

Siemens Traffic Controls
Sopers Lane
Poole
Dorset
BH17 7ER

ISOLATORS & FEEDER PILLARS GENERAL HANDBOOK

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Document Authorisation			
Role	Name	Function	Signed
Prepared by:	Mike Tonkin	Project Support Manager	
	Peter Lings	Senior Product Engineer	
	Dave Ackland	Mechanical Design Engineer	
Reviewed by:	Dave Martin	Engineering Manager	
Authorised by:	Colin Whipps	Technical Support Manager	

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SAFETY WARNING

HEALTH AND SAFETY AT WORK

Safety of Installation and Maintenance Personnel

In the interests of health and safety, when installing, using or servicing this equipment the following instructions must be noted and adhered to:

- (i) Only skilled or instructed personnel with relevant technical knowledge and experience, who are also familiar with the safety procedures required when dealing with modern electrical/electronic equipment are to be allowed to use and/or work on the equipment. All work shall be performed in accordance with the Electricity at Work Regulations 1989.
- (ii) Such personnel must take heed of all relevant notes, cautions and warnings in this Handbook and any other Document or Handbook associated with the equipment including, but not restricted to, the following:
 - (a) The equipment must be correctly connected to the specified incoming power supply.
 - (b) The equipment must be disconnected/isolated from the incoming power supply before removing any protective covers or working on any part from which the protective covers have been removed.
 - (c) **Mains voltages are present in pillars.** Before any maintenance work is carried out, the mains supply to the equipment must be isolated/switched off.
 - (d) All equipment of conductive material installed in these pillars must be bonded to earth, unless double insulated or access to it is restricted to use of a tool.
 - (e) Only trained / competent persons should work on this equipment. This includes persons who are employed to change bulbs. All wiring has basic insulation and should be regarded as hazardous, i.e. hazardous voltages are accessible if the insulation is damaged.
 - (f) Any power tools must be regularly inspected and tested.
 - (g) Any personnel working on site must wear the appropriate protective clothing, e.g. reflective vests, etc.
 - (h) Any Personnel carrying out work on the Cut-out must have G39 training and the correct PPE.

Safety of Road Users

It is important that all personnel are aware of the dangers to road users that could arise during repair and maintenance of traffic control equipment.

Ensure that the junction area is coned and signed as necessary to warn motorists and pedestrians of any dangers and to help protect the personnel working on the site.

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1. GENERAL

1.1 Purpose and Scope

This document is intended as guidance to the installation and usage of Isolators and Feeder Pillars with Siemens Traffic products and EFACEC EV Chargers.

This guidance should be followed and if, due to local circumstances, it is not possible to stay within the limits shown advice must be sought from Product Engineering at Poole.

Power Provision is normally via a **DNO** cut-out. DNO is the Acronym for **Distribution Network Operator**; this will usually be the local Electricity supply company.

1.2 Traffic Product Isolators

There are three types of Traffic Product Isolator described in this document.

- Simple 3 way (unit width) standard isolator.

The Standard isolator is suitable for all products where no additional protection is required.

- 4 way (unit width) isolator with additional protection.

In the case of the 4 way isolator the MCB size must be chosen to meet the desired application, this is detailed later in this document

- Generator connect changeover switch

The changeover switch is used **only within the generator connect feeder pillar**, as described in this document.

1.3 EV Charger Isolators

There are two types of EV Charger Isolator described in this document.

- 4 way (unit width) Single Phase EV Isolator

This isolator caters for all single phase EV charger products. The correct MCB and RCD must be chosen to meet the charger installation requirements, as described in this document.

- 8 way (unit width) Three Phase EV Isolator

This isolator caters for all three phase EV charger products. The correct MCB and RCD must be chosen to meet the charger installation requirements, as described in this document.

1.4 Feeder Pillars

This document describes four types of feeder pillar.

- Small feeder pillar

This is designed to take the DNO supply cut-out and an Isolator.

- Large feeder pillar

This is designed to take the DNO supply cut-out, Supply Meter and an Isolator.

- XL feeder pillar

This is designed to take the DNO supply cut-out, Supply Meter and an Isolator for three phase installations.

- Generator connect feeder pillar

This is a variant of the large feeder pillar that provides a connection point for an external generator as well as the DNO supply cut-out, Supply Meter and a changeover switch.

The feeder pillar should always be kept within the maximum distance of the equipment and the maximum distances are shown later in the document.

