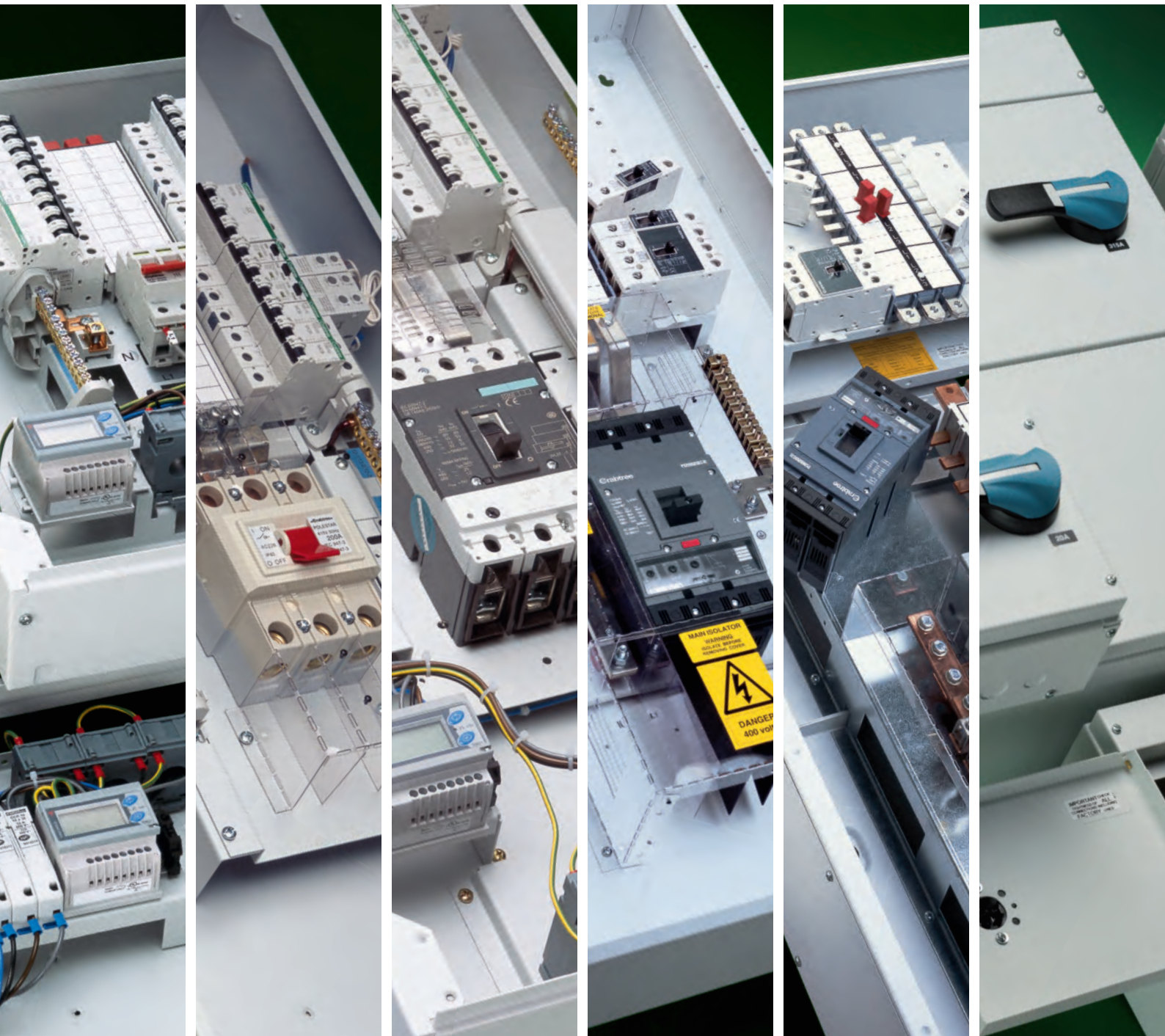




Commercial
Circuit Protection



Acknowledged as one the leading brands in the UK and in British Standard markets around the world, Crabtree offers designers & specifiers a wide range of quality products that caters for a vast array of applications including Commerce, Offices, Education, Hospitals & Health, Hotels & Leisure facilities, in fact wherever quality products are required.

Crabtree factories operate a series of internationally recognized standards including ISO9001 for quality, OHSAS 18001 for Health & Safety and ISO14001 for Environmental Management. The UK manufacturing locations are also home to the product management, engineering, design, quality & logistics teams.

Crabtree also operates to recognised standards for product safety & sustainability, Crabtree wiring accessories are ROHS and REACH compliant often in excess of the UK market standards.

Crabtrees WEEE compliance process and recycling scheme ensures that the end of product life circumstances are catered for in line with UK & EU Legislation.



Recycled materials are used in product packaging, and declared into a recycling scheme locally to control environmental impacts and assure that the maximum level of recycling of materials and use of recycled materials is achieved.

As a Siemens company Crabtree also operates a zero harm scheme within all of its manufacturing, logistics & sales facilities.



In the UK Crabtree operates two UKAS accredited Laboratories that carry out R&D and compliance testing on all Crabtree products, these highly accredited facilities ensure that safety, quality & reliability remain consistent with UK & EU legislation regulations & Siemens internal standards, policies and practices.

Crabtree products are all designed manufactured and tested in accordance with the recognised product standards, and backed by standard & extended guarantees.

Crabtree continues to manufacture Wiring Accessories and Circuit Protection products in the UK.

1. Cannock Commercial Headquarters

Home to Sales & Marketing, Supply Chain Management, Finance & Customer Service.

2. Wythenshawe

Manufacturing location for domestic & commercial circuit protection, with R&D, UKAS test laboratory ISO9001 production facilities.

3. Hindley Green

Manufacturing location for wiring accessories & domestic circuit protection with R&D, UKAS test laboratory ISO9001 production, warehouse, distribution & logistics facilities.



Crabtree



Electrium's purpose built
Commercial Centre in
Cannock, Staffordshire

Crabtree's range of circuit protection and control products includes a comprehensive range of distribution boards, panelboards and enclosed fuse switch switchgear, ideal for commercial and industrial applications

The Polestar Compact distribution boards are complemented with a range of outgoing devices, including MCBs and RCBOs in 18mm modules but rated at an advantageous high performance 16kA.

The Powerstar MCCB Panel-Board range is extremely flexible and suitable for on site customisation for the more basic applications and the range is also available via the company's factory built assembly operation for the more complex solutions. With additional facilities such as surge protection and metering on incoming and outgoing ways this range easily meets the circuit protection needs of the modern energy conscious installation environment.

Enclosed fuse switch combination units and Isolators provide for the single circuit applications of sub mains or large loads.

This comprehensive off the shelf range is backed up by a factory build service that will help designer and installer to meet the demands of commercial and industrial installations. Whether you are buying a selection of components or specifying a large project the Crabtree sales team, quotations service and technical support team are there to help with all of your needs.

Take a closer look at the options available from Crabtree and discover how we can help you to maintain your competitive edge.

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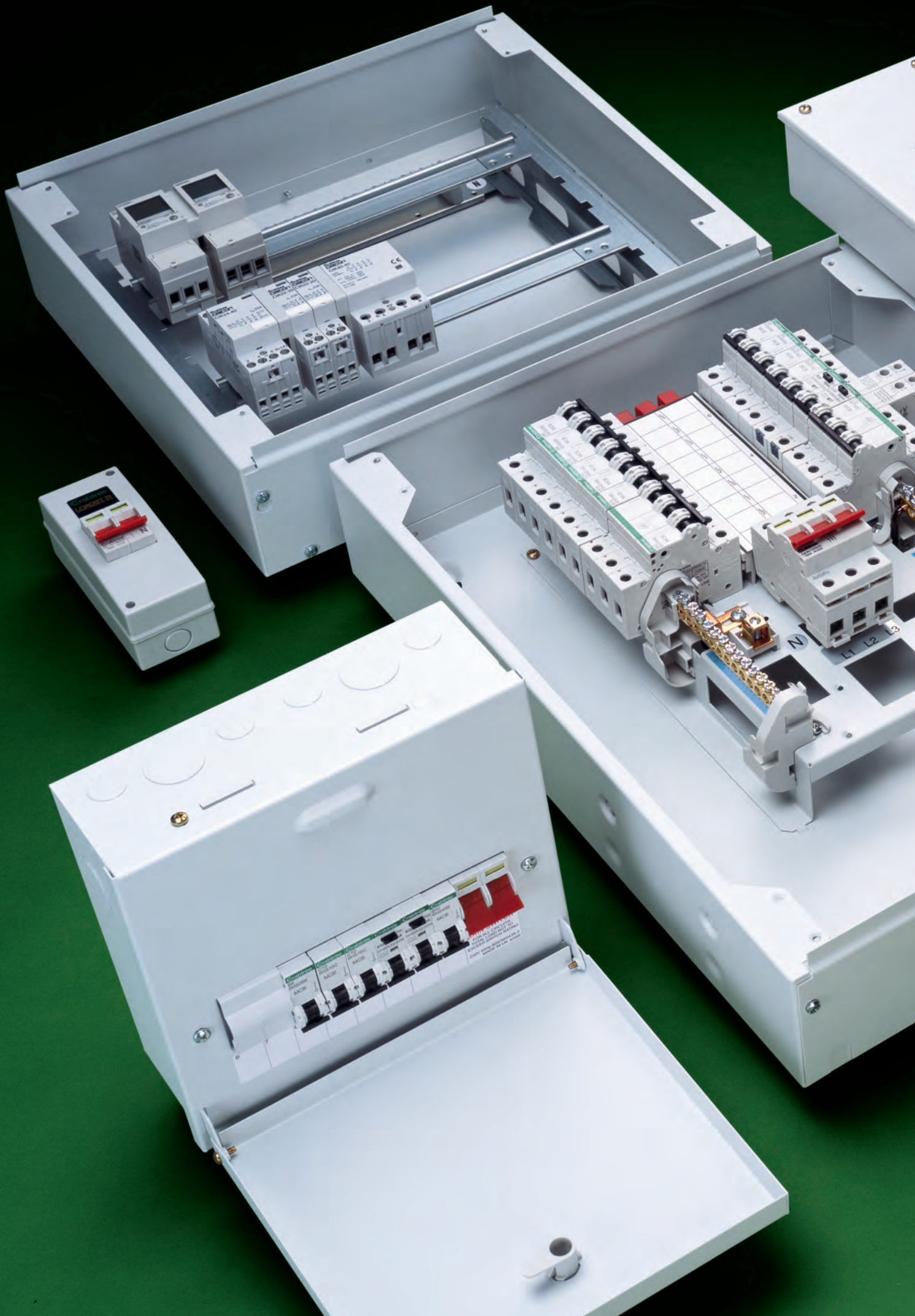
FLOORBOXES

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All Crabtree products comply with the applicable British Standard specification and should be installed by suitably qualified personnel in accordance with the requirements of relevant legislation, regulations (including IEE Wiring Regulations) and the accepted practice in the industry.

The products listed or described in this publication may be protected by one or more patents, and/or registered designs and/or applications. A full list of patents registered designs and applications may be obtained from the company secretary of Electrium Limited.



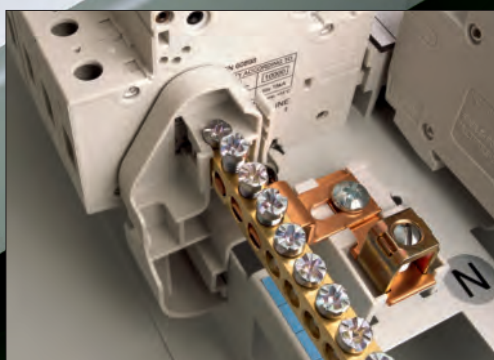
MCBs AND DISTRIBUTION BOARDS

Devices

- 10kA Miniature Circuit Breakers
- 6A - 63A
- Single, Double and Triple Pole
- Type B, C & D Characteristics
- Single Module RCBOs
- 6A - 50A
- Type B & C Characteristics

System

- 80A TPN Single Row Distribution Board
- 125A SPN & TPN Distribution Boards
- 250A TPN Distribution Boards
- Integral Metering options
- Incoming Switch Disconnectors DP, TP & 4P up to 125A 4P RCCBs to 100A
- DIN Rail/Service Centres available 'Built in' or 'Add on'
- Paint Finish-Grey Powder Coat to RAL 7035
- Designed and Manufactured in the UK to BS EN 61439-3
- Custom Built 'Specials' Service





18LS08MR Integral Metering option



18LS212MR



18SN14

LOADSTAR 80A SINGLE ROW TYPE B DISTRIBUTION BOARD

No of Ways	H	W	D	List No.
6	257	460	155	18LS06AMR

- 80A 6w TPN Distribution Board
- TP or 4P switch disconnector incomer available
- Full complement of Neutral & Earth terminals
- Supplied with hinged outer door and catch (lock is optional extra)
- Supplied with undrilled removable gland plates
- Compliance with BS EN 61439-3

LOADSTAR 125A 'METER READY' TYPE B DISTRIBUTION BOARD

No of Ways	Surface	Flush	with DIN Section
4	18LS04MR	18LF04	18LS04D
6	18LS06MR	18LF06	-
8	18LS08MR	18LF08	18LS08D
12	18LS12MR	18LF12	18LS12D
16	18LS16MR	18LF16	18LS16D
20	18LS20MR	18LF20	18LS20D
24	18LS24MR	18LF24	-

- DIN rail to accommodate up to 18 modules of control devices Contactor, Timer etc. with DIN section models

ADD-ON 12W LOADSTAR 'L' BOARD

No of Ways	H	W	D	List No.
12	675	430	155	18LS12A
Vertical connection kit				18LK12V

- 18LS12A 'Add-on' Board is designed to fit above 16, 20 & 24 way 'L' Boards, to create 28, 32 & 36 way TP Boards
- 18LK12V kit connects 18LS12A to 16, 20 & 24 way Boards

250A TYPE B DISTRIBUTION BOARDS 'METER READY' SURFACE

No of Ways	H	W	D	List No.
4	768	430	155	18LS204MR
6	822	430	155	18LS206MR
8	876	430	155	18LS208MR
12	984	430	155	18LS212MR
16	1092	430	155	18LS216MR
20	1200	430	155	18LS220MR
24	1308	430	155	18LS224MR

SWITCH DISCONNECTORS DIRECT CONNECTION & MCCB INCOMERS

Switch Disconnector	List No
250A* 3P	250TPSD

- 150mm² Terminal capacity
- * Derated to 225A when used as an incomer to MCB distribution boards.

Direct Connection	
250A 3P	250TPDC

- 120mm² Terminal capacity
- All Incomers are supplied complete with mounting kit, links & fixing screws

200A 3P MCCB	200TPMB
--------------	----------------

- 185mm² terminal capacity
- All Incomers are supplied complete with mounting kit, links & fixing screws
- IEC 60947-2, EN 60947-2

LOADSTAR 125A TYPE A DISTRIBUTION BOARD

No of Ways	H	W	D	List No.
5	235	188	128	18SN05
8	235	242	128	18SN08
11	235	293	128	18SN11
14	235	343	128	18SN14
19	235	437	128	18SN19

- Board supplied with 125A DP Switch Disconnector MCBs to be specified and ordered separately

LOADSTAR 125A TYPE B DISTRIBUTION BOARDS

- Incoming options - **order separately**:
125A Switch Disconnecter TP/4P - 50mm²
100A RCCB 4P - 35mm²
125A Direct Cable - 50mm²
- Integral metering available with Meter Ready (MR) board utilising a TP Incoming option
- Busbars rated at 125A
- Full compliment of Neutral & Earth terminals
Incoming maximum 70mm²
Outgoing maximum 25mm²
- Allows the fixture of dual Earth bars
- Clean Earth kit available
- All boards supplied as standard with hinged outer door and catch (lock is optional extra) and removable top/bottom gland plates
- Neutral busbar supports incorporate an integral MCB end stop
- BS EN 60439-3

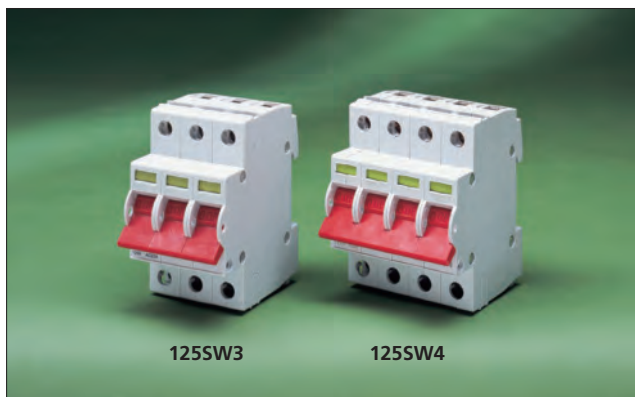


18LS08MR



18LS08D

LOADSTAR 125A INCOMER OPTIONS



125SW3

125SW4

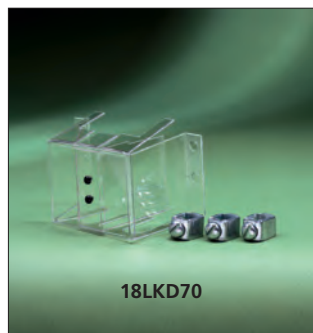


100SW2

18R100/30/4



18LK125



18LKD70

LOADSTAR 125A INCOMING OPTIONS

Order Device and Kit (where required) separately.

Switch Disconnecter, modular (50mm ²)		Device	Kit
40A TP		40SW3	
63A TP		63SW3	None
100A TP		100SW3	Required
125A TP		125SW3	
40A 4P		40SW4	18LK125
63A 4P		63SW4	18LK125
100A 4P		100SW4	18LK125
125A 4P		125SW4	18LK125
100A DP (TP to SP conversion)		100SW2	18LKTPSP
125A DP (TP to SP conversion)		125SW2	18LKTPSP
RCCB (35mm ²)		Device	Kit
40A 4P	30mA	18R40/30/4	18LK125
	100mA	18R40/100/4	18LK125
	300mA	18R40/300/4	18LK125
63A 4P	30mA	18R63/30/4	18LK125
	100mA	18R63/100/4	18LK125
	300mA	18R63/300/4	18LK125
100A 4P	30mA	18R100/30/4	18LK125
	100mA	18R100/100/4	18LK125
	300mA	18R100/300/4	18LK125
100A 4P 100mA Time Delay		241/100TD	18LK125
100A DP 30mA		18R100/30/2	18LKTPSP
100A DP 100mA		18R100/100/2	18LKTPSP
100A DP 100mA Time Delay		18R100/100/2TD	18LKTPSP

Special oversize Incoming Cable connection kit for use with TP Sw Disc above.

Accommodate up to 120mm² TP Sw Disc only. **18LKD120**

Direct Connection	Device	Kit
Incoming Cable Connection (50mm ²)	18LKD50	None
Outgoing Cable Connection Kit/Shroud (50mm ²) (Set of 3 Cable Clamps + Shroud)	18LKD70	Required



18AS2

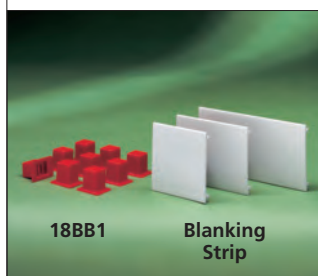


18DIN18



18GP2S

18GP4M



18BB1

Blanking Strip



CSBC

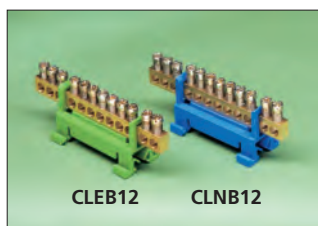
18MBP1



MCBLD + 748



16CL

17CC
(fitted to Earth Bar)

CLEB12

CLNB12

DINRAIL, ROWBOARD, SERVICE CENTRES

Rowboard:

- Suitable for 'Stand-Alone' use or 'Add-On' above surface 'L' type board.
- Each row will accommodate 18 off 18mm module wide DIN Rail mounted devices.
- Main Neutral and Earth Bars included, along with provision for additional 'Mini' Neutral and Earth bars.

No of Rows	H	W	D	Surface
1	245	430	155	18AS1
2	410	430	155	18AS2
3	570	430	155	18AS3
4	735	430	155	18AS4
5	815	430	155	18AS5

Service Centre/DIN Rail Board:

- 'Add-On' for fixture above or below surface 'L' Type board.
- Equipped with easily removed DIN Rail to accommodate 18 or 36, 18mm module wide DIN Rail mounted devices
- 245mm & 410mm high

18 Module	18DIN18
36 Module (2 Rows of 18)	18DIN36

Cable Spreader Box

Add on Enclosure, 245mm high, Blank front cover plate	18SB
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INDIVIDUAL ENCLOSURES

	H	W	D	Insulated
2 Modules wide	152	63	63	18GP2S
4 Modules wide	152	79	61	18GP4S
	H	W	D	Metalclad
2 Modules wide	225	90	67	18GP2M
4 Modules wide	317	136	82	18GP4M

GENERAL LOADSTAR ACCESSORIES TP & SP

	List No
Cylinder Lock & Key	16CL
MCB Locking device (excl. lock)	MCBLD
Padlock & Key for use with MCBLD	748
Clean Earth Bar Kit	18CEBK
(4 to 12 way=2 kits, 16 to 24 way=4 kits).	
Blanking Strip - 6 Individual 1 module wide pieces	18BP1/6
Blanking Strip - 12 Individual 1 module wide pieces	18BP1/12
Blanking Strip - 4 lengths each 3 modules wide	18PB3/4
Blanking Strip - 2 lengths each 12 modules wide	18BP12/2
Clip In Blank SP Moulding	CSBC
Busbar cross connector insulator - pack of 9	18BB1
SP MCB size Blank (shields MCB & Busbar Terminal)	18MBP1
Cable clamp assembly (70mm ²) - pack of 3	17CC
• Previously manufactured DBs utilise 18CB1 blank pieces	

ADDITIONAL EARTH BAR KITS

Additional Earth Bars to fit TP Distribution Boards

No of Ways	List No	No of Ways	List No
4	18EB04	16	18EB16
6	18EB06	20	18EB20
8	18EB08	24	18EB24
12	18EB12		

Earth and Neutral bar, 10mm² cable max, for use with DIN Rail

	NEUTRAL	EARTH
7 Terminals	CLNB07	CLEB07
12 Terminals	CLNB12	CLEB12
15 Terminals	CLNB15	CLEB15



SINGLE POLE MCBs - 10kA

RATING AMPS	B TYPE	C TYPE	D TYPE
6A	6HS06B	6HS06C	6HS06D
10A	6HS10B	6HS10C	6HS10D
16A	6HS16B	6HS16C	6HS16D
20A	6HS20B	6HS20C	6HS20D
25A	6HS25B	6HS25C	6HS25D
32A	6HS32B	6HS32C	6HS32D
40A	6HS40B	6HS40C	6HS40D
50A	6HS50B	6HS50C	6HS50D
63A	6HS63B	6HS63C	6HS63D

BS EN 60898



DOUBLE POLE MCBs - 10kA

RATING AMPS	B TYPE	C TYPE	D TYPE
6A	6HD06B	6HD06C	6HD06D
10A	6HD10B	6HD10C	6HD10D
16A	6HD16B	6HD16C	6HD16D
20A	6HD20B	6HD20C	6HD20D
25A	6HD25B	6HD25C	6HD25D
32A	6HD32B	6HD32C	6HD32D
40A	6HD40B	6HD40C	6HD40D
50A	6HD50B	6HD50C	6HD50D
63A	6HD63B	6HD63C	6HD63D

Not suitable for use within Distribution Boards

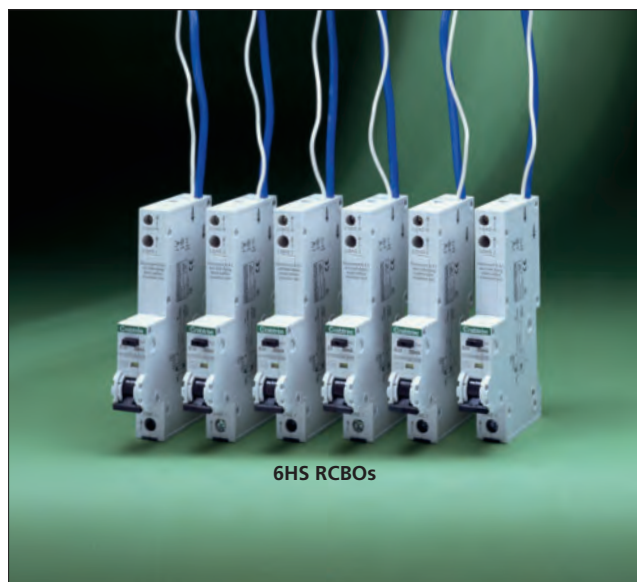
BS EN 60898



TRIPLE POLE MCBs - 10kA

RATING AMPS	B TYPE	C TYPE	D TYPE
6A	6HT06B	6HT06C	6HT06D
10A	6HT10B	6HT10C	6HT10D
16A	6HT16B	6HT16C	6HT16D
20A	6HT20B	6HT20C	6HT20D
25A	6HT25B	6HT25C	6HT25D
32A	6HT32B	6HT32C	6HT32D
40A	6HT40B	6HT40C	6HT40D
50A	6HT50B	6HT50C	6HT50D
63A	6HT63B	6HT63C	6HT63D

BS EN 60898



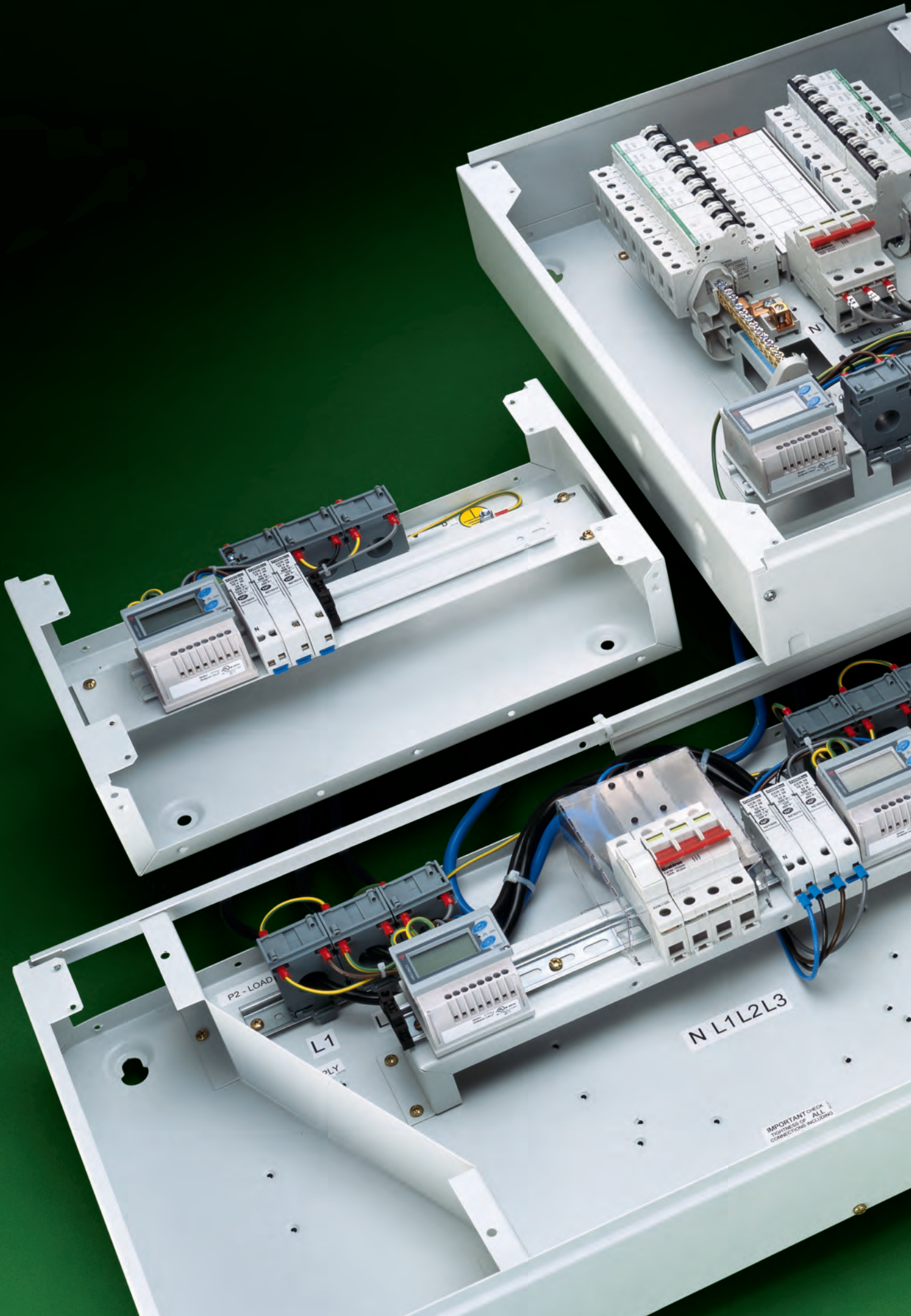
RCBOs SINGLE MODULE - 30mA SENSITIVITY - 10kA

RATING AMPS	B TYPE	C TYPE
6A	6HSR06/30B	6HSR06/30C
10A	6HSR10/30B	6HSR10/30C
16A	6HSR16/30B	6HSR16/30C
20A	6HSR20/30B	6HSR20/30C
32A	6HSR32/30B	6HSR32/30C
40A	6HSR40/30B	6HSR40/30C
50A	6HSR50/30B	6HSR50/30C

18mm wide, suitable for use within Loadstar Distribution Boards 30mA sensitivity, 'B' or 'C' characteristic, unswitched Neutral.

