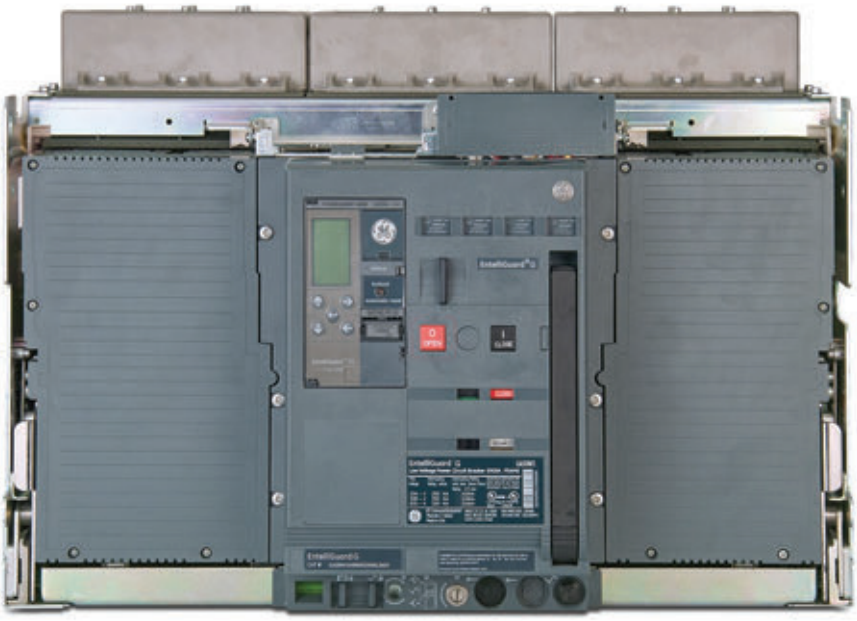
GE
Energy Management

EntelliGuard* G Circuit Breakers

ArcWatch ON GUARD

Don’t compromise arc flash protection for system reliability.



The next chapter in the history of low-voltage circuit breakers

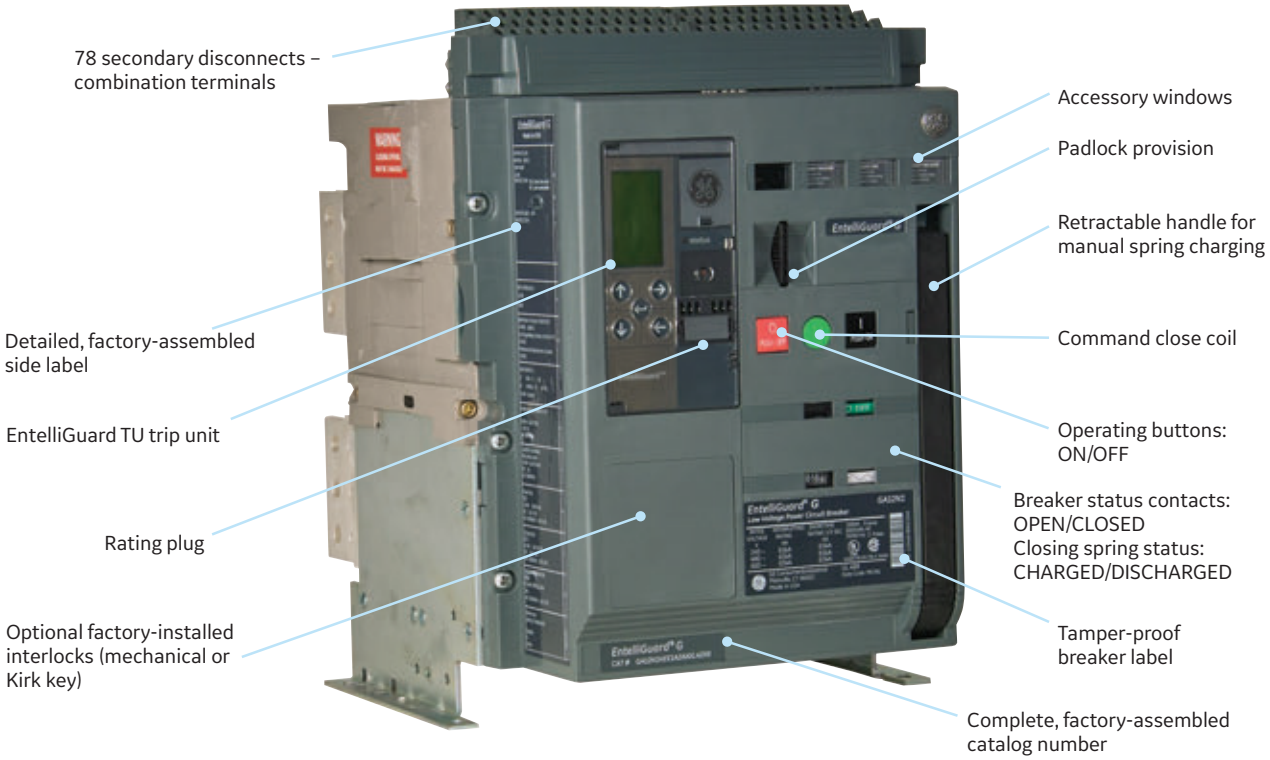
EntelliGuard* G circuit breakers are the newest line of GE low-voltage circuit breakers, the next step in the evolution of a line known for its exceptional reliability and performance. They are available in 3- and 4-pole designs rated from 400A to 6000A, with fault interruption ratings up to 200kAIC.

