

LP LOW Power range

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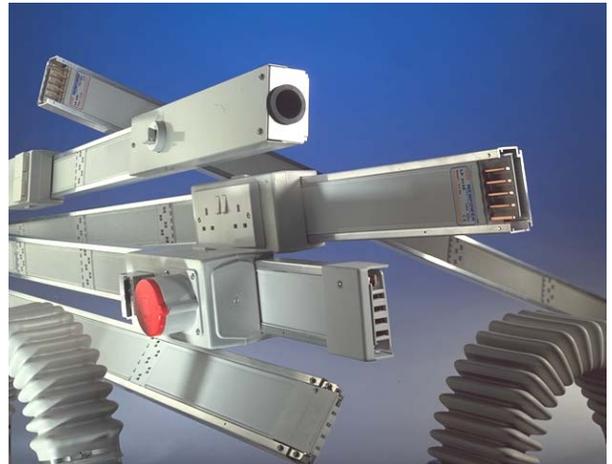
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System range

Power trunking up to **125A** rated current on a **415V**max 3-phase supply in a **5-pole** configuration.

Single-pole tap-off units rated up to **32 A** at 240Vmax 1-phase (SP&N+PE). Options: Outgoing circuit protective device – MCB, RCD or RCBO; BS4343 industrial socket outlet +MCB; BS1363 twin 13A socket outlet.

Triple-pole tap-off units rated up to **32 A** at 415V 3-phase (TP&N+PE). Options: Outgoing circuit protective device – MCB; BS4343 industrial socket-outlet +MCB.

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System components and list numbers

Component	Description	Example of list number
Straight lengths	40 –125A 5-pole in 3 metre lengths with 8 tap-off outlets per length 1 and 2 metre lengths available on request	Example: LP3100 LP = low power range 3 = 3 metres 100 = 100A rated
Feed units	Switched cable end-feed units up to 80A. Un-switched cable end-feed units at 100A and 125A. Polarity N, L1, L2, L3, E. Reverse cable end-feed units, rated as above. Polarity E, L3, L2, L1, N. <i>Switched end-feeds at 100A and 125A available on request.</i> Centre-feed units, comprising an intersection (see below) an end-feed and an end-cap. May be used to feed in from the LH side or the RH side of the face.	Example: LP80EFS LP = low power range 80 = 80A rated EF = end-feed S = switched Example: LP100REF LP = low power range 100 = 100A rated REF = reverse end-feed Example: LP125CF LP = low power range 125 = 125A rated CF = centre-feed
Intersection [cross]	Allows a run to branch off left or right, or both. An end-cap is required if only one branch is used - to seal the unused branch.	Example: LP125IS LP = low power range 125 = 125A rated IS = intersection
Angles	A flat angle turns the face of the trunking laterally through 90°. A right-hand angle turns the tapping face to the right as viewed from the normal direction of run. A left-hand angle turns the tapping face to the left as viewed from the normal direction of run. An edge angle turns the face of the trunking perpendicularly through 90° either away from (AOE), or forward from the tapping face (AIE). <i>Note: In all cases an 80A angle is used for all ratings up to 80A and a 125A angle is used for ratings of 100 and 125A.</i>	Example: LP80AFRH LP = low power range 80 = 80A rated AFRH = angle flat right-hand Example: LP125AIE LP = low power range 125 = 125A rated AIE = angle inside edge
End cap	Cover to seal the open end of a run. Fits all ratings.	LP125EC
Universal fixing bracket	Trunking fixing bracket for surface mounting. Fits all ratings.	LPUFB
Universal code letters added to list numbers	'X' – added at the end of the list number of any of the trunking components signifies an IP54 protection rating 'T' – added after the numerals of the list number of any of the trunking components signifies tinned copper bars. Where the above letters are combined the sequence of use is 'T' after the numerals with 'X' at the end of the part number	Example: LP80EFSX As LP80EFS with degree of protection increased to IP54. Example: LP3100T 100A straight length with tinned copper bars Example: LP80TEFSX

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System components and list numbers [cont'd.]

