Beyond X™

Susol
UL Smart MCCB

UL Smart Molded Case Circuit Breakers

LS ELECTRIC

Susol

UL Smart Molded Case Circuit Breakers

Susol UL Smart MCCB is developed by combining over 40 years of LS Electric's power equipment technology with modern features for connectivity and data analysis. The product's relay and metering functions have been updated for improved diagnostic and maintenance capabilities.

These days, energy digitalization is taking place in various fields. By applying Susol UL Smart MCCB to in-demand areas such as renewable energy, commercial distribution, and low voltage EV charging infrastructure, businesses and facilities can safely protect the line.

Susol Super Solution

UL Smart MCCB

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Rating

Basic type		UTS150			UTS250			UTS400		
Frame size	[AF]	150			250			400		
No. of poles	[P]	3			3			3		
Rated current, In	[A]	40, 100, 150			250			250, 400		
Interrupting capacity (kA rms) AC(50/60Hz) UL, CSA	Type	Ni	Hi	Li	Ni	Hi	Li	Ni	Hi	Li
	240 Vac	65	100	150	65	100	150	65	100	150
	480 Vac	35	65	100	35	65	100	35	65	100
	600 Vac	18	35	50	18	35	50	18	35	50
Trip units ETSi: Standard ETMi: Multi-function ETHi: High performance ETLi: Ultimate performance	ETSi	available			available			available		
	ETMi	available			available			available		
	ETHi	available			available			available		
	ETLi	available			available			available		
Trip relay		-			-			-		
Size Inch(mm)	W	4.13 (105)			4.13 (105)			5.51 (140)		
	H	6.50 (165)			7.48 (190)			11.42 (290)		
	D	3.44 (87.5)			3.44 (87.5)			4.33 (110)		
Standard		UL			UL			UL		
Unit mounted		available			available			available		
Mechanical lugs		available			available			available		
Busbar connectors		available			available			available		
Control wire terminal kit		available			available			available		
Terminal shields		available			available			available		
Interphase barriers		available			available			available		
Shunt trip		available			available			available		
Undervoltage trip		available			available			available		
Auxiliary switch		available			available			available		
Alarm switch		available			available			available		
Fault alarm switch		available			available			available		
Flange cable handle		available			available			available		
Flange variable-depth mechanism		available			available			available		
Directly-mounted rotary operating handle		available			available			available		
NEMA-Door-mounted operating mechanisms		available			available			available		
IEC-Door-mounted operating mechanisms		available			available			available		
Mechanical interlocks		available			available			available		
Handle padlock attachment		available			available			available		
Motor operator		available			available			available		
Residual current device		available			available			available		

	UTS600			UTS800			UTS1200		
	600			800			1200		
	3			3			3		
	600			400, 600, 800			800, 1000, 1200		
	Ni	Hi	Li	Ni	Hi	Li	Ni	Hi	Li
	65	100	150	50	100	150	50	100	150
	35	65	100	35	65	100	35	65	100
	18	35	50	18	35	50	18	35	50
	available			-			-		
	available			-			-		
	available			-			-		
	available			-			-		
	-			available			available		
	5.51 (140)			8.27 (210)			8.27 (210)		
	13.39 (340)			12.88 (327.2)			16.26 (413)		
	4.33 (110)			6 (152.5)			6 (152.5)		
	UL			UL			UL		
	available			available			available		
	available			available			available		
	available			available			available		
	available			-			-		
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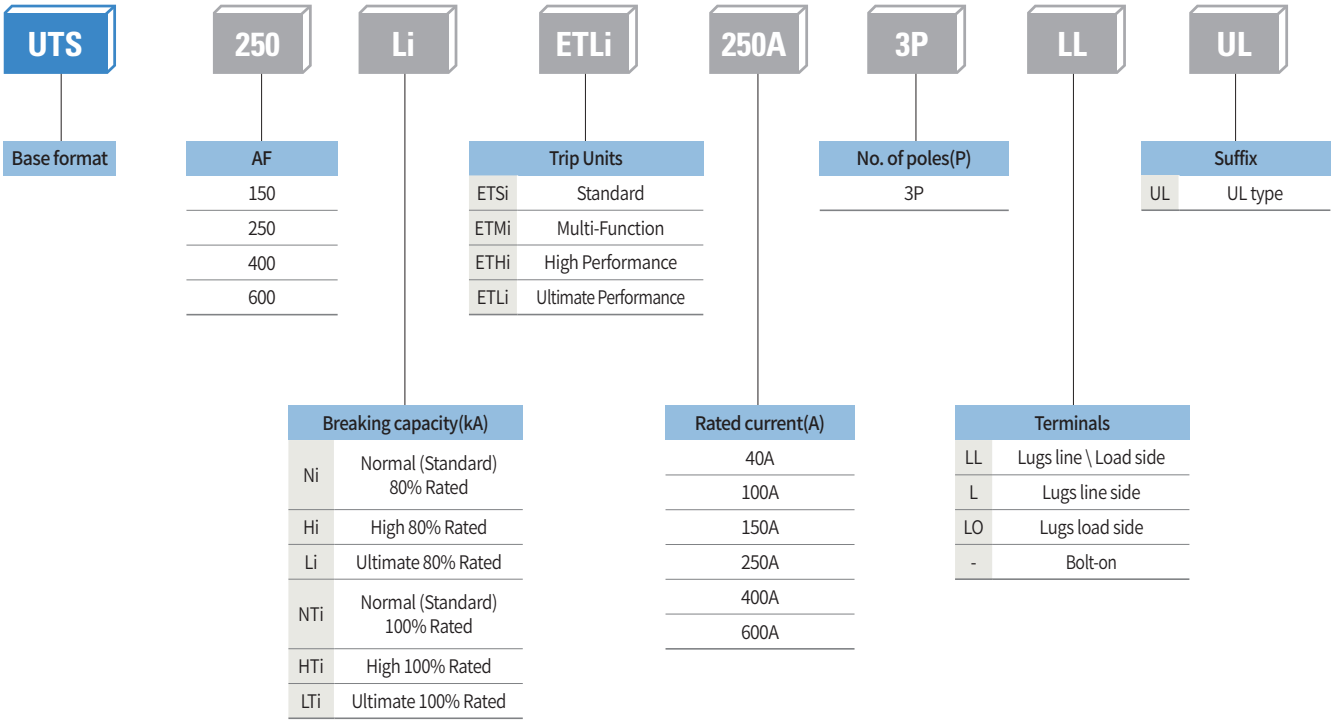
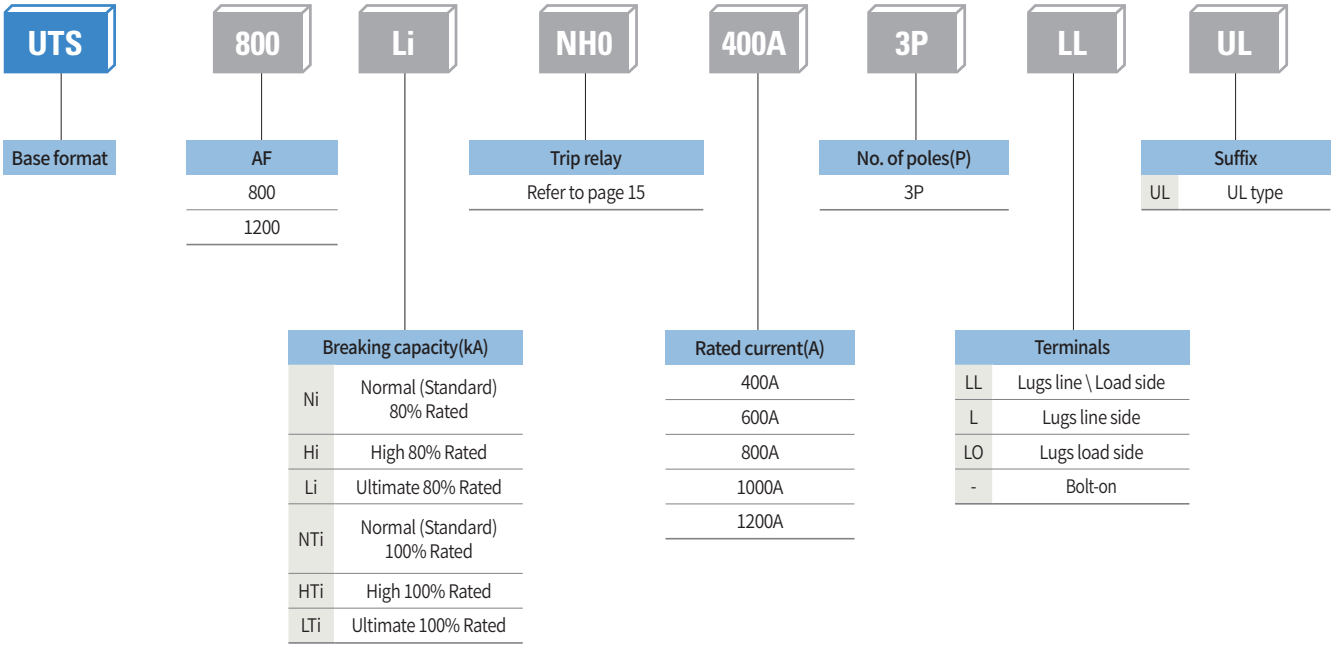
	available			-			-		

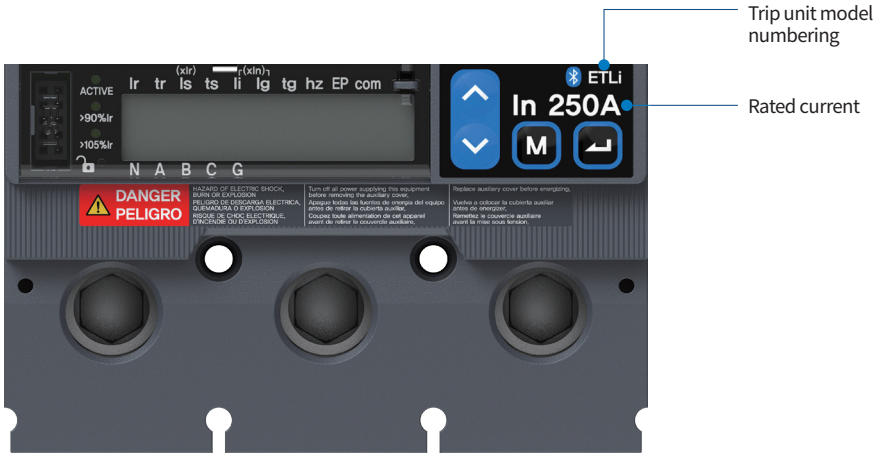
Ordering information





Smart trip units (ETSi, ETMi, ETHi, ETLi)

Trip unit exterior



Trip unit type

The Smart MCCB electronic trip unit is available in 4 variations. Standard (ETSi) for basic current metering, Multi-function (ETMi) for metering with additional communication functions, High Performance (ETHi) for added communication and voltage measurement functions, and Ultimate (ETLi) which adds mobile BLE communications.

ETSi (Standard)

ETMi (Multi-Function)

ETHi (High Performance)

ETLi (Ultimate Performance)

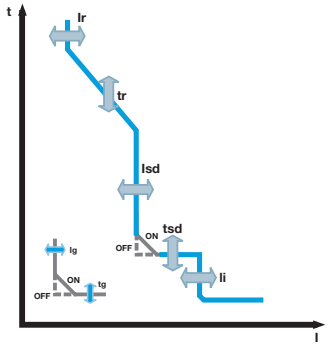
- **ETSi**
  Standard/LSIG relay, current measurement
- **ETMi**
  Multi-Function/LSIG relay, current measurement, communication function
- **ETHi**
  High Performance/LSIG relay, current/voltage/power measurement, communication function
- **ETLi**
  Ultimate Performance/LSIG relay, current/voltage/power measurement, communication function, mobile communication

Smart trip units (ETSi, ETMi, ETHi, ETLi)

Trip unit rated current

AF	Rated current
150AF	40A, 100A, 150A
250AF	250A
400AF	250A, 400A
600AF	600A
800AF	400A, 600A, 800A
1200AF	800A, 1000A, 1200A

Trip unit features

ETU		ETSi	ETMi	ETHi	ETLi
Relay (setting)					Long time Short time Instantaneous Ground fault
Button		available	available	available	available
LCD		available	available	available	available
Status LED		available	available	available	available
Test port		available	available	available	available
Measurement	Current	available	available	available	available
	Power	-	-	available	available
Communication	RS485	-	available	available	available
	BLE	-	-	-	available

