

The Simpler Solution



Automatic Power Factor Controllers



Power factor correction – now easier than ever.

New etaULTRA Series - 3 CT Input

etaSMART Series - 1 CT Input

Brought to you by Larsen & Toubro – India's largest manufacturer of LT switchgear – the etaSMART & etaULTRA Series automatically corrects the power factor, with the help of contactor & thyristor for the connection and disconnection of capacitor banks.

Packed with a specially formulated optimisation program, the controller ensures accurate power factor control at the set point and hunt free operation.

The L&T Advantage - etaULTRA

- 3- Phase Current and Voltage measurement.
- Available upto 16 steps
- Cascading - Master-slave configuration possible to increase contact output up to 64 steps.
- Dual PF setting for Mains-DG application.
- Individual harmonics measurement up to 31st order.
- PF setting - up to 3rd digit after decimal.
- Display of voltage angles and current angles for ease of troubleshooting.



The L&T Advantage - etaSMART

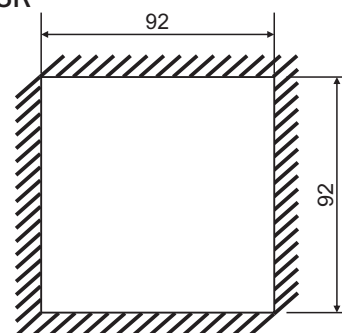
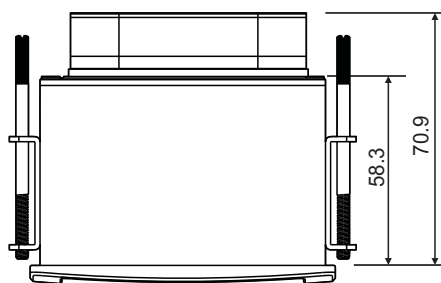
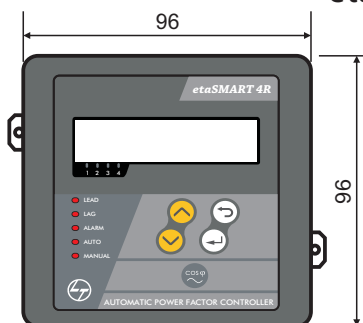
- Available up to 16 steps
- Space-saving. Compact size of 96x96 mm for controller up to 8 steps
- CT Secondary 1A/5A.
- Automatic detection of CT polarity saves time and effort. etaSMART detects the CT reversal and automatically corrects it.
- Option of LIFO, FIFO, and Intelligent control mode.
- Instant information on the quality of your power system. etaSMART measures current THD and voltage THD, and alerts you if levels go beyond set limits.
- Capacitor health check monitoring function ensures that capacitor is declared faulty if its power falls beyond a certain limit.
- Last relay output contact can be configured as Step or Alarm. Second-last relay output can be configured as Step or Fan control
- Ambient temperature monitoring via internal sensor