RCBOs with longer incoming neutral flying leads (1.2m) are available - Suffix the Type C list number with /LT. (eg: **6HSR32/30C/LT**).

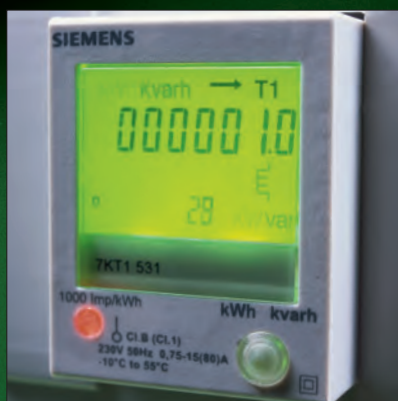
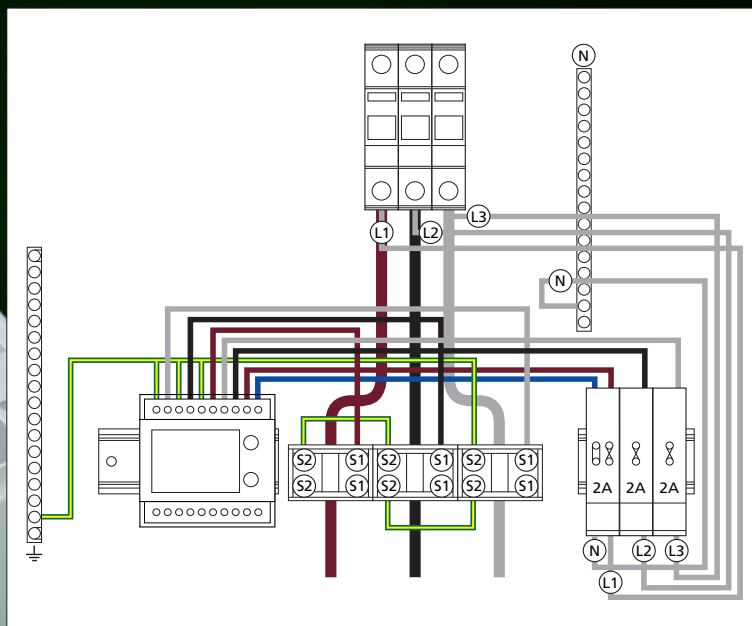
IEC/EN 61009



METERING OPTIONS... METERING SOLUTIONS

Part L2 of the Building Regulations, covering the energy efficiency requirements of new buildings other than domestic dwellings, recognises the essential role that is played by metering. Correctly installed meters provide information that is necessary to the implementation of an effective energy management plan.

Loadstar pulsed output and Modbus output metering options provide simple and straightforward solutions. Integral energy monitoring can be applied to all Meter Ready (MR) Distribution Boards, whilst two 'add-on' enclosures, single or dual, ensure all Loadstar surface 125A & 250A type B Distribution Boards are catered for.





125A & 250A INTEGRAL METER KITS

Integral meter kit suitable for mounting within 125A & 250A type B **Meter Ready** (MR) Distribution Boards*. Includes a Digital energy meter, three current transformers, fuses, wiring looms and mounting base plate.

Description	LIST No
125A Integral Meter Kit	LS125MPKIT
125A Integral Meter Kit (MID)	LS125MIDMPKIT
250A Integral Meter Kit	LS250MPKIT
250A Integral Meter Kit (MID)	LS250MIDMPKIT

*Integral meter kits are designed for use in conjunction with modular three pole incoming options only. For other incoming options select the 'add-on' assembly seen below.



125A SINGLE METER PACKS

245mm high 'add on' assemblies suitable for mounting directly beneath any surface 125A type B Distribution Board. Includes a digital energy meter, three current transformers and all associated fuses and wiring. Enclosures have a slotted front plate and hinged door with catch offering a lockable option.

Description	LIST No
125A 'Add-on Meter Pack	18ML125
125A Vertical Lighting and Power Kit	18ML125VLPK

Suitable for use with 2 x 125A type B Meter Ready (MR) Distribution Boards, one mounted above the other. The kit consists of 3 phase and neutral connection cables, cable clamps and shrouding. 125A integral meter kits to be ordered separately.

Please note the maximum 3 phase load on the upper board should not exceed 100A.



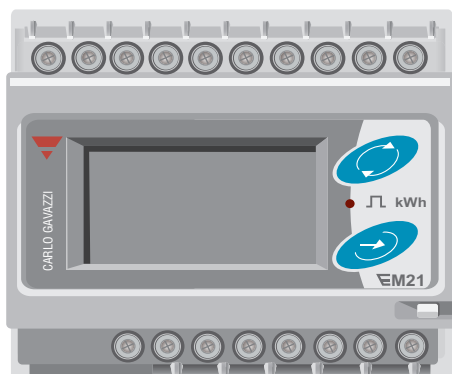
125A & 250A DUAL METER PACKS

'Add on' assemblies suitable for mounting directly beneath two surface 125A/250A type B Distribution Boards. Includes two digital energy meters, six current transformers, all associated fuses & wiring and flexible interconnections to Distribution Boards. Provides single point isolation while dual meters allow for separate monitoring of **Light** and small **Power** energy consumption.

Suitable for use with a 3ph 4 wire unbalanced system

Description	125A	250A
Height	410mm	740mm
'Add-on' Dual Meter Pack	18ML125LP	18MH250LP

For use with IP3X Type B Distribution Boards



Energy meters within all Loadstar final assemblies display values of:

kWh	Kilowatt hours	A L2	Current
kW (Σ)	Real Power (system)	A L3	Current
kvarh	Kilovolt amp reactive hours	V L1-2	Line Voltage
kvar (Σ)	Reactive Power (system)	V L2-3	Line Voltage
PF (Σ)	Power Factor (system)	V L3-1	Line Voltage
Hz (Σ)	Frequency (system)	V L1	Phase Voltage
PF L1	Power Factor	V L2	Phase Voltage
PF L2	Power Factor	V L3	Phase Voltage
PF L3	Power Factor		
A L1	Current		

Non MID meters include MODBUS (RTU) connections and pulsed output as a standard feature.

MID meters are supplied with a pulsed output as a standard feature.



SUB METERING

Sub metering provides an awareness of energy use. Trends of minimum and maximum demand become visible enabling any instances of energy waste to be identified.

Metering alone cannot reduce energy consumption or subsequent carbon emissions - **action taken based upon knowledge gained from an effective metering strategy can.**

Schedule 7 of the Electricity Act 1989 requires that all meters must be approved for use in a billing situation. MID (Measuring Instruments Directive) approved meters have since 2006, been approved for billing purposes across the EU.



C7KT1531

80A SP DIRECT CONNECTION ENERGY METERS

Description	LIST No
Single Phase direct connection energy meter	C7KT1531
Single Phase direct connection energy meter (MID calibrated)	C7KT1533

- Direct connect kWh meter
- Pulsed output
- DIN rail mounting
- 35mm² terminal capacity
- Green backlit display



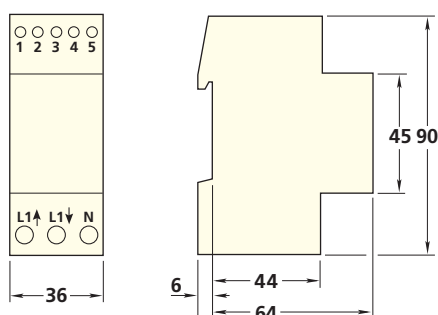
C7KT1543

80A TP DIRECT CONNECTION ENERGY METERS

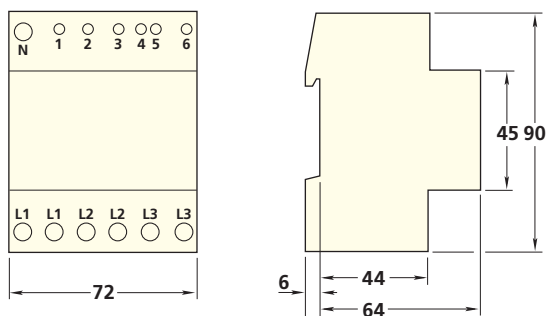
Description	LIST No
Three Phase direct connection energy meter	C7KT1543
Three Phase direct connection energy meter (MID calibrated)	C7KT1545

- Direct connect kWh meter
- Pulsed output
- DIN rail mounting
- 35mm² terminal capacity
- Green backlit display

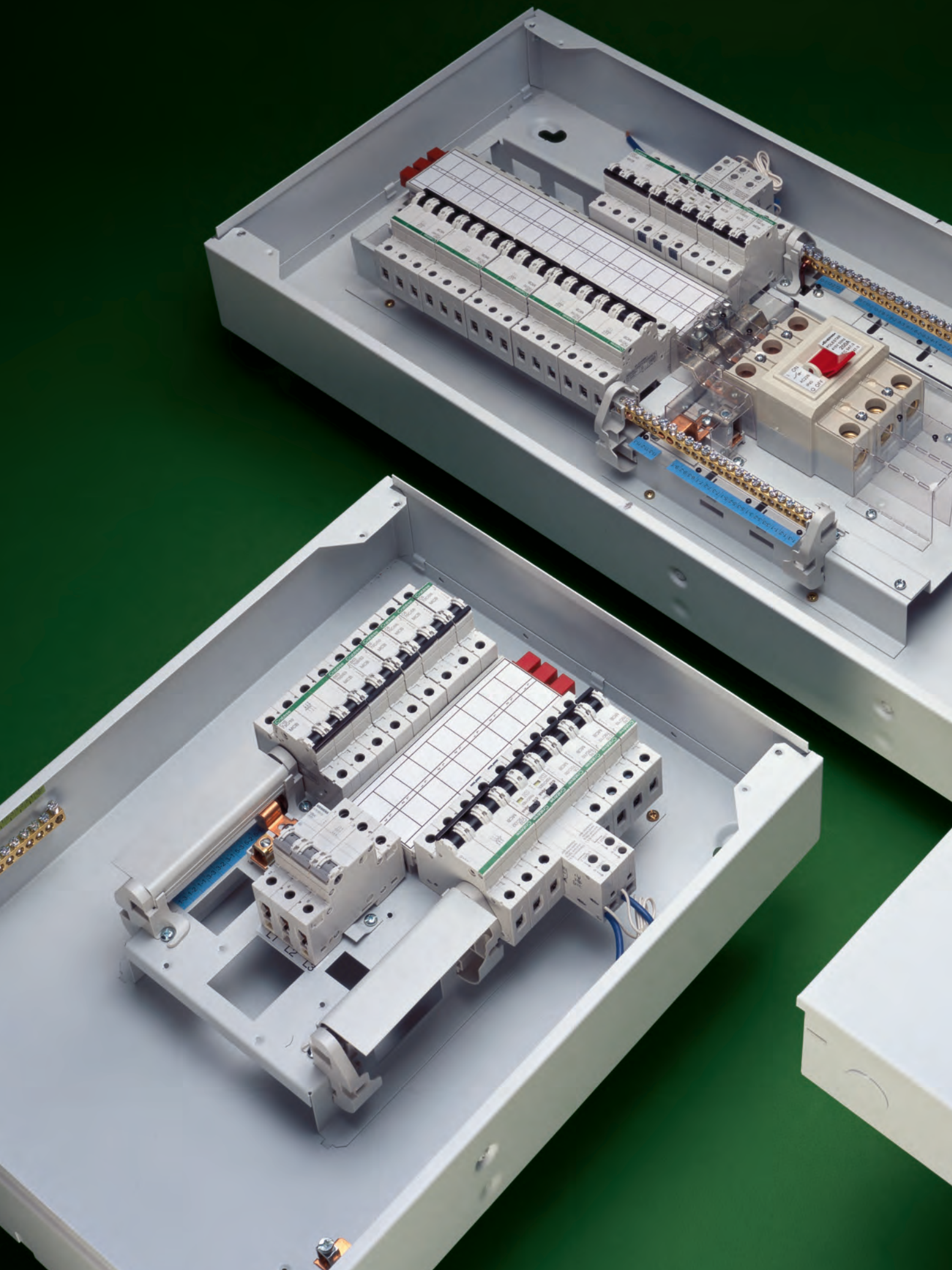
ENERGY METER DIMENSIONS



C7KT1 531 & C7KT1 533



C7KT1 543 & C7KT1 545



POLESTAR COMPACT

MCBs, RCBOs AND DISTRIBUTION BOARDS

- MCBs - 6A to 63A
- Type B, C and D Characteristics
- Single, Double and Triple Pole
- 18mm modular width
- 16kA BS EN 60898-1
- RCBOs - 6A to 50A
- Type C Characteristic
- Single Pole
- 18mm wide
- 16kA BS EN 61009

System

- TPN Boards rated 125A & 250A
 - SPN Boards rated 125A
 - Paint Finish, Epoxy Powder, Light Grey RAL 7035 for standard boards and shade 697 to BS381C for IP66
 - Custom Built 'Specials' Service



125A IP3X DISTRIBUTION BOARDS AND THEIR INCOMING OPTIONS

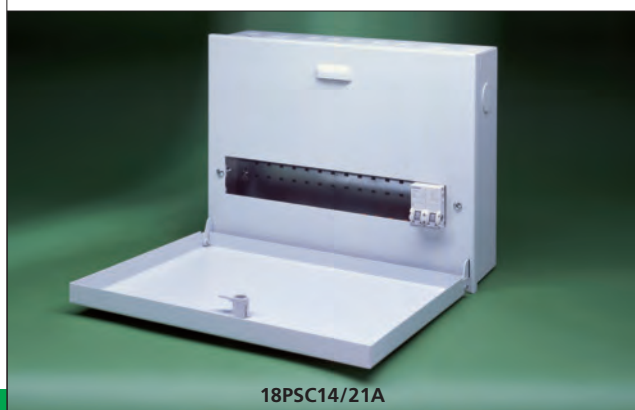
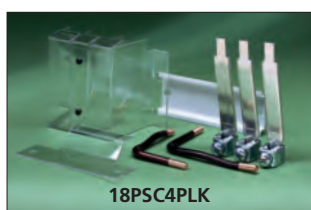
16kA rated SPN and TPN MCB

Distribution Boards

- Incoming options - **order separately**:
125A Switch Disconnector TP/4P - 50mm²
100A RCCB 4P - 35mm²
125A Direct Cable - 50mm²
- Integral metering available with Meter Ready

- (MR) board utilising a TP Incoming option
- Busbars rated at 125A
- IP3X (Door Closed)
- Full compliment of Neutral & Earth terminals
Incoming maximum 70mm²
Outgoing maximum 25mm²
- Allows the fixture of dual Earth bars (IP3X)

- Clean Earth kit available (IP3X)
- All IP3X boards are supplied as standard with hinged outer door, catch (lock is optional extra) and removable top/bottom gland plates
- Neutral busbar supports incorporate an integral MCB end stop
- BS EN 61439-3



125A TPN DISTRIBUTION BOARDS 'METER READY' SURFACE

Description	List No.
IP3X 125A 4 way TPN Distribution Board	18PSC04MR
IP3X 125A 6 way TPN Distribution Board	18PSC06MR
IP3X 125A 8 way TPN Distribution Board	18PSC08MR
IP3X 125A 12 way TPN Distribution Board	18PSC12MR
IP3X 125A 16 way TPN Distribution Board	18PSC16MR
IP3X 125A 20 way TPN Distribution Board	18PSC20MR
IP3X 125A 24 way TPN Distribution Board	18PSC24MR

50mm² Terminal capacity

Optional integral meter ready facility available as standard

125A TPN DISTRIBUTION BOARD INCOMER OPTIONS SWITCH DISCONNECTORS AND DIRECT CONNECTION

Order device and kit (where required) separately

Switch Disconnector	Device	Kit
125A 2P	1252SD	18PSC2PLK
125A 3P	1253SD	Not Required
125A 4P	1254SD	18PSC4PLK
Direct Connection	Device	Kit
125A 3P	125DCB	Not Required

50mm² Terminal capacity. IEC/EN 60947-3

Residual Current Circuit Breakers	Device	Kit
100A 4P 30mA	241/030	18PSC4PLK
100A 4P 100mA	241/100	18PSC4PLK
100A 4P 100mA TD	241/100TD	18PSC4PLK
100A 4P 300mA	241/300	18PSC4PLK
100A 4P 300mA TD	241/300TD	18PSC4PLK

Type AC 35mm² Terminal capacity BS EN 61008

125A SPN DISTRIBUTION BOARDS COMPLETE WITH 125A DP SWITCH DISCONNECTOR INCOMER

Description	List No.
IP3X 125A 5 way SPN Distribution Board	18PSC05/21A
IP3X 125A 8 way SPN Distribution Board	18PSC08/21A
IP3X 125A 11 way SPN Distribution Board	18PSC11/21A
IP3X 125A 14 way SPN Distribution Board	18PSC14/21A
IP3X 125A 19 way SPN Distribution Board	18PSC19/21A
IP3X 125A 28 way SPN Distribution Board	18PSC28/21A

125A Busbar. 28 way distribution board supplied in 2 bank format

COMPLETE WITH 80A 30mA RCCB INCOMER

IP3X 80A 5 way SPN Distribution Board	18PSC05/33A
IP3X 80A 8 way SPN Distribution Board	18PSC08/33A
IP3X 80A 11 way SPN Distribution Board	18PSC11/33A

COMPLETE WITH 80A 100mA RCCB INCOMER

IP3X 80A 5 way SPN Distribution Board	18PSC05/31A
IP3X 80A 8 way SPN Distribution Board	18PSC08/31A
IP3X 80A 11 way SPN Distribution Board	18PSC11/31A

COMPLETE WITH DUAL RCCB SPLIT LOAD INCOMERS

IP3X 80A 4+6 way Split Load Distribution Board	18PSC10/S413A
IP3X 80A 5+5 way Split Load Distribution Board	18PSC10/S513A
IP3X 80A 6+4 way Split Load Distribution Board	18PSC10/S613A

125A double pole main switch control of all MCB ways

Final circuit additional protection by two 80A 30mA RCCBs

250A IP3X TYPE B DISTRIBUTION BOARDS AND THEIR INCOMING OPTIONS

25kA rated TPN MCB Distribution Boards

- Incoming options - **order separately**:
- Integral metering available
- Busbars rated at 250A
- IP3X (Door Closed)

- Full compliment of Neutral & Earth terminals
Incoming maximum 120mm²
Outgoing maximum 25mm²
- Allows the fixture of dual Earth bars (IP3X)
- Clean Earth kit available (IP3X)

- All IP3X boards are supplied as standard with hinged outer door, catch (lock is optional extra) and removable top/bottom gland plates
- Neutral busbar supports incorporate an integral MCB end stop
- BS EN 61439-3



18PSC212MR

250A TYPE B DISTRIBUTION BOARDS 'METER READY' SURFACE

Description	List No.
IP3X 250A 4 way TPN Distribution Board	18PSC204MR
IP3X 250A 6 way TPN Distribution Board	18PSC206MR
IP3X 250A 8 way TPN Distribution Board	18PSC208MR
IP3X 250A 12 way TPN Distribution Board	18PSC212MR
IP3X 250A 16 way TPN Distribution Board	18PSC216MR
IP3X 250A 20 way TPN Distribution Board	18PSC220MR
IP3X 250A 24 way TPN Distribution Board	18PSC224MR

POLESTAR COMPACT 200A INCOMER OPTIONS



250/SDB

SWITCH DISCONNECTORS AND DIRECT CONNECTION

Switch Disconnector	List No
250A 3P*	250/SDB
200A 2P	200/SDBDP

- 150mm² Terminal capacity
- BS EN 60947-3, IEC 60947-3
- * Derated to 225A when used as an incomer to MCB Distribution Boards

Direct Connection

250A 3P	250/DCB
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- 120mm² Terminal capacity
- All Incomers are supplied complete with mounting kit, links & fixing screws



2003MB

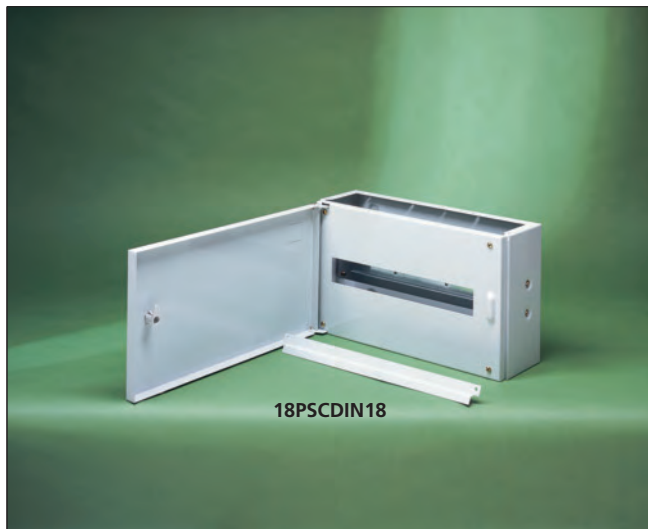
MOULDED CASE CIRCUIT BREAKERS

200A 3P	2003MB
200A 4P	2004MB

- 185mm² terminal capacity
- All Incomers are supplied complete with mounting kit, links & fixing screws
- IEC 60947-2, EN 60947-2



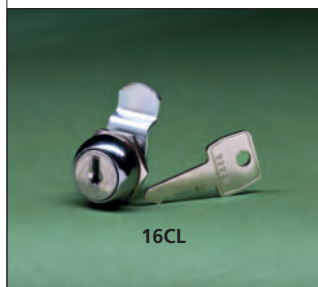
200/SDBDP



18PSCDIN18



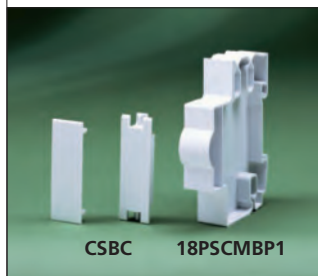
18PSCAS2



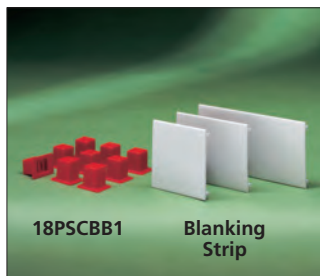
16CL



MCBLD + 748



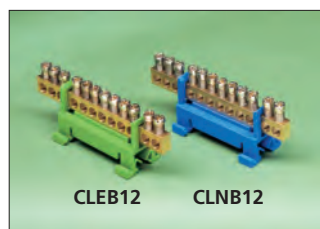
CSBC 18PSCMBP1



18PSCBB1 Blanking Strip



17CC
(fitted to Earth Bar)



CLEB12 CLNB12

DINRAIL, ROWBOARD, SERVICE CENTRES

Service Centre/DIN Rail Board:	List No
18 Module	18PSCDIN18
36 Module (2 Rows of 18)	18PSCDIN36

- 'Add-On' for fixture above or below surface type B board.
- Equipped with easily removed DIN Rail to accommodate 18 or 36 18mm module wide DIN Rail mounted devices
- 245 & 410mm high

Cable Spreader Box	
Add on Enclosure, 245mm high, Blank front cover plate	18PSCSB

Rowboard:

No of Rows	H	W	D	
1	245	430	155	18PSCAS1
2	410	430	155	18PSCAS2
3	570	430	155	18PSCAS3
4	735	430	155	18PSCAS4
5	815	430	155	18PSCAS5

- Suitable for 'Stand-Alone' use or 'Add-On' above surface type B board.
- Each row will accommodate 18 off 18mm module wide DIN Rail mounted devices.
- Main Neutral and Earth Bars included, along with provision for additional 'Mini' Neutral and Earth bars.

GENERAL POLESTAR ACCESSORIES TP & SP

	List No
Cylinder Lock & Key	16CL
MCB Locking device (excl. lock)	MCBLD
Padlock & Key for use with MCBLD	748
Clean Earth Bar Kit type B Boards only.	18CEBK
(4 to 12 way=2 kits, 16 to 24 way=4 kits).	
SP MCB size Blank (shields MCB & Busbar Terminal)	18PSCMBP1
Blanking Strip - 6 Individual 1 module wide pieces	18PSCBP1/6
Blanking Strip - 4 lengths each 3 modules wide	18PSCBP3/4
Blanking Strip - 2 lengths each 12 modules wide	18PSCBP12/2
Clip In Blank SP Moulding	CSBC
Busbar cross connector insulator - pack of 9	18PSCBB1
Cable clamp assembly (70mm ²) - pack of 3	17CC

ADDITIONAL EARTH BAR KITS

Additional Earth Bars to fit TP Distribution Boards

No of Ways	List No	No of Ways	List No
4	18EB04	16	18EB16
6	18EB06	20	18EB20
8	18EB08	24	18EB24
12	18EB12		

Earth and Neutral bar, 10mm² cable max, for use with DIN Rail

	NEUTRAL	EARTH
7 Terminals	CLNB07	CLEB07
12 Terminals	CLNB12	CLEB12
15 Terminals	CLNB15	CLEB15



MCBs

SINGLE POLE MCBs - 16kA

RATING AMPS	B TYPE	C TYPE	D TYPE
6A	70B/06	70C/06	70D/06
10A	70B/10	70C/10	70D/10
16A	70B/16	70C/16	70D/16
20A	70B/20	70C/20	70D/20
32A	70B/32	70C/32	70D/32
40A	70B/40	70C/40	70D/40
50A	70B/50	70C/50	70D/50
63A	70B/63	70C/63	70D/63

- BS EN 60898-1
- Type B (3–5In), C (5–10In), D (10–20In) classification
- Short circuit duty rating: Type B/C/D 16000A 240V/415V 50Hz
- Terminal capacity up to 35mm² cable
- 18mm modular width



72B/20

72C/10

DOUBLE POLE MCBs - 16kA

RATING AMPS	B TYPE	C TYPE	D TYPE
6A	72B/06	72C/06	72D/06
10A	72B/10	72C/10	72D/10
16A	72B/16	72C/16	72D/16
20A	72B/20	72C/20	72D/20
32A	72B/32	72C/32	72D/32
40A	72B/40	72C/40	72D/40
50A	72B/50	72C/50	72D/50
63A	72B/63	72C/63	72D/63

- BS EN 60898-1
- Type B (3–5In), C (5–10In), D (10–20In) classification
- Short circuit duty rating: Type B/C/D 16000A 240V/415V 50Hz
- Terminal capacity up to 35mm² cable
- 18mm modular width
- Not for use within standard type A or B distribution boards



73C/10

73C/32

TRIPLE POLE MCBs - 16kA

RATING AMPS	B TYPE	C TYPE	D TYPE
6A	73B/06	73C/06	73D/06
10A	73B/10	73C/10	73D/10
16A	73B/16	73C/16	73D/16
20A	73B/20	73C/20	73D/20
32A	73B/32	73C/32	73D/32
40A	73B/40	73C/40	73D/40
50A	73B/50	73C/50	73D/50
63A	73B/63	73C/63	73D/63

- BS EN 60898-1
- Type B (3–5In), C (5–10In), D (10–20In) classification
- Short circuit duty rating: Type B/C/D 16000A 240V/415V 50Hz
- Terminal capacity up to 35mm² cable
- 18mm modular width



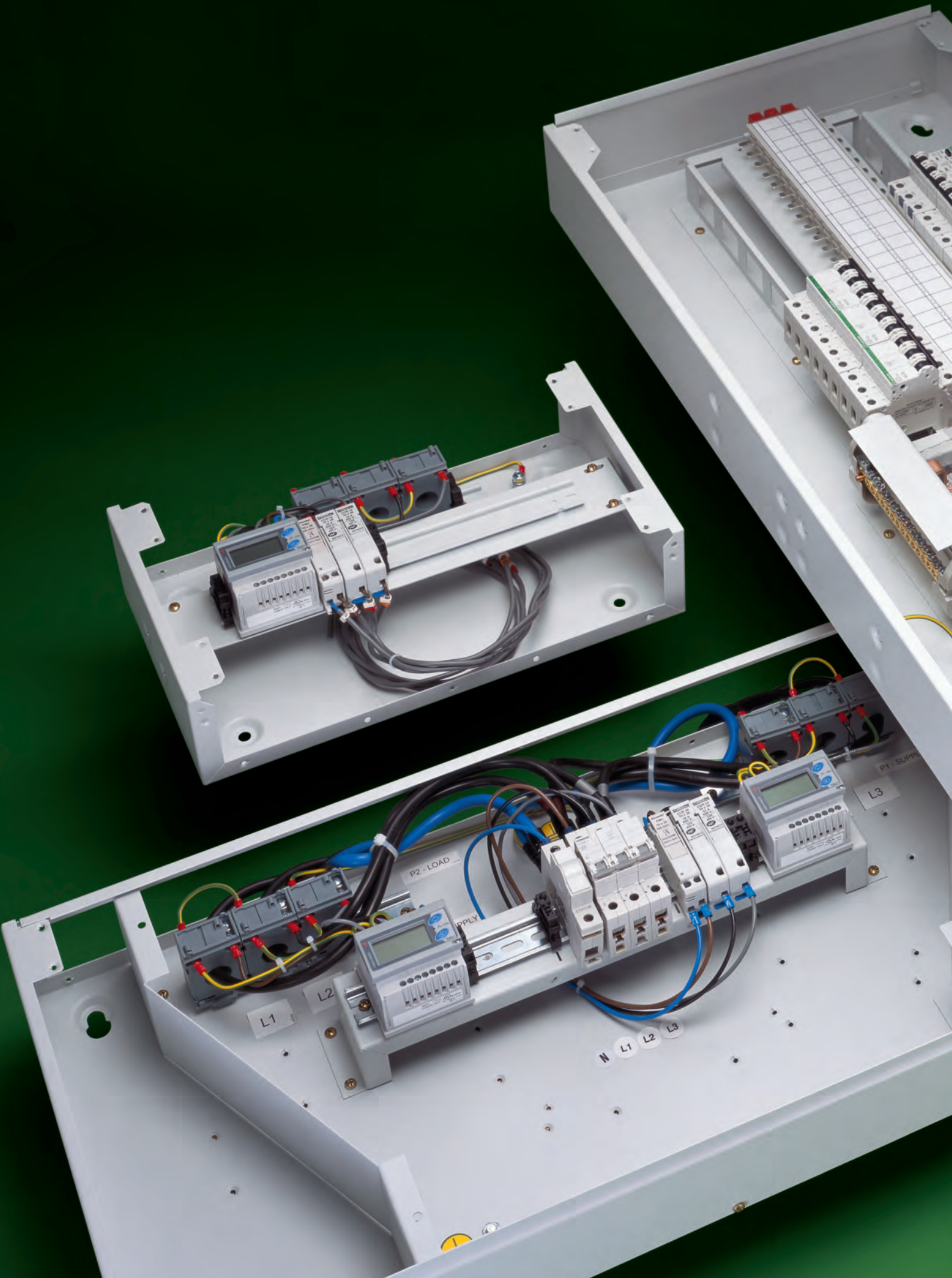
RCBOs

RCBOs SINGLE MODULE - 30mA SENSITIVITY - 16kA

Single Pole	Type A 
MCB Type C	List No
Current rating (A)	
6A	701C/063
10A	701C/103
16A	701C/163
20A	701C/203
32A	701C/323
40A	701C/403
50A	701C/503

- Standard compliance BS EN 61009; IEC 1009.
- Short circuit duty rating 16000A 240V 50Hz.
- Terminal capacity up to 16mm² cable.
- 18mm modular width

RCBOs with longer incoming neutral flying leads (1.2m) are available - Suffix the Type C list number with /LT. (eg: **6HSR32/30C/LT**).

