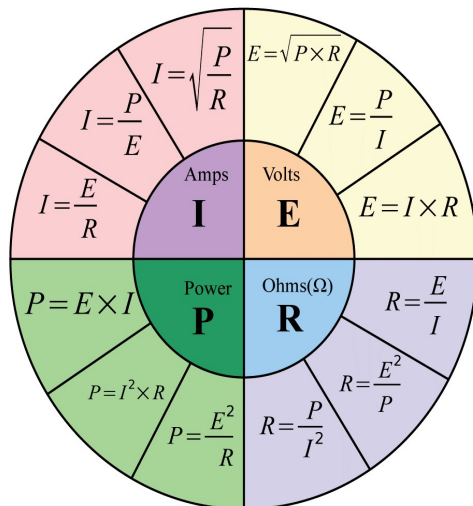


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 Step 2 Mains Size AS3008.1.1:2017 page 35 (for V75/90)
 Step3 Voltage drop AS3008.1.1:2017 page 91 (non simple)
 Step4 Find main Earth Size AS3000 Page278
 Step 5 Final sub circuits
 a) Max demand for final sub circuits
 b) Cable selection -cable protection-Voltage drop-Max route length-max fault loop ZorR

0.5m insulated <1000v
 1.0m uninsulated <1000v
 3.0m >1000 <33KV
 6.0m <33KV

$$IFL = (KV \times 1000) / (\sqrt{3} \times VP)$$

$$ISC = IFL \times 100 / Z\%$$

$$\text{Powerfactor} = \text{True power} / \text{VoltsAmps}$$

$$\text{Input power 3phase motor } P = \sqrt{3} \times V \times I \times \cos$$

$$3\text{phase to } 1\text{phase } (3\text{phase}/\sqrt{3}) = \text{single phase equivalent}$$

Cable conductor size	Single-phase (230 V) circuit	Three-phase (400 V) circuit
	Am per %Vd	Am per %Vd
1 mm ²	45	90
1.5 mm ²	70	140
2.5 mm ²	128	256
4 mm ²	205	412
6 mm ²	306	615
10 mm ²	515	1034
16 mm ²	818	1643
25 mm ²	1289	2588
35 mm ²	1773	3560
50 mm ²	2377	4772
70 mm ²	3342	6712
95 mm ²	4445	8927

Simple Method
 Cable for volt drop
 Run Length in Meters (m)
 Max demand in Amps (A)
 $A_m \times m$
 Voltage drop in % of Supply $(\frac{V_d}{V_s}) \times 100$
 $A_m / V_d \% = A_m \text{ per } \% V_d$
 Choose cable by going to the next bigger Am per %Vd
 Actual Volt drop using the selected Cable
 $A_m / A_m \text{ per } \% V_d = \text{Voltage drop over length of cable for Max demand} \times 230/100$
 Double check Vd doesn't exceed allowed Vd%
 Using 3008 method (page 91)
 Go to page 110 and choose the Vc for cable.
 (Times Vc by 1.155 for single phase)
 $V_d = I \times L \times V_c / 1000$

Nominal size of active conductor mm ²	Nominal size of copper earthing conductor, mm ²	
	With copper active conductors	With aluminium active conductors
1	1*	—
1.5	1.5*	—
2.5	2.5	—
4	2.5	—
6	2.5	—
10	4	—
16	6	4
25	6	6
35	10	6
50	16	10
70	25	10
95	25	16
120	35	25
150	50	25
185	70	35
240	95	50
300	120	70
400	≥120†	≥95†
500	≥120†	≥95†
630	≥120†	≥120†

Isolation Procedure Guide
 1. Report to supervisor
 2. Identify with the supervisor where the DB is, CB, Iso switch, motor & known live sources advice power to be turned off
 3. Complete JSA and make area safe
 4. Turn the isolation switch off, lock it, and attached danger Tag. Write your name, EW number, date, time
 5. Identify CB on the sub DB
 6. Isolate supply by switching the CB off, lock it attach Danger tag
 7. Check the multimeter on a known source
 8. Test for 0V at Terminals, Test all actives to neutral and earth
 9. Recheck the Multimeter on a known Source
 10. Check all conductor using a phase pen
 11. Label, then disconnect all terminals, insulate with tape all cables
 12. If job is not complete remove Danger tag and place a out of service tag at CB and Iso switch
 13. Advice supervisor when work is complete

