	A.4
LG07N5	**444367**	A.4
LG07N6	**444113**	A.4
LG07S4	**444067**	A.4
LG07S5	**444355**	A.4
LG07S6	**444101**	A.4
LG08N4	**444080**	A.4
LG08N5	**444368**	A.4
LG08N6	**444114**	A.4
LG08S4	**444068**	A.4
LG08S5	**444356**	A.4
LG08S6	**444102**	A.4
LG10N4	**444081**	A.4
LG10N5	**444369**	A.4
LG10N6	**444115**	A.4
LG10S4	**444069**	A.4
LG10S5	**444357**	A.4
LG10S6	**444103**	A.4
LG13N4	**444082**	A.4
LG13N5	**444370**	A.4
LG13N6	**444116**	A.4
LG13S4	**444070**	A.4
LG13S5	**444358**	A.4
LG13S6	**444104**	A.4
LG16N4	**444083**	A.4
LG16N5	**444371**	A.4
LG16N6	**444117**	A.4
LG16S4	**444071**	A.4
LG16S5	**444359**	A.4
LG16S6	**444105**	A.4
LG20D4	**444074**	A.4
LG20D5	**444362**	A.4
LG20D6	**444108**	A.4
LG20D4	**444086**	A.4
LG20D5	**444374**	A.4
LG20D6	**444120**	A.4
LG20N4	**444084**	A.4
LG20N5	**444372**	A.4
LG20N6	**444118**	A.4
LG20S4	**444072**	A.4
LG20S5	**444360**	A.4
LG20S6	**444106**	A.4
LG25D4	**444075**	A.4
LG25D5	**444363**	A.4
LG25D6	**444109**	A.4
LG25D4	**444087**	A.4
LG25D5	**444375**	A.4
LG25D6	**444121**	A.4
LG25N4	**444085**	A.4
LG25N5	**444373**	A.4
LG25N6	**444119**	A.4
LG25S4	**444073**	A.4
LG25S5	**444361**	A.4
LG25S6	**444107**	A.4
LG32D4	**444076**	A.4
LG32D5	**444364**	A.4
LG32D6	**444110**	A.4
LG32D4	**444088**	A.4
LG32D5	**444376**	A.4
LG32D6	**444122**	A.4
LG40D4	**444077**	A.4
LG40D5	**444365**	A.4
LG40D6	**444111**	A.4
LG40D4	**444089**	A.4
LG40D5	**444377**	A.4
LG40D6	**444123**	A.4
LJ04S4	**444161**	A.7
LJ04S5	**444390**	A.7
LJ04S6	**444173**	A.7
LJ07S4	**444162**	A.7
LJ07S5	**444391**	A.7
LJ07S6	**444174**	A.7
LJ08S4	**444163**	A.7
LJ08S5	**444392**	A.7
LJ08S6	**444175**	A.7
LJ10S4	**444164**	A.7
LJ10S5	**444393**	A.7
LJ10S6	**444176**	A.7
LJ13S4	**444165**	A.7
LJ13S5	**444394**	A.7
LJ13S6	**444177**	A.7
LJ16S4	**444166**	A.7
LJ16S5	**444395**	A.7
LJ16S6	**444178**	A.7
LJ20D4	**444169**	A.7
LJ20D5	**444398**	A.7
LJ20D6	**444181**	A.7
LJ20S4	**444167**	A.7
LJ20S5	**444396**	A.7
LJ20S6	**444179**	A.7
LJ25D4	**444170**	A.7
LJ25D5	**444399**	A.7
LJ25D6	**444182**	A.7
LJ25S4	**444168**	A.7
LJ25S5	**444397**	A.7
LJ25S6	**444180**	A.7
LJ32D4	**444171**	A.7
LJ32D5	**444400**	A.7
LJ32D6	**444183**	A.7
LJ40D4	**444172**	A.7
LJ40D5	**444401**	A.7
LJ40D6	**444184**	A.7

3 & 4 pole Breakers and Isolators draw-out portion only

Cat. No	Ref. No.	Page
LG04N1	**444012**	A.4
LG04N2	**444342**	A.4
LG04N3	**444045**	A.4
LG04S1	**444000**	A.4
LG04S2	**444330**	A.4
LG04S3	**444033**	A.4
LG07N1	**444013**	A.4
LG07N2	**444343**	A.4
LG07N3	**444046**	A.4
LG07S1	**444001**	A.4
LG07S2	**444331**	A.4
LG07S3	**444034**	A.4
LG08N1	**444014**	A.4
LG08N2	**444344**	A.4
LG08N3	**444047**	A.4
LG08S1	**444002**	A.4
LG08S2	**444332**	A.4
LG08S3	**444035**	A.4
LG10N1	**444015**	A.4
LG10N2	**444345**	A.4
LG10N3	**444048**	A.4
LG10S1	**444003**	A.4
LG10S2	**444333**	A.4
LG10S3	**444036**	A.4
LG13N1	**444016**	A.4
LG13N2	**444346**	A.4
LG13N3	**444049**	A.4
LG13S1	**444004**	A.4
LG13S2	**444334**	A.4
LG13S3	**444037**	A.4
LG16N1	**444017**	A.4
LG16N2	**444347**	A.4
LG16N3	**444050**	A.4
LG16S1	**444005**	A.4
LG16S2	**444335**	A.4
LG16S3	**444038**	A.4
LG20D1	**444008**	A.4
LG20D2	**444338**	A.4
LG20D3	**444041**	A.4
LG20D1	**444020**	A.4
LG20D2	**444350**	A.4
LG20D3	**444053**	A.4
LG20N1	**444018**	A.4
LG20N2	**444348**	A.4
LG20N3	**444051**	A.4
LG20S1	**444006**	A.4
LG20S2	**444336**	A.4
LG20S3	**444039**	A.4
LG25D1	**444009**	A.4
LG25D2	**444339**	A.4
LG25D3	**444042**	A.4
LG25D1	**444021**	A.4
LG25D2	**444351**	A.4
LG25D3	**444054**	A.4
LG25N1	**444019**	A.4
LG25N2	**444349**	A.4
LG25N3	**444052**	A.4
LG25S1	**444007**	A.4
LG25S2	**444337**	A.4
LG25S3	**444040**	A.4
LG32D1	**444010**	A.4
LG32D2	**444340**	A.4
LG32D3	**444043**	A.4
LG32D1	**444022**	A.4
LG32D2	**444352**	A.4
LG32D3	**444055**	A.4
LG40D1	**444011**	A.4
LG40D2	**444341**	A.4
LG40D3	**444044**	A.4
LG40D1	**444023**	A.4
LG40D2	**444353**	A.4
LG40D3	**444056**	A.4
LJ04S1	**444135**	A.7
LJ04S2	**444378**	A.7
LJ04S3	**444147**	A.7
LJ07S1	**444136**	A.7
LJ07S2	**444379**	A.7
LJ07S3	**444148**	A.7
LJ08S1	**444137**	A.7
LJ08S2	**444380**	A.7
LJ08S3	**444149**	A.7
LJ10S1	**444138**	A.7
LJ10S2	**444381**	A.7
LJ10S3	**444150**	A.7
LJ13S1	**444139**	A.7
LJ13S2	**444382**	A.7
LJ13S3	**444151**	A.7
LJ16S1	**444140**	A.7
LJ16S2	**444383**	A.7
LJ16S3	**444152**	A.7
LJ20D1	**444143**	A.7
LJ20D2	**444386**	A.7
LJ20D3	**444155**	A.7
LJ20S1	**444141**	A.7
LJ20S2	**444384**	A.7
LJ20S3	**444153**	A.7
LJ25D1	**444144**	A.7
LJ25D2	**444387**	A.7
LJ25D3	**444156**	A.7
LJ25S1	**444142**	A.7
LJ25S2	**444385**	A.7
LJ25S3	**444154**	A.7
LJ32D1	**444145**	A.7
LJ32D2	**444388**	A.7
LJ32D3	**444157**	A.7
LJ40D1	**444146**	A.7
LJ40D2	**444389**	A.7
LJ40D3	**444158**	A.7

3 & 4 pole Cassettes, supplied with breakers

Cat. No	Ref. No.	Page
LG40D2XXXXXM	**444128**	A.6
LG16S2FXXXXM	**444276**	A.6
LG16S2HXXXXM	**444278**	A.6
LG16S2UXXXXM	**444277**	A.6
LG16S2VXXXXM	**444030**	A.6
LG16S5FXXXXM	**444279**	A.6
LG16S5HXXXXM	**444281**	A.6
LG16S5UXXXXM	**444280**	A.6
LG16S5VXXXXM	**444031**	A.6
LG20N2HXXXXM	**444284**	A.6
LG20N5HXXXXM	**444287**	A.6
LG25N2FXXXXM	**444282**	A.6
LG25N2UXXXXM	**444283**	A.6
LG25N2VXXXXM	**444032**	A.6
LG25N5FXXXXM	**444285**	A.6
LG25N5UXXXXM	**444286**	A.6
LG25N5VXXXXM	**444058**	A.6
LG32D2HXXXXM	**444289**	A.6
LG32D2UXXXXM	**444288**	A.6
LG32D2VXXXXM	**444060**	A.6
LG32D5HXXXXM	**444291**	A.6
LG32D5UXXXXM	**444290**	A.6
LG32D5VXXXXM	**444062**	A.6
LG40D2VXXXXM	**444292**	A.6
LG40D5VXXXXM	**444293**	A.6
LG40D5XXXXXM	**444130**	A.6

3 & 4 pole Cassettes, supplied separately

Cat. No	Ref. No.	Page
L16H1UNIR	**444124**	A.14
L1CTC1	**444450**	A.14
L1CTC3	**444451**	A.14
L25H1UNIR	**444125**	A.14
L2CTC1	**444452**	A.14
L2CTC3	**444453**	A.14
L32M1UNIR	**444126**	A.14
L40M1RVIR	**444127**	A.14
LG16N2XXXXXR	**444028**	A.14
LG16N5XXXXXR	**444029**	A.14
LG16S2FXXXXR	**444306**	A.14
LG16S2HXXXXR	**444308**	A.14
LG16S2UXXXXR	**444307**	A.14
LG16S5FXXXXR	**444309**	A.14
LG16S5HXXXXR	**444311**	A.14
LG16S5UXXXXR	**444310**	A.14
LG20N2HXXXXR	**444314**	A.14
LG20N5HXXXXR	**444317**	A.14
LG25N2FXXXXR	**444312**	A.14
LG25N2UXXXXR	**444313**	A.14
LG25N2VXXXXR	**444057**	A.14
LG25N5FXXXXR	**444315**	A.14
LG25N5UXXXXR	**444316**	A.14
LG25N5VXXXXR	**444059**	A.14
LG32D2HXXXXR	**444319**	A.14
LG32D2UXXXXR	**444318**	A.14
LG32D2VXXXXR	**444061**	A.14
LG32D5HXXXXR	**444321**	A.14
LG32D5UXXXXR	**444320**	A.14
LG32D5VXXXXR	**444063**	A.14
LG40D2VXXXXR	**444322**	A.14
LG40D2XXXXXR	**444129**	A.14
LG40D5VXXXXR	**444323**	A.14
LG40D5XXXXXR	**444131**	A.14

Power Circuit Breakers, Valid Catalogue number combinations

Available Accessories

LI Breakers		
Fixed	**Drawout**	**Page**
LI04N4	LI04N1	A.5
LI04N5	LI04N2	A.5
LI04N6	LI04N3	A.5
LI04S4	LI04S1	A.5
LI04S5	LI04S2	A.5
LI04S6	LI04S3	A.5
LI07N4	LI07N1	A.5
LI07N5	LI07N2	A.5
LI07N6	LI07N3	A.5
LI07S4	LI07S1	A.5
LI07S5	LI07S2	A.5
LI07S6	LI07S3	A.5
LI08N4	LI08N1	A.5
LI08N5	LI08N2	A.5
LI08N6	LI08N3	A.5
LI08S4	LI08S1	A.5
LI08S5	LI08S2	A.5
LI08S6	LI08S3	A.5
LI10N4	LI10N1	A.5
LI10N5	LI10N2	A.5
LI10N6	LI10N3	A.5
LI10S4	LI10S1	A.5
LI10S5	LI10S2	A.5
LI10S6	LI10S3	A.5
LI13N4	LI13N1	A.5
LI13N5	LI13N2	A.5
LI13N6	LI13N3	A.5
LI13S4	LI13S1	A.5
LI13S5	LI13S2	A.5
LI13S6	LI13S3	A.5
LI16N4	LI16N1	A.5
LI16N5	LI16N2	A.5
LI16N6	LI16N3	A.5
LI16S4	LI16S1	A.5
LI16S5	LI16S2	A.5
LI16S6	LI16S3	A.5
LI20C4	LI20C1	A.5
LI20C5	LI20C2	A.5
LI20C6	LI20C3	A.5
LI20D4	LI20D1	A.5
LI20D5	LI20D2	A.5
LI20D6	LI20D3	A.5
LI20N4	LI20N1	A.5
LI20N5	LI20N2	A.5
LI20N6	LI20N3	A.5
LI20S4	LI20S1	A.5
LI20S5	LI20S2	A.5
LI20S6	LI20S3	A.5
LI25C4	LI25C1	A.5
LI25C5	LI25C2	A.5
LI25C6	LI25C3	A.5
LI25D4	LI25D1	A.5
LI25D5	LI25D2	A.5
LI25D6	LI25D3	A.5
LI25N4	LI25N1	A.5
LI25N5	LI25N2	A.5
LI25N6	LI25N3	A.5
LI25S4	LI25S1	A.5
LI25S5	LI25S2	A.5
LI25S6	LI25S3	A.5
LI32C4	LI32C1	A.5
LI32C5	LI32C2	A.5
LI32C6	LI32C3	A.5
LI32D4	LI32D1	A.5
LI32D5	LI32D2	A.5
LI32D6	LI32D3	A.5
LI40C4	LI40C1	A.5
LI40C5	LI40C2	A.5
LI40C6	LI40C3	A.5
LI40D4	LI40D1	A.5
LI40D5	LI40D2	A.5
LI40D6	LI40D3	A.5

Rogowskis Envelope 1		
Cat. No	**Ref. No.**	**Page**
G04HNRC	**408000**	A.9
G07HNRC	**408001**	A.9
G08HNRC	**408002**	A.9
G10HNRC	**408003**	A.9
G13HNRC	**408004**	A.9
G16HNRC	**408005**	A.9
G20HNRC	**408006**	A.9
G25HNRC	**408007**	A.9

Rogowskis Envelope 2		
Cat. No	**Ref. No.**	**Page**
G20MNRC		A.9
G25MNRC	**408162**	A.9
G32MNRC		A.9
G40MNRC		A.9

Trip Units	
Factory Mounted	**Page**
LIG00K9X2SFXXXX	A.9
LIG00K9X4SFXXXX	A.9
LIG00K9X5SFXXXX	A.9
LIG00K3X5SFXXXX	A.9
LIG00K3ZXSFXXXX	A.10
LIG00K3TXSFXXXX	A.10
LIG00K9X6SFXXXX	A.10
LIG00K9X8SFXXXX	A.10
LIG00K3X6SFXXXX	A.10

Voltage Conditioners		
Cat. No	**Ref. No.**	**Page**
GMPU5		A.15
GMPU6		A.15
GMPU7		A.15
GMPU4	**408793**	A.15

Lifting Beams		
Cat. No	**Ref. No.**	**Page**
GLD3F12		A.16
GLD4F12		A.16

Power Circuit Breakers, Valid Catalogue number combinations

Available Accessories

Trip Units and their accessories		
Cat. No	**Ref. No.**	**Page**
GAPU	**408789**	A.15
GCB1	**407990**	A.15
GCB2	**407991**	A.15
GCB3	**407992**	A.15
GCB4	**407993**	A.15
GCB5	**407994**	A.15
GCB6	**407995**	A.15
GCB7	**407996**	A.15
GPBD	**408040**	A.15
GTDM048A	**407816**	A.15
GTDM120A	**407818**	A.15
GTDM120D	**407819**	A.15
GTDM240A	**407820**	A.15
GTDM240D	**407821**	A.15
GTDM400A	**407825**	A.15
GTUS	**408046**	A.15
GTUTK20	-	A.15
L1LHD	**444240**	A.15
L1RHD	**444241**	A.15
L2LHD	**444242**	A.15
L2RHD	**444243**	A.15
LREPM	**444246**	A.15

Factory Mounted accessories		
Cat. No	**Ref. No.**	**Page**
GCCN024D	**407861**	A.11
GCCN120	**407867**	A.11
GCCN240	**407869**	A.11
GCCN400A	**407877**	A.11
GM01024D	**407700**	A.11
GM01110D	**407706**	A.11
GM01120A	**407712**	A.11
GM01220D	**407720**	A.11
GM01240A	**407714**	A.11
GMCN	**408035**	A.11
GRTC1	**407897**	A.11
GSTR024D	**407770**	A.11
GSTR048	**407772**	A.11
GSTR120	**407776**	A.11
GSTR240	**407778**	A.11
GSTR400A	**407782**	A.11
GUVT024D	**407795**	A.11
GUVT048	**407797**	A.11
GUVT120	**407801**	A.11
GUVT240	**407803**	A.11
GUVT400A	**407807**	A.11
L12FAD	**444221**	A.12
L12WAD	**444222**	A.12
L13FB	**444223**	A.12
L13FC	**444225**	A.12
L13FDT	**444227**	A.12
L13WB	**444224**	A.12
L13WC	**444226**	A.12
L13WDT	**444228**	A.12
LAS3	**444205**	A.11
LAS4	**444206**	A.11
LBAT1	**444207**	A.11
LBCA9	**444214**	A.11
LBPRO	**444211**	A.11
LBRON	**444212**	A.11
LCPRO	**444215**	A.11
LCPS1	**444230**	A.11
LCPS2	**444232**	A.11
LCRON	**444216**	A.11
LM01024D	**444190**	A.11
LM01110D	**444191**	A.11
LM01120A	**444193**	A.11
LM01220D	**444192**	A.11
LM01240A	**444194**	A.11

Field Mountable accessories		
Cat. No	**Ref. No.**	**Page**
GCCN024DR	**407860**	A.13
GCCN120R	**407866**	A.13
GCCN120R	**407866**	A.13
GCCN240R	**407868**	A.13
GCCN240R	**407868**	A.13
GCCN400AR	**407876**	A.13
GM01024DR	**407701**	A.13
GM01110DR	**407707**	A.13
GM01120AR	**407713**	A.13
GM01220DR	**407721**	A.13
GM01240AR	**407715**	A.13
GMCNR	**408033**	A.13
GPRO	**407987**	A.13
GRON	**407985**	A.13
GSTR024DR	**407771**	A.13
GSTR048R	**407773**	A.13
GSTR120R	**407777**	A.13
GSTR240R	**407779**	A.13
GSTR400AR	**407783**	A.13
GUVT024DR	**407796**	A.13
GUVT048R	**407798**	A.13
GUVT120R	**407802**	A.13
GUVT240R	**407804**	A.13
GUVT400AR	**407808**	A.13
LAS3R	**444208**	A.13
LAS4R	**444209**	A.13
LBAT1R	**444210**	A.13
LCPS1	**444230**	A.13
LCPS1R	**444231**	A.13
LCPS2R	**444233**	A.13
LM01024DR	**444195**	A.13
LM01110DR	**444196**	A.13
LM01120AR	**444198**	A.13
LM01220DR	**444197**	A.13
LM01240AR	**444199**	A.13
L1LHD	**444240**	A.15
L1RHD	**444241**	A.15
L2LHD	**444242**	A.15
L2RHD	**444243**	A.15

Spare parts		
Cat. No	**Ref. No.**	**Page**
GDPRW	**408026**	A.16
GE-1000	-	A.16
GGDEFD	**408038**	A.16
GLD3F12	-	A.16
GLD4F12	-	A.16
GUNI	**408047**	A.16
L13NCLS	**444405**	A.16
L16NCLS	**444406**	A.16
L25NARC	**444404**	A.16
L25NCHT	**444407**	A.16
L25NCLS	**444408**	A.16
L40DARC	**444410**	A.16
L40DCHT	**444411**	A.16
L40DCLS	**444409**	A.16
LDPRF	**444200**	A.16
LFAL1	**444413**	A.16
LFAL2	**444414**	A.16
LRHN	**444412**	A.16
LSDFTR	-	A.16
LSDT	**444415**	A.16

Electronic trip units

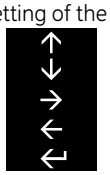
Time current curves (cold state)

Electronic trip units layout and main menu

State of the art electronic trip unit

All EntelliGuard power circuit breakers are equipped with a digital electronic trip unit, available in 3 basic versions L, N and H. Each has a common design that comes with a screen providing an ammeter and allowing a simple and accurate menu driven adjustment of the breaker parameters across a broad current range.

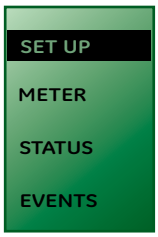
All functionality is menu driven accessed by using 4 setting and one enter key thus allowing a fast and accurate setting of the device. These have the following functionality:



UP: scroll up, increment value
DOWN: scroll down, decrement value
NEXT function, next page
PREVIOUS function, previous page
SAVE setting into memory

After inserting the universal rating plug (not applicable to GT-L), 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) along with the free Trip Unit Toolkit software.

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 (not applicable to GT-L) 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).

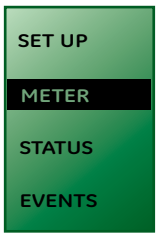


SET UP MENU

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

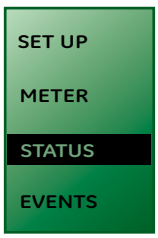
Each EntelliGuard electronic trip units provides long-time over-current protection (**LT**), long-time delay (**LTD**) and some form of short-circuit over-current protection (**ST and/or I &, RELT**). Depending on the chosen trip unit tier or type and the selected options a, host of other protection, metering relaying functions and a wave form capture option are available.

