Ready to install

Distribution and control products

a brand of Schneider Electric

SQUARE D

Contents

Established over 50 years ago, Square D has a comprehensive range of ready to install products. As ever, we're committed to providing innovative, functional and reliable products that are tailored to your needs.

In addition to the products shown in this catalogue, we can provide the following:

- Fully assembled and tested custom built distribution switchgear
- Busbar trunking, Power Factor Correction and active filtering
- Integrated metering and communications solutions
- Project management, site supervision, testing and commissioning
- Training to European and British standards

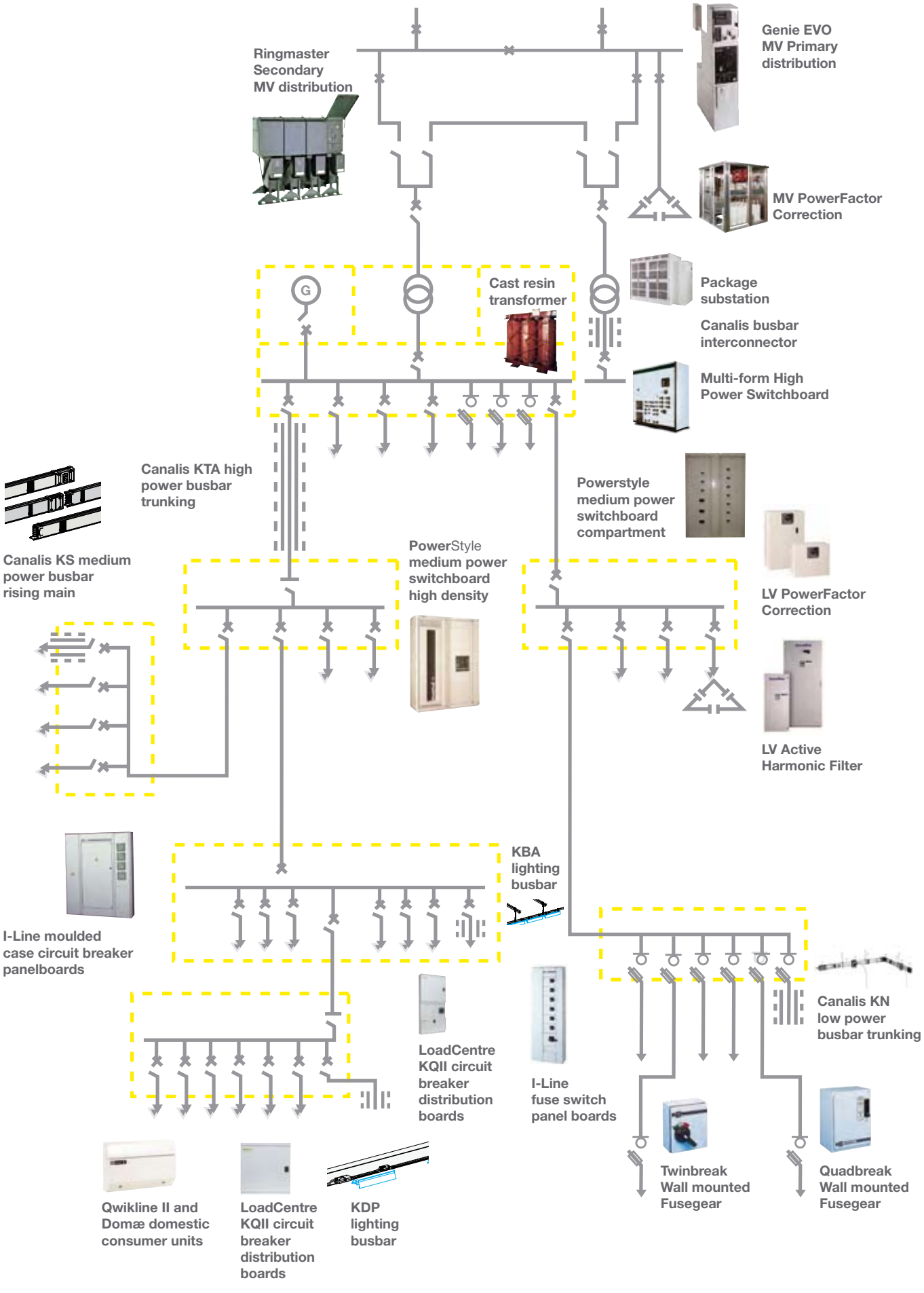
Low voltage equipment from Square D

One of the great advantages of the Square D solution is the unique and world-renowned plug on technology which is simple to install and upgrade.

Located in Telford in the heart of Shropshire, Schneider Electric's LVE facility is a modern 3000m^2 factory utilising skilled personnel and market leading products. From design and build to installation and maintenance, Square D and Schneider Electric provide the complete electrical solution from package substations to Low Voltage distribution boards within commercial and industrial applications.

All our product ranges are supported by routine and type tested documentation, comprehensive catalogues and operation and maintenance information. In addition to this we operate to ISO9001, ISO14001 and Investors in People.

For more information on LVE please ask your Square D sales engineer for brochure SQD6256


Ringmaster Secondary MV distribution
Genie EVO MV Primary distribution
MV PowerFactor Correction
G
Cast resin transformer
Package substation
Canalis busbar interconnector
Multi-form High Power Switchboard
Canalis KTA high power busbar trunking
Canalis KS medium power busbar rising main
Powerstyle medium power switchboard compartment
PowerStyle medium power switchboard high density
LV PowerFactor Correction
LV Active Harmonic Filter
KBA lighting busbar
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Twinbreak Wall mounted Fusegear
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Qwikline II and Domæ domestic consumer units
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Section 01
Consumer units
Domae and Qwikline II

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Consumer units

Domae and Qwikline II

Domae consumer units

- Highly flexible - Domae consumer units can be used with a single main incomer or used as a split load board
- Configurable on site - choose the split of protected or unprotected RCD ways. Standard single incomer boards can be converted to split load at a later date
- Ideal for rewire applications - right hand incomer for easier installation where existing incoming cables fall on the right
- Controls flexibility - control devices can be easily installed within the same enclosure
- Additional installer safety - the busbar shield is firmly held in place when fitted and requires a tool to remove
- Value for money - backed by the Square D brand you can be assured that Domae is a cost effective and quality solution

Qwikline II consumer units

- Fully type tested to BS EN 60439-3 and CM16 tested
- Unrestricted cable entry can be made from any side
- Totally encapsulated busbar system. Provides complete finger safety to IP2XB, bringing new levels of safety to consumer unit design
- Incoming devices can be ordered separately giving over 1000 combinations from just 46 references
- Single pole RCBO. Tested to BS EN 61009
- Unique MCB/RCBO fixing system. Retains plug-on philosophy for speed of installation and guaranteed connections. Provides the additional benefit of a rear clip which increases device security once plugged on
- Control devices may be installed on any outgoing way. No extra mounting accessories required
- Lockable cover option now available on metal units

Domae and Qwikline II

Consumer units

The Domae range of consumer units offers the ultimate in terms of onsite flexibility at a very affordable price.

There are no bespoke split load consumer units, however any Domae enclosure can be taken and used with a single incomer or converted to a split load board with the minimum of effort.

A wide range of RCD protected and unprotected ways is possible and a standard board can be converted to a split load type at any time in the future. In terms of safety Domae offers a wide range of protective devices and installer safety is maximised via a busbar shield which, once fitted, can only be removed with the use of a tool.

Domae is now available with insulated or metal enclosures.

The Qwikline II range of consumer units provides arguably the highest levels of residential circuit protection safety.

A wide range of switch disconnectors, RCDs and MCBs is also complemented by an SP RCBO offer for maximum continuity of supply in the event of fault.

What really sets Qwikline II apart, is the plug-on breaker concept and fully encapsulated busbars. All outgoing devices can be connected in seconds and with no incoming terminal to tighten, the correct mechanical connection force is guaranteed every time. For unused ways, Qwikline II's unique fully encapsulated busbar system means that the highest levels of installer and end user protection are always guaranteed.

Even with the front cover of the enclosure removed, the main busbar is protected to IP2X, meaning it remains finger safe but allows access with test probes by the installer. For energy management and safety Qwikline II can also accept a wide range of control devices.

Square D, a brand of Schneider Electric is a market leader in the design and manufacture of British Standard consumer units. To help compliance with the 17th Edition of the Wiring Regulations, Square D has expanded both the Domae and Qwikline II ranges to include new devices and consumer units. The consumer units are fully type tested to BSEN60439-3.

Supported by a network of nation wide stockists, Square D is now able to provide two dramatically different styles of consumer units, Domae and Qwikline II. Suitable for installation in domestic dwellings, schools, colleges etc., both offers provide high levels of quality and installer flexibility.

17th Edition wiring regulations

Domae and Qwikline II

17th Edition of the wiring regulations BS7671:2008

The 17th Edition of the Wiring Regulations fully comes into effect from July 1 2008. There are significant changes from the previous editions of the wiring regulations which mean that for many installations, the traditional configurations for consumer units will change. The regulations require for most installations the increased use of RCDs. For residential installations the following changes in particular are required:-

Regulation 522.6.6 & 522.6.7 - Cables concealed in walls or partitions Regulation 522.6.6 describes methods of protecting cables concealed in walls or partitions.

For practical purposes and for most residential installations Regulation 522.6.7 will be applied where circuits will be protected by means of a 30mA RCD.

Regulation 413.3 - Socket outlets. Regulation 413.3 describes the need to protect socket outlets up to 20A for general use by ordinary persons e.g. home owners, and mobile equipment used outdoors up to 32A. There are exceptions, but in most cases this will mean such circuits must be protected by a 30mA RCD.

Regulation 314.1 - Division of circuits. Regulation 314.1 describes the requirements to divide circuits in order to meet several needs. Point iv means that circuits should not all be protected by an individual RCD.

Section 701 - Locations containing a bath or shower. Under certain conditions 13A sockets can be installed in bathrooms, these must be protected by a 30mA RCD.

Option 1

Incoming switch disconnector & outgoing RCBO's
Option 1 is the safest option, providing each outgoing way with individual over current, and residual current protection.

Option 2

Split load consumer unit, using RCBO's
Option 2 shows how a split load consumer unit can be used. Safety circuits such as smoke alarms, and other circuits such as sockets can be individually protected by RCBOs.

Option 3

Incoming switch disconnector with RCBO ways, plus two RCD protected busbars
Option 3 is a new configuration that allows safety circuits such as smoke alarms to be individually protected. In addition other circuits are protected by one of two RCCB's.

Option 4

Incoming switch disconnector feeding two RCD protected busbars
Option 4 provides two busbars each fed by an RCCB.

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Select consumer unit

Insulated units		Metal units	
Number of ways	Reference number	Number of ways	Reference number
2	**DOM2CU**	2	**DOM2MCU**
4	**DOM4CU**	4	**DOM4MCU**
6	**DOM6CU**	6	**DOM6MCU**
8	**DOM8CU**	8	**DOM8MCU**
12	**DOM12CU**	12	**DOM12MCU**
16	**DOM16CU**	16	**DOM16MCU**
20	**DOM20CU**		

Select incoming device

Description	Rating	Max cable size mm²	Reference number
Switch Disconnector	63A	35	**DOM63SW**
Switch Disconnector	100A	50	**DOM100SW**
RCCB (RCD)	63A 30mA	35	**DOM63R30**
RCCB (RCD)	80A 30mA	50	**DOM80R30**

For split load applications select a split load kit

Description	Rating	Reference number
RCCB & cables	63A 30mA	**DOM63R30KIT2**
RCCB & cables	80A 30mA	**DOM80R30KIT2**

Includes cables & RCCB (RCD)

Select consumer units with switch/RCD's fitted to comply with 17th Edition of Wiring Regulations

Total no. of ways	Description	Switch only way	RCD 1 protected ways	RCD 2 protected ways	Reference number
12	6+6 way configurable Domae CU 100A Sw & 2 63A RCDs		6	6	**DOMR6R6CU**
12	6+6 way configurable Domae CU 100A Sw & 2 80A RCDs		6	6	**DOMR6R6DCU**
16	8+8 way Domae CU 100A Sw & 2 x 80A RCDs		8	8	**DOMR8R8DCU***
12	2+5+5 way Domae CU 100A Sw & 2 x 80A RCDs	2	5	5	**DOMS2R5R5DCU**
16	2+7+7 way Domae CU 100A Sw & 2 x 80A RCDs	2	7	7	**DOMS2R7R7DCU***

*Available September 2008

Select consumer unit package

Pre-assembled ready to install consumer unit packages

Description	Typical application	Reference number
2 way enclosure + 63A 30mA RCCB & 40A MCB	Electric shower supply	**SHOWER6340D**
2 way enclosure + 63A 30mA RCCB & 45A MCB	Electric shower supply	**SHOWER6345D**
2 way IP55 enclosure + 63A RCD, 6A & 16A MCB	Electricity supply to a garage	**GARAGE63D**

Domae ready to install consumer unit packages are supplied complete with enclosure, incoming and outgoing devices and all internal connections required. Order 1 part number then simply fix, connect, test and energise.

Pre-assembled ready to install consumer unit packages

Insulated kitbox - Typical application general residential rebuild or rewire

Description	Reference number
12 way enclosure, Switch, 63A 30mA RCCB kit, 3 x 6A MCB's, 2 x 16A MCB's, 4 x 32A MCB's, 1 x 40A MCB	**KITBOXD**
12 way enclosure, Switch, 80A 30mA RCCB kit, 3 x 6A MCB's, 2 x 16A MCB's, 4 x 32A MCB's, 1 x 40A MCB	**KITBOXD80**
12 way enclosure, Switch, 63A 30mA RCCB kit, 2 x 6A MCB's, 2 x 16A MCB's, 3 x 32A MCB's, 1 x 40A MCB	**KITBOXD1263**
12 way enclosure, Switch, 80A 30mA RCCB kit, 2 x 6A MCB's, 2 x 16A MCB's, 3 x 32A MCB's, 1 x 40A MCB	**KITBOXD1280**
16 way enclosure, Switch, 80A 30mA RCCB kit, 3 x 6A MCB's, 2 x 16A MCB's, 4 x 32A MCB's, 1 x 40A MCB	**KITBOXD1680**

Metal kitbox - Typical application general residential rebuild or rewire

Description	Reference number
12 way enclosure, Switch, 63A 30mA RCCB kit, 3 x 6A MCB's, 2 x 16A MCB's	**KITBOXDM**
12 way enclosure, Switch, 63A 30mA RCCB kit, 2 x 6A MCB's, 2 x 16A MCB's, 3 x 32A MCB's, 1 x 40A MCB	**KITBOXDM1263**
12 way enclosure, Switch, 80A - 30mA RCCB kit, 2 x 6A MCB's, 2 x 16A MCB's, 3 x 32A MCB's, 1 x 40A MCB	**KITBOXDM1280**

Select outgoing devices or accessories

SP 6kA MCBs (B curve)

Description	Rating	Max cable size mm²	Reference number
MCB (B curve)	3A	25	**DOM03B6**
MCB (B curve)	6A	25	**DOM06B6**
MCB (B curve)	10A	25	**DOM10B6**
MCB (B curve)	16A	25	**DOM16B6**
MCB (B curve)	20A	25	**DOM20B6**
MCB (B curve)	32A	35	**DOM32B6**
MCB (B curve)	40A	35	**DOM40B6**
MCB (B curve)	45A	35	**DOM45B6**
MCB (B curve)	50A	35	**DOM50B6**

SP 6kA MCBs (C curve)

MCB (C curve)	6A	25	**DOM06C6**
MCB (C curve)	10A	25	**DOM10C6**
MCB (C curve)	16A	25	**DOM16C6**

SP 6kA 1 module RCBO (B curve)

RCBO 30mA 1 module 1P&N	6A	10	**DOM06B6R30**
RCBO 30mA 1 module 1P&N	10A	10	**DOM10B6R30**
RCBO 30mA 1 module 1P&N	16A	10	**DOM16B6R30**
RCBO 30mA 1 module 1P&N	20A	10	**DOM20B6R30**
RCBO 30mA 1 module 1P&N	32A	10	**DOM32B6R30**
RCBO 30mA 1 module 1P&N	40A	10	**DOM40B6R30**
RCBO 30mA 1 module 1P&N	45A	10	**DOM45B6R30**
RCBO 30mA 1 module 1P&N	50A	10	**DOM50B6R30**

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Consumer units - insulated

Standard units

Number of ways	Dimensions Height	Width	Depth	Reference number
2	240	189	127	**SQO2**
4	240	224	127	**SQO4**
6	240	260	127	**SQO6**
8	240	296	127	**SQO8**
12	240	368	127	**SQO12**
16	240	440	127	**SQO16**
24	480	368	127	**SQO23**

Split load units

Number of ways Circuit A	RCD ways	Dimensions Height	Width	Depth	Reference number
2	4	240	296	127	**SQOS2R4**
3	3	240	296	127	**SQOS3R3**
4	2	240	296	127	**SQOS4R2**
4	6	240	368	127	**SQOS4R6**
5	5	240	368	127	**SQOS5R5**
6	4	240	368	127	**SQOS6R4**
7	3	240	368	127	**SQOS7R3**
7	7	240	440	127	**SQOS7R7**

Dual incomer units

Number of ways Circuit A	RCD ways	Dimensions Height	Width	Depth	Reference number
2	4	240	296	127	**SQO204**
3	3	240	296	127	**SQO303**
4	2	240	296	127	**SQO402**
4	6	240	368	127	**SQO406**
5	5	240	368	127	**SQO505**
6	4	240	368	127	**SQO604**
7	3	240	368	127	**SQO703**
7	7	240	440	127	**SQO707**

New consumer units to meet the new 17th Edition of Wiring Regulations

Multiple split busbars supplied with switch disconnectors and RCDs

No. of ways	Switch ways	RCD 1 ways	RCD 2 ways	Reference number
12	-	6	6	**SQOSR6R6**
12	2	5	5	**SQODS2R5R5**

Consumer units - metal

Standard units

Number of ways	Dimensions Height	Width	Depth	Reference number
2	247	181	111	**SQOM2**
4	247	217	111	**SQOM4**
6	247	253	111	**SQOM6**
8	247	289	111	**SQOM8**
12	247	361	111	**SQOM12**
16	247	433	111	**SQOM16**
24	487	361	111	**SQOM23**

Split load units

Number of ways Circuit A	RCD ways	Dimensions Height	Width	Depth	Reference number
4	6	247	378	111	**SQOMS4R6**
5	5	247	378	111	**SQOMS5R5**
6	4	247	378	111	**SQOMS6R4**
7	7	247	450	111	**SQOMS7R7**

Dual incomer units

Number of ways Circuit A	RCD ways	Dimensions Height	Width	Depth	Reference number
4	6	247	378	111	**SQOM406**
5	5	247	378	111	**SQOM505**
6	4	247	378	111	**SQOM604**
7	7	247	450	111	**SQOM707**

Multi tariff units

Number of ways Circuit A	Circuit B	Circuit B	Dimensions Height	Width	Depth	Reference number
6	5	1	247	450	111	**SQOM60501**
7	4	1	247	45 0	111	**SQOM70401**
8	3	1	247	450	111	**SQOM80301**

Note: Flush mounted standard metal consumer units are available by adding an 'F' suffix to the above reference numbers. e.g. SQOM2F = 2 way flush mounted unit. For flush mounting of split load, dual incomer and multi tariff boards use SQOFC12 for 10 mod. boards and SQOFC16 for 14 mod. boards

Incoming devices

Description	Number of poles	Current rating	Operating voltage (V)	Max. cable cap. mm²	Standards Approval	Width (17.5mm mods)	Reference number
Switch dis.	2	100A	230/240	50	BS EN 60947-3	2	**SQO1100M**
Term block	2	100A	230/240	50	-	2	**SQO1100L**
RCCB	2	100A, 30mA	230/240	50	BS EN 61008	2	**SQOE100030**
RCCB	2	100A, 100mA	230/240	50	BS EN 61008	2	**SQOE100100**
RCCB	2	100A, 300mA	230/240	50	BS EN 61008	2	**SQOE100300**
RCCB	2	100A, 100mA TD	230/240	50	BS EN 61008	2	**SQOE100100S**
RCCB	2	63A, 30mA	230/240	35	BS EN 61008	2	**SQOE063030**
RCCB	2	63A, 100mA	230/240	35	BS EN 61008	2	**SQOE063100**

Note: All Qwikline II consumer units are supplied without incoming devices. Any incoming device may be installed at any incoming point, or busbar split in any Qwikline II consumer unit.

Requirements

Standard units	1 incoming device required.
Dual incomer units	2 incoming devices required.
Split load units	2 incoming devices required.
Multi tariff units	3 incoming devices required.

Outgoing devices

Single pole circuit breakers (B curve)

Current rating	Operating voltage (V)	Breaking capacity (Icn (kA))	Max cable cap. mm²	Standards approval	Reference number
3A	230/240	6	25	BS EN 60898	**SQO103EB6**
6A	230/240	6	25	BS EN 60898	**SQO106EB6**
10A	230/240	6	25	BS EN 60898	**SQO110EB6**
16A	230/240	6	25	BS EN 60898	**SQO116EB6**
20A	230/240	6	25	BS EN 60898	**SQO120EB6**
25A	230/240	6	25	BS EN 60898	**SQO125EB6**
32A	230/240	6	35	BS EN 60898	**SQO132EB6**
40A	230/240	6	35	BS EN 60898	**SQO140EB6**
50A	230/240	6	35	BS EN 60898	**SQO150EB6**
63A	230/240	6	35	BS EN 60898	**SQO163EB6**

Miniature circuit breakers (C curve)

Current rating	Operating voltage (V)	Breaking capacity (Icn (kA))	Max cable cap. mm²	Standards approval	Reference number
3A	230/240	6	25	BS EN 60898	**SQO103EC6**
6A	230/240	6	25	BS EN 60898	**SQO106EC6**
10A	230/240	6	25	BS EN 60898	**SQO110EC6**
16A	230/240	6	25	BS EN 60898	**SQO116EC6**
20A	230/240	6	25	BS EN 60898	**SQO120EC6**
25A	230/240	6	25	BS EN 60898	**SQO125EC6**
32A	230/240	6	35	BS EN 60898	**SQO132EC6**
40A	230/240	6	35	BS EN 60898	**SQO140EC6**
50A	230/240	6	35	BS EN 60898	**SQO150EC6**
63A	230/240	6	35	BS EN 60898	**SQO163EC6**

RCBOs (B curve)

Current rating	Operating voltage (V)	Breaking capacity (Icn (kA))	Max cable cap. mm²	Standards approval	Reference number
6A, 30mA (AC class)	230/240	6	10	BS EN 61009	**SQOR106B03**
10A, 30mA (AC class)	230/240	6	10	BS EN 61009	**SQOR110B03**
16A, 30mA (AC class)	230/240	6	10	BS EN 61009	**SQOR116B03**
20A, 30mA (AC class)	230/240	6	10	BS EN 61009	**SQOR120B03**
32A, 30mA (AC class)	230/240	6	10	BS EN 61009	**SQOR132B03**
45A, 30mA (AC class)	230/240	6	10	BS EN 61009	**SQOR145B03**

Control devices

Device	Coil (V)	Ways occupied	Reference number
2P 25A contactor	230/240	1	**CCN225**
4P 25A contactor	230/240	2	**CCN425**
2P 40A contactor	230/240	2	**CCN240**
3P 40A contactor	230/240	3	**CCN340**
4P 40A contactor	230/240	3	**CCN440**
3P 63A contactor	230/240	4	**CCN363**
1P Impulse relay (16A)	230/240	1	**CIR116**
2P Impulse relay (16A)	230/240	1	**CIR216**
1P Changeover relay (10A)	230/240	1	**CCR110**
Bell (8V)		1	**CBL8**
Transformer 240-8V (8VA)		2	**CBX8**
Buzzer (8V)		1	**CBZ8**
Light sensitive switch		3.5	**CLS110**
Single pole time switch		1	**CTS24**
Single channel electrical time switch		2.5	**CPT11**
Dual channel electrical time switch		2.5	**CPT21**
1P Delay off timer		1	**CDT116**

Accessories

Device	Ways occupied	Reference number
DIN blanking plates	5	**SQODNBP**
Half mod spacer	0.5	**CPS9**
Padlock device (suitable for use with all Qwikline II devices)	-	**QOEPLA**
Padlock	-	**QOPL**
Door lock kit (metal units only)	-	**DOMLKIT**

Note: All control devices are suitable for mounting in any Qwikline II consumer unit.

Residual current breakers

Description	Terminal capacity mm²	Dimensions Height	Width	Depth	Weight Kg	Reference number
25A RCCB 30mA trip 2 pole	35	81	36	75	0.227	**RSD25032**
25A RCCB 300mA trip 2 pole	35	81	36	75	0.227	**RSD25302**
40A RCCB 30mA trip 2 pole	35	81	36	75	0.227	**RSD40032**
40A RCCB 100mA trip 2 pole	35	81	36	75	0.227	**RSD40102**
40A RCCB 300mA trip 2 pole	35	81	36	75	0.227	**RSD40302**
63A RCCB 30mA trip 2 pole	35	81	36	75	0.227	**RSD63032**
63A RCCB 100mA trip 2 pole	35	81	36	75	0.227	**RSD63102**
63A RCCB 300mA trip 2 pole	35	81	36	75	0.227	**RSD63302**
80A RCCB 30mA trip 2 pole	50	81	36	75	0.227	**RSD80032**
100A RCCB 30mA trip 2 pole	50	81	36	75	0.227	**RSD100032**
100A RCCB 100mA trip 2 pole	50	81	36	75	0.227	**RSD100102**

RSD unit mounted RCCB's and insulated enclosures

Unit mounted RCCB's and their associated enclosures offer a cost effective method of supplementing existing installations with the benefits of earth fault protection. Enclosures may be mounted at the incoming point of the installation or locally to the load eg, in garages or sheds with socket outlets.

- Test button enables RCCB to be tested periodically
- Comply with BS EN 61008. Specification for residual current operated circuit breakers
- Rated voltage 240/415Vac single/three phase

For short circuit back-up protection, maximum fuse rating:-

RSD 25A	Fuse to BS 88 Type T 40A or BS 1361 Type RH 30A
RSD 40A	Fuse to BS 88 Type T 50A or BS 1361 Type RH 40A
RSD 63A	Fuse to BS 88 Type T 63A or BS 1361 Type RH 60A
RSD 80A	Fuse to BS 88 Type T 80A or BS 1361 Type RH 80A
RSD 100A	Fuse to BS 88 Type T 100A or BS 1361 Type RH 100A

Individual RCCB insulated enclosures

A cost effective method of providing earth fault protection for existing single circuits or entire installations.

Description	Dimensions Height	Width	Depth	Weight Kg	Reference number
2 x 18mm module IP40 protection	150	50	60	0.10	**RSD2IP40**
4 x 18mm module IP54	200	110	112	0.35	**RSD4IP54**

Section 02
Contents

LoadCentre KQII distribution boards

Safety

IP2X finger safe factory fitted busbar assembly with non removable insulating barriers, provide protection against accidental direct contact. This is particularly useful if work such as testing and commissioning is required on an
energised enclosure.