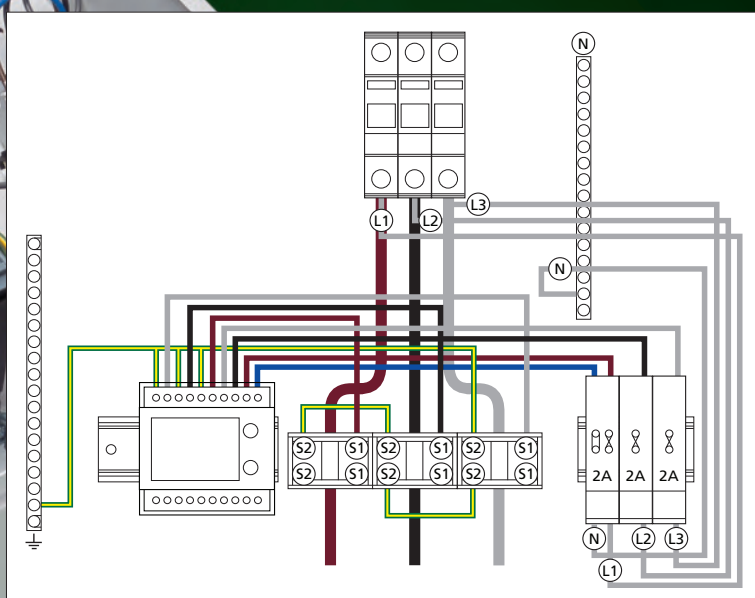


POLESTAR COMPACT

METERING OPTIONS... METERING SOLUTIONS

Part L2 of the Building Regulations, covering the energy efficiency requirements of new buildings other than domestic dwellings, recognises the essential role that is played by metering. Correctly installed meters provide information that is necessary to the implementation of an effective energy management plan.

Polestar Compact pulsed output and Modbus output metering options provide simple and straightforward solutions. Integral energy monitoring can be applied to all Meter Ready (MR) Distribution Boards, whilst two 'add-on' enclosures, single or dual, ensure all Polestar surface 125A & 250A type B Distribution Boards are catered for.



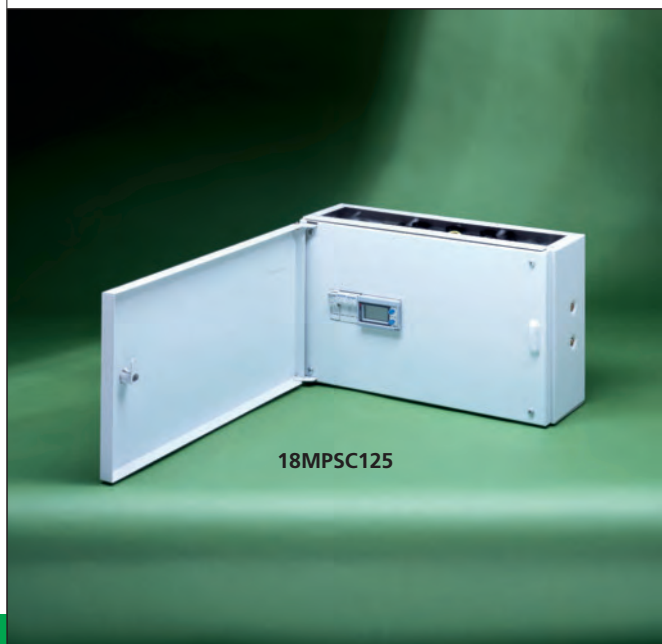
POLESTAR COMPACT SUB METERING OPTIONS



250MP/120



125MP/50



18MPSC125

SUB METERING

Sub metering provides an awareness of energy use. Trends of minimum and maximum demand become visible enabling any instances of energy waste to be identified.

Metering alone cannot reduce energy consumption or subsequent carbon emissions - **action taken based upon knowledge gained from an effective metering strategy can.**

Schedule 7 of the Electricity Act 1989 requires that all meters must be approved for use in a billing situation. MID (Measuring Instruments Directive) approved meters have, since 2006, been approved for billing purposes across the EU.

INTEGRAL METER KIT

Integral meter kits suitable for mounting within 125A or 250A type B **Meter Ready** (MR) Distribution Boards. Includes a Digital energy meter, three current transformers, fuses, wiring looms and mounting base plate.

Description	125A	250A
Integral Meter Kit	125MP/50	250MP/120
Integral Meter Kit (MID)	125MP/50/MID	250MP/120/MID

Description	250A
Integral Meter Kit 185mm ² cable	250MP/185
Integral Meter Kit 185mm ² cable (MID)	250MP/185/MID

- 125A Integral meter kits are designed for use in conjunction with modular three pole incoming options only. For other incoming options select the 'add-on' assembly seen below.
- 250A Meter kits accepting up to 185mm² cable will require the addition of a cable spreader box, 18PSCSB.

SINGLE METER PACKS

245mm high 'add on' assemblies suitable for mounting directly beneath any surface 125A type B Distribution Board. Includes a digital energy meter, three current transformers and all associated fuses and wiring. Enclosures have a slotted front plate and hinged door with catch offering a lockable option.

Description	125A
Add-on Meter Pack	18MPSC125



18MPSC125LP

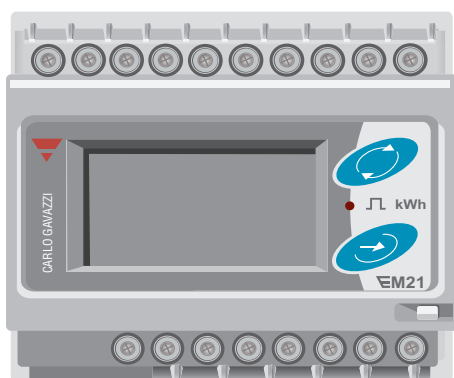
DUAL METER PACKS

'Add on' assemblies suitable for mounting directly beneath two surface 125A/250A type B Distribution Boards. Includes two digital energy meters, six current transformers, all associated fuses & wiring and flexible interconnections to Distribution Boards. Provides single point isolation while dual meters allow for separate monitoring of **Light** and small **Power** energy consumption.

Suitable for use with a 3ph 4 wire unbalanced system

Description	125A	250A
Height	410mm	740mm
'Add-on' Dual Meter Pack	18MPSC125LP	18MPSC250LP

For use with IP3X Type B Distribution Boards



Energy meters within all Polestar Compact final assemblies display values of:

kWh	Kilowatt hours	A L2	Current
kW (Σ)	Real Power (system)	A L3	Current
kvarh	Kilovolt amp reactive hours	V L1-2	Line Voltage
kvar (Σ)	Reactive Power (system)	V L2-3	Line Voltage
PF (Σ)	Power Factor (system)	V L3-1	Line Voltage
Hz (Σ)	Frequency (system)	V L1	Phase Voltage
PF L1	Power Factor	V L2	Phase Voltage
PF L2	Power Factor	V L3	Phase Voltage
PF L3	Power Factor		
A L1	Current		

Non MID meters include MODBUS (RTU) connections and pulsed output as a standard feature.

MID meters are supplied with a pulsed output as a standard feature.

POLESTAR COMPACT FINAL CIRCUIT METERING OPTIONS



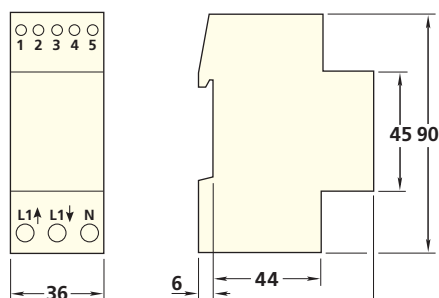
C7KT1531

80A SP & TP DIRECT CONNECTION ENERGY METERS

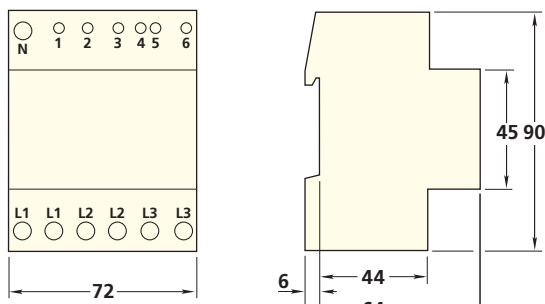
Description	LIST No
Single Phase Direct connection Energy Meter	C7KT1531
Single Phase Direct connection Energy Meter (MID)	C7KT1533
Three Phase Direct connection Energy Meter	C7KT1543
Three Phase Direct connection Energy Meter (MID)	C7KT1545

- Direct Connect kWh meter
- Pulsed Output
- DIN rail Mounting
- 35mm² terminal capacity
- Green Backlit display

ENERGY METER DIMENSIONS



C7KT1531 & C7KT1533



C7KT1543 & C7KT1545



POWERSTAR 125

- 250A and 400A Panelboards
- Designed and Manufactured in the UK to BSEN/IEC 61439-2: 2009
- Fully RoHS compliant
- Form 3b Type 2
- Supplied with Incoming Switching Unit or Direct Connection facility as standard
- User defined Incomer function (MCCB/Switch Disconnecter)
- Integral incoming metering option
- Cableways to accept outgoing meters
- Over-voltage protection option

Devices

- Utilising Siemens technology
- GG frame 25kA MCCB
- Ratings from 15A to 125A
- Single Pole and Triple Pole configurations
- IEC/EN 60947-2





17GG2506SW



7T225/OR3



17GG2506DC

250A PANELBOARD WITH TP SWITCHING UNIT

	Outgoing ways	Modular Height	Height (mm)	LIST No
250A	6	12	912	17GG2506SW
	8	13	988	17GG2508SW
	12	15	1140	17GG2512SW
	16	17	1292	17GG2516SW

- 250A rated Panelboards
- Busbar 25kA conditional
- IP3X (door closed)
- 120 mm² 4 Core Maximum on Incoming Terminals
- BSEN/IEC 61439-2: 2009

Designation of the incoming device is defined by the selection of an overcurrent release or Switch Disconnect module.
THE SWITCHING UNIT MUST BE FITTED WITH ONE OF THESE MODULES.

OVERCURRENT RELEASE AND SWITCH DISCONNECTOR MODULES

	Rated Current (In)	Overcurrent adjustment (0.4 to 1xIn)	LIST No
160A	63A 160A		7T216/OR3
250A	100A 250A		7T225/OR3

- Adjustable overcurrent release
- Adjustable short circuit release

250A	Switch Disconnecter	7T225/SD
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250A PANELBOARD WITH DIRECT CONNECTION

	Inc. Terminals only	Outgoing ways	Modular Height	Height (mm)	LIST No
250A		6	12	912	17GG2506DC
		8	13	988	17GG2508DC
		12	15	1140	17GG2512DC
		16	17	1292	17GG2516DC

- 250A rated Panelboards
- Busbar 25kA conditional
- IP3X (door closed)
- Incoming terminations: 30mm wide copper bar 1 x M8 connection
- BSEN/IEC 61439-2: 2009

DIMENSIONS 250A PANELBOARDS

LIST No	Overall Mod. Height	Height (mm)	
17GG2506SW	12	912	
17GG2508SW	13	988	
17GG2512SW	15	1140	
17GG2516SW	17	1292	
17GG2506DC	12	912	
17GG2508DC	13	988	
17GG2512DC	15	1140	
17GG2516DC	17	1292	



400A PANELBOARD WITH TP SWITCHING UNIT

	Outgoing ways	Modular Height	Height (mm)	LIST No
400A	6	14	1064	17GG4006SW
	8	15	1140	17GG4008SW
	12	17	1292	17GG4012SW
	16	19	1444	17GG4016SW

- 400A rated Panelboards
- Busbar fault rated 25kA for 1 sec
- IP3X (door closed)
- Incoming terminations: 32mm wide lug connections*
- BS EN/IEC 61439-2: 2009

Designation of the incoming device is defined by the selection of an overcurrent release or Switch Disconnecter module.
THE SWITCHING UNIT MUST BE FITTED WITH ONE OF THESE MODULES.

* Dependant on the type of cable lug selected, cables up to 300mm² can be connected to these 32mm wide connections



OVERCURRENT RELEASE AND SWITCH DISCONNECTOR MODULES

Rated Current (In)	Overcurrent adjustment (0.4 to 1xIn)	LIST No
250A	100A 250A	7T325/OR3
400A	160A 400A	7T340/OR3

- Adjustable overcurrent release
- Adjustable short circuit release

400A	Switch Disconnecter	7T363/SD
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400A PANELBOARD WITH DIRECT CONNECTION

Inc. Terminals only	Outgoing ways	Modular Height	Height (mm)	LIST No
400A	6	14	1064	17GG4006DC
	8	15	1140	17GG4008DC
	12	17	1292	17GG4012DC
	16	19	1444	17GG4016DC

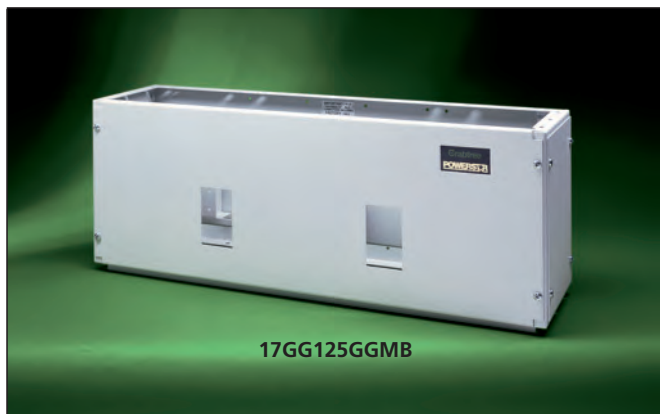
- 400A rated Panelboards
- Busbar fault rated 25kA for 1 sec
- IP3X (door closed)
- Incoming terminations: 30mm wide copper bar 1 x M10 connection
- BS EN/IEC 61439-2: 2009



DIMENSIONS 400A PANELBOARDS

LIST No	Overall Mod. Height	Height (mm)	
17GG4006SW	14	1064	
17GG4008SW	15	1140	
17GG4012SW	17	1292	
17GG4016SW	19	1444	
17GG4006DC	14	1064	
17GG4008DC	15	1140	
17GG4012DC	17	1292	
17GG4016DC	19	1444	





17GG125GGMB



17GG250MPKIT



17GG24SS



17GG06DR

ADD-ON MCCB OUTGOING HOUSINGS

	Modular Height	Height (mm)	LIST No
2 off GG MCCB	3	228	17GG125GGMB

- Includes all interconnections
- Busbar fault rated 25kA for 1 sec
- GG Unit accepts SP/TP MCCBs up to 125A
- Fits above 250A/400A Panelboards.
- 630mm wide x 188mm deep

POWERSTAR 125 ADD-ON METER PACKS

An Add-on Assembly, 228mm high, to fit beneath a Panelboard, comprising: Enclosure with slotted front plate and door, Energy Meter with pulsed output, offering Amps, Volts and kWh readout.

3 off 250A/400A Current Transformers, with associated fuses and wiring.

	LIST No
250A	17GG250MPKIT
400A	17GG400MPKIT

SINGLE POLE DISTRIBUTION BOARD

	Modular Height	Height (mm)	LIST No
Outgoing 1P ways	3	228	17GG19DB

- Supplied with 100A Switch Disconnecter and busbar
- Accepts up to 63A Polestar Compact and Loadstar MCBs
- 630mm wide x 188mm deep

CONTROL MODULE ENCLOSURE

	Modular Height	Height (mm)	LIST No
18mm wide modules	3	228	17GG24SS

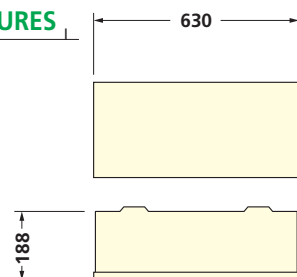
- Accepts DIN rail mounted devices

CABLE SPREADER BOX

	Modular Height	Height (mm)	LIST No
Empty enclosure	3	228	17GGCSB

DIMENSIONS ADD-ON ENCLOSURES

LIST No	Height (mm)	Mod. Height
17GG19DB	228	3
17GG24SS	228	3
17GGCSB	228	3
17GG--0MPKIT	228	3
17GG125GGMB	228	3



POWERSTAR 125 DOOR KITS

Description	LIST No	Panelboard Type
Door kits with catch		
3 module	17GG03DR	Add-on Units
5 module	17GG05DR	Half door - 6 Way
6 module	17GG06DR	Half door - 8 Way
7 module	17GG07DR	Half door - 250A incomer
8 module	17GG08DR	Half door - 12 Way
9 module	17GG09DR	Half door - 400A incomer
10 module	17GG10DR	Half door - 16 Way
12 module	17GG12DR	Full door - 250A 6 Way
13 module	17GG13DR	Full door - 250A 8 Way
14 module	17GG14DR	Full door - 400A 6 Way
15 module	17GG15DR	Full door - 250A 12 Way/400A 8 Way
Door Cylinder lock	16CL	



17GG250INCTM

INCOMER INTEGRAL METER PACKS

Rating Description	LIST No
250A Integral CT operated Energy meter	17GG250INCTM
400A Integral CT operated Energy meter	17GG400INCTM

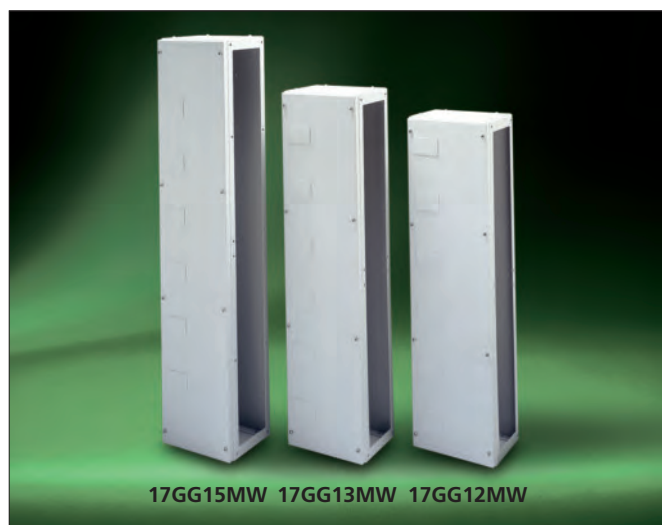
INCOMER INTEGRAL MID METER PACKS

Rating Description	LIST No
250A Integral CT operated Energy meter MID	17GG250INCTMID
400A Integral CT operated Energy meter MID	17GG400INCTMID

- Integral meter packs include a digital energy meter, three current transformers, fuses, wiring loom and mounting bases

Non MID meters include MODBUS (RTU) connections and pulsed output as a standard feature

MID meters are supplied with a pulsed output as a standard feature



17GG15MW 17GG13MW 17GG12MW

CABLEWAYS

Modular Height	Height (mm)	No. of available meter knockouts	LIST No
3	228	NIL	17GG03MW
12	912	6	17GG12MW
13	988	6	17GG13MW
14	1064	6	17GG14MW
15	1140	6	17GG15MW
17	1292	8	17GG17MW
19	1444	9	17GG19MW

- All cableways accept the outgoing metering options below (not 3 module)
- Cableways may be used with or without metering
- 250mm wide



17GG4WCT125M

OUTGOING METER PACKS

Description	LIST No
63A CT operated Energy meter	17GG4WCT63M
125A CT operated Energy meter	17GG4WCT125M

OUTGOING MID METER PACKS

Description	LIST No
125A CT operated Energy meter MID	17GG4WCT125MID

- Energy meters include pulsed output, offering Amps, Volts, kWh readout
- Outgoing meter packs include a digital energy meter, current transformers, terminals, wiring loom and mounting bases

Meter Pack Voltage supply cable loom (only one required per bank of meters) **170UMKCL**

Non MID meters include MODBUS (RTU) connections and pulsed output as a standard feature

MID meters are supplied with a pulsed output as a standard feature



17GGSa

LIGHTNING & SURGE ARRESTORS (INCOMER ONLY)

Description	LIST No
Combination Lightning & Surge Arrestor kit-type 1/2	17GGCLSA
Lightning Arrestor kit-type 1	17GGLA
Surge Arrestor kit-type 2	17GGSa

- Lightning/Surge Arrestors include: MCCB, cabling and mounting base
- The combination lightning & surge arrestor kit and the lightning arrestor kit will be supplied with a new front cover in addition to the above
- Only one of the above options possible per panelboard
- Kits will utilise the bottom right hand MCCB position



1 Pole MCCB

1 POLE GG FRAME MCCBs

Rating (A)	LIST No
15	7PBGGN115
20	7PBGGN120
25	7PBGGN125
30	7PBGGN130
40	7PBGGN140
50	7PBGGN150
60	7PBGGN160
80	7PBGGN180
100	7PBGGN1100
125	7PBGGN1125

- Standards: IEC/EN 60947-2
- 25kA Icu at 240VAC
- Fixed thermal and magnetic trips
- Terminal Capacity up to 30A - 16mm² above 30A - 50mm²

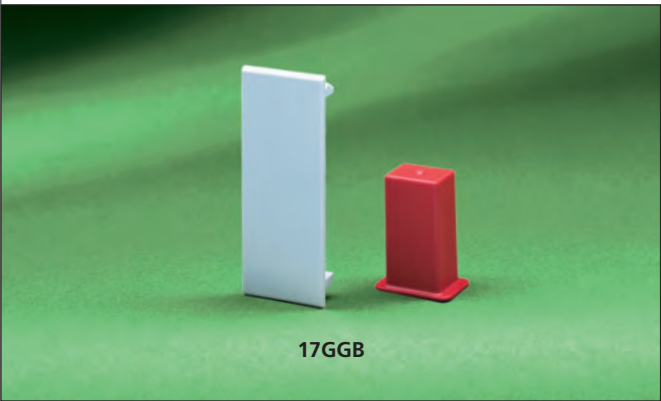


3 Pole MCCB

3 POLE GG FRAME MCCBs

Rating (A)	LIST No
15	7PBGGN315
20	7PBGGN320
25	7PBGGN325
30	7PBGGN330
40	7PBGGN340
50	7PBGGN350
60	7PBGGN360
80	7PBGGN380
100	7PBGGN3100
125	7PBGGN3125

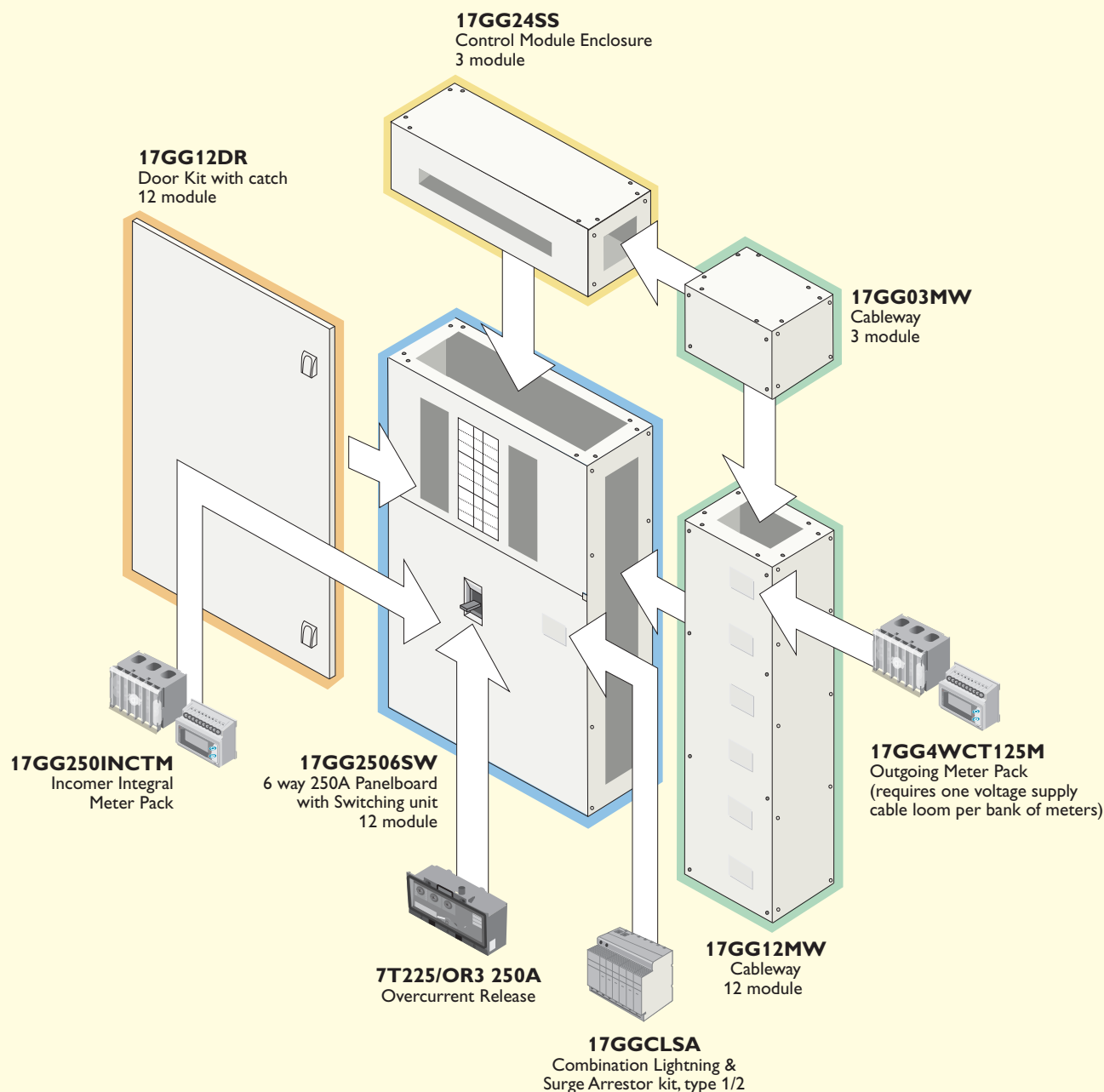
- Standards: IEC/EN 60947-2
- 25kA Icu at 415VAC
- Fixed thermal and magnetic trips
- Terminal Capacity up to 30A - 16mm² above 30A - 50mm²



17GGB

ACCESSORIES

Description	LIST No
GG Frame MCCB SP blanking kit	17GGB
Locking devices	BQDPLD



Modular Height	250A with switching unit	250A direct connection	400A with switching unit	400A direct connection	Door Kits with catch	Cableways	Add-on Boxes
3	-	-	-	-	17GG03DR	17GG03MW	MCCB Housing 17GG125GGMB Incomer Meter Packs 17GG—0MPKIT SP&N Distribution Board 17GG19DB Control Module Enclosure 17GG24SS Cable Spreader Box 17GGCSB
5	-	-	-	-	17GG05DR	-	
6	-	-	-	-	17GG06DR	-	
7	-	-	-	-	17GG07DR	-	
8	-	-	-	-	17GG08DR	-	
9	-	-	-	-	17GG09DR	-	
10	-	-	-	-	17GG10DR	-	
12	17GG2506SW	17GG2506DC	-	-	17GG12DR	17GG12MW	
13	17GG2508SW	17GG2508DC	-	-	17GG13DR	17GG13MW	
14	-	-	17GG4006SW	17GG4006DC	17GG14DR	17GG14MW	
15	17GG2512SW	17GG2512DC	17GG4008SW	17GG4008DC	17GG15DR	17GG15MW	
17	17GG2516SW	17GG2516DC	17GG4012SW	17GG4012DC	-	17GG17MW	
19	-	-	17GG4016SW	17GG4016DC	-	17GG19MW	

An appropriate overcurrent release or switch disconnector module must be selected for Panelboards which include switching units (suffixed SW)

Overall Panelboard doors are available up to 15 mod. Two doors can be used for larger units. (250A incoming section = 7 mod. 400A incoming section = 9 mod.)