Technical Specifications

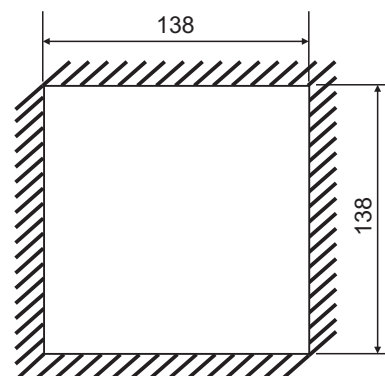
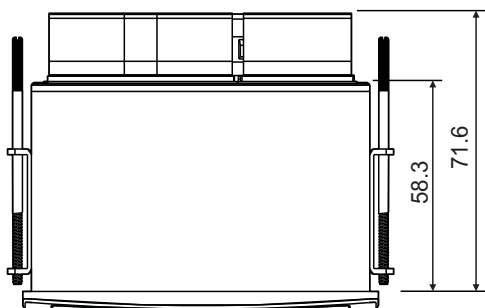
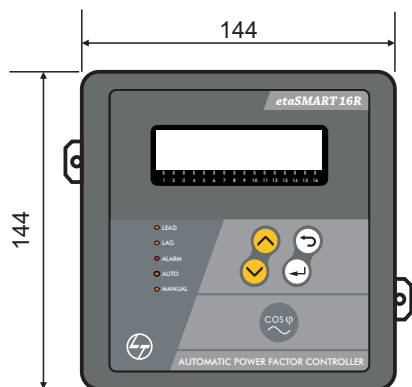
Parameter	etaSMART 'R'	etaULTRA 'R'	etaULTRA 'T'
No. of steps	4R, 6R, 8R, 12R, 14R, 16R	8R, 16R	8T, 14T
Switching device	Contactors	Contactors	Thyristor
Current measurement	Single phase	Three phase	Three phase
Current input	1A / 5A	1A / 5A	1A / 5A
Aux. Supply	-	85-300VAC	85-300VAC
Voltage input (L-L)	415 - 440 VAC	50 - 760 VAC / 110 VAC	50 - 760 VAC / 110 VAC
Rated Frequency	50-60 Hz	50-60 Hz	50-60 Hz
Output contact rating	Relay, 250 VAC@ 5 A	Relay, 250 VAC@ 5 A	Thyristor, 8-48VDC @100mA
Control Mode	Intelligent mode, LIFO, FIFO	Intelligent mode, LIFO, FIFO	Intelligent mode, LIFO, FIFO
Sensitivity (Only for Contactors logic)	5 – 300 sec	5 – 300 sec	-
Switching delay (Only for thyristor logic)	-	-	1 – 200 cycle
Relay discharge time (only for contactors logic)	10 – 300 sec	10 – 300 sec	-
Static discharge time (Only for thyristor logic)	-	-	0 – 120 s
kVAr limit	0 – 9999 kVAr	0 – 9999 kVAr	0 – 9999 kVAr
Operation Mode	Automatic, Manual	Automatic, Manual	Automatic, Manual
Communication Interface	-	Modbus RTU (RS 485)	Modbus RTU (RS 485)
Cascading	-	Up to 64 step	Up to 64 step
Display parameters	PF, V, I, Required KVar, KVA, KW, KVar, V-THD, I-THD, Hz, emperature.	System PF, Individual PF ,V, I, Required KVar, Voltage angles, Current angles, KVA, KW, KVar, V-THD, I-THD, Hz, Individual harmonics up to 31st order, Temperature.	System PF, Individual PF , V, I, Required KVar, Voltage angles, Current angles, KVA, KW, KVar, V-THD, I-THD, Hz, Individual harmonics up to 31st order, Temperature.
Record parameters	Min/Max V, Max I, Max KVA/KW/ KVar, Max V-THD, Max I-THD, Max Temperature.	Weekly avg. PF, Min/Max V, Max I, Max KVA/KW/KVar, Max V-THD, Max I-THD, Max Temperature.	Weekly avg. PF, Min/Max V, Max I, Max KVA/KW/KVar, Max V-THD, Max I-THD, Max Temperature.
Power factor control range	0.3 Lag to 0.3 Lead	0.3 Lag to 0.3 Lead	0.3 Lag to 0.3 Lead
Dual PF setting	Target PF 1 - Default Target PF 2 – In export condition	Target PF 1 - Default Target PF 2 - Based on Digital input	Target PF 1 – Default Target PF 2 - Based on Digital input
Digital Input	-	2 Digital Inputs, Programmable Range : 65-285VAC.	2 Digital Inputs, Programmable Range : 65-285VAC.
Alarms	Over / Under compensation, Over / Under voltage, Over / Under Current, High V-THD, High I-THD, Over / Under frequency, Over temperature.	Over / Under compensation, Over / Under voltage, Over / Under Current, High V-THD, High I-THD, Over / Under frequency, Over temperature, Modbus fail alarm, Capacitor fault alarm.	Over / Under compensation, Over / Under voltage, Over / Under Current, High V-THD, High I-THD, Over / Under frequency, Over temperature, Modbus fail alarm, Capacitor fault alarm.
Power consumption	7.5 VA	5.0 VA	5.0 VA
Operating temperature	-20 to +60 °C	-20 to +60 °C	-20 to +60 °C
Relative humidity	< 90 %	< 90 %	< 90 %
Mounting	Flush	Flush	Flush
Degree of protection	IP20 (Front Ip54)	IP20 (Front IP54)	IP20 (Front IP54)
Compliances	EN 61010 - 1, IEC/EN 61000-6-2, IEC/EN 61000-6-4, EN 61326	EN 61010 - 1, IEC/EN 61000-6-2, IEC/EN 61000-6-4, EN 61326	EN 61010 - 1, IEC/EN 61000-6-2, IEC/EN 61000-6-4, EN 61326

