

## TECHNICAL INFORMATION

This information is intended to provide the specifier or contractor guidance on all aspects of Marshall-Tufflex Cable Management products from the specification to installation.

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## MATERIAL DATA

### PVC-U

Marshall-Tufflex Cable Management Products are produced in Extra Super High Impact PVC-U grade material capable of withstanding the most hazardous conditions on site and which exceeds the most stringent requirements of the British Standards.

#### Characteristics of Marshall-Tufflex Extra Super High Impact PVC-U

Specific Gravity	1.35-1.45
Co Efficient of Linear Expansion	$7 \times 10^{-5}/m/^{\circ}C$
Water Absorption	Negligible
Impact Resistance	See notes below
Electric Strength	To the requirements of BS4607, BS6099
Flammability	BS EN 50085, BS EN 50086 BS4607, BS6099 BS EN 50085, BS EN 50086
Oxygen Index	42%
Tensile Strength	492/562 kg/cm <sup>2</sup> (7,000/8,000 lb per sq in)
Insulation Resistance	To the requirements of BS4678, BS4607, BS6099 BS EN 50085, BS EN 50086
Chemical Resistance	See notes
Vicat Softening Point (Conduit & Trunking)	80°C BS EN ISO 306 (BS 2782-1:METHOD 120B)
Vicat Softening Point (Moulded Fittings)	76°C BS EN ISO 306 (BS 2782-1:METHOD 120B)

### CHEMICAL RESISTANCE

The material is virtually unaffected by solutions of inorganic acids, alkalis and salts and is resistant to many organic chemicals. It may be softened by some organic materials such as Ketones and aromatic compounds. It will not corrode. See Chemical Resistance table for further details.

### FIRE RESISTANCE

The materials used in Marshall-Tufflex trunking/conduit are self extinguishing and comply with the requirements of BS476 Part 6 and 7, BS4678 Part 4 and BS6099 Section 2:2. Non-flame propagating to BSEN50085 and BSEN50086.

### THERMAL PROPERTIES

Marshall-Tufflex conduit and trunking is designed to accommodate variations of ambient temperature equating to 5.25mm/3m for a temperature rise of 25°C. Operating temperatures: -5 to 60°C. Thermal conductivity: 0.19 w/m/°C.

### IMPACT RESISTANCE

High impact resistant. The material is formulated to comply with the -5°C clause of BS4678 Part 4 (1982) Cable Trunking Standard and the -5°C Heavy Gauge Requirements of BS EN 50086.

### STANDARDS

Trunking systems are manufactured to comply with the requirements of BS4678 Part 4 (1982) where applicable. Conduit systems to comply with the requirements of BSEN50086, BS6099: 1982 and BS4607.

### POLYCARBONATE

#### CHEMICAL RESISTANCE

Polycarbonate is resistant to most mineral and organic acids, a number of fats and oils, saturated aliphatic and aromatic hydrocarbons and alcohols with the exception of methyl alcohol. It is not resistant to alkalis ammonia gas and its solution, nor to amines.

#### MOULDINGS ONLY

Vicat softening point - ISO 306	VST/B 145°C
Flammability to UL94 @ 1.5mm	94V-2
Flammability - Oxygen index	35%
Density	1.2g/cm <sup>3</sup>
Water absorption (in water)	0.35%

### HIGH IMPACT FR ABS

Fire Retardant (FR) ABS has a good chemical resistance to inorganic salt solutions, alkalis, mineral acids (except strong oxidising acids) and some mineral, vegetable and animal based oils. It is attacked by organic solvents such as alcohols, esters, ketones and ethers.

#### Characteristics of Marshall-Tufflex High Impact ABS

Vicat Softening Point ISO 306	80°C
Density	1.18g/cm <sup>3</sup>
Material	UL UL listed
Flammability	UL94 V-1 at 1.5mm V-0 at 2.00mm
Flammability	BS4678:PT4:1982 Pass
Water Absorption	ASTM D570 0.3%

### ALUMINIUM

Grade HE9TF: Sterling Screen Insert.

Grade 6060TS: Sterling Series 2, PowerPole and Post, Bench Trunking Aluminium, Sterling Aluminium, Sterling XL Aluminium, Series R.

Tensile strength: 190n/mm<sup>2</sup>

Co Efficient of Linear Expansion:  $24 \times 10^{-6}/m/^{\circ}C$ .

Thermal conductivity: 120w/m/°C.

# MATERIAL DATA continued

## PVC-U CHEMICAL RESISTANCE TABLE

The resistance of unplasticised PVC to a wide range of chemicals is listed in the following table.

The symbols used to denote performance are as follows:

✓ Satisfactory

# Some attack or absorption: the material may be considered for use when alternative materials are unsatisfactory and where limited life is acceptable. When PVC is to be used with such chemicals full scale trials under realistic conditions are particularly necessary.

≈ Unsatisfactory: so rated because of decomposition, solution, swelling loss of ductility etc, of the samples tested.

For clarification and for details of resistance to other chemicals please call our technical information line on 01424 856688.

**NOTE:** To determine the suitability of PVC-U for external applications we strongly recommend you contact our Technical Sales Department on 01424 856688.

Chemical	Concentration	Unplasticised PVC	
		20°C	60°C
acetaldehyde	40% aq. solution	✓	≈
acetic acid	60% aq. solution	✓	✓
acetic anhydride		≈	≈
acetone	Traces	≈	≈
alcohol, ethyl	40% w/w water	✓	#
alcohol, isopropyl		✓	✓
alcohol, menthyl	6% aq. solution	✓	✓
	100%	✓	#
aliphatic hydrocarbons		✓	✓
aluminium chloride		✓	✓
aluminium hydroxide		✓	✓
ammonia	0.88S.G., aq solution	✓	✓
	Anhydrous gas	≈	≈
	Anhydrous liquid	≈	≈
ammonium chloride		✓	✓
ammonium hydroxide		✓	✓
aniline		≈	≈
animal oils		✓	✓
aqua regia	Dilute	✓	✓
	Concentrated	✓	≈
barium sulphate		✓	✓
beer		✓	✓
benzene		≈	≈
benzoyl chloride		≈	≈
borax		✓	✓
boric acid		✓	✓
brine		✓	✓
bromide	Traces, gas	#	≈
	100% (dry gas)	≈	≈
	Liquid	≈	≈
calcium chloride	Aq. solution	✓	✓
	20% in methyl alcohol	✓	✓
calcium hydroxide		✓	✓
calcium hypochlorite		✓	✓
carbon dioxide		✓	✓
carbonic acid		✓	✓
carbon monoxide		✓	✓
carbon tetrachloride		#	≈
castor oil		✓	✓
chloric acid		✓	✓
chlorine	100% (dry gas)	✓	#
	10% (moist gas)	#	#
chlorine water	Sat. solution	#	#
chloroform		≈	≈
chrome alum		✓	✓
chromic acid	Plating solution	✓	✓

Concentration	Unplasticised PVC		
	20°C	60°C	
cider	✓	✓	
citric acid	✓	✓	
copper chloride	✓	✓	
copper cyanide	✓	✓	
copper nitrate	✓	✓	
copper sulphate	✓	✓	
cupric sulphate	✓	✓	
cyclohexanone	≈	≈	
detergent, synthetic All concentrations	✓	✓	
developers, photographic	✓	✓	
dextrin	✓	✓	
dextrose	✓	✓	
dialzo salts	✓	✓	
dichlorodifluoromethane	✓	✓	
diethyl ether	≈	≈	
emulsifiers All concentrations	✓	✓	
emulsions, photographic	✓	✓	
ethyl acetate	≈	≈	
ethylene glycol	✓	✓	
ethylene oxide	≈	≈	
fatty acids	✓	✓	
ferric chloride	✓	✓	
ferric nitrate	✓	✓	
ferric sulphate	✓	✓	
ferrous ammonium citrate	✓	✓	
ferrous chloride	✓	✓	
ferrous sulphate	✓	✓	
fixing solution, photographic	✓	✓	
fluorine	#	#	
formaldehyde 40% w/w water	✓	✓	
formic acid 50% solution	✓	#	
	100% solution	✓	≈
fructose		✓	✓
fruit pulp		✓	✓
glucose		✓	✓
glycerol		✓	✓
grape sugar		✓	✓
heptane		✓	✓
hydrobromic acid 100%		✓	✓
hydrochloric acid 22% aq. solution		✓	✓
	Concentrated	✓	✓
	40% aq. solution	✓	#
	60% aq. solution	#	≈
	Concentrated	≈	≈
hydrogen bromide Anhydrous		✓	✓
hydrogen chloride Anhydrous		✓	✓
hydrogen fluoride Anhydrous		✓	✓
hydrogen peroxide 3% (10vol)		✓	✓
	12% (40 vol)	✓	✓
	30% (100 vol)	✓	✓
	90% and above	✓	✓
hydrogen sulphide		✓	✓
iodine Solution in potassium iodide		≈	≈
lactic acid 10% aq. solution		✓	✓
	100%	≈	≈
lanoline		✓	✓
linoleic acid		✓	✓
linseed oil		✓	✓
magnesium hydroxide		✓	✓
maleic acid 50% aq. solution		✓	✓
	Concentrated	✓	#
metallic soaps (water soluble)		✓	✓
methyl bromide		≈	≈
methyl chloride		≈	≈
methyl cyclohexanone		≈	≈
methyl ethyl ketone		≈	≈
methyl isobutyl ketone		≈	≈
methylated spirit		✓	✓
methylene chloride		≈	≈
milk		✓	✓
mineral oil		✓	✓
mixed acids (sulphuric/nitric Various proportions)		#	≈
molasses		✓	✓
naphtha		✓	✓
naphtalene		≈	≈
nicotine		✓	✓

Concentration	Unplasticised PVC		
	20°C	60°C	
nitric acid 5% aq. solution	✓	✓	
	50% aq. solution	#	
nitrobenzene	≈	≈	
oleic acid	✓	✓	
oxalic acid	✓	✓	
oxygen	✓	✓	
ozone	✓	✓	
paraffin	✓	✓	
pentane	✓	✓	
petrol	✓	✓	
phosphoric acid 30% aq. solution	✓	✓	
	95% aq. solution	✓	✓
photographic developers		✓	✓
potassium bromide		✓	✓
potassium carbonate		✓	✓
potassium cyanide		✓	✓
potassium ferricyanide		✓	✓
potassium hydroxide 10% aq. solution		✓	✓
	Concentrated	✓	✓
potassium hypochlorite		✓	✓
potassium permanganate		✓	✓
propane		✓	✓
propylene glycol		✓	✓
propylene oxide		≈	≈
saccharose		✓	✓
sea water		✓	✓
silver nitrate		✓	✓
soap solution		✓	✓
sodium bicarbonate		✓	✓
sodium bisulphite		✓	✓
sodium borate		✓	✓
sodium bromide		✓	✓
sodium carbonate		✓	✓
sodium chlorate		✓	✓
sodium chloride		✓	✓
sodium cyanide		✓	✓
sodium ferricyanide		✓	✓
sodium ferrocyanide		✓	✓
sodium fluoride		✓	✓
sodium hydroxide 40% aq. solution		✓	✓
	Concentrated	✓	✓
sodium hypochlorite 15% Cl		✓	✓
sodium hyposulphate		✓	✓
sodium nitrate		✓	✓
sodium peroxide		✓	✓
sodium silicate		✓	✓
sodium sulphate		✓	✓
sodium sulphide 25% aq. solution		✓	✓
	Concentration	✓	✓
sodium sulphite		✓	✓
soft soap		✓	✓
surface active agents All concentrations (emulsifiers, synthetic detergents and wetting agents)		✓	✓
starch		✓	✓
stearic acid		✓	✓
sucrose		✓	✓
sulphur Colloidal		✓	✓
	Dry	✓	✓
	Liquid	#	≈
sulphuric acid 80% aq. solution		✓	✓
	90% aq. solution	✓	#
	Fuming	≈	≈
sulphurous acid 10% aq. solution		✓	✓
tallow		✓	✓
tanning extracts		✓	✓
tartaric acid		✓	✓
transformer oil		✓	✓
trichloroethane		≈	≈
trichloroethylene		≈	≈
turpentine		✓	✓
vegetable oils		✓	✓
vinegar		✓	✓
water		✓	✓
wetting agents All concentrations		✓	✓
wines and spirits		✓	✓
xylene		≈	≈
zinc carbonate		✓	✓
zinc chloride		✓	✓
zinc sulphide		✓	✓

## STERLING RANGE

### STERLING PVC TRUNKING SYSTEMS

#### GENERAL GUIDELINES

The properties of PVC-U (unplasticised polyvinyl chloride) make it an ideal cable trunking material. Resistant to impact and inert to atmospheric environments. The Sterling range is a 'clip-on' modular system ideal for the management of data, communication and power cables.

Available in Mono, Mono Plus, Compact, Sterling Profile and Sterling XL ranges, with multi-segregated compartments for both dado and skirting, mounting in either a horizontal or vertical plane.

Fully compatible with the current range of switches, sockets and outlet units. Adaptable to accommodate future wiring alterations or additions.

#### EXPANSION/CONTRACTION

PVC-U expands/contracts at a uniform rate approx 5.25mm in a 3 metre length for a temperature change of 25°C.

Adequate allowance is made for thermal movement, within the fittings, which have a 10mm overlap on each side. A 3mm gap between each length of trunking base is recommended.

#### POSITIONING

When using as a skirting system sufficient clearance should be allowed for between the floor covering and the profile fittings which clip over the cover (5mm + floor covering).

#### INSTALLATION

All Sterling bases are supplied with pre-cut elongated holes at 250mm centres along its length to facilitate fastening. Internal Couplers on the base units are not required.

When fastening the base use No. 8 round head screws and washers, avoid over tightening to permit thermal movement. When aluminium screening is to be fitted the pre-cut elongated holes cannot be used. Therefore, drilling of a 6mm hole through screening and base is necessary. Fasten in the manner previously described.

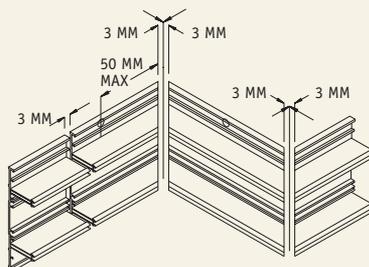
To cut the trunking use a fine toothed panel or power jig-saw. The cutting does not have to be critical as the external profile fittings overlap the joints by up to 10mm and cover any inaccuracies. An electric variable angle jig-saw or chop saw will aid with the cutting to length and the 45 degree mitres of the trunking base.

#### SINGLE LENGTHS

Where it is required to fit a single length of trunking between two inside walls (under 3 metres) it is advisable to place an additional coupler set in the centre of the trunking run to facilitate the removal of the cover if no accessory has been fitted.

#### JOINTS AND BENDS (excluding Mono Plus and Sterling XL External Bends - see below)

All joints should have a 3mm gap to allow for expansion. At corners the trunking base must be mitred to ensure total enclosure of the trunking, including any internal segregator fitted. The cutting is not critical as the fittings cover the joint and overlap the trunking lid thus covering any inaccuracies.



#### MONO PLUS/XL EXTERNAL BENDS

Mono Plus and XL should be cut square at the corner and an internal segregator inserted as shown in Diagram 1 for XL, Diagram 2 for Mono Plus which gives additional retention to the clip-on fitting.

Diagram 1 XL

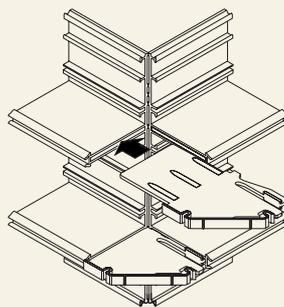
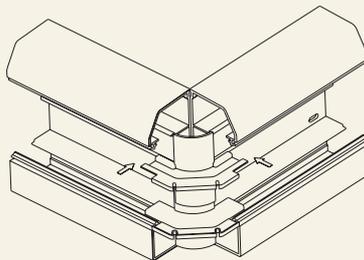
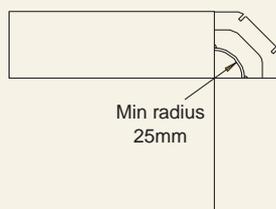


Diagram 2 Mono Plus



#### BEND RADIUS CONTROL

The performance of data transmission is reduced when the bend radius of the cable is exceeded beyond that which is recommended. The use of Mono Plus trunking assists in meeting this minimum bend radius requirement



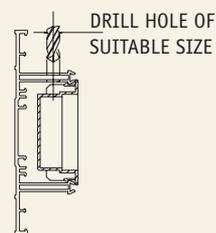
Mono Plus 20 and 30

#### MONO/MONO PLUS ACCESSORY BOXES

Remove the appropriate KO or drill the box and feed the cables into the box and clip into the desired location. For the outer compartments (Mono Plus) clip the dividing segregator into position between each accessory box.

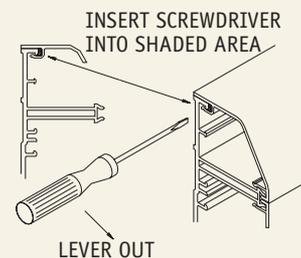
#### COMPACT/PROFILE/XL TRUNKING ACCESSORY BOXES

Drill the main web and any Data Accessory Boxes in the desired position. For main compartment supply, remove the appropriate box knock-outs, feed the cable into box and then clip the box into trunking base. When assembled the lid is butt joined to the edge of the box (ESSB type only) which is subsequently covered when the accessory is fitted. When boxes are installed consecutively a 14mm wide spacer (ES1) is required to cover the space between the boxes. All cut edges of lid are concealed by the accessory or external fitting.



#### COMPACT/PROFILE/XL TRUNKING LID REMOVAL

The covers have been designed to remain in position irrespective of impact during normal conditions, minor undulations of the mounting surface, and to limit unauthorised removal. All lids peel off, although the angle and square lids should be eased from the base by inserting a terminal screwdriver between the captive legs of the lid and the base, by first removing an external fitting.

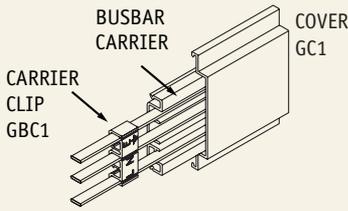


**FOR STERLING TWIN PLUS  
SEE PAGE 216**

# STERLING RANGE continued

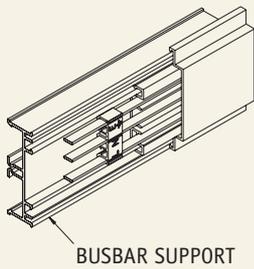
## BUSBAR ASSEMBLY – STERLING MONO 10/ COMPACT/PROFILE

Busbar Assembly (GRA1) 63 Amp distribution system comes complete for installation directly into the above trunking systems. For Busbar fittings and accessories please refer to relevant sections.



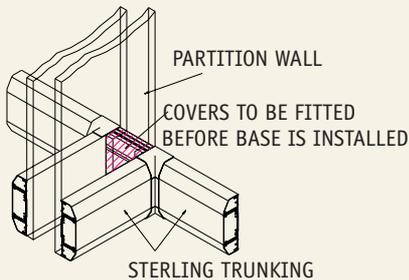
## STERLING XL/TWIN PLUS

Requires Busbar Support to position Busbar Assembly within the trunking base.



For more detailed instructions see page 213.

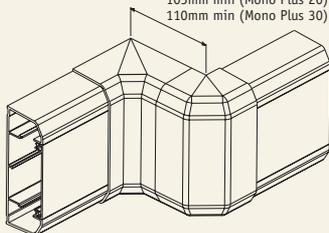
## Method of continuing Mono, Mono Plus, Compact, Profile, Sterling XL and Twin Plus through a partition wall.



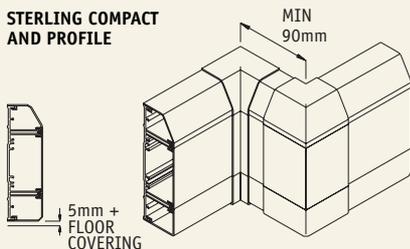
## DIMENSIONAL REFERENCE FOR OFFSETS FLAT ANGLES AND TEES

The minimum set that can be accommodated in the same plane (from internal to external bend), is shown below.

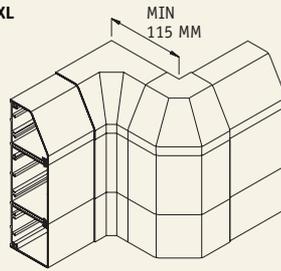
**MONO/MONO PLUS**  
 100mm min (Mono 10)  
 105mm min (Mono Plus 20)  
 110mm min (Mono Plus 30)



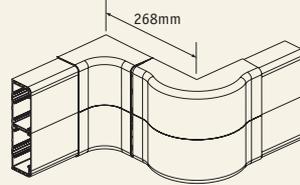
## STERLING COMPACT AND PROFILE



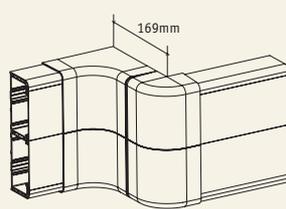
## STERLING XL



## STERLING TWIN PLUS DATA BENDS

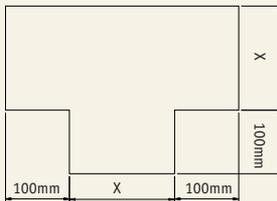
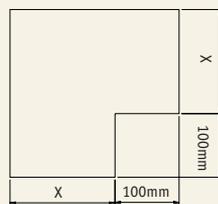


## STERLING TWIN PLUS STANDARD BENDS



Reduces cable capacity by 50% when using cable control insert.

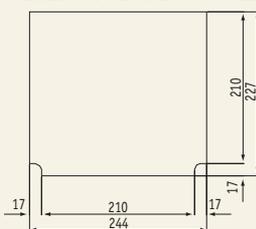
## FABRICATED ANGLES AND TEES



X = Height of Profile

<b>Mono 10 (Tee only)</b>	= 100mm
<b>Mono Plus 20</b>	= 140mm
<b>Mono Plus 30</b>	= 155mm
<b>Compact</b>	
1, 2	= 130mm
3	= 181mm
<b>Sterling Profile</b>	
1, 2, 3	= 167mm
4, 5	= 218mm
6	= 268mm
11, 12, 13	= 255mm
<b>Sterling XL</b>	
1, 2, 3	= 220mm
11, 12, 13	= 308mm

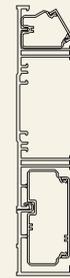
## STERLING TWIN PLUS MOULDED



## STERLING ELECTROMAGNETIC SHIELDING

### ALUMINIUM SCREENING INSERT FOR STERLING MONO PLUS, COMPACT AND PROFILE

All screening lengths should be butt jointed, and the corners mitred. All joints should be electrically connected by means of the screening bonding strap (ESBS1) to maintain continuity (see general notes on installation). Failure to correctly fully bond the screening section to a suitable earth potential may seriously impair its effectiveness.



PROFILE 4 WITH CENTRE COMPARTMENT EMPTY FOR ACCESSORY BOXES

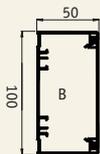
### CONDUCTIVE SPRAY COATING FOR COMPACT, STERLING PROFILE AND STERLING TWIN PLUS

Specially formulated non-oxidizing copper loaded resin based conductive coating system. Comprising of copper flakes plated with silver. Coating thickness typically 25-40 microns Surface resistance typically 0.25<sup>-05</sup> Ω/sq Equates to 5Ω/3 metre section of trunking Attenuation: 40-60dB from 10MHz-1GHz Humidity no change in resistivity or attenuation MLD-STD-202 method 106-40 cycle Adhesion rating: excellent Failure to fully bond the conductive coating to a suitable ground potential can seriously impair its effectiveness.