Each bank of outgoing meter packs to be installed in conjunction with a voltage supply cable loom (17OUMKCL)

Product list numbers and descriptions can be found within the body of the catalogue



POWERSTAR 250

- 400A and 630A Panelboards
- Designed and Manufactured in the UK to BSEN/IEC 61439-2: 2009
- Fully RoHS compliant
- Form 3b Type 2
- Supplied with Incoming Switching unit
- User defined Incomer function (MCCB/Switch Disconnecter)
- Main Units are available with 2, 4 or 6 outgoing ways suitable for 250A TP MCCBs
 - 8 way Add-on Unit for 250A outgoing MCCBs
 - 4, 8 or 12 way Add-on units for SP and TP 125A outgoing MCCBs
 - A choice of standard or metering cableways available
 - Over-voltage protection option

Devices

- Utilising Siemens technology
- 250A TP 36kA and 65kA rated MCCBs (T2 frame size)
- 125A SP and TP 25kA rated MCCBs (GG frame size)
- IEC/EN60947-2





173T2402

400A PANELBOARD WITH TP SWITCHING UNIT

	Outgoing TP ways	Height (mm)	LIST No
400A	2	1055	173T2402
	4	1160	173T2404
	6	1265	173T2406

- 400A rated Panelboards
- 900mm wide x 250mm deep (including door)
- Busbar fault rated 35kA for 1 sec
- 250A outgoing TP MCCBs (T2 frame size)
- IP3X (door closed)
- Incoming connections
 - Incomer: 32mm wide lug connections*
 - Neutral: 30 x 6mm copper bar 1 x M8 connection
 - Earth: 25 x 5mm copper bar 1 x M12 connection
- BSEN/IEC 61439-2: 2009

Designation of the incoming device is defined by the selection of an overcurrent release or Switch Disconnecter module.
THE SWITCHING UNIT MUST BE FITTED WITH ONE OF THESE MODULES.



174T2402

400A PANELBOARD WITH 4P SWITCHING UNIT

	Outgoing TP ways	Height (mm)	LIST No
400A	2	1055	174T2402
	4	1160	174T2404
	6	1265	174T2406

- 400A rated Panelboards
- 900mm wide x 250mm deep (including door)
- Busbar fault rated 35kA for 1 sec
- 250A outgoing TP MCCBs (T2 frame size)
- IP3X (door closed)
- Incoming connections
 - Incomer: 32mm wide lug connections*
 - Neutral: 30 x 6mm copper bar 1 x M8 connection
 - Earth: 25 x 5mm copper bar 1 x M12 connection
- BSEN/IEC 61439-2: 2009

Designation of the incoming device is defined by the selection of an overcurrent release.

THE SWITCHING UNIT MUST BE FITTED WITH ONE OF THESE MODULES.

* Dependant on the type of cable lug selected, cables up to 300mm² can be connected to these 32mm wide connections



7T340/OR3

OVERCURRENT RELEASE AND SWITCH DISCONNECTOR MODULES FOR TP SWITCHING UNIT

Rated Current (In)	Overcurrent adjustment (0.4 to 1xIn)	LIST No
250A	100A 250A	7T325/OR3
400A	160A 400A	7T340/OR3

- Adjustable overcurrent release
- Adjustable short circuit release

400A	Switch Disconnecter	7T363/SD
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OVERCURRENT RELEASE MODULES FOR 4P SWITCHING UNIT

Rated Current (In)	Overcurrent adjustment (0.4 to 1xIn)	LIST No
250A	100A 250A	7T325/OR4
400A	160A 400A	7T340/OR4

- Adjustable overcurrent release
- Adjustable short circuit release
- Protected neutral function



17INMK400CT

INCOMER INTEGRAL METER PACKS

Rating	Description	LIST No
400A	Integral 3 Ph CT operated Energy meter	17INMK400CT
400A	Integral 3 Ph CT operated Energy meter MID	17INMK400MCT

- Integral meter packs include a digital energy meter, current transformers, fuses, wiring loom and mounting base plates

Non MID meters include MODBUS (RTU) connections and pulsed output as a standard feature

MID meters are supplied with a pulsed output as a standard feature



630A PANELBOARD WITH TP SWITCHING UNIT

	Outgoing TP ways	Height (mm)	LIST No
630A	2	1055	173T2632
	4	1160	173T2634
	6	1265	173T2636

- 630A rated Panelboards
- 900mm wide x 250mm deep (including door)
- Busbar fault rated 50kA for 1 sec
- 250A outgoing TP MCCBs (T2 frame size)
- IP3X (door closed)
- Incoming connections
 - Incomer: 32mm wide lug connections*
 - Neutral: 30 x 6mm copper bar 1 x M8 connection
 - Earth: 25 x 5mm copper bar 1 x M12 connection
- BSEN/IEC 61439-2: 2009

Designation of the incoming device is defined by the selection of an overcurrent release or Switch Disconnecter module.
THE SWITCHING UNIT MUST BE FITTED WITH ONE OF THESE MODULES.



630A PANELBOARD WITH 4P SWITCHING UNIT

	Outgoing TP ways	Height (mm)	LIST No
630A	2	1055	174T2632
	4	1160	174T2634
	6	1265	174T2636

- 630A rated Panelboards
- 900mm wide x 250mm deep (including door)
- Busbar fault rated 50kA for 1 sec
- 250A outgoing TP MCCBs (T2 frame size)
- IP3X (door closed)
- Incoming connections
 - Incomer: 32mm wide lug connections*
 - Neutral: 30 x 6mm copper bar 1 x M8 connection
 - Earth: 25 x 5mm copper bar 1 x M12 connection
- BSEN/IEC 61439-2: 2009

Designation of the incoming device is defined by the selection of an overcurrent release.

THE SWITCHING UNIT MUST BE FITTED WITH ONE OF THESE MODULES.

* Dependant on the type of cable lug selected, cables up to 300mm² can be connected to these 32mm wide connections



OVERCURRENT RELEASE AND SWITCH DISCONNECTOR MODULES FOR TP SWITCHING UNIT

	Rated Current (In)	Overcurrent adjustment (0.4 to 1xIn)	LIST No
400A	160A 400A		7T340/OR3
630A	250A 630A		7T363/OR3

- Adjustable overcurrent release
- Adjustable short circuit release

630A	Switch Disconnecter	7T363/SD
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OVERCURRENT RELEASE MODULES FOR 4P SWITCHING UNIT

	Rated Current (In)	Overcurrent adjustment (0.4 to 1xIn)	LIST No
400A	160A 400A		7T340/OR4
630A	250A 630A		7T363/OR4

- Adjustable overcurrent release
- Adjustable short circuit release
- Protected neutral function



INCOMER INTEGRAL METER PACKS

	Rating Description	LIST No
630A	Integral 3 Ph CT operated Energy meter	17INMK630CT
630A	Integral 3 Ph CT operated Energy meter MID	17INMK630MCT

- Integral meter packs include a digital energy meter, current transformers, fuses, wiring loom and mounting base plates

Non MID meters include MODBUS (RTU) connections and pulsed output as a standard feature

MID meters are supplied with a pulsed output as a standard feature



17GG408A

ADD ON UNITS GG FRAME

Amps (A)	Outgoing ways	Height (mm)	LIST No
400	4	267	17GG404A
400	8	425	17GG408A
400	12	583	17GG4012A

- To be used in conjunction with the 400A rated Panelboards only
- Busbar fault rated 25kA for 1 sec
- Accepts GG range of MCCBs (15A - 125A) SP & TP
- 900mm wide x 250mm deep (including door)

Amps (A)	Outgoing ways	Height (mm)	LIST No
630	4	267	17GG634A
630	8	425	17GG638A
630	12	583	17GG6312A

- To be used in conjunction with the 630A rated Panelboards only
- Busbar fault rated 25kA for 1 sec
- Accepts GG range of MCCBs (15A - 125A) SP & TP
- 900mm wide x 250mm deep (including door)



17T2408A

ADD ON UNITS T2 FRAME

Amps (A)	Outgoing ways	Height (mm)	LIST No
400	8	583	17T2408A
630	8	583	17T2638A

- 400A - 35kA Busbar fault rating. To be used in conjunction with the 400A rated Panelboards only
- 630A - 50kA Busbar fault rating. To be used in conjunction with the 630A rated Panelboards only
- Accepts T2 range of MCCBs to 250A TP only
- 900mm wide x 250mm deep (including door)

Cable Spreader Box

17T2CSB



16CL

DOOR LOCKING DEVICE

Description	LIST No
Door Cylinder Lock	16CL

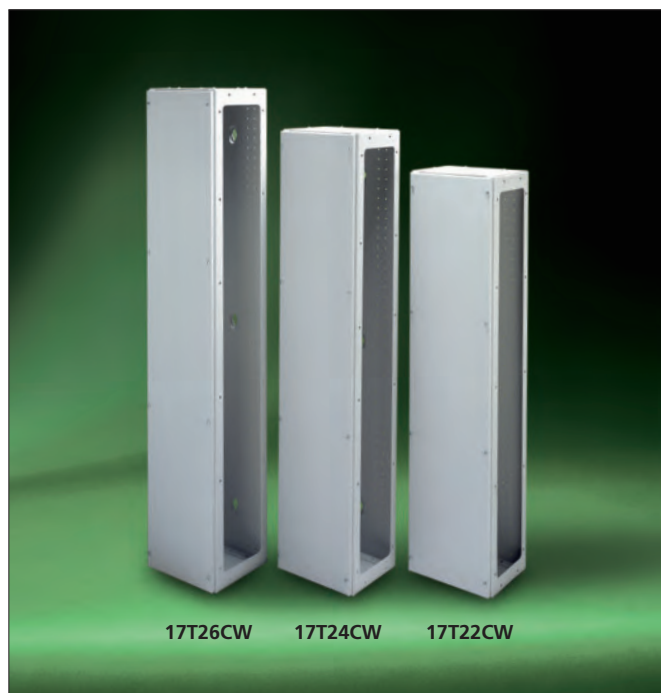


17SAR2

LIGHTNING & SURGE ARRESTORS (INCOMER ONLY)

Description	LIST No
Combination Lightning & Surge Arrestor kit-type 1/2	17CSAR1/2
Lightning Arrestor kit-type 1	17LAR1
Surge Arrestor kit-type 2	17SAR2

- Lightning/Surge Arrestors include: MCCB, cabling and mounting base
- The combination lightning & surge arrestor kit and the lightning arrestor kit will be supplied with a new front cover in addition to the above
- Only one of the above options possible per panelboard
- Kits will utilise the bottom left hand MCCB position



CABLEWAYS-MAIN UNIT

Description	Available K/Os	LIST No
2 way standard		17T22CW
4 way standard		17T24CW
6 way standard		17T26CW
2 way metering	6	17T22CWM
4 way metering	6	17T24CWM
6 way metering	7	17T26CWM

- Standard cableway width 250mm
- Metering cableway width 400mm



CABLEWAYS-ADD ON

Description	Available K/Os	LIST No
4 way standard GG		17GG4CWA
8 way standard GG		17GG8CWA
12 way standard GG		17GG12CWA
4 way metering GG	1	17GG4CWMA
8 way metering GG	2	17GG8CWMA
12 way metering GG/8 way metering T2	3	17GG12CWMA
8 way standard T2	3	17T28CWA

- Standard cableway width 250mm
- Metering cableway width 400mm



OUTGOING METERING-MAIN UNIT & ADD ON T2

Description	LIST No
Three phase Energy meter 160/5 CTs	17OUMK160CT
Three phase Energy meter 250/5 CTs	17OUMK250CT
Three phase Energy meter 160/5 CTs MID	17OUMK160MCT
Three phase Energy meter 250/5 CTs MID	17OUMK250MCT
Meter Pack Voltage supply cable loom (only one required per bank of meters)	17OUMKCL

- To be used in conjunction with a metering cableway
- Energy meters are suitable for a 3P 4 wire system

Non MID meters include MODBUS (RTU) connections and pulsed output as a standard feature

MID meters are supplied with a pulsed output as a standard feature



OUTGOING METERING PACK-ADD ON GG

Description	LIST No
Three phase Energy meter 63/5 CTs	17OUMK63CT
Three phase Energy meter 125/5 CTs	17OUMK125CT
Three phase Energy meter 125/5 CTs MID	17OUMK125MCT
Meter Pack Voltage supply cable loom (only one required per bank of meters)	17OUMKCL

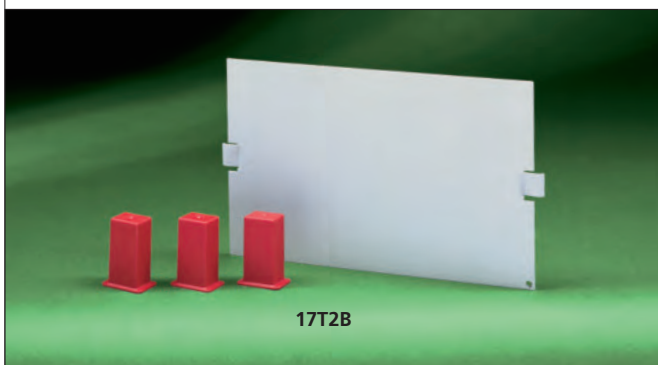
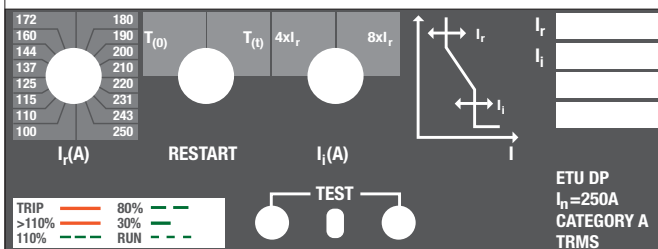
- To be used in conjunction with a metering cableway
- Energy meters are suitable for a 3P 4 wire system

Non MID meters include MODBUS (RTU) connections and pulsed output as a standard feature

MID meters are supplied with a pulsed output as a standard feature



7T2S3250 + OR



17T2B



1 Pole MCCB



3 Pole MCCB

MAIN UNIT MCCBs - 40A TO 250A

Description	LIST No
250A 36kA Switching Unit	7T2S3250
250A 65kA Switching Unit	7T2H3250

- Standards: IEC/EN 60947-2
- Terminal Capacity 120mm²

TRIP UNIT OVERLOAD SETTINGS

Rated Current I_n :	100A	7T210/OR3
Overload protection I_r :	40, 43, 46, 48, 50, 55, 58, 61, 63, 69, 72, 76, 80, 87, 91 and 100A	
Rated Current I_n :	160A	7T216/OR3
Overload protection I_r :	63, 69, 72, 80, 87, 91, 100, 110, 115, 120, 125, 130, 137, 144, 150 and 160A	
Rated Current I_n :	250A	7T225/OR3
Overload protection I_r :	100, 110, 115, 125, 137, 144, 160, 172, 180, 190, 200, 210, 220, 231, 243 and 250A	

Restart: $T(0)$, $T(t)$
 Instantaneous short circuit protection: $I_i = 4 \times I_r$, $I_i = 8 \times I_r$
 The rating of these MCCBs is defined by selection of the appropriate overcurrent release.
 THE SWITCHING UNIT MUST BE FITTED WITH AN OVERCURRENT RELEASE MODULE.

ANCILLIARIES

Description	LIST No
3P Terminal Shields	7T3A3TS
4P Terminal Shields	7T3A4TS
Auxiliary	7T3ACO
UVR 110V AC or DC	7T3AUV/110
Shunt Trip 24V/48V AC or DC	7T3AST/48
Shunt Trip 230V AC or DC	7T3AST/230

BLANKING PLATES

Description	LIST No
T2 frame MCCB TP blanking kit	17T2B

1 POLE GG FRAME MCCBs

Rating (A)	LIST No	Rating (A)	LIST No
15	7PBGGN115	50	7PBGGN150
20	7PBGGN120	60	7PBGGN160
25	7PBGGN125	80	7PBGGN180
30	7PBGGN130	100	7PBGGN1100
40	7PBGGN140	125	7PBGGN1125

- Standards: IEC/EN 60947-2
- 25kA Icu at 240VAC
- Fixed thermal and magnetic trips
- Terminal Capacity up to 30A - 16mm² above 30A - 50mm²

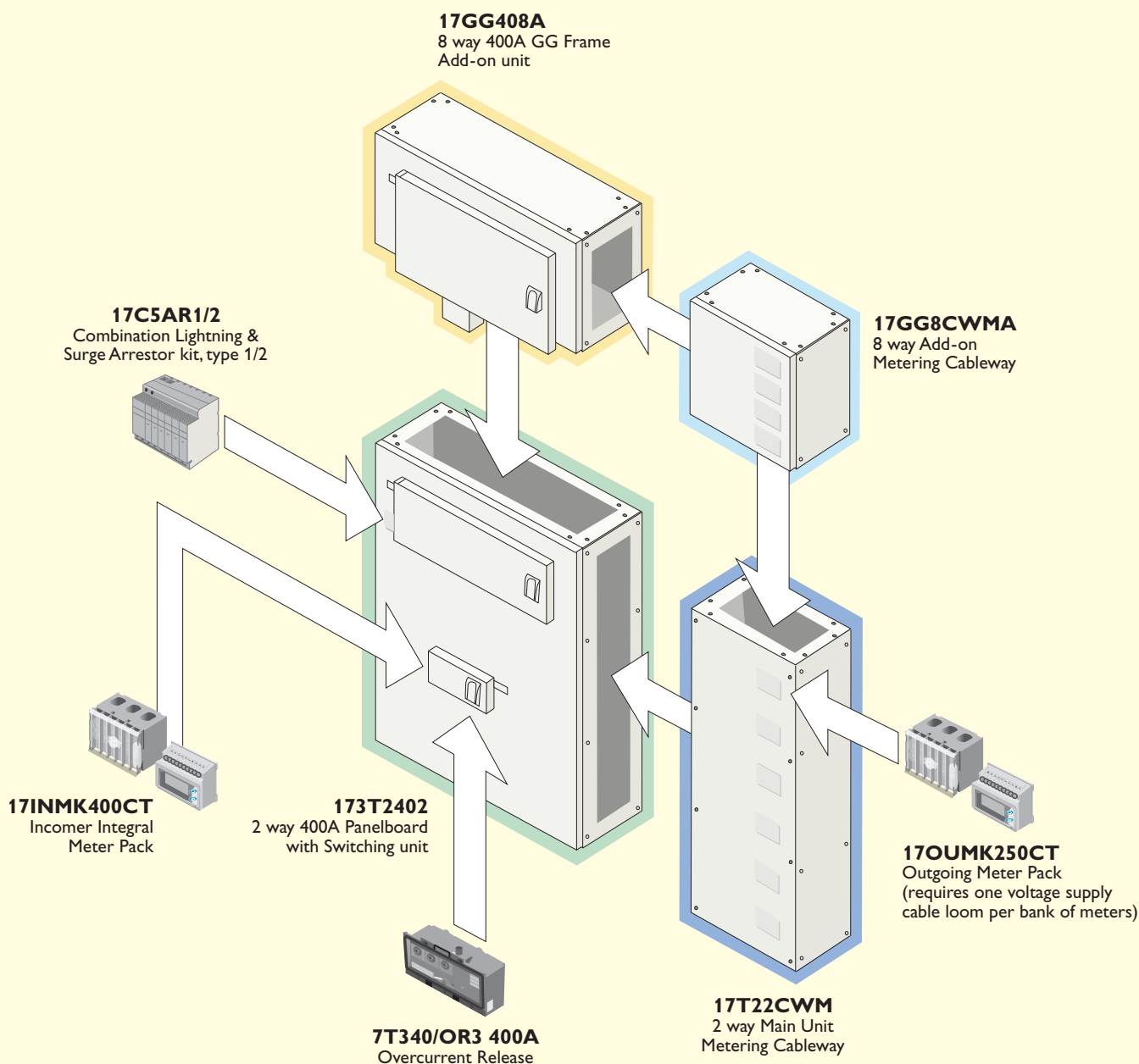
3 POLE GG FRAME MCCBs

Rating (A)	LIST No	Rating (A)	LIST No
15	7PBGGN315	50	7PBGGN350
20	7PBGGN320	60	7PBGGN360
25	7PBGGN325	80	7PBGGN380
30	7PBGGN330	100	7PBGGN3100
40	7PBGGN340	125	7PBGGN3125

- Standards: IEC/EN 60947-2
- 25kA Icu at 415VAC
- Fixed thermal and magnetic trips
- Terminal Capacity up to 30A - 16mm² above 30A - 50mm²

BLANKING PLATES

Description	LIST No
GG Frame MCCB SP blanking kit	17GGB



400A 3P with switching unit	400A 4P with switching unit	630A 3P with switching unit	630A 4P with switching unit	Main Unit Standard Cableways	Main Unit Metering Cableways	Add-on units	Add-on Standard Cableways	Add-on Metering Cableways
173T2402	-	-	-	17T22CW	17T22CWM	T2 frame 17T2408A GG frame 17GG404A 17GG408A 17GG4012A	17T28CWA	17GG12CWMA
173T2404	-	-	-	17T24CW	17T24CWM		17GG4CWA	17GG4CWMA
173T2406	-	-	-	17T26CW	17T26CWM		17GG8CWA	17GG8CWMA
-	174T2402	-	-	17T22CW	17T22CWM		17GG12CWA	17GG12CWMA
-	174T2404	-	-	17T24CW	17T24CWM			
-	174T2406	-	-	17T26CW	17T26CWM			
-	-	173T2632	-	17T22CW	17T22CWM	T2 frame 17T2638A GG frame 17GG634A 17GG638A 17GG6312A	17T28CWA	17GG12CWMA
-	-	173T2634	-	17T24CW	17T24CWM		17GG4CWA	17GG4CWMA
-	-	173T2636	-	17T26CW	17T26CWM		17GG8CWA	17GG8CWMA
-	-	-	174T2632	17T22CW	17T22CWM		17GG12CWA	17GG12CWMA
-	-	-	174T2634	17T24CW	17T24CWM			
-	-	-	174T2636	17T26CW	17T26CWM			

An appropriate overcurrent release or switch disconnector module must be selected for Powerstar 250 Panelboards
 Each bank of outgoing main or add on unit meter packs must be installed in conjunction with a voltage supply cable loom (17OUMKCL)
 Product list numbers and descriptions can be found within the body of the catalogue



SWITCH DISCONNECTORS AND FUSE SWITCHES

Fuse Switch Range

- 20A to 800A
- SPN,TPN and 4P
- Modular Range of Enclosures with built in Cable spreading room
- Removable door, opens through 180° for all round access

- Neutrals, fully rated
- Includes HRC fuses, up to 125A rating
- BS EN 60947-3
- Paint finish Epoxy Powder, Light Grey RAL 7035

Switch Disconnector Range

- 20A to 125A
- SPN,TPN and 4P
- Metal Enclosures with hinged door, IP4X
- Insulated Enclosures, IP65



20/32



63/100



125/160/200



315/400

FUSE COMBINATION UNIT 20A-32A

20A	SP&N TP&N 4P	supplied with 20A fuses	190201NF 190203NF 190204F
32A	SP&N TP&N 4P	supplied with 32A fuses	190321NF 190323NF* 190324F
Accessories	Cable Spreader Box Copper Isolator Link Each		19032CSB 19LK32
Modular width	4		
Terminals	20A-32A	16mm ² Max	Cable Clamp
Spreading room	up to 10mm ² 4 Core *		

FUSE COMBINATION UNIT 63A-100A

63A	SP&N TP&N 4P	supplied with 63A fuses	190631NF 190633NF* 190634F
100A	SP&N TP&N 4P	supplied with 100A fuses	191001NF 191003NF* 191004F
Accessories	Cable Spreader Box Copper Isolator Link Each 63A Copper Isolator Link Each 100A Castell Lock (factory fitted)		19100CSB 19LK63 19LK200 Suffix CLK
Modular width	5		
Terminals	63A-100A	63A-Cable Clamp 25mm ² 100A- M8 Hole	
Spreading room	up to 70mm ² 4 Core *		
Cable lug palm copper size	20mm wide Maximum		

FUSE COMBINATION UNIT 125A-200A

125A	SP&N TP&N 4P	supplied with 125A fuses	191251NF 191253NF 191254F
160A	SP&N TP&N 4P	no fuses supplied	191601N 191603N* 191604
200A	SP&N TP&N 4P	no fuses supplied	192001N 192003N 192004
Accessories	Cable Spreader Box Copper Isolator Link Each Castell Lock (factory fitted)		19200CSB 19LK200 Suffix CLK
Modular width	6		
Terminals	125A-200A		M8
Spreading room	up to 150mm ² 4 Core *		
Cable lug palm copper size	20mm wide Maximum		

FUSE COMBINATION UNIT 315A-400A

315A	TP&N 4P	no fuses supplied	193153N* 193154
400A	TP&N 4P	no fuses supplied	194003N 194004
Accessories	Cable Spreader Box Copper Isolator Link Each Castell Lock (factory fitted)		19400CSB 19LK400 Suffix CLK
Modular width	8		
Terminals	315A-400A		M10
Spreading room	up to 300mm ² 4 Core *		
Cable lug palm copper size	45mm wide Maximum		

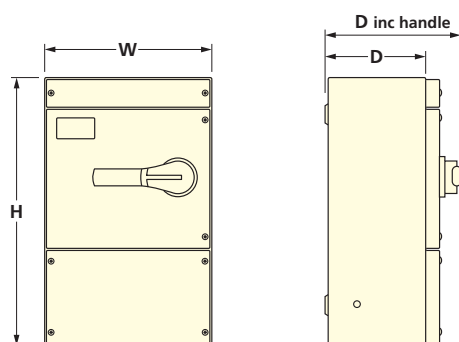
* Spreading Room is allowed for at one end only. To fit a 4 core cable at both ends an additional Cable spreader box will be required. 1 Module = 52.5mm



FUSE COMBINATION UNIT 630A–800A

630A	TP&N 4P	no fuses supplied	196303N* 196304
800A	TP&N 4P	no fuses supplied	198003N 198004
Accessories	Cable Spreader Box Copper Isolator Link Each Brass Gland Plate Castell Lock (factory fitted)		19800CSB 19LK800 19800BGP Suffix CLK
Modular width			12
Terminals	630A–800A		M12
Spreading room			up to 630mm ² 4 Core *
Cable lug palm copper size			63mm wide Maximum

FUSESTAR DIMENSION DETAILS



	H	W	D	D inc. handle
20-32A	220	210	136	200
63A	420	263	188	263
100A	420	263	188	263
125-200A	525	315	241	305
315-400A	735	420	241	305
630-800A	850	620	293	355



BUS BAR CHAMBER

400A	TP&N	16 Mod.	1949BB
Dimensions	H 368	W 840	D 190
Terminals Pre fitted	4 x 250A & 400A Supplied		M8
Fault rated			31.5kA 1Sec

SWITCH MOUNTING & BLANK FILLER PLATES

20A–32A	4 MOD	1932MTG
63A–100A	5 MOD	19125MTG
125A–200A	6 MOD	19200MTG
315A–400A	8 MOD	19400MTG
1 Mod	Blank Filler Plate	191BL
2 Mod	Blank Filler Plate	192BL
4 Mod	Blank Filler Plate	194BL
8 Mod	Blank Filler Plate	198BL

Note: Bus Bar chamber supplied with 2 x 4 Mod, 2 x 2 Mod & 2 x 1 Mod
Blank Filler Plates 1 – Mod = 52.5

250A	Pack quantity 4	19TMBB
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Steel Enclosure Hinged Door



Insulated enclosure Yellow/Red Handle



Accessories

GENERAL PURPOSE ENCLOSURE

Accepts	Max 3ph Rating	TP&N	4 Pole
7T1 mccb	140A	7T1-ENC-3N	7T1-ENC-4P
7T2 mccb	250A	7T2-ENC-3N	7T2-ENC-4P
7T3 mccb	550A	7T3-ENC-3N	7T3-ENC-4P

SWITCH DISCONNECTOR STEEL ENCLOSURE

Rating (A)	Box Size	TP&N/SP&N	TP&SWN
20	1	190203NSW1	190204SW1
32	1	190323NSW1	190324SW1
40	1	190403NSW1	190404SW1
63	1	190633NSW1	190634SW1
63	2	190633NSW2	190634SW2
100	2	191003NSW2	191004SW2
125	2	191253NSW2	191254SW2

- Hinged Door

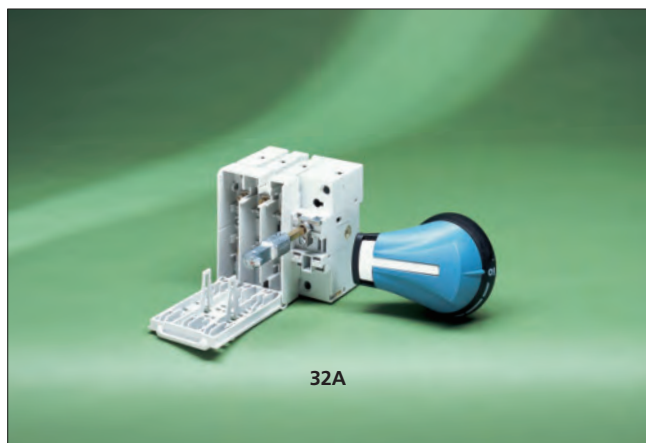
SWITCH DISCONNECTOR INSULATED ENCLOSURE

Rating (A)	Box Size	Yellow/Red Handle	Black/Grey Handle
16	A	15416/11	15416/12
25	A	15425/11	15425/12
32	B	15432/11	15432/12
40	B	15440/11	15440/12
63	C	15463/11	15463/12
80	D	15480/11	15480/12
100	D	154100/11	154100/12
125	E	154125/11	154125/12

- Gland Fixings are Metric sizes
- Optional Switched Neutral
15416/11 & 15416/12 have Non-interlocked handles.

