

Electrak® powertrack / underfloor busbar system

design and installation

General installation notes

Electrak powertrack is a compact system that can be installed in floor voids as low as 48 mm

Feed units are provided with one or two 25 mm diameter holes suitable for MICCC, armoured cables or single core cables in conduit
Track lengths connect together and to feed units using the integral connectors on each length

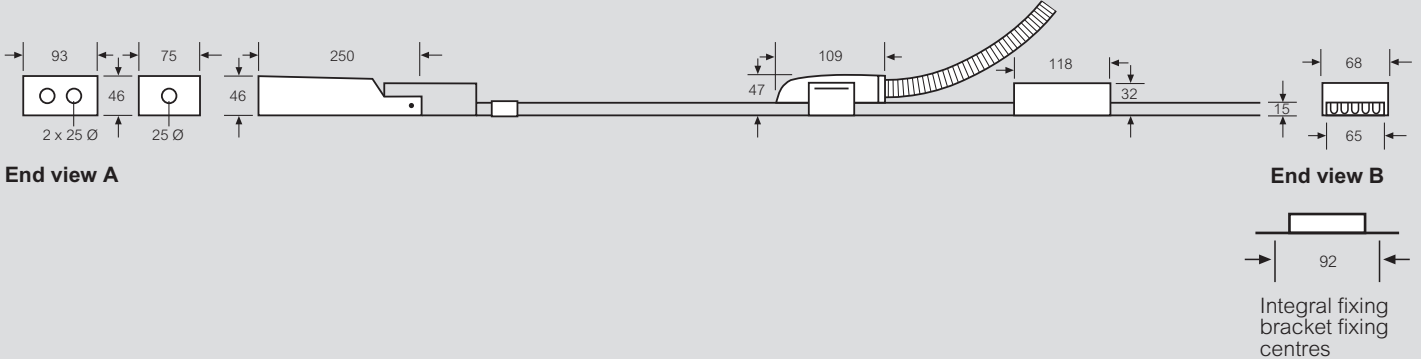
Lengths should always be secured using the integral floor fixing brackets; three on the 3.6 m length and two on 2.4 m, 1.8 m or 1.2 m lengths

Access to power is provided along the busbar length by simply plugging tap-off units into shuttered socket outlets. These tap-off units feed all types of conventional floor service outlet boxes or feed workstations directly through the floor via insulated conductors contained in flexible metal or VO rated nylon conduit. When connecting tap-offs directly through the floor via grommet outlets to workstations care must be taken to ensure that the tap-off length is adequate

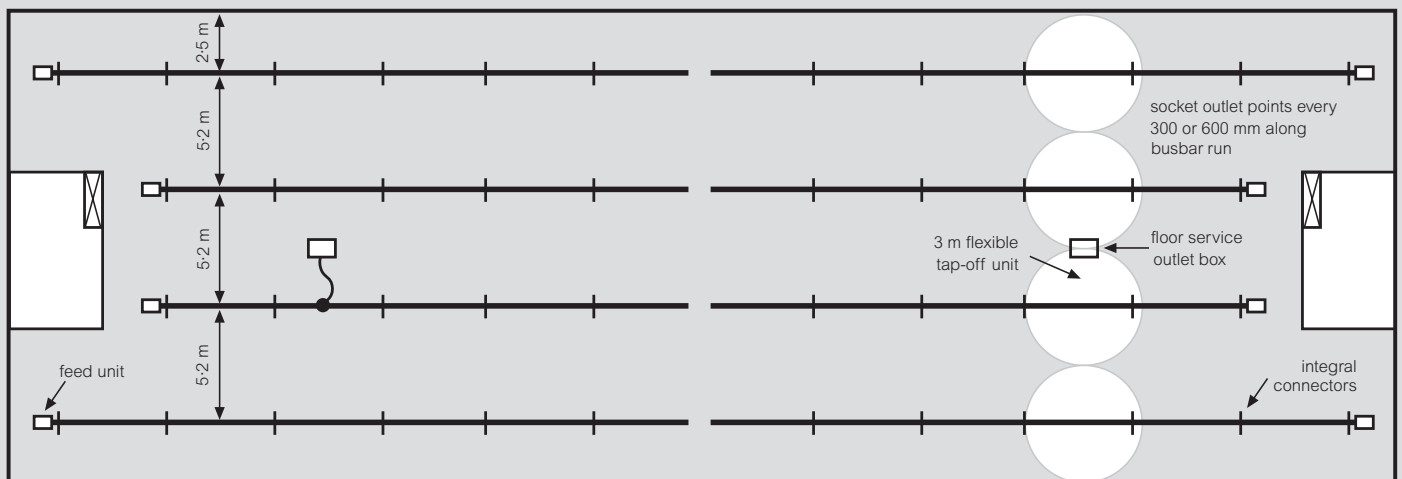
The dual system has both standard and low noise / clean earth systems incorporated. As well as dual tap-offs, both standard and low noise / clean earth tap-offs can be plugged into any socket outlet along the busbar length. The dual tap-off incorporates both standard and low noise cables

