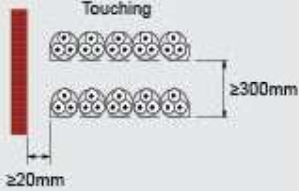
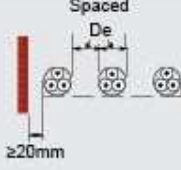
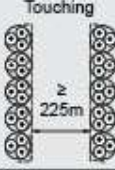
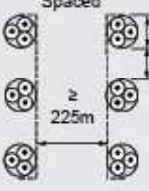
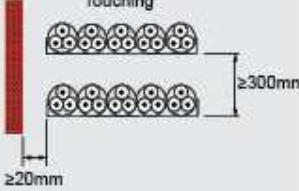
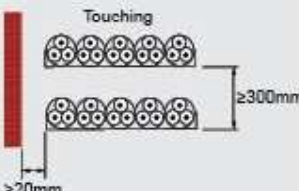
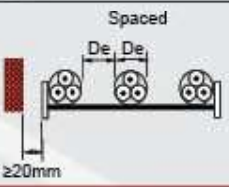


TABLE T16: RATING FACTORS FOR GROUPS OF MORE THAN ONE MULTICORE CABLE, TO BE APPLIED TO REFERENCE CURRENT-CARRYING CAPACITIES FOR MULTICORE CABLES IN FREE AIR - REFERENCE METHOD E IN TABLES T1 TO T8

Installation Method in Table T19			Number of trays or ladders	Number of cables per tray or ladder					
				1	2	3	4	6	9
Perforated cable tray systems (Note 3)	31		1	See item 3 of Table T13					
			2	1.00	0.87	0.80	0.77	0.73	0.68
			3	1.00	0.86	0.79	0.76	0.71	0.66
			6	1.00	0.84	0.77	0.73	0.68	0.64
			1	1.00	1.00	0.98	0.95	0.91	-
			2	1.00	0.99	0.96	0.92	0.87	-
			3	1.00	0.98	0.95	0.91	0.85	-
Vertical perforated cable tray systems (Note 4)	31		1	See item 3 of Table T13					
			2	1.00	0.88	0.81	0.76	0.71	0.70
			1	1.00	0.91	0.89	0.88	0.87	-
			2	1.00	0.91	0.88	0.87	0.85	-
Unperforated cable tray systems	30		1	0.97	0.84	0.78	0.75	0.71	0.68
			2	0.97	0.83	0.76	0.72	0.68	0.63
			3	0.97	0.82	0.75	0.71	0.66	0.61
			4	0.97	0.81	0.73	0.69	0.63	0.58
Cable ladder systems, cleats, wire mesh tray, etc. (Note 3)	32		1	See item 4 of Table TC1					
			2	1.00	0.86	0.80	0.78	0.76	0.73
			3	1.00	0.85	0.79	0.76	0.73	0.70
			4	1.00	0.84	0.77	0.73	0.68	0.64
	33		1	1.00	1.00	1.00	1.00	1.00	-
			2	1.00	0.99	0.98	0.97	0.96	-
			3	1.00	0.98	0.97	0.96	0.93	-
	34								

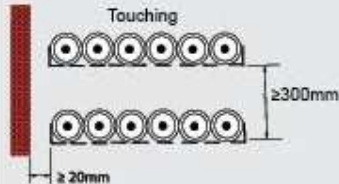
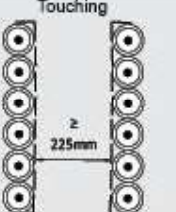
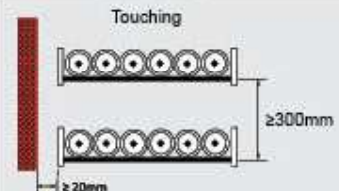
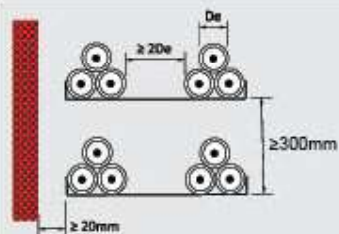
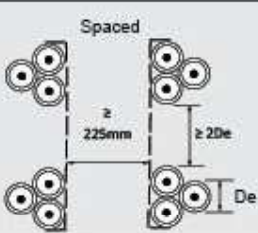
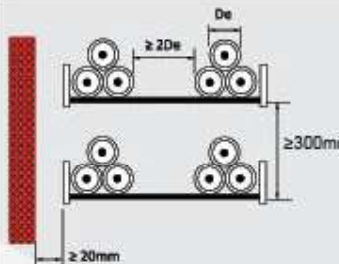
NOTE 1: Values given are averages for the cable types and range of conductor sizes considered in Tables T1 to T8. The spread of values is generally less than 5%.

NOTE 2: Factors apply to single layer groups of cables as shown above and do not apply when cables are installed in more than one layer touching each other. Values for such installations may be significantly lower and must be determined by an appropriate method.

NOTE 3: Values are given for vertical spacing between cable trays of 300mm and at least 20mm between cable trays and wall. For closer spacing the factors should be reduced.

NOTE 4: Values are given for horizontal spacing between cable trays of 225mm with cable trays mounted back to back. For closer spacing the factors should be reduced.

TABLE T17: RATING FACTORS FOR GROUPS OF ONE OR MORE CIRCUITS OF SINGLE-CORE CABLES TO BE APPLIED TO REFERENCE CURRENT-CARRYING CAPACITIES FOR ONE CIRCUIT OF SINGLE-CORE CABLES IN FREE AIR - REFERENCE METHOD F IN TABLES T1 TO T8

Installation Method in Table T19			Number of trays or ladders	Number of three-phase circuits per tray or ladder			Use as a multiplier to rating for
				1	2	3	
Perforated cable tray systems (Note 3)	31		1	0.98	0.91	0.87	Three cables in horizontal formation
			2	0.96	0.87	0.81	
			3	0.95	0.85	0.78	
Vertical perforated cable tray systems (Note 4)	31		1	0.96	0.86	-	Three cables in vertical formation
			2	0.95	0.84	-	
Cable, ladder systems, cleats, wire mesh tray, etc. (Note 3)	32 33 34		1	1.00	0.97	0.96	Three cables in horizontal formation
			2	0.98	0.93	0.89	
			3	0.97	0.90	0.86	
Perforated cable tray systems (Note 3)	31		1	1.00	0.98	0.96	
			2	0.97	0.93	0.89	
			3	0.96	0.92	0.86	
Vertical perforated cable tray systems (Note 4)	31		1	1.00	0.91	0.89	Three cables in trefoil formation
			2	1.00	0.90	0.86	
Cable ladder systems, cleats, wire mesh tray, etc. (Note 3)	32 33 34		1	1.00	1.00	1.00	
			2	0.97	0.95	0.93	
			3	0.96	0.94	0.90	

NOTE 1: Values given are averages for the cable types and range of conductor sizes considered in Tables T1 to T8. The spread of values is generally less than 5%.