■ Neutral terminal bar cover provides additional shielding of live parts. This is secured by screw fixing to prevent accidental disturbance in order to maintain safety levels

■ Distribution boards and devices are 3rd party type tested to 20kA
(MCCB incomer), to BS EN 60439

■ Guaranteed connection between MCB and busbar

High performance

■ Two frame sizes – 125A B boards and 250A B boards with up to 72 outgoing SP ways. LoadCentre KQII is designed to cater for the most demanding of installations

■ Boards accept 10kA MCB's and RCBO's to BS EN 60898

■ 20kA conditional short circuit rating

■ Range of three and four pole incoming devices

Versatility

■ Interchangeable incoming devices can easily be upgraded to meet the changing needs of an application

■ Control devices such as contactors, time clocks and impulse relays can be mounted in any unused outgoing way

■ Boards can be joined top/bottom or side by side to form split load or extra service

Easy installation

■ Guaranteed Plug-On system for MCB's and RCBO's

■ A new integral cable way is provided for control cables, making installation easier

■ A new split earth and neutral bar design means all terminals are easily accessible from either side of the distribution board

■ Common enclosure sizes and a range of extension boxes simplify group mounting of boards

■ Removable gland plates (one plain and one with knockouts) provide quick and safe cable entry

■ 25mm^2 earth and neutral termination points

■ Improved symmetrical layout and increased enclosure size provides more wiring space and avoids cable bunching

■ Incoming devices are an integral feature of all distribution boards. No extension boxes, joining kits or special tools are needed to fit incoming devices

■ Our modified standards design and production facility means Square D can now engineer bespoke products to meet your specific needs. Typical applications include: boards to meet the exact colour scheme of the buildings interior or a customers corporate image; distribution boards with enclosure dimensions to accommodate electrical cupboards with restricted access fully populated, wired and labelled

Extensive choice

■ Extensive choice

■ Over 500 distribution board and incomer combinations to choose from

■ Standard distribution boards, with high flexibility

■ Over 300 combinations of split load board in standard offer

■ Over 400 combinations of extra service boards in standard offer

LoadCentre KQII

Single phase A type distribution boards - 125A

- Manufactured and tested to BS EN 60439 parts 1 and 3
- Maximum busbar rating 125A
- Voltage rating 230/240V AC
- External IP3X protection to BS EN 60529
- Internal IP2XB protection to BS EN 60529 provided by permanent, non removable, factory fitted barriers
- Shielded neutral bars
- Cable knockouts on all sides for speed of installation
- Earth bar capacity 25mm^2
- Neutral bar capacity 25mm^2
- Wide range of bolt-on incomers, Plug-On outgoers
- All A boards accept DIN control products e.g. contactors, time clocks, in any unused outgoing way without adaptation

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Standard type (excluding incomers)

Number of SP ways	Dimensions Height	Width	Depth	Reference number
6	270	266	127	**KQ125A6**
8	270	321	127	**KQ125A8**
12	270	376	127	**KQ125A12**
16	270	456	127	**KQ125A16**
24	500	376	127	**KQ125A24**

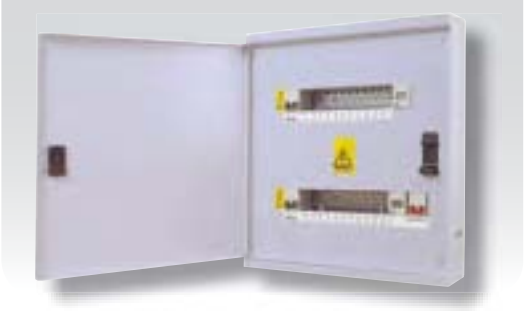
Split load type* (excluding incomers)

Number of ways Unprotected SP	Protected RCD	Dimensions Height	Width	Depth	Reference number
4	6	270	376	127	**KQ125A4SL6**
5	5	270	376	127	**KQ125A5SL5**
4	8	270	456	127	**KQ125A4SL8**
6	6	270	456	127	**KQ125A6SL6**

Split load boards are designed for use with earth protection devices (RCD's) on the secondary side and provide the user with additional protection for selected units.

Notes * 2 incoming devices required for split load units. e.g. Switch and RCCB's.
Secondary incomer is a plug on device - see page 2/3.
All devices are supplied separately.

Split meter board (including incomers)



Number of ways Lighting	Power	Dimensions Height	Width	Depth	Reference number
12	12	484	470	139	**KQA12S12**

The split metering board is supplied with 2 meters, an overall switch disconnector and individual switch disconnectors for lighting and power. Meters are direct connected with pulse output.

Type A LoadCentre KQ+ DIN incoming devices

Device type	Current rating	Number of poles	Standard approval	Cable capacity mm²	Reference number
Terminal block	125A	2	-	50	**KQ125L2**
Switch disc.	125A	2	BS EN 60947-3	50	**KQ125SW2**
RCCB	63A, 30mA	2	BS EN 61008	35	**RSD63032**
RCCB	63A, 100mA	2	BS EN 61008	35	**RSD63102**
RCCB	63A, 300mA	2	BS EN 61008	35	**RSD63302**
RCCB	100A, 30mA	2	BS EN 61008	50	**RSD100032**
RCCB	100A, 100mA	2	BS EN 61008	50	**RSD100102**

Note For a wider range of RCCB incomers see the RSD offer on page 2/11

Plug on RCCB secondary incomers for split load A boards

Device type	Current rating	Number of poles	Standard approval	Cable capacity mm²	Reference number
RCCB	63A 30mA	2	BS EN 61008	35	**SQOE063030**
RCCB	63A 100mA	2	BS EN 61008	35	**SQOE063100**
RCCB	100A 30mA	2	BS EN 61008	50	**SQOE100030**
RCCB	100A 100mA TD	2	BS EN 61008	50	**SQOE100100S**
RCCB	100A 100mA	2	BS EN 61008	50	**SQOE100100**
RCCB	100A 300mA	2	BS EN 61008	50	**SQOE100300**

125A A board accessories

Device type	Reference number
Barrel lock and 2 keys new square door catch	**KQK**
Blanking plate (5 poles)	**SQODNBP**
MCB padlock attachment (pack of 5)	**QOEPLA**
Padlock for use with QOEPLA 3.7/4mm shank	**QOPL**
A type din rail extension enclosure (16 SP ways available)	**KQAE16**
100A lug unit single pole	**KQ1100L**
Replacement door catch	**KQSDC**
63A direct connected Kwh meter with pulsed output	**SDMEIZR**
Blank plate 25 x 5	**KQBP25**

LoadCentre KQII

Three phase B type distribution boards - 125A

- Manufactured and tested to BS EN 60439 parts 1 and 3
- Maximum busbar rating 125A
- Voltage Rating 400/415V AC
- External IP3X protection to BS EN 60529
- IP2XB finger safe with door and cover removed to BS EN 60529, provided by permanent, non removable, factory fitted barriers
- Fully shielded neutral bars
- Earth and neutral bar cable capacity 25mm^2
- All incoming devices fit integral to the board, no extension boxes required
- All incoming connections are the same length i.e. 4 pole configuration
- Range of integral incomers for all applications including lugs, switches and RCCB's
- Outgoing MCB's available up to 63A B, C or D curves
- 18mm wide RCBO available, minimising use of outgoing ways
- Plug-On outgoers for speed of installation and guaranteed connection
- All B boards accept DIN control products (timers, contactors) in any unused outgoing way without adaptation
- Control wiring cable way integrated to moulding

Standard type (excluding incomers)

Number of TP ways	Dimensions Height	Width	Depth	Reference number
4	484	470	139	**KQ12B125**
6	484	470	139	**KQ18B125**
8	538	470	139	**KQ24B125**
12	700	470	139	**KQ36B125**
16	808	470	139	**KQ48B125**
18	808	470	139	**KQ54B125**
24	970	470	139	**KQ72B125**

Split load (excluding incomers)

Number of ways Protected TP	Reference number
4	**KQ12B125**
6	**KQ18B125**
8	**KQ24B125**
12	**KQ36B125**
16	**KQ48B125**
18	**KQ54B125**
24	**KQ72B125**

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Number of ways Unprotected TP	Reference number
4	**KQ12B125**
6	**KQ18B125**
8	**KQ24B125**
12	**KQ36B125**
16	**KQ48B125**
18	**KQ54B125**
24	**KQ72B125**

Split load joining kit for mechanical connection **KQJK**.
63A tapoff to feed protected board (including joining kit) **KQ63SLK**

Extra service units 125A (combination of a standard board and DIN rail enclosure)

Number of TP Busbar ways	Reference number
4	**KQ12B125**
6	**KQ18B125**
8	**KQ24B125**
12	**KQ36B125**
16	**KQ48B125**
18	**KQ54B125**
24	**KQ72B125**

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Number of rows	Number of modules	Dimensions Height	Width	Depth	Reference number
1	17	270	470	139	**KQ17BES**
2	34	484	470	139	**KQ12B2D**
2	34	538	470	139	**KQ18B2D**
3	51	700	470	139	**KQ36B3D**
4	68	808	470	139	**KQ54B4D**
5	85	970	470	139	**KQ54B2504D**

Extra service units are designed for application using numerous control products and RCCB's.
These units provide a professional finish while economising on ease and speed of installation.

Split metering board 125A

Number of TP ways		Rating	Dimensions			Reference
Section 1	Section 2	A	Height	Width	Depth	number
12	8	125	1290	470	139	**KQB36S24125**
14	6	125	1290	470	139	**KQB42S18125**
16	4	125	1290	470	139	**KQB48S12125**

125A boards are supplied with a switch disconnector
2 x PM750 meters included (pulsed and ModBus output)

125A type B LoadCentre KQII incoming devices

Device type	Current rating	Number of poles	Standard approval	Cable capacity mm²	Reference number
Terminal block	125A	4	-	50	**KQ125L4**
Switch disc.	125A	4	BS EN 60947-3	50	**KQ125SW4**
Switch disc.	125A	3+N lug	BS EN 60947-3	50	**KQ125SW3L**
RCCB	80A, 30mA	4	BS EN 61008	35	**RSD80034**
RCCB	100A, 300mA	4	BS EN 61008	50	**RSD100304**
RCCB	100A, 300mA TD	4	BS EN 61008	50	**RSD100304S**
Contactor + switch	100A	4	BS EN 60439	50	**KQCSW100**

Note For a wider range of RCCB incomers see the RSD offer on page 2/11

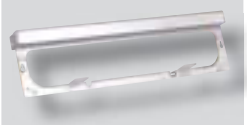
Metering kit

KQ250MET	
Description	Multi function metering kit for LoadCentre KQII 3 phase B type distribution boards.
Components	PM750 multi function meter provides V, A, Power factor kW/h, kVA/h. Three current transformers. Three single pole MCB's.
Voltage rating	415V nominal, 455V maximum. 3 phase 4 wire 50-60 Hz
Output	Pulse output contact is standard + ModBus

Contactor control kit

Reference number	
KQCSW100	100A contactor control kit

B board accessories



Device type	Reference number	Device type	Reference number
Side joining kit	**KQSJK**	24 way extra earth kit	**KQ24EE**
Top/bottom joining kit	**KQJK**	36 way extra earth kit	**KQ36EE**
63A Top off or split load	**KQ63SLK**	48 way extra earth kit	**KQ48EE**
Barrel lock and 2 keys for catch	**KQK**	54 way extra earth kit	**KQ54EE**
Spare keys for above	**KQK33**	72 way extra earth kit	**KQ72EE**
MCCB locking attachment	**W29370**	100A lug unit single pole	**KQ1100L**
125A single phasing kit for use with RCD and switch incomers	**KQ125SPP**	Spare gland plate with knockouts	**KQGPKO**
		Spare gland plate	**KQGP**
Blanking plate (5 poles)	**SQODNBP**	Clean earth 12 terminals	**KQCE12T**
MCB padlock attachment (pack of 5)	**QOEPLA**	Clean earth 24 terminals	**KQCE24T**
Padlock for use with QOEPLA	**QOPL**	Spare way label 72 ways	**KQ72BL**
Circuit directory and wallet (pack of 10)	**WALLET**	Spare gland plate for extension box	**KQEXGP**
12 way extra earth kit	**KQ12EE**	Spare door catch	**KQSDC**
18 way extra earth kit	**KQ18EE**	Neutral terminal cover	**KQBNC**
Padlocking door kit	**KQPD**	Spare cover fixing (24)	**KQBFCF**
Plain extension box	**KQBES**		

LoadCentre KQII

Three phase B type distribution boards - 250A

- Manufactured and tested to BS EN 60439 parts 1 and 3
- Maximum busbar rating 250A
- Voltage Rating 400/415V AC
- External IP3X protection to BS EN 60529
- Internal IP2XB protection to BS EN 60529, provided by permanent, non removable, factory fitted barriers
- Neutral bar shields supplied as standard
- Earth and neutral bar cable capacity 25mm^2
- All incoming devices fit integral to the board, no extension boxes required
- Integral incomers for all applications including lugs, switch, MCCB's and RCCB's
- All incoming connections are the same length i.e. 4 pole configuration
- Outgoing MCB's available up to 63A B, C or D curves
- 18mm wide RCBO available, maximising use of outgoing ways
- Plug-On outgoers for speed of installation and guaranteed connections
- All B boards accept DIN control products timers, contactors in any unused outgoing way without adaptation
- Control wiring cable way integral to moulding

Standard type (excluding incomers)

Number of TP ways	Dimensions Height	Width	Depth	Reference number
4	754	470	139	**KQ12B250**
6	754	470	139	**KQ18B250**
8	808	470	139	**KQ24B250**
12	970	470	139	**KQ36B250**
16	1078	470	139	**KQ48B250**
18	1078	470	139	**KQ54B250**
24	1240	470	139	**KQ72B250**

Extra service units 250A (combination of a standard board and DIN rail enclosure)

Number of TP Busbar ways	Reference number
4	**KQ12B250**
6	**KQ18B250**
8	**KQ24B250**
12	**KQ36B250**
16	**KQ48B250**
18	**KQ54B250**
24	**KQ72B250**

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Number of rows	Number of modules	Dimensions Height	Width	Depth	Reference number
1	17	270	470	139	**KQ17BES**
2	34	484	470	139	**KQ12B2D**
2	34	538	470	139	**KQ18B2D**
3	51	700	470	139	**KQ36B3D**
4	68	808	470	139	**KQ54B4D**
5	85	970	470	139	**KQ54B2504D**

Extra service units are designed for application using numerous control products and RCCB's. These units provide a professional finish while economising on ease and speed of installation.

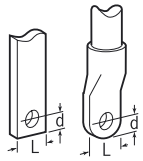
Joining kit **KQJK** (not required for **KQ17BES**).

Split metering board 250A

Number of TP ways Section 1	Section 2	Rating A	Dimensions Height	Width	Depth	Reference number
12	8	250	1290	470	139	**KQB36S24250**
14	6	250	1290	470	139	**KQB42S18250**
16	4	250	1290	470	139	**KQB48S12250**

250A boards require a switch disconnector to be added
2 x PM750 meter included (pulsed and ModBus output)

250A type B LoadCentre KQII incoming devices



L <25mm
d <10mm
Ø >8mm

Device type	Current rating	Number of poles	Cable capacity mm²	Standard approval	Reference number
Terminal block	250A	4	185	-	**KQ250L4P**
Switch disconnector	160A	3+N	95	BS EN 60947-3	**KQ160SW3L**
Switch disconnector	200A	3+N	185	BS EN 60947-3	**KQ200SW3L**
Switch disconnector	250A	3+N	185	BS EN 60947-3	**KQ250SW3L**
Switch disconnector	160A	4	95	BS EN 60947-3	**KQ160SW4**
Switch disconnector	200A	4	185	BS EN 60947-3	**KQ200SW4**
Switch disconnector	250A	4	185	BS EN 60947-3	**KQ250SW4**
MCCB	100A	3+N	95	BS EN 60947-2	**KQ100MCCB3L**
MCCB	160A	3+N	95	BS EN 60947-2	**KQ160MCCB3L**
MCCB	200A	3+N	185	BS EN 60947-2	**KQ200MCCB3L**
MCCB	250A	3+N	185	BS EN 60947-2	**KQ250MCCB3L**
RCCB 160A	Adjustable 30mA -10A	4	95	BS EN 61008	**KQ160RCD**

Metering kit

KQ250MET	
Description	Multi function metering kit for LoadCentre KQII 3 phase B type distribution boards.
Components	PM750 multi function meter provides V, A, Power factor kW/h, kVA/h. Three current transformers. Three single pole MCB's.
Voltage rating	415V nominal, 455V maximum. 3 phase 4 wire 50-60 Hz
Output	Pulse output contact is standard + Modbus

B board accessories

Device type	Reference number	Device type	Reference number
Side joining kit	**KQSJK**	24 way extra earth kit	**KQ24EE**
Top/bottom joining kit	**KQJK**	36 way extra earth kit	**KQ36EE**
63A Top off or split load	**KQ63SLK**	48 way extra earth kit	**KQ48EE**
Barrel lock and 2 keys for catch	**KQK**	54 way extra earth kit	**KQ54EE**
Spare keys for above	**KQK33**	72 way extra earth kit	**KQ72EE**
MCCB locking attachment	**W29370**	100A lug unit single pole	**KQ1100L**
250A single phasing kit for use with RCD and switch incomers	**KQ250SPP**	Spare gland plate with knockouts	**KQGPKO**
		Spare gland plate	**KQGP**
Blanking plate (5 poles)	**SQODNBP**	Clean earth 12 terminals	**KQCE12T**
MCB padlock attachment (pack of 5)	**QOEPLA**	Clean earth 24 terminals	**KQCE24T**
Padlock for use with QOEPLA	**QOPL**	Spare way label 72 ways	**KQ72BL**
Circuit directory and wallet (pack of 10)	**WALLET**	Spare gland plate for extension box	**KQEXGP**
12 way extra earth kit	**KQ12EE**	Spare door catch	**KQSDC**
18 way extra earth kit	**KQ18EE**	Neutral terminal cover	**KQBNC**
Padlocking door kit	**KQPD**	Spare cover fixing (24)	**KQBFCF**
Plain extension box	**KQBES**		

- Manufactured and tested to BS EN 60898
- 10kA breaking capacity 15kA to BS EN 60947-2
- Let through energy classification of 3 (lowest let through energy giving best cable protection classification)
- Positive contact indication (guaranteed on/off indication)
- Trip free mechanism operates even when the toggle is locked on
- Lockable in the ON or OFF position
- Speed of connection of Plug-On devices - guaranteed connection Plug-On devices
- For use in LoadCentre KQII A and B boards
- All MCB's have their part number clearly printed on the front face for ease of identification

Type B (magnetic setting 3-5 in)

For resistive and light reactive loads, e.g. heating, incandescent lighting etc

Current rating (Icn*)	Cable capacity mm²	Reference numbers 1 pole	2 pole	3 pole
3A	25	**KQ10B103**	-	-
6A	25	**KQ10B106**	-	-
10A	25	**KQ10B110**	-	-
16A	25	**KQ10B116**	-	-
20A	25	**KQ10B120**	-	-
25A	25	**KQ10B125**	-	-
32A	35	**KQ10B132**	-	-
40A	35	**KQ10B140**	-	-
50A	35	**KQ10B150**	-	-
63A	35	**KQ10B163**	-	-

Type C (magnetic setting 5-10 in)

For moderately light reactive loads, e.g. fluorescent lighting

Current rating (Icn*)	Cable capacity mm²	Reference numbers 1 pole	2 pole	3 pole
6A	25	**KQ10C106**	**KQ10C206**	**KQ10C306**
10A	25	**KQ10C110**	**KQ10C210**	**KQ10C310**
16A	25	**KQ10C116**	**KQ10C216**	**KQ10C316**
20A	25	**KQ10C120**	**KQ10C220**	**KQ10C320**
25A	25	**KQ10C125**	**KQ10C225**	**KQ10C325**
32A	35	**KQ10C132**	**KQ10C232**	**KQ10C332**
40A	35	**KQ10C140**	**KQ10C240**	**KQ10C340**
50A	35	**KQ10C150**	**KQ10C250**	**KQ10C350**
63A	35	**KQ10C163**	**KQ10C263**	**KQ10C363**

Type D (magnetic setting 10-14 in)

For highly reactive loads, e.g. motors, pumps and transformers

Current rating (Icn*)	Cable capacity mm²	Reference numbers 1 pole	2 pole	3 pole
6A	25	**KQ10D106**	**KQ10D206**	**KQ10D306**
10A	25	**KQ10D110**	**KQ10D210**	**KQ10D310**
16A	25	**KQ10D116**	**KQ10D216**	**KQ10D316**
20A	25	**KQ10D120**	**KQ10D220**	**KQ10D320**
25A	25	**KQ10D125**	**KQ10D225**	**KQ10D325**
32A	35	**KQ10D132**	**KQ10D232**	**KQ10D332**
40A	35	**KQ10D140**	**KQ10D240**	**KQ10D340**
50A	35	**KQ10D150**	**KQ10D250**	**KQ10D350**
63A	35	**KQ10D163**	**KQ10D263**	**KQ10D363**

DIN rail mounted 80/100A MCB

Suitable for use in extension enclosures or extra service units

Description	Terminal capacity	Modular size	Reference number
MCB 3P 100A Type C	50	4.5	**KQ10C3100**
MCB 3P 80A Type C	50	4.5	**KQ10C380**

Must be used with **KQ17BES** enclosure and 3 x **KQ1100L**.

- Manufactured and tested to BS EN 61009
- 10kA breaking capacity
- Let through energy classification of 3 (lowest let through energy giving best cable protection classification)
- Positive contact indication on toggle (guaranteed on/off indication)
- Trip free MCB mechanism
- Lockable in on or off position
- Automatic trip on loss of neutral
- Automatic protection against reverse polarity
- Type C tripping characteristics (5In to 10In)
- Operating voltage 150 - 230Vac
- 6 - 45A; 10, 30 and 100mA sensitivities
- AC class sensitivity
- For use in LoadCentre A and B boards
- One single pole way occupied in a distribution board ideal for retrofitting earth fault protection
- Cable capacity 16mm^2
- Speed of connection of Plug-On devices
- Assured system integrity, no other devices fit KQ+ boards
- All RCBO's have part numbers marked on the front of device

Applications

RCBO's are available with various earth leakage sensitivities to suit numerous applications including 10mA devices for protection of sensitive machine/equipment, 30mA devices which are generally used for personnel protection and 100mA for meeting high earth loop impedance levels.

RCBO's should be carefully selected for the relevant application.

Residual current circuit breakers

Current rating (A)	Residual tripping current	Cable capacity mm^2	Reference number
6	10mA	16	**KQE106C01**
10	10mA	16	**KQE110C01**
16	10mA	16	**KQE116C01**
20	10mA	16	**KQE120C01**
32	10mA	16	**KQE132C01**
45	10mA	16	**KQE145C01**
6	30mA	16	**KQE106C03**
10	30mA	16	**KQE110C03**
16	30mA	16	**KQE116C03**
20	30mA	16	**KQE120C03**
32	30mA	16	**KQE132C03**
45	30mA	16	**KQE145C03**
6	100mA	16	**KQE106C10**
10	100mA	16	**KQE110C10**
16	100mA	16	**KQE116C10**
20	100mA	16	**KQE120C10**
32	100mA	16	**KQE132C10**
45	100mA	16	**KQE145C10**

Accessories

	Reference number
Padlocking device (pack of 5)	**QOEPLA**
Padlock for above	**QOPL**

All LoadCentre KQII A and B type LoadCentres accept DIN rail mounted control devices in any unused MCB way.

For high density control applications a range of extra service units can be created using standard product providing 17 to 72 SP ways. For stand alone control applications a range of insulated or metal enclosures are available.

Control and command devices

Description	Application	Modular size	Reference number
Bell 8V ac	Audible alarm	1	**CBL8**
Transformer 240/8V 8VA	Bell circuits	2	**CBX8**
Buzzer 8V ac	Audible alarm	1	**CBZ8**
Contactor 2 pole 25A	Switching large single phase loads	1	**CCN225**
Contactor 2 pole 40A	Switching large single phase loads	2	**CCN240**
Contactor 3 pole 40A	Switching 3 phase loads	3	**CCN340**
Contactor 3 pole 63A	Switching 3 phase loads	3	**CCN363**
Contactor 4 pole 100A	Switching 3 phase loads	6	**CCN4100**
Contactor 4 pole 25A	Switching 3 phase loads	2	**CCN425**
Contactor 4 pole 40A	Switching 3 phase loads	3	**CCN440**
Changeover relay 10A	Switching small loads	1	**CCR110**
Delay OFF timer 16A	1–7 min timer for stairs/corridor lighting	1	**CDT116**
Multi function meter	Metering KWh	6	**CEM01**
Impulse relay 1 pole 16A	Lighting switching	1	**CIR116**
Impulse relay 2 pole 16A	Lighting switching	1	**CIR216**
Light sensitive switch 10A	Lighting during low light levels	3.5	**CLS110**
Presence detector	Detecting persons in the area	-	**CPD360**
PIR detector	Movement detection	-	**CPIR**
Contactor spacer	Spacing contactors in boards	0.5	**CPS9**
7 day elect. time switch, 1 channel 16A	7 day programmable time switch	2.5	**CPT11**
7 day elect. time switch, 2 channel 16A	7 day programmable time switch	2.5	**CPT21**
Astronomic time switch 16A	Lighting control	2.5	**CPLST110**
Time delay ON relay	Delay switch on	1	**CTR1**
24 hour time switch 16A	24 hour regular switching	1	**CTS24**
Multi function time switch	Time switch with conditional functions	5	**CPT9**
Memory cartridge for CPT9	-	-	**CPT9MC**
KQ metering kit	KQ B type distribution boards	-	**KQ250MET**
100A Contactor in extension enclosure	KQII	-	**KQCSW100**
KQ metering enclosure	-	-	**MSKQ1277***
Insulated enclosure, 4 modules	IP54 enclosure with door	-	**RSD4IP54**
Metal enclosure, 3 modules	IP30 enclosure, sealable	-	**SDEN3**
Metal enclosure, 4 modules	IP30 enclosure, sealable	-	**SDEN4**
Metal enclosure, 5 modules	IP30 enclosure, sealable	-	**SDEN5**
Insulated enclosure, 4 modules	IP40 enclosure with door	-	**SDEN4P**
Insulated enclosure, 6 modules	IP40 enclosure with door	-	**SDEN6P**
Insulated enclosure, 8 modules	IP40 enclosure with door	-	**SDEN8P**
Extension enclosure	Accepts 17 modules of devices	17	**KQ17BES**
Plain extension enclosure	-	-	**KQBES**

Note When installing several CCN contactors, side by side in an enclosure, include a 1/2 module spacer (CPS9) between every two units. This also applies to adjacent MCB's.

* Supplied as **KQ250MET** less meter, see page 4/21 for selection of meters.

All RSD residual current circuit breakers are suitable for use as main incomers in LoadCentre KQII distribution boards.