Optimum layout flexibility is achieved by positioning busbar lengths a maximum of 5.2 m apart and 2.5 m from the wall, and by connecting the 3 m tap-off units to floor outlet boxes. This means every part of the floor area can be served. Flexible interlinks can be used to overcome obstructions or used as corners if required

Dimensions



Example floor layout



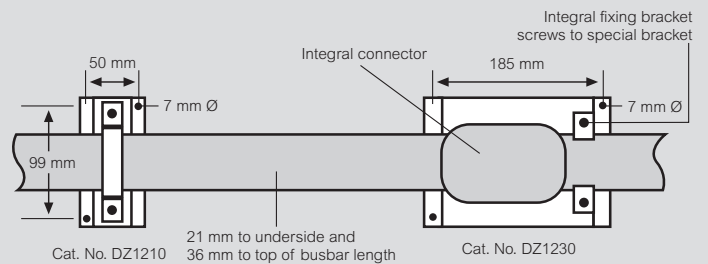
All dimensions (mm) are nominal

Special fixing brackets

Electrak special fixing brackets are available to raise the system by 21 mm. Ensure brackets are spaced 600 mm apart and always have support under the integral connectors and feed units. Failure to do so may undermine the integrity of the system

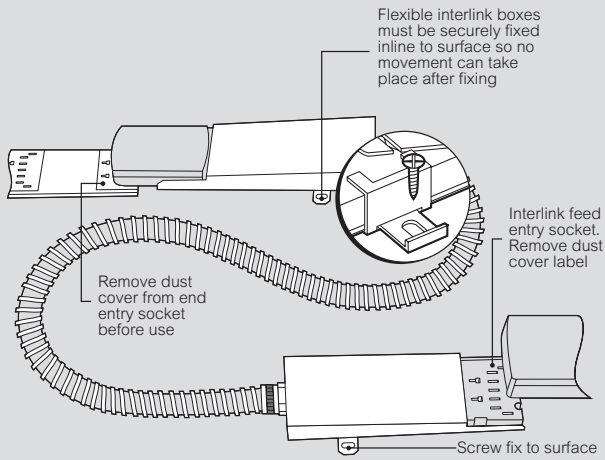
Cat. No. DZ1210 raised off-floor fixing brackets are spaced at 600 mm centres along the busbar run. Also use bottom half of bracket under feed unit and flexible interlink

Cat. No. DZ1230 raised off-floor fixing brackets are always used under integral connectors. Busbar is secured to raised brackets using the integral fixing bracket