	Description	Example of list number
Tap-off units This page - listed range	Tap-off unit with 1-pole Type C MCB 10A, 16A or 32A, in moulded enclosure. Connected phase specified.	Example: LT116M/L1 LT = LP range tap-off unit 1 = 1-pole 16 = 16A M = MCB L1 = connected L1 and N + E
	Tap-off unit with 3-pole Type C MCB10A, 16A and 32A, in moulded enclosure	Example: LT316M LT = LP range tap-off unit 3 = 3-pole 16 = 16A M = MCB
	Tap-off unit with twin 13A BS1363 socket outlet in moulded enclosure. Connected phase specified.	Example: LT113B/L2 LT = LP range tap-off unit 1 = 1-pole 13B = 13A BS socket outlet L2 = connected L2 and N + E
	Tap-off unit with 1-pole Type C MCB, 16A or 32A, with BS4343 socket outlet in moulded enclosure. Connected phase specified.	Example: LT116MC/L2 LT = LP range tap-off unit 1 = 1-pole 16 = 16A rated M = MCB C = BS4343 socket-outlet L2 = connected L2 and N + E
	Tap-off unit with 3-pole Type C MCB, 16A or 32A, with BS4343 socket outlet in moulded enclosure.	Example: LT316MC LT = LP range tap-off unit 3 = 3-pole 16 = 16A rated M = MCB C = BS4343 socket-outlet
	Tap-off unit with 3-pole Type C MCB, 32A, in metal enclosure.	LT332MST ST = steel enclosure
	Tap-off unit 3-pole fused, 30A, in moulded enclosure.	LT332F F = fused
	Tap-off unit with double-pole 25A RCCB, I Δ n = 30mA, in moulded enclosure. Connected phase specified.	Example: LT125RCD/L3 LT = LP range tap-off unit 1 = 1-phase (double-pole) 25 = 25A rated RCD = RCCB L3 = connected L3 and N + E
Tap-off unit with 1-pole 32A RCBO	Example: LT132MST/RCD LT = LP range tap-off unit 1 = 1-pole 32 = 32A rated M = MCB module ST = steel enc. RCD = RCBO L3 = connected L3 and N + E	
	An RCBO is a combined circuit-breaker and RCD in the modular width of an MCB RC = residual current; B = breaker; O = overcurrent protection.	

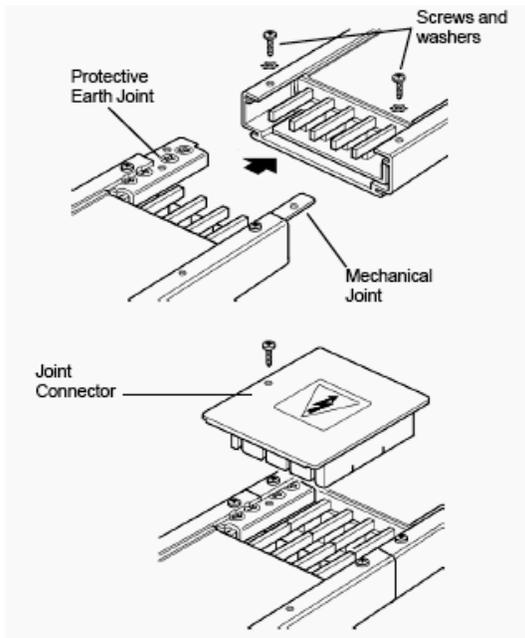
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System components and list numbers [cont'd.]

Component	Description	Example of list number
Tap-off units Units available to special order	Tap-off unit 1-pole in metal enclosure with fuse unit mounted through lid. Connected phase specified.	Example: LT132FST/BTL/L2 LT = LP range tap-off unit 1 = 1-pole 32 = 32A rated F = fused ST = = steel enc. BTL = Through lid L2 = connected L2 and N + E
	Tap-off unit 1-pole in metal enclosure with MCB mounted through lid. Connected phase specified.	Example: LT132MST/BTL/L2 LT = LP range tap-off unit 1 = 1-pole 32 = 32A rated M = MCB ST = = steel enc. BTL = Through lid L2 = connected L2 and N + E
Variations on listed tap-offs	Alternative fuse ratings up to 32A	
	Alternative MCB ratings up to 63A	
	Alternative MCB Type to BSEN 60898 Type C characteristic MCBs are fitted unless otherwise specified – suitable for most applications. If resistance to higher inrush currents is required then Type D is recommended.	Example: LT116M/D/L1 'D' signifies Type D MCB

