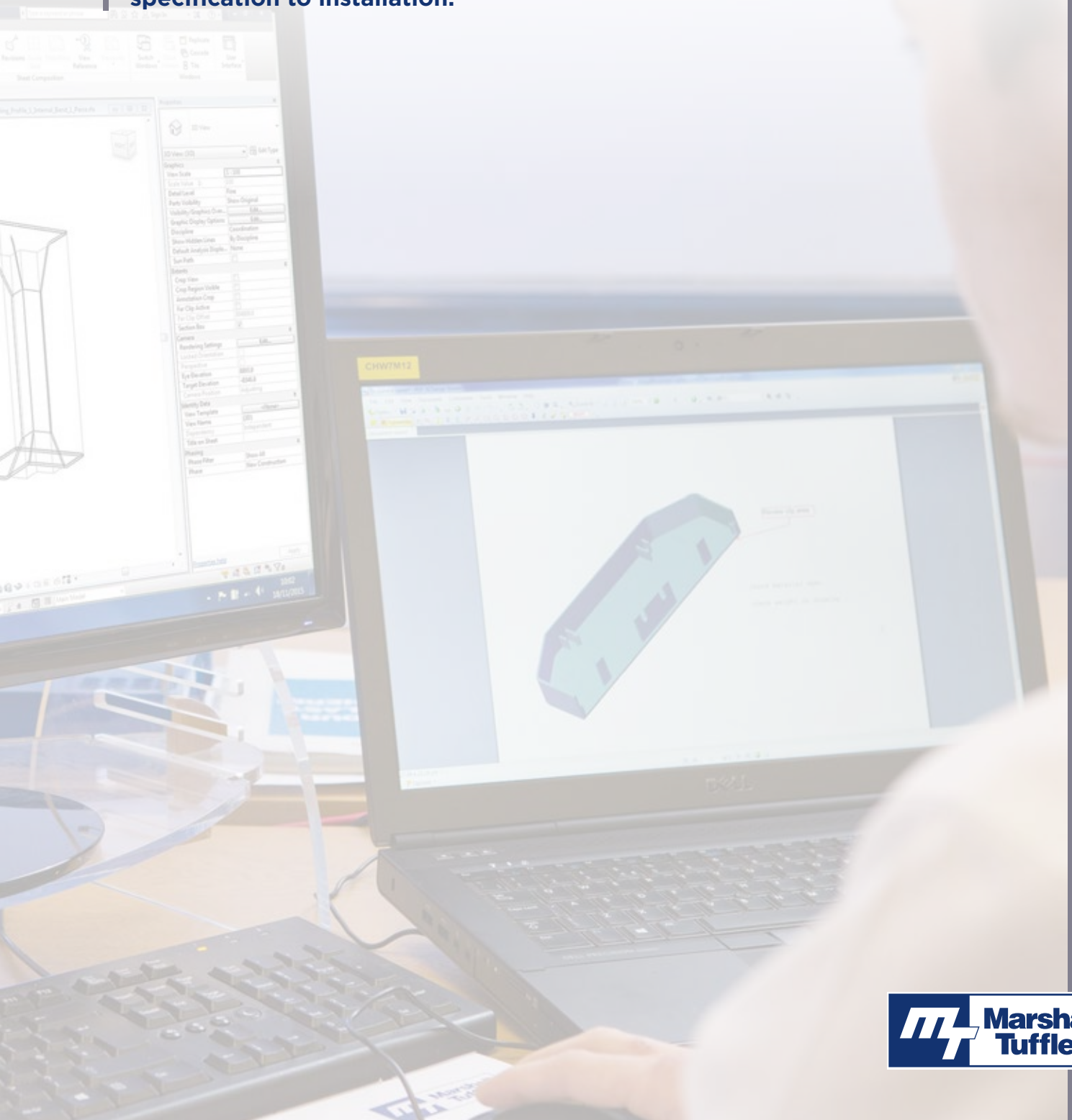
# TECHNICAL INFORMATION

**This information is intended to provide the specifier or contractor with guidance on all aspects of Marshall-Tufflex cable management products, from specification to installation.**





Marshall Tufflex

## Contents



## PVC-U material data

Marshall-Tufflex cable management products are manufactured 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

| | | |
|---|---|---|
| Specific gravity | | 1.42 |
| Co Efficient of Linear Expansion | | 7 x $10^{-5}$/m/°C |
| Water Absorption | | Negligible |
| Electric Strength | | To the requirements of BS 4678, BS EN 50085 |
| Fire Performance | BS 476 PT6 & PT7<br>BS 4678<br>BS EN 50085<br>UL94<br>BS EN 61386-1<br>BS 4607 | PASS<br>PASS<br>PASS<br>V-0 @1.6mm<br>PASS<br>PASS |
| Oxygen Index | | 42% |
| Tensile Strength | | 492/562 kg/cm² |
| Insulation Resistance | | To the requirements of BS 4678, BS 4607, BS EN 50085, BS EN 61386-1 |
| Chemical Resistance | | See below |
| Vicat Softening Point (conduit & trunking) | | 80°c<br>BS EN ISO 306 |
| Vicat Softening Point (moulded fittings) | | 76°c<br>BS EN ISO 306 |

### 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 on page 241 for further details.

### Fire resistance

The material used in Marshall-Tufflex conduit and trunking are self-extinguishing and comply with the requirements of BS 476 Parts 6 and 7 and BS 4678. Non-flame propagating to BS EN 50085 and BS EN 61386-1.

(See Characteristics table above)

### 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°C to +60°C.

Thermal conductivity: 0.19 w/m/°C.

### Impact resistance

High impact resistance. The material is formulated to comply with the -5°C clause of BS 4678 Part 4 (1982) Cable Trunking Standard and the -5°C Heavy Gauge Requirements of BS EN 61386-1.

### Standards

Trunking systems are manufactured to comply with the requirements of BS 4678-4:1982 and BS EN 50085-1: 2005+A1:2013 where applicable. Conduit systems comply with the requirements of BS 4607-5: 1982+A3:2010 and BS EN 61386-1:2008.

## PVC-U chemical resistance table

The resistance of unplasticised PVC-U 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 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 Team on +44 (0)1424 856688.

**Note:** To determine the suitability of PVC-U for external applications we strongly recommend you contact our Technical Team on +44 (0)1424 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 | √ | √ |
| cider | | √ | |
| citric acid | | √ | √ |
| copper chloride | | √ | √ |
| copper cyanide | | √ | √ |
| copper nitrate | | √ | √ |
| copper sulphate | | √ | √ |
| cyclohexanone | | ≈ | ≈ |
| detergent, synthetic | All concentrations | √ | √ |
| developers, photographic | | √ | √ |
| dextrin | | √ | √ |
| dextrose | | √ | √ |
| diazo salts | | √ | √ |
| dichlorodifluoromethane | | √ | |
| diethyl ether | | ≈ | ≈ |
| emulsifiers | All concentrations | √ | √ |
| emulsions, photographic | | √ | √ |
| ethyl acetate | | ≈ | ≈ |
| ethylene glycol | | √ | √ |
| ethylene oxide | | ≈ | ≈ |
| fatty acids | | √ | √ |
| ferric chloride | | √ | √ |
| ferric nitrate | | √ | √ |
| ferric sulphate | | √ | √ |
| ferric 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 | √ | √ |
| hydrochloric acid | 40% aq. solution | √ | # |
| | 60% aq. solution | # | ≈ |
| | concentrated | ≈ | ≈ |

| Chemical | Concentration | Unplasticised PVC 20°C | Unplasticised PVC 60°C |
|---|---|---|---|
| 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 | | √ | √ |
| linolectic acid | | √ | √ |
| linseed oil | | √ | √ |
| magnesium hydroxide | | √ | √ |
| maleric 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 | (sulphic/nitric various proportions) | # | ≈ |
| molasses | | √ | √ |
| naptha | | √ | √ |
| napthalene | | ≈ | ≈ |
| nicotine | | √ | √ |
| 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 | | √ | |

| Chemical | Concentration | Unplasticised PVC 20°C | Unplasticised PVC 60°C |
|---|---|---|---|
| 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 (emulsifiers, synthetic detergents and wetting agents) | All concentrations | √ | √ |
| starch | | √ | √ |
| stearic acid | | √ | √ |
| sucrose | | √ | √ |
| sulphur | Colloidal | √ | √ |
| sulphur dioxide | 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 | | √ | √ |

## Polycarbonate material data

### 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 or to amines.

### Characteristics

| | |
|---|---|
| Vicat softening point – ISO 306 | VST/B 145°C |
| Flammability to UL94 @ 1.5mm | 94V-2 |
| Flammability – oxygen index | 35% |
| Density | 1.2g/cm3 |
| Water absorption (in water) | 0.35% |

## ABS high impact FR material data

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

| | | |
|---|---|---|
| Vicat softening point | ISO 306 | 96°C |
| Density | 1.18g/cm³ | |
| Material | | UL listed |
| Fire performance | BS 4678<br>BS EN 50085<br>UL94 | PASS<br>PASS<br>V-O @ 1.6mm |
| Water absorption (in water) | DIN53495/L | 0.3% |

## Aluminium material data

Grade HE9TF: Screen Insert.

Grade 6063T5: Series 2 PowerPole and PowerPost, Bench Trunking Aluminium, Sterling Profile Aluminium, XL Aluminium, Twin Plus Aluminium.

Grade 6060T5: Elegance 170.
Tensile strength: 190n/mm²
Co Efficient of linear expansion:
24 x 10-6/m/°C.

Thermal conductivity: 120w/m/°C.

## GRP ladder and tray material data

### Fire behaviour

| Properties | Standard references | Press Moulded Fittings | Pultruded Extrusions | Units |
|---|---|---|---|---|
| **Flammability** | **ASTM D 6194 / IEC 60695-2-12** Glow-wire flammability index (GWFI) test method for materials. | 960 | 960 | °C |
| **Flammability** | **UL 94** Test for flammability of plastic materials. | V0 | V0 | – |
| **Fire propagation** | **NF P 92-501** Fire behaviour of building materials. | Not tested | Not tested | – |
| **Flame spread & smoke developed index** | **ASTM E84 / UL 723** | FSI = 25 | FSI = 35 | Index |
| | Surface burning characteristics of building materials. | SDI = 350 | SDI = 450 | Index |
| | Class following the Uniform Building Code. | Class I | Class II | – |
| **Flammability & smoke index** | **NF F 16-101** | I2 | I2 | Index |
| | Fire behaviour of materials for rolling stock. | F0 | F1 | Index |
| **Limiting oxygen index** | **ASTM D 2863 / ISO 4589-2** Plastics - Determination of burning behaviour by oxygen index. Part 2 : Ambient - temperature test. | > 32% | > 32% | % |
| **Flammability & smoke index** | **VKF** Materials and building parts. Part B : Test methods. | 5.3 | 5.3 | Index |
| **Fire behaviour** | **DIN 4102-1** Fire behaviour of building materials and elements. Part 1: Classification of building materials. | B2 | B2 | – |
| **Fire behaviour** | **DIN 5510-2** Preventive fire protection in railway vehicles. | S4 / SR2 / ST2 | S4 / SR2 / ST2 | Index |
| | Part 2 : Fire behaviour and fire side effects of materials and parts. | FED(30 min.) = 0,09 | FED(30 min.) = 0,04 | Index |
| | Appendix C : FED (30 min.) < 1 | | | |
| **Fire behaviour** | **EN 45545-2** Railway applications - Fire protection on railway vehicles. Part 2 : Requirements for fire behaviour of materials and components. Applicable requirement : R6 | None | None | HL |
| **Fire behaviour** | **ISO 5660-1** Parameter MARHE | 103,7 | 101,3 | kW/m² |
| | **EN ISO 5659-2 (50 kW/m²)** Parameter DS(4) | 376,2 | 331,2 | – |
| | **EN ISO 5659-2 (50 kW/m²)** Parameter VOF4 | 454,6 | 488,5 | – |
| | **EN 45545-2 Appendix C (50kW/m²)** Parameter CITG at 4 min. | 0,016 | 0,015 | – |
| | **EN 45545-2 Appendix C (50kW/m²)** Parameter CITG at 8 min. | 0,068 | 0,064 | – |

## GRP ladder and tray material data – continued

### Mechanical behaviour

| Properties | Standard references | Press Moulded Fittings | Pultruded Extrusions | Units |
|---|---|---|---|---|
| **Tensile strength at break point** | **ISO 527-5** Plastics - Determination of tensile properties. Part 5 : Unidirectional fibre-reinforced plastic composites. | ~ 55 | ~ 187 | MPa |
| **Tensile modulus** | **ISO 527-5** Plastics - Determination of tensile properties. Part 5 : Unidirectional fibre-reinforced plastic composites. | ~ 7200 | ~ 11900 | MPa |
| **Accelerated ageing test by UV exposure** | **ISO 4892-2 / ISO 527-5** Methods of exposure to laboratory light sources - Part 2 : Xenon-arc sources. | Good mechanical and chromatic behaviour | Good mechanical and chromatic behaviour | – |
| **Accelerated ageing test by salt spray exposure** | **ISO 9227 / ISO 527-5** Corrosion tests in artificial atmospheres - Salt spray tests. | Good mechanical and chromatic behaviour | Good mechanical and chromatic behaviour | – |
| **Accelerated ageing test by UV and salt spray exposure** | **ISO 4892-2 / ISO 9227 / ISO 527-5** UV and salt spray exposure. | Good mechanical and chromatic behaviour | Good mechanical and chromatic behaviour | – |

### Electrical behaviour

| Properties | Standard references | Press Moulded Fittings | Pultruded Extrusions | Units |
|---|---|---|---|---|
| **Measure of surface resistivity & discharge** | **IEC 60079-0** Explosive atmospheres. | ~ $4.10^9$ | > $10^{11}$ | Ω |
| | Part 0 : Equipment - General requirements. | IIA, IIB, IIC | IIA, IIB, IIC | – |
| **Dielectric strength** | **IEC 60243-1** Electric strength of insulating materials. Part 1 : Tests at power frequencies. | ~ 6,5 | Not tested | kV/mm |
| **Proof tracking index** | **IEC 60112** Method for the determination of the proof and the comparative tracking indices of solid insulating materials. | 575 | 600 | V |

### Marine approval

| Properties | Standard references | Press Moulded Fittings | Pultruded Extrusions | Units |
|---|---|---|---|---|
| **Approval for vessels and drilling platforms** | **ABS** (American Bureau of Shipping) | $K^2$ Approved | KP - UL Approved | |

### Others

| Properties | Standard references | Press Moulded Fittings | Pultruded Extrusions | Units |
|---|---|---|---|---|
| Density | | 1,8 | 1,8 | g/cm3 |
| Thermal conductivity | | 0,3 | 0,3 | W/m.K |
| Coefficient of linear thermal expansion | ISO 11359-2 Plastics - Thermo mechanical analysis (TMA). Part 2 : Determination of coefficient of linear thermal expansion. | ~ 36 x 10-6 | ~ 10 x 10-6 | cm/cm/K |
| Water absorption | ISO 62 Plastics - Determination of water absorption. | 0,16 | 0,3 | % |
| Glass content | | > 20% | > 45% | % |
| Linear shrinkage | | 0,1 | 0,1 | % |
| Rockwell hardness | | not tested | not tested | HRm |
| Barcol hardness | | > 50 | > 50 | Barcol |
| Material temperature range* | | -80°C to +130°C | -80°C to +130°C | °C |
| Continuous operating temperature range | | -50°C to +80°C | -50°C to +80°C | °C |
| Material resistance to high temperatures | | good, no flexion | good, no flexion | °C |

* Reduced mechanical resistance when ambient temperature is increasing.

### GRP Material Chemical Resistance Table

| Chemical | Concentration | Performance |
|---|---|---|
| Water | – | Good Performance |
| Acids | 10% | Medium Performance |
| Base | 10% | Good Performance |
| Ethanol | – | Good Performance |
| Benzine | – | Good Performance |
| Benzol | – | Medium Performance |
| Mineral Oil | – | Good Performance |
| Vegetable and animal fat | – | Good Performance |
| Chemical products | – | Good Performance |

## Storage of GRP material

It is best to store GRP products prior to installation at temperatures higher than 0°C and less than 40°C. However the GRP products may be stored at temperatures between -60°C to over 130°C

## Information on recycling and environmental impact for the GRP products

Thermoset composite material is made of glass and polyester resin. It can be recycled in waste treatment stations for a further waste processing. This material is inert and has no environmental impact as GRP waste can be re-used in outside applications as raw material for the road building or in cement production.

## 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 (H2SO4HC1…) |
| Carbon loaded polyester (on request) | anitistatic properties for highly explosive atmospheres |

## Power and data segregation

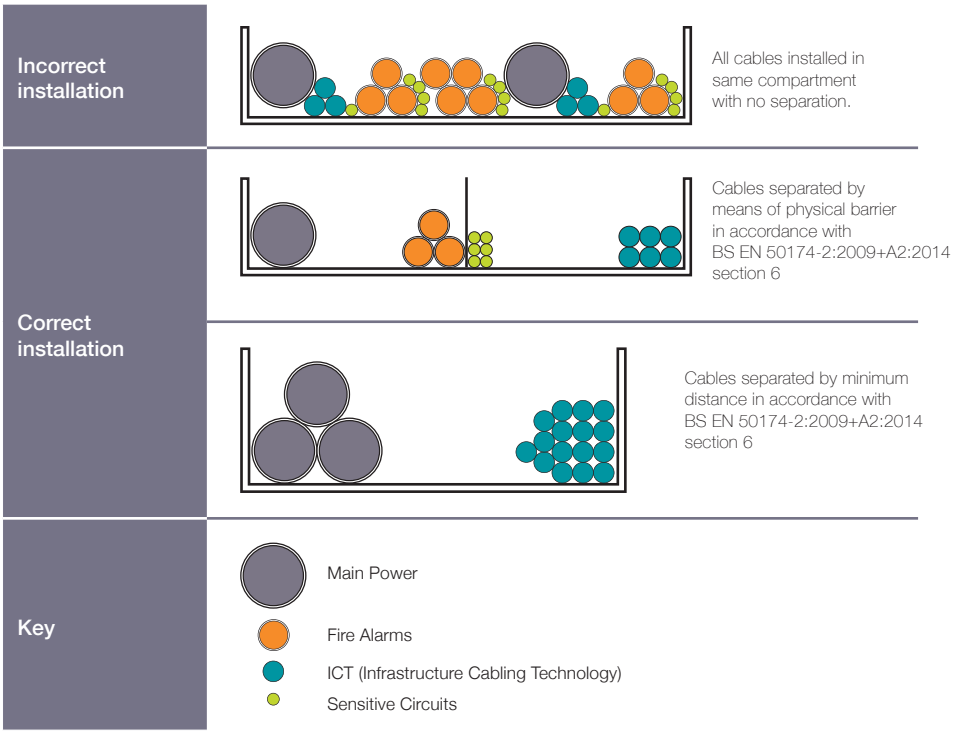
It is important when installing power and data cables in the same installation that the installation complies with the relevant standard. If any conflicts in separation distances arise then the greater separation distance must always apply. To comply with the correct separation distance between power and data cables please refer to BS EN 50174-2:2009+A2:2014 section 6.

There are a number of factors that will affect the separation distance of power and data cables these are listed below:

- Total number of power circuits
- The total load on the power circuit
- The type of data cable being installed
- The installation method of the power and data cables

Every installation is different so it is important to refer to the installation standard for each installation to ensure compliance.

## Understanding segregation methods




## Types of data cable – different categories of cable

Data cables are classified in a number of different categories such as Cat 5e and Cat 6 etc. Generally speaking the higher the category number the higher the performance specification. Data cable is backwards compatible so a Cat 6 installation will always perform to a higher specification than a Cat 5 installation. The basic principle of data cable is very similar across all the different categories and is based on 4 pair twisted cable which is shielded to protect from external EMI and alien or cross talk interference from adjacent cables.

## Data cable comparison table

| Data Cable type | *Cable diameter | Frequency | Speed | Notes |
|---|---|---|---|---|
| Cat 5e | 6mm | Up to 100MHz | Up to 1000MBps | Cat 5e has its limitations and will not be able to support emerging 10GBase-T Ethernet |
| Cat 6 | 7.2mm | Up to 250MHz | Up to 10GBps | Cat 6 will run at a much higher performance than Cat 5e supporting more than double the speed and frequency, running to a much tighter specification. |
| Cat 6a | 7.4mm | Up to 500MHz | Up to 10GBps | Cat 6a is designed to support 10GBase-T over a maximum distance of 100 metres. |
| Cat 7 | 7.9mm | Up to 600MHz | Up to 10GBps | Cat 7 and Cat 7a data cables are shielded including both the individual cables and the overall cables being screened. |
| Cat 7a | 8.2mm | Up to 1000MHz | Up to 10GBps | |

*Please note that cable diameters have been calculated on an average figure from a range of data cable manufacturers.

## 45% Cable capacity

It is important to follow the Wiring Regulations when installing cables in trunking. By following the Wiring Regulations you minimise the potential of heat rise and cable damage and maintain data throughput when installing new circuits. For further information on trunking cable capacity and grouping factors please refer to the latest BS 7671:2008 Wiring Regulations.

| Conductor type | Size | Cable factor |
|---|---|---|
| Stranded PVC power | 1.5mm² | 8.0 |
| Stranded PVC power | 2.5mm² | 11.9 |
| Stranded PVC power | 4.0mm² | 16.6 |
| *Data cable | Ø5.5mm | 23.8 |
| *Data cable | Ø6.0mm | 28.3 |
| *Data cable | Ø6.5mm | 33.2 |
| *Data cable | Ø7.0mm | 38.5 |
| *Data cable | Ø8.4mm | 55.4 |

Please note that made to order fabricated fittings can be manufactured to meet your Cat 7a data cable minimum bend radius. Please contact our technical department on +44 (0)1424 856688 for further information.

## Marshall-Tufflex cable management systems are suitable for a variety of data category cables.

The information in the table below is based on average data cable diameters taken from a number of data cable manufacturers.

In all cases it is highly recommended to contact the data cable manufacturer to confirm the specification and minimum bend radius of the data cable prior to installation.

## Guidance to determine minimum bend radius

| Data Cable | Un-Shielded | Shielded |
|---|---|---|
| Cat 5 | Up to 10 x cable diameter | – |
| Cat 5e | Up to 10 x cable diameter | Up to 7 x cable diameter |
| Cat 6 | Up to 8 x cable diameter | Up to 7 x cable diameter |
| Cat 6a | Up to 8 x cable diameter | Up to 6 x cable diameter |
| Cat 7 | – | Up to 6 x cable diameter |
| Cat 7a | – | Up to 6 x cable diameter |

## Installation guidance laying vs pulling

It is important to consider the installation method prior to installing data cables. Incorrect method or poor installation techniques can alter the cable characteristics and degrade the overall specification of the data cable. When pulling cables into trunking systems it is important to note the manufactures maximum pulling force as this can reduce the minimum bend radii of the data cable. Laying data cables into a trunking system ensures that minimum bend radius can be achieved and that the data cables installed complies with the required specifications for the installation.

## Types of screening available materials of screening

The shielding of data cables is important as this stops the signal generated within the data cable radiating and interfering with signals in nearby cables and circuitry. The shielding also protects the signal from surrounding cables and other external influences. The two main types of shielding material are metallic foil and metallic braid. A number of factors should be considered before selecting the type of shielding for an installation.

- The flexibility of the data cable
- The mechanical strength
- The required shield effectiveness
- Ease of stripping and terminating

Once the correct type of shielding has been selected it is important that the shielding is bonded correctly for it to be effective in protecting against signal interference.

## Data cable types advantages/disadvantages

### Advantages

- Screened cables offer better protection against electromagnetic interference compared to un-screened data cables.
- Screened and unscreened cables work fine at 1Gigabit Ethernet data rates but screened data cables will outperform at data rates such as 10Gigabit due to their ability to support higher frequency transmissions

### Disadvantages

- Unscreened data cables require a physical barrier and or separation distance between power cables must be increased.

## Data aperture sizes – LJ6C and Euro modules

LJ6C data modules are suitable for use in trunking systems, floor boxes or any systems that has an industry standard LJ6C aperture. The aperture size for the LJ6C module is 22mm x 37mm but may differ slightly between manufacturers. The Euro data modules have a slightly larger aperture at 25mm x 50mm. Coordinating accessory plates can accommodate one or multiple Euro data modules.

## PVC-U vs aluminium trunking advantages/disadvantages

PVC-U trunking systems are low cost, light weight and can be easily fabricated whilst on site, however PVC-U is a non-conductive material so offers no protection against EMI. When using a PVC-U trunking for data installation it is important to segregate and screen the data cables from power and control cables.

This can be easily overcome by either using our range of conductive copper sprayed multi compartment trunking systems or by using the steel screening divider. Steel screening dividing strips can be easily retro fitted to an existing PVC-U trunking installation.

Aluminium trunking systems are lightweight and easy to handle and have high impact and mechanical strength compared to a PVC-U trunking installation. Aluminium trunking systems offer great protection against EMI especially at higher frequencies. Both material options aid and support compliant installations.

## GRP ladder and tray

### Overview

GRP (Glass Reinforced Polyester) has, good stability to UV, great mechanical strength and is 40% lighter than steel. GRP is a non-conductive insulating material, resistant to temperatures from -80ºC to +130ºC and has excellent resistance to fire and corrosion being self-extinguishing and zero halogen.

### Approvals

- BS 7671:2008+A1:2011
- EC Directive 2014/5/EC
- Low Voltage Directive

#### Mechanical Behaviour

- Breaking point to NEMA FG1
- IEC 61537
- Tensile strength at break point to ISO 527-5
- Modulus of elasticity to ISO 527-5
- Accelerated aging to ISO 4892-2 & ISO 9227

#### Electrical behaviour

- Surface resistivity to IEC 6079-0
- IEC 60093
- Breakage voltage to IEC 60243-1
- Comparative tracking index IEC 60112

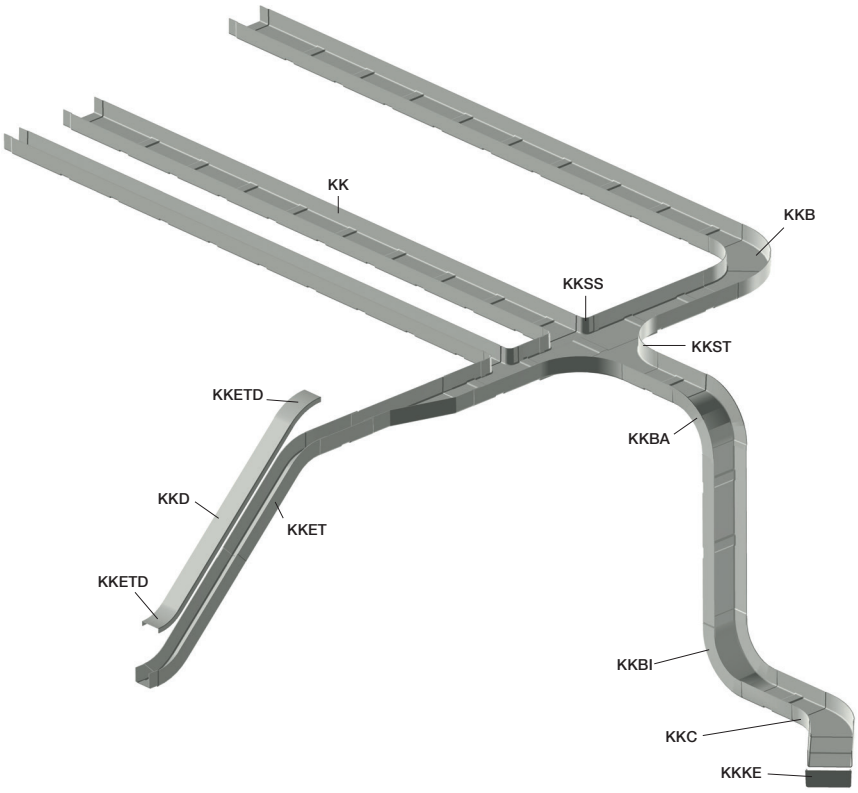
#### Density to DIN 53479

- Linear Thermal Dilatation to DIN 53752
- Water Absorption to ISO 62

#### Fire Behaviour

- Inflammability to IEC 60695-2-12/ UL94
- UL 723
- DIN 5510-2
- NF-F-16101
- Spread of flame to BS 476 part 7 class 2/ ASTM E84 (Up to Class 1 on request)
- Fire propagation to BS 476 Part 6
- Smoke emissions to BS 6853 App B53
- Fire standard to DIN 4102 part 12

## GRP tray




### KKB

During installation care must be taken to position a support at each end of the cable tray fitting. It is also recommended that the large radius fitting is fixed laterally to each end of adjoining cable tray.

### KK

Each length of tray comes complete with built in, self adjusting coupler. An expansion gap of 8mm must be considered for thermal movement.

### KKSS

During installation care must be taken to position a support at each end of the cable tray fitting.

### KKST

During installation care must be taken to position a support at each end of the cable tray entry

### KKRR

During installation every reducer must be supported at each end. It is also recommended that the reducer fitting is fixed laterally to each end of adjoining cable tray.

### KKBA

During installation care must be taken to position a support at each end of the cable tray entry. It is also recommended that the outside elbow fitting is fixed laterally to each end of adjoining cable tray.

### KKETD

Covers are attached using either DF50/DF80 stainless steel cover clips. In strong winds the quantity of clips should be increased.

### KKD

For a stronger assembly, covers with a width greater than 400mm are strengthened. Strengthening ribs are visible on the outside of the cover. Covers are attached using either DF50/DF80 stainless steel cover clips. In strong winds the quantity of clips should be increased.

### KKET

During installation all fittings must be supported at every cable entry, and central support for all fittings with a radius greater than 250mm, and/or with width greater than 400mm. It is also recommended that the change in elevation fitting is fixed laterally to each end of adjoining cable tray.

### KKBI

During installation care must be taken to position a support at each end of the cable tray entry. It is also recommended that the inside elbow fitting is fixed laterally to each end of adjoining cable tray.

### KKC

To ensure correct installation, the horizontal elbow must be fixed laterally to each end of the adjoining cable tray.

### KKKE

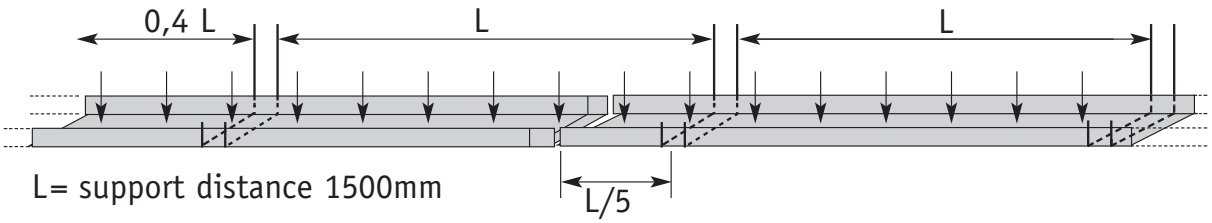
Mounting accessories required for this fitting - 2 x M6x16 Bolts (to be ordered separately)

p47 Product Information

## Standard span pressed tray

### Load characteristics

Coefficient of safety > 1.7 (in accordance with IEC 61537) this data is given for ladders coupled with splice plates and bolts.



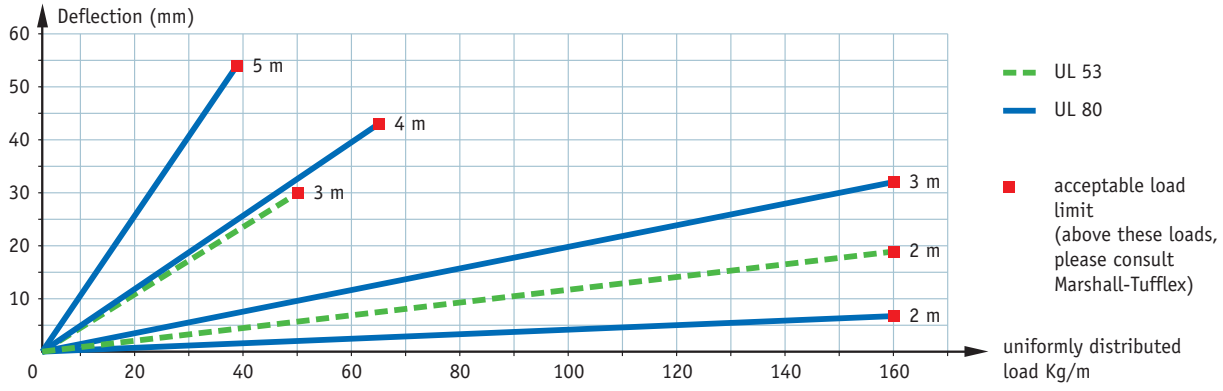

The deflection values are measured with the position of the junction between 2 ladders at a distance L/5 from a support. If this distance is not respected, it is necessary to raise the deflection values by about 30% when fully loaded.

| | | Useful area (mm²) | Weight of cables kg/m | Maximum admissable 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 | | | 60 | 30 | |

Optimal conditions, for cost reduction on your installation.

Series UL load diagram: supporting distances from 2 to 5m.

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



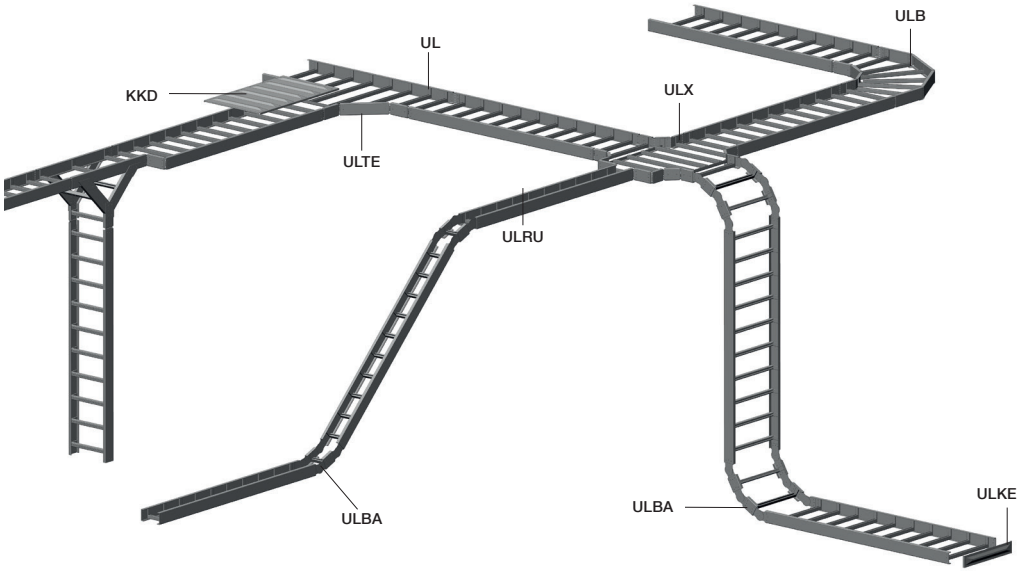

### Localised loads

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).

### Loading characteristics

- Defection <5mm (1/300).
- Coefficient of safety >1.7 (in accordance with IEC 61537) using the interlocking and self-adjustable coupling without fasteners.
- Loading diagram details (below) in accordance with IEC 61537, at an ambient temperature of 25°C.

## GRP pultruded ladder




### ULB
During installation you must take care to position a support under each elbow at each cable ladder end. If the bending radius is greater than 250mm and/or the width greater than 400mm, an additional intermediary support is necessary.

### UL
Cable ladders are supplied with non-perforated rungs. Should you require perforated ladder rungs please contact a member of the technical team who will be happy to assist in your enquiry.

### ULX
During installation all fittings must be supported at every cable entry. A central support is required for all fittings with a bend radius greater that 250mm and/or or the width greater than 400mm

### ULRU
During installation the stainless steel splice plates must be fixed on each cable ladder end using 8 x M6 x 16 bolts. (to be ordered separately)

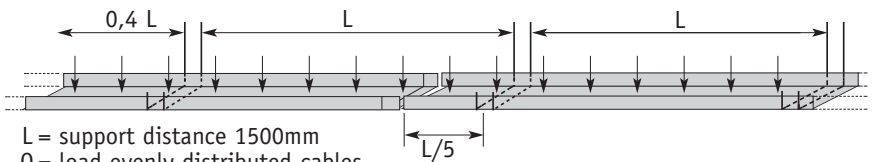
### KKD
For a stronger assembly, covers with a width greater than 400mm are strengthened. Strengthening ribs are visible on the outside of the cover. Covers are attached using either DF50/DF80 stainless steel cover clips. In strong winds the quantity of clips should be increased.

