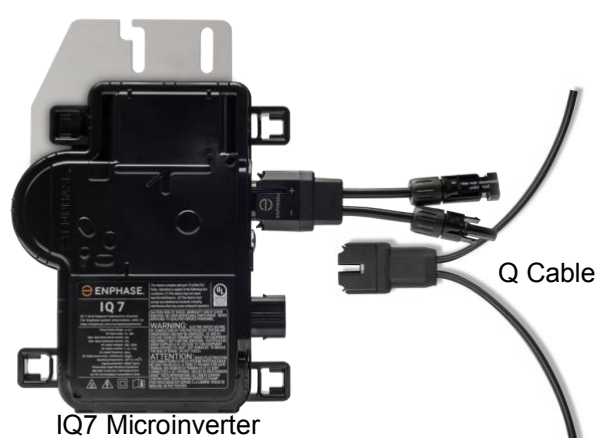


## AUSTRALIA / NEW ZEALAND

### Design Considerations for 230 VAC Single-Phase Q Cable

#### Enphase Q Cable and Q Cable Accessories

Enphase Q Cable is the cable assembly system for Enphase IQ Microinverters. IQ Microinverters are equipped with a class II double-insulated enclosure and so do not require an earthing conductor.



The following table lists the 230 VAC single-phase Q Cable options for various module spacing scenarios.

| Q CABLE TYPES / ORDERING OPTIONS |                     |                   |                       |                         |
|----------------------------------|---------------------|-------------------|-----------------------|-------------------------|
| Model Number                     | Max Nominal Voltage | Connector Spacing | PV Module Orientation | Connector Count per Box |
| Q-25-10-240                      | 250 VAC             | 1.3 m             | Portrait              | 240                     |
| Q-25-17-240                      | 250 VAC             | 2.0 m             | Landscape (60-cell)   | 240                     |
| Q-25-20-200                      | 250 VAC             | 2.3 m             | Landscape (72-cell)   | 200                     |

Q Cable and accessories are UV rated, certified, and specifically required for use with IQ Microinverters.

| ENPHASE Q CABLE ACCESSORIES       |              |                                                                            |
|-----------------------------------|--------------|----------------------------------------------------------------------------|
| Name                              | Model Number | Description                                                                |
| Raw Q Cable (unconnectorised)     | Q-25-RAW-300 | 300 meters cable with no connectors                                        |
| Field-wireable connector (male)   | Q-CONN-R-10M | Make connections                                                           |
| Field-wireable connector (female) | Q-CONN-R-10F | Make connections from any Q Cable open connector                           |
| Cable Clip                        | ET-CLIP-100  | Used to fasten cabling to the racking or to secure looped cabling          |
| Disconnect tool                   | Q-DISC-10    | Disconnect tool for Q Cable connectors, DC connectors, and AC module mount |
| Q Cable sealing caps (female)     | Q-SEAL-10    | One needed to cover each unused connector on the cabling                   |
| Terminator                        | Q-TERM-R-10  | Terminator cap for unused cable ends                                       |

## Q Cable

- The single-phase Q Cable contains two 2.5mm<sup>2</sup> conductors, rated to 20A.
- There is no earth conductor in the Q Cable as the IQ microinverters are equipped with a class II double-insulated enclosure.
- The male Q Connectors plug directly into the Microinverter bulkhead.



**Q Cable:** CSA 2.5mm<sup>2</sup>, OD 10.3±0.30 (mm)

## Circuit Design Requirements for Q Cable

Installers must follow Microinverter and Q Cable branch limits to ensure system safety and correct operation. A maximum 20A circuit breaker is required on each microinverter circuit. The maximum number of microinverters per circuit is indicated in the following table.

|         | Number of Microinverters per 230 VAC 20A Circuit |
|---------|--------------------------------------------------|
| IQ7X    | 12                                               |
| IQ7Plus | 13                                               |
| IQ7     | 16                                               |