Product Dimensions

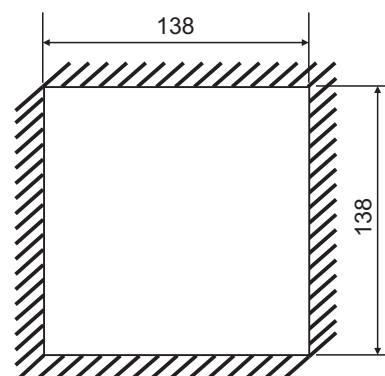
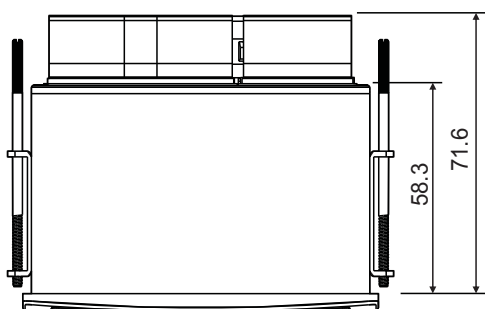
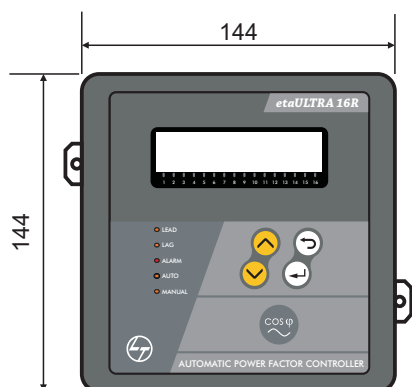
etaSMART 4R, etaSMART 6R and etaSMART 8R