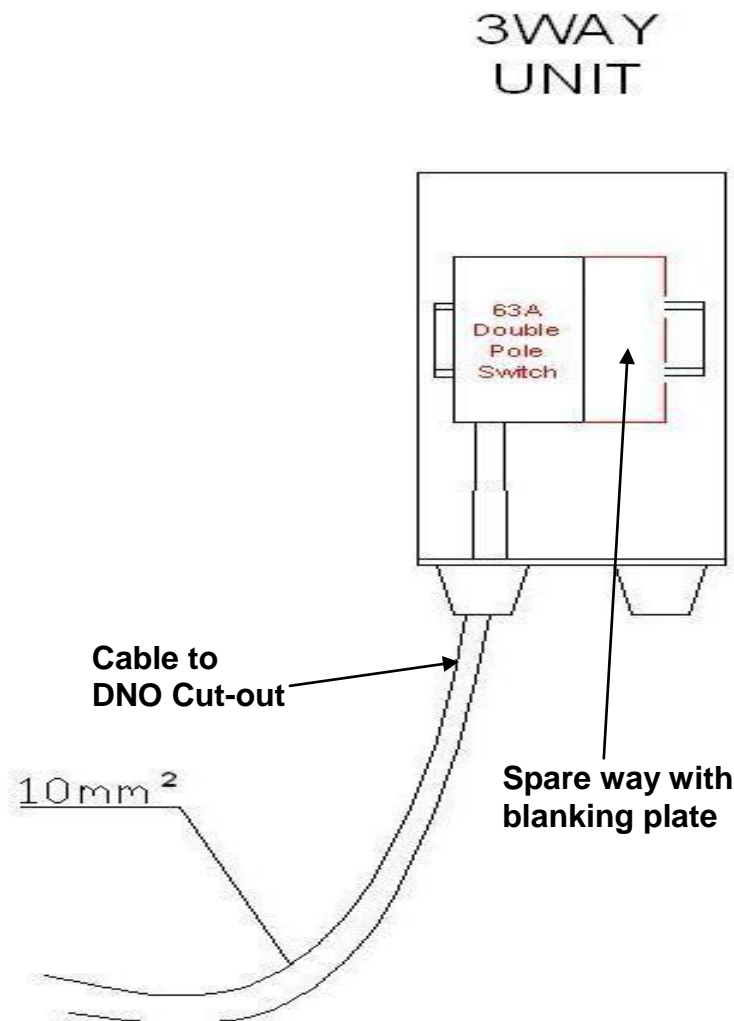
It is generally bad practice for the mains cable from the Isolation pillar to share a duct with the Signal and other equipment cables. This is particularly the case on an ELV installation. If for any reason the ducts must be shared then all reasonable precautions must be taken and the client consulted.

2. TRAFFIC PRODUCT ISOLATORS

2.1 Standard Isolator

The standard Isolator (667/7/45030/300) is designed to suit all traffic products.

This unit is recommended when there is no additional requirement to have a protection device within the isolator. Only 2 positions of the 3 available are used, the additional position is required to allow the cables to enter and exit the bottom of the isolator.



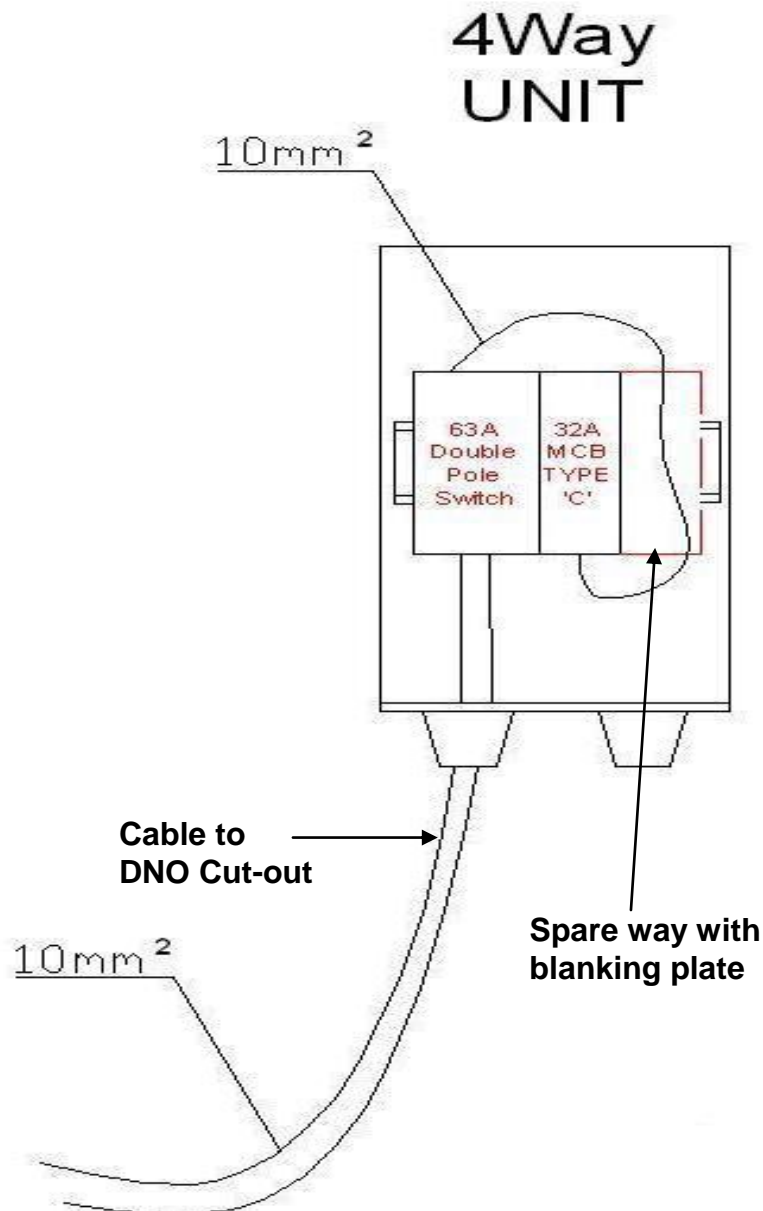
Three way standard isolator 667/7/45030/300

2.2 Special isolators

There are a series of special isolators (667/7/45031/4XX)

The special isolators are required when a site survey (or the Customer/End User/Electricity Supplier) requires a protection device in the isolator. In this case the MCB rating depends on the product.