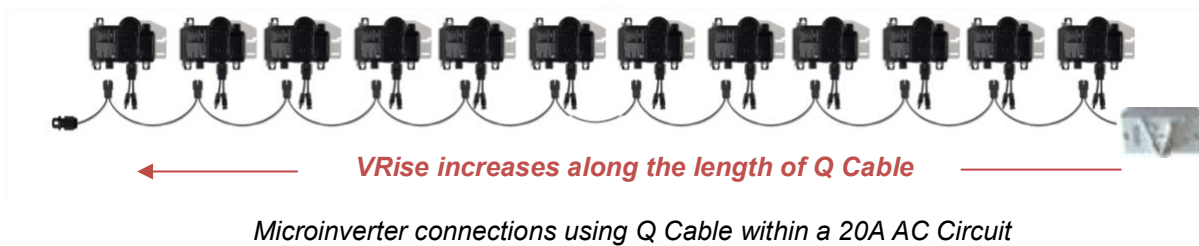
## Designing for Voltage Rise

Minimise voltage rise by adhering to the following recommendations.

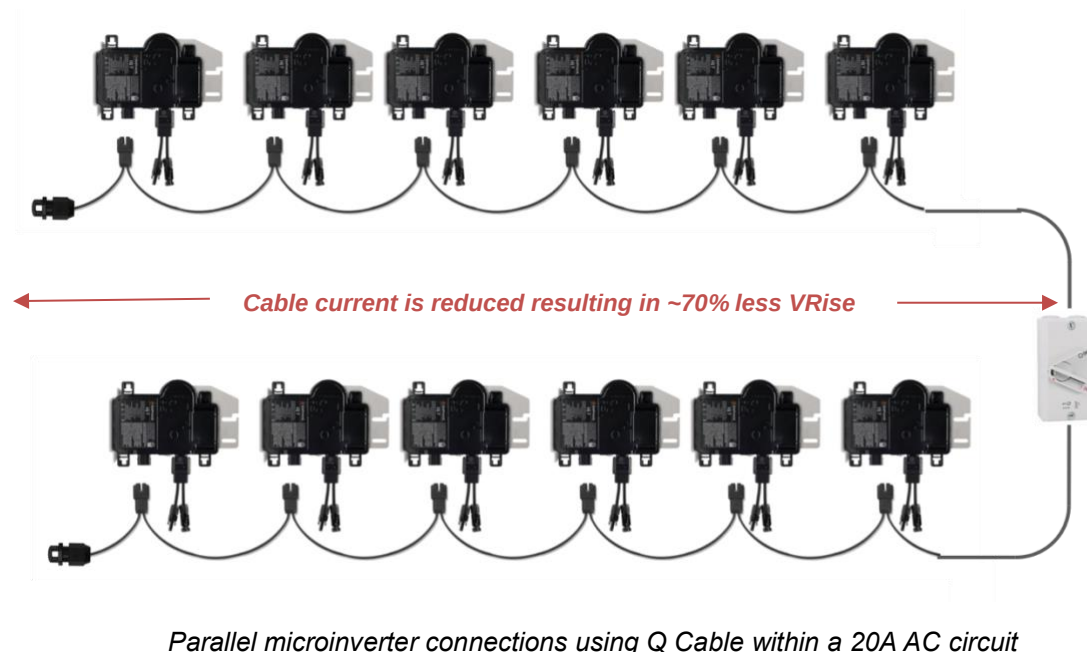
### **Parallel Branch wiring connections**

Parallel AC Branch wiring within an AC circuit reduces the voltage rise across the Q Cable system.

**Example 1: Microinverters installed in single connection at AC isolator.** Voltage rises occurs across the circuit over the entire length of the Q Cable.



**Example 2: Recommended Wiring Layout with Parallel Wiring Connections.** Microinverters installed in single connection at AC isolator. Voltage rise reduces as maximum wiring length across the microinverter circuit to the AC isolator is halved.