NOTE 2: Factors apply to single layer groups of cables (or trefoil groups) as shown above and do not apply when cables are installed in more than one layer touching each other. Values for such installations may be significantly lower and must be determined by an appropriate method.

NOTE 3: Values are given for vertical spacing between cable trays of 300mm and at least 20mm between cable trays and wall. For closer spacing the factors should be reduced.

NOTE 4: Values are given for horizontal spacing between cable trays of 225mm with cable trays mounted back to back. For closer spacing the factors should be reduced.

NOTE 5: For circuits having more than one cable in parallel per phase, each three-phase set of conductors is to be considered as a circuit for the purpose of this table.

TABLE T18: RATING FACTORS FOR CABLES ENCLOSED IN INFLOOR CONCRETE TROUGHS

The rating factors tabulated below relate to the disposition of cables illustrated in items Table T19 and are applicable to the current-carrying capacities for Reference Methods E and F as given in the relevant tables of this appendix.

Conductor cross-sectional area	Rating Factor									
	in enclosed trench 450mm x 300mm (table T19)				in enclosed infloor concrete trough 450mm x 600mm (table T19)			in enclosed infloor concrete trough 600mm x 760mm (table T19)		
	2 single-core cables, or 1 three-or-four-core cable	3 single-core cables, or 2 two-core cables	4 single-core cables, or 2 three-or-four-core cables	6 single-core cables, 4 two-core cables, or 3 three-or-four-core cables	6 single-core cables, 4 two-core cables, or 3 three-or-four-core cables	8 single-core cables, or 4 three-or-four-core cables	12 single-core cables, 8 two-core cables, or 6 three-or-four-core cables	12 single-core cables, 8 two-core cables, or 6 three-or-four-core cables	18 single-core cables, 12 two-core cables, or 9 three-or-four-core cables	24 single-core cables, 16 two-core cables, or 12 three-or-four-core cables
1	2	3	4	5	6	7	8	9	10	11
(mm ²)										
4	0.93	0.90	0.87	0.82	0.86	0.83	0.76	0.81	0.74	0.69
6	0.92	0.89	0.86	0.81	0.86	0.82	0.75	0.80	0.73	0.68
10	0.91	0.88	0.85	0.80	0.85	0.80	0.74	0.78	0.72	0.66
16	0.91	0.87	0.84	0.78	0.83	0.78	0.71	0.76	0.70	0.64
25	0.90	0.86	0.82	0.76	0.81	0.76	0.69	0.74	0.67	0.62
35	0.89	0.85	0.81	0.75	0.80	0.74	0.68	0.72	0.66	0.60
50	0.88	0.84	0.79	0.74	0.78	0.73	0.66	0.71	0.64	0.59
70	0.87	0.82	0.78	0.72	0.77	0.72	0.64	0.70	0.62	0.57
95	0.86	0.81	0.76	0.70	0.75	0.70	0.63	0.68	0.60	0.55
120	0.85	0.80	0.75	0.69	0.73	0.68	0.61	0.66	0.58	0.53
150	0.84	0.78	0.74	0.67	0.72	0.67	0.59	0.64	0.57	0.51
185	0.83	0.77	0.73	0.65	0.70	0.65	0.58	0.63	0.55	0.49
240	0.82	0.76	0.71	0.63	0.69	0.63	0.56	0.61	0.53	0.48
300	0.81	0.74	0.69	0.62	0.68	0.62	0.54	0.59	0.52	0.46
400	0.80	0.73	0.67	0.59	0.66	0.60	0.52	0.57	0.50	0.44
500	0.78	0.72	0.66	0.58	0.64	0.58	0.51	0.56	0.48	0.43
630	0.77	0.71	0.65	0.56	0.63	0.57	0.49	0.54	0.47	0.41

NOTE 1: The factors in Table T18 are applicable to groups of cables all of one size. The value of current derived from application of the appropriate factors is the maximum current to be carried by any of the cables in the group.

NOTE 2: If due to known operating conditions, a cable is expected to carry not more than 30% of its grouped rating, it may be ignored for the purpose of obtaining the rating factor for the rest of the group.

NOTE 3: Where cables having different conductor operating temperatures are grouped together the current rating should be based on the lowest operating temperature of any cable in the group.

NOTE 4: When the number of cables used differs from those stated in the table, the rating factor for the next higher stated number of cables should be used.

TABLE T19: SCHEDULE OF INSTALLATION METHODS OF CABLES (INCLUDING REFERENCES METHODS) FOR DETERMINING CURRENT-CARRYING CAPACITY

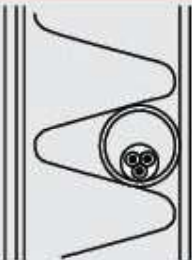
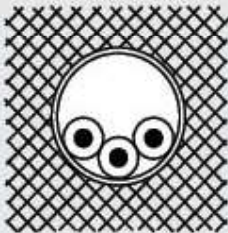
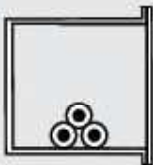
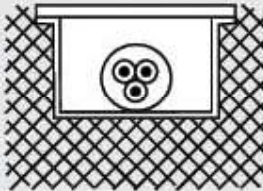

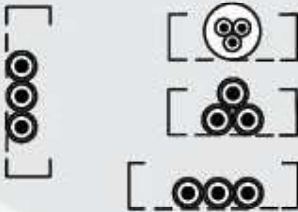
Installation method	Examples	Appropriate reference Method for determining Current-carrying capacity
Description		
Sheathed cables in conduit in a thermally insulating wall etc.		Method A
Cables in conduit embedded in masonry, brickwork, concrete, plaster or the like (other than thermally insulating materials)		Method B
In trunking		
Cables in trunking on a wall or suspended in the air		Method B
Cables in flush floor trunking		Method B
Single core cables in skirting trunking		Method B
On trays:		
Sheathed cables on a perforated cable tray, bunched and unenclosed. A perforated cable tray is considered as a tray to which the holes occupy at least 30% of the surface area		Method E or F