Relay specification table

Protection	Setting range									Notes
Long time protection	Current setting Ir (A)	Rated current			Min(0.4×In)			Max(1.0×In)		fine adjustments in 1A step
		40A			16A			40A		
		100A			40A			100A		
		150A			60A			150A		
		250A			100A			250A		
		400A			160A			400A		
		600A			240A			600A		
	Time delay tr (s) Accuracy ±20%	Setting		0.5	1	2	4	8	16	
		Operation time	1.5×Ir	11	22	45	90	180	360	
			6×Ir	0.5	1	2	4	8	16	
			7.2×Ir	0.35	0.7	1.4	2.8	5.5	11	
Short time protection	Current setting Isd (A) Accuracy ±10%	1.5×Ir ~ 10×Ir (18 steps)								fine adjustments in 0.5×Ir steps
	Time delay tsd (s) Accuracy ±20%	Setting	I^2tOff		0	0.1	0.2	0.3	0.4	
			I^2tOn		-	0.1	0.2	0.3	0.4	
		I^2tOff Operation time	Non-tripping		0.02	0.08	0.14	0.24	0.35	
			Maximum break		0.08	0.14	0.24	0.35	0.50	
Instantaneous protection	Current setting Ii (A) Accuracy ±15%	Setting	Rated current		Range					fine adjustments in 0.5×In steps
			40A ~ 150A		1.5×In ~ 15×In(28 steps)					
			250A ~ 400A		1.5×In ~ 12×In(22 steps)					
			600A		1.5×In ~ 11×In(20 steps)					
		Non-tripping time: 10ms, Maximum break time: 60ms								
Ground leakage protection	Current setting Ig (A) Accuracy ±10%	Setting	Rated current		Range					fine adjustments in 0.05×In steps
			40A		0.45×In ~ 1.0×In(12 steps)					
			100A		0.35×In ~ 1.0×In(14 steps)					
			150A		0.25×In ~ 1.0×In(16 steps)					
			In > 150A		0.2×In ~ 1.0×In(17 steps)					
	Time delay tg (s) Accuracy ±25%	Setting	I^2tOff		0	0.1	0.2	0.3	0.4	
			I^2tOn		-	0.1	0.2	0.3	0.4	
		I^2tOff Operation time	Non-tripping		0.02	0.08	0.14	0.24	0.35	
			Maximum break		0.08	0.14	0.24	0.35	0.50	

Smart trip units (ETSi, ETMi, ETHi, ETLi)

Measurement

Type		ETU Type				Display		
		ETSi	ETMi	ETHi	ETLi	ETU	HMI (3.5")	HMI (7.0")
Current	Each phase and neutral (Ia, Ib, Ic, In)	available	available	available	available	available	available	available
	Highest current of each phase and neutral (Imax of Ia, Ib, Ic, In)	available	available	available	available	available	-	-
	Ground fault (Ig)	available	available	available	available	available	-	-
	Highest Ground fault current (Imax of Ig)	available	available	available	available	available	-	-
	Average of phases: Iavg=(Ia+Ib+Ic)/3	available	available	available	available	-	-	-
	Unbalance *	available	available	available	available	-	-	-
Voltage	Phase voltage(Va, Vb, Vc)/ Line voltage(Vab, Vbc, Vca)	-	-	available	available	available	available	available
	Average voltage: Vavg =(Va(Vab)+Vb(Vbc)+Vc(Vca))/3	-	-	available	available	-	-	-
	Unbalance **	-	-	available	available	-	-	-
Frequency	Hz	-	-	available	available	-	available	-
Power	Active, Reactive, Apparent (total, each phase)	-	-	available	available	available	available	available
Power factor	Power Factor (total, each phase)	-	-	available	available	-	available	available
Energy	Active, Reactive, Apparent	-	-	available	available	available	available	available
Demand (Previous, Max)	Current (Ia, Ib, Ic)	-	available	available	available	-	available	-
	Power (Active, Reactive, Apparent)	-	-	available	available	-	available	available
Power Quality	THDV: Total Harmonic Distortion V	-	-	available	available	-	available	-
	THDI: Total Harmonic Distortion I	-	available	available	available	-	available	-

* **Unbalance:** (Iub(%)) = ((|Maximum| - |Minimum|)/|Maximum|) *100(%)
** **Unbalance:** (Vub(%)) = (|Maximum deviation of the Line Voltage from its average value|/Average value of line voltage)*100(%)

Measurement accuracy

- Reference standards: IEC 61557-12
- Current: Three phase (0.2 ~ 0.4In : ± 1.5%, 0.4 ~ 1.2In : ± 1.%0), single phase (0.2 ~ 1.2In : ± 2.0%)
- Voltage: ±0.5%
- Power and Energy: Class 2

Type		Error range	Error
Power / Energy	PF 1.0	0.2~0.4In	±2.5%
		0.4~1.2In	±2.0%
	PF 10 PF 0.5(Lag) PF 0.8(Lead)	0.4~0.8In	±2.5%
		0.8~1.2In	±2.0%

ZSI function

1. ZSI in is not applicable for breaker below 250AF
2. ZSI cable length must be less than 3m

Diagnosis and maintenance

The UL Smart MCCB's ETU maintains an event log of device operation and settings changes that can be accessed via local HMI or over remote communications.

Record

1) Fault event
- In the event of relay operation, up to 50 records including the type and time of occurrence can be recorded
- If additional events occur, the oldest event in the log is overwritten (Roll-Over)
- Accident waveform recording: Record up to 2 events (current and voltage waveforms, 8 cycles)

2) Max. Demand and Max. Power value
- Records and saves the occurrence value and occurrence time

3) Device operation
- Operation/breaker on (input) time (hour)
- Number of mechanical/electrical/trip count
- Contact wear rate (%): wear rate according to the number of electric opening and closing of the main body
- Load profile (load usage rate): Usage time according to the used load (hour) measured in 4 levels (0~49%In, 50~79%In, 80~89%In, >90%In)

Device management

Device information can be obtained remotely from communication enabled ETU's.
- Communication related items (communication address, speed, etc.)

Type			ETU Type				Display	
			ETSi	ETMi	ETHi	ETLi	ETU	HMI (3.5")
Event record	System	Status change, Setting change, System control, etc.(Up to 50) - Event type and time	-	available	available	available	-	available
	Fault	Long time/short time/ instantaneous/ ground fault(Up to 50) - Fault type, value and time	-	available	available	available	-	available
Maximum value record	Demand	Ia, Ib, Ic	-	available	available	available	-	available
		Active, Reactive, Apparent	-	-	available	available	-	available
	Power	Active, Reactive, Apparent	-	-	available	available	available	-
Device operation	Operating time (hour)		-	available	available	available	-	available
	On time (hour)		-	available	available	available	-	available
	Mechanical count (number of times)		-	available	available	available	-	available
	Electrical count (number of times)		-	available	available	available	-	available
	Trip count (number of times)		-	available	available	available	-	available
	Contact wear rate (%)		-	-	available	available	-	available
	Load profile		-	available	available	available	-	available

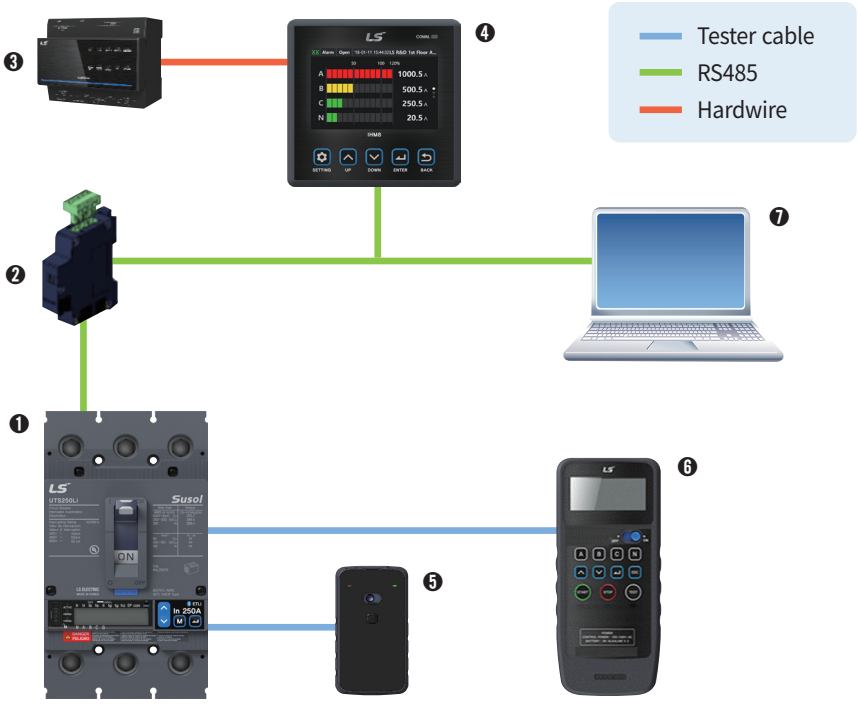
Types of events

Items		Settings	Description
System event	Status change	Operating status inside a device	Operating the unlock key
			Current direction (forward/backward)
			Device restart
			Local/Remote
		Device DI status	Trip status (Trip/None trip)
			CB status (On/Off)
			ZSI DI
		Device DO status	Trip pulse output
			ZSI DO
		Device malfunction (self-diagnostics)	Memory failure
			RTC failure
			Mechanical count alarm
			Electrical count alarm
			Contact life alarm
			Device overheat
		Others	MTD Status
	Change settings	System configuration	Factory configuration
			System configuration
		Relay configuration	Long time
			Short time
			Instantaneous
			Ground fault
			N-phase protection
			Use of ZSI
	System control	Data Clear	Fault reset
			System event buffer clear
			Fault event buffer clear
			Energy reset
			Max demand reset
			Max power reset
			Max Internal temperature reset
			Load profile clear
			Operation time[hour] reset
			On time[hour] reset
			Max. W reset by key
			Max. Var reset by key
			Max. VA reset by key
			Wh reset by key
			Varh reset by key
			VAh reset by key
			Test trip by key
		Device DO and CB control (Operation)	CB ON
			CB OFF
			CB RESET

Fault event	Long time	Relay occurrence/return
	Short time	
	Instantaneous	
	Ground fault	

Composition of Smart MCCB

The UL Smart MCCB communications environment incorporates a multitude of features and capabilities, allowing integration into any system. With the T-Connection module, the breaker can send and receive data via RS485 to and from a higher-level operating software or an LS Display module/HMI.
Accessing from the test port at the front of the breaker, data can be retrieved and viewed using the portable battery and trip module or portable OCR tester.



Number	Description	Notes
❶	Smart MCCB	MCCB product
❷	ITCM	T-Connection module
❸	IPM	DC power module
❹	IHM8	Display module
❺	IPBM	Portable battery and trip module
❻	Tester	OCR Tester
❼	Communication	Higher-level operating software

Communication

Remote communication (RS485)

1) Communication protocol: Modbus RTU
2) Communication speed: 9,600, 19,200 and 38,400 bps
3) Communication distance: Max. 5m (between devices), can be connected to up to 16 devices
4) DC 24V power supplied from outside
5) Slave addresses: 1 ~ 247
6) Transmitted information: Device status, measurement values, setting information, record data, etc.

※ Communication available only when there is an external power supply.

Tester Port communication

1) DC 12V power supplied from outside
2) Connected devices: OCR Tester, IPBM: Input the relay test current signal.

BLE communication

1) Communication range: 1m (in an open space)
2) Transmitted information: Device status, measurement values, setting information, record data, etc.

※ Communication available only when there is an external power supply.

* When the device is re-energized, the device time will be reset to 01:01:01, January 1, 2018.

Smart trip units for UTS800 and UTS1200

Trip relay

N — Trip Relay Type

N	
000	Trip Relay N/A
N	Normal

H — Communication and protection

H	L, S, I, G

* L/S/I/G configuration as standard
  - with LED indicators
  - without output contacts
* Ground fault system by vector sum

0 — Control voltage and frequency

	Frequency used	Control power voltage	Comm.
0	60Hz	Self-Power Note	NFC
5	50Hz	Self-Power Note	NFC

A — Ammeter

H — Communication and protection

H	L, S, I, G
D	L, S, I, G + Comm.
J	L, S, I, Gext + LS ZCT + Comm.
Y	L, S, I, Gext + Ground wire CT + Comm.

* L, S, I: Long time delay trip, Short time delay trip, Instantaneous trip
* G: Ground fault (Residual earth fault protection)
* Ground fault system by vector sum
* Communication and output contacts DO NOT work under self-power co ndition
* Gext + Ground wire CT: Source return Type
* Customers must purchase their own Ground wire CT (Secondary output: 5A, accuracy 1%)

0 — Control voltage and frequency

	Frequency used	Control power voltage	Comm.
0	60Hz	Self-Power	N/A
1	60Hz	AC/DC 100V~250V	N/A
2	60Hz	AC/DC 24V~48V	N/A
5	50Hz	Self-Power	N/A
6	50Hz	AC/DC 100V~250V	N/A
7	50Hz	AC/DC 24V~48V	N/A

Note: The Self-Power function is designed to receive power from the main circuit inside the circuit breaker without external power to the STU Communication, ZSI and Remote Reset. DO functions are not available and EVENT is not logged when using Self -Power only.