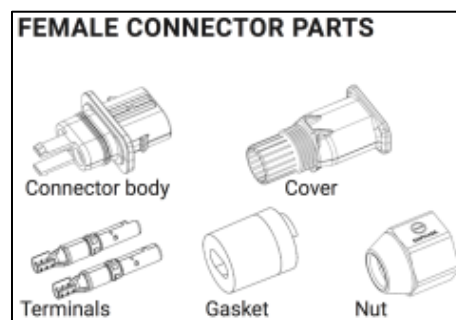
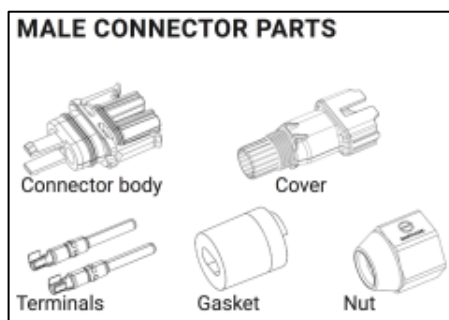
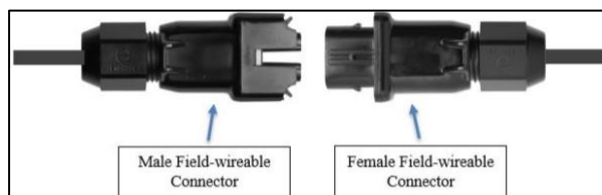
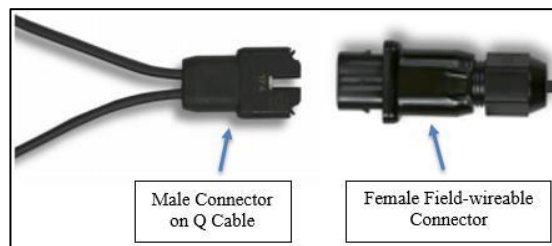
## Custom Q Cables

You can create custom sections of cable with Enphase Raw Q Cable and Enphase Field Wireable Connectors.



Raw Q Cable is a round, twin 2.5mm<sup>2</sup> conductor cable, with a 10.3mm outside diameter specifically designed for Enphase Field Wireable Connectors.

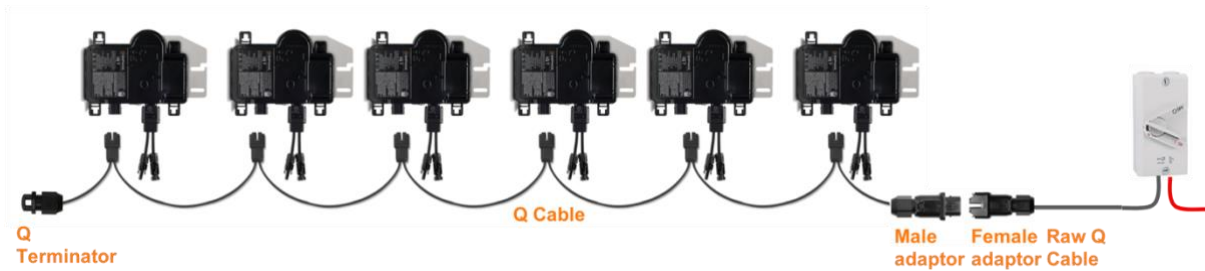
Field Wireables are plugs and sockets that enable the interconnection to Q Cable. You will need a **Multi-Contact PV crimping tool to assemble the connector assembly.**