etaSMART 12R, etaSMART 14R & etaSMART 16R

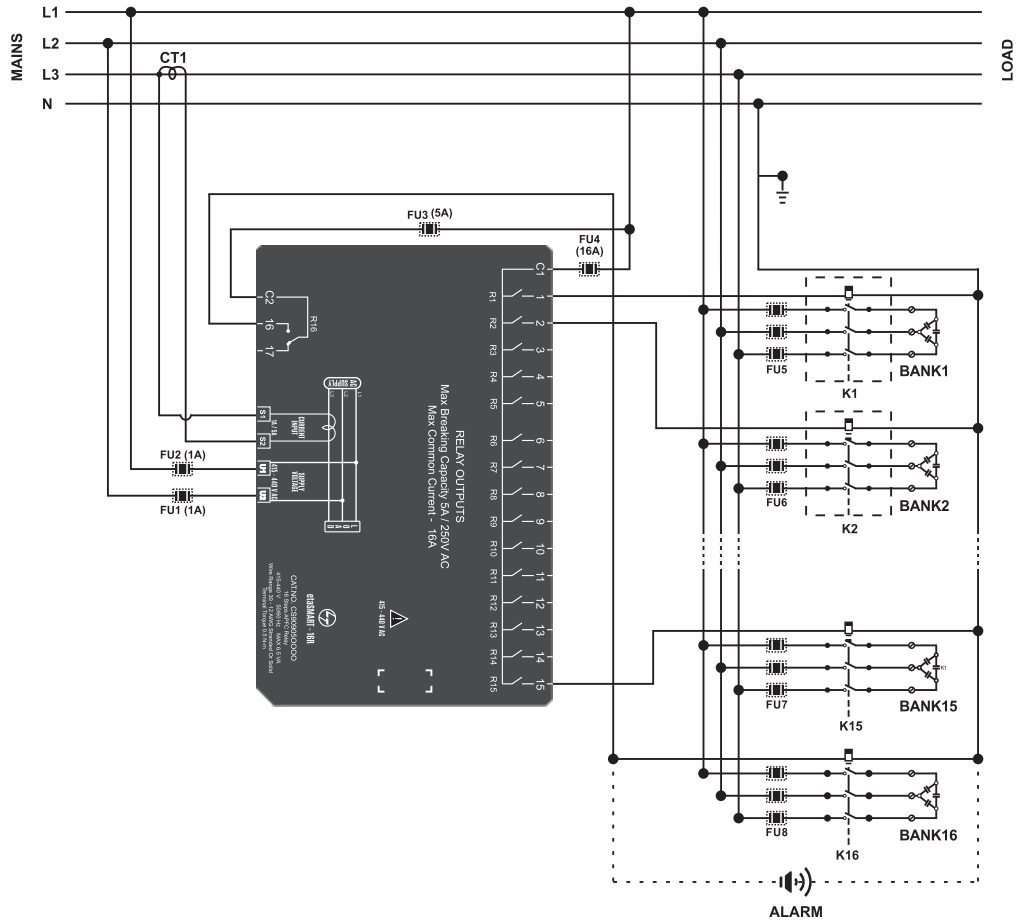
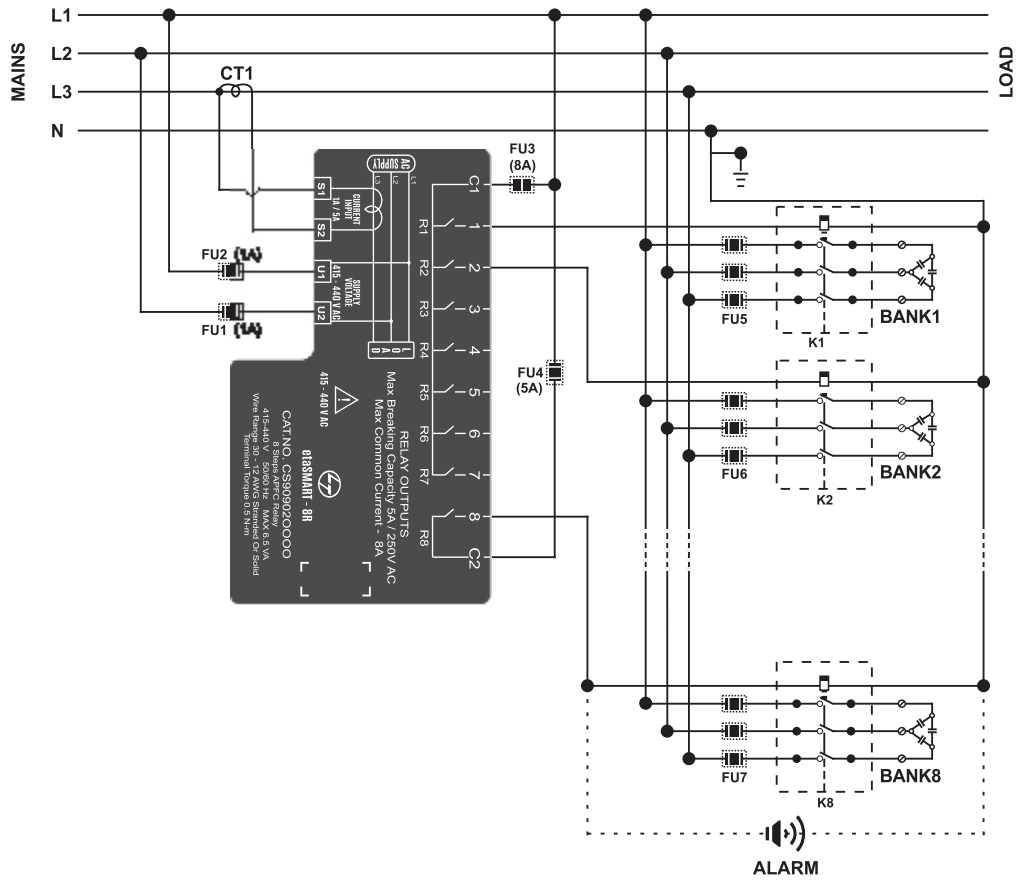