ACCESSORIES

Description	LIST No.
Neutral Link 63amp	19963
125amp	199125
Auxiliary Switch 10amp	19701
Terminal Shrouds	
SP 16-63amps (set of 2)	19811
TP 16-63amps (set of 2)	19813
SP 63-125amps (set of 2)	19821
TP 63-125amps (set of 2)	19823
Switched 4th Pole	
16A	198164
32A	198324
40A	198404
63A	198634
80A	198804
100A	1981004
125A	1981254



SKELETON FUSE SWITCH ASSEMBLIES FOR USE WITH SYSTEM POWERSTAR

FOR USE IN FUSE SWITCH PANEL BOARD ONLY.

Triple Pole and Integrated Neutral link Fuse Switch, complete with shaft, handle and terminal shroud for outgoing cables.

Rating	Format	LIST No
63A	TP & N	19KP0633N
100A	TP & N	19KP1003N
160A	TP & N	19KP1603N
200A	TP & N	19KP2003N

FOR USE IN ELEMENTS OF SYSTEM POWERSTAR, OTHER THAN PANEL BOARDS.

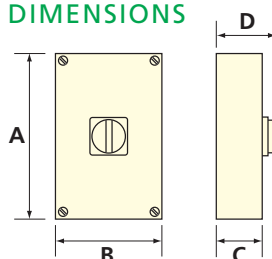
For use in Fuse Switches complete with shaft, handle and terminal shroud for outgoing cables.

Rating	Format	LIST No
32A	TP & N	19K0323N
63A	TP & N	19K0633N
100A	TP & N	19K1003N
160A	TP & N	19K1603N
200A	TP & N	19K2003N
315A	TP & N	19K3153N
400A	TP & N	19K4003N
630A	TP & N	19K6303N
800A	TP & N	19K8003N

Rating	Format	LIST No
32A	4P	19K0324
63A	4P	19K0634
100A	4P	19K1004
160A	4P	19K1604
200A	4P	19K2004
315A	4P	19K3154
400A	4P	19K4004
630A	4P	19K6304
800A	4P	19K8004

• 63A to 200A 4P Fuse Switch Cannot be used in System Powerstar Form 4 Panel Boards

DIMENSIONS



BOX SIZE	DIMENSIONS			
	A	B	C	D
A	130	85	75	105
B	175	125	100	137
C	250	175	100	135
D	310	200	135	170
E	410	200	135	170
1	220	158	136	172.5
2	325	158	136	172.5

SIVACON S4

Part of the comprehensive SIVACON product range, which covers all aspects of power distribution: from the switchgear to the busbar trunking system. The integration in Totally Integrated Power assures full consistency in terms of planning and configuration.

New features for enhanced safety

As type-tested switchgear, SIVACON S4 stands for maximum reliability and a high degree of safety.

High-quality, perfectly matched switching devices ensure easy integration in building control thanks to the system's built-in intelligence. Fast and easy access to the devices through doors with swivel frames and quick-release locks. Thanks to the powerful locking system, maximum personal safety is assured even during fault conditions.

Forms of internal separation 1, 2b, 3b, 4a, (type 2 and 3) 4b (type 4, 5, 6 and 7) available.



Roof mounted arc-fault venting provides enhanced personnel protection

SIVACON S4 - CONSISTENT PROTECTION, MAXIMUM BENEFITS: Low-voltage Power Distribution Board

Construction:

The Sivacon S4 energy distribution concept consists of fully galvanised sheet steel frames, of sturdy design, freestanding or wall mounted.

Sivacon S4 low-voltage power distribution cabinets are constructed in accordance to a modular design system with flexible assembly kits, and can be combined to meet a wide range of power distribution needs

Technical Data

Standards and regulations

Type-tested low voltage switchgear combination (TTA) IEC 61439-1, EN 61439-1

Clearances and creepage distances

Rated impulse withstand voltage (U_{imp}) 12kV

Overvoltage category IV

Pollution degree 3

Type of internal separation 1, 2b, 3b, 4a (type 2 & 3) 4b (type 4, 5, 6 & 7)

Rated insulation voltage (U_i) 1,000V

Rated operational voltage (U_e) Up to 690V

Rated frequency 50/60 Hz

Rated currents (I_n) Busbars (3-pole and 4-pole)

Main busbars horizontal

Rated current Up to 4,000A

Rated peak withstand current (I_{pk}) Up to 220kA

Rated short-time withstand current (I_{cw}) Up to 100kA, 1s

Surface treatment

Frame parts, extension parts Zinc-plated

Enclosure parts Powder-coated RAL 7035, light grey

Design parts Powder-coated blue-green basic

Protection class

In accordance with IEC 61140, EN 61140 I

Degree of protection

In accordance with IEC 60529, EN 60529 IP30, IP31, IP40, IP41, IP55

Operating conditions

Ambient temperature ¹⁾ 35°C

Installation altitudes ≤ 2,000m

Framework components

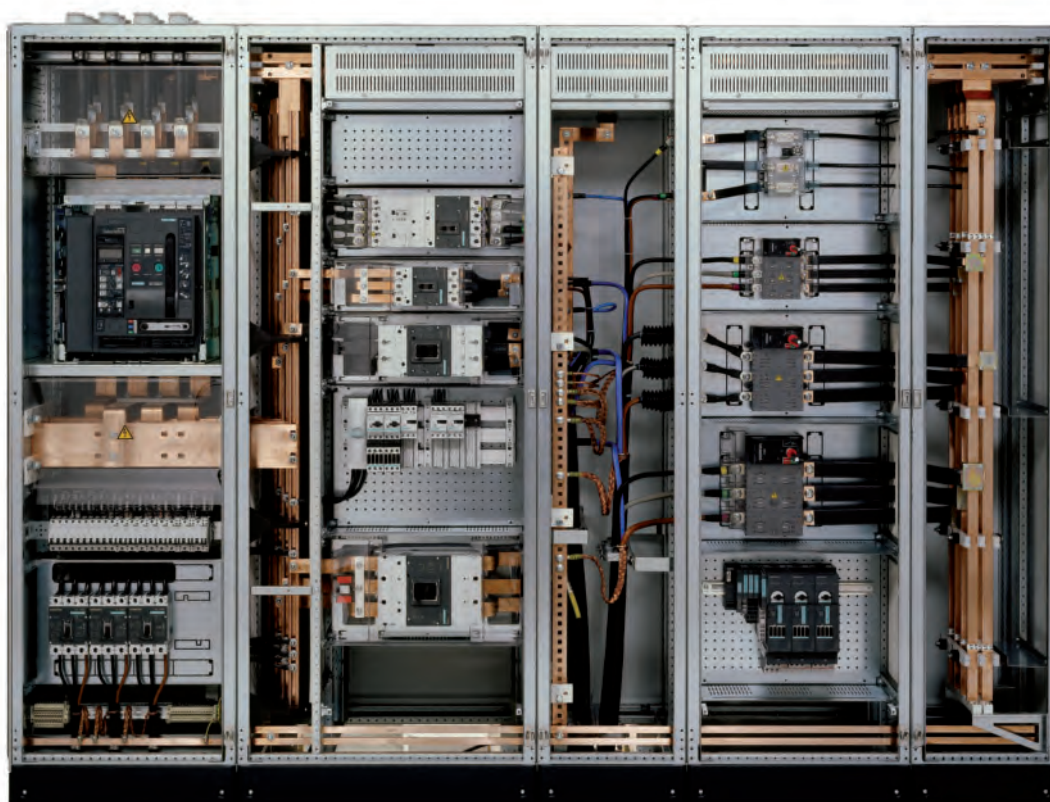
2.5mm sheet-steel with 25mm hole matrix in accordance with DIN 43660

Dimensions

Outside framework dimensions	Height	2,000mm
	Width	400/600/800/1,000/1,200mm
	Depth	400/600/800mm

Equipping dimensions	Equipping height	1,800mm
	Module	36 modules of 50mm each
	Height	100/200mm

¹⁾ Observe the connection type operating conditions and installation altitude.



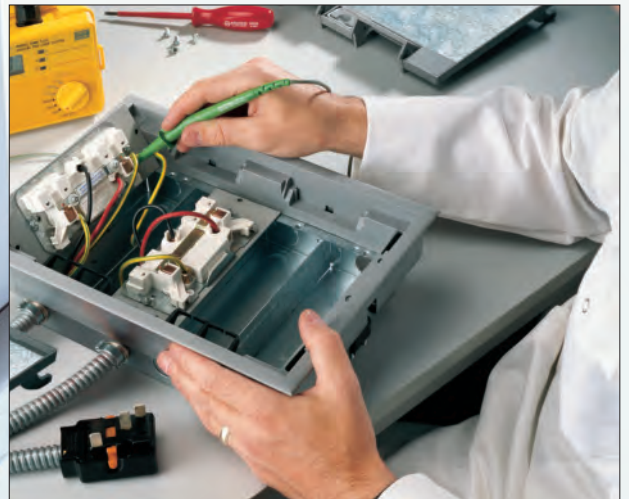
FLOOR BOX DISTRIBUTION

The Britmac range of cable management products have been utilised in the design and installation of electrical systems in commercial and industrial projects for many years. The comprehensive fast-fit floor box provides a wide choice from which to select the most appropriate for a specific application. Units can be supplied fitted with accessories pre-wired to customers' requirements and fully factory tested in the UK prior to delivery. The products are supported by a nationwide team of Sales Engineers and Stockists.





- Large capacity cable routing guides ensure cables exit the box safely and neatly
- Lid hinge design ensures that lid will always self-close
- Snap-out facility enables the lid to be removed for access to accessory plates
 - Pre-wired saving time during site installation





GR03G

3 COMPARTMENT FLOOR BOX & ACCESSORIES

TRIM COLOUR	LIST No
Grey	GR03G

- The most popular size of raised access floor box for use in commercial office applications where power, voice and data services are required.
- Utilises 87mm wide accessory plates.

For Floor Box Dimensions See page 53.



GB3SRCD30/BG GB3SSN2/BG

SWITCHED 13A SOCKETS

	LIST No
13A 2 Gang switched socket TWIN EARTH	GB3SS2/BG
13A 2 Gang switched socket CLEAN EARTH	GB3SS2CE/BG
13A 2 Gang switched socket NON-STD TWIN EARTH	GB3SSN2/BG
13A 2 Gang switched socket NON-STD CLEAN EARTH	GB3SSN2CE/BG
13A 2 Gang switched safety socket 30mA	GB3SRCD30/BG

- Clean Earth has a normal and an isolated earth.

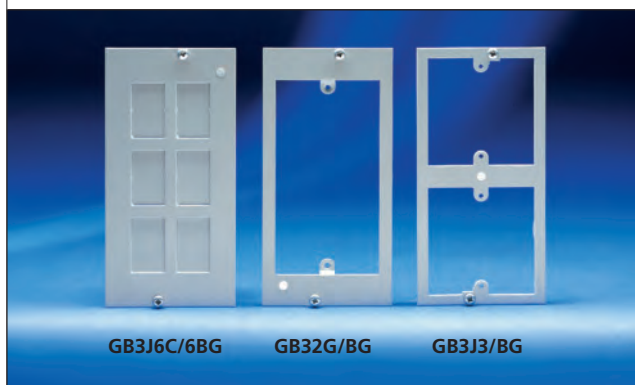


GB3S2/BG GB3SN2/BG

UNSWITCHED 13A SOCKETS

	LIST No
13A 2 Gang unswitched socket TWIN EARTH	GB3S2/BG
13A 2 Gang unswitched socket CLEAN EARTH	GB3S2CE/BG
13A 2 Gang unswitched socket NON-STD	GB3SN2/BG

- Clean Earth has a normal and an isolated earth.



GB3J6C/6BG GB32G/BG GB3J3/BG

DATA AND COMMUNICATIONS

	LIST No
Accessory plate 4 knockout LU6C/RJ45	GB3J6C/BG
Accessory plate to accept 6x LU6C/RJ45	GB3J6C/6BG
Accessory plate to accept 2x 1G standard accessory	GB3J3/BG
Accessory plate to accept 2G standard accessory	GB32G/BG
Blank plate	GB3BP/BG
Accessory plate to accept 4x Alpha	GB3ALPHA/BG
Accessory plate to accept 2x Euro module (Will accept 4x Crabtree communication modules 25mm x 50mm).	GB3EURO/BG

- All plates 87mm x 173mm.
- All accessory plates are supplied with fixing screws.



GB3ALPHA/BG GB3EURO/BG



4 COMPARTMENT FLOOR BOX & ACCESORIES

TRIM COLOUR	LIST No
Grey	GR04G

- Compact 4 compartment unit - utilises 66mm wide accessories.
- 4 compartment units can provide an attractive and economical solution for applications, where power, voice and data systems are to be accessed, particularly where both clean and utility power outlets are required or where more than one type of data system is required.

For Floor Box Dimensions See pages 53.



SWITCHED 13A SOCKETS

	LIST No
13A 2 Gang switched socket TWIN EARTH	GBSS2/BG
13A 2 Gang switched socket CLEAN EARTH	GBSS2CE/BG
13A 2 Gang switched socket NON-STD TWIN EARTH	GBSSN2/BG
13A 2 Gang switched socket NON-STD CLEAN EARTH	GBSSN2CE/BG

- Power sockets supplied with rear entry terminals as standard.
- Clean earth have a normal and an isolated earth.
- Only two 13A 2 gang Sockets can be fitted per Floor Box, in centre compartment only.



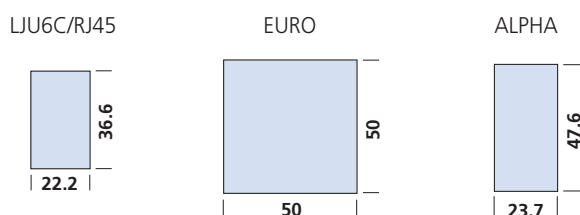
DATA AND COMMUNICATIONS

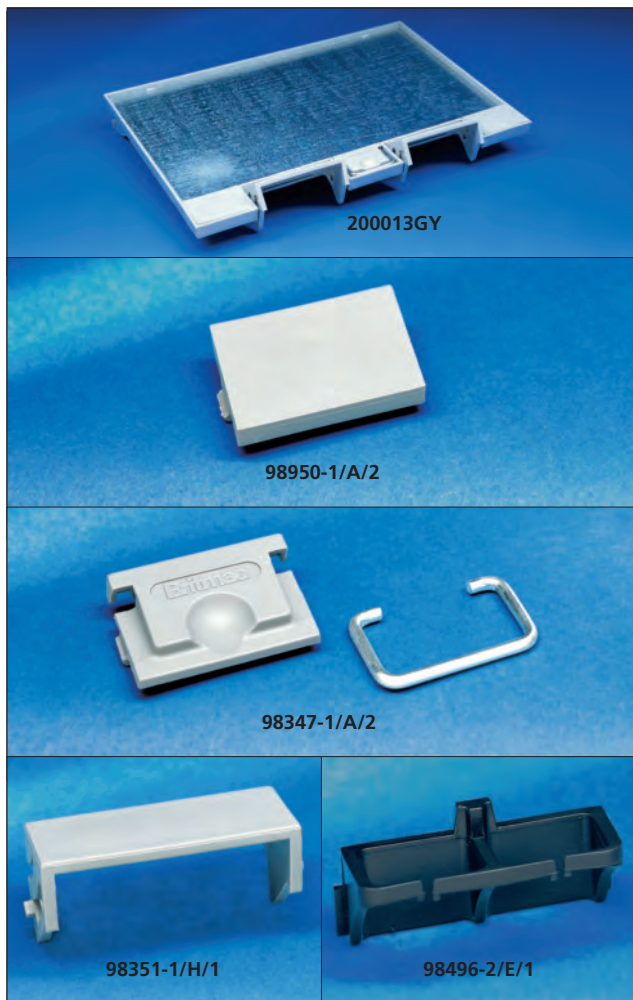
	LIST No
Plate to accept 4 LJU6C voice or 4 RJ45 data outlets	GBJ6C/BG
Blank plate for on-site piercing	GBBP/BG
Plate to accept 4x Alpha	GBALPHA/BG
Plate to accept 2x Euro modules (Will accept 4x Crabtree communication modules 25mm x 50mm).	GBEURO/BG

- All plates 66mm x 173mm.
 - All accessory plates are supplied with fixing screws.
- 13A accessory plates are supplied with the appropriate interior fitted.



KNOCKOUT DIMENSIONS





CURRENT RANGE

GROSVENOR LID REPLACEMENT 3 & 4 GANG

Lid assembly, Grey	200013GY
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GROSVENOR SPARES

Trim piece (plain), Grey	98950-1/A/2
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Trim piece (handle), Grey - Complete	98347-1/A/2
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Cable flap, Grey	98351-1/H/1
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Cable retainer, Black	98496-2/E/1
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FLOOR GROMMET

In the modern office environment where flexibility is vital, the BRITACCESS floor grommet can accommodate most requirements for accessing cables on flexible conduits up to cable managed desks etc.

If the requirement is for a basic access point the top element will satisfy that need. To allow a desk module to pass through from a floor void whether it be a 3 core flexible cable or a flexible conduit, the BRITACCESS grommet is suitable for the job.

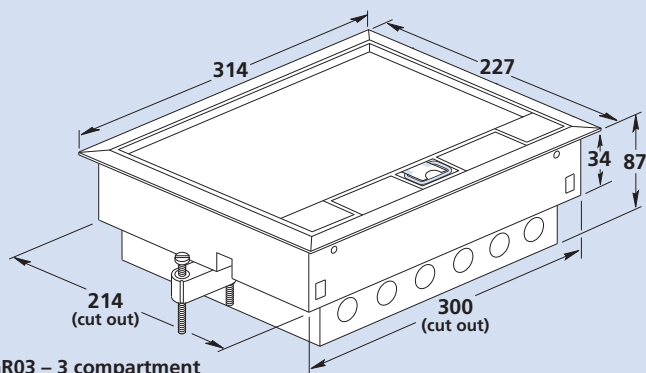
FLOOR ACCESS GROMMET

Top Grommet Only	BAG150
Floor Grommet c/w Switched 1G Socket & Back box	BAGSS

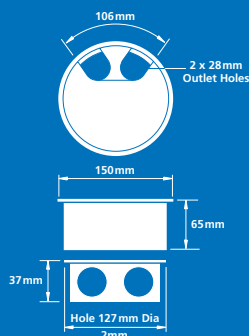




GROSVENOR 'FAST FIT' RAISED ACCESS FLOOR BOXES



**GR03 – 3 compartment
GR04 – 4 compartment**



SPECIFICATION Top Element (Grommet Only)

Dimensions:

O/A Diameter	150mm
Internal Diameter	120mm
Depth	65mm

Material:	High Impact ABS
Colour:	RAL 7016

BRITMAC FLOOR DISTRIBUTION SYSTEMS

Materials

All systems are constructed from high quality materials and are designed to meet relevant British and International Standards including the installation requirements of the IEE Wiring Regulations.

Raised Access Floors

Throughout this catalogue the term Raised Access Floor has been used to describe any modular flooring system which is supported on adjustable pedestals providing a service void. Other names frequently used are Cavity Floor, False Floor, Platform Floor, Access Floor, Computer Floor, etc.

GROSVENOR RAISED ACCESS FLOOR BOXES

Floorboxes

The Grosvenor floorbox has been designed to withstand working loads of the PSA MOB PF2 PS/SPU specification for raised floors.

The floorboxes listed within this catalogue are capable of accepting a very wide range of accessories fitted in any compartment. However, certain combinations do impose restrictions on positioning, due to the clashes of connectors, plug tops or the cables themselves.

Accessories

All accessory plates are supplied complete with the appropriate thread cutting screws. Each fixing hole in the unit frames is unthreaded and deep plunged for ease of location of fixing.

The minimum plug clearance between accessory plate and underside of floor is 34mm.

POWER (13A)

Twin Earth sockets.
Non-standard sockets.
Clean Earth sockets.

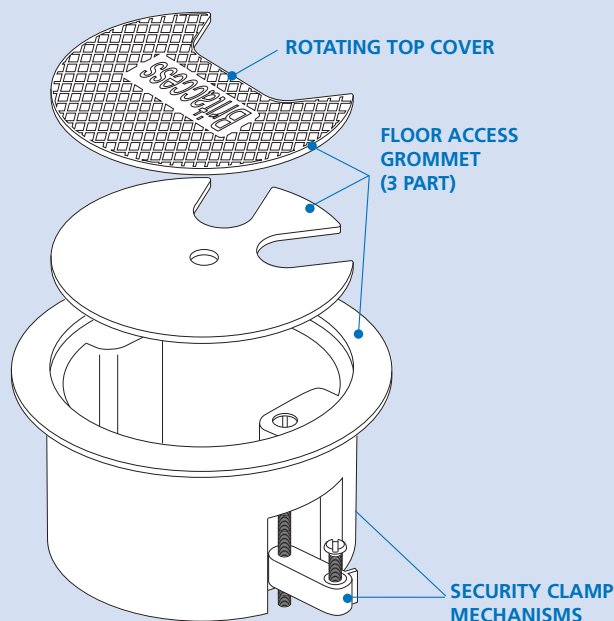
TELEPHONE

Components for most British Telecom, Mercury and other national and international systems.

DATA

A wide range of components to suit virtually all systems in current use. These include IBM, Wang, Phillips, ICL and many others.