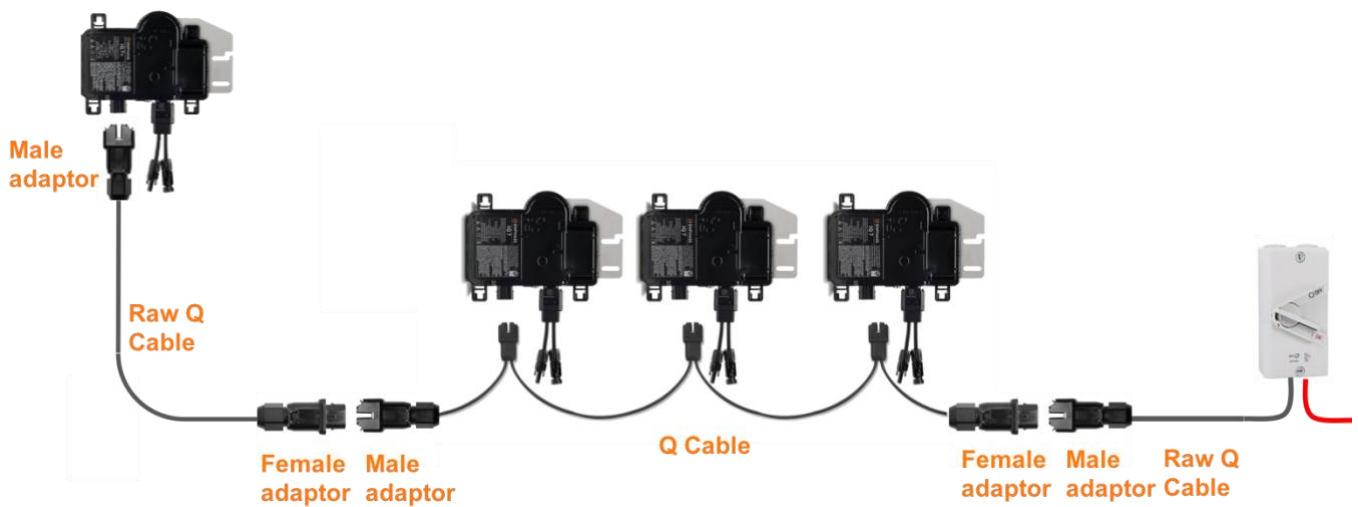
## Custom Q Cable Solutions

You can adapt the Field-Wireable Connectors and Raw Q Cable for a number of installation solutions:

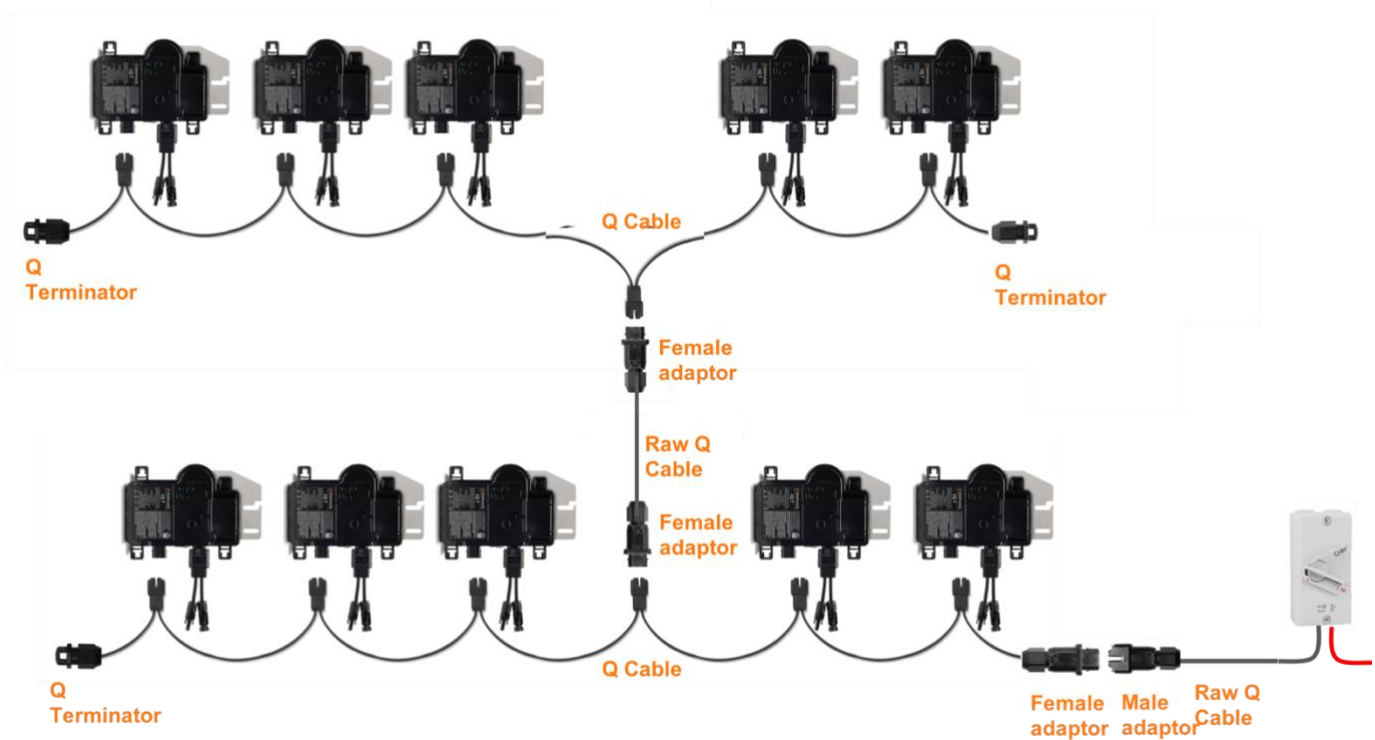
1. Wiring between arrays
2. Extending the Q Cable to junction boxes or AC isolators
3. Direct connection into IQ Microinverter AC socket