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



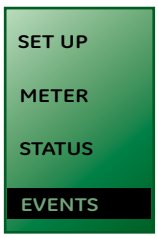
METER

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



STATUS

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



EVENTS

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

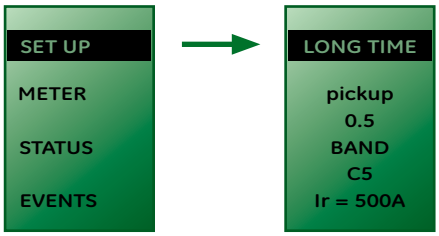
Tripping events as LT, ST, I GF, overload trip imminent (pre alarm) or any other, release or relay trip event are visualized with the associated levels. It is possible to clear this so called "trip register" locally. If the trip unit is equipped with this option, a history of up to 256 tripping occurrences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

Overload protection LT-C and LTD

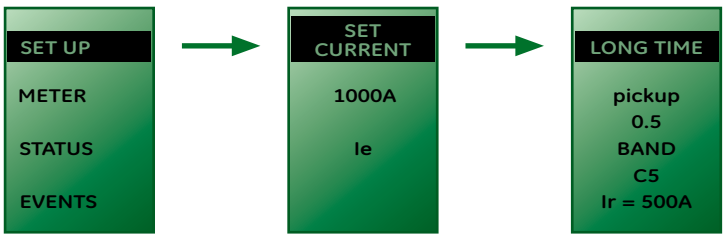
Overload (LT-C) protection

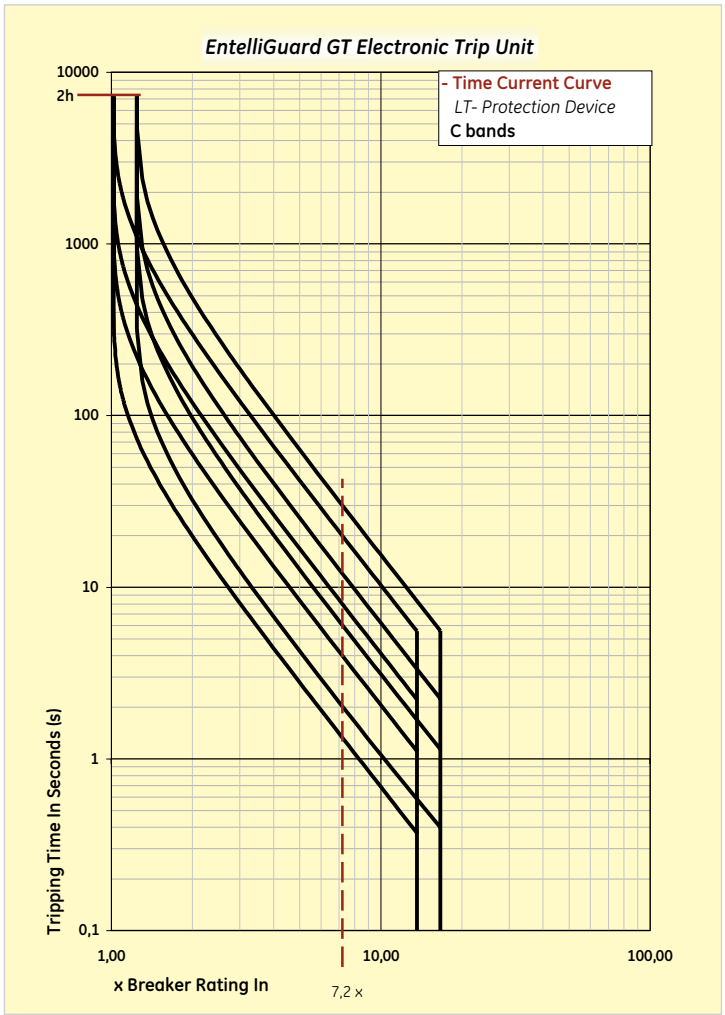
The EntelliGuard electronic trip has an extremely accurate and easy to set overload or Long Time (LT-C) Protection. It is designed to pick up overloads that exceed 112% of the set value within two hours with a tolerance of 10%[1].
The available 66 (15 if using a GT-L unit) different current adjustments (see page B.4) result in an extremely broad setting range of 0.2 to 1 (0.4 to 1 times if using a GT-L unit) 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 I^2t 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.

GT-L



GT-N and GT-H





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-L, GT-N, GT-H

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

Table indicating available Long Time settings

With a GT-N or GT-H trip unit, 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

With a GT-L trip unit, per chosen breaker rating (In), 15 current values (Ir) can be set

Trip Unit LT settings

Breaker In (A)	400	630	800	1000	1250
GT-L Setting x In	Available Setpoints (A)				
0,4	160	252	320	400	500
0,45	180	284	360	450	563
0,5	200	315	400	500	625
0,55	220	347	440	550	688
0,6	240	378	480	600	750
0,65	260	410	520	650	813
0,7	280	441	560	700	875
0,75	300	473	600	750	938
0,8	320	504	640	800	1000
0,85	340	536	680	850	1063
0,9	360	567	720	900	1125
0,95	380	599	760	950	1188
1	400	630	800	1000	1250

Breaker In (A)	1600	2000	2500	3200	4000
GT-L Setting x In	Available Setpoints (A)				
0,4	640	800	1000	1280	1600
0,45	720	900	1125	1440	1800
0,5	800	1000	1250	1600	2000
0,55	880	1100	1375	1760	2200
0,6	960	1200	1500	1920	2400
0,65	1040	1300	1625	2080	2600
0,7	1120	1400	1750	2240	2800
0,75	1200	1500	1875	2400	3000
0,8	1280	1600	2000	2560	3200
0,85	1360	1700	2125	2720	3400
0,9	1440	1800	2250	2880	3600
0,95	1520	1900	2375	3040	3800
1	1600	2000	2500	3200	4000

Short-circuit protection ST and STDB

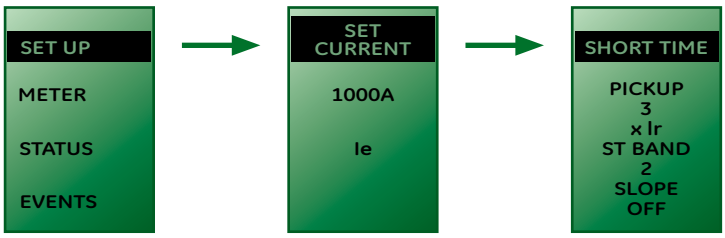
Overcurrent protection against short-circuit: ST, STDB

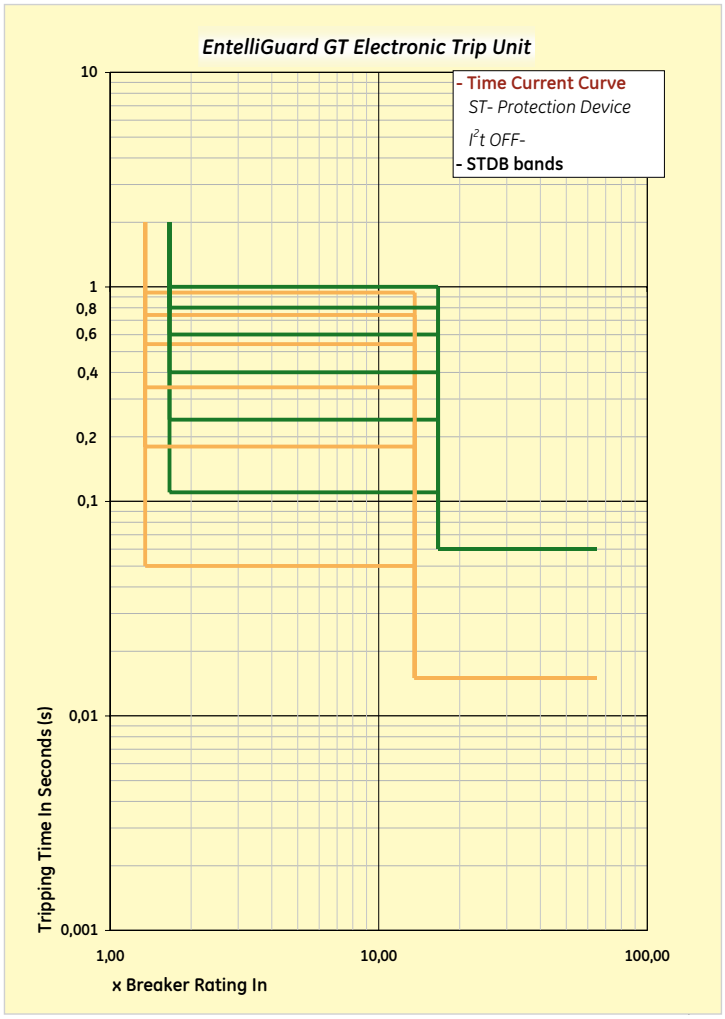
The EntelliGuard electronic trip unit and breaker combination can be equipped with a number of different Short-circuit protection devices each with their own distinctive properties and field of application.

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.





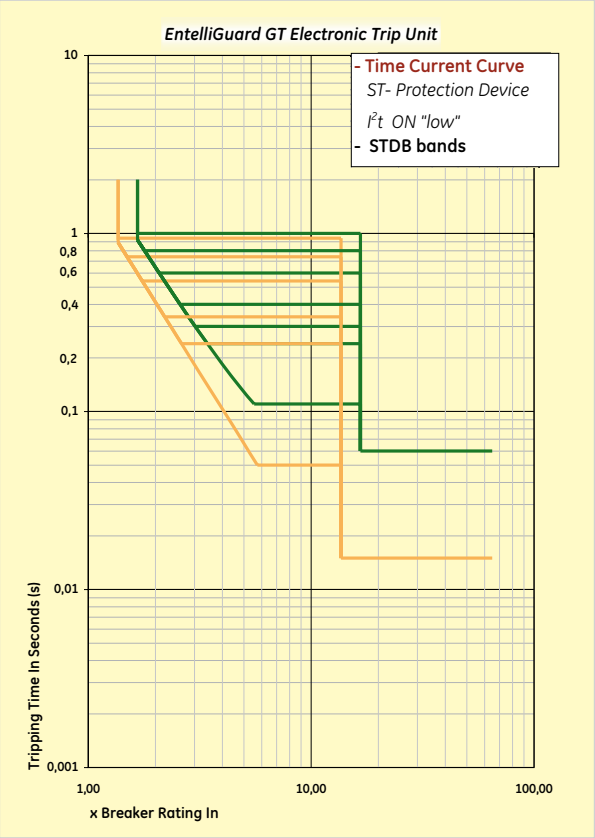
Short time tripping times at indicated levels per selected STDB band - I²t OFF, in milliseconds

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

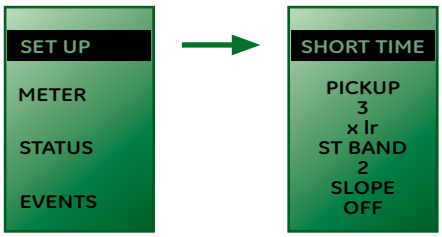
Standard on — GT-L — GT-N — GT-H

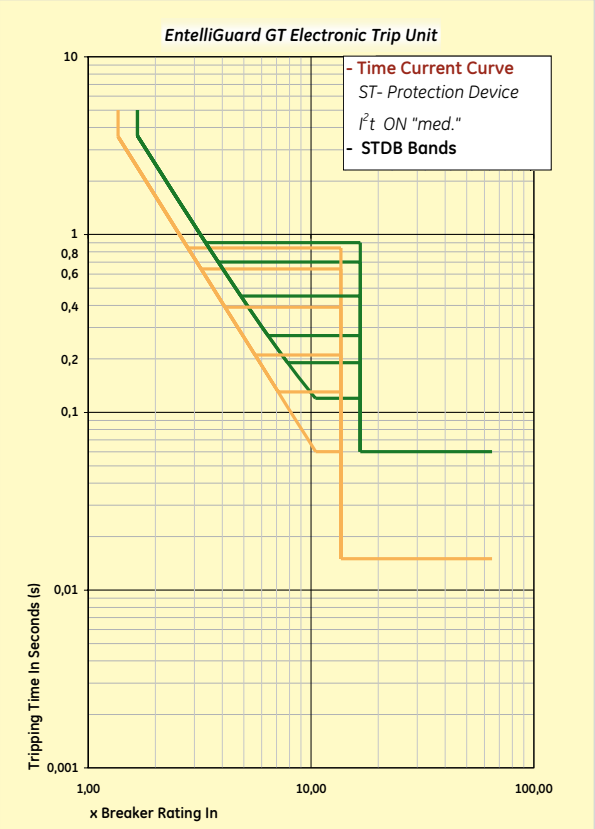
(1) Is limited to lower values in certain cases, please refer to page B.9

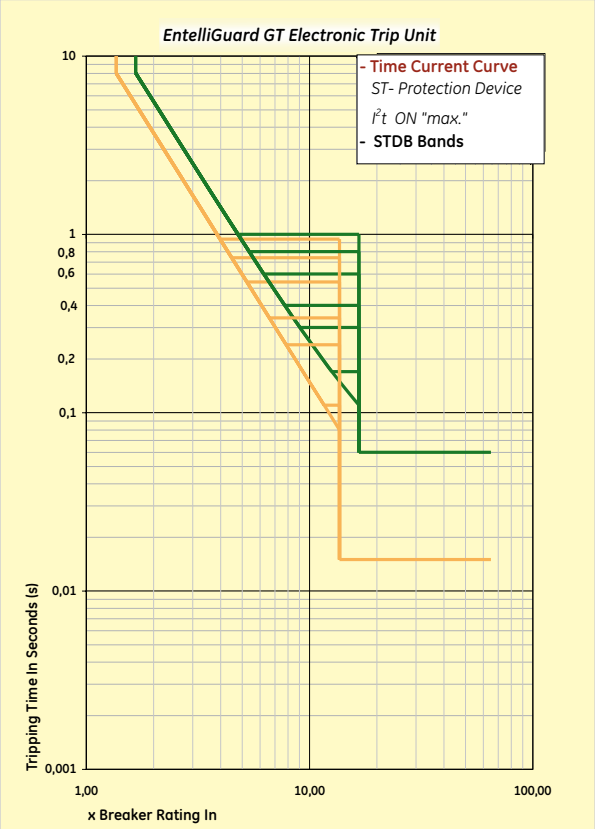
Short-circuit protection ST and I²T slope



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.







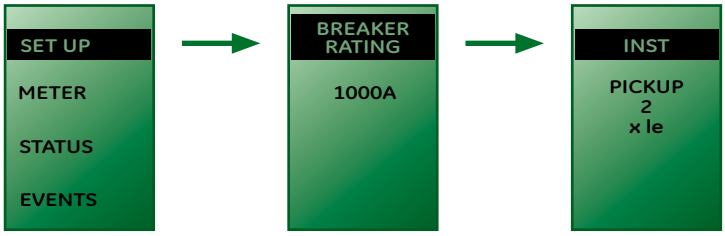
Standard on | GT-L | GT-N | GT-H

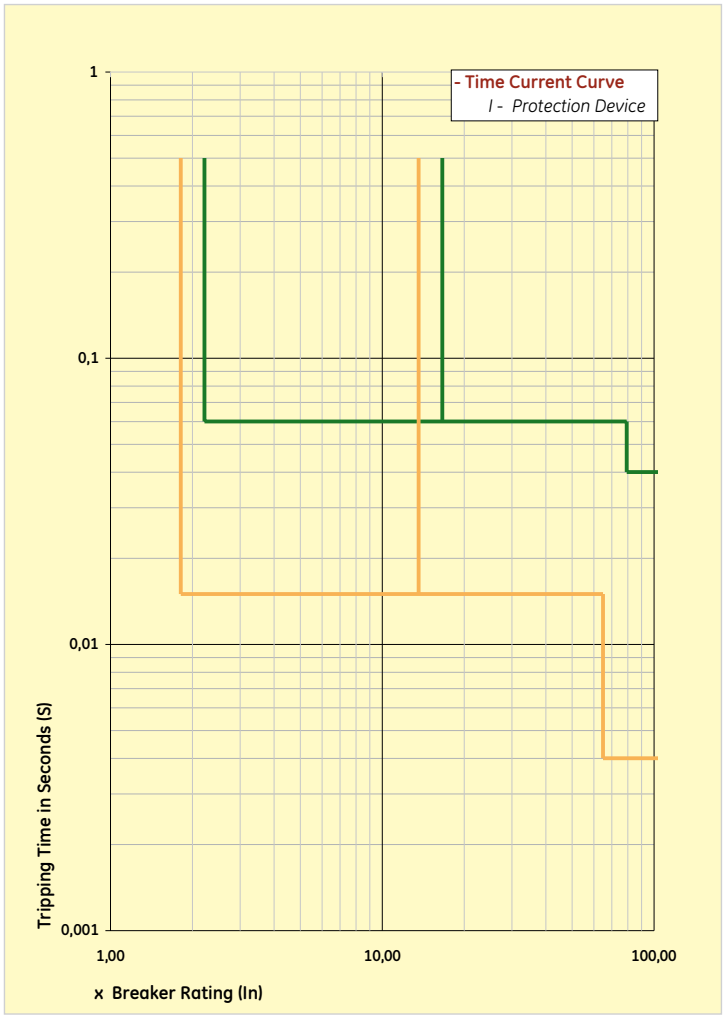
(1) When the LT fuse band option is selected (22 F bands) the I²T slope functions of this device are disabled

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 B.10).
The instantaneous tripping system used in the EntelliGuard electronic trip unit has a unique programming feature that waits for the downstream device to trip before reacting to an overcurrent fault. This providing the user with a unique combination of **Speed** and **Selectivity**.

The graph indicates the maximum interruption time and non tripping time across the full current setting band and the transition to the HSIOC protection device (see page B.10).





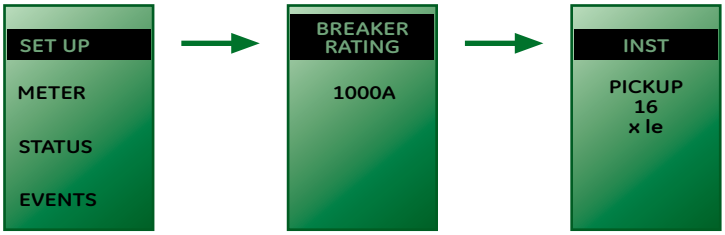
Standard on | GT-L | GT-N | GT-H

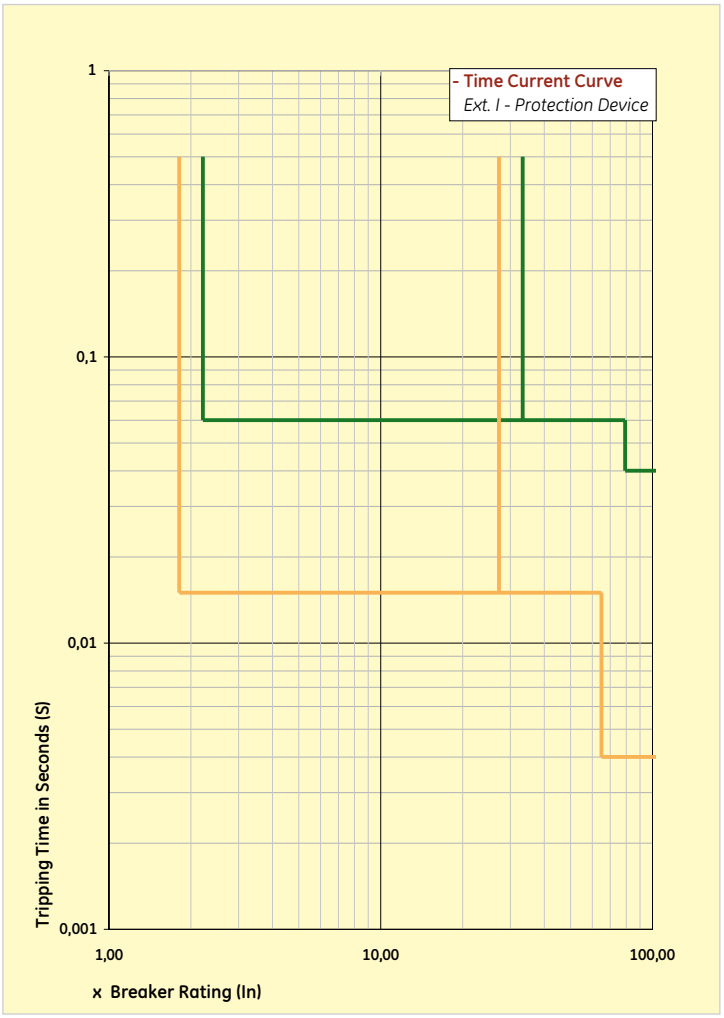
(1) 4000A, C-type configuration is limited to 12 times primary current value (Ie)

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 B.10).
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 B.10).





Optional on — GT-L — GT-N — GT-H

Short-circuit protection temporary reduced I (RELT)

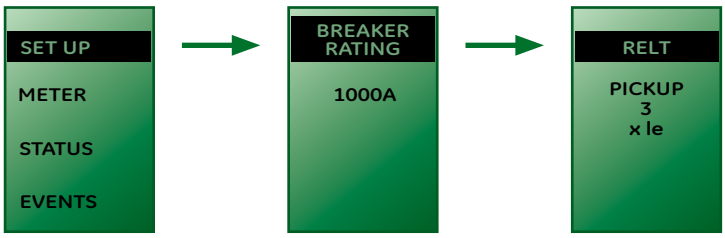
Temporary reduced setting of instantaneous short-circuit device (RELT)
When a short-circuit event takes place, large amount of electrical energy is released that can be hazardous to users in the direct vicinity of such an occurrence.
Reducing the levels of arc flash incident energy during such events 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**

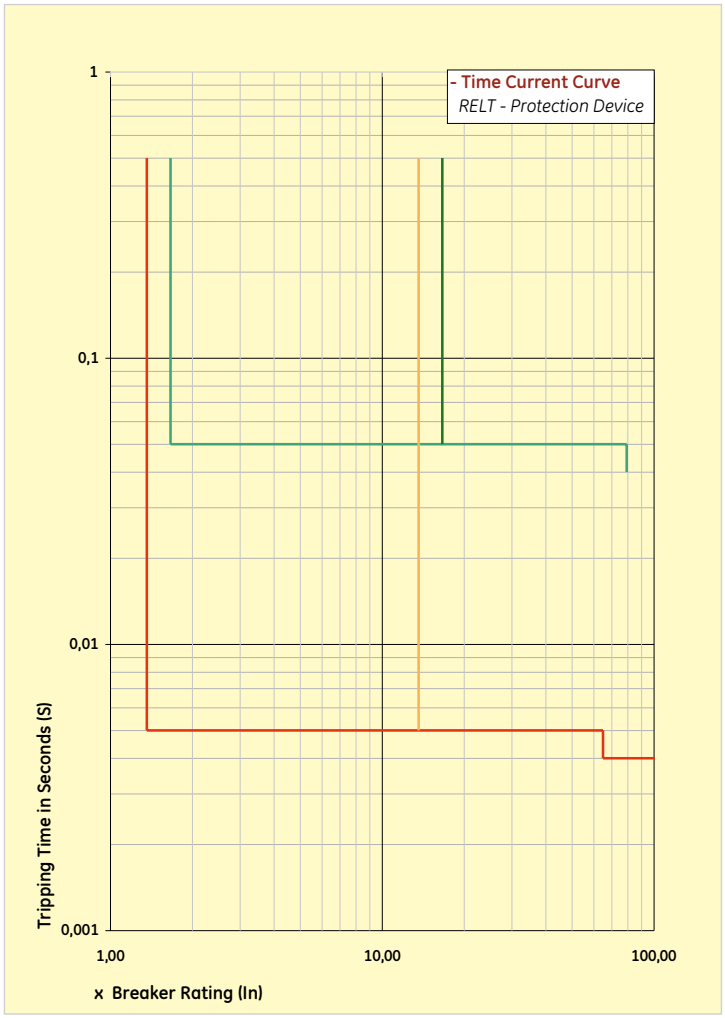
The RELT device can be turned ON by accessing input one of the trip unit(1). When the device is switched ON relay output one(1) changes position and reverts to it's standard position when RELT is OFF.
The RELT device can be adjusted from 1.5 to 15 (±10%) times the chosen primary current value (Ie) in 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-N | GT-H

(1) See section on electronic inputs and relay ouputs on page B.6

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.

HSIOC protection device
To prevent very high level short-circuit currents causing damage to their electrical installation and their components EntelliGuard power circuit breaker are equipped with a HSIOC protection device.

This high-level short-circuit device is installed in all EntelliGuard breakers and is designed to trip the breaker at the specified Icw value of the device. 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(1).

Overview of installed HSIOC devices in automatic types:		Set value (rms)
Frame 1		
	LG04S to LG25S	50000A
	LI04S to LI25S	50000A
	LG04N to LG20N	65000A
	LI04N to LI25N	65000A
Frame 2		
	LG20C to LG40C	50000A
	LI20C and LI40C	50000A
	LG20D to LG40D	65000A
	LI20D to LI40D	65000A

Making current (MCR) protection device
If a breaker is closed onto a short-circuit current it is mandatory that the device interrupts before the electrical installation and its components incur any damage.

An MCR device is present in all EntelliGuard power circuit breakers specifically designed to trip the breaker when closing onto a fault.

Overview of installed MCR devices in automatic types:		Set value (rms)
Frame 1		
	LG04S to LG25S	32000A
	LI04S to LI25S	32000A
	LG04N to LG20N	42000A
	LI04N to LI25N	42000A
Frame 2		
	LG20C to LG40C	32000A
	LI20C and LI40C	32000A
	LG20D to LG40D	42000A
	LI20D to LI40D	42000A

(1) 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%

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.

