Solar Photo Voltaic Switchgear Solutions

PV

Issue 2

Solar Voltaics in Domestic Installations

Cables with a power supply at each end need special considerations.

Using Double pole RCBOs on a dedicated circuit could be the simplest answer.

1. **Circuit protection for both power supplies may be required (subject to inverter operating characteristics)**
2. **PV supplies with an RCD providing additional protection for the final circuit must be DP and disconnect Line and Neutral conductors (e.g. Double pole RCBO). Use of DP RCBOs may negate the need to take account of inverter shut down times**
3. **PV supplies require DC and AC Isolators so that the inverter can be isolated from both supplies for maintenance**
4. **PV supplies should be connected to a dedicated circuit at the consumer unit (not share a final sub circuit)**
5. **PV Meters must comply with MID2004/22/EC B&D or B&F**

A new range of Wylex products is available to help installers meet the above

Combination DC/AC PV Isolator

Dual Supply PV /Main Supply Switch

PV Ready Consumer Unit (with meter)

PV Ready Consumer Unit (with DP RCBO & meter)

A **411.3.2.2**
The maximum disconnection time shown in Table 41.1 applies to circuits not exceeding 32A. 0.4 s TN System & 0.2 s TT Systems.

B **551.4.1**
Fault protection shall be provided for of each source of supply or combination of sources of supply.
(Also, refer to chapter 55, regulation group 551 - Low Voltage Generating Sets)

C **551.5.1**
Over current protection should be located as near as practical to the generator terminals (where required).

D **712.537.2.1.1**
To allow maintenance of the PV Inverter, means of isolating the PV inverter from the DC side and the AC side shall be provided.
(Also, refer to chapter 53, regulation group 537 - Isolation and Switching)

E **712.434.1**
The PV supply cable (AC side) shall be protected against fault current by an overcurrent protective device installed at the connection to the AC mains.
Also, refer to Part 7, all regulations in Section 712 - Solar Photovoltaic (PV) Power Supply Systems)

F **712.411.3.2.1.1**
The PV Supply cable (on the AC side) shall be connected to the supply side of the protective device for automatic disconnection of circuits supplying current - using equipment.

G **314.1**
Every installation shall be divided into circuits as necessary to: (ii) facilitate safe inspection testing & maintenance (vi) prevent the indirect energising of a circuit intended to be isolated.

H **314.4**
In an installation comprising more than one final circuit, each final circuit shall be connected to a separate way in a distribution board.
The wiring of each final circuit shall be electrically separate from that of every other final circuit, so as to prevent the indirect energising of a final circuit intended to be isolated.

I **522.6.101 522.6.102 & 522.6.103**
Installers must consider the need for Additional Protection by 30mA RCD in accordance with regulations (Previously 522.6.6 & 522.6.8) that relate to concealed cables in walls & partitions.

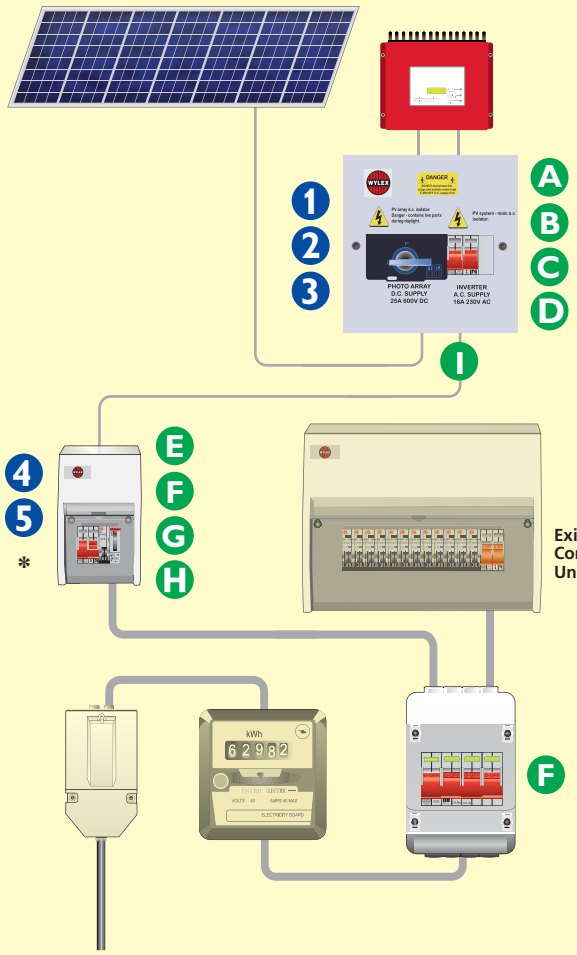
Wylex have created a number of new PV dedicated products to help installers to economically and efficiently install Solar Photovoltaic (PV) Systems up to 4kW, including:

- AC & DC Enclosed Isolators
- Combination DC/AC PV Isolator in a single enclosure
- Dual Supply PV & Grid Mains Supply Switch
- PV Consumer Units (all 17th edition models available)

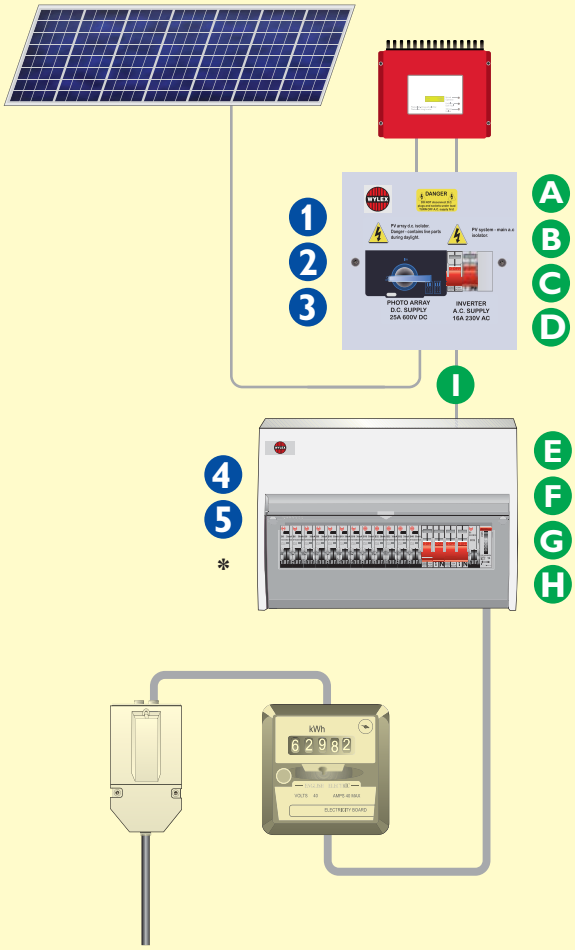
The equipment is designed to allow the installer to make parallel power connections simply and easily.

Typical Installation Diagrams

Adding PV to an Existing Installation



Complete New Installation



Recommended methods for meeting requirements 1-5 & A to I
* Class B RCDs may be required with certain types of inverter.

Class B RCDs & Surge Protection Devices also available

This guide to Wylex circuit protection & switchgear products is not a substitute for the IET 17th Edition wiring regulations (BS 7671:2001 Requirements for Electrical Installations amendment 1) which should always be used for design and installation work. Always check with manufacturers of all components of the PV System (including Solar-Panel & Inverter manufacturers) before selecting and installing circuit protection devices.

Other relevant documents include:
DTI publication Photovoltaics in Buildings, Guide to the installation of PV systems 2nd Edition publication number URN 06/1972,
The Microgeneration Certification Scheme installation standard MIS 3002 Solar PV,
Electrical Safety Council best practice guide 3 Connecting a Microgeneration system to a domestic or similar electrical installation,
Approved building regulation Document P

NSPE-5359/5

COMBINATION DC & AC PV ISOLATOR

DESCRIPTION	LIST No.
Two isolators in a single enclosure that allows the installer to save time by comparison to other methods that utilise two separate enclosures. Class II construction.	

- Available with or without local circuit protection devices (MCB, RCD or RCBO)
- Compact combined DC & AC Isolator in one enclosure
- Speeds up installation
- Securable in the Off position
- Robust metal enclosure with Knockout cable entries

Dual Isolator	NSPE-5359/5
Dual Isolator with SP 16A MCB	NHDS106B16

When circuit protection devices are provided at the inverter output, the installer must ensure that the characteristics of the protective device are suitable for the fault levels at that point in the circuit and will meet required disconnection times

PV supplies (DC & AC) must be arranged so that the converter can be isolated from both supplies for maintenance

NHDSREC4

DUAL SUPPLY PV/MAINS SUPPLY SWITCH

DESCRIPTION	LIST No.
Two isolators in a single enclosure that allows the installer to save time by comparison to other methods that utilise two separate enclosures.	