### ULTE
During installation all fittings must be supported at every cable entry. A central support is required for all fittings with a bend radius greater that 250mm and/or or the width greater than 400mm

### ULBA
During installation the metallic splice plates must be fixed at each cable ladder end using 4 x M6 x 16 bolts. (to be ordered separately). If the bending radius is greater than 250mm and/or the width greater than 400mm, an additional intermediary support is necessary.

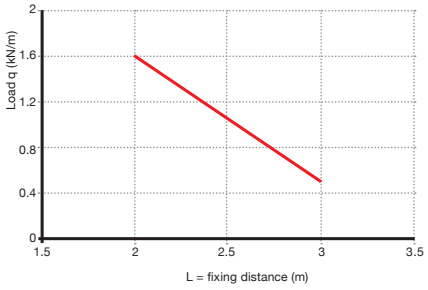
### ULKE
Mounting this accessory requires 2 x M6 x 16 bolts. (to be ordered separately)

## Load characteristics

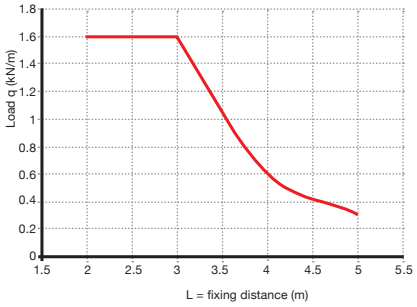



L = support distance 1500mm
Q = load evenly distributed cables
(according to DIN EN IEC 61537 standard)

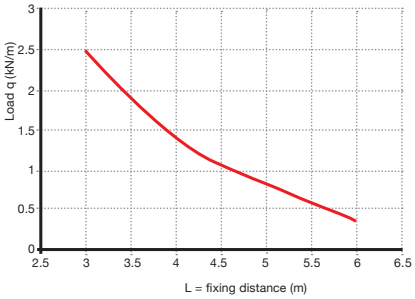
### 53mm High Cable Ladder



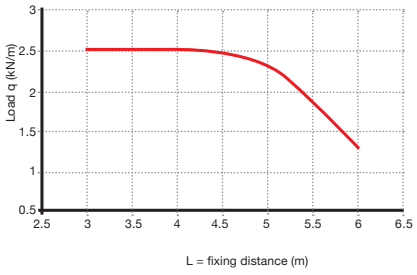

### 80mm High Cable Ladder




### 100mm High Cable Ladder




### 150mm High Cable Ladder



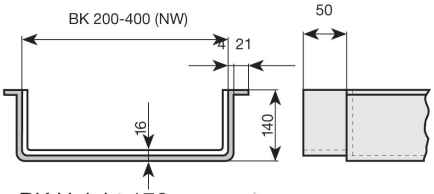

**Warning:** the deflection is measured with a junction position between 2 cable trays at a distance of L/5 from the support. If this distance is not respected, it is necessary to raise the deflection values by approx 30%.

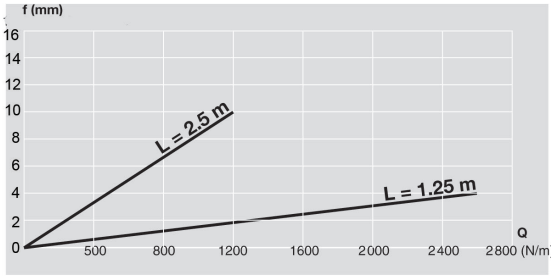
## GRP ground ducts

### Load characteristics of ground duct

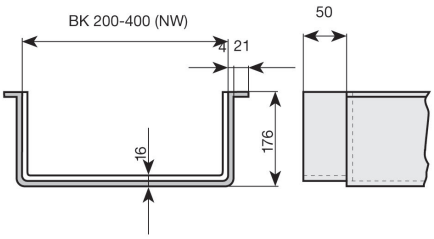
BK Height 140 mm

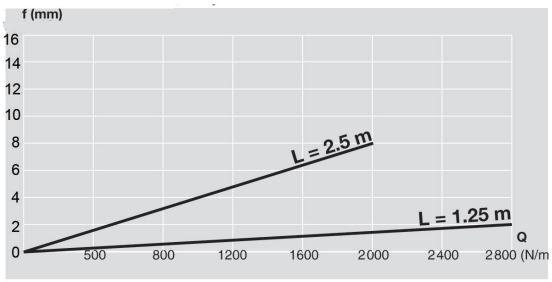
F = Deflection
L = Support Distance
Q = Distributed Load



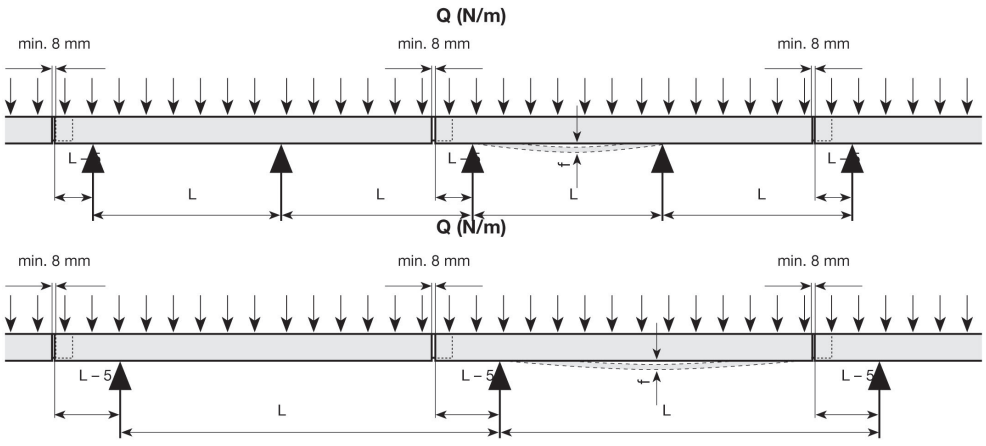



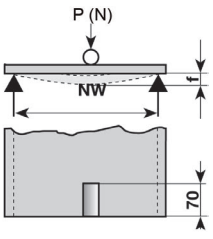

BK Height 176 mm




Tested in normal conditions of use



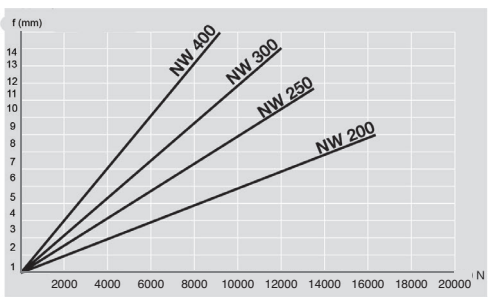




Load at edge of piece

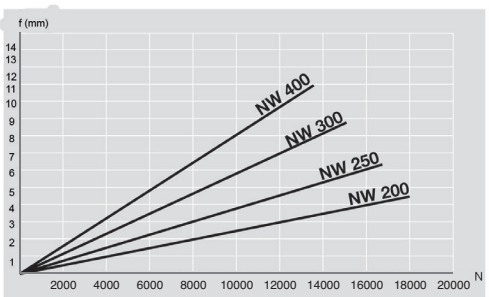
### Load diagrams of plate covers

P = Load in N
f = Deflection
NW = Nominal width BK

BKDR 5mm




BKDR 8mm



## Material

### Electrogalvanised (ELECTROZINC/EZ)

A steel base coated with a zinc layer by electrolysis, by means of submerging the lengths in a bath composed of a zinc solution, in accordance with BS EN ISO 2081. Depending on the type of zinc layer, it shall have a different degree of protection on the steel, avoiding corrosion and enhancing the visual appearance of the length. This treatment is carried out once the length has been formed. The IEC 61537 Standard classifies the degree of resistance to corrosion of the system's components depending on the steel's electrolytic covering, belonging to Class 1 those with a minimum thickness of 5µm and to Class 2 those of 12µm. Marshall-Tufflex uses Class 2 as its standard material in order to guarantee the quality of its products against corrosion. This treatment is used in dry environments free of pollutants.

### Hot Dip Galvanised Steel (HDG) Non-standard material

Laminated or rust removed galvanised after forming steel according to BS EN ISO 1461 Standard. The steel's protection is covered by a zinc coating which varies depending on the steel's thickness, offering a uniform covering. The zinc coating's thickness depends on the thickness of the base material. The IEC 61537 Standard classifies the resistance against corrosion of these galvanised steels as Class 5 for the covering of 45µm, Class 6 for 55µm, Class 7 for 70µm and Class 8 for 85µm. Hot dip galvanised steel is used in humid environments, granting a high protection during adverse atmospheric situations, light chemical situations, light marine situations and urban situations.

### Stainless Steel AISI 316 (I316) Non-standard material

Denominated 14401 according to the numerical classification established by the BS EN 10088 Standard. Steel's protection happens due to the great affinity which metals such as chromium have with oxygen, which gives place to the creation of a protective chromium oxide layer which avoids the corrosion of iron. Type I316 stainless steels are similar to type 1304, but they contain a 2.5% of molybdenum which confers it a greater resistance to localised corrosion. It is ideal for use in very corrosive environments, even at high temperatures. Under special conditions, and always under order, there is the possibility of conducting a passivation process. Passivation is a treatment which enhances stainless steel's protection against corrosion by means of forming a relatively inert film on the surface of a material which protects it against the action of external agents. The passivation film or layer does not allow these agents to interact, reducing or stopping the chemical reaction from happening.

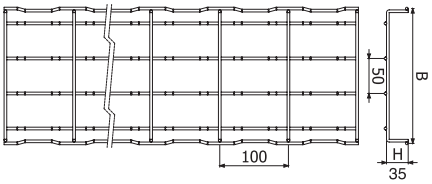
IEC 61537 Standard classifies this steel's resistance to corrosion as Class 9B without the passivation treatment and as Class 9D with the passivation treatment.

Stainless Steel AISI 316L, denominated 14401 according to the numerical classification established by the BS EN 10088 Standard has the same characteristics regarding corrosion as steel AISI 316, but offers a higher degree of welding and easier forming of the lengths with a thickness of more than 6mm.

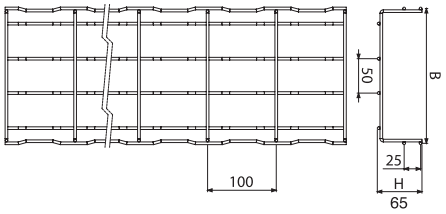
## Dimensions

### Height 35mm

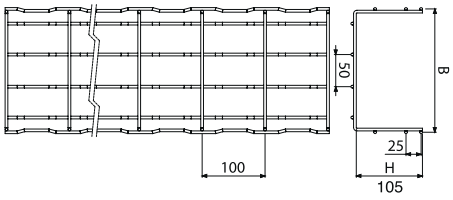
Standard Wire Basket



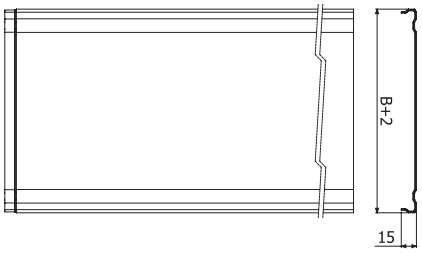

### Height 65mm




### Height 105mm




### Cover




## Working temperature

| | Minimum working temperature | Maxiumum working temperature | According to Standard |
|---|---|---|---|
| Standard Wire Basket 35mm | -50°C | +150°C | IEC 61537 |
| Fast-Coupling Wire Basket 65mm | -50°C | +150°C | IEC 61537 |
| Fast-Coupling Wire Basket 105mm | -50°C | +150°C | IEC 61537 |

## Resistance to corrosion

### Atmospheric corrosion

Atmospheric corrosion happens when metal is exposed to liquids, solids or gases, Humidity, salt corrosive gases and dirt are its main factors. Atmospheric corrosion takes place in open air conditions, areas with poor ventilation and marine environments.

Saline corrosion happens when a metallic surface is exposed to different saline concentration levels forming a galvanic pile. At times where the surface is exposed to the lowest degree of saline concentration this will then behave as an anode for the corrosion to take place.

### Chemical corrosion

Chemical corrosion happens when metal is directly exposed to chemical solutions. Depending on the concentration of the solution, contact time , cleaning frequency and ambient temperature the level of corrosion will be higher or lower.

### Galvanic corrosion

Galvanic corrosion is the most common type of corrosion, and happens when two different metals are in contact with one another. When two different metals come into contact a small galvanic par is created, as one metal acts as an anode the other acts as a cathode. The metal with the most negative reduction potential shall oxidise whilst the metal with the most positive charge shall have less corrosion.

### Storage conditions

The product must be stored in a dry and well ventilated area. The product must not be stored outside even in low humidity conditions.

## Free base area

| Base size | Classification | Free base area |
|---|---|---|
| 60 | Z | More than 90% |
| 100 | Y | Over 80% and up to 90% |
| 150 | Y | Over 80% and up to 90% |
| 200 | Y | Over 80% and up to 90% |
| 300 | Y | Over 80% and up to 90% |
| 400 | Y | Over 80% and up to 90% |
| 500 | Y | Over 80% and up to 90% |
| 600 | Y | Over 80% and up to 90% |

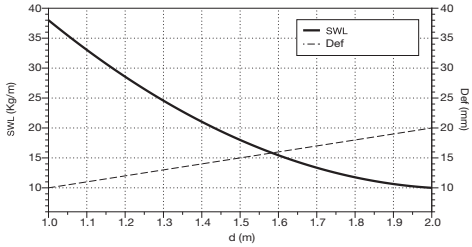
To show the installation designer the level of ventilation allowed for the cable tray, the IEC 61537 standard established that the manufacturer has to inform of the percentage of the base 'free' (without material, in solid cable trays this means the "degree of perforation").

## Safe working load (SWL)

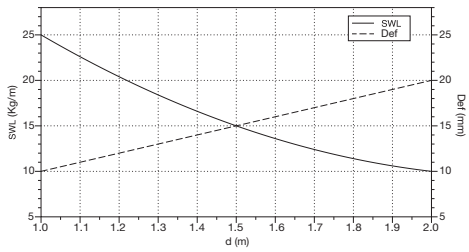
The safe working load (SWL) is the maximum load which can be applied during normal use, without danger. Therefore, the workload shall always be less than the SWL.

The SWL of our products are calculated in accordance with IEC 61537. For any further information contact our Technical Team in +44 (0)1424 856688.

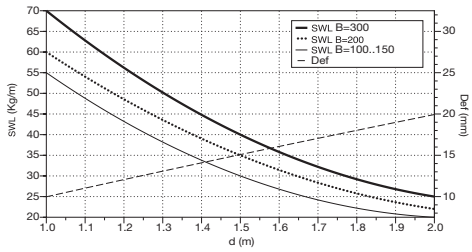
Standard Wire Basket – 35mm



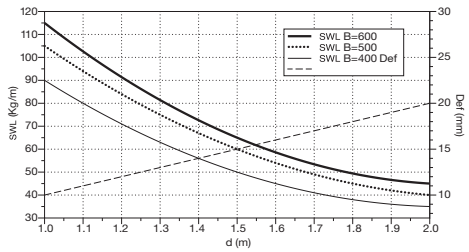

Fast-Coupling Wire Basket 60 x 65mm Height



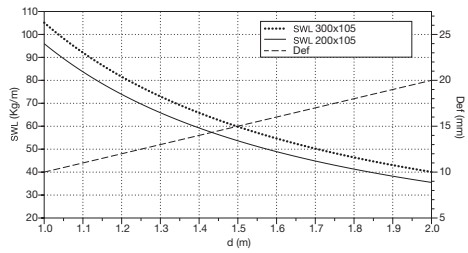

Fast-Coupling Wire Basket 100-300 x 65mm Height



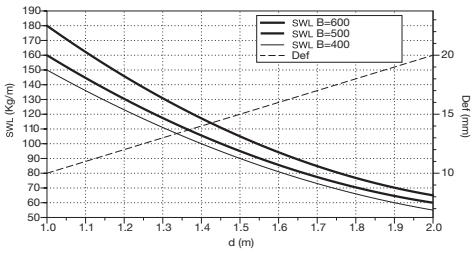

Fast-Coupling Wire Basket 400-600 x 65mm Height




Fast-Coupling Wire Basket 200-300 x 105mm Height




Fast-Coupling Wire Basket 400-600 x 105mm Height



## Cable capacities

- All calculations allow for a 45% space factor.

As there can be differences between data cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.

| Basket Width (mm) | 35mm Standard Basket | | | 65mm Fast-coupling Wire Basket | | | 105mm Fast-coupling Wire Basket | | |
|---|---|---|---|---|---|---|---|---|---|
| | Without Matting | Flexible Matting | Rigid Matting | No Cablelay | With Cablelay Matting | With Cablelay Ridgid | No Cablelay | With Cablelay Matting | With Cablelay Ridgid |
| **Data Cable: Ø5.5mm** | | | | | | | | | |
| 60 | - | - | - | 43 | 39 | 41 | - | - | - |
| 100 | 51 | 42 | 46 | 89 | 80 | 84 | - | - | - |
| 150 | 79 | 65 | 72 | 142 | 127 | 134 | - | - | - |
| 200 | 109 | 89 | 99 | 193 | 173 | 183 | 365 | 345 | 355 |
| 300 | - | - | - | 297 | 266 | 281 | 562 | 531 | 546 |
| 400 | - | - | - | 401 | 358 | 380 | 759 | 716 | 738 |
| 500 | - | - | - | 505 | 451 | 478 | 956 | 902 | 929 |
| 600 | - | - | - | 609 | 544 | 577 | 1153 | 1088 | 1120 |
| **Data Cable: Ø6mm** | | | | | | | | | |
| 60 | - | - | - | 36 | 33 | 34 | - | - | - |
| 100 | 42 | 35 | 39 | 74 | 67 | 71 | - | - | - |
| 150 | 66 | 54 | 60 | 119 | 107 | 113 | - | - | - |
| 200 | 92 | 75 | 83 | 162 | 145 | 153 | 307 | 290 | 298 |
| 300 | - | - | - | 249 | 223 | 236 | 472 | 446 | 459 |
| 400 | - | - | - | 337 | 301 | 319 | 638 | 602 | 620 |
| 500 | - | - | - | 424 | 379 | 402 | 803 | 758 | 781 |
| 600 | - | - | - | 512 | 457 | 485 | 969 | 914 | 941 |
| **Data Cable: Ø6.5mm** | | | | | | | | | |
| 60 | - | - | - | 31 | 28 | 29 | - | - | - |
| 100 | 36 | 30 | 33 | 63 | 57 | 60 | - | - | - |
| 150 | 56 | 46 | 51 | 101 | 91 | 96 | - | - | - |
| 200 | 78 | 64 | 71 | 138 | 124 | 131 | 261 | 247 | 254 |
| 300 | - | - | - | 212 | 190 | 201 | 402 | 380 | 391 |
| 400 | - | - | - | 287 | 256 | 272 | 543 | 513 | 528 |
| 500 | - | - | - | 362 | 323 | 342 | 684 | 646 | 665 |
| 600 | - | - | - | 436 | 389 | 413 | 825 | 779 | 802 |
| **Data Cable: Ø7mm** | | | | | | | | | |
| 60 | - | - | - | 26 | 24 | 25 | - | - | - |
| 100 | 31 | 26 | 28 | 54 | 49 | 52 | - | - | - |
| 150 | 49 | 40 | 44 | 87 | 78 | 83 | - | - | - |
| 200 | 67 | 55 | 61 | 119 | 106 | 113 | 225 | 213 | 219 |
| 300 | - | - | - | 183 | 164 | 173 | 347 | 327 | 337 |
| 400 | - | - | - | 247 | 221 | 234 | 468 | 442 | 455 |
| 500 | - | - | - | 312 | 278 | 295 | 590 | 557 | 573 |
| 600 | - | - | - | 376 | 336 | 356 | 712 | 671 | 691 |
| **Data Cable: Ø8.4mm** | | | | | | | | | |
| 60 | - | - | - | 18 | 16 | 17 | - | - | - |
| 100 | 21 | 18 | 20 | 38 | 34 | 36 | - | - | - |
| 150 | 34 | 28 | 31 | 60 | 54 | 57 | - | - | - |
| 200 | 47 | 38 | 42 | 82 | 74 | 78 | 156 | 148 | 152 |
| 300 | - | - | - | 127 | 114 | 120 | 241 | 227 | 234 |
| 400 | - | - | - | 172 | 153 | 163 | 325 | 307 | 316 |
| 500 | - | - | - | 216 | 193 | 205 | 410 | 386 | 398 |
| 600 | - | - | - | 261 | 233 | 247 | 494 | 466 | 480 |

## Load table

Find out the load capacity of all our wire baskets. We recommend that you plan for extra space in cable pathways during the initial installation to allow capacity for future cable additions.

For spacing factors please refer to current Wiring Regulations BS 7671:2008 and all current amendments.

| MT Code | Description | Weight kg/m |
|---|---|---|
| MT2/3616 | Standard 100x35mm | 0.55 |
| MT2/3617 | Standard 150x35mm | 0.69 |
| MT2/3618 | Standard 200x35mm | 0.83 |
| MT2/3619 | Standard 300x35mm | 1.18 |
| MT2/7389 | Fast coupling 60x65mm | 0.54 |
| MT2/7248 | Fast coupling 100x65mm | 0.79 |
| MT2/7249 | Fast coupling 150x65mm | 0.84 |
| MT2/7250 | Fast coupling 200x65mm | 1.09 |
| MT2/7251 | Fast coupling 300x65mm | 1.60 |
| MT2/7394 | Fast coupling 400x65mm | 1.94 |
| MT2/7395 | Fast coupling 500x65mm | 2.72 |
| MT2/7396 | Fast coupling 600x65mm | 3.13 |
| MT2/7397 | Fast coupling 200x105mm | 1.59 |
| MT2/7398 | Fast coupling 300x105mm | 1.93 |
| MT2/7399 | Fast coupling 400x105mm | 2.71 |
| MT2/7400 | Fast coupling 500x105mm | 3.12 |
| MT2/7401 | Fast coupling 600x105mm | 3.53 |

## EMC and data

It is recommended to separate power and data circuits by a minimum of 20cm. (EN 50174-2)

Where power and data circuits must cross, this must be done at 90 degrees.

Wire Basket systems without electrical continuity do not protect against electromagnetic fields. Make sure electrical continuity is preserved by using the appropriate earth bonding accessories.

## Electrical continuity

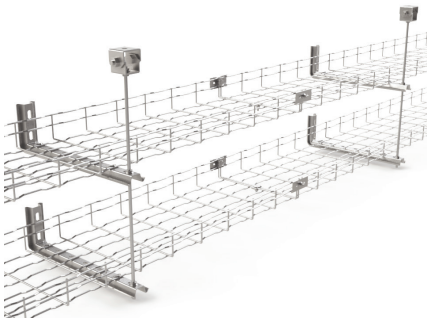
Our Fast-Coupling Wire Basket conforms to IEC 61537. The wire mesh basket has an impedance lower than:

- 50mΩ across the joint
- 5mΩ per metre in a straight section

## Fire resistance

Marshall-Tufflex and Basor Electric certifies that the wire basket installed with the below mentioned characteristics complies with Class E90 of function maintenances, in accordance with Standard DIN 4102, Section 12.

This system incorporates Standard Wire Basket with a height of 65mm. This system uses Fast Fix Wall Bracket supports fixed to the wall and reinforced on the ceiling using the Variable Support Bracket, M8 Threaded Rod and M8 Nut on one side, as per the below image.



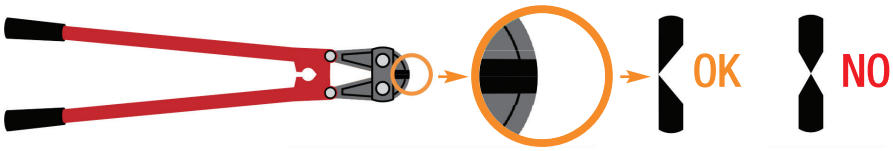
The distance between supports is of 1.2m and the maximum load is of 10kg/m. The system may have one or two levels.

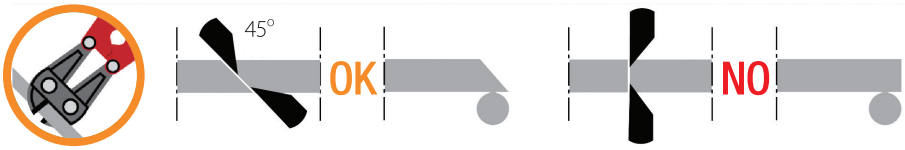
## Earth bonding

For earth bonding requirements please refer to the current Wiring Regulations BS 7671:2008 and all current amendments.

## Cutting

Always use asymmetrical cut wire cutters. Cut as close as you can to where horizontal and vertical rods cross each other, as shown.




We recommend always placing the basket on a flat surface to make the cuts.

**Wire gauge:**

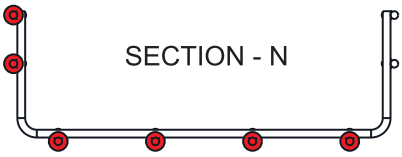
100mm - 200mm Width = 4.0mm

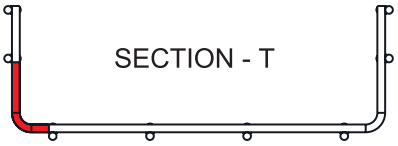
300mm - 400mm Width = 4.3mm

500mm - 600mm Width = 4.6mm

The below drawings show in red the section cuts that are needed for the bends, tees and changing levels as explained in the Installation section on pages 256-257.



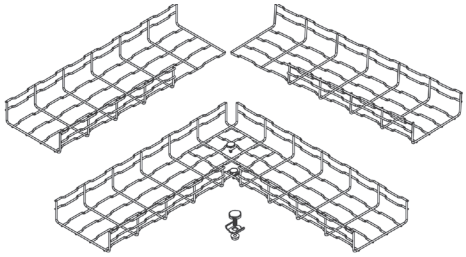


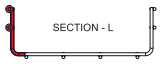



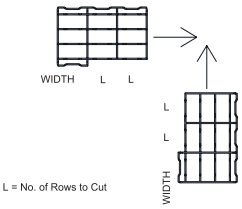

## Installation

The following drawings show in red the sections that should be removed to make the associated join or bend.

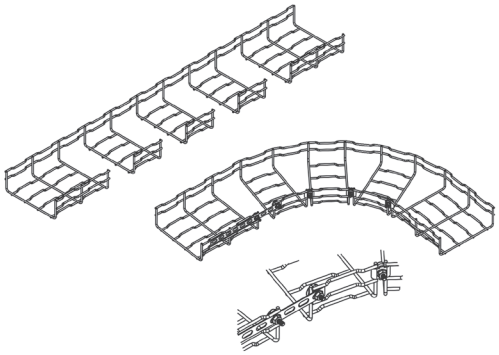
### Horizontal bend from two straight sections

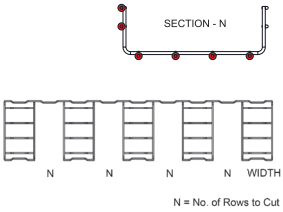




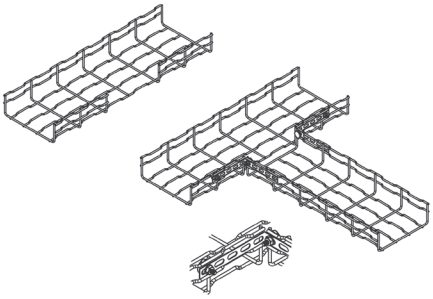



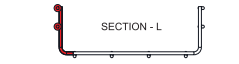

### Horizontal bends long radius – right angle

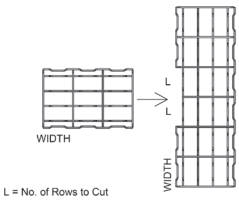




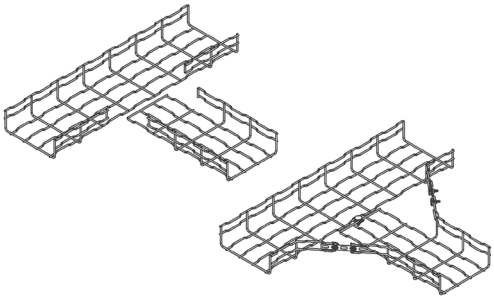

### Horizontal tees

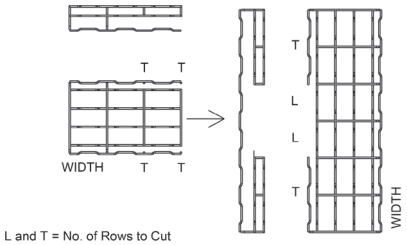




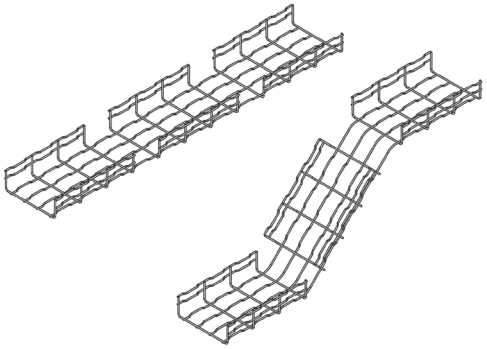

### Tee with large radius

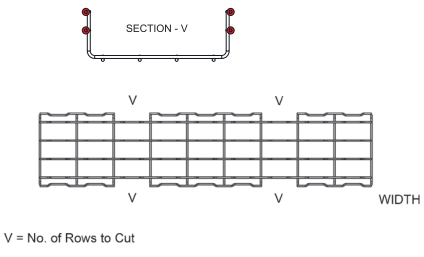






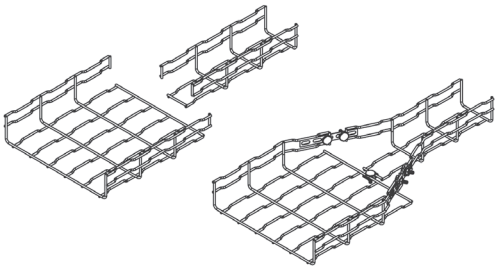
### Vertical inside and outside bends

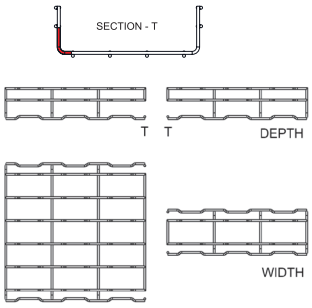





TECHNICAL INFORMATION

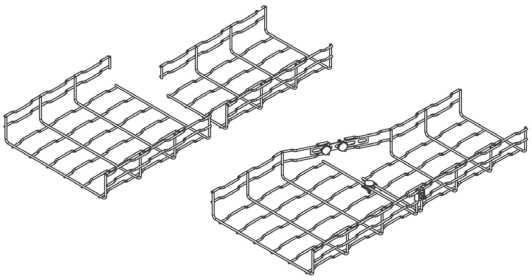
### Reducers straight

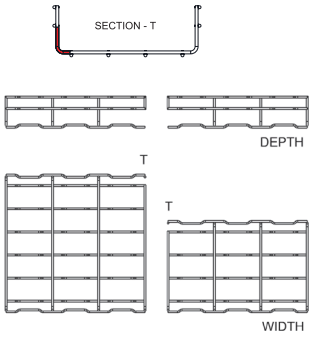





T = No. of Rows to Cut

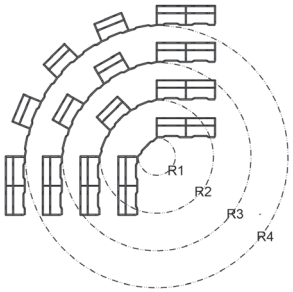
### Reducers left or right



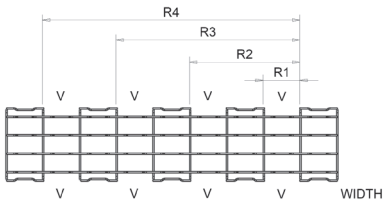



T = No. of Rows to Cut

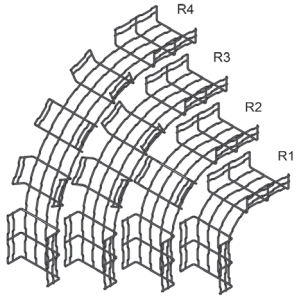
### Vertical bends








V = No. of Rows to Cut




| Radius | Radius diameter | Number of rows that will need to be cut |
|---|---|---|
| R1 | 64mm | 1 row |
| R2 | 190mm | 2 rows |
| R3 | 320mm | 3 rows |
| R4 | 445mm | 4 rows |



p65 Product Information

## MT32 Pre-wired underfloor power distribution

### Singles cabling system

**Extension, connection, adaptor and terminal cables**

| | |
|---|---|
| Cable Type | 6491B (HO1Z-R) to BS 7211 (LS0H) |
| Size | 4.0mm² x 3 (PE) or 4.00m² x 4 (CE) |
| Connector Self Lock Retention | > 80N |
| Male/Female Connector Diameter | 19.2mm |
| Terminal Block | 6 x 4.0mm² |
| Adaptor (4.0mm²) | 20mm |

**Underfloor Distribution System**

**Conduit assembly, tap off and adaptor**

| | |
|---|---|
| Cable Type | 6491X (BASEC BS 6004 H07V-R) |
| Protective Earth (P.E) | 4.0mm² x 3 (Grey Plug) |
| Clean Earth (C.E) | 4.0mm² x 4 (Red Plug) |
| Protection: Conduit Assembly | 25mm Steel flexible conduit (>1KN Tensile Load to BS EN 61386-23) |
| Protection: Tap Off | 20mm Steel flexible conduit (>1KN Tensile Load to BS EN 61386-23) |

**General specification**

| | |
|---|---|
| Approvals: System | Designed to comply with BS 7671:2008 IEE Wiring Regulations |
| Approvals: Connector | Designed to comply with EN 61535:2009<br>(Fixed installation couplers for permanent connection) |
| Normal Voltage | 250 volts |
| Frequency | 50/60 Hertz |
| Volt Drop Line & Neutral Connector | 1.0 mV/A/M |
| Volt Drop Line & Neutral | |
| (Flexible Cabling System) 2.5mm | 19.0 mV/A/M |
| Volt Drop Line & Neutral (Underfloor) 4.0mm | 12.0 mV/A/M |
| Connector Impedance | 1.0m Ω/connector |
| Connector, Body Material | PA66 – GF25 |
| Connector Colour Female | Black |
| Connector Colour Male | White |
| Compatibility | Keyed against incorrect insertion |
| Operating Temperature (Ambient) | -5°C to + 40°C |
| Safety | PE contact engages first |
| Degree of Protection | Engaged IP2XC |

## Installation

### MT32 pre-wired socket range

**Fitting**

- Plug in incoming pre-wired lead (from previous socket or distribution board) to appropriate connector mounted in socket assembly box.
- Connect selected pre-wired lead to outgoing connector mounted on opposite side of socket assembly box.
- Clip complete assembly into trunking compartment.
- When trunking cover is fitted, it should be slid between back box frame and the loosened accessory face plate.
- Front plate is then fully tightened down to clamp accessory in place.
- For pre-made close coupled assemblies, use lid spacer (ES1WH) between boxes.

### MT32 system with non-Marshall-Tufflex socket assemblies

**Fitting**

- For non-Marshall-Tufflex accessories, use pre-assembled outlet box unit.
- Connect cable tails to accessory in accordance with wiring regulations and fit accessory to back box.
- Connect pre-wired incoming and outgoing leads and fit to trunking (as above).
- For close coupled assemblies, use lid spacer (ES1WH) between boxes.

## Earthing requirements for the installation of equipment having High Protective/Conductor currents. BS 7671: 2008 Reg. 543.7

The scope of Reg. 543.7.1.203 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 integrity protective connection.

## Singles Cabling System 4.0mm²

**Final Circuit**

MT32 singles systems conform to the high integrity protective requirement by virtue of having a single copper protective conductor of 4mm², (Reg 543.7.1.203) with the protective conductor being enclosed throughout in trunking or flexible conduit to provide additional protection against mechanical damage.

**Note:** Different key ways apply between 2.5mm² and 4.0mm²

p105 & 179 Product Information

## Powertrack

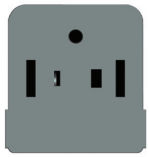
Powertrack is an underfloor busbar system rated at 63Amp maximum. It is available in Standard or CE (Clean Earth) versions.

### Lengths

- Powertrack lengths of 1.2m, 1.8m, 2.4m and 3.6m with tap-off outlets at 300mm

### Safety

- Snap-fit feed units, couplers and tap-offs are key and colour-coded to avoid assembly errors.