Assembly and mounting



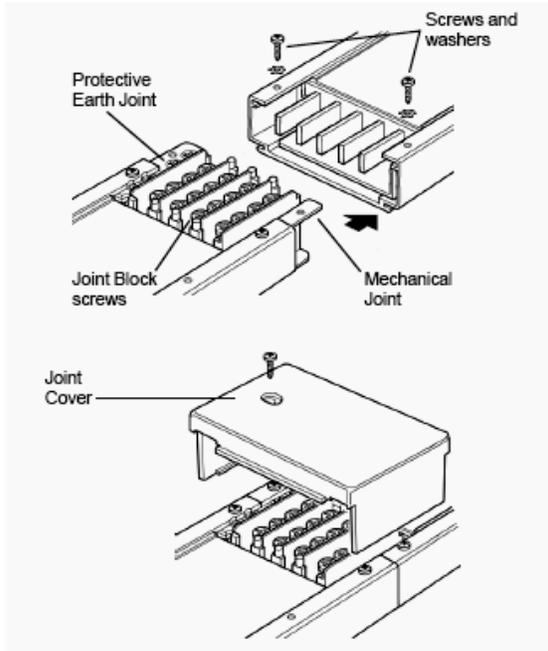
Jointing 40A to 80A

The two sections slot together as shown. The PE has a screw connector and as standard is bonded to the case. Screws secure the sections together mechanically. The line and neutral connections are made by screw-less spring contacts in the joint connector. The joint connector is plugged on to the bars and secured by a screw.

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Assembly and mounting [cont'd.]

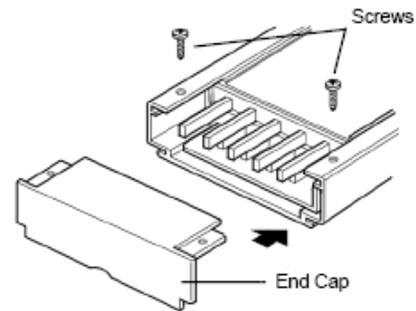


Jointing 100A and 125A

The two sections slot together as shown. The PE and the line and neutral connections are made by a screw connector and screws secure the sections together mechanically. As standard the PE conductor is bonded to the case. The joint cover is fitted to provide protection against direct contact.

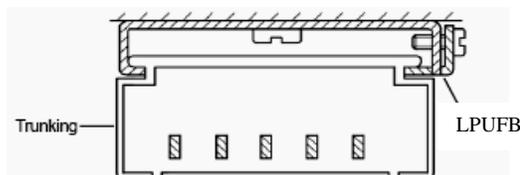
End cap

An end cap must be fitted to the open end of the trunking run as a barrier against direct contact.

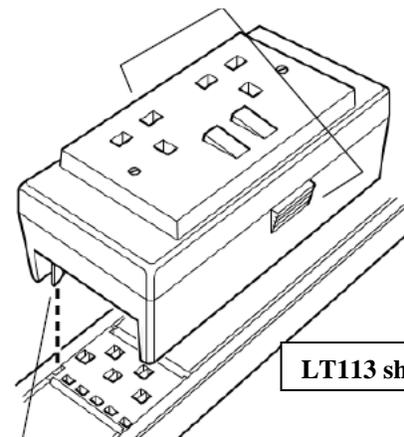


Mounting

LP trunking is mounted using a universal fixing bracket LPUFB. The mounting position may be horizontal, flat or on edge, or vertical.



Side clips



Fitting a tap-off unit (insulated enclosure)

The wiring of the outgoing circuit should be carried out before fitting the unit to the trunking. The tap-off outlet is fitted with a spring-loaded shutter to prevent accidental contact with live parts when not in use. The shutter release peg engages first and the unit clips on to the trunking.

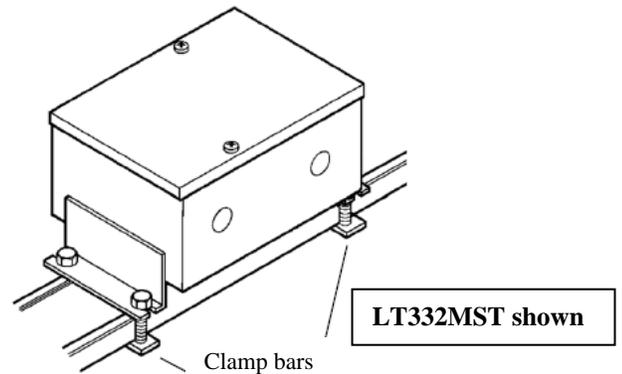
Shutter release

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Assembly and mounting [cont'd.]