The 10kA rating is designed to accommodate 60A (and 80A, but not 100A) BS88-3 (formerly BS1361) supply cut-out fuses.



The 4 way Isolator is available with 3 sizes of type C MCB (32A Shown)

2.3 Special Isolators requirement for products

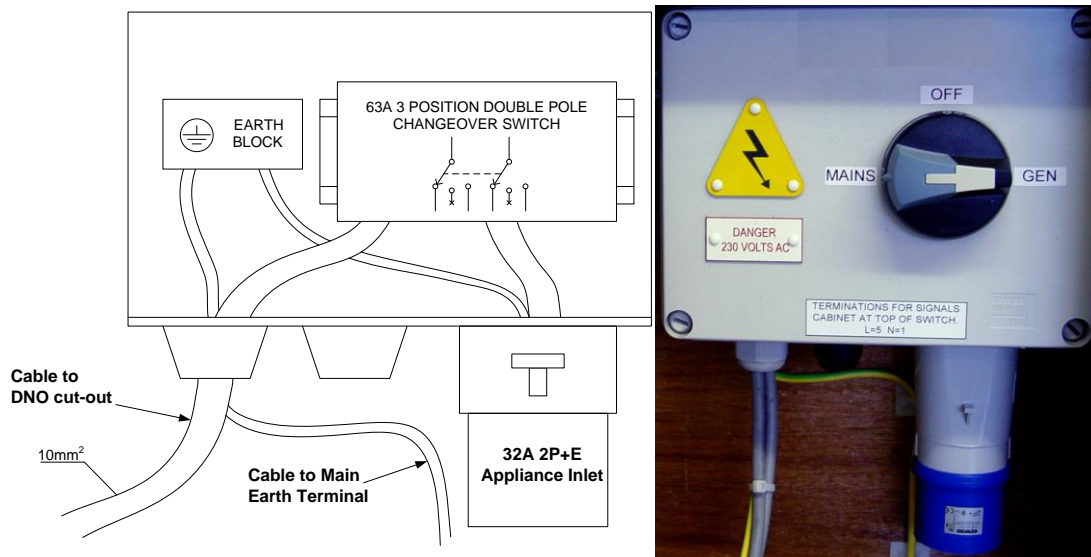
In the table below are the part numbers along with breaker sizes for Siemens traffic products. If a Special Isolator is required for a Siemens product not listed below please contact the Product Engineering team at Poole.

It can be seen that many of the products listed below are now suitable for the smaller 25A style Cut-outs preferred by local electricity supply companies Product	Cut-out Rating	Master Fuse Rating	Special Isolators
ST950/900ELV Std	45A	30A	32A rated at 10kA - 667/7/45031/432
ST950/900ELV Low inrush	25A	16A	20A rated at 10kA - 667/7/45031/420
ST950/900	60A	45A	50A rated at 10kA - 667/7/45031/450
ST950/900LED	25A	20A	20A rated at 10kA - 667/7/45031/420
ST750	25A	20A	20A rated at 10kA - 667/7/45031/420
ST750ELV	25A	20A	20A rated at 10kA - 667/7/45031/420
Elektra	25A	20A	20A rated at 10kA - 667/7/45031/420

2.4 Generator Connect Changeover Switch

This isolator forms part of the Generator Connect Feeder Pillar and comes fitted as standard. There is no protection device within the changeover switch.

It incorporates a 32A 2 pole + earth appliance inlet for connectivity to an external generator. Isolation is provided by a 63A double pole 3 position changeover switch clearly labelled 'MAINS', 'OFF' and 'GEN', lockable in the OFF position.

