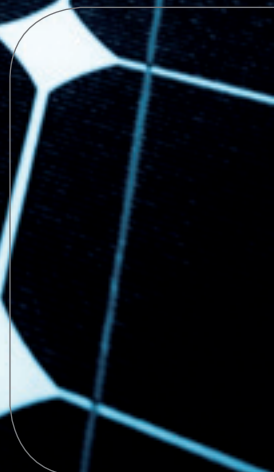




Photovoltaic solutions





A sure future, assuring our future

The increased popularity of renewable energy installations is set to continue, partly fuelled by the governments Feed In Tariff policy and partly the realisation that household fuel bills will continue to rise over the coming years. Many homeowners have taken the decision to produce their own electricity through either photovoltaic cells or wind turbines.

Photovoltaic panels are most often retrofitted into existing buildings, usually mounted on top of the existing roof structure or on the existing walls. Alternatively, panels can be located separately from the building but connected by cable to supply power for the building.

Building-integrated photovoltaic's (BIPV) are increasingly incorporated into new domestic and industrial buildings as a principal or ancillary source of electrical power.

At Hager we have brought together a portfolio of domestic and commercial PV devices from our existing product ranges into one complete catalogue. Not only are we able to provide a range of 'loose kit' for both the AC and DC side of the installation, through our Engineered Solution business we can also offer a fully tailored solutions, design and build service for PV and wind power control enclosures to detailed specifications, all manufactured in a ISO 9001:2000 factory.

Photovoltaic solutions

Hager Enclosures

A range that meets your needs and provides the protection you require when switching to photovoltaics.

The Hager Consumer Unit has been designed to fit into today's home environment. Whether it is used to house electrical distribution, smart control devices or PV devices including metering.



Hager Devices



Hager Engineered Solutions Service

Factory assembly of non-standard PV control units, special configurations in standard enclosures, IP 55 or metal DIN rail enclosures, providing an exact product that meets the requirements of a particular PV installation.

This allows the board to be configured to suit the individual needs of a PV installation with a factory assured and tested product.

To learn more about our Engineered Solutions offer, please contact our estimation team:

Call - 01952 675600
eMail - estimation@hager.co.uk
Fax - 0870 240 2400

Typical installation

Requirements for Electrical Installations IET Wiring Regulations 17th Edition

PV Equipment on the DC side shall be considered to be energized, even when the system is disconnected from the AC side.

Isolation: To allow maintenance of the PV converter, means of isolating the PV converter from the DC side and the AC side shall be provided. **712.537.2.1.1**

Division of Installation: Every installation shall be divided into circuits, as necessary, to: (i) Avoid danger and minimise inconvenience in the event of a fault. (ii) Facilitate safe inspection, testing and maintenance. (vi) Prevent the indirect energising of a circuit intended to be isolated. **314.1**

Fault protection: Shall be provided for each source of supply or combination of sources of supply. **551.4.1**

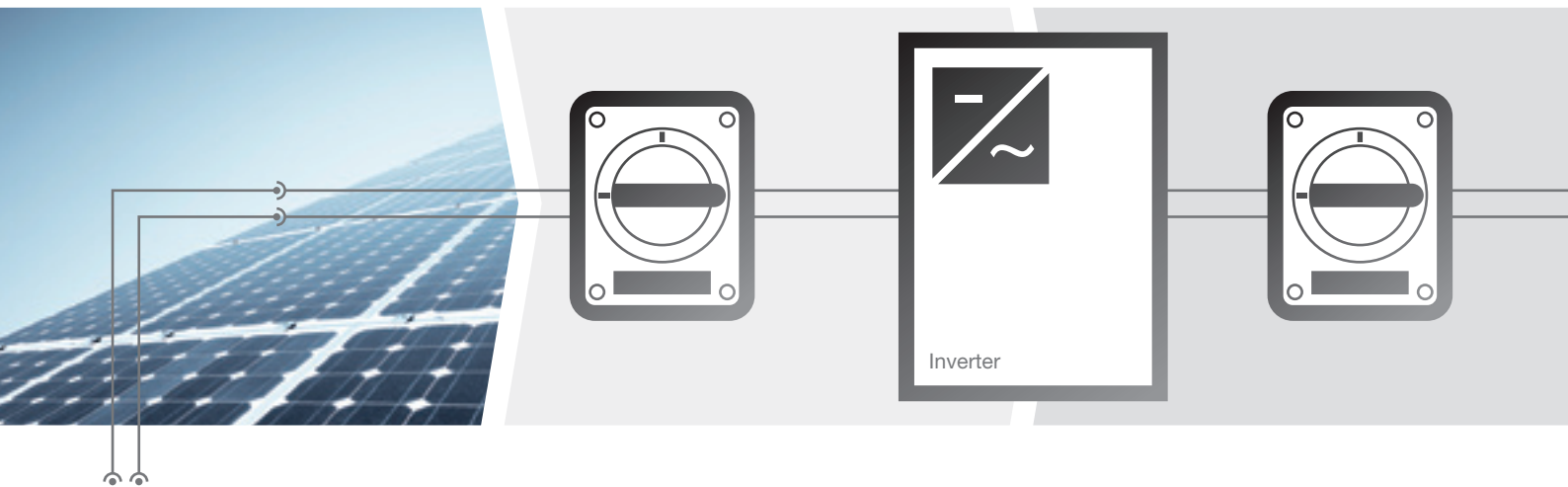
Overcurrent protection: Should be located as near as practical to the generator terminals (where required). **551.5.1**