All dimensions in mm Tolerance on cut-out dimensions is ± 1 mm



LOADSTAR RANGE

DISTRIBUTION BOARDS

Standards Compliance:	BSEN60439-3 and IEC 60439-3
Rated Voltage:	230/400V, 50/60Hz
Busbar Rating:	80A, 125A & 250A
Rated Insulation Voltage:	500V a.c.
Short Circuit Withstand:	16kA Conditional
Protection Degree:	IP3X (Door Closed)

ISOLATORS & SWITCH DISCONNECTORS

Standards Compliance:	BSEN60947-3 and IEC 60947-3
Rated Voltage:	230/400V, 50/60Hz
Rated Insulation Voltage:	500V a.c.
Rated Impulse Withstand Voltage:	4kV a.c. peak (125A) 6kV a.c. peak (250A)
Rated Duty 200A:	AC22B (Double Pole)
Rated Duty 225A:	AC22B (Triple Pole)
Rated Duty 250A:	(Direct Connection)
Rated Duty 63 to 125A:	AC 22A (63A at AC23B)
Pole Configuration:	Double Pole, Triple Pole
Maximum Terminal Capacity 125A:	50mm ²
Maximum Terminal Capacity 250A:	M10 LUG (20mm wide)

RESIDUAL CURRENT CIRCUIT BREAKERS (RCCBs)

Standards Compliance:	EN61008 and IEC 61008
Rated Voltage:	230/400V, 50/60Hz
RCD Class:	Type AC
Maximum Terminal Capacity:	35mm ²

MINIATURE CIRCUIT BREAKERS (MCBs)

Standards Compliance:	BSEN60898 and IEC 60898
Rated Voltage:	230/400V, 50/60Hz
Short Circuit Capacity:	10kA (BSEN60898 and IEC60898). 15kA IEC/EN60947-2
Tripping Characteristics:	Types B, C and D
Temperature Range:	Maximum Operating Temperature: 55°C
Pole Configuration:	Single Pole, Double Pole, Triple Pole
Maximum Terminal Capacity:	35mm ²

RCBOs

Standards Compliance:	EN61009, IEC 61009
Rated Voltage:	230V 50Hz
Rated Short Circuit Capacity:	10kA
MCB Tripping Characteristics:	Types B and C
RCD Class:	Type A
Neutral:	Unswitched
Maximum Terminal Capacity:	16mm ²

Neutral flying lead and functional earth lead provided

During interruption of the neutral conductor the protective function is guaranteed when FE & PE conductors are connected

TYPE B AND ROW DISTRIBUTION BOARDS

80A Standard

List No.	H	W
18LS06AMR	257	460

125A Standard

List No.	H	List No.	H	List No.	H
18LS04MR	490	18LS04D	650	18LS204MR	768
18LS06MR	570	-	-	18LS206MR	822
18LS08MR	650	18LS08D	815	18LS208MR	876
18LS12MR	815	18LS12D	975	18LS212MR	984
18LS16MR	895	18LS16D	1140	18LS216MR	1092
18LS20MR	1000	18LS20D	1140	18LS220MR	1200
18LS24MR	1140	-	-	18LS224MR	1308

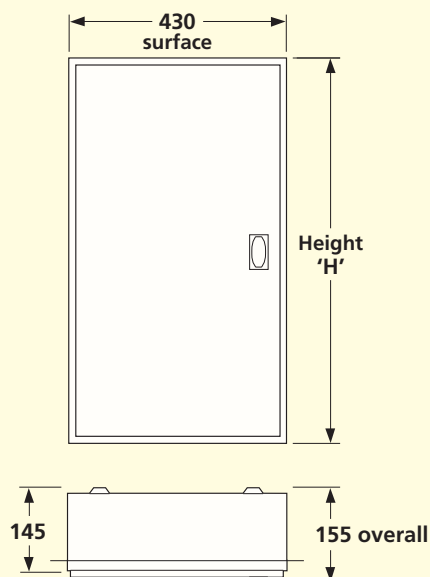
Add on enclosures

List No.	H	List No.	H
18DIN18	245	18AS1	245
18DIN36	410	18AS2	410
18SB	245	18AS3	570
		18AS4	735
		18AS5	815
18LS12A	675	18AS6	815

Meter Packs

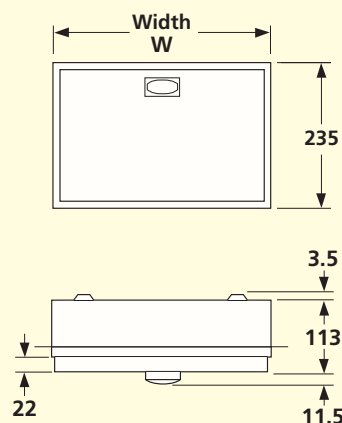
18ML125	245	18MH250LP	740
18ML125LP	410		

Dual meter packs (LP) have a width equal to that of two distribution boards



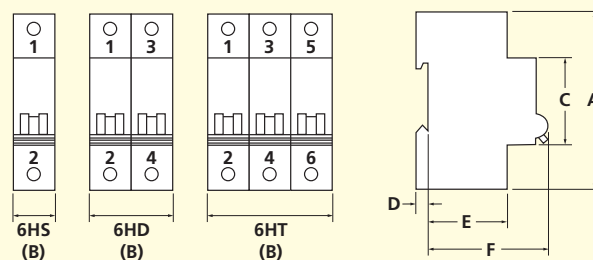
TYPE A DISTRIBUTION BOARDS & GP ENCLOSURES

List No.	W	List No.	H	W	D
18SN05	188	18GP2S	61	152	51
18SN08	242	18GP4S	76	140	67
18SN11	293				
18SN14	343	18GP2M	90	225	66
18SN19	437	18GP4M	135	346	74



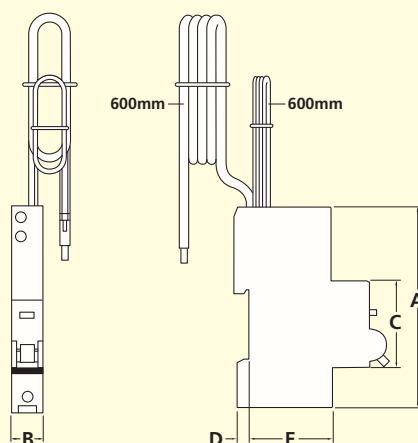
MINIATURE CIRCUIT BREAKERS (MCBs)

List No	A	B	C	D	E	F
6HS ...	90	18	45	6	44	70
6HD ...	90	36	45	6	44	70
6HT ...	90	54	45	6	44	70



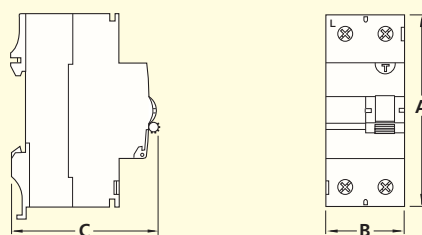
LOADSTAR RCBOs (SINGLE MODULE)

List No	A	B	C	D	E
6HSR ... /30 ...	125	17.6	45	6.2	44



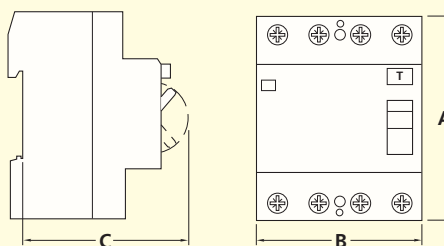
2 MODULE RESIDUAL CURRENT CIRCUIT BREAKERS

List No	A	B	C
18R100 / ... / 2	90	35	75



4 MODULE RESIDUAL CURRENT CIRCUIT BREAKERS

List No	A	B	C
18R100 / ... / 4	85	70	68



POLESTAR COMPACT RANGE

DISTRIBUTION BOARDS

Standards Compliance:	BSEN61439-3 and IEC 61439-3
Rated Voltage:	230/400V, 50/60Hz
Busbar Rating:	125A/250A
Rated Insulation Voltage:	500V a.c.
Short Circuit Withstand:	25kA Conditional 17.2kA for 0.25 sec. 12.0kA for 1 sec.
Protection Degree:	IP3X (Door Closed)

ISOLATORS & SWITCH DISCONNECTORS

When used as an incomer to MCB Distribution Boards

Standards Compliance:	BSEN60947-3 and IEC/EN60947-3
Rated Voltage:	230/400V, 50/60Hz
Rated Insulation Voltage:	500V a.c.
Rated Impulse Withstand Voltage:	6kV a.c. peak
Rated Duty:	
125A	AC 22A
200A	AC 22B (Double Pole)
225A	AC 22B (Triple Pole)
Pole Configuration:	Double Pole, Triple Pole
Isolators 63A to 125A:	50mm ²
Isolators 225A	M10 Lug (20mm wide)

ISOLATORS & SWITCH DISCONNECTORS

When supplied loose

Standards Compliance:	BSEN60947-3 and IEC/EN60947-3
Rated Voltage:	230/400V, 50/60Hz
Rated Insulation Voltage:	500V a.c.
Rated Impulse Withstand Voltage:	6kV a.c. peak
Rated Duty:	
125A	AC 22A
200A	AC 22B (Double Pole)
250A	AC 22B (Triple Pole)
Pole Configuration:	Double Pole, Triple Pole
Isolators 250A:	Incoming - M10 Lug (20mm wide) Outgoing - M8 Lug (16mm wide)

RESIDUAL CURRENT CIRCUIT BREAKERS (RCCBs)

Standards Compliance:	EN61008 and IEC 61008
Rated Voltage:	230/400V, 50/60Hz
RCD Class:	Type AC
Maximum Terminal Capacity:	35mm ²

MINIATURE CIRCUIT BREAKERS (MCBs)

Standards Compliance:	BSEN60898 and IEC 60898
Rated Voltage:	230/400V, 50/60Hz
Short Circuit Capacity:	16kA BSEN60898-1 and IEC60898-1
Tripping Characteristics:	Types B, C and D
Temperature Range:	Maximum Operating Temperature: 55°C
Pole Configuration:	Single Pole, Double Pole, Triple Pole
Maximum Terminal Capacity:	35mm ²

MOULDED CASE CIRCUIT BREAKERS (MCCBs)

Standards Compliance:	IEC/EN60947-2
Rated Current In:	200A
Rated Configuration:	3 Pole or 4 Pole
Rated Operational voltage:	690V
Rated Breaking Capacity:	65kA

RCBOs

Standards Compliance:	EN61009, IEC 61009
Rated Voltage:	230V 50Hz
Rated Short Circuit Capacity:	16kA
MCB Tripping Characteristics:	Type C
RCD Class:	Type A
Neutral:	Unswitched
Maximum Terminal Capacity:	16mm ²

Neutral flying lead and functional earth lead provided

During interruption of the neutral conductor the protective function is guaranteed when FE & PE conductors are connected

TYPE B AND ROW DISTRIBUTION BOARDS

125A		250A	
List No.	H	List No.	H
18PSC04MR	490	18PSC204MR	768
18PSC06MR	570	18PSC206MR	822
18PSC08MR	650	18PSC208MR	876
18PSC12MR	815	18PSC212MR	984
18PSC16MR	895	18PSC216MR	1092
18PSC20MR	1000	18PSC220MR	1200
18PSC24MR	1140	18PSC224MR	1308

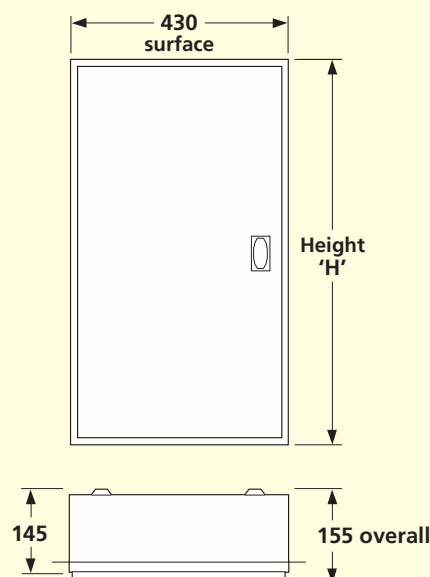
Add on enclosures

List No.	H	List No.	H
18PSCDIN18	245	18PSCAS1	245
18PSCDIN36	410	18PSCAS2	410
18PSCSB	245	18PSCAS3	570
		18PSCAS4	735
		18PSCAS5	815

Meter Packs

18MPSC125	245		
18MPSC125LP	410	18MPSC250LP	740

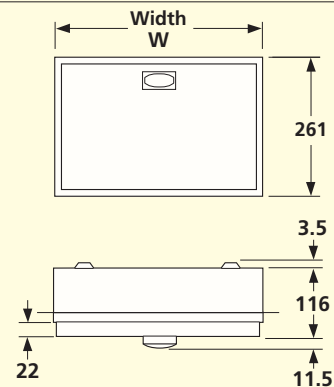
Dual meter packs (LP) have a width equal to that of two distribution boards



TYPE A DISTRIBUTION BOARDS

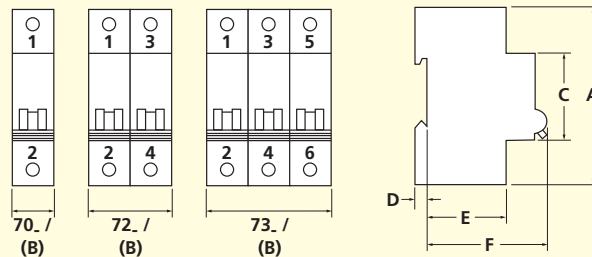
List No.	W	List No.	W	List No.	W	List No.	W
18PSC05/21A	188	18PSC05/33A	188	18PSC05/31A	188	18PSC10/S413A	343
18PSC08/21A	242	18PSC08/33A	242	18PSC08/31A	242	18PSC10/S513A	343
18PSC11/21A	293	18PSC11/33A	293	18PSC11/31A	293	18PSC10/S613A	343
18PSC14/21A	343						
18PSC19/21A	438						
18PSC28/21A*	343						

* 2 Bank Unit H = 500mm



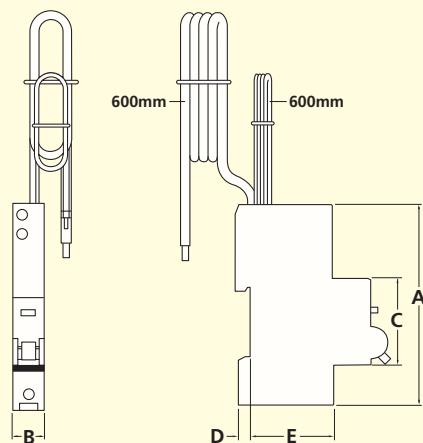
MINIATURE CIRCUIT BREAKERS (MCBs)

List No	A	B	C	D	E	F
70_ / _ _	90	18	45	6	44	70
72_ / _ _	90	36	45	6	44	70
73_ / _ _	90	54	45	6	44	70



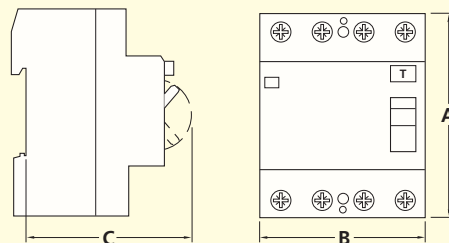
POLESTAR COMPACT RCBOs (SINGLE MODULE)

List No	A	B	C	D	E
701C/ _ _ 3	125	17.6	45	6.2	44



4 MODULE RESIDUAL CURRENT CIRCUIT BREAKERS

List No	A	B	C
241/ _ _ _	85	70	68





TRANSFORMERS

Transformers produce inrush currents when they are switched on, typically 15 times the normal running current. The tables below show the recommended MCB rating for single phase (230V) and 3 phase (400V) transformers.

SINGLE PHASE 230V AC SUPPLY

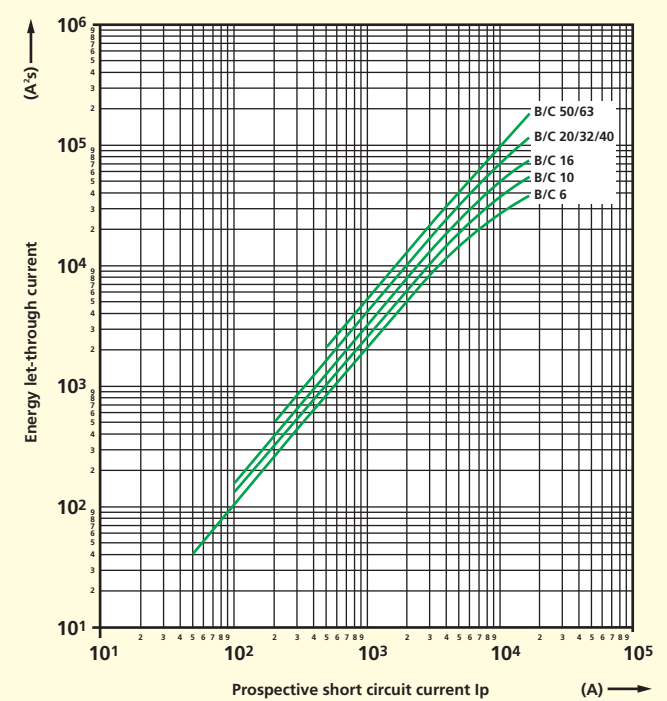
TRANSFORMER RATING (VA)	MCB RATING (A)		
	Type B	Type C	Type D
50	6	6	6
100	6	6	6
200	6	6	6
300	10	6	6
400	10	6	6
500	16	10	6
750	16	10	6
1000	32	16	10
2500	63	32	16
5000	–	63	32
7500	–	–	50
10000	–	–	63

THREE PHASE 400V AC SUPPLY

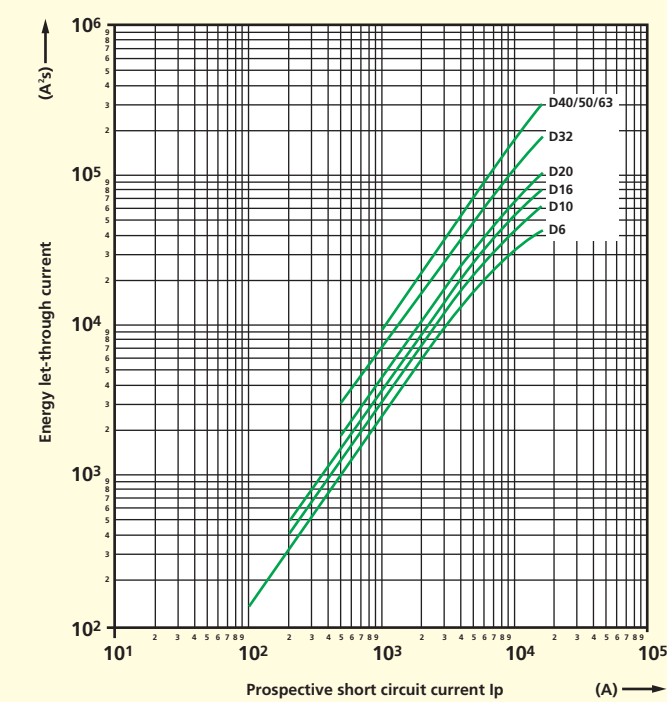
TRANSFORMER RATING (VA)	MCB RATING (A)		
	Type B	Type C	Type D
500	6	6	6
750	6	6	6
1000	10	6	6
2000	16	10	6
3000	32	16	10
4000	32	20	10
5000	40	32	16
7500	63	32	16
10000	–	50	32
15000	–	63	32
20000	–	–	50
25000	–	–	63
30000	–	–	63

The above information applies to MCBs supplying transformers irrespective of the load on the secondary circuit. If the MCBs are on the secondary side of the transformer, they do not see the inrush current and so nuisance tripping does not occur.

CHARACTERISTIC: B & C

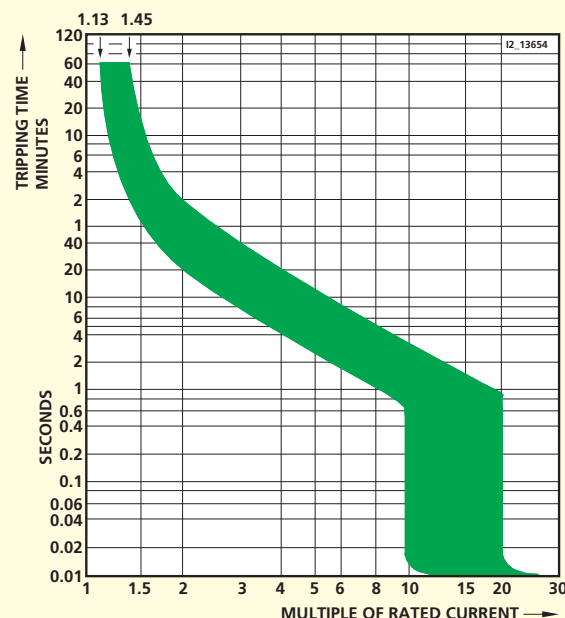
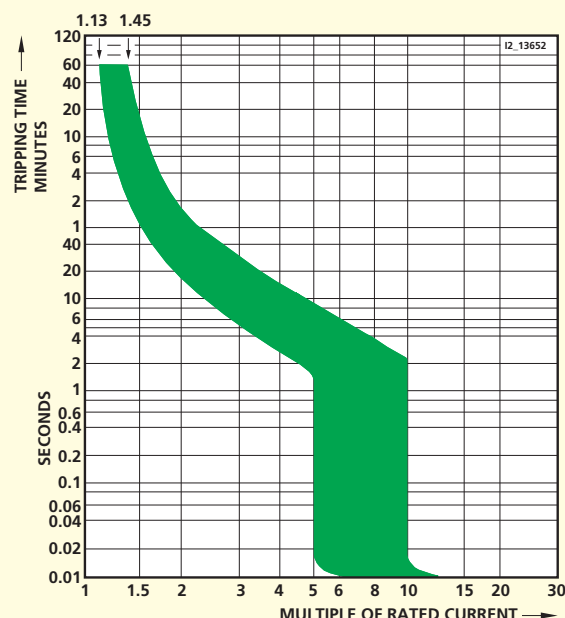
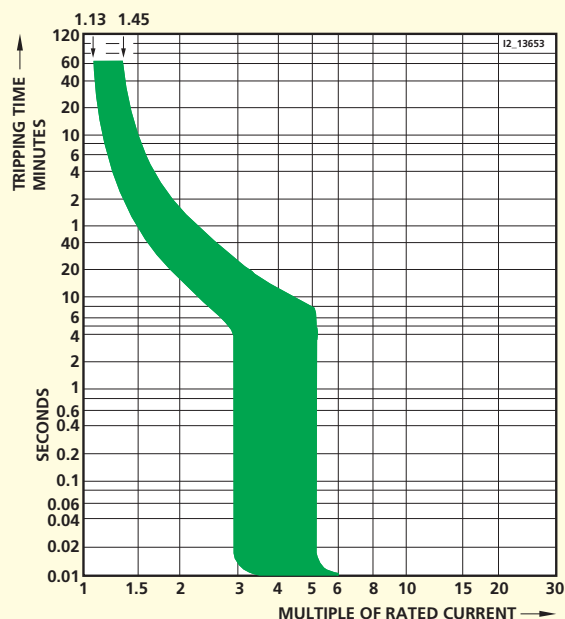


CHARACTERISTIC: D



POLESTAR COMPACT MINIATURE CIRCUIT BREAKER - Tripping Characteristics and Earth loop Impedance Values

Tripping Characteristics



Maximum earth fault loop impedance (Z_s) for circuit breakers with U_o of 230V, incorporating the 0.95 C_{min} factor, 17th Edition IET Wiring Regulations (BS7671:2008), Amendment 3 effective from 1st January 2015

Characteristic B

I_n (A)	$t_a \leq 0.4s$ Ω	$t_a \leq 5s$ Ω
6	7.22	7.22
10	4.37	4.37
16	2.76	2.76
20	2.19	2.19
32	1.33	1.33
40	1.05	1.05
50	0.86	0.86
63	0.67	0.67

Tripping characteristic B

For universal use in socket outlet and lighting circuits.

Characteristic C

I_n (A)	$t_a \leq 0.4s$ Ω	$t_a \leq 5s$ Ω
6	3.61	7.22
10	2.19	4.37
16	1.33	2.66
20	1.05	2.09
32	0.67	1.33
40	0.57	1.14
50	0.48	0.95
63	0.38	0.76

Tripping characteristic C

Particularly advantageous in lamp and motor circuits with higher starting currents.

Characteristic D

I_n (A)	$t_a \leq 0.4s$ Ω	$t_a \leq 5s$ Ω
6	2.38	7.22
10	1.05	4.37
16	0.67	2.66
20	0.48	2.09
32	0.29	1.33
40	0.27	1.14
50	0.22	0.95
63	0.19	0.76

Tripping characteristic D

For electrical circuits with strong pulse-generating equipment, such as transformers or solenoid valves.

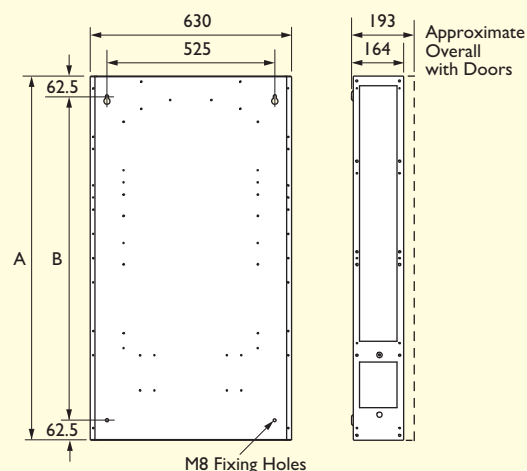
POWERSTAR PANELBOARD RANGE

POWERSTAR 125 PANELBOARDS

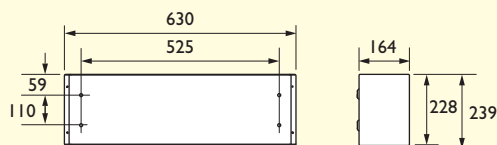
	250A	400A
Standards Compliance:	BS EN/IEC 61439-2:2009	
Rated Voltage:	230/400V 3ph 50Hz	
Fault Rating:	25kA Conditional	25kA for 1 sec
Degree of Protection:	IP3X (door closed)	
Form of Separation:	3B Type 2 Group Mounted	
Incoming maximum terminal capacity:	150mm ² 4 Core	32mm wide lug connections
(direct connection boards)	1 x M8 connection on 30mm wide copper	1 x M10 connection on 30mm wide copper
Finish:	Light Grey RAL7035	

POWERSTAR 125 PANELBOARD DIMENSIONS

250A				400A		
Modules	List No.	A	B	List No.	A	B
3						
12	17GG2506SW	912	787			
13	17GG2508SW	988	863			
14				17GG4006SW	1064	939
15	17GG2512SW	1140	1015	17GG4008SW	1140	1015
17	17GG2516SW	1292	1167	17GG4012SW	1292	1167
19				17GG4016SW	1444	1319

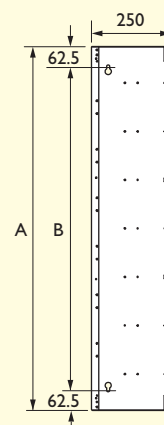


Add on Meter Packs			
Modules	List No.	List No.	
3	17GG250MPKIT	17GG400MPKIT	



Add on units for 250A & 400A Panelboards			
Modules	List No.		
3	17GG125GGMB		
3	17GG19DB		
3	17GG24SS		
3	17GGCSB		

Cableways			
Modules	List No.	A	B
3	17GG03MW	228	110
12	17GG12MW	912	787
13	17GG13MW	988	863
14	17GG14MW	1064	939
15	17GG15MW	1140	1015
17	17GG17MW	1292	1167
19	17GG19MW	1444	1319



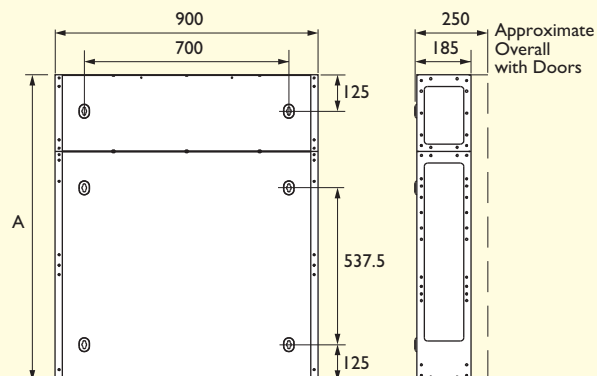
POWERSTAR PANELBOARD RANGE

POWERSTAR 250 PANELBOARDS

	400A	630A
Standards Compliance:	BS EN/IEC 61439-2:2009	
Rated Voltage:	230/400V 3ph 50Hz	
Fault Rating:	35kA for 1 sec	50kA for 1 sec
Degree of Protection:	IP3X (door closed)	
Form of Separation:	3B Type 2 Group Mounted	
Incoming maximum terminal capacity:	32mm wide lug connections	
Finish:	Light Grey RAL7035	

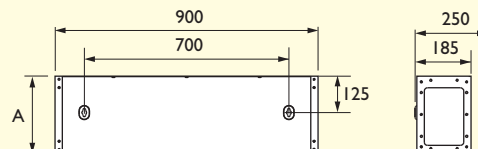
POWERSTAR 250 PANELBOARD DIMENSIONS

400A		630A	
List No.	A	List No.	A
173T2402	1055	173T2632	1055
173T2404	1160	173T2634	1160
173T2406	1265	173T2636	1265



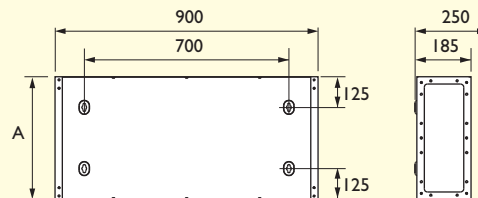
4W Extension Units

List No.	A	List No.	A
17GG404A	265	17GG634A	265



8W & 12W Extension Units

List No.	A	List No.	A
17GG408A	425	17GG638A	425
17GG4012A	583	17GG6312A	583
17T2408A	583	17T2638A	583

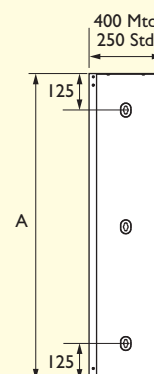


Panelboard Standard Cableways

List No.	A
17T22CW	1055
17T24CW	1160
17T26CW	1265

Metered Cableways

List No.	A
17T22CWM	1055
17T24CWM	1160
17T26CWM	1265

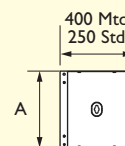


4W Extension Unit Standard Cableways

List No.	A
17GG4CWA	265

Metered Cableways

List No.	A
17GG4CWMA	265

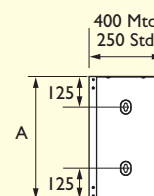


8W & 12W Extension Unit Standard Cableways

List No.	A
17GG8CWA	425
17GG12CWA	583
17T28CWA	583

Metered Cableways

List No.	A
17GG8CWMA	425
17GG12CWMA	583
17GG12CWMA	583



BSEN61439-1 : FORMS OF SEPARATION

FORMS OF SEPARATION

Main criteria	Sub criteria	Form	Type of Construction
No separation		Form 1	
Separation of busbars from all functional units.	Terminals for external conductors not separated from busbars.	Form 2a	
	Terminals for external conductors separated from busbars.	Form 2b	Type 1. Busbar separation is achieved by insulated covering, e.g. sleeving, wrapping or coatings. Type 2. Busbar separation is by metallic or non-metallic rigid barriers or partitions
- Separation of busbars from all functional units - Separation of all functional units from one another. - Separation of terminals for external conductors from the functional units, but not from the terminals of other functional units.	Terminals for external conductors not separated from busbars.	Form 3a	
	Terminals for external conductors and external conductors separated from busbars.	Form 3b	Type 1. Busbar separation is achieved by insulated covering, e.g. sleeving, wrapping or coatings. Type 2. Busbar separation is by metallic or non-metallic rigid barriers or partitions
- Separation of busbars from all functional units - Separation of all functional units from one another - Separation of terminals for external conductors associated with a functional unit from the terminals of any other functional unit and the busbars - Separation of the external conductors from the busbars - Separation of the external conductors associated with a functional unit from other functional units and their terminals - External conductors need not be separated from each other	Terminals for external conductors not in the same compartment as the associated functional unit.	Form 4a	Type 1. Busbar separation is achieved by insulated covering, e.g. sleeving, wrapping or coatings. Cables may be glanded elsewhere Type 2. Busbar separation is by metallic or non-metallic rigid barriers or partitions. Cables may be glanded elsewhere Type 3. Busbar separation is by metallic or non-metallic rigid barriers or partitions. The termination for each functional unit has its own integral glanding facility
	Terminals for external conductors not in the same compartment as the associated functional unit, but in individual, separate, enclosed protected spaces or compartments.	Form 4b	Type 4. Busbar separation is achieved by insulated covering, e.g. sleeving, wrapping or coatings. Cables may be glanded elsewhere
			Type 5. Busbar separation is by metallic or non-metallic rigid barriers or partitions. Terminals may be separated by insulated coverings and glanded in common cabling chamber(s)
			Type 6. All separation requirements are by metallic or non-metallic rigid barriers or partitions. Cables are glanded in common cabling chamber(s)
			Type 7. All separation requirements are by metallic or non-metallic rigid barriers or partitions. The termination for each functional unit has its own integral glanding facility

FORMS OF SEPARATION

As described in BSEN60439-1 the Forms of Separation comprise four levels as detailed in the above table. The various methods of achieving separation can involve sleeving the busbars inside a separate box or a combination of both methods.