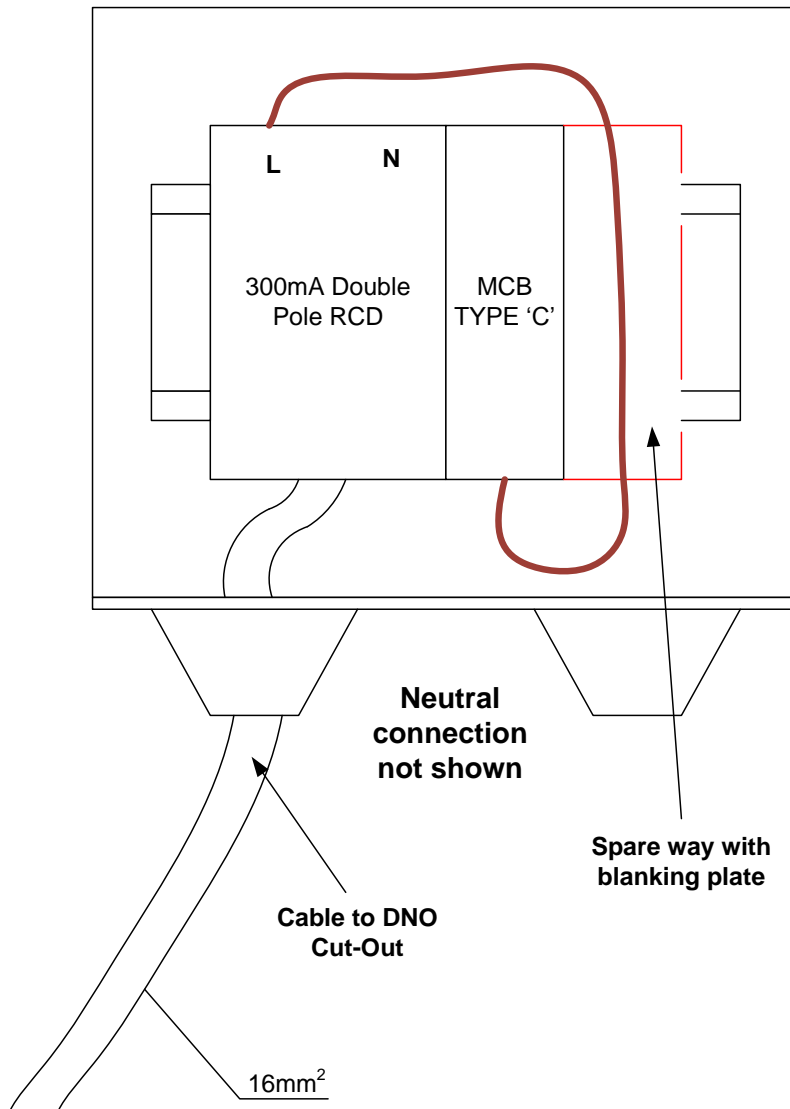


The changeover switch allows the supply source for the site to be selected safely.

3. EV CHARGER ISOLATORS

3.1 Single Phase EV Isolator

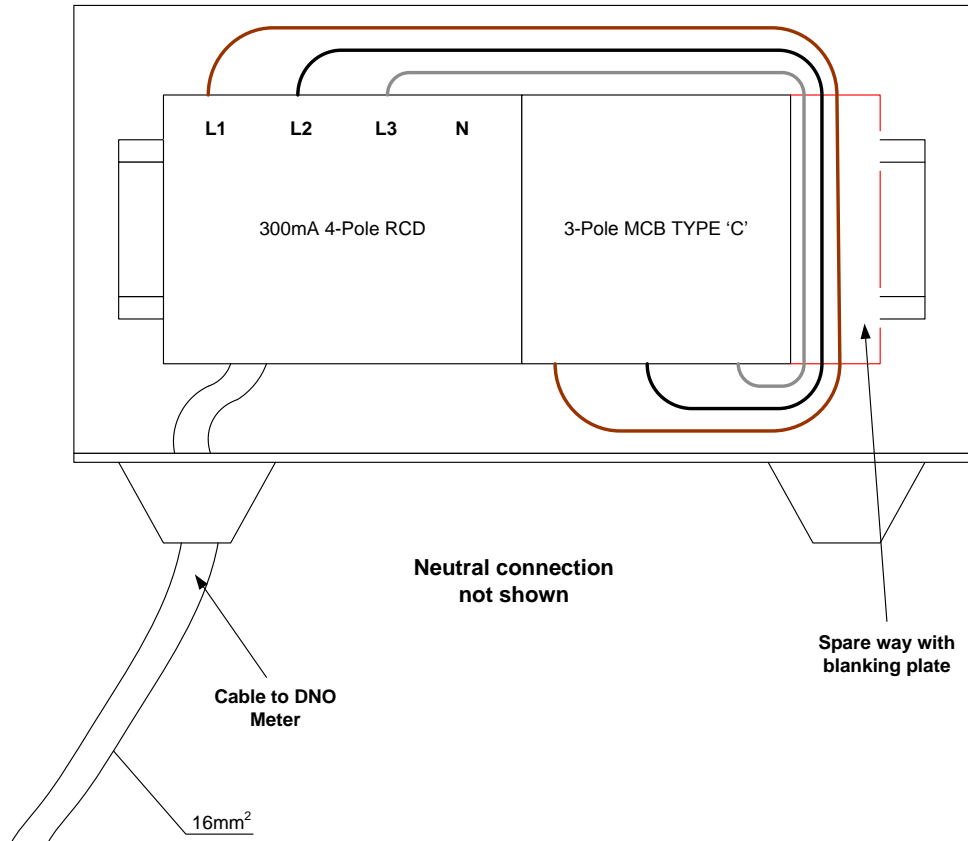
The Single phase EV isolator is suited for use with all single phase EV charger installations and incorporates a 2-pole 300mA RCD and 1-pole Type C MCB. The ratings of the RCD and MCB depend on the charger being installed.



Note: This isolator does not come pre-wired and must be assembled on site.

3.2 Three Phase EV Isolator

The three phase EV isolator is suited for use with all three phase EV charger installations and incorporates a 4-pole 300mA RCD and 3-pole Type C MCB. The ratings of the RCD and MCB depend on the charger being installed.



Note: This isolator does not come pre-wired and must be assembled on site.

3.3 Isolator requirements for EV Chargers

In all cases, with no exceptions, an EV charger must be connected to its supply via a Type C MCB followed by a 300mA Type S RCD. Ratings for these are shown in the table below according to the charger being installed.