Standard = grey

CE = red

- A shutter is operated on insertion to prevent accidental contact.
- Avoid exceeding the maximum power rating of the track. This is ascertained by the maximum power requirement for each floor outlet box

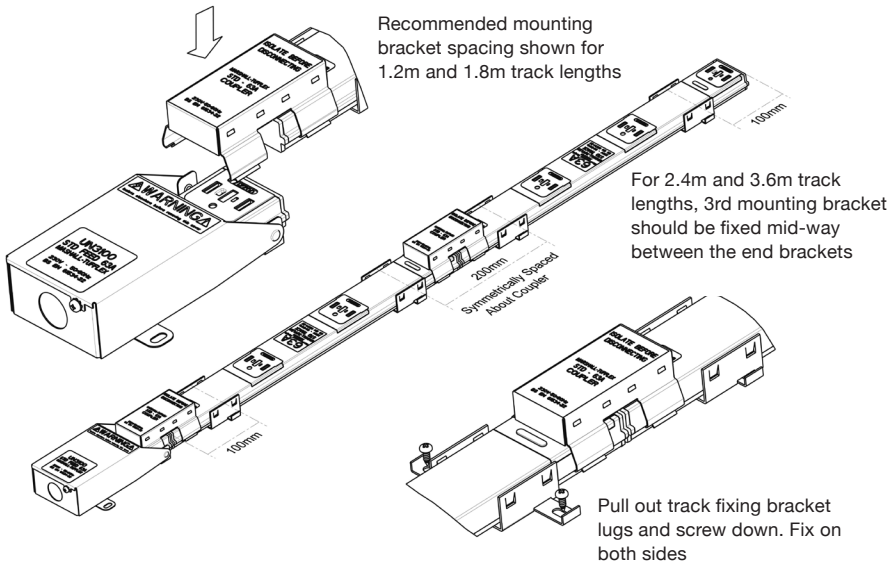
### Positioning

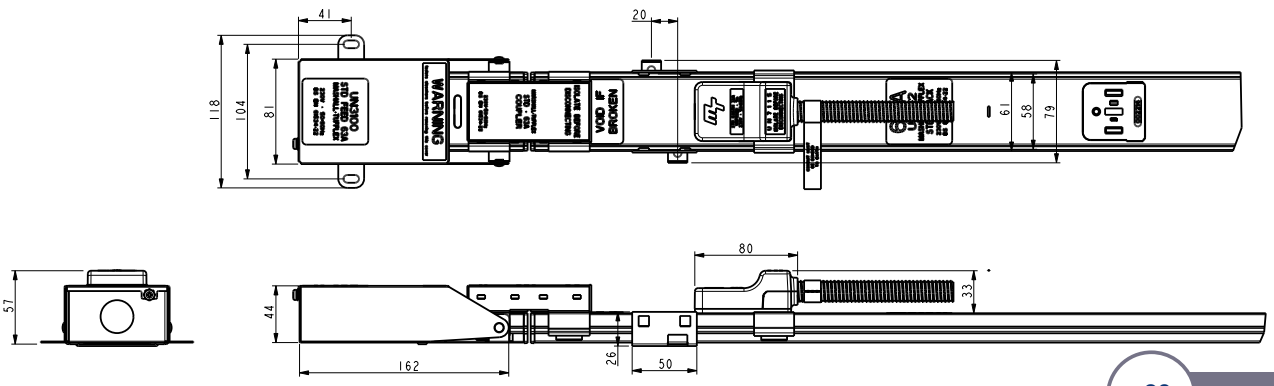
- For the most economic format, it is advised that Powertrack is arranged in parallel runs with Powertrack feed units orientated to the incoming supply.
- For optimum layout flexibility, spacing should be a maximum of 5.5m between each length of track and 2.5m from the perimeter when using a standard 3m tap-off to a floor box.

## Installation

- Lay out track lengths and feed unit as required to suit final assembly
- Position and secure the feed unit in place
- Carefully engage the first track length on to the feed unit socket
- Ensure the clip action is secure at the coupler and unit feed also that alignment is correct in laying the track length to the floor
- Secure the track length in place along its length at recommended spacing shown below using the brackets provided
- Additional track lengths can now be placed as below.
- Ensure the assembly is secure and prepare to make electrical connections

Please refer to the full installation instructions, EL182 available at www.marshall-tufflex.com or by contacting the Technical Team on +44 (0)1424 856688.




TECHNICAL INFORMATION

p80 Product Information

| Electrical Characteristics | | | |
|---|---|---|---|
| Rated Current | | 63 | Amps |
| Rated Voltage | | 230 | Volts |
| Frequency | | 50/60 | Hz |
| Conditional Short Circuit Rating | (Protection device: BS 1361 fuse) | 16 | KA |
| Conductor Resistance Line & Neutral | | 4.4 | mΩ/m |
| Volt Drops Line & Neutral | Powertrack | 4.4 | mV/A/m |
| | Feed Unit + Coupler | 2.2 | mV/A |
| | Tap-Off | 0.73 | mV/A |
| | 4mm² Cable | 11.0 | mV/A/m |
| | Coupler | 1.5 | mV/A |
| | Interlink Unit | 4.5 | mV/A |
| | 16mm² Cable (1.2m) | 3.9 | 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 |
| | 4mm² Cable | 11.0 | mΩ/m |
| | Coupler | 1.5 | mΩ |
| | Interlink Unit | 4.5 | mΩ |
| | 16mm² Cable | 3.9 | mΩ/m |
| **Mechanical Data** | | | |
| Number of Copper Conductors | | 2 or 3 | |
| Conductor Cross-section Area | Nominal | 20 | mm² |
| Powertrack Casing Copper Equivalent | (Where casing is protective Earth) | 12 | mm² |
| Cable Termination Capacity | | 16 | mm² |
| Tap-Off Cable 32A | | 4.0 | mm² |
| Tap-Off Cable 13A or 16A | | 4.0 | mm² |
| Tap-Off Conduit Sizes | Rating: Heavy duty conduit <1KN Tensile Load to BS EN 61386-23 | Ø20 | mm |
| Flexible Interlink Cable | | 16 | mm² |
| Flexible Interlink Conduit | Rating: Heavy duty conduit <1KN Tensile Load to BS EN 61386-23 | Ø25 | mm |
| Feed Conduit Entry | | 1 x Ø25 | mm |
| IP Rating | | 40 | |
| Minimum void depth (track + tap-off) | | 59 | mm |
| **Materials specification** | | | |
| Powertrack Casing | Galvanised Steel | | |
| Conductors | High Conductivity Copper/brass | | |
| Powertrack Insulators | PBT | | |
| Sockets/Tap-Off Plug/Joint Mouldings | Polycarbonate | | |
| Shutter | PBT | | |
| Tap-Off/Interlink Flexible Conduit | Galvanised Steel | | |
| Tap-Off Cable | BASEC BS 6004 H07V-R | | |
| Tap-Off/Coupler Blade | Copper | | |
| Feed Unit Case | Galvanised Steel | | |
| Flexible Interlink Cable | BASEC BS 6004 H07V-R | | |
| Feed/Flexible Interlink Housing | Galvanised Steel | | |

## Technical Specifications

Third party certified and tested to comply with:

BS EN 61534-1: 2011

BS EN 61534-22: 2009

BS 5733: 1995 where applicable.

Marshall-Tufflex is registered by BSI to BS EN ISO 9001: 2008

MT Powertrack is designed to comply with the requirements of BS 7671: 2008 (IEE Wiring Regulations).

### ASTA Type Test Certification

Powertrack is independently tested by Intertek to BS EN 61534-22:2009 clauses 15.4,18.4.3.2, & 18.4.3.3

## Regulation 543.7 Installations to BS 7671:2008 Earthing requirements for the installation of equipment having high protective/ conductor currents.

The scope of Reg. 543.7.1.203 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 MT Powertrack tap-off units conform to the high integrity protective requirement by virtue of using a protective conductor of 4mm² enclosed within a flexible conduit, thus providing additional protection against mechanical damage. Regulation 543.7.1.203.

## 32Amp 3 metre tap-off unit

The 32Amp tap-off unit comprises of an unfused tap-off* a flexible metal conduit with integral 4mm² conductors.

These units are designed to comply with regulation 434.2.1(i) of BS 7671:2008 by virtue of the following:

1 Maximum length of cable is <3 metres.

2 Minimum risk of faults as the item is factory assembled and fully tested.

3 Fully protected by flexible steel conduit located within raised access floor that offers further protection.

*Fused 3 metre tap-offs are available if required.

## 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 32Amp rated protective device.

## Raised floor boxes

Three and four compartment boxes and a range of grommets that can be configured to meet client requirements for accessing multiple services concealed below a raised floor system.

## Technical specifications

Raised floor boxes are third party tested to comply with:

BS EN 61534-22:2009

BS EN 60670-1:2005

BS EN 60670-23:2008

BS EN 50085-1:2005

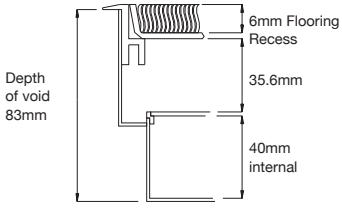
BS EN 50085-2-2:2008

## Material

- Lid/trim: flame retardant polypropylene grey RAL 7011
- Box assembly: galvanised steel
- Load plate: 3mm zinc plated steel
- Accessory plate: galvanised steel

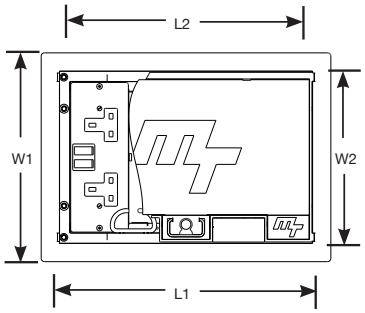
## Installation

- Box module has 20 and 25mm knockouts (pre-wired options available).
- Mounting plates:
  3 compartment = 185 x 95mm
  4 compartment = 185 x 71mm
- Standard accessory mounting plates available depending on suitability of floor box configuration.
- Cable covers protect cables when lid is closed.
- Detailed installation instructions are supplied in box.




## Dimensions

- For dimensions of non standard boxes and trims, contact Technical Hotline on +44 (0)1424 856688.




## Dimensions

| No of compartments | Nominal trim size (L1 x W1) | Cut out dimensions (L2 x W2) | Accessory Plate Dimensions |
|---|---|---|---|
| 3 | 357 x 257mm | 322 x 222mm | 185 x 95mm |
| 4 | 357 x 257mm | 322 x 222mm | 185 x 71mm |
| | | General tolerance +3mm | |

Care should be taken to ensure that box edges are smoothed and free from burrs.
Carpet tile cut size for lid is 303 x 166mm.

## Load testing

Load testing of floor boxes to:

BS EN 61534-22:2009
BS EN 50085-2-2:2008

The floor boxes have been tested to and comply with the loading requirements of the aforementioned standards.

There are two loading criteria for the floor boxes:

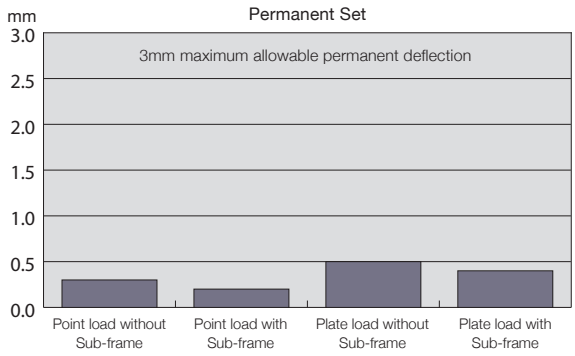
1. A point loading; to simulate foot traffic or light furniture like a chair leg / caster sitting on the lid. The maximum permissible deflection is 6mm (BS EN 61534-22:2009 and BS EN 50085-2-2:2008)
2. A plate loading; to simulate heavy foot traffic or larger furniture loads. the maximum permissible deflection is 4mm (BS EN 61534-22:2009) or 6mm (BS EN 50085-2-2:2008)

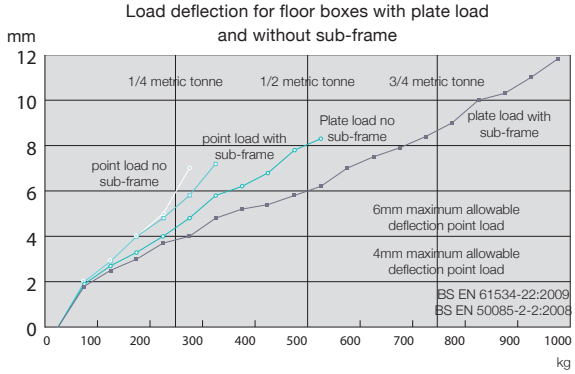
**Note:** The maximum permissible permanent deflection after the load has been removed is 3mm for both standards.

The loading graphs show the deflection based on floor boxes without and with a sub-frame. The point loading value is approaching ¼ of a metric tonne without sub-frame and reaching ¼ of a metric tonne with sub-frame. In both cases the permanent deflection is less than ¼ mm.

For plate loading without sub-frame the value is approaching ¼ of a metric tonne with 4mm deflection and ⅓ of a metric tonne with 6mm deflection. With the sub-frame fitted the loading reaches ¼ of a metric tonne with 4mm deflection and ½ a metric tonne with 6mm deflection. In both cases the permanent deflection is reaching 0.5mm.

**Note:** floor boxes fitted with sub-frame can exceed more than 1 metric tonne plate load before lid failure. In all tests (with and without sub-frame) the required loading was reached without damage to the plastic trim or compromised the lid.




TECHNICAL INFORMATION

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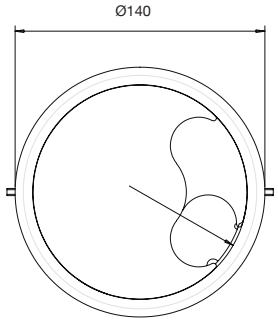
## Grommets

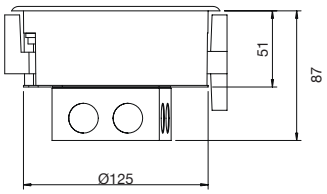
### Material

- ABS Flame retardant
- Flammability: UL94 V-0 at 2.0mm
- Colour: polypropylene grey RAL 7011
- Lid: captive screwdown
- Lid recess: 15mm for extra strength
- Through power/data options

### Dimensions




### Cut out dimensions




## In-screed system

Three and four compartment boxes configured to meet client requirements for accessing multiple services concealed within an in-screed floor system.

Standard system is suitable for screed depths of 63mm to 85mm. For other screed depths please contact the Technical Team on +44 (0)1424 856688.

### Material

- Lid/trim: polypropylene grey RAL 7011
- Frame assembly: galvanised steel
- Modular boxes: galvanised steel
- Load plate: galvanised steel

### Installation

- Layout planning essential as alterations are not possible once screed is laid.
- Place floor boxes and junction boxes in position with top of boxes level and in line with expected finished floor level, with the sub-frame raised 10mm.
- Adjust boxes to screed depth by adjusting sub frame height.
- When boxes are in correct position, use PVC-U or steel duct to link between.
- To use conduit for linking boxes, utilize the Ø20mm knockout in the blank plate.

- Floor boxes can only be used as through boxes.
- Junction boxes have all round access with internal segregation.
- Duct adaptors and blank ends are not supplied for junction and service boxes. These must be ordered separately to individual requirements.
- Use a connector to join lengths of ducting.
- Flat and vertical bends or junction boxes are used where a change of direction is required.
- An optional steel screeding plate (USFSP1) is available to replace the box lid temporarily when screeding the floor.

**Wiring accessories and mounting plates**

- 3 compartment box: 185 x 95mm
- 4 compartment box: 185 x 71mm
- For use with standard 60.3mm and 120.6mm accessories with blank or pre-punched plates for data/telecoms etc.

## Desk units

### Flip up units

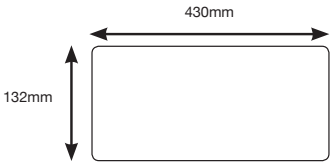
- Units have bi-directional access and are suitable for installation to BS 6396.
- Up to 4 x individually fused 3.15 sockets.
- Up to 4 x data outlets.

### Fitting

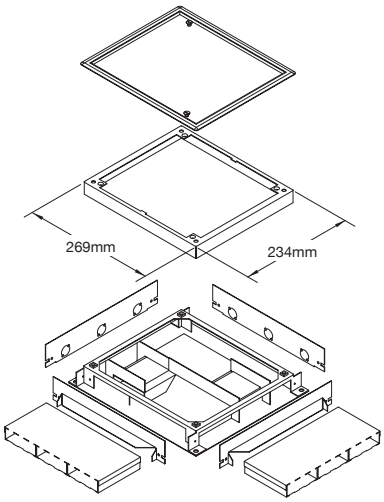
- Simple, secure ratchet with hidden screw fixing.

### Desk cut out size

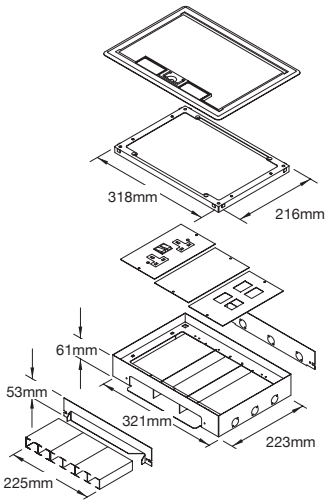
- 132 x 430mm.
- Unit casing depth 90mm from top surface of desk.
- It is recommended that at least 400mm is clear below the cut out to allow cables to move freely.
- Cut out width is constant (132mm).
- Cut out length (430mm) will vary according to order requirements.



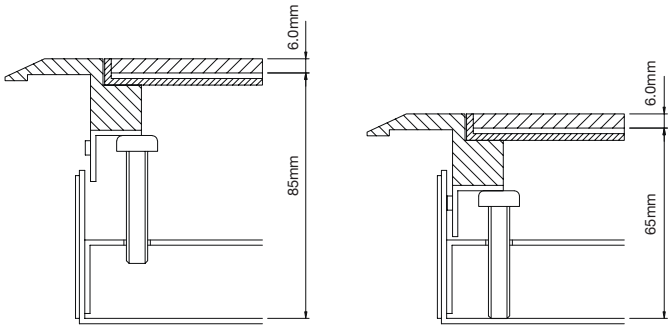

### Junction box




### Floor outlet box




### Box screed depth adjustment

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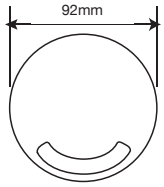
## Desk grommets

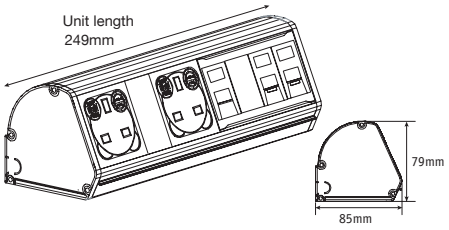
### Dimensions




**Cut out size**

| Box type | Diameter |
|---|---|
| DG1 | 80mm |
| General tolerance | 2mm |

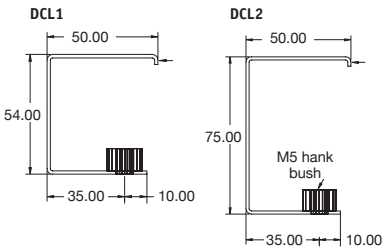
**Curved surface unit**




**Adjustable desk clamp**

Adjustable clamps suit desks from 5mm – 48mm thick.

- For use with curved surface units only.




## Power and data modules

### Standards

BS 1363-1

BS 1363-2 (where applicable)

BS 5733:2010+A1:2014

EN 50581:2012

EN 301 489-34(2012)

IEC 60884-1:2005

For more information please contact our Technical Team on +44 (0)1424 856688.

### Material

Power and Power and Data Modules are constructed from high strength flame retardant black polycarbonate mouldings. RCBO – constructed from aluminium casing.

### Insulation

Reinforced insulation.

### Earth Bonding:

- **Power Modules**
  An external earth terminal allows connection of earth bonding leads without dismantling the unit. Please use suitable tools to cut earth lead from Power Modules if required.
- **Power and Data Modules**
  Our Power and Data Modules units are supplied as standard with a prefitted 250mm earth lead to 5mm ring terminal.

### Fusing

To enable compliance to BS 6396 the UK sockets are fitted with Ø5 x 20mm anti-surge ceramic fuses, with colour-coded fuse clips to denote the rating (3.15Amp or 5Amp).

### RCBO rating

30mA 16Amp

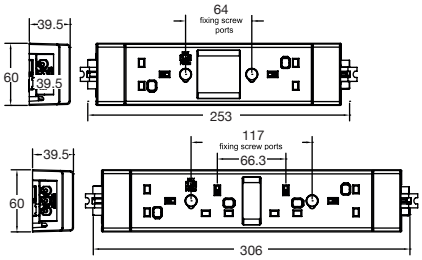
### Quality and testing:

100% testing – continuity, polarity, insulation & earth

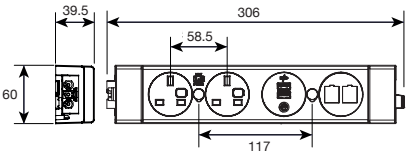
- **Power and Data Modules only**
- USB charger: Output voltage and resistance
- Data & AV: All sockets continuity tested

### Dimensions

**Power modules**




**Power and data modules**



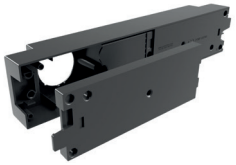

### Configuration

- **Power modules**
  Power only
- **Power and data modules**
  2 x UK fused sockets plus 2 configurable gangs for Power, USB charging or data/AV
- **RCBOs**
  Designed to be connected directly to underfloor track.
- Input connections via tap-off.
- Output connection via Weiland GST18/3.

### Connection options

Power and Data Modules - Built in GST18/3 male for power in, plus optional GST18/3 female connector for power out on certain configurations.

Two modules units can be securely clipped together via the inbuilt GST18/3 connectors e.g. a DM5001 and DM5030 (both with 3.15Amp fuses) can be joined to form a BS 6396 compliant 6 socket unit.

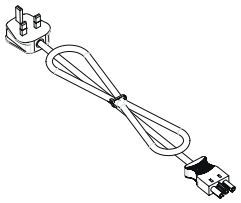


The rear section of the Power and Data Modules can be removed for onsite data/AV installation.

### Cable type

In-feed power cable shown with optional Wieland connector.

- 13Amp rating
- Specification of cable length is necessary



**Power module earth lead**

Size: 1.5mm$^2$

Length: 250mm with 5mm ring terminal.

p89 Product Information

## Series 2 PowerPole

### Double sided PowerPole

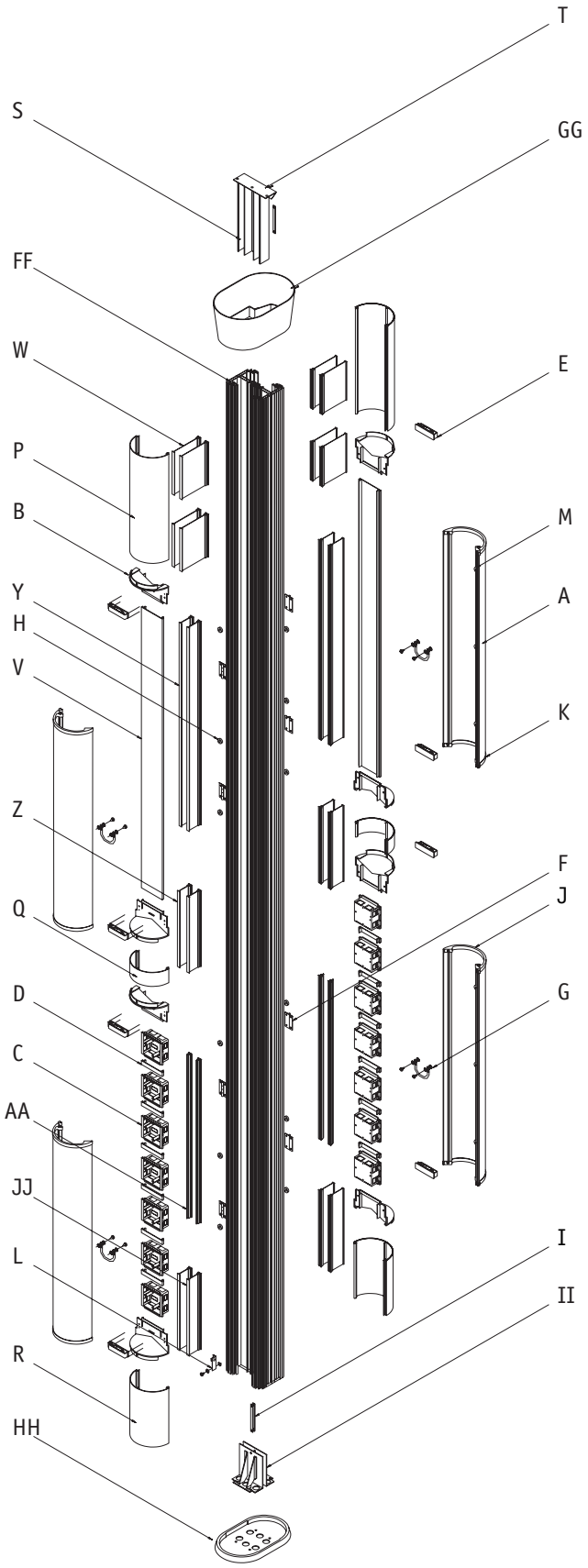
with 4 hinged lids and 14 ESSB1WH outlets (NPPE36001441)

| Code | | Description | Quantity |
|---|---|---|---|
| FF | NPPMB3600 | Square PowerPole base 3600mm long | 1 |
| A | NPPHLA/W# | 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 |

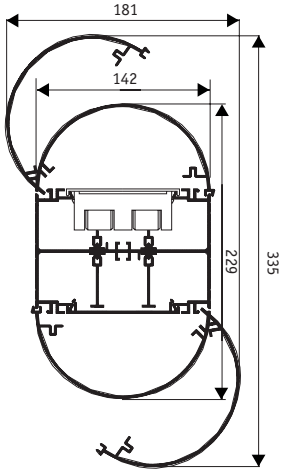
#Please use A or W to denote anodised or white

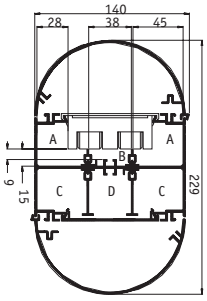
Note: The Sterling PowerPole is suitable for both solid and suspended ceilings up to 3.6 metres high. An alternative adjusting slide which can be extended to one metre is available for additional heights within the ceiling void (*PHAS2).

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.

## Series 2 PowerPole – continued

### Single sided PowerPole

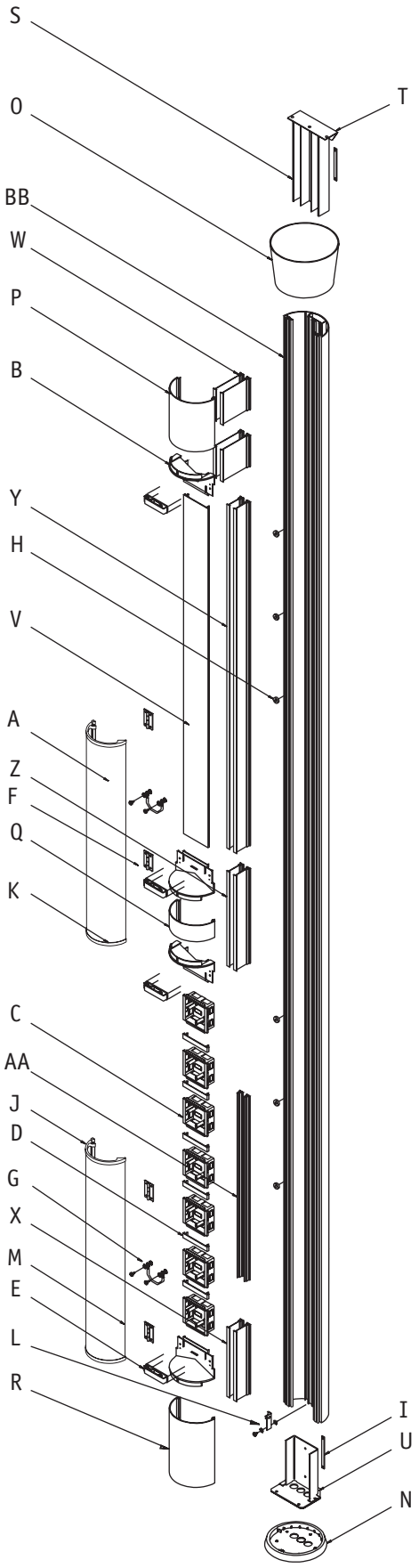
with 2 hinged lids and 7 ESSB1 outlets (NPPC3600721)

| Code | | Description | Quantity |
|---|---|---|---|
| BB | NPPB3600 | Semi-circular PowerPole base 3600mm | 1 |
| A | NPPHLA/W# | 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 |

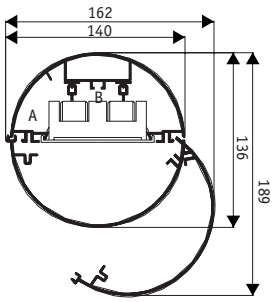
#Please use A or W to denote anodised or white

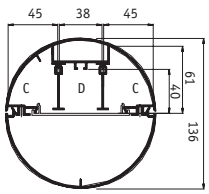
**Note:** The Sterling PowerPole is suitable for both solid and suspended ceilings up to 3.6 metres high. An alternative adjusting slide which can be extended to one metre is available for additional heights within the ceiling void (*PHAS2).

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.

p94 Product Information

## Double sided PowerPole

| Code | | Description | Quantity |
|---|---|---|---|
| | PP36001 | 250mm adj. slide incl | 1 pack |
| | PP36002 | 1150mm adj. slide incl | 1 pack |
| **A** | **NPPFB2** | **Fixing Bracket** | **1** |
| B | PHAS1/2 | *Adjusting Slide | 1 |
| **C** | **PPSN1** | **Sliding Nut** | **3** |
| **D** | **PPTC1** | **Top Cover (white only)** | **1** |
| E | PL1 | Lid 3600mm | 2 |
| F | PPMB1 | Pole 3600mm | 1 |
| G | ESSB1 | Single Gang Box | 6 |
| I | PPBF3 | Base Foot (Metal) | 1 pair |
| **J** | **PPBF1** | **Base Foot (white only)** | **1** |
| K | ES1 | Spacing Cover | 5 |
| **L** | **PPBT1** | **16mm Bonding Terminal Ass.** | **1** |
| | **PPF1** | **#Fixing Kit** | **1** |

### Accessory Kits

Accessory kits are available to order using the code PPAKIT and include the items within the above table marked in bold text.

*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.

# PPF2 Fixing Kit includes the following items:
5 x M5x8 slotted pan head steel m/c screws
4 x M5 internal tooth steel lock washers
1 x M5 Square (8x8x4) pressed steel nut

1400mm Extension Pole body kits available to increase Pole height to 5.0m.

## Single sided PowerPole

| Code | | Description | Quantity |
|---|---|---|---|
| | PPS36001 | 250mm adj. slide | 1 pack |
| | PPS36002 | 1150mm adj. slide | 1 pack |
| A | NPPFB2 | Fixing Bracket | 1 |
| B | PHAS1/2 | *Adjusting Slide | 1 |
| **C** | **PPSN1** | **Sliding Nut** | **3** |
| **D** | **PPTC2** | **Top Cover (white only)** | **1** |
| E | PL1 | Lid 3600mm | 1 |
| F | PPSS1 | Single Sided Pole 3600mm | 1 |
| G | ESSB1 | Single Gang Box | 6 |
| **I** | **PPBF3** | **Base Foot (Metal)** | **1** |
| **J** | **PPBF4** | **Base Foot (white only)** | **1** |
| **K** | **ES1** | **Spacing Cover** | **5** |
| **L** | **PPBT1** | **16mm Bonding Terminal Ass.** | **1** |
| | **PPF1** | **#Fixing Kit** | **1** |

### Accessory Kits

Accessory kits are available to order using the code PPAKIT and include the items within the above table marked in bold text.

*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.

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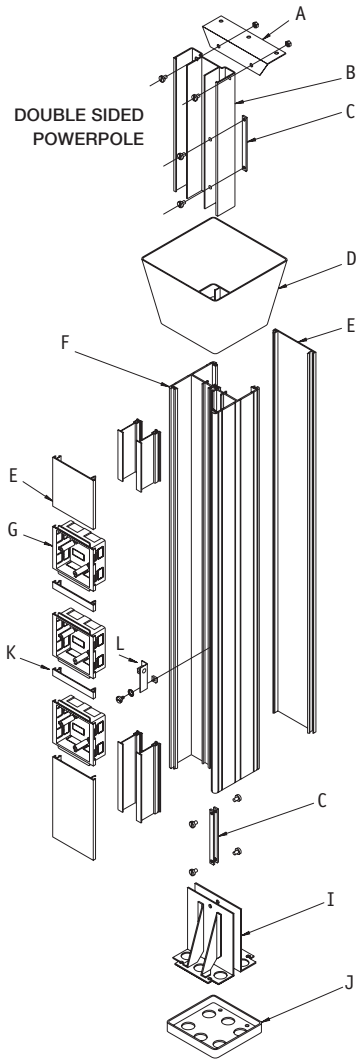
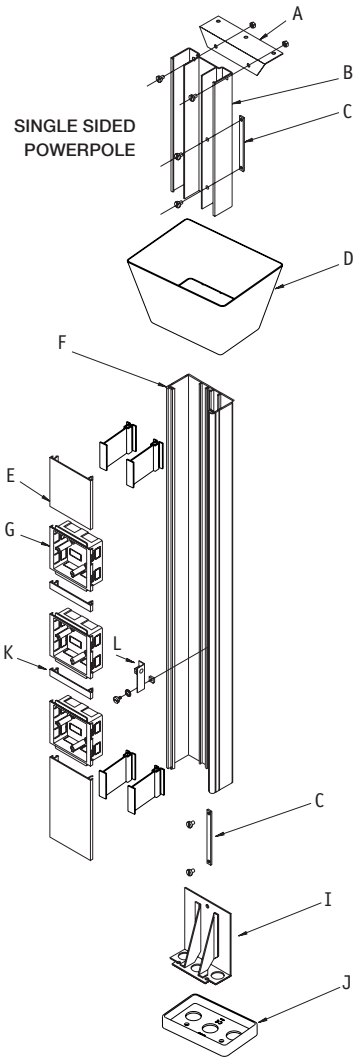
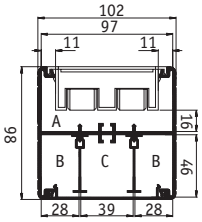
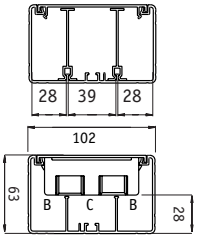
1400mm Extension Pole body kits available to increase Pole height to 5.0m.




## 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.

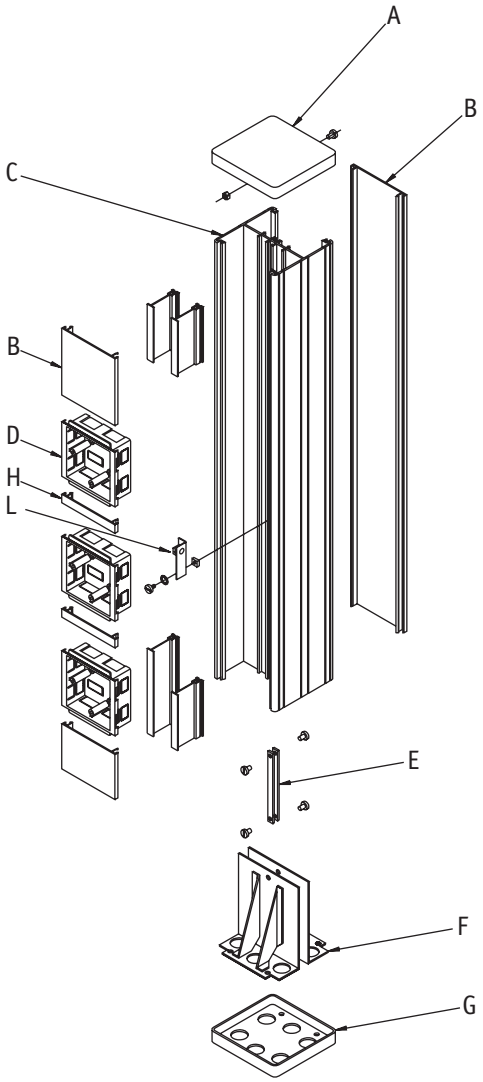
## Double sided PowerPost

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

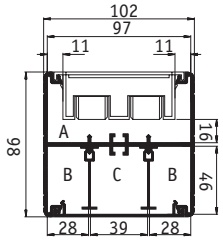
The standard height of the PowerPost is 685mm and the overall height, including cap and base, is 692mm.