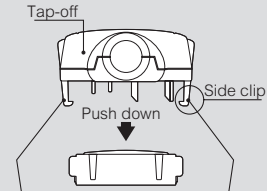
Product configuration

Flexible interlink



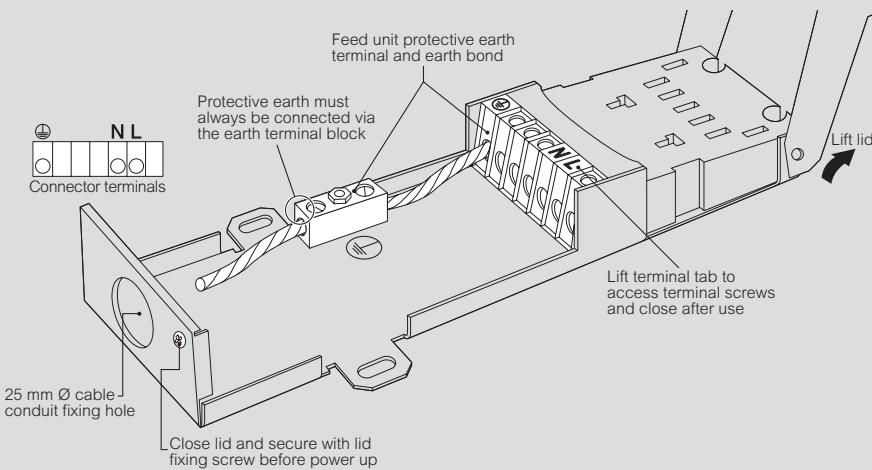
Tap-off connection

Depress tap-off side clips and push down

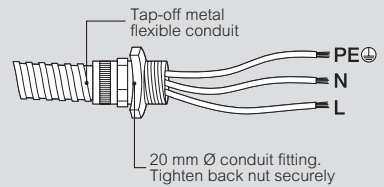


Make sure both tap-off side clips are fully pushed home on both sides of the bar

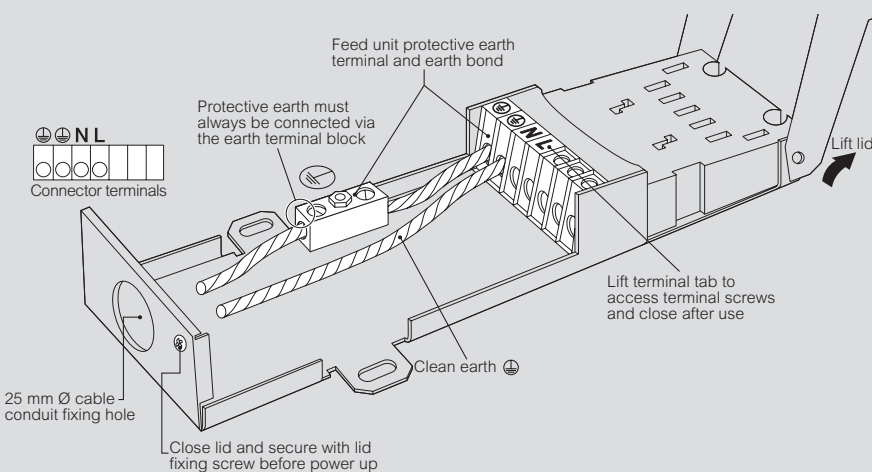
Feed unit (Cat. No. DF1010) Sub-cabling



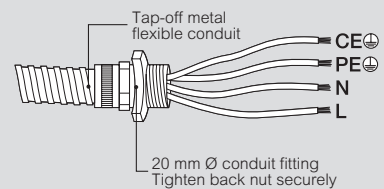
Tap-off connection



Feed unit (Cat. No. JF2010 and JF2010R) Sub-cabling

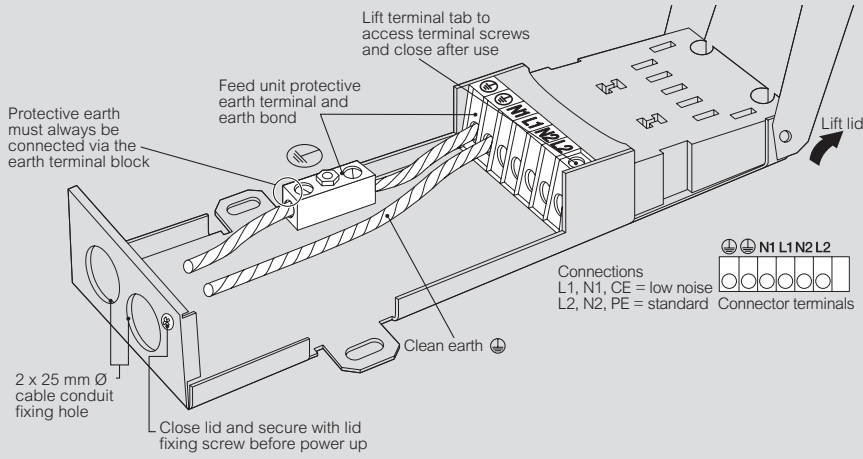


Tap-off connection

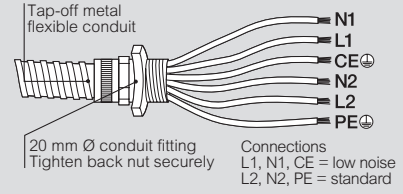


Product configuration (continued)