EV Charger Type	Rated Current	Required MCB	Required RCD
QC45 DC Rapid Charger	73A	3-Pole Type C MCB 80A 516/4/02082/104	4-Pole 300mA RCD 100A 516/4/02074/000
22kW Dual Outlet AC Public	64A		
11kW Dual Outlet AC Public	32A	3-Pole Type C MCB 40A 516/4/97076/113	4-Pole 300mA RCD 40A 516/4/02074/403
7.4kW Dual Outlet AC Public	64A	1-Pole Type C MCB 80A 516/4/02082/100	2-Pole 300mA RCD 100A 516/4/02074/002
Single Outlet AC Pole-Mount	32A	1-Pole Type C MCB 40A 516/4/97076/013	2-Pole 300mA RCD 40A 516/4/02074/203
7.4kW AC Homecharger	32A		
3.4kW AC Homecharger	16A		

4. PILLARS

4.1 Pillar types available

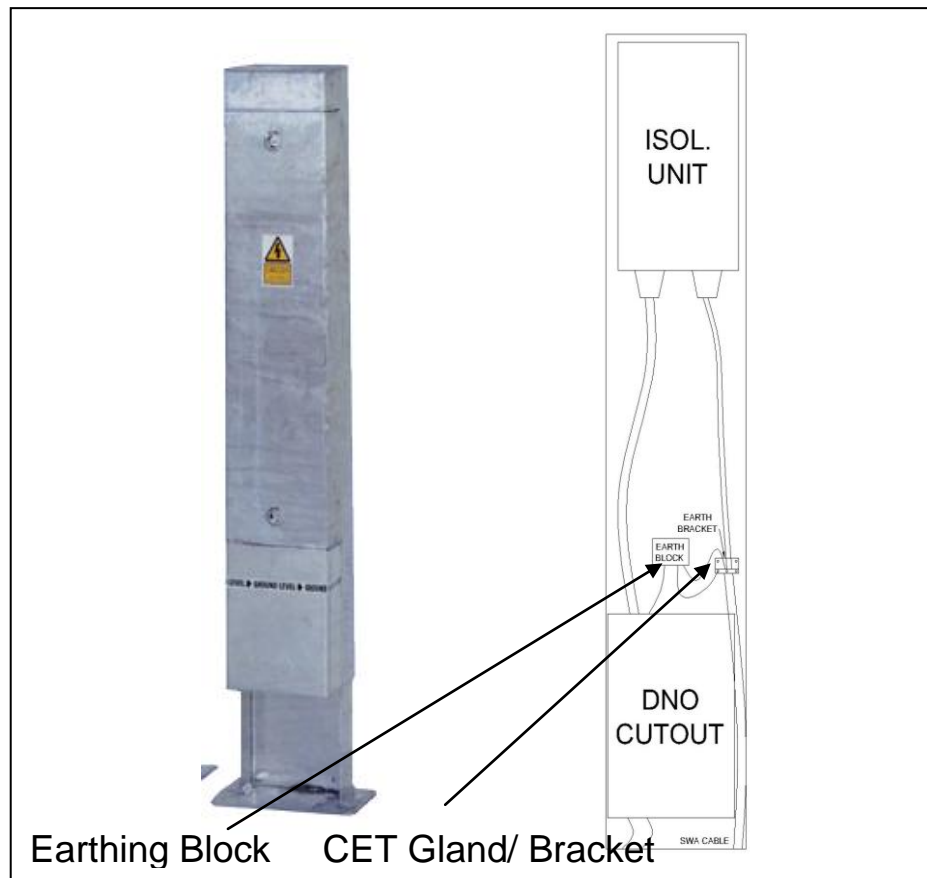
There are 4 Pillar options:

- Small Pillars; are required when a site supply **is not** metered, the pillar should be laid out as shown in section 4.2
- Large Pillars; are required when a site supply **is** metered, the pillar should be laid out as shown in section 4.3
- XL Feeder Pillars; are required when a site makes use of a 3-phase supply, the pillar should be laid out as shown in section 4.4
- Generator Connect Pillars; are required when a site supply is to be supported by an external generator, whether metered or unmetered, the pillar should be laid out as shown in section 4.5

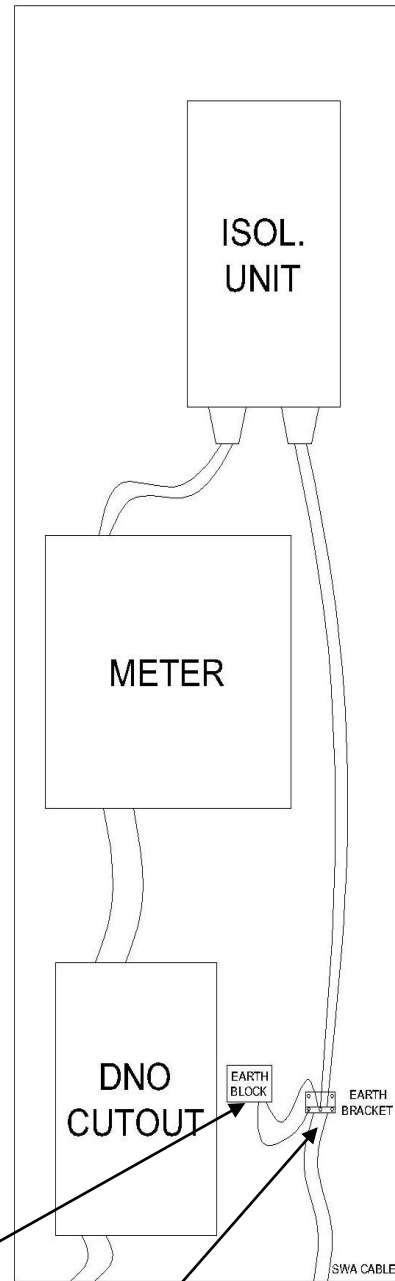
The pillars are available in standard Galvanised finish, Stainless Steel finish or to match our standard equipment cabinet finishes in Grey or Black.