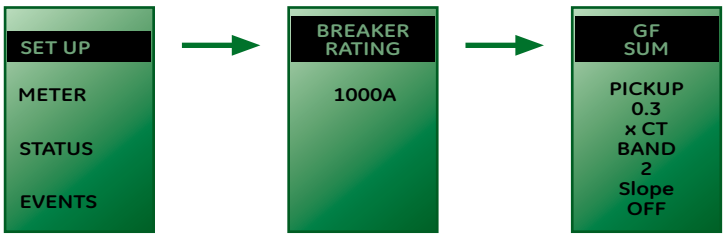
A short-circuit device as an EntelliGuard power circuit breaker can be used to meet this requirement. However these short-circuit protection devices are normally set at values that are too high to detect normally occurring faults to earth.

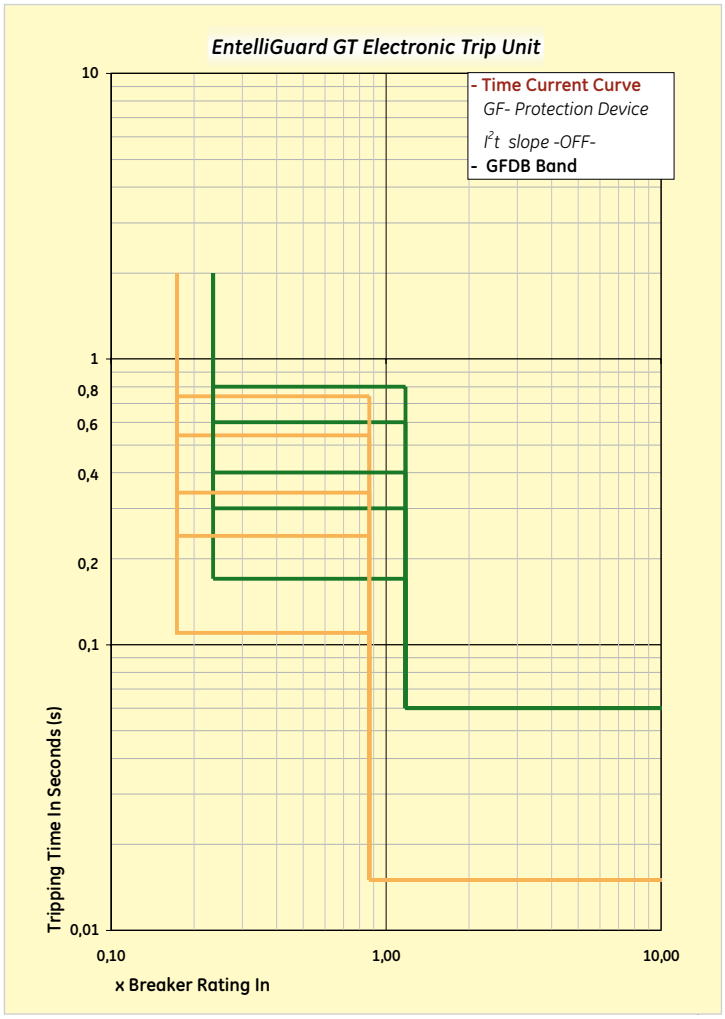
The optionally available ground fault protection feature is specifically designed to detect lower currents than a standard short-circuit device and operates by residually summing the current in the phases and neutral. When a fault to Earth creates an unbalance in the system the resulting Fault is detected 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.



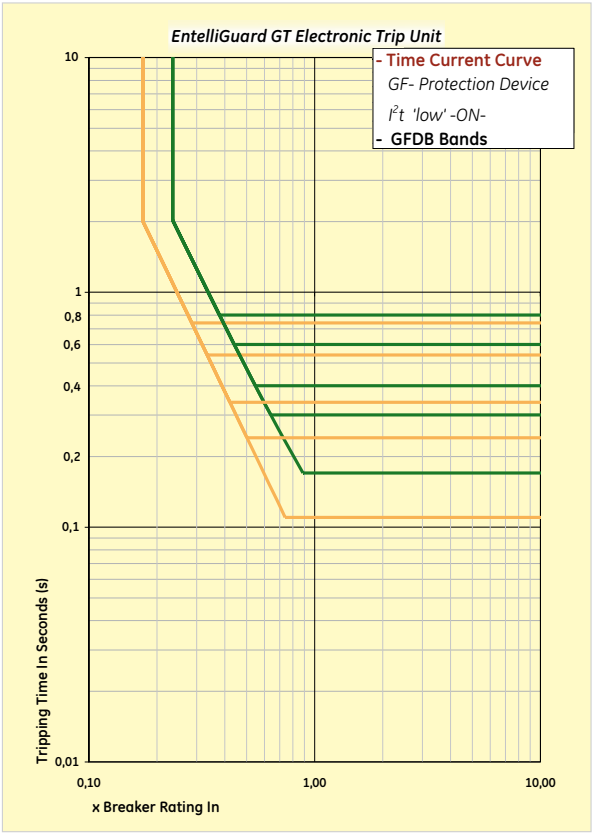


Ground fault tripping times at indicated levels per selected GFDB band -I²t slope OFF, in milliseconds

	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

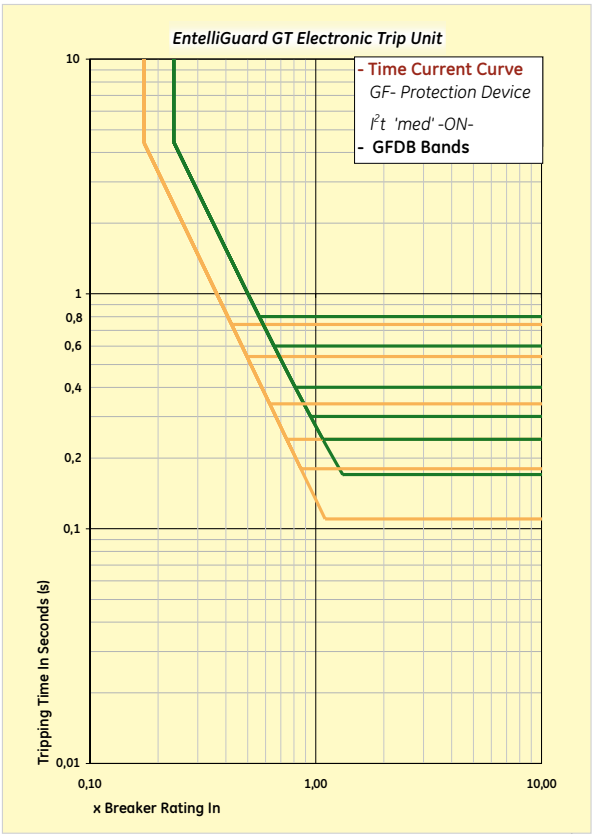
(1) When an auxiliary supply is connected (24V DC) an extra setting range of 0.1 to 0.2 becomes available.
(2) Use a Rogowksi coil of the appropriate rating, distance to breaker limited to 10 meters.

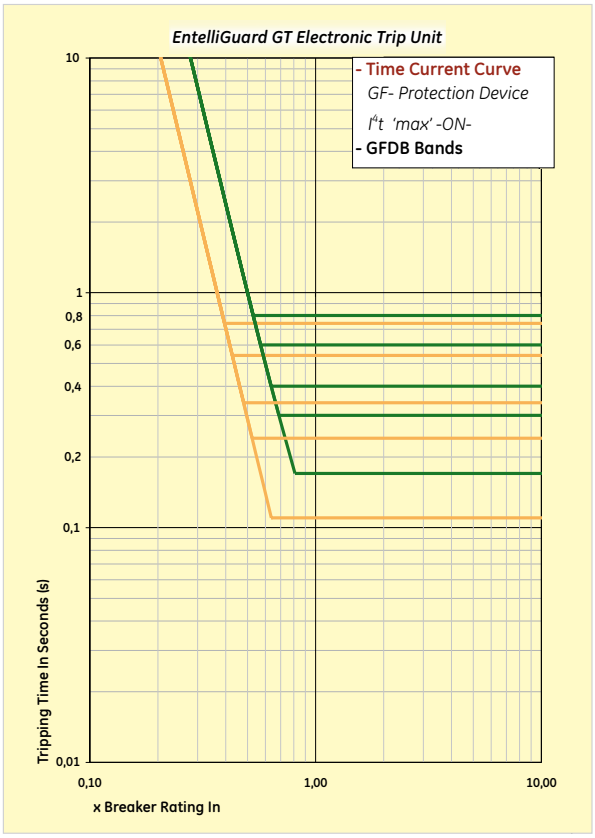
Ground fault protection



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.

GF SUM
PICKUP 0.3 x CT
BAND 2
Slope Med.





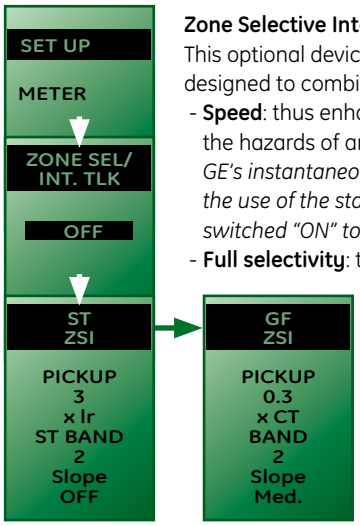
Optional on — GT-L — GT-N — GT-H

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

Notes

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:

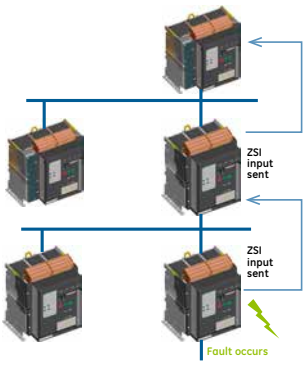
- **Speed**: thus enhancing safety by reducing the hazards of arc flash incident energy. *GE's instantaneous ZSI (Arcwatch*) allows the use of the standard instantaneous switched "ON" to achieve* ***Speed****.*
- **Full selectivity**: thus enhancing reliability. *GE's instantaneous ZSI (Arcwatch) allows 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-N — GT-H

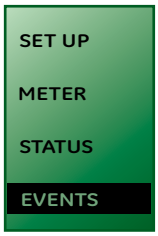
Load shedding alarm output
(Current alarm 1 & 2, see relay ouputs on B.18)
The load shedding device has been designed to allow the user to switch off NON priority loads before the LT functions trips the breaker due to an overload.

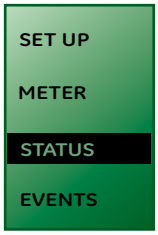
It can also be used to verify the current consumption in the circuit which the EntelliGuard breaker protects and preventing it exceeding a certain pre-determined value.

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].

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.

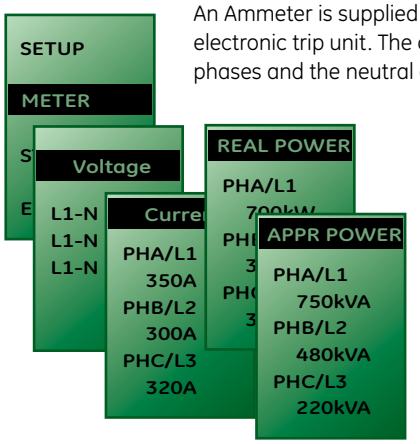
Overcurrent (LT, ST, I GF)
Relaying functions (see page B.13)
Shunt or undervoltage release (if the associated contacts are connected via the trip unit)

Accessible under the '**STATUS**' menu the trip operations counter registers a maximum of 255 overcurrent faults with their reason (LT, ST, I or GF-EF). The data can be viewed and reset through the STATUS menu pickup status option.

Standard on — GT-L — GT-N — GT-H

(1) See section on relay outputs on page B.16

Measurement functions and power supplies

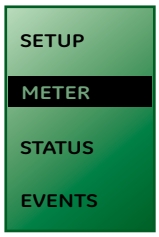


An Ammeter is supplied with each EntelliGuard electronic trip unit. The current in each of the three phases and the neutral can be viewed.

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-L — GT-N — GT-H



Full measurement package (Power conditioners needed)

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

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-N — GT-H

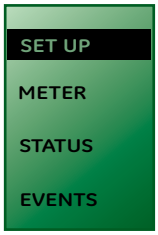
Power conditioners and auxiliary power supply

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-L — GT-H

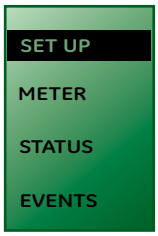
Protective relaying functions; relay and trip unit inputs
Wave form capture option



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

Protective relay	Adjustability	Steps	Accur.	Trips breaker
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



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

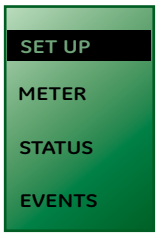
Relay output reset (group 1, 4, 5 & 6)
If the reason of the contact closure is removed the contact will re-open. This typically occurring when a health status warning is produced or when a current alarm drops below it's threshold. If the breaker trips whilst the relay contacts are activated the contacts will be reset and revert to their original open position.

Relay output reset (group 2, 3, & 8)
If a 24 V DC power supply is present and the event associated with the relay closure causes the breaker to trip the contacts will not change position. A breaker re-set 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

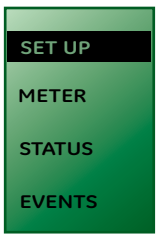
(1) Only works when a trip unit has the ground fault alarm installed.

Optional — GT-N — GT-H



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

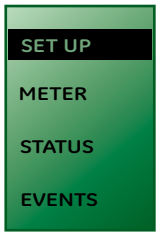
Optional — GT-N — GT-H



Wave form capture option
When a fault has taken place, it can be of importance to visualize the event. The wave form capture option included in the GT-H type electronic trip unit can track and visualize any fault event. The device tracks 8 cycles, 4 before and 4 after the event with resolution of 48 samples per cycle at 50Hz and stores the results in memory. It registers events in all three phases and the neutral. After the event, the waveform event is stored and can be accessed by using the waveform client module of the 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.

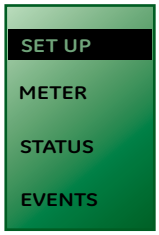
Standard on — GT-H

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. The communication option needs a 24 V auxiliary voltage input capable of supplying 90mA.
Modbus can be directly connected to the trip unit without the use of any interfaces. 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.
It 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

Optional on — GT-N — 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.

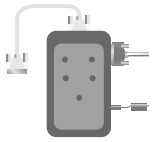
Standard on — GT-L — GT-N — GT-H

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-L — GT-N — 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 jack on the trip unit front face. When this device is not installed, the trip unit will revert to its minimum setting, which has as value of 16-18% of the breaker rating In.
Please note GT-L trip units do not support rating plug

Accessory for — GT-L — GT-N — 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-L — GT-N — GT-H

(1) Kits are available that allow the user to block the switch in one of either position (see page A.15)

Overview of GT electronic trip unit functionality

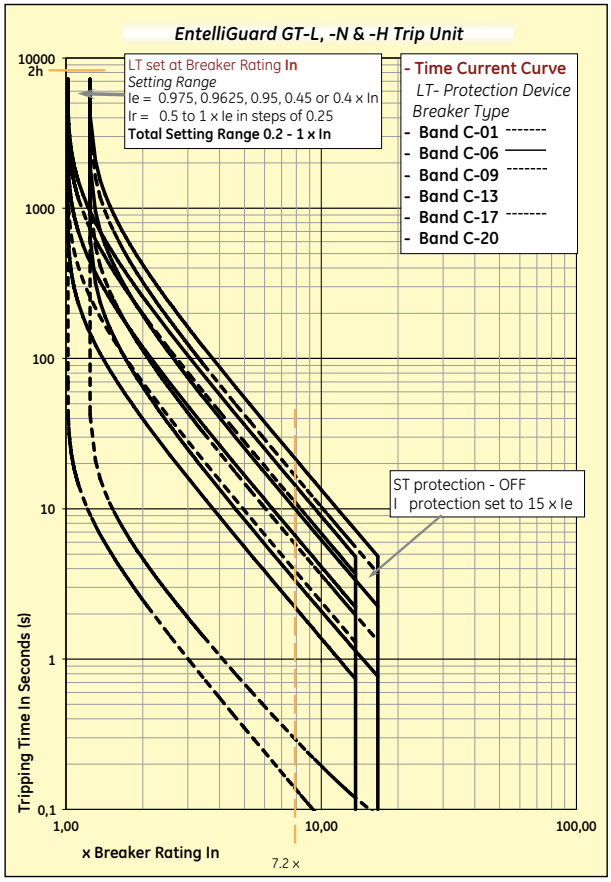
			GT-L	GT-N	GT-H	Remarks
Setting interface		LCD screen allowing access to 4 distinct menus	X	X	X	--
		Touch pad adjustments	X	X	X	--
		Multilingual	X	X	X	--
		Adjustable manual or automatic RESET option	X	X	X	--
Long time or overload current protection		Ir=0.4 to 1 In 15 secondary current settings	X	-	-	--
		6 primary current settings with FULL RANGE rating plug **1; 0.975; 0.9625; 0.95; 0.45 & 0.4** x breaker rating In	X	X	X	--
		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	--
		22 thermal protection (C type) time bands available ranging from class 0.5 to 40 (bands at 7.2 x Ir)	X	X	X	--
		Neutral protection 0-50%-63%-100%	X	X	X	--
		Cooling function and thermal memory	X	X	X	--
Short time short-circuit current protection		Setting RANGE from **1.5 to 12** x Ir (LT setting)	X	X	X	--
		Steps of 0.5 (A total of 22 settings)	X	X	X	--
		17 time delay settings **(STDB)** ranging from 30 to 940 milliseconds delay setting result in a 90 to 1000 milliseconds clearing time	X	X	X	--
		Clearance times to IEC 40979-1 and IEC 60364	X	X	X	--
		3 I^2t protection time bands available	X	X	X	--
Instantaneous short-circuit current protection	Standard	I_i setting RANGE from **2 to 15** x Ie (primary setting)	X	X	X	--
		Steps of 0.5 (a total of 28 settings)	X	X	X	--
		Possibility to switch **OFF**	X	X	X	--
		Selective execution	X	X	X	--
		Fixed instantaneous or HSIOC protection	X	X	X	--
	RELT	I_i setting RANGE from **1.5 to 15** x Ie (primary setting)	-	X	X	--
		Steps of 0.5 (A total of 29 settings)	-	X	X	--
		Possibility to switch **OFF**	-	X	X	--
		Remote and local ON and OFF with position indication signal	-	X	X	--
Ground or earth fault protection		Setting RANGE from **0.1 to 1** x In (breaker rating)[1]	O	O	O	--
		Steps of 0.01 (A total of 92 settings)	O	O	O	--
		Possibility to switch **OFF**	O	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	O	--
		Clearance times to IEC 40979-1 and IEC 60364	O	O	O	--
		3 I^2t protection time bands available	O	O	O	--
		Residual principle	O	O	O	
Measurement package (for measurements using voltage power conditioners are needed)		Current (L1, L2, L3, N)	X	X	X	--
		Voltage (L1, L2, L3)	-	X	X	C
		Energy (kWh) total real	-	X	X	C
		Real power (L1, L2, L3, total)	-	X	X	C
		Apparent power (L1, L2, L3, total)	-	X	X	C
		Reactive power (L1, L2, L3, Total)	-	X	X	C
		Total power (L1, L2, L3, total)	-	X	X	C
		Power (kW) peak (total)	-	X	X	C
		Demand power (kW) (total)	-	X	X	C
		Frequency (L1, L2, L3)	-	X	X	--
Protective relaying		Voltage unbalance	-	-	X	N
		Undervoltage	-	-	X	N
		Overvoltage	-	-	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	X	--
		Trip info (magnitude / phase)	X	X	X	--
		Waveform capture	-	O	O	N
		Trip counter	X	X	X	--
		Event logger (trip events)	X	X	X	--
		Good and bad health indicator	X	X	X	--
		Watchdog	X	X	X	--
Other		Zone selective interlock on ST, GF and I	-	O	O	--
		Shunt trip status input (2 inputs)	-	-	O	--
		UVR trip status input (2 inputs)	-	-	O	--
		General relay outputs and electronic inputs	X	X	X	--
		Communication 2 way	O	O	O	N
		Modbus	O	O	O	N
		24V DC auxiliary power supply	O	O	O	--
		Text kit with power support function	O	O	O	--

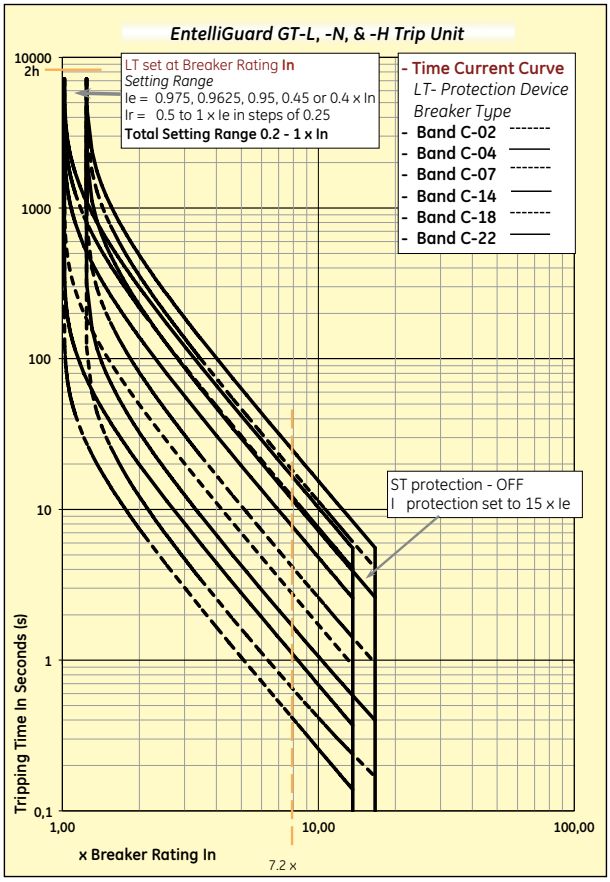
(1) With a 24V auxiliary power supply, GT-N and GT-H can be set as low as 0.1

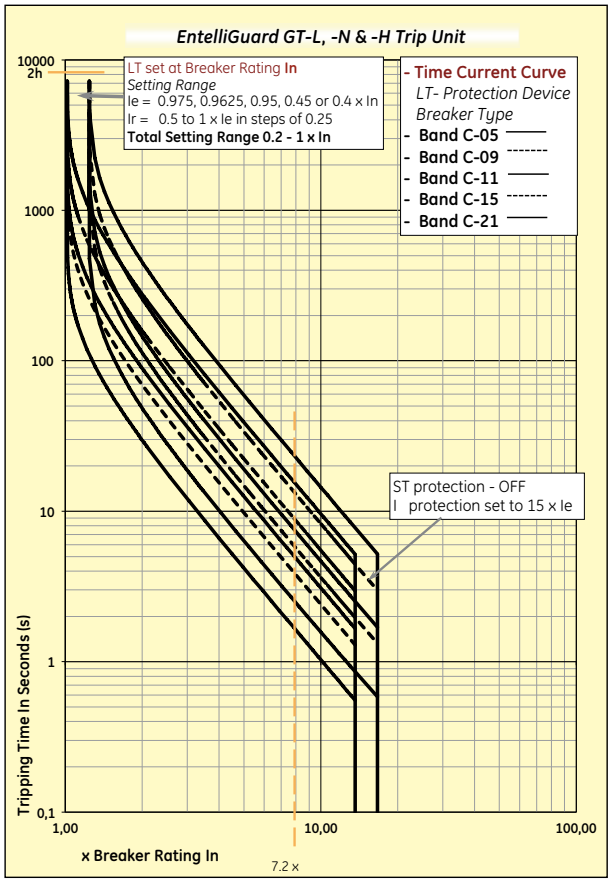
Key
X - Present; O = Optional; - = Not possible
N indicates that a 24V auxiliary voltage supply is required
C indicates the need of a power conditioner