P — Trip unit type

P	Power meter

S — Relay function / Communtation (MODBUS)

S	L, S, I, G + PTA
J	L, S, I, Gext + LS ZCT
Y	L, S, I, Gext + Ground wire CT

1

	Frequency	Control power voltage	Communication
1	60Hz	AC/DC 100V~250V	N/A
2	60Hz	AC/DC 24V~48V	N/A
3	60Hz	AC/DC 100V~250V	Bluetooth
4	60Hz	AC/DC 24V~48V	Bluetooth
6	50Hz	AC/DC 100V~250V	N/A
7	50Hz	AC/DC 24V~48V	N/A
8	50Hz	AC/DC 100V~250V	Bluetooth
9	50Hz	AC/DC 24V~48V	Bluetooth

S — Trip unit type

S	Supreme meter

S — Relay function / Communtation fuction(Default)

S	L, S, I, G + PTA
J	L, S, I, Gext + LS ZCT
Y	L, S, I, Gext + Ground wire CT

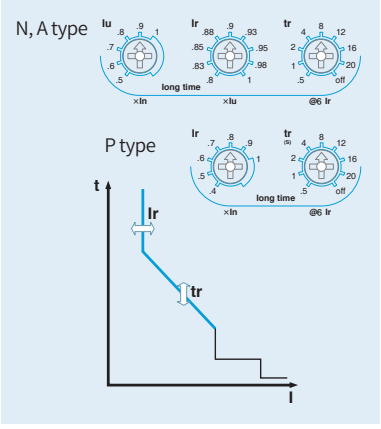
1

	Frequency	Control power voltage	Communication
1	60Hz	AC/DC 100V~250V	Bluetooth, NFC
2	60Hz	AC/DC 24V~48V	Bluetooth, NFC
6	50Hz	AC/DC 100V~250V	Bluetooth, NFC
7	50Hz	AC/DC 24V~48V	Bluetooth, NFC

* Self-power is basic function (Automatic power supply to the trip unit without additional control power)
* L, S, I: Long time delay trip, Short time delay trip, Instantaneous trip
* G: Ground fault (Residual earth fault protection)
* Gext + Ground wire CT: Source return type
* PTA: Pre-trip alarm function
* Customers must purchase their own ground wire CT (Secondary output: 5A, accuracy 1%)
* The STU acceptable voltage range is 100 to 250V.

Operation characteristics

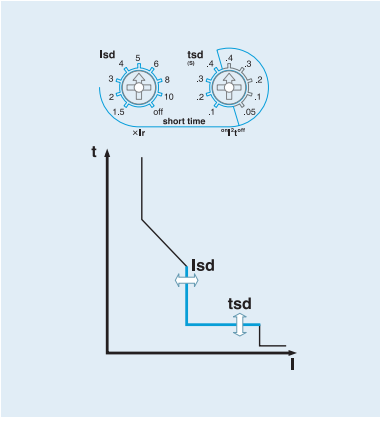
Long time delay (L)



The overload protection function has a time delayed characteristic with inverse ratio to fault current.

1. Standard current setting knob: Ir *The S type STU is set on HMI (no knob).
   1) Setting range in P type: (0.4-0.5-0.6-0.7-0.8-0.9-1.0)×In
   2) Setting range in N type and A type: (0.4 ~1.0)×In
      - Iu: (0.5-0.6-0.7-0.8-0.9-1.0)×In
      - Ir: (0.8-0.83-0.85-0.88-0.9-0.93-0.95-0.98-1.0)×Iu
2. Time delay setting knob: tr *The S type STU is set on HMI (no knob).
   - Standard operating time is based on the time of 6×Ir
   - Setting range: 0.5-1-2-4-8-12-16-20-Off sec
3. Relay pick-up current
   - When current over (1.11)×Ir flows in, relay is picked up.
4. Relay operates based on largest load current in R/S/T/N phase.

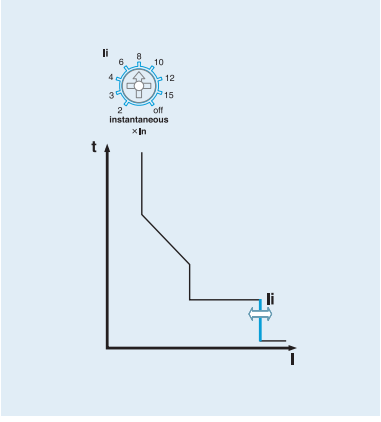
Short time delay (S)



The fault current (over current) protection function has a definite time characteristic and time delay with inverse ratio to fault current.

1. Standard current setting knob: Isd *The S type STU is set on HMI (no knob).
   - Setting range: (1.5-2-3-4-5-6-8-10-Off)×Ir
2. Time delay setting knob: tsd *The S type STU is set on HMI (no knob exist).
   - Standard operating time is based on the time of 10×Ir.
   - Inverse time (I^2t On): 0.1-0.2-0.3-0.4 sec
   - Definite time (I^2t Off): 0.05-0.1-0.2-0.3-0.4 sec
3. Relay operates based on largest load current in R/S/T/N phase.
4. When ZSI function is set, the protection operation will take place instantaneously with input absent by downstream devices. It is advised to disable ZSI function on the last downstream device.

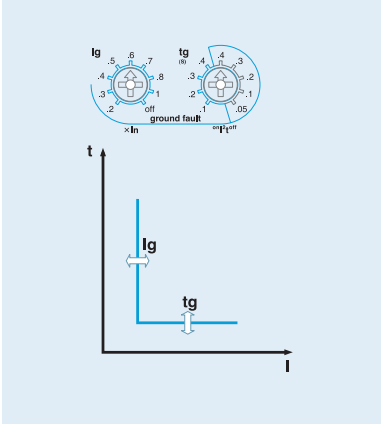
Instantaneous (I)



The function for breaking fault current above the setting value within the shortest time protects the circuit from short circuit.

1. Standard current setting knob: Ii *The S type STU is set on HMI (no knob).
   - N/A/P type setting range: (2-3-4-6-8-10-12-15-Off)×In
   - S type setting range: (2-16)×In
2. Relay operates based on largest load current in R/S/T/N phase.
3. Total breaking time is below 50ms.

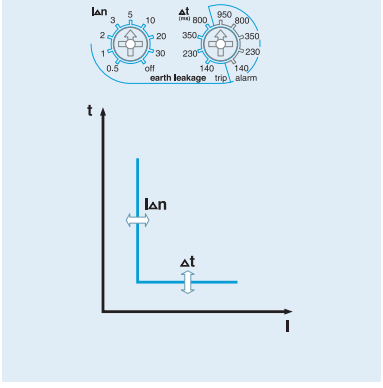
Ground Fault (G)



The function for breaking ground fault current above setting value after time delay protects the circuit from ground fault.

1. Standard setting current knob: Ig *The P/S type is set on HMI (no knob).
   - Setting range: (0.2-0.3-0.4-0.5-0.6-0.7-0.8-1.0-Off)×In
2. Time delay setting knob: tg *The P/S type is set on HMI (no knob).
   N/A type setting range
   - Inverse time (I^2t On): 0.1-0.2-0.3-0.4 sec
   - Definite time (I^2t Off): 0.05-0.1-0.2-0.3-0.4 sec
   - P/S type setting range: 0.05 ~ 3.0 sec
3. The fault current is the value detected by Vector sum of the current input as R, S, T phase (3P) or R, S, T, N (4P).
4. When ZSI function is set, the protection operation will take place instantaneously with input absent by downstream devices. It is advised to disable ZSI function on the last downstream device.

Earth Leakage (G) - Option

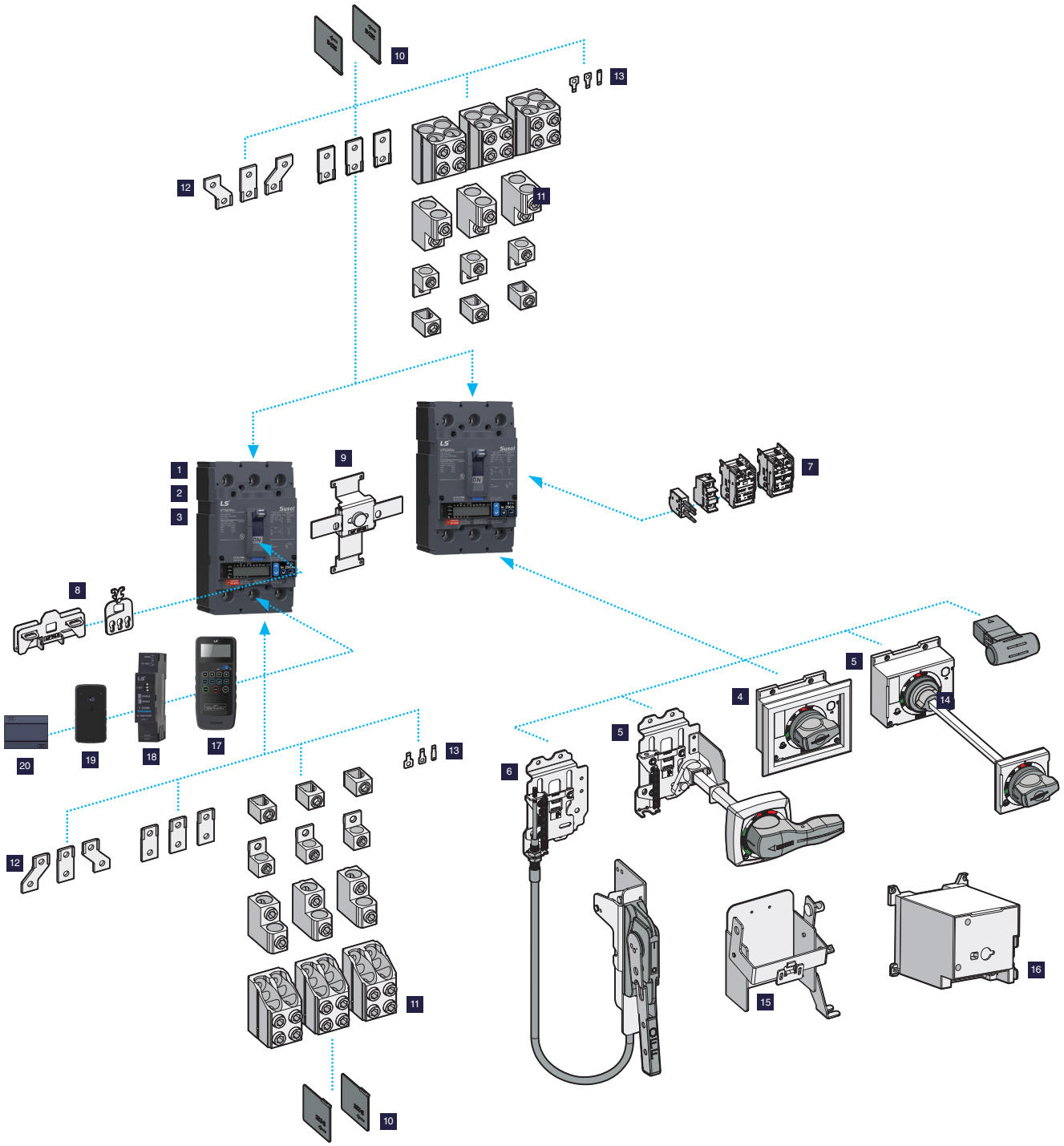


The function for breaking earth leakage current above setting value after time delay protects the circuit from earth leakage. (A, P, S type)

1. Standard setting current knob: I△n *The P/S type is set on HMI (no knob).
   - A type setting range: 0.5-1-2-3-5-10-20-30-Off (A)
   - P/S type setting range: 0.1 ~ 30 (A)
2. Time delay setting knob: △t *The P/S type is set on HMI (no knob).
   A type setting range
   - Trip time: 140-230-350-800 ms
   - Alarm time: 140-230-350-800-950 ms
   P/S type setting range (Same as Trip/Alarm)
   - Long time: 0.1 ~ 3.0 sec
   - Short time: (0.1 ~ 3.0 sec)@30A
3. Settings within its alarm range will prevent its breaker from tripping but activating its alarm.
4. This function is enabled and can be used only with standard ZCT provided by LS or private external CT(secondary output 5A) selected by customers.
5. When ZSI function is set, the protection operation will take place instantaneously with input absent by downstream devices. It is advised to disable ZSI function on the last downstream device.