- Comply with BS EN 61008. Specification for residual current operated circuit breakers
- Rated voltage 240/415V AC 50/60 Hz
- Test button enables RCCB to be tested periodically
- 30mA device suitable for use as additional protection on final sub circuits

e.g. equipment outside equipotential zone or items requiring 2/4 pole protection i.e. switched neutral applications

Residual current circuit breakers

Description	Cable capacity mm²	Dimensions Height	Width	Depth	Weight Kg	Reference number
25A RCCB 30mA trip 2 pole	35	81	36	75	0.227	**RSD25032**
25A RCCB 300mA trip 2 pole	35	81	36	75	0.227	**RSD25302**
40A RCCB 30mA trip 2 pole 3	35	81	36	75	0.227	**RSD40032**
40A RCCB 100mA trip 2 pole	35	81	36	75	0.227	**RSD40102**
40A RCCB 300mA trip 2 pole	35	81	36	75	0.227	**RSD40302**
63A RCCB 30mA trip 2 pole	35	81	36	75	0.227	**RSD63032**
63A RCCB 100mA trip 2 pole	35	81	36	75	0.227	**RSD63102**
63A RCCB 300mA trip 2 pole	35	81	36	75	0.227	**RSD63302**
80A RCCB 30mA trip 2 pole	50	81	36	75	0.227	**RSD80032**
100A RCCB 30mA trip 2 pole	50	81	36	75	0.227	**RSD100032**
100A RCCB 100mA trip 2 pole	50	81	36	75	0.227	**RSD100102**
25A RCCB 300mA trip 4 pole	35	81	72	75	0.428	**RSD25304**
25A RCCB 30mA trip 4 pole	35	81	72	75	0.428	**RSD25034**
25A RCCB 100mA trip 4 pole	35	81	72	75	0.428	**RSD25104**
40A RCCB 30mA trip 4 pole	35	81	72	75	0.428	**RSD40034**
40A RCCB 100mA trip 4 pole	35	81	72	75	0.428	**RSD40104**
40A RCCB 300mA trip 4 pole	35	81	72	75	0.428	**RSD40304**
63A RCCB 30mA trip 4 pole	35	81	72	75	0.428	**RSD63034**
63A RCCB 100mA trip 4 pole	35	81	72	75	0.428	**RSD63104**
63A RCCB 300mA trip 4 pole	35	81	72	75	0.428	**RSD63304**
80A RCCB 30mA trip 4 pole	35	81	72	75	0.500	**RSD80034**
100A RCCB 300mA trip 4 pole	50	81	72	75	0.500	**RSD100304**
100A RCCB 300mA trip 4 pole +TD	50	81	72	75	0.500	**RSD100304S**

For short circuit back-up protection, maximum fuse rating

RSD 25A	Fuse to BS88 Type T 40A or BS1361 type RH 30A
RSD 40A	Fuse to BS88 Type T 50A or BS1361 type RH 40A
RSD 63A	Fuse to BS88 Type T 63A or BS1361 type RH 60A
RSD 80A	Fuse to BS88 Type T 80A or BS1361 type RH 80A
RSD 100A	Fuse to BS88 Type T 100A or BS1361 type RH 100A

Individual RCCB insulated enclosures

Description	Dimensions Height	Width	Depth	Weight Kg	Reference number
4 x 18mm Module IP54 protection	200	110	112	0.35	**RSD4IP54**

RSD insulated enclosures are also suitable for any DIN rail mounted product including time clocks, timers, contactors, switches and relays.

LoadCentre KQII enclosures are available for applications where matching extension boxes are required to house system extensions or stand alone control systems.

There are two configurations, plain enclosures with door, enclosures with DIN rail, door and front cover assembly.

Steel enclosures with plain cover and door

Dimensions Height	Width	Depth	Reference number
484	470	139	**KQ12BCD**
538	470	139	**KQ18BCD**
700	470	139	**KQ36BCD**
808	470	139	**KQ54BCD**
970	470	139	**KQ54B250CD**

Steel enclosures with DIN rails and a front cover assembly and door

Dimensions Height	Width	Depth	Number of rows	Total number of SP modules	Reference number
484	470	139	2	34	**KQ12B2D**
538	470	139	2	34	**KQ18B2D**
700	470	139	3	51	**KQ36B3D**
808	470	139	4	68	**KQ54B4D**
970	470	139	5	85	**KQ54B2504D**

Steel enclosure with 1 row of DIN rails and a front cover assembly and door

Dimensions Height	Width	Depth	Number of rows	Total number of SP modules	Reference number
270	470	139	1	17	**KQ17BES**

Steel enclosure

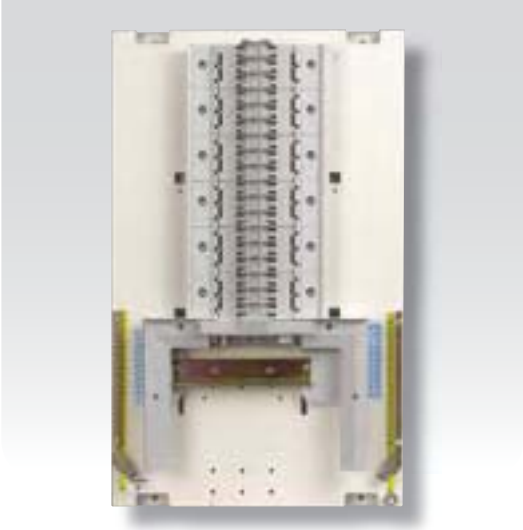
Dimensions Height	Width	Depth	Number of rows	Total number of SP modules	Reference number
270	470	124	-	-	**KQBES**

- Manufactured and tested to BS EN 60439 parts 1 and 3
- Maximum busbar rating A type 125A, B type 125A or 250A
- Voltage rating A type 230/240V AC, B type 400/415V AC
- IP2XB with doors and covers removed to BS 60529
- Provided by permanent, non-removable, factory fitted barriers
- Fully shielded neutral bars
- Earth and neutral bar cable capacity 25mm^2
- All incoming connections are the same length i.e. 4 pole configuration
- Range of incomers for all application including lugs, switch disconnectors, RCCB's and MCCB's (250A only)
- Outgoing MCB's available up to 63A in B, C or D curves
- 18mm wide RCBO available, minimising use of outgoing ways
- Plug-On outgoers for speed of installation and guaranteed connection
- Interiors accept a range of control product which may be mounted in any unused outgoing way

A Type 125A

Number of SP ways	Reference numbers Interior	Door and cover assembly	Cover assembly
6	KQ125INTA6	KQ125INTCD6	KQ125INTAC6
8	KQ125INTA8	KQ125INTCD8	KQ125INTAC8
12	KQ125INTA12	KQ125INTCD12	KQ125INTAC12
16	KQ125INTA16	KQ125INTCD16	KQ125INTAC

B Type 125A



Number of SP ways	Number of TP ways	Reference numbers Interior	Door and cover assembly
12	4	KQ12B125INT	KQ12B125CP
18	6	KQ18B125INT	KQ18B125CP
24	8	KQ24B125INT	KQ24B125CP
36	12	KQ36B125INT	KQ36B125CP
48	16	KQ48B125INT	KQ48B125CP
54	18	KQ54B125INT	KQ54B125CP
72	24	KQ72B125INT	KQ72B125CP

B Type 250A

Number of SP ways	Number of TP ways	Reference numbers Interior	Door and cover assembly
12	4	KQ12B250INT	KQ12B250CP
18	6	KQ18B250INT	KQ18B250CP
24	8	KQ24B250INT	KQ24B250CP
36	12	KQ36B250INT	KQ36B250CP
48	16	KQ48B250INT	KQ48B250CP
54	18	KQ54B250INT	KQ54B250CP
72	24	KQ72B250INT	KQ72B250CP

Section 03
Contents
Control and Command products

Control and Command products

Since the introduction of the Climate Change Levy, wasting energy is not just bad for the environment: it now carries a heavy financial penalty, with electricity the most heavily taxed fuel of all. In addition, the introduction of the building regulations part L2 calls for the implementation of energy efficient technology and metering of specific loads.

With a Square D consumer unit or distribution board, you have access to a unique range of control and command devices designed to make savings in every area of consumption and ensure compliance with current regulation.

This catalogue contains all the components you need to help your organisation save energy.
All devices connect directly to distribution boards and consumer units, so installation couldn't be simpler.
All devices are available independently, giving you the flexibility to select only those which you actually need.

If you would like more information about control and command devices from Square D,
call 0870 608 8 608 or visit www.schneider-electric.co.uk

Natural daylight is the best and lowest cost form of light but unfortunately, it is not always available when or where required. It is necessary to provide electric lighting to supplement natural light during the day and provide full illumination at night.

Electricity costs money so it is necessary to make efficient use of the lighting and switch it off when not required. This control may either be manual or have a level of automation introduced. The government encourage the use of automated technology with the energy technology list. Many Square D products feature on the list.

Products

Description	Application	Modular size	Reference
24 hour time switch, contact rating 16A resistive	24 hour regular switching	1	**CTS24**
7 day electronic time switch, 1 channel, contact rating 16A resistive	7 day programmable time switch	2.5	**CPT11**
7 day electronic time switch, 2 channel, contact rating 16A resistive	7 day programmable time switch	2.5	**CPT21**
Multi function time switch, contact rating 10A resistive	Time switch with conditional functions	5	**CPT9**
Presence detector 10A	Detecting persons in the area	N/A	**CPD360**
PIR detector, contact rating 10A resistive	Movement detection	N/A	**CPIR**
Light sensitive switch,	Lighting during low light levels contact rating 10A resistive	3.5	**CLS110**
Astronomical switch,	Lighting control at sunrise/sunset contact rating 16A resistive	2.5	**CPLST110**
Changeover relay 10A	Switching small loads	1	**CCR110**
Contactor 2 pole 25A 240V coil	Switching large single phase loads	1	**CCN225**
Contactor 4 pole 25A 240V coil	Switching 3 phase loads	2	**CCN425**
Contactor 2 pole 40A 240V coil	Switching large single phase loads	2	**CCN240**
Contactor 3 pole 40A 240V coil	Switching 3 phase loads	3	**CCN340**
Contactor 4 pole 40A 240V coil	Switching 3 phase loads	3	**CCN440**
Contactor 3 pole 63A 240V coil	Switching 3 phase loads	3	**CCN363**
Contactor 4 pole 100A	Switching 3 phase loads	6	**CCN4100**
Contactor spacer	Spacing contactors in boards (1)	0.5	**CPS9**
Time delay ON relay, contact rating 8A resistive	Delay switch on	1	**CTR1**
Delay OFF timer	1–7 min timer for stairs & corridor lighting	1	**CDT116**
Impulse relay 1 pole 16A	Multi location switching	1	**CIR116**
Impulse relay 2 pole 16A	Multi location switching	1	**CIR216**
Metal enclosure, 3 modules,	IP30, sealable		**SDEN3**
Metal enclosure, 4 modules,	IP30, sealable		**SDEN4**
Metal enclosure, 5 modules,	IP30, sealable		**SDEN5**
Insulated enclosure with door,	4 modules, IP40		**SDEN4P**
Insulated enclosure with door,	6 modules, IP40		**SDEN6P**
Insulated enclosure with door,	8 modules, IP40		**SDEN8P**
Insulated enclosure with door,	4 modules, IP54		**RSD4IP54**

Notes (1) when installing several CCN contactors, side by side in an enclosure, include a half module spacer CPS9 between every two units.
This also applies if the contactors are mounted adjacent to MCBs.

Electricity is an expensive means of heating so it is essential to make the most efficient use of the heating, to have it on only when required and to switch it off when not required. The most common forms of electric heating are water heating and space heating. These notes apply equally to both these functions. The control may either be manual or have a level of automation introduced.

Products

Description	Application	Modular size	Reference
24 hour time switch, contact rating 16A resistive	24 hour regular switching	1	**CTS24**
7 day electronic time switch, 1 channel, contact rating 16A resistive	7 day programmable time switch	2.5	**CPT11**
7 day electronic time switch, 2 channel, contact rating 16A resistive	7 day programmable time switch	2.5	**CPT21**
Multi function time switch, contact rating 10A resistive	Time switch with conditional functions	5	**CPT9**
Memory cartridge for CPT9		N/A	**CPT9MC**
Presence detector	Supply heat only when persons present	N/A	**CPD360**
Contactor 2 pole 25A	Switching large single phase loads	1	**CCN225**
Contactor 4 pole 25A	Switching 3 phase loads	2	**CCN425**
Contactor 2 pole 40A	Switching large single phase loads	2	**CCN240**
Contactor 3 pole 40A	Switching 3 phase loads	3	**CCN340**
Contactor 4 pole 40A	Switching 3 phase loads	3	**CCN440**
Contactor 3 pole 63A	Switching 3 phase loads	3	**CCN363**
Contactor 4 pole 100A	Switching 3 phase loads	6	**CCN4100**
Contactor spacer	Spacing contactors in boards (1)	0.5	**CPS9**
Time delay ON relay, contact rating 8A resistive	Delay switch on	1	**CTR1**
Metal enclosure, 3 modules,	IP30, sealable		
Metal enclosure, 4 modules,	IP30, sealable		**SDEN4**
Metal enclosure, 5 modules,	IP30, sealable		**SDEN5**
Insulated enclosure with door,	4 modules, IP40		**SDEN4P**
Insulated enclosure with door,	6 modules, IP40		**SDEN6P**
Insulated enclosure with door,	8 modules, IP40		**SDEN8P**
Insulated enclosure with door,	4 modules, IP54		**RSD4IP54**

Notes (1) when installing several CCN contactors, side by side in an enclosure, include a half module spacer CPS9 between every two units. This also applies if the contactors are mounted adjacent to MCBs.

In the commercial and light industrial environment there are a number of applications where a small motor drive is required. The switching duty may be light therefore it is not necessary to use industrial style control equipment.

The Square D range of contactors may be used for these light duty applications, category of duty AC7b to BS60947–1. BS7671 requires that all motors of ratings greater than 0.37kW must have control equipment incorporating a means of protection against overload.

Products

Description	Application	Modular size	Reference
Small Motors			
Contactor 2 pole 25A	1.4kW single phase motor with capacitor	1	**CCN225**
Contactor 2 pole 40A	2.5kW single phase motor with capacitor	2	**CCN240**
Contactor 3 pole 63A	4.0kW single phase motor with capacitor	4	**CCN363**
Contactor 4 pole 25A	4.0kW three phase motor	2	**CCN425**
Contactor 3 pole 40A	7.5kW three phase motor	3	**CCN340**
Contactor 3 pole 63A	15kW three phase motor	3	**CCN363**
Contactor spacer	Spacing contactors in boards (1)	0.5	**CPS9**
Metal enclosure, 3 modules,	IP30, sealable		**SDEN3**
Metal enclosure, 4 modules,	IP30, sealable		**SDEN4**
Metal enclosure, 5 modules,	IP30, sealable		**SDEN5**
Insulated enclosure with door, 4 modules,	IP40		**SDEN4P**
Insulated enclosure with door, 6 modules,	IP40		**SDEN6P**
Insulated enclosure with door, 8 modules,	IP40		**SDEN8P**
Insulated enclosure with door, 4 modules,	IP54		**RSD4IP54**

Notes (1) when installing several CCN contactors, side by side in an enclosure, include a half module spacer CPS9 between every two units. This also applies if the contactors are mounted adjacent to MCBs.

In the commercial and light industrial environment there are a number of applications where a small motor drive is required. The switching duty may be light therefore it is not necessary to use industrial style control equipment.

The Square D range of contactors may be used for these light duty applications, category of duty AC7b to BS60947–1. BS7671 requires that all motors of ratings greater than 0.37kW must have control equipment incorporating a means of protection against overload.

Products

Description	Application	Modular size	Reference
Bell transformer 230V primary, 8V or 12V	Voltage source for bell and buzzer secondary 8VA	2	**CBX8**
Bell 8Vac 70dB	Audible signal	1	**CBL8**
Buzzer 8Vac 70dB	Audible signal	1	**CBZ8**
Metal enclosure, 3 modules	IP30, to contain transformer &/or bell / buzzer		**SDEN3**
Insulated enclosure, 4 modules	IP40, to contain transformer &/or bell / buzzer*		**SDEN4P**
Insulated enclosure, 4 modules	IP54, to contain transformer &/or bell / buzzer*		**RSD4IP54**

* Sound volume likely to be reduced due to higher IP rating of enclosure

The recent introduction of the building regulations part L2 strengthened the requirements for the conservation of fuel and power in buildings. The document is concerned with the efficient use of fuel and power and ensuring that no more energy is used than is reasonable in the circumstances. Part L2 calls for the implementation of energy efficient technology and metering of specific loads.

Section 3 of Document L2, titled “Providing information” is concerned with the installation of sufficient facilities, including energy meters to enable building owners or occupiers to measure their actual energy consumption and to take steps to minimise it.

Products

Description	Application	Reference
Metering kit for KQ distribution board	Any KQ type ‘B’ board	**KQ250MET***
3 phase multi function meter	For door/panel mounting DIN96	**PM700**
3 phase multi function meter (for pulsed output)	For door/panel mounting DIN96	**PM700P**
3 phase multi function meter (for pulsed output)	For door/panel mounting DIN96	**PM710**
3 phase multi function meter pulse & ModBus output	For door/panel mounting DIN96	**PM750**
Single phase 63A direct connected Kwh meter with pulsed output		**SDMEIZR**

* KQ250MET is also supplied with a PM750 meter (pulsed and ModBus output), three current transformers, three single pole MCBs and all wiring looms.

Split meter board (including incomers)

Number of ways		Dimensions			Reference
Lighting	Power	Height	Width	Depth	number
12	12	484	470	139	**KQA12S12**

The split metering board is supplied with 2 meters, an overall switch disconnector and individual switch disconnectors for lighting and power. Meters are direct connected with pulse output.

Split metering board 125A

Number of TP ways		Rating	Dimensions			Reference
Section 1	Section 2	A	Height	Width	Depth	number
12	8	125	1290	470	139	**KQB36S24125**
14	6	125	1290	470	139	**KQB42S18125**
16	4	125	1290	470	139	**KQB48S12125**

125A boards are supplied with a switch disconnector
2 x PM750 meters included

Split metering board 250A

Number of TP ways		Rating	Dimensions			Reference
Section 1	Section 2	A	Height	Width	Depth	number
12	8	250	1290	470	139	**KQB36S24250**
14	6	250	1290	470	139	**KQB42S18250**
16	4	250	1290	470	139	**KQB48S12250**

250A boards require a switch disconnector to be added
2 x PM750 meter included

Section 04
Contents
I-Line panelboards

To help electrical contractors and installers Square D provide:

- An extensive range of easy to install products.
- Readily available products from our authorised distributors
- Distributor staff training to help develop familiarity and the ability to promptly resolve queries
- A team of Sales Engineers to support both distributors and electrical contractors
- A ready assembled product service for applications requiring either;
  - Non-standard products
  - Completely assembled products to help reduce site installation time

The benefits of I-Line panelboards

- High levels of safety to protect against contact with live parts. Incoming devices are fully shrouded to protect against accidental contact. With the use of blanking plates for unused outgoing ways the busbar is finger safe
- **Simplicity** - Boards are supplied complete and ready to install. Simply affix to the wall and fit the required MCCBs and switch-disconnector-fuse units. The board is then ready for cabling
- **Fast installations** - Plug-On devices help reduce installation time
- **Flexibility** - It is very easy to add or retrospectively change outgoing devices
- **Durability** - Boards are constructed from anti-corrosion treated sheet steel
- **Quality** - All I-Line busbar systems are ASTA certified and the unique I-Line mounting system ensures devices cannot be incorrectly fitted
- **Proven experience** - During the last 30 years Square D panelboards have been used extensively across industry and commerce

Easy to install Plug-On MCCB's

Plug-On MCCB's - Plug-On breaker connections are designed so that under short circuit conditions, the magnetic forces developed push the jaws together, gripping the busbar more firmly. There are no wiring connections to be made to the busbars as the connectors form an integral part of the circuit breakers. All MCCB's plug onto the busbar stack. Modular I-Line construction lets you mount branch breakers anywhere to save valuable space.

Busbar assembly - Moulded polyester glass insulators separate and continuously support each busbar. High strength insulated bolts clamp the vertical busbar assembly securely together.

Breakers on the left-hand side of bus structure are completely independent of position or frame size of those on right-hand side.

Single, double and three pole devices can be fitted in any combination without loss of outgoing ways.

Circuit breaker Plug-On connectors shrouded and braced in moulded protective insulator.

Circuit breaker mounting bracket, a permanent part of each circuit breaker, securely supports and aligns load end of circuit breaker.

Insulating shroud keys into slots in base insulator. Aligns and supports line end of circuit breaker.

Size 1 250/400A panelboards

- Single sided to give best possible space utilisation
- Incomers can be mounted at top or bottom of the panelboard
- Ample cabling space
- Plated copper 50kA for 1s busbars
- Degree of protection IP3X
- Hinged lift off cable way cover
- MCCB separation to form 3b Type 2 BSEN 60439-1
- Fully rated earth and neutral bars
- Simple ordering
- Removable top and bottom gland plates

Step 1 Select panelboard required

Description	Modules	Reference number 250A	400A
4 triple pole outgoing ways	12	-	**MP40041**
6 triple pole outgoing ways	18	**MP25061**	-
7 triple pole outgoing ways	21	-	**MP40071**
12 triple pole outgoing ways	36	**MP250121**	**MP400121**

Step 2 Select incoming device

250A	**Reference number**
250A 36kA triple pole MCCB	**CNAE34250**
250A 50kA triple pole MCCB	**CHAE34250**
100A automatic switch disconnector (isolator)	**CNAE34000S10**
160A automatic switch disconnector (isolator)	**CNAE34000S15**
250A automatic switch disconnector (isolator)	**CNAE34000S25**
225A plug on lug unit	**SL225**

400A*	
400A 36kA triple pole MCCB	**SLA3400**
400A automatic switch disconnector (isolator)	**SLA3000M**
400A switch-disconnector-fuse	**MFS400**

*Trim, required when 250A incomer fitted **TKA4, TKA7, TKA12**

Step 3 Select outgoing devices

Single and double pole MCCB's are phase dedicated. To obtain correct reference add suffix as below example:
40A SP MCCB to fit L3 will be SFA1040C

MCCB

16-100A 25kA	**Single Pole (1 Mod)**				**Double Pole (2 Mod)**		
		L1	**L2**	**L3**		**L1/L2**	**L2/L3**
	Suffix				**Suffix**		
16A	**SFA1016**	A	B	C	**SFA2016**	AB	BC
20A	**SFA1020**				**SFA2020**		
32A	**SFA1032**				**SFA2032**		
40A	**SFA1040**				**SFA2040**		
50A	**SFA1050**				**SFA2050**		
63A	**SFA1063**				**SFA2063**		
80A	**SFA1080**				**SFA2080**		
100A	**SFA1100**				**SFA2100**		

Step 3 Select outgoing devices cont.

Triple pole (3 mods)

	25kA	36kA	50kA	Additional tunnel terminals Reference No.	Acceptable cable size
16A	**CDAE34016**	**CNAE34016**	**CHAE34016**		
25A	**CDAE34025**	**CNAE34025**	**CHAE34025**		
32A	**CDAE34032**	**CNAE34032**	**CHAE34032**		
40A	**CDAE34040**	**CNAE34040**	**CHAE34040**	**W29242**	1.5-95mm
50A	**CDAE34050**	**CNAE34050**	**CHAE34050**		
63A	**CDAE34063**	**CNAE34063**	**CHAE34063**		
80A	**CDAE34080**	**CNAE34080**	**CHAE34080**		
100A	**CDAE34100**	**CNAE34100**	**CHAE34100**		
125A		**CNAE34125**	**CHAE34125**		
160A		**CNAE34160**	**CHAE34160**		
200A		**CNAE34200**	**CHAE34200**	**W29259**	95-185mm
250A		**CNAE34250**	**CHAE34250**	**W29259**	
160A electronic		**CNAE34160E20**		**W29242**	1.5-95mm
250A electronic		**CNAE34028E20**		**W29259**	95-185mm

Note: extension blanking plate **EKW** or **EKW4BL** must be fitted on devices 250A and below when fitted on the LHS. Triple Pole MCCB's are available in 3 different breaking capacities.

Step 4 Select metering

The I-Line Panelboard product range has being enhanced to include the facility to meter incoming and outgoing circuits. This enables contractors to easily and simply meet the requirements of Part L2 of the Building Regulations. These metering kits allow great flexibility in the choice of meter and also in the configuration of the boards.

Incoming metering
This metering kit is for the incoming supply to the board. It comprises an extension box that can be fitted to the top or the bottom of a standard board. This box contains a three-phase block current transformer, fuses for the voltage supply and a PM750 multi-function meter. Because the main incoming cables pass through this enclosure it is not suitable for a retrofit. The kit comes complete: no other parts are required to install this metering kit.

Reference number		
MPME2501	250A	top/bottom metering extension box

Outgoing metering
A standard board can be adapted to meter the incoming supply and some or all of the outgoing circuits by the addition of three components. These components are:
1 Metering kit. This contains a replacement wireway door with 96 sq cutouts for the number of outgoing ways of the board plus one. This additional cutout is to meter the incoming supply as required. Blanking plates are supplied for unused meter positions. One door kit per board.

A. Select metering kit

Size 1 400A

Reference number	
MPMK104	4 way I-Line metering kit
MPMK107	7 way I-Line metering kit
MPMK112	12 way I-Line metering kit

B. Select metering CT set for each MCCB to be monitored

2 Current transformer kit. One kit for each circuit to be measured. The kit will comprise a three phase CT block, mounting plate and cable loom. The CT blocks fit to the breakers. The CT size and ratio matches the breaker.