COST EFFECTIVE SPECIFICATION

In order to gain maximum benefit from the standard it is necessary to consider the application for which the switchboard is required and the appropriate level of separation for the environment in which it is to be installed. For example a Form 4 switchboard may be appropriate where general access is permitted to the switch room but where the switchboard is in a locked substation with access restricted to qualified personnel, a lesser degree of separation may be more appropriate.

TYPICAL APPLICATIONS

Form 1 – No separation

Typical applications are places where the switchboard is in a secure location and where failure of the switchboard will cause little or no additional disruption to other areas being fed by the switchboard.

Form 2 – Separation of busbars from functional units.

Applications may well be the same as Form 1 but where it is important that a fault in the switchboard need not affect all functional units being fed from the same busbar system.

Form 3 – Separation of busbars from functional units and the functional units from one another but not their terminations.

Should be applied where it is important to provide protection from internal live parts and where failure of functional units being fed from the same busbar would cause unacceptable disruption.

Form 4 – Separation of busbars from functional units and the functional units from one another including their terminations.

Should be applied where it is important to provide protection from internal live parts and where failure of functional units being fed from the same busbar would cause unacceptable disruption. Because all the terminations are separated it is possible to isolate and work on a single functional unit.

7PBGG FRAME MCCBs TECHNICAL SPECIFICATION

GG FRAME SPECIFICATION

• Specification	IEC 60947-2
• Current Range	15 – 125A
• Ue Rated Operation Voltage	240V SP 415V TP
• Ui Rated Insulation Voltage	500V AC
• Rated Frequency	50/60Hz
• Release	Thermal Magnetic
• Adjustment	None
• Ambient Range	-20°C to 55°C
• Humidity Range	0 – 90%
• Weight	SP - 0.4kg TP - 0.95kg
• Mechanical Duration	8000 operations

AVAILABLE OPTIONS

- Padlocking
- AUX switches

SHORT CIRCUIT BREAKING CAPACITY

Type	Icu
Ue	TP
220 V	30
415 V	25

Ics = 50% Icu

MAIN CONNECTIONS

Clamps: $\leq 30A = 16mm^2$
 $\geq 30A = 50mm^2$

SUMMARY

The Powerstar GG frame breaker is a compact, robust design that is suitable for panel or DIN rail mounting without the need for additional adapters. Accessories including auxiliary releases and contacts are available upon request.

Tripping Characteristics and Earth Loop Impedance Values

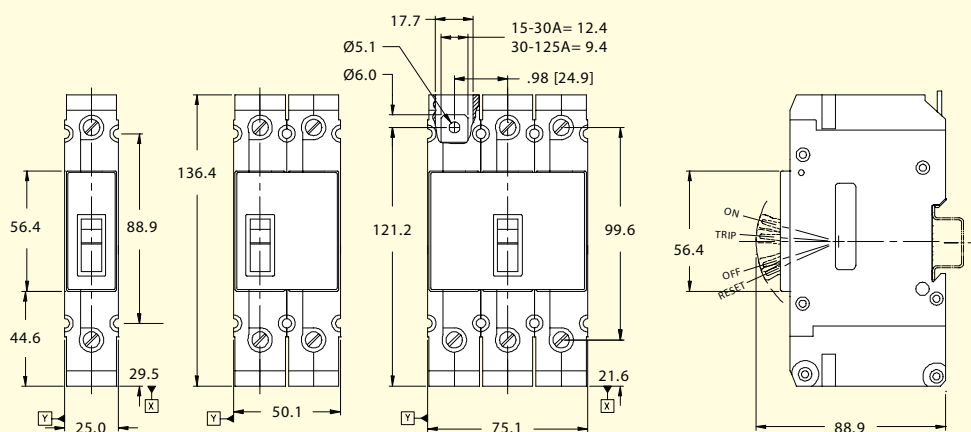
Maximum eart fault loop impedance (Z_s) for circuit breakers with U_o of 230V, incorporating the 0.95 C_{min} factor, 17th Edition IET Wiring Regulations (BS 7671:2008), Amendment 3 effective from 1st January 2015

0.4 SEC VALUES

Ampere	15	20	25	30	40	50	60	80	100	125
Ohm	1.12	0.84	0.68	0.56	0.42	0.33	0.28	0.26	0.21	0.19

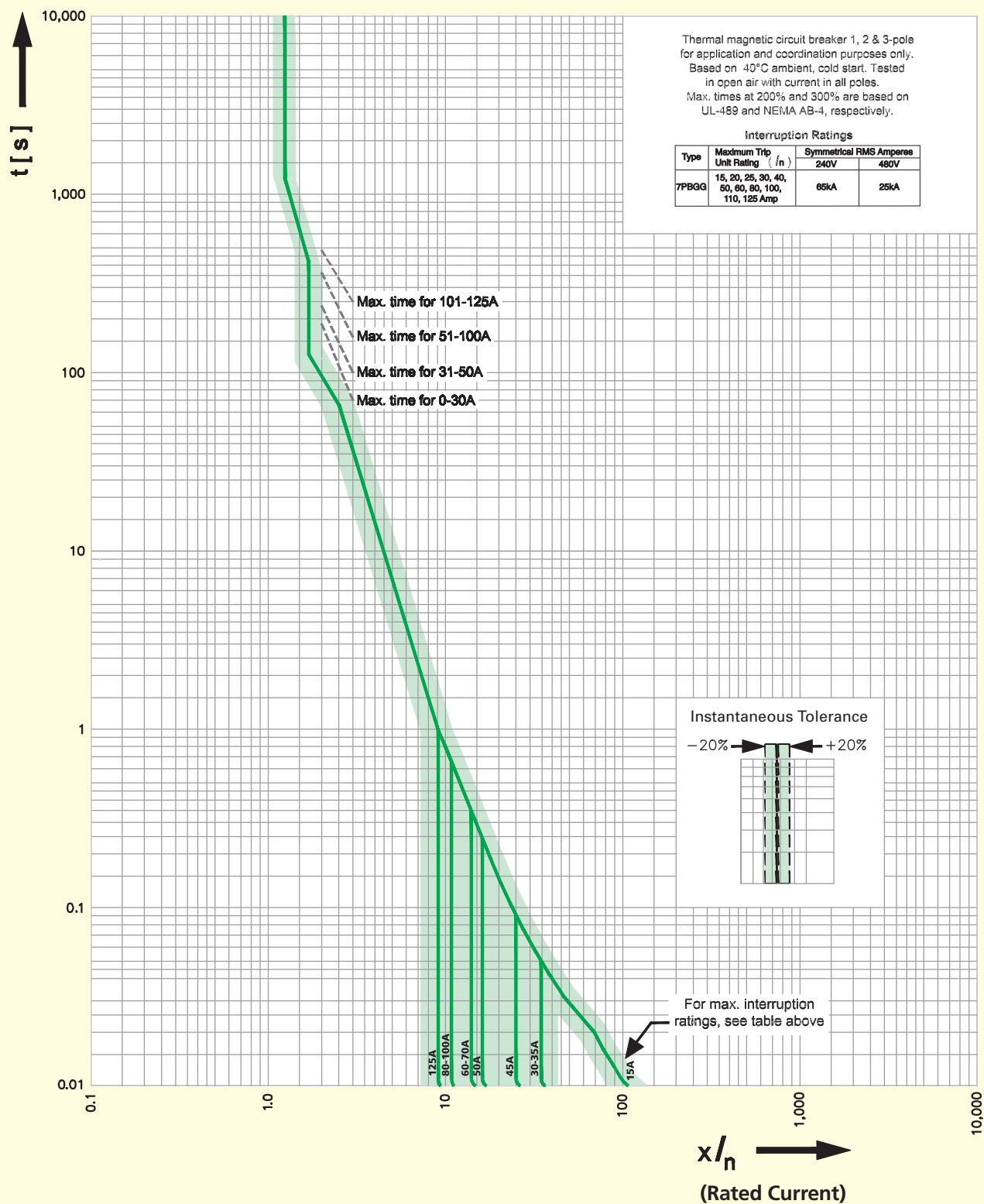
5 SEC VALUES (230V / 5.5X IN) FOR OTHER RATINGS ARE AS FOLLOWS

Ampere	15	20	25	30	40	50	60	80	100	125
Ohm	2.65	1.99	1.59	1.32	1.00	0.80	0.67	0.49	0.40	0.31



INSTANTANEOUS TRIP VALUES

125A	=	1125A
100A	=	1050A
80A	=	840A
60A	=	840A
50A	=	800A
40A	=	1000A
30A	=	1050A
15A	=	1200A



7T2 FRAME MCCBs TECHNICAL SPECIFICATION

7T2 FRAME SPECIFICATION

• Specification	IEC 60947-2 & IEC 60947-3
• Current Range	40 – 250A
• Ue Rated Operation Voltage	690V AC
• Ui Rated Insulation Voltage	690V AC
• Rated Frequency	50/60Hz
• Release	Electronic
• Thermal Adjustment	0.4 – 1.0 x Trip Unit Rated Current
• Instantaneous Adjustment	Adjustable
• Icu (415V) Short Circuit Breaking Capacity	7T2S 36kA 7T2H 65kA
• Ambient Range	-40°C to 55°C
• Working Environment	Both Dry and Tropical Climates
• Mechanical Endurance	30,000 Cycles

7T2 FRAME FEATURES

The 7T2 circuit breaker consists of a switching unit and either a range of different rated electronic trip units or a switch disconnector module. The modular design provides the maximum flexibility as the user can decide not only the rating but also the function, disconnector or protective device. With a wide setting bandwidth electronic trip units offer unparalleled functionality.

AVAILABLE OPTIONS

- ST UVR
- Aux SW
- Rotary Handle (available on request)
- Padlocking
- Terminal Shrouds

SHORT CIRCUIT BREAKING CAPACITY

Ue	7T2S Icu	7T2H Icu
280 V	60 kA	100kA
415 V	36kA	65kA

Ics = 50% Icu

TRIP UNIT SETTINGS

Over current IR = 0.4 - 1.0 x In
Instantaneous 4 or 8 x IR
In - Nominal Trip Unit Rating

MAIN CONNECTIONS

Front-connected clamps –
150mm²

AUXILIARY EQUIPMENT OPTIONS (RETRO-FITTABLE)

- UVR
- Shunt Trip
- Auxiliary Switches

Shunt Trip Voltage Range ≥ 70%
Under Voltage Release Threshold ≤ 35%
Input Power of Auxiliary Releases < 3VA AC, < 3W DC

CURRENT CHARACTERISTICS

Maximum earth fault loop impedance (Zs) for circuit breakers with Uo of 230V, incorporating the 0.95 Cmin factor, 17th Edition IET Wiring Regulations (BS 7671:2008), Amendment 3 effective from January 1st 2015

IR & II SET AT MINIMUM

AMPS	CURRENT VALUE (A)		VOLTAGE	OHMIC VALUE	
	0.4 SECONDS	5 SECONDS		0.4 SECONDS	5 SECONDS
100	150A	150A	230V	1.457Ω	1.457Ω
160	240A	240A	230V	0.910Ω	0.910Ω
250	375A	375A	230V	0.583Ω	0.583Ω

IR SET AT MINIMUM & II SET AT MAXIMUM

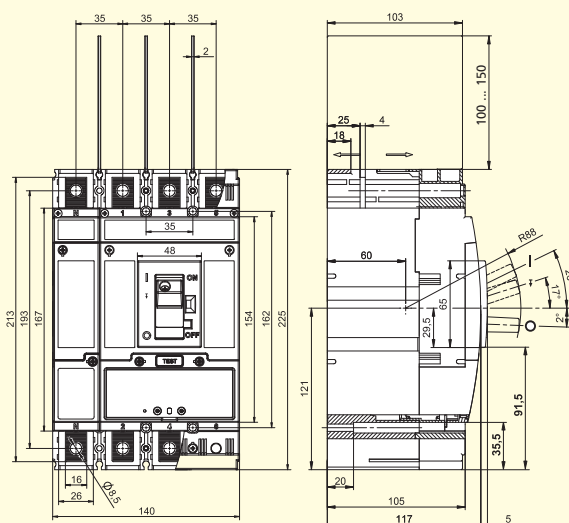
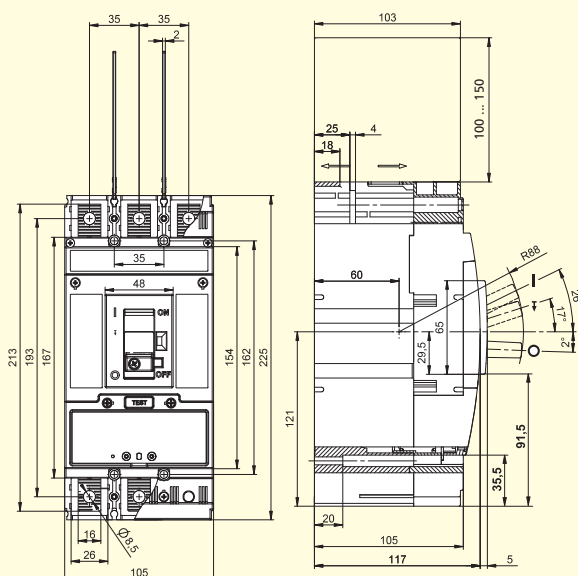
100	320A	230A	230V	0.683Ω	0.950Ω
160	512A	368A	230V	0.427Ω	0.594Ω
250	800A	575A	230V	0.273Ω	0.380Ω

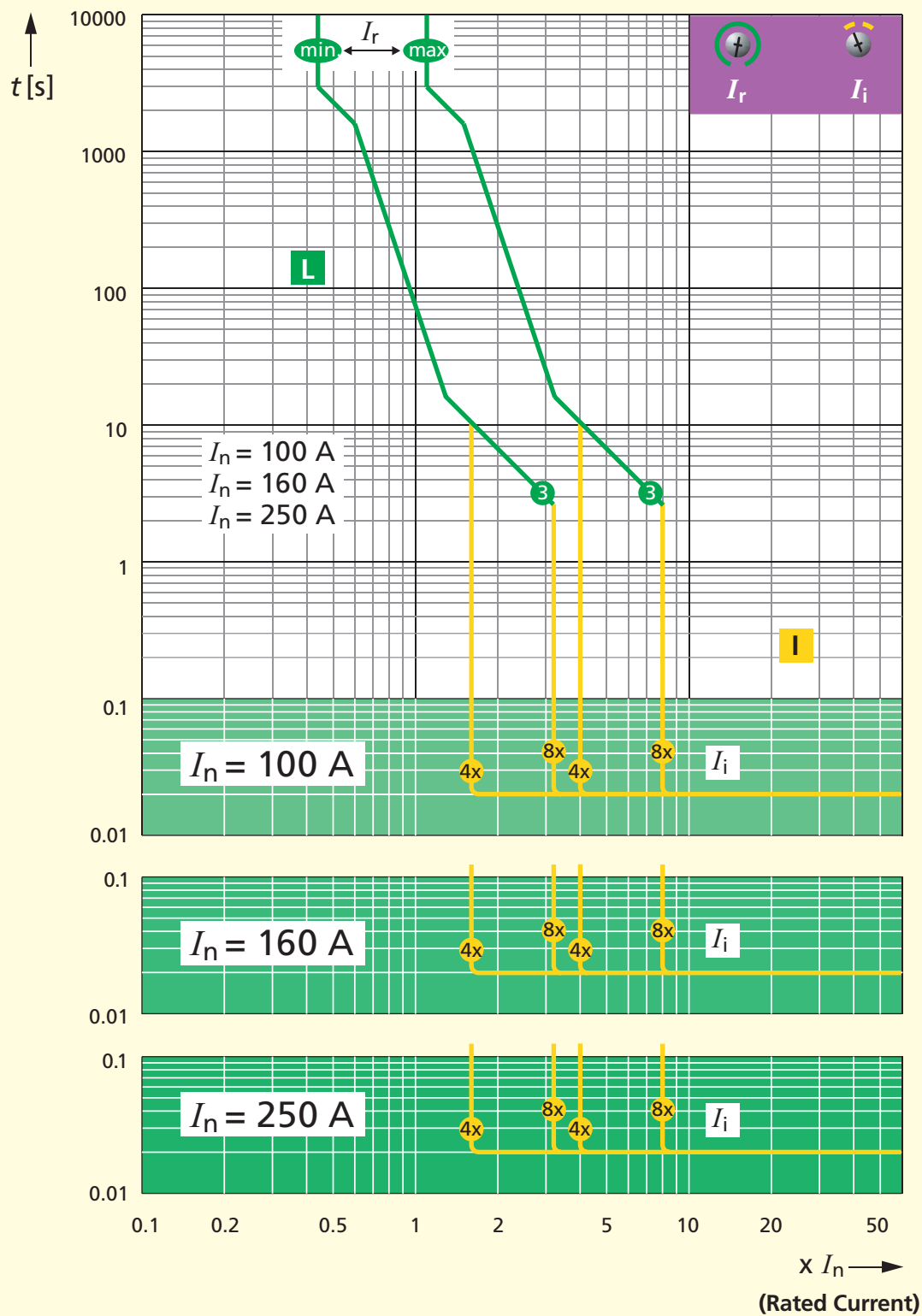
IR & II SET AT MAXIMUM

100	800A	600A	230V	0.273Ω	0.364Ω
160	1280A	960A	230V	0.171Ω	0.228Ω
250	2000A	1500A	230V	0.109Ω	0.146Ω

IR SET AT MAXIMUM & II SET AT MINIMUM

100	400A	400A	230V	0.546Ω	0.546Ω
160	640A	640A	230V	0.341Ω	0.341Ω
250	1000A	1000A	230V	0.219Ω	0.219Ω





7T3 FRAME MCCBs TECHNICAL SPECIFICATION

7T3 FRAME SPECIFICATION

• Specification	IEC 60947-2 & IEC 60947-3
• Current Range	100 – 630Amps
• Ue Rated Operation Voltage	690V AC
• Ui Rated Insulation Voltage	690V AC
• Rated Frequency	50/60Hz
• Release	Electronic
• Adjustment	0.4 – 1.0 x Trip Unit Rated Current
• Instantaneous Adjustment	Adjustable – see below
• Icu (415V) Short Circuit Breaking Capacity	7T3S 36kA 7T3H 65kA
• Working Environment	Both Dry and Tropical Climates
• Mechanical Endurance	20,000 Cycles

7T3 FRAME FEATURES

The 7T3 circuit breaker consists of switching unit and either a range of different rated electronic trip units, or a disconnector module. The modular design provides the maximum flexibility as the user can decide not only the rating but also the function, disconnector or protective device. With a wide setting bandwidth electronic trip units offer unparalleled functionality.

AVAILABLE OPTIONS

- ST UVR
 - Aux SW
 - Rotary Handle (available on request)
 - Padlocking
- (See Product Section for selection)

SHORT CIRCUIT BREAKING CAPACITY

Ue	7T3S Icu	7T3H Icu
230 V	60 kA	100 kA
415 V	36 kA	65 kA

Ics = 50% Icu

TRIP UNIT SETTINGS

Over current IR = 0.4 - 1.0 x In
Instantaneous 4 or 12.5 x IR
In - Nominal Trip Unit Rating

MAIN CONNECTIONS

The switching unit has a 32mm main contact which will accept up to M10 cable lugs, maximum width 30mm.

AUXILIARY EQUIPMENT OPTIONS

- UVR
- Shunt Trip
- Auxiliary Switches

Shunt Trip Voltage Range	≥ 70%
Under Voltage Release Threshold	≤ 35%
Input Power of Auxiliary Releases	< 3VA AC, < 3W DC

CURRENT CHARACTERISTICS

Maximum earth fault loop impedance (Zs) for circuit breakers with Uo of 230V, incorporating the 0.95 Cmin factor, 17th Edition IET Wiring Regulations (BS 7671:2008), Amendment 3 effective from January 1st 2015

IR & II SET AT MINIMUM

AMPS	CURRENT VALUE (A)		VOLTAGE	OHMIC VALUE	
	0.4 SECONDS	5 SECONDS		0.4 SECONDS	5 SECONDS
250	375A	375A	230V	0.583Ω	0.583Ω
400	600A	600A	230V	0.364Ω	0.364Ω
630	945A	945A	230V	0.231Ω	0.231Ω

IR SET AT MINIMUM & II SET AT MAXIMUM

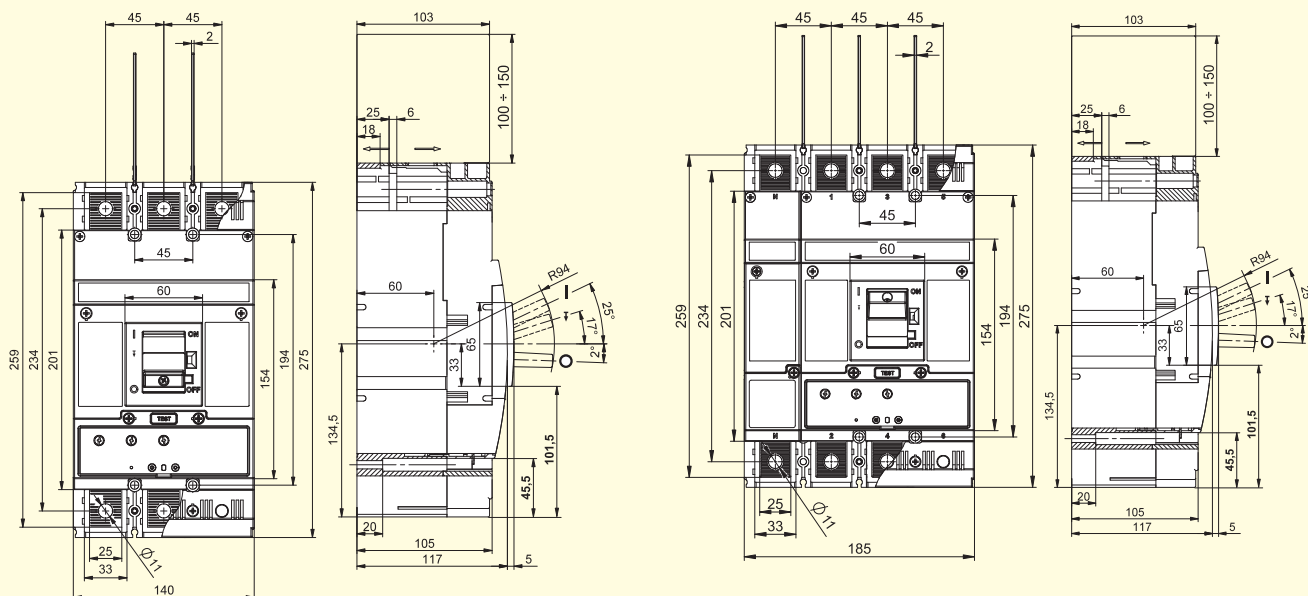
250	1250A	575A	230V	0.175Ω	0.380Ω
400	2000A	920A	230V	0.109Ω	0.238Ω
630	3150A	1449A	230V	0.069Ω	0.151Ω

IR & II SET AT MAXIMUM

250	3125A	1500A	230V	0.070Ω	0.146Ω
400	5000A	2400A	230V	0.044Ω	0.091Ω
630	7875A	3780A	230V	0.028Ω	0.058Ω

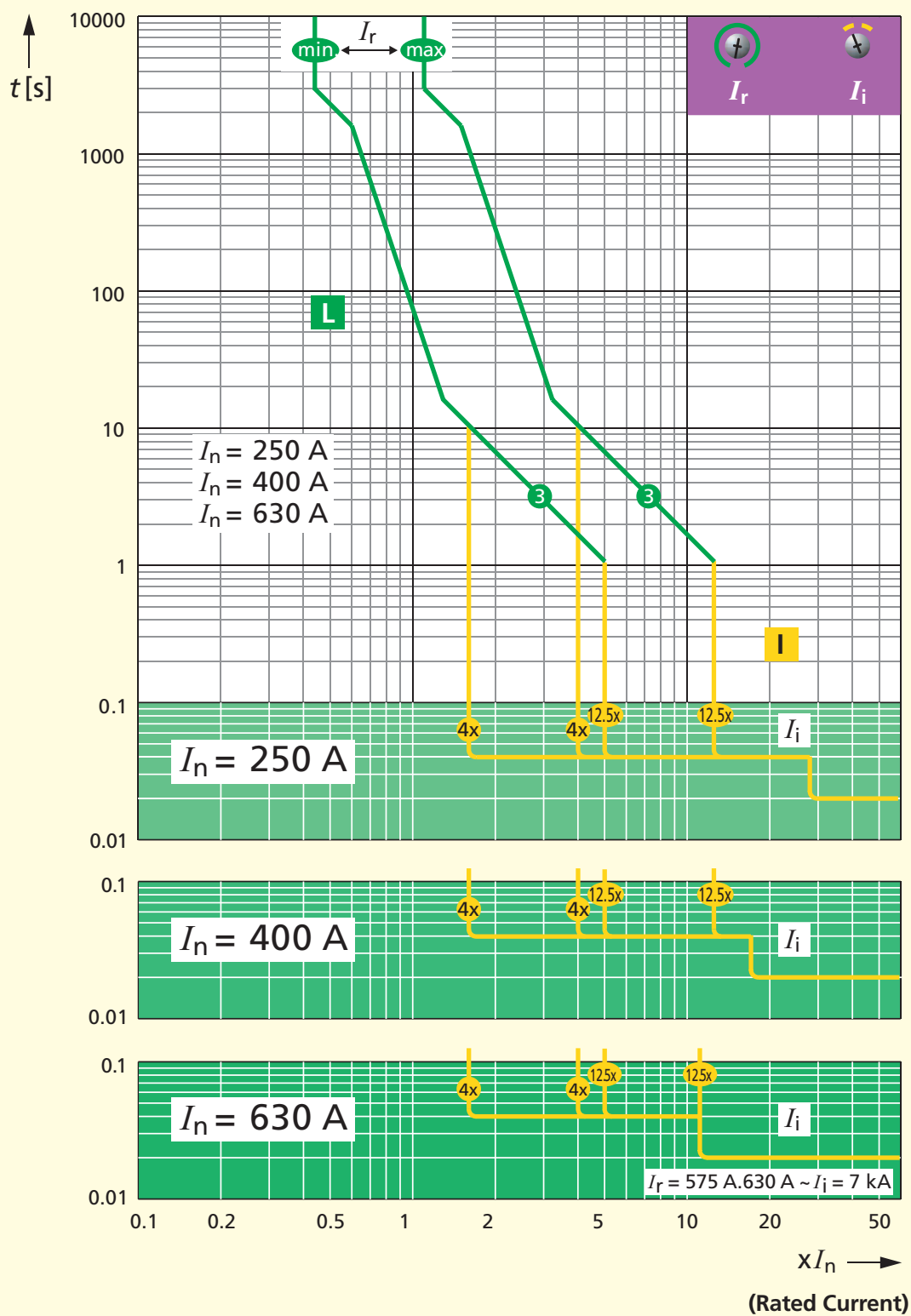
IR SET AT MAXIMUM & II SET AT MINIMUM

250	1000A	1000A	230V	0.219Ω	0.219Ω
400	1600A	1600A	230V	0.137Ω	0.137Ω
630	2520A	2520A	230V	0.087Ω	0.087Ω



IEC 60947-2 copper conductors for test currents

350 – 400A 1 x 240mm² 600 – 630A 2 x 185mm² 400 – 500A 2 x 150mm² 630 – 800A 2 x 240mm²



PRIMARY-SIDE TRANSFORMER PROTECTION

The circuit breaker as primary-side transformer protection

When switching on low-voltage AC transformers, the extremely high inrush current peaks place special demands on the trip unit or on the making-capacity of the circuit breakers if these are also used to switch the transformer.

For most applications, an inrush current of 20 to 30 times rated operating current is expected in practice and must be taken into account when selecting the circuit breakers.

The maximum short-circuit current I_k of the Powerstar circuit breakers 7T2 – 7T5 depends on the frame size. A circuit breaker in the lower setting range must therefore be operated for primary-side transformer protection.