Maximum disconnection times: The maximum disconnection time shown in Table 41.1 shall be applied to final circuits not exceeding 32A. 0.4s TN System & 0.2s TT Systems. **411.3.2.2**

Roof Installation

DC Installation

New AC Installation



DC Isolator

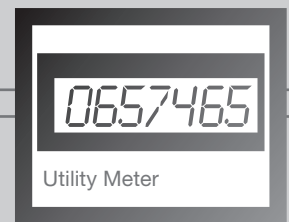
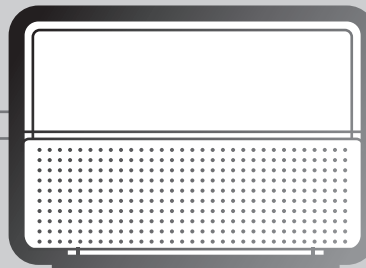
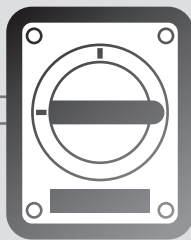


AC Isolator

Where an installation comprises 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 energizing of a final circuit intended to be isolated.

314.4

Existing AC Installation



Generation Meter



AC Isolator



Consumer Unit

Description

The hager range of switch disconnectors further complements the existing commercial range giving a range of enclosed switch disconnectors to IP65 for individual isolation.

The devices are padlockable in three positions and offer plenty of cabling space. Clip on auxiliary contacts can be fitted retrospectively.

Product features

Complies with: BS EN 60947-3
IP65 to BS EN 60529

Utilisation category

AC-21

Cable Capacity

20 - 40A = 16mm²
63 - 100A = 35mm²



JAB402

IP65 Switch Disconnectors Triple Pole and Neutral

Description	In AC 21	In AC 22	Cat ref.
IP65 Switch Disconnector	20A	10A	JG00S
IP65 Switch Disconnector	25A	16A	JG01S
IP65 Switch Disconnector	40A	25A	JG02S
IP65 Switch Disconnector	63A	40A	JG03S
IP65 Switch Disconnector	80A	63A	JG04S
IP65 Switch Disconnector	100A	80A	JG05S

Auxiliary Changeover Contacts

Description	Cat ref.
1 NO / 1 NC	JG10A
3 NO / 2 NC	JG20A

Description

These DC switches are very popular for use in solar powered photo voltaic applications where they isolate the incoming side of the inverter.

They are supplied in grey with a black handle so that it is easy to distinguish them from the yellow/red AC switches used on the outgoing side of the inverter.

Product Features

Complies with: BS EN 60947-3 IP65 to BS EN 60529
An interlock ensures that the cover cannot be removed in both the ON and PADLOCKED OFF positions.