- Allows for the addition of PV supplies using the normal input terminations at each consumer unit
- 4 Pole Switch gives single point for total Isolation of both supplies
- Compact Combined Dual Supply Isolator
- Securable in the OFF position
- Sealable covers for security
- Security Screw can be wire sealed

REC Isolator

100A, 230V AC DP 2 Module Isolator, lockable 40A, 230V AC DP 2 Module Isolator, lockable Enclosure with split cover and meter seal and seal-able security screw.	NHDSREC4

NHB16MPV

PV CONSUMER UNIT

DESCRIPTION	LIST No.
Insulated metered consumer unit supplied with either Main Switch and 16A SP MCB or 16A RCBO with optional MID meter.	

- 63A 320V AC DP Isolator
- 16A B Curve SP MCB
- 40A direct read MID Meter.
- Ready assembled consumer unit complete with MID Certified meter
- Combined unit simplifies and speeds up installation
- Complete with Isolator & MCB
- Easy read permanently displayed kWh reading
- Option available with RCBO or MCB

With DP 16A RCBO (with meter)	NHRCBO16BMPV
With SP 16A MCB (with meter)	NHB16MPV
With DP 16A RCBO (no meter)	NSPE-5392/6
With SP 16A MCB (no meter)	NHB16PV

PV supplies should be connected to a dedicated circuit at the consumer unit (not share a final sub circuit)

PV supplies should be connected to the supply side of the MCB at the consumer unit (not reverse fed)

PV Meters must comply with MID2004/22/EC B&D or B&F

Note: Surge Protection devices and Type B RCDs are available on request

DC ISOLATOR

DESCRIPTION	LIST No.
DC Isolator in an all insulated enclosure with rotary handle and padlock locking Off facility.	

- Multi Pole
- 25A, 32A, 40A
- 500V or 600V DC
- Insulated Enclosure
- Rotary Handle & padlock 'Off' facility
- DC - 21B utilization category

32A 500V 4 Pole	NHDC325004P
40A 500V 4 Pole	NHDC405004P
25A 600V 6 Pole	NHDC256006P
40A 600V 6 Pole	NHDC406006P

AC ISOLATOR

DESCRIPTION	LIST No.
AC Isolator in an all insulated IP65 enclosure with rotary door interlock and padlock locking Off facility.	

- Multi Pole
- 16, 25 or 32A
- 230V AC
- IP65 Enclosure
- Rotary Handle & padlock 'Off' facility

16A 230V AC 3 Pole	NHTPSD16
25A 230V AC 3 Pole	NHTPSD25
32A 230V AC 3 Pole	NHTPSD32

MID METERS IN ENCLOSURE

DESCRIPTION	LIST No.
MID B&D certified meters c/w an IP40 insulated enclosure.	

- Direct connected kWh meter
- Mechanical barell number or Liquid Crystal Display
- Pulsed output for BMS monitoring
- DIN Rail mounting

1 Mod MID Meter (Analogue)	NHSPMTRA
1 Mod MID Meter (Digital)	NHSPMTRD

Note: Surge Protection devices and Type B RCDs are available on request

Main Switch Dual Supply PV Consumer unit with MID Certified Generation Meter

DESCRIPTION	LIST No.
15 way unit with dual supply isolators & 16A SP MCB	NH15DSMPVF
10 way unit with dual supply isolators & 16A SP MCB	NH10DSMPVF
14 way unit with dual supply isolators & 16A DP RCBO	NH14DSRCBMPVF
9 way unit with dual supply isolators & 16A DP RCBO	NH9DSRCBMPVF

Main Switch Dual Supply PV Consumer unit

16 way unit with dual supply isolators & 16A SP MCB	NH16DSPVF
11 way unit with dual supply isolators & 16A SP MCB	NH11DSPVF
15 way unit with dual supply isolators & 16A DP RCBO	NH15DSRCBPVF
10 way unit with dual supply isolators & 16A DP RCBO	NH10DSRCBPVF

Double Pole MCB options available on request

Split Load Dual Supply PV Consumer unit with MID Certified Generation Meter

DESCRIPTION	LIST No.
13 way unit with dual supply isolators & 16A SP MCB	NH13DSMPVSL
8 way unit with dual supply isolators & 16A SP MCB	NH8DSMPVSL
12 way unit with dual supply isolators & 16A DP RCBO	NH12DSRCBMPVSL
7 way unit with dual supply isolators & 16A DP RCBO	NH7DSRCBMPVSL