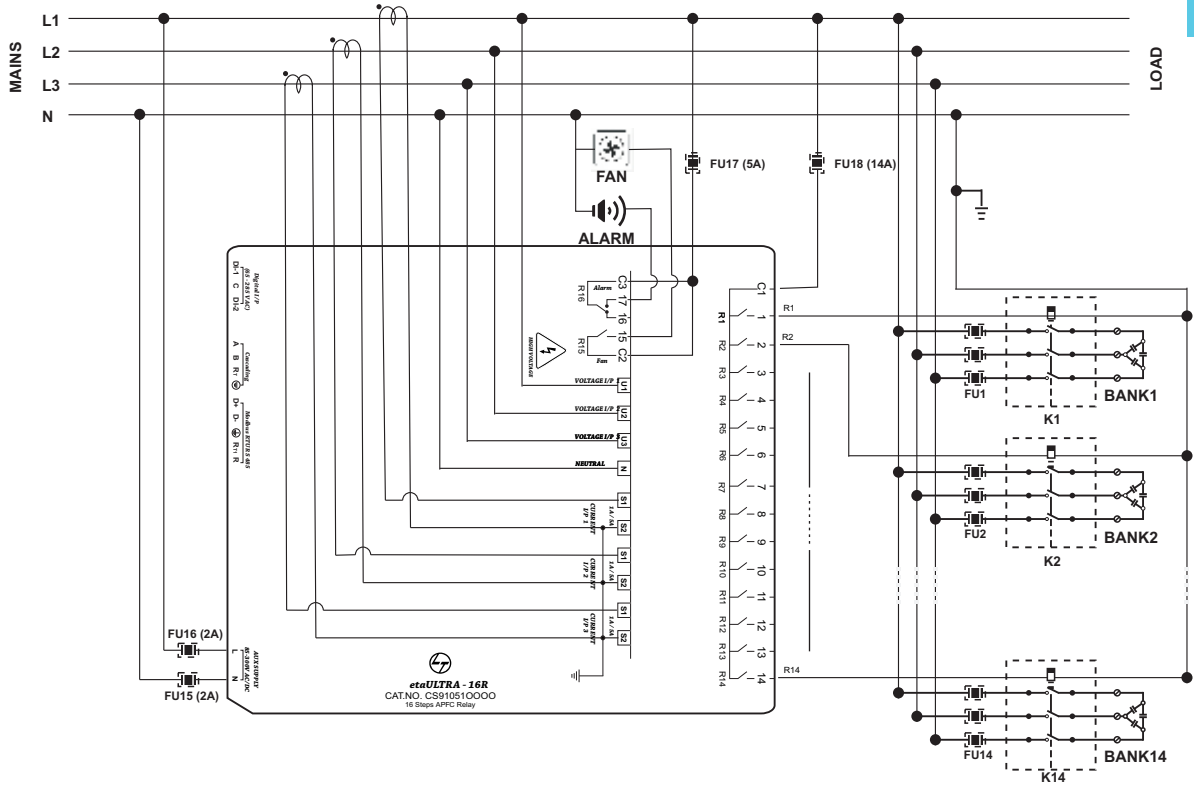
etaULTRA 8R, etaULTRA 16R, etaULTRA 8T+2R, etaULTRA 14T+2R