Reference number		CT ratio
MPCT125	C frame breaker	125/5
MPCT150	C frame breaker	150/5
MPCT250	C frame breaker	250/5

C. Select PowerLogic meters for each circuit to be measured

Reference number	
PM700	Multi function PowerMeter.
PM700P	Multi function PowerMeter with pulse outputs
PM710	Multi function PowerMeter with Modbus RS485 output
PM750	Same functions as the PM710, plus two digital inputs, one digital output, alarms and signed power factor. The PM750 digital output can be simply configured as a kWh pulse output

Step 5 Select accessories

Panelboard		MP25061	MP250121	MP40041	MP40071	MP400121
Blanking plates for all unused ways						
	Single pole	**HNM1BL**	**HNM1BL**	**HNM1BL**	**HNM1BL**	**HNM1BL**
	Triple pole	**HNM4BL**	**HNM4BL**	**HNM4BL**	**HNM4BL**	**HNM4BL**
Blanking plates for every MCCB way when one or more PF devices fitted						
	Single pole	-	-	**HNF1BL**	**HNF1BL**	**HNF1BL**
	Triple pole	-	-	**HNF4BL**	**HNF4BL**	**HNF4BL**
Trim, required when 250A incomer fitted				**TKA4**	**TKA7**	**TKA12**
Side extension box						
	508mm wide	**EXMS20411**		**EXMS20681**		-
	550mm wide	-	-	**EXMS827**	**EXMS1170**	**EXMS1742**
Top / bottom extension box						
	226mm high	**EXS91**	**EXS91**	-	-	-
	379mm high	-	-	**EXS151**	**EXS151**	**EXS151**
MCCB Incomer padlocking device						
	250A	**W29370**	**W29370**	**W29370**	**W29370**	**W29370**
	400A	-	-	**HPALM**	**HPALM**	**HPALM**
Door lock		**QOKS1**	**QOKS1**	**QOKS1**	**QOKS1**	**QOKS1**
	2 Spare keys	**KQK33**	**KQK33**	**KQK33**	**KQK33**	**KQK33**
Terminal shields x 2		**W29323**	**LCA1**	**MCA1**	**FTS**	
Plug-on metering kit for incoming supply - occupies 4 modules						
	Analogue, voltmeter & ammeter	**MP250INS**	**MP250INS**	**MP400INS**	**MP400INS**	**MP400INS**
	* Digital, multi function meter	**MP250kW**	**MP250kW**	**MP400kW**	**MP400kW**	**MP400kW**
Weight in kg		46	76	44	74	100
Overall dimensions H x W x D		1041x508x184	1727x508x184	827x680x258	1170x680x258	1742x680x258
Fixing centres		800	1486	533	876	1448

* See page 4/16 for outgoing metering

Size 2 630A panelboards

- Degree of protection IP3X
- Door lock fitted as standard
- Ample cabling space
- Plated copper busbars 50kA for 1s
- Removable neutral link
- Hinged lift off cable way covers
- MCCB separation to form 3b Type 2 BSEN 60439-1
- Fully rated earth and neutral bars
- Removable top and bottom gland plates
- Simple ordering
- Maximum outgoers 250A

Step 1 Select panelboard required

6 triple pole outgoing ways 9+9	**MP63062**
10 triple pole outgoing ways 15+15	**MP630102**
14 triple pole outgoing ways 21+21	**MP630142**
18 triple pole outgoing ways 27+27	**MP630182**

Step 2 Select incoming device

250A 36kA triple pole MCCB	**SLA3250**
400A 36kA triple pole MCCB	**SLA3400**
400A automatic switch disconnector (isolator)	**SLA3000M**
630A 50kA triple pole MCCB	**SMA3630**
630A automatic switch disconnector (isolator)	**SMA30006M**
630A main lugs kit	**ML630**

Note. Any SLA MCCB or switch disconnector up to 400A and any SMA MCCB or switch disconnector up to 630A can be used as an alternative incoming device.

Step 3 Select outgoing devices

Single and double pole MCCB 's are phase dedicated. To obtain correct reference add suffix as below example: 40A SP MCCB to fit L3 will be SFA1040C

MCCB

16-100A 25kA	**Single Pole (1 Mod)**				**Double Pole (2 Mod)**		
		L1	**L2**	**L3**		**L1/L2**	**L2/L3**
	Suffix				**Suffix**		
16A	**SFA1016**	A	B	C	**SFA2016**	AB	BC
20A	**SFA1020**				**SFA2020**		
32A	**SFA1032**				**SFA2032**		
40A	**SFA1040**				**SFA2040**		
50A	**SFA1050**				**SFA2050**		
63A	**SFA1063**				**SFA2063**		
80A	**SFA1080**				**SFA2080**		
100A	**SFA1100**				**SFA2100**		

Triple pole (3 mods)				**Additional tunnel terminals Reference No.**	**Acceptable cable size**
	25kA	**36kA**	**50kA**		
16A	**CDAE34016**	**CNAE34016**	**CHAE34016**		
25A	**CDAE34025**	**CNAE34025**	**CHAE34025**		
32A	**CDAE34032**	**CNAE34032**	**CHAE34032**		
40A	**CDAE34040**	**CNAE34040**	**CHAE34040**	**W29242**	1.5-95mm
50A	**CDAE34050**	**CNAE34050**	**CHAE34050**		
63A	**CDAE34063**	**CNAE34063**	**CHAE34063**		
80A	**CDAE34080**	**CNAE34080**	**CHAE34080**		
100A	**CDAE34100**	**CNAE34100**	**CHAE34100**		
125A		**CNAE34125**	**CHAE34125**		
160A		**CNAE34160**	**CHAE34160**		
200A		**CNAE34200**	**CHAE34200**	**W29259**	95-185mm
250A		**CNAE34250**	**CHAE34250**	**W29259**	
160A electronic		**CNAE34160E20**		**W29242**	1.5-95mm
250A electronic		**CNAE34028E20**		**W29259**	95-185mm

Note: extension blanking plate **EKW** or **EKW4BL** must be fitted on devices 250A and below when fitted on the LHS. Triple Pole MCCB's are available in 3 different breaking capacities.

Step 4 Select metering

The I-Line Panelboard product range has being enhanced to include the facility to meter incoming and outgoing circuits. This enables contractors to easily and simply meet the requirements of Part L2 of the Building Regulations. These metering kits allow great flexibility in the choice of meter and also in the configuration of the boards.

A standard board can be adapted to meter the incoming supply and some or all of the outgoing circuits by the addition of three components.
These components are:
1 Metering kit. This contains a replacement wireway door with 96 sq cutouts for the number of outgoing ways of the board plus one. This additional cutout is to meter the incoming supply as required. Blanking plates are supplied for unused meter positions. One door kit per board.

A. Select metering kit

Size 2 630A Reference number	
MPMK206	6 way I-Line metering kit
MPMK210	10 way I-Line metering kit
MPMK214	14 way I-Line metering kit
MPMK218	18 way I-Line metering kit

B. Select metering CT set for each MCCB to be monitored

2 Current transformer kit. One kit for each circuit to be measured. The kit will comprise a three phase CT block, mounting plate and cable loom. The CT blocks fit to the breakers. The CT size and ratio matches the breaker.

Reference number		CT ratio
MPCT125	C frame breaker	125/5
MPCT150	C frame breaker	150/5
MPCT250	C frame breaker	250/5
MPCT400	L frame breaker	400/5
MPCT600	M & P frame breakers	600/5

C. Select PowerLogic meters for each circuit to be measured

Reference number	
PM700	Multi function PowerMeter.
PM700P	Multi function PowerMeter with pulse outputs
PM710	Multi function PowerMeter with Modbus RS485 output
PM750	Same functions as the PM710, plus two digital inputs, one digital output, alarms and signed power factor. The PM750 digital output can be simply configured as a kWh pulse output

Step 5 Select accessories

Panelboard		MP63062	MP630102	MP630142	MP630182
Blanking plates for all unused ways					
	Single pole	**HNM1BL**	**HNM1BL**	**HNM1BL**	**HNM1BL**
	Triple pole	**HNM4BL**	**HNM4BL**	**HNM4BL**	**HNM4BL**
Side extension box	550mm wide	**EXMS53**	**EXMS62**	**EXMS71**	**EXMS80**
Top / bottom extension box	226mm high	**EXS29**	**EXS29**	**EXS29**	**EXS29**
Corner unit, to complete enclosure when top/bottom and side extension are both fitted					
		MSIL636	**MSIL636**	**MSIL636**	**MSIL636**
Door lock					
	2 Spare keys	**KQK33**	**KQK33**	**KQK33**	**KQK33**
Terminal shields x 2		**W29323**	**LCA1**	**MCA1**	**FTS**
Integral metering kit for incoming supply					
	Analogue, voltmeter & ammeter				
	400A	**400INSKN**	**400INSKN**	**400INSKN**	**400INSKN**
	630A	**600INSKN**	**600INSKN**	**600INSKN**	**600INSKN**
	* Digital, multi function meter				
	400A	**400kW**	**400kW**	**400kW**	**400kW**
	630A	**630kW**	**630kW**	**630kW**	**630kW**
Weight in kg		**112**	**128**	**145**	**164**
Overall dimensions H x W x D		1350x1100x258	1579x1100x258	1807x1100x258	2036x1100x258

* See page 4/16 for outgoing metering

Size 3 800A panelboards

- Degree of protection IP3X
- Door lock fitted as standard
- Ample cabling space
- Plated copper busbars 50kA for 1s
- Removable neutral link
- Hinged lift off cable way covers
- MCCB separation to form 3b Type 2 BSEN 60439-1
- Fully rated earth and neutral bars
- Removable top and bottom gland plates
- Simple ordering

Step 1 Select panelboard required

Description	Modules LH+RH (1)	Reference number MCCB incomer Order separately
6 triple pole outgoing ways	9+9	**MP80063**
10 triple pole outgoing ways	15+15	**MP800103**
14 triple pole outgoing ways	21+21	**MP800143**
18 triple pole outgoing ways	27+27	**MP800183**

Notes: (1) Only left hand (LH) side of board accepts SLA or SMA.

Step 2 Select incoming device

630A	**Reference number**
630A 50kA triple pole MCCB	**SMA3630**
630A automatic switch disconnector (isolator)	**SMA30006M**
Lugs kit	**ML630**

800A	
800A 50kA triple pole MCCB	**SMA3800**
800A automatic switch disconnector (isolator)	**SMA3000M**
Lugs kit	**ML800**

Note: Any SMA MCCB or switch disconnector up to 800A can be used as an alternative incoming device

Step 3 Select outgoing devices

Single and double pole MCCB 's are phase dedicated. To obtain correct reference add suffix as below example: 40A SP MCCB to fit L3 will be SFA1040C

MCCB

16-100A 25kA	**Single Pole (1 Mod)**				**Double Pole (2 Mod)**		
		L1	**L2**	**L3**		**L1/L2**	**L2/L3**
	Suffix				**Suffix**		
16A	**SFA1016**	A	B	C	**SFA2016**	AB	BC
20A	**SFA1020**				**SFA2020**		
32A	**SFA1032**				**SFA2032**		
40A	**SFA1040**				**SFA2040**		
50A	**SFA1050**				**SFA2050**		
63A	**SFA1063**				**SFA2063**		
80A	**SFA1080**				**SFA2080**		
100A	**SFA1100**				**SFA2100**		

Step 3 Select outgoing devices cont.

Triple pole (3 mods)

	25kA	36kA	50kA	Additional tunnel terminals Reference No.	Acceptable cable size
16A	**CDAE34016**	**CNAE34016**	**CHAE34016**		
25A	**CDAE34025**	**CNAE34025**	**CHAE34025**		
32A	**CDAE34032**	**CNAE34032**	**CHAE34032**		
40A	**CDAE34040**	**CNAE34040**	**CHAE34040**	**W29242**	1.5-95mm
50A	**CDAE34050**	**CNAE34050**	**CHAE34050**		
63A	**CDAE34063**	**CNAE34063**	**CHAE34063**		
80A	**CDAE34080**	**CNAE34080**	**CHAE34080**		
100A	**CDAE34100**	**CNAE34100**	**CHAE34100**		
125A		**CNAE34125**	**CHAE34125**		
160A		**CNAE34160**	**CHAE34160**		
200A		**CNAE34200**	**CHAE34200**	**W29259**	95-185mm
250A		**CNAE34250**	**CHAE34250**	**W29259**	
160A electronic		**CNAE34160E20**		**W29242**	1.5-95mm
250A electronic		**CNAE34028E20**		**W29259**	95-185mm

Note: extension blanking plate **EKW** or **EKW4BL** must be fitted on devices 250A and below when fitted on the LHS. Triple Pole MCCB's are available in 3 different breaking capacities.

300/1250A*	36kA 4mods	50kA 6mods	10mods
300A	**SLA3300**	**SMA3300**	
350A	**SLA3350**	**SMA3350**	
400A	**SLA3400**	**SMA3400**	
450A		**SMA3450**	
500A		**SMA3500**	
630A		**SMA3630**	
700A		**SMA3700**	
800A		**SMA3800**	
900A			**SNA3900**
1000A			**SNA31000**
1250A			**SNA31250**

*Restricted to LHS of panelboard only

Fuse outgoers (can also be used along side MCCB outgoers)

32/160A Switch-disconnector fuse device 50kA*

			Mods 6 mods	Fuse fitted	BS88 fuse link
32A	Triple Pole	**PF32**	3	AAO32	A1,A2
63A		**PF63**	4	BAO63	A2, A3
100A		**PF100**	5	CEO100	A2,A3,A4 max dia 32mm
160A		**PF160**	5	DEO160	A2, A3, A4

* Restricted to LHS of panelboard only

Step 4 Select metering

The I-Line Panelboard product range has being enhanced to include the facility to meter incoming and outgoing circuits. This enables contractors to easily and simply meet the requirements of Part L2 of the Building Regulations. These metering kits allow great flexibility in the choice of meter and also in the configuration of the boards.

A standard board can be adapted to meter the incoming supply and some or all of the outgoing circuits by the addition of three components.
These components are:
1 Metering kit. This contains a replacement wireway door with 96 sq cutouts for the number of outgoing ways of the board plus one. This additional cutout is to meter the incoming supply as required. Blanking plates are supplied for unused meter positions. One door kit per board.

A. Select metering kit

Size 3 800A Reference number	
MPMK306	6 way I-Line metering kit
MPMK310	10 way I-Line metering kit
MPMK314	14 way I-Line metering kit
MPMK318	18 way I-Line metering kit

B. Select metering CT set for each MCCB to be monitored

2 Current transformer kit. One kit for each circuit to be measured. The kit will comprise a three phase CT block, mounting plate and cable loom. The CT blocks fit to the breakers. The CT size and ratio matches the breaker.

Reference number		CT ratio
MPCT125	C frame breaker	125/5
MPCT150	C frame breaker	150/5
MPCT250	C frame breaker	250/5
MPCT400	L frame breaker	400/5
MPCT600	M & P frame breakers	600/5
MPCT800	M & P frame breakers	800/5

C. Select PowerLogic meters for each circuit to be measured

Reference number	
PM700	Multi function PowerMeter.
PM700P	Multi function PowerMeter with pulse outputs
PM710	Multi function PowerMeter with Modbus RS485 output
PM750	Same functions as the PM710, plus two digital inputs, one digital output, alarms and signed power factor. The PM750 digital output can be simply configured as a kWh pulse output

Step 5 Select accessories

Panelboard		MP80063	MP800103	MP800143	MP800183
Blanking plates for all unused ways					
	Single pole	**HNM1BL**	**HNM1BL**	**HNM1BL**	**HNM1BL**
	Triple pole	**HNM4BL**	**HNM4BL**	**HNM4BL**	**HNM4BL**
Blanking plates for every way on L.H.S. of board when one or more PF devices fitted					
	Single pole	**HNF1BL**	**HNF1BL**	**HNF1BL**	**HNF1BL**
	Triple pole	**HNF4BL**	**HNF4BL**	**HNF4BL**	**HNF4BL**
Extension blanking plates					
	Single pole	**EKW1BL**	**EKW1BL**	**EKW1BL**	**EKW1BL**
	Triple pole	**EKW4BL**	**EKW4BL**	**EKW4BL**	**EKW4BL**
Side extension box	550mm wide	**EXMS62**	**EXMS71**	**EXMS80**	**EXMS89**
Top / bottom extension box	226mm high	**EXS39**	**EXS39**	**EXS39**	**EXS39**
Corner unit, to complete enclosure when top/bottom and side extension are both fitted		**MSIL636**	**MSIL636**	**MSIL636**	**MSIL636**
Plinth	305mm high	**PLN312**	**PLN312**	**PLN312**	**PLN312**
Door lock	2 Spare keys	**KQK33**	**KQK33**	**KQK33**	**KQK33**
Terminal shields x 2		**W29323**	**LCA1**	**MCA1**	**FTS**
Integral metering kit for incoming supply					
	Analogue, voltmeter & ammeter	**800INSKN**	**800INSKN**	**800INSKN**	**800INSKN**
	* Digital, multi function meter	**800kW**	**800kW**	**800kW**	**800kW**
Weight in kg		**160**	**185**	**195**	**210**
Overall dimensions H x W x D		1579x1300x258	1807x1300x258	2036x1300x258	2265x1300x258
Plinth dimensions H x W x D		360x1220x258	360x1220x258	360x1220x258	360x1220x258

* See page 4/16 for outgoing meters

Size 4 1600 panelboards

The Size 4 I-Line Panelboards, having ratings of 1600A & 2000A have been totally redesigned to meet the ever changing requirements of the market. Now offering up to 26 – 250A outgoing ways (78 modules).
The boards have main incoming breakers with the latest technology to ensure full discrimination with the outgoing breakers. As standard, the incoming circuit is fitted with a PowerLogic multi-function meter type PM750. Facilities are provided to enable customers to meet the metering requirements of Part L of the Building Regulations on the outgoing circuits. The base unit consists of the incoming section and a right hand side outgoing section. This outgoing section is able to accept up to 13 – 250A TP breakers or any combination of SFA, C frame, SLA, SMA and SNA breakers up to 39 modules. All breakers may be fitted in any position.
A side extension cubicle, supplied separately, is recommended to give adequate space for the termination of the outgoing cables. Top and bottom cable entry is possible.

Technical Date

- Manufactured and tested to BSEN60439-1
- Busbars rated at 1600 / 2000A at 415V 50Hz
- Short circuit withstand 50kA 1s
- Rigid modular framework construction with removable side, rear and front covers
- Steelwork finished in polyester epoxy powder, cream colour RAL9001
- Degree of protection: IP30
- Degree of protection against mechanical impacts: IK07 minimum
- The multi-function meter in the incoming section is a Square D PM700P Power Meter with pulse output for kWh & kVArh
- The meter is factory set up for <480V 3ph 4w 50Hz supply & for the installed CTs

Step 1 Select panelboard required

Main boards - 13TP ways (39 mods.)	
MP1600134	1600A board for bottom entry main incoming supply
MP1600134T	1600A board for top entry main incoming supply

Extension boards - to increase outgoing TP ways to 26 in total	
MP1600EX134	Bottom entry extension panel 1600A 13 way for MP1600134
MP1600EX134T	Top entry extension panel 1600A 13 way for MP1600134T

Step 2 Select incoming device

The recommended incomer is a MCCB fitted with a Micrologic 5.0 trip unit. This device, when correctly set up, will provide full discrimination with the outgoing breakers. Alternative incomers are MCCBs with Micrologic 2.0 which gives less adjustment. A switch disconnector may be fitted if overcurrent protection is provided upstream.

Incoming devices rating amps	**Reference numbers MCCB with Micrologic 5.0**	**MCCB with Micrologic 5.0**	**Switch disconnector**
800	**PNFE36080U33R**	**PNFE36080U32R**	**PNFE36000S80**
1000	**PNFE36100U33R**	**PNFE36100U32R**	**PNFE36000S10**
1250	**PNFE36125U33R**	**PNFE36125U32R**	**PNFE36000S12**
1600	**PNFE36160U33R**	**PNFE36160U32R**	**PNFE36000S16**

These boards are supplied with the incoming breaker RNFE36200U33R fitted. This breaker is complete with a Micrologic 5.0 trip unit.

Reference number - 13TP ways (39 mods.)	
MP2000134	Size 4 2000A board, 13 way, for bottom entry main incoming supply
MP2000134T	Size 4 2000A board, 13 way, for top entry main incoming supply

Extension boards - to increase outgoing TP ways to 26 in total	
MP2000EX134	Bottom entry extension panel 2000A 13 way for MP2000134
MP2000EX134T	Top entry extension panel 2000A 13 way for MP2000134T
Cabling cubicles	For use with 1600A and 2000A boards

A side extension cubicle is strongly recommended for easy termination of the outgoing cables. Two versions are available, both 400mm deep and 400mm wide

EXMS400	Cubicle with plain front lockable door
EXMS401M	Cubicle with front lockable door able to accept up to 12 off – 96 sq DIN case meters

Being modular, more than one extension cubicle can be fitted if additional space is required for cabling or for mounting other equipment

Step 3 Select outgoing devices

Single and double pole MCCB 's are phase dedicated. To obtain correct reference add suffix as below example: 40A SP MCCB to fit L3 will be SFA1040C

MCCB

16-100A 25kA	Single Pole (1 Mod)				Double Pole (2 Mod)		
		L1	L2	L3		L1/L2	L2/L3
		Suffix				Suffix	
16A	**SFA1016**	A	B	C	**SFA2016**	AB	BC
20A	**SFA1020**				**SFA2020**		
32A	**SFA1032**				**SFA2032**		
40A	**SFA1040**				**SFA2040**		
50A	**SFA1050**				**SFA2050**		
63A	**SFA1063**				**SFA2063**		
80A	**SFA1080**				**SFA2080**		
100A	**SFA1100**				**SFA2100**		

Triple pole (3 mods)				Additional tunnel terminals Reference No.	Acceptable cable size
	25kA	36kA	50kA		
16A	**CDAE34016**	**CNAE34016**	**CHAE34016**		
25A	**CDAE34025**	**CNAE34025**	**CHAE34025**		
32A	**CDAE34032**	**CNAE34032**	**CHAE34032**		
40A	**CDAE34040**	**CNAE34040**	**CHAE34040**	**W29242**	1.5-95mm
50A	**CDAE34050**	**CNAE34050**	**CHAE34050**		
63A	**CDAE34063**	**CNAE34063**	**CHAE34063**		
80A	**CDAE34080**	**CNAE34080**	**CHAE34080**		
100A	**CDAE34100**	**CNAE34100**	**CHAE34100**		
125A		**CNAE34125**	**CHAE34125**		
160A		**CNAE34160**	**CHAE34160**		
200A		**CNAE34200**	**CHAE34200**	**W29259**	95-185mm
250A		**CNAE34250**	**CHAE34250**	**W29259**	
160A electronic		**CNAE34160E20**		**W29242**	1.5-95mm
250A electronic		**CNAE34028E20**		**W29259**	95-185mm

Note: extension blanking plate **EKW** or **EKW4BL** must be fitted on devices 250A and below when fitted on the LHS. Triple Pole MCCB's are available in 3 different breaking capacities.

300/1250A*	36kA 4mods	50kA 6mods	10mods
300A	**SLA3300**	**SMA3300**	
350A	**SLA3350**	**SMA3350**	
400A	**SLA3400**	**SMA3400**	
450A		**SMA3450**	
500A		**SMA3500**	
630A		**SMA3630**	
700A		**SMA3700**	
800A		**SMA3800**	
900A			**SNA3900**
1000A			**SNA31000**
1250A			**SNA31250**

*Restricted to LHS of panelboard only

Fuse outgoers (can also be used along side MCCB outgoers)

32/160A Switch-disconnector fuse device 50kA*

			Mods 6 mods	Fuse fitted	BS88 fuse link
32A	Triple Pole	**PF32**	3	AAO32	A1,A2
63A		**PF63**	4	BAO63	A2, A3
100A		**PF100**	5	CEO100	A2,A3,A4 max dia 32mm
160A		**PF160**	5	DEO160	A2, A3, A4

* Restricted to LHS of panelboard only

Step 4 Select metering

Incoming metering
As standard, the incoming circuit is fitted with a PowerLogic multi-function meter type PM750

Outgoing metering
To meet the metering requirements of Part L of the Building Regulations on the outgoing circuits

A. Select metering cubicle

Reference number	
EXMS401M	Cubicle with front lockable door able to accept up to 12 off – 96 sq DIN case meters

B. Select metering CT set for each MCCB to be monitored

2 Current transformer kit. One kit for each circuit to be measured. The kit will comprise a three phase CT block, mounting plate and cable loom. The CT blocks fit to the breakers. The CT size and ratio matches the breaker.

Reference number		CT ratio
MPCT125	C frame breaker	125/5
MPCT150	C frame breaker	150/5
MPCT250	C frame breaker	250/5
MPCT400	L frame breaker	400/5
MPCT600	M & P frame breakers	600/5
MPCT800	M & P frame breakers	800/5
MPCT1000	N & R frame breakers	1000/5
MPCT1250	N & R frame breakers	1250/5

C. Select PowerLogic meters for each circuit to be measured

Reference number	
PM700	Multi function PowerMeter.
PM700P	Multi function PowerMeter with pulse outputs
PM710	Multi function PowerMeter with Modbus RS485 output
PM750	Same functions as the PM710, plus two digital inputs, one digital output, alarms and signed power factor. The PM750 digital output can be simply configured as a kWh pulse output

Step 5 Select accessories

Panelboard		MP1600134	MP2000134
Blanking plates for all unused ways			
	Single pole	**HNM1BL**	**HNM1BL**
	Triple pole	**HNM4BL**	**HNM4BL**
Extension blanking plates (1)			
	Single pole	**EKW1BL**	**EKW1BL**
	Triple pole	**EKW4BL**	**EKW4BL**

Meter Blanking Plates	**03908**	Cream 96sq blanking plate

Notes:
For spare ways - HNM and EKW are required
For 250A MCCB and below - EKW only is required
For 300A MCCB and above - no blanks are required

Blanking plates

Suitable for all sizes of panelboard, blanking plates must be fitted in all unoccupied outgoing ways to maintain appropriate busbar shrouding.

Panelboards are supplied without blanking plates.

1 module way:	**HNM1BL** pack quantity 1
3 module way:	**HNM4BL** pack quantity 1

Side extension boxes

Supplied with hinged door, side extension boxes may be used to provide additional wiring space or fitting of control equipment or Qwikline II MCB distribution boards.

Side extension boxes can be fitted to either side of the panelboard and may be coupled together to form larger units.

Box width
250A boards: 508mm.
400A, 630A & 800A boards: 550mm.

Top/bottom extension boxes

Supplied with a flat front plate the extension box provides additional cable spreading space.

Box heights
250A, 630A, 800A: 226mm.
400A: 380mm.

Corner units are available to ‘square off’ a board when a side and a top/bottom extension box are fitted.

Plinth

Supplied with a removable flat front plate the plinth provides additional floor support to the wall mounting size 3 panelboard height 305mm.

Available on size 3 only	**PLN312**

Door lock

All keys are identical.
For size 1 panelboard, field installable.

Door lock	**QOKS1** supplied with 2 keys.

Panelboard sizes 2, 3 and 4 are supplied with door locks as standard.
If replacement locks are required, order reference **QOKSB**. Set of 2 spare keys KQK 33

Termination bars

Solid brass terminal bars provide tunnel terminals. Main neutral and earth bars are pre-drilled to accept the termination bars indicated. Bars suitable for size 1, 2 and 3.

Reference number	Number of ways	Conductor size
NE916	9	25
NE1816	18	25
NE950	9	50
NE7150	7	150
NE13150	13	150

MCCB locking devices

Provide facilities for padlocking MCCB's.

Frame	Reference number	Facility	Padlocks
SFA	**HPAFK**	On/Off	1
C 3 pole	**W29370**	Off	3
SLA/SMA	**HPALM**	Off	1
SLA/SMA	**HPAXLM***	Off	1
SNA	**HPANE**	Off	1

* Use with handle extension

Extension blanking plates

To shroud left hand side of busbar stack on size 3 and 4 boards only, when fitted with CD, CN, CH and SF frame circuit breakers and HNM blanking plates.

	Reference number	
1 module way	**EKW1BL**	Pack quantity 1
3 module way	**EKW4BL**	Pack quantity 1

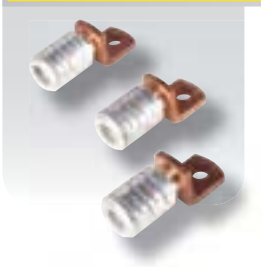
Cable clamp terminals

Triple pole CD, CN and CH MCCB's are supplied with bolt connections. Field fitted terminals.