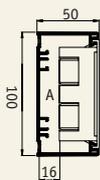
### WARNING

Due to its relatively high surface resistance, Conductive Spray Coating **SHOULD NOT** be used in contact with low voltage circuits BS7671 (1992) 50 V.A.C. – 1000 V.A.C. unless additional measures are undertaken. For Data/Voice circuits only.

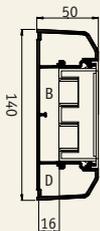
# STERLING RANGE DIMENSIONS AND CAPACITIES



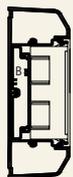
**STERLING MONO 10**  
 B = 4141 sq mm total area 45% space factor = 1863 sq mm.



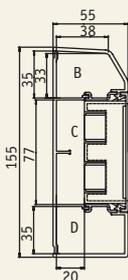
**STERLING MONO 10 AND ACCESSORY BOX (30mm)**  
 A = 1874 sq mm total area 45% space factor = 843 sq mm.



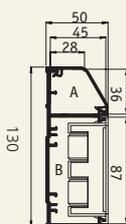
**STERLING MONO PLUS 20 AND ACCESSORY BOX (30mm)**  
 B = 1185 sq mm total area 45% space factor = 533 sq mm.  
 D = 1024 sq mm total area 45% space factor = 461 sq mm.



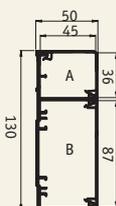
**STERLING MONO PLUS 20 AND SCREENING INSERT**  
 B = 715 sq mm total area 45% space factor = 322 sq mm.



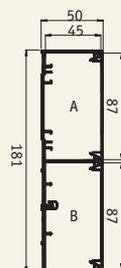
**STERLING MONO PLUS 30 AND ACCESSORY BOX (30mm)**  
 B = 1450 sq mm total area 45% space factor = 652 sq mm.  
 C = 1563 sq mm total area 45% space factor = 703 sq mm.  
 D = 1646 sq mm total area 45% space factor = 741 sq mm.



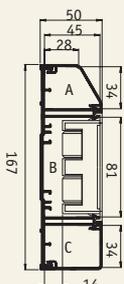
**STERLING COMPACT 1 AND ACCESSORY BOX**  
 A = 1280 sq mm total area 45% space factor = 576 sq mm.  
**With ESSB1 Box**  
 B = 1497 sq mm total area 45% space factor = 673 sq mm.



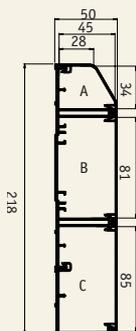
**STERLING COMPACT 2**  
 A = 1534 sq mm total area 45% space factor = 690 sq mm.  
 B = 3763 sq mm total area 45% space factor = 1693 sq mm.



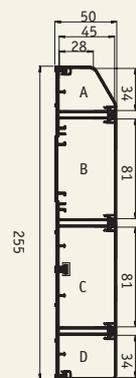
**STERLING COMPACT 3**  
 A = 3763 sq mm total area 45% space factor = 1693 sq mm.  
 B = 3700 sq mm total area 45% space factor = 1665 sq mm.



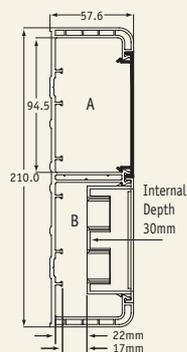
**STERLING PROFILE 2/ STERLING ALUMINIUM PROFILE 3002 AND ACCESSORY BOX**  
 A = 1197 sq mm total area 45% space factor = 538 sq mm.  
 B = 1279 sq mm total area 45% space factor = 575 sq mm.  
**Without Accessory Box**  
 B = 3556 sq mm total area 45% space factor = 1600 sq mm.  
 C = 1451 sq mm total area 45% space factor = 652 sq mm.



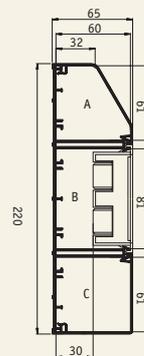
**STERLING PROFILE 4**  
 A = 1197 sq mm total area 45% space factor = 538 sq mm.  
 B = 3556 sq mm total area 45% space factor = 1600 sq mm.  
 C = 3626 sq mm total area 45% space factor = 1631 sq mm.



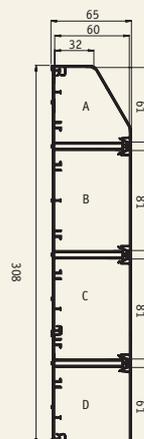
**STERLING PROFILE 12**  
 A = 1197 sq mm total area 45% space factor = 538 sq mm.  
 B = 3556 sq mm total area 45% space factor = 1600 sq mm.  
 C = 3482 sq mm total area 45% space factor = 1567 sq mm.  
 D = 1451 sq mm total area 45% space factor = 652 sq mm.



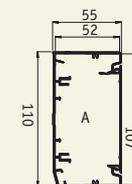
**STERLING TWIN PLUS**  
 A = 4755 sq mm 45% space factor 2140 sq mm.  
 B = 2431 sq mm 45% space factor 1094 sq mm.



**STERLING XL 202/302 AND ACCESSORY BOX**  
 A = 2824 sq mm total area 45% space factor = 1271 sq mm.  
 B = 2504 sq mm total area 45% space factor = 1127 sq mm.  
**Without Accessory Box**  
 B = 4771 sq mm total area 45% space factor = 2147 sq mm.  
 C = 3531 sq mm total area 45% space factor = 1589 sq mm.



**STERLING XL 212/312**  
 A = 2824 sq mm total area 45% space factor = 1271 sq mm.  
 B = 4771 sq mm total area 45% space factor = 2147 sq mm.  
 C = 4732 sq mm total area 45% space factor = 2130 sq mm.  
 D = 3531 sq mm total area 45% space factor = 1589 sq mm.



**STERLING ELEGANCE ALUMINIUM**  
 A = 5254 sq mm total area 45% space factor = 2364 sq mm.

**ALUMINIUM SCREENING INSERT**  
 Angled 45% space factor = 332mm.  
 Main 45% space factor = 916mm.

For each cable it is intended to use, obtain the appropriate factor from the table right. Add all the cable factors and compare with the factors for the given trunking. The resulting sum of the cable factors should be equal or less than the trunking factor. The number of power cables installed should be such that the resulting space factor does not exceed 45%.

Type of Conductor	Size	Cable Factor
Stranded PVC Power	1.5mm <sup>2</sup>	8.6
Stranded PVC Power	2.5mm <sup>2</sup>	12.6
Stranded PVC Power	4.0mm <sup>2</sup>	16.6
Stranded PVC Power	6.0mm <sup>2</sup>	21.2
Cat. 5e UTP	ø5.5mm*	30.2
Cat. 5e STP	ø6.0mm*	36.0
Cat. 6 UTP	ø6.5mm*	42.2
Cat. 6 STP	ø7.0mm*	49.0

\*Typical values, check with manufacturer.

## STERLING BUSBAR

### ELECTRICAL DATA

The Busbar has a design rating of 63 Amp, 250V AC, 50/60Hz single phase.

Average ambient temperature 35°C over 24 hour period.

### VOLT DROP

Phase & Neutral:	3.47 mV/A/metre
Phase & Earth:	3.47 mV/A/metre
Neutral & Earth:	3.47 mV/A/metre

### EARTH FAULT LOOP IMPEDANCE

Phase & Earth:	3.47 mΩ/metre
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### SHORT CIRCUIT RATING

Fuse links BS88 – 100 Amp

Prospective current 16.5 kAmp

Mechanical withstand 10.0 kAmp peak min

Thermal withstand 3.6 kAmp<sup>2</sup> seconds.

BS 7671:2001 (Wiring Regulations), requires the earth fault loop impedance to be sufficiently low to operate the protective device within the specified time, namely 0.4 seconds to circuits supplying socket outlets which may supply hand-held equipment.

### CABLE CAPACITY OF TERMINALS

Cable connector:	16mm <sup>2</sup> /25mm <sup>2</sup>
20/32 Amp switch:	10mm <sup>2</sup>
13 Amp accessories:	10mm <sup>2</sup>

### DEGREE OF PROTECTION

Enclosure Classification IP40.

### MATERIAL DATA

Extrusions – self extinguishing PVC-U to BS4678 Part 4.

Mouldings – PVC-U, polycarbonate, urea formaldehyde, P.B.T.

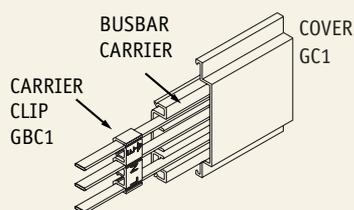
### STANDARDS

The Busbar system is designed to comply with: BS5486 Part 2 and BSENISO 60439 Part 2. Accessories with: BS1363, BS3676 and BS5733.

### STERLING MONO 10/COMPACT/PROFILE

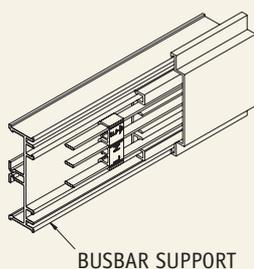
Busbar Assembly (GRA1) 63 Amp distribution system comes complete for installation directly into the above trunking systems.

### GRA1 ASSEMBLY



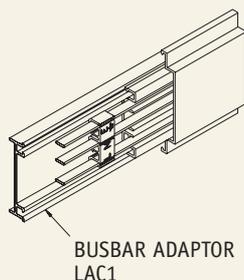
### STERLING XL/TWIN PLUS (PVC-U OR ALUMINIUM)

Requires Busbar Support to position Busbar Assembly within the trunking base.



### STERLING ELEGANCE ALUMINIUM

An adaptor Section (LAC1) must be used in conjunction with the Busbar Assembly within the aluminium base.

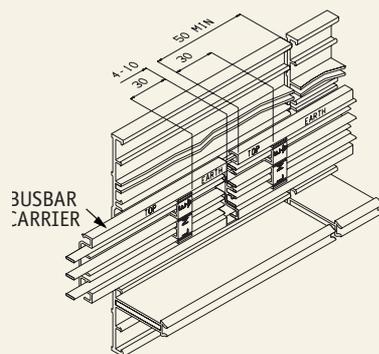


### INSTALLATION

The Marshall-Tufflex Sterling Busbar Assembly can be installed either as a 30/32 Amp Ring or Radial Circuit. For maximum flexibility and potential the system can be installed as a 60/63 Amp Radial Circuit with appropriate over current and fault current protection.

Busbar assembly is to be installed with the protective (earth) conductor uppermost. The spacing between each Busbar being unequal to avoid error when components are installed. Each Busbar requires 4-10mm between adjoining lengths for correct installation of the busbar coupler. With a complete range of fittings, which overlap the inner cover, offers total security of the Busbar even if the outer cover is removed.

Install the Busbar by placing the Carrier Assembly with its respective carrier support/adaptor into the main section of the trunking with the protective (earth) conductor uppermost. Confirm the carrier support/adaptor projects the Busbar Assembly by a minimum of 50mm at joints and clip into place, thus ensuring the Busbar is completely enclosed at all times. Slide nearest carrier clip to straddle base joint for extra rigidity, the remaining clips to be positioned at 100mm intervals. **On no account should the Busbar Carrier Assembly and carrier support/adaptor joints align.**



### BUSBAR COUPLER

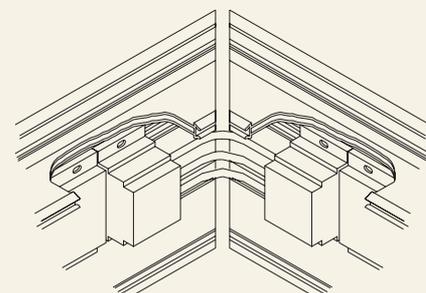
Align Busbars. Ensure adjacent Busbars are within 4-10mm. Plug coupler onto Busbar and secure.

### CABLE TERMINATION

Plug terminal block into Busbar, connect cables into terminal block and secure cover using screws provided.

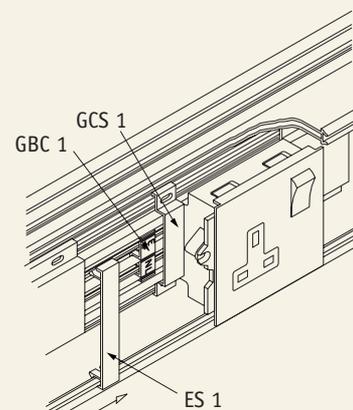
### CORNER ASSEMBLY (INTERNAL/EXTERNAL)

For power distribution around a bend, a pre-wired corner assembly GCA1 is required. Clip each connector onto Busbar and secure covers, ensuring any earth bonding. For Angles and Tees use a GTL1 and GTR1 terminal blocks and suitable cable.



### PLUG-IN ACCESSORIES (BUSBAR)

Insert socket connectors onto Busbar and clip into place. Final positioning can be achieved by sliding accessory along trunking. For a continuous run of sockets slide carrier clip GBC1 to accessory. Install Busbar accessory spacer GCS1 and secure using mounting screws provided. Insert lid spacer ES1 and clip additional socket into next position.



### BUSBAR COVER

Clip cover over carrier ensuring all component flanges are adequately overlapped. Secure at the two elongated holes adjacent to Busbar component using screws provided. Further fastening at 500mm maximum intervals maintains Busbar cover security.

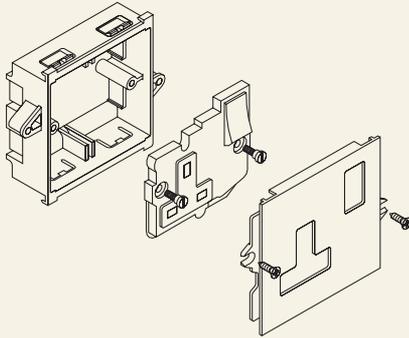
## STERLING ACCESSORIES

### POWER ACCESSORIES

All power accessories are designed to be installed in place of the main compartment cover of Sterling (ETL1). Face plates come with a built in overlap to accommodate cutting inaccuracies.

### POWER STERLING WIRED ACCESSORIES

Come complete with face plate, panel mounted accessory, box and screws.



### ACCESSORY BOXES

Come in three designs – all accepting standard accessories with the following feature:

M3.5 x 60.3mm fixing centres single gang box.

M3.5 x 120.6mm fixing centres twin gang box.

M3.5 x 180.9mm fixing centres triple gang box.

**ESSB1/ESSB2/ESSB3:** Plain flush boxes, lids cut square with edge of box.

**GAB1/GAB2:** Comes with picture frame cover with its built in overlap to accommodate cutting inaccuracies.

### POWER STERLING BUSBAR ACCESSORIES

Come complete with the box ready assembled and individually tested, which plug directly onto the Busbar.

**GBAB1/GBAB2:** These unique boxes plug directly onto the Busbar enabling standard 13A accessories to be used with the Busbar.

M3.5 x 60.3mm fixing centres single gang box.

M3.5 x 120.6mm fixing centres twin gang box.

Both have picture frame covers with built in overlap.

### VOICE AND DATA MODULAR SOCKET

The comprehensive range of modules clip securely into a surface or flush front plate which is then secured to the applicable back box for fixing directly to the wall or in trunking.

### FACE PLATES

1 modular 56mm x 50mm aperture

2 modular 56mm x 100mm aperture

Surface mounting plate 9mm thick

1G 85mm x 85mm

2G 145mm x 85mm

Flush mounting plate 1.8mm thick

1G 91mm x 88mm

2G 149mm X 88mm

### SPECIFICATIONS

#### D-Sub Connectors (FD20, FD21, FD22)

Shell and terminations comply with MIL-C-24308 specifications

Insulator rating UL94V-0

Contact plating 0.2mm gold

Working voltage 300V rms

Insulator resistance >10<sup>6</sup>MΩ

#### BNC Module (FD23, FD33)

Rating 50Ω

Working voltage 500V peak

Maximum frequency 4000MHz

#### Twin-Ax Module (FD25)

Body and terminations comply with MIL-C-3655

Insulator resistance 5 x 10<sup>3</sup>MΩ

Maximum frequency 250MHz

Working voltage 500V peak

#### TV/FM Module (FA24)

Co-axial socket direct connection non-isolated.

#### Data Jacks (FD26, FD27, FD28)

FD26 used for RJ11 or RJ12.

FD27 used for RJ45 Cat.5e Data. (For wiring details see Table 3).

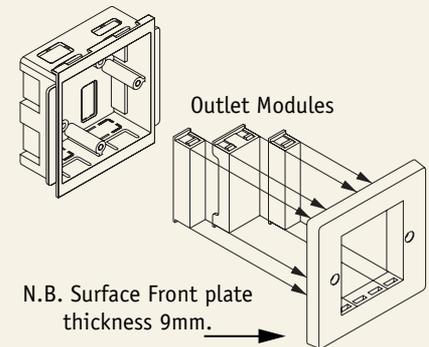
#### Telecom FV35, FV36, FV37

The modular telephone socket outlets have been designed for use on public service telephone network (PSTN), private branch exchange (PBX or PABX) or other commercial telephone systems using high impedance telephones and can only be mounted on Marshall-Tufflex Modular front plates. These products comply with OFTEL approval NS/G/1235/M/100009.

**WARNING:** Any number of sockets can be installed but the cumulative value of the REN numbers of telephones MUST NOT exceed the value of 4 on each PSTN/PBX/Exchange line. Only one master per line plus as many secondaries as the REN number permits.

### INSTALLATION GUIDE

1. Feed the cables into the Accessory Box through the appropriate knockouts.
2. Terminate the Outlet Module.
3. Clip the Outlet Module into the Front Plate.
4. Clip in additional plates, if required, prior to securing front plate to Outlet Box.
5. Secure the assembly to the Outlet Box using the screws provided. If the front plate has no screws snap the plate onto the box and clip into trunking.



### TERMINATIONS (IDC)

All modular jacks are provided with rapid insulation displacement connectors (IDC) which accepts one or two equal size conductors between 0.4mm and 0.6mm.

### 6c MODULES AND APERTURES

This range of modules clip securely into a range of surface plates, flush modules (for Sterling) or punched couplers (Sterling).

#### 6c APERTURE SIZES 37 X 223mm SURFACE PLATES

1G x 1 6c 60.3mm F/C.

1G x 2 6c 60.3mm F/C.

2G x 4 6c 120.6mm F/C.

#### FLUSH MODULES (Box and Plate)

With or without fixing screws:

1G x 1 6c.

1G x 2 6c.

2G x 4 6c.

#### PUNCHED COUPLERS (Sterling Range)

These enable 6c modules to clip directly into the coupler without the need for a separate box and face plate.

### SPECIFICATIONS

Data Jacks (FD29, FD30, FD31, FD32).

FD29 – RJ45 Cat.5e.

FD30 – Screened RJ45 Cat.5e.

FD31 – RJ45 Cat.6.

FD32 – Screened RJ45 Cat.6.

(For wiring details see Table 3).

### TELECOM (FV92, FV91, FM90)

FV92 Secondary Outlet.

FV91 Mastering Unit for FV92.

## WIRING DETAILS

### METHOD OF TERMINATION

1. Locate the wires using the colour coding detailed in the relevant product table. Remove the cable sheath surrounding the conductor wires. DO NOT remove the conductor wire insulation. Allow a minimum of the conductor wire to be exposed.
2. Use the special tool provided to push the conductor wires into place.
3. Trim any excess conductor wire.
4. Secure the cable with cable tie.

### TELEPHONE (FV35, FV36, FV37, FV92, FV91) WIRING DETAILS

TABLE 1	
Terminal	Base/Stripe
1	Green/White
2	Blue/White
3	Orange/White
4	White/Orange
5	White/Blue
6	White/Green

### DATA (FD26, FD28) WIRING DETAILS

TABLE 2		
Terminal	RJ11 (FD26)	RJ12 (FD26)
1		T3 – White/Green
2	T2 – White/Orange	T2 – White/Orange
3	R1 – Blue/White	R1 – Blue/White
4	T1 – White/Blue	T1 – White/Blue
5	R2 – Orange/White	R2 – Orange/White
6		R3 – Green/White

### DATA (FD27, FD29, FD30) WIRING DETAILS

Using band stripe colour coding

T1 – White/Blue	T3 – White/Green
R1 – Blue/White	R3 – Green/White
T2 – White/Orange	T4 – White/Brown
R2 – Orange/White	R4 – Brown/White

TABLE 3					
RJ45 (FD27 – CAT. 5e) (FD29, FD30 – CAT. 5e)					
Terminal	USOC	T568B/258A (IEEE 802.3)	10 Base T	T568A (IEEE 802.5)	Token Ring
1	R4	T2	T2	T3	NC
2	T3	R2	R2	R3	NC
3	T2	T3	T3	T2	T2
4	R1	R1	NC	R1	R1
5	T1	T1	NC	T1	T1
6	R2	R3	R3	R2	R2
7	R3	T4	NC	T4	NC
8	T4	R4	NC	R4	NC

## FLAPJACK RJ45 OUTLETS

### MOUNTING PLATE SIZE

Aperture 6c 37 x 22.5mm

### OUTLET CONNECTION MODULE CAT.5e/6 UNSHIELDED AND SHIELDED

The Cat.5e/6 connection module complies with the latest international standard proposals, including full interoperability and backwards compatibility.

### MAIN FEATURES

- Complies with the latest Cat.5e/6 standard proposals of ISO/IEC.
- Conforms to Cat.6 requirements according to EIA/TIA.
- Compatible with Cat.6 standard plugs
- Tool-free connection technique for solid and stranded data cables with wire sizes AWG 22-24.
- Pair sequencing and re-useable IDC contacts.
- Simple and time-saving shield contacting with integral strain relief.
- Halogen-free material.

### MECHANICAL DATA

Material	Polycarbonate (UL94V-0)
Mating cycles	>1000
Wire diameter	AWG 24 – AWG 22
Insulation diameter	0.8-1.6mm
Wire strain relief	Through clamps in IDC block
Cable strain relief	Through cable ties
Shield contacting	Shield lance
Earthing	2 earthing terminals for plugs
Shield material	CuSn, tin-plated, 2-4um

### ELECTRIC AND TRANSMISSION DATA

Contact resistance	<50mOhm (cond-cond)
Contact resistance	<20mOhm (shield-shield)
Insulation resistance	<500Mohm (500 VDC)
Dielectric strength	1000Veff (cond-cond)
Dielectric strength	1500Veff (cond-shield)
Coupling resistance	IEC 96-1
1 MHz	<15mOhm
10 MHz	<100 mOhm

For performance data, telephone Technical Services on 01424 856688.

# DATA MANAGEMENT SYSTEMS

## All Bends, Angles and Tees come with Installation Instructions

### STERLING TWIN PLUS

Sterling Twin Plus provides a fully integrated solution for the installation of high performance data and power cables in perimeter locations. The system has an extensive range of moulded fittings that incorporate a large 50mm bend radius control that is crucial to optimum cable performance.

#### POSITIONING

When using as a skirting system, sufficient clearance should be allowed for between the floor covering and the trunking (5mm + floor covering).

#### INSTALLATION

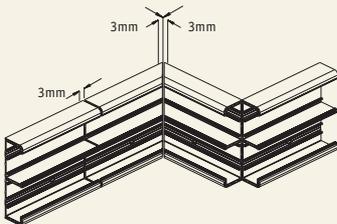
**PVC-U:** The Sterling Twin Plus PVC-U base is supplied with pre-cut elongated holes at 250mm centres along its length to facilitate fastening. It should be secured at 500mm intervals and within 50mm of the end on each base section.  
**Aluminium:** Sterling Twin Plus aluminium base should be secured every 750mm utilising the grooves in the base to facilitate the drilling of 6mm clearance holes.

Internal couplers are not required on either PVC-U or aluminium base units.

When securing the base, use No. 8 round head screws and washers and avoid over-tightening to permit thermal movement. It is recommended that the use of plastic caps over screw heads to provide protection to the installed cables.  
 To cut the trunking base, use a fine-toothed saw or power tool. An electric variable angle jigsaw will also aid with the cutting to length and the 45-degree mitre.