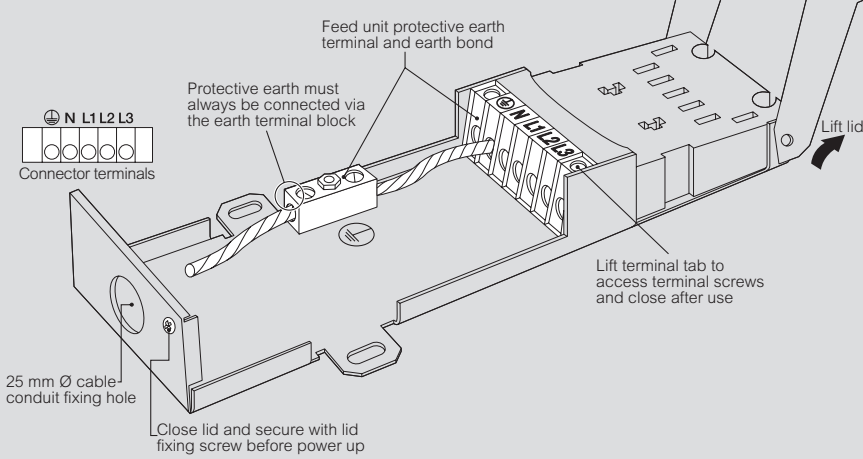
Feed unit (Cat. No. KF3010) Sub-cabling



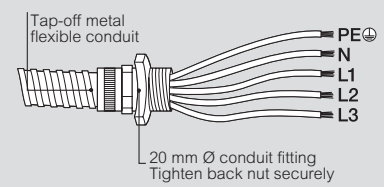
Dual tap-off connection (dark green)