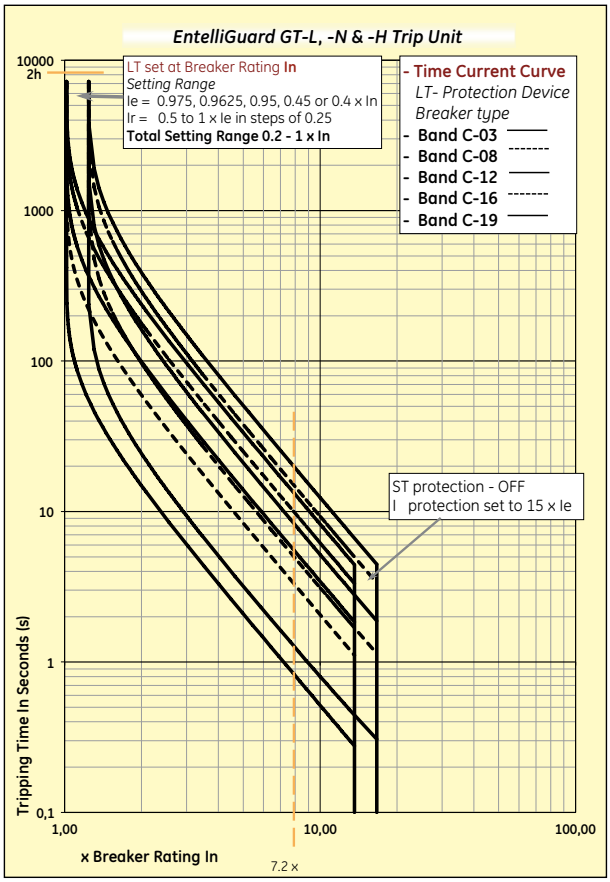
Time current curves (cold state)

LT protection device



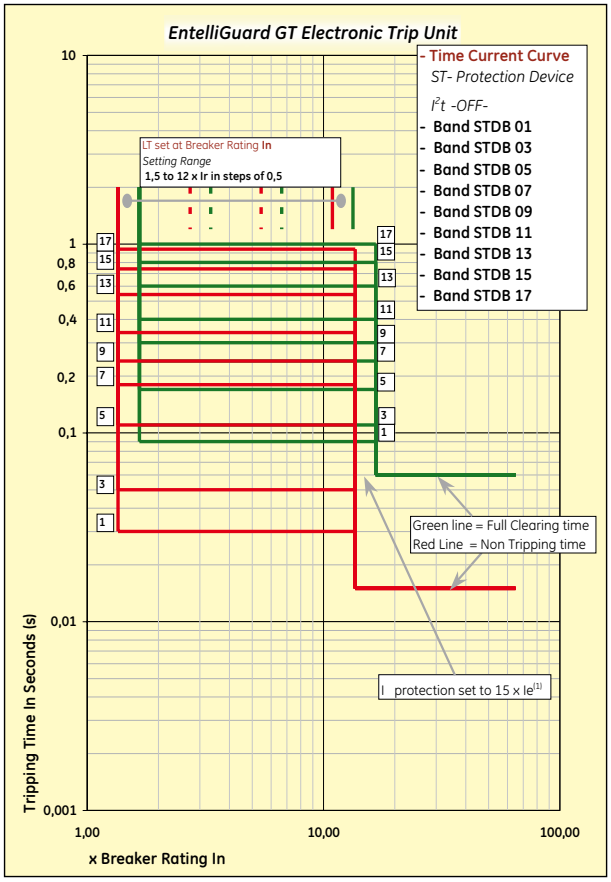


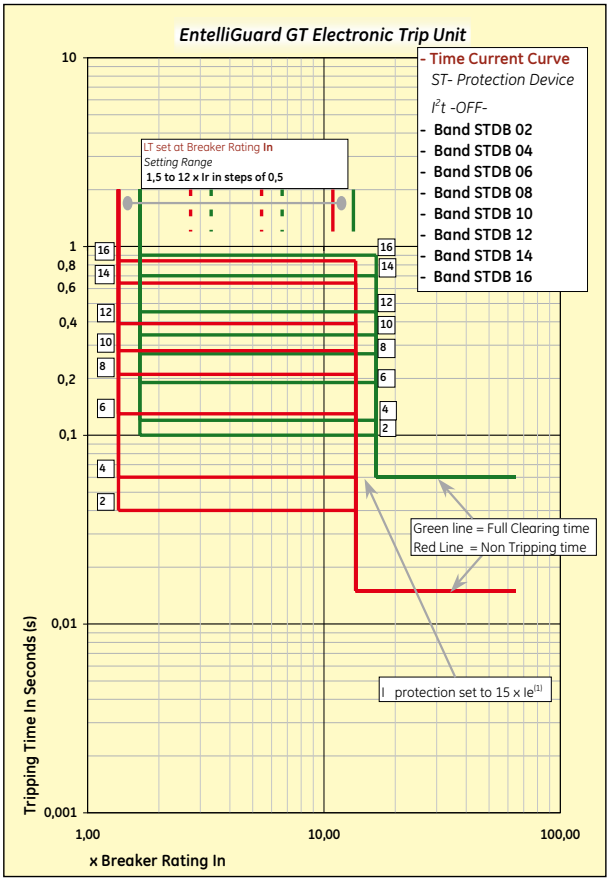




Time current curves (cold state)

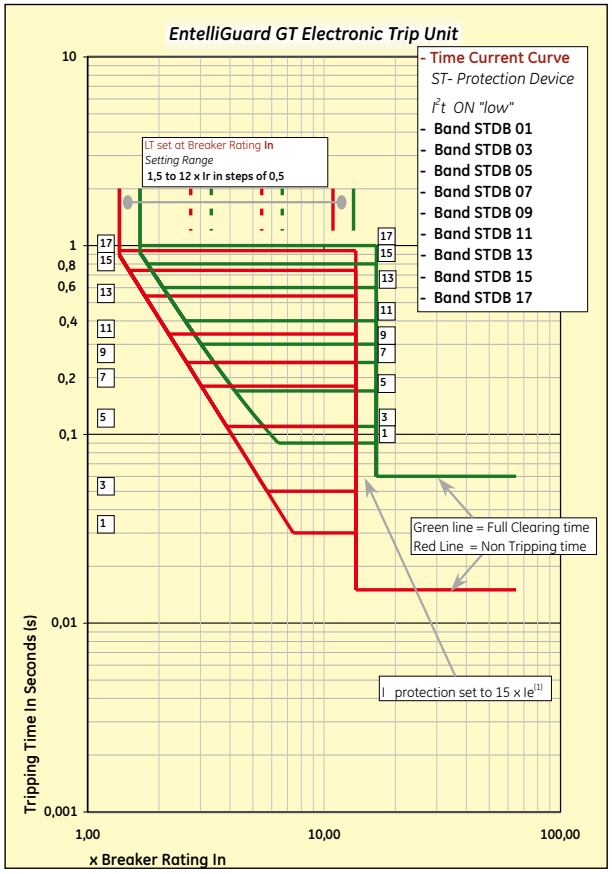
ST protection device

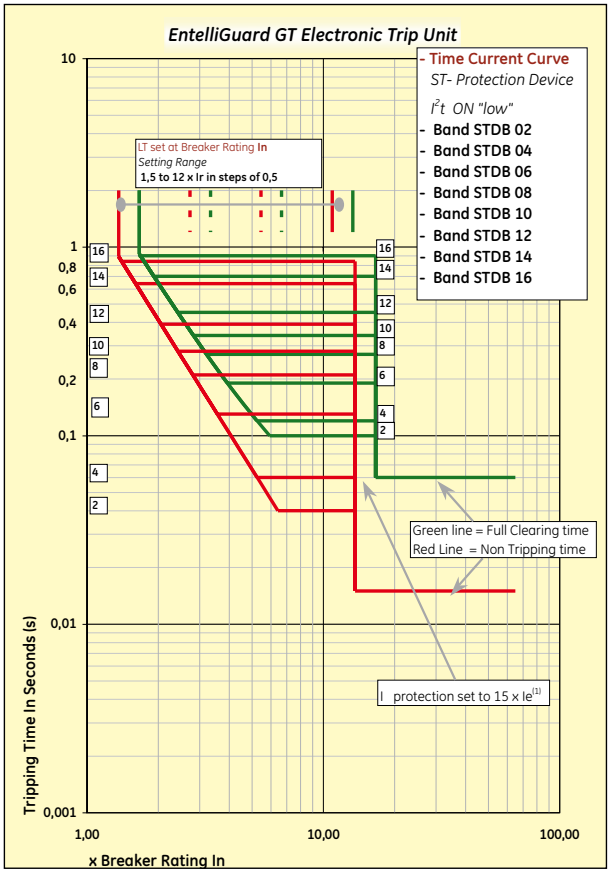


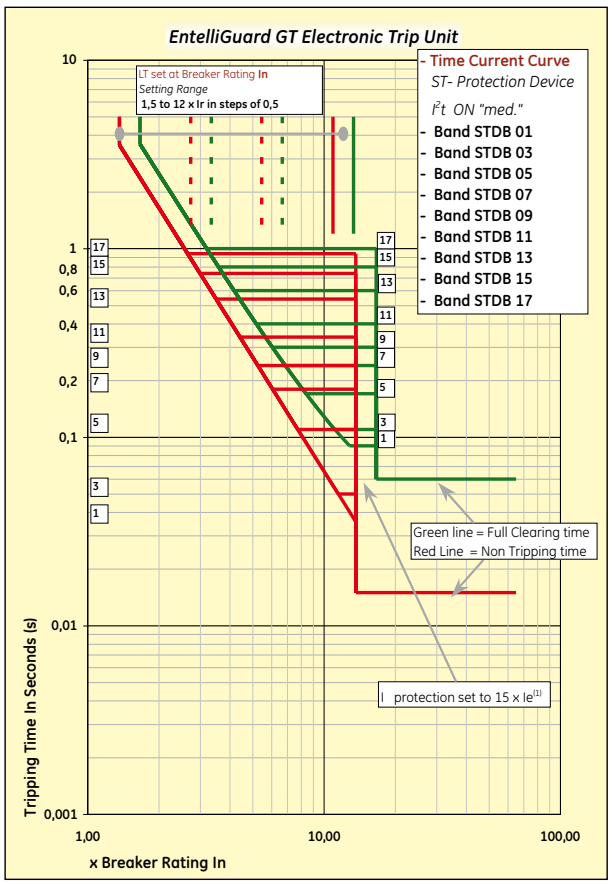


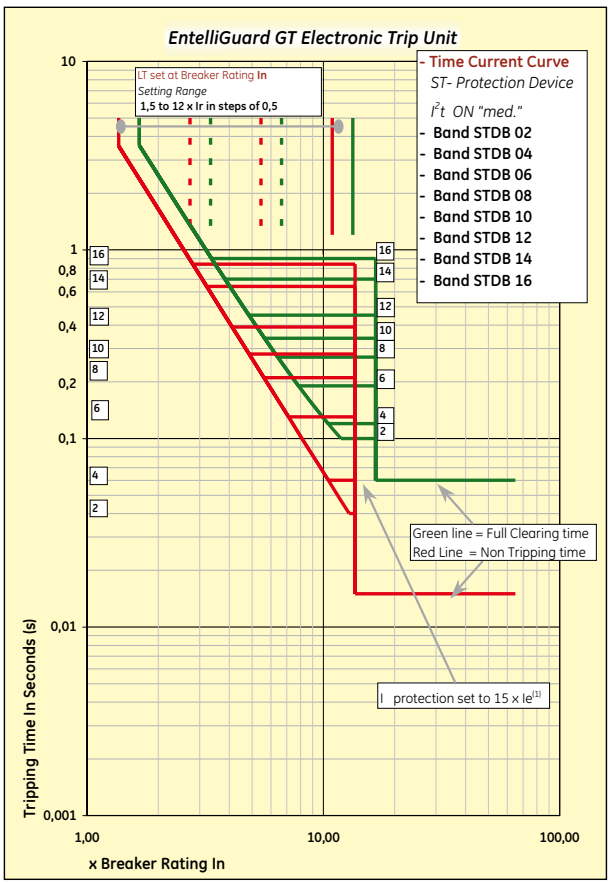
Time current curves (cold state)

ST protection device



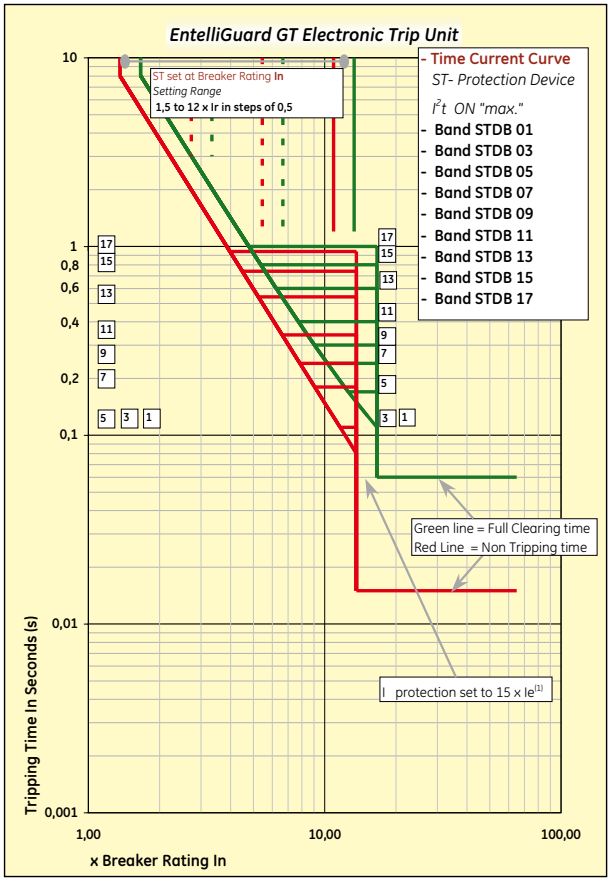


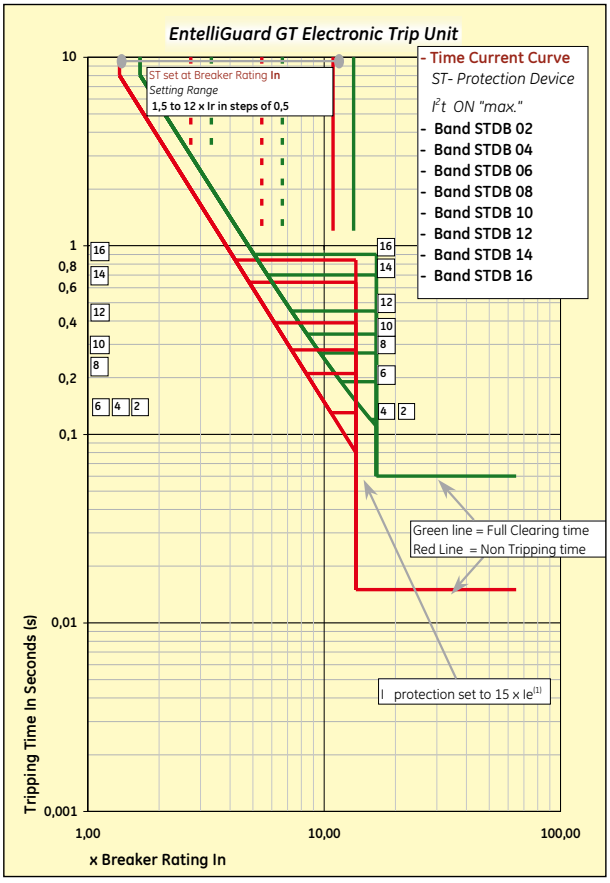


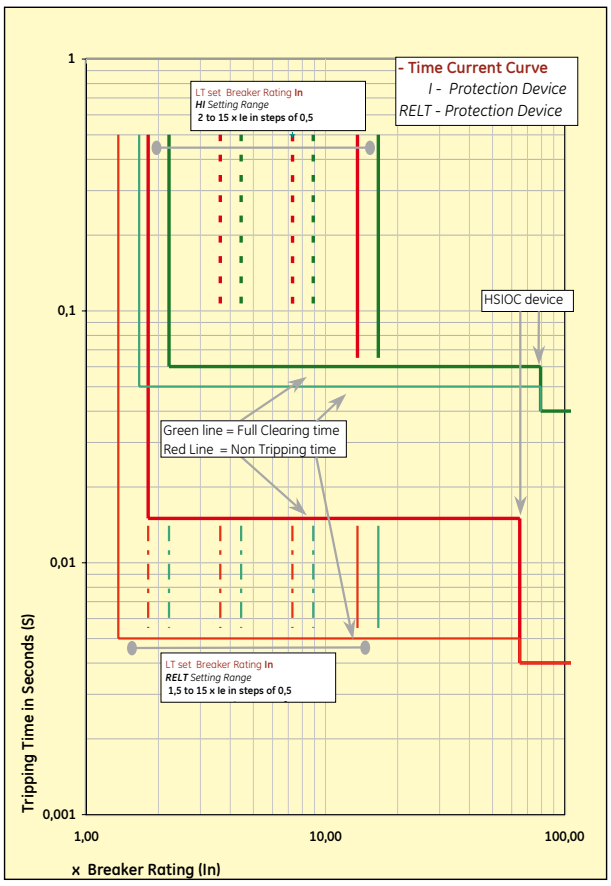


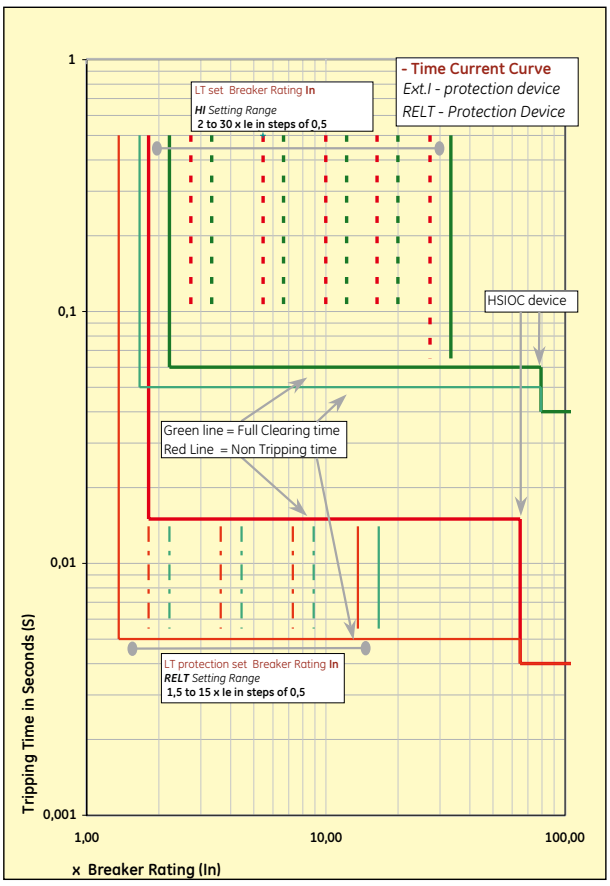
Time current curves (cold state)

ST and I protection device



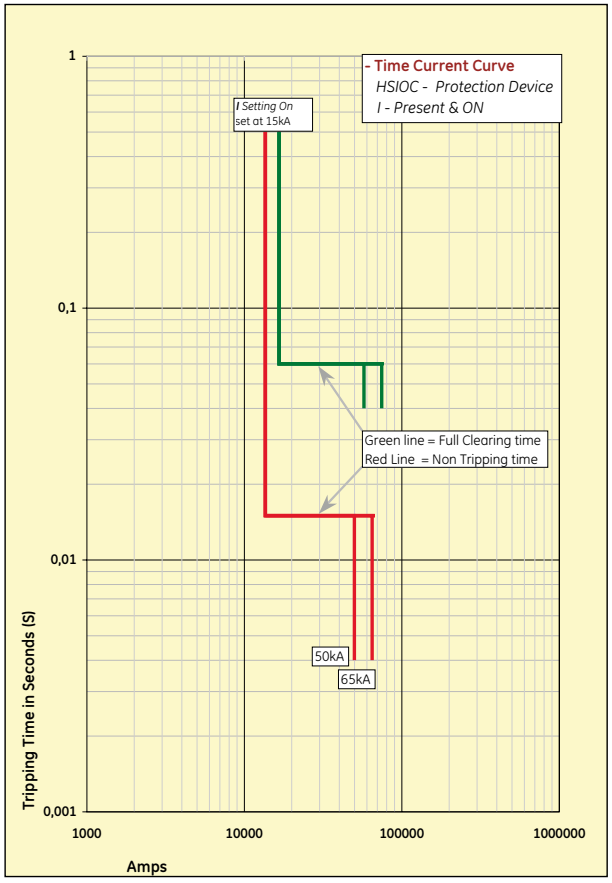


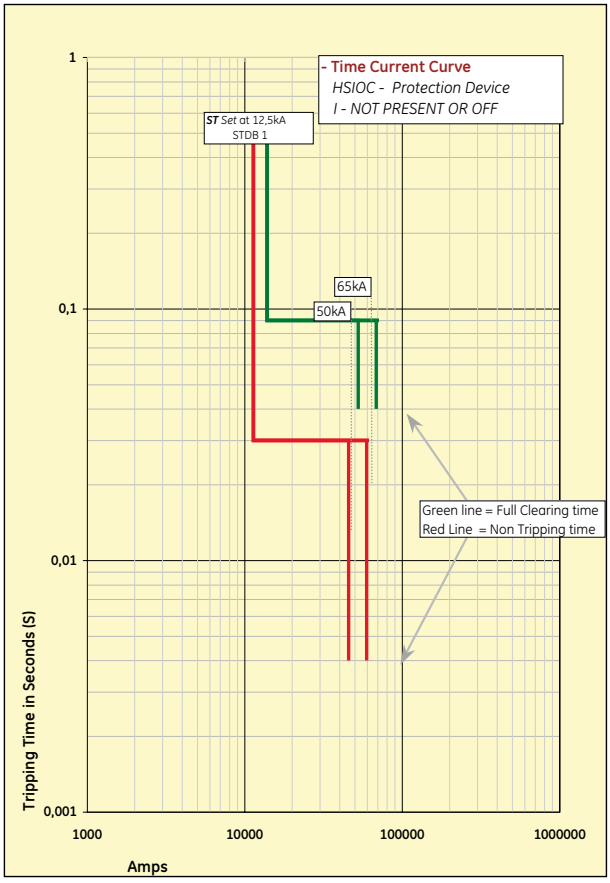


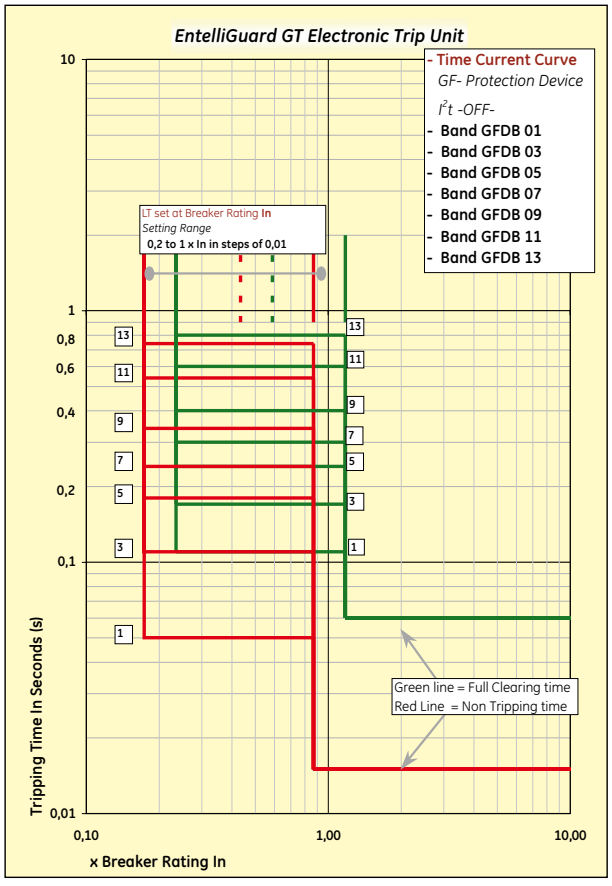


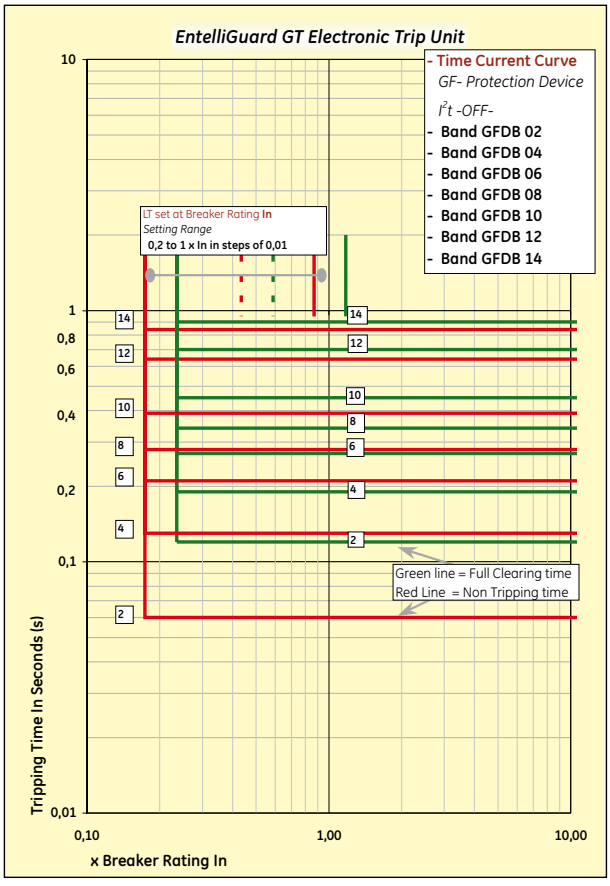
Time current curves (cold state)