Description	Part Number
Small Feeder Pillar Galvanised	667/7/45035/000
Small Feeder Pillar Grey	667/7/45035/100
Small Feeder Pillar Black	667/7/45035/200
Small Feeder Pillar Stainless Steel	667/7/45037/000
Large Feeder Pillar Galvanised	667/7/45036/000
Large Feeder Pillar Grey	667/7/45036/100
Large Feeder Pillar Black	667/7/45036/200
XL Feeder Pillar Galvanised	667/7/45044/000
XL Feeder Pillar Grey	667/7/45044/100
XL Feeder Pillar Black	667/7/45044/200
Generator Connect Feeder Pillar Galvanised	667/7/45043/000
Generator Connect Feeder Pillar Grey	667/7/45043/100
Generator Connect Feeder Pillar Black	667/7/45043/200

4.2 Small Feeder Pillar and Layout

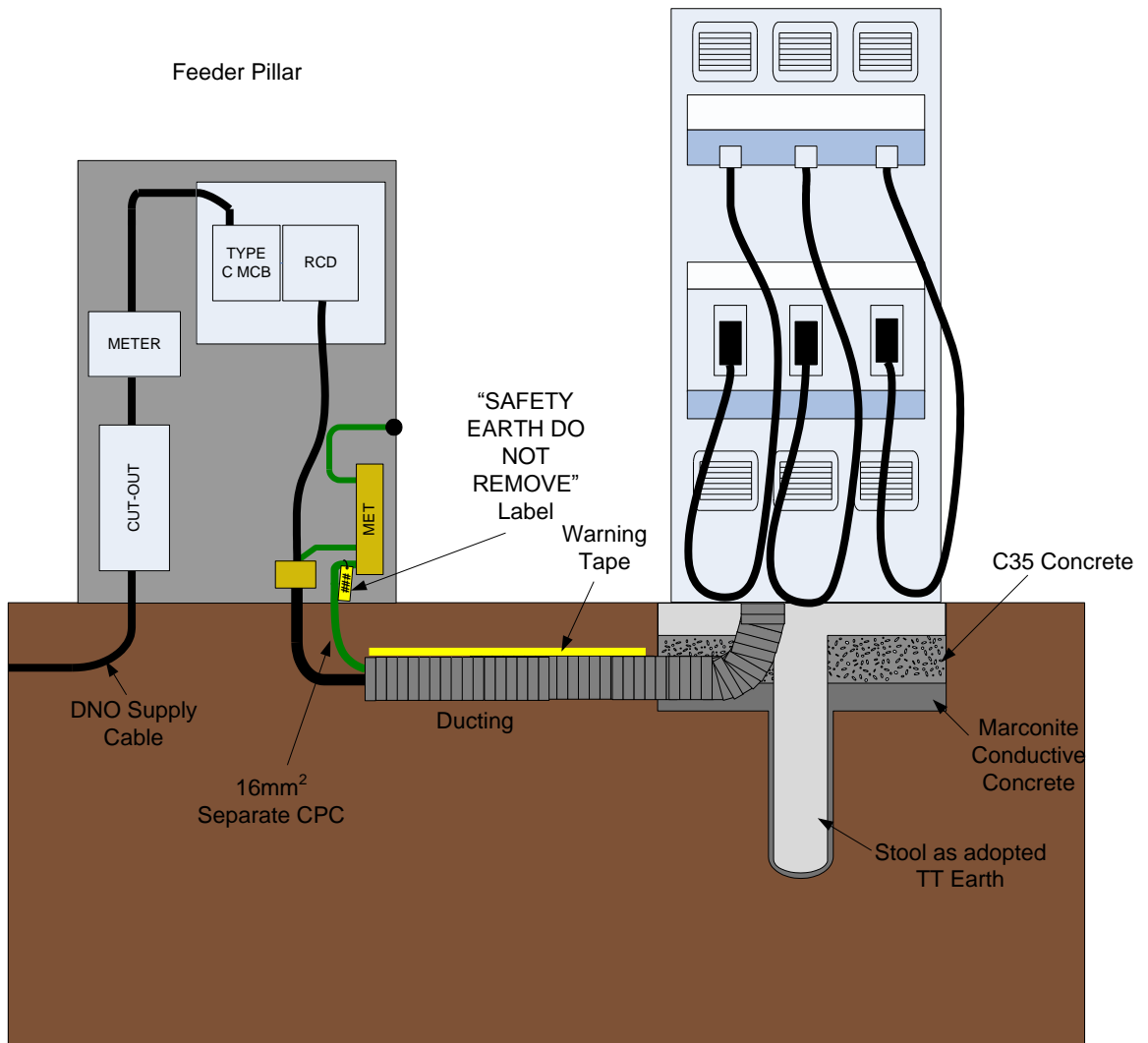


4.3 Large Feeder Pillar and Layout



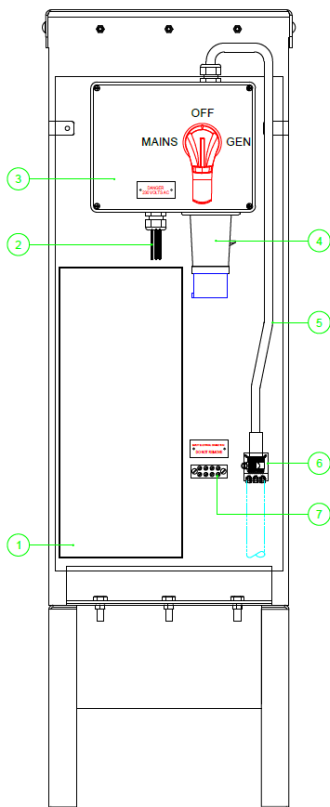
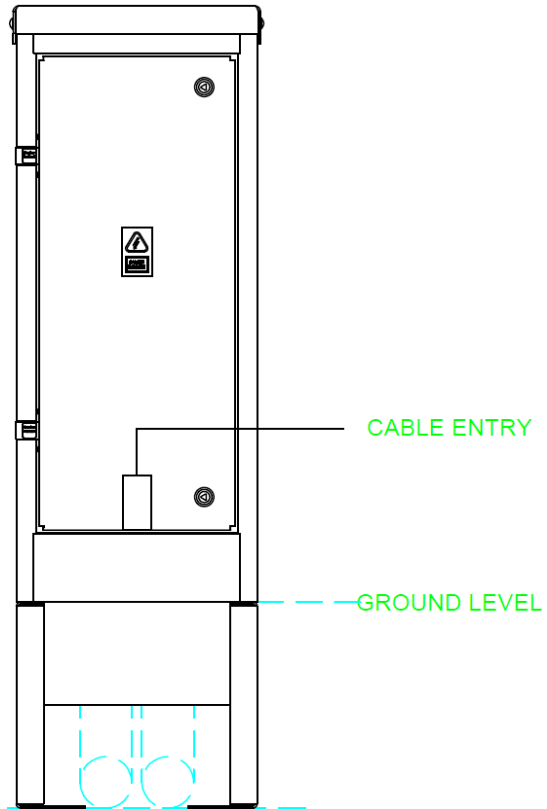
Earthing Block CET Gland/ Bracket

4.4 XL Feeder Pillar



Note that for EV installations, as shown here, the feeder pillar is normally earthed via a local TT earth provided by the EV Charger stool. For detailed information on EV charger earthing, see the EV Charger UK Installation document 667/HE/47470/000.

4.5 Generator Connect Feeder Pillar and Layout



LEGEND:

- 01 Space for DNO Equipment
- 02 10mm² Double insulated cable with 10mm² CPC
- 03 63A Double pole Changeover switch (3 position and lockable)
- 04 32A Appliance inlet Chassis mounted
- 05 Out going cable to signals cabinet
- 06 CET cable gland
- 07 Main Earth terminal

5. CABLE LENGTHS BETWEEN FEEDER PILLARS AND EQUIPMENT

5.1 Requirements

The distance between the feeder pillar and the equipment is based upon:

- Safety
- Fuse sizes
- Expected voltage drop.