Integral to the EntelliGuard G breakers are the new, state-of-the-art EntelliGuard TU Trip Units, which provide superior system protection, system reliability, monitoring and communications. The breaker-trip unit system delivers superior circuit protection without compromising either selectivity or arc flash protection.

The EntelliGuard breaker-trip unit system demonstrates yet again GE's core competencies in reliable electric power distribution, circuit protection and personnel protection.

With the introduction of the EntelliGuard 200kAIC rated breaker, GE now has a full offering of 200kAIC rated low voltage power circuit breakers. High AIC ratings are desirable in growing industries with critical power systems, such as large-scale data storage and telecommunications.

1882	1894	1918	1935	1946	1955	1960	1966	1971
First Arc Blast Arrester	First High Voltage, Oil Immersed Switch/Circuit Breaker	First Metal-Clad Switchgear	AE and AL - Oilfilm Trip Devices	AK-1 Breaker and EC-1 Trip Device	AK-2 Stored Energy Design and EC-2 Trip Device	AKD-5 Switchgear	AK-3 Static Power Sensor Trip Breaker	AKE, AKL Replacement D/O Breaker



Accessories

There are more than 20 different types of factory installed and loose accessories available for the EntelliGuard G circuit breaker. Whether it's a bell alarm contact, key interlock or redundant shunt trips, we have the accessory combinations to meet your need!

Factory or Field Installable Accessories

Motor Operators
Closing Devices
Shunt Trip for Ground Fault
UVR with Fixed Time Delay
Second Shunt Trip or UV Release
Auxiliary Switches & Contacts
Bell Alarm / Trip Annunciation
Breaker Mounted Key Interlocks
Mechanical Interlocks – Fixed Breakers
Mechanical Interlocks – Drawout Breakers
Network Interlock
Gas Channel
Anti-Bounce System
Coil Signaling Contact Module
Electrical Close Switch
Lock Kits
Mechanical Operation Counter
Pushbutton Padlock Device
Ready-to-Close Switch
Secondary Disconnect Block
Spring Charged Contact

Other Loose Accessories

Carriage Position Switch
Contact Wear Indicator
Door Interlock
Lifting Truck
UVR Time Delay Modules

1977	1978	1980	1985	1986	1993	1994	1998	2005	2008
AKD-6 Switchgear with AKR Breakers ECS, SST Solid State Trip Devices	AKJ-50/T50 Replacement Breakers	AKD-8 Switchgear and MVT-9 Trip Unit	AKR-30S Breaker	RMS9 and Epic Trip Units	Power Leader Products with MVT Plus and PM Trip Unit	AKR-125 5000A Breaker	WavePro* Breaker and AKD-10 Switchgear	EntelliGuard Breaker and Entellisys* Switchgear	EntelliGuard G Breaker, EntelliGuard TU Trip Unit and AKD-20 Switchgear

Arc flash protection and selectivity

Now you don't have to choose

Reliable circuit and equipment protection has always been the circuit breaker's primary purpose. Providing appropriate overcurrent protection while preserving selective coordination to maximize system reliability is the main goal of virtually every system designer. And that was once good enough. It isn't anymore.