Split Load Dual Supply PV Consumer unit

14 way unit with dual supply isolators & 16A SP MCB	NH14DSPVSL
9 way unit with dual supply isolators & 16A SP MCB	NH9DSPVSL
13 way unit with dual supply isolators & 16A DP RCBO	NH13DSRCBPVSL
8 way unit with dual supply isolators & 16A DP RCBO	NH8DSRCBPVSL

Double Pole MCB options available on request

High Integrity Dual Supply PV Consumer unit with MID Certified Generation Meter

DESCRIPTION	LIST No.
11 way unit with dual supply isolators & 16A SP MCB	NH11DSMPVHI
10 way unit with dual supply isolators & 16A DP RCBO	NH10DSRCBMPVHI

High Integrity Dual Supply PV Consumer unit

12 way unit with dual supply isolators & 16A SP MCB	NH12DSPVHI
11 way unit with dual supply isolators & 16A DP RCBO	NH11DSRCBPVHI

Double Pole MCB options available on request

Dual RCD Dual Supply PV Consumer unit with MID Certified Generation Meter

DESCRIPTION	LIST No.
11 way unit with dual supply isolators & 16A SP MCB	NH11DSMPVDR
6 way unit with dual supply isolators & 16A SP MCB	NH6DSMPVDR
10 way unit with dual supply isolators & 16A DP RCBO	NH10DSRCBMPVDR
5 way unit with dual supply isolators & 16A DP RCBO	NH5DSRCBMPVDR

Dual RCD Dual Supply PV Consumer unit

12 way unit with dual supply isolators & 16A SP MCB	NH12DSPVDR
7 way unit with dual supply isolators & 16A SP MCB	NH7DSPVDR
11 way unit with dual supply isolators & 16A DP RCBO	NH11DSRCBPVDR
6 way unit with dual supply isolators & 16A DP RCBO	NH6DSRCBPVDR

Double Pole MCB options available on request

Note: Surge Protection devices and Type B RCDs are available on request

MINIATURE CIRCUIT BREAKERS Single Pole - 6kA

RATING	B CURVE	C CURVE
6A SP MCB 6kA	NHXB06	NHXC06
10A SP MCB 6kA	NHXB10	NHXC10
16A SP MCB 6kA	NHXB16	NHXC16
20A SP MCB 6kA	NHXB20	NHXC20
32A SP MCB 6kA	NHXB32	NHXC32
40A SP MCB 6kA	NHXB40	NHXC40
50A SP MCB 6kA	NHXB50	NHXC50

RCBO Single Pole - 6kA (Combined MCB/RCD device)

RATING	B CURVE	C CURVE
6A SP RCBO 6kA	NHXSBS1B06	NHXSBS1C06
10A SP RCBO 6kA	NHXSBS1B10	NHXSBS1C10
16A SP RCBO 6kA	NHXSBS1B16	NHXSBS1C16
20A SP RCBO 6kA	NHXSBS1B20	NHXSBS1C20
32A SP RCBO 6kA	NHXSBS1B32	NHXSBS1C32
40A SP RCBO 6kA	NHXSBS1B40	NHXSBS1C40
50A SP RCBO 6kA	NHXSBS1B50	NHXSBS1C50

RCBO Double Pole - 10kA C Curve (Combined MCB/RCD device)

RATING	WITH NEUTRAL LEAD	DIRECT CONNECTION
6A DP RCBO 10kA	WRCBL6C2	WRCBX6C2
10A DP RCBO 10kA	WRCBL10C2	WRCBX10C2
16A DP RCBO 10kA	WRCBL16C2	WRCBX16C2
20A DP RCBO 10kA	WRCBL20C2	WRCBX20C2
32A DP RCBO 10kA	WRCBL32C2	WRCBX32C2
40A DP RCBO 10kA	WRCBL40C2	WRCBX40C2

PV - DC Type B RCD in enclosure

RATING	LIST No.
16A 30mA DP RCD	NSPE-5579
40A 30mA DP RCD	NSPE-5580
40A 300mA DP RCD	NSPE-5581

MCB Accessories

DESCRIPTION	LIST No.
Padlock 3mm Hasp	WPL
SP MCB Dummy Blank	NHB1PP
SP Blanking plate - twist fit	NH00PP
DIN Enclosure IP40	ESE2
Locking device for MCB	MCBLDX

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