

# EntelliGuard<sup>®</sup> TU Trip Unit

## Conversion/Upgrade Kits



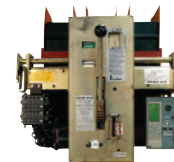
GE AK/AKR



GE WavePro



GE Power  
Break I & II



Allis Chalmers



I-T-E



Westinghouse

**Upgrade your existing equipment**  
Arc flash protection and selectivity at the same time



imagination at work

# Conversion/upgrade kits include everything you need

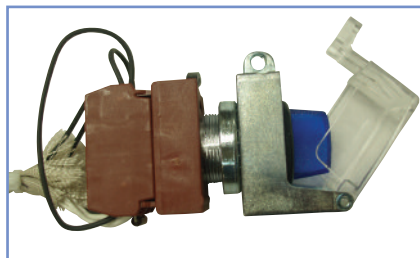
## AK, AKR, Westinghouse, ITE, Allis Chalmers Conversion Kits

- EntelliGuard TU trip unit and rating plug
- Direct acting flux shifter with automatic reset
- Epoxy encapsulated high-accuracy current transformers
- Specially designed mounting hardware and wire harnesses with communication cable and RELT harness for easy upgrade later
- Detailed instruction manual



## EPIC, RMS9, MVT+, MVT PM Upgrade Kits

- EntelliGuard TU trip unit and rating plug
- RELT and Ground Fault Alarm Harness for Conversion Kits
- RELT Switch with warning labels – GTURSK
- Communication cable for Modbus & 24 VDC
- Power Break II carrier plate assemblies (authorized service only)
- WavePro secondary disconnect kits



## Harness Kits and Hardware to add RELT (Reduced Energy Let Through)

See back cover for additional components that may be required for your installation

Breakers	Component	Cat No.	Description
All	24V Power Supply	PLPS4G01	Power Leader 1.5A Power supply for up to 15 trip units
	RELT Switch Kit	GTURSK	Includes Blue Lighted RELT Switch, lockable Cover, contacts, 8' wire harness, warning labels (see picture above)
AK, AKR, Allis Chalmers, ITE, Westinghouse	RELT Harness Kit	GTURHA	6 wires (4 for RELT, 2 for 24VDC), Manual Disconnect, Terminal Block and Warning Label. Used to add RELT to an existing MVT Installation.
WavePro - 800-2000A	RELT Harness Kit	GTURHWP1	6 Wires (4 for RELT, 2 for 24VDC) from Trip Unit to Secondary Disc Block. Used to add RELT to an existing MVT Installation.
WavePro - 3200-4000A	RELT Harness Kit	GTURHWP2	6 Wires (4 for RELT, 2 for 24VDC) from Trip Unit to Secondary Disc Block. Used to add RELT to an existing MVT Installation.
WavePro - 5000A	RELT Harness Kit	GTURHWP3	6 Wires (4 for RELT, 2 for 24VDC) from Trip Unit to Secondary Disc Block. Used to add RELT to an existing MVT Installation.
WavePro - All Frames	WavePro "C" Disconnect Block	10080736G1	WavePro Breaker Side Secondary Disconnect "C"
WavePro - 800-2000A	WavePro "C" Disconnect Block	0228C8408G003	WavePro Equipment Side Secondary Disconnect "C", Includes 36 wire harness
WavePro - 3200-5000A		0228C8408G005	
Stationary Power Break I	RELT Harness Kit	GTURHPB1S	6 wires (4 for RELT, 2 for 24VDC) and Cut-Off Switch. Used to add RELT to an existing MVT Installation.
Drawout Power Break I	RELT Harness Kit	GTURHPB1D	6 wires (4 for RELT, 2 for 24VDC), Cut-Off Switch, 6 wire harness from Terminal Block to Secondary Disconnect. Used to add RELT to an existing MVT Installation.
Power Break I - All Frames	Power Break I Disconnect Block	TDOSD6S	Power Break I Secondary Disconnect 6 Circuit Drawout - Equipment Side
		TDOSD6B	Power Break I Secondary Disconnect 6 Circuit Drawout - Breaker Side
		TDOSVD04	Power Break I Secondary Disconnect with Zone Interlocking
Stationary Power Break II	RELT Harness Kit	GTURHPB2S	6 wires (4 for RELT, 2 for 24VDC) and complete wired carrier plate. Used to add RELT to an existing MVT Installation. (Installation by Authorized service only)
Drawout Power Break II	RELT Harness Kit	GTURHPB2D	6 wires (4 for RELT, 2 for 24VDC), complete wired carrier plate, and 6 wire harness from Terminal Block to Secondary Disconnect. Used to add RELT to an existing MVT Installation. (Installation by Authorized service only)
Power Break II - All Frames	Power Break II "B" Disconnect Block	SPDOSD36S	Power Break II Secondary Disconnect Block B - Equipment Side
		SPDOSD36B	Power Break II Secondary Disconnect Block B - Breaker Side