Full installation instructions are included within each pack.

#PPF2 Fixing Kit includes the following items:
5 x M5x8 slotted pan head steel m/c screws
4 x M5 internal tooth steel lock washers
1 x M5 Square (8x8x4) pressed steel nut




## 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.



p96 Product Information

## Double sided PowerPost

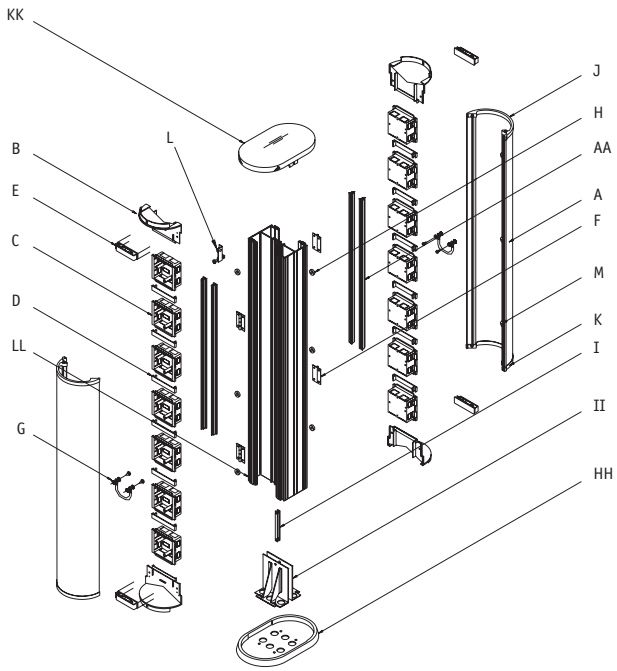
with 2 hinged lids and 14 ESSB1 outlets (NPPE811142)

| Code | | Description | Quantity |
|---|---|---|---|
| LL | NPPMB811 | Square PowerPost base 811mm long | 1 |
| A | NPPHLA/W# | 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 |

#Please use A or W to denote anodised or white

Overall height 838mm.

Full installation instructions are included within each pack.




## Single sided PowerPost

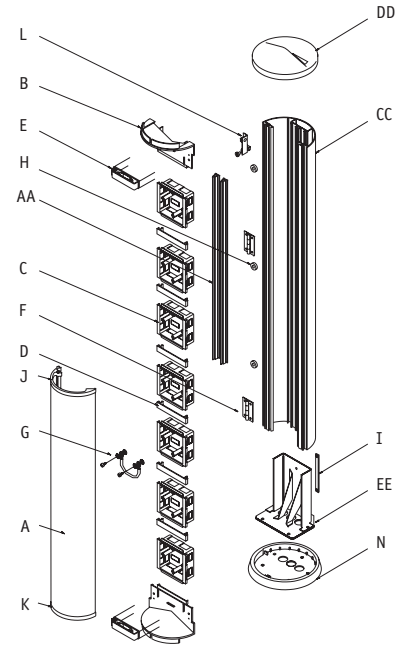
with 1 hinged lid and 7 ESSB1 outlets (NPPC80671)

| Code | | Description | Quantity |
|---|---|---|---|
| CC | NPPB806 | Semi-circular PowerPost base 806mm | 1 |
| A | NPPHLA/W# | 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 |

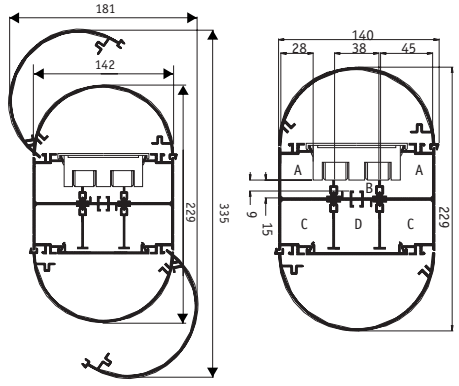
#Please use A or W to denote anodised or white

Overall height 838mm.

Full installation instructions are included within each pack.




## Dimensions and cable capacities



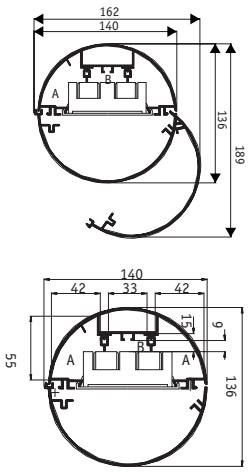

**Double sided PowerPost**

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.




**Single sided PowerPost**

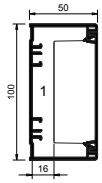
A = 1238 sq mm total area 45% space factor = 557 sq mm.

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

TECHNICAL INFORMATION

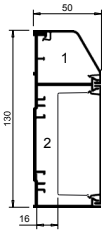
## PVC-U perimeter trunking capacity guide

### Trunking sizes up to 150mm



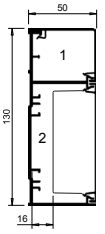

**Mono 10 no box**
1 = 4141mm² total area
1 = 1863mm² 45% space factor

**With box in comp 1**
1 = 1874mm² total area
1 = 843mm² 45% space factor



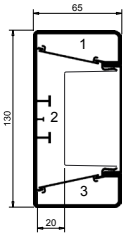

**Compact 1 no box**
1 = 1280mm² total area
1 = 576mm² 45% space factor
2 = 3763mm² total area
2 = 1693mm² 45% space factor

**With box in comp 2**
2 = 1497mm² total area
2 = 673mm² 45% space factor



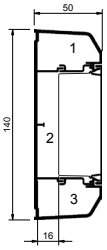

**Compact 2 no box**
1 = 1534mm² total area
1 = 690mm² 45% space factor
2 = 3763mm² total area
2 = 1693mm² 45% space factor

**With box in comp 2**
2 = 1497mm² total area
2 = 673mm² total area



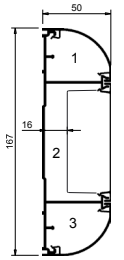

**Series R 130 with box and segregators**
1 & 3 = 957mm² total area
1 & 3 = 431mm² 45% space factor
2 = 2210mm² total area
2 = 995mm² 45% space factor

**Without segregators**
1 = 4272mm² total area
1 = 1922mm² 45% space factor



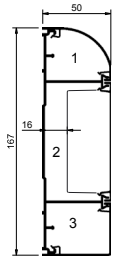

**Mono Plus 20 – no box**
1 & 3 = 1024mm² total area
1 & 3 = 461mm² 45% space factor
2 = 3451mm² total area
2 = 1553mm² 45% space factor

**With box in comp 2**
2 = 1185mm² total area|
2 = 533mm² 45% total area




**Sterling Curve Profile 1 – no box**
1 & 3 = 1170mm² total area
1 & 3 = 527mm² 45% space factor
2 = 3858mm² total area
2 = 1736mm² 45% space factor

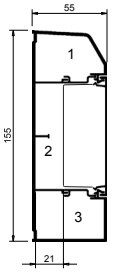
**With box in comp 2**
2 = 1376mm² total area
2 = 619mm² 45% total area




**Sterling Curve Profile 2 – no box**
1 = 1170mm² total area
1 = 527mm² 45% space factor
2 = 3858mm² total area
2 = 1736mm² 45% space factor
3 = 1542mm² total area
3 = 694mm² 45% space factor

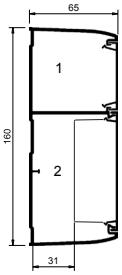
**With box in comp 2**
2 = 1376mm² total area
2 = 619mm² 45% space factor

### Trunking sizes from 150mm to 200mm



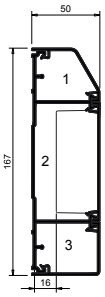

**Mono Plus 30 no box**
1 = 1450mm² total area
1 = 652mm² 45% space factor
2 = 3829mm² total area
2 = 1723mm² 45% space factor
3 = 1646mm² total area
3 = 741mm² 45% space factor

**With box in comp 2**
2 =1563mm² total area
2 =703mm² 45% space factor



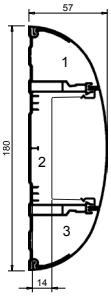

**Twin165 no box**
1 = 3272mm² total area
1 = 1472mm² 45% space factor
2 = 5404mm² total area
2 = 2431mm² 45% space factor

**With box in comp 2**
2 = 3100mm² total area
2 = 1395mm² 45% space factor



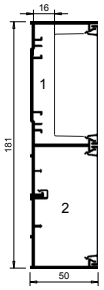

**Sterling Profile 2 no box**
1 = 1266mm² total area
1 = 570mm² 45% space factor
2 = 3858mm² total area
2 = 1736mm² 45% space factor
3 = 1542mm² total area
3 = 694mm² 45% space factor

**With box in comp 2**
2 = 1376mm² total area
2 = 619mm² 45% space factor




**Odyssey no box**
1 & 3 = 1256mm² total area
1 & 3 = 565mm² 45% space factor
2 = 4022mm² 45% total area
2 = 1810mm² 45% space factor

**With box in comp 2**
2 = 1230mm² total area
2 = 554mm² 45% space factor



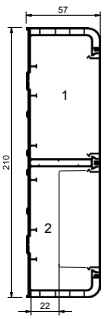

**Compact 3 – no box**
1 = 3763mm² total area
1 = 1693mm² 45% space factor
2 = 3700mm² total area
2 = 1665mm² 45% space factor

**With box in comps 1 and 2**
1 = 1503mm² total area
1 = 676mm² 45% space factor
2 = 1440mm² total area
2 = 648mm² 45% space factor

| Conductor type | Size | Cable factor |
|---|---|---|
| Stranded PVC power | 1.5mm² | 8.0 |
| Stranded PVC power | 2.5mm² | 11.9 |
| Stranded PVC power | 4.0mm² | 16.6 |

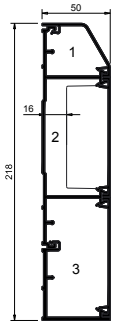
For Data cable information, please see page 246

### Trunking sizes over 200mm



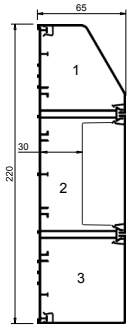

**Twin Plus – no box**
1 & 2 = 4755mm² total area
1 & 2 = 2140mm² 45% space factor

**With box in comps 1 or 2**
1 & 2 = 2431mm² total area
1 & 2 = 1094mm² 45% space factor



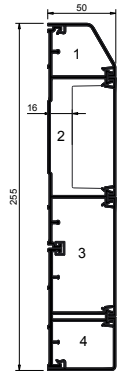

**Sterling Profile 4 no box**
1 = 1266mm² total area
1 = 570mm² 45% space factor
2 = 3858mm² total area
2 = 1736mm² 45% space factor
3 = 3716mm² total area
3 = 1672mm² 45% space factor

**With box in comp 2 or 3**
2 = 1376mm² total area
2 = 619mm² 45% space factor
3 = 1234mm² total area
3 = 555mm² 45% space factor



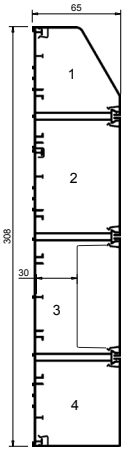

**XL 202**
**XL 202 – no box**
1 = 2824mm² total area
1 = 1271mm² 45% space factor
2 = 4771mm² total area
2 = 2147mm² 45% space factor
3 = 3531mm² total area
3 = 1589mm² 45% space factor

**With box in comp 2**
2 = 2504mm² total area
2 = 1127mm² 45% space factor




**Sterling Profile 12 no box**
1 = 1266mm² total area
1 = 570mm² 45% space factor
2 = 3858mm² total area
2 = 1736mm² 45% space factor
3 = 3566mm² total area
3 = 1605mm² 45% space factor
4 = 1430mm² total area
4 = 644mm² 45% space factor

**With box in comp 2 or 3**
2 = 1376mm² total area
2 = 619mm² 45% space factor
3 = 1084mm² total area
3 = 488mm² 45% space factor




**XL 212 – no box**
1 = 2824mm² total area
1 = 1271mm² 45% space factor
2 = 4771mm² total area
2 = 2147mm² 45% space factor
3 = 4732mm² total area
3 = 2130mm² 45% space factor
4 = 3531mm² total area
4 = 1589mm² 45% space factor

**With box in comps 2 or 3**
2 = 2511mm² total area
2 = 1130mm² 45% space factor
3 = 2466mm² total area
3 = 1109mm² 45% space factor

## Compact trunking

### Material

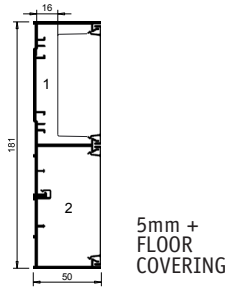
PVC-U is flame retardant and self-extinguishing. PVC-U is 100% recyclable.

### Installation

#### Positioning

Compact 1, 2 & 3 suitable for dado. Should Compact 3 be used as skirting system, a clearance of 5mm is recommended above the floor covering to allow the profile fittings to clip over the cover.

If Compact 2 is installed close to desk/bench top – invert so small compartment is on bottom.




#### Expansion/contraction

PVC-U expands and contracts at a uniform rate of approx 5.25mm in a 3 metre length for a temperature change of 25°C. Therefore, a 3mm gap between each length of trunking base is recommended. Fittings have a 10mm overlap on each side to allow for thermal movement of the covers.

#### Fitting

- The base is supplied with pre-cut elongated holes at 250mm centres.
- To fasten base, use No 8 round head screws and washers.
- Avoid over-tightening to permit thermal movement.
- The use of plastic caps over screw heads is recommended to protect installed cables.
- To cut the trunking, use a fine-toothed panel or power jig-saw.
- External moulded fittings overlap the joints by up to 10mm to cover cutting inaccuracies.
- A variable angle jig-saw or chop saw is recommended for cutting 45 degree mitres.

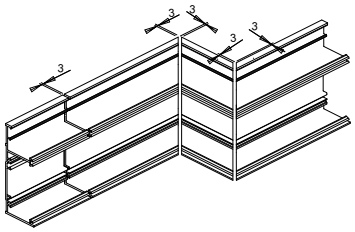
#### Single lengths

Where it is required to fit a single length of trunking (under 3 metres) between two inside walls and no accessory box is fitted, it is advisable to install a coupler in the centre of the run to facilitate the removal of the cover.

#### Joints and bends

Base joints should have a 3mm gap to allow for expansion.

- Internal, external bends and flat angles, the base must be mitred 45 degrees to ensure total enclosure of trunking, including any internal fitted segregator.
- External moulded fittings overlap the joints by up to 10mm to cover cutting inaccuracies.
- Flat angles, tees and crossovers are also available pre-fabricated.

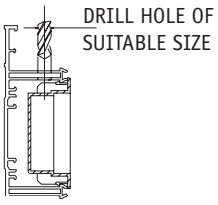



#### Bend radius control

The data internal and external bend radius control fittings for Compact Trunking provide a bend radius of 50mm.

#### Accessory boxes

- For mounting an accessory box in the alternative compartment to supply, drill the main web adjacent to the box position.
- Remove the appropriate knock out and clip the box into the trunking base.
- For boxes in the same compartment as the supply, remove the appropriate box knock-outs and clip the box into trunking base.
- When boxes are installed consecutively, a 14mm wide spacer (ES1) is required to cover the space between the boxes.
- Part M box assemblies with contrasting coloured faceplates are available to meet the requirements of DDA regulations for Visual Impairment.
- If Compact 3 is used as a skirting system. All power accessories should be installed in the top compartment.




#### Covers

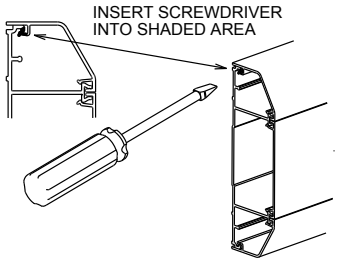
Covers are designed to limit unauthorised removal and to remain in position during normal conditions irrespective of impact and minor undulations of the mounting surface.

#### Covers – fitting

Covers are clipped into place from front. If accessory boxes are installed, the ETL1 cover is butt-joined to the edge of the box. Cut edges of the cover are subsequently concealed by the accessory. For fittings, a gap of 25mm is left between the two cover ends to permit the fitting to clip to base.

#### Covers – removal

To remove a cover, first detach a coupler, internal or external bend component to gain access. The main cover can then be gently eased off the base. To remove the outer cover, firstly ease from the base by inserting the blade of a terminal screwdriver between the captive legs of the cover and the base and then peel off.




#### Screening

Special conductive spray coating can be applied to one compartment, the cover, accessory boxes and fittings, to screen data cables against EMI interference.

- For data/voice circuits only:
  Warning: Owing to its relatively high surface resistance, CS coating SHOULD NOT be in contact with low voltage circuits BS 7671:2008 50 V.A.C. – 1000 V.A.C. unless additional measures are undertaken.

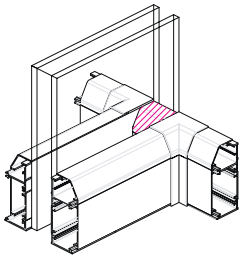
#### Antimicrobial

For technical details of antimicrobial Bio Compact trunking, please refer to Laboratory and Healthcare section.

## Compact trunking – continued

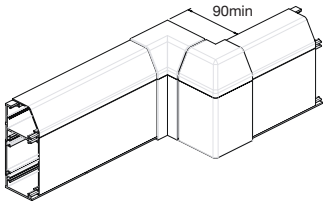
### Method of continuation through a partition wall

Continue the main lateral run of base through the partition wall. Fit short lengths of cover where the trunking passes through the partition. The partition wall trunking is then butted up to the main run and the joint covered by an internal bend fitting.

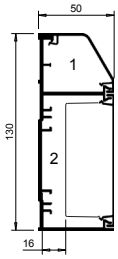


### Offset dimensions

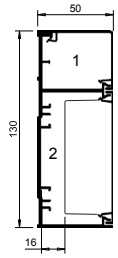
The minimum set that can be accommodated in the same plane (from internal to external bend), is shown below.



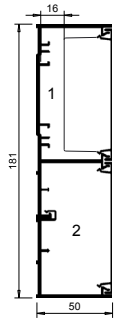

## Dimensions




**Compact 1 trunking – with box**
Compartment 1 total area = 1280mm²
Compartment 2 total area = 1497mm²




**Compact 2 trunking – no box**
Compartment 1 total area = 1534mm²
Compartment 2 total area = 3763mm²




**Compact 3 trunking – no box**
Compartment 1 total area = 3763mm²
Compartment 2 total area = 3700mm²

## Cable capacities

- All calculations allow for a 45% space factor.

As there can be differences between data cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.

| Cable capacity chart | Compartment 1 | | Compartment 2 | |
|---|---|---|---|---|
| | No box | With box | No box | With box |
| **PVC power cable 1.5mm² stranded copper** | | | | |
| Compact 1 | 72 | – | 212 | 84 |
| Compact 2 | 86 | – | 212 | 84 |
| Compact 3 | 212 | 85 | 208 | 81 |
| **PVC power cable 2.5mm² stranded copper** | | | | |
| Compact 1 | 48 | – | 142 | 57 |
| Compact 2 | 58 | – | 142 | 57 |
| Compact 3 | 142 | 57 | 140 | 54 |
| **PVC power cable 4.0mm² stranded copper** | | | | |
| Compact 1 | 35 | – | 102 | 41 |
| Compact 2 | 42 | – | 102 | 41 |
| Compact 3 | 102 | 41 | 100 | 39 |
| **Data cable: Ø5.5mm** | | | | |
| Compact 1 | 24 | – | 71 | 28 |
| Compact 2 | 29 | – | 71 | 28 |
| Compact 3 | 71 | 28 | 70 | 27 |
| **Data cable: Ø6.0mm** | | | | |
| Compact 1 | 20 | – | 60 | 24 |
| Compact 2 | 24 | – | 60 | 24 |
| Compact 3 | 60 | 24 | 59 | 23 |
| **Data cable: Ø6.5mm** | | | | |
| Compact 1 | 18 | – | 53 | 21 |
| Compact 2 | 21 | – | 53 | 21 |
| Compact 3 | 53 | 21 | 52 | 20 |
| **Data cable: Ø7.0mm** | | | | |
| Compact 1 | 15 | – | 44 | 17 |
| Compact 2 | 18 | – | 44 | 17 |
| Compact 3 | 44 | 18 | 43 | 17 |
| **Data cable: Ø8.4mm** | | | | |
| Compact 1 | 10 | – | 31 | 12 |
| Compact 2 | 12 | – | 31 | 12 |
| Compact 3 | 31 | 12 | 30 | 12 |



p115 Product Information

## Mono and Mono Plus trunking – PVC-U

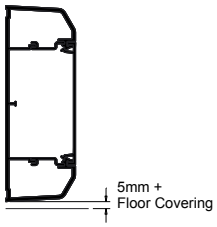
### Material

PVC-U is flame retardant and self-extinguishing. It provides a 100% recyclable material with good sustainability.

### Installation

#### Positioning

- Mono 10
  For dado application only.
- Mono Plus 20 and 30
  When used as a skirting system, sufficient clearance should be allowed between the floor covering and the profile fittings that clip over the cover i.e. 5mm + floor covering is recommended.




#### Expansion/contraction

PVC-U expands and contracts at a uniform rate of approx 5.25mm in a 3 metre length for a temperature change of 25°C. Therefore, a 3mm gap between each length of trunking base is recommended. Adequate allowance is made within the fittings for thermal movement of the covers, which have a 7mm overlap on each side.

#### Fitting

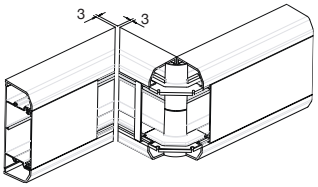
- The base is supplied with pre-cut elongated holes at 250mm centres.
- Internal couplers on base units are not required.
- To fasten base, use No 8 round head screws and washers.
- Avoid over-tightening to permit thermal movement.
- The use of plastic caps over screw heads is recommended to protect installed cables.
- To cut the trunking, use a fine-toothed panel or power jig-saw.
- External moulded fittings overlap the joints by up to 10mm to cover cutting inaccuracies.
- A variable angle jig-saw or chop saw is recommended for cutting 45 degree mitres.
- Mono Plus 20 and 30
  Cut the compartment segregators (x 2 provided) to lengths to fit between accessory boxes and corners. Fit into position after wiring has been completed.

#### Single lengths

Where it is required to fit a single length of trunking (under 3 metres) between two inside walls and no accessory box is fitted, it is advisable to install a coupler in the centre of the run to facilitate the removal of the cover.

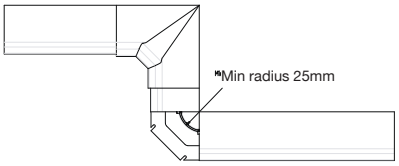
#### Joints and bends

- Base joints should have a 3mm gap to allow for expansion.
- External moulded fittings overlap the joints by up to 7mm to cover cutting inaccuracies.
- Mono 10
  For external bends and flat angles, the base must be mitred 45 degrees to ensure total enclosure of trunking, including any internal fitted segregator. Tees are fabricated.
- Mono Plus 20 and 30
  External bends should be cut square at the corner and in internal segregator inserted as shown below, to give additional retention to the clip-on fitting. Flat angles and tees are prefabricated.




#### Bend radius control

- Mono 10
  Not applicable
- Mono Plus 20 and 30
  The data bend radius control fittings for Mono Plus trunking provide a bend radius of 25mm.




#### Accessory boxes

- If the accessory box is to be fed from a supply in either of the outer compartments, remove the appropriate knock out (top or bottom) and clip the box into the trunking base.
- For boxes supplied from the main compartment, remove the appropriate box knock-outs and clip the box into trunking base.
- When boxes are installed consecutively, a 14mm wide spacer (ES1) is required to cover the space between the boxes.
- Part M box assemblies with contrasting coloured faceplates are available to meet the requirements of DDA regulations for Visual Impairment.

#### Covers

The cover has been designed to limit unauthorised removal and to remain in position during normal conditions, irrespective of impact and minor undulations of the mounting surface.

#### Covers – fitting

The cover is clipped into place from the front. If accessory boxes are installed, the cover is butt-joined to the edge of the box and the cut edges of the cover is subsequently concealed by the accessory. For fittings, a gap of 25mm is left between the two cover ends to permit the fitting to clip to the base.

#### Covers – removal

To remove the cover, first detach a coupler, internal or external bend component to gain access. The main cover can then be gently eased off the base.

#### Screening

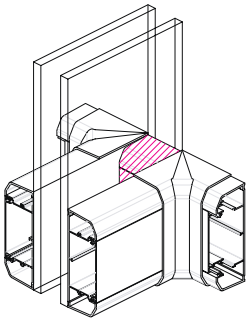
Refer to the Technical Team on +44 (0)1424 856688.

#### Antimicrobial

For technical details of antimicrobial Mono 10 and Mono Plus 20 Bio trunking, please refer to Laboratory and Healthcare section.

#### Method of continuation through a partition wall

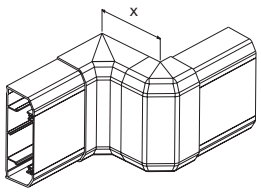
Continue the main lateral run of base through the partition wall with a short length of cover fitted where the trunking passes through the partition. The partition wall trunking is then butted up to the main run and the joint covered by an Internal bend. (as shown below)



## Mono and Mono Plus trunking – PVC-U – continued

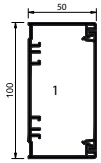
### Offset dimensions

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



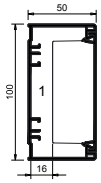

x =
100mm min (Mono 10)
105mm min (Mono Plus 20)
110mm min (Mono Plus 30)

## Dimensions



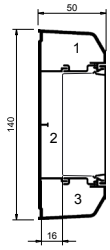

### Mono 10 trunking – no box

Compartment 1 total area = 4141mm²



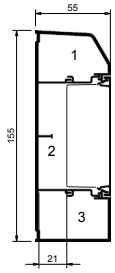

### Mono 10 trunking – with box

Compartment 1 total area =1874mm²




### Mono Plus 20 trunking – with box

Compartment 1 total area = 1024mm²
Compartment 2 total area = 1185mm²
Compartment 3 total area = 1024mm²




### Mono Plus 30 trunking – with box

Compartment 1 total area = 1450mm²
Compartment 2 total area = 1563mm²
Compartment 3 total area = 1646mm²

## Cable capacities

- All calculations allow for a 45% space factor.

As there can be differences between data cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.

| Cable capacity chart | Compartment 1 | | Compartment 2 | | Compartment 3 | |
|---|---|---|---|---|---|---|
| | No box | With box | No box | With box | No box | With box |
| **PVC power cable 1.5mm² stranded copper** | | | | | | |
| Mono 10 | 233 | 105 | – | – | – | – |
| Mono Plus 20 | 58 | – | 194 | 67 | 58 | – |
| Mono Plus 30 | 82 | – | 215 | 88 | 93 | – |
| **PVC power cable 2.5mm² stranded copper** | | | | | | |
| Mono 10 | 157 | 71 | – | – | – | – |
| Mono Plus 20 | 39 | – | 131 | 45 | 39 | – |
| Mono Plus 30 | 55 | – | 145 | 59 | 62 | – |
| **PVC power cable 4.0mm² stranded copper** | | | | | | |
| Mono 10 | 112 | 51 | – | – | – | – |
| Mono Plus 20 | 28 | – | 94 | 32 | 28 | – |
| Mono Plus 30 | 39 | – | 104 | 42 | 45 | – |
| **Data cable: Ø5.5mm** | | | | | | |
| Mono 10 | 78 | 35 | – | – | – | – |
| Mono Plus 20 | 19 | – | 65 | 22 | 19 | – |
| Mono Plus 30 | 27 | – | 72 | 30 | 31 | – |
| **Data cable: Ø6.0mm** | | | | | | |
| Mono 10 | 66 | 30 | – | – | – | – |
| Mono Plus 20 | 16 | – | 55 | 19 | 16 | – |
| Mono Plus 30 | 23 | – | 61 | 25 | 26 | – |
| **Data cable: Ø6.5mm** | | | | | | |
| Mono 10 | 58 | 26 | – | – | – | – |
| Mono Plus 20 | 14 | – | 48 | 17 | 14 | – |
| Mono Plus 30 | 20 | – | 54 | 22 | 23 | – |
| **Data cable: Ø7.0mm** | | | | | | |
| Mono 10 | 48 | 22 | – | – | – | – |
| Mono Plus 20 | 12 | – | 40 | 14 | 12 | – |
| Mono Plus 30 | 17 | – | 45 | 18 | 19 | – |
| **Data cable: Ø8.4mm** | | | | | | |
| Mono 10 | 34 | 15 | – | – | – | – |
| Mono Plus 20 | 8 | – | 28 | 10 | 8 | – |
| Mono Plus 30 | 12 | – | 31 | 13 | 13 | – |



p109 Product Information

## Odyssey trunking

### Material

Odyssey accessory boxes and fittings are flame retardant ABS which is 100% recyclable.

### Installation

#### Positioning

For dado, horizontal or vertical installation.

#### Expansion/contraction

PVC-U expands and contracts at a uniform rate of approx 5.25mm in a 3 metre length for a temperature change of 25°C. Therefore, a 3mm gap between each length of trunking base is recommended.

Adequate allowance is made within the fittings for thermal movement of the covers, which have a 10mm overlap on each side.

#### Fitting

- The base is supplied with pre-cut elongated holes at 250mm centres.
- Internal couplers on base units are not required.
- To fasten base, use No 8 round head screws and washers.
- Avoid over-tightening to permit thermal movement.
- The use of plastic caps over screw heads is recommended to protect installed cables.
- To cut the trunking, use a fine-toothed panel or power jig-saw.
- External moulded fittings overlap the joints by up to 10mm to cover cutting inaccuracies.
- A variable angle jig-saw or chop saw is recommended for cutting 45 degree mitres.

#### Single lengths

Where it is required to fit a single length of trunking (under 3 metres) between two inside walls and no accessory box is fitted, it is advisable to install a coupler in the centre of the run to facilitate the removal of the covers.

#### Joints and bends

All base joints should have a 3mm gap to allow for expansion.

- Internal bends: the two base sections should be cut square and butt joined at the corner. The internal end cap component should be fitted to the open end to maintain trunking integrity.
- External bends: the base must be cut square with the corner and the internal radius control segregator fitted into the two base sections. Adjustable bends: these allow 85° to 95° to accommodate building tolerances.
- Flat bends and tees: have moulded and segregated base units. These are fitted into position and the trunking base then cut to butt up to mouldings.

Cutting is not critical as the external moulded clip-on fittings cover the joints and overlap the trunking covers by 10mm each side, thus covering any inaccuracies.

#### Bend radius control

The bend radius control fittings for Odyssey provide a bend radius of 25mm, 50mm and 65mm.

#### Accessory boxes

Accessory boxes are mounted in the centre compartment. If supplied from either of the outer compartments, drill the main web adjacent to the box position. Remove the appropriate knock out and clip the box into the trunking base. For boxes in the same compartment as the supply, remove the appropriate box knock-outs and clip the box into trunking base.

- If boxes DD1510 and DD1520 are installed consecutively, a cut section of centre cover should be fitted between them.
- If DD1540 or DD1550 are installed, Adaptor DD1590 must be fitted either side to align with curved cover.
- If DD1540 or DD1550 are installed consecutively, use the spacer provided and at each end of a run use accessory adaptor DD1590 to align with curved cover.
- Part M coloured accessory boxes are available to meet the requirements of DDA regulations for Visual Impairment.

#### Covers

The covers have been designed to limit unauthorised removal and remain in position during normal conditions, irrespective of impact and minor undulations of the mounting surface.

#### Covers – fitting

Outer covers are fitted first. Locate front clip feature into the base and then roll the cover to the back of the trunking until the rear clip feature positively locates – it is possible to hear the click when this is located correctly. The centre cover is then clipped into place from the front. If accessory boxes are installed, the centre cover is butt joined beneath the moulded flange of the box (Odyssey box DD1510/ DD1520) or adaptor (DD1590). The cut edges of lids are then concealed.
A gap of 15mm should be left between cover joints to permit fittings to clip to the base.

#### Covers – removal

To remove a cover, first detach a coupler, internal or external bend component to gain access. The main cover can then be gently eased off the base. To remove the outer cover, firstly ease from the base by inserting the blade of a terminal screwdriver between the captive legs of the cover and the base and then peel off.

#### Screening

Special conductive spray coating can be applied to one compartment, the cover, accessory boxes and fittings, to screen data cables against EMI interference.

- For data/voice circuits only:
  Warning: Owing to its relatively high surface resistance, CS coating SHOULD NOT be in contact with low voltage circuits BS 7671:2008 50 V.A.C. – 1000 V.A.C. unless additional measures are undertaken.

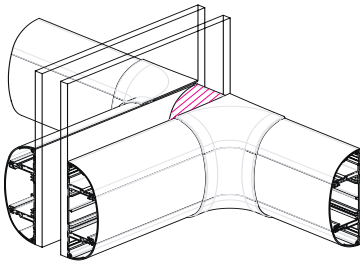
#### Antimicrobial

For technical details of antimicrobial Odyssey Bio trunking, please refer to Laboratory and Healthcare section.

## Odyssey trunking – continued

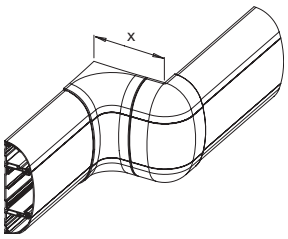
### Method of continuation through a partition wall

Continue the main lateral run of base through the partition wall with short lengths of cover fitted where the trunking passes through the partition. The partition wall trunking is then butted up to the main run and the joint covered by an Internal bend. (as shown below)



### Offset dimensions

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




x =
Fixed bend offset 138mm
Adjustable bend offset 165mm
Adjustable external bend, fixed internal bend offset 163mm
Adjustable internal bend, fixed external bend offset 140mm

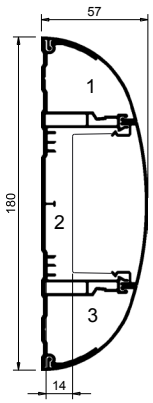
## Cable capacities

- All calculations allow for a 45% space factor.

As there can be differences between data cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.

| Cable capacity chart | Compartment 1 | | Compartment 2 | | Compartment 3 | |
|---|---|---|---|---|---|---|
| | No box | With box | No box | With box | No box | With box |
| PVC power cable 1.5mm² stranded copper | 71 | – | 226 | 69 | 71 | – |
| PVC power cable 2.5mm² stranded copper | 47 | – | 152 | 47 | 47 | – |
| PVC power cable 4.0mm² stranded copper | 34 | – | 109 | 33 | 34 | – |
| Data cable: Ø5.5mm | 24 | – | 76 | 23 | 24 | – |
| Data cable: Ø6.0mm | 20 | – | 64 | 20 | 20 | – |
| Data cable: Ø6.5mm | 18 | – | 56 | 17 | 18 | – |
| Data cable: Ø7.0mm | 15 | – | 47 | 14 | 15 | – |
| Data cable: Ø8.4mm | 10 | – | 33 | 10 | 10 | – |

## Dimensions




### Odyssey trunking – with box

Compartment 1 & 3 total area = 1278mm²
Compartment 2 total area = 859mm²

### Odyssey trunking – no box

Compartment 2 total area = 3972mm²



p106 Product Information

## Series R trunking

### Material

PVC-U is flame retardant and self-extinguishing. It provides a 100% recyclable material with good sustainability.

### Installation

#### Positioning

Series R is suitable for dado.

#### Expansion/contraction

PVC-U expands and contracts at a uniform rate of approx 5.25mm in a 3 metre length for a temperature change of 25°C. Therefore, a 3mm gap between each length of trunking base is recommended.

Adequate allowance is made within the fittings for thermal movement of the covers, which have a 10mm overlap on each side.

#### Fitting

- The base is supplied with pre-cut elongated holes at 250mm centres.
- Internal couplers on base units are not required.
- To fasten base, use No 8 round head screws and washers.
- Avoid over-tightening to permit thermal movement.
- The use of plastic caps over screw heads is recommended to protect installed cables.
- To cut the trunking, use a fine-toothed panel or power jig-saw.
- External moulded fittings overlap the joints by up to 10mm to cover cutting inaccuracies.
- A variable angle jig-saw or chop saw is recommended for cutting 45 degree mitres.