TABLE T19 (continued)

Installation method	Examples	Appropriate reference Method for determining Current-carrying capacity
Description		
In free air, on cleats, brackets or a ladder:		
<p>Sheathed single-core cables in free air (any supporting metalwork under the cables occupying less than 10% of the plan area):</p> <p>Two or three cables vertically one above the other, minimum distance between cable surfaces equal to the overall cable diameter (D_e); distance from the wall not less than $0.5D_e$.</p> <p>Two or three cables horizontally, with spacings as above.</p> <p>Three cables in trefoil, distance between wall and surface of nearest cable $0.5D_e$ or nearest cables $0.75D_e$.</p>		Method E, F or G
<p>Sheathed multicore cables on ladder or brackets; separation greater than $2D_e$.</p> <p>Sheathed multicore cables in free air distance between wall and cable surface not less than $0.3D_e$.</p> <p>Any supporting metalwork under the cables occupying less than 10% of the plan area.</p>		Method E or F
Cables suspended from or incorporating a catenary wire		Method E or F

Cables in building voids:

<p>Sheathed cables installed directly in a thermally insulating wall or above a thermally insulating ceiling, the cable being in contact with a thermally conductive surface on one side</p>		Method A
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TABLE T19 (continued)



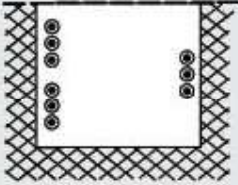
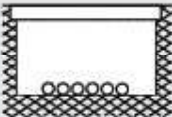
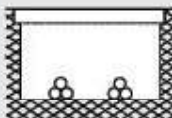
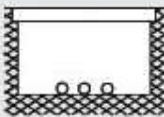
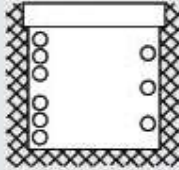
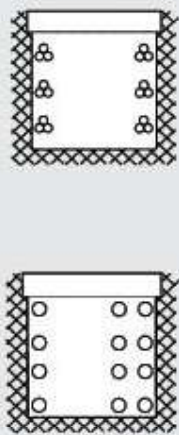
Installation method	Examples	Appropriate reference Method for determining Current-carrying capacity
Description		
Sheathed cables in ducts or voids formed by the building structure, other than thermally insulating materials	 	<p>Method A Where the cable has a diameter D_c and the duct has a diameter not greater than $5D_c$ or a perimeter not greater than $20D_c$</p> <p>Method B Where the duct has either a diameter greater than $5D_c$ or a perimeter greater than $20D_c$. Note 1 – Where the perimeter is greater than $60D_c$, installation methods E or F, as appropriate, should be used. Note 2 – D_c is the overall cable diameter. For group of cables D_g is the sum of the cable diameter.</p>
Cables in trenches:		
Cables supported on the wall of an open or ventilated trench, with spacings as indicated for reference method E or F as appropriate		Method E or F
Cables in enclosed trench 450mm wide by 300mm deep (minimum dimension) including 100mm cover	<p>Two single-core cables with surfaces separated by a minimum of one cable diameter.</p>  <p>Three single-core cables in trefoil and touching throughout.</p>  <p>Multicore cables or groups of single-core cables with surfaces separated by a minimum of 50mm</p> 	Method E or F Using rating factor in table 18

TABLE T19 (continued)

Installation method	Examples	Appropriate reference Method for determining Current-carrying capacity
Description		
Cables in enclosed trench 450mm wide by 600mm deep (minimum dimension) including 100mm cover	<p>Single-core cables arrange in flat groups of two or three on the vertical trench wall with surfaces separated by one diameter with a minimum distance of 50mm between groups. Multicore cables installed with surfaces separated by a minimum* of 75mm. All cables spaced at least 25mm from the trench wall</p> 	Method E or F Using rating factor in table 18
Cables in enclosed trench 600mm wide by 760mm deep (minimum dimension) including 100mm cover	<p>Single-core cables arranged in groups of two or three in flat formation with the surfaces separated by one diameter or in trefoil formation with cables touching.</p> <p>Groups separated by a minimum* of 50mm either horizontally or vertically.</p> <p>Multicore cables installed with surfaces separated by a minimum* of 75mm either horizontally or vertically. All cables spaced at least 25mm from the trench wall.</p> 	Method E or F Using rating factor in table 18

* Larger spacing to be used where practicable.

TABLE T20: IDENTIFICATION OF CONDUCTORS

Function	Alphanumeric	Colour
Protective conductors		Green-and-yellow
a.c. power circuit ⁽¹⁾		
Line of single-phase circuit	L	Brown
Neutral of single- or three-phase circuit	N	Blue
Line 1 of three-phase a.c. circuit	L1	Brown
Line 2 of three-phase a.c. circuit	L2	Black
Line 3 of three-phase a.c. circuit	L3	Grey

NOTE: Power circuits include lighting circuits

TABLE T21: CONDUCTOR RESISTANCE & SHORT CIRCUIT CURRENT

Conductor	Max. Conductor Resistance at 20°C		Short Circuit Current Rating at 1 second			
			Copper		Aluminium	
Size mm ²	Copper ohm/km	Aluminium ohm/km	XLPE or LSHF Cable KA	PVC Cable KA	XLPE or LSHF Cable KA	PVC Cable KA
1.5	12.1		0.215	0.173	0.141	0.114
2.5	7.41		0.358	0.288	0.235	0.190
4	4.61	7.41	0.572	0.460	0.376	0.304
6	3.08	4.61	0.858	0.690	0.564	0.456
10	1.83	3.08	1.430	1.150	0.940	0.760
16	1.15	1.91	2.288	1.840	1.504	1.216
25	0.727	1.20	3.575	2.875	2.350	1.900
35	0.524	0.868	5.005	4.025	3.290	2.660
50	0.387	0.641	7.150	5.750	4.700	3.800
70	0.268	0.443	10.010	8.050	6.580	5.320
95	0.193	0.320	13.585	10.925	8.930	7.220
120	0.153	0.253	17.160	13.800	11.280	9.120
150	0.124	0.206	21.450	17.250	14.100	11.400
185	0.0991	0.164	26.455	21.275	17.390	14.060
240	0.0754	0.125	34.320	27.600	22.560	18.240
300	0.0601	0.100	42.900	34.500	28.200	22.800
400	0.0470	0.0778	57.200	41.200	37.600	27.200
500	0.0366	0.0605	71.500	51.500	47.000	34.000
630	0.0283	0.0469	90.090	64.890	59.220	42.840
800	0.0221	0.0367	114.400	82.400	75.200	54.400
1000	0.0176	0.0291	143.000	103.000	94.000	68.000

NOTES:

$$I = 0.143A / t^{0.5}$$

$$I = 0.115A / t^{0.5} \text{ for } \leq 300\text{mm}^2$$

$$I = 0.094A / t^{0.5}$$

$$I = 0.076A / t^{0.5} \text{ for } \leq 300\text{mm}^2$$

Where I: SHORT CIRCUIT CURRENT in KA.