Fitting a tap-off unit (metal enclosure)

The wiring of the outgoing circuit should be carried out before fitting the unit to the trunking. The tap-off outlet is fitted with a spring-loaded shutter to prevent accidental contact with live parts when not in use. The shutter release peg on the tap-off unit engages first and the unit clips on to the trunking. It is then secured by means of clamps at both ends.



Circuit diagram

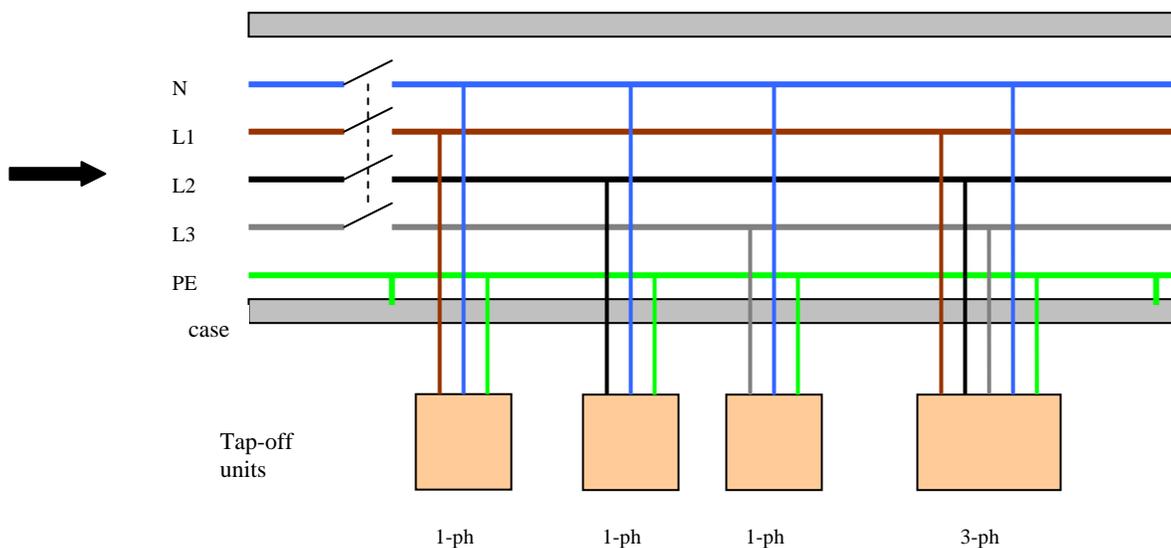


Figure 1. 5-pole trunking on a TP&N + PE supply. Single-phase tap-off units evenly distributed across the phases to minimise the current in the neutral. Supplied through a 3-phase and neutral linked switch.

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Technical data

	40A	63A	80A	100A	125A
Standards	BSEN60439-2, EN60439-2, IEC60439-2				
Rated current	40A	63A	80A	100A	125A
This is the maximum current per pole. Single-phase tap-off units must be evenly distributed across the poles so as not to exceed the current rating in one pole or the neutral.					
Rated insulation voltage (Ui)	500 V a.c.	500 V a.c.	500 V a.c.	500 V a.c.	500 V a.c.
- This is a.c. voltage that the trunking system is designed for and provides a safety factor over the rated operational voltage.					
Rated operational voltage (Ue)	415 V a.c.	415 V a.c.	415 V a.c.	415 V a.c.	415 V a.c.
- This is the maximum 3-phase voltage that trunking system is designed to operate at in service.					
Rated frequency	50Hz	50Hz	50Hz	50Hz	50Hz
Phase resistance [mΩ/m]	0.96	0.96	0.96	0.48	0.48
- This is the resistance R_{20} (at 20°C) of the conductor of each phase pole and the neutral and is used in the calculation of fault current, earth-loop impedance and voltage drop. For resistance at F/L temperature add 11%.					
Phase reactance [mΩ/m]	0.098	0.098	0.098	0.085	0.085
This is the inductive reactance X of each phase pole and the neutral and is used in the calculation of volt-drop and circuit impedance					
PE resistance [mΩ/m]	0.96	0.96	0.96	0.96	0.96
PE reactance [mΩ/m]	0.023	0.023	0.023	0.023	0.023
The PE resistance and reactance are used in the calculation of the fault level to earth.					
Volt-drop [V/A/100m]					
- Unity pf	0.166	0.166	0.166	0.083	0.083
- 0.9 pf	0.157	0.157	0.157	0.077	0.077
- 0.8 pf	0.143	0.143	0.143	0.070	0.070
- 0.7 pf	0.128	0.128	0.128	0.062	0.062
This figure allows an estimate to be made of the voltage drop along a run. This is the phase-to-phase voltage drop per ampere of load, along a 100m run without tap-offs. When loaded with tap-off units evenly distributed along the run the figures are multiplied by 0.55. See example of application below. Note that it is advisable to check the actual voltage drop on the completed installation					
Overload current protection	40A	63A	80A	100A	125A
Rated current of fuses or circuit-breaker					
Fault current (S/C) protection	80kA	80kA	80kA	80kA	80kA
- Rated fused S/C current (I_{cf})	*	*	*	*	*
- Rated S/C current with CB					
The rated fused S/C current I_{cf} is the maximum fault level at the incomer to the trunking when protected by BS88 fuses of the rating quoted above for overload current protection. * The rated S/C current with circuit-breaker protection is dependent on the type of circuit breaker – details of suitable devices on application.					
Degree of protection to BSEN60529	IP 4X as standard				
- IP4X code indicates protection against solid objects ≥ 1 mm diameter and protection against access to hazardous parts even with a 1mm diameter wire.					
Weight of trunking [Kg/m]	1.7	1.7	1.7	2.9	2.9
Cable capacity – feed units	25mm ²	35mm ²	35mm ²	70mm ²	70mm ²

