Tmax T5 Ekip E-LSIG
New integrated solution for energy measurement

The product

With this new trip unit, covering the range from 320A up to 630A, ABB completes its offer of 'integrated solution for energy measurement' for applications with values of rating currents starting from 16A up to 1600A.

Main characteristics

- Available for T5 in three-pole and four-pole versions.
- Protections:
  - against overloads (L): 0.18...1xIn adjustable protection threshold, with adjustable time trip curve;
  - against short-circuits with delay (S): 0,6...10xIn adjustable protection threshold, with adjustable time trip curve;
  - against instantaneous short-circuits (I): 1,5...12xIn adjustable protection threshold, with instantaneous trip curve;
  - of the neutral in four-pole circuit-breakers.
- Measurements:
  - available from 0.1xIn in Vaux mode;
  - Currents: three phases (L_1, L_2, L_3), neutral (Ne) and earth fault;
  - Voltage: phase-phase, phase-neutral;
  - Power: active, reactive and apparent;
  - Power factor;
  - Frequency and peak factor;
  - Energy: active, reactive, apparent, counter.
- Setting:
  - manual setting using the relative dip-switches on the front of the trip unit, which allow the settings to be made even when the trip unit is off;
  - electronic setting, made both locally using Ekip T&P accessory and also via remote control, with version of trip unit with communication function. The electronic setting have a wider range and a thicker regulation step. Use of electronic setting allows other functions to be activated:
    - function for protection against earth faults (G);
    - over voltage protection;
    - under voltage protection.
- LED:
  - LED on with steady green light indicating that the trip unit is supplied correctly. The LED comes on when the current exceeds 0.2xIn;
  - red LED for each protection:
    - L: LED with steady red light, indicates pre-alarm for current exceeding 0.9xI_1;
    - L: LED with flashing red light, indicates alarm for current exceeding setted threshold;
    - fixed LED MAN/ELT show the kind of active parameters;
    - LSI: LED with steady red light, shows that the protection has tripped. After the circuit-breaker has opened, connect the Ekip TT or Ekip T&P accessory to find out which protection function tripped the trip unit;
  - the trip unit is equipped with a device that detects the eventual opening solenoid disconnection thanks to the simultaneous blinking of all the LED.
- Test connector on the front of the release:
  - to connect the Ekip TT trip test unit, which allows trip test, LED test and signalling about the latest trip happened;
  - to connect the Ekip T&P unit, which allows the measurements to be read, the trip test to be conducted, the protection functions test to be carried out, electronic setting of the protection functions of the trip unit and of the communication parameters;
- Self-supply from a minimum current of 0.2xIn up.
- With version of trip unit with communication function, you can:
  - acquire and transmit a wide range of information via remote control;
  - accomplish the circuit-breaker opening and closing commands by means of the motor operator in the electronic version (MOE-E);
  - know the state of the circuit-breaker (open/closed/trip) via remote control;
  - setting the configuration and programming the unit, such as the current thresholds and the protection function curves.
- The three-pole version can be accessorized with external neutral current transformer and, in order to measure also phase powers, with external neutral voltage connection kit.

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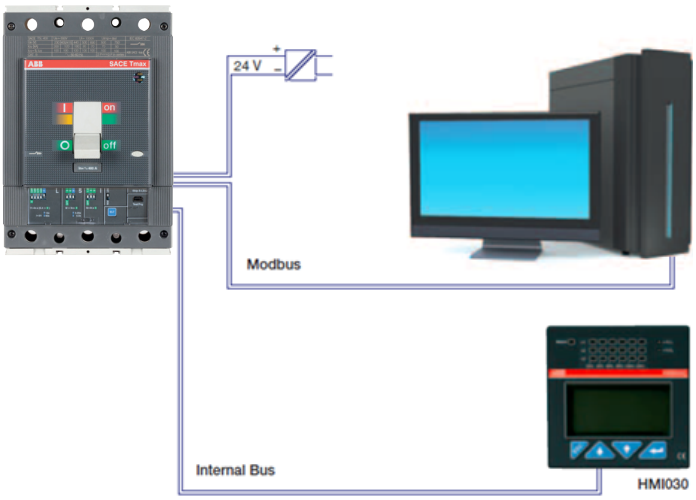
The new solution

With this new electrical trip unit, ABB offers an optimal solution for energy and power measurements without the usage of external accessories, as the device VM210



This new trip unit will have the following ratings:

Ratings IEC			
In (A)	320	400	630
T5 400	•	•	-
T5 630	•	•	•

With Ekip E-LSIG T5, upon request, will be available simultaneously the communication, through internal bus, with ABB interface on the front of the switchgear HMI030 and, through system bus, with an external MODBUS network.