#### JOINTS AND BENDS

At each joint, 3mm should be left for expansion. Internal bends must be mitred to ensure total enclosure of trunking. External bends should be cut square, flat bends must be mitred at 45 degrees, tees and crossovers are available pre-fabricated from the Sterling Twin Plus Range of fittings. None of the cutting is critical as the external moulded clip-on fittings have a built-in 7mm overlap for the lid and sidewalls to cover any inaccuracies.



#### SINGLE LENGTHS

Where it is required to fit a single length of trunking between two inside walls (under 3metres), it is advisable to place an additional coupler set in the centre of the trunking run in order to facilitate the removal of the cover if no accessory has been fitted.

#### MMT2/MMT4 ADAPTORS

Adaptors are available from the Sterling Twin Plus range of fittings. Two methods of fixing are as follows:

1. drill a suitable hole in the sidewall of the Sterling Twin Plus base, thread cables through the hole and into the installed Mini Trunking.

2. cut the sidewall of the Sterling Twin Plus base to aid cable installation.

#### BUSBAR ASSEMBLY

Upgrades the trunking to a 63A Busbar distribution system. Can be fitted in either compartment of the base. See page 213 for details.

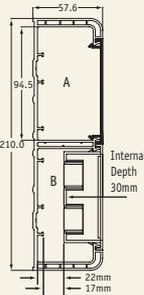
#### ACCESSORY BOXES

Drill the main web if the accessory box is to be mounted in the alternative compartment to the supply. For boxes in the same compartment supply, remove the appropriate box knock-outs, feed the cable into box and then clip the box into trunking base. When assembled, the lid is butt joined to the edge of the box (ESSB1/2/3 only) which is subsequently covered when the accessory is fitted. When boxes are installed consecutively, a 14mm wide spacer (ES1) is required to cover the space between the boxes. All cut edges of lid are concealed by the accessory or external fitting.

#### LID AND FITTINGS

Install radius inserts according to instructions supplied with the individual fitting.  
 When the cable installation is completed, start at a convenient point and snap-clip the lid and fitting alternately into place. Ensure the fitting overlaps the lid completely.

### DIMENSIONS AND CABLE CAPACITIES



#### STERLING TWIN PLUS

- A = 4755 sq mm
- 45% space factor
- 2140 sq mm.
- B = 2431 sq mm
- 45% space factor
- 1094 sq mm.

Type of Conductor	Size	Cable Factor	Max. No. Cables in A @ 45% Fill	Max. No. Cables in B @ 45% Fill
Stranded PVC Power	1.5mm <sup>2</sup>	8.6	248	127
Stranded PVC Power	2.5mm <sup>2</sup>	12.6	169	86
Stranded PVC Power	4.0mm <sup>2</sup>	16.6	128	65
Stranded PVC Power	6.0mm <sup>2</sup>	21.2	100	51
Cat. 5e UTP	ø5.5mm*	30.2	70	36
Cat. 5e STP	ø6.0mm*	36.0	59	30
Cat. 6 UTP	ø6.5mm*	42.2	50	25
Cat. 6 STP	ø7.0mm*	49.0	43	22

\*Typical values, check with manufacturer.

### MINI 4 DATA

#### RADIUS CONTROL MINI FITTINGS

Radius Control Mini Fittings are designed to incorporate a large 50mm bend radius. This extensive range of stylish moulded fittings provides the exceptional data cabling control that is crucial to good performance in advanced LAN's and greatly improves security to surface data cables. Marshall-Tufflex Data Mini Fittings offer an efficient and economical solution to data cable management.

Two versions are available. The first offers complete control of the cable. The second, using

the outer cover only, is aesthetically identical but does not offer the same level of cable control. Both versions can be used on new applications or, with small adaptations, to retrofit current installations.

#### INSTALLATION

Before installing the trunking, confirm the route of the main circuits, marking spurs and accessory box positions.

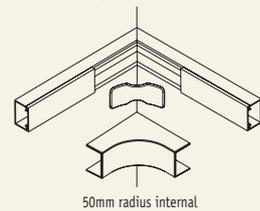
#### MOUNTING TRUNKING

Drill oversize holes and secure (at least every 375mm in low level applications) using No.8 round head screws. Do not over-tighten to allow thermal movement. (For thermal properties, see Material Data page)

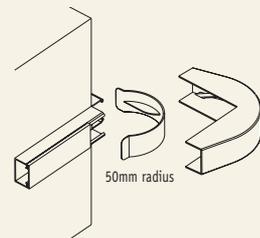
It is recommended that the use of plastic caps over screw heads to provide protection to the installed data cables.

#### JOINTS

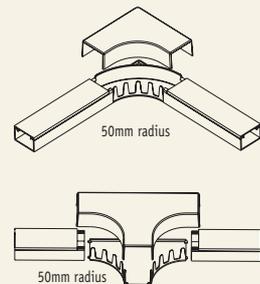
At each joint, 3mm should be left for expansion. Internal bends must be mitred to ensure total enclosure of trunking.



External bends should be cut square with the corner.



At flat angles and tees, allowance should be made for the base moulding (assembly only) in the length of trunking base to be installed.



The cutting is not critical as the clip-on fittings have a built-in overlap for lids and sidewalls.

#### LID

When base and cable installation is completed, start at a convenient point and snap-clip the lid and fitting alternately into place. Ensure the fitting overlaps the lid completely.

#### ACCESSORY BOXES

Select the appropriate box and remove the required knock-out, cleaning any burrs from around aperture. Snap adaptor into position on the box and place into position. Ensure trunking seats securely into adaptor. Secure the box using diagonally opposite fixing holes with No.8 countersunk screws.

# SOVEREIGN PLUS

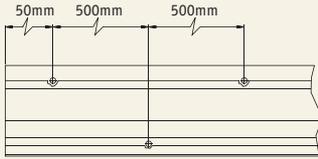
The neat, simple and economical system for surface wiring in all types of buildings. With three fully segregated compartments for dissimilar services. Fully compatible with Marshall-Tufflex Mini-Trunking for greater versatility and with a wide range of overlapping fittings which cater for expansion/contraction and easier installation without the necessity of precision measuring and cutting to tight tolerances.

### PLANNING

Before installing the trunking as a skirting system it is advisable to allow sufficient clearance for the floor covering to be fitted underneath.

### BASE

The base should be secured every 500mm by drilling alternating 6mm holes in the two outer slots provided and fasten using No. 8 round head screws with washers. Avoid over tightening to permit thermal movement. See Material Data page 208 for Thermal Properties.



### JOINTS

At each joint 3mm should be left for expansion and all corners and bends must be mitred to ensure total enclosure of trunking. The cutting is not critical as the fitting conceals the mitre and overlaps the lid by a maximum of 10mm.

### EARTHING (ALUMINIUM)

Covers and base are to be cleaned of protective coating and earth bonded using the twin earth channel.

The installation should be in accordance with the latest edition of BS 7671:2001 Wiring Regulations.

### ACCESSORY BOX

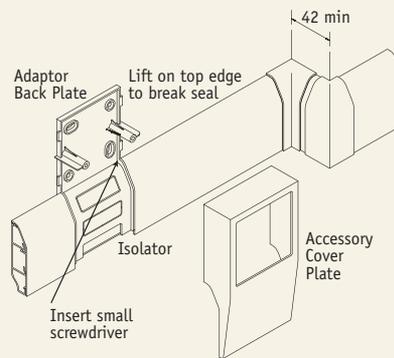
Remove the required knock-out in the back segregator, feed through cables and secure using two diagonally opposite holes. The front cover clips in the back plate adaptor after the trunking cover has been attached to the base. The accessory is then wired and secured to the accessory box assembly.

### MINI ADAPTORS

For segregation use the cable retainers, confirming sufficient cable is available for the Mini Trunking spur. The Adaptor is then held in position by the external covers.

### LID REMOVAL

Isolate circuit and remove accessory and cover. This permits access to the top edge of the cover to break the seal and peel off cover.

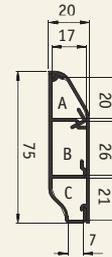


## DIMENSIONS AND CABLE CAPACITIES



### SOVEREIGN PLUS ARCHITRAVE

A = 238mm<sup>2</sup> total area  
45% SF = 107mm<sup>2</sup>.  
B = 405mm<sup>2</sup> total area  
45% SF = 182mm<sup>2</sup>.  
C = 315mm<sup>2</sup> total area  
45% SF = 141mm<sup>2</sup>.



### SOVEREIGN PLUS SKIRTING

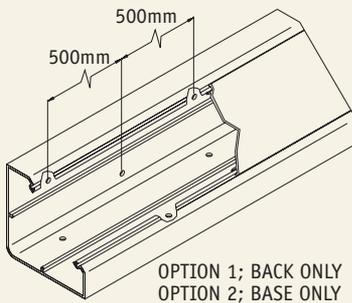
A = 229mm<sup>2</sup> total area  
45% SF = 103mm<sup>2</sup>.  
B = 416mm<sup>2</sup> total area  
45% SF = 187mm<sup>2</sup>.  
C = 262mm<sup>2</sup> total area  
45% SF = 118mm<sup>2</sup>.

## BENCH TRUNKING

Bench Trunking utilises the successful Sterling compatible surface and flush clip-on accessories and can be subdivided with the use of Clip-in Divider Fillets. In both PVC-U and aluminium the option of material is available whatever the application.

### MOUNTING

Secure the base in one plane only every 500mm by drilling alternate 6mm holes either side of the divider nib and fasten using No. 8 round head screws and washers. Do not over tighten to permit thermal movement and avoid distortion. See Material Data page 208 for Thermal properties. Washers are not required on Aluminium Base.



### JOINTS

PVC-U base should be joined using a connector with 3mm of movement available between consecutive lengths of base. The lid part of the connector also has 10mm overlap on each side to facilitate thermal movement of the trunking due to change in temperature.

Aluminium base the consecutive lengths are aligned and butt jointed together.

### FITTINGS

Dividing fillets are snapped on to the internal nibs in the base. Accessories and boxes clip direct into the trunking base and the lid cut to length and pressed into position. The lid connector is now aligned with the base connector (PVC-U only) and the end caps secured using a solvent adhesive MSC3 (PVC-U only) and the retaining screws for use with aluminium.

### EARTHING (ALUMINIUM)

Covers, base and metallic fittings are to be cleaned of protective coating and earth bonded. Incoming earth connectors are made using the LBT1 Bonding Assembly installed in the earth channel of the base.

In final ring or radial 32A circuits the bonding strap LBS1 may be used in the earth channel for bonding lengths of trunking. The base, cover and end caps should be bonded using the Bonding Strap LBS2.

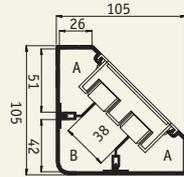
### LID REMOVAL PVC

This is best attended to at an accessory or coupler to avoid damage to the lid. Remove the fitting and applying light pressure under the lid peel off a small section (300mm) at a time.

### LID REMOVAL ALUMINIUM

Remove accessory face plate cover and then gently ease lid from the base taking care to avoid damage.

## DIMENSIONS AND CABLE CAPACITIES



A = 1285 sq mm total  
area 45% space factor  
= 578 sq mm.

B = 2138 sq mm total  
area 45% space factor  
= 962 sq mm.

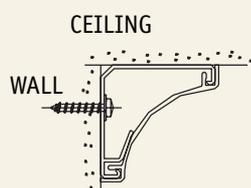
The installation should be in accordance with the latest edition of BS 7671:2001 Wiring Regulations.

## CORNICE TRUNKING

A perimeter cable management system designed to run at ceiling height. With a range of overlapping clip-on fittings and adaptors to enable Marshall-Tufflex Mini-Trunking to be integrated within the system. With a base section specially designed to cater for imperfect walls to ceiling corners.

### INSTALLATION

The base should be secured every 500mm by drilling oversize holes in the wall side of the trunking and fastened using round head screws with washers. Avoid over tightening to permit thermal movement. See Material Data page 208 for Thermal Properties.



### JOINTS

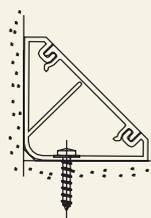
At each base joint 3mm should be left between each consecutive length of base for expansion and all bends must be mitred to ensure total enclosure of trunking. These mitres are not critical as the fitting covers the bend and overlaps the lid and simply clips on to the base.

## ANGLED CABLEWAY

The Angled Cableway System is suitable for both horizontal and vertical corner mounting and features either a single or twin compartment trunking.

### INSTALLATION

The base should be secured every 500mm by drilling oversize holes in the wall side of the trunking and fastened using round head screws with washers. Avoid over tightening to permit thermal movement. See Material Data page 208 for Thermal Properties.



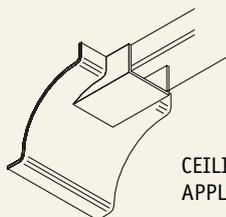
### ACCESSORY BOXES

All accessory box entries are detailed with the divider in the top of the trunking in horizontal applications, to the left in vertical applications. The standard accessory boxes are installed between the trunking. The direct entry can be installed in any position along the trunking length by using any two in line fixing holes.

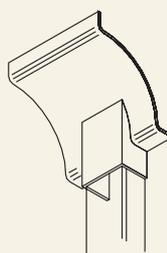
### ACCESSORIES

These are serviced through a spur using a mini trunking adaptor across the ceiling or down the wall to an appropriate box.

### Reversible Adaptors



CEILING APPLICATION



VERTICAL WALL APPLICATION

### LID

On completion of the base and cable installation, using cable retainers where necessary, install lid by pressing firmly into position ensuring adequate overlap at the fittings.

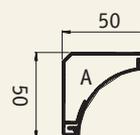
### END CAPS

These come complete with clips offering security to the end of the trunking.

### LID REMOVAL

Remove a suitable fitting and peel off cover.

## DIMENSIONS AND CABLE CAPACITIES

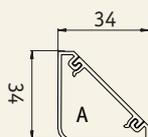


A = 837mm<sup>2</sup> total area  
45% SF = 376mm<sup>2</sup>.

### COVER

On completion of the base and cable installation, the cover is pressed firmly into position ensuring the cover extends beyond the base joints for maximum strength.

## DIMENSIONS AND CABLE CAPACITIES



A = 515mm<sup>2</sup> total area  
45% SF = 231.8mm<sup>2</sup>.



B = 162mm<sup>2</sup> total area  
45% SF = 73mm<sup>2</sup>.

C = 334mm<sup>2</sup> total area  
45% SF = 150mm<sup>2</sup>.

## SERIES R

The PVC-U base is supplied with pre-cut elongated holes at 250mm centres along its length. Fasten the base with No. 8 round head screws and washers. Avoid over tightening to permit thermal movement. All base joints should have a 3mm gap (min) to allow for expansion between consecutive lengths which are covered by the coupler. The internal segregator and dividing fillet both clip within the base.

### ACCESSORY BOXES

Remove the appropriate box knock-out and thread the cables into the box then clip each side individually into the trunking base.

### JOINTS AND BENDS

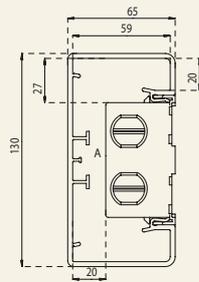
Internal bends must be mitred to ensure total enclosure of the trunking. External bends should be cut square with the corner. Fabricated 170 internal/external bends are installed as per the base.

### EARTHING (ALUMINIUM)

Covers, base and metallic fittings are to be cleaned of protective coating and earth bonded. Incoming earth connectors are made using the LBT1 Bonding Assembly installed in the earth channel of the base.

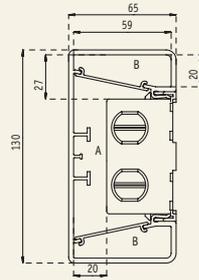
In final ring or radial 32A circuits the bonding strap LBS1 may be used in the earth channel for bonding lengths of trunking. The base, cover and end caps should be bonded using the Bonding Strap LBS2.

## DIMENSIONS AND CABLE CAPACITIES



### SERIES R 130

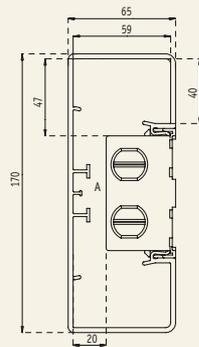
A = 4272 sq mm total area  
45% space factor = 1922mm<sup>2</sup>.



### SERIES R 130

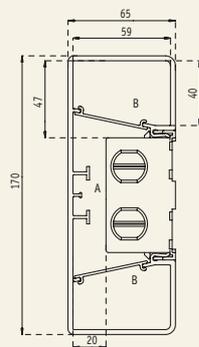
#### WITH SEGREGATOR

A = 2210 sq mm total area  
45% space factor = 995mm<sup>2</sup>.  
B = 957 sq mm total area  
45% space factor = 431mm<sup>2</sup>.



### SERIES R 170

A = 6632 sq mm total area  
45% space factor = 2984mm<sup>2</sup>.



### SERIES R 170

#### WITH SEGREGATOR

A = 2210 sq mm total area  
45% space factor = 995mm<sup>2</sup>.  
B = 2137 sq mm total area  
45% space factor = 962mm<sup>2</sup>.

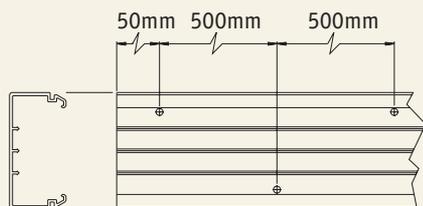
The installation should be in accordance with the latest edition of BS 7671:2001 Wiring Regulations.

# SCEPTRE AND MAXI TRUNKING

The installation of both Sceptre and Maxi-Trunking is very similar with the main differences being the application. With a wide range of clip-on fittings and flush accessory boxes the Sceptre range is ideal for fast and efficient installation in perimeter locations. The Maxi range with moulded, fabricated or clip-on fittings is ideal for encasement of cables in most situations. Both systems can be easily sub-divided by utilising clip-in dividing fillets to maintain cable segregation, the total number of compartments dependable upon the type of trunking. Clip-in cable retainers maintain the cables during installation giving the benefit of a third hand in lid down situations.

## BASE PERIMETER

The base should be secured every 500mm by drilling alternating 6mm holes either side of centre as is practical and fasten using No. 8 round head screws with washers. Avoid over tightening to permit thermal movement. See Material Data page 208 for Thermal Properties.



## BASE SUSPENDED

When the trunking is to be installed suspended on brackets consideration to the number and type of cables should be given, which equates to a maximum deflection of 1%.

Cross sectional area of trunking	Max. distance between supports	
	Horizontal	Vertical
Exceeding 300 and not exceeding 1500mm <sup>2</sup>	0.5m	0.5m
Exceeding 1500 and not exceeding 2500mm <sup>2</sup>	1.25m	1.25m
Exceeding 2500 and not exceeding 5000mm <sup>2</sup>	1.5m	2.0m
Exceeding 5000mm <sup>2</sup>	1.75m	2.0m

### Notes to Table

- The spacings tabulated allow for maximum fill of cables and the thermal limits specified in the relevant British Standards. They assume that the trunking is not exposed to other mechanical stress.
- The above figures do not apply to lighting suspension trunking, or where special strengthening couplers are used.

## JOINTS

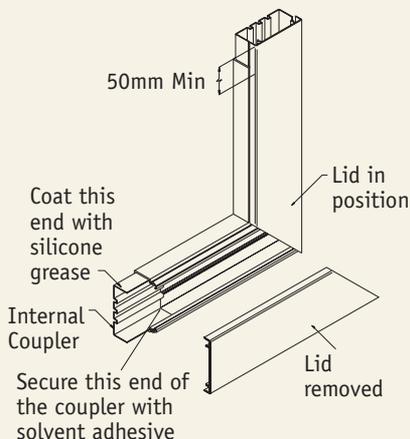
All lengths of trunking should be connected using an internal or external coupler with 3mm of movement available between consecutive lengths of trunking. The external coupler is designed for perimeter applications with 10mm of overlap on each side, the internal coupler should be cemented at one end using MSC3 solvent adhesive and the projecting end coated with MSC1 lubricant sealant. This provides a seal and facilitates thermal movement of the trunking due to change in temperature and should align with any support bracket.

## CLIP-ON FITTINGS

The clip-on fittings are for perimeter use only and on internal and external bends, the trunking base must be mitred to ensure total enclosure of the trunking.

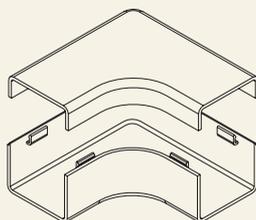
## FABRICATED FITTINGS

Sceptre trunking fabricated fittings come complete with external couplings (see joints) and the lid 'cut back' ready for installation. Maxi-Trunking fabricated fittings are supplied with internal couplings and lids that extend beyond the base maintaining non-alignment between base and lid joints for maximum strength.



## MOULDED FITTINGS

These are two-part fittings with a female slide fit over the trunking. For both perimeter and suspended applications.



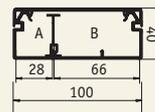
## END CAPS

These should be cemented into position for security using solvent adhesive MSC3.

## LIDS

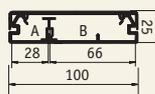
When utilising the internal coupler, especially in suspended applications, it is recommended the lid extends beyond the trunking joint by a minimum of 50mm for additional rigidity.

## DIMENSIONS AND CABLE CAPACITIES



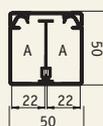
### DTR1

Total = 3168mm<sup>2</sup> total area 45% SF = 1426mm<sup>2</sup>.  
A = 816mm<sup>2</sup> total area 45% SF = 367mm<sup>2</sup>.  
B = 2002mm<sup>2</sup> total area 45% SF = 901mm<sup>2</sup>.



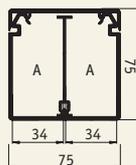
### DTR2

Total = 1731mm<sup>2</sup> total area 45% SF = 779mm<sup>2</sup>.  
A = 435mm<sup>2</sup> total area 45% SF = 196mm<sup>2</sup>.  
B = 1197mm<sup>2</sup> total area 45% SF = 538mm<sup>2</sup>.



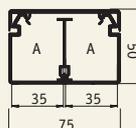
### MTRS50

Total = 1979mm<sup>2</sup> total area 45% SF 890mm<sup>2</sup>.  
A = 911mm<sup>2</sup> total area 45% SF = 410mm<sup>2</sup>.



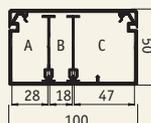
### MTRS75

Total = 4709mm<sup>2</sup> total area 45% SF = 2119mm<sup>2</sup>.  
A = 2196mm<sup>2</sup> total area 45% SF = 988mm<sup>2</sup>.



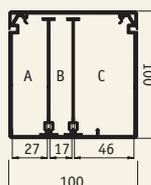
### MTRS75/50

Total = 3032mm<sup>2</sup> total area 45% SF = 1365mm<sup>2</sup>.  
A = 1347mm<sup>2</sup> total area 45% SF = 606mm<sup>2</sup>.



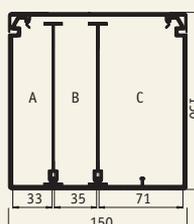
### MTRS100/50

Total = 4040mm<sup>2</sup> total area 45% SF = 1818mm<sup>2</sup>.  
A = 1056mm<sup>2</sup> total area 45% SF = 475mm<sup>2</sup>.  
B = 660mm<sup>2</sup> total area 45% SF = 297mm<sup>2</sup>.  
C = 1829mm<sup>2</sup> total area 45% SF = 823mm<sup>2</sup>.