	Reference number	
16- 160A	**W29242**	1.5 - 95mm²
200- 250A	**W29259**	95 - 185mm²

Supplied in sets of 3

Crimp cable lugs



Special lugs for fitting oversize cables to CD, CN and CH MCCB's

Reference number		
W29252	120mm²	Copper
W29253	150mm²	Copper
W29254	185mm²	Copper
W29504	150mm²	Aluminium
W29506	185mm²	Aluminium

Supplied in sets of 3. Required for oversized cables only

Terminal shields

	Reference number	Quantity
CD, CN and CH short (15mm)	**W29321**	2
CD, CN and CH long (80mm)	**W29323**	2
SLA	**LCA1**	2
SMA	**MCA1**	2
SFA single pole	**FTS**	1

Use short terminal shields with tunnel terminals.
Use long terminal shields with crimp terminals.

Handle extension

For use in providing extra leverage when operating larger frame I-Line MCCB's.

	Reference number
SLA frame	**AHEXLI**
SM, SNA frame	**MAHEX**

Terminal extension pads

3 plated copper pads to which crimp type lugs may be fastened (unshrouded).

	Reference number
C frame	**W31563**
SLA frame	**LATK3**
SMA frame	**MATK3**

The pads require an air gap of 25mm between them and adjacent MCCB's the use of an HNM1BL either side of the MCCB will provide the necessary spacing.

Shunt trip (ST)

Energisation of shunt trip coil will initiate MCCB tripping.

CD, CN and CH	Connection terminals accept wires up to 1.5mm²
SL, SM, SN	Supplied with 1mm² flying leads

Field installable.

Under voltage release (UVR)

The coil must be energised before the MCCB can be switched on.

CD, CN and CH	Connection terminals accept wires up to 1.5mm²
SL, SM, SN	Supplied with 1mm² flying leads

Field installable.

Auxiliary switches (aux)

Change over contacts indicate MCCB contact position.
For CD, CN and CH may be used as an alarm switch.

CD, CN and CH	Connection terminals accept wires up to 1.5mm²
SL, SM, SN	Supplied with 1mm² flying leads

Field installable.

4

Order references

Description	CD-CN-CH	SLA	SMA	SNA	SPA
Shunt trip 110/130V 50Hz	**W29386**	-	-	-	-
Shunt trip 200/240V 50Hz	**W29387**	-	-	-	-
Shunt trip 120/240V 50Hz	-	**LA11021**	**MA11021**	**NA11021**	**PA11021**
Shunt trip 277/480V 50Hz	-	**LA11037**	**MA11037**	**NA11037**	**PA11086**
Shunt trip 24V dc	**W29390**	**LA11027**	**MA11027**	**NA11027**	**PA11027**
Under voltage release 110/130V 50Hz	**W29406**	**LA11121**	**MA11121**	**NA11121**	**PA11101**
Under voltage release 200/240V 50Hz	**W29407**	**LA11124**	**MA11124**	**NA11124**	**PA11104**
Under voltage release 24V dc	**W29410**	**LA11127**	**MA11127**	**NA11127**	-
Auxiliary switch 1 change over contact	**W29450**	**LA11212**	**MA11212**	**NA11212**	**PA11212**
Auxiliary switch 2 change over contact	**W29450 x 2**	**LA11352**	**MA11352**	-	**PA11352**

Lug unit

To sub-feed power from, or into the busbar stack. Current rating of plug-on lug must be equal to or greater than the incoming protective device.

Reference number reference	Rating	Modules	Terminal capacity mm²
SL100	100A	3	50
SL225	225A	3	185
SL400	400A	4	300
SL800	800A	6	3 x 240

Metering facilities

The I-Line Panelboard product range has being enhanced to include the facility to meter incoming and outgoing circuits. This enables contractors to easily and simply meet the requirements of Part L2 of the Building Regulations. These metering kits allow great flexibility in the choice of meter and also in the configuration of the boards. The metering arrangement varies depending on the size of board.

For the Size 1 250A board there is an extension box which may be fitted to the top or bottom of a board to meter the incoming supply.

For Size 1 400A, Size 2 and Size 3 boards components are provided to meter some or all outgoing ways and / or the incoming supply.

Currently most boards have incoming metering kits. These new kits may be used as well as or instead of these existing arrangements.

Size 1 250A boards
This metering kit is for the incoming supply to the board. It comprises an extension box that can be fitted to the top or the bottom of a standard board. This box contains a three-phase block current transformer, fuses for the voltage supply and a PM700P multi-function meter. Because the main incoming cables pass through this enclosure it is not suitable for a retrofit. The kit comes complete: no other parts are required to install this metering kit.

Size 1
Reference number **MPME2501** 250A top/bottom metering extension box

Size 1, Size 2 and size 3 panelboards
A standard board can be adapted to meter the incoming supply and some or all of the outgoing circuits by the addition of three components.

These components are
1 Metering kit. This contains a replacement wireway door with 96 sq cutouts for the number of outgoing ways of the board plus one. This additional cutout is to meter the incoming supply as required. Blanking plates are supplied for unused meter positions. One door kit per board.

2 Current transformer kit. One kit for each circuit to be measured. The kit will comprise a three phase CT block, mounting plate and cable loom. The CT blocks fit to the breakers. The CT size and ratio matches the breaker.

3 The multi-function meter for each circuit to be measured. The meter is selected from the Square D Power Meter range. See below for details.

Size 1 400A

Reference number	
MPMK104	4 way I-Line metering kit
MPMK107	7 way I-Line metering kit
MPMK112	12 way I-Line metering kit

Size 2 630

Reference number	
MPMK206	6 way I-Line metering kit
MPMK210	10 way I-Line metering kit
MPMK214	14 way I-Line metering kit
MPMK218	18 way I-Line metering kit

Size 3 800

Reference number	
MPMK306	6 way I-Line metering kit
MPMK310	10 way I-Line metering kit
MPMK314	14 way I-Line metering kit
MPMK318	18 way I-Line metering kit

Size 4 1600/2000
As standard, the incoming circuit is fitted with a PowerLogic multi-function meter type PM750. To meet the metering requirements of Part L of the Building Regulations on the outgoing circuits

Reference number	
EXMS401M	Cubicle with front lockable door able to accept up to 12 - 96 sq DIN case meters

Metering CT set for each MCCB to be monitored

Reference number		CT ratio
MPCT125	C frame breaker	125/5
MPCT150	C frame breaker	150/5
MPCT250	C frame breaker	250/5
MPCT400	L frame breaker	400/5
MPCT600	M & P frame breakers	600/5
MPCT800	M & P frame breakers	800/5
MPCT1000	N & R frame breakers	1000/5
MPCT1250	N & R frame breakers	1250/5

Meter blanking plates

Reference number	
3908	Cream 96sq blanking plate

PowerLogic meters

Reference number	
PM700	Multi function PowerMeter.
PM700P	Multi function PowerMeter with pulse outputs.
PM710	Multi function PowerMeter with Modbus RS485 output
PM750	Multi function PowerMeter with Modbus RS485 and pulse outputs

I-Line fuse switch panelboards

Size 1 400A

Step 1 Select panelboard required

Reference number	Outgoing modules	Max outgoing TP fuse switch units 63A	100/160A	250A
FP40061	30	7	6	4

Step 2 Select incoming device

Reference number	Module ways	Max current rating	Max fuse size	Terminal stud
FP100	5	100	A4	6mm
FP160	5	160	B2	M8
FP250	7	250	B3	M10
FP400	7	400	B4	M10
FPSL160*	5	160	Link	M8
FPSL400*	7	400	Link	M10

* Lug units - not fitted with circuit protection or isolating device
All terminals accept cable lugs up to 25mm wide

Step 3 Select outgoing devices

Reference number	Module ways	Max current rating	Fuse ref	Terminal stud	Max lug width (mm)
FP32	4	32	A2	M4	8.5
FP63	4	63	A3	M6	7
FP100	5	100	A4	6mm	25
FP160	5	160	B2	M8	25
FP250	7	250	B3	M10	25
FP400	7	400	B4	M10	25

Step 4 Select accessories

Catalogue number	Description	Dimensions (mm) Height	Width	Depth	Weight (kg)
EXS3811	Cable spreader box	381	680	258	14
EXMS1960	Side extension box 30 mod	1960	550	258	60

■ Cable spreader box to assist in easier termination of larger feeder cables. May be used on the top or bottom of the fuse switch panelboard
■ Side extension box with steel covers may be used to accommodate auxiliary equipment

I-Line fuse switch panelboards

Size 2 630A

Step 1 Select panelboard with factory fitted incomer

Reference number	Outgoing modules LH	RH	Max outgoing TP fuse switch units 63A	100/160A	250A
Main switch					
FPS63062	15	15	6	6	4
FPS630102	25	25	12	10	6
FPS630142	35	35	16	14	10
Main fuse switch					
FPF63062	15	15	6	6	4
FPF630102	25	25	12	10	6
FPF630142	35	35	16	14	10
Main Lugs					
FPL63062	15	15	6	6	4
FPL630102	25	25	12	10	6
FPL630142	35	35	16	14	10

Step 2 Select outgoing switch disconnector

Reference number	Module ways 100/160A	Max current rating A 250A	Fuse reference
FP32	4	32	A2
FP63	4	63	A3
FP100	5	100	A4
FP160	5	160	B2
FP250	7	250	B3
FP400	7	400	B4

Step 3 Select accessories

Catalogue number	Description	Dimensions (mm) Height	Width	Depth	Weight (kg)
EXS3812	Cable spreader box	381	1100	258	17
FP630INS2	Instrumentation kit 600:5	236	543	187	8.2
EXMS1579	Side extension box 6 way	1579	550	258	54
EXMS1960	Side extension box 10 way	1960	550	258	60
EXMS2341	Side extension box 14 way	2341	550	258	82

■ Cable spreader box to assist in easier termination of larger feeder cubicles. May be used on the top or bottom of the fuse switch panelboard
■ Instrumentation kit field installable, comprising of three ammeters and CT's, voltmeter and selector switch and phase indication lamps
■ Side extension box with steel covers may be used to accommodate auxiliary equipment and could provide extra cabling space

Main incoming terminals

Reference number	Terminal stud
FPS	M10, 25mm pad width
FPF	M10, 38mm pad width
FPL	M10, 38mm pad width

I-Line fuse switch panelboards

Size 3 800A

Step 1 Select panelboard with factory fitted incomer

Reference number	Outgoing modules LH	RH	Max outgoing TP fuse switch units 63A	100/160A	250A
Main switch					
FPS80063	15	15	6	6	4
FPS800103	25	25	12	10	6
FPS800143	35	35	16	14	10
Main fuse switch					
FPF80063	15	15	6	6	4
FPF800103	25	25	12	10	6
FPF800143	35	35	16	14	10
Main Lugs					
FPL80063	15	15	6	6	4
FPL800103	25	25	12	10	6
FPL800143	35	35	16	14	10

Step 2 Select outgoing switch disconnector fuse

Reference number	Module ways 100/160A	Max current rating A 250A	Fuse reference
FP32	4	32	A2
FP63	4	63	A3
FP100	5	100	A4
FP160	5	160	B2
FP250	7	250	B3
FP400	7	400	B4

Step 3 Select accessories

Reference number	Description	Dimensions (mm) Height	Width	Depth	Weight (kg)
EXS3813	Cable spreader box	381	1300	258	21
FP800INS3	Instrumentation kit 800:5	236	543	187	8.2
EXMS1579	Side extension box 15 way	1579	550	258	54
EXMS1960	Side extension box 25 way	1960	550	258	60
EXMS2341	Side extension box 35 way	2341	550	258	82

■ Cable spreader box to assist in easier termination of larger feeder cables. May be used on the top or bottom of the fuse panelboard
■ Instrumentation kit field installable, comprising of three ammeters and CT's, voltmeter and selector switch and phase indication lamps
■ Side extension box with steel covers may be used to accommodate auxiliary equipment

Selection

A new range of enclosed circuit breakers suitable for commercial and industrial applications.

Benefits

- Easy to mount heavy duty enclosure
- Simple breaker mounting
- Breakers provide overcurrent protection and isolation feature
- Easy selection of breaker and enclosure
- Enclosures for oversize cables
- All accessories are user installable
- Wide range of termination accessories

Features

- Complies with BS EN 60947-2
- IP42 enclosure
- Ample cable spreading space
- Heavy duty removable gland plates
- Positive contact indication - clear and reliable indication of OFF
- AC23A switching capacity for the control of motor circuits and other highly inductive loads
- Excellent side and front access for cabling
- Disconnectable neutral link

Use the information in table A to determine which enclosure you require
Use table B to choose which combination of breaker and enclosure you require

Table A - Enclosures

Ratings from 16A to 250A	Ratings up to 630A
Small - suitable for cables up to 50mm²	**Small** - suitable for cables up to 120mm²
SDENC1 420H x 230W x 145D	**SDEND1** 700H x 356W x 169D
Large - suitable for cables up to 120mm²	**Large** - suitable for cables up to 300mm²
SDENC1 620H x 230W x 145D	**SDEND1** 940H x 356W x 169D

Table B

Select		One circuit breaker			And	One enclosure	
Breaking capacity at 415V		MCCB references				Large	Small
Rating	Overload adjustment range	25kA	36kA	50kA			
16	13-16	**CDLE34016**		**CHLE34016**	**Choose the correct enclosure by referring to Table A**	**SDENC2**	**SDENC1**
25	20-25	**CDLE34025**		**CHLE34025**		**SDENC2**	**SDENC1**
32	26-32	**CDLE34032**		**CHLE34032**		**SDENC2**	**SDENC1**
40	32-40	**CDLE34040**		**CHLE34040**		**SDENC2**	**SDENC1**
50	40-50	**CDLE34050**		**CHLE34050**		**SDENC2**	**SDENC1**
63	50-63	**CDLE34063**		**CHLE34063**		**SDENC2**	**SDENC1**
80	64-80	**CDLE34080**		**CHLE34080**		**SDENC2**	**SDENC1**
100	80-100	**CDLE34100**		**CHLE34100**		**SDENC2**	**SDENC1**
125	100-125		**CNLE34125**	**CHLE34125**		**SDENC2**	**SDENC1**
160	128-160		**CNLE34160**	**CHLE34160**		**SDENC2**	**SDENC1**
200	160-200		**CNLE34200**	**CHLE34200**		**SDENC2**	**SDENC1**
250	200-250		**CNLE34250**	**CHLE34250**		**SDENC2**	**SDENC1**
400	160-400			**DHLE34400**		**SDENC2**	**SDENC1**
630	252-630			**DHLE34630**		**SDENC2**	**SDENC1**
Switch disconnectors							
100			**CNLE34000S10**			**SDENC2**	**SDENC1**
160			**CNLE34000S15**			**SDENC2**	**SDENC1**
250			**CNLE34000S25**			**SDENC2**	**SDENC1**
400			**DNLE34000S40**			**SDENC2**	**SDENC1**
630			**DNLE34000S63**			**SDENC2**	**SDENC1**

Terminal sizes

Breaker rating	Terminal bolt	Torque Nm	Tool	Maximum (lug width mm)
100A	M6*	10	Cross head screw	25
160A	M8	15	6mm hexagon key	25
250A	M8	15	6mm hexagon key	25
400A	M10	50	17mm hexagon	32
630A	M10	50	17mm hexagon	32

Note: The neutral link has same terminal arrangement as the breaker.
* Except 100A where neutral has M8 bolt requiring 6mm hex key.

Accessories

For C frame breakers, all ratings up to 250A

Cable terminations	
W29242	Clamp terminals for 1.5 - 95mm² (160A maximum), set of 3
W29259	Clamp terminals for 1.5 - 185mm², set of 3
W29252	Crimp cable lugs for 120mm² Cu, set of 3
W29253	Crimp cable lugs for 150mm² Cu, set of 3
W29254	Crimp cable lugs for 185mm² Cu, set of 3
W29504	Crimp cable lugs for 150mm² Al, set of 3
W29506	Crimp cable lugs for 185mm² Al, set of 3
W29329	Phase barriers, set of 6
Terminal shields	
W29320	Pair single pole terminal shields for neutral link
W29323	Pair terminal shields for 3 pole breaker
Electrical auxiliaries	
W29450	Auxiliary switch (maximum 2) or alarm switch
W29387	Shunt trip 220/240V AC
W29407	Undervoltage release 220/240V AC
Handles and locking arrangements	
W29337	Rotary handle, black
W29339	Rotary handle, red/yellow
W29371	Fixed type padlocking device
W29370	Removable padlock device

For D frame breakers, all ratings up to 630A

Cable terminations	
W32479	Clamp terminals for 35 - 300mm², set of 3
W32481	Clamp terminals for 2 x 95 - 240mm², set of 3
W32500	Crimp cable lugs for 240mm² Cu, set of 3
W32502	Crimp cable lugs for 300mm² Cu, set of 3
W32504	Crimp cable lugs for 240mm² Al, set of 3
W32506	Crimp cable lugs for 300mm² Al, set of 3
W32570	Phase barriers, set of 6
Terminal shields	
W32564	Pair terminal shields for 3 pole breaker
Electrical auxiliaries	
W29450	Auxiliary switch (maximum 3) or alarm switch
W29387	Shunt trip 220/240V AC
W29407	Undervoltage release 220/240V AC
Handles and locking arrangements	
W32597	Rotary handle, black
W32599	Rotary handle, red/yellow
W32631	Fixed type padlocking device
W29370	Removable padlock device

Section 05
Contents

Switch and Fusegear

Fully rated to meet the requirements of AC23 up to 100A, Twinbreak eliminates the need to have a complete knowledge of the circuit and its application before selecting a device.

Twinbreak is available as a switch disconnector fuse or switch disconnector. It is supplied complete for individual mounting, mounting on cable trunking or for mounting on the Twinbreak range of busbar chambers.

- Units tested and constructed to BSEN60947-3
- Live terminal barriers
- Clear visual indication of the contact position
- Door interlock preventing the door being opened with the switch on
- Door interlock has integral defeat mechanism
- Operating handle is padlockable in the ON or OFF position (padlock shackle 5-10mm dia.)
- Operating handle stays in position once the door is opened
- Supplied with fuses fitted
- Fully removable single piece switch unit, for ease of installation
- ASTA certified to AC23B up to 100A (AC22B 125A & 160A)
- ASTA certified short circuit rating of 50kA and 12 x rated current for 1 second
- IP41 degree of protection
- Fully removable cross rails 100A and above for ease of cabling as cables can be laid in
- Fully removable gland plate allows the unit to be directly connected to 3” cable trunking
- Positive contact indication
- Easy access to fuses
- Cable knockouts provided as standard
- Lift off door provides greater access to switch units, for ease of cabling and for installation
- The door opens within its own overall dimensions allowing Twinbreak units to be mounted adjacent to each other
- Keyhole slots on the enclosure base allow ease of installation
- Fully shrouded operating mechanism ensure cables etc. do not interfere with the switch operation
- Neutral terminal block with link fitted as standard
- Earthing kit supplied as standard

Switch disconnector fuse

Application
Heavy duty fuse products for use in commercial and industrial environments, providing isolation and traditional fuse protection for electrical loads.

Features
- Rated for 240/415V 50/60Hz
- Ratings 20A, 32A, 63A, 100A, SP&SwN, TP&N
- Utilisation category AC20A, AC21A, AC22A, AC23B at rated current
- Degree of protection IP41
- Handle position provides positive contact indication
- Door handle prevents door being opened when switch is ON or padlocked
- Handle padlockable in ON and OFF positions
- Fuse links supplied as standard

Construction
- Live terminals fully shrouded
- Door interlock has integral defeat mechanism allowing door to be opened without switching OFF. This feature is not operable when the handle is padlocked
- Removable gland plates with cable knockouts
- Lift off door provides greater access for installation and cabling
- Door opens within the width of the unit allowing units to be mounted adjacent
- Neutral has disconnectable link and capacity for 3 outgoing cables
- Keyhole slots in the enclosure base allow easy installation
- Earthing kit provided as standard
- Easy access to fuse links
- Steelwork finished in polyester epoxy powder

Technical data

Standard	BS EN 60947-3			
Rated operational voltage	415V 50/60Hz			
Rating	20A	32A	63A	100A
Rated current at 400C, A	20	32	63	100
Rated impulse voltage	6kV	6kV	6kV	6kV
Rated short time withstand Icw, A		416	416	756
1300				
Rated short circuit making capacity Icm	1.35kA	1.35kA	1.35kA	3.5kA
Rated short circuit breaking capacity Icn	50kA	50kA	50kA	50kA
Utilisation category at rated current		AC-20A/ 21A/ 22A/ 23B		
Kilowatt rating	11kW	15kW	30kW	55kW
Cable size, maximum mm^2	$10mm^2$	$10mm^2$	$25mm^2$	$50mm^2$

Reference numbers

Rating AC21/22/23	Single pole & switched neutral		Three pole with neutral link	
	Switch disconnector fuse	Switch disconnector	Switch disconnector fuse	Switch disconnector
20A	**SD202SFK**	**SD202SW**	**SD203SFK**	**SD203SW**
32A	**SD322SFK**	**SD322SW**	**SD323SFK**	**SD323SW**
63A	**SD632SFK**	**SD632SW**	**SD633SFK**	**SD633SW**
100A	**SD1002SFK**	**SD1002SW**	**SD1003SFK**	**SD1003SW**
125A				**SD1253SW**
160A				**SD1603SW**

Busbar chambers

Step 1
Select Twinbreak units required. If a 125 or 160A unit is fitted the rating of the adjacent units cannot exceed 63A.

Step 2
Select appropriate busbar chamber.

Current ratings Amps	Number of units 4	Number of units 6
160	**SBC106**	**SBC109**

SBC106 is supplied complete with 4 x TBCKIT.
SBC109 is supplied complete with 6 x TBCKIT.

Fuse switch disconnector

Application
Heavy duty fuse products for use in commercial and industrial environments, providing isolation and traditional fuse protection for electrical loads.

Features
- Rated for 240/415V 50/60Hz
- Ratings 100A, 160A, 200A, 250A, 315A, 400A, 500A, 630A TP&N
- Utilisation category AC20A, AC21A, AC22A, AC23B at rated current, AC23A for ratings up to 160A
- Handle position provides positive contact indication
- Door handle prevents door being opened when switch is ON or padlocked
- Handle padlockable in ON and OFF positions
- Device may be fed to either top or bottom terminals
- Fuse links or copper links supplied as standard

Construction
- All terminals are fully shrouded
- Quick make and break silver plated contacts
- Door interlock has defeat mechanism allowing switch to be closed with door open
- Removable plain gland plates are fitted at top and bottom
- Cabling space may be increased by the addition of the cable boxes
- Lift off door provides greater access for installation and cabling
- Door opens within the width of the unit allowing units to be mounted adjacent
- Neutral is fitted with disconnectable link
- Earthing kit provided as standard
- Easy access to fuse links
- Removable cross rails allow cables to be laid in easily
- Direct front access to terminals without dismantling the mechanism
- Clear shrouds allow easy access for inspection and visual indication of contact position
- Steelwork finished in polyester epoxy powder

Reference numbers

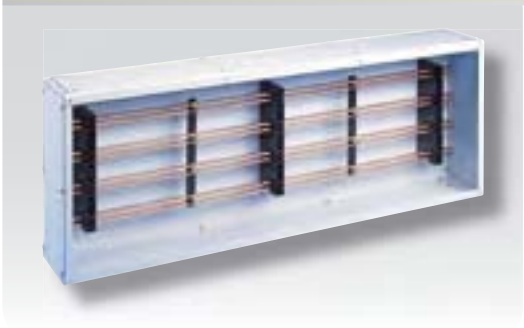
Rating AC21/22/23	Single pole & switched neutral		Three pole with neutral link			
	Switch disconnector fuse	Switch disconnector	Switch disconnector fuse	Switch disconnector	Recommended cable box	Spare links
63A	**SQB0632K**	**SQB0632L**	**SQB0633K**	**SQB0633L**		
100A	**SQB1002K**	**SQB1002L**	**SQB1003K**	**SQB1003L**	**SQBX100**	**XCL160**
160A	**SQB1602K**	**SQB1602L**	**SQB1603K**	**SQB1603L**	**SQBX160**	
200A	**SQB2002K**	**SQB2002L**	**SQB2003K**			
250A	**SQB2502K**	**SQB2502L**	**SQB2503K**	**SQB2503L**	**SQBX250**	**XCL250**
315A			**SQB3153K**			
400A			**SQB4003K**	**SQB4003L**	**SQBX500**	**XCL400**
500A			**SQB5003K**	**SQB5003L**		**XCL630**
630A			**SQB6303K**	**SQB6303L**	**SQBX630**	
800A				**SQB8003L**		**XCL800**

Castell figure locks

Quadbreak can be factory fitted with Castell interlock type FS for locking in off position
To order:
1 Specify required unit e.g. SQB2503K
2 Add Castle figure lock order suffix EY
3 Add Castle key symbol e.g. A

Thus the order reference for a 250A switch disconnector fuse fitted with a Castell lock symbol A is SQB2503KEYA.

Busbar chambers



Primarily designed for Quadbreak switch disconnector (fuse) the Quadbreak busbar chamber can be used for the mounting of any equipment.

- Manufactured in accordance with BSEN60439-1
- 200, 400, 630 and 800 rated copper busbars
- Available in 750, 1200 and 1800mm lengths
- Rigid construction
- Copper link kits available for direct connection of Quadbreak switch disconnector (fuse)
- Overall height and depth of units remains unchanged for the different current ratings

Height = 450mm
Depth = 215mm

Busbar chambers ratings

Rating	Length (mm) 750 Reference number	Length (mm) 1200 Reference number	Length (mm) 1800 Reference number
200	**SBC20007TN**	**SBC20012TN**	**SBC20018TN**
400	**SBC40007TN**	**SBC40012TN**	**SBC40018TN**
630	**SBC63007TN**	**SBC63012TN**	**SBC63018TN**
800	**SBC80007TN**	**SBC80012TN**	**SBC80018TN**

Busbar connection kits

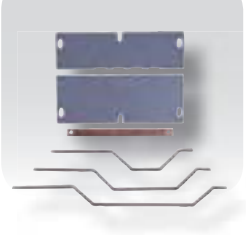
Each kit comprises connections for three phases and neutral

Rating (A)	Busbar interconnections to link busbar chambers* Reference number	Flexible busbar inter connections to link non Square D busbar chambers Reference number	Cable connections to connect to busbars** Reference number
200	**CEC200**	-	**FTC200**
400	**CEC400**	**CED400**	**FTC400**
600	**CEC630**	**CED630**	**FTC630**
800	**CEC800**	**CED800**	**FTC800**

* The busbar connection kits allow 2 or more busbar chambers to be electrically and mechanically joined together providing facilities for a greater number of outgoing circuits.

** The cable connection kits comprise 4 bolts, nuts and washers to connect a set of cables fitted with crimped lugs to the busbars.