Modern economic reality and the regulatory environment demand system performance while recognizing the need to protect against the arc flash hazards that expose maintenance personnel to dangerous levels of heat, electrical energy, debris from damaged equipment and concussive forces.

The challenge is to provide both better personnel protection by minimizing arc flash hazards and maintain electrical power to mission-critical loads. But these objectives often seem to conflict, pitting the speed and sensitivity required to optimize safety against the sequence of operations and interlocking required to maximize power system availability.

The EntelliGuard G breaker-trip unit system meets the challenge. It achieves selectivity in a wide range of situations without excessive sacrifice of arc flash protection. With its Reduced Energy Let-through setting (RELT), the system protects at HRC1 or 2 for available fault currents as high as 100kA.

Furthermore, the EntelliGuard trip unit is ArcWatch enabled. ArcWatch is a set of GE Technologies, WaveForm Recognition (WFR) and Instantaneous Zone Selective Interlocking (I-ZSI) which, when used in combination with one another allow system design that does not require compromise between instantaneous protection from arcing faults and full (.01 second) selective coordination. Using these technologies, ArcWatch can reduce incident energy permanently to less than 8 cal/cm2. See publication DEA-565.

Here are some of the ways that is accomplished:

- Multiple Short Time bands under 100ms optimally fit above the Instantaneous clearing times.
- Alternate Instantaneous setting (RELT) mitigates arc flash hazard while maintaining complete selectivity during normal operation. Remote activation can be safely achieved with off-the-shelf devices or, for networked systems, RELT can be activated via the communications port. RELT annunciation can be direct or indirect, either locally on the equipment or remotely via control devices or the industrial network.
- Adjustable ST and GF Zone Selective Interlocking optimizes restrained and unrestrained bands.
- Zone Selective Instantaneous protection, multiple zone protection, 3 cycle clearing and selectivity are provided simultaneously.
- Instantaneous trip adjusts up to 30X trip plug rating.

2011	2013	2014	2015
EntelliGuard R Retrofill; EntelliGuard Trip Unit Conversion Kits	Enhanced Instantaneous Zone Selective Interlocking (I-ZSI) with Ability to Overlap Pickups (T-ZSI); Built-in Mechanism Self-Timing; Built-in ZSI Test Capability	200kAIC Envelope 3; Comprehensive Set Up, Troubleshooting and Test Windows Based Software for the EntelliGuard and Other Trip Units	NEW! Optimized 4000A Envelope (28"W Minimum Enclosure Size)