Measurement function

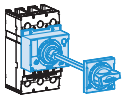
Type			Unit	Measurement element	Detailed element	Unit	Measurement range
S type P type		A type	Current	Line current	Ia, Ib, Ic	A	0.02In~1.2In
				Normal current	I_1		
				Reverse current	I_2		
			Voltage	Line voltage	Vab, Vbc, Vca	V	1200V
				Phase voltage	Va, Vb, Vc	V	600V
				Normal voltage	V_1	V	3V~690V
				Reverse voltage	V_2		
			Angle	Line-to-line Line-to-current	∠VabIa, ∠VabIb, ∠VabIc, ∠VabVbc, ∠VabVca	°	0~360°
				Phase-to-phase	∠VaVb, ∠VaVc		
				Phase-to-current	∠VaIa, ∠VbIb, ∠VcIc		
			Power	Active power	Pa(ab), Pb(bc), Pc(ca), P	kW	0kW~99999kW
				Reactive power	Qa(ab), Qb(bc), Qc(ca), Q	kVar	0kVar~99999kVar
				Apparent power	Sa(ab), Sb(bc), Sc(ca), S	kVA	0kVA~99999kVA
			Energy	Active energy	WHa(ab), WHb(bc), WHc(ca), WH	kWh, MWh	0kWh~999,999MWh
				Reactive energy	VARHa(ab), VARHb(bc), VARHc(ca), VARH	kVarh, Mvarh	0kVarh~999,999MVarh
				Reverse active energy	rWHa(ab), rWHb(bc), rWHc(ca), rWH	kWh, MWh	0kWh~999,999MWh
			Freq.	Frequency (F)	Frequency	Hz	10~200Hz
			Power factor	Power factor (PF)	PFa(ab), PFb(bc), PFc(ca), PF	-	+ : Lead - : Lag
			Unbalance	Unbalance rate	Iunalance, Vunbalance	%	0.0~100.0
			Demand	Active power demand	Peak demand	kW	0kW~99999kW
				Current demand	Peak demand	A	0.02In~1.2In
			Harmonics	Voltage harmonics	1^{st}~63^{th} harmonics of Va(ab),Vb(bc),Vc(ca)	V	4~690V
				Current harmonics	1^{st}~63^{th} harmonics of Ia,Ib,Ic	A	95%(3, 5, 7) / 65%(etc)
				THD, TDD	-	%	0.0 ~ 100.0
				K-Factor	-	-	1.0 ~



1 Molded Case Circuit Breaker
2 Motor Circuit Protector
3 Molded Case Switch
4 Direct Rotary Handle
5 Extended Handle
6 Flange Cable Handle
7 Internal Accessories (AL, AX, UVT, SHT)
8 Locking Device (Handle)
9 Mechanical Interlock
10 Interphase Barriers
11 Mechanical Lugs
12 Busbar Connectors
13 Control Wire Terminal
14 Auxiliary Handle
15 Operating Mechanism (VDM/COM)
16 Motor Operator (MOP)
17 IPOT (Intelligent Potable OCR Tester)
18 T-connection module
19 Portable Battery and Trip Module
20 DC Power Module

Accessory order codes

NO	Item	Type	AF	CODE	Description	Notes
1	Lug Mount		UTS150i	70821172025	LUG ASS'Y,AL150TS 3P,UTS150i	
2			UTS250i	70821172027	LUG ASS'Y,AL250TS 3P,UTS250i	
3			UTS400i	70821173006	LUG ASS'Y,AL400TS 3P,UTS400,SET(2sets of 3)	
4			UTS600i	70821173008	LUG ASS'Y,AL600TS 3P,UTS600,SET(2sets of 3)	
5			UTS800i	70821176303	LUG ASS'Y,AL800TS 3P,UTS800	
6			UTS1200i	70821176304	LUG ASS'Y,AL1200TS 3P,UTS1200	
7	Bolt On Mount		UTS150i	83261172411	SPARE PART ASS'Y,3P BOLT ON,TP2a3,UTS150i	
8			UTS250i	83261172413	SPARE PART ASS'Y,3P BOLT ON,TP2b3,UTS250i	
9	Busbar Connectors		UTS150i	83261172322	SPARE PART ASS'Y,BUSBAR 3P,SP2a3a,UTS150	
10			UTS250i	83261172324	SPARE PART ASS'Y,BUSBAR 3P,SP2b3a,UTS250	
11			UTS400/600i	83261173322	SPARE PART ASS'Y,BUSBAR 3P,SP33a,UTS400/600	
12			UTS800/1200i	83261176801	SPARE PART ASS'Y,BUSBAR 3P,SP53a,TS1600/UTS800-1200	
13				83261176803	SPARE PART ASS'Y,BUSBAR VERTICAL 3P,SP53v,TS1600/UTS800-1200	VERTICAL
14				83261176805	SPARE PART ASS'Y,BUSBAR EXTENSION 3P,SP53e,TS1600/UTS800-1200	EXTENSION
15				83261176808	SPARE PART ASS'Y,BUSBAR 3P COM5/VDM5,UTS800/1200	COM5/VDM5
16	CWT	Control Wire Terminals 	UTS150i	62671172004	TERMINAL ASS'Y,CWT,UTS150	
17			UTS250i	62671172005	TERMINAL ASS'Y,CWT,UTS250	
18			UTS400i	62671173001	TERMINAL ASS'Y,CWT,UTS400	
19			UTS600i	62671173002	TERMINAL ASS'Y,CWT,UTS600	
20	PL	Padlock 	UTS150/250i	56771172301	LOCK ASS'Y,PL2,UTS250	
21	(Lock in “OFF” position)		UTS400i	56771173301	LOCK ASS'Y,PL3,UTS400	
22			UTS600i	56771176301	LOCK ASS'Y,PL5,UTS1200	
23	PHL	Plate Handle Lock 	UTS150/250i	56771172303	LOCK ASS'Y,PHL2,UTS250	
24	(Lock in “ON” “OFF or “ON”)		UTS400i	56771173303	LOCK ASS'Y,PHL3,UTS400	
25			UTS600i	56771176303	LOCK ASS'Y,PHL5,UTS1200	
26	MIT	Mechanical Interlock 	UTS150/250i	56121172301	INTERLOCK ASS'Y,MIT23,UTS250	
27	(For 3-Pole breaker)		UTS400i	56121173301	INTERLOCK ASS'Y,MIT33,UTS400	
28			UTS600i	56121176301	INTERLOCK ASS'Y,MIT53,UTS1200	
29	Barrier Insulation		UTS150/250i	83261172026	SPARE PART ASS'Y,BARRIER INSULATION 3P,B23,UTS150-UTS250	
30			UTS400/600i	83261173407	SPARE PART ASS'Y,BARRIER INSULATION 3P,B33,UTS400-UTS600	
31	AX	Auxiliary Switch 	UTS150~600i	83011171301	A,AX,UTS150~UTS600	
32			UTS800/1200i	83011176301	A,AX,UTS1200	
33	AL	Alarm Switch 	UTS150~600i	83011171302	A,AL,UTS150~UTS600	
34			UTS800/1200i	83011176303	A,AL,UTS1200	
35	SHT	Shunt Trip 	UTS150~600i	83211171331	T,SHT,T,DC12V,UTS150~UTS600	
36				83211171332	T,SHT,T,AC/DC24V,UTS150~UTS600	
37				83211171333	T,SHT,T,AC/DC48V,UTS150~UTS600	
38				83211171334	T,SHT,T,AC/DC110~130V,UTS150~UTS600	
39				83211171335	T,SHT,T,AC220~240V/DC250V,UTS150~UTS600	
40				83211171336	T,SHT,T,AC380~500V,UTS150~UTS600	
41				83211171341	T,SHT,T,DC12V,UTS150~UTS600-LW	Lead Wire Type
42				83211171342	T,SHT,T,AC/DC24V,UTS150~UTS600-LW	Lead Wire Type
43				83211171343	T,SHT,T,AC/DC48V,UTS150~UTS600-LW	Lead Wire Type
44				83211171344	T,SHT,T,AC/DC110~130V,UTS150~UTS600-LW	Lead Wire Type
45				83211171345	T,SHT,T,AC220~240V/DC250V,UTS150~UTS600-LW	Lead Wire Type
46				83211171346	T,SHT,T,AC380~500V,UTS150~UTS600-LW	Lead Wire Type
47	UVT	Undervoltage Trip	UTS150~600i	83211171351	T,UVT,T,AC/DC24V,UTS150~UTS600	
48				83211171352	T,UVT,T,AC/DC48V,UTS150~UTS600	
49				83211171353	T,UVT,T,AC/DC110~130V,UTS150~UTS600	
50				83211171354	T,UVT,T,AC220~240V/DC250V,UTS150~UTS600	

NO	Item	Type	AF	CODE	Description	Notes
51	UVT	Undervoltage Trip 	UTS150~600i	83211171355	T,UVT,T,AC380~440V,UTS150~UTS600	
52				83211171356	T,UVT,T,AC440~480V,UTS150~UTS600	
53				83211171361	T,UVT,T,AC/DC24V,UTS150~UTS600-LW	Lead Wire Type
54				83211171362	T,UVT,T,AC/DC48V,UTS150~UTS600-LW	Lead Wire Type
55				83211171363	T,UVT,T,AC/DC110~130V,UTS150~UTS600-LW	Lead Wire Type
56				83211171364	T,UVT,T,AC220~240V/DC250V,UTS150~UTS600-LW	Lead Wire Type
57				83211171365	T,UVT,T,AC380~440V,UTS150~UTS600-LW	Lead Wire Type
58				83211171366	T,UVT,T,AC440~480V,UTS150~UTS600-LW	Lead Wire Type
59	MOP	Motor Operator (Unable to communicate with MCCB) 	UTS150/250i	83471172201	MOTOR OPERATOR,MOP2U,DC24V	Standard type(Not lockable)
60				83471172202	MOTOR OPERATOR,MOP2U,AC110V/DC110V	Standard type(Not lockable)
61				83471172203	MOTOR OPERATOR,MOP2U,AC230V/DC220V	Standard type(Not lockable)
62				83471172204	MOTOR OPERATOR,MOP2U-L,DC24V	Lockable type
63				83471172205	MOTOR OPERATOR,MOP2U-L,AC110V/DC110V	Lockable type
64				83471172206	MOTOR OPERATOR,MOP2U-L,AC230V/DC220V	Lockable type
65			UTS400/600i	83471173201	MOTOR OPERATOR,MOP3U,DC24V	Standard type(Not lockable)
66				83471173202	MOTOR OPERATOR,MOP3U,AC110V/DC110V	Standard type(Not lockable)
67				83471173203	MOTOR OPERATOR,MOP3U,AC230V/DC220V	Standard type(Not lockable)
68				83471173204	MOTOR OPERATOR,MOP3U-L,DC24V	Lockable type
69				83471173205	MOTOR OPERATOR,MOP3U-L,AC110V/DC110V	Lockable type
70				83471173206	MOTOR OPERATOR,MOP3U-L,AC230V/DC220V	Lockable type
71	Rotary Operating Handles	Direct Mount 	UTS150/250i	83111172311	HANDLE(ACCE),DH2-S,UTS250	NEMA Type 1
72				83111172323	HANDLE(ACCE),DH2-L,UTS250	NEMA Type 1
73				83111172324	HANDLE(ACCE),DH2-R,UTS250	NEMA Type 1
74				83111172511	HANDLE(ACCE),DH2 (Q)-S,UTS250	NEMA Type 1
75				83111172519	HANDLE(ACCE),DH2 (Q)-L,UTS250	NEMA Type 1
76				83111172520	HANDLE(ACCE),DH2 (Q)-R,UTS250	NEMA Type 1
77			UTS400/600i	83111173311	HANDLE(ACCE),DH3-S,UTS400	NEMA Type 1
78				83111173323	HANDLE(ACCE),DH3-L,UTS400	NEMA Type 1
79				83111173324	HANDLE(ACCE),DH3-R,UTS400	NEMA Type 1
80				83111173511	HANDLE(ACCE),DH3 (Q)-S,UTS400	NEMA Type 1
81				83111173519	HANDLE(ACCE),DH3 (Q)-L,UTS400	NEMA Type 1
82				83111173520	HANDLE(ACCE),DH3 (Q)-R,UTS400	NEMA Type 1
83			UTS800/1200i	83111176311	HANDLE(ACCE),DH5-S 3P,UTS1200	NEMA Type 1
84		Direct Mount (with Key lock) 	UTS150/250i	83111172312	HANDLE(ACCE),DHK2-S,UTS250	NEMA Type 1
85				83111172325	HANDLE(ACCE),DHK2-L,UTS250	NEMA Type 1
86				83111172326	HANDLE(ACCE),DHK2-R,UTS250	NEMA Type 1
87			UTS400/600i	83111173312	HANDLE(ACCE),DHK3-S,UTS400	NEMA Type 1
88				83111173325	HANDLE(ACCE),DHK3-L,UTS400	NEMA Type 1
89				83111173326	HANDLE(ACCE),DHK3-R,UTS400	NEMA Type 1
90			UTS800/1200i	83111176312	HANDLE(ACCE),DHK5-S 3P,UTS1200	NEMA Type 1
91		Extended (Door Mount) 	UTS150/250i	83111172309	HANDLE(ACCE),REH2-S-12,UTS250	NEMA Type 1
92				83111172310	HANDLE(ACCE),REH2-S-16/24(WITHOUT SHAFT),UTS250	NEMA Type 1
93			UTS400/600i	83111173309	HANDLE(ACCE),REH3-S-12,UTS400	NEMA Type 1
94				83111173310	HANDLE(ACCE),REH3-S-16/24(WITHOUT SHAFT),UTS400	NEMA Type 1
95			UTS800/1200i	83111176307	HANDLE(ACCE),REH5-L-12,UTS1200	NEMA Type 1
96				83111176308	HANDLE(ACCE),REH5-R-12,UTS1200	NEMA Type 1
97				83111176309	HANDLE(ACCE),REH5-S-12,UTS1200	NEMA Type 1
98				83111176310	HANDLE(ACCE),REH5-S-16/24(WITHOUT SHAFT),UTS1200	NEMA Type 1
99				83111176339	HANDLE(ACCE),REH5-L-16/24(WITHOUT SHAFT),UTS1200	NEMA Type 1
100				83111176340	HANDLE(ACCE),REH5-R-16/24(WITHOUT SHAFT),UTS1200	NEMA Type 1