Fuse switch connection kits



Each kit comprises connections for three phases and neutral

Rating (A)	Top mounted Reference number	Bottom mounted Reference number
63/160A	**QBL160TN**	**QBL160TN**
200/250A	**QBL250TN**	**QBL250TN**
315/630A	**QBL630TTN**	**QBL630BTN**
800A	-	**QBL800BTN**

Section 06
Contents
Technical data

Discrimination

Discrimination is the co-ordination of circuit breakers so that when a fault occurs in a network, it is cleared by the breaker immediately upstream of the fault. No breaker further upstream operates, thus, the number of circuits affected by the fault is minimised. In many cases full discrimination is achieved up to the breaking capacity of the breaker disconnecting the fault. This is indicated by 'F' in the table below. In other cases discrimination is achieved up to a lesser current as indicated below in amps.

Downstream breaker	Upstream breaker								Electronic breaker							
	CD/CN/CH breaker with Thermal magnetic trip units												CN/CH		DH		SMAL SPAF
	16	25	32	40	50	63	80	100	125	160	200	250	160	250	400	630	
KQ/SQO=<10	200	300	300	500	500	500	630	800	F	F	F	F	F	F	F	F	Discrimination is achieved up to the Magnetic setting of the Upstream breaker
16		300	300	500	500	500	630	800	F	F	F	F	F	F	F	F	
20					500	500	630	800	F	F	F	F	F	F	F	F	
25					500	500	630	800	F	F	F	F	F	F	F	F	
32						500	630	800	F	F	F	F	F	F	F	F	
40						500	630	800	F	F	F	F	F	F	F	F	
50								800	F	F	F	F	F	F	F	F	
63								800	F	F	F	F	F	F	F	F	

F = Full discrimination

Cascading chart

Cascading permits the installation of a circuit breaker having a breaking capacity lower than the prospective at its point of installation. The upstream breaker, which must have the required breaking capacity, limits the fault current to that which may safely be interrupted by the downstream breaker.

In the case of a high fault current both breakers may operate.
For example: A KQ breaker rated at 10kA may be used at a point in the network having a prospective fault current of 40kA provided that it is protected by a CH breaker (50kA).

Downstream breaker		Upstream breaker					
			CD	CN	CN	CH	CH
		Ref Rating	100A	100A	250A	100A	250A
Ref	Rating	Icu	25kA	36kA	36kA	50kA	50kA
SQO/KQ	3-63A	6 & 10 kA	25	25	30	40	30

I²t let through values for KQ MCB's/RCBO's

KQ 1P devices @ 230 / 240v B, C & D curve

Rating	Fault level (kA)				
(A)	2	4	6	8	10
			(A2 s/1000)		
≤6	4	7	9	10	11
10	6	12	17	19	24
16	7	16	23	30	37.5
20	7	16	23	30	37.5
25	7	16	23	30	37.5
32	10	23	32.5	42.5	55
40	10	23	32.5	42.5	55
50	13	28	35	55	70
63	13	28	35	55	70

KQ 1P 2 & 3 devices @ 400 / 415v C & D curve

Rating	Fault level (kA)				
(A)	2	4	6	8	10
			(A2 s/1000)		
≤6	4	8	8.5	9.5	10
10	6	12	16	19	22
16	7	15	22	29	35
20	7	15	22	29	35
25	7	15	22	29	35
32	10	21	32.5	35	50
40	10	21	32.5	35	50
50	12	26	40	55	68
63	12	26	40	55	68

Square D KQ (and SQO) MCB's have an energy let through classification of '3', this is the highest current limiting classification to BS EN 60898.

Compared with the protection offered by lower performance devices, MCB's having a class of "3" may be used to protect cables having a smaller cross section area. This eases installation and reduces cost. To provide adequate short circuit protection for a conductor, the I2t value of the MCB should always be less than the K2S2 value of the conductor (as stated in BS 7671).

Standard conditions for operation in service

Circuit breakers complying with BS EN 60898 shall be capable of operating under the following standard conditions:

- The ambient air temperature does not exceed +40°C and its average over a period of 24 hours does not exceed +35°C
- The lower limit of the ambient air temperature is -15°C
- Circuit breakers intended to be used in ambient air temperatures above +40°C (particularly in tropical countries) or below -5°C shall either be specially designed or be used according to the information given in the manufacturer's catalogue

Circuit breakers type KQ KQ 2 and 3P devices @ 200/415v C and D curve

Current	Ambient temperature °C				
(A)	20	30	40	50	60
3	3.2	**3**	2.8	2.6	2.3
6	6.3	**6**	5.6	5.2	4.6
10	10.5	**10**	9.4	8.6	7.6
16	16.8	**16**	15.0	13.8	12.2
20	21.0	**20**	18.8	17.2	15.2
25	26.3	**25**	23.5	21.5	19.0
32	33.6	**32**	30.1	27.5	24.3
40	42.0	**40**	37.6	34.4	30.4
50	52.5	**50**	46.5	43.0	38.0
63	66.2	**63**	58.0	52.9	46.6

Temperature de-rating of circuit breakers

Circuit breakers listed in the service current table may be used at temperatures from -30°C to +60°C.
The table indicates the maximum current to be used as a function of the ambient temperature.
Figures in bold type are the nominal current rating at calibrated temperature.
This avoids the necessity to derate for normal ambient temperatures likely to be encountered when circuit breakers are grouped together in an enclosure.

Three phase circuit breaker ratings for infrequent start motor loads.
Circuit breakers are not generally intended to provide close current protection for motors. Normally they are used in conjunction with a recognised motor over current protective device. Under these conditions the circuit breaker will protect the cable to the motor whilst the motors own protective device will protect the motor itself.
The comparison between full load current and kW rating, is based upon an average efficiency and power factor for each motor rating.

3 phase circuit breaker ratings for infrequent start motor loads

Reference number	MCB current rating	DOL starting Full load current	DOL starting kW @400Vac	Reduced voltage starting Full load current	Reduced voltage starting kW @400Vac
KQ10C306	6	3	1.5	4	2.2
KQ10C310	10	5	2.6	6	3.6
KQ10C316	16	7	4.1	10	5
KQ10C320	20	8	5.2	13	6
KQ10C325	25	10	6.5	16	8
KQ10C332	32	13	9	20	10
KQ10C340	40	16	11	25	13
KQ10C350	50	20	14	32	16
KQ10C363	63	26	17	40	21
KQ10D306	6	3	1.5	4	2.2
KQ10D310	10	5 2.	6	6	3.6
KQ10D316	16	7	4.1	10	5
KQ10D320	20	8	5.2	13	6
KQ10D325	25	10	6.5	16	8
KQ10D332	32	13	9	20	10
KQ10D340	40	16	11	25	13
KQ10D350	50	20	14	32	16
KQ10D363	63	26	17	40	21

The circuit breaker ratings used to protect the cable to the motor are based upon DOL starting = Up to 4kW, 7 x full load current for 4.5 seconds 4.1kW to 30kW, 7 x full load current for 6 seconds.
Reduced voltage starting = Up to 18.5kW, 3.5 x full load current for 10 seconds 19kW to 30kW, 4 x full load current for 18 seconds.

Circuit breaker ratings for infrequent start motor loads

Reference number	Current rating	DOL starting Full load current	DOL starting kW @230Vac
KQ10C106	6	3.2	0.4
KQ10C110	10	5.4	0.7
KQ10C116	16	9	1.1
KQ10C120	20	11	1.4
KQ10C125	25	13	1.7
KQ10C132	32	17	2.2
KQ10C140	40	21	2.8
KQ10C150	50	27	3.5
KQ10C163	63	34	4.3
KQ10D106	6	3.2	0.4
KQ10D110	10	5.4	0.7
KQ10D116	16	9	1.1
KQ10D120	20	11	1.4
KQ10D125	25	13	1.7
KQ10D132	32	17	2.2
KQ10D140	40	21	2.8
KQ10D150	50	27	3.5
KQ10D163	63	34	4.3

DOL starting = Up to 4kW, 7 x full load current for 4.5 seconds 4.1 to 10kW, 7 x full load current for 6 seconds.

Circuits with a large number of lamp fittings my cause some inconvenience in the event of a fault, as due regard for safety in the working environment must be considered with a large area of lighting being extinguished (e.g. lamps in shaded area). Consideration must also be given to the number of lamp fittings used in each circuit as this may entail the use of unusually large cable and terminals, based on the rating of the required circuit breaker. The number of lamp fittings switched on at once must also be carefully considered, as high inrush current may cause the circuit breaker to operate.
Circuits are based on distance to the first lamp of 20 metres and 7 metres between additional fittings. Cable size used is based on the circuit breaker rating, with the maximum size recommended and 10mm² and 63A rating and calculated on the basis of steady circuit current of each lamp and control gear at stated voltage.

Low pressure sodium (SOX-SOXE with PF correction) @ Vac = 230

Lamp wattage (W)	Circuit current (A)	Number of lamps in circuit 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
18	0.14	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
26	0.16	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
35/36	0.22	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
55	0.35	6	6	6	6	6	6	6	6	6	6	6	6	6	10	10	10	10	10	10	10
91	0.49	6	6	6	6	6	6	6	6	6	10	10	10	10	10	10	10	16	16	16	16
131	0.66	6	6	6	10	10	10	10	10	10	10	10	10	16	16	16	16	16	16	16	20
135	0.73	6	6	6	10	10	10	10	10	10	10	10	16	16	16	16	16	16	20	20	20
180	1	6	6	10	10	10	10	10	10	16	16	16	16	20	20	20	20	25	25	25	25
Electronic																					
36	0.16	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
55	0.23	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
66	0.28	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	10	10	10
91	0.5	6	6	6	6	6	10	10	10	10	10	10	10	10	10	10	10	16	16	16	16

High pressure sodium (SON-SONT-SONC with PF correction) @ Vac = 230

Lamp wattage (W)	Circuit current (A)	Number of lamps in circuit 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		Circuit breaker type C trip																			
50	0.3	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	10	10	10	10
70	0.45	6	6	6	6	6	6	6	6	6	6	10	10	10	10	10	10	10	16	16	16
100	0.6	6	6	6	6	6	6	6	6	10	10	10	10	10	16	16	16	16	16	16	16
150	0.85	6	6	10	10	10	10	10	10	6	16	16	16	16	16	16	20	20	20	25	25
250	1.4	6	10	16	16	16	20	20	20	20	16	20	25	25	25	32	32	32	32	40	40
400	2.2	10	16	20	25	32	32	32	32	32	32	32	40	40	40	50	50	50	50	63	63
1000	5.4	16	32	40	50	50	50	50	63	63	-	-	-	-	-	-	-	-	-	-	-
Electronic																					
35	0.2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
50	0.35	6	6	6	6	6	6	6	6	6	6	6	6	6	10	10	10	10	10	10	10
100	0.55	6	6	6	6	6	6	6	6	10	10	10	10	10	10	16	16	16	16	16	16

High pressure metal halide (MH-MHN-MHC-HPI with PF correction) @ Vac = 230

Lamp wattage (W)	Circuit current (A)	Number of lamps in circuit 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		Circuit breaker type C trip																			
35	0.24	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
70	0.45	6	6	6	6	6	6	6	6	6	6	10	10	10	10	10	10	10	16	16	16
150	0.85	6	6	10	10	10	10	10	10	10	16	16	16	16	16	16	20	20	20	25	25
250	1.4	6	10	16	16	16	20	20	20	20	20	20	25	25	25	32	32	32	32	40	40
1000	5.4	16	32	40	50	50	50	50	63	63	-	-	-	-	-	-	-	-	-	-	-
1800	8.6	25	40	63	63	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
MHC	**Electronic**																				
35	0.23	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
70	0.4	6	6	6	6	6	6	6	6	6	6	6	6	10	10	10	10	10	10	10	10
150	0.75	6	6	6	10	10	10	10	10	10	10	16	16	16	16	16	16	16	20	20	20
HPI																					
250	1.35	6	10	16	16	16	20	20	20	20	20	20	25	25	25	32	32	32	32	40	40
400	2.15	6	16	20	25	25	32	32	32	32	32	32	40	40	40	50	50	50	50	63	63
1000	5.3	16	32	40	50	50	50	50	63	63	-	-	-	-	-	-	-	-	-	-	-
2000	9.9	25	50	63	63	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

High pressure metal halide (MHN-HPI with PF correction) @ Vac = 400

Lamp wattage (W)	Circuit current (A)	Number of lamps in circuit 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		Circuit breaker type C trip																			
MHN																					
1800	5.6	16	32	40	50	50	50	50	63	63	-	-	-	-	-	-	-	-	-	-	-
2000	5.6	16	32	40	50	50	50	50	63	63	-	-	-	-	-	-	-	-	-	-	-
HPI																					
2000	6	16	32	40	50	50	50	50	63	-	-	-	-	-	-	-	-	-	-	-	-

High pressure mercury vapour (HPL with PF correction) @ Vac = 230

Lamp wattage (W)	Circuit current (A)	Number of lamps in circuit 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		Circuit breaker type C trip																			
50	0.3	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	10	10	10	10
80	0.45	6	6	6	6	6	6	6	6	6	6	10	10	10	10	10	10	10	16	16	16
125	0.7	6	6	6	10	10	10	10	10	10	10	10	16	16	16	16	16	16	16	20	20
250	1.35	6	10	10	16	16	16	16	16	16	20	20	25	25	25	32	32	32	32	40	40
400	2.15	6	16	20	25	25	32	32	32	32	32	32	40	40	40	50	50	50	50	63	60
1000	5.3	16	32	40	50	50	50	50	63	63	-	-	-	-	-	-	-	-	-	-	63

Low pressure sodium (SOX-SOXE with PF correction) @ Vac = 230

Lamp wattage (W)	Circuit current (A)	Number of lamps in circuit 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		Circuit breaker type D trip																			
18	0.14	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
26	0.16	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
35/36	0.22	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
55	0.35	6	6	6	6	6	6	6	6	6	6	6	6	6	6	10	10	10	10	10	10
91	0.49	6	6	6	6	6	6	6	6	6	6	10	10	10	10	10	10	16	16	16	16
131	0.66	6	6	6	6	6	6	6	10	10	10	10	10	16	16	16	16	16	16	16	20
135	0.73	6	6	6	6	6	6	10	10	10	10	10	16	16	16	16	16	16	20	20	20
180	1	6	6	6	6	10	10	10	10	16	16	16	16	20	20	20	20	25	25	25	25
Electronic																					
36	0.16	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
55	0.23	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
66	0.23	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	10	10	10
91	0.5	6	6	6	6	6	6	6	6	6	10	10	10	10	10	10	10	16	16	16	16

Low pressure sodium (SON-SONT – SONC with PF correction) @ Vac = 230

Lamp wattage (W)	Circuit current (A)	Number of lamps in circuit 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		Circuit breaker type D trip																			
50	0.3	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	10	10	10	10
70	0.45	6	6	6	6	6	6	6	6	6	6	10	10	10	10	10	10	10	16	16	16
100	0.6	6	6	6	6	6	6	6	6	10	10	10	10	10	16	16	16	16	16	16	16
150	0.85	6	6	6	6	6	10	10	10	10	16	16	16	16	16	16	20	20	20	25	25
250	1.4	6	6	10	10	16	16	16	16	16	20	20	25	25	25	32	32	32	32	40	40
400	2.2	6	10	16	16	20	20	25	25	25	32	32	40	40	40	50	50	50	50	63	63
1000	5.4	10	20	32	32	40	40	50	63	63	-	-	-	-	-	-	-	-	-	-	-
Electronic																					
35	0.2	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
50	0.35	6	6	6	6	6	6	6	6	6	6	6	6	6	10	10	10	10	10	10	10
100	0.55	6	6	6	6	6	6	6	6	10	10	10	10	10	10	16	16	16	16	16	16

High pressure metal halide (MH-MHN-MHC-HPI with PF correction) @ Vac = 230

Lamp wattage (W)	Circuit current (A)	Number of lamps in circuit 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		Circuit breaker type D trip																			
35	0.24	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
70	0.45	6	6	6	6	6	6	6	6	6	6	6	10	10	10	10	10	10	16	16	16
150	0.85	6	6	6	6	6	10	10	10	10	16	16	16	16	16	16	20	20	20	25	25
250	1.4	6	6	10	10	16	16	16	16	16	20	20	25	25	25	32	32	32	32	40	40
MHN																					
1000	5.4	10	20	32	32	40	50	50	63	63	-	-	-	-	-	-	-	-	-	-	-
1800	8.6	16	32	40	50	63	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Electronic																					
35	0.23	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
70	0.4	6	6	6	6	6	6	6	6	6	6	6	6	10	10	10	10	10	10	10	10
150	0.75	6	6	6	6	6	6	6	10	10	10	16	16	16	16	16	16	16	20	20	20
HPI																					
250	1.35	6	6	10	10	16	16	16	16	16	20	20	25	25	25	32	32	32	32	40	40
400	2.15	6	10	16	16	20	20	25	25	25	32	32	40	40	40	50	50	50	50	63	63
1000	5.3	10	20	25	32	40	40	50	63	63	-	-	-	-	-	-	-	-	-	-	-
2000	9.9	20	32	40	50	63	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

High pressure metal halide (MHN-HPI with PF correction) @ Vac = 400

Lamp wattage (W)	Circuit current (A)	Number of lamps in circuit 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		Circuit breaker type D trip																			
MHN																					
1800	5.6	16	20	32	32	32	32	50	63	63	-	-	-	-	-	-	-	-	-	-	-
2000	5.6	16	20	32	32	32	32	50	63	63	-	-	-	-	-	-	-	-	-	-	-
HPI																					
2000	6	16	25	32	32	32	40	50	63	-	-	-	-	-	-	-	-	-	-	-	-

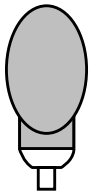
High pressure metal halide (MHN-HPI with PF correction) @ Vac = 400

Lamp wattage (W)	Circuit current (A)	Number of lamps in circuit 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		Circuit breaker type D trip																			
50	0.3	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	10	10	10	10
80	0.45	6	6	6	6	6	6	6	6	6	6	10	10	10	10	10	10	10	16	16	16
125	0.7	6	6	6	6	6	6	10	10	10	10	10	16	16	16	16	16	16	16	20	20
250	1.35	6	6	10	10	10	10	16	16	16	20	20	25	25	25	32	32	32	32	40	40
400	2.15	6	10	16	16	20	20	25	25	25	32	32	40	40	40	50	50	50	50	63	63
1000	5.3	10	20	25	32	40	40	50	63	63	-	-	-	-	-	-	-	-	-	-	-

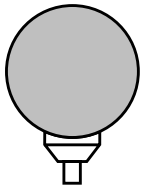
Ecotone, ambiance globe, PL-EU @ Vac = 230

Lamp wattage (W)	Circuit current (A)	Number of lamps in circuit 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
		Circuit breaker type C and D trip																			
6	0.048	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
9	0.07	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
11	0.088	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
14	0.093	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
16	0.105	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
18	0.12	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
20	0.14	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6

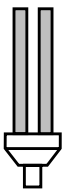
Compact flourescent lamps



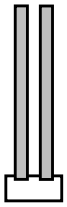
Ecotone ambiance



Globe ambiance



Ecotone economy
PL PE professional



Non integrated PL-L

Prismatic professional
SL comfort

Lighting loads with contactors

High pressure metal halide (MHI, MHN, MHC, HPI with PF correction)

Wattage and lamp number	Circuit current	Contactor rating 25 A	40 A	63 A
(W/N°)	(A)	Lamp unit number per phase		
MH				
35	0.24	54	87	137
70	0.45	29	46	73
150	0.85	15	24	39
250	1.40	9	15	23
MHN				
1000	5.4	2	4	6
1800	8.6	2	2	4
MHC Electronic				
35	0.23	57	90	142
50	0.40	33	52	82
150	0.75	17	28	44
HPI				
250	1.35	10	15	24
400	2.15	6	10	15
1000	5.3	2	4	6
2000	9.9	1	2	3

Low pressure sodium lamps (SOX-SOXE with PF correction)

Wattage and lamp number	Circuit current	Contactor rating 25 A	40 A	63 A
(W/N°)	(A)	Lamp unit number per phase		
18	0.14	93	149	234
26	0.16	81	130	205
35/36	0.22	59	95	149
55	0.35	37	59	94
91	0.49	27	42	67
131	0.66	20	32	50
135	0.73	18	28	45
180	1.0	13	21	33
Electronic				
36	0.16	81	130	205
55	0.23	57	90	142
66	0.28	46	74	117
91	0.50	26	42	66

High pressure mercury vapour lamps (HPL with PF correction)

Wattage and lamp number	Circuit current	Contactor rating 25 A	40 A	63 A
(W/N°)	(A)	Lamp unit number per phase		
50	0.30	43	69	109
80	0.45	29	46	73
125	0.67	19	31	49
250	1.35	10	15	24
400	2.15	6	10	15
1000	5.30	2	4	6

Contactors type CCN

Determination of contactor rating-lighting loads.
Based on 230/240V AC rated fittings.

- 2 pole contactor used on a single phase two wire system
- 3 and 4 pole contactor used on a three phase four wire system

Electronic control flourescent lamps

Wattage and lamp number	Circuit current	Contactor rating 25 A	40 A	63 A
(W/N°)	(A)	Lamp unit number per phase		
14/18	0.09	144	231	364
14 x2	0.15	87	139	218
14 x3	0.23	57	90	142
18 x2	0.18	72	116	182
21/24	0.12	108	173	273
21/24 x2	0.24	54	87	137
28	0.16	81	130	205
28 x2	0.28	46	74	117
35/36/39	0.19	68	109	172
36 x2	0.34	38	61	96
38/39 x2	0.38	34	55	86
40/42	0.21	62	99	156
42 x2	0.41	32	51	80
49/50	0.24	54	87	137
49/50 x2	0.48	27	43	68
54/55	0.27	48	77	121
54/55 x2	0.54	24	39	61
60	0.30	43	69	109
70	0.38	34	55	86
80	0.41	32	51	80
90	0.45	29	46	73

High pressure sodium lamps (SON-SONT-SONC with PF correction)

Wattage and lamp number	Circuit current	Contactor rating 25 A	40 A	63 A
(W/N°)	(A)	Lamp unit number per phase		
50	0.30	43	69	109
70	0.45	29	46	73
100	0.60	22	35	55
150	0.85	15	24	39
250	1.4	9	15	23
400	2.2	6	9	15
1000	5.4	2	4	6
Electronic				
35	0.20	65	104	164
50	0.35	37	59	94
100	0.55	24	38	60

Three phase circuit breaker ratings for infrequent start motor loads

Circuit breakers are not generally intended to provide close current protection for motors. Normally they are used in conjunction with a recognised motor over current protective device. Under these conditions the circuit breaker will protect the cable to the motor whilst the motors own protective device will protect the motor itself.

The comparison between full load current and kW rating, is based upon an average efficiency and power factor for each motor rating at 400Vac. The circuit breaker rating used to protect the cable to the motor are based upon :-

D.O.L. starting =
Up to 4kW, 7x full load current for 5 seconds

4.1kW to 18.5kW, 7x full load current for 6 seconds

19kW to 35kW, 7x full load current for 10 seconds

Assisted starting =
Up to 4kW, 4x full load current for 5 seconds

4.1kW to 18.5kW, 4x full load current for 7 seconds

19kW to 35kW, 4x full load current for 10 seconds

36kW to 110kW, 4x full load current for 15 seconds

Reference number also CDLE CNLE	Short time setting (Im)	Long time setting (Ir)	Thermal setting A	D.O.L. starting motor Load current A	D.O.L. starting motor Rating at 400Vac kW	Assisted start motor Load current A	Assisted start motor Rating at 400Vac kW
CDAE34016	Fixed	1	16	8	4	12	6
		0.9	14	7.5	3.6	10	5.3
		0.8	13	7	3	9	5
		1	25	11	5	16	8
CDAE34025	Fixed	0.9	23	10	4.9	14	7
		0.8	20	9	4	13	6
		1	32	15	7	20	10
CDAE34032	Fixed	0.9	29	13	7	18	9
		0.8	26	12	6	16	8
		1	40	18	9	26	13
CDAE34040	Fixed	0.9	36	16	8	23	12
		0.8	32	15	7	20	10
		1	50	23	12	32	16
CDAE34050	Fixed	0.9	45	21	10	29	15
		0.8	40	18	9	26	13
		1	63	29	15	40	21
CDAE34063	Fixed	0.9	57	26	13	36	19
		0.8	50	23	12	32	17
		1	80	54	28	60	32
CDAE34080	Fixed	0.9	72	49	25	54	29
		0.8	64	43	22	48	26
		1	100	68	36	75	40
CDAE34100	Fixed	0.9	90	61	32	68	36
		0.8	80	54	29	60	32

Long time settings — Ir = 0.8, 0.9, 1
Short time settings — 16 to 100A Im = fixed

D.O.L. starting =
Up to 4kW, 7x full load current for 5 seconds

4.1kW to 18.5kW, 7x full load current for 6 seconds

19kW to 35kW, 7x full load current for 10 seconds

Assisted starting =
Up to 4kW, 4x full load current for 5 seconds

4.1kW to 18.5kW, 4x full load current for 7 seconds

19kW to 35kW, 4x full load current for 10 seconds

36kW to 110kW, 4x full load current for 15 seconds

Reference number	Short time setting (Im)	Long time setting (Ir)	Thermal setting A	D.O.L. starting motor Load current A	D.O.L. starting motor Rating at 400Vac kW	Assisted start motor Load current A	Assisted start motor Rating at 400Vac kW
CNLE34160E20	10	1	160	108	58	120	64
CHLE34160E20	8	0.9	144	97	52	108	58
CNAE34160E20	8	0.8	128	86	46	96	51
	8	0.7	112	76	40	84	45
	8	0.6	96	65	35	72	39
	8	0.5	80	54	29	60	32
	8	0.4	64	43	23	48	26
CNLE34250E20	10	1	250	169	90	188	100
CHLE34250E20	8	0.9	225	152	81	169	90
CNAE34250E20	8	0.8	200	135	72	150	80
	8	0.7	175	118	63	131	70
	8	0.6	150	101	54	113	60
	8	0.5	125	84	45	94	50
	8	0.4	100	68	36	75	40
DHLE34400	10	1	400	270	144	300	160
	8	0.9	360	243	130	270	144
	8	0.8	320	216	116	240	128
	8	0.7	280	189	101	210	112
	8	0.6	240	162	87	180	96
	8	0.5	200	135	72	150	80
	8	0.4	160	108	58	120	64
DHLE34630	10	1	630	425	227	473	253
	8	0.9	567	383	205	425	227
	8	0.8	504	340	182	378	202
	8	0.7	441	298	159	331	177
	8	0.6	378	255	136	284	152
	8	0.5	315	213	114	236	126
	8	0.4	252	170	91	189	101

Long time settings — Ir = 0.8, 0.85, 0.88, 0.9, 0.93, 0.95, 0.98, 1
Io = 0.5, 0.63, 0.7, 0.8, 0.9, 1
Short time settings — Im = 2, 3, 4, 5, 6, 7, 8,10 x long time setting

MCCB ratings

MCCB's	SFA	CD	CN	CH	CN Electronic	SLA	SM	SN	PA
Standard	BSEN 60947 - 2								
Poles	1, 2	3	3	3	3	3	3	3	3
Ratings in	16 - 100A	16 - 100A	16 - 250A	16 - 250A	160 - 250A	250 -400A	300 - 800A	630 - 1250A	630 - 2000A
Category	A								
Rated Insulation Voltage Ui	500V							750	
Rated Impulse Voltage Uimp	6KV								
Rated Operational Voltage Ue	415V 50/60HZ								
Ultimate Breaking Capacity Icu	25kA	25kA	36kA	50kA	36kA	36kA	50kA	50kA	50kA
Service Breaking Capacity Ics	50%	75%	75%	75%	75%	50%	50%	50%	75%
Thermal Overload	Fixed	Adjustable 0.8 - 1In			Adj 0.4-1xIn	Fixed			
Magnetic Overload	16 to 160A Fixed			200 to 250A Adj 5-10xIn		Adjustable 5-10xIn			
Connection	Tunnel		Crimp			Tunnel			Crimp

I^2t Energy let through

The cable withstand depends upon the conductor material, the insulation used and the conductor size.
Maximum let through at various prospective fault currents in Ampere^2 seconds x 10^6

Prospective fault current kA

Frame	Ratings	10	20	25	30	36	40	50
CD	16-100A	0.28	0.42	0.47				
CN	125-250A	0.52	0.7	0.71	0.72	0.73		
CH	16-250A	0.52	0.7	0.71	0.72	0.73	0.74	0.75
SMA	300-800A		8.6	12	15	21	25	36

For PVC insulated copper cable the thermal withstand in A^2s x 10^6 (k = 115)

Cable size mm^2	4	6	10	16	25	35	50
Max thermal stress I^2t	0.212	0.476	1.32	3.4	8.26	16.2	33.1

Panelboards

Standard	BSEN 60439-1 Form 3b Type 2 (with terminal shields fitted)
IP rating	IP4X to BSEN 60529
Short circuit withstand	50kA for 1 second
Busbars	Plated copper fully braced and supported
Neutral bar	Plated copper fully rated pre-drilled
Earth bar	Plated copper fully rated pre-drilled
Enclosure	Corrosion resistant folded sheet steel
Paint	Epoxy powder coated light blue grey

Discrimination

Discrimination is the co-ordination of Circuit breakers such that when a fault occurs in a network it is cleared by the breaker immediately upstream of the fault. No breaker further upstream operates. Thus the number of circuits affected by the fault is minimised. In many cases full discrimination is achieved up to the breaking capacity of the breaker disconnecting the fault. This is indicated by “F” in the table below. In other cases discrimination is achieved up to a lesser current as indicated below in amps. When no figure is shown discrimination is not achieved.