This cable must carry the total equipment current requirement as well as any possible fault currents. To minimise the cross section area of the cable between the feeder pillar and equipment the following cable sizes and distances must be followed.

The maximum lengths of cable between the feeder pillar and the equipment are based upon a maximum voltage drop not exceeding 1% and adding no more than 0.2 Ohms to the ELI measurement taken at the feeder pillar.

The ELI figure must still comply with the requirements in the Installation and Maintenance handbook for the relevant equipment.

5.2 Maximum Cable lengths from feeder pillars.

The table below gives the **maximum** length of power cable to be fitted between the feeder pillar and equipment listed below.

If the equipment is not on the list below then the figure should be based on the size of the master fuse but in any event should not exceed 20m.

Product	Part Number	Supply Cut out (Amps)	Master Fuse		Cable Area (mm ²)	Max Dist (metres)
			Rating	Type		
ST950ELV Controller	667/1/45950/nnn except 5nn	45	30A	58x22 mm	6	15
ST950ELV Low inrush Controller	667/1/45950/5nn	25	16A	58x22 mm	6	20
ST950 (LV) Controller	667/1/46950/nnn except nn8 & nn9	60	45A	58x22 mm	10	15
ST950 (LV) LED Controller	667/1/46950/nn8 and nn9	25	20A	58x22 mm	6	20
ST900ELV Controller	667/1/32900/nnn except 5nn	45	30A	58x22 mm	6	15
ST900ELV Low inrush Controller	667/1/32900/5nn	25	16A	58x22 mm	6	20
ST900 (LV) Controller	667/1/33900/nnn except nn8 & nn9	60	45A	58x22 mm	10	15
ST900 (LV) LED Controller	667/1/33900/nn8 and nn9	25	20A	58x22 mm	6	20
Elektra	667/1/440n0/nnn and 667/1/441n0/nnn	25	20A	29x12.7 mm	6	20
ST750	667/1/33750/nnn	25	20A	29x12.7 mm	6	20
ST750ELV	667/1/32750/nnn	25	20A	29x12.7 mm	6	20

If it is not possible to get the feeder pillar within the distance shown in the table above Siemens Traffic Engineering in Poole should be contacted.

