The interchangeability of the VL circuit breaker trip units allow for easy conversion from any of 3 types of protection. They are thermal-magnetic, electronic, or electronic with a built-in LCD display. The thermal-magnetic trip unit features an adjustable magnetic trip setting. The electronic trip units are microprocessor based true RMS sensing devices and are available with a variety of adjustable trip settings, configurations, and information menus. With precise control over the circuit beaker functions and access to system status, diagnostics, and information, these trip units allow for unsurpassed flexibility in circuit coordination.

An example of coordination is the out of the box Ground Fault function on the Model 545 trip units. The pick-up and time delay settings are fixed for each frame and do not overlap with the settings on the other frames. Therefore, when VL breakers are used together in a system the GF protection is automatically coordinated. The user also has the ability to program a custom coordination scheme with the high level of adjustability available on the Model 576 trip units.

Trip Unit Functions	VL Trip Units						
	Model 525	Model 545				Model 576	
	Thermal-Magnetic	Electronic LI	Electronic LIG	Electronic LSI	Electronic LSIG	Electronic with LCD LSI	Electronic with LCD LSIG
Continuous Current Setting (I_r)	Fixed	◆	◆	◆	◆	◆	◆
Long Time Delay (t_r)	☐	◆	◆	Fixed	Fixed	◆	◆
Instantaneous Overcurrent Setting (I_i)	◆	◆	◆	Fixed	Fixed	◆	◆
Short Time Pick-up (I_{sd})	☐	☐	☐	◆	◆	(ON/OFF)	(ON/OFF)
Short Time Delay (t_{sd})	☐	☐	☐	◆	◆	◆	◆
Short Time I^2t Pick-up	☐	☐	☐	◆	◆	◆	◆
Ground Fault Pick-up (I_g)	☐	☐	Fixed	☐	Fixed	☐	◆
Ground Fault Delay (t_g)	☐	☐	Fixed	☐	Fixed	☐	◆
Alarm & Status LEDs	☐	●	●	●	●	☐	☐
Built-in Display (LCD)	☐	☐	☐	☐	☐	●	●
Pre-Trip Alarm①	☐	☐	☐	☐	☐	●	●
Last trip information①	☐	☐	☐	☐	☐	●	●
Zone Selective①	☐	☐	☐	☐	☐	●	●
Communications①	☐	☐	☐	☐	☐	●	●

◆ – Adjustable setting.
● – This feature is included.
"fixed" – Non-Adjustable setting.
☐ – Feature is not included.
① – Requires the trip unit to be connected to a PC (via a COMPRO or COMMOD communications module) for access or programming.

Continuous Amps Rating (I_r)
This setting is the continuous current that the breaker will carry without tripping. It can be set up to 100% of the trip unit's nominal rating (I_n).

Long Time Delay (t_r)
Sometimes referred to as the "overload" position, this function controls the breaker's "pause-in-tripping" time. It allows low level, temporary inrush currents such as those encountered when starting a motor to pass without tripping. The time delay begins when the current reaches 6 x I_r.

Instantaneous Pick-up (I_i)
This function sets the breaker to trip instantaneously during high fault conditions. On Model 545 trip units this setting is fixed on LSI and LSIG trip units and adjustable on LI and LIG trip units. These features are fully adjustable on Model 576 trip units.

Short Time Pick-Up (I_{sd})
This function controls the level of fault current the breaker will carry for a short time without tripping, thus allowing downstream devices to clear short circuits ahead of up-stream protection. It may be defeated (turned-off) on Model 576 trip units.

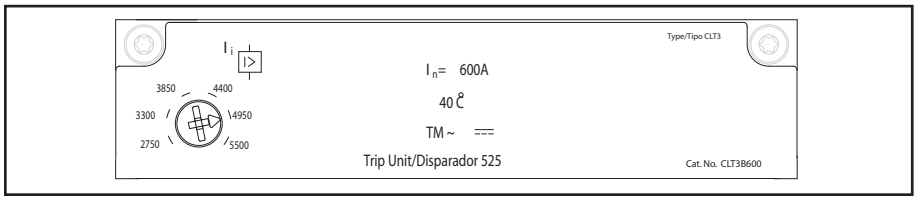
Short Time Delay (t_{sd})
This controls the interval of time the breaker will remain closed against a fault (at the Short Time Pick-up current level) without tripping. The time delay may be set at fixed points or at short time intervals based on I^2t curves. This function is used with the Short Time Pick-up to achieve selectivity and better system coordination.

Ground Fault Pick-Up (I_g)
This setting controls the level of ground fault current that will cause the breaker to trip. Model 545 Electronic Trip Units act on the residual current to sense ground current. The Model 576 Electronic Trip Unit is programmable and allows the user to select either the residual current method or direct detection (via a separate current transformer) to detect ground current.