A: CONDUCTOR CROSS-SECTION AREA in mm².

t: TIME OF SHORT CIRCUIT in second

$$I = 0.103A / t^{0.5} \text{ for } \geq 400\text{mm}^2$$

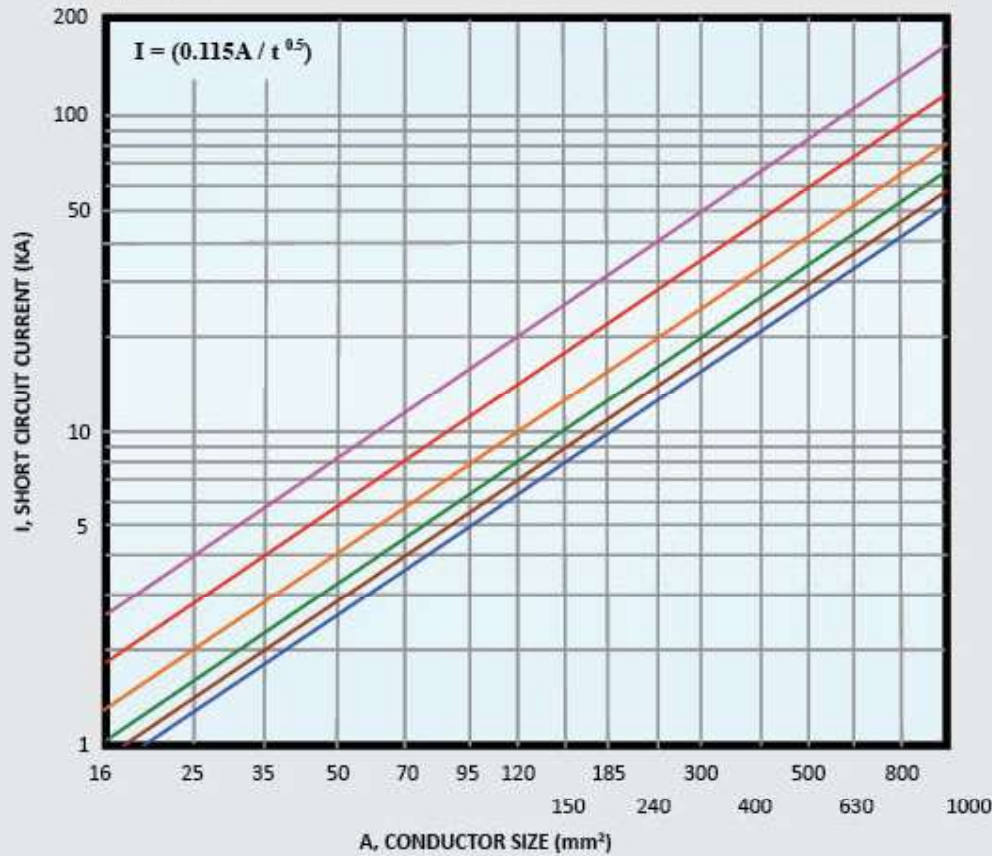
$$I = 0.068A / t^{0.5} \text{ for } \geq 400\text{mm}^2$$