#### Single lengths

Where it is required to fit a single length of trunking (under 3 metres) between two inside walls and no accessory box is fitted, it is advisable to install a coupler in the centre of the run to facilitate the removal of the cover.

#### Joints and bends

All base joints should have a 3mm gap to allow for expansion.

- Internal bends and external bends: trunking body must be mitred at 45° to ensure total enclosure of trunking, including any internal fitted segregator.
- Flat angles and tees: are prefabricated. Trunking bases should be cut to butt up to fittings.

Cutting is not critical as the external moulded clip-on fittings cover the joints and overlap the trunking covers by 10mm each side, thus covering any inaccuracies.

#### Bend radius control

Please contact the Technical Team on +44 (0)1424 856688

#### Accessory boxes

All accessory boxes are mounted in the main, centre compartment. The appropriate knockout removal depends whether supply is to be run in the centre compartment or either/both of the outer segregated compartments. When knockouts are removed, clip the box into the trunking body. When boxes are installed consecutively, a short cut length of centre cover (14mm min.) is required to cover the space between boxes.

#### Covers

The cover has been designed to remain in position irrespective of impact during normal conditions, minor undulations of the mounting surface, and to limit unauthorised removal.

#### Covers – fitting

The single cover is clipped into place from the front. If accessory boxes are installed, the covers are butt-joined to the edge of the box (RSSB1/2). The cut edges the cover are subsequently concealed by the accessory.

#### Covers – removal

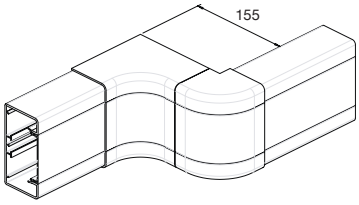
To remove the cover, first detach a coupler, internal or external bend component to gain access. The cover can then be gently eased off the base.

#### Method of continuation through a partition wall

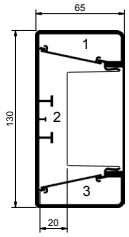
- Continue the main lateral run of base through the partition wall with short lengths of cover fitted where the trunking passes through the partition. The partition wall trunking is then butted up to the main run and the joint covered by an Internal bend.

#### Offset dimensions

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

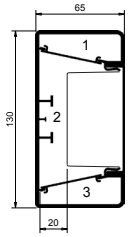


## Series R – continued




### Series R 130 – with box and segregators

Compartment 1 & 3 total area = 957mm$^2$
Compartment 2 total area = 2210mm$^2$
Compartment 2 (45% space factor) = 995mm$^2$




### Series R 130 – with box, no segregators

Compartment total area = 4272mm$^2$
Compartment (45% space factor) = 1992mm$^2$

## Cable capacities

- All calculations allow for a 45% space factor.

As there can be differences between data cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.

| Cable capacity chart | Compartment 1 | | Compartment 2 | | Compartment 3 | |
|---|---|---|---|---|---|---|
| | No box | With box | No box | With box | No box | With box |
| **PVC power cable 1.5mm² stranded copper** | | | | | | |
| Series R 130 | 89 | – | – | 40 | 89 | – |
| **PVC power cable 2.5mm² stranded copper** | | | | | | |
| Series R 130 | 60 | – | – | 27 | 60 | – |
| **PVC power cable 4.0mm² stranded copper** | | | | | | |
| Series R 130 | 43 | – | – | 19 | 43 | – |
| **Data cable: Ø5.5mm** | | | | | | |
| Series R 130 | 30 | – | – | 13 | 30 | – |
| **Data cable: Ø6.0mm** | | | | | | |
| Series R 130 | 25 | – | – | 11 | 25 | – |
| **Data cable: Ø6.5mm** | | | | | | |
| Series R 130 | 22 | – | – | 10 | 22 | – |
| **Data cable: Ø7.0mm** | | | | | | |
| Series R 130 | 19 | – | – | 8 | 19 | – |
| **Data cable: Ø8.4mm** | | | | | | |
| Series R 130 | 13 | – | – | 6 | 13 | – |



p154 Product Information

## Sterling Profile trunking

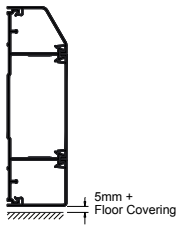
### Material

PVC-U is flame retardant and self-extinguishing. It provides a 100% recyclable material with good sustainability.

### Installation

#### Positioning

When used as a skirting system, sufficient clearance should be allowed between the floor covering and the profile fittings that clip over the cover i.e. 5mm + floor covering is recommended.




#### Expansion/contraction

PVC-U expands and contracts at a uniform rate of approx 5.25mm in a 3 metre length for a temperature change of 25°C. Therefore, a 3mm gap between each length of trunking base is recommended. Fittings have a 10mm overlap on each side to allow for thermal movement of the covers.

#### Fitting

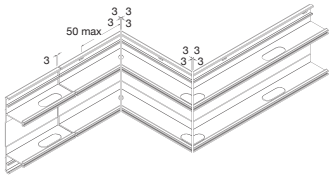
- The base is supplied with pre-cut elongated holes at 250mm centres.
- Internal couplers on base units are not required.
- To fasten base, use No 8 round head screws and washers.
- Avoid over-tightening to permit thermal movement.
- The use of plastic caps over screw heads is recommended to protect installed cables.
- To cut the trunking, use a fine-toothed panel or power jig-saw.
- External moulded fittings overlap the joints by up to 10mm to cover cutting inaccuracies.
- A variable angle jig-saw or chop saw is recommended for cutting 45° mitres.
- To increase number of compartments to any number required, use base extension EBE1WH and extendable base EEB1.

#### Single lengths

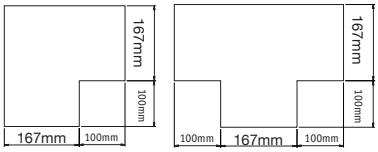
Where it is required to fit a single length of trunking (under 3 metres) between two inside walls and no accessory box is fitted, it is advisable to install a coupler in the centre of the run to facilitate the removal of the cover.

#### Joints and bends

- Base joints should have a 3mm gap to allow for expansion.
- Internal, external bends and flat angles, the base must be mitred 45° to ensure total enclosure of trunking, including any internal fitted segregator.
- Flat angles, tees and crossovers are available prefabricated.
- External moulded fittings overlap the joints by up to 10mm to cover cutting inaccuracies.




#### Template dimensions for Flat angle and Tee

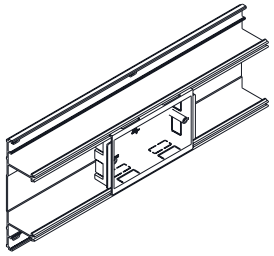



#### Bend radius control

The data internal and external bend radius control fittings for Sterling Profile trunking provide a bend radius of 50mm.

#### Accessory boxes

- For mounting an accessory box in the alternative compartment to supply. Fit the box and remove the closest knockout in the main web.
- Remove the appropriate knock out and clip the box into the trunking base.
- For boxes in the same compartment as the supply, remove the appropriate box knock-outs and clip the box into trunking base.
- When boxes are installed consecutively, a 14mm wide spacer (ES1) is required to cover the space between the boxes.
- Part M box assemblies with contrasting coloured faceplates are available to meet the requirements of DDA regulations for Visual Impairment.



#### Covers

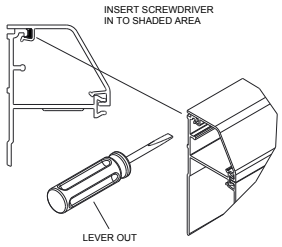
Covers are designed to limit unauthorised removal and to remain in position during normal conditions irrespective of impact and minor undulations of the mounting surface.

#### Covers – fitting

Covers are clipped into place from front. If accessory boxes are installed, the ETL1 cover is butt-joined to the edge of the box. Cut edges of the cover are subsequently concealed by the accessory. For fittings, a gap of 25mm is left between the two cover ends to permit the fitting to clip to base.

#### Covers – removal

To remove a cover, first detach a coupler, internal or external bend component to gain access. The main cover can then be gently eased off the base. To remove the outer cover, firstly ease from the base by inserting the blade of a terminal screwdriver between the captive legs of the cover and the base and then ease away from the base.




#### Screening

Special conductive spray coating can be applied to one compartment, the cover, accessory boxes and fittings, to screen data cables against EMI interference.

- For data/voice circuits only: Warning: Owing to its relatively high surface resistance, CS coating SHOULD NOT be in contact with low voltage circuits BS 7671:2008 50 V.A.C. – 1000 V.A.C. unless additional measures are undertaken.

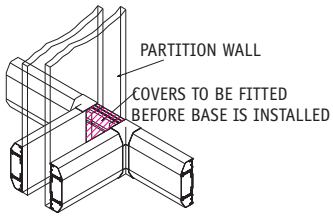
#### Antimicrobial

For technical details of antimicrobial Sterling Profile Bio trunking, please refer to Laboratory and Healthcare section on page 34.

## Sterling Profile trunking – continued

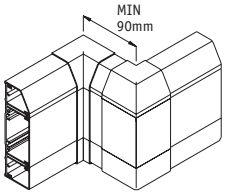
### Method of continuation through a partition wall

- Continue the main lateral run of base through the partition wall.
- Fit short lengths of cover where the trunking passes through the partition.
- The partition wall trunking is then butted up to the main run and the joint covered by an internal bend fitting.

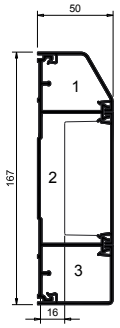



### Offset dimensions

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

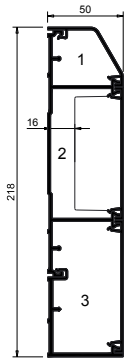



## Dimensions



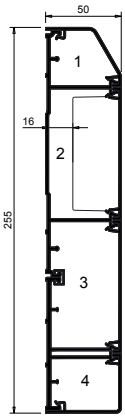

**Sterling Profile 2 no box**
1 = 1266mm² total area
1 = 570mm² 45% space factor
2 = 3858mm² total area
2 = 1736mm² 45% space factor
3 = 1542mm² total area
3 = 694mm² 45% space factor

**With box in comp 2**
2 = 1376mm² total area
2 = 619mm² 45% space factor



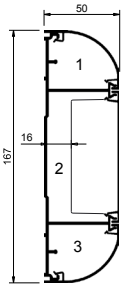

**Sterling Profile 4 no box**
1 = 1266mm² total area
1 = 570mm² 45% space factor
2 = 3858mm² total area
2 = 1736mm² 45% space factor
3 = 3716mm² total area
3 = 1672mm² 45% space factor

**With box in comp 2 or 3**
2 = 1376mm² total area
2 = 619mm² 45% space factor
3 = 1234mm² total area
3 = 555mm² 45% space factor



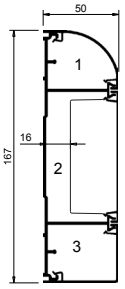

**Sterling Profile 12 no box**
1 = 1266mm² total area
1 = 570mm² 45% space factor
2 = 3858mm² total area
2 = 1736mm² 45% space factor
3 = 3566mm² total area
3 = 1605mm² 45% space factor
4 = 1430mm² total area
4 = 644mm² 45% space factor

**With box in comp 2 or 3**
2 = 1376mm² total area
2 = 619mm² 45% space factor
3 = 1084mm² total area
3 = 488mm² 45% space factor




**Sterling Curve Profile 1 – no box**
1 & 3 = 1170mm² total area
1 & 3 = 527mm² 45% space factor
2 = 3858mm² total area
2 = 1736mm² 45% space factor

**With box in comp 2**
2 = 1376mm² total area
2 = 619mm² 45% total area




**Sterling Curve Profile 2 – no box**
1 = 1170mm² total area
1 = 527mm² 45% space factor
2 = 3858mm² total area
2 = 1736mm² 45% space factor
3 = 1542mm² total area
3 = 694mm² 45% space factor

**With box in comp 2**
2 = 1376mm² total area
2 = 619mm² 45% space factor

**Other Sterling Profile dimensions**

Other Sterling Profiles are a combination of the ones shown on this page and can be calculated using the compartment dimensions shown here.

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## Sterling Profile

### Cable capacities

- All calculations allow for a 45% space factor.

As there can be differences between cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.

| Cable capacity chart | Compartment 1 | | Compartment 2 | | Compartment 3 | | Compartment 4 |
|---|---|---|---|---|---|---|---|
| | No box | With box | No box | With box | No box | With box | No box |
| **PVC power cable 1.5mm² stranded copper** | | | | | | | |
| Sterling Profile 1 | 71 | - | 217 | 77 | 71 | - | - |
| Sterling Profile 2 | 71 | - | 217 | 77 | 87 | - | - |
| Sterling Profile 3 | 87 | - | 217 | 77 | 87 | - | - |
| Sterling Curve Profile 1 | 66 | - | 217 | 77 | 66 | - | - |
| Sterling Curve Profile 2 | 66 | - | 217 | 77 | 87 | - | - |
| Sterling Profile 4 | 71 | - | 217 | 77 | 209 | 69 | - |
| Sterling Profile 5 | 87 | - | 217 | 77 | 209 | 69 | - |
| Sterling Profile 6 | 209 | 69 | 217 | 77 | 209 | 69 | - |
| Sterling Profile 11 | 71 | - | 217 | 77 | 201 | 61 | 71 |
| Sterling Profile 12 | 71 | - | 217 | 77 | 201 | 61 | 80 |
| Sterling Profile 13 | 80 | - | 217 | 77 | 201 | 61 | 80 |
| **PVC power cable 2.5mm² stranded copper** | | | | | | | |
| Sterling Profile 1 | 48 | - | 146 | 52 | 48 | - | - |
| Sterling Profile 2 | 48 | - | 146 | 52 | 58 | - | - |
| Sterling Profile 3 | 58 | - | 146 | 52 | 58 | - | - |
| Sterling Curve Profile 1 | 44 | - | 146 | 52 | 44 | - | - |
| Sterling Curve Profile 2 | 44 | - | 146 | 52 | 58 | - | - |
| Sterling Profile 4 | 48 | - | 146 | 52 | 141 | 47 | - |
| Sterling Profile 5 | 58 | - | 146 | 52 | 141 | 47 | - |
| Sterling Profile 6 | 141 | 47 | 146 | 52 | 141 | 47 | - |
| Sterling Profile 11 | 48 | - | 146 | 52 | 135 | 41 | 48 |
| Sterling Profile 12 | 48 | - | 146 | 52 | 135 | 41 | 54 |
| Sterling Profile 13 | 54 | - | 146 | 52 | 135 | 41 | 54 |
| **PVC power cable 4.0mm² stranded copper** | | | | | | | |
| Sterling Profile 1 | 34 | - | 105 | 37 | 34 | - | - |
| Sterling Profile 2 | 34 | - | 105 | 37 | 42 | - | - |
| Sterling Profile 3 | 42 | - | 105 | 37 | 42 | - | - |
| Sterling Curve Profile 1 | 32 | - | 105 | 37 | 32 | - | - |
| Sterling Curve Profile 2 | 32 | - | 105 | 37 | 42 | - | - |
| Sterling Profile 4 | 34 | - | 105 | 37 | 101 | 33 | - |
| Sterling Profile 5 | 42 | - | 105 | 37 | 101 | 33 | - |
| Sterling Profile 6 | 101 | 33 | 105 | 37 | 101 | 33 | - |
| Sterling Profile 11 | 34 | - | 105 | 37 | 97 | 29 | 34 |
| Sterling Profile 12 | 34 | - | 105 | 37 | 97 | 29 | 39 |
| Sterling Profile 13 | 39 | - | 105 | 37 | 97 | 29 | 39 |
| **Data cable: Ø5.5mm²** | | | | | | | |
| Sterling Profile 1 | 24 | - | 73 | 26 | 24 | - | - |
| Sterling Profile 2 | 24 | - | 73 | 26 | 29 | - | - |
| Sterling Profile 3 | 29 | - | 73 | 26 | 29 | - | - |
| Sterling Curve Profile 1 | 22 | - | 73 | 26 | 22 | - | - |
| Sterling Curve Profile 2 | 22 | - | 73 | 26 | 29 | - | - |
| Sterling Profile 4 | 24 | - | 73 | 26 | 70 | 23 | - |
| Sterling Profile 5 | 29 | - | 73 | 26 | 70 | 23 | - |
| Sterling Profile 6 | 70 | 23 | 73 | 26 | 70 | 23 | - |
| Sterling Profile 11 | 24 | - | 73 | 26 | 67 | 20 | 24 |
| Sterling Profile 12 | 24 | - | 73 | 26 | 67 | 20 | 27 |
| Sterling Profile 13 | 27 | - | 73 | 26 | 67 | 20 | 27 |

| Cable capacity chart | Compartment 1 | | Compartment 2 | | Compartment 3 | | Compartment 4 |
|---|---|---|---|---|---|---|---|
| | No box | With box | No box | With box | No box | With box | No box |
| **Data cable: Ø6.0mm²** | | | | | | | |
| Sterling Profile 1 | 20 | - | 61 | 22 | 20 | - | - |
| Sterling Profile 2 | 20 | - | 61 | 22 | 25 | - | - |
| Sterling Profile 3 | 25 | - | 61 | 22 | 25 | - | - |
| Sterling Curve Profile 1 | 19 | - | 61 | 22 | 19 | - | - |
| Sterling Curve Profile 2 | 19 | - | 61 | 22 | 25 | - | - |
| Sterling Profile 4 | 20 | - | 61 | 22 | 59 | 20 | - |
| Sterling Profile 5 | 25 | - | 61 | 22 | 59 | 20 | - |
| Sterling Profile 6 | 59 | 20 | 61 | 22 | 59 | 20 | - |
| Sterling Profile 11 | 20 | - | 61 | 22 | 57 | 17 | 20 |
| Sterling Profile 12 | 20 | - | 61 | 22 | 57 | 17 | 23 |
| Sterling Profile 13 | 23 | - | 61 | 22 | 57 | 17 | 23 |
| **Data cable: Ø6.5mm²** | | | | | | | |
| Sterling Profile 1 | 18 | - | 54 | 19 | 18 | - | - |
| Sterling Profile 2 | 18 | - | 54 | 19 | 22 | - | - |
| Sterling Profile 3 | 22 | - | 54 | 19 | 22 | - | - |
| Sterling Curve Profile 1 | 16 | - | 54 | 19 | 16 | - | - |
| Sterling Curve Profile 2 | 16 | - | 54 | 19 | 22 | - | - |
| Sterling Profile 4 | 18 | - | 54 | 19 | 52 | 17 | - |
| Sterling Profile 5 | 22 | - | 54 | 19 | 52 | 17 | - |
| Sterling Profile 6 | 52 | 17 | 54 | 19 | 52 | 17 | - |
| Sterling Profile 11 | 18 | - | 54 | 19 | 50 | 15 | 18 |
| Sterling Profile 12 | 18 | - | 54 | 19 | 50 | 15 | 20 |
| Sterling Profile 13 | 20 | - | 54 | 19 | 50 | 15 | 20 |
| **Data cable: Ø7.0mm²** | | | | | | | |
| Sterling Profile 1 | 15 | - | 45 | 16 | 15 | - | - |
| Sterling Profile 2 | 15 | - | 45 | 16 | 18 | - | - |
| Sterling Profile 3 | 18 | - | 45 | 16 | 18 | - | - |
| Sterling Curve Profile 1 | 14 | - | 45 | 16 | 14 | - | - |
| Sterling Curve Profile 2 | 14 | - | 45 | 16 | 18 | - | - |
| Sterling Profile 4 | 15 | - | 45 | 16 | 43 | 14 | - |
| Sterling Profile 5 | 18 | - | 45 | 16 | 43 | 14 | - |
| Sterling Profile 6 | 43 | 14 | 45 | 16 | 43 | 14 | - |
| Sterling Profile 11 | 15 | - | 45 | 16 | 42 | 13 | 15 |
| Sterling Profile 12 | 15 | - | 45 | 16 | 42 | 13 | 17 |
| Sterling Profile 13 | 17 | - | 45 | 16 | 42 | 13 | 17 |
| **Data cable: Ø8.4mm²** | | | | | | | |
| Sterling Profile 1 | 10 | - | 31 | 11 | 10 | - | - |
| Sterling Profile 2 | 10 | - | 31 | 11 | 13 | - | - |
| Sterling Profile 3 | 13 | - | 31 | 11 | 13 | - | - |
| Sterling Curve Profile 1 | 10 | - | 31 | 11 | 10 | - | - |
| Sterling Curve Profile 2 | 10 | - | 31 | 11 | 13 | - | - |
| Sterling Profile 4 | 10 | - | 31 | 11 | 30 | 10 | - |
| Sterling Profile 5 | 13 | - | 31 | 11 | 30 | 10 | - |
| Sterling Profile 6 | 30 | 10 | 31 | 11 | 30 | 10 | - |
| Sterling Profile 11 | 10 | - | 31 | 11 | 29 | 9 | 10 |
| Sterling Profile 12 | 10 | - | 31 | 11 | 29 | 9 | 12 |
| Sterling Profile 13 | 12 | - | 31 | 11 | 29 | 9 | 12 |

## Twin165 trunking

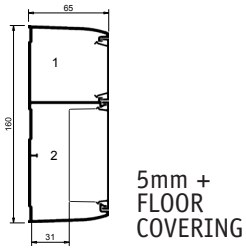
### Material

PVC-U is flame retardant and self-extinguishing. It provides a 100% recyclable material with good sustainability.

### Installation

#### Positioning

When used as a skirting system, sufficient clearance should be allowed between the floor covering and the profile fittings that clip over the cover i.e. 5mm + floor covering is recommended.




#### Expansion/contraction

PVC-U expands and contracts at a uniform rate of approx 5.25mm in a 3 metre length for a temperature change of 25°C. Therefore, a 3mm gap between each length of trunking base is recommended.

Adequate allowance is made within the fittings for thermal movement of the covers, which have a 7mm overlap on each side.

#### Fitting

- The base is supplied with pre-cut elongated holes at 250mm centres.
- Internal couplers on base units are not required.
- To fasten base, use No 8 round head screws and washers.
- Avoid over-tightening to permit thermal movement.
- The use of plastic caps over screw heads is recommended to protect installed cables.
- To cut the trunking, use a fine-toothed panel or power jig-saw.
- External moulded fittings overlap the joints by up to 10mm to cover cutting inaccuracies.
- A variable angle jig-saw or chop saw is recommended for cutting 45° mitres.

#### Single lengths

Where it is required to fit a single length of trunking (under 3 metres) between two inside walls and no accessory box is fitted, it is advisable to install a coupler in the centre of the run to facilitate the removal of the cover.

#### Joints and bends

- Base joints should have a 3mm gap to allow for expansion.
- Internal and external bends: Base should be cut square to bend base component.
- Flat angles and tees are pre-fabricated.
- External moulded fittings overlap the joints by up to 7mm to cover cutting inaccuracies.
- End caps to be screw fixed to base.

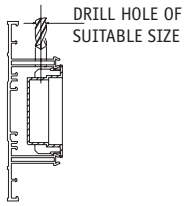
#### Bend radius control

The bend radius control fittings for Twin165 provide a bend radius of 50mm

#### Accessory boxes

The accessory box is mounted in the larger compartment (compartment 2). If supply is from the smaller compartment, drill the main web adjacent to the box position. Remove the appropriate knock out and clip the box into the trunking base. For boxes supplied from the main compartment, remove the appropriate box knock-outs and clip the box into trunking base. When boxes are installed consecutively, a 14mm wide spacer (ES1) is required to cover the space between the boxes.

- Part M box assemblies with contrasting coloured faceplates are available to meet the requirements of DDA regulations for Visual Impairment.




#### Covers

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.

#### Covers – fitting

Covers are clipped into place from the front. If accessory boxes are installed, the covers are butt-joined to the edge of the box. For the fitting of couplers, a gap of 25mm is left between the two cover ends.

#### Covers – removal

To remove a cover, first detach a coupler, internal or external bend component to gain access. Both covers can then be gently eased off the base.

#### Screening

Special conductive spray coating can be applied to one compartment, the cover, accessory boxes and fittings, to screen data cables against EMI interference.

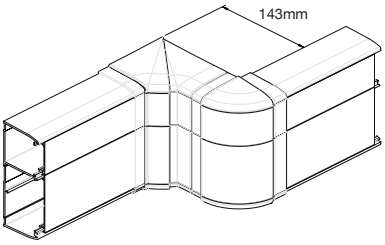
- For data/voice circuits only: Warning: Owing to its relatively high surface resistance, CS coating SHOULD NOT be in contact with low voltage circuits BS 7671 (2008) 50 V.A.C. – 1000 V.A.C. unless additional measures are undertaken.
- Part M box assemblies with contrasting coloured faceplates are available to meet the requirements of DDA regulations for Visual Impairment.

#### Antimicrobial

For technical details of antimicrobial Twin165 Bio trunking, please refer to Laboratory and Healthcare section

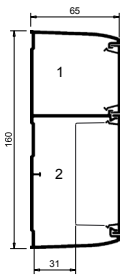
#### Offset dimensions

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



## Twin165 – continued

### Dimensions




**Twin165 trunking – no accessory box**

Compartment 1 = 3272mm² total area
Compartment 1 = 1472mm² 45% space factor
Compartment 2 = 5404mm² total area
Compartment 2 = 2431mm² 45% space factor

**Twin165 trunking – with accessory box**

Compartment 1 = 3272mm² total area
Compartment 1 = 1472mm² 45% space factor
Compartment 2 = 3100mm² total area
Compartment 2 = 1395mm² 45% space factor

### Cable capacities

- All calculations allow for a 45% space factor.

As there can be differences between data cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.

| Cable capacity chart | Compartment 1 | | Compartment 2 | |
|---|---|---|---|---|
| | No box | With box | No box | With box |
| PVC power cable 1.5mm² stranded copper | 184 | – | 304 | 174 |
| PVC power cable 2.5mm² stranded copper | 124 | – | 204 | 117 |
| PVC power cable 4.0mm² stranded copper | 89 | – | 146 | 84 |
| Data cable: Ø5.5mm | 62 | – | 102 | 59 |
| Data cable: Ø6.0mm | 52 | – | 86 | 49 |
| Data cable: Ø6.5mm | 46 | – | 76 | 43 |
| Data cable: Ø7.0mm | 38 | – | 63 | 36 |
| Data cable: Ø8.4mm | 27 | – | 44 | 25 |



p149 Product Information

## Twin Plus trunking

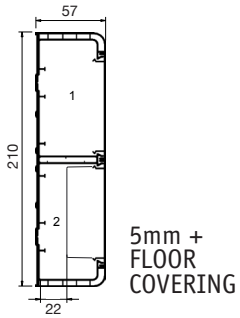
### Material

PVC-U is flame retardant and self-extinguishing. It provides a 100% recyclable material with good sustainability.

### Installation

#### Positioning

When used as a skirting system, sufficient clearance should be allowed between the floor covering and the profile fittings that clip over the cover i.e. 5mm + floor covering is recommended.




#### Expansion/contraction

PVC-U expands and contracts at a uniform rate of approx 5.25mm in a 3 metre length for a temperature change of 25°C. Therefore, a 3mm gap between each length of trunking base is recommended.

Adequate allowance is made within the fittings for thermal movement of the covers, which have a 10mm overlap on each side.

#### Fitting

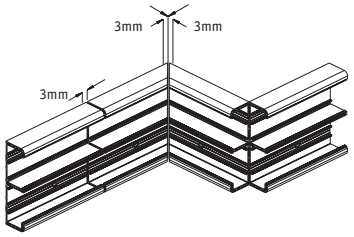
- The base is supplied with pre-cut elongated holes at 250mm centres.
- Internal couplers on base units are not required.
- To fasten base, use No 8 round head screws and washers.
- Avoid over-tightening to permit thermal movement.
- The use of plastic caps over screw heads is recommended to protect installed cables.
- To cut the trunking, use a fine-toothed panel or power jig-saw.
- External moulded fittings overlap the joints by up to 10mm to cover cutting inaccuracies.
- A variable angle jig-saw or chop saw is recommended for cutting 45° mitres.

#### Single lengths

Where it is required to fit a single length of trunking (under 3 metres) between two inside walls and no accessory box is fitted, it is advisable to install a coupler in the centre of the run to facilitate the removal of the cover.

#### Joints and bends

- Base joints should have a 3mm gap to allow for expansion.
- External bends: base should be cut square.
- Internal bends and flat angles, the base must be mitred 45° to ensure total enclosure of trunking, including any internal fitted segregator.
- Tees and crossovers are available prefabricated.
- External moulded fittings overlap the joints by up to 7mm to cover cutting inaccuracies.




#### Bend radius control

The bend radius control fittings for Twin Plus provide a bend radius of 50mm

#### Accessory boxes

If the accessory box is to be mounted in the alternative compartment to the supply, drill the main web adjacent to the box position. Remove the appropriate knock out and clip the box into the trunking base. For boxes in the same compartment as the supply, remove the appropriate box knock-outs and clip the box into trunking base. When boxes are installed consecutively, a 14mm wide spacer (ES1) is required to cover the space between the boxes.

- Part M box assemblies with contrasting coloured faceplates are available to meet the requirements of DDA regulations for Visual Impairment.

#### Covers

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.

#### Covers – fitting

Covers are clipped into place from the front. If accessory boxes are installed, the covers are butt-joined to the edge of the box. For the fitting of couplers to conceal the cover joint, a gap of 30mm is left between the two cover ends.

#### Covers – removal

To remove a cover, first detach a coupler, internal or external bend component to gain access. Both covers can then be gently eased off the base.

#### Screening

Special conductive spray coating can be applied to one compartment, the cover, accessory boxes and fittings, to screen data cables against EMI interference.

- For data/voice circuits only:
  Warning: Owing to its relatively high surface resistance, CS coating SHOULD NOT be in contact with low voltage circuits BS 7671:2008 50 V.A.C. – 1000 V.A.C. unless additional measures are undertaken.

#### Antimicrobial

For technical details of antimicrobial Twin Plus Bio trunking, please refer to Laboratory and Healthcare section.

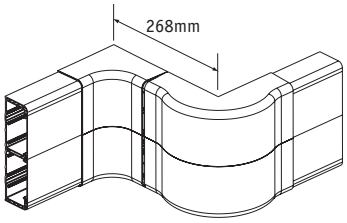
#### Method of continuation through a partition wall

Continue the main lateral run of base through the partition wall with short lengths of cover fitted where the trunking passes through the partition. The partition wall trunking is then butted up to the main run and the joint covered by an Internal bend.

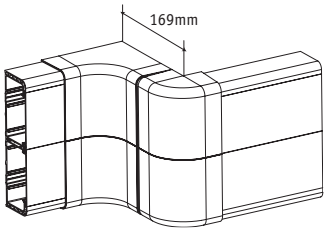
#### Offset dimensions

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

Large data capacity bend



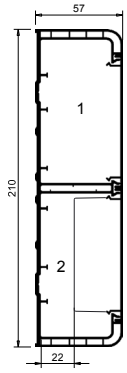

Standard bend




TECHNICAL INFORMATION

## Twin Plus trunking – continued

### Dimensions




**Twin Plus trunking – with accessory box**

1 = 2431mm² total area
1 = 1094mm² 45% space factor
2 = 2431mm² total area
2 = 1094mm² 45% space factor

**Twin Plus trunking – no accessory box**

1 = 4755mm² total area
1 = 2139mm² 45% space factor
2 = 4755mm² total area
2 = 2139mm² 45% space factor

### Cable capacities

- All calculations allow for a 45% space factor.

As there can be differences between data cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.

| Cable capacity chart | Compartment 1 | | Compartment 2 | |
|---|---|---|---|---|
| | No box | With box | No box | With box |
| PVC power cable 1.5mm² stranded copper | 267 | 137 | 267 | 137 |
| PVC power cable 2.5mm² stranded copper | 180 | 92 | 180 | 92 |
| PVC power cable 4.0mm² stranded copper | 129 | 66 | 129 | 66 |
| Data cable: Ø5.5mm | 90 | 46 | 90 | 46 |
| Data cable: Ø6.0mm | 76 | 39 | 76 | 39 |
| Data cable: Ø6.5mm | 66 | 34 | 66 | 34 |
| Data cable: Ø7.0mm | 56 | 28 | 56 | 28 |
| Data cable: Ø8.4mm | 39 | 20 | 39 | 20 |



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## XL trunking

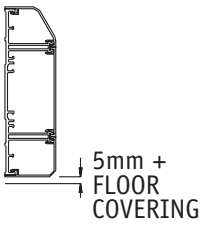
### Material

PVC-U is flame retardant and self-extinguishing. It provides a 100% recyclable material with good sustainability.

### Installation

#### Positioning

When used as a skirting system, sufficient clearance should be allowed between the floor covering and the profile fittings that clip over the cover i.e. 5mm + floor covering is recommended.




#### Expansion/contraction

PVC-U expands and contracts at a uniform rate of approx 5.25mm in a 3 metre length for a temperature change of 25°C. Therefore, a 3mm gap between each length of trunking base is recommended.

Adequate allowance is made within the fittings for thermal movement of the covers, which have a 10mm overlap on each side.

#### Fitting

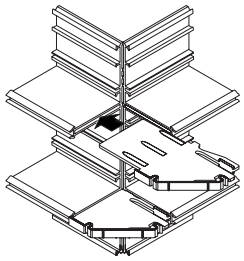
- The base is supplied with pre-cut elongated holes at 250mm centres.
- Internal couplers on base units are not required.
- To fasten base, use No 8 round head screws and washers.
- Avoid over-tightening to permit thermal movement.
- The use of plastic caps over screw heads is recommended to protect installed cables.
- To cut the trunking, use a fine-toothed panel or power jig-saw.
- External moulded fittings overlap the joints by up to 10mm to cover cutting inaccuracies.
- A variable angle jig-saw or chop saw is recommended for cutting 45° mitres.

#### Single lengths

Where it is required to fit a single length of trunking (under 3 metres) between two inside walls and no accessory box is fitted, it is advisable to install a coupler in the centre of the run to facilitate the removal of the cover.

#### Joints and bend

- Base joints should have a 3mm gap to allow for expansion.
- External bends: base should be cut square and segregators inserted as shown in drawing below.



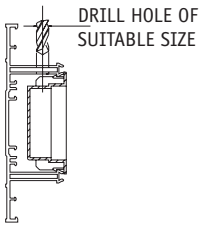
- Internal bends and flat angles, the base must be mitred 45° to ensure total enclosure of trunking, including any internal fitted segregator.
- Tees and crossovers are available prefabricated.
- External moulded fittings overlap the joints by up to 7mm to cover cutting inaccuracies.

#### Bend radius control

For data bend radius control fittings for XL, please contact the Technical Team on +44 (0)1424 856688.

#### Accessory boxes

- If accessory box main compartment is supplied from an outer compartment, drill the main web adjacent to the box position.
- Remove the appropriate knock out and clip the box into the trunking base.
- For boxes in the same compartment as the supply, remove the appropriate box knock-outs and clip the box into trunking base.
- When boxes are installed consecutively, a 14mm wide spacer (ES1) is required to cover the space between the boxes.
- Part M box assemblies with contrasting coloured faceplates are available to meet the requirements of DDA regulations for Visual Impairment.




#### Covers

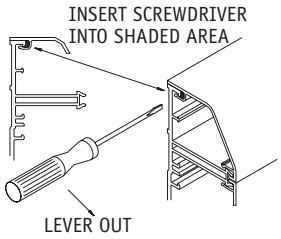
The covers have been designed to remain in position irrespective of impact during normal conditions, minor undulations of the mounting surface, and to limit unauthorised removal.

#### Covers – fitting

Covers are clipped into place from the front. If accessory boxes are installed, the covers are butt-joined to the edge of the box (ESSB1 and 2 only) and the cut edges of lids are subsequently concealed by the accessory. For fittings, a gap of 30mm is left between the two cover ends to permit the fitting to clip to the base.

#### Covers – removal

To remove a cover, first detach a coupler, internal or external bend component to gain access. The main cover can then be gently eased off the base. To remove the outer cover, firstly ease from the base by inserting the blade of a terminal screwdriver between the captive legs of the cover and the base and then peel off.




#### Screening

Special conductive spray coating can be applied to one compartment, the cover, accessory boxes and fittings, to screen data cables against EMI interference.

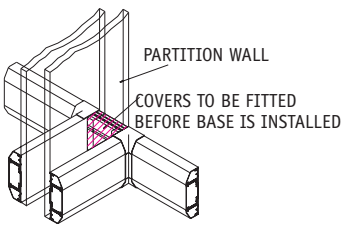
- For data/voice circuits only:
  Warning: Owing to its relatively high surface resistance, CS coating SHOULD NOT be in contact with low voltage circuits BS 7671:2008 50 V.A.C. – 1000 V.A.C. unless additional measures are undertaken.