Example:

A 300kVA transformer with a 430A rated current; 20 times inrush current

Selected: 7T3 with ETU of $I_n = 630A$; setting range $0.4 - 1 \times I_n = 252A$ to $630A$

I_R can be set at 430A; Instantaneous short circuit protection set at $10.8kA = 25 \times$ current setting

Note

Switching the circuit breaker off

It is imperative to note that the minimum short-circuit current I_{kMIN} in accordance with VDE 0100 is switched off in every case using a protection facility (e.g. circuit breaker).

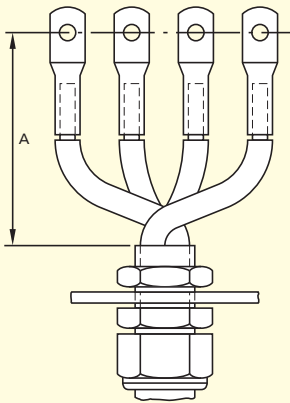
BS5372 SPREADING ROOM

The scope of BS5372 relates to dimensions which should be observed in the design of cable terminations, having uninsulated conductor fittings, for external cables on electrical equipment to enable the cables to be connected satisfactorily.

The standard is based upon the use of compression type conductor terminations and allows for the cores to be crossed within the terminal enclosure because this combination requires more space.

The diagram and table below gives the dimensions quoted by this standard.

4 CORE TERMINATIONS, SPREADING ROOM



Cable Size (mm ²)	Dimension 'A' (mm)
16	103
25	127
35	142
50	167
70	197
95	224
120	245
150	272
185	297
240	333
300	375

FUSESTAR HOUSED FUSE SWITCH

SPECIFICATION

- BS EN60947-3, IEC 60947-3
- Range of ratings 20A -800A in 5 frame sizes
- Pole configurations SP & N, TP & N, and 4 Pole
- Voltage rating 415V ac
- Frequency rating 50/60 Hz
- Fuse type BS88
- Fused Short Circuit, 80kA RMS

PRODUCT FEATURES

- Switching speed totally operator independent
- Handle padlockable on or off

HOUSED UNITS

- Modular enclosure design (52.5mm) with inbuilt cable spreader box
- Reversible door which opens 180°
- IP4X



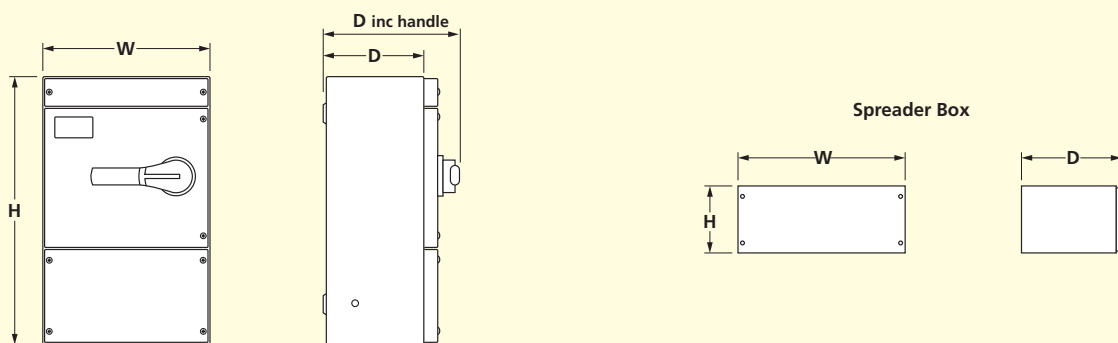
TECHNICAL DATA

	20-32A	63A	100A	125A	160A	200A	315A	400A	630A	800A
Mechanical Endurance	20,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	8,000	8,000
Ratings	A kW	A kW	A kW	A kW	A kW	A kW	A kW	A kW	A kW	A kW
415V Ie/pe	32 15	63 30	100 51	125 75	160 90	200 80	315 160	400 220	630 355	800 450

FUSE COMPARISON DATA*

Current Rating	BS 88 Reference	Lawson	GEC	Bussman
20/32A	A1	NIT	NIT	NITD
63A	A3	TIS, TIA GTIA	TIS, TIA	BAO, AAO
100A	A4 (Dia 31 max)	TCP	-	CEO
125A	A4 (Dia 31 max)	TFP	TFP	DEO, CEO
160/200A	A4 (Dia 31 max)	TFP	TFP	DEO, CEO
315A	B3, B2, B1	TFK, TF	TF	ED, DD, CD
400A	B3, B2, B1	TMF, TFK, TF, TC	TMF, TFK, TF, TC	ED, DD, CD
630A	C2, C1	TTM, TM	TTM, TM	FF, EF
800A	C3, C2, C1	TLM, TTM, TM	TLM, TTM, TM	GF, FF, EF

FUSESTAR DIMENSION DETAILS



DIMENSIONS (mm)

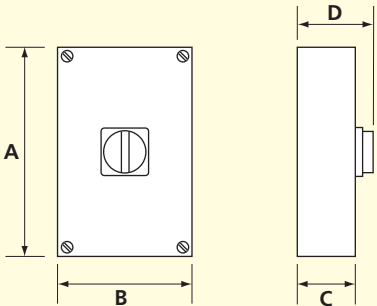
	H	W	D	D inc. handle		H	W	D
20-32A	225	210	136	200	SPREADER BOX	125	210	130
63A	425	263	188	263	SPREADER BOX	125	263	185
100A	425	263	188	263	SPREADER BOX	125	263	185
125-200A	530	315	241	305	SPREADER BOX	125	315	235
315-400A	800	420	241	320	SPREADER BOX	230	420	235
630-800A	900	640	293	400	SPREADER BOX	230	640	300

* Fuse selections are indicative and maybe subject to change, please contact manufacturer for latest details.

FUSESTAR HOUSED SWITCH DISCONNECTOR

	Moulded Enclosure								Sheet Steel Enclosure							
RATING IN AMPS	16A	25A	32A	40A	63A	80A	100A	125A	20A	32A	40A	63A	63A	100A	125A	
Rated Insulation Voltage Ui (V)	800	800	800	800	800	800	800	800	800	800	800	800	800	800	800	
Dielectric Strength (kV) 50 Hz 1min	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
Shock Resistance Uimp (kV)	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	
OPERATIONAL CURRENT Ie (A)																
415 V AC - AC21A / AC21B	16	25	32	40	63	80	100	125	20	32	40	63	80	100	125	
AC22A / AC22B	16	25	32	40	63	80	100	125	20	32	40	63	80	100	125	
AC23A / AC23B	16	25	32	40	63	80	80	80	20	32	40	63	80	80	80	
500 V AC - AC21A / AC21B	16	25	32	40	63	80	100	125	20	32	40	63	80	100	125	
AC22A / AC22B	16	25	32	40	63	80	100	125	20	32	40	63	80	100	125	
AC23A / AC23B	16	25	32	40	40	63	63	63	20	32	40	40	63	63	63	
690 V AC - AC20A / AC20B	16	25	32	40	63	80	100	125	20	32	40	63	80	100	125	
AC21A / AC21B	16	25	32	40	63	80	100	125	20	32	40	63	80	100	125	
AC22A / AC22B	16	25	32	40	63	80	100	100	20	32	40	63	80	100	100	
AC23A / AC23B	16	25	25	25	25	50	50	50	20	25	25	25	50	50	50	
MOTOR POWER (kW) AC 23																
415 V AC	7.5	9	11	11	15	22	37	40	7.5	11	11	15	18.5	37	40	
500 V AC	7.5	9	11	15	18.5	30	37	37	7.5	11	15	18.5	22	37	37	
690 V AC	11	11	11	18.5	18.5	30	30	30	11	11	18.5	18.5	25	30	30	
FUSE TYPES TO BS88																
OVERLOAD CAPACITY																
Fuse rating gG	16	25	32	40	63/40	80	100	125	20	32	40	63/40	63	100	125	
Short circuit current with fuses (kA Rms)	50	50	50	50	20/50	40	20	15	50	50	50	20/50	50	20	15	
Asymmetric short time rating current (kA peak)	6	6	6	6	6	9	9	9	6	6	6	9	9	9	9	
Admissible short time current 1 s. (kA Rms)	1.26	1.26	1.26	1.26	1.26	1.5	1.5	1.5	1.26	1.26	1.26	1.5	1.5	1.5	1.5	
MAKING & BREAKING CHARACTERISTICS																
Breaking capacity (A Rms)																
415 V AC 23 A	128	200	256	320	504	640	640	640	160	256	320	504	504	640	640	
Making capacity (A Rms)																
415 V AC 23 A	160	250	320	400	630	800	800	800	200	320	400	630	630	800	800	
WITHSTAND																
Mechanical (number of operations) x 1000	100	100	100	100	100	30	30	30	100	100	100	100	30	30	30	
Electrical (number of operations at 415V AC 23A) x 1000	3	3	3	3	3	1.5	1.5	1.5	3	3	3	3	1.5	1.5	1.5	
CONNECTION																
Maximum Cu cable section (mm²) lth	16	16	16	16	16	50	50	50	16	16	16	16	50	50	50	
using stranded cable (mm²)	25	25	25	25	25											
WEIGHT (kg)																
3 pole	0.13	0.13	0.13	0.13	0.13	0.26	0.26	0.26	2.00	2.00	2.00	2.00	2.50	2.50	2.50	
4 pole	0.18	0.18	0.18	0.18	0.18	0.34	0.34	0.34	2.00	2.00	2.00	2.00	2.50	2.50	2.50	
BOX SIZE	A	A	B	B	C	D	D	E	1	1	1	1	2	2	2	

APPROXIMATE DIMENSIONS (mm)



BOX	A	B	C	D
A	130	85	75	105
B	175	125	100	137
C	250	175	100	135
D	310	200	135	170
E	410	200	135	170
1	220	158	136	172.5
2	325	158	136	172.5

FULL LOAD CURRENTS OF MOTORS (approx)

Please note that the kW and HP ratings given below and elsewhere in this publication are to be used only as a guide to the selection of the required starter. The actual full load current of the motor should be determined to ensure that a starter having a suitably rated overload relay is chosen.

RATING OF MOTOR		ALTERNATING CURRENT (A)					
kW	HP	Single phase 240V	Three phase 220V	380V	415V	440V	500V
0.06	0.08	1.2	0.38	0.22	0.21	0.19	0.16
0.09	0.12	1.5	0.56	0.33	0.30	0.28	0.24
0.12	0.16	1.8	0.76	0.42	0.39	0.37	0.33
0.18	0.25	2.8	1.1	0.58	0.52	0.49	0.46
0.25	0.33	3.2	1.4	0.88	0.71	0.64	0.59
0.37	0.50	3.5	2.1	1.3	1.2	1.1	0.85
0.55	0.75	4.8	2.7	1.5	1.4	1.3	1.2
0.75	1.0	6.2	3.3	2.1	2.0	1.7	1.5
1.1	1.5	8.7	4.9	2.6	2.5	2.3	2.1
1.5	2.0	11.8	6.2	3.6	3.5	3.1	2.6
2.2	3.0	17.5	8.7	5.1	5.0	4.4	3.8
3.0	4.0	20	11.6	6.6	6.5	5.8	5.1
3.7	5.0	24	14.2	8.2	7.5	7.1	6.2
4.0	5.5	29	15.3	8.5	7.7	7.6	6.5
5.5	7.5	36	21	11.5	11	10.3	8.9
7.5	10	45	27	15.5	14	13.5	11.9
11.0	15	70	39	22	21	19.3	16.7
15.0	20	91	53	30	29	27	23
18.5	25	113	64	37	35	32	28
20	27	128	70	40	38	35	31
22	30	135	75	43	40	38	33
25	34	156	85	50	45	42	38
30	40	180	101	60	54	51	44
37	50		124	72	66	62	54
40	54		134	79	77	67	60
45	60		150	85	80	74	65
55	75		181	105	98	90	79
59	80		194	112	105	97	85
75	100		245	140	135	123	106
90	125		292	170	165	146	128
100	134		325	188	179	162	143
110	150			205	200	178	156
129	175			242	230	209	184
132	180			245	236	214	186
147	200			273	259	236	207
160	220			295	278	256	220
184	250			340	325	295	259
200	270			370	350	321	278

NUMERICAL INDEX

7PBGGN360

194003N

17GG2508SW

17GG03MW

7T225/OR3

18PSC12MR

125SW3

18LS08MR

18ML125

73B/16

6HS32C

125MP/50

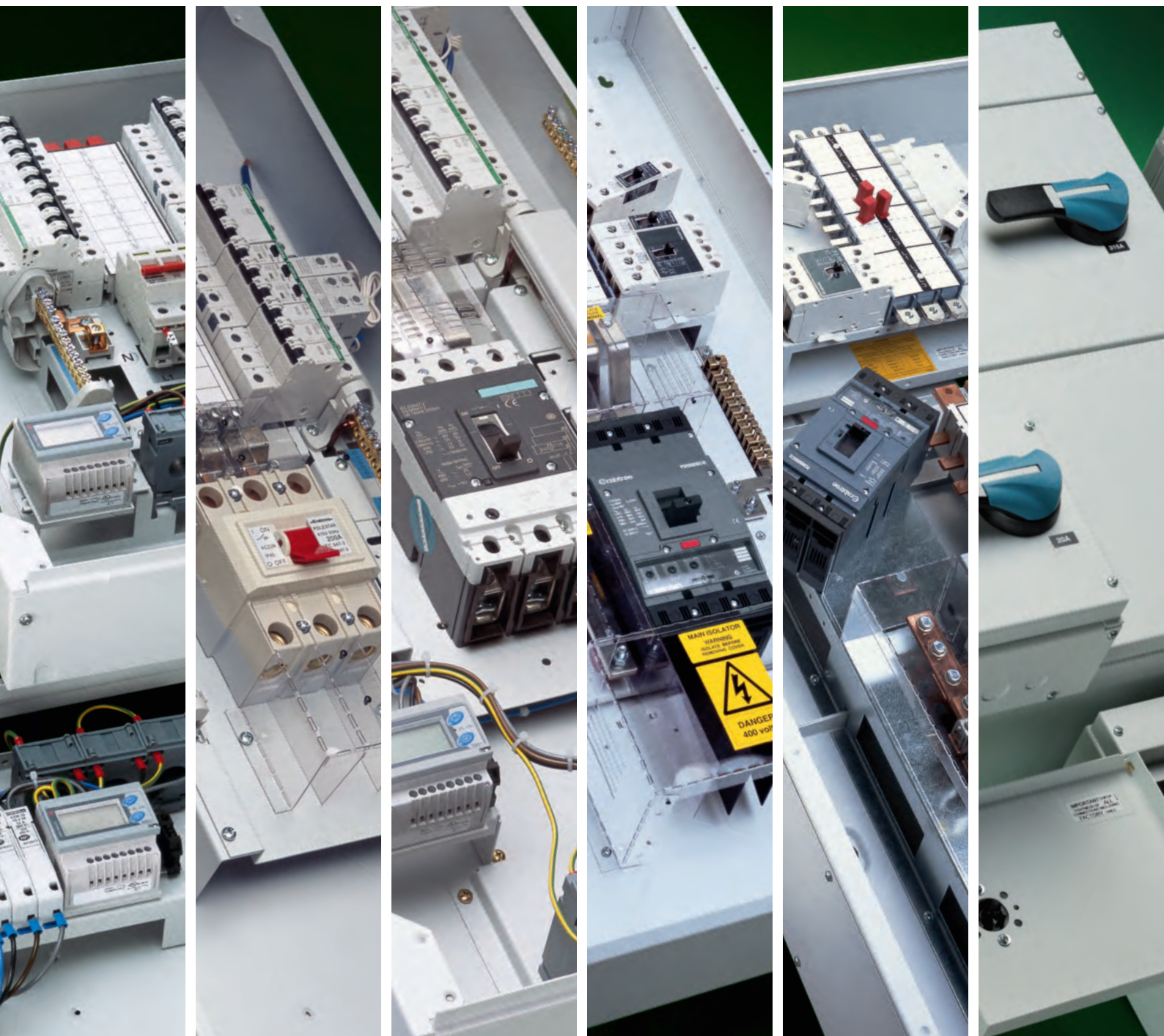
100SW2	7	17GG15MW	29, 31, 61	17T22CWM	37, 39, 62	18LS20MR	6, 55
100SW3	7	17GG17MW	29, 31, 61	17T2408A	36, 39, 62	18LS212MR	6, 55
100SW4	7	17GG19DB	28, 61	17T24CW	37, 39, 62	18LS216MR	6, 55
1252SD	16	17GG19MW	29, 31, 61	17T24CWM	37, 39, 62	18LS220MR	6, 55
1253SD	16	17GG24SS	28, 61	17T2638A	37, 39, 62	18LS224MR	6, 55
1254SD	16	17GG2506DC	26, 31	17T26CW	37, 39, 62	18LS24MR	6, 55
125DCB	16	17GG2506SW	26, 31, 61	17T26CWM	37, 39, 62	18MBP1	8
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125MP/50/MID	22	17GG2508SW	26, 31, 61	17T2CSB	36	18ML125	12, 57
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125SW3	7	17GG250INCTMID	29	18AS2	8, 55	18ML125VLPK	12
125SW4	7	17GG250MPKIT	28, 61	18AS3	8, 55	18MPSC125	22, 57
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154100/12	50	17GG2512SW	26, 31, 61	18AS5	8, 55	18MPSC250LP	22, 57
154125/11	50	17GG2516DC	26, 31	18AS6	55	18PB3/4	8
154125/12	50	17GG2516SW	26, 31, 61	18BB1	8	18PSC04MR	16, 57
15416/11	50	17GG4006DC	27, 31	18BP1/12	8	18PSC05/21A	16, 58
15416/12	50	17GG4006SW	27, 31, 61	18BP1/6	8	18PSC05/31A	16, 58
15425/11	50	17GG4008DC	27, 31	18BP12/2	8	18PSC05/33A	16, 58
15425/12	50	17GG4008SW	27, 31, 61	18CEBK	8, 18	18PSC06MR	16, 57
15432/11	50	17GG400INCTM	29	18DIN18	8, 55	18PSC08/21A	16, 58
15432/12	50	17GG400INCTMID	29	18DIN36	8, 55	18PSC08/31A	16, 58
15440/11	50	17GG400MPKIT	28, 61	18EB04	8, 18	18PSC08/33A	16, 58
15440/12	50	17GG4012A	36, 39, 62	18EB06	8, 18	18PSC08MR	16, 58
15463/11	50	17GG4012DC	27, 31	18EB08	8, 18	18PSC10/S413A	16, 58
15463/12	50	17GG4012SW	27, 31, 61	18EB12	8, 18	18PSC10/S513A	16, 58
15480/11	50	17GG4016DC	27, 31	18EB16	8, 18	18PSC10/S613A	16, 58
15480/12	50	17GG4016SW	27, 31, 61	18EB20	8, 18	18PSC11/21A	16, 58
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173T2402	34, 39, 62	17GG408A	36, 39, 62	18GP2M	8, 55	18PSC11/33A	16, 58
173T2404	34, 39, 62	17GG4CWA	37, 39, 62	18GP2S	8, 55	18PSC12MR	16, 57
173T2406	34, 39, 62	17GG4CWMA	37, 39, 62	18GP4M	8, 55	18PSC14/21A	16, 58
173T2632	34, 39, 62	17GG4WCT125M	29	18GP4S	8, 55	18PSC16MR	16, 57
173T2634	34, 39, 62	17GG4WCT125MID	29	18LF04	6	18PSC19/21A	16, 58
173T2636	34, 39, 62	17GG4WCT63M	29	18LF06	6	18PSC204MR	17, 57
174T2402	34, 39	17GG6312A	36, 39, 62	18LF08	6	18PSC206MR	17, 57
174T2404	34, 39	17GG634A	36, 39, 62	18LF12	6	18PSC208MR	17, 57
174T2406	34, 39	17GG638A	36, 39, 62	18LF16	6	18PSC20MR	16, 57
174T2632	34, 39	17GG8CWA	37, 39, 62	18LF20	6	18PSC212MR	17, 57
174T2634	34, 39	17GG8CWMA	37, 39, 62	18LF24	6	18PSC216MR	17, 57
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17GG03MW	29, 31, 61	17GGSA	29	18KD70	7	18PSC28/21A*	58
17GG05DR	28, 31	17INMK400CT	34	18KTPSP	7	18PSC2PLK	16
17GG06DR	28, 31	17INMK400MCT	34	18LS04D	6, 55	18PSC4PLK	16
17GG07DR	28, 31	17INMK630CT	35	18LS04MR	6, 55	18PSCAS1	18, 57
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17GG09DR	28, 31	17LAR1	36	18LS06MR	6, 55	18PSCAS3	18, 57
17GG10DR	28, 31	17OUMK125CT	37	18LS08D	6, 55	18PSCAS4	18, 57
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17GG12CWMA	37, 39, 62	17OUMK160MCT	37	18LS12D	6, 55	18PSCBP1/6	18
17GG12DR	28, 31	17OUMK250CT	37	18LS12MR	6, 55	18PSCBP12/2	18
17GG12MW	29, 31, 61	17OUMK250MCT	37	18LS16D	6, 55	18PSCBP3/4	18
17GG13DR	28, 31	17OUMK63CT	37	18LS16MR	6, 55	18PSCDIN18	18, 57
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18R100/100/2TD	7	1949BB	43	6HD06D	9	6HSR20/30C	9
18R100/100/4	7	194BL	43	6HD10B	9	6HSR32/30B	9
18R100/30/2	7	196303N*	43	6HD10C	9	6HSR32/30C	9
18R100/30/4	7	19701	44	6HD10D	9	6HSR40/30B	9
18R100/300/4	7	198003N	43	6HD16B	9	6HSR40/30C	9
18R40/100/4	7	19800BGP	43	6HD16C	9	6HSR50/30B	9
18R40/30/4	7	19800CSB	43	6HD16D	9	6HSR50/30C	9
18R40/300/4	7	191604	42	6HD20B	9	6HT - - -	56
18R63/100/4	7	192004	42	6HD20C	9	6HT06B	9
18R63/30/4	7	193154	42	6HD20D	9	6HT06C	9
18R63/300/4	7	194004	42	6HD25B	9	6HT06D	9
18SB	8, 55	196304	43	6HD25C	9	6HT10B	9
18SN05	6, 56	198004	43	6HD25D	9	6HT10C	9
18SN08	6, 56	198164	44	6HD32B	9	6HT10D	9
18SN11	6, 56	198324	44	6HD32C	9	6HT16B	9
18SN14	6, 56	198404	44	6HD32D	9	6HT16C	9
18SN19	6, 56	198634	44	6HD40B	9	6HT16D	9
190201NF	42	198804	44	6HD40C	9	6HT20B	9
190203NF	42	19811	44	6HD40D	9	6HT20C	9
190203NSW1	44	19813	44	6HD50B	9	6HT20D	9
190204F	42	199125	44	6HD50C	9	6HT25B	9
190204SW1	42	1981004	44	6HD50D	9	6HT25C	9
190321NF	42	1981254	44	6HD63B	9	6HT25D	9
190323NF*	42	19821	44	6HD63C	9	6HT32B	9
190323NSW1	42	19823	44	6HD63D	9	6HT32C	9
190324F	42	19963	44	6HS - - -	56	6HT32D	9
190324SW1	44	19KP1003N	45	6HS06B	9	6HT40B	9
19032CSB	42	19KP1603N	45	6HS06C	9	6HT40C	9
190403NSW1	44	19KP2003N	45	6HS06D	9	6HT40D	9
190404SW1	44	19LK200	42	6HS10B	9	6HT50B	9
190631NF	42	19LK32	42	6HS10C	9	6HT50C	9
190633NF*	42	19LK400	42	6HS10D	9	6HT50D	9
190633NSW1	44	19LK63	42	6HS16B	9	6HT63B	9
190633NSW2	44	19LK800	43	6HS16C	9	6HT63C	9
190634F	48	19TMBB	43	6HS16D	9	6HT63D	9
190634SW1	44	200/SDBDP	17	6HS20B	9	70 - / - -	58
190634SW2	44	200013GY	52	6HS20C	9	701C/ - - 3	58
191001NF	42	2003MB	17	6HS20D	9	701C/063	19
191003NF*	42	2004MB	17	6HS25B	9	701C/103	19
191003NSW2	44	200TPMB	6	6HS25C	9	701C/163	19
191004F	42	241/ - - -	58	6HS25D	9	701C/203	19
191004SW2	44	241/030	16	6HS32B	9	701C/323	19
19100CSB	42	241/100	16	6HS32C	9	701C/403	19
191253NF	42	241/100TD	7, 16	6HS32D	9	701C/503	19
191253NSW2	44	241/300	16	6HS40B	9	70B/06	19
191254F	42	241/300TD	16	6HS40C	9	70B/10	19
191254SW2	42	250/DCB	17	6HS40D	9	70B/16	19
19125MTG	43	250/SDB	17	6HS50B	9	70B/20	19
191601N	42	250MP/120	22	6HS50C	9	70B/32	19
191603N*	42	250MP/120/MID	22	6HS50D	9	70B/40	19
191BL	43	250MP/185	22	6HS63B	9	70B/50	19
192001N	42	250MP/185/MID	22	6HS63C	9	70B/63	19
192003N	45	250TPDC	6	6HS63D	9	70C/06	19
19200CSB	42	250TPSD	6	6HSR - - /30 -	56	70C/10	19
19200MTG	43	40SW3	7	6HSR06/30B	9	70C/16	19
192BL	43	40SW4	7	6HSR06/30C	9	70C/20	19
193153N*	42	63 SW3	7	6HSR10/30B	9	70C/32	19
1932MTG	43	63SW4	7	6HSR10/30C	9	70C/40	19
194003N	42	6HD - - -	55	6HSR16/30B	9	70C/50	19

70C/63	19	7PBGGN1125	30, 38	GB32G/BG	50
70D/06	19	7PBGGN115	30, 38	GB3ALPHA/BG	50
70D/10	19	7PBGGN120	30, 38	GB3BP/BG	50
70D/16	19	7PBGGN125	30, 38	GB3EURO/BG	50
70D/20	19	7PBGGN130	30, 38	GB3J3/BG	50
70D/32	19	7PBGGN140	30, 38	GB3J6C/6BG	50
70D/40	19	7PBGGN150	30, 38	GB3J6C/BG	50
70D/50	19	7PBGGN160	30, 38	GB3S2/BG	50
70D/63	19	7PBGGN180	30, 38	GB3S2CE/BG	50
72 - / - -	58	7PBGGN3100	30, 38	GB3SN2/BG	50
72B/06	19	7PBGGN3125	30, 38	GB3SRCD30/BG	50
72B/10	19	7PBGGN315	30, 38	GB3SS2/BG	50
72B/16	19	7PBGGN320	30, 38	GB3SS2CE/BG	50
72B/20	19	7PBGGN325	30, 38	GB3SSN2/BG	50
72B/32	19	7PBGGN330	30, 38	GB3SSN2CE/BG	50
72B/40	19	7PBGGN340	30, 38	GBALPHA/BG	51
72B/50	19	7PBGGN350	30, 38	GBBP/BG	51
72B/63	19	7PBGGN360	30, 38	GBEURO/BG	51
72C/06	19	7PBGGN380	30, 38	GBJ6C/BG	51
72C/10	19	7T1-ENC-3N	50	GBSS2/BG	51
72C/16	19	7T1-ENC-4P	50	GBSS2CE/BG	51
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72C/32	19	7T216/OR3	26, 38	GBSSN2CE/BG	51
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72C/50	19	7T225/SD	26	GR04G	51
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72D/10	19	7T2-ENC-4P	58	LS250MIDMPKIT	12
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73B/63	19	7T3-ENC-4P	50		
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73C/10	19	98351-1/H/1	52		
73C/16	19	98496-2/E/1	52		
73C/20	19	98950-1/A/2	52		
73C/32	19	BAG150	52		
73C/40	19	BAGSS	52		
73C/50	19	BQDPLD	30		
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73D/10	19	C7KT1543	13, 23		
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Electrium



ELECTRIUM SALES LIMITED A SIEMENS COMPANY

Commercial Centre, Lakeside Plaza, Walkmill Lane, Bridgtown, Cannock WS11 0XE.

eMail: info@electrium.co.uk Web: www.electrium.co.uk Twitter: [follow@ElectriumNews](https://twitter.com/ElectriumNews)

UK SALES

Telephone: 01543 455010 Facsimile: 01543 455011 eMail: crabtree.sales@electrium.co.uk

TECHNICAL

Telephone: 01543 438310 Facsimile: 01543 438311 eMail: crabtree.technical@electrium.co.uk

EXPORT SALES

Telephone: +44 1543 455049 Facsimile: +44 1543 455048 eMail: export@electrium.co.uk

DUBAI OFFICE

Telephone: +971 4 3660687 Facsimile: +971 4 3660676 eMail: btlv.sales.ae@siemens.com

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