# Upgrade your low-voltage equipment with electronic trip unit technology.



Normal wear and tear of aging electro-mechanical trip devices on low-voltage circuit breakers can lead to loss of calibration that jeopardizes system coordination, protection and reliability.

GE has channeled its decades of trip system experience into the development of the EntelliGuard TU Trip Unit, which incorporates advanced algorithms that enable arc flash protection and selectivity at the same time. Upgrade and conversion kits are ANSI C37.59 design verification tested to ensure safe, reliable operation. These kits extend the life of your mechanically sound breaker and they:

- eliminate costly downtime due to nuisance tripping via a Waveform Recognition Instantaneous Algorithm
- improve electrical power system coordination and protection
- permit easy upgrades to communicating Power Management Control Systems (PMCS), open Modbus RTU protocol
- enable the implementation of RELT and Zone Selective Interlock Instantaneous to reduce arc flash energy levels.

## Standard Features

- Flexible time current settings
- 22 I<sup>2</sup>T Long Time Curves, Long Time Delay
- Short Time, Short Time Delay, 3 Short Time I<sup>2</sup>T slopes
- Waveform Recognition Instantaneous
- Ammeter
- Large backlit LCD screen\*
- Date and time\*
- Breaker status indication
- Universal rating plugs
- Status and event log (10 Events)
- LED health status indicator\*
- Set-up software
- I/O – 1 input and 1 output\*
- Thermal memory, battery back-up
- Common interface across all versions

## Options

- Internal/external ground fault trip or alarm with 4 curves to select from (I<sup>2</sup>T, I<sup>4</sup>T, SGF, Definite Time Slope)\*
- Switchable ground fault trip / alarm (Not UL Listed)
- 22 Fused Long Time curves (I<sup>4</sup>T)
- Modbus open RTU communications\*
- Waveform capture – enables harmonic analysis
- Full-function metering\*
- Protective relaying\*
- Zone Selective Interlock – GF, S, I\*
- RELT – Reduce Energy Let Through\*
- RELT and ground fault alarm harness kits
- Test Set GTUTK20

## Arc flash protection and selectivity at the same time

The EntelliGuard TU Trip Unit offers optimum circuit protection and system reliability simultaneously, with little or no compromise to either of these critical functions. With its Reduced Energy Let-Through Setting (RELT), the system protects at HRC1 or 2 for available fault currents as high as 100kA. Reliability and arc flash protection, in one package, at the same time, all the time.

## Algorithms enabling arc flash protection and selectivity

- RELT – Reduced Energy Let Through
- Zone Selective Interlocking – Instantaneous (ZSI-I)
- Waveform Recognition Instantaneous – coordinates with current limiting devices and reduces nuisance trips
- Flexible time current curves – create the shape you need

## Reliability – Health Status

- Non-volatile memory with continuous self-testing micro-processor
- Health Status LED indicates normal operation, errors, pick-up, trip
- External power not required with long-life lithium battery
- Positive setpoint recognition, values flash until saved

## Plug and Play

- Same form, fit, function as the popular MicroVersaTrip trip unit, simplifying upgrade to an existing converted breaker\*