#### Antimicrobial

For technical details of antimicrobial XL Bio trunking, please refer to Laboratory and Healthcare section.

#### Method of continuation through a partition wall

Continue the main lateral run of base through the partition wall with short lengths of cover fitted where the trunking passes through the partition. The partition wall trunking is then butted up to the main run and the joint covered by an Internal bend. (as shown below)

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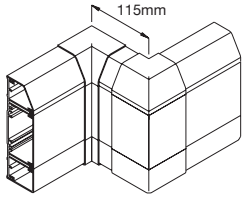
Product Information

## XL trunking – continued

### Offset dimensions

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



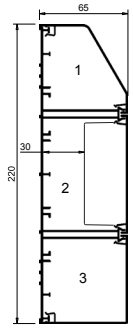

## Dimensions

### XL 202 Trunking - with box

1 = 2824mm² total area
1 = 1270mm² 45% space factor
2 = 2504mm² total area
2 = 1126mm² 45% space factor
3 = 3531mm² total area
3 = 1589mm² 45% space factor

### XL 202 Trunking - no box

2 = 4771mm² total area
2 = 2147mm² 45% space factor

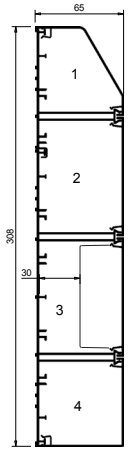



### XL 212 Trunking - no box

1 = 2824mm² total area
1 = 1270mm² 45% space factor
2 = 4771mm² total area
2 = 2147mm² 45% space factor
3 = 4732mm² total area
3 = 2129mm² 45% space factor
4 = 3531mm² total area
4 = 1589mm² 45% space factor

### XL 212 Trunking - with box in comp 2 or 3

2 = 2511mm² total area
2 = 1130mm² 45% space factor
3 = 2466mm² total area
3 = 1109mm² 45% space factor




## Cable capacities

- All calculations allow for a 45% space factor.

As there can be differences between data cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.

**Other Sterling Profile dimensions**

Other XL trunking profiles are a combination of the ones shown on this page and can be calculated using the compartment dimensions shown here.

| Cable capacity chart | Compartment 1 | | Compartment 2 | | Compartment 3 | | Compartment 4 |
|---|---|---|---|---|---|---|---|
| | No box | With box | No box | With box | No box | With box | No box |
| **PVC power cable 1.5mm² stranded copper** | | | | | | | |
| XL 201 | 159 | – | 268 | 141 | 159 | - | - |
| XL 202 | 159 | – | 268 | 141 | 199 | - | - |
| XL 203 | 199 | – | 268 | 141 | 199 | - | - |
| XL 211 | 159 | – | 268 | 141 | 266 | 139 | 159 |
| XL 212 | 159 | – | 268 | 141 | 266 | 139 | 199 |
| XL 213 | 199 | – | 268 | 141 | 266 | 139 | 199 |
| **PVC power cable 2.5mm² stranded copper** | | | | | | | |
| XL 201 | 107 | – | 180 | 95 | 107 | - | - |
| XL 202 | 107 | – | 180 | 95 | 134 | - | - |
| XL 203 | 134 | – | 180 | 95 | 134 | - | - |
| XL 211 | 107 | – | 180 | 95 | 179 | 93 | 107 |
| XL 212 | 107 | – | 180 | 95 | 179 | 93 | 134 |
| XL 213 | 134 | – | 180 | 95 | 179 | 93 | 134 |
| **PVC power cable 4.0mm² stranded copper** | | | | | | | |
| XL 201 | 77 | – | 129 | 68 | 77 | - | - |
| XL 202 | 77 | – | 129 | 68 | 96 | - | - |
| XL 203 | 96 | – | 129 | 68 | 96 | - | - |
| XL 211 | 77 | – | 129 | 68 | 128 | 67 | 77 |
| XL 212 | 77 | – | 129 | 68 | 128 | 67 | 96 |
| XL 213 | 96 | – | 129 | 68 | 128 | 67 | 96 |
| **Data cable: Ø5.5mm UTP & STP** | | | | | | | |
| XL 201 | 53 | – | 90 | 47 | 53 | - | - |
| XL 202 | 53 | – | 90 | 47 | 67 | - | - |
| XL 203 | 67 | – | 90 | 47 | 67 | - | - |
| XL 211 | 53 | – | 90 | 47 | 89 | 47 | 53 |
| XL 212 | 53 | – | 90 | 47 | 89 | 47 | 67 |
| XL 213 | 67 | – | 90 | 47 | 89 | 47 | 67 |
| **Data cable: Ø6.0mm UTP & STP** | | | | | | | |
| XL 201 | 45 | – | 76 | 40 | 45 | - | - |
| XL 202 | 45 | – | 76 | 40 | 56 | - | - |
| XL 203 | 56 | – | 76 | 40 | 56 | - | - |
| XL 211 | 45 | – | 76 | 40 | 75 | 39 | 45 |
| XL 212 | 45 | – | 76 | 40 | 75 | 39 | 56 |
| XL 213 | 56 | – | 76 | 40 | 75 | 39 | 56 |
| **Data cable: Ø6.5mm UTP & STP** | | | | | | | |
| XL 201 | 39 | – | 67 | 35 | 39 | - | - |
| XL 202 | 39 | – | 67 | 35 | 49 | - | - |
| XL 203 | 49 | – | 67 | 35 | 49 | - | - |
| XL 211 | 39 | – | 67 | 35 | 66 | 34 | 39 |
| XL 212 | 39 | – | 67 | 35 | 66 | 34 | 49 |
| XL 213 | 49 | – | 67 | 35 | 66 | 34 | 49 |
| **Data cable: Ø7.0mm UTP & STP** | | | | | | | |
| XL 201 | 33 | – | 56 | 29 | 33 | - | - |
| XL 202 | 33 | – | 56 | 29 | 41 | - | - |
| XL 203 | 41 | – | 56 | 29 | 41 | - | - |
| XL 211 | 33 | – | 56 | 29 | 55 | 29 | 33 |
| XL 212 | 33 | – | 56 | 29 | 55 | 29 | 41 |
| XL 213 | 41 | – | 56 | 29 | 55 | 29 | 41 |
| **Data cable: Ø8.4mm UTP & STP** | | | | | | | |
| XL 201 | 23 | – | 39 | 20 | 23 | - | - |
| XL 202 | 23 | – | 39 | 20 | 29 | - | - |
| XL 203 | 29 | – | 39 | 20 | 29 | - | - |
| XL 211 | 23 | – | 39 | 20 | 38 | 20 | 23 |
| XL 212 | 23 | – | 39 | 20 | 38 | 20 | 29 |
| XL 213 | 29 | – | 39 | 20 | 38 | 20 | 29 |

## Mini trunking

### Material

PVC-U is flame retardant and self-extinguishing. It provides a 100% recyclable material with good sustainability.

### Installation

#### Positioning

As feeder trunking.

#### Expansion/contraction

PVC-U expands and contracts at a uniform rate of approx 5.25mm in a 3 metre length for a temperature change of 25°C. Therefore, a 3mm gap between each length of trunking base is recommended. Fittings allow for thermal expansion of the covers.

#### Fitting

Mini trunking

- Secure trunking base at lease every 375mm by drilling 6mm holes.
- Fasten using roundhead screws.

Self-fixing mini trunking

- Remove protective film exposing 100-150mm of adhesive foam.
- Line up accurately and press firmly into position.
- Repeat until base is installed.
- For long term performance we recommend additional securing with screws and washers.

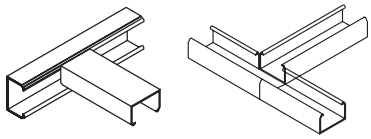
**Note:** the bond created by the tape can be very strong. Maximum adhesion occurs after 24 hours. Ensure surface is dust-free, dry, clean and flat. Uneven surface contact will reduce bonding performance. Installation in cold conditions below +5°C may affect adhesion.

#### Mini and Mini SF trunking

- Avoid over-tightening to permit thermal movement.
- The use of plastic caps over screw heads is recommended to protect installed cables.
- To cut the trunking, use a fine-toothed panel or power jig-saw.
- External profile fittings overlap joints by up to 10mm to cover cutting inaccuracies.
- A variable angle jig-saw or chop saw is recommended for cutting 45° mitres.
- End caps are secured using adhesive solvent MSC.

#### Joints and bends

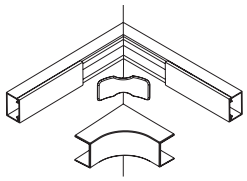
- All fittings incorporate clip-on design.
- 3mm gap between trunking base and bend or flat angle is recommended.
- For internal bends and flat angles, bases should be mitred 45°.
- For external bends, bases should be cut square to the corner.

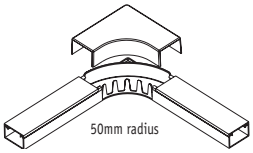


- For tees, bases should be cut square and butt up to each other.
- External clip on fittings overlap trunking base by up to 10mm to cover cutting inaccuracies.
- Secure end caps using solvent adhesive MSC3.

#### Bend radius control – MMT4 only

- For internal bends, base should be mitred at 45°
- For external bends, base should be cut square with the corner and the radius control fitted.
- For flat angles and tees, allowance should be made when cutting base, for moulded components.



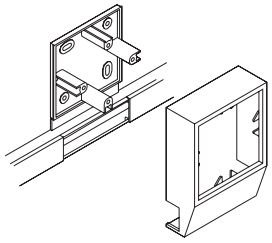




#### Accessory boxes

- Select appropriate surface box.
- Remove required knockout.
- Clean burrs from around aperture.
- Snap mini adaptor into position on box and place in position.
- Ensure trunking seats securely into adaptor.
- Secure box using diagonally opposite fixing holes.

#### Shrouded entry boxes

- For use with MMT2 or MMT3 only.
- Fit back plate in position, secure using diagonally opposite fixing holes.
- Run mini base up to back plate (for terminal accessory) or continue through.
- Remove required knockout from outer cover to fit mini trunking and fit over base plate. Install wiring leaving sufficient to wire accessory.
- Complete assembly is finally secured together when the wired accessory is screwed to accessory front plate.
- Fit mini trunking cover to base, ensuring cover extends into knockout.



#### Covers

Covers are designed to limit unauthorised removal and to remain in position during normal conditions irrespective of impact and minor undulations of the mounting surface.

#### Covers – fitting

Covers are clipped into place from front.

#### Covers – removal

To remove a cover, first detach a coupler or internal/external bend to gain access. The cover can then be gently eased off the base.

### Cable capacities

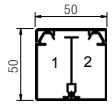
- All calculations allow for a 45% space factor.
- Divide cable factor (1st table) into capacity (2nd table) to ascertain number of cables.

**As there can be differences between data cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.**

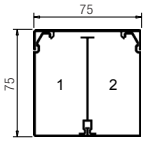
| Conductor type | Size | Cable factor |
|---|---|---|
| Stranded PVC power | 1.5mm² | 8.0 |
| Stranded PVC power | 2.5mm² | 11.9 |
| Stranded PVC power | 4.0mm² | 16.6 |
| *Data cable | Ø5.5mm | 23.8 |
| *Data cable | Ø6.0mm | 28.3 |
| *Data cable | Ø6.5mm | 33.2 |
| *Data cable | Ø7.0mm | 38.5 |
| *Data cable | Ø8.4mm | 55.4 |

| Mini trunking | Size mm | 45% capacity |
|---|---|---|
| MMT100 | 10 x 8 | 18.5mm² |
| MMT0 | 16 x 10 | 42mm² |
| MMT1 | 16 x 16 | 77.2mm² |
| MMT2 | 25 x 16 | 119.7mm² |
| MMT3 | 38 x 16 | 193mm² |
| MMT4 | 38 x 25 | 342mm² |
| MMT5 | 50 x 25 | 449mm² |
| MMT6 | 38 x 38 | 501mm² |
| MMT7 | 75 x 16 | 397mm² |

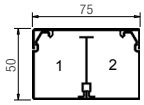
## Maxi and Sceptre trunking



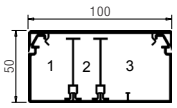

**Maxi MTRS50**
Total = 1979mm² total area
Total = 890mm² 45% space factor
1 & 2 = 911mm² total area
1 & 2 = 410mm² 45% space factor



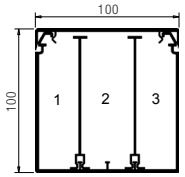

**Maxi MTRS75**
Total = 4709mm² total area
Total = 2119mm² 45% space factor
1 & 2 = 2196mm² total area
1 & 2 = 988mm² 45% space factor



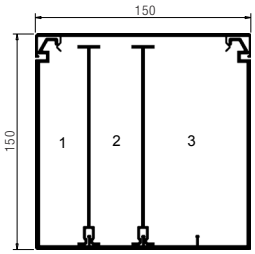

**Maxi MTRS75/50**
Total = 3032mm² total area
Total = 1365mm² 45% space factor
1 & 2 = 1347mm² total area
1 & 2 = 606mm² 45% space factor



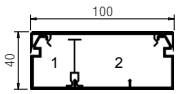

**Maxi MTRS100/50**
Total = 4040mm² total area
Total = 1818mm² 45% space factor
1 = 1056mm² total area
1 = 475mm² 45% space factor
2 = 660mm² total area
2 = 297mm² 45% space factor
3 = 1829mm² total area
3 = 823mm² 45% space factor



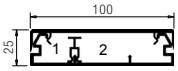

**Maxi MTRS100**
Total = 8733mm² total area
Total = 3930mm² 45% space factor
1 = 2375mm² total area
1 = 1069mm² 45% space factor
2 = 1464mm² total area
2 = 659mm² 45% space
3 = 4075mm² total area
3 = 1834mm² 45% space factor




**Maxi MTRS150**
Total = 20193mm² total area
Total = 9087mm² 45% space factor
1 = 4406mm² total area
1 = 1983mm² 45% space factor
2 = 4728mm² total area
2 = 2128mm² 45% space factor
3 = 9482mm² total area
3 = 4267mm² 45% space factor




**Sceptre DTR1**
Total = 3168mm² total area
Total = 1426mm² 45% space factor
1 = 816mm² total area
1 = 367mm² 45% space factor
2 = 2002mm² total area
2 = 901mm² 45% space factor




**Sceptre DTR2**
Total = 1731mm² total area
Total = 779mm² 45% space factor
1 = 435mm² total area
1 = 196mm² 45% space factor
2 = 1197mm² total area
2 = 538mm² 45% space factor

| Conductor type | Size | Cable factor |
|---|---|---|
| Stranded PVC power | 1.5mm² | 8.0 |
| Stranded PVC power | 2.5mm² | 11.9 |
| Stranded PVC power | 4.0mm² | 16.6 |
| *Data cable | Ø5.5mm | 23.8 |
| *Data cable | Ø6.0mm | 28.3 |
| *Data cable | Ø6.5mm | 33.2 |
| *Data cable | Ø7.0mm | 38.5 |
| *Data cable | Ø8.4mm | 55.4 |

For Data cable information, please see page 246

To determine cable capacity, select the size of the cable required and its corresponding cable factor from the table. Divide the compartment area figure (with or without 45% space factor) with the cable factor figure to achieve cable capacity.

**Note:** When 30mm deep accessory boxes are installed in MTRS100, MTRS100/50 and DTR1, reduce the area by 2600²mm.

## Maxi and Sceptre trunking – continued

### Material

PVC-U is flame retardant and self-extinguishing. It provides a 100% recyclable material with good sustainability.

### Installation

#### Positioning

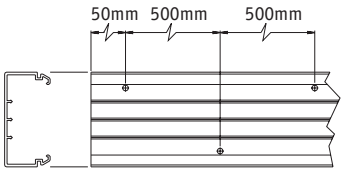
Feeder or distribution trunking.

#### Expansion/contraction

PVC-U expands and contracts at a uniform rate of approx 5.25mm in a 3 metre length for a temperature change of 25°C. Therefore, a 3mm gap between each length of trunking base is recommended. Fittings allow for thermal expansion of the covers.

#### Fitting

- Secure trunking base in one plane only every 500mm by drilling alternate 6mm holes.
- Use roundhead screws.
- Avoid over-tightening to permit thermal movement.
- The use of plastic caps over screw heads is recommended to protect installed cables.
- To provide cable segregation, dividing fillets are snapped on to internal nibs in base.
- To cut the trunking, use a fine-toothed panel or power jig-saw.
- External profile fittings overlap joints by up to 10mm to cover cutting inaccuracies.
- A variable angle jig-saw or chop saw is recommended for cutting 45° mitres.
- **Maxi only:** trunking lengths are connected using internal couplers as follows:
  – Cement one end of the internal coupler to one base using adhesive solvent MSC. Leave other end of coupler free in adjoining base to facilitate thermal movement.

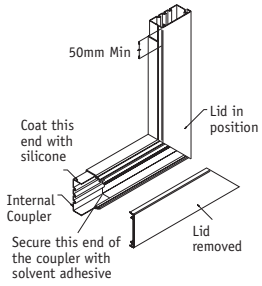



#### Single lengths

Where it is required to fit a single length of trunking (under 3 metres) between two inside walls and no accessory box is fitted, it is advisable to install a coupler in the centre of the run to facilitate the removal of the cover.

#### Joints and bends

- Clip-on fittings and 2-part moulded flat angle: base must be mitred at 45° to ensure total enclosure of trunking, including any internal fitted segregator.
- Fabricated fittings: a 3mm gap between trunking base and bend or flat angle is recommended.
- External moulded fittings overlap the joints by up to 10mm to cover cutting inaccuracies.
- Maxi fabricated fittings are supplied with internal couplers (see Fittings)
- Secure end caps using solvent adhesive MSC3.




#### Accessories

- **Sceptre DTR1, Maxi MTRS100/50 and MTRS100:** accessory boxes and plates can be used.
- Remove appropriate knockout and clip box into base.
- **Sceptre DTR2:** only accessory plates can be used.
- When boxes or plates are installed consecutively, fit a 25mm cover spacer (MTRS100LID25WH) between the accessories to conceal space between the boxes.

#### Covers

Covers are designed to limit unauthorised removal and to remain in position during normal conditions irrespective of impact and minor undulations of the mounting surface.

#### Covers – fitting

Covers are clipped into place from front. If accessory boxes are installed, the cover is butt-joined to the edge of the box. Cut edges of the cover are concealed by the accessory. For external fitting couplers, the following gaps should be left between the two cover ends to permit the fitting to clip to base:

| | |
|---|---|
| DTR2 | 20mm |
| MTRS50 | 20mm |
| MTRS75 | 20mm |
| MTRS75/50 | 20mm |
| MTRS100/50 | 20mm |
| MTRS100 | 30mm |

**DTR1:** DTR1 couplers are held in place by the two covers. To install, slide coupler up against first installed cover. Fit adjoining cover and slide up to coupler, ensuring the coupler moulding extends over the two covers.

#### Covers removal

To remove a cover, first detach a coupler or internal/external bend to gain access. The main cover can then be gently eased off the base.

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## Maxi and Sceptre trunking – continued

| Maxi trunking Cable capacity chart | Total | Compartment 1 | Compartment 2 | Compartment 3 |
|---|---|---|---|---|
| | | With box | No box | With box |
| **PVC power cable 1.5mm² stranded copper** | | | | |
| MTRS50 | 111 | 51 | 51 | - |
| MTRS75 | 265 | 124 | 124 | - |
| MTRS75/50 | 171 | 76 | 76 | - |
| MTRS100/50 | 227 | 59 | 37 | 103 |
| MTRS100 | 491 | 134 | 82 | 229 |
| MTRS150 | 1136 | 248 | 266 | 533 |
| **PVC power cable 2.5mm² stranded copper** | | | | |
| MTRS50 | 75 | 34 | 34 | - |
| MTRS75 | 178 | 83 | 83 | - |
| MTRS75/50 | 115 | 51 | 51 | - |
| MTRS100/50 | 153 | 40 | 25 | 69 |
| MTRS100 | 330 | 90 | 55 | 154 |
| MTRS150 | 764 | 167 | 179 | 359 |
| **PVC power cable 4.0mm² stranded copper** | | | | |
| MTRS50 | 54 | 25 | 25 | - |
| MTRS75 | 128 | 60 | 60 | - |
| MTRS75/50 | 82 | 37 | 37 | - |
| MTRS100/50 | 110 | 29 | 18 | 50 |
| MTRS100 | 237 | 64 | 40 | 110 |
| MTRS150 | 547 | 119 | 128 | 257 |
| **Data cable: Ø5.5mm** | | | | |
| MTRS50 | 37 | 17 | 17 | - |
| MTRS75 | 89 | 42 | 42 | - |
| MTRS75/50 | 57 | 25 | 25 | - |
| MTRS100/50 | 76 | 20 | 12 | 35 |
| MTRS100 | 165 | 45 | 28 | 77 |
| MTRS150 | 382 | 83 | 89 | 179 |
| **Data cable: Ø6.0mm** | | | | |
| MTRS50 | 31 | 14 | 14 | - |
| MTRS75 | 75 | 35 | 35 | - |
| MTRS75/50 | 48 | 21 | 21 | - |
| MTRS100/50 | 64 | 17 | 10 | 29 |
| MTRS100 | 139 | 38 | 23 | 65 |
| MTRS150 | 321 | 70 | 75 | 151 |
| **Data cable: Ø6.5mm** | | | | |
| MTRS50 | 28 | 13 | 13 | - |
| MTRS75 | 66 | 31 | 31 | - |
| MTRS75/50 | 42 | 19 | 19 | - |
| MTRS100/50 | 56 | 15 | 9 | 26 |
| MTRS100 | 122 | 33 | 20 | 57 |
| MTRS150 | 282 | 62 | 66 | 133 |
| **Data cable: Ø7.0mm** | | | | |
| MTRS50 | 23 | 11 | 11 | - |
| MTRS75 | 55 | 26 | 26 | - |
| MTRS75/50 | 35 | 16 | 16 | - |
| MTRS100/50 | 47 | 12 | 8 | 21 |
| MTRS100 | 102 | 28 | 17 | 48 |
| MTRS150 | 236 | 51 | 55 | 111 |
| **Data cable: Ø8.4mm** | | | | |
| MTRS50 | 16 | 7 | 7 | - |
| MTRS75 | 38 | 18 | 18 | - |
| MTRS75/50 | 25 | 11 | 11 | - |
| MTRS100/50 | 33 | 9 | 5 | 15 |
| MTRS100 | 71 | 19 | 12 | 33 |
| MTRS150 | 164 | 36 | 38 | 77 |

### Cable capacities

- All calculations allow for a 45% space factor.

As there can be differences between data cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.

| Sceptre trunking Cable capacity chart | Total | Compartment 1 | Compartment 2 |
|---|---|---|---|
| | | No box | No box |
| **PVC power cable 1.5mm² stranded copper** | | | |
| DTR1 | 178 | 46 | 113 |
| DTR2 | 97 | 24 | 67 |
| **PVC power cable 2.5mm² stranded copper** | | | |
| DTR1 | 120 | 31 | 76 |
| DTR2 | 65 | 16 | 45 |
| **PVC power cable 4.0mm² stranded copper** | | | |
| DTR1 | 86 | 22 | 54 |
| DTR2 | 47 | 12 | 32 |
| **Data cable: Ø5.5mm** | | | |
| DTR1 | 60 | 15 | 38 |
| DTR2 | 33 | 8 | 23 |
| **Data cable: Ø6.0mm** | | | |
| DTR1 | 50 | 13 | 32 |
| DTR2 | 28 | 7 | 19 |
| **Data cable: Ø6.5mm** | | | |
| DTR1 | 44 | 11 | 28 |
| DTR2 | 24 | 6 | 17 |
| **Data cable: Ø7.0mm** | | | |
| DTR1 | 37 | 10 | 23 |
| DTR2 | 20 | 5 | 14 |
| **Data cable: Ø8.4mm** | | | |
| DTR1 | 26 | 7 | 16 |
| DTR2 | 14 | 4 | 10 |

## Cornice trunking

### Material

PVC-U is flame retardant and self-extinguishing. It provides a 100% recyclable material with good sustainability.

### Installation

#### Positioning

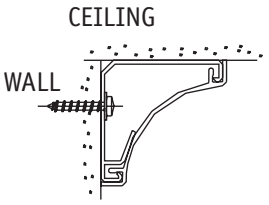
For surface wiring around ceilings.

#### Expansion/contraction

PVC-U expands and contracts at a uniform rate of approx 5.25mm in a 3 metre length for a temperature change of 25°C. Therefore, a 3mm gap between each length of trunking base is recommended. Fittings allow for thermal expansion of the covers.

#### Fitting

- Secure trunking base in one plane every 500mm by drilling 6mm holes in the wall side of the trunking and use round head screws and washers.
- Avoid over-tightening to permit thermal movement.
- The use of plastic caps over screw heads is recommended to protect installed cables.
- To cut the trunking, use a fine-toothed panel or power jig-saw.
- External profile fittings overlap joints by up to 10mm to cover cutting inaccuracies.
- A variable angle jig-saw or chop saw is recommended for cutting 45° mitres.




#### Joints and bends

- Base joints should have a 3mm gap to allow for expansion.
- Base must be mitred 45˚ to ensure total closure of trunking.
- End caps with clips ensure security of trunking.

#### Covers

Covers are designed to limit unauthorised removal and to remain in position during normal conditions irrespective of impact and minor undulations of the mounting surface.

#### Covers – fitting

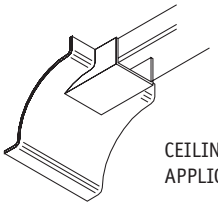
Covers are clipped into place from front. For external moulded fittings, a gap of 25mm is left between the two cover ends to permit the fitting to clip to base.

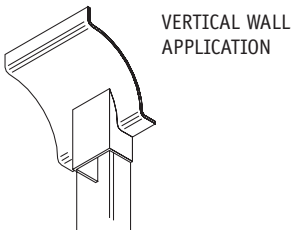
#### Covers – removal

To remove a cover, first remove a fitting to gain access. Insert blade of terminal screwdriver between captive legs of cover and base and gently ease off.

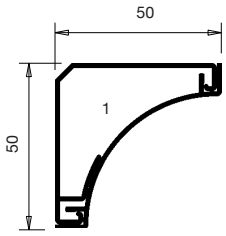
#### Accessories

Accessories are serviced through a spur using a mini trunking adaptor and mini trunking across the ceiling to a pendant drop or down the wall to an appropriate accessory box.




### Dimensions




1 = 837mm² total area
1 = 376mm² 45% space factor

### Cable capacities

- All calculations allow for a 45% space factor.

As there can be differences between data cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.

| Cable capacity chart | Cable factor | Compartment 1 |
|---|---|---|
| PVC power cable 1.5mm² stranded copper | 8.0 | 47 |
| PVC power cable 2.5mm² stranded copper | 11.9 | 31 |
| PVC power cable 4.0mm² stranded copper | 16.6 | 22 |
| Data cable: Ø5.5mm | 23.8 | 15 |
| Data cable: Ø6.0mm | 28.3 | 13 |
| Data cable: Ø6.5mm | 33.2 | 11 |
| Data cable: Ø7.0mm | 38.5 | 9 |
| Data cable: Ø8.4mm | 55.4 | 6 |

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## Sovereign Plus trunking

### Material

PVC-U is flame retardant and self-extinguishing. It provides a 100% recyclable material with good sustainability.

### Installation

#### Positioning

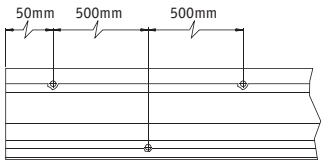
Suitable for skirting and architrave installation. When used as a skirting system, sufficient clearance should be allowed between the floor covering and the profile fittings that clip over the cover i.e. 5mm + floor covering is recommended.

#### Expansion/contraction

PVC-U expands and contracts at a uniform rate of approx 5.25mm in a 3 metre length for a temperature change of 25°C. Therefore, a 3mm gap between each length of trunking base is recommended. Fittings allow for thermal expansion of the covers.

#### Fitting

- Secure base every 500mm by drilling alternate 6mm in the two outer slots provided.
- Secure using No 8 round head screws and washers.
- Avoid over-tightening to permit thermal movement. Internal couplers on base units not required.
- To cut the trunking, use a fine-toothed panel or power jig-saw.
- External profile fittings overlap joints by up to 10mm to cover cutting inaccuracies.
- A variable angle jig-saw or chop saw is recommended for cutting 45° mitres.
- For segregation, use the cable retainers to retain cables in correct compartments.




#### Single lengths

Where it is required to fit a single length of trunking (under 3 metres) between two inside walls and no accessory box is fitted, it is advisable to install a coupler in the centre of the run to facilitate the removal of the cover.

#### Joints and bends

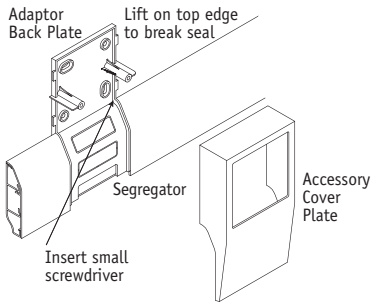
- Base joints should have a 3mm gap to allow for expansion.
- Mitre bases for internal bends, external bends and flat angles at 45° to ensure total enclosure of trunking.
- External moulded fittings overlap the joints by up to 10mm to cover cutting inaccuracies.
- Trunking cover holds external moulded fittings in place when they are clipped on to base.

#### Bend radius control

Not available.

#### Accessory boxes

- Mounted on to trunking body with accessory external to the trunking.
- Remove required knockout in back segregator plate that aligns with trunking cable compartment.
- Clip to trunking base and secure to wall surface using 2 diagonally opposite fixing holes.
- Feed cables through knockout.
- After trunking cover has been fitted to base, clip front cover plate to back plate.
- Complete assembly is finally secured together when the wired accessory is screwed to accessory front plate.




#### Covers

Covers are designed to limit unauthorised removal and to remain in position during normal conditions irrespective of impact and minor undulations of the mounting surface.

#### Covers – fitting

Covers are clipped into place from front. If accessory boxes are installed, covers are butt-joined to the edge of the box assembly. Cut edges of the cover are concealed by the accessory. For fittings, a gap of 4mm is left between the two cover ends to permit the fitting to clip to base.

#### Covers – removal

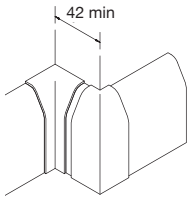
To remove a cover, isolate circuit and detach an accessory and front mounting component. Insert blade of screwdriver between captive legs of cover and gently peel off.

#### Screening

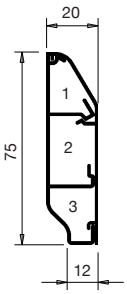
Not available.

#### Offset dimensions

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




### Dimensions




#### Sovereign Plus skirting

1 = 238mm² total area
1 = 107mm² 45% space factor
2 = 416mm² total area
2 = 187mm² 45% space factor
3 = 261mm² total area
3 = 117mm² 45% space factor

### Cable capacities

- All calculations allow for a 45% space factor.

As there can be differences between data cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.

| Cable capacity chart | Compartment 1 | Compartment 2 | Compartment 3 |
|---|---|---|---|
| | No box | No box | No box |
| **PVC power cable 1.5mm² stranded copper** | | | |
| Sovereign Plus skirting | 13 | 23 | 15 |
| **PVC power cable 2.5mm² stranded copper** | | | |
| Sovereign Plus skirting | 9 | 16 | 10 |
| **PVC power cable 4.0mm² stranded copper** | | | |
| Sovereign Plus skirting | 6 | 11 | 7 |
| **Data cable: Ø5.5mm** | | | |
| Sovereign Plus skirting | 5 | 8 | 5 |
| **Data cable: Ø6.0mm** | | | |
| Sovereign Plus skirting | 4 | 7 | 4 |
| **Data cable: Ø6.5mm** | | | |
| Sovereign Plus skirting | 3 | 6 | 4 |
| **Data cable: Ø7.0mm** | | | |
| Sovereign Plus skirting | 3 | 5 | 3 |
| **Data cable: Ø8.4mm** | | | |
| Sovereign Plus skirting | 2 | 3 | 2 |

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# Bench trunking

## Material

PVC-U is flame retardant and self-extinguishing. It provides a 100% recyclable material with good sustainability.

## Installation

### Positioning

If used as a skirting system, a clearance of 5mm is recommended above the floor covering to allow the profile fittings to clip over the cover.

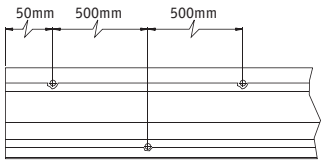
Bench and desk installations: a single run can be fitted to rear of furniture or, if run down centre line, two units can be joined back to back presenting accessories on both sides.

### Expansion/contraction

PVC-U expands and contracts at a uniform rate of approx 5.25mm in a 3 metre length for a temperature change of 25°C. Therefore, a 3mm gap between each length of trunking base is recommended. Fittings allow for thermal expansion of the covers.

### Fitting

- Secure trunking base in one plane only every 500mm by drilling alternative 6mm holes either side of divider nib.
- Avoid over-tightening to permit thermal movement.
- The use of plastic caps over screw heads is recommended to protect installed cables.
- To provide cable segregation, dividing fillets are snapped on to internal nibs in base.
- To cut the trunking, use a fine-toothed panel or power jig-saw.
- External profile fittings overlap joints by up to 10mm to cover cutting inaccuracies.
- Accepts Marshall-Tufflex and standard UK wiring and data accessories.




### Single lengths

Where it is required to fit a single length of trunking (under 3 metres) between two inside walls and no accessory box is fitted, it is advisable to install a coupler in the centre of the run to facilitate the removal of the cover.

### Joints and bends

- Base joints should have a 3mm gap to allow for expansion.
- Internal and external bends are prefabricated.
- External moulded fittings overlap the joints to cover cutting inaccuracies.
- Couplers are required to align and join bend assemblies to trunking.
- Secure end caps using solvent adhesive MSC3.

### Accessory boxes

- Remove the appropriate knock out that aligns with segregated compartment containing supply cable and clip the box into the trunking base.
- When boxes are installed consecutively, a 14mm wide spacer (ES1) is required to cover the space between the boxes.
- Part M box assemblies with contrasting coloured faceplates are available to meet the requirements of DDA regulations for Visual Impairment.

### Covers

Covers are designed to limit unauthorised removal and to remain in position during normal conditions irrespective of impact and minor undulations of the mounting surface.

### Covers – fitting

Covers are clipped into place from front. If accessory boxes are installed, the cover is butt-joined to the edge of the box . Cut edges of the cover are concealed by the accessory.
For couplers, a gap of 25mm is left between the two cover ends to permit the fitting to clip to base.

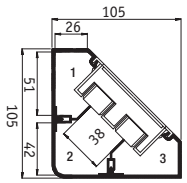
### Covers – removal

To remove a cover, first detach a coupler to gain access. The cover can then be gently eased off the base.

### Antimicrobial

For technical details of antimicrobial Bio Bench trunking, please refer to Laboratory and Healthcare section.

## Dimensions




### Bench trunking – with box

1 = 1285mm² total area
1 = 578mm² 45% space factor
2 = 2128mm² total area
2 = 957mm² 45% space factor
3 = 1285mm² total area
3 = 578mm² 45% space factor

### Bench trunking – no box

1 = 1782mm² total area
1 = 802mm² 45% space factor
2 = 3282mm² total area
2 = 1477mm² 45% space factor
3 = 1782mm² total area
3 = 802mm² 45% space factor

### Cable capacities

- All calculations allow for a 45% space factor.

As there can be differences between data cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.

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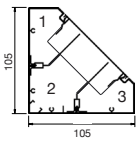
| Cable capacity chart | Compartment 1 | | Compartment 2 | | Compartment 3 | |
|---|---|---|---|---|---|---|
| | No box | With box | No box | With box | No box | With box |
| PVC power cable 1.5mm² stranded copper | 100 | 72 | 185 | 120 | 100 | 72 |
| PVC power cable 2.5mm² stranded copper | 67 | 49 | 124 | 80 | 67 | 49 |
| PVC power cable 4.0mm² stranded copper | 48 | 35 | 89 | 58 | 48 | 35 |
| Data cable: Ø5.5mm | 34 | 24 | 62 | 40 | 34 | 24 |
| Data cable: Ø6.0mm | 28 | 20 | 52 | 34 | 28 | 20 |
| *Data cable: Ø6.5mm | 25 | 18 | 46 | 30 | 25 | 18 |
| *Data cable: Ø7.0mm | 21 | 15 | 38 | 25 | 21 | 15 |
| *Data cable: Ø8.4mm | 14 | 10 | 27 | 17 | 14 | 10 |

*Only for straight runs. If bends are required please contact the Technical Team on +44 (0)1424 856688.