HSIOC and GF protection device



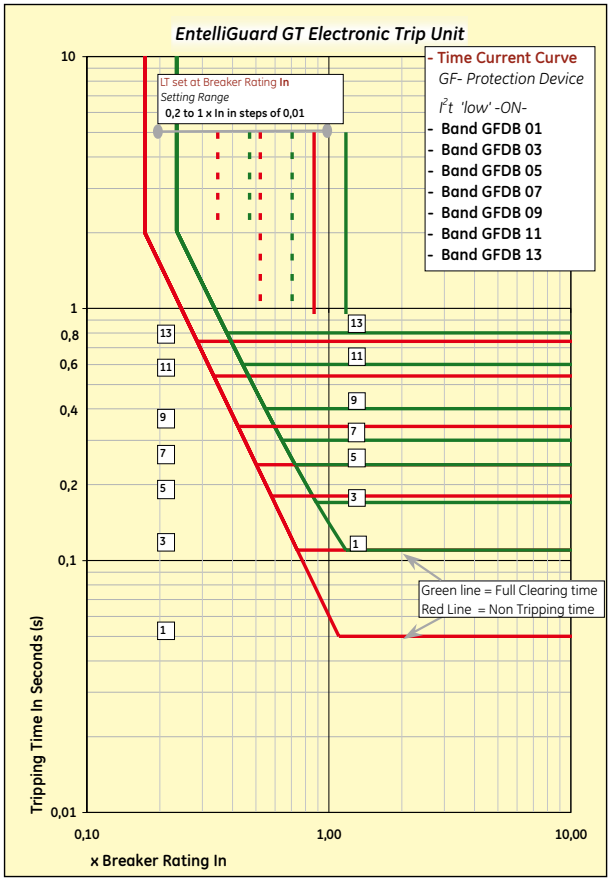


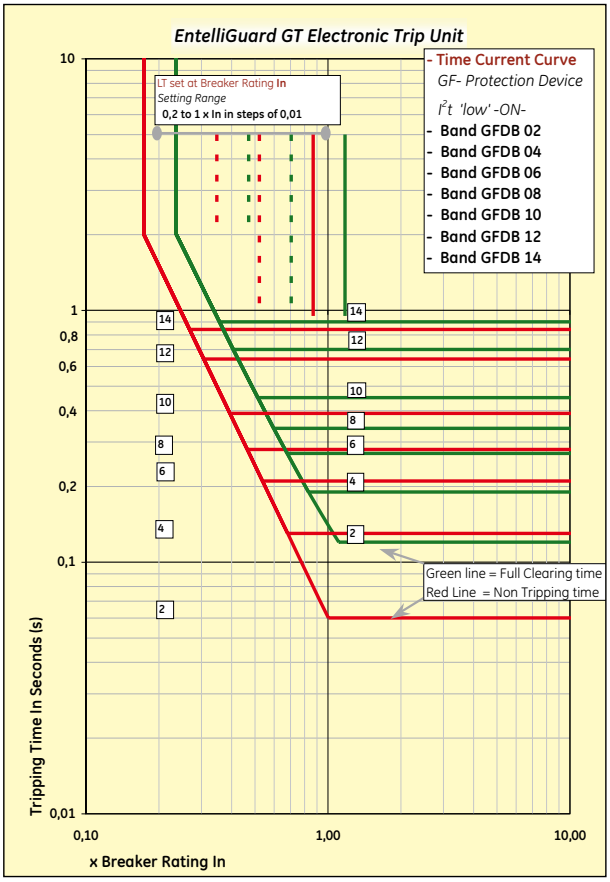


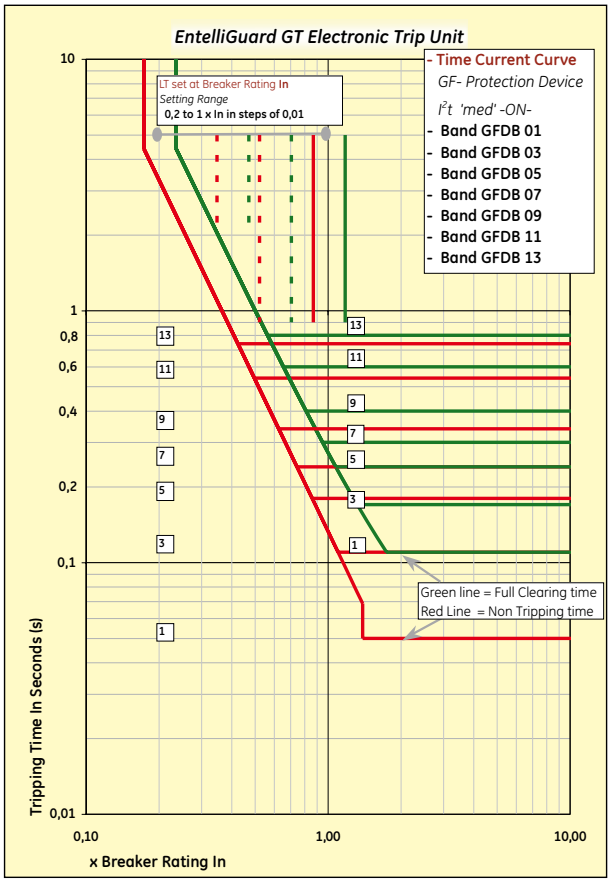


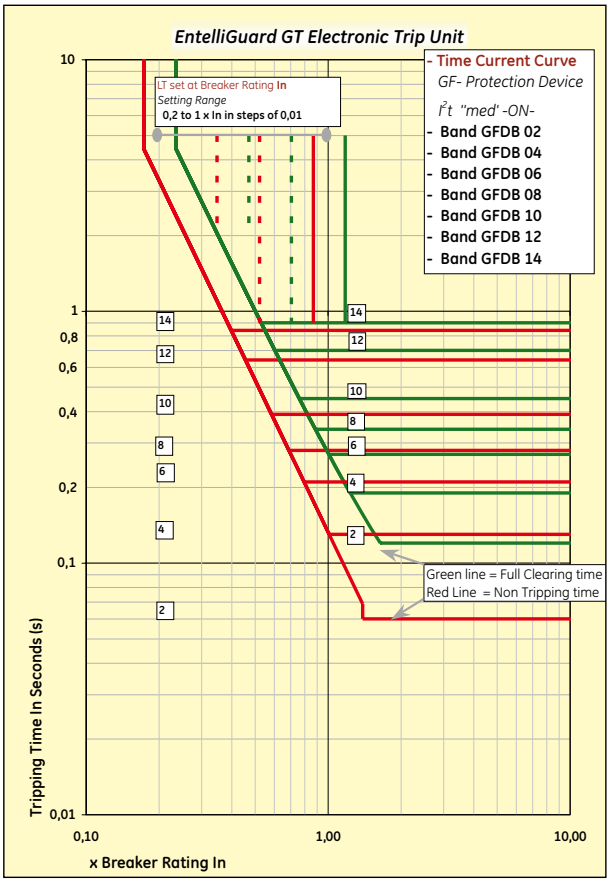
Time current curves (cold state)

GF protection device



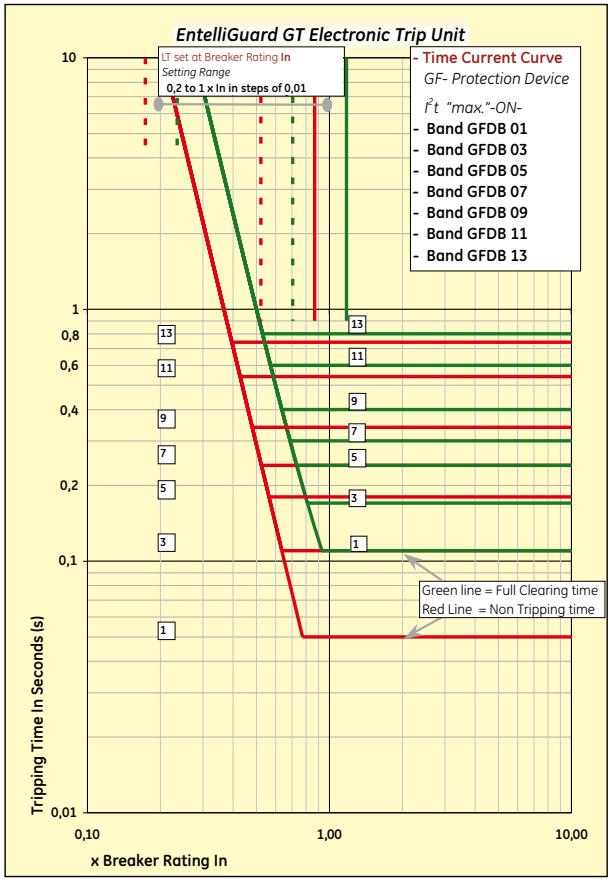


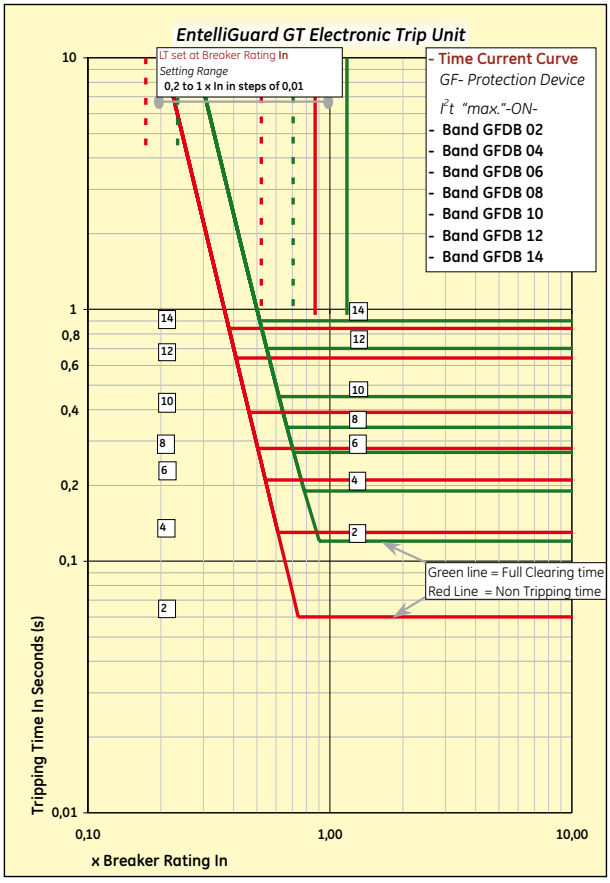




Time current curves (cold state)

Terminology



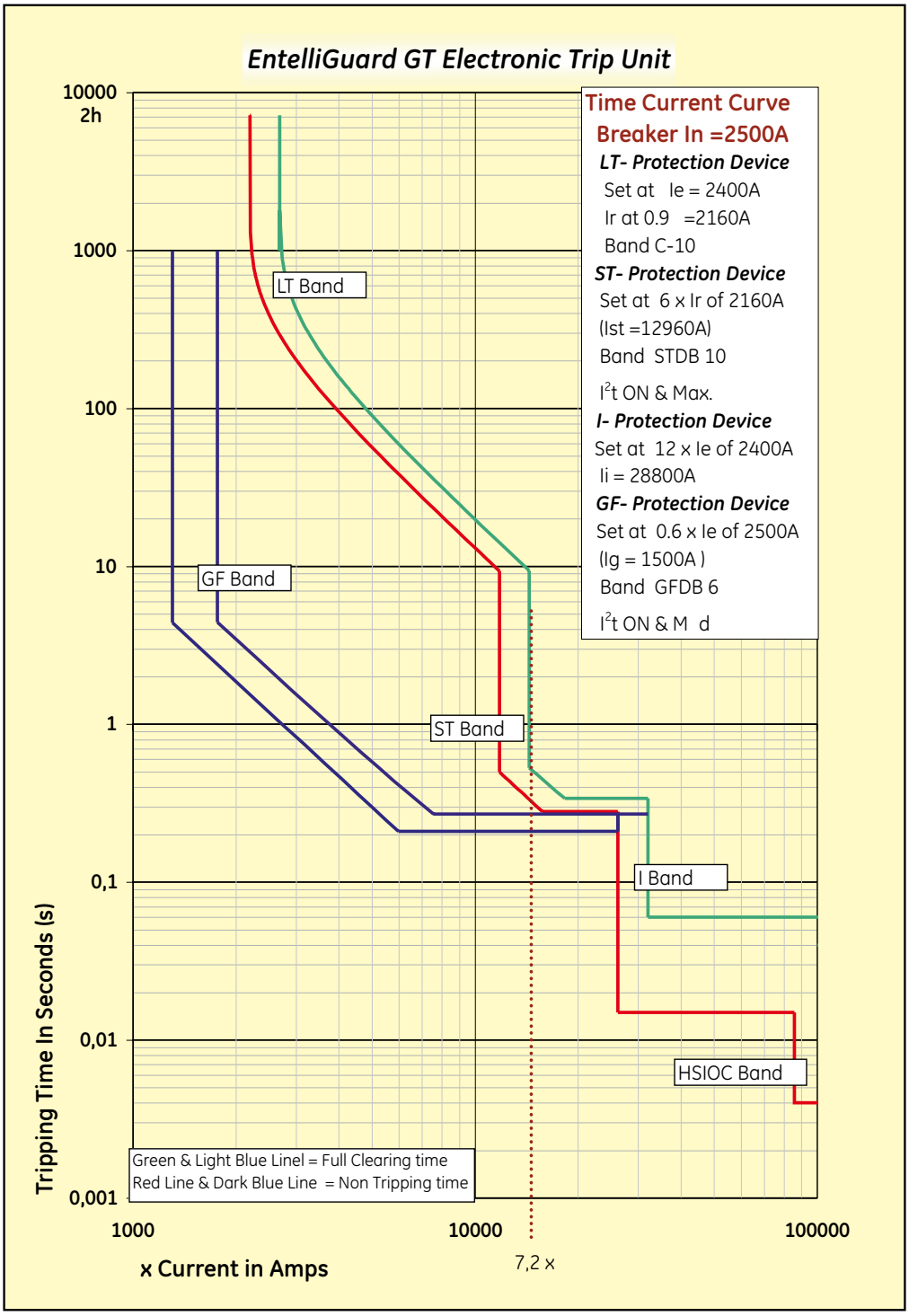


Denonimation	Description
In	Current rating of breaker
Ie	Primary current setting
Iu	Maximum breaker user current (see section D)
LT	Long time or overload protection
ST	Short time or timed short-circuit current setting
I	Standard or extended instantaneous setting
GF	Groundfault
EF	Earthfault
Ir	LT or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

Time current curves (cold state)

Example of full time current curve

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

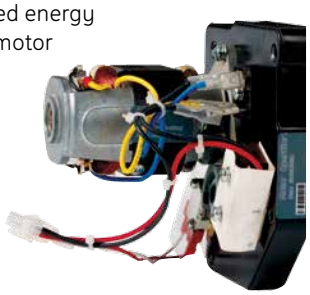


The Breaker & it's Accessories

Breaker accessories

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. An optional 'ready to close' or 'spring charging indication' 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 and 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 and OFF remotely a closing coil and shunt release is also necessary.

Connections

The motor mechanism connection points can be found on terminal B of both the fixed pattern and draw-out breaker types. Please refer to page C.7.

Electrical characteristics

Control voltage	Motor operator
	Power consumption
24DC, 110-130DC 220V DC	300W
110-130AC 220 - 240AC	350VA

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.

Connections

The closing coils connection points can be found on terminal B of both the fixed pattern and draw-out breaker types. Please refer to page C7.

Electrical characteristics

AC	DC	Power consumption
--	24V	350 VA Inrush
--	48V	
110-130V	110-130V	
220-240V	220-240V	
380-415V	--	

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 (50 msec). All EntelliGuard shunt release are suitable for a continuous power supply and are designed to be used as a closure prevention device when energized.

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

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

Undervoltage release

A device designed to open the breaker contacts and to prevent the breaker from closing when in a "No Volt" condition. On a de-energization the undervoltage release activates the circuit breaker mechanism and ensures a rapid disconnection of the main contacts (50 milliseconds). When not re-energized in accordance to the conditions stated in the IEC60947 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 air interruptions or 'Brown Outs' the device has a built in delay of 50 milliseconds.

Breaker accessories

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 device have a wide voltage range, thus limiting the number of devices needed and can be used in an operating frequency of up to two operations per minute.

The release can have a life span equivalent to that of the full breakers life span.

Connections

The connection points of both releases (UV and shunt) can be found on terminal B of both the fixed pattern and draw-out breaker types. Please refer to page C.7.

Electrical characteristics

AC	DC	Power consumption
--	24V	350 VA / 350 W Inrush 60 VA / 50W Holding
48V(1)	48V	
110-130V	110-130V	
220-240V	220-240V	
380-415V	--	

(1) Applicable only to shunt release

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

AC	DC	Power consumption
110-130V	48 V	350 VA Inrush 60 VA Hold
220-240V	110 - 130V	
380-415V	220 - 240V	

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 another package is available that can be used to increase the number of available contacts by replacing the standard auxiliary contact block.

Auxiliary contact packages

Standard: 3 NO + 3 NC power rated
Optional: 4 NO + 4 NC power rated

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.

Auxiliary switch characteristics	
Power rated	
Nominial control voltage	**Current rating**
	Non-inductive
AC 50 HZ	Amps
110/120V	10
220/240V	10
380/415V	5
DC	
110/120V	5
220/250V	0.25

Connections

The connection points of the auxiliary contacts can be found on terminal C of both the fixed pattern and draw-out breaker types. When the standard 4 NO + 4 NC is required, only the standard terminal C is used. For other combinations terminal A needs to be ordered separately.

Bell alarm contact

When an EntelliGuard Air Circuit Breaker has tripped due to a fault detected by the trip unit, a bell alarm changeover contact is available to indicate this. The contact can only be used when the breaker is adjusted to "Manual Reset".

Connections

The connection points of the bell alarm contact can be found on terminal B of both the fixed pattern and draw-out breaker types.

Breaker accessories

Electrical characteristics

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

Spring charged and ready to close contacts

A breaker with electrical charging mechanism is equipped with a spring charged contact that closes if the spring mechanism is charged.

The second contact is ready to close indication, contact can optionally replaces the spring charge contact. It only changes the indication when the following conditions are met:

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

Both contacts are available in a 1 NO configuration.

Electrical characteristics

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

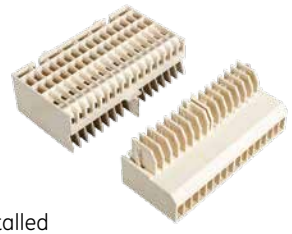
Operations counter

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

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

Terminal block

Breakers in fixed pattern, cassettes and breakers in draw-out mode are always supplied with an auxiliary connection block (terminal B and C).



When the number of factory installed accessories exceed, the available number of connection points needed, a 3rd connection block is added (terminal A) accordingly.
For connections please refer page C.7.

IP54 cover

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.

Rogowski coils

If the EntelliGuard 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. Rogowski are also required for sensing the set values and then allowing the trip unit to provide protection accordingly.

Hoisting / Lifting accessories

All EntelliGuard protection devices are equipped with a set of hoisting eyes. To use these hoisting eyes with standard lifting equipment, specifically designed adaptors are available.

Fascia pushbutton padlocking facilities

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

Breaker accessories

Cassette key lock facilities
The Air Circuit Breaker can be equipped with optional cassette key locks. The key lock system encompasses a device fitted to the cassette allowing the lock functionality. 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 swithced on.

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

Door interlock
A device designed to prevent the door of the equipment in which the breaker is installed to be opened when the Air 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.

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 position mode, can be inserted into the cassette and by use of the racking handle it can be moved to one of three positions; which are described below.

Connected, test, disconnected or withdrawn
To indicate in which position the EntelliGuard breaker is located within the cassette, position 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. Commonly referred to as carriage switches they are available as a factory mounted component or as a field mountable device.

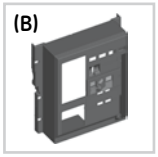
Connections
The device is located in the left side base of the cassette substructure and can be accessed and connected directly.

Electrical characteristics

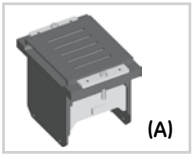
AC ratings		DC ratings	
Voltage	**Amps**	**Voltage**	**Amps**
250V	AC21-10A	125V	DC21-0,5A
		250V	DC21-0,25A

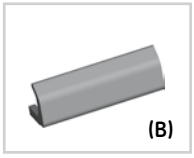
Spare parts for general use
The EntelliGuard* Power Circuit breaker uses components that are designed to last the full life span of the device. However, certain components can be damaged or break during operational use. For these specific cases, the following spare parts are available:

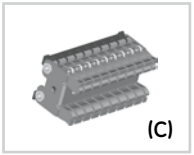
Racking handle **(A)**
Breaker front cover **(B)**

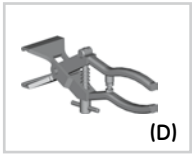


Spare part for maintenace purposes
Air Circuit Breakers as the Entellliguard Power Circuit Breakers require periodic maintenance. Here, in some cases certain components critical to the devices functionality could need replacement.
Please contact our service department for specialist assistance in establishing which components need replacement and the physical replacement activities.
The following items are available:
- Arc Chutes **(A)**
- Fixed arcing Contacts **(B)**
- Cassette cluster contacts **(C)**
- Pliers to remove Cassette cluster contacts **(D)**









Please contact our nearest authorised service centre for other available spare parts for EntelliGuard

Mechanical Interlocking of Multiple Breakers

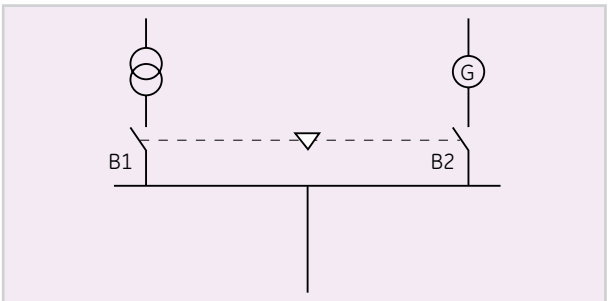
Mechanically Interlocked Breakers
Many Low Voltage Installations have multiple power sources that are used in many different configurations.
The power sources are required to supply the installation simultaneously, alternatively or in a certain logical combinations of both.