## Optional full-function metering

- Current (Amps, kAmps)
- Voltage (Ph-Ph, Ph-N)
- Energy (kWh, MWh, GWh)
- Real power (kW, MW)
- Total power (kVA, MVA)
- Frequency (Hz)
- Demand (avg. kW, MW) and peak demand

## Optional protective relaying functions

- Undervoltage
- Overvoltage
- Voltage unbalance
- Current unbalance
- Power reversal
- Power direction setup

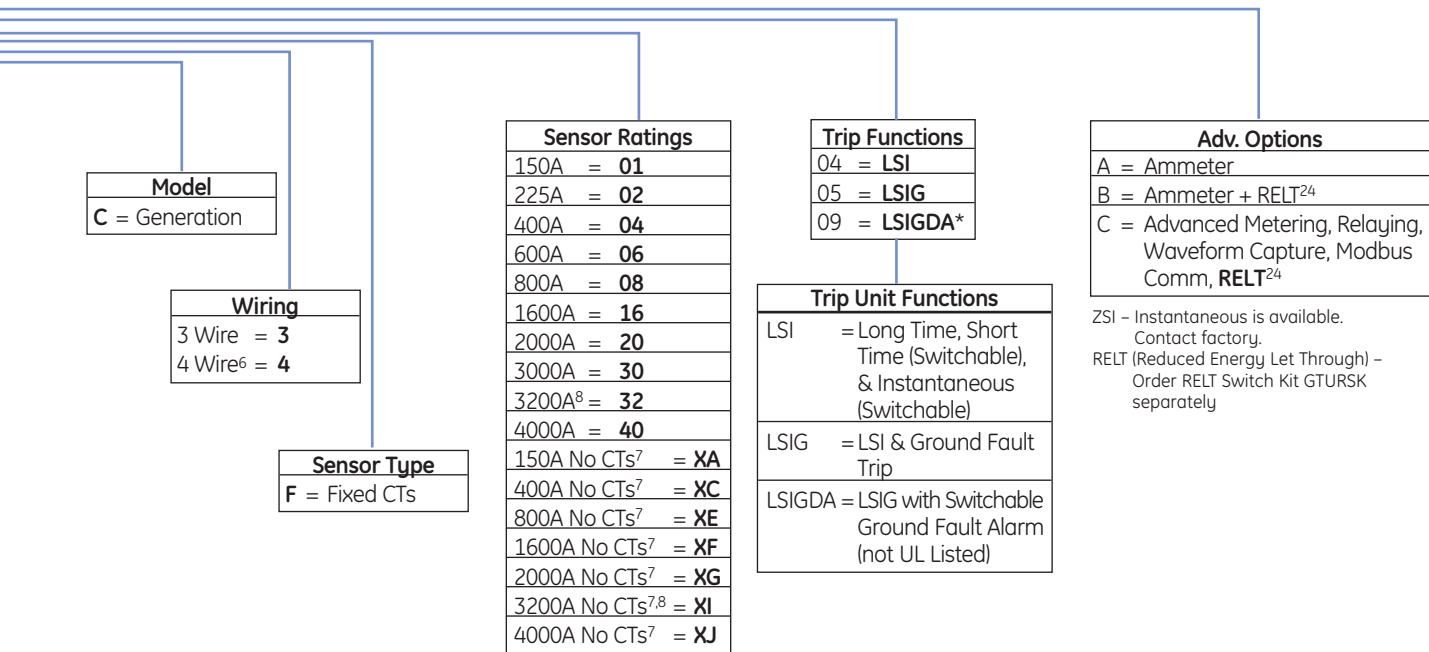
\* Note: Some options require 24VDC additional hardware to enable Metering, Relaying, RELT, ZSI, Modbus to be added to the breaker, equipment cubicle and equipment sections.

