HIGHER POWER

BLAKLEY ELECTRICS

TA series Site Transformers

Blakley Electrics TA series Site Transformers are manufactured in accordance with BS4363:1998 and provide a 110 Volt Reduced Low Voltage (RLV) Supply to BS7671 (IEE Wiring Regulations). They are available in power ratings from 4 to 20 kVA, single-phase and three-phase, with different distribution arrangements of 16A and 32A 2P+E sockets and / or hard wired lighting outlets with MCB protection and the option of RCD protection (for hard wired lighting circuits). See also data sheet ref. HPDS26 for more detailed information on Site Transformers with integral time clock and contactors to control lighting circuits.

Standard Configurations

Type	Item No.	Rating	Input MCB	Distribution
TA/P/1/4/S4	S210058	4 kVA, single-phase	16A DP	3 x 16A sockets, 1 x 32A socket ##
TA/P/1/4/C4	S210046	4 kVA, single-phase	16A DP	4 x 16A DP MCBs lighting gland outputs (3 core)
TA/P/1/4/C4-RCD	S210308	4 kVA, single-phase	16A DP	As S210046 + RCD protection of MCBs in pairs
TA/P/1/5/S5	S210237	5 kVA, single-phase	25A DP	4 x 16A sockets, 1 x 32A socket #
TA/P/1/10/S6	S210238	10 kVA, single-phase	50A DP	4 x 16A sockets, 2 x 32A sockets #
TA/P/1/10/S6/C2	S210214	10 kVA, single-phase	50A DP	As S210238 + 2 x 16A MCB lighting gland outputs (3 core)
TA/P/1/10/S6/C2-RCD	S210306	10 kVA, single-phase	50A DP	As S210214 + RCD protection of lighting MCBs
TA/P/1/10/C6	S210259	10 kVA, single-phase	50A DP	6 x 16A DP MCBs each with lighting gland outputs (3 core)
TA/P/1/10/C6-RCD	S210302	10 kVA, single-phase	50A DP	As S210259 + RCD protection of MCBs
TA/P/3/10/S6	S210230	10 kVA, three-phase	16A TP	4 x 16A sockets, 2 x 32A sockets ##
TA/P/3/10/S6/C2	S210231	10 kVA, three-phase	16A TP	As S210230 + 2 x 16A MCB lighting gland outputs (3 core)
TA/P/3/10/S6/C2-RCD	S210307	10 kVA, three-phase	16A TP	As S210231 + RCD protection of lighting MCBs
TA/P/3/10/C6	S210260	10 kVA, three-phase	16A TP	6 x 16A DP MCBs each lighting gland outputs (3 core)
TA/P/3/10/C6-RCD	S210303	10 kVA, three-phase	16A TP	As S210260 + RCD protection of MCBs
TA/P/3/10/C6/TC	S210042	10 kVA, three-phase	16A TP	6 x 16A DP MCBs, 4 x Time Clock Controlled ways (3 core)
TA/P/3/10/C6-RCD/TC	S210304	10 kVA, three-phase	16A TP	As above + RCD protection of MCBs
TA/P/3/10/C6/TC/4C	S210078	10 kVA, three-phase	16A TP	6 x 16A DP MCBs, all T/C Controlled (4 core)
TA/P/3/10/C6-RCD/TC/4C	S210305	10 kVA, three-phase	16A TP	As above + RCD protection
TA/P/3/20/S12	S210122	20 kVA, three-phase	25A TP	8 x 16A sockets, 4 x 32A sockets ##

= 2 x 16A sockets protected by 1 x 16A DP MCB. ## = Each 16A socket protected by 1 x 16A DP MCB.
All 32A sockets are individually protected by 32A DP MCBs.
Each 20mm gland is pre-wired to an individual 16A DP MCB with the option of RCD protection. The connections are 3C or 4C as shown above.
All MCBs are Merlin Gerin C60H series devices to BS EN 60898. Input MCBs are Type “D” and output MCBs are Type “C”.
All RCDs are Merlin Gerin RMG series devices, double-pole, 30mA sensitivity to BS EN 61008.