Information on the load will be required along with the ELI measurement at the feeder pillar.

If the equipment is low power equipment such as a car park Gemini unit then the size of the master fuse and the expected load of the equipment should be obtained before asking advice from the Siemens Traffic Engineering at Poole.

5.3 Maximum Cable lengths for EV Chargers.

In all EV Charger cases, cables must be **no more than 50m** in length from the supply within the feeder pillar to the charger itself.

6. CABLE TYPES

6.1 Cable colours

The following cables are recommended for connecting the power between the feeder pillar and the equipment.

The recommended power supply cables are 3 core SWA cable and the colour code is as follows:

Brown	Live	Ident L
Black	Neutral	Ident N
Grey	Earth	Sleeved Yellow/Green

Important Note: Some Customers have their own colour code as part of a full specification and is a contractual requirement. In general these customer specific requirements must be followed. If there is any doubt over the safety of these requirements Siemens Traffic Engineering at Poole can be contacted. In all cases both ends of the cable **must be** fitted with idents and the Grey core Earth wire sleeved Yellow/Green.

6.2 Cable part numbers

Cable 3 core armoured 6mm	998/4/88311/000
Cable 3 core armoured 10mm	998/4/88316/000

6.3 EV Charger Cable part numbers

The number of cores and CSA of cable to be used depend on the type of charger being installed. In all cases, for every type of charger, the earth connection is to be cabled using a separate 16mm² CPC. This can be run alongside the main supply cable.

EV Charger Type	Required Supply	Outdoor Cable
QC45 DC Rapid Charger	3-phase @ 73A	4-Core 25mm ² XLPE 998/4/88388/024
22kW Dual Outlet AC Public	3-phase @ 64A	
11kW Dual Outlet AC Public	3-phase @ 32A	4-Core 10mm ² XLPE 998/4/88387/104
7.4kW Dual Outlet AC Public	1-phase @ 64A	2-Core 25mm ² XLPE 998/4/88388/022
Single Outlet AC Pole-Mount	1-phase @ 32A	2-Core 10mm ² XLPE 998/4/88387/102
7.4kW HomeCharger	1-phase @32A	
3.7kW HomeCharger	1-phase @ 16A	2-Core 4mm ² XLPE 998/4/88387/044
Earth Connection for ALL CHARGERS		16mm ² Green/Yellow flexible cable 998/4/88386/100

The following three-phase cable colouring convention is recommended between feeder pillar and EV charger:

Brown	Live 1
Black	Live 2
Grey	Live 3
Blue	Neutral
Green/Yellow	Earth

Further information can be found in 667/HE/47470/000.

7. EARTHING

7.1 Traffic Installation Earthing

The standard earth bracket CET-003/**R should be used. Part number 4MC1039.

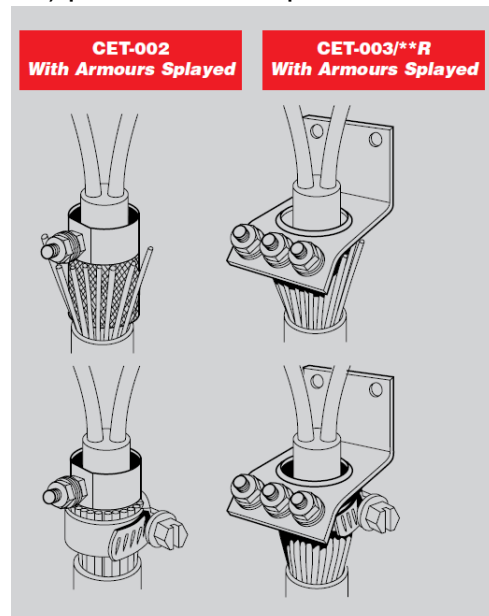
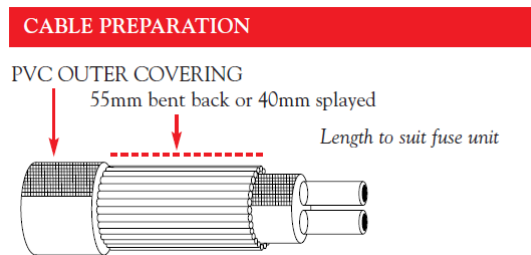
The earthing should utilise both the Grey core Earth wire (sleeved Yellow/Green) and the Steel Wire Armouring (SWA).

The Grey core Earth wire (sleeved Yellow/Green) must be earthed to the bracket or directly to the earth block in the feeder pillar.

The CET-003/**R bracket **must be** attached to the wooden board or an appropriate place to ensure strain relief on the power supply cable.

In all cases the Steel wire armouring must be connected with a 10mm² Yellow/Green Earth cable to the primary earth points in both the equipment outer-case and the feeder pillar

Use the Yellow/Green Earth wire, provided with the isolator to earth the CET-003/**R bracket to the primary earth point (Earthing block) provided in the pillar.



7.2 EV Charger Earthing

Note that for EV installations, as shown here, the feeder pillar is normally earthed via a local TT earth provided by the EV Charger stool. For detailed information on EV charger earthing, see the EV Charger UK Installation document 667/HE/47470/000.