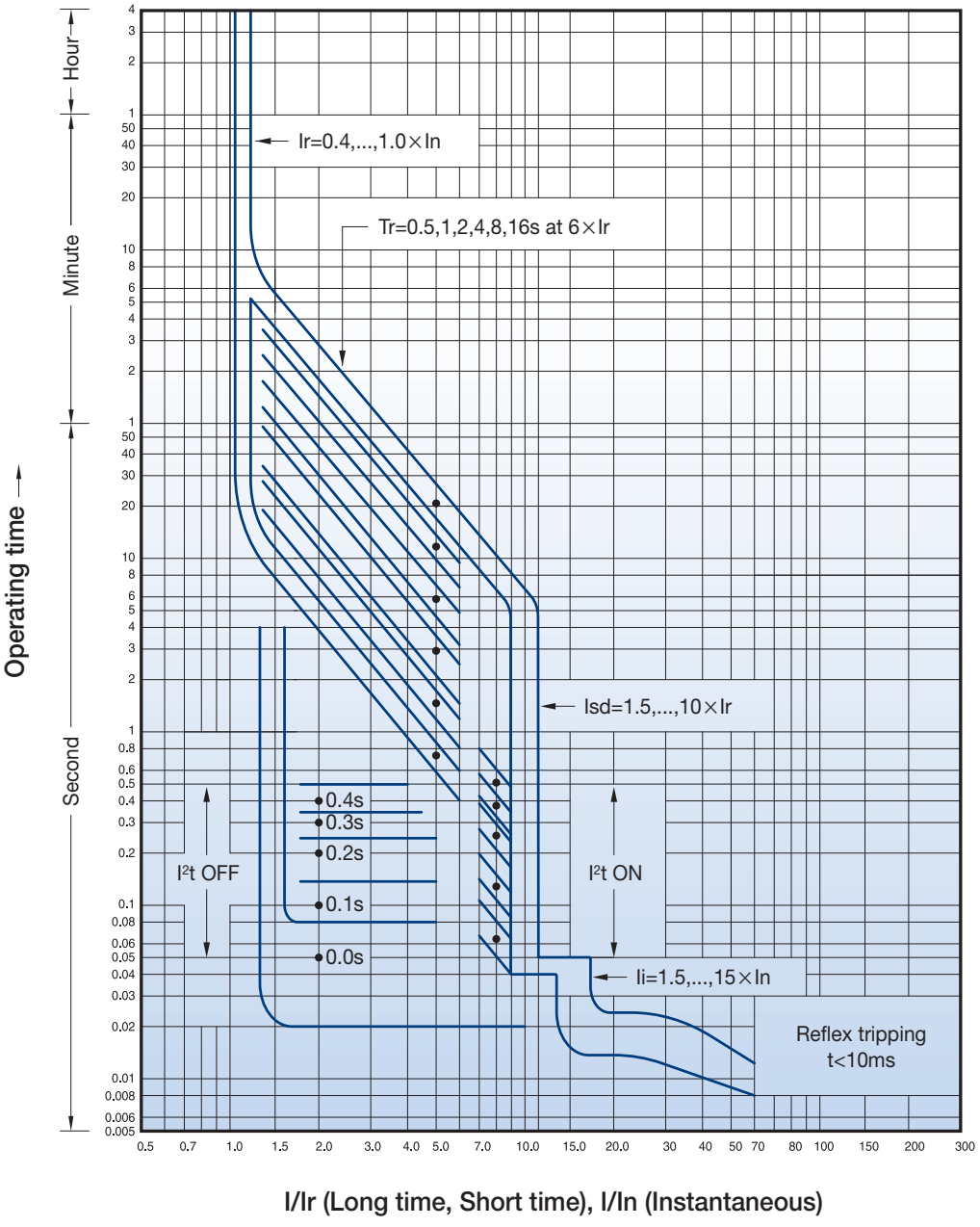
Accessory order codes

NO	Item	Type	AF	CODE	Description	Notes
101	Rotary Operating Handles	NEMA Door Mount	UTS150/250i	83111172301	HANDLE(ACCE),EHU2-12,UTS250	NEMA Type 1, 12
102				83111172302	HANDLE(ACCE),EHV2-12,UTS250	NEMA Type 3, 3R, 4
103				83111172303	HANDLE(ACCE),EHX2-12,UTS250	NEMA Type 3, 4, 4X
104				83111172304	HANDLE(ACCE),EHU2-16/24(WITHOUT SHAFT),UTS250	NEMA Type 1, 12
105				83111172305	HANDLE(ACCE),EHV2-16/24(WITHOUT SHAFT),UTS250	NEMA Type 3, 3R, 4
106				83111172306	HANDLE(ACCE),EHX2-16/24(WITHOUT SHAFT),UTS250	NEMA Type 3, 4, 4X
107			UTS400/600i	83111173301	HANDLE(ACCE),EHU3-12,UTS400	NEMA Type 1, 12
108				83111173302	HANDLE(ACCE),EHV3-12,UTS400	NEMA Type 3, 3R, 4
109				83111173303	HANDLE(ACCE),EHX3-12,UTS400	NEMA Type 3, 4, 4X
110				83111173304	HANDLE(ACCE),EHU3-16/24(WITHOUT SHAFT),UTS400	NEMA Type 1, 12
111				83111173305	HANDLE(ACCE),EHV3-16/24(WITHOUT SHAFT),UTS400	NEMA Type 3, 3R, 4
112				83111173306	HANDLE(ACCE),EHX3-16/24(WITHOUT SHAFT),UTS400	NEMA Type 3, 4, 4X
113			UTS800/1200i	83111176301	HANDLE(ACCE),EHU5-12,UTS1200	NEMA Type 1, 12
114				83111176302	HANDLE(ACCE),EHV5-12,UTS1200	NEMA Type 3, 3R, 4
115				83111176303	HANDLE(ACCE),EHX5-12,UTS1200	NEMA Type 3, 4, 4X
116				83111176304	HANDLE(ACCE),EHU5-16/24(WITHOUT SHAFT),UTS1200	NEMA Type 1, 12
117				83111176305	HANDLE(ACCE),EHV5-16/24(WITHOUT SHAFT),UTS1200	NEMA Type 3, 3R, 4
118				83111176306	HANDLE(ACCE),EHX5-16/24(WITHOUT SHAFT),UTS1200	NEMA Type 3, 4, 4X
119	Flange Handle with Sliding Operating Mechanism	Handle(with sliding mechanism and without cable)	UTS150/250i	83111172307	HANDLE(ACCE),FHU2-36~72,UTS250	NEMA Type 1, 12, 3, 3R, 4
120				83111172308	HANDLE(ACCE),FHX2-36~72,UTS250	NEMA Type 4, 4X
121			UTS400/600i	83111173307	HANDLE(ACCE),FHU3-36~72,UTS400	NEMA Type 1, 12, 3, 3R, 4
122				83111173308	HANDLE(ACCE),FHX3-36~72,UTS400	NEMA Type 4, 4X
123	Flange Handle with Cable Operation Mechanism	Long Type Handle (with operating mechanism)	UTS150/250i	83111172314	HANDLE(ACCE),COM2/FHU-S,UTS250	NEMA Type 1, 12, 3, 3R, 4
124				83111172318	HANDLE(ACCE),COM2/FHX-S,UTS250	NEMA Type 4, 4X
125			UTS400/600i	83111173314	HANDLE(ACCE),COM3/FHU-L,UTS400	NEMA Type 1, 12, 3, 3R, 4
126				83111173318	HANDLE(ACCE),COM3/FHX-L,UTS400	NEMA Type 4, 4X
127			UTS800/1200i	83111176314	HANDLE(ACCE),COM5/FHU-L,UTS1200	NEMA Type 1, 12, 3, 3R, 4
128				83111176316	HANDLE(ACCE),COM5/FHX-L,UTS1200	NEMA Type 4, 4X
129	Flange Handle with Variable Depth Mechanism	Long Type Handle (with operating mechanism)	UTS150/250i	83111172313	HANDLE(ACCE),VDM2/FHU-S,UTS250	NEMA Type 1, 12, 3, 3R, 4
130				83111172317	HANDLE(ACCE),VDM2/FHX-S,UTS250	NEMA Type 4, 4X
131			UTS400/600i	83111173313	HANDLE(ACCE),VDM3/FHU-L,UTS400	NEMA Type 1, 12, 3, 3R, 4
132				83111173317	HANDLE(ACCE),VDM3/FHX-L,UTS400	NEMA Type 4, 4X
133			UTS800/1200i	83111176313	HANDLE(ACCE),VDM5/FHU-L,UTS1200	NEMA Type 1, 12, 3, 3R, 4
134				83111176315	HANDLE(ACCE),VDM5/FHX-L,UTS1200	NEMA Type 4, 4X
135	Cabel (for handle)	FH and COM Type	UTS150/250i	76611172801	CABLE ASS'Y,FH1/2-36in,UTE100-UTS250/TD125U-TS250U	36 inch
136				76611172802	CABLE ASS'Y,FH1/2-48in,UTE100-UTS250/TD125U-TS250U	48 inch
137				76611172803	CABLE ASS'Y,FH1/2-60in,UTE100-UTS250/TD125U-TS250U	60 inch
138				76611172804	CABLE ASS'Y,FH1/2-72in,UTE100-UTS250/TD125U-TS250U	72 inch
139			UTS400/600i	76611174801	CABLE ASS'Y,FH3/4-36in,UTS400-UTS600/TS400U-TS800U	36 inch
140				76611174802	CABLE ASS'Y,FH3/4-48in,UTS400-UTS600/TS400U-TS800U	48 inch
141				76611174803	CABLE ASS'Y,FH3/4-60in,UTS400-UTS600/TS400U-TS800U	60 inch
142				76611174804	CABLE ASS'Y,FH3/4-72in,UTS400-UTS600/TS400U-TS800U	72 inch
143				76611174809	CABLE ASS'Y,FH3/4-128in,UTS400-UTS600/TS400U-TS800U	128 inch
144			UTS800/1200i	76611176301	CABLE ASS'Y,FH5-60in,UTS800/1200	60 inch
145				76611176302	CABLE ASS'Y,FH5-84in,UTS800/1200	84 inch
146				76611176303	CABLE ASS'Y,FH5-128in,UTS800/1200	128 inch

