



Cable Data

4mm² - 3c - 31m

Copper: Cable:90°C:XLPE:SWA:BS5467:600/1000v: Table 4E4

Cable Rating I_t (tabulated)	Table 4E4A Col-3	42A		
Cable Rating I_z (effective)		42A	$I_z \geq I_b$	PASS
mV/A/mtr (tabulated)	Table 4E4B Col-4	10mV/A/m (r)		
mV/A/mtr (temperature corrected)	operating 52.99°C	8.844mV/A/m (r)		
Voltage drop permitted (per phase)	4.00% (9.24V)			
Voltage drop Calculated (per phase)	1.69%	Circuit voltage drop = 3.91V		PASS

Correction Factors

C (total) = 1.000

Ambient temperature (C_a)	30°C	$C_a = 1.000$	Table 4B1	
Grouping (C_g)	1 ccts	$C_g = 1.000$	Table 4C1	
Thermal Insulation (C_i)	0mm	$C_i = 1$	Table 52.2	

Circuit Protective conductors (cpc)

Total cpc value = 0.1002Ω

Minimum CPC size ($S = \sqrt{I^2 t/k}$)	1.30mm ²	$k = 143$	0.100 sec	$I = 589.21 A$
Cable sheath (copper equivalent)	6.43mm ²	6.43mm ²		
Internal core	4mm ²	4mm ²	$CPC \geq \sqrt{I^2 t/k}$	PASS

Protective Device Details

RCBO 30mA 32A

BS EN 61009

Selected for	Short-circuit protection only			
Rating (I_n)	32	$32 \geq 26$	$I_n \geq I_b$	PASS
Breaking capacity (I_{cn})	6kA	$6 \geq 1.78$	$I_{cn} \geq I_{sc}$	PASS
Operating current (I_2)	0.03A			
Calculated disconnection time	0.100 sec			PASS
Maximum permitted disconnection time	0.2 sec	Table 41.1		
Impedance of device (Z)	1,666.000Ω	$1,666.000 \geq 0.3920$	$Z \geq Z_s$	PASS

Earth Fault Data

Earth fault loop impedance (Z_e)	0.1300Ω			
Circuit R1 value	0.1618Ω			
Circuit R2 value	0.1002Ω			
Circuit R1+R2 value	0.2620Ω			
Earth loop impedance ($Z_s = Z_e + R1 + R2$)	0.3920Ω	$1,666.00 \geq 0.3920$	$Z \geq Z_s$	PASS
Earth fault current ($I_a = U_o / Z_s$)	589.21A	$U_o = 230.95V$	$Z_s = 0.3920\Omega$	

Short Circuit Data

Prospective short circuit current	1.78 kA			
Short circuit withstand time ($t = k^2 S^2 / I^2$)	0.942 sec	$k = 143$	$S = 4mm^2$	$I = 589.21 A$