Downstream breakers	**Upstream breakers**														**Electronic breakers**			
	I-Line CD/CN/CH breaker with Thermal magnetic trip units														**CN/CH**	**DH**	**SMAL**	**SPAF**
	16	25	32	40	50	63	80	100	125	160	200	250	160	250	400	630	1000	2000
KQ/SQO=<10	200	300	300	500	500	500	630	800	F	F	F	F	F	F	F	F		
16		300	300	500	500	500	630	800	F	F	F	F	F	F	F	F		
20					500	500	630	800	F	F	F	F	F	F	F	F		
25					500	500	630	800	F	F	F	F	F	F	F	F		
32							630	800	F	F	F	F	F	F	F	F		
40							630	800	F	F	F	F	F	F	F	F		
50								800	F	F	F	F	F	F	F	F		
63								800	F	F	F	F	F	F	F	F		
16 CD				500	500	500	630	800	2000	2000	F	F	2000	F	F	F		
25						500	630	800	2000	2000	F	F	2000	F	F	F		
32							630	800	2000	2000	F	F	2000	F	F	F		
40							630	800	2000	2000	F	F	2000	F	F	F		
50								800	2000	2000	F	F	2000	F	F	F		
63								800	2000	2000	F	F	2000	F	F	F		
80									1250	1250	F	F		F	F	F		
100										1250	F	F		F	F	F		
125 CN											4000	5000		3000	F	F		
160												5000			F	F		
200																F		
250																F		
16 CH				500	500	500	630	800	2000	2000	F	F	2000	3000	F	F		
25						500	630	800	2000	2000	F	F	2000	3000	F	F		
32							630	800	2000	2000	F	F	2000	3000	F	F		
40							630	800	2000	2000	F	F	2000	3000	F	F		
50								800	2000	2000	F	F	2000	3000	F	F		
63								800	2000	2000	F	F	2000	3000	F	F		
80									1250	1250	F	F		3000	F	F		
100										1250	F	F		3000	F	F		
125											4000	5000		3000	F	F		
160												5000			F	F		
200																F		
250																F		
400 DH																		
630																		

Discrimination is achieved up to the magnetic setting of the upstream breaker

F = Full Discrimination

Cascading chart

Cascading permits the installation of a circuit breaker having a breaking capacity lower than the prospective at its point of installation. The upstream breaker, which must have the required breaking capacity, limits the fault current to that which may safely be interrupted by the downstream breaker. In the case of a high fault current both breakers may operate. For example: a KQ breaker rated at 10kA may be used at a point in the network having a prospective fault current of 40kA provided that it is protected by a CH breaker (50kA).

Downstream breaker		**Upstream breaker**									
		Ref	**CD**	**CN**	**CN**	**CH**	**CH**	**SLA**	**DH**	**SMAL**	**SPAF**
		Rating	100A	100A	250A	100A	250A	400A	630A	1000A	2000A
Ref	**Rating**	**Icu**	25kA	36kA	36kA	50kA	50kA	36kA	50kA	50kA	50kA
KQ	63A	6&10kA	25	25	30	40	30				
CD	100A	25kA		36	36	50	50	36	50	36	36
CN	250A	36kA				50	50		50	50	50
SLA	400A	36kA								50	50

Frame	Rating	Max. Zs ohms at 230V 0.4s	5s
SFA	16	0.58	2.36
	20	0.58	1.89
	32	0.48	1.12
	40	0.38	0.90
	50	0.38	0.72
	63	0.23	0.57
	80	0.19	0.45
	100	0.19	0.36
C	16	1.21	2.30
	25	0.77	1.67
	32	0.58	1.33
	40	0.46	1.06
	50	0.46	0.85
	63	0.46	0.68
	80	0.36	0.36
	100	0.29	0.29
	125	0.18	0.18
	160	0.18	0.18
	200	0.12	0.12
	250	0.09	0.09
C electronic	160	0.14	0.22
	250	0.09	0.14
SL	250	0.092	0.092
	300	0.077	0.077
	350	0.066	0.066
	400	0.058	0.058
SM	300	0.077	0.077
	350	0.066	0.066
	400	0.058	0.058
	450	0.051	0.051
	500	0.046	0.046
	630	0.037	0.037
	700	0.033	0.033
	800	0.029	0.029
SN	630	0.029	0.037
	700	0.029	0.033
	800	0.029	0.032
	900	0.023	0.027
	1000	0.023	0.026
	1250	0.023	0.023

For adjustable breakers the figures given refer to the breaker with settings on maximum.

Switch-disconnector-fuse outgoing units

		PF32	PF63	PF100	PF160
Standard			BSEN 60947-3		
Poles		3	3	3	3
Rating In		32	63	100	160
Utilisation category	415V	AC23A	AC23A	AC23A	AC23A
Rated Insulation voltage		750	750	750	750
Rated Operational voltage		750	750	750	750
Rated Impulse voltage		8kA	8kA	8kA	8kA
Rated s.c. making capacity Icm	415V	176kA	176kA	176kA	176kA
Rated s.c. breaking capacity Icn	415V	80kA	80kA	80kA	80kA
Connections		Clamp	Clamp	Clamp	Clamp
BS88 fuse reference		A1, A2, A3	A2, A3	A2, A3, A4*	A2, A3, A4

* A4 maximum dia 32 mm

Manual control

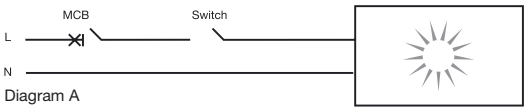


Diagram A

This circuit shows the simplest form of control. A manual switch controls the lighting. This arrangement is adequate if the load is small, the cable runs are short and people can be relied upon to turn the lights out when they are not needed.
Diagram A

Automatic control

The introduction of some form of automatic control can reduce electricity costs and simplify the total electrical installation. Whilst automation in some form may add to the initial installation costs, this has to be balanced against the electricity consumption costs over the life of the electrical installation.
Products that may be used to automate the installation, in part or fully, are:

- Time switches
- Passive infra red detectors
- Presence detectors
- Contactors
- Light sensitive switches
- Bi-stable relays
- Astronomical switch

All these devices may be used individually or in combination to provide the best possible installation to suit the needs of the occupants.

Time switches

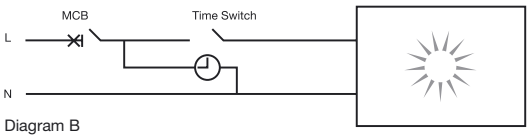


Diagram B

Typical applications are retail trading areas where the main lighting is required to be switched at set times each day without the need for manual intervention. The type of time switch to be used depends upon the level of sophistication required.
Diagram B

Simple 24 hour time switch, repeating the same pre-set switching sequence each day. Battery back up is included to eliminate the need to reset the device every time there is a power cut.

Digital time switch, 7 day type. These are available with 1 or 2 programmable contacts. The program can be set to have different switching times each day or day omission if required. e.g. no switching at weekends. The two contacts of the 2-channel version can be programmed completely independently. Battery back up stores the switching programme for at least 5 years.

Multi function time switch, having 4 independently programmable time contacts. Each contact can have a conditional input associated with it. In addition ON delays and OFF delays, hours counters and switching counters can be incorporated. The programme is stored in a cartridge which enables the programme to be copied to another device.

Astronomically programmable light sensitive switch, time control automatically calculated, based upon sunrise and sunset times in a given geographical position. Can be beneficial in certain applications. This type of control is provided by an astronomical switch.

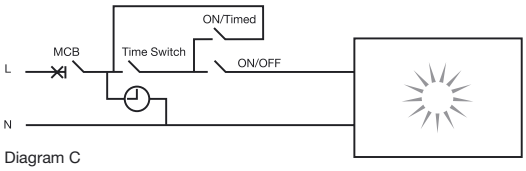


Diagram C

Control by light sensitive switch, this device enables lighting to be switched, not according to time but according to the level of daylight. The threshold can be adjusted to determine the light level below which the lighting is switched ON. This may be used with external or internal lighting. An ON / OFF override facility exists on the time switches. On the digital devices this override can be temporary, until the next switch operation or permanent. To prevent unauthorised access to the time switch and possible tampering it may be preferred to have external ON / Timed / OFF control. This switching arrangement can be achieved by using a standard 2-gang single pole one way light switch. The supply to the time switch motor is maintained. On loss of supply the time switch will continue to keep time but the contacts will not switch.
Diagram C

Presence detectors and PIR detectors

Both of these devices can be used to control lighting but their functions are very different. Presence detectors are used to turn lights ON when people are present in the room and to turn them OFF when the room is unoccupied. Normally ceiling mounted they detect human presence. Their use saves energy consumption. They are intended for use in offices, hotels etc where areas are not permanently occupied.

PIR detectors most obvious use is for security purposes to switch external lighting ON when movement is detected within the sensing area. This area is an arc of up to 180° with a radius of 12 metres.

Larger lighting schemes

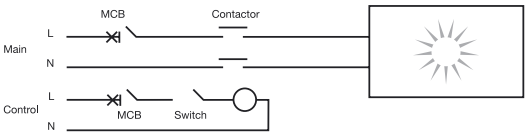


Diagram D

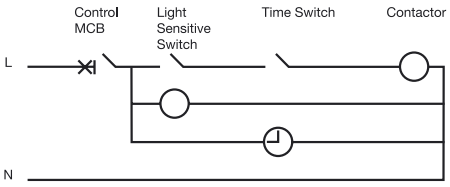


Diagram E

The previous lighting schemes are very effective in the small environment but as the lighting load increases and the floor area to be lit increases so does the electrical load. In addition, the longer cable runs introduce greater voltage drops making the need for larger cables more likely. Whilst it may seem a paradox to introduce more components to simplify the arrangement, the use of contactors in the lighting circuits makes the installation easier to install and simpler to calculate. Voltage drop calculations are greatly simplified as the switching circuit is not part of the main circuit. This main circuit is direct from the distribution board to the luminaries. The switching circuit only carries the load of the contactor coil, which at switch on is of the order of 0.2A.
A separate control circuit MCB is required if the main MCB is of such a rating that it does not protect the control circuit cable against overcurrent.
Diagram D

Contactor control is essential when the lighting is controlled by BMS system. The control circuits are run from the distribution boards to the BMS controller that may be positioned wherever convenient for the operation of the building.

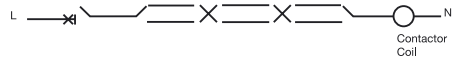
Time switches, presence detectors and PIR detectors can all be used with contactor controlled circuits. These controlling devices are all connected in the switch circuit so only carry and switch the contactor coil current giving longer contact life.

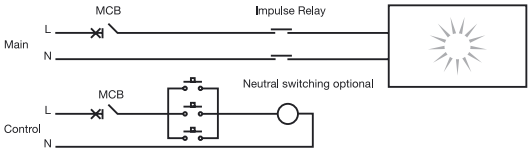
Controlling devices can be combined to provide more sophisticated control. These combinations are much easier with contactor control.

e.g. Combine light sensitive switch & time switch: with their contacts connected in series they ensure that lights are only on during permitted hours and when the natural light level is below the set threshold.

Whether the main lighting load is single or 3 phase, only one set of control devices is required. Apart from the light sensitive switch sensor, all the components and wiring is contained in the distribution board.
Diagram E

Multi location switching





The use of contactor control has its limitations if control is required at more than one switch position.

If the switches are wired in series all switches must be closed before the lights will be ON.

Alternatively if the switches are in parallel any one closed will put the lights on and they must all be off before the lights are extinguished.

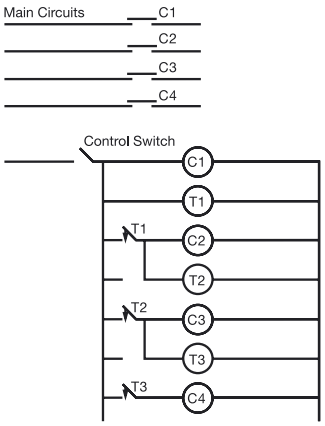
The introduction of 2 way switching and intermediate switches solves this problem but still leaves complications if the lights are to be controlled from a large number of switch positions.

There is a simpler way and that is to introduce impulse relays instead of contactors into the circuit. Contactor coils need to be permanently energised to maintain the supply to the lighting load. This means that heat is being continuously dissipated in the panel.

Impulse relays are relays, rated at 16A which have two stable operating states: with the main contacts open or closed. An electrical supply does not have to be maintained to the coil to keep the contacts closed. A short impulse to the coil will change the contact state. Another impulse will change the contact back. Thus one pushbutton can be used to switch the lights on or off.

The simplicity of the circuit means that any number of pushbuttons can be connected in parallel to provide lighting control at any number of locations.
Thus the lighting of a large area can be switched on at any entrance and switched off at any exit. The pushbuttons only carry control current and then only when they are actually pressed Voltage drop calculations and problems can be forgotten in the control circuit. Additional switch positions can be introduced without the need to change any of the existing cabling.

Multi step control



In large warehouses there is often a need to switch all the lights on using one switch or control. If all the luminaries are energised at the same time there is likely to be a severe current surge in the supply causing problems elsewhere in the installation.

T1, T2 and T3 are time delay relays having a delay on energisation. If the timers are set as follows: T1 = 5 sec, T2 = 10 sec and T3 = 15 sec, the sequence is:

- Closing the control switch energises C1, T1, T2 and T3, turns first row of lights ON (C1) and start T1, T2 and T3 counting
- 5 sec after closing the control switch T1 allows C2 to close and turns second row of lights ON (C2)
- 10 sec after closing the control switch T2 allows C3 to close and turns third row of lights ON (C3)
- 15 sec after closing the control switch T3 allows C4 to close and turns fourth row of lights ON (C4)
- On opening the control switch all lights are extinguished. Breaking the supply resets all timers

The use of time delay relays allows the sequenced control of the lighting without a large current inrush.

Stairwells

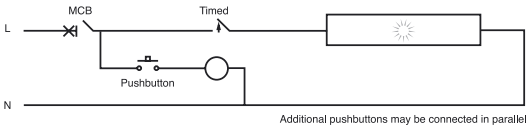


Diagram F

Stairwells and hallways need to be well lit whilst people are present but as the areas are only occasionally occupied energy is wasted by leaving the lights on permanently.

Use a timer relay to switch the lights ON when required and then to switch OFF automatically after a time delay.

With the location of switches at every point that people would use to enter the stairwell it is easy for users to switch the lights ON.
Diagram F

The period that the lights stay ON can be set between 1 and 7 minutes. The switches need to be push button (retractive) types. If required they may be fitted with a neon indicator, wired across the contacts, to aid location in the dark.

Installation costs vs savings

Generally the extra cost of the additional components in the electrical distribution equipment will be recovered many times over by the reduction in electricity consumption over the life of the installation.

For high density control applications a range of extra service distribution boards are available, each one providing 13 module spaces for control products.

For stand alone control applications or where there is insufficient space within the boards a range of insulated and metal enclosures are available.

Run on timer

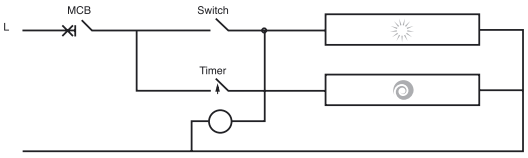


Diagram G

The circuit is designed to switch lights and an associated ventilation fan. On closing the switch the lights and the ventilation fan are switched ON. When the switch is opened the lights go out but the fan continues to run for a period of time, adjustable between 1 and 7 minutes.
Diagram G

Impulse relay - type CIR 16A - operational information

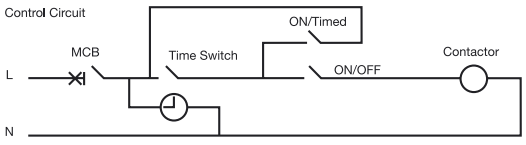
Determination of relay rating – lighting loads.
Incandescent and halogen lamps

Lamp wattage W	Lamp current A	Line current A	1 pole @240Vac lamp number (max)
Incandescent and halogen lamps			
20	0.09	8	89
40	0.18	8	44
60	0.27	8	30
75	0.34	8	24
100	0.45	8	18
150	0.68	8	12
200	0.90	8	9
300	1.35	8	6
500	2.25	8	4
750	3.38	8	2
1000	4.50	8	2
Fluorescent lamps			
18	0.8	8	100
36	0.19	8	42
42	0.21	8	38
58	0.26	8	31
70	0.30	8	27
Low pressure sodium lamps (SOX)			
35	0.23	8	35
55	0.36	8	22
90	0.49	8	16
135	0.73	8	11
180	1.00	8	8
High pressure sodium lamps (SON)			
150	0.83	8	9
250	1.38	8	6
400	2.20	8	4
700	3.85	8	2
1000	5.50	8	1
High pressure mercury vapour lamps (HPL/MBF)			
50	0.30	8	27
80	0.44	8	18
125	0.69	8	12
250	1.31	8	6
400	2.30	8	3
700	3.85	8	2
1000	5.50	8	1

Installation recommendations

- Contactor and relay controls must be bounce free
- When several contactors are mounted side by side a half module spacer must be fitted between every two contactors
- It is advisable to mount electronic units at the bottom of modular enclosures and to separate them from electro-mechanical devices by a space equal to one module or by two CPS9 half module spacers
- For applications where the temperature inside the enclosure is likely to exceed 40°C refer to: Square D - Technical Department Tel: 0870 608 8 608

Time switches



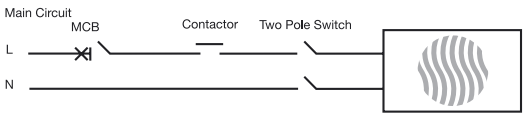


Diagram A

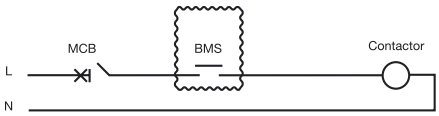


Diagram B

Typical applications are office areas where the heating is required to be switched at set times each day without the need for manual intervention.

The type of time switch to be used depends upon the level of sophistication required.
Simple 24 hour time switch, repeating the same pre-set switching sequence each day. Battery back up is included to eliminate the need to reset the device every time there is a power cut.
Digital time switch, 7 day type. These are available with 1 or 2 programmable contacts.
The programme can be set to have different switching times each day or day omission if required. e.g. no switching at weekends. The two contacts of the 2-channel version are programmed completely independently. Battery back up stores the switching programme for at least 5 years.

An ON / OFF override facility exists on all the time switches but it may be preferred to have external ON / Timed / OFF control. This allows control without giving access to the time switch settings. When the heater is controlled by a contactor this can be achieved by using a standard 2-gang single pole one way light switch. The supply to the time switch motor is maintained. On loss of supply the time switch will continue to keep time but the contacts will not switch.
Diagram A

Contactor control is essential when the heating is controlled by a BMS system. The control circuits are run from the distribution board to the BMS controller positioned wherever convenient for the operation of the building.
Diagram B

Generally the extra cost of the additional components in the electrical distribution equipment will be recovered many times over by the reduction in electricity consumption over the life of the installation if suitable controlling products are used.

Operational information

Heating may be controlled, at one extreme, by a time switch, giving a small number of switching operations per day or, at the other extreme by a close tolerance thermostat when the number of daily switchings may be very high. Before selecting a contactor it is necessary to estimate the likely number of switching operations in an average day.

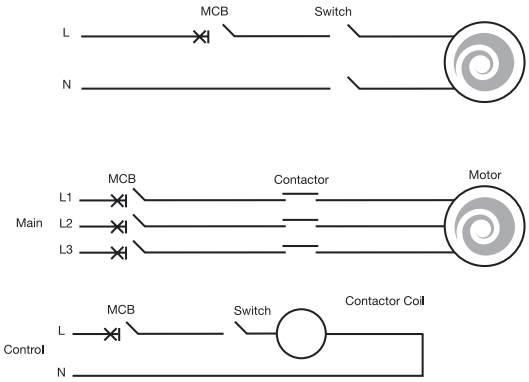
Single phase (230Vac) heater loads

Contactor N°. of switching operations per day	kW CCN225	kW CCN240	kW CCN363 (using 1 or 2 poles)
25	5.4	8.6	14.0
50	5.4	8.6	14.0
75	4.6	7.4	12.0
100	4.0	6.0	9.5
250	2.5	3.8	6.0
500	1.7	2.7	4.5

Three phase (415Vac) heater loads

Contactor N°. of switching operations per day	kW CCN425	kW CCN340 CCN440	kW CCN363
25	16	26	41
50	16	26	41
75	14	22	35
100	11	17	26
250	5	8	13
500	4	6	9

Motor control



For very small motors the control method can be a directly connected switch-disconnector in the circuit that is used for isolation and control.

This arrangement requires that the control device is near to the motor and that it is capable of the switching duty required by the application.

For larger drives or where a more sophisticated control scheme is required the use of a contactor in the circuit gives many advantages.

Control by contactor means that the contactor performs the switching duty. The switching is achieved by energising and de-energising the contactor coil by remote pushbuttons or switches. These control devices only carry and switch the current taken by the contactor coil which is less than 0.25A. This means that voltage drop calculations are usually not necessary for these control circuits.

For simplicity it is normal to derive the control circuit supply from one phase to neutral ie 230V 50Hz.

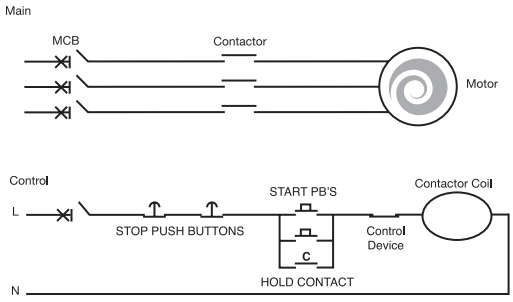
This arrangement eliminates the need for a separate supply or a control circuit transformer. Control circuit protection (MCB) is required unless the main breaker is of such a rating that it provides protection for the control circuit cabling. Generally, if the main breaker is rated more than 10A with the control circuit cabled in 1.0mm^2 a separate control MCB is required. Contactor control can be either ‘two wire’ or ‘three wire’ depending on the circuit configuration.

Two wire control

As its name implies this means of control has two wires to the remote control station. If more than one switch is in the circuit they must all be closed before the contactor is energised. On loss of supply the contactor will drop out.

On return of the supply the contactor will close automatically causing the motor restart without warning. Consideration must be given as to whether this situation is acceptable, which it may be in many applications. This method of control is used in contactor controlled lighting circuits where it would be a great inconvenience have to reset the lights after every loss of supply.

Three wire control



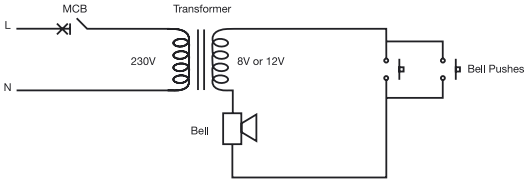
The control device, installed if required, may be an overtemperature switch, vane switch or any other safety device to cut off the supply if an unsafe situation occurs.

In addition to the contactors shown in this catalogue Square D have a range of enclosed control gear suitable for the control of motors:

- Direct on line up to 11kW with or without switch-disconnectors
- Single direction or reversing
- Star-delta up to 22kW with or without switch-disconnectors
- Switch-disconnectors up to 63A
- A wide range of pushbutton stations

Please see the T-Express product range in our Select product catalogue.

Sounds

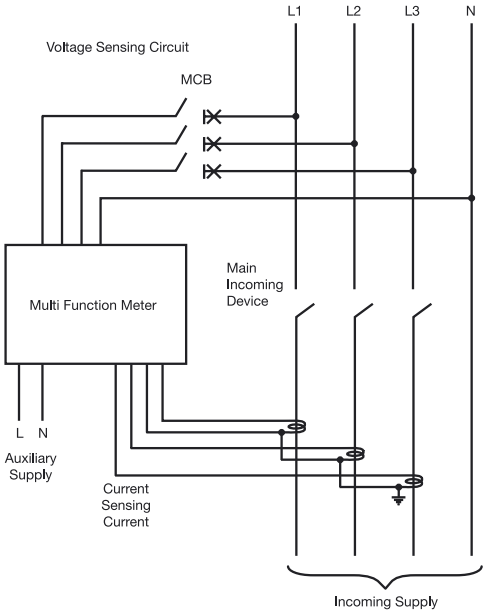


Many domestic bells are battery operated but in a commercial situation this is not practical nor economic.

It is preferable to operate bell circuits as separated extra-low voltage circuits where the circuit is isolated from earth in such a way that a single fault cannot give rise to a risk of electric shock. The voltage source is derived from a safety transformer complying with BS3535 and having a secondary voltage of 8V or 12V.