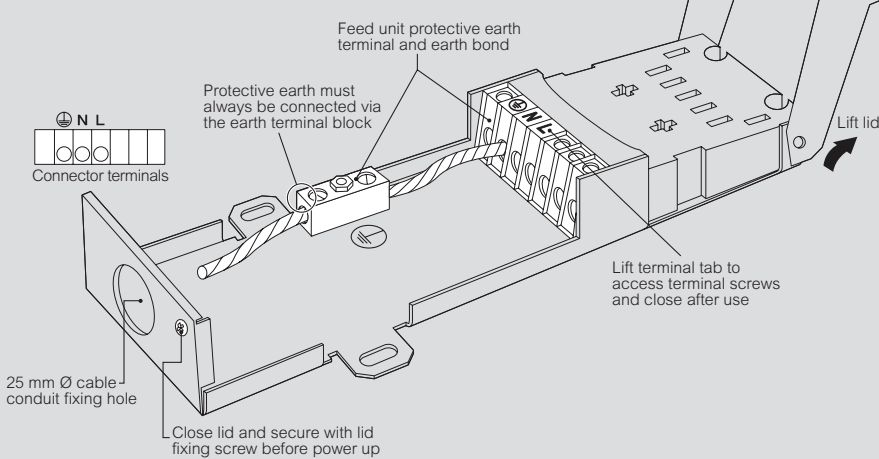
Feed unit (Cat. No. NF4010) Sub-cabling



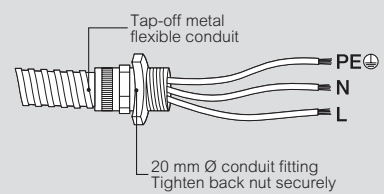
3 phase tap-off connection



Feed unit (Cat. No. YF5010 and YF5010R) Sub-cabling



Tap-off connection

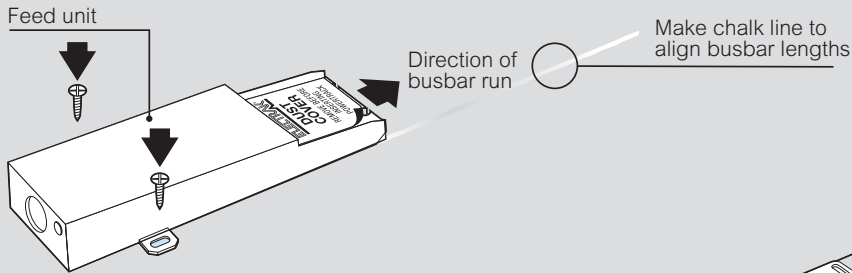


All dimensions (mm) are nominal

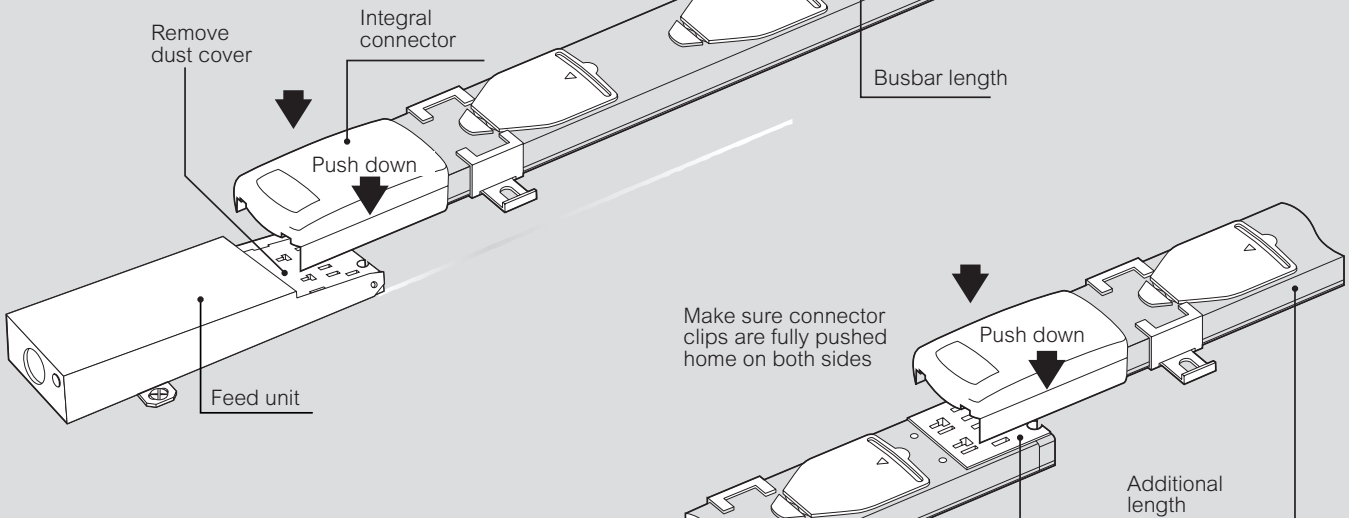
Electrak® powertrack / underfloor busbar system

installation (continued)