Cable Capacity

20 - 40A = 16mm²
63 - 100A = 35mm²



JG440DC

DC Switches

Rating	Utilisation Category	Cat ref.
12A at 500V DC-21B, 10A at 600V DC-21B 8A at 800V DC-21B, 6A at 440V DC-22B	DC-21B	JG416DC
16A at 500V DC-21B, 12A at 600V DC-21B 10A at 800V DC-21B, 6A at 440V DC-22B	DC-21B DC-22B	JG425DC
20A at 500V DC-21B, 16A at 600V DC-21B 12A at 800V DC-21B, 16A at 440V DC-22B	DC-21B DC-22B	JG440DC



SB432PV

DC Switch 4 Pole

Description	Width	Cat ref.
32A / 100V ...	61.25mm	SB432PV

DC

4 Pole RCCBs



CFB440F

4 Pole RCCB, type B, DC Sensitive 30mA

Sensitivity type B	Current rating	Cat ref.
30mA	40A	CDB440F
30mA	63A	CDB463F

Description

Protection and control of circuits against overloads and short circuits.

- In domestic installations

Technical data

Type B tripping characteristics complies with BS EN 60898. Calibration temperature 30°C
 Breaking capacity: 6kA
 Voltage rating: 230 - 400V
 Current rating: 6 - 63A
 Electrical operations: 20,000

Connection capacity

Rigid conductor 25mm²
 Flexible conductor 16mm²



MTN163

Single Pole MCBs 6kA Type B



Rating	Width (17.5mm)	Cat ref.
6A	1 Mod	MTN106
10A	1 Mod	MTN110
16A	1 Mod	MTN116
20A	1 Mod	MTN120
25A	1 Mod	MTN125
32A	1 Mod	MTN132
40A	1 Mod	MTN140
50A	1 Mod	MTN150
63A	1 Mod	MTN163

AC - RCBO (Domestic)

Single Pole 6kA

Compact protection devices which combine the overcurrent functions of an MCB with the earth fault functions of an RCCB in a single unit. A range of sensitivity and current ratings are available for use in domestic installations.

Technical Data

Insulated DIN clip
 Complies with BS EN 61009, IEC1009
 Sensitivities (fixed)
 10mA and 30mA
 Breaking capacity: 6kA
 Flying neutral lead: 200mm

Terminal Capacities

16mm² rigid,
 10mm² flexible

Application

1 module devices provide a compact solution for installation in consumer units.

These devices are 1pole & solid neutral.

Operating Voltage

127-230V AC



ADN120

Sensitivity 30mA (6kA)

Current rating	Width (17.5mm)	Type B Cat ref.
6A	1 Mod	ADN106
10A	1 Mod	ADN110
16A	1 Mod	ADN116
20A	1 Mod	ADN120
32A	1 Mod	ADN132
40A	1 Mod	ADN140
45A	1 Mod	ADN145
50A	1 Mod	ADN150

Description

Surge protective devices Type 1
General protection,
self protected against the short
circuit currents below 12.5kA
operation indicator

Complies with: IEC 61643-1

Auxiliary contacts for remote
signalling information from
reserve and end of life.

Reserve indicator: Shows the
when the cartridge needs
replacing.

Backup protection is required.

Width

1 Mod = 17.5mm
2 Mod = 35mm
4 Mod = 70mm
8 Mod = 140mm

limp = Impulse discharge current
Imax = Maximum discharge
current



SPA412A

Surge Protection Devices - Type 1

limp 12.5 kA
Imax 25ka
Wave 10/350 μ s
Up 2.5kV

Description	Width	Cat ref.
1 Ph + N	4 Mod	SPA212A
3 Ph + N	8 Mod	SPA412A



SPN265R

Surge Protection Devices - Type 2

Imax 65 kA
Wave 8/20 μ s
In 20 kA
Up 1.5 kV

Description	Width	Cat ref. with reserve light
1 Ph + N	2 Mod	SPN265R
3 Ph + N	4 Mod	SPN465R

Surge Protection Devices - Type 2

Imax 40 kA
Wave 8/20 μ s
In 15 kA
Up 1.2 kV except SPN140C Up 2kA

Description	Width	Cat ref. without reserve light	Cat ref. with reserve light
1 Ph	1 Mod	SPN140C	
1 Ph + N	2 Mod	SPN240D	SPN240R
3 Ph + N	4 Mod	SPN440D	SPN440R



SPN415R

Surge Protection Devices - Type 2

Imax 15 kA
Wave 8/20 μ s
In 5 kA
Up 1.0 kV

Description	Width	Cat ref. without reserve light	Cat ref. with reserve light
1 Ph + N	2 Mod	SPN215D	SPN215R
3 Ph + N	4 Mod	SPN415D	SPN415R