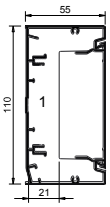
## Aluminium trunking capacity guide

### Trunking sizes up to 150mm




**Bench trunking – no box**
1 & 3 = 1842mm² total area
1 & 3 = 829mm² 45% space factor
2 = 3342mm² total area
2 = 1504mm² 45% space factor

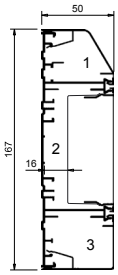
**With box in comp 2**
2 = 2188mm² total area
2 = 984mm² 45% space factor




**Elegance 110 aluminium – no box**
1 = 5254mm² total area
1 = 2364mm² 45% space factor

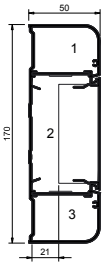
**With box in comp 1**
1 = 2987mm² total area
1 = 1344mm² 45% space factor

### Trunking sizes from 150mm to 200mm




**Sterling Profile 3002 – no box**
1 = 1060mm² total area
1 = 477mm² 45% space factor
2 = 3802mm² total area
2 = 1711mm² 45% space factor
3 = 1400mm² total area
3 = 630mm² 45% space factor

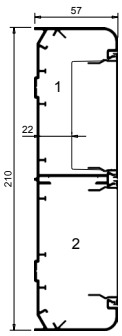
**With box in comp 2**
2 = 1535mm² total area
2 = 691mm² 45% space factor




**Elegance 170 aluminium – no box**
1 = 1764mm² total area
1 = 794mm² 45% space factor
2 = 4508mm² Total Area
2 = 2029mm² 45% space factor

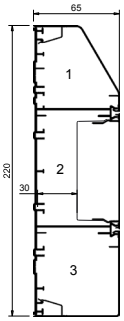
**With box in comp 2**
2 = 1748mm² total area
2 = 787mm² 45% space factor

### Trunking sizes over 200mm



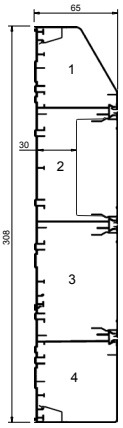

**Twin Plus – no box**
1 & 2 = 5000mm² total area
1 & 2 = 2250mm² 45% space factor

**With box in comps 1 or 2**
1 & 2 = 2733mm² total area
1 & 2 = 1230mm² 45% space factor




**XL 302 – no box**
1 = 2680mm² total area
1 = 1206mm² 45% space factor
2 = 4639mm² total area
2 = 2088mm² 45% space factor
3 = 3490mm² total area
3 = 1570mm² 45% space factor

**With box in comp 2**
2 = 1123mm² total area
2 = 505mm² 45% space factor




**XL 312 – no box**
1 = 2824mm² total area
1 = 1271mm² 45% space factor
2 = 4771mm² total area
2 = 2147mm² 45% space factor
3 = 4732mm² total area
3 = 2130mm² 45% space factor
4 = 3531mm² total area
4 = 1589mm² 45% space factor

**With box in comps 2 or 3**
2 = 2511mm² total area
2 = 1130mm² 45% space factor
3 = 2466mm² total area
3 = 1109mm² 45% space factor

| Conductor type | Size | Cable factor |
|---|---|---|
| Stranded PVC power | 1.5mm² | 8.0 |
| Stranded PVC power | 2.5mm² | 11.9 |
| Stranded PVC power | 4.0mm² | 16.6 |
| *Data cable | Ø5.5mm | 23.8 |
| *Data cable | Ø6.0mm | 28.3 |
| *Data cable | Ø6.5mm | 33.2 |
| *Data cable | Ø7.0mm | 38.5 |
| *Data cable | Ø8.4mm | 55.4 |

For Data cable information, please see page 246

To determine cable capacity, select the size of the cable required and its corresponding cable factor from the table. Divide the compartment area figure (with or without 45% space factor) with the cable factor figure to achieve cable capacity.

**Calculations**

Please note that all the above calculations are based on a box depth of 30mm

## Bench trunking aluminium

### Material

Aluminium trunking is manufactured from high precision extruded aluminium with a powder coat finish.

White RAL 9016

Silver Grey RAL 9006

Accessory boxes are supplied in PVC-U or polycarbonate both of which are 100% recyclable.

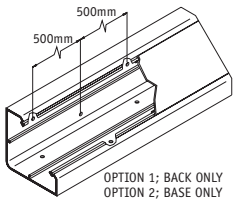
### Installation

#### Positioning

Bench and desk installations: a single run can be fitted to rear of furniture or, if run down centre line, two units can be joined back to back presenting accessories on both sides.

#### Fitting

- Secure trunking base in one plane only every 500mm by drilling alternative Ø6mm holes either side of divider nib.
- Secure using No 8 round head screws and washers. Avoid over-tightening to permit thermal movement.
- The use of plastic caps over screw heads is recommended to protect installed cables.
- To cut the trunking, use a fine tooth blade (32/36tpi) or, preferably, a circular saw with a 350mm fine tungsten blade (90/108tpi). This will produce an edge requiring minimal de-burring.
- Consecutive lengths of base are aligned and butt jointed together.




#### Earthing

- Base, covers and metallic fittings to be cleaned of protective and powder coatings and earth bonded.
- Incoming earth connection is made using LTB1 bonding assembly installed in the earth channel of the base.
- Bonding base to base: in final ring or radial 32Amp circuits, bonding strap LBS1 can be used. Bonding cover to base use LBS2

#### Joints and bends

- Base joints should be butt jointed together.
- Internal and external bends are prefabricated in aluminium, aligned and butt jointed together so cutting of base and covers has to be very accurate to produce a good finish.

#### Bend radius control

Contact the Technical Team on +44 (0)1424 856688

#### Accessory boxes

- Remove the appropriate box knockout that align with segregated compartment containing supply cable and clip the box into the trunking base.
- When boxes are installed consecutively, a 14mm wide spacer (ES1) is required to cover the space between the boxes.
- Part M box assemblies with contrasting coloured faceplates are available to meet the requirements of DDA regulations for Visual Impairment.

#### Covers

Covers are designed to limit unauthorised removal and to remain in position during normal conditions irrespective of impact and minor undulations of the mounting surface.

#### Covers – fitting

Covers are clipped into place from front. If accessory boxes are installed, the LTL1 cover is butt-joined to the edge of the box (ESSB1/2 only). Cut edges of the cover are concealed by the accessory. Adjoining covers are butt-jointed.

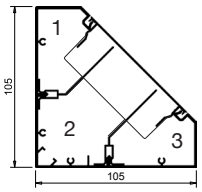
#### Covers – removal

To remove a cover, first detach an accessory to gain access. The main cover can then be gently eased off the base.

#### Screening

Aluminium containment protects internal circuits from external electromagnetic interference. For internal segregation and screening, use a screened dividing fillet.

### Dimensions




#### Bench trunking – with box

1 = 1345mm² total area
1 = 605mm² 45% space factor
2 = 2188mm² total area
2 = 984mm² 45% space factor
3 = 1345mm² total area
3 = 605mm² 45% space factor

#### Bench trunking – No box

1 = 1842mm² total area
1 = 828mm² 45% space factor
2 = 3342mm² total area
2 = 1504mm² 45% space factor
3 = 1842mm² total area
3 = 828mm² 45% space factor

### Cable capacities

- All calculations allow for a 45% space factor.

As there can be differences between data cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.

| Cable capacity chart | Compartment 1 | | Compartment 2 | | Compartment 3 | |
|---|---|---|---|---|---|---|
| | No box | With box | No box | With box | No box | With box |
| PVC power cable 1.5mm² stranded copper | 104 | 76 | 188 | 123 | 104 | 76 |
| PVC power cable 2.5mm² stranded copper | 70 | 51 | 126 | 83 | 70 | 51 |
| PVC power cable 4.0mm² stranded copper | 50 | 36 | 91 | 59 | 50 | 36 |
| Data cable: Ø5.5mm | 35 | 25 | 63 | 41 | 35 | 25 |
| Data cable: Ø6.0mm | 29 | 21 | 53 | 35 | 29 | 21 |
| Data cable: Ø6.5mm | 26 | 19 | 47 | 31 | 26 | 19 |
| Data cable: Ø7.0mm | 22 | 16 | 39 | 26 | 22 | 16 |
| Data cable: Ø8.4mm | 15 | 11 | 27 | 18 | 15 | 11 |

Only for straight runs. If bends are required please contact the Technical Team on +44 (0)1424 856688.

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## Elegance Aluminium

### Material

Aluminium trunking is manufactured from high precision extruded aluminium with a powder coat finish.

White RAL 9016

Silver Grey RAL 9006

Accessory boxes are supplied in PVC-U or polycarbonate both of which are 100% recyclable.

### Installation

#### Positioning

Elegance can be installed at dado level or as a bench-mounted installation.

#### Fitting

- Secure trunking base every 750mm.
- Secure using No.8 round head screws and washers using the grooves in the outer (110) or inner (170) compartments of the base to facilitate drilling Ø6mm holes.
- Avoid over-tightening to permit thermal movement.
- The use of plastic caps over screw heads is recommended to protect installed cables.
- To cut the trunking, use a fine tooth blade (32/36tpi) or, preferably, a circular saw with a 350mm diameter fine tungsten blade (90/108tpi). This will produce an edge requiring minimal de-burring.
- Consecutive lengths of base are aligned and butt jointed together.

#### Earthing

- Base, covers and metallic fittings to be cleaned of protective powder coatings for earth bonding.
- Elegance 110: Incoming earth connection is made using LBT1 bonding assembly installed in the earth channel of the base.
- Elegance 170: Incoming earth connection is made using LBT3 bonding kit, with edge clip attached to the earth rib in the base and faston connector crimped to incoming earth cable.
- Bonding base to base: in final ring or radial 32Amp circuits, bonding strap LBS1 can be used.
- Bonding end caps to base: use bonding strap LBS5.
- Bonding base to cover, use LBS2.

#### Joints and bends

- Straight lengths should be butt jointed together with the aid of LDP1 coupler pin if required.
- Internal bends, external bends, flat angles and tees are prefabricated in aluminium and butt jointed together so cutting of base and covers has to be very accurate to produce a good finish.

#### Accessory boxes

- Remove appropriate knockout and clip box into trunking base.
- For boxes in same compartment as supply, remove appropriate knockout and clip box into trunking base.
- When boxes are installed consecutively, a 14mm wide length of cover is required to cover the space between the boxes.
- Part M box assemblies with contrasting coloured faceplates are available to meet the requirements of DDA regulations for Visual Impairment.

#### Covers

Covers are designed to limit unauthorised removal and to remain in position during normal conditions irrespective of impact and minor undulations of the mounting surface.

#### Covers – fitting

Covers are clipped into place from front. If accessory boxes are installed, the LTL1/LP1010 cover is butt-joined to the edge of the box (ESSB1/2 only). Cut edges of the cover are concealed by the accessory.

#### Covers – removal

To remove a cover, first detach an accessory to gain access. The main cover can then be gently eased off the base.

#### Screening

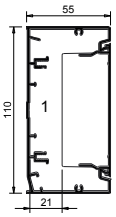
Aluminium containment will protect all internal circuits from external electromagnetic interference. For internal segregation metallic dividing fillets are available.

#### Offset dimensions

The minimum set that can be accommodated in the same plane (from internal to external bend), is 145mm.

### Dimensions

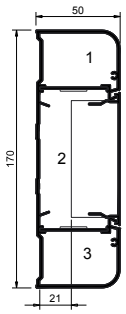
#### Elegance 110




1 = 5254mm² total area
1 = 2364mm² 45% space factor

With box in comp 1
1 = 2987mm² total area
1 = 1344mm² 45% space factor

#### Elegance 170




A = 1764mm² total area
A = 794mm² 45% space factor

Without Accessory
B = 4508mm² total area
B = 2029mm² 45% space factor

With Accessory
B = 1748mm² total area
B = 787mm² 45% space factor

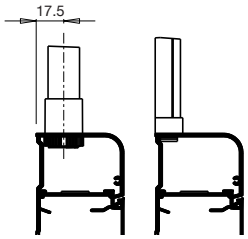
#### Cable capacities

- All calculations allow for a 45% space factor.

As there can be differences between data cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.

#### Fixing to Conduit and Mini Trunking

Elegance 170 can be used in conjunction with Conduit and Mini trunking systems as detailed in the diagrams below:

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| Cable capacity chart<br>Total cables = Volume/cable factor | Elegance 110 | | Elegance 170 | | |
|---|---|---|---|---|---|
| | Compartment 1 | | Compartment 1 | Compartment 2 | |
| | No box | With box | | No box | With box |
| PVC power cable 1.5mm² stranded copper | 296 | 168 | 99 | 254 | 98 |
| PVC power cable 2.5mm² stranded copper | 199 | 113 | 67 | 170 | 66 |
| PVC power cable 4.0mm² stranded copper | 142 | 81 | 48 | 122 | 47 |
| Data cable: Ø5.5mm | 99 | 56 | 33 | 85 | 33 |
| Data cable: Ø6.0mm | 84 | 47 | 28 | 72 | 28 |
| Data cable: Ø6.5mm | 73 | 42 | 25 | 63 | 24 |
| Data cable: Ø7.0mm | 61 | 35 | 21 | 53 | 20 |
| Data cable: Ø8.4mm | 43 | 24 | 14 | 37 | 14 |

## Sterling Profile aluminium

### Material

Aluminium trunking is manufactured from high precision extruded aluminium with a powder coat finish.

White RAL 9016

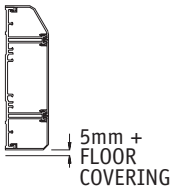
Silver Grey RAL 9006

Accessory boxes are supplied in PVC-U or polycarbonate both of which are 100% recyclable.

### Installation

#### Positioning

Suitable for dado and skirting installation. When used as a skirting system, sufficient clearance should be allowed between the floor covering and the profile fittings that clip over the cover i.e. 5mm + floor covering is recommended.

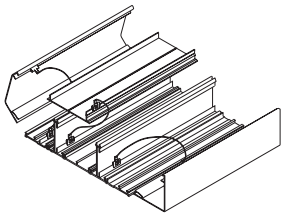



#### Fitting

- Secure trunking base every 750mm.
- Secure using No 8 round head screws and washers using the grooves in the outer compartments of the base to facilitate drilling Ø6mm holes.
- Avoid over-tightening to permit thermal movement.
- The use of plastic caps over screw heads is recommended to protect installed cables.
- To cut the trunking, use a fine tooth blade (32/36tpi) or, preferably,a circular saw with a 350mm diameter fine tungsten blade (90/108tpi). This will produce an edge requiring minimal de-burring.
- Consecutive lengths of base are aligned and butt jointed together.

#### Earthing

- Clean protective coating from base, covers and metallic fittings and then earth bond.
- Incoming earth connection is made using LTB1 bonding assembly installed in the earth channel of the base.
- Bonding base to base: in final ring or radial 32Amp circuits, bonding strap LBS1 can be used.
- Bonding covers and end caps to base: use bonding strap LBS2.



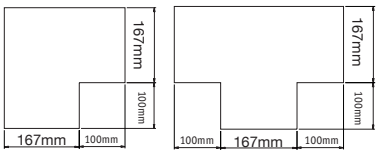
#### Single lengths

Where it is required to fit a single length of trunking (under 3 metres) between two inside walls and no accessory box is fitted, it is advisable to install a coupler in the centre of the run to facilitate the removal of the cover.

#### Joints and bends

- Moulded from colour matching polycarbonate.
- Internal and external bends must be mitred at 45° to ensure total enclosure and segregation of trunking compartments, including any internal fitted segregator.
- Straight lengths should be butt jointed together.
- Flat angles and tees are prefabricated in aluminium.
- Cutting of base and covers is not critical as external moulded clip-on fittings cover the joint and overlap covers by 10mm each side to cover minor inaccuracies.

#### Template dimensions for Flat angle and Tee

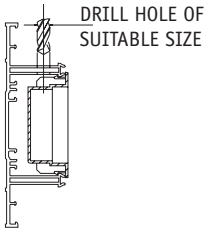



#### Bend radius control

Contact the Technical Team on +44 (0)1424 856688

#### Accessory boxes

- For mounting an accessory box in the alternative compartment to supply, drill the main web adjacent to the box position.
- Remove the appropriate knock out and clip the box into the trunking base.
- For boxes in the same compartment as the supply, remove the appropriate box knock-outs and clip the box into trunking base.
- When boxes are installed consecutively, a 14mm wide spacer (ES1) is required to cover the space between the boxes.
- Part M box assemblies with contrasting coloured faceplates are available to meet the requirements of DDA regulations for Visual Impairment.



### Covers

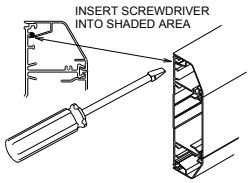
Covers are designed to limit unauthorised removal and to remain in position during normal conditions irrespective of impact and minor undulations of the mounting surface.

### Covers – fitting

Covers are clipped into place from front. If accessory boxes are installed, the LTL1 cover is butt-joined to the edge of the box. Cut edges of the cover are subsequently concealed by the accessory. For fittings, a gap of 25mm is left between the two cover ends to permit the fitting to clip to base.

### Covers – removal

To remove a cover, first detach a coupler, internal or external bend component to gain access. The main cover can then be gently eased off the base. To remove the outer cover, firstly ease from the base by inserting the blade of a terminal screwdriver between the captive legs of the cover and the base and then ease away from the base.

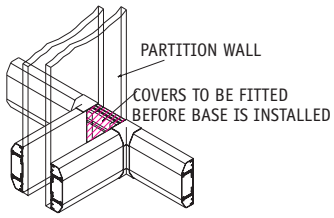



### Screening

Aluminium containment will protect all internal circuits from external electromagnetic interference. For internal segregation and screening, use a screened dividing fillet.

### Method of continuation through a partition wall

Continue the main lateral run of base through the partition wall. Fit short lengths of cover where the trunking passes through the partition. The partition wall trunking is then butted up to the main run and the joint covered by an internal bend fitting.



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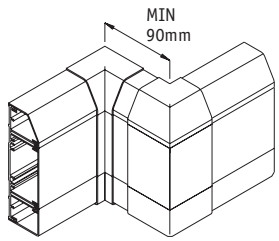
Product Information

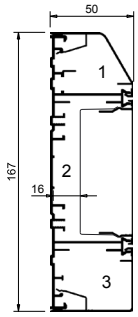
## Sterling Profile aluminium – continued

### Offset dimensions

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




### Dimensions




**Sterling Profile 3002 - no box**

1 = 1060mm² total area
1 = 477mm² 45% space factor
2 = 3802mm² total area
2 = 1711mm² 45% space factor
3 = 1400mm² total area
3 - 630mm² 45% space factor

**Sterling Profile 3002 - with box**

2 = 1535mm² total area
2 = 691mm² 45% space factor

### Cable capacities

- All calculations allow for a 45% space factor.

As there can be differences between data cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.

| Cable capacity chart | Compartment 1 | | Compartment 2 | | Compartment 3 | |
|---|---|---|---|---|---|---|
| | No box | With box | No box | With box | No box | With box |
| **PVC power cable 1.5mm² stranded copper** | | | | | | |
| Sterling Profile 1 | 60 | – | 214 | 86 | 65 | – |
| Sterling Profile 2 | 60 | – | 214 | 86 | 79 | – |
| Sterling Profile 3 | 73 | – | 214 | 86 | 79 | – |
| **PVC power cable 2.5mm² stranded copper** | | | | | | |
| Sterling Profile 1 | 40 | – | 144 | 58 | 44 | – |
| Sterling Profile 2 | 40 | – | 144 | 58 | 53 | – |
| Sterling Profile 3 | 49 | – | 144 | 58 | 53 | – |
| **PVC power cable 4.0mm² stranded copper** | | | | | | |
| Sterling Profile 1 | 29 | – | 103 | 42 | 31 | – |
| Sterling Profile 2 | 29 | – | 103 | 42 | 38 | – |
| Sterling Profile 3 | 35 | – | 103 | 42 | 38 | – |
| **Data cable: Ø5.5mm** | | | | | | |
| Sterling Profile 1 | 20 | – | 72 | 29 | 22 | – |
| Sterling Profile 2 | 20 | – | 72 | 29 | 26 | – |
| Sterling Profile 3 | 25 | – | 72 | 29 | 26 | – |
| **Data cable: Ø6.0mm** | | | | | | |
| Sterling Profile 1 | 17 | – | 60 | 24 | 18 | – |
| Sterling Profile 2 | 17 | – | 60 | 24 | 22 | – |
| Sterling Profile 3 | 21 | – | 60 | 24 | 22 | – |
| **Data cable: Ø6.5mm** | | | | | | |
| Sterling Profile 1 | 15 | – | 53 | 21 | 16 | – |
| Sterling Profile 2 | 15 | – | 53 | 21 | 20 | – |
| Sterling Profile 3 | 18 | – | 53 | 21 | 20 | – |
| **Data cable: Ø7.0mm** | | | | | | |
| Sterling Profile 1 | 12 | – | 44 | 18 | 14 | – |
| Sterling Profile 2 | 12 | – | 44 | 18 | 16 | – |
| Sterling Profile 3 | 15 | – | 44 | 18 | 16 | – |
| **Data cable: Ø8.4mm** | | | | | | |
| Sterling Profile 1 | 9 | – | 31 | 12 | 9 | – |
| Sterling Profile 2 | 9 | – | 31 | 12 | 11 | – |
| Sterling Profile 3 | 11 | – | 31 | 12 | 11 | – |

## Twin Plus aluminium

### Material

Aluminium trunking is manufactured from high precision extruded aluminium with a powder coat finish.
White RAL 9016
Silver Grey RAL 9006

Accessory boxes are supplied in PVC-U or polycarbonate both of which are 100% recyclable.

### Installation

#### Positioning

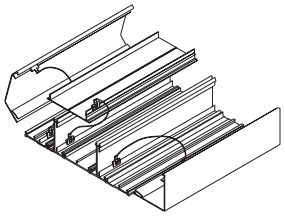
Suitable for dado and skirting installation. When used as a skirting system, sufficient clearance should be allowed between the floor covering and the profile fittings that clip over the cover i.e. 5mm + floor covering is recommended.

#### Fitting

- Secure trunking base every 750mm.
- Secure using No 8 round head screws and washers using the grooves in the outer compartments of the base to facilitate drilling Ø6mm holes.
- Avoid over-tightening to permit thermal movement.
- The use of plastic caps over screw heads is recommended to protect installed cables.
- To cut the trunking, use a fine tooth blade (32/36tpi) or, preferably,a circular saw with a 350mm fine tungsten blade (90/108tpi). This will produce an edge requiring minimal de-burring.
- Consecutive lengths of base are aligned and butt jointed together.

#### Earthing

- Clean protective coating from base, covers and metallic fittings and then earth bond.
- Incoming earth connection is made using LTB1 bonding assembly installed in the earth channel of the base.
- Bonding base to base: in final ring or radial 32Amp circuits, bonding strap LBS1 can be used.
- Bonding covers and end caps to base: use bonding strap LBS2.

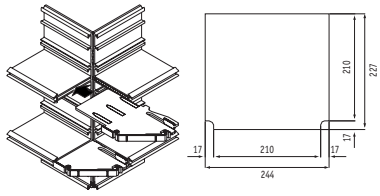


#### Single lengths

Where it is required to fit a single length of trunking (under 3 metres) between two inside walls and no accessory box is fitted, it is advisable to install a coupler in the centre of the run to facilitate the removal of the cover.

#### Joints and bends

- Moulded from colour-matching polycarbonate. External bends: base should be cut square at the corner and the internal segregator inserted into the web of each base.
- Internal bends: base must be mitred 45° to ensure total enclosure of trunking, including any internal fitted segregator.
- External moulded fittings overlap the joints by up to 10mm to cover cutting inaccuracies.




#### Bend radius control

The bend radius control fittings for Twin Plus provide a bend radius of 50mm

#### Accessory boxes

- If the accessory box is to be mounted in the alternative compartment to the supply, drill the main web adjacent to the box position.
- Remove the appropriate knock out and clip the box into the trunking base.
- For boxes in the same compartment as the supply, remove the appropriate box knock-outs and clip the box into trunking base.
- When boxes are installed consecutively, a 14mm wide spacer (ES1) is required to cover the space between the boxes.
- Part M box assemblies with contrasting coloured faceplates are available to meet the requirements of DDA regulations for Visual Impairment.

#### Covers

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.

#### Covers – fitting

Covers are clipped into place from the front. If accessory boxes are installed, the covers are butt-joined to the edge of the box. For the fitting of couplers to conceal the cover joint, a gap of 25mm is left between the two cover ends.

#### Covers – removal

To remove a cover, first detach a coupler, internal or external bend component to gain access. Both covers can then be gently eased off the base.

#### Screening

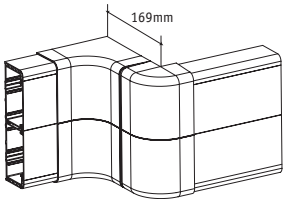
Aluminium containment will protect all internal circuits from external electromagnetic interference. For internal segregation and screening, use a screened dividing fillet.

#### Method of continuation through a partition wall

Continue the main lateral run of base through the partition wall with short lengths of cover fitted where the trunking passes through the partition. The partition wall trunking is then butted up to the main run and the joint covered by an Internal bend.

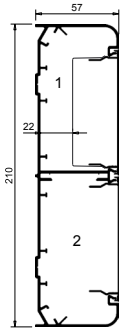
#### Offset dimensions

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



## Twin Plus aluminium – continued

### Dimensions




**Twin Plus trunking – with accessory box**

1 = 2733mm² total area
1 = 1230mm² 45% space factor
2 = 2833mm² total area
2 = 1275mm² 45% space factor

**Twin Plus trunking – no box**

1 = 5000mm² total area
1 = 2250mm² 45% space factor
2 = 5100mm² total area
2 = 2295mm² 45% space factor

### Cable capacities

- All calculations allow for a 45% space factor.

As there can be differences between data cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.

| Cable capacity chart | Compartment 1 | | Compartment 2 | |
|---|---|---|---|---|
| | No box | With box | No box | With box |
| PVC power cable 1.5mm² stranded copper | 281 | 154 | 287 | 159 |
| PVC power cable 2.5mm² stranded copper | 189 | 103 | 193 | 107 |
| PVC power cable 4.0mm² stranded copper | 136 | 74 | 138 | 77 |
| Data cable: Ø5.5mm | 95 | 52 | 96 | 54 |
| Data cable: Ø6.0mm | 80 | 43 | 81 | 45 |
| Data cable: Ø6.5mm | 70 | 38 | 71 | 40 |
| Data cable: Ø7.0mm | 58 | 32 | 60 | 33 |
| Data cable: Ø8.4mm | 41 | 22 | 41 | 23 |

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# XL trunking aluminium

## Material

Aluminium trunking is manufactured from high precision extruded aluminium with a powder coat finish.

Accessory boxes are supplied in PVC-U or polycarbonate both of which are 100% recyclable.

## Installation

### Positioning

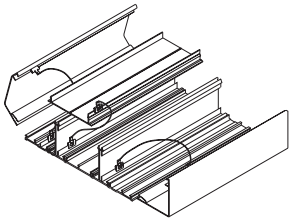
For dado and skirting installation. When used as a skirting system, sufficient clearance should be allowed between the floor covering and the profile fittings that clip over the cover i.e. 5mm + floor covering is recommended.

### Fitting

- Secure trunking base every 750mm.
- Secure using No 8 round head screws and washers using the grooves in the outer compartments of the base to facilitate drilling 6mm holes.
- Avoid over-tightening to permit thermal movement.
- The use of plastic caps over screw heads is recommended to protect installed cables.
- To cut the trunking, use a fine tooth blade (32/36tpi) or, preferably,a circular saw with a 350mm diameter fine tungsten blade (90/108tpi). This will produce an edge requiring minimal de-burring.
- Consecutive lengths of base are aligned and butt jointed together.

### Earthing

- Clean protective coating from base, covers and metallic fittings and then earth bond.
- Incoming earth connection is made using LTB1 bonding assembly installed in the earth channel of the base.
- Bonding base to base: in final ring or radial 32Amp circuits, bonding strap LBS1 can be used.
- Bonding covers and end caps to base: use bonding strap LBS2.

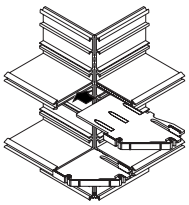


### Single lengths

Where it is required to fit a single length of trunking (under 3 metres)between two inside walls and no accessory box is fitted, it is advisable to install a coupler in the centre of the run to facilitate the removal of the cover.

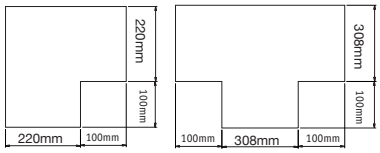
### Joints and bends

- Moulded from colour-matching polycarbonate.
- External bends: base should be cut square at the corner and the internal segregator inserted into the web of each base.



- Internal bends: base must be mitred 45° to ensure total enclosure of trunking, including any internal fitted segregator.
- Flat angles, tees and crossovers are prefabricated aluminium.
- External moulded fittings overlap the joints by up to 10mm to cover cutting inaccuracies.

### Template dimensions for Flat angle and Tee

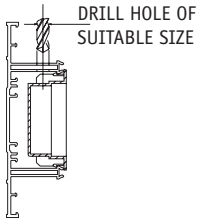



### Bend radius control

For data bend radius control fittings for XL, please contact the Technical Team on +44 (0)1424 856688.

### Accessory boxes

- If accessory box in main compartment is supplied from an outer compartment, drill the main web adjacent to the box position.
- Remove the appropriate knock out and clip the box into the trunking base.
- For boxes in the same compartment as the supply, remove the appropriate box knock-outs and clip the box into trunking base.
- When boxes are installed consecutively, a 14mm minimum space is required to cover the space between the boxes (use PVC-U ES1WH or use section of aluminium cover)
- Part M box assemblies with contrasting coloured faceplates are available to meet the requirements of DDA regulations for Visual Impairment.




### Covers

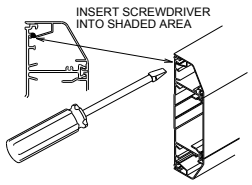
The covers have been designed to remain in position irrespective of impact during normal conditions, minor undulations of the mounting surface, and to limit unauthorised removal.

### Covers – fitting

Covers are clipped into place from the front. If accessory boxes are installed, the LTL1 covers are butt-joined to the edge of the box (ESSB1 and 2 only) and the cut edges of lids are subsequently concealed by the accessory. For fittings, a gap of 30mm is left between the two cover ends to permit the fitting to clip to the base.

### Covers – removal

To remove a cover, first detach a coupler, internal or external bend component to gain access. The main cover can then be gently eased off the base. To remove the outer cover, firstly ease from the base by inserting the blade of a terminal screwdriver between the captive legs of the cover and the base and then peel off.

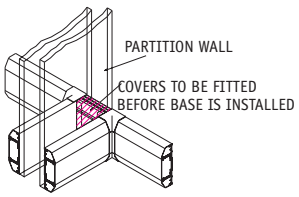



### Screening

Aluminium containment will protect all internal circuits from external electromagnetic interference. For internal segregation and screening, use a screened dividing fillet.

### Method of continuation through a partition wall

Continue the main lateral run of base through the partition wall with short lengths of cover fitted where the trunking passes through the partition. The partition wall trunking is then butted up to the main run and the joint covered by an Internal bend. (as shown below)

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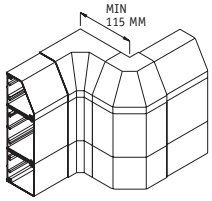
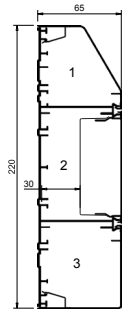
## XL trunking aluminium – continued

### Offset dimensions

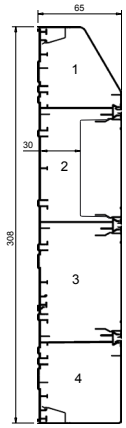
The minimum set that can be accommodated in the same plane (from internal to external bend), is shown below.




## Dimensions




XL 302




XL 312

### XL 302 – no box

1 = 2680mm² total area
1 = 1206mm² 45% space factor
2 = 4639mm² total area
2 = 2087mm² 45% space factor
3 = 3490mm² total area
3 = 1570mm² 45% space factor

### XL 302 – with box

2 = 1123mm² total area
2 = 505mm² 45% space factor

### XL 312 – no box

1 = 2680mm² total area
1 = 1206mm² 45% space factor
2 = 4639mm² total area
2 = 2087mm² 45% space factor
3 = 4570mm² total area
3 = 2056mm² 45% space factor
4 = 3490mm² total area
4 = 1570mm² 45% space factor

### XL 312 – with box

2 = 2323mm² total area
2 = 1045mm² 45% space factor
3 = 2254mm² total area
3 = 1014mm² 45% space factor

## Cable capacities

- All calculations allow for a 45% space factor.

As there can be differences between data cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.

| Cable capacity chart | Compartment 1 | | Compartment 2 | | Compartment 3 | | Compartment 4 |
|---|---|---|---|---|---|---|---|
| | No box | With box | No box | With box | No box | With box | No box |
| **PVC power cable 1.5mm² stranded copper** | | | | | | | |
| XL 301 | 151 | – | 261 | 63 | 156 | - | - |
| XL 302 | 151 | – | 261 | 63 | 196 | - | - |
| XL 303 | 191 | – | 261 | 63 | 196 | - | - |
| XL 311 | 151 | – | 261 | 131 | 257 | 127 | 156 |
| XL 312 | 151 | – | 261 | 131 | 257 | 127 | 196 |
| XL 313 | 191 | – | 261 | 131 | 257 | 127 | 196 |
| **PVC power cable 2.5mm² stranded copper** | | | | | | | |
| XL 301 | 101 | – | 175 | 42 | 105 | - | - |
| XL 302 | 101 | – | 175 | 42 | 132 | - | - |
| XL 303 | 128 | – | 175 | 42 | 132 | - | - |
| XL 311 | 101 | – | 175 | 88 | 173 | 85 | 105 |
| XL 312 | 101 | – | 175 | 88 | 173 | 85 | 132 |
| XL 313 | 128 | – | 175 | 88 | 173 | 85 | 132 |
| **PVC power cable 4.0mm² stranded copper** | | | | | | | |
| XL 301 | 73 | – | 126 | 30 | 75 | - | - |
| XL 302 | 73 | – | 126 | 30 | 95 | - | - |
| XL 303 | 92 | – | 126 | 30 | 95 | - | - |
| XL 331 | 73 | – | 126 | 63 | 124 | 61 | 75 |
| XL 312 | 73 | – | 126 | 63 | 124 | 61 | 95 |
| XL 313 | 92 | – | 126 | 63 | 124 | 61 | 95 |
| **Data cable: Ø5.5mm** | | | | | | | |
| XL 301 | 51 | – | 88 | 21 | 53 | - | - |
| XL 302 | 51 | – | 88 | 21 | 66 | - | - |
| XL 303 | 64 | – | 88 | 21 | 66 | - | - |
| XL 311 | 51 | – | 88 | 44 | 86 | 43 | 53 |
| XL 312 | 51 | – | 88 | 44 | 86 | 43 | 66 |
| XL 313 | 64 | – | 88 | 44 | 86 | 43 | 66 |
| **Data cable: Ø6.0mm** | | | | | | | |
| XL 301 | 43 | – | 74 | 18 | 44 | - | - |
| XL 302 | 43 | – | 74 | 18 | 55 | - | - |
| XL 303 | 54 | – | 74 | 18 | 55 | - | - |
| XL 331 | 43 | – | 74 | 37 | 73 | 36 | 44 |
| XL 312 | 43 | – | 74 | 37 | 73 | 36 | 55 |
| XL 313 | 54 | – | 74 | 37 | 73 | 36 | 55 |
| **Data cable: Ø6.5mm** | | | | | | | |
| XL 301 | 37 | – | 65 | 16 | 39 | - | - |
| XL 302 | 37 | – | 65 | 16 | 49 | - | - |
| XL 303 | 47 | – | 65 | 16 | 49 | - | - |
| XL 311 | 37 | – | 65 | 32 | 64 | 32 | 39 |
| XL 312 | 37 | – | 65 | 32 | 64 | 32 | 49 |
| XL 313 | 47 | – | 65 | 32 | 64 | 32 | 49 |
| **Data cable: Ø7.0mm** | | | | | | | |
| XL 301 | 31 | – | 54 | 13 | 32 | - | - |
| XL 302 | 31 | – | 54 | 13 | 41 | - | - |
| XL 303 | 40 | – | 54 | 13 | 41 | - | - |
| XL 311 | 31 | – | 54 | 27 | 53 | 26 | 32 |
| XL 312 | 31 | – | 54 | 27 | 53 | 26 | 41 |
| XL 313 | 40 | – | 54 | 27 | 53 | 26 | 41 |
| **Data cable: Ø8.4mm** | | | | | | | |
| XL 301 | 22 | – | 38 | 9 | 23 | - | - |
| XL 302 | 22 | – | 38 | 9 | 28 | - | - |
| XL 303 | 28 | – | 38 | 9 | 28 | - | - |
| XL 311 | 22 | – | 38 | 19 | 37 | 18 | 23 |
| XL 312 | 22 | – | 38 | 19 | 37 | 18 | 28 |
| XL 313 | 28 | – | 38 | 19 | 37 | 18 | 28 |

# Steel trunking Series 130 and Series 170

## Material

Steel trunking is manufactured from pre-galvanised steel with a powder coat finish to RAL 9010.