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

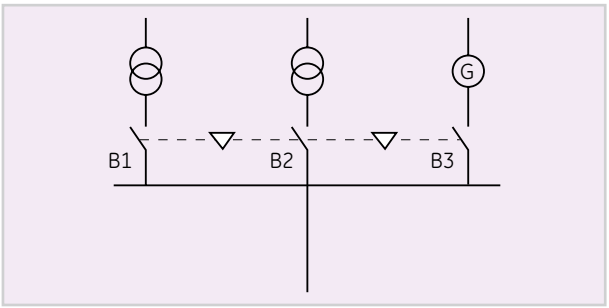
The device has two parts; the first a kit customized for use with the breaker in fixed pattern or the cassette when a draw-out pattern is required (field mountable). Two or more specially designed field mountable cables available in lengths of 1,0; 1,6; 2,0; 2,5; 3,0; 3,5 and 4,0 meters being the second.

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

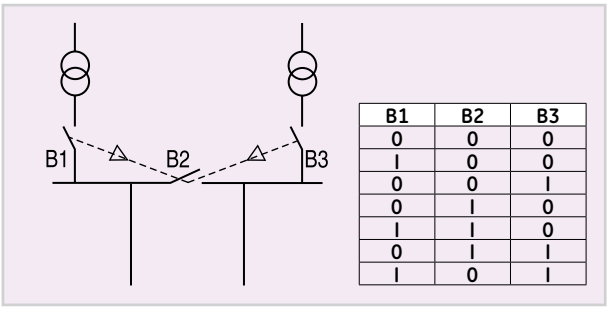
Two Breaker Interlock
Interlock type A in which one of the two breakers (B1 or B2) can be switched ON. Each breaker must be equipped with a factory mounted interlock type A. Two cables are needed.



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

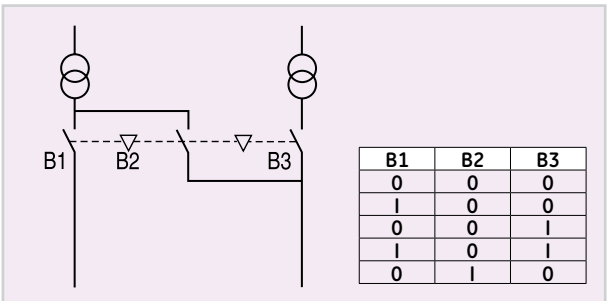


Three Breaker Interlock type C
Interlock type C in which one or two of the three breakers can be switched ON in accordance with the inserted diagram. Each breaker must be equipped with a factory mounted interlock type C. Six cables are needed.



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

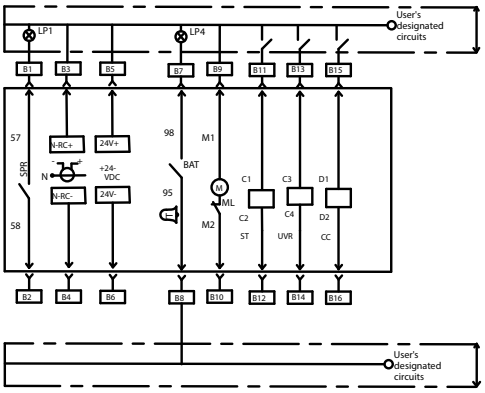
Three Breaker Interlock type D
Interlock type D in which one or two of the three breakers can be switched ON in accordance with the inserted diagram. Breakers B1 & B3 must be equipped with a factory mounted interlock type A and B2 with a interlock type D. Four cables are needed.



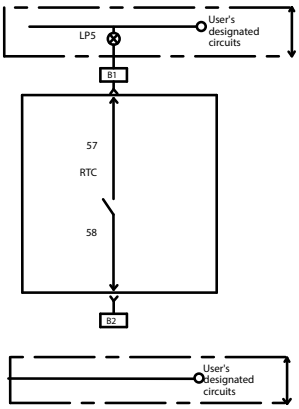
B1	B2	B3
0	0	0
I	0	0
0	0	I
I	0	I
0	I	0

Breaker connection scheme

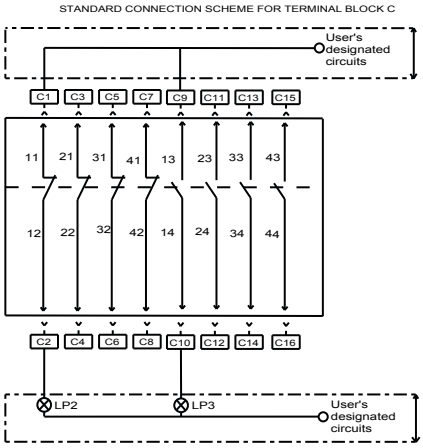
Standard connection scheme for terminal Block B



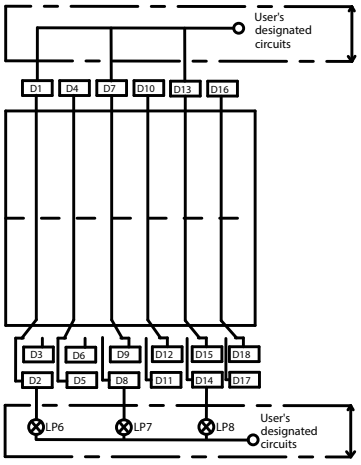
Optional connection scheme for terminal Block B



Standard connection scheme for terminal Block C
(when 3 sets of auxiliary contact are installed contacts 41 and 42 are not present)



Connection scheme for terminal Block D
(Located on the side plate of the cassette. Depicted carriage switches scheme is of the two switch per position type)



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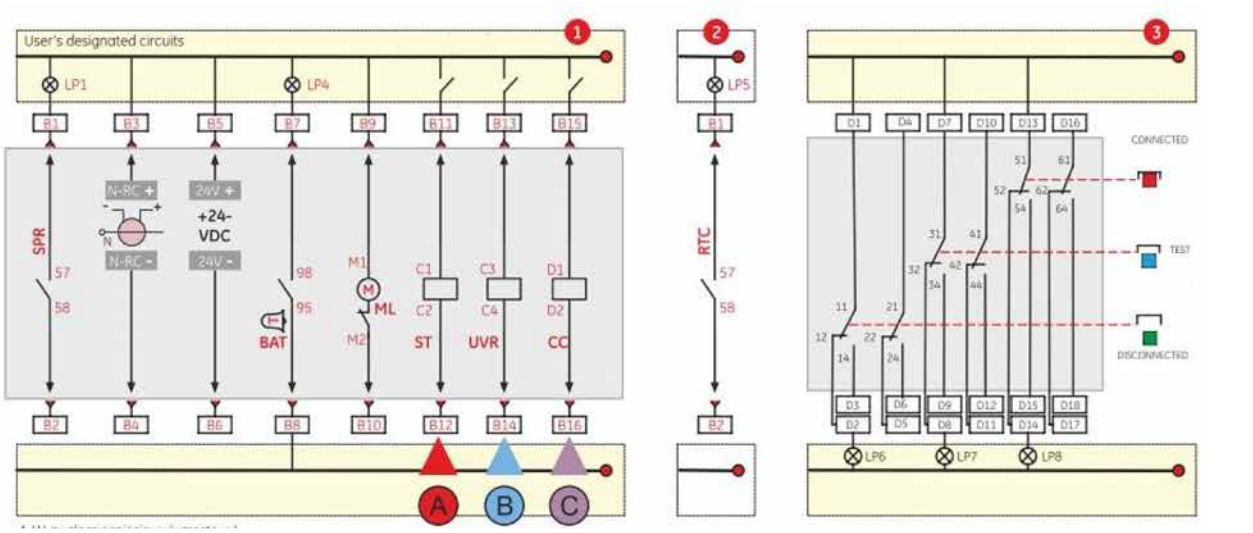
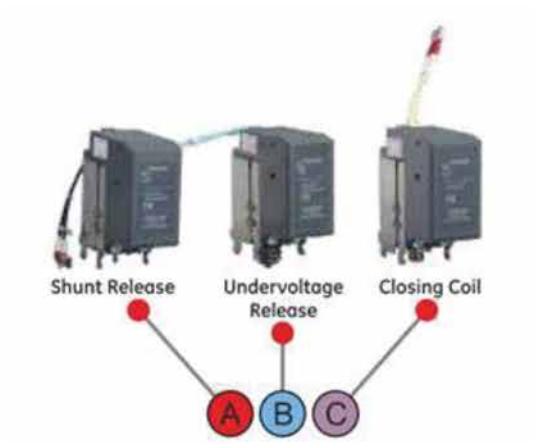
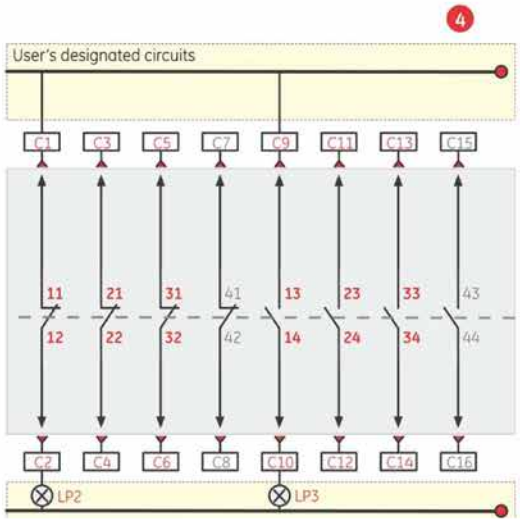
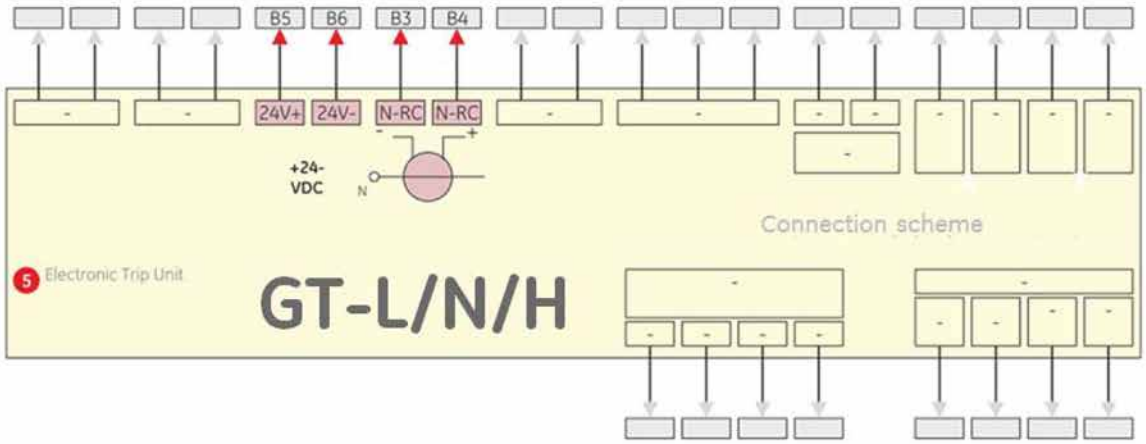
Trip unit		Indication (ct'd)		Abbreviations	
24V+/24V-	Auxiliary power supply to trip unit	**LP5**	Breaker ready to close	**CC**	Close coil
N-RC	Neutral rogowski coil	**LP6**	Disconnected position	**ST**	Shunt release
		LP7	Test position	**UVR**	Under voltage release
Indication		**LP8**	Connected position	**SPR**	Spring change status
LP1	Spring charge status			**RTC**	Ready to close status
LP2	Breaker open			**M**	Motor operator
LP3	Breaker closed			**BAT**	Bell alarm trip
LP4	Fault				







1. STANDARD CONNECTION SCHEME FOR TERMINAL BLOCK B
2. Optional connection scheme for RTC (Block B)
3. CONNECTION SCHEME FOR Cassette Position Indication Contacts
4. STANDARD CONNECTION SCHEME FOR TERMINAL BLOCK C



Optional connection scheme for terminal block A (For GT-N/H trip unit)

A1	A2	A3	A4	A5	A6	A7	A8	A9	A10	A11	A12	A13	A14	A15	A16
5V ISO	TxEN1	Rx (Modbus)	Tx	GND	Volt A	Volt B	Volt C	ISO GRND	+ ZSI -		+ ZSO -		I/P COM	INPUT 1 (RELT input)	INPUT 2
Trip unit Communication				System phase voltage signals									Relay input to trip unit		

(Need 4 Wire for Voltage Condtioner)

Application Guide

Handling, mounting and connecting

Clearance distances

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

EntelliGuard 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(2)	0	0
B1	30	30
B2	30	30

(1) Dimension allows for field arc chute replacements

(2) With cassette top covers; distance without these parts 160mm

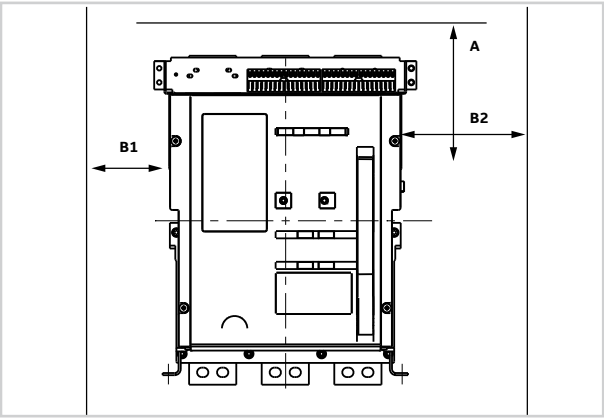
Handling

EntelliGuard Breakers in the fixed pattern and as draw-out portion have two retractable lifting eyes. One of these is located on the breaker right hand side and second on the left hand side (please see sketch).
The cassettes have four re-enforced tilting points with M10 screw thread.

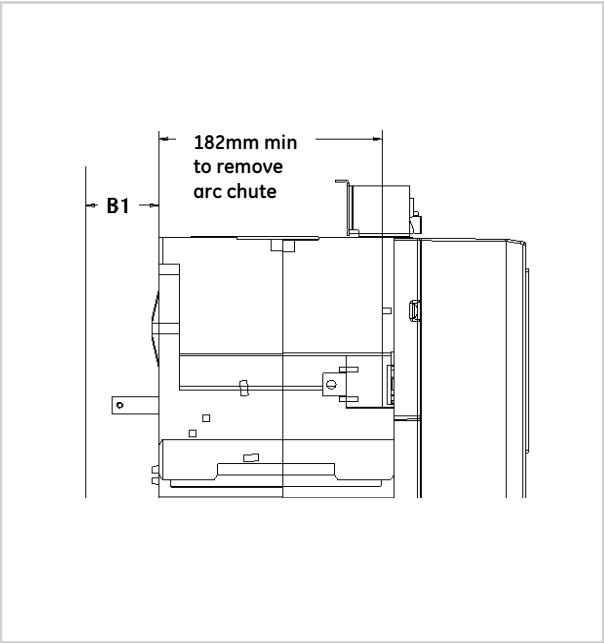
Recommended connection cross sections

The adjacent table indicates the recommended bus bar dimensions to be used in connecting the EntelliGuard Air Circuit Breaker.

Front view fixed or draw-out pattern



Side view fixed pattern



Recommended copper busbar sizes (per phase)

Envelope	Rating (A)	Horizontal and flat/front termination	Vertical termination
1	630	2 x 50 x 5	1 x 100 x 5
	800	2 x 50 x 5	1 x 100 x 5
	1000	2 x 60 x 5	2 x 100 x 5
	1250	2 x 50 x 10	2 x 80 x 5
	1600	2 x 50 x 10	2 x 100 x 5
	2000	3 x 50 x 10	3 x 100 x 5
	2500	N/A	4 x 100 x 5
2	2000	3 x 50 x 10	3 x 100 x 5
	2500	4 x 50 x 10	4 x 100 x 5
	3200	4 x 100 x 10	4 x 100 x 10
	4000	(1)	4 x 100 x 10 + 1 x 100 x 5

(1) Consider vertical configuration. No horizontal configuration available.

Recommended aluminium busbar sizes (per phase)

Envelope	Rating (A)	Horizontal termination	Vertical termination
1	400	2 x 40 x 8	2 x 40 x 8
	630	2 x 40 x 8	2 x 40 x 8
	800	2 x 50 x 8	2 x 50 x 8
	1000	2 x 50 x 10	2 x 50 x 10
	1250	2 x 63 x 12	2 x 63 x 12
	1600	4 x 50 x 8	4 x 50 x 8
	2000	(4)	3 x 100 x 10
	2500	(4)	4 x 100 x 10
2	2000	3 x 100 x 10	3 x 100 x 10
	2500	4 x 100 x 10	4 x 100 x 10
	3200	(4)	4 x 150 x 10
	4000	(4)	5 x 150 x 10

(3) With specifically designed Aluminium connection kit; please contact us.

(4) Consider vertical configuration. No horizontal configuration available.

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

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

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

EntelliGuard 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 vicinity of the breaker in free air.
The values apply for breakers used with rear connections and the preferred vertical busbars. The recommended connection cross sections can be found on page D.2

EntelliGuard L type	Envelope	In in A	Power loss at In per pole in Watts		Temperature in the direct environment of the EntelliGuard									
					≤50°C	55°C	60°C	65°C	70°C	≤50°C	55°C	60°C	65°C	70°C
			Fixed breaker	Draw-out breaker	Maximum user Current Ie in A Vertical connection mode: Fixed pattern					Maximum user Current Ie in A Vertical connection mode: Draw out pattern				
LG04S, LI04S	1	400	4,60	8,80	400	400	400	400	400	400	400	400	400	400
LG04N & R, LI04N & R	1	400	2,40	4,80	400	400	400	400	400	400	400	400	400	400
LG07S, LI07S	1	630	11,80	21,80	630	630	630	630	630	630	630	630	630	630
LG07N & R, LI07N & R	1	630	6,00	11,90	630	630	630	630	630	630	630	630	630	630
LG08S, LI08S	1	800	19,20	35,20	800	800	800	800	800	800	800	800	800	800
LG08N & R, LI08N & R	1	800	9,60	19,20	800	800	800	800	800	800	800	800	800	800
LG10S, LI10S	1	1000	30,00	55,00	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
LG10N & R, LI10N & R	1	1000	15,00	30,00	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
LG13S, LI13S	1	1250	46,90	85,90	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
LG13N & R, LI13N & R	1	1250	23,40	46,90	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
LG16S, LI16S	1	1600	66,60	128,00	1600	1600	1600	1600	1600	1600	1600	1500	1400	1350
LG16N & R, LI16N & R	1	1600	38,40	76,80	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
LG20S & N, LI20S & N, LJ20R	1	2000	60,00	120,00	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
LG25S & N, LI25S & N, LJ25R	1	2500	93,80	187,00	2500	2500	2500	2500	2500	2500	2450	2232	2100	2000
LG20C & D, LI20C & D, LJ20C	2	2000	60,00	120,00	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
LG25C & D, LI25C & D, LJ25C	2	2500	93,80	187,00	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
LG32C & D, LI32C & D, LJ32C	2	3200	81,90	184,30	3200	3200	3100	3050	3000	3200	3200	3100	3050	3000
LG40C & D, LI40C & D, LJ40C	2	4000	128,00	256,00	4000	3750	3500	3350	3200	4000	3750	3500	3350	3200

EntelliGuard L type	Envelope	In in A	Power loss at In per pole in Watts		Temperature in the direct environment of the EntelliGuard									
					≤50°C	55°C	60°C	65°C	70°C	≤50°C	55°C	60°C	65°C	70°C
			Fixed breaker	Draw-out breaker	Maximum user Current Ie in A Horizontal connection mode: Fixed pattern					Maximum user Current Ie in A Horizontal connection mode: Draw out pattern				
LG04S, LI04S	1	400	4,60	8,80	400	400	400	400	400	400	400	400	400	400
LG04N & R, LI04N & R	1	400	2,40	4,80	400	400	400	400	400	400	400	400	400	400
LG07S, LI07S	1	630	11,80	21,80	630	630	630	630	630	630	630	630	630	630
LG07N & R, LI07N & R	1	630	6,00	11,90	630	630	630	630	630	630	630	630	630	630
LG08S, LI08S	1	800	19,20	35,20	800	800	800	800	800	800	800	800	800	800
LG08N & R, LI08N & R	1	800	9,60	19,20	800	800	800	800	800	800	800	800	800	800
LG10S, LI10S	1	1000	30,00	55,00	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
LG10N & R, LI10N & R	1	1000	15,00	30,00	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
LG13S, LI13S	1	1250	46,90	85,90	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
LG13N & R, LI13N & R	1	1250	23,40	46,90	1250	1250	1250	1250	1250	1250	1250	1250	1250	1250
LG16S, LI16S	1	1600	66,60	128,00	1600	1500	1450	1400	1350	1600	1500	1450	1400	1350
LG16N & R, LI16N & R	1	1600	38,40	76,80	1600	1600	1600	1600	1600	1600	1600	1600	1600	1600
LG20S & N, LI20S & N, LJ20R	1	2000	60,00	120,00	2000	2000	2000	2000	2000	2000	2000	2000	1900	1800
LG25S & N, LI25S & N, LJ25R	1	2500	93,80	187,00	2500	2450	2232	2100	2000					
LG20C & D, LI20C & D, LJ20C	2	2000	60,00	120,00	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000
LG25C & D, LI25C & D, LJ25C	2	2500	93,80	187,00	2500	2500	2500	2500	2500	2500	2500	2500	2500	2500
LG32C & D, LI32C & D, LJ32C	2	3200	81,90	184,30	3200	3200	3100	3050	3000	3200	2800	2700	2650	2500

Selectivity / Discrimination

Selectivity / Discrimination
In a low voltage distribution network it is necessary that during a fault, the protection device nearest to the fault reacts whilst all others remain closed.

This capability is called discrimination or selectivity.

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 upstream EntelliGuard Breaker as a a ratio to that of the downstream protection devices.