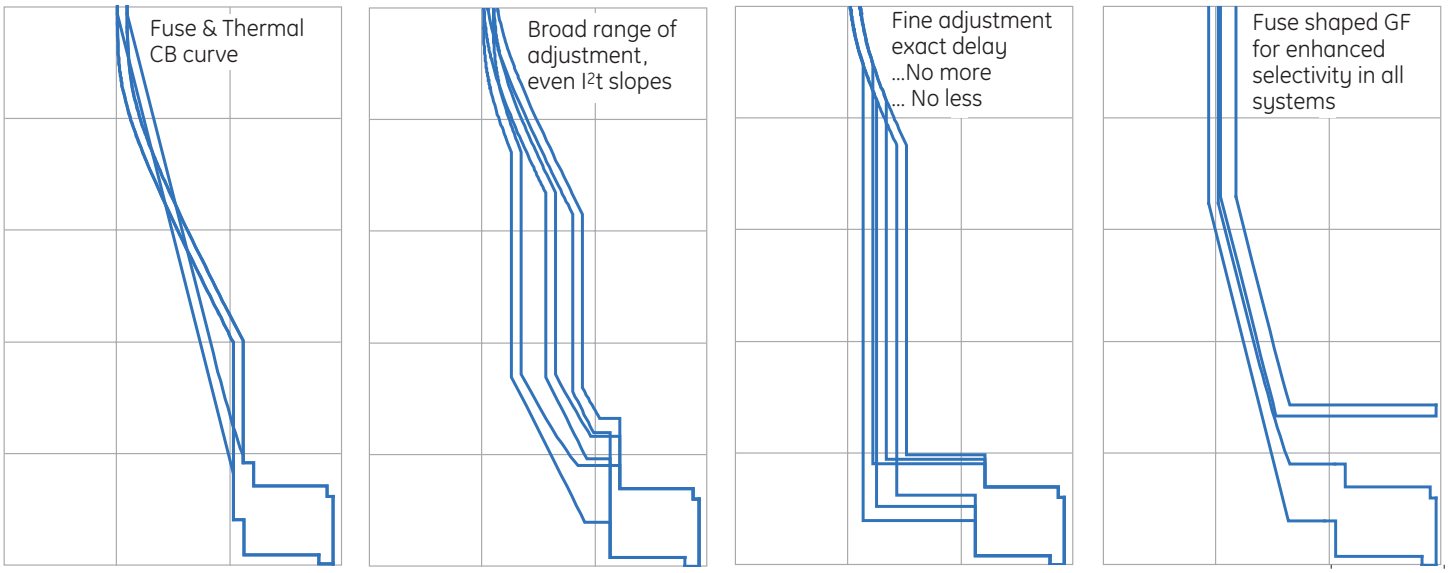
EntelliGuard TU Trip Unit

The EntelliGuard TU Trip Unit offers optimum circuit protection and system reliability simultaneously, with minimum compromise. Reliability and protection in one package, at the same time, all the time.

In addition to arc flash protection and selectivity features, the EntelliGuard TU also includes many new innovative features:

- Availability to choose two different industry-recognized open communication protocols: Modbus RTU or Profibus DP.
- As the industry's only completely universal spare/replacement trip unit, it can be installed in any EntelliGuard G circuit breaker, regardless of frame size, sensor size, short circuit rating or standard (UL, ANSI, IEC). Patent pending.
- Time current curves compatible with traditional fuse curves, along with more and tighter breaker curves, ensure accurate coordination. Regardless of what mix of protective devices your system includes – electronic trips, thermal magnetic circuit breakers or fuses – the EntelliGuard TU has the right curve shape to fit your system's needs.
- Ground Fault curves compatible with common fuse ground fault curves. If you have fused feeders under the circuit breaker with the ground fault protection, you can optimize selectivity without giving up protection and still meet code-mandated requirements.
- The industry's only true Zone Selective Interlocking (ZSI) works with Ground Fault Protection (G'FP), Short Time (ST) and Instantaneous (I), and includes the ability to set precise clearing times of each circuit breaker when restrained or unrestrained. Recently, this feature has been expanded to include Threshold Zone-Selective-Interlocking (T-ZSI) which allows breakers with identically set pickup currents to maintain selectivity and protect their zones without the need to lose sensitivity as the system grows.

For more information, see publication DEA-461.



EntelliGuard G short circuit & interrupting ratings

ANSI/UL1066

Interrupting Rating Tier ANSI/UL 1066 Devices, LVPCB					Envelope 1		Envelope 2		Envelope 2.5	Envelope 3	
Type	254V	508V	635V	1/2S Withstand	400-1200	400-2000	2500-3200	400-3200	800-4000	3200	4000-5000
S	65,000	65,000	50,000	50,000	X						
N	65,000	65,000	65,000	65,000		X	X				
H	85,000	85,000	65,000	65,000		X					
P	100,000	100,000	65,000	65,000		X					
E	85,000	85,000	85,000	85,000				X			X[1]
M	100,000	100,000	100,000	85,000				X			X
U	130,000	100,000	100,000	100,000					X		
B	100,000	100,000	100,000	100,000						X	X
L	150,000	150,000	100,000	100,000						X	X
W	200,000	200,000	100,000	100,000						X	X