**Wiring Configuration Example 1:** Raw Q Cable interconnected directly to an AC isolator



**Wiring Configuration Example 2:** Raw Q Cable wired to directly to an IQ Microinverter



**Wiring Configuration Example 3: Raw Q Cable interconnecting arrays**

When assembling custom cable sections, check the number of microinverters and the cable length to minimise voltage rise within AC microinverter circuits.

Refer to the following table to confirm the maximum cable length of Raw Q Cable to support microinverters.

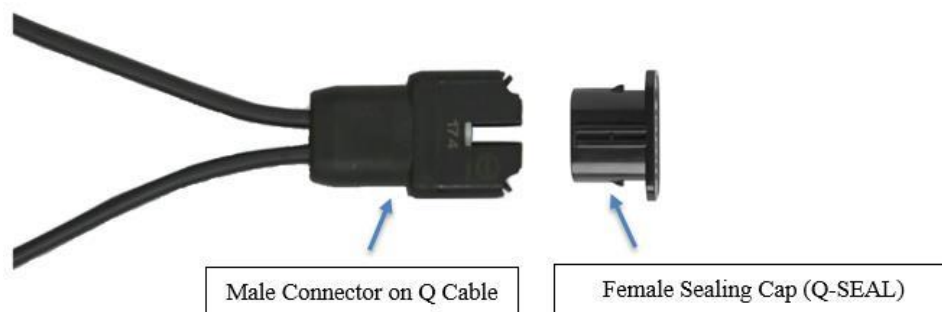
| Single Phase Maximum Q Raw Cable length (m) (1% VRise) |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|--------------------------------------------------------|-----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|----|
| IQ7X<br>IQ7PLUS<br>IQ7                                 | 92  | 46 | 30 | 23 | 18 | 15 | 13 | 11 | 10 | 9  | 8  | 7  |    |    |    |    |
|                                                        | 100 | 50 | 33 | 25 | 20 | 16 | 14 | 12 | 11 | 10 | 9  | 8  | 7  |    |    |    |
|                                                        | 122 | 61 | 40 | 30 | 24 | 20 | 17 | 15 | 13 | 12 | 11 | 10 | 9  | 8  | 8  | 7  |
| Number of microinverters supplied by Q Raw Cable       |     |    |    |    |    |    |    |    |    |    |    |    |    |    |    |    |
|                                                        | 1   | 2  | 3  | 4  | 5  | 6  | 7  | 8  | 9  | 10 | 11 | 12 | 13 | 14 | 15 | 16 |

*Maximum length of Raw Q Cable within a 20A microinverter circuit*

## Q Cabling Accessories

### **Q Sealing Caps (Part number Q-SEAL)**

You must seal each unused Q Cable connector with a sealing cap.