GE		Allis Chalmers <sup>25</sup>		I-T-E <sup>25</sup>		Westinghouse <sup>25</sup>	
Breaker		Breaker		Breaker		Breaker	
AK-1-15	= AK115	LA	= ASL25 <sup>9</sup>	KA	= AIKA2 <sup>10,11</sup>	DB-15	= ADB15
AK-15	= AKO15 <sup>1</sup>	LA-25A	= ASL2A <sup>9</sup>	K-225	= AIK22	DK-15	= ADK15 <sup>9</sup>
AK-1-25	= AK125	LA-600(Blue)	= ASL6B <sup>17,18</sup>	KB (metal)	= AIKBM <sup>12</sup>	DB-25	= ADB25
AK-25	= AKO25 <sup>1</sup>	LAF-600(Blue)	= ASL6B <sup>17,18,19</sup>	KB (slate drawout)	= AIKBS <sup>12</sup>	DBL-25	= ADB25
AKU-25	= AKO25 <sup>1</sup>	LA-600(Gold)	= ASL6G <sup>18,20</sup>	KB (slate stationary)	= AIKBX <sup>12</sup>	DK-25	= ADK25 <sup>9</sup>
AKR-30		LAF-600(Gold)	= ASL6G <sup>18,19,20</sup>	K-600	= AIK60	DS-206	= ADS06
AKR-30H	= AKR30	LA-50(800A)	= ASL5B <sup>9,21</sup>	KDON-600	= AIK60	DSL-206	= ADS06
AKRU-30		LA-800	= ASL80 <sup>18,20</sup>	KC (800A)	= AIKC8 <sup>10,12,14</sup>	DA-50	= ADA50 <sup>9</sup>
AKR-30S		LAF-800	= ASL80 <sup>18,19,20</sup>	K-800	= AIK80	DB-50	= ADB50
AKRU-30S	= AKR3S <sup>2</sup>	RL-800	= ASR80 <sup>9</sup>	KDON-800	= AIK80	DBL-50	= ADB50
AK-1-50	= AK150	RLX-800	= ASR80 <sup>9</sup>	KC (1600A)	= AIKC1 <sup>10,12,13</sup>	DS-416	= ADS16
AK-50		RLE-800	= ASR80 <sup>9</sup>	K-1600 (red)	= AIK16 <sup>15</sup>	DSL-416	= ADS16
AKU-50 <sup>3</sup>		LA-50(1600A)	= ASL51 <sup>9,22</sup>	K-1600 (black)	= AIK1B <sup>15</sup>	DS-420	= ADS20
AKT-50	= AKO50 <sup>1</sup>	LA-50(1600A)	= ASL52 <sup>9,23</sup>	KDON-1600 (black)	= AIK1B <sup>15</sup>	DS-532	= ADS53 <sup>9</sup>
AKS-50		LA-1600(Blue)	= ASL1B <sup>17,18</sup>	KDON-1600 (red)	= AIKN1	DA-75	= ADA75 <sup>9</sup>
AKSU-50 <sup>3</sup>		LAF-1600(Blue)	= ASL1B <sup>17,18,19</sup>	K-2000	= AIK20	DB-75	= ADB75
AKST-50		LA-1600(Gold)	= ASL1G <sup>18,20</sup>	KD	= AIKD3 <sup>16</sup>	DS-632	= ADS32
AKR-50		LAF-1600(Gold)	= ASL1G <sup>18,19,20</sup>	K-3000	= AIK30	DA-100	= ADA10 <sup>9</sup>
AKR-50H		RL-1600	= ASR16 <sup>9</sup>	KE	= AIKE4 <sup>16</sup>	DB-100	= ADB10
AKRU-50		RLX-1600	= ASR16 <sup>9</sup>	LG	= AIKG4 <sup>9</sup>	DS-840	= ADS40 <sup>9</sup>
AKRT-50		RLE-1600	= ASR16 <sup>9</sup>	K-4000	= AIK40		
AKRT-50H	= AKR50 <sup>4</sup>	RL-2000	= ASR0 <sup>9</sup>				
AKJ-50		LA-75	= ASL75 <sup>9</sup>				
AKJ-50H		LA-3000	= ASL30 <sup>9,18</sup>				
AKJT-50		LA-3200(Blue)	= ASL3B <sup>9,17,18</sup>				
AKJT-50H		LA-3200(Gold)	= ASL3G <sup>9,18,20</sup>				
AK-75 <sup>3</sup>	= AKO75 <sup>5</sup>	RL-3200	= ASR32 <sup>9</sup>				
AKR-75	= AKR75 <sup>5</sup>	LA-4000(Blue)	= ASL4B <sup>9,17,18</sup>				
AK-100 <sup>3</sup>	= AKO10 <sup>5</sup>	LA-4000(Gold)	= ASL4G <sup>9,18,20</sup>				
AKR-100	= AKR10 <sup>5</sup>	RL-4000	= ASR40 <sup>9</sup>				
AKW-100	= AKW10 <sup>5</sup>						