SPN715D

Tamper Proof Surge Protection Devices - Type 2

Imax 15 kA
Wave 8/20 μ s
Up 1 kV

Description	Width	Cat ref. with reserve light
1 Ph + N	2 Mod	SPN715D



SPN040D

Replacement Cartridges - Phase

Suitable for	Cat ref.
SPN265R, SPN465R	SPN065R
SPN140C	SPN040C
SPN240R, SPN440R	SPN040R
SPN240D, SPN440D	SPN040D
SPN215R, SPN415R	SPN015R
SPN215R, SPN415D, SPN715D	SPN015D



SPN040N

Replacement Cartridges - Neutral

Suitable for	Cat ref.
SPN265R, SPN465R	SPN065N
SPN240R, SPN440R, SPN215R, SPN415R, SPN240D, SPN440D, SPN215D, SPN415D	SPN040N

DC Surge Protection

For the protection of photovoltaic installations.
Complies with:
EN 61 643-11

Circuit Breakers and Fuses DC

For the protection of photovoltaic installations.
Conforms to:
EN 60 269-2-1

Width

1 Mod = 17.5mm
2 Mod = 35mm
3 Mod = 52.5mm

Backup protection is required.



SPV325

Photovoltaic Surge Protector

I max. 25kA
In : 12.5kA
Uc : 1000V ...
Up ≤ 4kV

Description	Width	Cat ref.
2 Pole renewable surge protector	3 Mod	SPV325
Renewable cartridge for surge protector +/-	1 Mod	SPV025
Renewable cartridge for surge protector ±	1 Mod	SPV025E



L502PV

Fuse Carrier

Description	Width	Cat ref.
1 Pole	1 Mod	L501PV
2 Pole	2 Mod	L502PV



LF3XXPV

Fuses

Description	Cat ref.
2A	LF302PV
3A	LF303PV
4A	LF304PV
6A	LF306PV
8A	LF308PV
10A	LF310PV
12A	LF312PV
16A	LF316PV
20A	LF320PV

Description

Energy meters are used to measure the active energy consumed by an installation. They allow the user to understand and control the real cost of an installation generated by the PV installation.

MID approval for sub billing on EC154M.

Characteristics

- Fully compliant with the European standard EN 50470-3
- Class B
- Accuracy 1%
- Energy readout: 7 digits
- Backlit display
- Indication of instantaneous power consumption
- Total / partial counter
- Pulsed output

- Unlimited saving of measurements
- LED flashes according to consumption
- Option: tariff 1/ tariff 2
- Three phase energy meters are adapted to all kinds of networks
- Display indication in case of incorrect wiring

Width

3 Mod = 52.5mm



EC154M

Single Phase kWh Meters - Direct 63A

Voltage 230V~ 50/60Hz
 Starting current = 40mA
 Base current = 10A
 Max current = 63A

Characteristics	Width	Cat ref.
Energy meter with pulsed output - with MID approval	3 Mod	EC154M

Enclosure with door

1 row for 3, 6, 10 and 12 modules
 2 row for 24 modules
 3 row for 36 modules
 Adjustable depth DIN rail (except VE103U).

Supplied with sealing plugs to re-instate IP rating after fixing.
 Front cover sealing.

Door operation

3-10 modules - vertical hinging retained in open position at 90°
 12-36 modules - horizontal hinging.

Hinging reversible (left or right).

Colour: RAL 7035 (light grey).

Wiring ducts 12 - 36 module enclosures/mini wiring channels left and right ensures conductors are neatly dressed.

IP 55: AC 400V.
 insulation class: class II

Vector II Enclosures



VE212U

Description	Moulded blanks (In front cover)	Cat ref.
1 row, 3 modules N: 1 x 25 + 3 x 16, E: 1 x 25 + 5 x 16	2 x 1/2	VE103U
1 row, 6 modules N: 1 x 25 + 5 x 16, E: 1 x 25 + 7 x 16	2 x 1	VE106U
1 row, 10 modules N: 1 x 25 + 9 x 16, E: 1 x 25 + 11 x 16	2 x 1	VE110U
1 row, 12 modules N: 1 x 25 + 10 x 16, E: 1 x 25 + 13 x 16		VE112U
2 rows, 24 modules N: 1 x 25 + 16 x 16, E: 1 x 25 + 16 x 16		VE212U
3 rows, 36 modules N: 1 x 25 + 19 x 16, E: 1 x 25 + 19 x 16		VE312U