### MTRS100

Total = 8733mm<sup>2</sup> total area 45% SF = 3930mm<sup>2</sup>.  
A = 2375mm<sup>2</sup> total area 45% SF = 1069mm<sup>2</sup>.  
B = 1464mm<sup>2</sup> total area 45% SF = 659mm<sup>2</sup>.  
C = 4075mm<sup>2</sup> total area 45% SF = 1834mm<sup>2</sup>.



### MTRS150

Total = 20193mm<sup>2</sup> total area 45% SF = 9087mm<sup>2</sup>.  
A = 4406mm<sup>2</sup> total area 45% SF = 1983mm<sup>2</sup>.  
B = 4728mm<sup>2</sup> total area 45% SF = 2128mm<sup>2</sup>.  
C = 9482mm<sup>2</sup> total area 45% SF = 4267mm<sup>2</sup>.

## MINI-TRUNKING & CALLMASTER SYSTEM

Designed to give improved appearance and security to surface cables, Marshall-Tufflex Mini-Trunking with its extensive range of fittings and dedicated accessory boxes, offers an efficient and economical solution to cable management.

### INSTALLATION

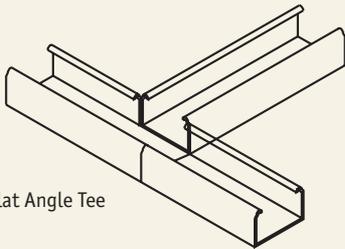
Before installing the trunking confirm the route of the main circuits marking spurs and accessory positions.

### MOUNTING

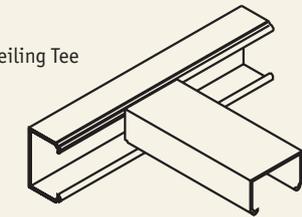
Drill oversize holes and secure at least every 375mm in low level applications using round head screws with washers. Do not over tighten to allow for thermal movement. See Material Data page 208 for Thermal Properties.

### JOINTS

At each joint 3mm should be left for expansion. Internal bends must be mitred to ensure total enclosure of trunking. External bends should be cut square with the corner and flat angles and tees, cut the side wall of trunking for cable entry. None of the cutting is critical as the clip-on fittings have a built-in overlap for the lid and side walls.



Flat Angle Tee



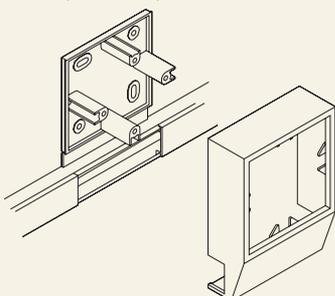
Ceiling Tee

### ACCESSORY BOXES

Select the appropriate box and remove the required knock-out, cleaning any burrs from around aperture. Snap adaptor into position on the box and place into position. Ensure trunking seats securely into adaptor. Secure the box using diagonally opposite fixing holes with No.8 countersunk screws.

### SHROUDED ENTRY BOXES

Designed to enable the termination of standard accessories without loss of capacity in the trunking and avoiding the need for spurs. Place back-plate into position and secure using diagonally opposite fixing holes. Feed the cables through the trunking cover and clip box into position.



### END CAPS

These should be secured into position by using solvent adhesive MSC3.

### LID

On completion of the base and cable installation, starting at a convenient place, snap alternative fitting and lid into place ensuring fittings completely overlap the lid.

### SELF-FIXING MINI-TRUNKING

To secure base of trunking remove protective film exposing 100-150mm of adhesive foam. Line up accurately and press firmly into position. Repeating the procedure until the base is installed. For long term permanence we recommend additional securing with screws and washers. Note: The bond created by the tape can be very strong. Maximum adhesion occurs after 24 hours. Ensure surface is dust free, dry, clean and flat. Uneven surface contact will reduce the bonding performance. Installation in cold conditions below +5°C may affect adhesion. Continue as for normal Mini-Trunking for the rest of the installation.

### MINI-TRUNKING CAPACITIES

MT Ref	Size mm	45% Capacity
MMT00	10 x 8	18.5mm <sup>2</sup>
MMT0	16 x 10	42mm <sup>2</sup>
MMT1	16 x 16	77.2mm <sup>2</sup>
MMT2	25 x 16	119.7mm <sup>2</sup>
MMT3	38 x 16	198.8mm <sup>2</sup>
MMT4	38 x 25	342mm <sup>2</sup>
MMT5	50 x 25	449mm <sup>2</sup>
MMT6	38 x 38	501mm <sup>2</sup>
MMT7	75 x 16	167.4mm <sup>2</sup>

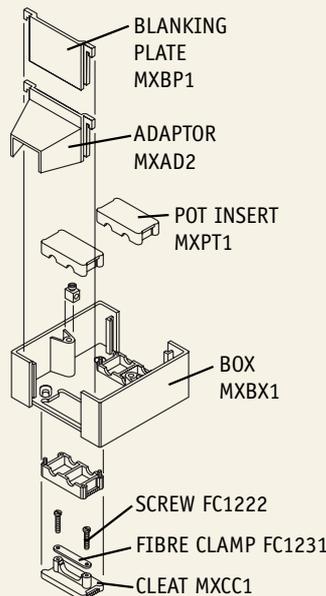
## CALLMASTER SYSTEM

A range of adaptable accessory boxes primarily developed for emergency applications where fire performance cables are used within MMT2 Mini Trunking. The boxes are supplied with internal pot retainers for MI cables, eliminating the need for cable glands and shrouds. Cable clamps for use with conventional and fire performance cables are also included giving further flexibility. All boxes are fitted with earth terminals.

### DIMENSIONAL DATA

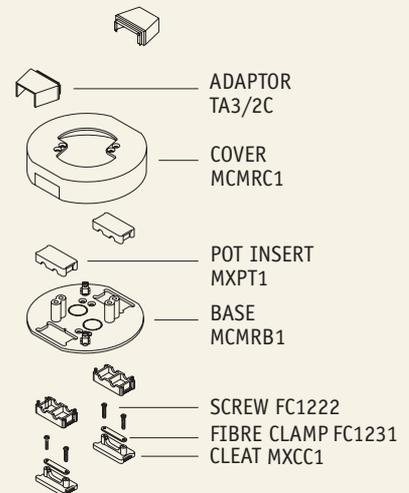
#### CALLMASTER SQUARE ACCESSORY BOXES

Overall: 87mm x 87mm excluding adaptors  
Depth: 38mm external 35mm internal  
Fixing centres: 60.3mm  
Pot size: 15mm



### CIRCULAR CALLMASTER ACCESSORY BOX

Overall diameter: 123mm excluding adaptors  
Depth: 28mm external, 24mm internal  
Dual fixing centre: 50.8mm and 60.3mm  
Pot size: 15mm.



### ADDITIONAL MINI-TRUNKING ADAPTORS

Mini-Trunking	Adaptor
MMT1 (16 x 16mm)	TA3/1C
MMT3 (38 x 16mm)	TA3

### FLAME PROPAGATION

The PVC-U material used is non-flame propagating and complies with the requirements of BS476, Parts 6 & 7 and BS4678, Part 4, where applicable.

### STANDARDS

The Callmaster System is designed to comply with BS7671:2001 (Wiring Regulations).

## PVC-U CONDUIT SYSTEMS

The following notes are intended to be a guide to the installation of Marshall-Tufflex PVC-U conduit and fittings. For further advice contact our Technical Hotline 01424 856688.

### CHOICE CONDUIT/CHANNEL

The choice is dependent on the type of work being undertaken and the specification. Heavy gauge round conduit is normally used in surface work and for casting in-situ. Light gauge round conduit is suitable for concealed work and in screeds. Oval conduit is normally chosen for use in plastered walls and can be used as switch drops in surface work. The channel sections are frequently used as an inexpensive method of installing cables in domestic installations beneath plaster. See Material Data page 208 for Thermal Properties.

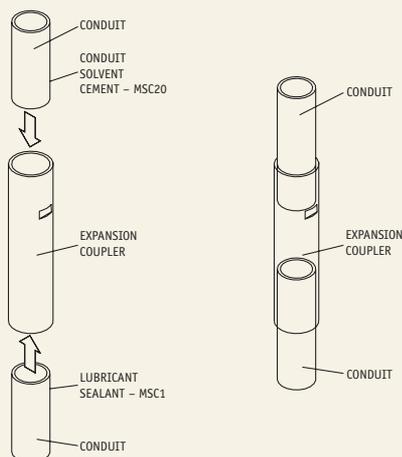
### SURFACE INSTALLATION

All horizontal runs of conduit should be secured at a maximum distance of 0.9m and vertical runs should be secured at a maximum of 1.2m. For high ambient temperatures or where rapid changes in temperature are likely to be encountered this distance should be reduced. At fittings or where directional changes takes place the conduit should be fastened approximately 150mm either side to maintain support. The fastenings should not be over tightened to permit thermal movement of the conduit.

### JOINTS AND COUPLERS

To accommodate for thermal movement due to temperature change (Materials Data) on surface installations, it is recommended that expansion couplings be used at a maximum distance of 6m intervals. Where high ambient temperatures or frequent variations in temperature are likely to occur this distance should be reduced.

Expansion couplers are installed with the short side coated with solvent cement and the coupler pushed firmly over the conduit down to the shoulder. The slip side coated inside with lubricant sealant receives the conduit to a midpoint to the nib. This will then permit expansion or contraction providing the conduit is free to move in the saddles.



Conduit fittings are installed in the system using solvent cement (MSC20) for permanent installations and lubricant sealant (MSC1) where the installation is subject to frequent changes.

### BENDS

**Note:** Care should be taken not to make too tight a bend and attention is drawn to BS 7671:2001 (Wiring Regulations) 522-08-03. The radius of every bend in a wiring system shall be such that conductors and cables shall not suffer damage.

### COLD BENDING 20-25MM CONDUIT

This may be carried out on all conduit sizes up to 25mm in diameter using the correct size and gauge of bending spring. It should be noted that the heavy gauge spring is colour banded green and the light gauge spring colour banded white near the tip of the spring. These springs are not interchangeable under any circumstances. Make sure they are not damaged in any way as this can cause the conduit to kink and fracture making removal of the spring difficult. (In cold weather the Conduit should be warmed by rubbing with a rag or some other suitable means before bending.)

To bend the conduit insert the spring to the desired position, grip the conduit on either side of the bend and bring slowly together to form the bend. The bend should be made more acute than necessary because of the tendency of the PVC-U to 'recover' after bending. To remove the spring twist in an anti-clockwise direction which will reduce its diameter. At the same time turn the conduit in a clockwise direction gently pulling the spring and conduit apart. If the spring fails to release during this operation do not pull too hard otherwise damage to the spring may occur. Repeat the removal procedure turning the spring again in an anti-clockwise direction and rotating the conduit clockwise slowly pulling them apart. The conduit should then be fastened into position to prevent further 'recovering' of the bend.

### HOT BENDING

This should be carried out on all conduit above 25mm diameter using the correct size and gauge of bending spring. Insert the bending spring into the conduit as previously described, gently heating the conduit with a hot air torch, hot water or by other suitable means, with care being taken to avoid the direct application of a flame to the conduit. When the conduit is in a pliable state, slowly bend around a suitable former, holding in position for about one minute until set when the bending spring may then be removed by twisting in an anti-clockwise direction and gently withdrawing from the conduit.

If the conduit is bent too fast or, particularly in the case of light gauge across the knee, there is a risk of damage to both the conduit and spring. Similarly once the bend has been made it should not be forced backwards but allowed to recover naturally.

### EARTHING

The properties of PVC-U make it an all insulated system and the use of a separate earth cable is essential which greatly reduces the risk of poor earth continuity that can result from any breakdown of joints which may occur in a steel system.

### JOINT SEALANTS

**Lubricant Sealant MSC1.** For use with expansion couplers or installations subject to frequent change. Water resistant.

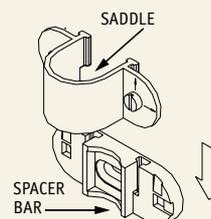
**Solvent Cement MSC20.** A slow acting solvent cement especially formulated for watertight conduit fittings.

**Solvent Adhesive MSC3.** A watertight fast acting solvent adhesive mainly for trunking systems with good take-up properties.

In accordance with COSHH Regulations details of our solvents are entered in The National Poison Centre computer records. Health and Safety Data Sheets are available from our Technical Department and are on the Marshall-Tufflex web site: [www.marshall-tufflex.com](http://www.marshall-tufflex.com)

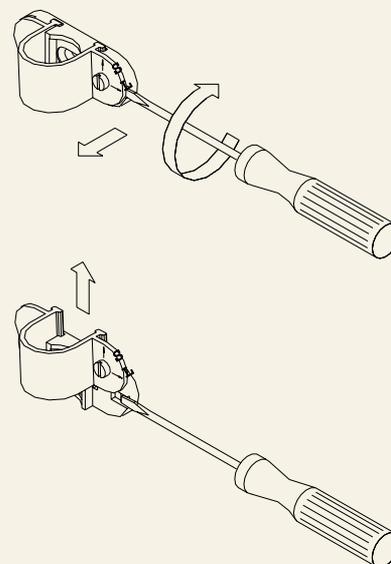
### SPACER BAR SNAP SADDLE ASSEMBLY

Slide Saddle into groove until Saddle locks into the Spacer Bar.



### DISMANTLE

Insert 4mm blade screwdriver into slot on side. Twist screwdriver which releases the Saddle in the Spacer Bar and slide Saddle out of the Spacer Bar groove.



# PVC-U CONDUIT CABLE CAPACITIES

## INTRODUCTION

This appendix describes a method which can be used to determine the size of conduit necessary to accommodate cables of the same size, or different sizes, and provides a means of compliance with Regulations, which states 'The number of cables drawn into conduit of a wiring system shall be such that no damage is caused to the cables or to the conduit during their installation.'

The method employs a 'unit system' each cable size being allocated a factor. The sum of all factors for the cables intended to be run in the same conduit is compared against the factors given for conduit in order to determine the size of conduit necessary to accommodate those cables.

It has been found necessary, for conduit, to distinguish between –

1. Straight runs not exceeding 3 metres in length, and
2. Straight runs exceeding 3 metres, or runs of any length incorporating bends or sets.

The term 'bend' signifies a British Standard 90° bend and one double set is equivalent to one bend.

For the case 1, each conduit size is represented by only one factor. For the case 2, each conduit size has a variable factor which is dependent on the length of run and the number of bends or sets. For a particular size of cable the factor allocated to it for case 1 is not the same as for case 2.

Because of certain aspects, such as the assessment of reasonable care of pulling-in, acceptable utilisation of the space available and the dimensional tolerance of cables and conduit, any method of standardising the cable capacities of such enclosures can only give guidance on the number of cables which can be accommodated.

Thus the sizes of conduit determined by the method given in this appendix are those which can be reasonably expected to accommodate the desired number of cables in a particular run using an acceptable pulling force and with the minimum probability of damage to cable insulation.

Only mechanical considerations have been taken into account in determining the factors given in the following tables.

As the number of circuits in a conduit increases, the current-carrying capacities of the cables must be reduced according to the appropriate grouping factors. It may therefore be more attractive economically to divide the circuits concerned between two or more enclosures.

## Single-core PVC-insulated cables in straight runs of conduit not exceeding 3 metres in length.

For each cable it is intended to use, obtain the appropriate factor from Table A. Add all the cable factors so obtained and compare with the conduit factors given in Table B. The conduit size which will satisfactorily accommodate the cables is that size having a factor equal to or exceeding the sum of the cable factors.

**TABLE A**

Cable factors for short straight runs

Type of conductor	Conductor cross-sectional area mm <sup>2</sup>	Factor
Solid	1	22
	1.5	27
	2.5	39
Stranded	1.5	31
	2.5	43
	4	58
	6	88
	10	146

**TABLE B**

Conduit factors for short straight runs

Conduit diam mm	Factor
20	460
25	800
32	1400

**TABLE D**

Conduit factors for runs incorporating bends

Length of run m	Conduit diameter, mm														
	Straight			One bend			Two bends			Three bends			Four bends		
	20	25	32	20	25	32	20	25	32	20	25	32	20	25	32
1	Covered by Tables A and B			303	543	947	286	514	900	256	463	818	213	388	692
1.5				294	528	923	270	487	857	233	422	750	182	333	600
2				286	514	900	256	463	818	213	388	692	159	292	529
2.5				278	500	878	244	442	783	196	358	643	141	260	474
3				270	487	857	233	422	750	182	333	600			
3.5	290	521	911	263	475	837	222	404	720	169	311	563			
4	286	514	900	256	463	818	213	388	692	159	292	529			
4.5	282	507	889	250	452	800	204	373	667	149	275	500			
5	278	500	878	244	442	783	196	358	643	141	260	474			
6	270	487	857	233	422	750	182	333	600						
7	263	475	837	222	404	720	169	311	563						
8	256	463	818	213	388	692	159	292	529						
9	250	452	800	204	373	667	149	275	500						
10	244	442	783	196	358	643	141	260	474						

## Single-core PVC-insulated cables in straight runs of conduit exceeding 3 metres in length, or in runs of any length incorporating bends or sets.

For each cable it is intended to use, obtain the appropriate factor from Table C. Add all the cable factors so obtained and compare with the conduit factors given in Table D, taking into account the length of the run it is intended to use and the number of bends and sets in that run. The conduit size which will satisfactorily accommodate the cables is that size having a factor equal to or exceeding the sum of the cable factors.

**TABLE C**

Cable factors for long straight runs or runs incorporating bends

Type of conductor	Conductor cross-sectional area mm <sup>2</sup>	Factor
Solid or Stranded	1	16
	1.5	22
	2.5	30
	4	43
	6	58
	10	105

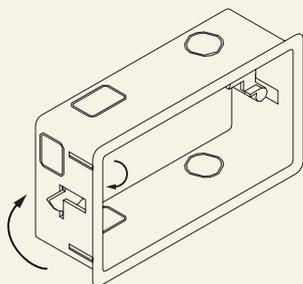
For MT Supertube increase cable factor by 15%.

## DRY LINING ACCESSORIES

### INSTALLATION – DRY LINING BOXES

Choose the correct box for the application and board depth. Cut the relevant size aperture for the box (see Table) in the board which should have sufficient strength to support the accessory. (Ceiling mounted circular boxes can support 3kg centrally at 60°C maximum subject to ceiling construction). Remove knockout and pass cables into the box. Insert the box into the aperture and swivel out the lugs using the internal fins if fitted, which will hold the box in position. Terminate accessory and using the accessory fixing screws draw in the lugs, clamping the box securely to the board.

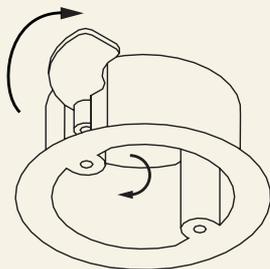
### RECTANGULAR DRY LINING BOX



For easy identification the lugs are colour coded to denote board thickness on **standard boxes**:

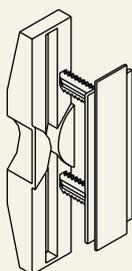
Lug Colour	Adjustment
Grey	1 – 9mm
White	6 – 14mm
Green	18 – 25mm

### CIRCULAR DRY LINING BOX



### DRY LINING SPACER

1. Cut aperture to the size of the boxes, see table above adding 28mm for the spacer.
2. Fit one box into the aperture and rotate one of the swivelling clamps onto the plaster board.
3. Place SPACER HORIZONTALLY into the aperture. ROTATE to the VERTICAL position passing the board between the spacer and align with box. SQUEEZE the front and back plates together.
4. Install all necessary wires through the box apertures provided and fit the second box in the normal way ensuring the swivelling clamps are behind the back plate of the spacer from both boxes.
5. Fit the accessory plates in the normal way.

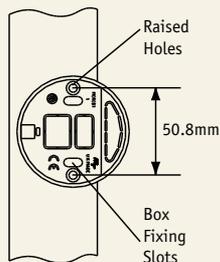


Box Type	Fixing Centres	Internal Depth	Aperture Size	Entry	Board Thickness
Single Gang Shallow	M3.5 x 60.3mm	25mm	73mm x 73mm	ø 20mm x 1 off KO 25 x 16mm x 1 off KO	1-11mm
Single Gang Standard	M3.5 x 60.3mm	34mm	73mm x 73mm	25 x 16mm x 1 off KO	1-9mm 6-14mm 18-25mm
Single Gang Deep	M3.5 x 60.3mm	46mm	73mm x 73mm	ø 20mm x 1 off KO 25 x 16 x 1 off KO	9-26mm
Twin Gang Shallow	M3.5 x 120.6mm	25mm	135mm x 73mm	ø 20mm x 2 off KO Back	1-11mm
Twin Gang Standard	M3.5 x 120.6mm	34mm	133mm x 73mm	25 x 16mm x 2 off KO	1-9mm 6-14mm 18-25mm
Twin Gang Deep	M3.5 x 120.6mm	46mm	135mm x 73mm	ø 20mm x 1 off KO 25 x 16mm x 1 off KO	9-26mm
Dual Gang	2 off M3.5 x 60.3mm	34mm	157mm x 73mm	ø 20mm x 1 off KO 25 x 16mm x 1 off KO each module	1-9mm 6-14mm 18-25mm
Circular Standard	M3.5 x 50.8mm	34mm	63.5mm dia.	ø 20mm x 1 off KO	9-32mm
Circular Large	M4.0 x 50.8mm M3.5 x 60.3mm	34mm	70.0mm dia.	ø 20mm x 2 off KO	9-32mm
Dry Lining Spacer	-	-	-	-	1-16mm
Ceiling Connector Box	50.8mm unsupported	8/65mm	ø65mm	3 off KO	10mm
Hole Cutter	-	-	ø 65mm ø 70mm	-	-

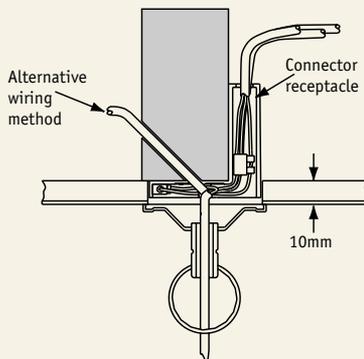
### CEILING CONNECTOR BOX

**ENSURE ELECTRICAL SUPPLY IS DISCONNECTED PRIOR TO INSTALLATION**

1. Prior to installation confirm the medium is capable of supporting the load.
2. Cut a hole ø65mm or use Hole Cutter HSK6570 or similar and position as shown.
3. Feed the cables through the appropriate knockouts.
4. Fix the box with two suitable screws through the two 5mm slots provided.
5. Terminate all wires with suitable connectors and insert into the receptacle in the box.
6. Place the cover of the fitting over the box and secure it with two No.8 screws into the load bearing medium through the two 5mm raised holes provided.

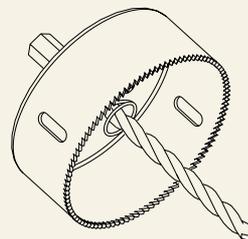


**THE PRODUCT DOES NOT SUPPORT THE ELECTRICAL FITTING**



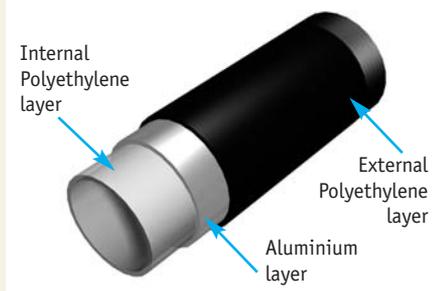
### THE MARSHALL-TUFFLEX CUTTER KIT

The Marshall-Tufflex hole cutters provide the perfect answer to cutting clean circular holes for the installation of circular dry lining boxes. With a standard drill in the centre for accurate location of the hole, cutting large holes could not be easier. Kit consists of two cutters: 65mm for standard box, 70mm for large box. One arbour with 6mm drill bit and ejector spring.