SHORT CIRCUIT CURRENT FOR PVC INSULATED & XLPE INSULATED CABLES

ALLOWABLE SHORT CIRCUIT CURRENTS FOR PVC INSULATED CABLES

CONDUCTOR: COPPER

INSULATION: PVC



ALLOWABLE SHORT CIRCUIT CURRENTS FOR XLPE INSULATED CABLES

CONDUCTOR: COPPER

INSULATION: XLPE

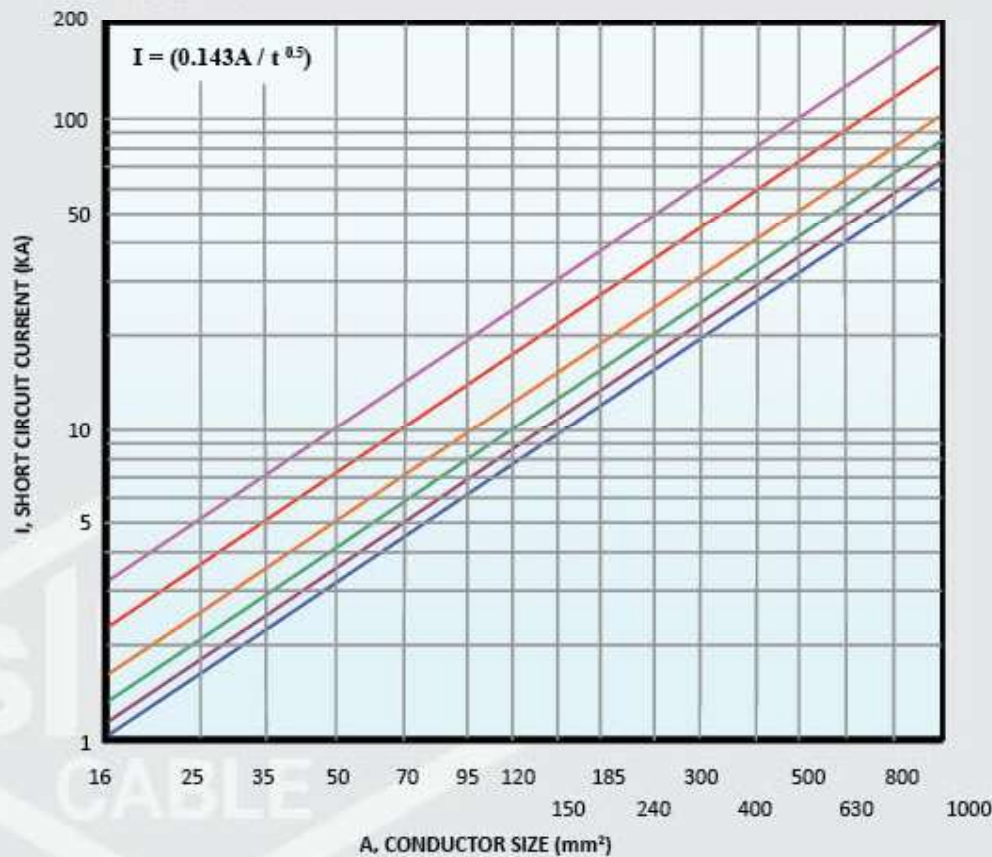


TABLE T22: MINIMUM BENDING RADIUS

Construction	OD of cable (mm)	Min. internal radius of bend
Circular copper conductor (unarmoured cable)	Up to and include 25	4 x cable OD
	Above 25	6 x cable OD
Circular copper conductor (armoured cable)	Any	6 x cable OD
All cable with solid aluminium or shaped compacted copper conductor	Any	8 x cable OD
All fire resistant cable with circular copper conductor	Any	8 x cable OD
All fire resistant cable with compacted copper conductor	Any	10 x cable OD

NOTE: Wherever possible, larger installation radii should be used.

**TABLE T23: CONVERSION TABLES
CONDUCTOR WIRE GAUGES**

AWG	SWG	Diameter		Cross-sectional Area		AWG	SWG	Diameter		Cross-sectional Area	
		mm	mil	mm ²	MCM			mm	mil	mm ²	MCM
6/0		14.732	580.0	170.5	336.40	10		2.588	101.90	5.261	10.380
5/0		13.119	516.5	135.2	266.80		13	2.337	92.00	4.289	8.465
	7/0	12.700	500.0	126.7	250.00	11		2.305	90.74	4.172	8.234
	6/0	11.786	464.0	109.1	215.30	12		2.053	80.81	3.309	6.531
4/0		11.684	460.0	107.2	211.60		14	2.032	80.00	3.243	6.400
	5/0	10.973	432.0	94.56	186.60		15	1.829	72.00	2.627	5.185
3/0		10.404	409.6	85.01	167.80	13		1.828	71.96	2.624	5.178
	4/0	10.160	400.0	81.07	160.00	14		1.628	64.08	2.081	4.107
	3/0	9.449	372.0	70.12	138.40		16	1.626	64.00	2.075	4.096
2/0		9.266	364.8	67.43	133.10	15		1.450	57.07	1.650	3.257
	2/0	8.839	348.0	61.36	121.10		17	1.422	56.00	1.589	3.136
1/0 (0)		8.252	324.9	53.49	105.60	16		1.291	50.82	1.309	2.583
	0	8.230	324.0	53.19	105.00		18	1.219	48.00	1.167	2.304
	1	7.620	300.0	45.60	90.00	17		1.150	45.26	1.038	2.048
1		7.348	289.3	42.41	83.69	18		1.024	40.30	0.8227	1.624
	2	7.011	276.0	38.60	76.18		19	1.016	40.00	0.8107	1.600
2		6.544	257.6	33.63	66.37		20	0.9144	36.00	0.6567	1.296
	3	6.401	252.0	32.18	63.50	19		0.9117	35.89	0.6529	1.288
	4	5.893	232.0	27.27	53.82		21	0.8128	32.00	0.5189	1.024
3		5.827	229.4	26.66	52.62	20		0.8116	31.95	0.5174	1.021
	5	5.385	212.0	22.77	44.94	21		0.7230	28.46	0.4015	0.8101
4		5.189	204.3	21.15	41.73		22	0.7112	28.00	0.3973	0.7840
	6	4.877	192.0	18.68	36.86	22		0.6439	25.35	0.3256	0.6426
5		4.621	181.9	16.77	33.10		23	0.6096	24.00	0.2919	0.5760
	7	4.470	176.0	15.69	30.97	23		0.5733	22.57	0.2581	0.5094
6		4.115	162.0	13.30	26.25		24	0.5588	22.00	0.2452	0.4840
	8	4.064	160.0	12.97	25.60	24		0.5106	20.10	0.2047	0.4040
7		3.665	144.3	10.55	20.82		25	0.5080	20.00	0.2027	0.4000
	9	3.658	144.0	10.51	20.74		26	0.4572	18.00	0.1642	0.3240
8		3.264	128.5	8.367	16.51	25		0.4546	17.90	0.1623	0.3204
	10	3.251	128.0	8.302	16.38		27	0.4166	16.40	0.1363	0.2690
	11	2.946	116.0	6.818	13.46	26		0.4049	15.94	0.1288	0.2541
9		2.906	114.4	6.633	13.09		28	0.3759	14.80	0.1110	0.2190
	12	2.642	104.0	5.481	10.82	27		0.3606	14.20	0.1021	0.2015

NOTE: 1MCM = 0.5067 mm²

Selection of Cable Based on Voltage Drops and Current-Carrying Capacity

Voltage drop is normally only of importance for cables of voltage rating not exceeding 600/1000 volts. If the voltage drops is to be in compliance with the Regulations of CP5/IEE Wiring Regulations, then the voltage drop for any particular cable run must be such that the total voltage drop in the circuit of which the cable forms a part does not exceed 4% of the nominal voltage.

Since the actual power factor of the load is usually

not known, the most practical approach to the question of the voltage drop is to assume the worst conditions, i.e. power factor equal to one and the conductor is at maximum operating temperature. The voltage drop value given in the tables are based on these assumptions and tabulated for a current of 1 amp for a 1 metre run, i.e. for a distance of 1 metre along the route taken by the cables, and represent the result of the voltage drops in all the circuit conductors.

For a balanced three phase a.c. circuits, the values relate to the line voltage. For any given run, the values need to be multiplied by the length of the run (in metres) and by the current (in amps) that the cables are to carry.