NOTE: All dimensions are in mm

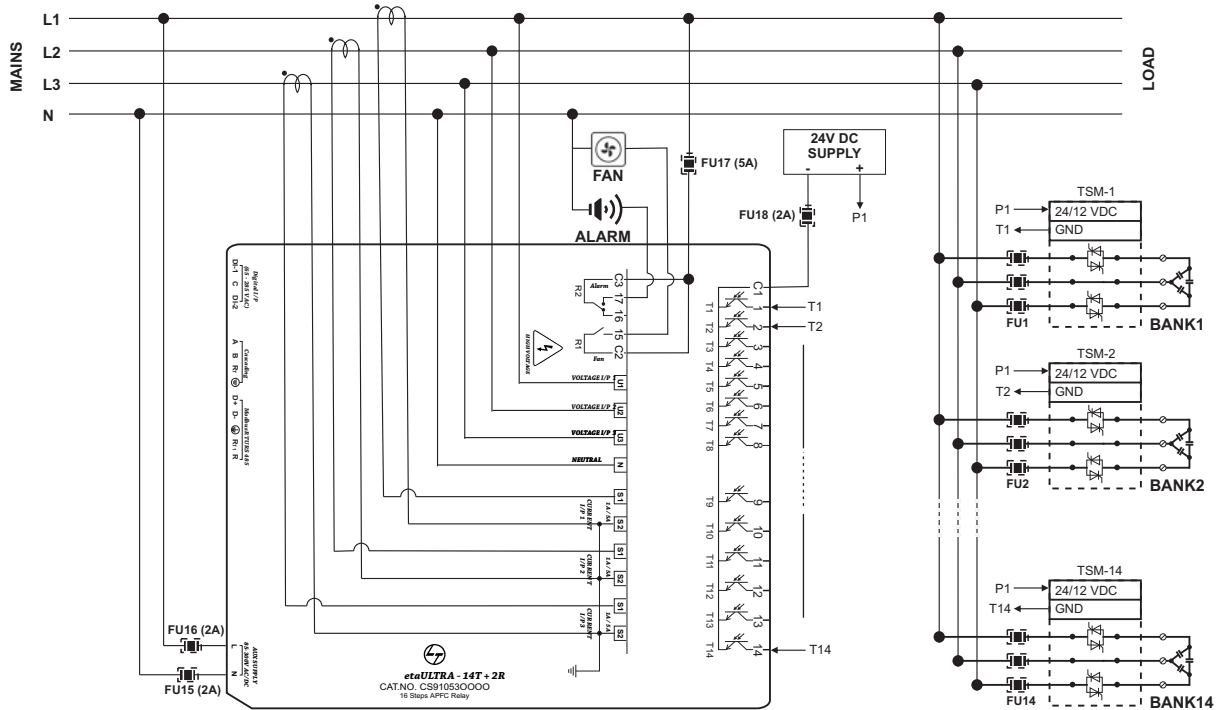
4.2 WIRING DIAGRAM





NOTE:

1. Last two relay output contacts can be configured either to switch the capacitor bank or to energise FAN and ALARM respectively as shown in wiring diagram.
2. All relay terminals, Voltage & current input terminals are suitable for wire range 12-30 AWG stranded or Solid copper wire. Modbus and cascading terminals are suitable for 14-30 AWG



NOTE:

Last two relay contacts meant for alarm and fan control. They are not to be used for thyristor control.

Power Quality Solutions



Optimise Reactive Power Solutions with etaPRO v3.0

- Save time:** Instantly select the right capacitor-reactor and switchgear combo
- Save money:** Calculate monthly payback
- Save effort:** Directly export bills of materials to MS Excel
- Discover more:** Learn improved techniques on RPM



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(For Windows-based Laptop / desktop)



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