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Technical data [cont'd.]

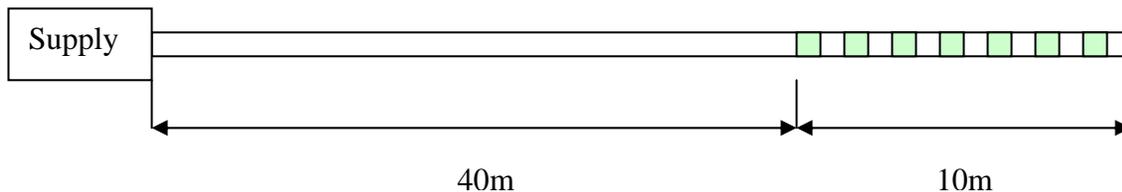
Voltage drop – Examples:

Case 1.

100A LP trunking run – total length 50 metres. 20 tap-off units evenly distributed along the run. Tap-off ratings the same and similarly loaded, drawing a total load of 87 A at 0.9 power-factor.

Volt-drop at the far end of the run = $0.077 \times 87 \times 50/100 \times 0.55 = 1.84$ volts ph to ph.

Case 2.



100A LP trunking run – total length 50 metres. 7 tap-off units evenly distributed over the last 10 metres. Tap-off ratings the same and similarly loaded, drawing a total load of 87 A at 0.9 power-factor.

Volt-drop at the far end of the run = $(0.077 \times 87 \times 40/100) + (0.077 \times 87 \times 10/100 \times 0.55)$
= **3.04** volts ph to ph.

Note that the volt-drop figure for the trunking has to be added to the volt-drop of the circuit from the supply source to the trunking feeder, to obtain the overall volt-drop according to the Wiring Regulations.

Neutral current

The neutral conductor within the busbar trunking is of the same capacity as the phase conductors (100% neutral). Particular care needs to be taken to ensure that the neutral current is not excessive. Conditions under which this can arise include the following: -

- **Unbalanced load** – the connections to single-phase tap-off units on a 3-phase system must be alternated across the phases along the run to balance the load.
- **Harmonic currents** – Electronic equipment and luminaires with electronic control gear generate harmonics in the supply current. Certain harmonic currents accumulate in the neutral of the supply, even when the load is balanced across the phases. Usually this is not a problem with a 100% neutral but in the case of total loads near to the full rating of the trunking this should be checked. Either consult the manufacturer of the equipment and, if necessary, size the trunking according to the neutral current. or split the load over two or more circuits.

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Maintenance procedure

1. A check should be made annually to ensure the security of mountings and the fixing of covers.
2. It is recommended that condition monitoring is carried out annually e.g. by thermal imaging. This would require a temperature profile being established under normal running conditions for comparison with the subsequent check results.
3. Subject to satisfactory results of monitoring, no routine examination of the electrical joints is necessary; however it is recommended that the integrity of each joint, where accessible, is checked at not more than 5 year intervals by the use of thermal-imaging.
4. Circuit protective devices in tap-off units should be maintained in accordance with the instructions for each device.

Special applications

Functional earth- also referred to as 'noiseless earth' or 'clean earth'.