Ground Fault Time Delay (t_g)
This controls the interval of time the breaker will remain closed after a ground fault is detected (at the Ground Fault Pick-up current level) without tripping.

Selection

Thermal-Magnetic trip units, Model 525, combine the inverse time element design for low level overloads, and instantaneous magnetic action for short circuit protection. The standard unit has preset overload protection and an adjustable instantaneous trip setting, with 6 set points. Thermal-Magnetic trip units are available throughout the VL family, from 15 to 1600A.



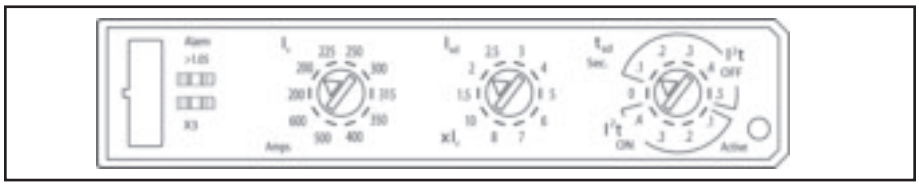
Electronic Trip Units

Electronic trip units are available through the VL family, from 60A (which can be set as low as 30A) up through 1600A . They are also available in four trip configurations (LI, LIG, LSI, LSIG) and features can include a built-in LCD display.

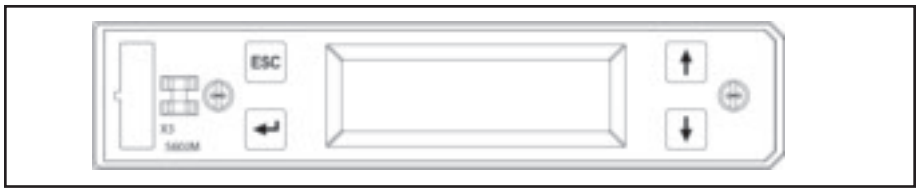
On the Model 545 Electronic Trip Unit a flashing LED confirms that the microprocessor in operating and another indicates an overload condition. For ease-of-use and to insure proper coordination, the set points for the continuous current are shown on the face of these trip units in amps.

On the Model 576, the LCD version, the current in each phase is continuously shown on the display. Unlike many displays, no secondary or auxiliary voltage is required as long as the breaker is energized and a minimal load current is present. These trip units can also indicate the "last trip" status (date, time, amps) when they're connected to a PC via one of our communications modules.

Typical Trip Unit Labeling and Adjustment Positions



Model 545 Electronic Trip Unit with LSIG trip functions



Model 576 Electronic Trip Unit has an LCD display

Ordering Information

Complete Assembled Breaker

Prices for a complete factory assembled DG breaker include the frame, trip unit, and standard line and load connectors, all factory installed and shipped as a complete breaker. Assembled breakers are only available with standard connectors.

For any other configuration, order the frame, trip unit, and terminals as separate items.

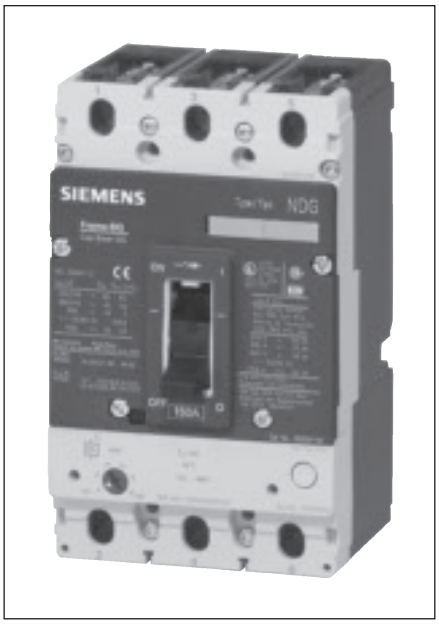
For DC applications, use thermal magnetic trip unit only.

For reverse feed applications, select non-interchangeable trip breakers only. For non-interchangeable trip breakers, change the third digit of the catalog number to "X" for standard breakers.

For special applications, refer to page 17/62.A

Mounting hardware is included with each frame or complete breaker.

For 100% rated breakers with a non-interchangeable trip unit, change the 3rd character of the catalog number to "Y".