Indeed for any ratings will be offered two versions:
- with MODBUS communication function
- without MODBUS communication function.

Protection features

Protection function		Trip threshold	Trip curve[1]	Excludability	Relation	Thermal memory
L	Against overloads with long inverse time delay trip according to IEC 60947-2	Manual setting: I_1= 0.4...1xIn step 0.04 Tolerance: trip between 1.1…1.3 I_1 (IEC 60947-2)	Manual setting: t_1 = 12-60s [4] at I=3xI_1 Tolerance: ±10%	–	$t = k/I^2$	–
		Electronic setting: I_1= 0.18...1xIn step 0.01 Tolerance: trip between 1.1…1.3 I_1 (IEC 60947-2)	Electronic setting: t_1 = 3...72s [4] at I=3xI_1 step 0.5 Tolerance: ±10%	–	$t = k/I^2$	Yes
S	Against short-circuits with inverse short ($t=k/I^2$) or indipendent (t=k) time delay trip	Manual setting: I_2 = OFF 3-6-9 Tolerance: ±10%	Manual setting: t_2= 0.25-0.50s Tolerance: ±10%	Yes	t = k	–
		Electronic setting: I_2 = 0.6...10xIn[3] step 0.1 Tolerance: ±10%	Electronic setting: t_2 = 0.05...0.5s step 0.01 Tolerance: ±10%	Yes	t = k	–
		Electronic setting: I_2 = 0.6...10xIn[3] step 0.1 Tolerance: ±10%	Electronic setting: t_2 = 0.05...0.4s step 0.01 at 10xIn Tolerance: ±10%	Yes	$t = k/I^2$	–
I	Against short-circuits with adjustable threshold and instantaneous trip time	Manual setting: I_3 = OFF 1.5-4-5.5-6-7.5-10-11.5[3] In Tolerance: ±10%	≤40ms	Yes	t = k	–
		Electronic setting: I_3 = 1.5...12xIn[3] step 0.1 Tolerance: ±10%	≤40ms	Yes	t = k	–
G	Against earth fault with independent time delay trip [2]	Electronic setting: I_4 = 0.2...1xIn step 0.02 Tolerance: ±10%	Electronic setting: t_4 = 0.1...0.8s step 0.01s Tolerance: ±15%	Yes	t = k	–
UV	Standard adjustable constant time	Electronic setting: U_8 = 0.5...0.95xUn step=0.01xUn Tolerance: ±5%	Electronic setting: t_8 = 0.1...5s step 0.1s Tolerance: min (±10% ±100ms)	Yes	t = k	–
OV	Against overvoltage with adjustable constant time	Electronic setting: U_9 = 1.05...1.2xUn step=0.01xUn Tolerance: ±5%	Electronic setting: t_9 = 0.1...5s step 0.1s Tolerance: min (±10% ±100ms)	Yes	t = k	–
	Neutral	Electronic setting: OFF, 50% and 100%	For I1<0.4In mandatory neutral Setting 100%			

[1] Tollerances in case of:
– self-powered trip unit at full power;
– 2 or 3 phase power supply.
In conditions other than those considered, the following tollerance hold:

Protection	Trip threshold	Trip time
L	release between 1.1 and 1.3 x I_1	±20%
S	±10%	±20%
I	±15%	≤60ms
G	±15%	±20%

[2] Protection G is inhibited for currents higher than 4 In.
[3] T5 630 I2 max = I3 max = 9.5In.
[4] T5 630 t1 max = 42s.