Electronic trip unit, ETSi, ETMi, ETHi, ETLi

UTS150Ni/Hi/Li

Rated current 40 ~ 150A

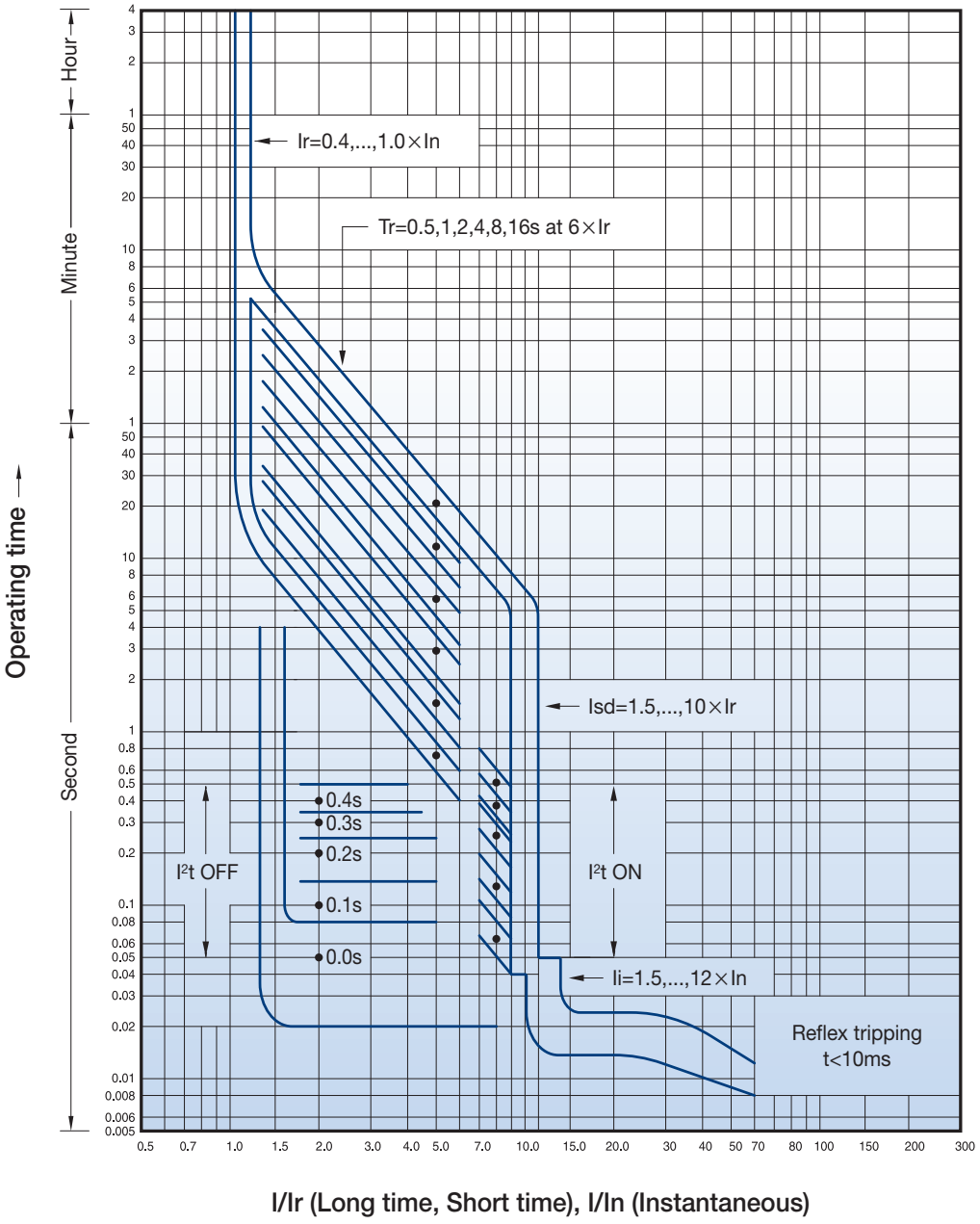


Characteristic curves

Electronic trip unit, ETSi, ETMi, ETHi, ETLi

Rated current 250~400A

UTS250Ni/Hi/Li
UTS400Ni/Hi/Li

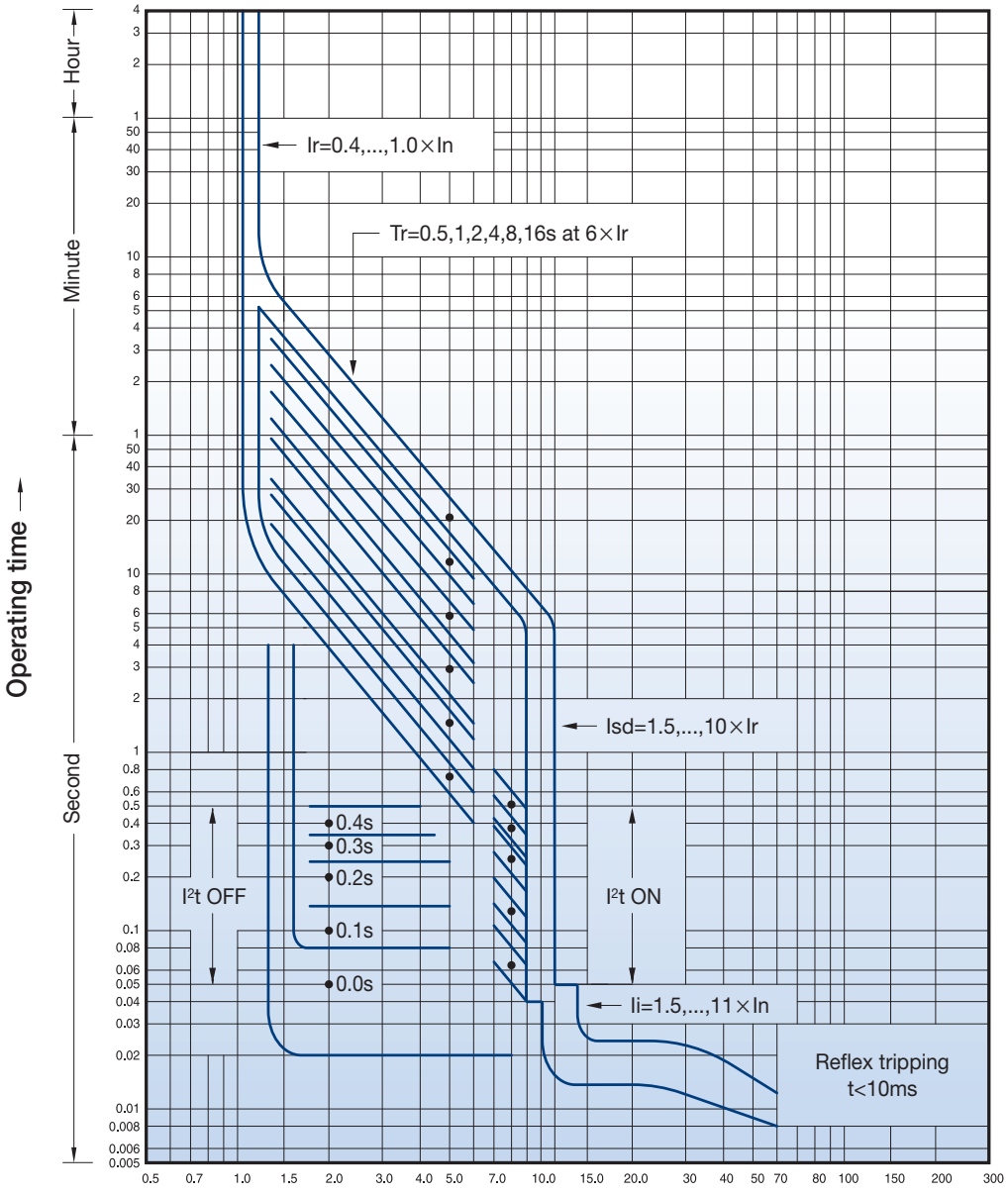


I/Ir (Long time, Short time), I/In (Instantaneous)

Electronic trip unit, ETSi, ETMi, ETHi, ETLi

UTS600Ni/Hi/Li

Rated current 600A



I/Ir (Long time, Short time), I/In (Instantaneous)

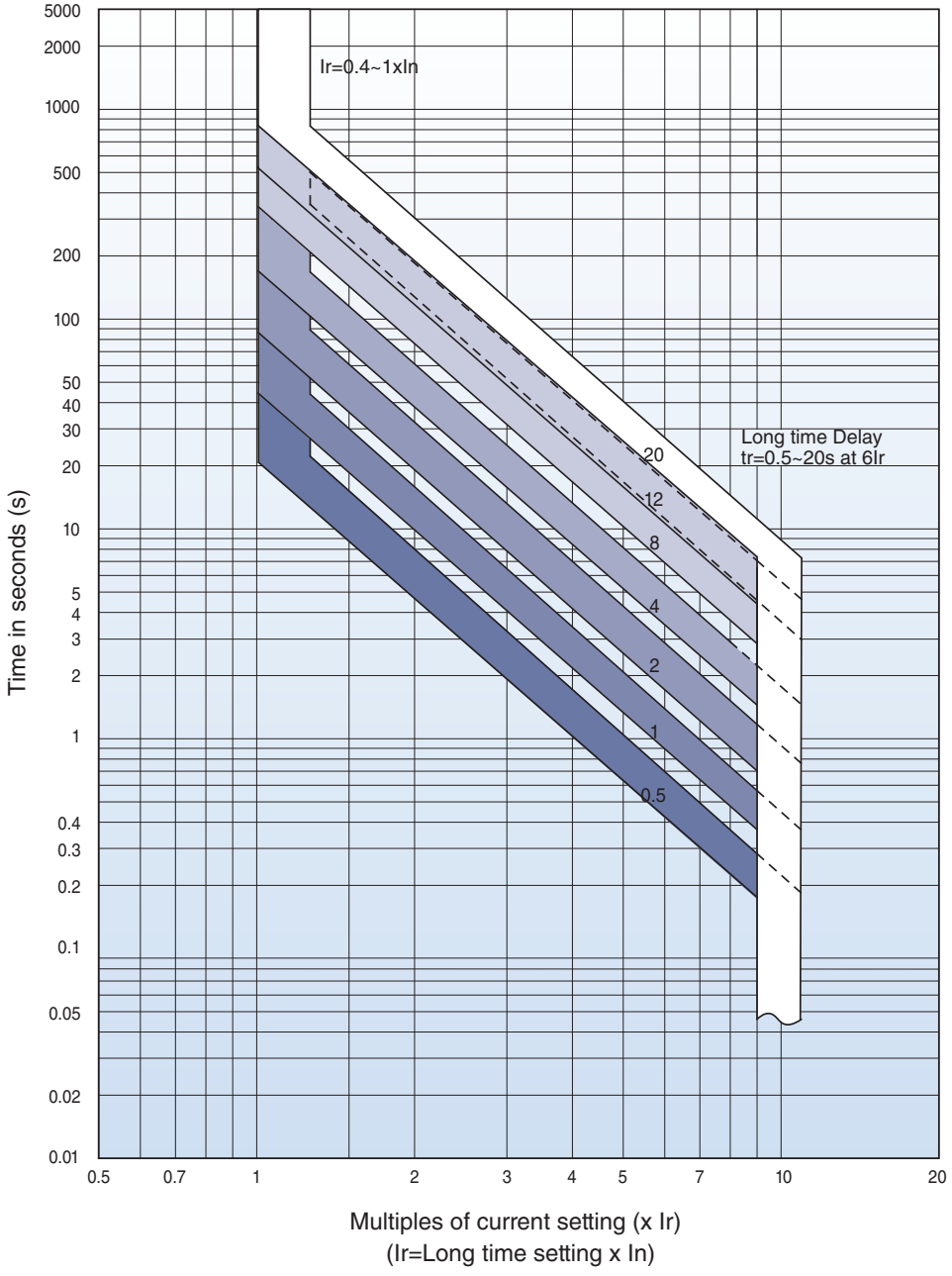
Characteristic curves

Electronic trip unit, ETSi, ETMi, ETHi, ETLi

Long time delay (400~1200A)

Long time pickup 0.4~1×Ir
and delay 0.5~20s

UTS800Ni/Hi/Li
UTS1200Ni/Hi/Li

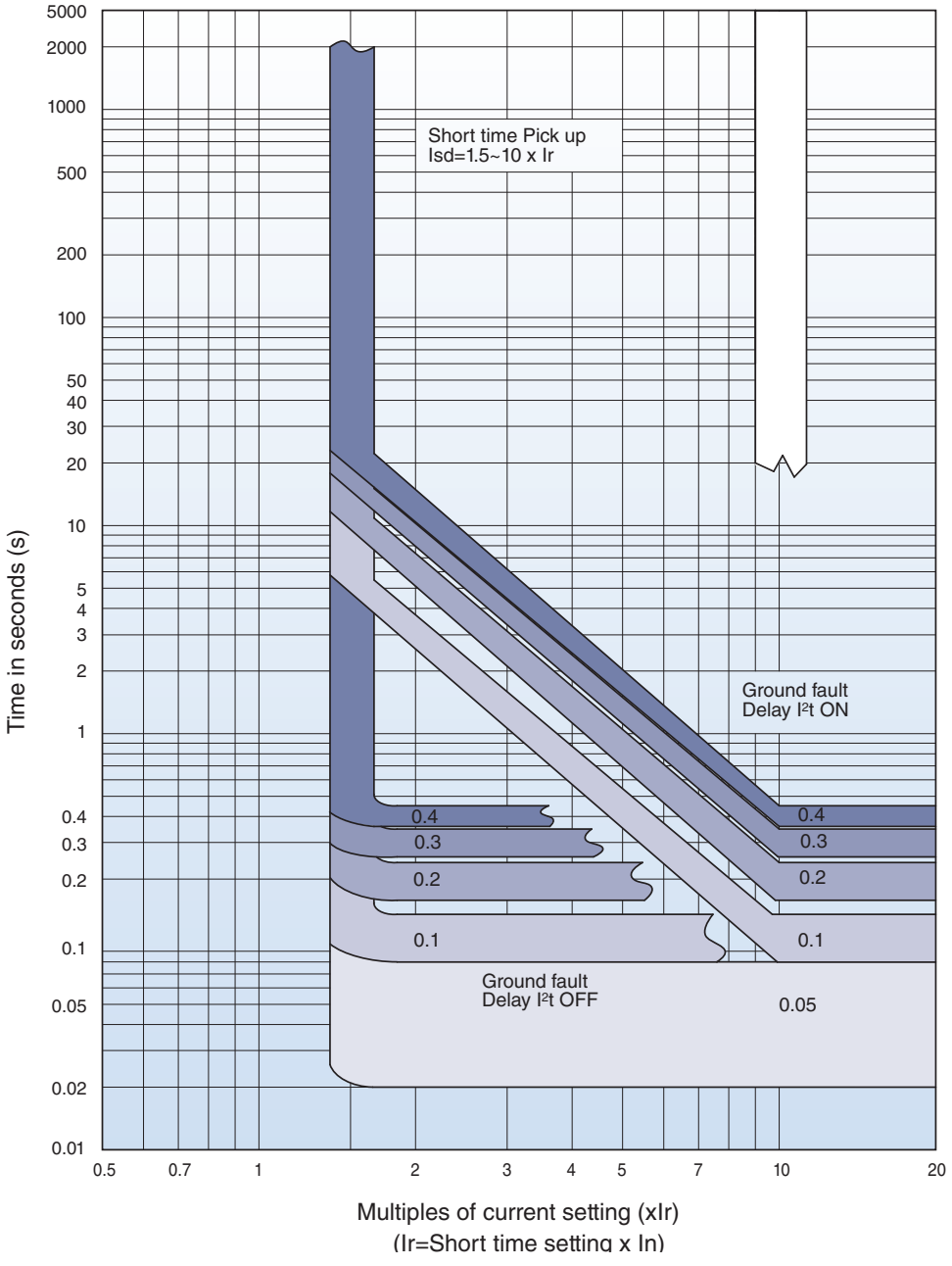


Electronic trip unit, ETSi, ETMi, ETHi, ETLi

Short time delay (400~1200A)