Earth and Neutral for TP&N Connection Assembly



VZ428

Description	Cat ref.
3 x (3 x 16mm ² + 2 x 10mm ²) 270mm wide N: 1 x (5 x 16mm ² + 6 x 10mm ²) In: 63A To fit 12 module wide enclosure only	VZ428

Earth and Neutral for Single Phase Connection Assembly

Description	Cat ref.
2 x (3 x 16mm ² + 4 x 10mm ²) 270mm wide In: 63A To fit 12 module wide enclosure only	VZ403

Key Lock

Description	Cat ref.
For all enclosures with 2 keys	VZ311

Sliding Support

Description	Cat ref.
1 Set = 2 Supports for fixing of additional terminal supports in bottom part of enclosure (VE112U and above)	VZ744

Insulated and metal DIN rail enclosures, 1 row from 4 to 22 modules.

Surface mounted enclosures, with a rigid chassis, housing a DIN rail.

Supplied with marking labels and instructions.

- Options:
- Keylock
 - Plain or transparent door

Complies with BS EN 62208-3 Annex 2A.



VC008G

DIN Rail - Insulated

Description	Enclosures size	Cat ref. Plain door	Cat ref. Glazed door
8 Module DIN Rail Enclosure	3	VC008	VC008G
12 Module DIN Rail Enclosure	4	VC012	VC012G
16 Module DIN Rail Enclosure	5	VC016	VC016G
22 Module DIN Rail Enclosure	6	VC022	VC022G



VH008

DIN Rail - Metal

Description	Enclosure size	Cat ref. Plain door	Cat ref. Glazed door
4 Module DIN Rail Enclosure	2	VH004	-
8 Module DIN Rail Enclosure	3	VH008	VH008G
12 Module DIN Rail Enclosure	4	VH012	VH012G
16 Module DIN Rail Enclosure	5	VH016	VH016G
22 Module DIN Rail Enclosure	6	VH022	VH022G

Insulated enclosures 1 row from 2 to 10 modules.

Surface mounted enclosures, with a rigid, chassis, housing a DIN rail.

Supplied with Earth terminals (except GD102E), marking labels and sealing grommets to maintain Class II.

- Options:
- Keylock
 - Plain or transparent door
 - Terminals and terminal supports



GD106E

Mini Gamma Enclosures

Description	Cat ref.
2 Modules compatible with WAGO type 273 connector block (not supplied).	GD102E
4 Modules E: 2 x 16 + 2 x 10mm ² (capacity to fit an additional 4 hole terminal bar on existing support)	GD104E
6 Modules E: 2 x 16 + 2 x 10mm ² (capacity to fit an additional two 4 hole terminal bars or one 7 hole terminal bar on existing support)	GD106E
8 Modules E: 3 x 16 + 4 x 10mm ² (capacity to fit an additional two 4 hole terminal bars or one 7 hole terminal bar on existing support)	GD108E
10 Modules E: 3 x 16 + 4 x 10mm ² (capacity to fit an additional three 4 hole terminal bars or two 7 hole terminal bars on existing support)	GD110E



GP110T

Mini Gamma Plain & Transparent Doors

Plain door with integrated handle (use of door increases IP rating to IP40)

For Cat ref.	Cat ref. Plain Door	Cat ref. Transparent Door
GD102E	GP102P	GP102T
GD104E	GP104P	GP104T
GD106E	GP106P	GP106T
GD108E	GP108P	GP108T
GD110E	GP110P	GP110T

Terminal Support (no terminals)

For Cat ref.	Cat ref.
GD104E	GZ104S
GD106E	GZ106S
GD108E	GZ108S
GD110E	GZ110S

Terminals (63A Rating)

Cable capacity	Neutral (blue) Cat ref.	Earth (green) Cat ref.
2 x 16mm ² + 2 x 10mm ²	GZ04N	GZ04E
3 x 16mm ² + 4 x 10mm ²	GZ07N	GZ07E

Keylock

Description	Cat ref.
Keylock for plain or transparent door	VZ313

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