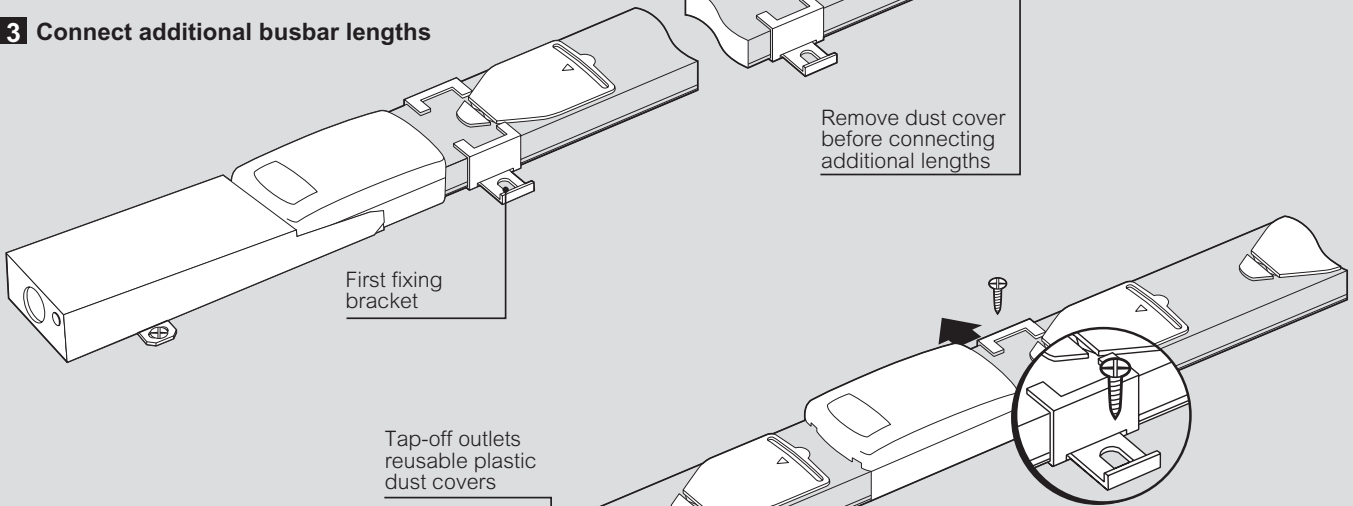
1 Fix feed unit to surface



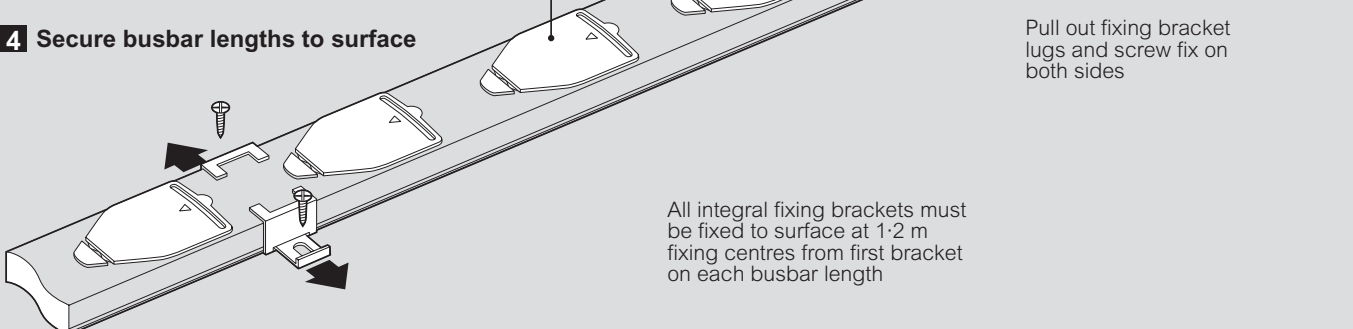
2 Connect busbar length to feed unit



3 Connect additional busbar lengths



4 Secure busbar lengths to surface



All dimensions (mm) are nominal

Standards



Approved to ASTA Standard 138
 BS EN 61534-22 : 2014
 and IEC 61534-22 : 2014
 Manufactured within an approved ISO 9001 : 2008 and ISO 14001 : 2004 facility
 Assessed Quality Assurance Certificate No. 2029
 Electrak powertrack / underfloor busbar fully complies with the requirements of BS 7671 : 2008 + AMD 3 : 2015 (IET Wiring Regulations)

Ambient temperature rating factors

The current carrying capacity for a powertrack / underfloor busbar (I_n) is affected by the ambient temperature
 For Electrak powertrack / underfloor busbar the ambient rating factor K_α is equal to 1 for ambient temperatures up to and including 35° C

$$I_z = K_\alpha I_n$$

Where :

I_z = effective current carrying capacity for continuous service under particular installation conditions

K_α = ambient temperature factor

I_n = nominal current carrying capacity

For ambient temperatures exceeding 35° C the values of K_α and I_z are given in the following tables

Powertrack / underfloor busbar system							
Ambient	20°C	25°C	30°C	35°C	40°C	45°C	50°C
K_α	1				0.95	0.85	0.80
I_z	63 A				59 A	53 A	50 A

32 A unfused tap-off (using thermosetting 90°C cables)							
Ambient	20°C	25°C	30°C	35°C	40°C	45°C	50°C
K_α	1				0.95	0.85	0.80
I_z	32 A				30 A	27 A	25 A

13 A fused tap-off (using 2.5 mm ² thermosetting 90°C cables)							
Ambient	20°C	25°C	30°C	35°C	40°C	45°C	50°C
K_α	1						
I_z	13 A						

References :

BS 7671 : 2008 incorporating amendment No. 3 : 2015
 Appendix 8 – Current carrying capacity for powertrack systems
 Appendix 4 – Table 4B1 Rating factors for thermosetting cables
 Appendix 4 – Table 4E1A – Single core 90°C thermosetting insulated cables (non-armoured)

Earth fault loop impedance

BS 7671 : 2008 + AMD 3 : 2015 IET Wiring Regulations require accurate determination of the total earth loop impedance, which must be sufficiently low to allow the protective device to operate within the specified time, which for socket outlets is 0.4 seconds. The values relevant to Electrak for calculating the earth fault loop impedance are shown in the electrical test data table, see opposite