Short time pickup 1.5~10×Ir
and delay 0.1~0.4s

UTS800Ni/Hi/Li
UTS1200Ni/Hi/Li



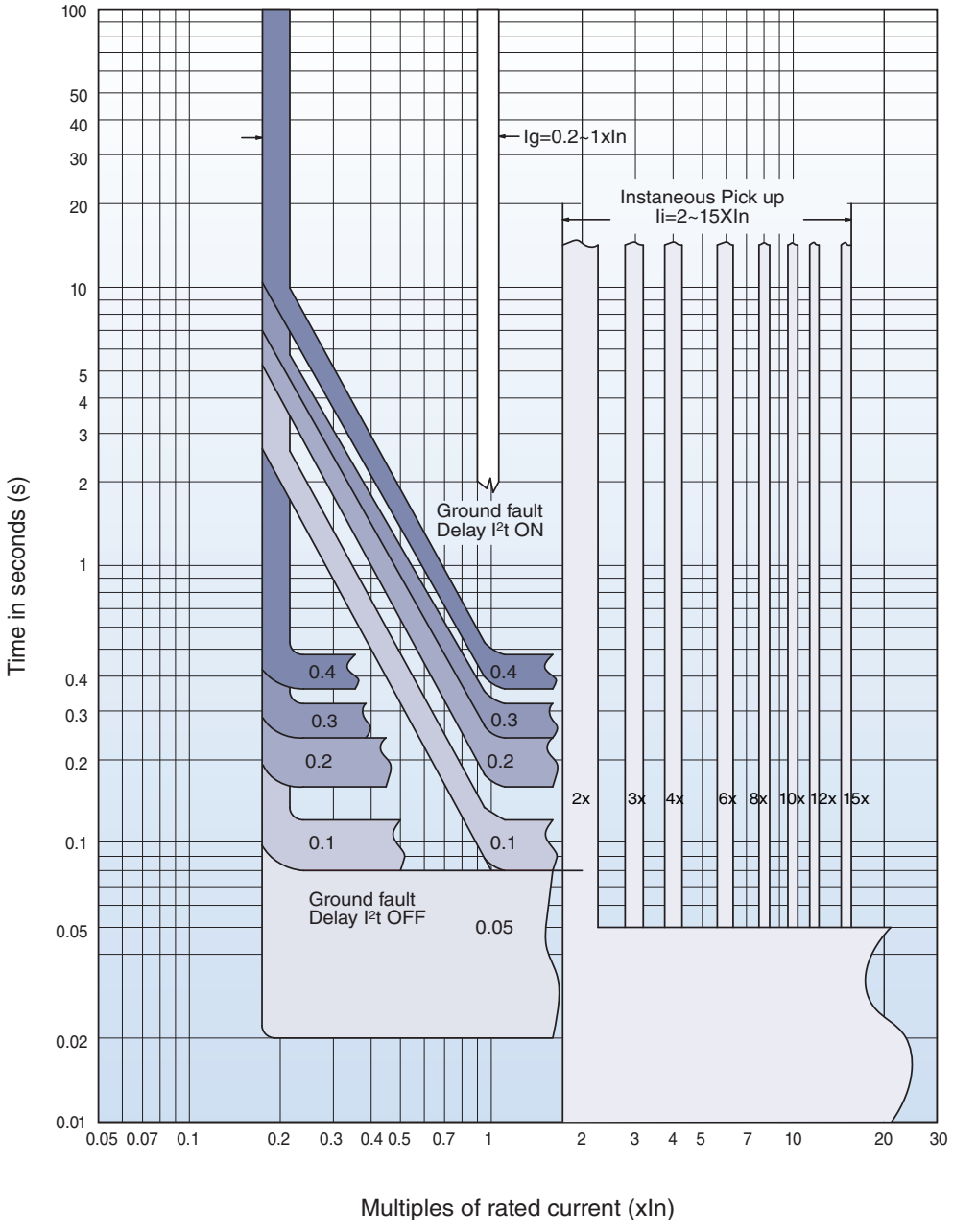
Characteristic curves

Electronic trip unit, ETSi, ETMi, ETHi, ETLi

Instantaneous and ground fault (400~1200A)

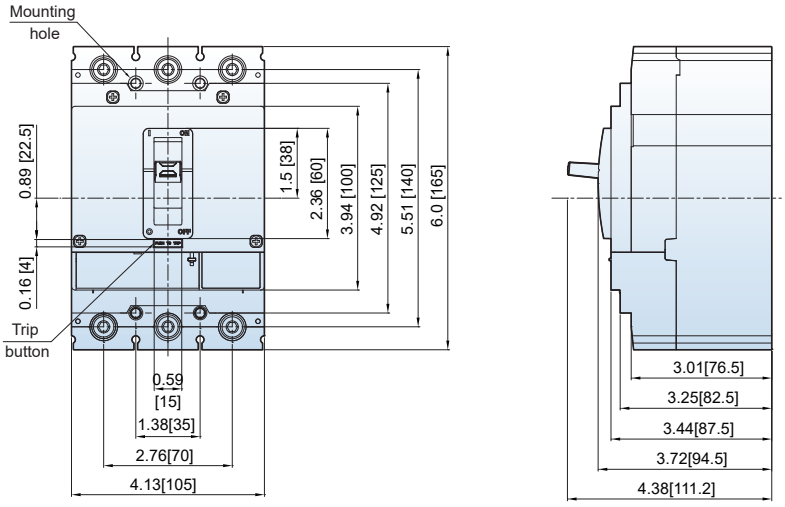
Instantaneous pickup 2~15×In
and Ground fault pickup 0.2~1×In
and delay 0.1~0.4s

UTS800Ni/Hi/Li
UTS1200Ni/Hi/Li

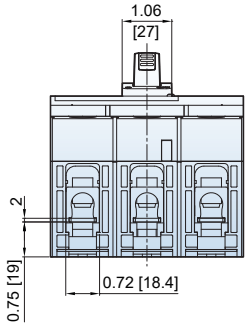


UTS150 3P Circuit Breaker [Lug type / Bolt-on type]

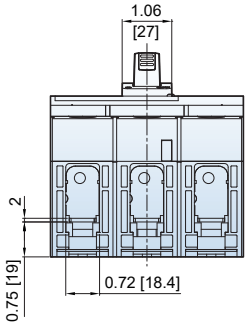
Dimensions: inch[mm]



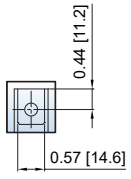
Lug type



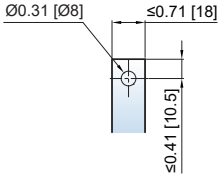
Bolt-on type



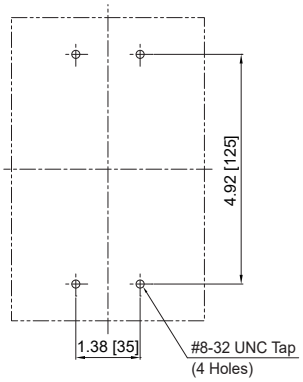
Terminal section



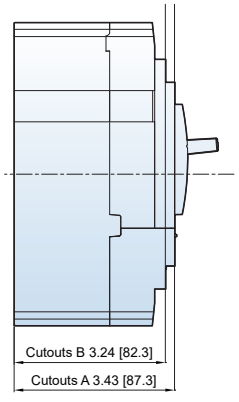
Conductor



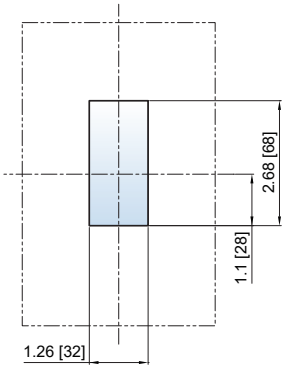
Panel drilling



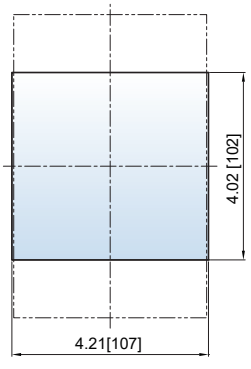
Door cutouts



Cutouts A

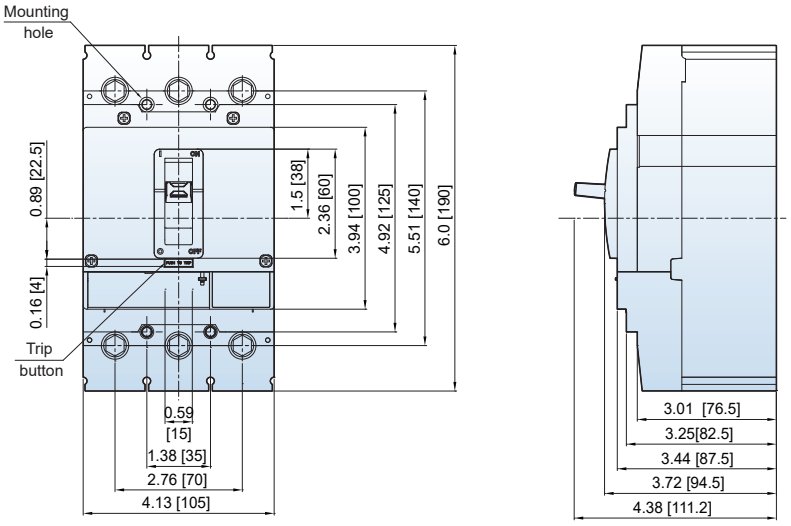


Cutouts B

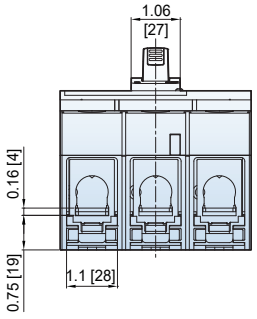


UTS250 3P Circuit Breaker [Lug type / Bolt-on type]

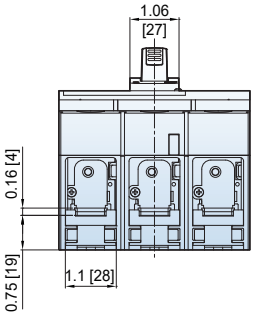
Dimensions: inch[mm]



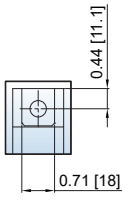
Lug type



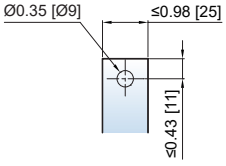
Bolt-on type



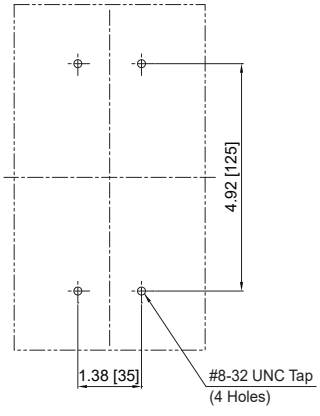
Terminal section



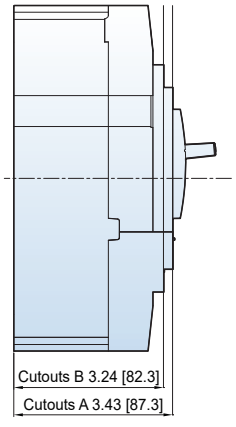
Conductor



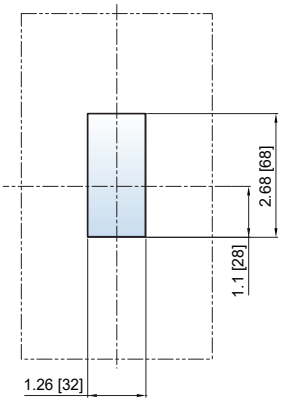
Panel drilling



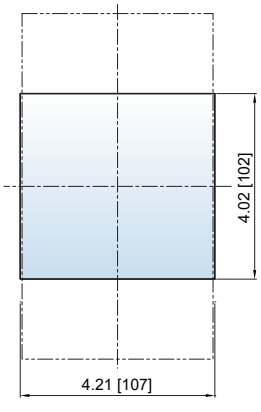
Door cutouts



Cutouts A

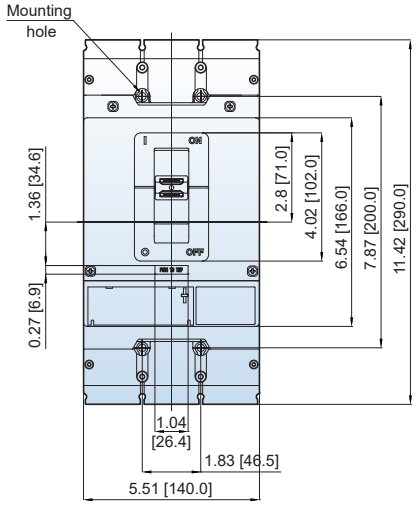


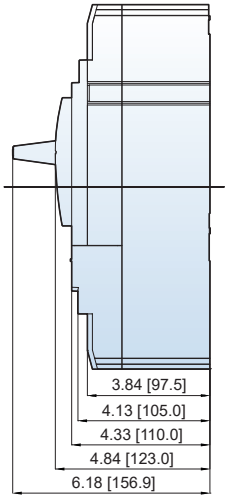
Cutouts B



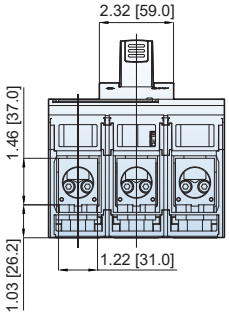
UTS400 3P Circuit Breaker [Lug type / Bolt-on type]

Dimensions: inch[mm]