### **Q Terminator (part number Q-TERM-R)**

Install a terminator cap on any cut end of Q Cable that is not terminated with a Field Wireable Q Connector.



### **Enphase Disconnect Tool (Part number Q-DISC)**

The Enphase Disconnect Tool is used for separating connectors and microinverters from the Q cabling system. For your convenience, the tool also includes MC4 removal tabs for removing the MC4 connector between the microinverter and PV module.



### **Cable Clip (Part number ET-CLIP)**

Use the cable clip to mechanically support Q Cable on solar railing.

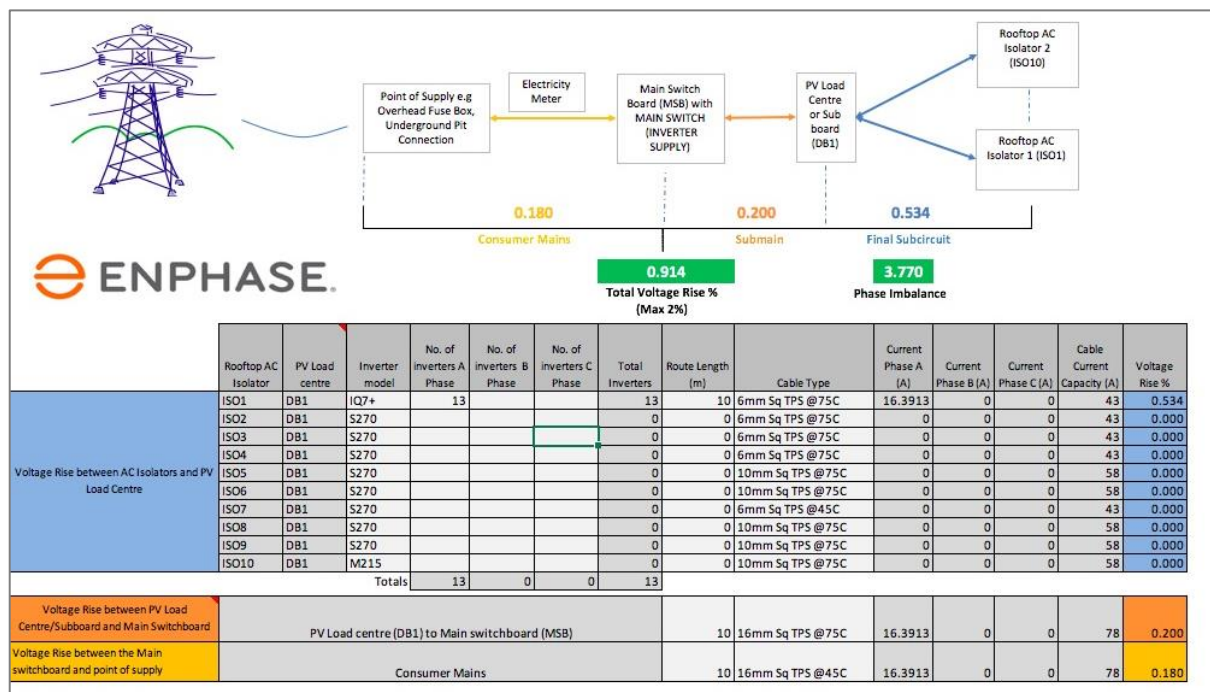


## Q Cable System Design and Installation Tips

1. Secure the Q Cable in position at least every 30cm.
2. Do not allow the Q Cable to contact the roof surface.
3. Minimise AC microinverter branch lengths to reduce voltage rise.
4. When using Raw Q cable, observe the recommended cable limits in this guide to minimise voltage rise.
5. Solar PV array earthing is required (refer to our [Technical Brief: Equipment Earthing in an Enphase System](#)). Q Cable does not contain an earth conductor.
6. Follow the Enphase installation guides and manuals to ensure a successful installation.

## Voltage Rise Calculator Tool

An Enphase design tool is available to determine the correct wiring design.



Follow this link to the [Enphase Voltage calculator](#) to confirm your wire selection meets Australian/New Zealand standards for installation wiring requirements.