SIMPLIFIED PROTECTIVE DEVICE SELECTION FOR CABLES FROM 1 mm² TO 25 mm² USED IN SINGLE-PHASE APPLICATIONS

Cable cross-sectional area mm ²		Protective device rating (In)			
		A			
		Unenclosed		Enclosed	
		In air	In thermal insulation partially surrounded	In air	In ground (see Note 3)
1	16	10	8	13	16
1.5	20	16	10	16	20
2.5	25	20	16	20	32
4	32	25	20	25	40
6	40	32	25	32	50
10	63	50	32	50	63
16	80	63	40	63	80
25	100	80	50	80	100

TABLE 8.2
MAXIMUM VALUES OF RESISTANCE OF FINAL SUBCIRCUITS AT 80% RATED CURRENT RELATING TO Zs IMPEDANCE VALUES IN TABLE 8.1

Protective device rating, amps	Conductor size		Circuit breakers						Fuses			
			Disconnection times									
	0.4 s			0.4 s			5 s					
	Active mm ²	Earth mm ²	Type B MCB		Type C MCB		Type D MCB		HRC fuses			
			R _{phs}	R _e	R _{phs}	R _e	R _{phs}	R _e	R _{phs}	R _e	R _e	
	Maximum final subcircuit resistance, Ω											
6	1.0	1.0	6.1	3.1	3.3	1.6	2.0	1.0	7.4	3.7	9.8	4.9
10	1.0	1.0	3.7	1.8	2.0	1.0	1.2	0.6	4.1	2.0	5.9	2.9
10	1.5	1.5	3.7	1.8	2.0	1.0	1.2	0.6	4.1	2.0	5.9	2.9
16	1.5	1.5	2.3	1.2	1.2	0.6	0.7	0.4	2.0	1.0	3.2	1.6
16	2.5	2.5	2.3	1.2	1.2	0.6	0.7	0.4	2.0	1.0	3.2	1.6
20	2.5	2.5	1.8	0.9	1.0	0.5	0.6	0.3	1.3	0.7	2.3	1.1
25	4.0	2.5	1.5	0.9	0.8	0.5	0.5	0.3	1.0	0.6	1.7	1.1
32	4.0	2.5	1.2	0.7	0.6	0.4	0.4	0.2	0.8	0.5	1.4	0.9
40	6.0	2.5	0.9	0.6	0.5	0.3	0.3	0.2	0.6	0.4	1.0	0.7
50	10.0	4.0	0.7	0.5	0.4	0.3	0.2	0.2	0.5	0.3	0.8	0.6
63	16.0	6.0	0.6	0.4	0.3	0.2	0.2	0.1	0.4	0.3	0.6	0.4

TABLE 8.1
MAXIMUM VALUES OF EARTH FAULT-LOOP IMPEDANCE FOR THE TOTAL CIRCUIT INCLUDING THE SUPPLY TRANSFORMER (Zs AT 230 V) VALUES RELATING TO OPERATION OF PROTECTIVE DEVICES ON THE FINAL SUBCIRCUIT

Protective device rating Amps	MCBs on the final subcircuit			Fuses on the final subcircuit	
	Type B	Type C	Type D	Disconnection times	
				0.4 s	
				0.4 s	
				5 s	
6	9.6	5.1	3.1	11.5	15.3
10	5.8	3.1	1.8	6.4	9.2
16	3.6	1.9	1.2	3.1	5.0
20	2.9	1.5	0.9	2.1	3.6
25	2.3	1.2	0.7	1.6	2.7
32	1.8	1.0	0.6	1.3	2.2
40	1.4	0.8	0.5	1.0	1.6
50	1.2	0.6	0.4	0.7	1.3
63	0.9	0.5	0.3	0.6	0.9
80	0.7	0.4	0.2	0.4	0.7
100	0.6	0.3	0.2	0.3	0.5
125	0.5	0.2	0.1	0.2	0.4
160	0.4	0.2	0.1	0.2	0.3
200	0.3	0.2	0.1	0.1	0.2