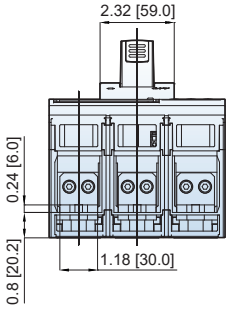




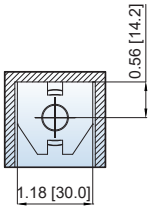
Lug type



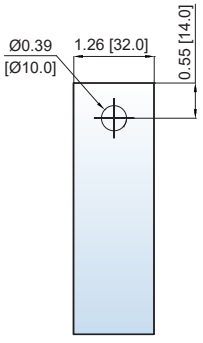
Bolt-on type



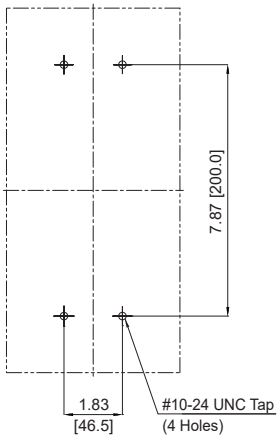
Terminal section



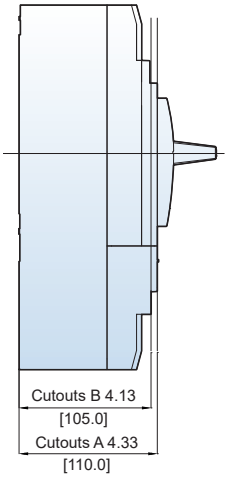
Conductor



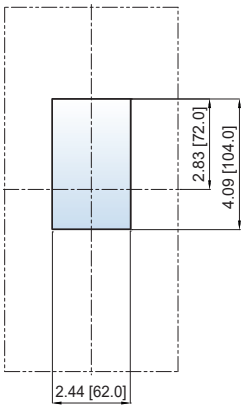
Panel drilling



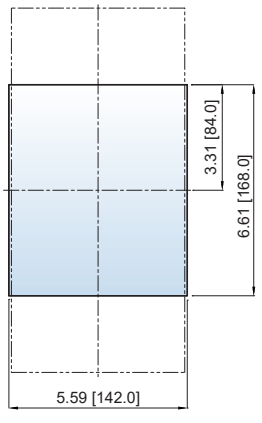
Door cutouts



Cutouts A

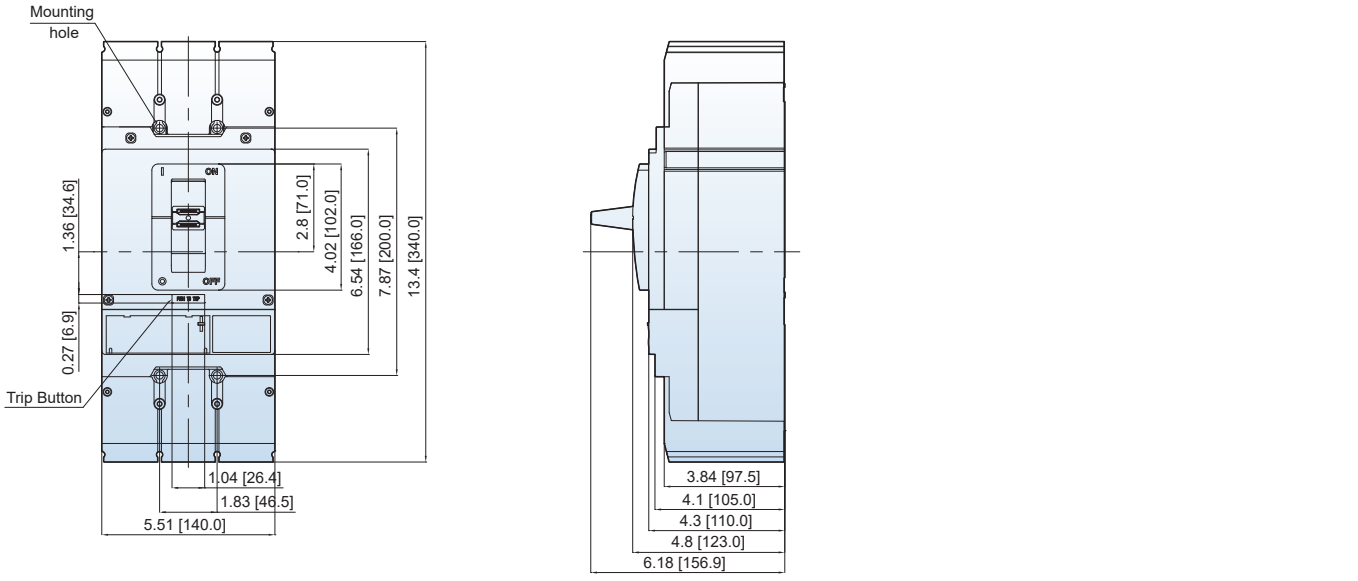


Cutouts B

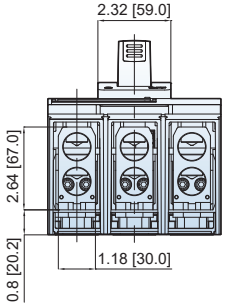


UTS600 3P Circuit Breaker [Lug type / Bolt-on type]

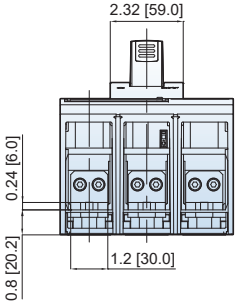
Dimensions: inch[mm]



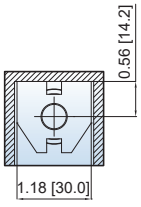
Lug type



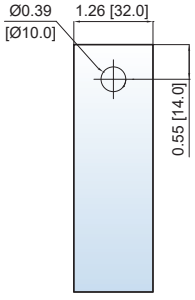
Bolt-on type



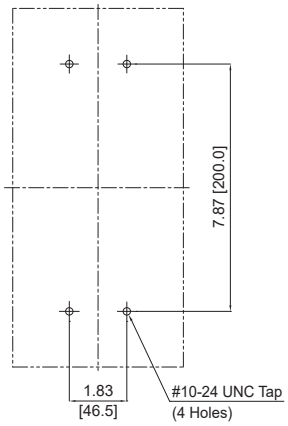
Terminal section



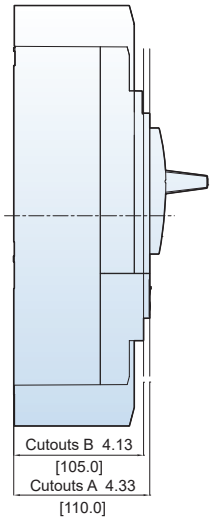
Conductor



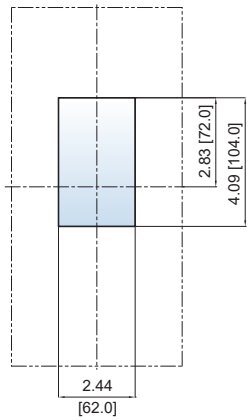
Panel drilling



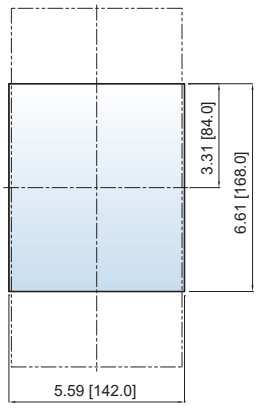
Door cutouts



Cutouts A

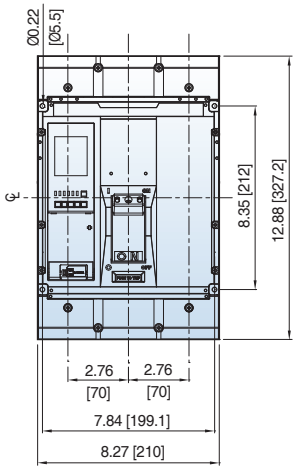


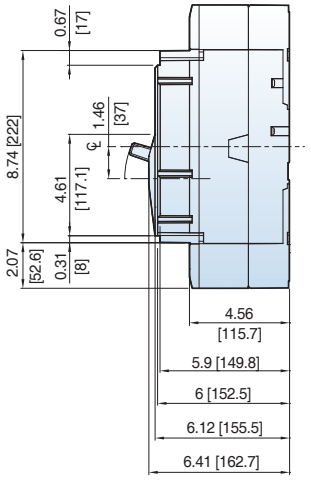
Cutouts B

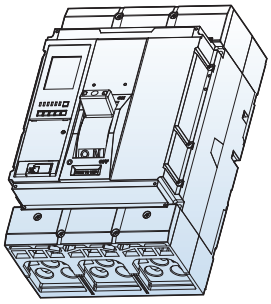


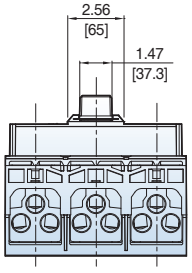
UTS800 3P Circuit Breaker [Lug type]

Dimensions: inch[mm]

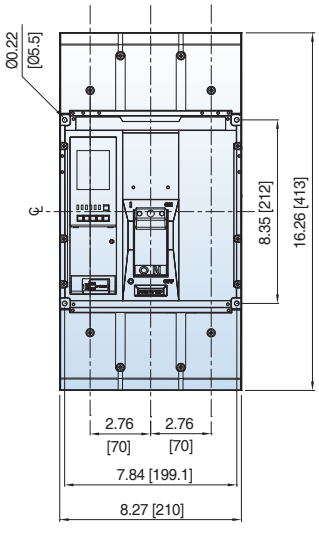


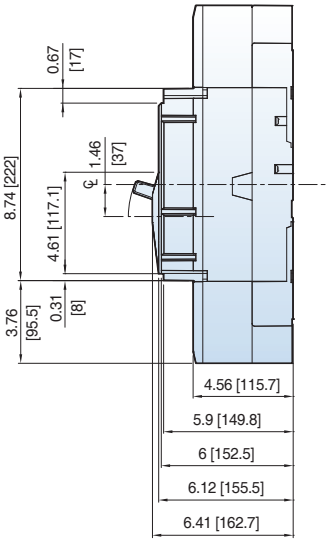


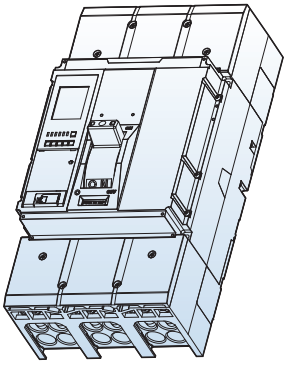


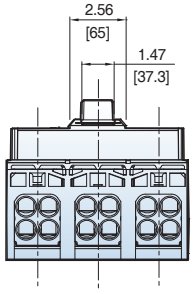


UTS1200 3P Circuit Breaker [Lug type]









Global Business

LS ELECTRIC set a mid- to long-term vision for each overseas market to broaden its global business presence. In addition to pursuing the evolution of our existing businesses, we are discovering new business opportunities and strengthening the basis of business operations to take a tailor-made approach to each local market.

1 Europe

Accelerating growth mainly in the renewable energy market

2 Middle East & Southwest Asia

Strengthening direct sales through localization

3 China

Strengthening business capabilities for power equipment and systems

4 Southeast Asia

Focusing on the sale of strategic products and project development

5 North America

Delivering global products and solutions, tapping into the Central and Latin American markets

Domestic Subsidiaries

LS Metal

Manufacturing copper tubes and STS pipes
Yongsan-gu, Seoul, Korea

- Head Office
- Seoul Office
- Domestic Worksites
- Domestic R&D Centers
- Overseas Holding Company
- Overseas Production Subsidiaries

(as of Dec. 31, 2023)

LS Mecapion	LS-Sauter	LS ITC	ACT system
Manufacturing industrial electronic equipment	**Selling BAS/IBS and GBS systems**	**Providing total IT services**	**Manufacturing industrial communication equipment**
Dalseo-gu, Daegu, Korea	Anyang-si, Gyeonggi-do, Korea	Yongsan-gu, Seoul, Korea	Anyang-si, Gyeonggi-do, Korea

Anyang	
Yongsan	
Cheongju, Cheonan, Busan	
R&D Campus (Anyang), Electric Power R&D Center (Cheongju), Power Testing & Technology Institute (Cheongju), Automation R&D Center (Cheonan), HVDC R&D Center (Busan)	
Shanghai (China), Chicago (US)	
Wuxi (China), Dalian (China), Lishui (China), Hanoi (Vietnam), Charlotte (US), Enoch (US), Istanbul (Turkey)	
Overseas Sales Subsidiaries	Hoofddorp (Netherlands), Dubai (UAE), Tokyo (Japan), Chicago (US), Istanbul (Turkey), Jakarta (Indonesia), Madrid (Spain)
Overseas Branches	Shanghai (China), Beijing (China), Guangzhou (China), Qingdao (China), Nanjing (China), Chengdu (China), Shenyang (China), Tokyo (Japan), Hanoi (Vietnam), Ho Chi Minh (Vietnam), Moscow (Russia), Bangkok (Thailand), Santa Fe Springs (US), Singapore (Singapore), Bengaluru (India), Brescia (Italy), Bastrop Campus (US)
Overseas R&D Center	Wuxi (China)

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