Voltage drop can be calculated using the following formulas:

$$V_{\max} = 4\% \times \text{supply voltage} \dots\dots\dots(1)$$

$$V_d = \frac{V_{\max} \times 1000}{I \times L} \dots\dots\dots(2)$$

$$V_c \leq V_d \dots\dots\dots(3)$$

$$V_t = \frac{V_c \times I \times L}{1000} \dots\dots\dots(4)$$

Where

I = Current (A)
 L = Length of cable installed (m)
 V_{\max} = Max. permissible volt drop in the circuit
 V_d (V)
 V_c = Max. volt drop in the circuit (mV/A/m)
 V_t = Volt drop of the selected cable (mV/A/m)
 V_t = Total volt drop in the circuit (V)

Example:

Consider a route of 200 metres of cable to be laid on a perforated cable tray and to carry a 200-amp load, the supply voltage being 400V, three phase a.c. and the cable to be copper conductor, XLPE insulated unarmoured type

1. V_{\max} = Max. permissible volt drop in the circuit = $4\% \times 400V = 16V$
2. V_d = Max. volt drop in the circuit $\frac{16 \times 1000}{200 \times 200} = 0.40\text{mV/A/m}$
3. Select a cable from Table T1a, such that the V_c value is equal to, or less than V_d , the 0.40mV/A/m calculated, at the same time ensuring that it would carry the current. It will be seen and this value (V_c) is 0.37mV/A/m (under Z in column 7 of Table T1a) giving a cable size of 120 mm².
4. V_t = Total volt drop in the circuit = $\frac{0.37 \times 200 \times 200}{1000} = 14.8V$



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TERMS AND CONDITIONS OF SALES

1. Application of Conditions

- 1.1. These Terms and Conditions of Sales (the "**Conditions**") shall apply exclusively to the sale of goods by Sigma Cable Company (Private) Limited (UEN no.: 196400204N), a private limited company incorporated in Singapore (the "**Seller**"), to the buyer (the "**Buyer**"). These Conditions (and any amendments which may be made from time to time by the Seller at its sole discretion) also apply to all future transactions and/or business relationships between the Seller and the Buyer. The term "**parties**" shall henceforth refer collectively to both the Seller and the Buyer and the term "**party**" shall refer to each of the parties. The term "**goods**" in these Conditions shall refer to the goods to be sold by the Seller to the Buyer.
- 1.2. These Conditions shall not be applicable to consumers who are individuals, who purchase the goods otherwise than exclusively for the purposes of a business.
- 1.3. These conditions govern the sales and purchase of goods ordered by Buyer from Seller ("the goods") and shall override any terms and conditions whether previously or hereafter stipulated incorporated or referred to by Buyer whether orally in its purchase order or other documents.

2. Entering into Contract

- 2.1. Each of the Seller's quotation (the "**Quotation**") are subject to written confirmation by the Seller in all instances. Any declarations or confirmation of acceptance and any purchase order placed by the Buyer must be ultimately confirmed by the Seller in writing (by letter, fax or electronic mail) (the "**Order Confirmation**") in order for them to be legally valid and binding on the parties. Each Order Confirmation so accepted or confirmed by the Seller shall be upon these Conditions and shall constitute an individual legally binding contract between the Seller and the Buyer and such contract is hereinafter referred to as a "**Contract**". The Buyer shall then drawdown on the goods ordered by requesting the Seller to deliver such proportion of the goods as the Seller may require. The aggregate value of the goods drawn down by the Buyer for each specific Contract shall +/- 3% of the total quoted value of the goods.
- 2.2. These Conditions shall override any contrary, different or additional terms (if any) contained on or referred to in an order form or other documents or correspondence from the Buyer, and no addition, deletion, alteration or substitution of these terms will bind the Seller or form part of the Contract unless they are expressly accepted in writing by an authorised personnel of the Seller.
- 2.3. All goods supplied by the Seller shall be in accordance with the current edition of the relevant product specifications in the Seller's brochures or publication (whether these are in print, electronic form, online or in any other form of media or platform) as published from time to time by the Seller. Any other goods which are not described as aforesaid shall be in accordance with the specifications set out in the Quotation by the Seller. The Seller shall not be deemed to be making any representations as to the goods in any exchange of information, correspondence and/or documentation between the parties. Except as specifically mentioned herein, no other specification, descriptive material, written or oral representation, correspondence or statement, promotional or sales literature shall form part of or be incorporated into the Contract. Notwithstanding any description of the goods given by the Seller or the Buyer, the sale of goods by the Seller shall not be construed as a sale by description.
- 2.4. The Seller reserves all rights of ownership and intellectual property rights (including copyright, design rights, trademark rights and patent rights) in and to the cost estimates, drawings and other information, in any form or media, which are provided to the Buyer.





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- 2.5. The Buyer shall indemnify the Seller against all damages, claims, costs and expenses in connection with any claims made against the Seller as a result of work done or goods sold in accordance with the Contract which involve infringement of any copyrights, patents, registered designs, trademarks or other intellectual property rights.**

3. Price and Payment

- 3.1. Unless otherwise agreed in writing by the parties, prices stated in the Quotation shall be valid for a period of time as stated in the Quotation. If the Buyer does not accept the prices in the Quotation within such stated time period, the quote shall become invalid and the Seller may, upon the request of the Buyer, provide a new price quote to the Buyer. The applicable prices shall be the prices stated in the Order Confirmation. When applicable, goods and services tax at the current statutory rate shall be added to these prices.**
- 3.2. The Buyer acknowledges that the prices of raw and other materials, components and/or parts can be highly volatile and that labour, freight, transport, delivery and other operating costs can increase significantly due to factors beyond the Seller's reasonable control including without limitation, events of Force Majeure (defined in Clause 5.8 below), foreign exchange fluctuation, currency regulations, alteration of duties, increase in costs of labour, raw materials or other costs of manufacture, or shortage of supply. Any costs increment shall be passed on to the Buyer where the Seller is subject to costs increase in excess of up to 100% as at the date of the Contract. The Seller reserves the right, by giving notice to the Buyer at any time before delivery, to increase the price of the goods to reflect any such cost increase, which is due to any factor beyond the Seller's reasonable control, including without limitation, events of Force Majeure, foreign exchange fluctuation, currency regulations, alteration of duties, increase in costs of labour, raw materials, or other costs of manufacture, or shortage of supply. The Buyer may either accept the increase in price of the goods or reject such price increment in which case the Buyer shall provide written notice to the Seller to terminate the Contract immediately without any liability to be incurred by the Buyer and the Seller.**
- 3.3. Unless otherwise stated by the Seller in writing, the Buyer shall pay for the goods based on the payment deadline stated in the Seller's invoice. The time within which the Buyer shall pay the Seller's invoice shall be of the essence for each Contract. The Buyer shall be charged interest of 1.5% per month. Such interest shall be applied to the outstanding payments in default from the date when such payment is due until the date of actual payment.**
- 3.4. The Seller reserves the right to set-off payments made by the Buyer against earlier debts incurred by the Buyer in connection with any goods purchased by the Buyer. The Seller will inform the Buyer of any set-offs made. If any costs and interests have arisen, the Seller has the right to set the payment off first against such costs, then against such interests and finally against the principal sum owing by the Buyer to the Seller.**
- 3.5. All sums payable by the Buyer under each Contract shall be paid free and clear of any deductions or withholding, except as required by law. If any such deductions or withholding are required by law, the Buyer shall pay the Seller an amount such that the Seller shall receive the sums payable under the Seller's invoices as if there was no such requirement to make a deduction or withholding.**
- 3.6. The Seller may in its absolute discretion issue a "credit facility" letter to the Buyer in which the Buyer may be able to order goods up to the stated credit limit, such credit facility letter to form part of the provisions of the Contract. The Buyer shall be entitled to drawdown on the goods confirmed in the Order Confirmation and/or such credit facility letter. Notwithstanding anything herein contained, or contained in the Quotation, the Order Confirmation or the credit facility letter, the Seller reserves the right to limit/ cancel the credit of the Buyer as to time and/or amount without giving any reasons thereof and to demand full settlement immediately of all sums that may be owing by Buyer notwithstanding that the credit period has not expired. The Seller may at**