# MT SUPERTUBE - LSOH CONDUIT

MT SUPERTUBE is a new type of conduit. Its uniqueness is in its three layer construction, incorporating a welded hermetically sealed aluminium tube providing the very latest method of EMI screening covered both internally and externally with a layer of LSOH Polyethylene. This gives the product comparable strength to that of a metal conduit with the flexibility of a PVC-U conduit.



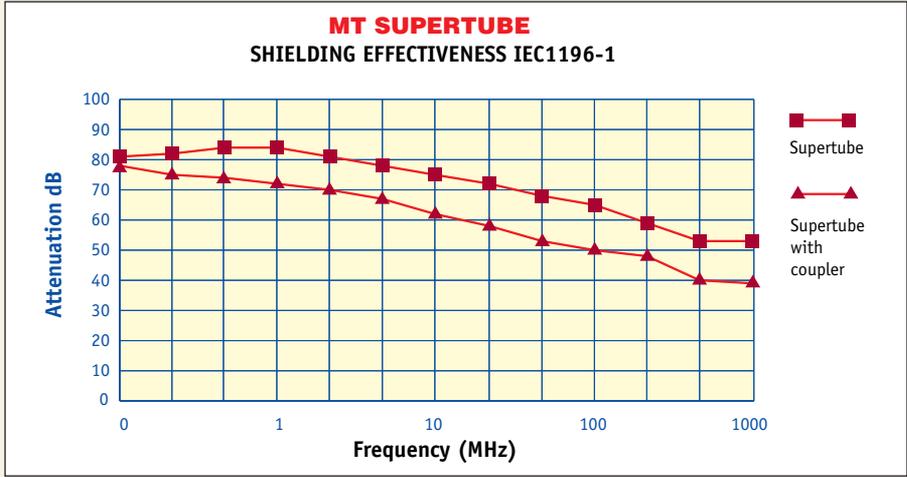
Shielding effectiveness (attenuation in dB) is a measurement of the ratio between the external environment field strength and that field strength measured after passing through any material. This is recorded in a logarithmic scale. MT SUPERTUBE multi layer conduit systems are designed to absorb and reflect emitted radiation from sources of interference, whereby with an attenuation of 80dB would reduce the resultant field within the Supertube by a factor of 10,000 (See tables).

SHIELDING EFFECTIVENESS	
Attenuation in dB	Field strength reduction
6	2
20	10
40	100
60	1000
80	10000

It can be clearly seen from the graph that the shielding effectiveness of MT SUPERTUBE System is highly effective throughout the entire frequency range, and will provide protection from interference for data, telecommunication and signal cables and is far superior in comparison to any other similar product currently available.

This is supplemented by the cost savings that can be made during installation and the greater flexibility of the range.

With MT SUPERTUBE, its unique construction and smooth internal bore makes the stripping of cable insulation a thing of the past, compared to steel conduit. Add to this the greater lengths through more bends which can be achieved without stretching the cables, the pulling of cable could not be easier. MT SUPERTUBE is a simple tubing product which can be installed with no mess, minimal wastage and in a fraction of the time taken for conventional systems, for cable protection, screening, fire protection and halogen free applications.



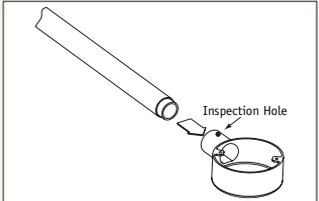
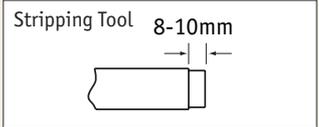
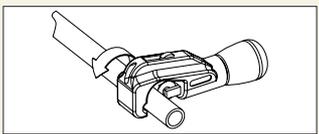
TUBE REFERENCE	22010/22003	22505/22503
Outside diameter (mm) OD	20	25
Internal diameter (mm) ID	15.5	20
Wall thickness (mm) W	2.25	2.5
Minimum bend radius (8 x dia)	160	200
Weight per metre (g)	145	184
Lengths (m)	100/3	50/3

Suspension distance (maximum)	Horizontal (mm) 1000 Vertical (mm) 1200
Electrical breakdown resistance	20,000 V
Temperature range °C	-45 +120
Thermal expansion coefficient	$2.0 \times 10^{-6}$ mm/m/K
Thermal conductivity	0.45 W (mK)
Earth bonding/continuity test results (per fitting)	$< 0.05 \Omega$ (0.00256 $\Omega$ )
Standards	BS EN 50086-2-1 1996 CLAUSE 12.1 DIN EN 50086-2-1 1995 IEC 1196-1

**WARNING** The aluminium tube is *not* suitable to be used as a protective conductor (CPC).

### INSTRUCTIONS FOR JOINTING MT SUPERTUBE

- FOR EMC SCREENING SYSTEM
  - Cut the tube squarely to the required length. Tool no. 20001.
  - Remove 8-10mm of insulation taking care not to cut the aluminium layer.
  - Push the conduit into the fitting. By confirming only the insulation layer is visible through the inspection hole. For additional retention a screw is available for location in the inspection hole.
- FOR HALOGEN FREE SYSTEM
  - Cut the tube squarely to the required length. Tool no. 20001.
  - Apply sealant (20006) to the end of the tube.
  - Push the tube firmly into the fitting spout.



### FORMING/BENDING OF MT SUPERTUBE



MT SUPERTUBE can be formed by hand, although care needs to be taken to avoid kinking.



A tighter radius (90°) can be achieved using the MT SUPERTUBE compact hand held bender.

## GRP SYSTEMS

GRP (Glass Reinforced Polyester) is chosen for its mechanical strength, lightness, ease of installation and excellent resistance to fire and corrosion.

- 80% lighter than steel, 30% lighter than aluminium.
- Rapid mounting and interlocking assembly.
- On-site modification without the need for special tools, no burring, no finishing, no danger of injury.
- Developed to withstand extreme weather conditions, salt water and most chemicals.
- Very good stability to UV.
- Insulating material, non-conductive, resistant to temperatures from -80 to +130°C.
- Excellent fire behaviour and self-extinguishing, GRP does not conduct heat and has zero halogen in the case of fire.
- Resistant to corrosion and contributes to low maintenance costs.

### GRP MATERIAL DATA (POLYESTER)

Flammability to UL94	94V-0
Flammability to low wire	960°C
Spread of flame BS476PT7	Class 2
Fire Propagation BS476PT6	18.3
Oxygen index	>35%
Mechanical Impact	IEIO
Density	1.75-1.90g/lcm <sup>2</sup>
Water absorption	0.1°h<0.4%
Working temperature	-30°C to +80°C
Colour (standard)	RAL7032
Co-efficient of linear expansion	
Pressed	36 x 10 <sup>-6</sup> /m/°C
Pultruded	8.0 x 10 <sup>-6</sup> /m/°C

### CUTTING/FABRICATION ON SITE

GRP can be cut and drilled with standard hand or power tools. The absence of sharp edges after fabrication makes these products safe for both cables and the installation personnel. When cutting by hand it is recommended that a tungsten carbide tipped heavy duty type cross-cut saw be used. Power disc cutting equipment will easily and effortlessly make this task quicker. Care and attention to compliance of Health and Safety at Work must be observed. Cutting by power tools should be done in an open air environment.

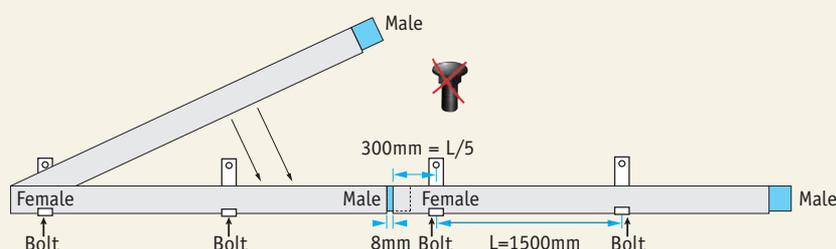
### PRESSED TRUNKING/TRAY

The hot press moulded technique based on composite materials permits the forming of both 3000mm base/lids and a large range of fittings with various bend radius controls.

### INSTALLATION

All bases come with built-in self-adjusting interlocking coupler, no fasteners required and they position themselves automatically in an optimal way in order to give an expansion joint for thermal movement. Support the base at 1500mm centres with 300mm of the base projecting male beyond the support. Place the projecting lip of the next base into previous base maintaining joint for expansion.

To position couplings without screwing junctions



Every junction/fitting should have an accompanying support within 200mm. All bases and fittings must be fixed laterally with 4mm clearance holes on each side of the support.

### COVERS

These should be misalign with the base joint by at least 300mm to ensure maximum strength and secured to the base by means of four clips, two required at 50 – 100mm from each end.

### LOADING CHARACTERISTICS

Deflection <5mm (1/300).  
Coefficient of safety > 1.7 (in accordance with IEC61537) using the interlocking and self adjustable coupling without fasteners.

Loading diagram details in accordance with IEC 61537, at an ambient temperature of 25°C

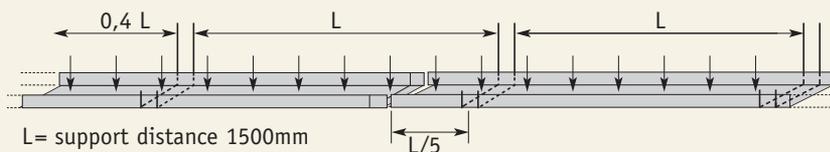
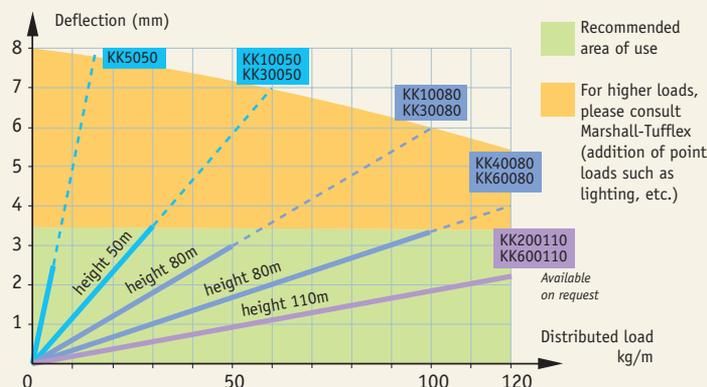


Diagram of loads K<sup>2</sup> series: supporting distance = 1.5 metres (for greater span, refer to Marshall-Tufflex).



# GRP SYSTEMS continued

## GRP CABLE LADDERS PULTRUDED

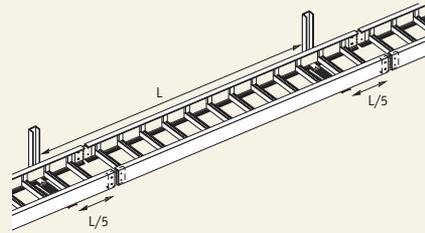
### RESIN TYPES (ALL ZERO HALOGEN)

Polyester (standard)	good all round performance, mechanical strength, corrosion resistance, fire behaviour, temperature rating
Acrylic (on request)	excellent resistance to fire in a corrosive environment.
Vymilester (on request)	highly resistant to a specific range of chemical agents (H <sub>2</sub> SO <sub>4</sub> , HC1...)
Carbon loaded polyester (on request)	antistatic properties for highly explosive atmospheres

Alternatively for specific projects we will define a solution to meet your needs.

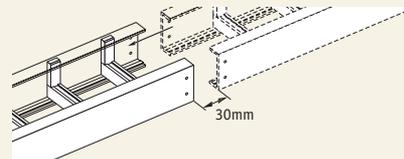
## INSTALLATION

1. Place the end of the ladder about L/5 away from the supporting bracket.

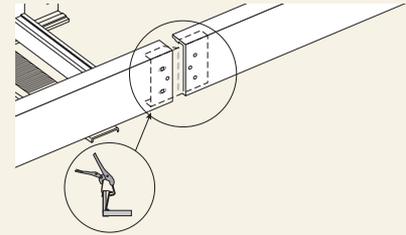


L/5 corresponds to the ideal place for mechanical stability: place the junction between 2 ladders at this point.

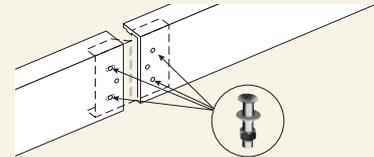
2. Connect the ladders together.



Place the side-rails facing each other.



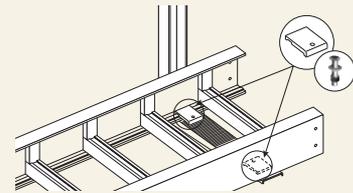
Fix the stainless steel splice plates UL IH with the help of clip stalls, the oval holes\* placed near the supporting bracket.



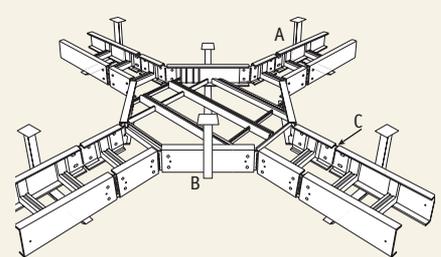
Lock the junction with 4 x M620/V4AS bolts.

(\* ) The splice plates UL IH are pre-punched with 2 holes Ø 8mm and 2 oval holes 20 x 8mm in order to assure a solid fixing and to allow the expansion of the GRP material.

3. Fix the ladder at each support with 2 hold-down clamps UL KS and 2 M1030/V4A bolts

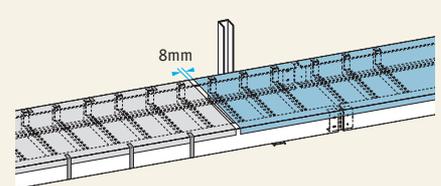


4. Respect the rules of installation.



- A. All fittings must be supported at every cable entry.
- B. Add a central support for all fittings with radius greater than 250mm and/or with width greater than 400mm.
- C. Lock systematically each splice plate UL IH with 4 M620/V4AS bolts on fittings extremities.

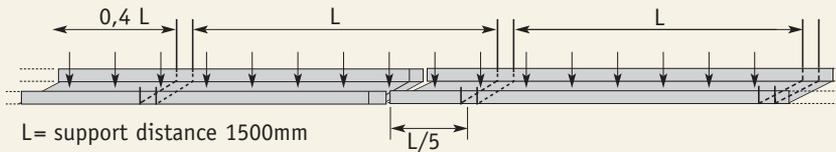
5. Fix the cover with clips made of stainless steel 316 (ref. DF50, DF80, DF100 and DF150).



Under normal conditions use 3 clips alternatively on each side per 3 metres of ladders. Under extreme conditions (strong winds > 60km/h) use 7 clips per 3 metres of ladders.

## LOAD CHARACTERISTICS

Coefficient of safety > 1.7 (in accordance with IEC61537) this data is given for ladders coupled with splice plates and bolts.

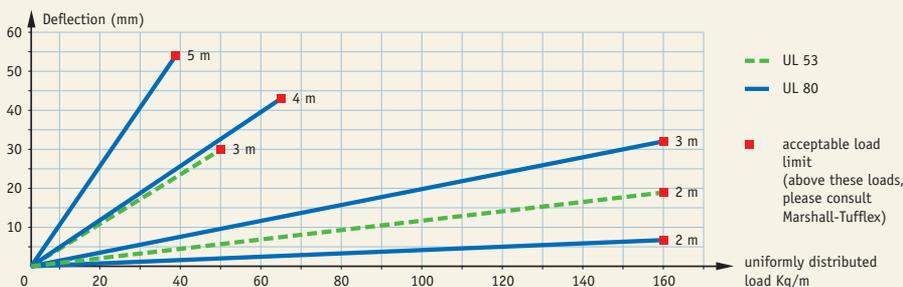


The deflection values are measured with the position of the junction between 2 ladders at a distance L/5 from a support. If this distance is not respected, it is necessary to raise the deflection values by about 30% when fully loaded.

	Useful area (mm <sup>2</sup> )	Weight of cables kg/m	Maximum admissible load kg/m according to the distance between supports				
			2m	3m	4m	5m	6m
UL...53	150 - 300	4420 - 9520 = 250	160	50			
	400 - 600	12920 - 19720 = 550		50			
UL...80	150 - 300	7690 - 16840 = 450	160	160	60	30	
	400 - 600	22940 - 35140 = 1000		160	60	30	

Optimal conditions, for cost reduction on your installation.

Series UL53 and UL80 load diagram: supporting distances from 2 to 5m.



For 100 and 150 wall height refer to Marshall-Tufflex.

## LOCALISED LOADS

To be able to compare this to a uniformly distributed load it is necessary to double the value of the localised load. Example: A 60kg local load at the centre of a ladder with 3m of support distance. Equivalent load: 60 x 2 = 120kg uniformly distributed along 3m (ie 40kg/m).

# POWERPOLE & POST

## STERLING SERIES 2 POWERPOST

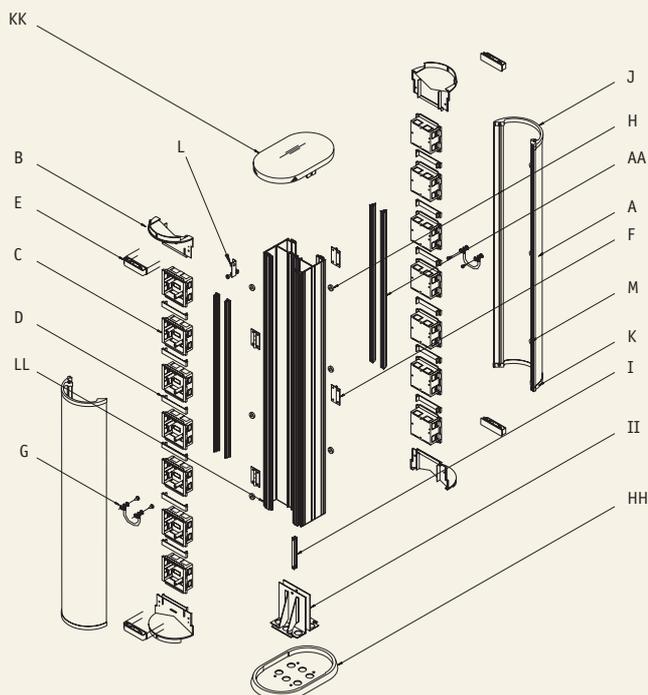
### DOUBLE SIDED POWERPOST

with 2 hinged lids and 14 ESSB1 outlets (NPPE811142)

Code	Description	Quantity
LL	NPPMB811 Square PowerPost base 811mm long	1
A	NPPHL716 Hinged lid assembly	2
J	NPPUT Hinged lid upper trim	2
K	NPPLT Hinged lid lower trim	2
KK	NPPC3 Oval Top cap	1
HH	NPPBF5 Oval base	1
B	NPPBH1 Bulkhead	4
C	ESSB1 Single gang box	14
D	ES1 Spacing cover	12
II	PPBF3 Base foot (galvanised)	2
E	NPPCC1 Cable clip	4
AA	MDFS15W632 Dividing fillet 632mm long	4
F	NPPLH1 Stainless steel hinges	4
L	PPBT1 16mm bonding terminal assembly	1
G	NPPLBS1 Hinged lid bonding strap	2
H	NPPLH1 Disc latch	6
M	NPPMC1 Magnet catch	6
I	PPSN1 Sliding nut	2

Overall height 838mm.

Full installation instructions are included within each pack.



## STERLING SERIES 2 POWERPOST

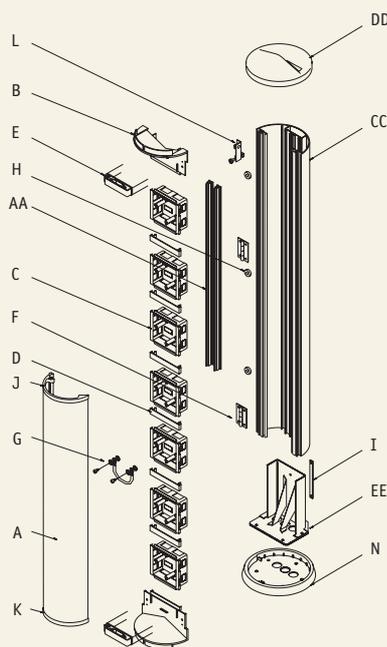
### SINGLE SIDED POWERPOST

with 1 hinged lid and 7 ESSB1 outlets (NPPC80671)

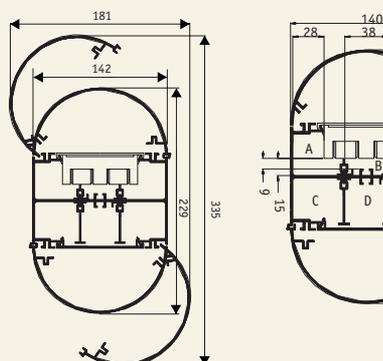
Code	Description	Quantity
CC	NPPB806 Semi-circular PowerPost base 806mm	1
A	NPPHL716 Hinged lid assembly	1
J	NPPUT Hinged lid upper trim	1
K	NPPLT Hinged lid lower trim	1
DD	NPPC2 Top cap	1
EE	NPPBF7 Circular post base foot (galvanised)	1
N	NPPBF4 Circular base foot	1
B	NPPBH1 Bulkhead	2
E	NPPCC1 Cable clip	2
D	ES1 Spacing cover	6
C	ESSB1 Single gang box	7
AA	MDFS15W632 Dividing fillet 632mm	2
H	NPPLH1 Disc latch	3
M	NPPMC1 Magnet catch	3
F	NPPH1 Stainless steel hinges	2
G	NPPLBS1 Hinged lid bonding strap	1
L	PPBT1 16mm bonding terminal assembly	1
I	PPSN1 Sliding nut	1

Overall height 838mm.

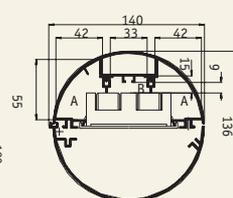
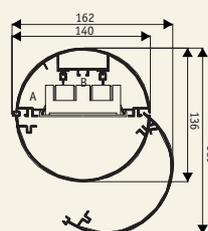
Full installation instructions are included within each pack.



## DIMENSIONS AND CABLE CAPACITIES



A = 1313 sq mm total area 45% space factor = 591 sq mm.  
 B = 505 sq mm total area 45% space factor = 227 sq mm.  
 C = 1798 sq mm total area 45% space factor = 809 sq mm.  
 D = 1628 sq mm total area 45% space factor = 733 sq mm.



A = 1238 sq mm total area 45% space factor = 557 sq mm.  
 B = 505 sq mm total area 45% space factor = 227 sq mm.