[1] Restricted

UL489

Interrupting Rating Tier UL 489 Devices, ICCB						Envelope 1		Envelope 2		Envelope 2.5	Envelope 3	
Type	240V	480V	600V	690V (IEC 60947-2)	1/2S Withstand	400-1200	400-2000	2500-3000	400-3000	800-4000	3000	4000-6000
S	65,000	65,000	50,000	40,000[1]	42,000	X						
N	65,000	65,000	65,000	50,000[1]	42,000		X	X				
H	85,000	85,000	65,000		50,000		X	X				
P	100,000	100,000	65,000		50,000		X					
M	100,000	100,000	100,000	85,000[1]	65,000				X			X
U	130,000	100,000	100,000		85,000					X		
L	150,000	150,000	100,000	100,000[1]	85,000						X	X
W	200,000	200,000	100,000		85,000						X	X

[1] Icu-Ics-Icw

ANSI/UL 1066 Device, Non-Auto LVPCB

Interrupting Rating Tier ANSI/UL 1066 Device, Non-Auto LVPCB		Envelope 1		Envelope 2	Envelope 2.5	Envelope 3
Type	254-635V	800-1200	800, 1600, 2000	800, 1600-3200	2000-4000	3200-5000
S[1]	42	X				
N	42/65		X			
M	65/100			X		
U[1]	65				X	
B	100					X

[1] 3 pole only

UL 489 Device, Molded Case Switches

Interrupting Rating Tier UL 489 Device, Molded Case Switches		Envelope 1		Envelope 2	Envelope 2.5	Envelope 3
Type	240-600V	800-1200	800-2000	800-3000	2000, 3000A, 4000A	3000-6000
S[1]	42	X				
N	42		X			
M	65			X		
U[1]	65				X	
B	100					X

[1] 3 pole only

Endurance Ratings - ANSI/UL 1066 Devices

Envelope	Max Amps	Rated Endurance		
		Minimum Mechanical Endurance	Minimum Electrical Endurance at 480 V	Minimum Electrical Endurance at 600 V
1	1600	16,000	10,000	7,500
1	2000	16,000	7,500	5,000
2	3200	11,000	5,000	5,000
2.5	4000	5,000	3,000	2,000
3	4000	7,000	3,000	2,000
3	5000	7,000	2,000	1,500

Endurance Rating - UL 489 Devices

Envelope	Max Amps	Rated Endurance		
		Minimum Mechanical Endurance	Minimum Electrical Endurance at 480 V	Minimum Electrical Endurance at 600 V
1	1600	16,000	10,000	7,500
1	2000	16,000	7,500	5,000
2	3000	11,000	5,000	5,000
2.5	4000	5,000	3,000	2,000
3	4000	7,000	3,000	2,000
3	5000	7,000	3,000	1,500
3	6000	7,000	1,500	1,000

Endurance Ratings - UL489B DC Switches

Envelope	Type	Amps	Short Interrupting Current (A)	Rated Endurance (Operations)		
				Minimum Mechanical Endurance	Minimum Electrical Endurance at 600 VDC	Minimum Electrical Endurance at 1000 VDC
2	**M**	800-3000	125,000	10,000	500	500

Enclosure Requirements

Frame Size[1]	Number of Poles	Minimum Specified Cubicle Space (inches)			Minimum Specified Cubicle Ventilation — Number of Vent Slots[2]		
		W	H	D	Top Wall	Bottom Wall	Rear Wall
1200A (Envelope 1)	3	20	21	16.5	12	16	—
1200A (Envelope 1)	4	22	21	16.5	12	16	—
2000A (Envelope 1)	3	20	16.4/21[3]	16.5	12	16	—
2000A (Envelope 1)	4	22	16.4/21[3]	16.5	12	16	—
3000A / 3200A (Envelope 2)	3	22	21	16.5	16	16	8
3000A / 3200A (Envelope 2)	4	25	21	16.5	20	16	8
4000A (Envelope 2.5)	3	28	21	16.5	20	16	8
6000A (Envelope 3)	3	32	30	16.5	24	20	20
6000A (Envelope 3)	4	41	30	16.5	30	24	20

[1] Applies to all amp ratings for the frame
[2] Slot dimensions 3/4" x 5 1/4" minimum for each slot
[3] Side-mounted / top-mounted secondary disconnects

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