Durability

Electrak systems are superbly designed and extremely robust. They can be expected to stand up to all normal site conditions. Electrak powertrack / underfloor busbar has been short circuit strength tested by ASTA

Installations with high protective conductor currents

All unfused tap-offs comply with Regulation 543.7 without the need for additional earth conductors. Regulation 543.7.1.103 (ii) states “a single copper protective conductor having a cross-sectional area of not less than 4 mm², complying with the requirements of Regulations 543.2 and 543.3, the protective conductor being enclosed to provide additional protection against mechanical damage, for example, within a flexible conduit”

For installations with high protective conductor currents requiring fused tap-offs, a 543.7 compliant tap-off must be used. Normally fused tap-offs incorporate 1.5 mm² conductors, however in our fused 543.7 tap-offs, the 1.5 mm² earth conductor is replaced with a 4 mm² conductor and are therefore compliant with Section 543.7.1.103 (ii)

32 A tap-off unit

The 3 m 32 A tap-off unit comprises an unfused tap-off with 2.6 m of flexible metal conduit with integral 4 mm² LSOH conductors

These units are designed to comply with regulation 434.2.1 of the IET Wiring Regulations by virtue of the following :

- maximum length of cable is 3 m
- it is factory assembled and fully tested item with cable installed in high quality flexible conduit

Fault condition protection for the tap-off assembly and the floor box socket outlets is delivered by the circuit protection device
 Disconnection time for socket outlets is 0.4 seconds (Regulation 411.3.2.2). The Electrak system meets this requirement

Tap-off units in excess of 3 m should only be used if they contain a fuse or the busbar run is protected by a protective device not exceeding 32 A

Volt drops (live and neutral)

Busbars	3.0 mV/A/m
Cable connector	0.4 mV/A
Integral connector	0.4 mV/A
32 A tap-off	0.4 mV/A
+ 4 mm ² cable	11 mV/A/m
Flexible corner assembly	1.5 mV/A
+ 10 mm ² cable	4.0 mV/A/m

Earth fault loop impedance

Phase busbar	1.5 mΩ/m
Earth busbar	1.5 mΩ/m
Earth housing	1.1 mΩ/m
Earth busbar and housing	0.8 mΩ/m
Cable connector	0.4 mΩ
Integral connector	0.6 mΩ
32 A tap-off	0.6 mΩ
+ 4 mm ² cable	11 mΩ/m
Flexible corner assembly	1.5 mΩ
+ 10 mm ² cable	4.0 mΩ/m
Rated conditional short-circuit current	16 KA
Ambient temperature	25°C

Mechanical data

	E24 – E28	E28R
Number of conductors	3-6	3
Busbar conductor cross sectional area	13 mm ²	13 mm ²
Housing cross sectional area (copper equivalent)	13 mm ²	13 mm ²
Cable terminal capacity	16 mm ²	16 mm ²
Tap-off cable 32 A	4 mm ²	4 mm ²
Tap-off cable 13 A fused	1.5 mm ²	2.5 mm ²
Tap-off conduit, up to 4 conductors	16 mmØ	20 mmØ
Tap-off conduit, 5 and 6 conductors	20 mm ²	N/A
Flexible corner cable (tri-rated, high temperature)	10 mm ²	10 mm ²
Flexible corner conduit	25 mmØ	25 mmØ
IP rating	40	40

Electrical test data

Rated current	63 A
Rated voltage	230/400 V~
Frequency	50/60 Hz
Conductor resistance - live and neutral	3.0 mΩ/m
Conductor impedance	1.5 mΩ/m

Material specifications

Housing - busbar lengths	Galvanised steel, natural finish
Busbars	High conductivity copper (Tinned version is electro-tin plated)
Busbar insulator	PTFE
Integral connectors / Tap-off outlets	Flame retardant polycarbonate
Tap-off outlet entry shutter	Acetal
Tap-off housing	Flame retardant polycarbonate
Integral connector blades	Copper (Tinned version is plated)
Tap-off blades	Copper (Tinned version is plated)
Tap-off/flexible corner conduit, metal	Electro-galvanised steel
Tap-off cable	LSOH to BS 7211
Flexible interlink cable	Tri-rated to BS 6231
Feed box/flexible interlink boxes	Galvanised steel
Feed connector terminals/earth block	Brass (Tinned version is plated)
Fixing brackets	Galvanised steel
13 A tap-off, fuse	To BS 1362, ASTA approved