Blue = Blue-gray breaker with plastic escutcheon  
 Gold = Gold breaker with metal escutcheon

Sensor Rating Selection

Frame	Sensors	Breaker Catalog Numbers			
		GE	Allis Chalmers	I-T-E	Westinghouse
225	150	AK-1-15, AK-15	Sensor rating not available.	KA, KA-225	DB-15, DK-15
	225				
600	150	AK-1-25, AK-25, AKU-25	-	-	-
	225				
	600				
800	150	AKR-30, AKR-30H, AKRU-30, AKR-30S, AKRU-30S	LA-50 (800A Version), LA-800, LAF-800, RL-800, RLE-800, RLX-800	KC (800A Version), K-800, KDON-800	DS-206, DSL-206
	400				
	800				
1600	800	AK-1-50, AK-50, AKU-50, AKS-50, AKSU-50, AKR-50, AKR-50H, AKRU-50, AKJ-50, AKJ-50H	LA-50 (1600A Version), LA-1600, LAF-1600, RL-1600, RLE-1600, RLX-1600	KC (1600A Version), K-1600, KDON-1600	DA-50, DB-50, DBL-50, DS-416, DSL-416
	1600				
2000	2000	AKT-50, AKST-50, AKRT-50, AKRT-50H, AKJT-50, AKJT-50H	RL-2000	K-2000	DS-420
3000	3000	AK-75	LA-75, LA-3000	KD, K-3000	DA-75, DB-75
3200	3200	AKR-75	LA-3200, RL-3200	-	DS-632
4000	4000	AK-100, AKR-100, AKW-100	LA-4000, RL-4000	KE, LG, K-4000	DA-100, DB-100, DS-840



Changes per email from Darrin Bock 5-4-2010

### Rating Plugs

Plug Rating	May Be Used With		Trip Plug Catalog No.
	Minimum Sensor	Maximum Sensor	
60A	150A	150A	GTP0060U0101
80A	150A	<del>200A</del> 150A	GTP0080U0102
100A	150A	<del>200A</del> 225A	GTP0100U0102
125A	150A	<del>200A</del> 225A	GTP0125U0102
150A	150A	400A	GTP0150U0104
200A	200A	400A	GTP0200U0204
225A	225A	600A	GTP0225U0306
250A	400A	630A	GTP0250U0407
300A	400A	800A	GTP0300U0408
350A	400A	800A	GTP0350U0408
400A	400A	1000A	GTP0400U0410
450A	600A	1200A	GTP0450U0612
500A	600A	1250A	GTP0500U0613
600A	600A	1600A	GTP0600U0616
700A	800A	1600A	GTP0700U0816
750A	800A	2000A	GTP0750U0820
800A	800A	2000A	GTP0800U0820
900A	1000A	2000A	GTP0900U1020
1000A	1000A	2500A	GTP1000U1025
1100A	1200A	2500A	GTP1100U1225
1200A	1200A	3200A	GTP1200U1232
1500A	1600A	4000A	GTP1500U1640
1600A	1600A	4000A	GTP1600U1640
1900A	2000A	5000A	GTP1900U2050
2000A	2000A	5000A	GTP2000U2050
2200A	2500A	5000A	GTP2200U2550
2400A	2500A	6400A	GTP2400U2564
2500A	2500A	6400A	GTP2500U2564
3000A	3000A	6400A	GTP3000U3064
3200A	3200A	6400A	GTP3200U3264
3600A	4000A	6400A	GTP3600U4064
4000A	4000A	6400A	GTP4000U4064
5000A	5000A	6400A	GTP5000U5064
6000A	6000A	6400A	GTP6000U6064

Conversion kits come standard with a rating plug that matches the current sensor. For rating plugs with different values, price and order separately.