A second table on page 45 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 delectivity	Recommended EntelliGuard settings				
				Ir or Ie setting ratio	LTDB setting band	Ist setting ratio	STDB setting band	I setting
FD and FE frame	LTMD	Ir	Ratio and Band	1.6 x	C22			
		Im	Ratio and Band			1.6 x	Band 2	*Minimum setting 5kA -FD160, 7kA - FE160, 9kA - FE250 or I = 'OFF'*
FD and FE frame	GTM	Ir	Ratio and Band	1.6 x	C22			
		Im	Ratio and Band			1.6 x	Band 2	
FE frame PremEon S	SMR PremEon S	Ir	Ratio and Band	1.3 x				
		LTD Motor	Band		C14			
		Ist	Ratio and Band			1.35 x	Band 2	
FG frame PremEon S	SMR1	Ir	Ratio and Band	1.3 x				
		LTD Motor	Band		C14			
		Ist	Ratio and Band			1.35 x	Band 3	
FG frame	SMR2	Ir	Ratio	1.3 x				*Minimum setting 14kA -FG400, 18kA - FG630 or use ZSI or I = 'OFF'*
		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 and Band	1.4 x	C8			
		Ist	Ratio			1.35 x		
		STD	Band				Band 7	
FK frame	SMR1s	Ir	Ratio	1.4 x				*Minimum setting 18kA -FK800 20kA - FK1000 20kA - FK1250 28kA - FK1600 or use ZSI or I = 'OFF'*
		LTD cl. 5	Band		C8			
		LTD cl.10	Band		C12			
		LTD cl.20	Band		C19			
		LTD cl.30	Band		C22			
		Ist	Ratio					
		STD=300ms	Band				Band 12	
		STD=200ms	Band				Band 10	
		STD=100ms	Band				Band 7	
EntelliGuard	GT-L, -E, -S '-N, -H, -HE	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 and Band	2 x	F20	ST = 8 x Ir, STDB band 5 and I = 12 x Ie		

Selectivity / Discrimination table

Downsteam Device	Trip Unit	Upstream EntelliGuard device and Selectivity limit I_s (1)				
		GG04S to GG20S	GG04N to GG20N	LG04N to LG25N	LG20C to LG40C	GG25N to GG40N
Elfa Plus MCBs EP30,45, 60,100&250, CP30,45&60, DME60, DPE100, DP(A)60, DP(A)100 & DPT100	All	T		T	T	T
Elfa Plus MCBs HTI & S90 C curve	All	T		T	T	T
Surion Manul Motor starters GPS1BS <=10A GPS1MH<=12.5A GPS2BS 10A, GPS2MH 10A	All	T		T	T	T
Surion Manul Motor starters GPS1BS, GPS1MS 12.5kA, GPS1MH > 12.5A, GPS2MH >10A	All	T		T	T	T
Surion Manul Motor starters GPS1BS, GPS1MS >=16A, GPS2BS >10A	All	T		T	T	T
Record Plus						
FD& FE frame C, E, V, S tiers	All	T		T	T	T
FD& FE frame N tier	All	T		T	T	T
FD& FE frame H tier	All	T		T	T	T
FD& FE frame L tier	All	T		T	T	T
FG frame N tier	All	T		T	T	T
FG frame H tier	All	T		T	T	T
FG frame L tier	All	T		T	T	T
FK frame N tier	All	T		T	T	T
FK frame H tier	All	T		T	T	T
FK frame L tier	All	T		T	T	T
EntelliGuard L						
LG04S to LG25S / LI04S to LI25S	All	50kA		T	50kA	T
LG04N to LG25N / LI04N to LI25N	All	50kA		65kA	50kA	65kA
LG20C to LG40C / LI20C to LI40C	All	50kA		T	50kA	T
LG20D to LG40D / LI20D to LI40D	All	50kA		65kA	50kA	65kA
Industrial fuses GL/Gg type	-	T		T	T	T

(1) T = Full discrimination until the Icu of the downstream or upstream device. (the lowest of the two)
Selectivity is also present with upstream EntelliGuard G devices type GG04E to GG40E, GG(GH)25H to GG(GH)40H , GG(GH)25M to GG(GH)40M, GG32G to GG40G, GG40M to GG64M and GG40L to GG64L.

Protection of standard circuits

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

Environment
EntelliGuard will function well in almost any industrial environment and fully complies with the environmental requirements of the relevant EN 60 947-2 standard. For conditions other than the above mentioned, please refer to page D.8 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 6 & 7 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 power circuit breakers
To protect standard circuits, the breakers are equipped with a number of protection devices.

Overload protection device
The first is a highly accurate menu driven overload protection device that has an adjustment range of 0.2 to 1 times the breaker rating with a GT-N or GT-H trip unit (0.4 to 1 x with a GT-L unit). Six main current ratings (Ie) are available. GT-N and GT-H units also 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).

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 power circuit breaker to interrupt a fault within the timing required by the standards. to offer selectivity across multiple levels and allow the user to take inrush currents into account.

Ground fault protection
It is possible to combine two devices 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 power circuit breaker to interrupt a fault within the timing required by the standards and offer selectivity across multiple levels.

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

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. Here number of the possible applications of these devices are 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 are 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 IEC60947-4 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 C8 to the C22 band).

Switching on a motor also produces a high but very short inrush peak current which could activate the short-circuit protection of a breaker and cause unexpected tripping. Here the timed short-circuit device of a 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, if motor and wiring are still warm, a 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
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 / HV transformers
Transformers generally produce a very high inrush current. The crest values of the first half cycle may reach values of 15 to 25 times the normal rated current.
Manufacturers 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	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 (ATS)
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 or 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 unit 3 phase undervoltage release. This is to establish if voltage on a certain power source is present and if a generator set has reached its nominal voltage.

Environmental considerations

Ambient temperature
EntelliGuard 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, de-rating 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 de-rating of breaker rated current or rated voltage is applicable. For altitudes above 2000m the following de-rating factors apply:

Alttitude	Altitude correction factors		
	≤ 2000M	2500M	4000M
Voltage (Ue)	1	0.95	0.80
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

Vibration
Air Circuit Breakers meet the vibration requirements of the following standards:

IEC 68-2-6	Vibration

Other
All EntelliGuard devices meet the existing European ROHS directive.

Electromagnetic compatibility
The EntelliGuard Air Circuit Breaker and its electronic trip unit meet the most stringent requirements of the EN 60947-2 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

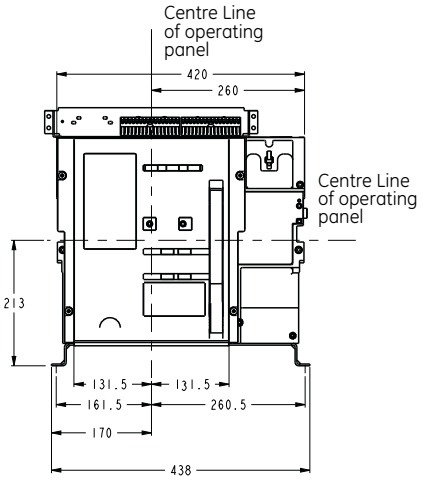
Notes

Notes

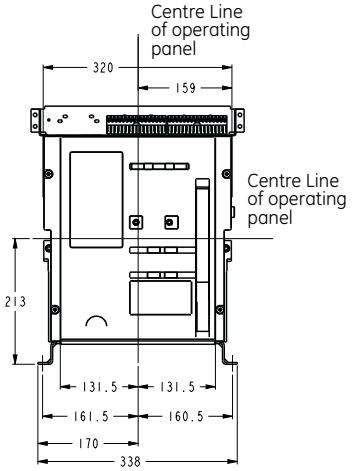
Dimensional Drawings

Envelope 1 - Fixed Pattern

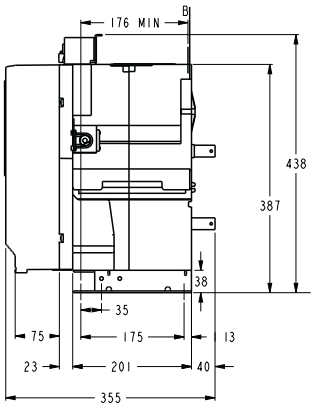
Front view 4pole



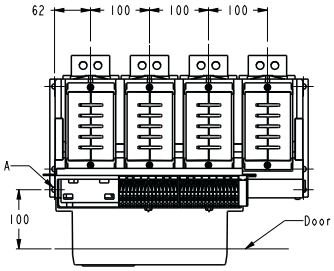
Front view 3pole



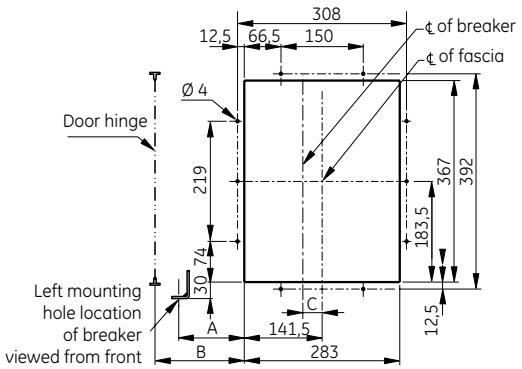
Side view



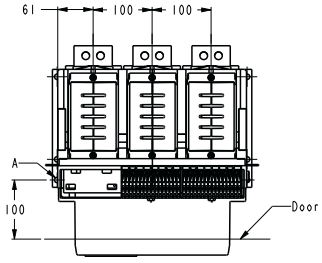
Top view 4pole



Door Cut-out

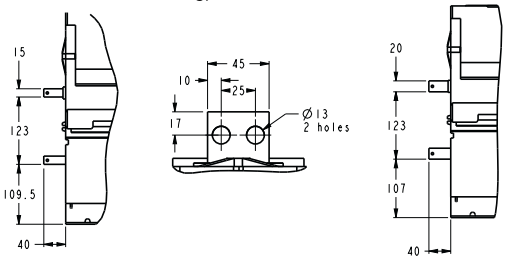


Top view 3pole



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

Standard Connection pads

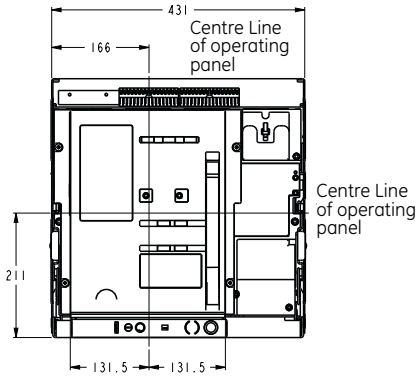


Remarks

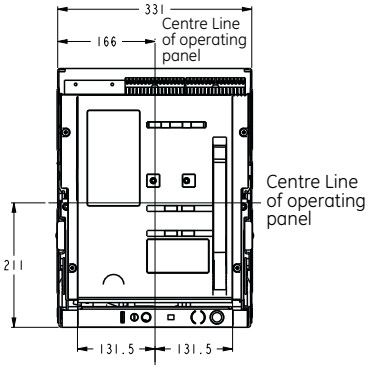
1. **6 mounting holes of Ø 9,5mm**
2. **Please refer to section C for clearance distances**

Envelope 1 - Draw-out Pattern: Universal connection pads

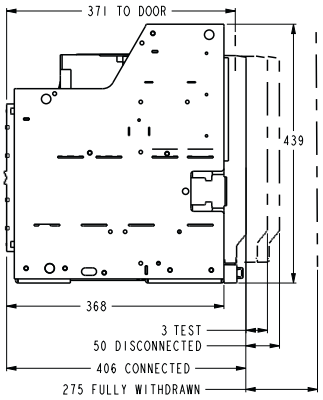
Front view 4pole



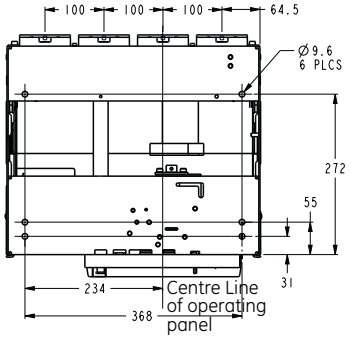
Front view 3pole



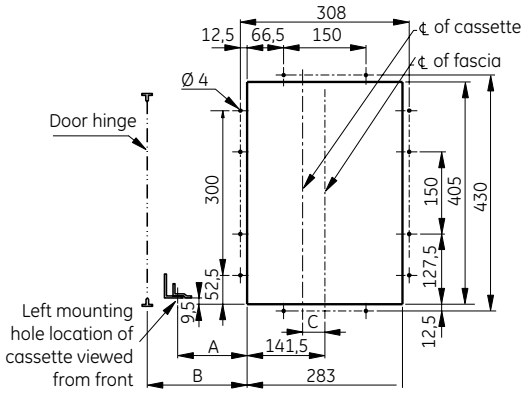
Side view



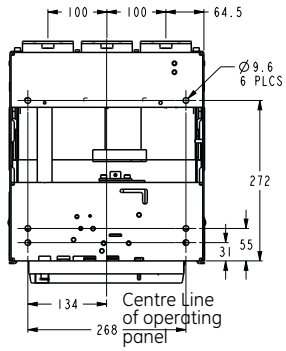
Bottom view 4pole



Door Cut-out



Bottom view 3pole

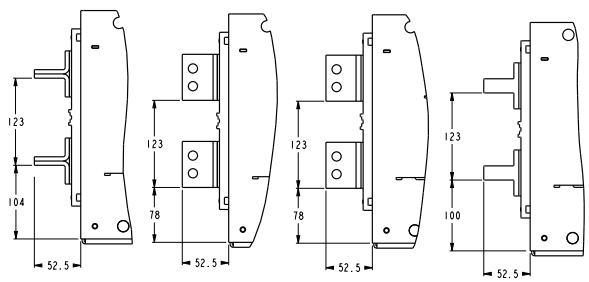


Breaker type	A	B minimum	C
Envelope 1 3 pole	-7,0	60,0	0,0
Envelope 1 4 pole	-7,0	60,0	-49,5

Remarks

1. **6 mounting holes of Ø 9,5mm**
2. **Please refer to section C for clearance distances**

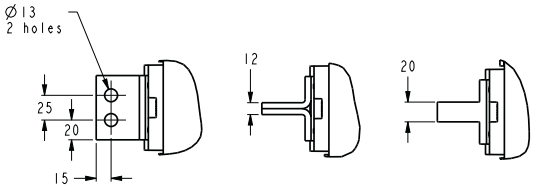
Universal Connection pads Mounted Horizontally or Vertically



S type <=1600A

N types 400-2500A
S type 2000 & 2500A

Universal Connection pads Details



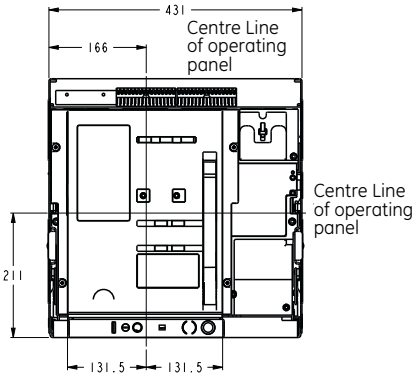
Valid for All types

S type <=1600A

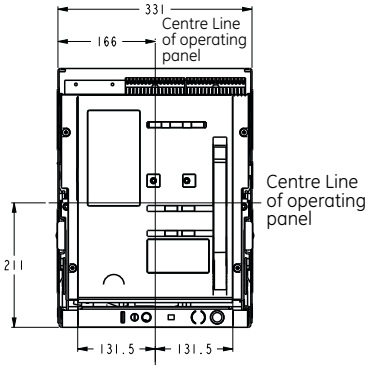
N & R types 400-2500A
S type 2000 & 2500A

Envelope 1 - Draw-out Pattern: Horizontal connection pads, applicable up to 2000A

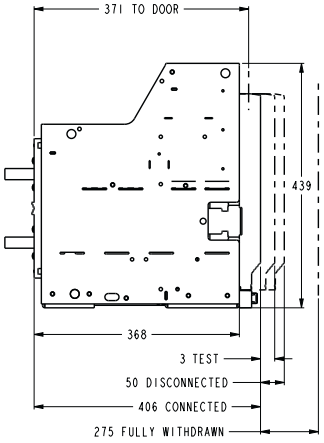
Front view 4pole



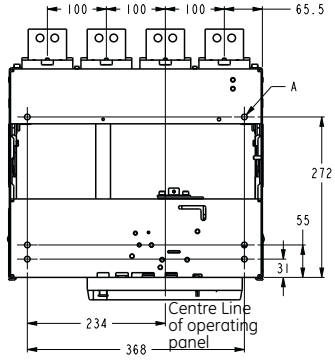
Front view 3pole



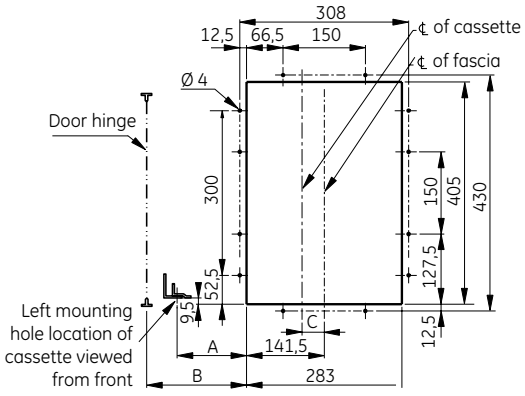
Side view



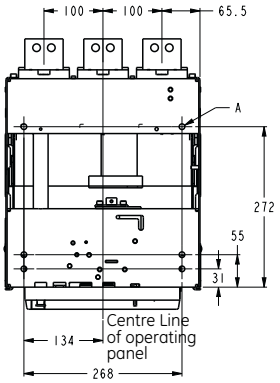
Bottom view 4pole



Door Cut-out



Top view 3pole

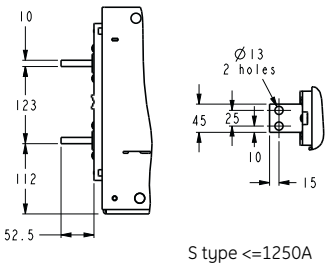


Breaker type	A	B minimum	C
Envelope 1 3 pole	-7,0	60,0	0,0
Envelope 1 4 pole	-7,0	60,0	-49,5

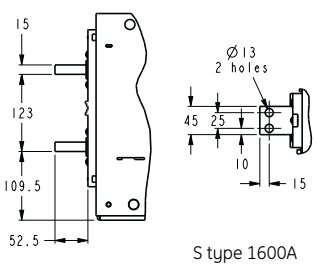
Remarks

1. **6 mounting holes of Ø 9,5mm**
2. **Please refer to section C for clearance distances**

Universal Connection pads Mounted Horizontally or Vertically



S type <=1250A



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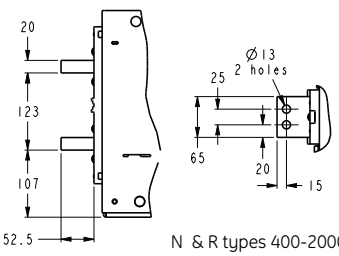
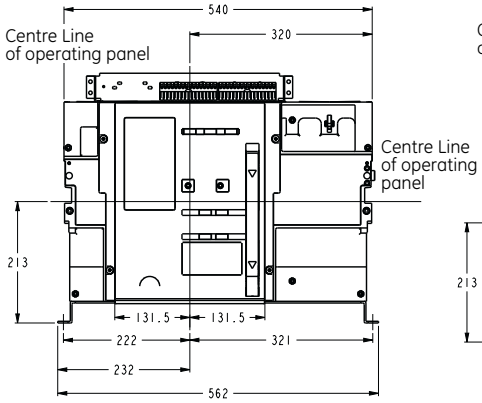


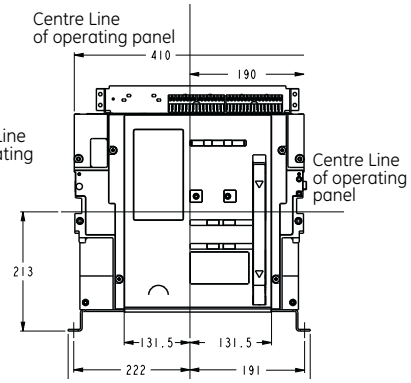
N & R types 400-2000A
S type 2000 A

Envelope 2 - Fixed Pattern

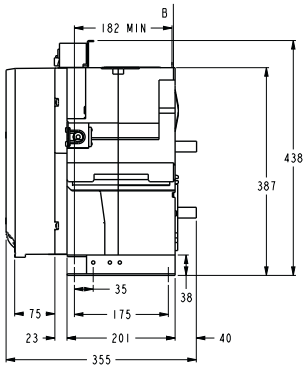
Front view 4pole



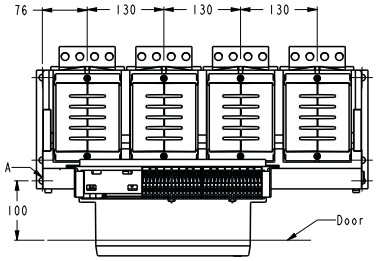
Front view 3pole



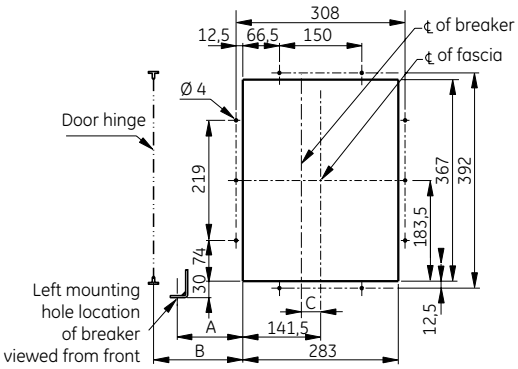
Side view



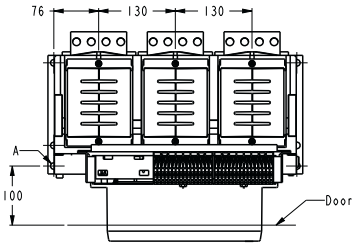
Top view 4pole



Door Cut-out

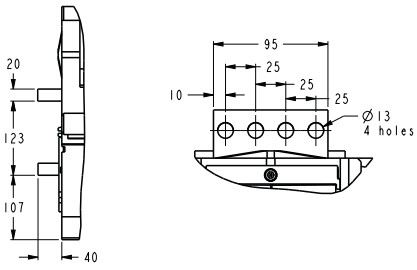


Top view 3pole



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

Standard Connection pads

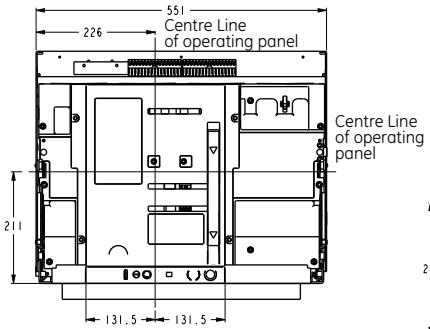


Remarks

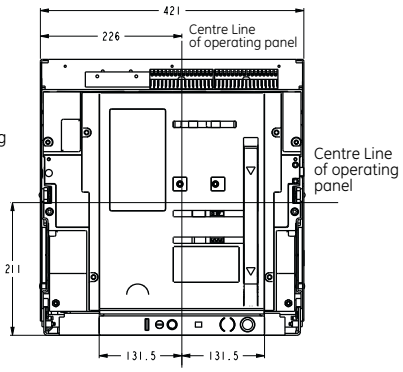
1. **6 mounting holes of Ø 9,5mm**
2. **Please refer to section C for clearance distances**