# POWERPOLE & POST continued

## STERLING SERIES 2 POWERPOLE

### DOUBLE SIDED POWERPOLE

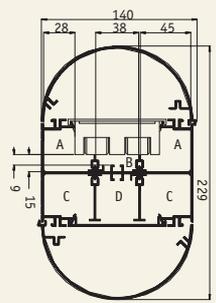
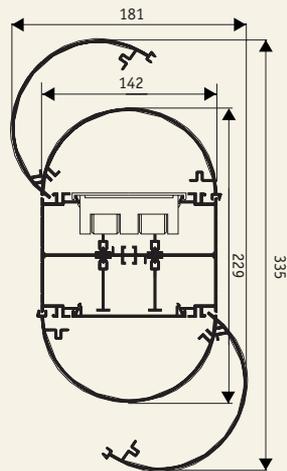
with 4 hinged lids and 14 ESSB1 outlets (NPPE36001441)

Code	Description	Quantity
FF	NPPMB3600 Square PowerPole base 3600mm long	1
A	NPPHL716 Hinged lid assembly	4
P	NPPCL1720 Clip on lid 1720mm long	2
Q	NPPCL50 Clip on lid 50mm long	2
R	NPPCL200 Clip on lid 200mm long	2
J	NPPUT Hinged lid upper trim	4
K	NPPLT Hinged lid lower trim	4
GG	NPPTC3 Oval top sliding cover	1
HH	NPPBF5 Oval base foot	1
B	NPPBH1 Bulkhead	8
II	PPBF3 Base foot (galvanised)	2
E	NPPCC1 Cable clip	8
C	ESSB1 Single gang box	14
D	ES1 Spacing cover	12
F	NPPH1 Stainless steel hinges	8
I	PPSN1 Sliding nut	3
H	NPPLH1 Disc latch	12
M	NPPMC1 Magnet catch	12
G	NPPLBS1 Hinged lid bonding strap	4
LBS2	Clip on lid bonding strap	6
L	PPBT1 16mm bonding terminal assembly	1
S	PHAS1 Top adjusting slide 250mm long	1
T	NPPFB2 Top fixing bracket	1
W	MDFS100W1630 100mm dividing fillet 1630mm long	4
Y	MDFS50W710 50mm dividing fillet 710mm long	4
Z	MDFS50W200 50mm dividing fillet 200mm long	4
AA	MDFS15W632 15mm dividing fillet 632mm long	4
JJ	MDFS50W175 50mm dividing fillet 175mm long	4
V	ETL1W633 Sterling lid 633mm long	2

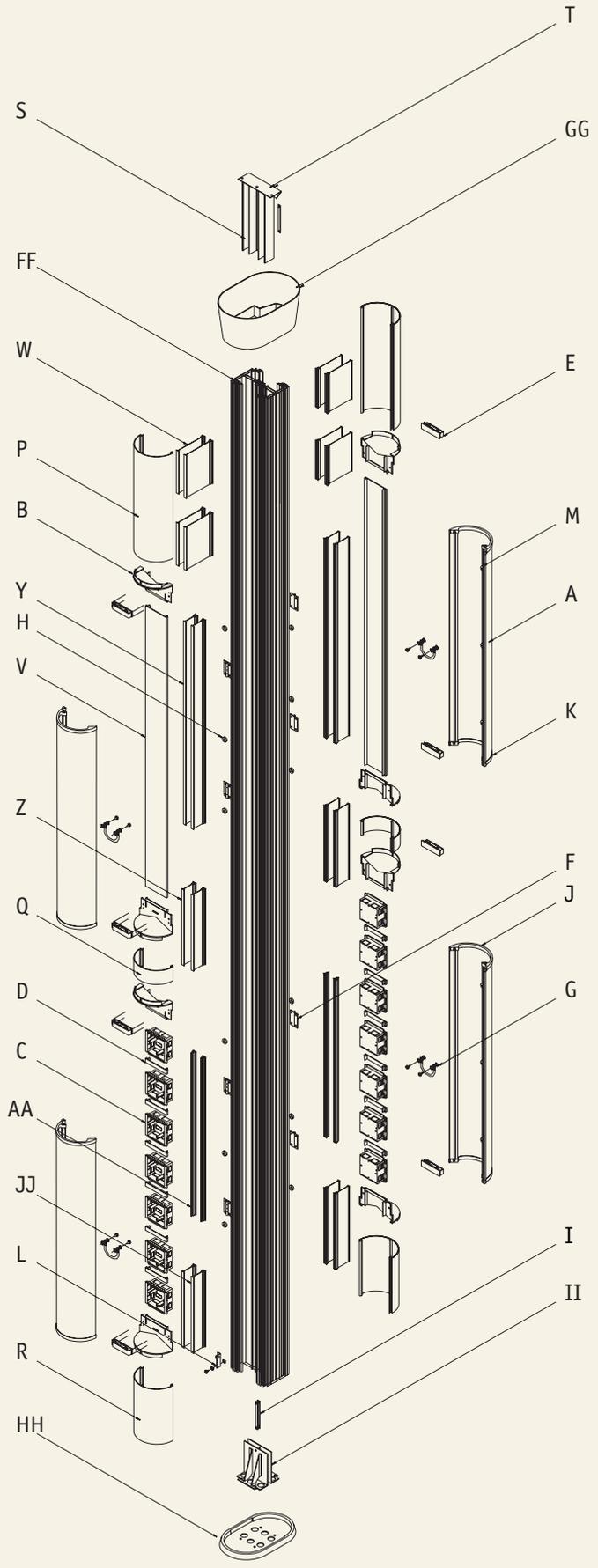
**Note:** The Sterling PowerPole is suitable for both solid and suspended ceilings up to 3.6 metres high. An alternative adjusting slide which can be extended to one metre is available for additional heights within the ceiling void.

Full installation instructions are included within each pack.

### DIMENSIONS AND CABLE CAPACITIES



- A = 1313 sq mm total area 45% space factor = 591 sq mm.
- B = 505 sq mm total area 45% space factor = 227 sq mm.
- C = 1798 sq mm total area 45% space factor = 809 sq mm.
- D = 1628 sq mm total area 45% space factor = 733 sq mm.



# POWERPOLE & POST continued

## STERLING SERIES 2 POWERPOLE

### SINGLE SIDED POWERPOLE

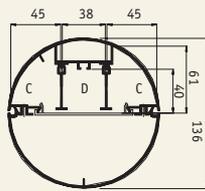
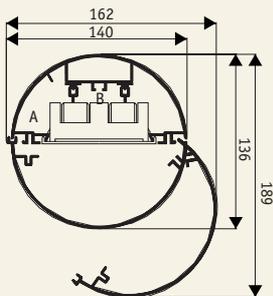
with 2 hinged lids and 7 ESSB1 outlets (NPPC3600721)

Code	Description	Quantity
BB	NPPB3600 Semi-circular PowerPole base 3600mm	1
A	NPPHL716 Hinged lid assembly	2
P	NPPCL1730 Clip on lid 1730mm long	1
Q	NPPCL50 Clip on lid 50mm long	1
R	NPPCL200 Clip on lid 200mm long	1
J	NPPUT Hinged lid upper trim	2
K	NPPLT Hinged lid lower trim	2
O	NPPTC2 Top sliding cover	1
N	NPPBF4 Circular base foot	1
B	NPPBH1 Bulkhead	4
U	PPBF6 Base foot (galvanised)	1
E	NPPCC1 Cable clip	4
C	ESSB1 Single gang box	7
D	ES1 Spacing cover	6
F	NPPH1 Stainless steel hinges	4
I	PPSN1 Sliding nut	2
H	NPPLH1 Disc latch	5
M	NPPMC1 Magnet catch	6
G	NPPLBS1 Hinged lid bonding strap	2
LBS2	Clip on lid bonding strap	3
L	PPBT1 16mm bonding terminal assembly	1
S	PHAS1 Top adjusting slide 250mm long	1
T	NPPFB2 Top fixing bracket	1
AA	MDFS15W632 15mm dividing fillet 632mm long	2
Z	MDFS50W200 50mm dividing fillet 200mm long	2
Y	MDFS50W710 50mm dividing fillet 710mm long	2
X	MDFS50W145 50mm dividing fillet 145mm long	2
W	MDFS100W1630 100mm dividing fillet 1630mm long	2
V	ETL1W633 Sterling lid 633mm long	1

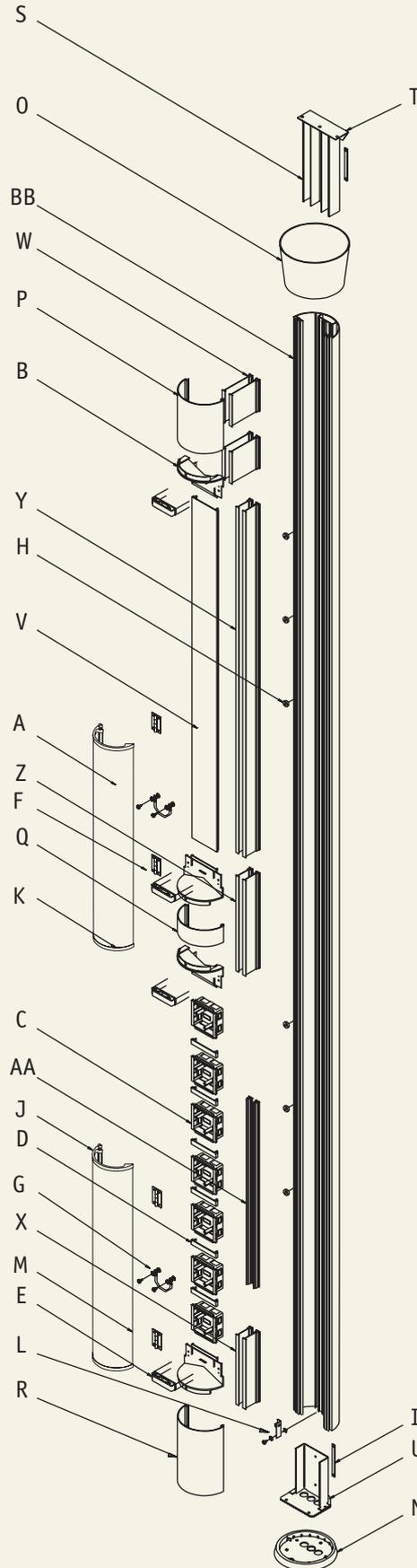
**Note:** The Sterling PowerPole is suitable for both solid and suspended ceilings up to 3.6 metres high. An alternative adjusting slide which can be extended to one metre is available for additional heights within the ceiling void.

Full installation instructions are included within each pack.

## DIMENSIONS AND CABLE CAPACITIES



- A = 1238 sq mm total area 45% space factor = 557 sq mm.
- B = 505 sq mm total area 45% space factor = 227 sq mm.
- C = 1798 sq mm total area 45% space factor = 809 sq mm.
- D = 1628 sq mm total area 45% space factor = 733 sq mm.



# POWERPOLE & POST continued

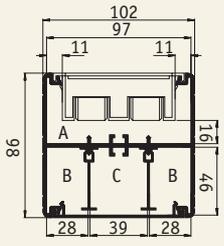
## STERLING DOUBLE SIDED POWERPOST

Code	Description	Quantity
PP685		1 pack
<b>A</b> PPC1	Cap	1
<b>B</b> PL2	Lid	2
<b>C</b> PPMB2	Post	1
<b>D</b> ESSB1	Single Gang Box	6
<b>E</b> PPSN1	Sliding Nut	2
<b>F</b> PPBF3	Base Foot (Metal)	1 pair
<b>G</b> PPBF1	Base Foot (white only)	1
<b>H</b> ES1	Spacing Cover	5
<b>L</b> PPBT1	16mm Bonding Terminal Ass.1	
PPF2	Fixing Kit	1

The standard height of the PowerPost is 685mm and the overall height, including cap and base, is 692mm.

Full installation instructions are included within each pack.

### DIMENSIONS AND CABLE CAPACITIES



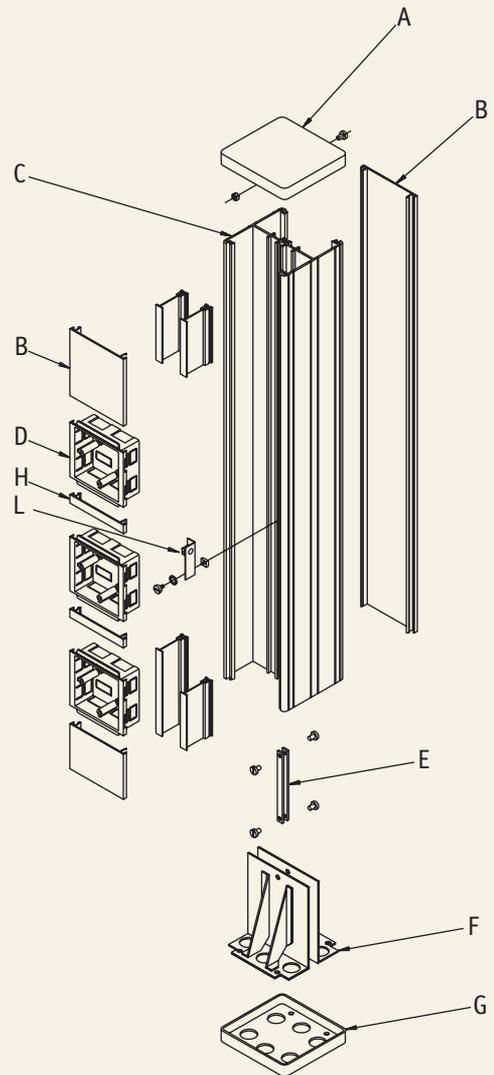
A = 2017 sq mm total area 45% space factor = 907 sq mm.

**Without Accessory Box**

A = 4284 sq mm total area 45% space factor = 1927 sq mm.

B = 1148 sq mm total area 45% space factor = 516 sq mm.

C = 1547 sq mm total area 45% space factor = 696 sq mm.



# POWERPOLE & POST continued

## STERLING DOUBLE SIDED POWERPOLE

Code	Description	Quantity
PP36001	250mm adj. slide	1 pack
PP36002	1150mm adj. slide	1 pack
<b>A</b>	PPFB1 Fixing Bracket	1
<b>B</b>	PHAS1/2 *Adjusting Slide	1
<b>C</b>	PPSN1 Sliding Nut	3
<b>D</b>	PPTC1 Top Cover (white only)	1
<b>E</b>	PL1 Lid 3600mm	2
<b>F</b>	PPMB1 Pole 3600mm	1
<b>G</b>	ESSB1 Single Gang Box	6
<b>I</b>	PPBF3 Base Foot (Metal)	1 pair
<b>J</b>	PPBF1 Base Foot (white only)	1
<b>K</b>	ES1 Spacing Cover	5
<b>L</b>	PPBT1 16mm Bonding Terminal Ass.1	
PPF1	Fixing Kit	1

\*The Sterling PowerPole is suitable for both solid and suspended ceilings up to 3.6 metres high. An alternative adjusting slide which can be extended to one metre is available for additional heights within the ceiling void.

1400mm Extension Kits are also available.

**Full installation instructions are included within each pack.**

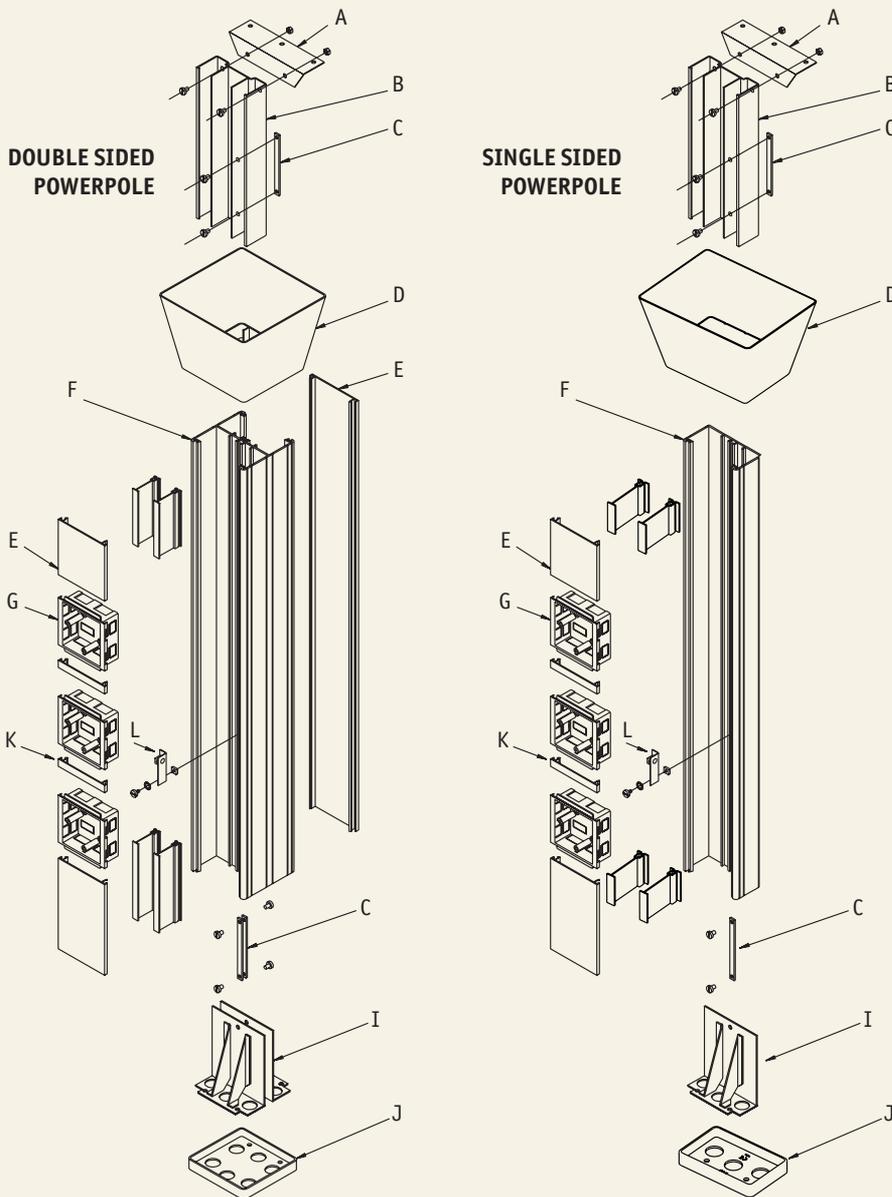
## STERLING SINGLE SIDED POWERPOLE

Code	Description	Quantity
PPS36001	250mm adj. slide	1 pack
PPS36002	1150mm adj. slide	1 pack
<b>A</b>	PPFB2 Fixing Bracket	1
<b>B</b>	PHAS1/2 *Adjusting Slide	1
<b>C</b>	PPSN1 Sliding Nut	3
<b>D</b>	PPTC2 Top Cover (white only)	1
<b>E</b>	PL1 Lid 3600mm	1
<b>F</b>	PPSS1 Single Sided Pole 3600mm	1
<b>G</b>	ESSB1 Single Gang Box	6
<b>I</b>	PPBF3 Base Foot (Metal)	1
<b>J</b>	PPBF4 Base Foot (white only)	1
<b>K</b>	ES1 Spacing Cover	5
<b>L</b>	PPBT1 16mm Bonding Terminal Ass.1	
PPF1	Fixing Kit	1

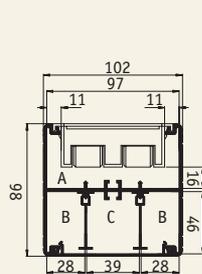
\*The Sterling PowerPole is suitable for both solid and suspended ceilings up to 3.6 metres high. An alternative adjusting slide which can be extended to one metre is available for additional heights within the ceiling void.

1400mm Extension Kits are also available.

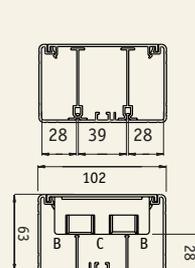
**Full installation instructions are included within each pack.**



## DIMENSIONS AND CABLE CAPACITIES



**DOUBLE SIDED POWERPOLE**  
 A = 2017 sq mm total area 45% space factor = 907 sq mm.  
**Without Accessory Box**  
 A = 4284 sq mm total area 45% space factor = 1927 sq mm.  
 B = 1148 sq mm total area 45% space factor = 516 sq mm.  
 C = 1547 sq mm total area 45% space factor = 696 sq mm.



**SINGLE SIDED POWERPOLE**  
 B = 1115 sq mm total area 45% space factor = 502 sq mm.  
 C = 1119 sq mm total area 45% space factor = 504 sq mm.

## STERLING ALUMINIUM RANGE

### ELEGANCE/STERLING PROFILE/STERLING XL/TWIN PLUS

Sterling aluminium cable management systems from Marshall-Tufflex is manufactured from high precision extruded aluminium with an optional Busbar System. Each compartment has its own cover and fittings for safe and easy access of each compartment excluding Elegance. A full range of bonding straps and connectors are available.

#### POSITIONING

When used in a skirting application the lower web should be drilled with a clearance hole to enable cables to pass through to the accessory boxes in the centre compartment before installation. The base unit should be mounted (5mm + floor covering) above the floor slab to enable cover and fitting to be installed.

#### INSTALLATION

Secure the trunking base every 750mm with no.8 round head screws, utilising the grooves in the outer compartment of the base to facilitate the drilling of 6mm clearance holes.

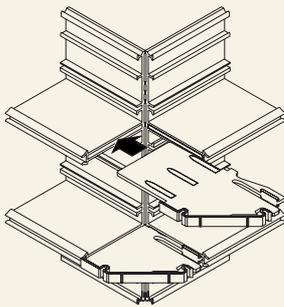
Use a fine tooth blade (32/36tpi) or preferably a circular saw with a 350mm diameter fine tungsten tipped blade (96/108tpi) for cutting the aluminium trunking. This will produce an edge requiring minimal deburring.

#### MOULDED JOINTS AND BENDS (excluding Sterling XL/Twin Plus External Bends – see below)

Consecutive lengths of base are butt jointed together. At corners the trunking base must be mitred to ensure total enclosure of the trunking, including any internal segregator fitted. The cutting is not critical as the fittings cover the joint and overlap the trunking lid to a maximum of 10mm thus covering any inaccuracies. See also Earthing.

#### XL/TWIN PLUS EXTERNAL BENDS

The base should be cut square at the corner and an internal segregator inserted into the web. This gives additional security to the clip-on bend. On Twin Plus cable control inserts slide into base.



#### SINGLE LENGTHS

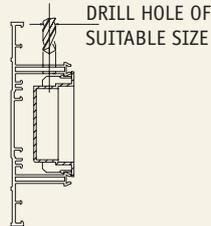
Where it is required to fit a single length of trunking between two inside walls (under 3 metres) it is advisable to place an additional coupler set in the centre of the trunking run to facilitate the removal of the covers.

#### ELEGANCE ACCESSORY BOXES

Remove the appropriate KO or drill the box and feed the cables into the box and clip into the desired location. All Flush Accessories must have front fixing screws visible to enable removal of the cover.

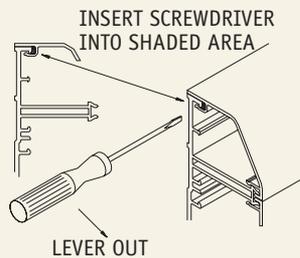
#### STERLING PROFILE/STERLING XL/TWIN PLUS ACCESSORY BOXES

These are installed by clipping the box into the centre compartment in place of the LTL1 cover. When being fed from the adjacent compartment drill a suitable size hole in the web and box if no suitable knock out is available. Install a bush or grommet to protect the cable when passing through the aluminium web.



#### COVER REMOVAL

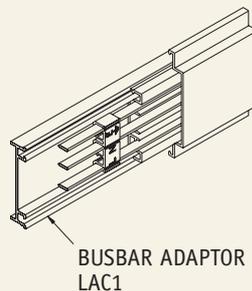
The covers have been designed to remain captive irrespective of impact during normal conditions and minor undulations to the base and to limit unauthorised removal. To remove the covers first detach a coupler, internal or external bend to gain access, care being taken to avoid any damage to the cover surface finish. The angle and square cover are eased from the base by inserting a small screwdriver between the base and the cover clip then lever out. All covers are then gently eased off the base taking care to avoid any damage. Main covers (LTL1) are removed by release of the accessory or fitting and eased from the base, care being taken to avoid damage to the cover.



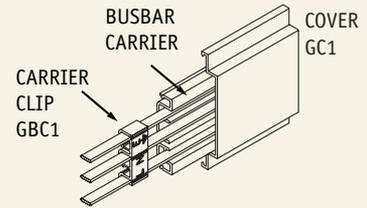
#### BUSBAR ASSEMBLY (GRA1) ELEGANCE

Upgrades the trunking to a 63Amp Busbar distribution system. Comprises: carrier support, carrier clip, Busbar rails, protective cover, cover screws. Requires Busbar Adaptor (LAC1) to position Busbar Assembly within the trunking base (see page 213).