In certain applications it is desirable to have an earth conductor that is not used as the protective earth (PE) for the system. This is to enhance the electromagnetic compatibility (EMC) function of the system, for example with supplies to buildings with a high concentration of data processing equipment. Using a separate earth conductor for connecting functional parts of equipment minimizes the risk of spurious signals or unwanted levels of voltage that might be present in the PE.

LP trunking can be factory-built with a 'clean earth' by isolating the earth terminals in the end feed and at each joint, from the case. A protective earth (PE) terminal is available at the end-feed in addition to a 'clean earth' terminal. This protective earth terminal serves to bond the trunking case.

In this case the tap-off units must be of the metal enclosed pattern in order to provide a PE connection to the outgoing circuit in addition to the clean earth connection.

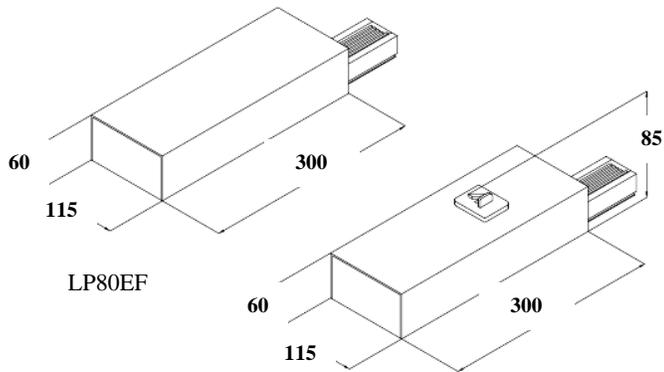
Flexible joint

A flexible connector can be supplied, for ratings 40A – 80A, to allow a change of direction in the trunking run of up to 90 degrees – Part No. LP80FB.

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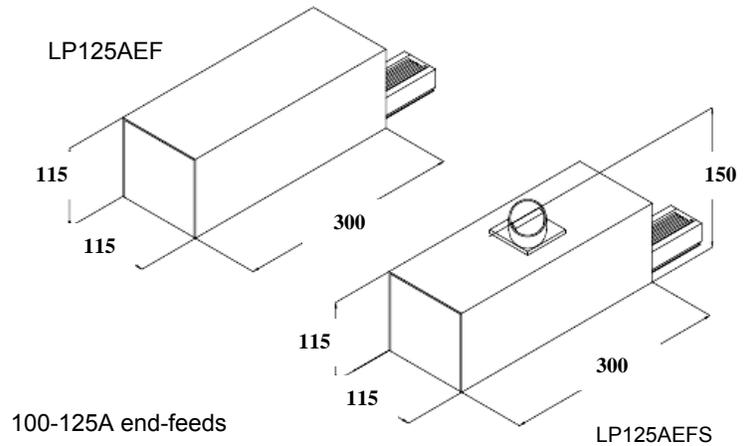
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Drawings and dimensions



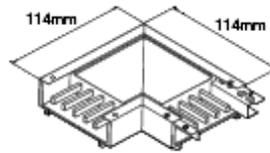
40 – 80A end-feeds

LP80EFS



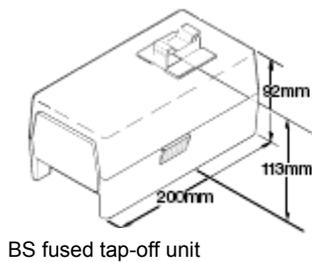
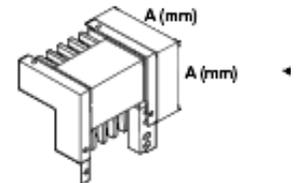
100-125A end-feeds

LP125AEFS

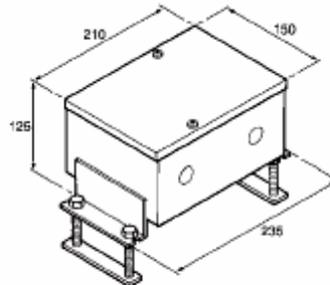


Angle-flat left hand

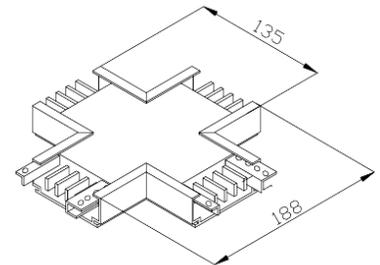
Angle outside edge A = 65mm
Angle inside edge A = 75mm



BS fused tap-off unit



Metal-clad tap-off unit



Intersection

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