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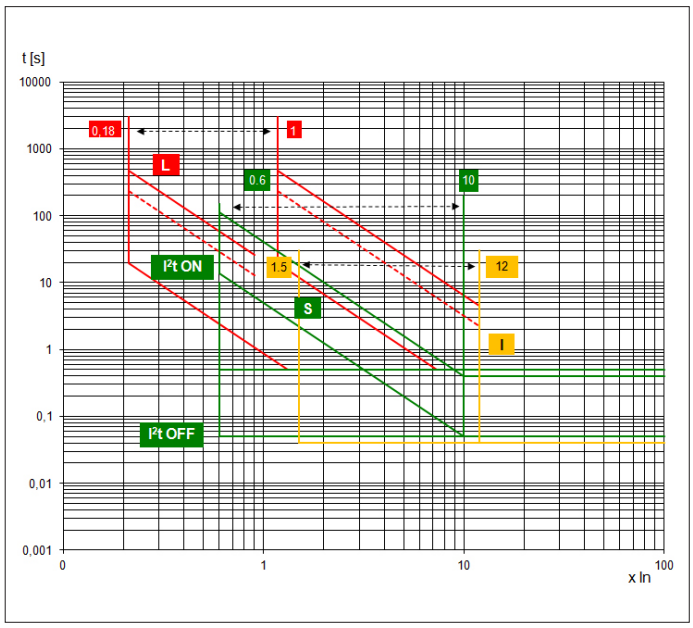
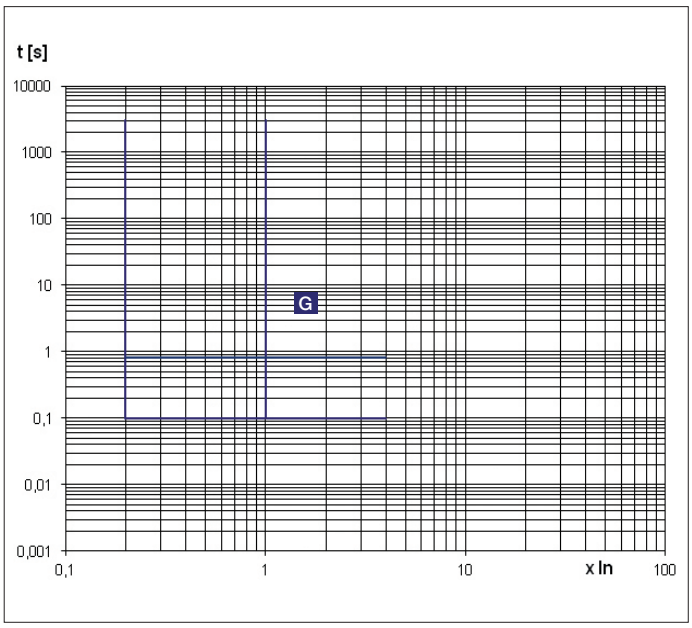
		Value	Range	Accuracy	Specified measuring range
Current		Phase current (I1, I2, I3, IN)	0.1 … 12 In	Cl 1	0.2 … 1.2 In
		Phase current minimum value			
		Phase current maximum value			
		Ground current (Ig)	0 … 4 In	–	–
Voltage		Phase voltage runtime, max and min (V1N, V2N, V3N) [3]	5 … 480 V	±0.5%	30 … 400 V
		Line voltage runtime, max and min (U12, U23, U31)	10 … 828 V	±0.5%	50 … 690 V
Power	**Active**	Phase power runtime, max and min (P1, P2, P3) [3]	-5.76 In kW … 5.76 In kW	Cl 2	-480In W … -6In W 6In W … 480In W [1]
		Total power runtime, max and min	-17.28 In kW … 17.28 In kW	Cl2	-1.44In kW … -18In W 18In W … 1.44In kW [1]
	Reactive	Phase power runtime, max and min (Q1, Q2, Q3) [3]	-5.76 In kvar … 5.76 In kvar	Cl 2	-480In var … -6In var 6In var … 4.80In var [1]
		Total power runtime, max and min	-17.28 In kvar … 17.28 In kvar	Cl2	-1.44In kvar … -18In var 18In var … 1.44In kvar [1]
	Apparent	Phase power runtime, max and min (S1, S2, S3) [3]	In VA … 5.76 In kVA	Cl 2	6In VA … 480In VA
		Total power runtime, max and min	3 In VA … 17.28 In kVA	Cl 2	18In VA … 1.44In kVA
Energy	**Active**	Total energy	1 kWh … 214.75 GWh	Cl 2	1 kWh … 214.75 GWh
		Incoming energy			
		Outgoing energy			
	Reactive	Total energy	1 kvarh … 214.75 Gvarh	Cl 2	1 kvarh … 214.75 Gvarh
		Incoming energy			
		Outgoing energy			
	Apparent	Total energy	1 kVAh … 214.75 GVAh	Cl 2	1 kVAh … 214.75 GVAh
Power quality		Harmonic analisys [2]	11th (50 - 60Hz)	–	–
		THD of phase L1, L2, L3 [2]	0 … 1000%	±10%	0 … 500%
		Frequency runtime, max, min	44 … 440 Hz	±0.2%	45 … 66 Hz
		PF of phase L1, L2, L3 [3]	-1 … 1	±2%	-1 … -0.5 0.5 … 1

[1] For: 0.2In < Ii < 1.2 In and 30V < Vi < 400V
[2] Available on demand by sending a Modbus command
[3] Not available if Neutral is not connected

Trip curves for power distribution

Functions LSIG electronic setting





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Ordering codes

The product will be available as loose trip units and also already mounted to specific breaking parts:

Codes	Descriptions
1SDA081043R1	T5N 400 Ekip E-LSIG In=320A 3p F F
1SDA081044R1	T5S 400 Ekip E-LSIG In=320A 3p F F
1SDA081045R1	T5H 400 Ekip E-LSIG In=320A 3p F F
1SDA081046R1	T5L 400 Ekip E-LSIG In=320A 3p F F
1SDA081047R1	T5V 400 Ekip E-LSIG In=320A 3p F F
1SDA081048R1	T5N 400 Ekip E-LSIG In=400A 3p F F
1SDA081049R1	T5S 400 Ekip E-LSIG In=400A 3p F F
1SDA081050R1	T5H 400 Ekip E-LSIG In=400A 3p F F
1SDA081051R1	T5L 400 Ekip E-LSIG In=400A 3p F F
1SDA081052R1	T5V 400 Ekip E-LSIG In=400A 3p F F
1SDA081053R1	T5N 400 Ekip E-LSIG In=320A 4p F F
1SDA081054R1	T5S 400 Ekip E-LSIG In=320A 4p F F
1SDA081055R1	T5H 400 Ekip E-LSIG In=320A 4p F F
1SDA081056R1	T5L 400 Ekip E-LSIG In=320A 4p F F
1SDA081057R1	T5V 400 Ekip E-LSIG In=320A 4p F F
1SDA081058R1	T5N 400 Ekip E-LSIG In=400A 4p F F
1SDA081059R1	T5S 400 Ekip E-LSIG In=400A 4p F F
1SDA081060R1	T5H 400 Ekip E-LSIG In=400A 4p F F
1SDA081061R1	T5L 400 Ekip E-LSIG In=400A 4p F F
1SDA081062R1	T5V 400 Ekip E-LSIG In=400A 4p F F
1SDA081063R1	T5N 630 Ekip E-LSIG In=630A 3p F F
1SDA081064R1	T5S 630 Ekip E-LSIG In=630A 3p F F

Codes	Descriptions
1SDA081065R1	T5H 630 Ekip E-LSIG In=630A 3p F F
1SDA081066R1	T5L 630 Ekip E-LSIG In=630A 3p F F
1SDA081067R1	T5V 630 Ekip E-LSIG In=630A 3p F F
1SDA081068R1	T5N 630 Ekip E-LSIG In=630A 4p F F
1SDA081069R1	T5S 630 Ekip E-LSIG In=630A 4p F F
1SDA081070R1	T5H 630 Ekip E-LSIG In=630A 4p F F
1SDA081071R1	T5L 630 Ekip E-LSIG In=630A 4p F F
1SDA081072R1	T5V 630 Ekip E-LSIG In=630A 4p F F
1SDA081094R1	DIALOG Ekip E-LSIG MOD.T5 (EXTR)
1SDA081082R1	Ekip E-LSIG In=320 3p T5
1SDA081083R1	Ekip E-LSIG/COM In=320 3p T5
1SDA081084R1	Ekip E-LSIG In=320 4p T5
1SDA081085R1	Ekip E-LSIG/COM In=320 4p T5
1SDA081086R1	Ekip E-LSIG In=400 3p T5
1SDA081087R1	Ekip E-LSIG/COM In=400 3p T5
1SDA081088R1	Ekip E-LSIG In=400 4p T5
1SDA081089R1	Ekip E-LSIG/COM In=400 4p T5
1SDA081090R1	Ekip E-LSIG In=630 3p T5 630
1SDA081091R1	Ekip E-LSIG/COM In=630 3p T5 630
1SDA081092R1	Ekip E-LSIG In=630 4p T5 630
1SDA081093R1	Ekip E-LSIG/COM In=630 4p T5 630
1SDA081073R1	KIT x CONNECTION Ext Ne T5

In order to receive for each complete CB the version with the communication function active, the extracode 1SDA081094R1 will have to be added.

Mechanical and Electrical accessories

The following electrical accessories for Tmax trip units:
– **Aux-E**, electronic auxiliary contacts
– **MOE-E**, stored energy motor operator
– **Aux-S51**, contact for signaling electronic trip unit tripped
– **HMI030**, interface on the front of switchgear
– **Current sensor** for external neutral
– **Ekip T&P**, test and configuration kit

and all the electrical and mechanical accessories for Tmax breaking parts will be compatible with the new trip unit Ekip E-LSIG.

For the commercial codes please refer to the technical catalogue “SACE Tmax. T Generation”.

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For more information please contact:

ABB SACE
A division of ABB S.p.A.
L.V. Breakers
Via Pescaria, 5
24123 Bergamo
Phone: +39 035 395.111
Fax: +39 035 395.306-433

www.abb.com

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