Interrupting Ratings

Breaker Type	RMS Symmetrical Amperes (KA)											
	UL 489					IEC 60947-2						
	Volts AC (50/60 Hz)			Volts DC		Volts AC (50/60 Hz)						
						220/240		380/415		690		
	240	480	600	250	500	I_{CU}	I_{CS}	I_{CU}	I_{CS}	I_{CU}	I_{CS}
NDG	65	35	18	30	18	65	65	40	40	12	6
HDG	100	65	20	30	18	100	75	70	70	12	6
LDG	200	100	25	30	18	200	150	100	75	12	6

Connectors for 75°C Wire

Construction	Ampere Rating	Wire Range	No. of cables per connector	Catalog Number	List Price $
Steel	30-150	#8–1/0 Cu	1	**3TW1DG20**②	
Aluminum①	30-150	#6–3/0 Al/Cu	1	**3TA1DG30**②	
Copper②	30-150	#6–3/0 Cu	1	**3TC1DG30**②	
Distribution Lugs					
	30-150	#14–#2 Cu (3pcs. Max)	3	**3TA3DG02**②	
	30-150	#14–#4 Cu	6	**3TA6DG04**②	
Compression Lugs					
	30-150	#14–2/0 kcmil Al/Cu	–	**2CLD20**③	
	30-150	#14–2/0 kcmil Al/Cu	–	**3CLD20**④	

① Standard connector supplied with complete breakers.
② Kit consists of 3 terminal connectors.
③ 2 Lugs for 2-pole breakers.
④ 3 Lugs for 3-pole breakers.

DG Thermal-Magnetic, Instantaneous Trip Adjustment Range

Trip Unit Continuous Amp Rating (I_n)	Instantaneous Overcurrent Setting (I_i)	
	Min.	Max.
50	450	700
60	450	700
70	450	700
80	450	800
90	500	1000
100	500	1000
110	550	1100
125	625	1250
150	800	1600

Note: Each breaker has 6 trip settings in this range.

A - Consult with Siemens for availability.

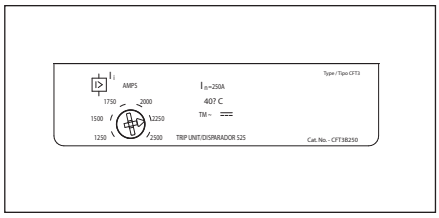
Dimensions, inches (mm)

Number of Poles	Width	Length	Depth	To Handle D1
2, 3	4.1 (105)	6.9 (175)	3.4 (81)	4.2(107)

Approx. Shipping Weight, lbs. (kg)

Poles	Frame	Trip Unit		Complete Breaker
		Thermal-Mag.	Electronic	
2, 3	3.7 (1.7)	2.2 (1.0)	2.6 (1.2)	5.9 (2.7)

External Accessories pages 17/43 to 17/57



Model 525 Trip Unit

FG 250A Frame 2-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	N-Interrupting Class		H-Interrupting Class		L-Interrupting Class			
	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
	FRAME ONLY							
	NFG2F250		HFG2F250		LFG2F250			
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER						TRIP UNIT ONLY	
100	NFG2B100L		HFG2B100L		LFG2B100L		CFT2B100	
110	NFG2B110L		HFG2B110L		LFG2B110L		CFT2B110	
125	NFG2B125L		HFG2B125L		LFG2B125L		CFT2B125	
150	NFG2B150L		HFG2B150L		LFG2B150L		CFT2B150	
175	NFG2B175L		HFG2B175L		LFG2B175L		CFT2B175	
200	NFG2B200L		HFG2B200L		LFG2B200L		CFT2B200	
225	NFG2B225L		HFG2B225L		LFG2B225L		CFT2B225	
250	NFG2B250L		HFG2B250L		LFG2B250L		CFT2B250	

FG 250A Frame 3-Pole with Thermal-Magnetic Trip Unit

Continuous Ampere Rating	N-Interrupting Class		H-Interrupting Class		L-Interrupting Class			
	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $	Catalog Number	List Price $
	FRAME ONLY							
	NFG3F250		HFG3F250		LFG3F250			
	COMPLETE FACTORY ASSEMBLED CIRCUIT BREAKER						TRIP UNIT ONLY	
100	NFG3B100L		HFG3B100L		LFG3B100L		CFT3B100	
110	NFG3B110L		HFG3B110L		LFG3B110L		CFT3B110	
125	NFG3B125L		HFG3B125L		LFG3B125L		CFT3B125	
150	NFG3B150L		HFG3B150L		LFG3B150L		CFT3B150	
175	NFG3B175L		HFG3B175L		LFG3B175L		CFT3B175	
200	NFG3B200L		HFG3B200L		LFG3B200L		CFT3B200	
225	NFG3B225L		HFG3B225L		LFG3B225L		CFT3B225	
250	NFG3B250L		HFG3B250L		LFG3B250L		CFT3B250	

A - Consult with Siemens for availability.