## Installation

### Positioning

- System 130: suitable for dado installation.
- System 170: suitable for dado and skirting installation.

When used as a skirting system, sufficient clearance should be allowed between the floor covering and the profile fittings that clip over the cover i.e. 5mm + floor covering is recommended.

### Fitting

- Secure trunking base every 750mm.
- Secure using No 8 round head screws and washers using the grooves in the outer compartments of the base to facilitate drilling 6mm holes.
- Avoid over-tightening to permit thermal movement.
- The use of plastic caps over screw heads is recommended to protect installed cables.
- To cut the trunking, use a fine tooth blade (32/36tpi) or, preferably,a circular saw with a 350mm fine tungsten blade (90/108tpi). This will produce an edge requiring minimal de-burring.
- Consecutive lengths of base are aligned and butt jointed together using the coupling/bonding set.

### Earthing

- Trunking base, main fittings and accessories are fitted with earth connections.
- Bonding base to fittings: use coupling/ bonding set or wire between fitted earth connections.
- Bonding base to cover: covers have pressed out side grippers which automatically establish earth contact when pressed into trunking base.
- Bonding base to end caps: use bonding strap LBS3.

### Single lengths

Where it is required to fit a single length of trunking (under 3 metres) between two inside walls and no accessory box is fitted, it is advisable to install a coupler in the centre of the run to facilitate the removal of the cover.

### Joints and bends

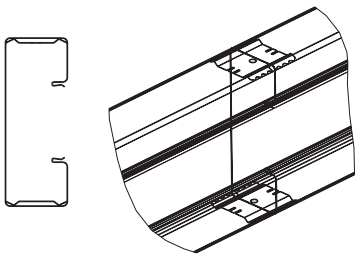
- Base joints should be aligned and butt jointed together.
- Internal and external bends, flat angles and tees are prefabricated in steel, aligned and butt jointed to the base using coupling bonding sets.
- Clip-on external tolerance sleeve overlaps the joints to cover minor inaccuracies.

### Screening

Steel containment protects internal circuits from external electromagnetic interference. For internal segregation and screening, use the steel dividing fillet 351189.

### Internal coupling/bonding set

- Comprises of two identical parts.
- Insert both parts into end of one length of trunking. Slide next section of base onto couplers and fix into position.



### Accessory boxes

Standard depth 40mm

Remove the appropriate box knockout and clip each side of the box into the trunking base.

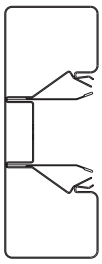
When boxes are installed consecutively, use cover spacer WG01085 between adjacent boxes.

### Dividing fillet

Dividing fillet 351189 is supplied in 1 metre lengths. It is held in place through using the universal multi-purpose clip. A minimum of 3 clips are required to hold 2 lengths of the dividing fillet in place.

The trunking can be divided into up to 3 compartments using the dividing fillet.

Please refer to element 3 of the diagram on page 204.



### Covers

Covers are designed to limit unauthorised removal and to remain in position during normal conditions irrespective of impact and minor undulations of the mounting surface.

### Covers – fitting

Covers are clipped into place from front. If accessory boxes are installed, covers are butt-joined to the edge of the box (RSSB10WH end RSSB20WH). Cover lengths are determined so that ends are covered by a fitting or accessory. External bends and flat angles should be fitted with the correct bend/flat angle cover.

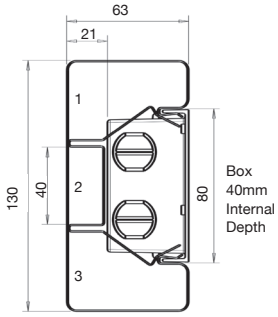
### Covers – removal

To remove a cover, first detach an external joint cover or accessory to gain access. The main cover can then be gently eased off the base.

## Steel trunking Series 130 and Series 170 – continued

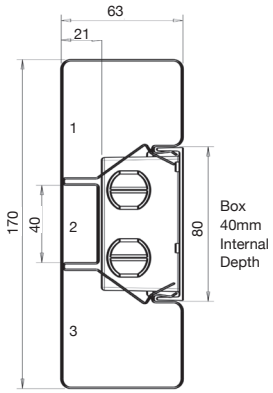
### Dimensions

**System 130 trunking**
**130 x 63mm**




Compartments 1 & 3 = 1585mm² (each) total area
Compartments 1 & 3 = 760mm² (each) 45% space factor
Compartment 2 = 713mm² total area (with box)
Compartment 2 = 342mm² 45% space factor (with box)

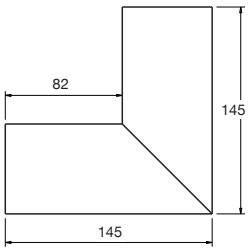
**System 170 trunking**
**170 x 63mm**



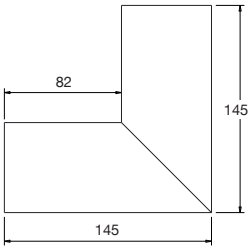

Compartments 1 & 3 = 2812mm² (each) total area
Compartments 1 & 3 = 1265mm² (each) 45% space factor
Compartment 2 = 760mm² total area (with box)
Compartment 2 = 342mm² 45% space factor (with box)

**Template dimensions for angles, tees and bends**

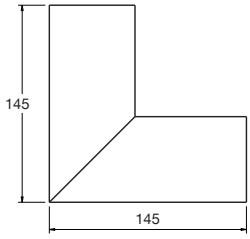
**System 130 external bend**



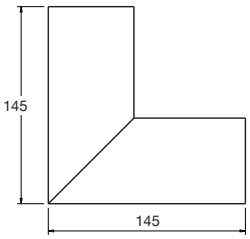

**System 170 external bend**



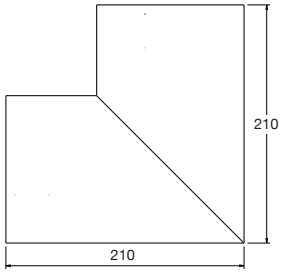

**System 130 internal bend**



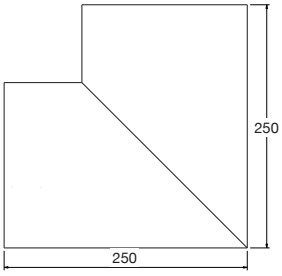

**System 170 internal bend**



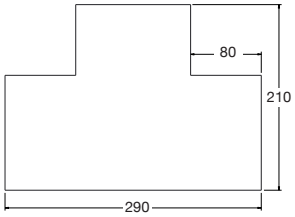

**System 130 flat angle**



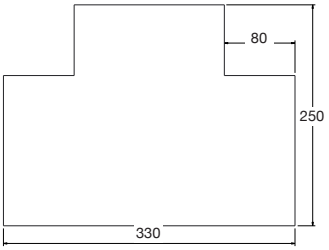

**System 170 flat angle**




**System 130 flat tee**




**System 170 flat tee**

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## Cable capacities

- All calculations allow for a 45% space factor.

As there can be differences between data cable sizes, Marshall-Tufflex recommend that cable dimensions are confirmed with the manufacturing company.

| Cable capacity chart | Compartment 1 Systems 130 & 170 | | Compartment 2 Systems 130 & 170 | | Compartment 3 Systems 130 & 170 | |
|---|---|---|---|---|---|---|
| | No box | With box | No box | With box | No box | With box |
| **PVC power cable 1.5mm² stranded copper** | | | | | | |
| System 130 | 89 | – | – | 40 | 89 | – |
| System 170 | 158 | – | – | 43 | 158 | – |
| **PVC power cable 2.5mm² stranded copper** | | | | | | |
| System 130 | 60 | – | – | 27 | 60 | – |
| System 170 | 106 | – | – | 29 | 106 | – |
| **PVC power cable 4.0mm² stranded copper** | | | | | | |
| System 130 | 43 | – | – | 19 | 43 | – |
| System 170 | 76 | – | – | 21 | 76 | – |
| **Data cable: Ø5.5mm** | | | | | | |
| System 130 | 30 | – | – | 13 | 30 | – |
| System 170 | 53 | – | – | 14 | 53 | – |
| **Data cable: Ø6.0mm** | | | | | | |
| System 130 | 25 | – | – | 11 | 25 | – |
| System 170 | 45 | – | – | 12 | 45 | – |
| **Data cable: Ø6.5mm** | | | | | | |
| System 130 | 22 | – | – | 10 | 22 | – |
| System 170 | 39 | – | – | 11 | 39 | – |
| **Data cable: Ø7.0mm** | | | | | | |
| System 130 | 19 | – | – | 8 | 19 | – |
| System 170 | 33 | – | – | 9 | 33 | – |
| **Data cable: Ø8.4mm** | | | | | | |
| System 130 | 13 | – | – | 6 | 13 | – |
| System 170 | 23 | – | – | 6 | 23 | – |

| Conductor type | Size | Cable factor |
|---|---|---|
| Stranded PVC power | 1.5mm² | 8.0 |
| Stranded PVC power | 2.5mm² | 11.9 |
| Stranded PVC power | 4.0mm² | 16.6 |
| *Data cable | Ø5.5mm | 23.8 |
| *Data cable | Ø6.0mm | 28.3 |
| *Data cable | Ø6.5mm | 33.2 |
| *Data cable | Ø7.0mm | 38.5 |
| *Data cable | Ø8.4mm | 55.4 |

To determine cable capacity, select the size of the cable required and its corresponding cable factor from the table. Divide the compartment area figure (with or without 45% space factor) with the cable factor figure to achieve cable capacity.

For Data cable information, please see page 246

# PVC-U Conduit

## Material

PVC-U is flame retardant and self-extinguishing. It provides a 100% recyclable material with good sustainability.

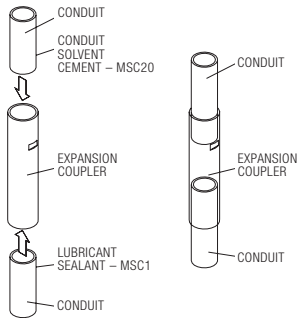
## Installation

### Fitting

- Secure horizontal runs of conduit at a maximum distance of 0.9m.
- Secure vertical runs of conduit at a maximum of 1.2m.
- In areas of high ambient temperature or where rapid changes in temperature are likely, these distances should be reduced.
- Where there are fittings or directional changes, the conduit should be secured approximately 150mm either side to maintain support.
- Avoid over-tightening to permit thermal movement.

### Joints and couplers

- To accommodate thermal movement on surface installations, it is recommended that expansion couplers be used at a maximum distance of 6m intervals.
- In areas of high ambient temperature or where rapid changes in temperature are likely, this distance should be reduced.
- To install an expansion coupler, coat the inside of the short side with solvent cement (MSC) and push firmly over the conduit down to the stop point.
- Slide the next length of conduit into the long side of the coupler until mid-way to the stop point. DO NOT GLUE INTO PLACE. This will permit expansion or contraction of the conduit, providing it is free to move in the saddles.




### Bends

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

Cold bending may be carried out on all conduit sizes up to 25mm in diameter using the correct size and gauge of bending spring.

- Heavy gauge spring is colour-banded green at the tip.
- Light gauge spring is colour-banded white at the tip. Springs are not interchangeable.
- Make sure springs are not damaged in any way as this can fracture or kink the conduit making removal of the spring difficult.
- In cold weather, warm the conduit by rubbing with a rag before bending.

To bend the conduit:

- Insert the spring to the desired position, grip the conduit on either side of bend and bring slowly together to form the bend.
- Cold bending of 20mm and 25mm conduit should be done with correct / undamaged spring inserted and bent over knee to initiate bend. Spring should remain inserted until the desired angle is achieved. (Under no circumstance should bends be increased or decreased without correct spring inserted)

  Failure to follow above procedure could increase possibility of product failure
- Make the bend more acute than necessary to allow for PVC-U to 'recover' after bending.
- To remove the spring, twist anti-clockwise (to reduce its diameter) whilst turning the conduit clockwise and gently pulling the conduit and the spring apart.
- If spring fails to release, do not pull too hard or damage to the spring may occur.
- Repeat the removal procedure until they come apart.
- The conduit should then be fastened into position to prevent further 'recovery' of the bend.

### Hot bending

Hot bending should be carried out on all conduit sizes over 25mm in diameter using the correct size and gauge of bending spring.

To bend the conduit:

- Insert the spring to the desired position as described in 'cold bending', gently heating conduit with a hot air torch, hot water or by other suitable means.
- Avoid direct application of flame to the conduit. When the conduit is in a pliable state, slowly bend around a suitable former, holding in position for about 1 minute until set.
- Remove the spring, twist anti-clockwise (to reduce its diameter) whilst turning the conduit clockwise and gently pulling the conduit and the spring apart.
- If the conduit is bent too fast or, in the case of light gauge conduit, across the knee, there is a risk of damage to conduit and spring. 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.

### Joint sealant

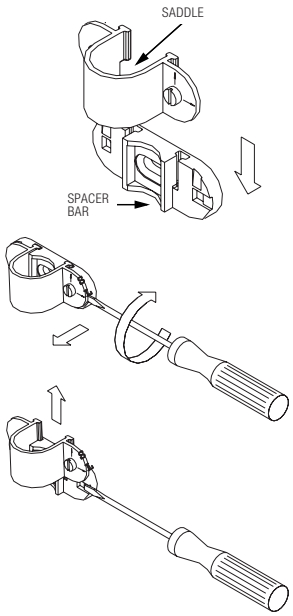
- Solvent cement MSC is a slow acting solvent cement especially formulated for watertight conduit fittings.

In accordance with COSHH Regulations, details of our solvents are entered in The National Poison Centre computer records. Health & Safety data sheets are available from our Technical Team or on the technical page of the Marshall-Tufflex website: **www.marshall-tufflex.com**

### Spacer bar snap saddle

- Slide saddle into groove until it locks into the spacer bar.
- To dismantle, insert 4mm blade screwdriver into slot on side. Twist screwdriver to release the saddle in the spacer bar groove.

If conduit is installed in a corner, ensure that the spacer bar snap saddle is fitted with release mechanism facing away from corner.

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Product Information

# MT Supertube

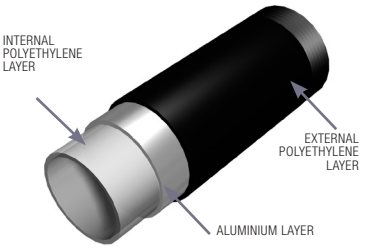
## General information

MT Supertube provides LS0H polyethylene-coated aluminium cable protection for installation where halogen free products are a requirement.

## Material

**Conduit:** A seamless aluminium tube sandwiched between two layers of extruded LS0H polyethylene.

**Fittings:** LS0H polycarbonate or cast metal with paint finish. (black or white).

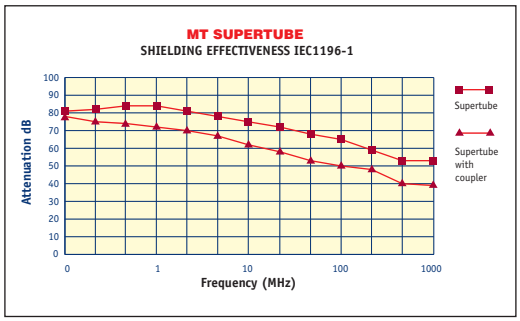



### Shielding effectiveness

Shielding effectiveness (attenuation in dB) measures the ratio between the external environment field strength and the field strength after passing through any material. This is recorded in a logarithmic scale.

| Shielding effectiveness | |
|---|---|
| Attenuation in dB | Field strength reduction |
| 6 | 2 |
| 20 | 10 |
| 40 | 100 |
| 60 | 1000 |
| 80 | 10000 |

MT Supertube multi layer conduit systems absorbs and reflect emitted radiation from sources of interference, where an attenuation of 80dB would reduce the resultant field within MT Supertube by a factor of 10,000. (See tables.)




The graphs above show that the shielding effectiveness of MT Supertube is highly effective throughout the entire frequency range and will provide protection from interference for data, telecoms and signal cables.

| Mechanical | | MT Supertube & MT Supertube FR | MT Supertube & MT Supertube FR |
|---|---|---|---|
| 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 | |

| Mechanical | MT Supertube | MT Supertube FR |
|---|---|---|
| Electrical breakdown resistance | 20,000 V | 20,000 V |
| Temperature range °C | -45 +120 | -45 +289 |
| Thermal expansion coefficient | 2.0 x 10-6mm/m/K | 2.0 x 10-6mm/m/K |
| Thermal conductivity | 0.45 W (mK) | 0.45 W (mK) |
| Earth bonding/continuity test results | <0.05 Ω | <0.05 Ω |
| Standards | EN 61386-21 | EN 61386-21 |
| | IEC 601196-1 | IEC 601196-1 |

WARNING NAIL PENETRATION: MT Supertube FR Plus complies with requirements for BS 7671, BS 8436 and BS EN 61386. Screening to ENIEC 1196-1.

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## Installation

### Conduit

MT Supertube can be shaped and slow bends formed by hand but care needs to be taken to avoid kinking.

For tighter radius bends use compact hand bender or inspection elbows and bends.

### Fittings

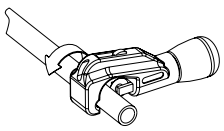
**1. For EMC screening system**

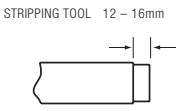
a. Cut the tube squarely to the required length (Tool No. 20001).

b. Remove 12-16mm of insulation, taking care not to cut the aluminium layer (Tool No. 20002).

c. Push conduit firmly into fitting and secure using screw located in spout.

d. Fasten tube with a saddle within 150mm of spout.





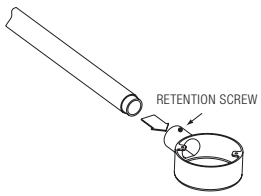

**2. For halogen free system**

a. Cut the tube squarely to the required length. (Tool no. 20001.)

b. Apply sealant (20006) to the end of the tube.

c. Push the tube firmly into the fitting spout.

d. Fasten tube with a saddle within 150mm of spout.



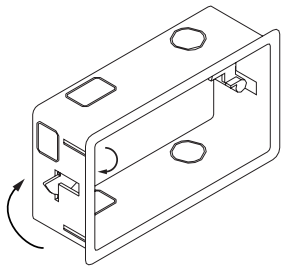

## MT Supertube FR Plus performance

| Fire Performance | | | | |
|---|---|---|---|---|
| Oxygen Index | BS EN ISO 4589-2 | | 46.5% | |
| Flammability Temperature | BS EN ISO 4589-3 | | 289°C | |
| (Temperature Index) | Annex A | | | |
| Elemental composition | Lassaigne Sodium | Nitrogen | Negative | |
| | | Fusion | Chloride | Negative |
| | | | Bromide | Negative |
| | | | Fluoride | Negative |
| | | | Sulphur | Negative |
| Smoke Density | Low Smoke | | | |

| Conduit Performance (BS EN 50086.1.2) | |
|---|---|
| Cold temperature impact test | Heavy gauge performance |
| Compression | Low compression |
| Resistance to flame propagation | Pass |

# Accessory boxes and enclosures

## Square and rectangular dry lining accessory boxes



### Installation

#### Fitting

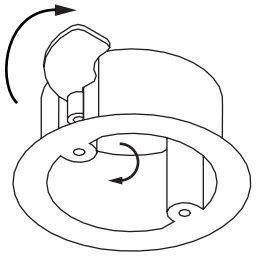
- Choose correct box for application and board depth and cut relevant size aperture in board for box (see table).
- Board should have sufficient strength to support the accessory.
- Remove knockout(s) and pass cables into box. Insert box into aperture and swivel out lugs using internal fins (if fitted) to hold box in position.
- Terminate accessory and, using accessory fixing screws, draw in the lugs, clamping box securely to the board.
- 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 |
| Black | 9 – 26mm |

### Cut out dimensions

| Box type | Cut out size |
|---|---|
| 1 gang | 73 x 73mm |
| 2 gang | 135 x 73mm |
| Dual gang | 157 x 73mm |

## Circular dry lining accessory boxes



- Choose correct box for application and board depth and cut relevant size aperture in board for box (see table).
- Board should have sufficient strength to support the accessory.
- Remove knockout(s) and pass cables into box. Insert box into aperture and swivel out lugs using internal fins, if fitted, to hold box in position.
- Terminate accessory and, using accessory fixing screws, draw in the lugs, clamping box securely to the board.

| Lug Colour | Type |
|---|---|
| White | Single entry box |
| Red | Dual entry box |

**Note: Ceiling mounted circular boxes can support 3kg centrally at 60°C maximum subject to ceiling construction.**

- For easy identification the lugs are colour-coded to denote type of box:

| | Dual entry |
|---|---|
| Board thickness | 9-32mm |
| Entry | Ø20mm x2 off KO |
| Aperture size | Ø70.0mm |
| Internal depth | 34mm |
| Fixing centres | M4.0 x 50.8mm<br>M3.5 x 60.3mm |

## Moulded enclosures Adaptable boxes

Adaptable boxes as supplied, have a degree of IP66 protection. Any openings that are drilled or cut the box body and are not sealed with appropriate IP66 components or a failure to use the silicon rubber seal fitted, will negate the IP66 rating.

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# Power, voice and data accessories

## General

MT32 13Amp pre-wired sockets, Marshall-Tufflex BS 1363 power assemblies and voice and data boxes for Marshall-Tufflex PVC-U and aluminium trunking systems (except Sovereign Plus and steel systems) Trunking accessory mounting boxes.

## Installation

### MT32 pre-wired socket range

#### Fitting

- Plug in incoming pre-wired lead (from previous socket or distribution board) to appropriate connector mounted in socket assembly box.
- Connect selected pre-wired lead to outgoing connector mounted on opposite side of socket assembly box.
- Clip complete assembly into trunking compartment.
- When trunking cover is fitted, it should be slid between back box frame and the loosened accessory face plate.
- Front plate is then fully tightened down to clamp accessory in place.
- For pre-made close coupled assemblies, use lid spacer (ES1WH) between boxes.

### MT32 system with non-Marshall-Tufflex socket assemblies

#### Fitting

- For non-Marshall-Tufflex accessories, use pre-assembled outlet box unit.
- Connect cable tails to accessory in accordance with wiring regulations and fit accessory to back box.
- Connect pre-wired incoming and outgoing leads and fit to trunking (as above).
- For close coupled assemblies, use lid spacer (ES1WH) between boxes.

### Marshall-Tufflex BS 1363 power assemblies (sockets, switches, spur units)

#### Fitting

- Remove front cover from assembly.
  - Front fix accessories: remove the two securing screws
  - Flush finish accessories: unclip from back box.
- Remove appropriate knockout/s for wiring.
- Wire according to wiring regulations.
- Re-assemble accessory and re-fit face plate.
- Clip complete assembly into trunking compartment.
- For close coupled assemblies, use lid spacer (ES1WH) between boxes.

### Voice and data outlet modules (punched 6c 22 x 37mm apertures to accept appropriate voice or data outlets)

#### Fitting

- Remove front cover from assembly.
  - Front fix accessories: remove the two securing screws.
  - Flush finish accessories: unclip from back box.
- Fit appropriate voice or data outlets.
- Wire according to manufacturer's instructions.
- Re-fit face plate.
- Clip complete assembly into trunking compartment.
- For close coupled assemblies, use lid spacer (ES1WH) between boxes.

### Trunking accessory boxes for mounting standard BS 1363 wiring accessories and Data plates

#### Standard boxes

- 1 gang fixing centres: 60.3mm
- 2 gang fixing centres: 120.6mm
- Depth: 30mm

#### Fitting

- Remove appropriate knockouts.
- Feed cables through knockout.
- Wire to accessory in accordance to wiring regulations and manufacturer's instructions.
- Screw accessory to box.
- Clip complete assembly into trunking compartment.

#### Adjustable boxes – two part

- 1 gang fixing centres: 60.3mm
- 2 gang fixing centres: 120.6mm
- Depth: 32 - 50mm

#### Fitting

- Remove appropriate knockouts.
- Feed cables through knockout.
- Wire to accessory in accordance to wiring regulations and manufacturer's instructions.
- Screw accessory to box front frame.
- Press (ratchet) both components together until required final box depth is reached.
- Clip complete assembly into trunking compartment.

#### Screening

- Boxes available with copper spray screening to protect data outlets from electromagnetic interference.

#### Part M boxes and box assemblies

- Comply with the requirements of Part M (DDA)
- Odyssey coloured boxes (DD1510 and DD1520) with coloured flanges to contrast with trunking cover colour.
- ESPM box assemblies with contrasting coloured flush accessory box frames. For colour varieties please view the perimeter trunking pages.

## Adjustable accessory box depth by product range

| | Maximum adjustment range | Page Reference |
|---|---|---|
| **PowerPoles and PowerPosts** | | |
| Series 1 and 2 | 32 - 40mm | 94 |
| **PVC-U Perimeter Trunking** | | |
| Mono 10 | 32 - 40mm | 109 |
| Compact 1 | 32 - 40mm | 115 |
| Compact 2 | 32 - 40mm | 117 |
| Compact 3 | 32 - 40mm | 119 |
| Mono Plus 20 | 32 - 40mm | 111 |
| Mono Plus 30 | 32 - 40mm | 113 |
| Twin165 | 32 - 47mm | 149 |
| Sterling Profile 1 - 3 | 32 - 45mm | 122 |
| Sterling Curve | 32 - 40mm | 128 |
| Odyssey | 32 - 40mm | 106 |
| Twin Plus | 32 - 47mm | 151 |
| Sterling Profile 4 - 13* | 32 - 45mm | 134 |
| XL Trunking 201 - 203 | 32 - 47mm | 141 |
| XL Trunking 211 - 213 | 32 - 47mm | 145 |
| **PVC-U Trunking** | | |
| Bench Trunking | 32 - 47mm | 173 |
| **Aluminium Trunking** | | |
| Bench Trunking | 32 - 47mm | 199 |
| Elegance 110 | 32 - 40mm | 180 |
| Elegance 170 | 32 - 40mm | 182 |
| Sterling Profile 3001 - 3003 | 32 - 40mm | 184 |
| Twin Plus | 32 - 47mm | 196 |
| XL Trunking 301 - 303 | 32 - 47mm | 188 |
| XL Trunking 311 - 313 | 32 - 47mm | 192 |

*Sterling Profile 4 - 13
The EAB1/2 can be adjusted to 45mm in the main compartment only. Where the EBE1 Base Extension is used the maximum adjustment achievable is 40mm

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## Callmaster fire and security systems

### Material

PVC-U is flame retardant and self extinguishing. It provides a 100% recyclable material with good sustainability. It complies with the requirements of BS 4761 Parts 6 and 7 and BS 4678. The Callmaster system is designed to comply with BS 7671:2008.

### Installation

- Select Terminal or through box to suit installation.
- If a terminal box is used, fit the blanking plate to unused entry.
- Depending upon circuit wiring, select MIC internal Pot retainer or cable Fibre clamp. Both components are suitable for single for single or twin cable runs.
- Insert one half of the retainer/clamp into the surface box (from the rear) and secure box to the wall.
- Lay in MIC or cable and secure in position with top half of retainer/clamp – fit Mini adaptor.
- Terminate wiring to accessory and fit to box.

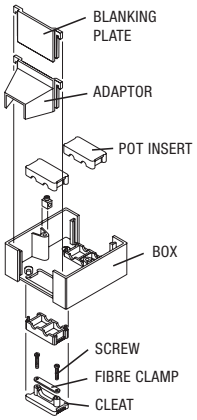
### Boxes

**Dimensional data for square boxes**

- Overall: 87 x 87mm
- Depth: 38mm external; 35mm internal
- Fixing centres: 60.3mm
- Pot size: Ø15mm

**Dimensional data for circular boxes**

- Overall diameter: 123mm excluding adaptors
- Depth: 28mm external; 24mm internal
- Dual fixing centre: 50.8 and 60.3mm
- Pot size: Ø15mm

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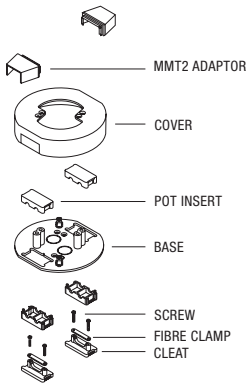
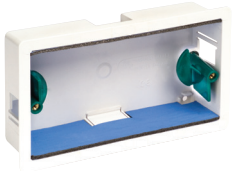
**Mini trunking additional adaptors**




## Intumescent (fire barrier) pads

Marshall-Tufflex dry lining boxes are available with intumescent (fire barrier) pads to comply with the requirements of BS 7671:2008 IEE Wiring Regulations and Document B of the UK Building Regulations.



## Firefly Fire Clips

### Standards

Compliant with the general principles of BS 5839-1:2013 Section 26.2d when independently tested.

### Installation

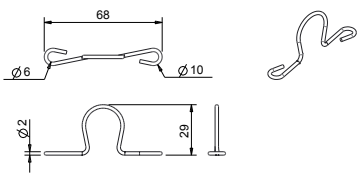
Vertical spacing – Use 400mm spacing

Horizontal spacing – Use 600mm spacing, except over doors and other openings which should be 300mm spacing.

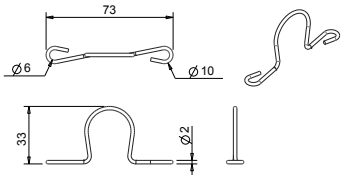
A qualified electrician must select the correct screw fixing for the substrate to comply with BS 7671 Amendment 3. These must be used with the correct drill size.

## Dimensions

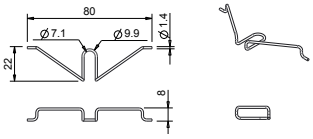
**FCCR20**



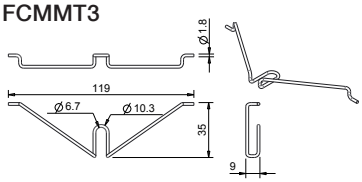

**FCCR25**



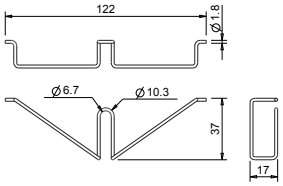

**FCMMT2**



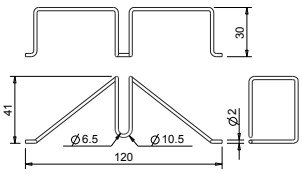

**FCMMT3**



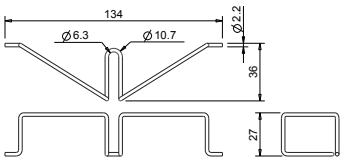

**FCMMT4**



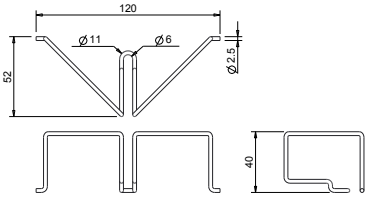

**FCMMT5**



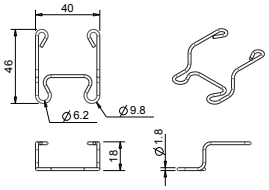

**FCMMT6**



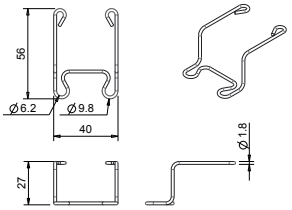

**FCMTRS50**




**FCXMMT2**




**FCXMMT4**



# Bio trunking

## General information

Certain microbial organisms are harmful to people and can proliferate, via surfaces, to spread infection and disease. We have a responsibility to control such organisms wherever possible, particularly in environments such as hospitals, care homes, medical units, surgeries, schools, sports and health centres.

Microbial organisms can also case product deterioration, discolouration and bad odours and antimicrobial treatments help to prevent these effects.

Marshall-Tufflex antimicrobial Bio trunking incorporates silver ions with the PVC-U compound, providing integral antimicrobial protection that prevents 99.9% of harmful bacteria growth.

## Material – PVC-U

PVC-U is flame retardant and self-extinguishing. It provides a 100% recyclable material with good sustainability. It complies with the requirements of BS 4761 Parts 6 and 7, BS 4678 and BS 7671:2008.

## Material – silver ion additive

Silver ions have been proven to exert recognised bactericidal effect. When incorporated within materials such as PVC-U, silver is toxic to multiple components of bacterial cell metabolism, damaging the cell wall and membrane permeability.

## Installation

For technical information on installation of all PVC-U Bio trunking systems, please refer to the relevant technical pages of PVC-U Perimeter trunking systems starting on page 269.

# PVC Material Test Results

**LABORATORY** Anti-Microbial Test Division, Kyoto Biseibutsu Kenkyusyo, Yamashina-ku, Kyoto 607-8482, Japan
**TEST ORGANISM** MRSA (Methicillin Resistant Staphylococcus aureus) Escherichia coli
**STANDARD** ISO 22196 / JIS Z 2801:2000

| Quantitative Assessment of Activity - MRSA (Methicillin Resistant Staphylococcus aureus) | | | | |
|---|---|---|---|---|
| | Number of live organisms (Colony Forming Units) | | % reduction of Colony Forming Units, expressed as comparison with control | |
| | 0 hours | 24 Hours | | |
| Control - Untreated polyethylene film | 110,000 | 96,000 | – | – |
| PVC | 110,000 | <10 | >99.98% Reduction | VERY GOOD |

| Quantitative Assessment of Activity - Escherichia coli | | | | |
|---|---|---|---|---|
| | Number of live organisms (Colony Forming Units) | | % reduction of Colony Forming Units, expressed as comparison with control | |
| | 0 hours | 24 Hours | | |
| Control - Untreated polyethylene film | 110,000 | 14,000,000 | – | – |
| PVC | 110,000 | <10 | >99.99992% Reduction | EXCELLENT |

# ABS Material Test Results

**LABORATORY** Thomson Research Associates Inc., Ontario, Canada
**TEST ORGANISM** Klebsiella pneumonia, Staphylococcus aureus
**STANDARD** ISO 22196 / JIS Z 2801:2000

| Quantitative Assessment of Activity - K. pneumoniae | | | | |
|---|---|---|---|---|
| Concentration of starting inoculum | | 1.92 x 105 | | |
| Sample Description | No. Bacteria Recovered | Log Value | R=[log(B/C)] | % Reduction |
| Inoculum Control | $8.39 \times 10^6$ | 6.9 | – | – |
| ABS | $<2.00 \times 10^1$ | <1.3 | >5.6 | >99.9% |

| Quantitative Assessment of Activity - S. aureus | | | | |
|---|---|---|---|---|
| Concentration of starting inoculum | | 1.92 x 105 | | |
| Sample Description | No. Bacteria Recovered | Log Value | R=[log(B/C)] | % Reduction |
| Inoculum Control | 1.00 x 106 | 6.0 | – | – |
| ABS | 1.04 x 102 | 2.0 | 4.0 | >99.9% |

## Aluminium systems

## Material

Aluminium is a high quality material which is light to handle but with excellent mechanical strength and impact-resistance. Aluminium provides inherent LS0H properties and first class screening performance, especially in high frequencies.

## XL Aluminium trunking

### Installation

For all technical information on XL Aluminium trunking, please refer to pages 286 and 287 of the Aluminium perimeter trunking section. All information on those pages is relevant with the following additions:

#### Positioning

For dado installation only.

#### Gas outlets

Covers for gas mounting plates EEBH05 (1 gang), EEBH04 (2 gang) and EEBH03 (3 gang) are pre-punched to accept gas outlets and can be used with XL trunking.

#### Light fittings

Pre-cut covers to accept external lighting mountings are available on request. For more information please contact the Technical Team on +44 (0)1424 855688.

**Please note:** in the general installation instructions for XL Aluminium trunking, polycarbonate fittings are shown as an option but these would not generally be used within a healthcare environment.