Weight and Dimensions
4 kVA single-phase: 450H x 415W x 420D; 43kgs.
5 kVA single-phase: 585H x 490W x 444D; 59kgs.
10 kVA single-phase: 585H x 490W x 444D; 82kgs.
10 kVA three-phase: 680H x 587W x 527D; 89kgs.
20 kVA three-phase: 800H x 820W x 610D; 190kgs.

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Enclosures

TA series enclosures are non-vented and provide ingress protection to IP44. They are manufactured from 1.5mm mild steel and are of seam welded construction. Enclosures are phosphate pre-treated prior to polyester powder coating, shade Traffic Yellow. MCBs are protected by a steel, hinged cover with quick release fastener. Lifting handles have been Type Tested at a Safe Working Load of 300kgs each (two handles per transformer up to 10kVA and four handles per transformer at 20 kVA).

Windings

Transformer windings are continuously rated and manufactured in accordance with BS EN 61558 Parts 1, 4 and 23. Standard ratings are 4, 5 or 10 kVA single-phase and 10 or 20 kVA three-phase. Single-phase transformers have a voltage ratio of 230:110CTE and three-phase transformers have a voltage ratio of 400:110NE, Delta/Star.

Time Clock Control

Lighting transformers are available with integral time clocks and contactors. Two versions are offered as standard. Option A is used with 3C cable and separate circuits are required for Emergency and non-Emergency fittings - only the non-emergency circuits are controlled by the time clock and contactors. Option B is used with 4C cable and all circuits can incorporate a mix of Emergency and non-Emergency fittings, with all circuits controlled by the time clock and contactors. See Higher Power Data Sheet HPDS26 for full details of Options A and B. Option B is also compatible with our new Flori-67/4P plug-in lighting system.

RCD Option

As TA transformers provide a Reduced Low Voltage system, which is deemed to be safe for normal construction site applications, why is RCD protection offered as an option for hard wired lighting circuits?
RCD protection is offered for hard wired lighting circuits in order to meet the 5 second disconnection time required for fault protection, per BS7671 Regulation 411.8.1.3. Although the low phase to earth voltage reduces the effect of electric shock (55V to earth for single-phase transformers and 63.5V for three-phase transformers) it restricts the ability of MCBs to clear earth faults with conventionally sized load conductors. Adding RCD protection removes the need to increase conductor sizes in order to lower the earth fault loop impedance. RCD protection may also be an economic option to provide fault protection on extended 110V power circuits. See below for details of cable run lengths when protection is by MCBs only.

MCB Rating, Type C	Maximum EFLI per BS7671 Table 41.6	Voltage to earth	Max Length of 1.5mm^2 Cable	Max Length of 2.5mm^2 Cable	Max Length of 4mm^2 Cable
6A	0.92Ω	55V	29M	48M	77M
10A	0.55Ω	55V	17M	29M	46M
16A	0.34Ω	55V	11M	18M	28M
6A	1.06Ω	63.5V	33M	56M	88M
10A	0.64Ω	63.5V	20M	34M	53M
16A	0.40Ω	63.5V	12.5M	21M	33M

The cable lengths are calculated using Table 4F3B of BS7671. Please note: the above cable lengths are “best case” and ignore the impedance of the cable supplying the transformer and the impedance of the transformer. Utilise the Transformer Fault Current worksheet of the Blakley Calculator at www.blakley.co.uk/excel/ElectricalFormula.xls to calculate specific fault currents / cable lengths.

Item illustrated is S210231, 10 kVA three-phase with 2 no. additional MCBs for lighting circuits

By introducing 30mA RCD protection, the theoretical maximum lengths of circuit for which disconnection in 5 seconds would still be achieved is 52km, 87km and 138km for 1.5mm², 2.5mm² and 4.0mm² respectively (based on a 50V touch voltage in accordance with BS7671 Regulation 411.8.3). Other practical considerations such as voltage drop would obviously limit these lengths, but the benefits gained by adopting RCD protection are clear. Incorporating RCDs adds costs and it is possible to protect multiple circuits with one RCD. However, as these are generally lighting circuits, should the RCD trip, it is very desirable to limit the number of circuits affected by the operation of one device. The circuit protection is provided by a separate DP MCB and DP RCD and not a combined RCBO. This is because standard RCBOs do not generally provide overcurrent protection for both poles (RLV circuits consist of L1 + L2 and not L + N) therefore true DP devices are required to comply with BS7671.

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