Envelope 2 - Draw-out Pattern: Univeral connection pads

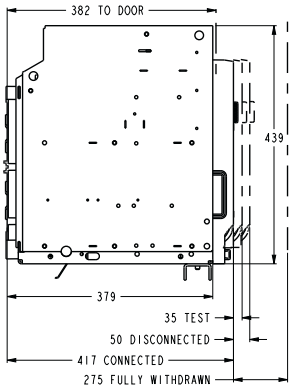
Front view 4pole



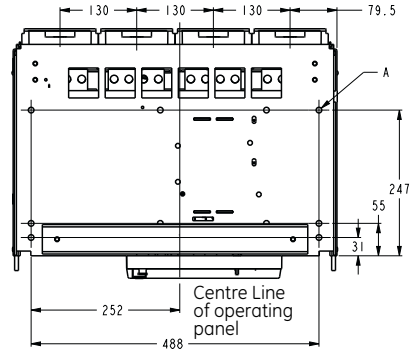
Front view 3pole



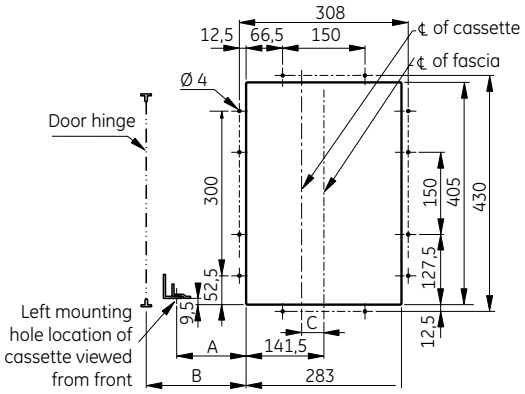
Side view



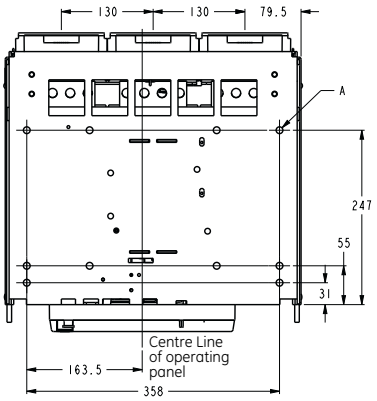
Bottom view 4pole



Door Cut-out

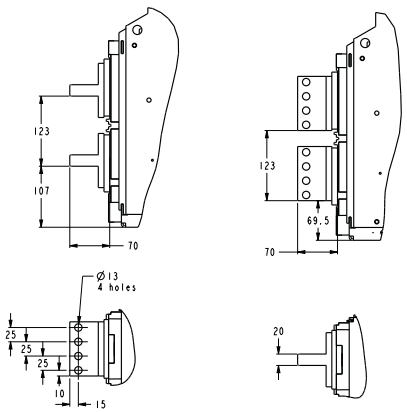


Bottom view 3pole

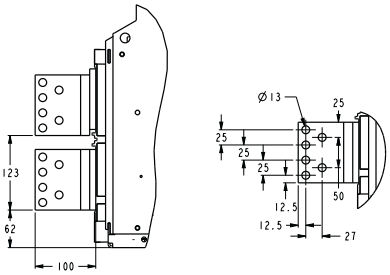


Breaker type	A	B minimum	C
Envelope 2 3 pole	53,0	125,0	15,5
Envelope 2 4 pole	53,0	125,0	-49,5

Universal Connection pads
Vertical or Horizontal max. 3200A



Vertical Connection pads
4000A rating

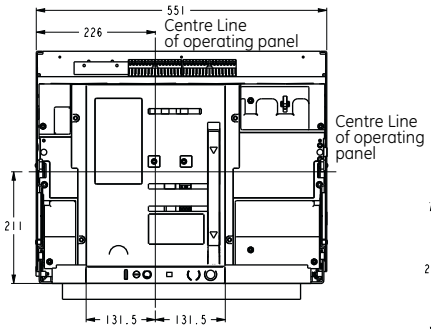


Remarks

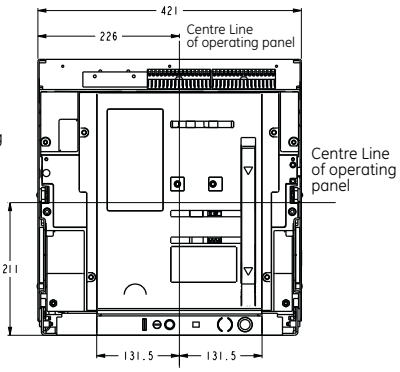
1. **6 mounting holes of Ø 9,5mm**
2. **Please refer to section C for clearance distances**

Envelope 2 - Draw-out Pattern: Horizontal connection pads, applicable upto 3200A

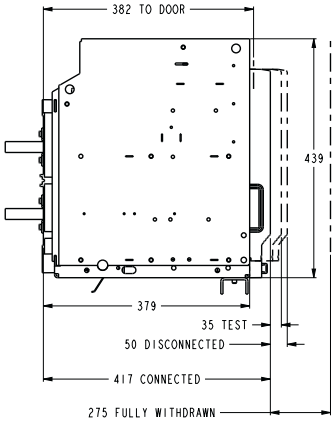
Front view 4pole



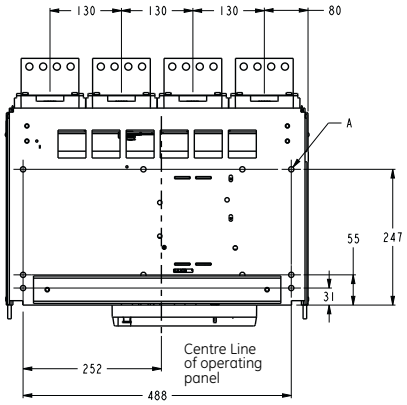
Front view 3pole



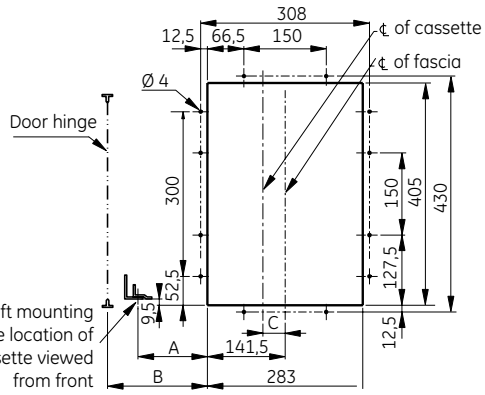
Side view



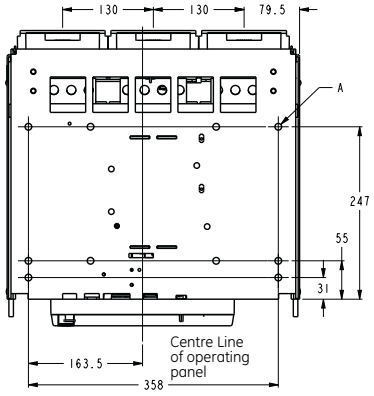
Bottom view 4pole



Door Cut-out

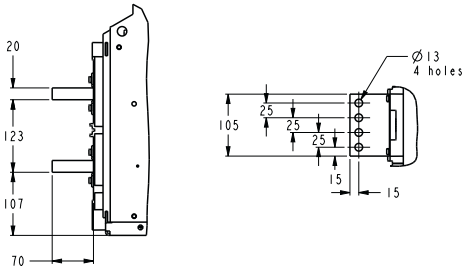


Bottom view 3pole



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

Connection pads details

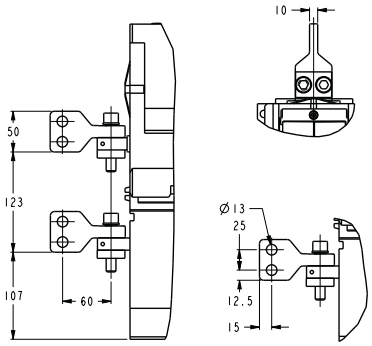


Remarks

1. 6 mounting holes of Ø 9,5mm
2. Please refer to section C for clearance distances

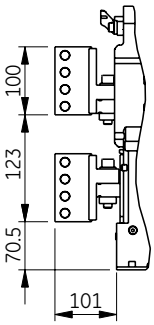
Envelope 1 & 2 - Alternate Connection Modes

Fixed Rear Vertical Connection
Envelope 1 < = 1600A

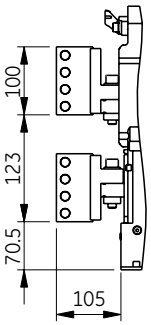


Fixed Vertical Rear Connection
Envelope 2

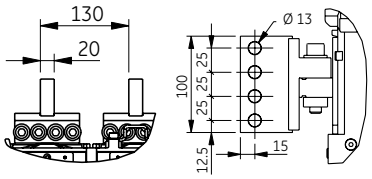
MAX. 3200A



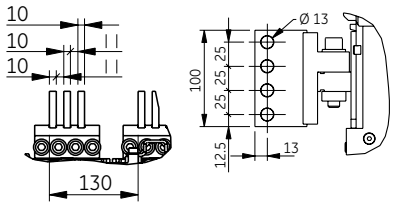
4000A



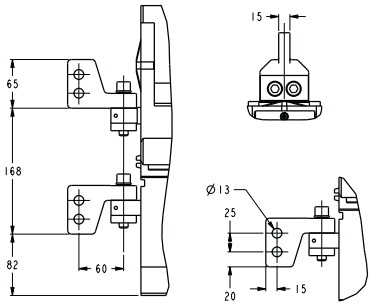
Details max. 3200A



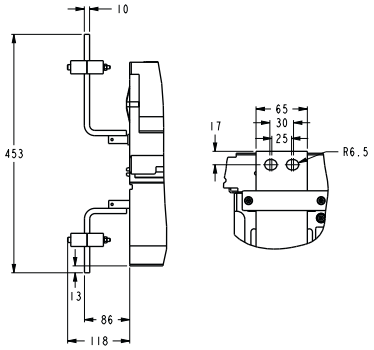
Details max. 4000A



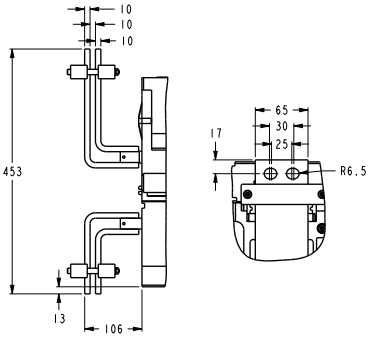
Fixed Rear Vertical Connection
Envelope 1 2000 & 2500A



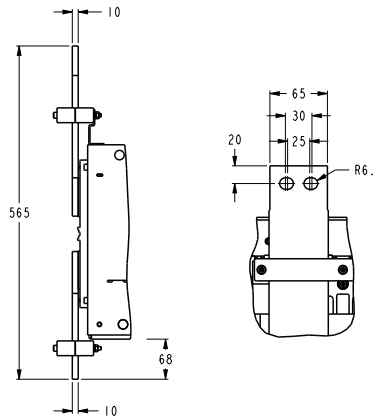
Fixed Front Connection
Envelope 1 <= 1600A



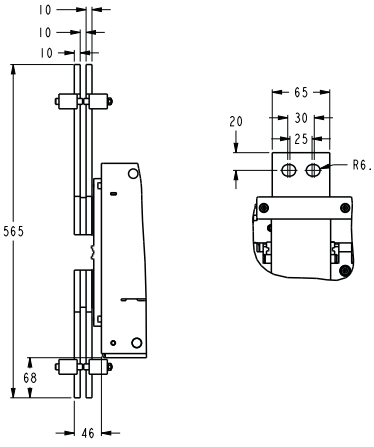
Fixed Front Connection
Envelope 1 2000 & 2500A



Draw-out Front Connection
Envelope 1 <=1600A

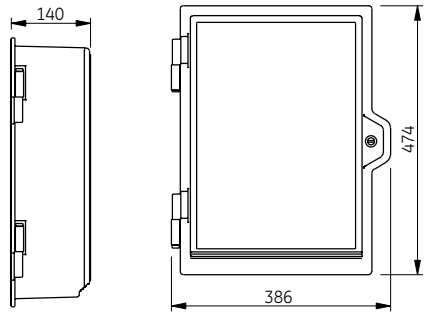


Draw-out Front Connection
Envelope 1 2000 & 2500A

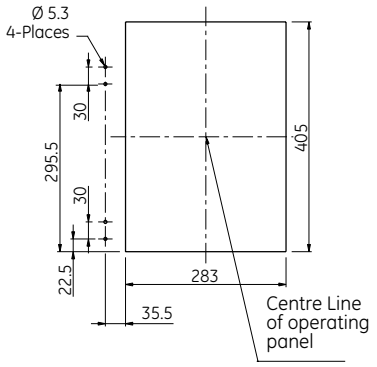


IP54 Flange, Time Delay Module UVR, 24V Power Supply

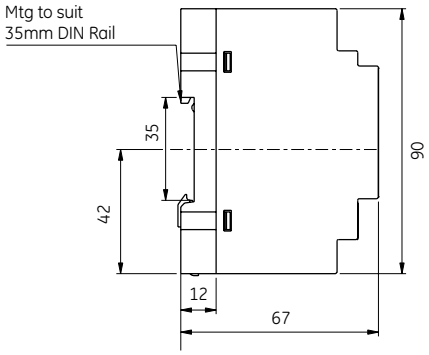
IP54 Flange

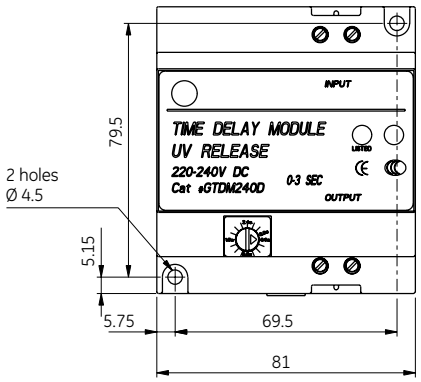


IP54 Flange drilling

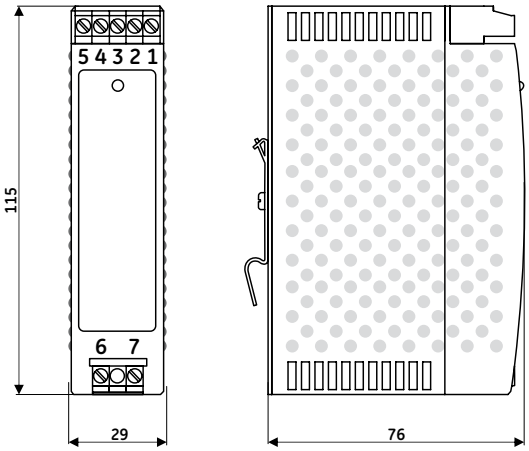


Time delay Module (UVR)



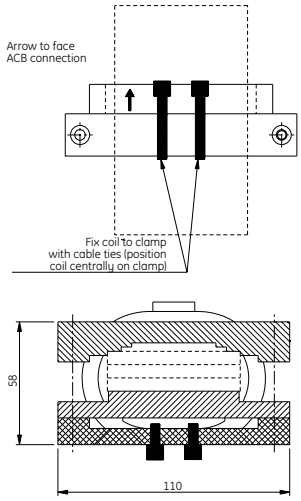


External 24V DC power supply

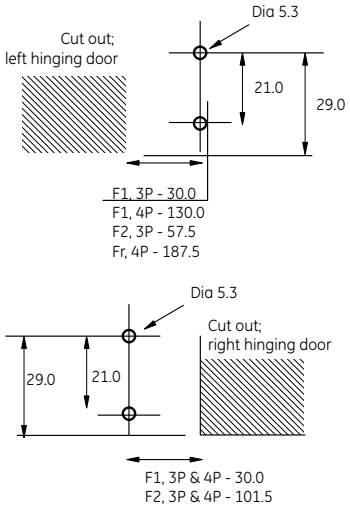


Rogowski's & Door Interlock systems

Rogowski Coil external

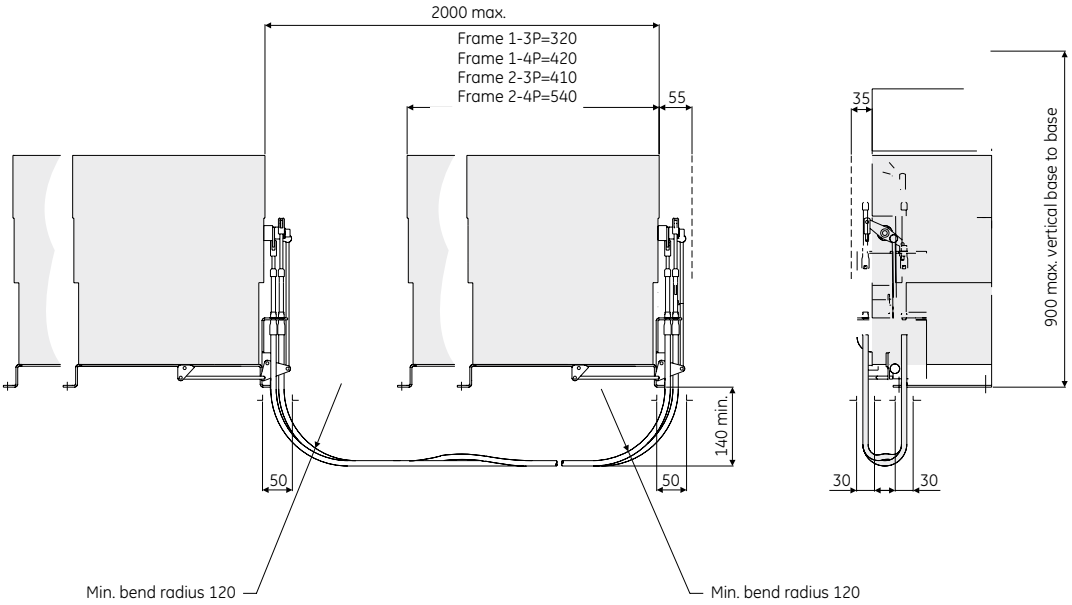


Door Interlock system

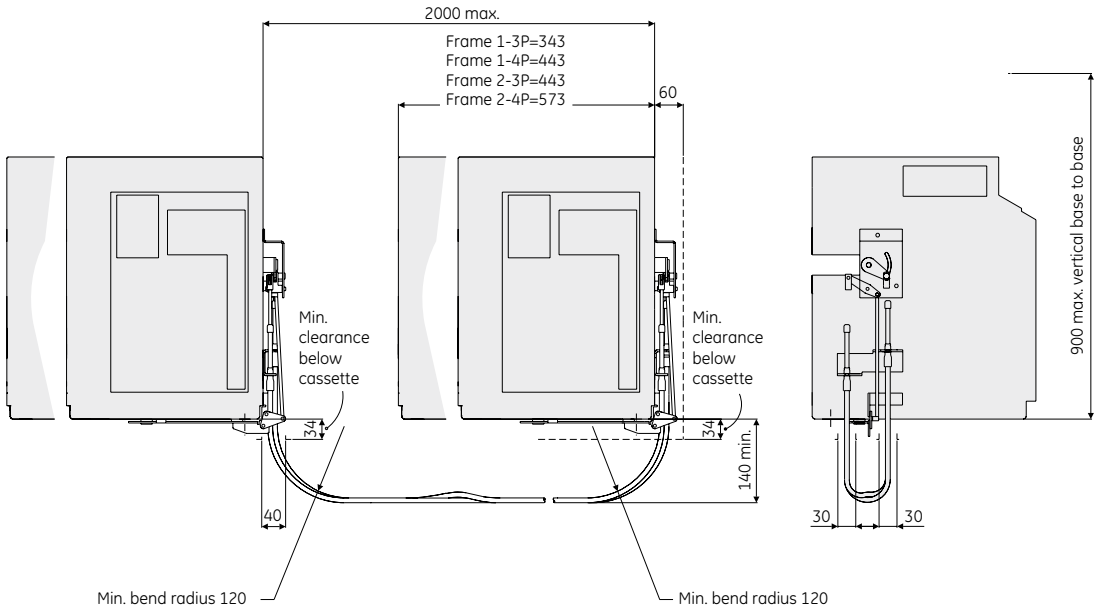


Interlocking with Cable systems; 2 way

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

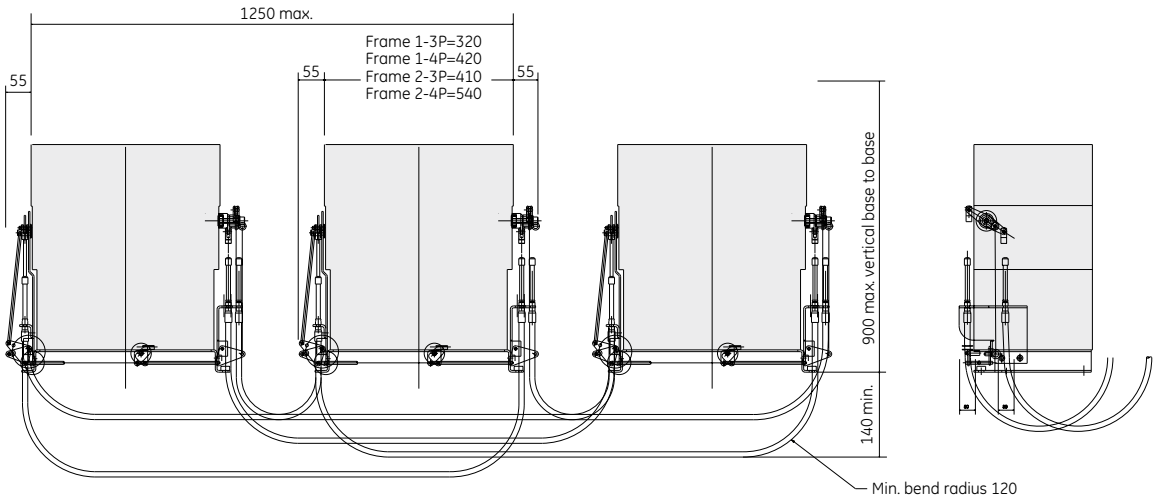


Draw-out 2-way cable interlock / Withdrawable pattern - Front/rear access

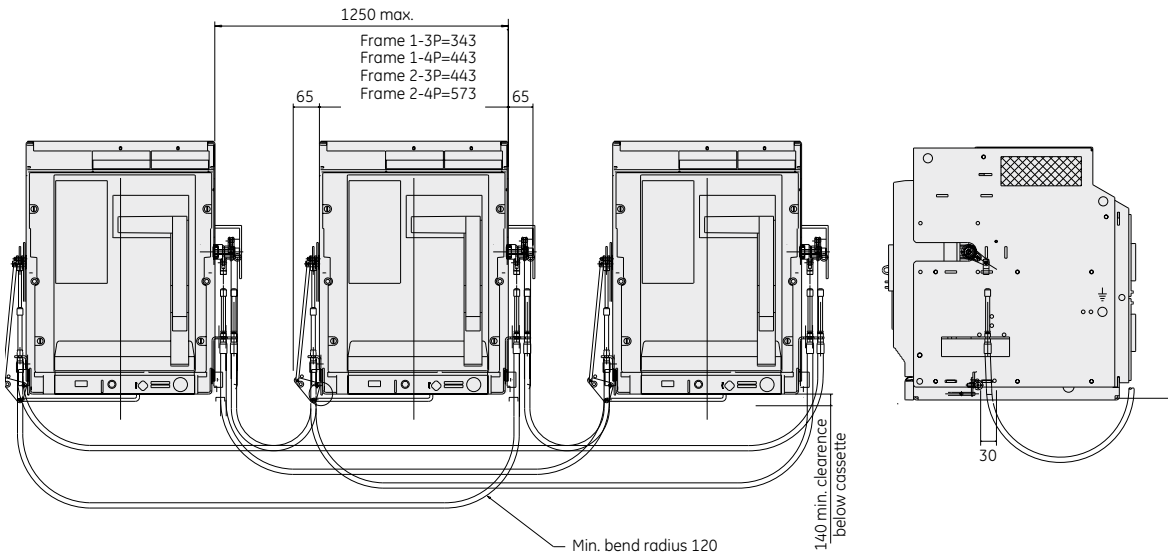


Interlocking with Cable systems; 3 way

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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407707	GM01110DR	A.13
407712	GM01120A	A.11
407713	GM01120AR	A.13
407714	GM01240A	A.11
407715	GM01240AR	A.13
407720	GM01220D	A.11
407721	GM01220DR	A.13
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407771	GSTR024DR	A.13
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407821	GTDM240D	A.15
407825	GTDM400A	A.15
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407869	GCCN240	A.11
407876	GCCN400AR	A.13
407877	GCCN400A	A.11
407897	GRTC1	A.11
407985	GRON	A.13
407990	GCB1	A.15
407991	GCB2	A.15
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407996	GCB7	A.15
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408001	G07HNRC	A.9
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408033	GMCNR	A.13
408035	GMCN	A.11
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408072	G40M4RVI	A.6
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NOTE: Reference numbers are being phased out, newer catalogue numbers do not have associated reference numbers.

Notes

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