**For Busbar fittings, accessories and installation please refer to relevant sections.**

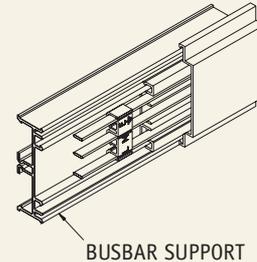


#### STERLING PROFILE



#### STERLING XL/TWIN PLUS

Requires Busbar Support to position Busbar Assembly within the trunking base.

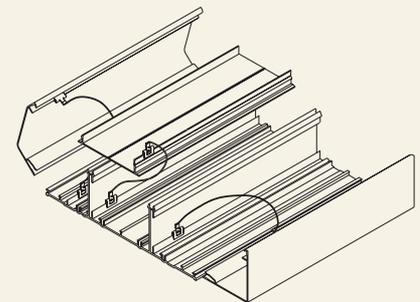


#### EARTHING.

Covers, base and metallic fittings are to be cleaned of protective coating and earth bonded.

Incoming earth connectors are made using the LBT1 bonding assembly installed in the earth channel of the base. For circuits protected by a device greater than 32A, the connector LBT2 is required to bond two lengths of base together. In final ring or radial 32A circuits the bonding strap LBS1 may be used in the earth channel for bonding lengths of trunking.

Covers and metallic fittings should be bonded using the bonding strap LBS2 onto the earth upstand.



#### Bonding Terminal (LBT1)

Terminating the incoming earth to the trunking base. Cable capacity 16mm<sup>2</sup>.

#### Bonding Connector (LBT2)

Base earth continuity link for 63A Busbar.

#### Bonding Strap (LBS1) 4.0mm<sup>2</sup>

Base earth continuity strap for 32A system.

#### Bonding Strap (LBS2) 1.5mm<sup>2</sup>

Base to cover/end cap earth continuity link.

#### DIMENSIONAL REFERENCE TO HORIZONTAL OFFSETS AND FABRICATED FITTINGS

See Sterling PVC-U Trunking page 211.

The installation should be in accordance with the latest edition of BS 7671:2001 Wiring Regulations.

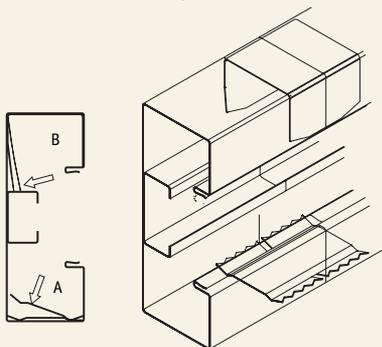
# STEEL PERIMETER CONTAINMENT SYSTEMS

The Marshall-Tufflex Steel Trunking Systems are suitable for the installation of most types of accessories with M3.5 x 60.3mm or M3.5 x 120.6mm fixing centres using a clip-in accessory box with an internal depth of 40mm.

## INSTALLATION

### BASE

When used as a skirting system sufficient clearance should be allowed for between the floor covering and the skirting base (2mm + floor covering). Secure the trunking base every 750mm with No. 8 screws by drilling the back of the trunking base. To cut the trunking use a fine tooth saw and jig. Trunking base and fittings are joined by use of coupling sets. The coupling sleeve B should be put halfway into the already installed trunking base. The next section of trunking base can be slid onto the sleeve and fixed into position. The serrated edged coupler plate is then pushed firmly into the bottom of the trunking base so that it covers the lower joint A, making a good bond between consecutive lengths of trunking. Finally the connecting sleeve must be pushed into position B. Fixing screws, cut edges etc. should be finished in such a way that no sharp edge can damage the cables inside the trunking.



## DIVIDING FILLET

Clip into 'C' Rail and cut to length between boxes.



## COVERS

The covers are provided with pressed out side grippers which automatically establishes an earth contact when they are pushed into the trunking base. The length of the covers must be determined so that the ends are covered by a fitting or accessory. Every cover has to have at least one pair of side grippers to ensure earth continuity. The length of a cut cover must be at least 50mm, with the side grippers in the middle. For external bends and flat angles the appropriate bend covers must be fitted.

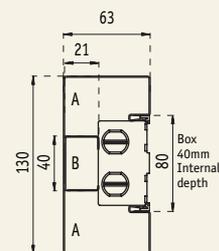
## ACCESSORY BOXES

Mounting boxes are available in single and twin gang versions. Remove appropriate box knock-out, feed cables into the box then clip each side individually into the trunking base. Boxes can be located at virtually any point on the length of the trunking with a minimum distance of 50mm between consecutive accessory boxes.

## EARTHING

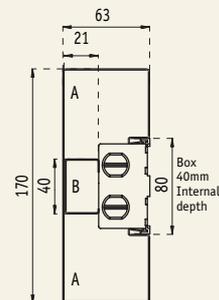
Each length of trunking and all major fittings and accessories are fitted with earth connections. The whole of the trunking system should be installed in accordance with the latest edition of BS 7671:2001 Wiring Regulations.

## DIMENSIONS AND CABLE CAPACITIES



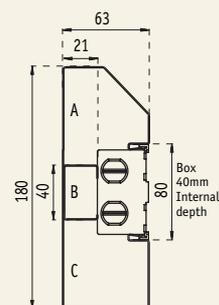
### SYSTEM 130

A = 1585mm<sup>2</sup> total area  
45% SF = 713mm<sup>2</sup>.  
B = 760mm<sup>2</sup> total area  
45% SF = 342mm<sup>2</sup>.



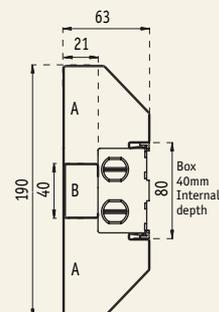
### SYSTEM 170

A = 2812mm<sup>2</sup> total area  
45% SF = 1265mm<sup>2</sup>.  
B = 760mm<sup>2</sup> total area  
45% SF = 342mm<sup>2</sup>.



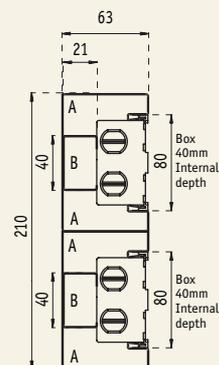
### SYSTEM 180

A = 2868mm<sup>2</sup> total area  
45% SF = 1290mm<sup>2</sup>.  
B = 760mm<sup>2</sup> total area  
45% SF = 342mm<sup>2</sup>.  
C = 2812mm<sup>2</sup> total area  
45% SF = 1265mm<sup>2</sup>.



### SYSTEM 190

A = 2868mm<sup>2</sup> total area  
45% SF = 1290mm<sup>2</sup>.  
B = 760mm<sup>2</sup> total area  
45% SF = 342mm<sup>2</sup>.



### SYSTEM 210

A = 892mm<sup>2</sup> total area  
45% SF = 401mm<sup>2</sup>.  
B = 760mm<sup>2</sup> total area  
45% SF = 342mm<sup>2</sup>.

## SERIES 507 POWERTRACK

The 63 Amp Series 507 Powertrack System caters for single phase standard, UPS and low noise (CE). The 50 Amp System caters for three phase or dual applications where both standard and low noise (CE) power are run together within the same track system using reduced floor area and installation time.

Series 507 Powertrack comes in lengths of 1.2m, 2.4m or 3.6m with tap-off positions provided at 150mm, 300mm or 600mm. A 1.8m length is also available with a 300mm Tap-off position. The system is therefore very versatile and suitable for high through to low density tap-off requirements – so access to power need never be a problem.

Both snap-fit couplers and tap-offs are key and colour coded to avoid any possible errors during assembly. For maximum safety each operates a shutter on insertion to ensure no accidental contact can be made.

### KEYS

	Track Type	Feed Unit	Tap-off Unit
Standard Grey 63Amp			
Auxiliary Yellow 63Amp			
Low Noise (CE) Red 63Amp			
3 Phase White 50Amp			
Dual Circuit (Standard/Low Noise) Blue 50Amp			

### INSTALLATION

Series 507 Powertrack System used within raised access floors is normally arranged in parallel runs with the feed units to the powertrack orientated towards the incoming supply. This offers an economic format inherent in long straight runs. Spacing should be a maximum of 5.5 metres between each length of track and 2.5 metres from the perimeter when using a standard 3 metre tap-off to a floorbox thus offering optimum layout flexibility.

Attention should be given to the total power requirements to avoid exceeding the maximum power rating of the track. This is based on the maximum power requirement for each floor outlet box.

### Series 507 Powertrack System Installation

Starting with the Feed Unit, remove the dust cover over the key and colour coded socket and simply snap the integral coupler, pre-installed on the powertrack, into the feed socket. The next length of track is then fitted to the socket end of the first length of powertrack as previously described, this is then repeated for the following lengths until the run is complete. On the final length of powertrack section the adhesive dust cover over the socket is maintained. This offers additional protection for the shuttered socket from dust or dirt. The Feed Unit is then secured via the slots in the base and the powertrack every 1200mm (max) by using the mounting brackets provided.

### Tap-off

Provision of power is provided along its length by inserting a colour key coded Tap-off unit into a shuttered socket.

Each Tap-off position on the powertrack is protected by a shutter and adhesive dust cover to further protect the outlet. The tap-off unit comes complete with LSF cabling welded directly to the contacts with a flexible outer steel conduit. Removal of the tap-off can only be achieved by releasing the twin integral clips which operates automatically on plug insertion which may be performed whilst the whole system is live.

**NB** There are numerous Tap-off configurations available. Please contact Technical Hotline, 01424 856688, for your exact requirements.

# SERIES 507 POWERTRACK continued

## ELECTRICAL CHARACTERISTICS

Rated Current	50/63	Amps
Rated Voltage	230/400	Volts
Frequency	50/60	Hz
Conditional Short Circuit Rating	(Protection device:BS88 fuse)	16 KA
Conductor Resistance Line & Neutral		3.2 mΩ/m
Conductor Impedance		1.6 mΩ/m
Volt Drops Line & Neutral	Powertrack	3.2 mV/A/m
	Feed Unit + Coupler	2.2 mv/A
	Tap-Off	0.73 mV/A
	4mm <sup>2</sup> Cable	12.0 mV/A/m
	1.5m <sup>2</sup> Cable	31.0 mV/A/m
	Coupler	1.5 mV/A
	Interlink Unit	4.5 mV/A
	10mm <sup>2</sup> Cable (1.2m)	4.7 mV/A/m
Earth Fault Loop Impedance:	Line to Earth (Casing)	2.8 mΩ/m
	Line to Earth (Conductor)	3.2 mΩ/m
	Line to Earth (Conductor + Casing)	2.8 mΩ/m
	Feed Unit + Coupler	2.2 mΩ
	Tap-Off	0.73 mΩ
	4mm <sup>2</sup> Cable	12.0 mΩ/m
	1.5m <sup>2</sup> Cable	31.0 mΩ/m
	Coupler	1.5 mΩ
	Interlink Unit	4.5 mΩ
	10mm <sup>2</sup> Cable	4.7 mΩ/m

## MECHANICAL DATA

Number of Copper Conductors		2, 3 or 5
Conductor Cross-section Area	Nominal	12 mm <sup>2</sup>
Powertrack Casing Copper Equivalent	(Where casing is protective Earth)	12 mm <sup>2</sup>
Cable Termination Capacity		16 mm <sup>2</sup>
Tap-Off Cable 32A		4.0 mm <sup>2</sup>
Tap-Off Cable 13A or 16A		1.5 mm <sup>2</sup>
Tap-Off Conduit Sizes		Ø16 or Ø20 mm
Flexible Interlink Cable		10 mm <sup>2</sup>
Flexible Interlink Conduit		Ø25 mm
Feed Conduit Entry		2 x Ø25 mm
IP Rating		40
Minimum void depth (track + tap-off)		54 mm

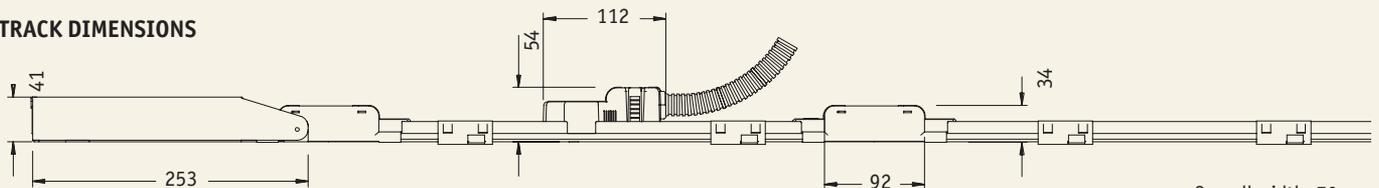
## MATERIALS SPECIFICATION

Powertrack Casing	Galvanised Steel
Conductors	High Conductivity Copper
Powertrack Insulators	PBT
Sockets/Tap-Off Plug/Joint Mouldings	Polycarbonate LSF
Shutter	PBT
Tap-Off/Interlink Flexible Conduit	Galvanised Steel
Tap-Off Cable	LSF cable to BS7211
Tap-Off/Coupler Blade	Brass Silver Plated
Feed Unit Case	Galvanised Steel
Flexible Interlink Cable	LSF cable to BS7211
Feed/Flexible Interlink Housing	Galvanised Steel

## AMBIENT TEMPERATURE CORRECTION FACTORS

Temperature	25°C	30°C	35°C	40°C	50°C
Factor	1.13	1.07	1.0	0.92	0.76

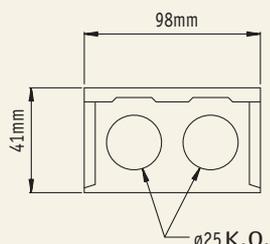
## TRACK DIMENSIONS



Overall width: 70mm

Overall width of Bracket extended: 107mm

## FEED UNIT DIMENSIONS



## Technical Specifications

Third party certified and tested to comply with:  
 BS EN 60 439-1: 1999 IEC 60439-1: 1999  
 BS EN 60 439-2: 2000 IEC 60439-2: 2000  
 BS 5733: 1995 where applicable

Marshall-Tufflex is registered by BSI to  
 BS EN ISO 9001

The Series 507 Powertrack System is designed to  
 comply with the requirements of BS 7671:2001  
 (IEE Wiring Regulations).

## Earth Fault Loop Impedance

BS 7671: 2001 (IEE Wiring Regulations) requires  
 the total earth loop impedance, to be sufficiently  
 low to operate the protective device within the  
 specified time, namely is 0.4 seconds, to circuits  
 supplying socket outlets which may supply hand-  
 held equipment.

## Section 607 Installations BS 7671:2001 Earthing Requirements for the Installation of Equipment having High Protective/Conductor Currents.

The scope of Reg. 607-02-04 requires that every  
 final circuit intended to supply one or more items  
 of equipment, where the total protective conductor  
 current is likely to exceed 10mA. in normal use,  
 shall have a high protective connection.  
 All powertrack 507 tap-off units conform to the  
 high integrity protective requirement by virtue of  
 using a protective conductor of 4mm<sup>2</sup> enclosed  
 within a flexible conduit, thus providing additional  
 protection against mechanical damage.  
 Regulation 607-02-04(ii).

## 32 Amp 3 metre tap-off unit

The 32 amp tap-off unit comprises of an unfused  
 tap-off a flexible metal conduit with integral 4mm<sup>2</sup>  
 LSF conductors.

These units are designed to comply with regulation  
 473-02-02 of BS 7671 by virtue of the following:

1. Maximum length of cable is 3 metres.
2. Minimum risk of fault current as the item is factory assembled and fully tested.
3. Fully protected by flexible steel conduit located within raised access floor which offers further protection.

## 5 metre tap-off unit

Tap-off units in excess of 3 metres should only be  
 used if they contain a fuse or the powertrack is  
 protected by a 32 amp rated protective device.

## SERIES 507 RAISED FLOOR BOXES

### SERIES 507 FLOOR BOX

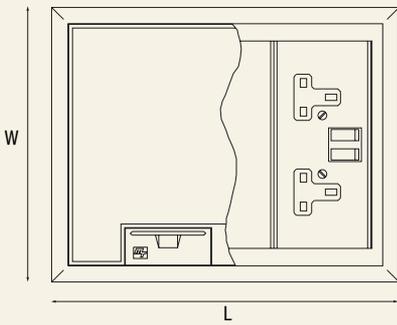
An effective way to access multiple services concealed below a raised floor system. With a choice of three or four compartment boxes which can be configured to meet the clients requirements.

Reversible self-closing lid with steel load plate. Cable covers that protect the cables when the lid is closed.

#### INSTALLATION

See instructions supplied in box.

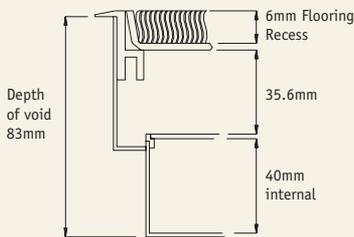
#### DIMENSIONAL DATA



#### Cut-out sizes mm

Box type	L	W
3/4-compartment URF3/4	322mm	222mm
General tolerance +3mm		

Care should be taken to ensure that the edges are smooth and free from burrs.



Box Module comes with 20mm and 25mm knock-outs with pre-wired options available.

Mounting plates 185 x 95mm (3 Comp)  
185 x 71mm (4 Comp).

Standard accessory mounting plates are available and suitability is dependent upon floor box configuration.

#### MATERIAL DATA

Lid/trim: Polypropylene Grey RAL 7011  
Box assembly: Galvanised steel  
Load plate: Galvanised steel  
Accessory plate: Plastisol RAL 7044

#### STANDARDS

Steel load plate withstands working loads to PSAMOB PF2 PS January 1990. Specification for raised floors.

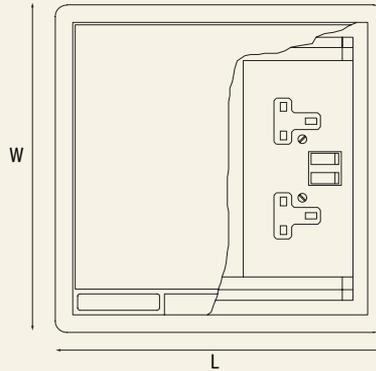
### HEIGHT ADJUSTABLE BOX

Offering a range of heights with a deep accessory box option for the latest data outlets.

#### INSTALLATION

See instructions supplied in box.

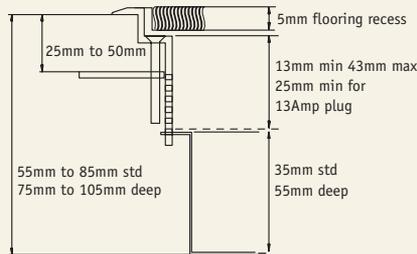
#### DIMENSIONAL DATA



#### Cut-out sizes mm

Box type	L	W
3-compartment URA31/32	258mm	258mm
General tolerance +3mm		

Care should be taken to ensure that the edges are smooth and free from burrs.



Box Module comes with 20mm knock-outs with pre-wired options available.

Mounting plates 185 x 71mm  
Standard accessory mounting plates are available and suitability is dependent upon floor box configuration.

#### MATERIAL DATA

Lid/trim: Polypropylene Grey RAL 7011  
Box assembly: Galvanised steel  
Load plate: Galvanised steel  
Accessory plate: Plastisol RAL 7044

#### STANDARDS

Steel load plate withstands working loads to PSAMOB PF2 PS January 1990. Specifications for raised floors.

### SINGLE COMPARTMENT BOX

Accepts most single gang accessories.

#### Cut-out sizes mm

Box type	L	W
1-compartment UHS120	128mm	128mm
General tolerance +3mm		

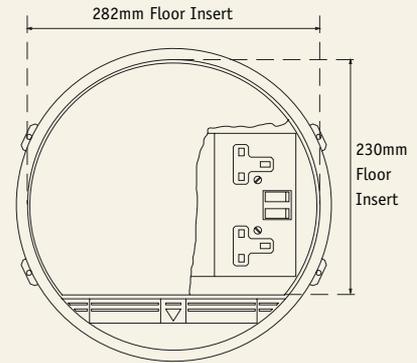
### CIRCULAR BOX

A circular box which allows more creative flair when designing an office environment.

#### INSTALLATION

See instructions supplied in box.

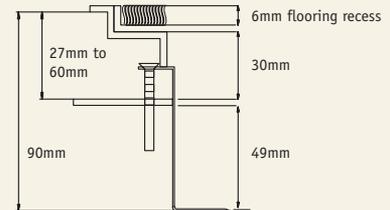
#### DIMENSIONAL DATA



#### Cut-out sizes mm

Box type	Diameter
3-compartment Circular URC3	ø297mm
General tolerance +3mm	

Care should be taken to ensure that the edges are smooth and free from burrs.



Box Module comes with 20mm and 25mm knock-outs with pre-wired options available.

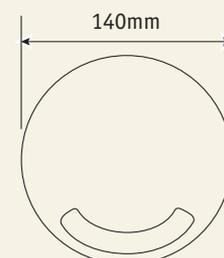
Mounting plates 156 x 77mm

#### MATERIAL DATA

Lid/trim: ABS Grey RAL 7011.  
Optional Natural Die-Cast Aluminium available.  
Box assembly: Galvanised steel  
Load plate: Galvanised steel  
Accessory plate: Steel Grey RAL 7011

#### GROMMET

#### DIMENSIONAL DATA



#### Cut-out sizes mm

Box type	Diameter
UPG1/UTG1 & UTG2	ø125mm
General tolerance +2mm	

## SERIES 507 IN-SCREED FLOORING SYSTEM

Series 507 is a three compartment floor distribution system designed to be installed in a 60mm-65mm depth of screed. Both the service outlet and junction box are both fully internally segregated to suit either the PVC-U or steel duct section option.

### INSTALLATION

See instructions supplied in box.

Planning the layout is essential as alterations are impossible once screed is laid.

Service and junction boxes should be placed in position making sure that the top of the boxes are level and in line with expected finished floor level. Depending on actual screed depth, this can be achieved by using the screws provided to the base of the box.

Once satisfied boxes are in correct position, PVC-U or steel duct can be used to link between boxes. Alternatively conduit can be used by utilizing the 20mm knock-out in the blank plate.

Note: Service box can only be used as a through box, whereas the junction box has all round access, with internal segregation.

Once the screed is in situ the support trim can be adjusted to the finished screed level. The accessories are terminated and the trim and lid fitted.

### ACCESSORIES

Duct adaptors and blank ends are available for both junction and service boxes and should be ordered separately as per individual requirements. These are not supplied with the boxes.

For additional lengths of ducting, a connector is available.

Flat bends and vertical bends are used where a single change of direction is required.

### MOUNTING PLATES

All plates use a standard 185mm x 95mm format encompassing plates for use with standard 60.3mm and 120.6mm accessories with blank or pre-punched plates for data/tel etc. Any configuration is possible using these plates.