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any time adjust the credit limit for each Buyer in its absolute discretion or demand payment for earlier delivery of the goods (whether or not payment was due then). Where the Seller deems necessary, the Seller shall also demand irrevocable letters of credit from the Buyer.

- 3.7. If the Seller is satisfied that there are circumstances that call into question the Buyer's credit-worthiness and in particular, if the Buyer dishonours a cheque or is in breach of any obligations to make payments to the Seller under these Conditions, the Seller shall have the right to demand immediate payment for any sums which are outstanding under these Conditions. In such a case, the Seller shall also have the right to demand payments in advance or provisions for security. The Seller shall then also be entitled to (i) extend the time of delivery of the goods and deliver the goods only if advance payment has been made or if adequate security has been made before the delivery of the goods or (ii) or terminate the Contract immediately and demand payment for goods already delivered and the Seller shall not be liable to deliver the remaining goods that the Buyer has not yet drawn down or requested delivery thereof.

4. Title

- 4.1. The Seller shall retain title in the goods until all payments and each and every claim under the relevant Contract in respect of such goods has been received by the Seller.
- 4.2. The Buyer shall not sell, pledge, mortgage or otherwise deal with the goods as security in respect of goods in which the Seller retains title.
- 4.3. In the event of a default in payment by the Buyer, the commencement of insolvency proceedings or seizure of assets with respect to the Buyer, the Seller (i) shall have the right to bring claims against the Buyer for outstanding payments and/or (ii) shall be entitled to recover the goods and resell the goods subject to the retention of title without the Buyer being able to make any claims against the Seller including claims of trespass of property, and the Buyer shall procure that the Seller and its employees or agents shall have the necessary access to such premises to recover the goods and/or (iii) if the Buyer has resold the goods, the Buyer shall hold the proceeds of sale on trust for the Seller and ensure that the Buyer pays the Seller promptly upon receipt of such proceeds of sale.

5. Delivery

- 5.1. Delivery of the goods shall be made by the Seller delivering the goods to the Buyer at the ground level of the agreed named location of the Buyer ("**Delivery Location**"). The Seller shall not be liable if an unauthorised person takes delivery of the goods at the Delivery Location. The Buyer shall be responsible for off-loading/ handling the goods once the goods are delivered to the Delivery Location.
- 5.2. The stated time for delivery of the goods is an estimated time only and the Seller shall not be liable for delayed delivery of the goods and any resulting damage or loss arising out of such delay. Any dates quoted for delivery of the Goods are an approximate only and the Seller shall not be liable for any delay in delivery of the goods howsoever caused, including any resulting loss or damage arising out of such delay. Time for delivery shall not be of the essence of the relevant Contract.
- 5.3. The delivery period is only deemed to have commenced when the Buyer has submitted the required documentation to the Seller according to the agreed timelines.
- 5.4. The Seller may deliver the goods in instalments. Failure or delay in delivering any instalment of goods shall not entitle the Buyer to terminate the contract.





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- 5.5. When goods are ordered by the Buyer on an ex-stock basis, availability of the goods is subject to such goods not being sold in another transaction between the date that the Seller advises the Buyer that such goods are available and the date when the Seller receives the Buyer's order.
- 5.6. If the Seller is unable to receive adequate supply of raw materials in order to have the goods manufactured for delivery to the Buyer, the Seller shall have the absolute right to terminate the Contract by notifying the Buyer as soon as practicably possible. The Buyer shall mitigate the losses by immediately finding a replacement supplier.
- 5.7. If the Buyer fails to take delivery of the goods or fails to give the Seller adequate delivery instructions at the time stated for delivery (otherwise than by reason of any cause beyond the Buyer's reasonable control or by reason of the Seller's fault) then, without prejudice to any other right or remedy available to the Seller, the Seller may:
- (i) store the goods until actual delivery and charge the Buyer for the reasonable cost (including insurance) of storage; or
 - (ii) sell the goods at the best price readily obtainable and (after deducting all reasonable storage and selling expenses) account to the Buyer for the excess over the price.
- 5.8. **The Seller shall not be liable for delay in performing or for failure to perform its obligations if the delay or failure results from Force Majeure. Following notification from the Seller to the Buyer of such cause, the Seller shall be allowed a reasonable extension of time plus an appropriate period for the performance of its obligations. If the period of Force Majeure exceeds 60 calendar days, the Seller shall be entitled to terminate the Contract by giving the Buyer 7 days' (being such 7 calendar days after the expiry of the aforesaid 60 days) written notice, whereupon the Seller shall be discharged from its obligations under the Contract. In the event of a termination of the Contract as described in this Clause, the Buyer shall not be entitled to any claims for compensation in damages if the time for delivery was extended or if the Seller is no longer obliged to deliver the goods to the Buyer.**

For the purposes of this clause 5.8, "Force Majeure" shall mean a) act of God, pandemic or epidemic, explosion, flood, tempest, fire or accident; b) war or threat of war, sabotage, insurrection, civil disturbance or requisition; c) act, restrictions (including restrictions on cross-border travels or cross-border controls), regulations, bye-laws, prohibitions or measure of any kind on the part of any governmental parliamentary or local authority; d) import or export regulations or embargoes; e) strikes, lock-outs or other industrial actions or trade disputes (whether involving employees of the Seller or of a third party); f) difficulties in obtaining raw materials, labour, fuel parts or machinery; g) power failure or breakdown in machinery h) any regional, country-wide or international event(s) affecting trade in general and/or in relation to the supply of raw and other materials, components and/or parts and/or labour, freight, transport, delivery and other operating expenses to the Seller and i) any cause or circumstance whatever beyond the Seller's reasonable control.