### Notes, Definitions

- For converting AK-2 version breakers and newer, not applicable for AK-1 or AKR.
- Contact factory for availability, requires INST function (I).
- Breakers equipped with older style open fuse lockout devices (OFLO), must be retrofitted with newer style OFLO device prior to conversion process. Order replacement OFLO kits as follows: AKU-50 - order OFLO Kit #121C2870G2, AK-75 - order OFLO kit #121C2870G3, AK-100 - order OFLO kit #121C2870G4.
- Not applicable for converting breakers equipped with Power Sensor - contact factory.
- Contact the factory for stationary breaker applications.
- Only applicable to trip units with ground fault.
- Available only for MicroVersaTrip RMS-9 type AKR breakers equipped with fixed current sensors.
- Not available on AK-75 breaker frames.
- Contact factory for availability.
- Not applicable for slate version breakers.
- Left pole accessories must be removed or relocated.
- Right pole accessories must be removed or relocated.
- 1600-amp version of the KC breaker.
- 800-amp version of the KC breaker.
- Order for red or black insulator as applicable.
- Not applicable to fixed mounted breakers.
- Only applicable for blue-gray color version breakers.
- Applicable to both "A" and "B" version breakers.
- Applicable to both nameplated versions of integral fused breakers (i.e., LA-600F and LAF-600).
- Only applicable for gold color version breakers.
- 800-amp version of the LA-50 breaker.
- Only applicable for the 1600-amp, 6-pole primary disconnect version of the LA-50 breaker.
- Only applicable for 1600-amp, 12 pole primary disconnect version of the LA-50 breaker.
- Requires 24VDC control power.
- Existing Allis Chalmers, I-T-E and Westinghouse bell alarms will not work with EntelliGuard TU.

101  
103  
103

## Additional Key Components

Breakers	Component	Cat No.	Description
All	ZSI Module	TIM1	Zone Selective Interlock Module/Repeater
	Voltage Conditioners (set of 3)	PLVC1G01	Supplies isolated bus voltage signal from PT's to EntelliGuard Trip Units (PT's not included)
	Voltage Conditioners Plate (set of 3)	See Page 3-66 BuyLog	Voltage Conditioners and Potential Transformers mounted on a metal plate with fuses
	24V Power Supply	PLPS4G01	Power Leader 1.5A Power supply for up to 15 trip units
	Voltage Conditioner, PT's (set of 3) and Power Supply	See Pub DEP-056A	Includes Voltage Conditioners, Potential Transformers, 24V DC and Fuses all mounted on one Metal Plate
	EntelliGuard TEST Kit	GTUTK20	Used for testing phase currents, ground fault, disabling ground fault, RELT. Ability to Trip Breaker and used to connect to a PC with Set-up Software to download settings
	Rating Plug Removal Tool	TRTOOL	Simplifies rating plug removal
	Set-up Software	GTUSS	Set-up EntelliGuard Trip Unit offline or connected. Ability to view Waveform Captured by Trip Unit
AK, AKR, Allis Chalmers, ITE, Westinghouse	9 Pin Wire Harness Equipment side	0247B8788G007	9 Pin Equipment side wire harness 8' long for 24VDC, Communications, Voltage Conditioner Input
WavePro - All Frames	Plastic Door Kit	10060051P3	WavePro Trip Unit Plastic Door
Power Break I - All Frames	Power Break Micro Switch	See Pub DEH40391	Replacement Microswitch on Power Break I's with EPIC Trip Units
Power Break II - All Frames	Plastic Door Kit	10054335P3	Power Break II Trip Unit Plastic Door

## Coming Soon!

### Power Break II in a Power Break I (fixed and drawout) EntelliGuard G in AKD-5, AKD-6, AKD-8 switchgear line-ups

Contact factory for availability and options

Information provided is subject to change without notice. Please verify all details with GE. All values are design or typical values when measured under laboratory conditions, and GE makes no warranty or guarantee, express or implied, that such performance will be obtained under end-use conditions.

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