### MATERIAL DATA

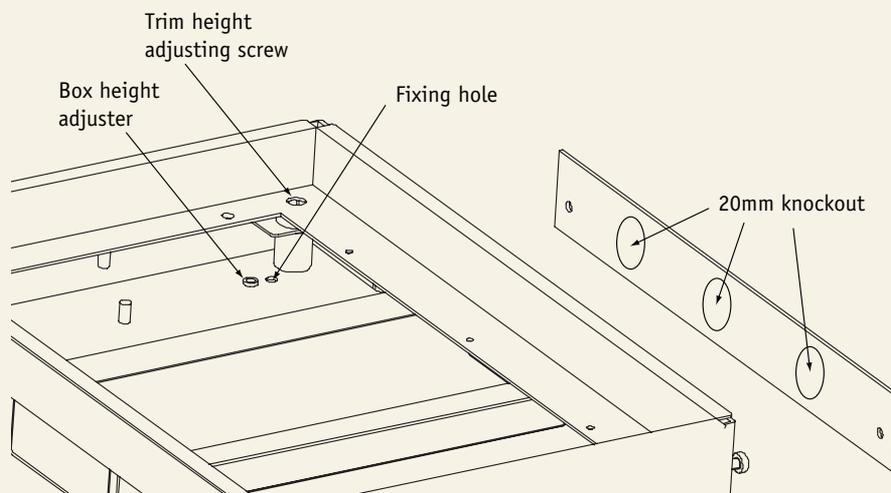
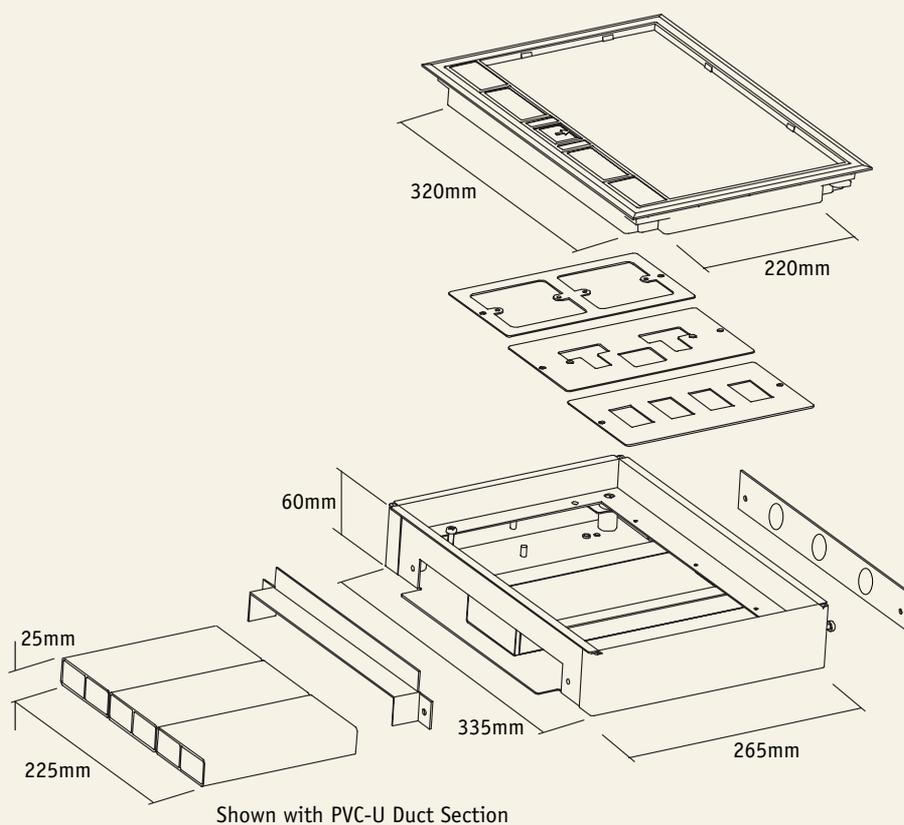
Lid/trim: Polypropylene Grey RAL 7011

Frame assembly: Galvanised steel

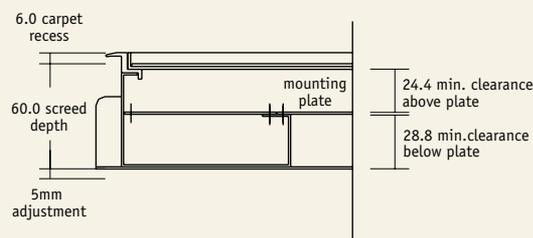
Modular boxes: Galvanised steel.

Load plate: Galvanised steel

Accessory plate: Plastisol RAL 7044



### FLOOR BOXES



# WORK STATION SOLUTIONS

## FLIP-UPS

Features:

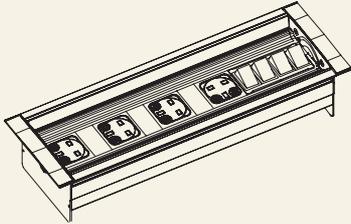
- Flush mounted on desk.
- Opens and shuts with plugs inserted.
- Bi-directional access.
- Suitable for installation to BS 6396.

## MOUNTING METHOD

Simple secure ratchet with hidden screw fixing.

## OPTIONS

Cable sack.



## CONFIGURATION

4 x UK 13Amp sockets.  
Individually 5Amp fused.  
4 x Data Outlets.

## DESK CUT-OUT SIZE

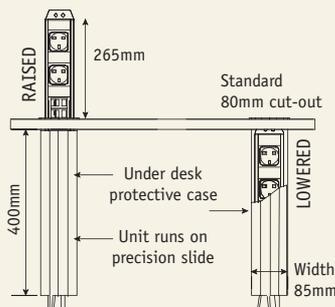
132 x 430mm.  
Unit casing depth 90mm from top surface of desk.  
We suggest that at least 400mm is clear below the cut-out to allow for cables to move freely.



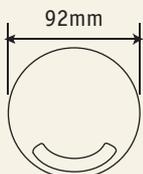
NOTE: The cut-out width (132mm) is constant. The length (430mm) will change according to the outlet requirements.

## PULL-UP UNIT

2 x sockets and 2 x RJ45



## DESK GROMMET DIMENSIONAL DATA

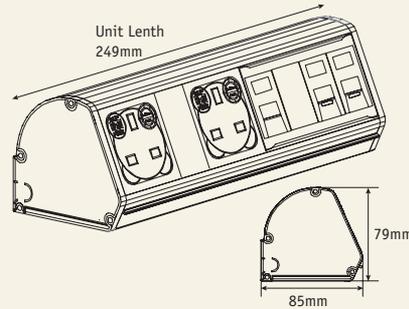


## Cut-out sizes mm

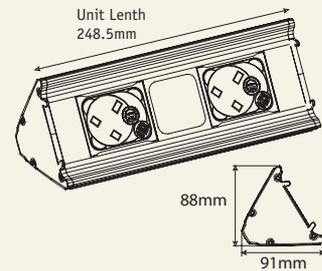
Box type	Diameter
DG1	ø80mm

General tolerance +2mm

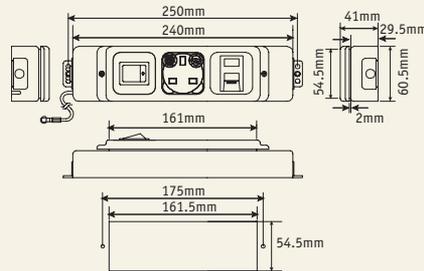
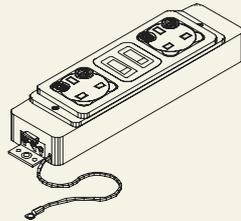
## SURFACE UNITS CURVED



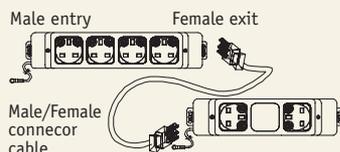
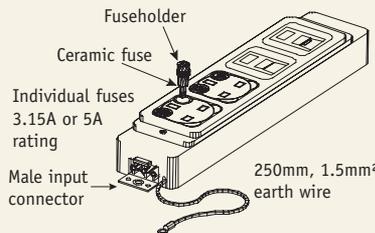
## SURFACE UNITS ANGLED



## MOULDED UNIT



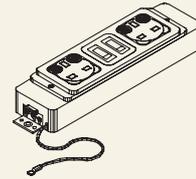
## FUSE OPTIONS MOULDED UNITS



Maximum of 4 sockets fused at 5Amps or 6 sockets fused at 3.15Amps fed from 13Amp supply plug.



4 power unit switched with input connector.



2 or 3 power unit individually fused and optional switches.

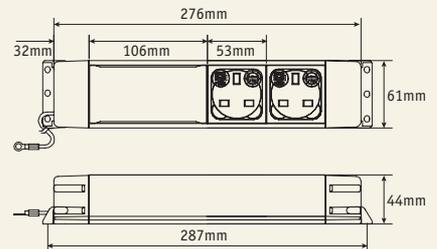
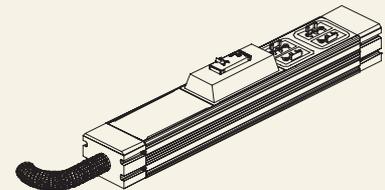
## POWER OUTLET EARTH CABLES

1.5mm - 250mm length to 5mm ring terminal.

## ALUMINIUM UNITS

### DISTRIBUTION UNIT

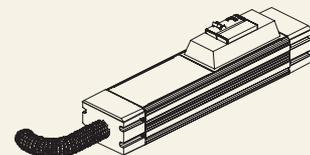
Type	Depth	Width	Height
2-way 1 x 16Amp MCB	61mm	329mm	44mm
2-way 2 x 16Amp MCB	61mm	329mm	44mm
4-way 1 x 16Amp MCB	61mm	382mm	44mm
4-way 2 x 16Amp MCB	61mm	382mm	44mm
6-way 1 x 16Amp MCB	61mm	435mm	44mm
6-way 2 x 16Amp MCB	61mm	435mm	44mm



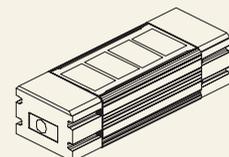
4 gang Aluminium unit comprising of 1 x 20mm hole for on site tap-off, 1 x 32A connector block for on site connection, 2 x UK sockets (individually fused with 5A) and 1 x 250mm (4mm<sup>2</sup>) earth lead.

## RCD UNIT

30mA RCD 16Amp Rated (other options available).



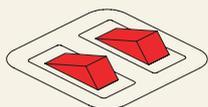
## 4-WAY DATA BOX



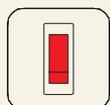
# WORK STATION SOLUTIONS continued

## SWITCH OPTIONS

Individual or Master Switch available.



Single and Double Pole switches are available. Blank (non-switched).



Double Pole Illuminated 16Amp 230V (AC)



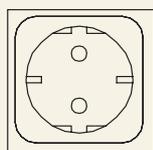
## SOCKET TYPE AND ORIENTATION

Most European and foreign socket types can be accommodated along with a choice of 90° orientation.

All sockets are available individually fused.



UK Fused



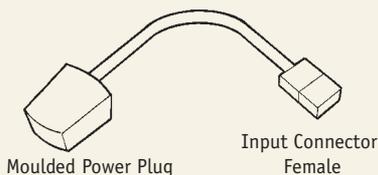
Schuco

## CABLE TYPE

### POWER INPUT CABLE

Rating: 13 Amp

Please specify cable length



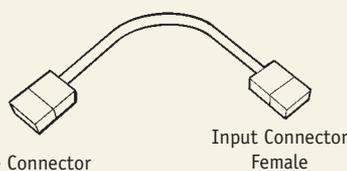
Moulded Power Plug

Input Connector Female

### INTER-CONNECTING CABLE

Rating: 16 Amp

Please specify cable length



Male Connector

Input Connector Female

### POWER OUTLET EARTH CABLES

Rating: 1.5 mm<sup>2</sup>

Length: 250mm with 5mm ring terminal.

## STANDARDS

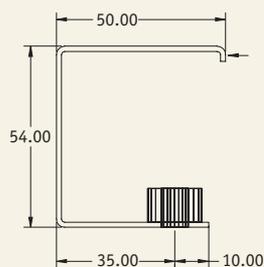
POWER OUTLET SYSTEM	BS5733 1973 plus Amendments 1, 2 and 3.
INTER-CONNECTING CABLE	BS5733 1979 plus Amendment 1.
POWER FEED CABLE	BS1363 Part 1 1995.

**BS 6396 Electrical Systems in Office Furniture.**

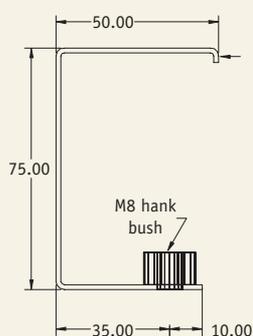
## ADJUSTABLE DESK CLAMP

Clamps are adjustable to suit desks from 5mm – 48mm thick.

### DCL1



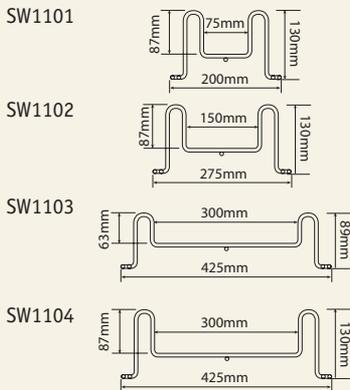
### DCL2



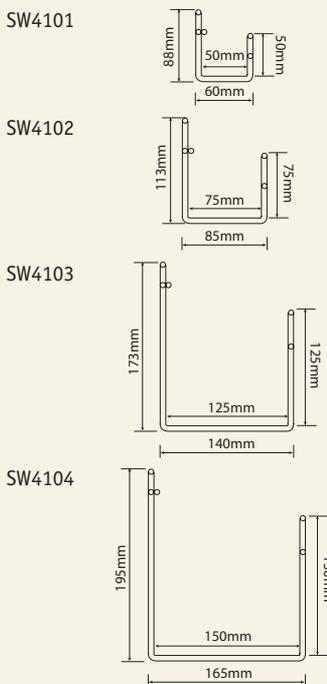
# SNAKEWAY CABLE SUPPORT SYSTEM

MT flexible SnakeWay is manufactured from ASTM A510 high strength steel wire to form a unique, completely hand bendable cable management system. Welding preformed steel hoops to a central spine every 100mm produces SnakeWay, allowing for its unique hand bendable design, while providing easy entry and exit for cables at any point along the length of the snakeway. The SnakeWays are constructed from pregalvanised wire in accordance with ASTM A641-89 to produce a resilient finish, which withstands indoor applications, or mild sheltered outdoor environments.

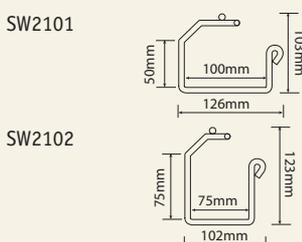
## FLOOR SNAKEWAY



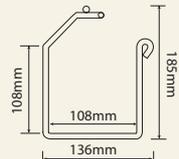
## WALL SNAKEWAY



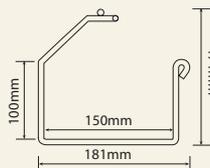
## HANGING SNAKEWAY – SINGLE



SW2103

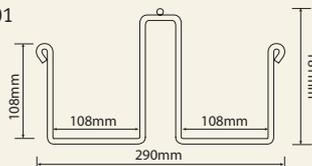


SW2104

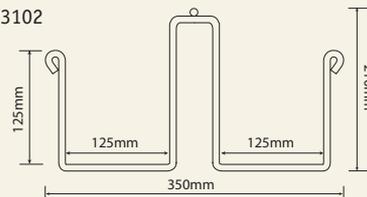


## HANGING SNAKEWAY – DOUBLE

SW3101



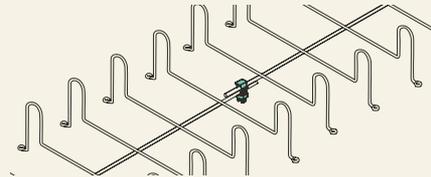
SW3102



**NOTE:** Use alternate mounting rings and support at the appropriate distance to accommodate the total cable capacity. Clamp each side of the mounting ring with a nut and washer. This will assist in maintaining a level profile when unbalanced loads are contained.

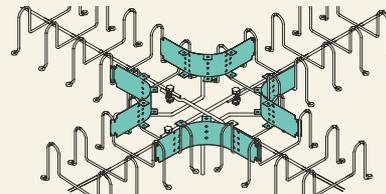
## SNAKEWAY CONNECTOR – SW1201

Provides both a mechanical and electrical connection when joining snakeway sections to one another. Only one required per connection.



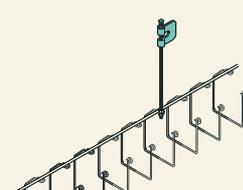
## FLOOR INTERSECTION OR TEE

Used when creating 101 Series snakeway horizontal intersections. Creates a consistent smooth transition. Will not allow cables to kink. Easily attaches to SnakeWay with cable ties.



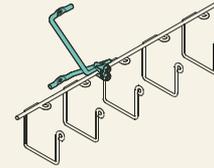
## BEAM CLAMP – SW2202

Attaches Hanging SnakeWay directly to the building structure or when suspending the snakeway with threaded rod. Clamp the mounting ring with a nut and washer on each side. The beam clamp will receive a 10mm threaded rod.



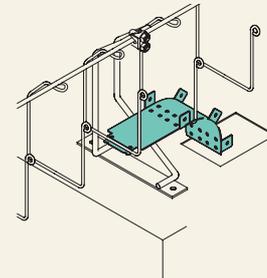
## WALL BRACKET – SW2232

Used to attach single hanging SnakeWay to walls and other vertical surfaces.



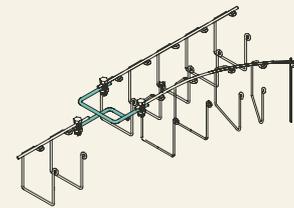
## CABLE DROP – SW2211 or SW2212

Provides a smooth transition for cables when exiting the SnakeWay. Maintains a consistent 100mm radius eliminating kinked cables. Easily attaches to SnakeWay with cable ties.



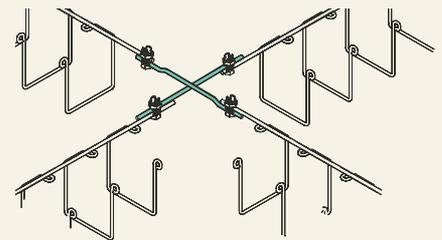
## HANGING Y CONNECTION – SW2222

Used to create a 'Y' intersection or split double hanging into two separate cable paths at a terminal end.



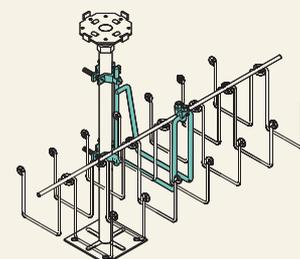
## SINGLE HANGING INTERSECTION – SW2221

Installed as either a tee or four way crossing intersection.



## PEDESTAL BRACKET – SW2234/SW3234

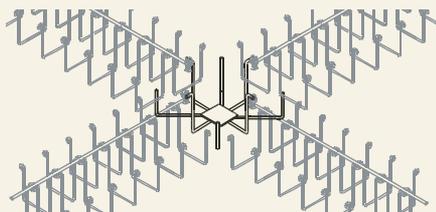
Used to attach hanging SnakeWay to the floor pedestals utilised in the construction of raised access floor.



# SNAKEWAY CABLE SUPPORT SYSTEM continued

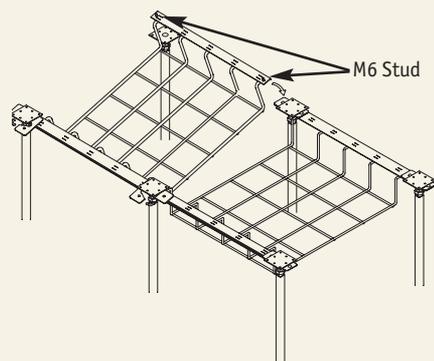
## DOUBLE HANGING INTERSECTION – SW3221

Installed as either a tee or four way crossing intersection component for the double hanging SnakeWay.



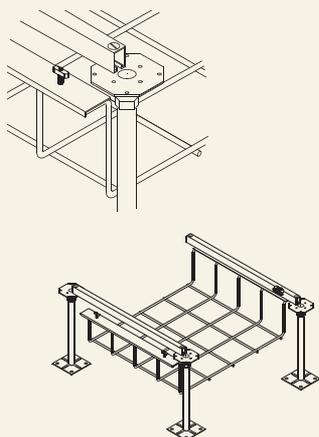
## UNDERFLOOR SNAKEWAY PEDESTAL

Plates slide together straddling the threaded shaft just above the adjustment nut on the pedestal. Next, the Underfloor SnakeWay component is positioned below the plate and affixed with the supplied attachment bolt. Thus creating a stable and efficient attachment platform. Allowing for the installation of Underfloor SnakeWay in standard floors.



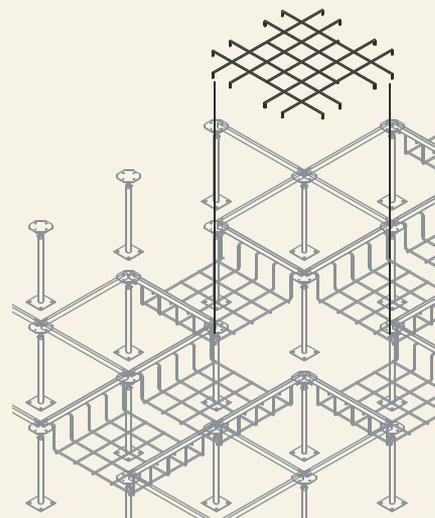
## UNDERFLOOR SNAKEWAY CAMLOC

Can be used on any stringer type that utilises open bottom box type design. The spring tensioned cam is inserted inside the stringer throughout the bottom slot and tightened with an allen key. The tightened cam creates a mechanical connection between the Underfloor SnakeWay basket and raised floor stringer.



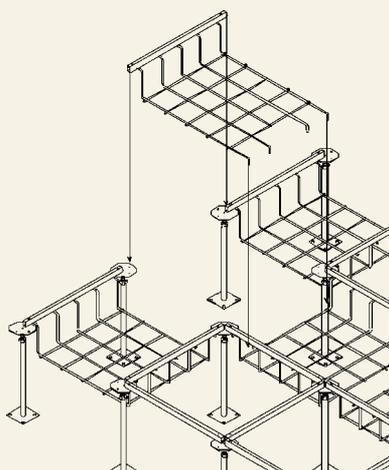
## UNIVERSAL INTERSECTION

Install small underfloor intersection where four way intersections are necessary. No additional tools or mounting hardware required to complete installation.



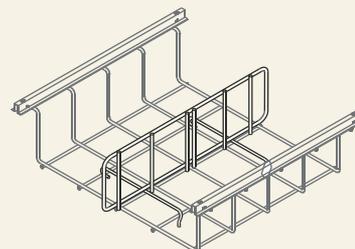
## TEE

The top edge is fastened in the relevant way with the hooks locked into the branch grid.



## DIVIDER FENCE FOR UNDERFLOOR SNAKEWAY

Divides underfloor modules into two separate cable pathways. Easy "Snap-in" design.



## LOADING CAPACITY DATA

Product Code	Cable Capacity						Max. Load U.D.L in Kg./m
	Space Factor sq mm	Twin & Earth 2.5mm/45% fill	Twin & Earth 4.0mm/45% fill	Typical 4 Core 35mm <sup>2</sup> SWA	Cat.5e UTP 5.5mm/45% Fill	Cat.6 UTP 6.5mm/45% Fill	
SW1101	6525	53	42	3	97	70	Not Applicable
SW1102	13050	107	84	6	194	139	Not Applicable
SW1103	18900	155	122	8	282	202	Not Applicable
SW1104	26100	214	168	11	389	278	Not Applicable
SW2101	5000	41	32	2	75	53	5.3 span 1.2m
SW2102	5625	46	36	3	84	60	5.3 span 1.2m
SW2103	11664	95	75	4	174	124	5.3 span 1.2m
SW2104	15000	123	96	6	224	160	5.3 span 1.2m
SW3101	23328	191	150	4 x 2	348	249	5.3 span 1.2m
SW3102	31250	256	201	6 x 2	466	333	11.0 span 1.2m
SW4101	2500	20	16	1	37	27	5.3 span 1.2m
SW4102	5625	46	36	2	84	60	5.3 span 1.2m
SW4103	15625	128	100	6	233	167	5.3 span 1.2m
SW4104	22500	184	145	6	335	240	5.3 span 1.2m
SW5103	85500	700	550	42	1274	912	Not Applicable
SW5113	85500	700	550	42	1274	912	Not Applicable

Loading to give a 1% deflection with support adjacent to connector.  
Additional fastenings may be required to accommodate cable capacities shown.