6. Risk

- 6.1. Risk of damage to or loss to the goods shall pass to upon delivery of the Goods to the Buyer at the Delivery Location.
- 6.2. If the Buyer delays in taking delivery of the goods, the Seller shall then have the right to demand reimbursement for any loss of the goods arising from such delay. The risk of accidental deterioration and accidental destruction of the goods passes to the Buyer if the Buyer delays in taking delivery of such goods.





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7. Acceptance of Goods and Defects

- 7.1. The Buyer shall inspect the goods immediately upon delivery of the goods to the Buyer. Unless the Seller receives a written notice from the Buyer that the goods are not in accordance with the specifications in the Order Confirmation and the goods returned to the Seller within 24 hours from the date of delivery at the Buyer's expense, the goods shall be deemed to have been accepted by the Buyer Provided That the Seller shall not accept any return of goods that have been used or processed in any way (including cables that have been cut).
- 7.2. Where there is a claim from the Buyer in respect of any of the goods which is based on any manufacturing defect in the goods or their failure to meet specification and the Buyer notifies the Seller of such a claim in accordance with these Conditions, the Seller's quality assurance team shall inspect such goods. If the Seller determines in its absolute discretion that such goods are defective, the Seller shall be entitled to replace the goods (or the part in question) and deliver to the Buyer's Delivery Location free of charge, or, at the Seller's sole discretion, refund to the Buyer the price of the goods (or a proportionate part of the price), and the Seller shall have no further liability to the Buyer. Upon delivery of the replaced goods to the Buyer, the Buyer shall have 24 hours from such date of delivery to inspect the replaced goods, provide written notification to the Seller if such goods are not in accordance with the specifications in the Order Confirmation and return such goods to the Seller, failing which the replaced goods shall be deemed to have been accepted by the Buyer. The Seller shall not accept any returned goods that have been used or processed in any way (including cables that have been cut).
- 7.3. Subject as expressly provided in these Conditions, all representations, warranties, conditions or other terms whether express, implied, statutory, under common law or otherwise relating in any way to the goods are excluded to the fullest extent permitted by law.

8. Liability of Seller and Insolvency of Buyer

- 8.1. The Seller shall not be liable to the Buyer by reason of any representation (unless fraudulent), or any other conditions, warranties, stipulations or other statements whatsoever concerning the goods, whether express or implied, in contract or tort, by statute, at common law or otherwise howsoever, for loss of profit or for any indirect, special or consequential loss or damage, costs, expenses or other claims for compensation whatsoever (whether caused by the negligence of the Seller, its employees or agents or otherwise) which arise out of or in connection with the sale of the goods (including any delay in delivery or failure to deliver the goods in accordance with these Conditions or at all) or their use or resale by the Buyer. [Notwithstanding Clause 8.1, the entire liability of the Seller under or in connection with these Conditions shall not exceed S\$10,000.00]
- 8.2. This clause 8.2 applies if:
- (i) the Buyer makes any voluntary arrangement with its creditors or becomes subject to an administration order or (being an individual or partnership) becomes bankrupt or (being a company) goes into liquidation (otherwise than for the purposes of solvent amalgamation or reconstruction); or
 - (ii) an encumbrancer takes possession, or a receiver is appointed, of any of the property or assets of the Buyer;
 - (iii) the Buyer ceases, or threatens to cease, to carry out business;
 - (iv) if any material change shall occur in the management, ownership or control of the Buyer; "material change" shall mean in this clause a change of more than 30% in the ownership or control of the Buyer or a change resulting in the ultimate



shareholders or the immediate shareholders of the Buyer owning or controlling less than 51% of the Buyer; or

- (v) the Seller reasonably apprehends that any of the events mentioned above is about to occur in relation to the Buyer and notifies the Buyer accordingly.

If this clause applies then without prejudice to any other right or remedy available to the Seller, the Seller shall be entitled to (a) cancel the Contract upon which cancellation such Contract shall be terminated or (b) suspend any further delivery of goods under the Contract without any liability to the Buyer, and if the Goods have been delivered but not paid for the price shall become immediately due and payable notwithstanding any previous agreement or arrangement with the Buyer to the contrary. The Seller shall not be liable to the Buyer for any damages that the Buyer may suffer or incur by reason thereof.

9. Confidentiality

Unless otherwise expressed or designated as confidential by the Buyer and/ or the Seller, information disclosed by the Buyer to the Seller in connection with an order for goods is not considered confidential information.

10. General Provisions

- 10.1. These Conditions shall be governed by and construed in accordance with the laws of Singapore. The United Nations Convention on Contracts for the International Sale of Goods (CISG) shall not apply to these Conditions.
- 10.2. The parties hereby submit to the non-exclusive jurisdiction of the Singapore courts.
- 10.3. The invalidity, illegality or unenforceability for any reason of any part of these terms and conditions shall not prejudice or affect the validity, legality or enforceability of the remaining terms.
- 10.4. No failure on the part of either party to exercise any rights, nor any delay in exercising any rights, under these Conditions at any time shall constitute a waiver of these Conditions nor shall any single or partial exercise of any right under these Conditions preclude any other or further exercise of any other right.
- 10.5. Unless otherwise expressly stated, the election by either party of a particular remedy in the event of default by the other party shall not be exclusive of any other remedy and all rights and remedies of the parties hereto shall be cumulative and not exhaustive of any other rights or remedies provided by the law.
- 10.6. The Buyer shall not without the prior written consent of the Seller assign transfer or sub-contract the rights or obligations under these Conditions or any part of these Conditions.
- 10.7. The Seller may assign transfer or sub-contract these Conditions or any part thereof to any other person or company.
- 10.8. A person who is not a party to these Conditions has no right under the Contracts (Rights of Third Parties) Act, Chapter 53B to enforce any term of these Conditions but this does not affect any right or remedy of a third party which exists or is available apart from that Act.