The transformer may be mounted in the distribution board or in an individual enclosure along with the audible device.

Metering



The regulations recommend that owners or occupiers should be provided with sufficient instructions, including an overall metering strategy that show how to attribute energy consumptions to end users and how the meter readings can be used to compare operating performance with published benchmarks.

Being reliant on a single meter, belonging to the electricity supply company is insufficient to understand the electrical consumption on a commercial or industrial site and to comply with the Building Regulations.

The regulations say that reasonable provision would be to enable at least 90% of the estimated annual energy consumption of each fuel to be accounted for. To achieve this, the regulations suggest that it would be reasonable for final electrical distribution boards having a load of 50kW or more to be provided with suitable metering.

The introduction of metering does not, by itself, reduce electrical consumption but it does allow a measure of usage so that positive actions can be taken to save costs. For ease of ordering and installation the metering requirement needs to be met by an off the shelf solution which is easy and quick to install without the need for special tools or skills.

To measure energy consumed it is necessary to have a voltage sensing circuit and a current sensing circuit. Voltage sensing is achieved from a three phase outgoing circuit on the main distribution board. To prevent the metering being switched off this circuit should be locked in the on position by a padlocking device. Current sensing is achieved via three current transformers, suitably rated for the maximum current taken by the board, normally the board's rated current.
These two inputs are fed to the multi function meter which provides the readings shown on the display. Designed to fit any three phase KQII board used on a three phase four wire system. One kit for all incoming 240V 50/60Hz supplies up to 250A.

The kit contains a multi function meter, reference PM700P which displays the following readings:
- Voltage of each phase
- Current in each phase
- Kilowatts taken by each phase and the total
- Total kilowatt-hours absorbed by the loads
- Total kVArh absorbed by the loads
- Power factor of each phase

In addition there is a pulse output, 1 pulse per kWh for use with a BMS system
Pulse output contact rated 27V ac or dc, 20mA.

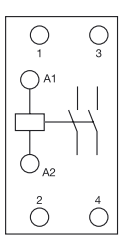
For an inexpensive and compact (96mmx96mm) meter that offer all the basic measurement capabilities, the PM700 or PM700P meter product is the best fit. With a large easy to read anti glare display that can show multiple readings on a single screen, the 50mm deep unit is the proven choice to meet the requirements of the building regulations part L2.

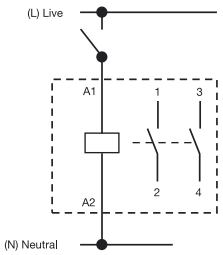
Contactors

Description	A range of contactors specially designed for distribution applications such as Lighting Heating Small motor control
Ratings	For specific application ratings refer to the relevant section of this catalogue.
Specifications	Comply with BSEN61095, IEC1095 Suitable for use on 415V 50Hz 3 phase 3 or 4 wire systems
Tropicalisation	Suitable for 95% relative humidity at 55°C
Temperature range	Suitable for use in temperatures from -5°C to +50°C Half module spacers CPS9 should be used between every two contactors. Suitable for 60°C ambient if spacers are fitted either side of each contactor
Indication	Indicator on front face of contactor: red when coil energised, white when unenergised
Main contacts	Normally open. Nominal ratings are at 40°C.
Main terminals	Tunnel type, capacities given in table below.
Control circuit	230/240v -15% +6% 50Hz
Control terminals	Tunnel type, capacity: rigid cable 2x2.5mm^2, flexible 2x1.5mm^2
Operating time	Closing: 10 - 25 mS, Opening: 10 - 30 mS
Noise level	<20dB
Mounting	On symmetrical DIN rail in KQ boards, Qwikline II units or individual enclosures

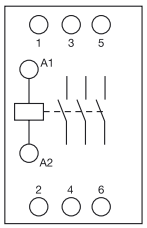
Reference	**CCN225**	**CCN240**	**CCN340**	**CCN363**	**CCN425**	**CCN440**	**CCN4100**
Rating	25A	40A	40A	63A	25A	40A	100A
No of poles	2	2	3	3	4	4	4
Voltage rating	250V	250V	415V	415V	415V	415V	415V
Making capacity	60A	120A	120A	200A	60A	120A	350A
Main terminals cable capacity							
Standard stranding	6mm^2	25mm^2	25mm^2	25mm^2	6mm^2	25mm^2	50mm^2
Flexible stranding	2x2.5mm^2	2x10mm^2	2x10mm^2	2x10mm^2	2x2.5mm^2	2x10mm^2	2x35mm^2
Coil consumption							
Pick-up VA	15	34	53	53	34	53	106
Hold VA	3.8	4.6	6.5	6.5	4.6	6.5	13
Hold W	1.3	1.6	2.1	2.1	1.6	2.1	4.2
Dimensions							
Width mm (modules)	18 (1)	36 (2)	54 (3)	54 (3)	36 (2)	54 (3)	108 (6)
Height mm	81	81	81	81	81	81	81
Depth mm	65	65	65	65	65	65	65

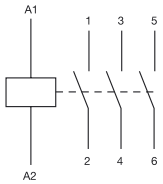
Contactor 2 pole



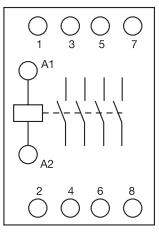


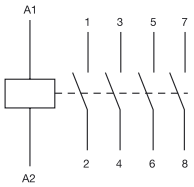
Contactor 3 pole





Contactor 4 pole





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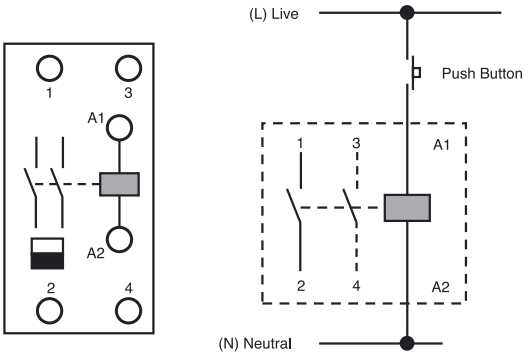
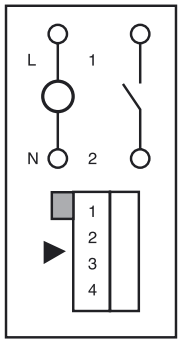
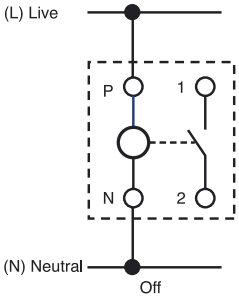
Impulse relays



References	**CIR116** One main contact **CIR216** Two main contacts (always the same status)
Description	Impulse relays, otherwise known as bi-stable relays are relays having two stable operating positions. The coil is energised for a short time to change the relay from one state to the other. Energising the coil again changes it back to its original position. Thus the coil is only energised momentarily to change the relay state. This has the advantage that there is not a coil being kept energised for long periods of time that would be expected with a contactor in a lighting circuit. Operation of the relay is by a pushbutton or retractive switch. Any number of pushbuttons may be connected into the circuit to give a switching facility at various switch positions. Each switch is connected in parallel and may be looped as required. Thus the need for two way switches and intermediates is eliminated. Because the switch circuit only carries the coil operating current the voltage drop calculations are greatly simplified. Only the main circuit need be considered.
Ratings	The main contacts are rated at 16A at 0.6pf 250V 50Hz. For specific ratings in lighting circuits refer to that section.
Specifications	Comply and tested to IEC 669-1 and 669-2
Status indication	Toggle on front face
Manual control	Toggle on front face
Endurance	200,000 cycles at AC22, pf = 0.6, 400,000 cycles at AC21, pf = 1.0
Coil circuit	230 /240 V -15% +6% 50Hz Pick up 19VA
Coil energisation	Minimum duration 50mS, Maximum 1 hour. Maximum switching 5 operations per hour
Main terminals	Tunnel type terminals, capacity 0.5 - 6mm^2
Control terminals	Tunnel type terminals, capacity 0.5 - 2.5mm^2
Mounting	On symmetrical DIN rail in KQ boards, Qwikline II units or individual enclosures.
Dimensions	Width mm (modules) 18mm (1) Height 81mm Depth 65mm

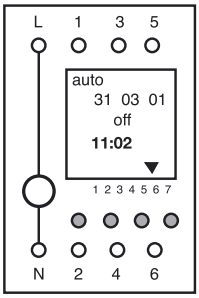
Analogue time switch

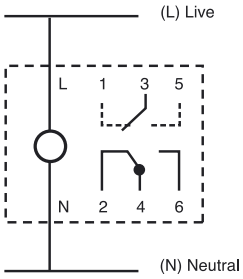




Reference	**CTS24**
Description	24 hour programmable timer
Time base	Quartz
Time accuracy	One second per day, not accumulative
Programming	Mechanical sliders, minimum interval 15 minutes Maximum 48 switchings per day
Manual control	3 position switch under front cover: ON - Automatic - OFF
Motor supply	230V +/- 10% 50–60Hz Load 2VA
Back up	100 hour capacitor type battery
Contact	1 changeover, rated 250V 50–60 Hz 16A resistive. 4A at 0.6 pf
Operating temp.	-10°C to +50°C
Terminals	Tunnel type, up to 6mm^2
Cover	Clear plastic, sealable
Mounting	On symmetrical DIN rail in KQ boards, Qwikline II units or individual enclosures
Dimensions	Width 18 (1 module) Height 90 Depth 66

Digital time switch





References	**CPT11** 7 day Digital time switch - one channel **CPT21** 7 day Digital time switch - two channel
Description	7 day programmable digital time switch
Time base	Quartz
Time accuracy	One second per day, not accumulative
Display	Time, day, date, contact status and mode
Programming	Multi lingual menu driven programming
Languages	English, French, Italian, Spanish, Portuguese or German
Manual control	Override, temporary or permanent
Min. switch time	One minute
Switching operations	CPT11: 28, CPT21: 42
Summer / winter	Manual or automatic control for UK, Europe or USA
Cover	Clear plastic, sealable
Motor supply	230V +/- 10% 50-60Hz Load 6VA
Back up	Battery: CPT11 - 3 years, CPT21 - 5 years
Contacts	1 changeover, rated 250V 50-60 Hz 16A resistive. 10A at 0.6 pf Motor load: 2300 VA
Operating temp	-10°C to +50°C
Mounting	On symmetrical DIN rail in KQ boards, Qwikline II units or individual enclosures
Terminals	Tunnel type, up to 6mm^2
Dimensions	Width 45mm (2.5 module) Height 90mm Depth 66mm

Multi functional time switch

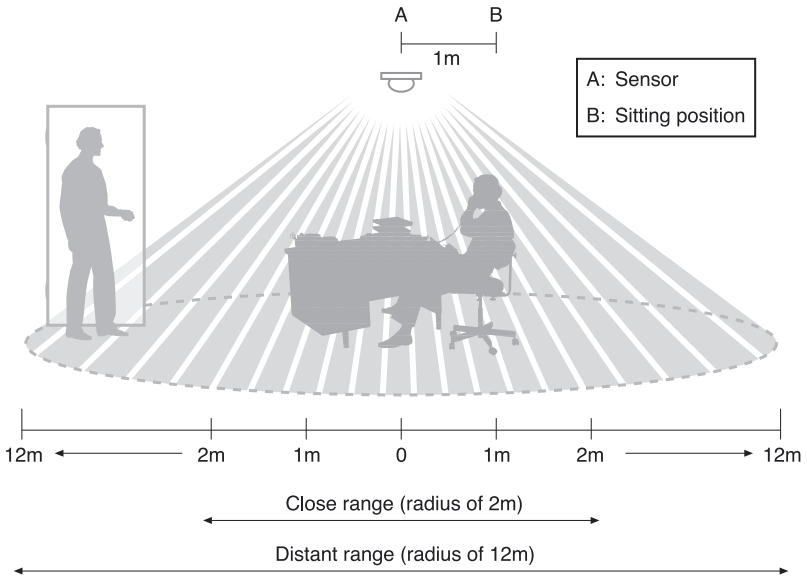
Reference	**CPT9**
Description	Multi functional time switch
Function	Controls the switching of up to four channels depending on the function allocated. There are 8 functions for the management of power and lighting Time programming: either daily, weekly or annually. Impulse programming: from 1 to 59 seconds Close delay: up to 10 hours Open delay: up to 10 hours Timer function Flashing facility Hours counter Impulse counter
Memory	45 time ranges for weekly time programming 15 time ranges for yearly time programming 20 different impulses for impulse programming Programme stored using EEPROM
Minimum switch time	1 minute between two programmed operations
Back up	Using a lithium battery. Autonomy 5 years. Life span 10 years.
Terminals	Tunnel terminals, 0.2 to 6mm^2 or 2x2.5mm^2
Cover	Clear plastic, sealable
Supply	230V +/-10% 50Hz
Inputs	6
Outputs	4; 2 NO relays and 2 CO relays 10A
Display	Time, day, date, contact status and mode
Operating temperature	-5°C to 50°C
Storage temperature	-25°C to 70°C
Electrical endurance	>20 x 106 operations
Mechanical endurance	>0.1 x 106 operations
Mounting	On symmetrical DIN rail in KQ boards, Qwikline II units or individual enclosures
Dimensions	Width 90mm (5 modules) Height 90mm Depth 65mm

Memory card for Multi functional time switch

Reference	**CPT9MC**
Description	Memory cartridge for CPT9

Presence detector

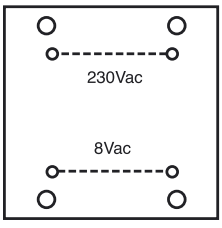
Reference	**CPD360**
Description	Infra red sensor for lighting control
	Lighting is switched if persons are detected and the lighting level is below the pre set threshold
Location	Ceiling mounted 2.5 to 3 m above floor level
Supply	230V 50Hz
Detection zone	360°C horizontally 180°C vertically
Contact rating	2000W incandescent lamps, 1000W LV halogen lamps 1000VA fluorescent tubes with standard control gear 16x(1x36W), 12x(2x36), 12x(1x58W) or 8x(2x58W) fluorescents with electronic control gear For higher ratings use contactor to switch the load
Maximum reach	High resolution close range 4m dia, safe distance range 24m dia
Switching threshold	20 - 1300 lux
Switch off delay	4 - 15 minutes adjustable
Enclosure	IP20
Operating temp.	-15°C to +50°C



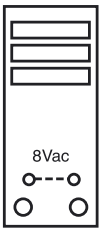
Audible alarms

References	**CBL8 Bell** **CBZ8 Buzzer**
Description	Audible alarms
Supply	8V ac for use with SQD bell transformer reference CBX8
Load	3.6VA
Sound level	70dB
Mounting	On symmetrical DIN rail in KQ boards, Qwikline II units or individual enclosures
Terminals	Tunnel terminals for cables up to 4mm²
Dimensions	Width 18mm (1 module) Height 82mm Depth 63mm

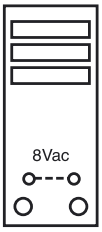
Reference	CBX8
Description	Double insulated bell transformer
Standards	Designed and tested to BS3535 Pt 1, BSEN 60742, BSEN 61558
Supply	Primary 240V 50Hz Secondary 8V or 12V 8VA
Mounting	On symmetrical DIN rail in KQ boards, Qwikline II units or individual enclosures
Terminals	Tunnel terminals for cables up to 4mm²
Dimensions	Width 36mm (2 modules) Height 80mm Depth 74mm



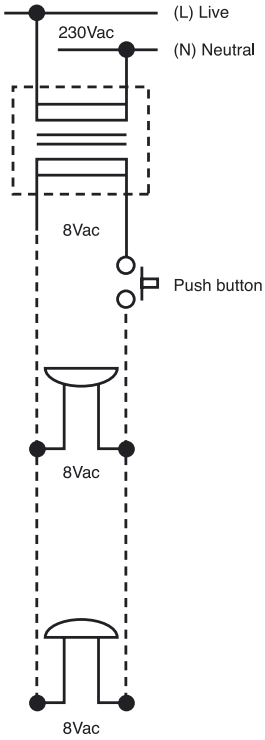
CBX8 Transformer



CBZ8 Buzzer

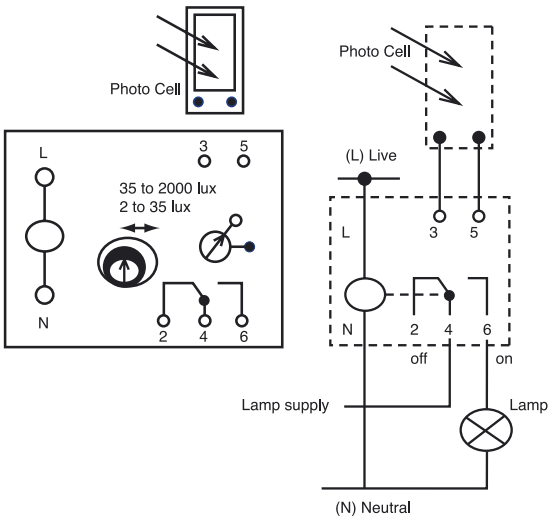


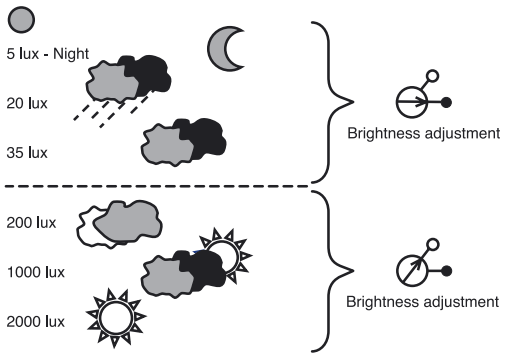
CBL8 Bell



Light sensitive switch

Reference	**CLS110**
Description	Light sensitive switch
Function	Monitors the ambient light level to switch on lighting when this falls below the preset threshold.
Sensor	The switch is supplied with a photo cell for remote mounting
Light levels	2 ranges are selectable: 2 - 35 lux or 35 - 2000 lux
Time delay	80 seconds to prevent inadvertent operation due to sudden light level changes
Status	LED indicator on front face of switch
Supply	220 / 240 V 50Hz
Burden	2.2VA
Contact	1 changeover, rated 250V 10A resistive, 1100W lighting, For larger loads use a suitable contactor to switch the load
Terminal capacity	Main terminals 0.5 - 6mm^2, control terminals 0.5 - 2.5mm^2
Mounting	On symmetrical DIN rail in KQ boards, Qwikline II units or individual enclosures
Dimensions	Width 63mm (3.5 modules) Height 81mm Depth 65mm

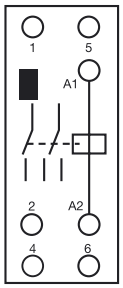


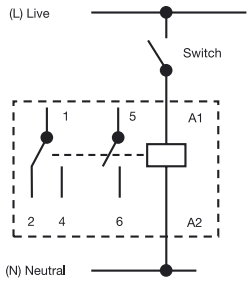


Astronomical switch

Reference	**CPLST110**
Description	Astronomical switch
Function	Monitors sunrise and sunset dependent upon geographical location to activate switch
Memory	14 switching locations
Minimum switch time	1 minute between two programmed intervals
Back up	Using a lithium battery. Autonomy 6 years, lifetime 12 years
Programming	Longitude -180° ... +180° in steps of 1° Latitude -90° ... +90° in steps of 1°
Terminals	Tunnel terminals 0.2 to 6mm² or 2x2.5mm²
Cover	Clear plastic
Supply	230Vac +/- 10% 50/60Hz
Enclosure	IP20
Operating temp	-20°C ... +50°C
Display	Time, day, date, mode
Languages	English, French, Italian, Portuguese and German
Contacts	1 changeover, rated 16A resistive, 10A at 0.6pf at 250v 50/60Hz
Mounting	On symmetrical DIN rail
Dimensions	Width 45mm (2.5 modules) Height 81mm Depth 65mm

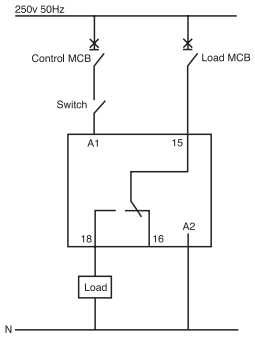
Control relay

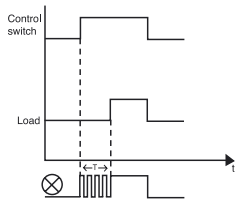




Reference	**CCR110**	
Description	Control relay	
Function	General purpose relay.	
Contacts	One changeover contact and one normally open contact, rated 250Vac 10A resistive.	
Manual control	The relay has a pushbutton on the front for testing purposes which also acts as an indicator, showing red when the coil is energised.	
Supply	230 / 240V 50Hz	
Consumption	4VA inrush and hold	
Mounting	On symmetrical DIN rail in KQ boards, Qwikline II units or individual enclosures	
Terminals	Main	Tunnel type, 0.5 - 6mm^2
	Coil	Tunnel type, 0.5 - 2.5mm^2
Dimensions	Width	18mm (1 module)
	Height	81mm
	Depth	69mm

Time delay ON relay

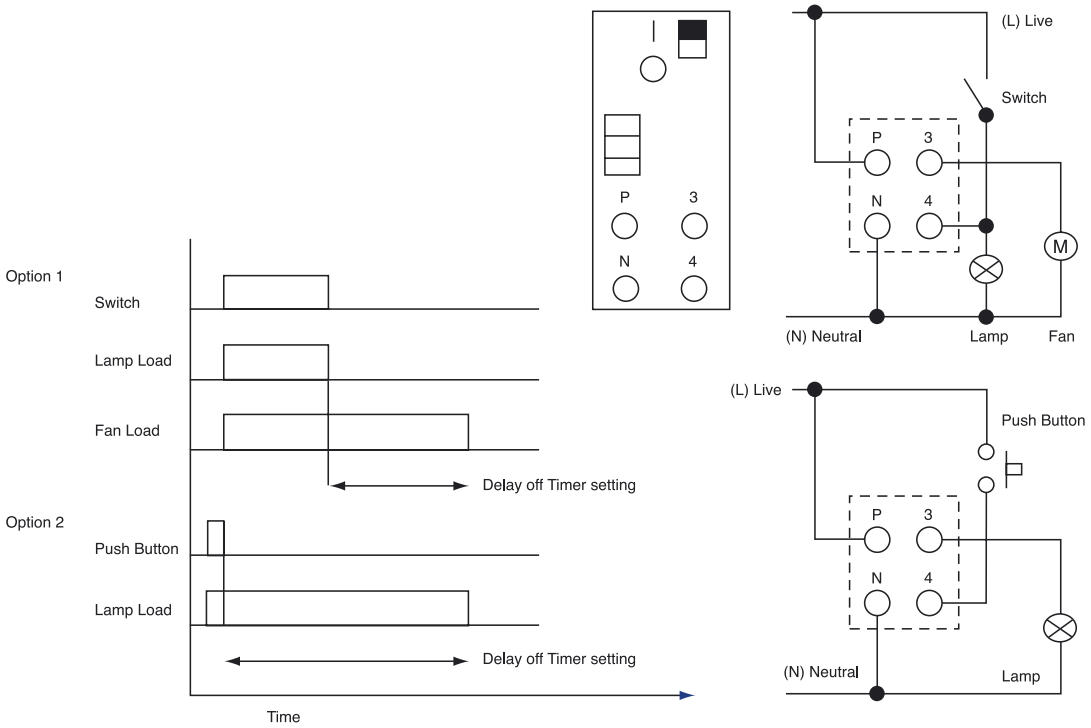




Reference	**CTR1**	
Description	Time delay ON relay. After coil energisation the contacts close at the end of the set time delay.	
Function	Use to delay the switching of a circuit. In large lighting schemes they can be used to stagger the lighting switch-on to limit the inrush current.	
Time range	0.1 seconds to 10 hours in 7 ranges. Accuracy +/- 10% of full scale	
Adjustment	2 adjustment knobs on the front face, under a transparent sealable cover	
Indication	Green indicator on front face. Flashes during timing period	
Contact	1 changeover contact	
Contact rating	250Vac. 8A resistive	
Supply	220 / 240V 50Hz	
Mounting	On symmetrical DIN rail in KQ boards, Qwikline II units or individual enclosures	
Terminals	Tunnel type, 0.5 - 6mm^2 or 2x2.5mm^2	
Dimensions	Width	18 mm (1 module)
	Height	81mm
	Depth	60mm

Delay OFF timer

Reference	**CDT116**	
Description	Time delay relay, relay de-energises after preset time, adjustable 1-7 minutes	
Function	Relay is intended for use in lighting circuits. On energisation of the relay the lighting is switched on. After the preset time period the lighting is switched off. This ensures that lighting is not left on unnecessarily and is therefore ideal for areas where persons are not continually present, such as hallways and stairways (option 2). The relay may also be used to control a ventilation fan so that it runs on after the lights have been switched off (option 1).	
Time range	1 to 7 minutes in 15 second steps	
Manual control	Override switch on front face allows lighting to be switched on permanently	
Contact	1 normally open contact	
Note	The switch on the side of the device must be in position '4' if the control switches are placed in the live side (normal practice)	
Contact rating	250Vac. 16A resistive, 2000W maximum lighting load	
Supply	220 / 240V 50Hz	
Consumption	200VA inrush, 1.1VA hold	
Mounting	On symmetrical DIN rail in KQ boards, Qwikline II units or individual enclosures	
Terminals	Main	Tunnel type, 0.5 - 6mm^2
	Coil	Tunnel type, 0.5 - 2.5mm^2
Dimensions	Width	18mm (1 module)
	Height	87mm
	Depth	70mm

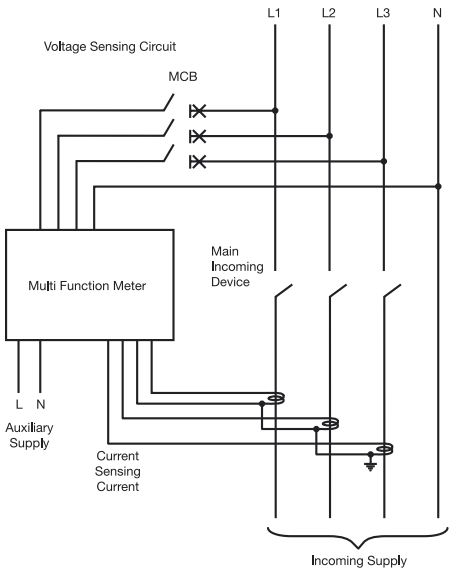


PIR detector

Reference	**CPIR**
Description	Passive infra red detector for sensing movement within the specified detection zone. A built in cell ensures that the lighting is only switched when the ambient light level is below that set on the device
Function	For switching security or safety lighting
Detection zone	12 metres and 180°C. The angular range may be reduced by using the shroud supplied
Ambient light level	Adjustable 3 - 80 lux
Switch off delay	After movement detection the contacts stay closed for an adjustable time period of 4 seconds to 15 minutes.
Contact rating	250Vac 10A resistive , 6A at 0.6 pf
Supply	230V +/- 10% 50Hz
Operating temp.	-25°C to +55°C
Protection	IP54
Mounting	Wall mounted positioned to cover the area to be secured

Multi function meter

References	**PM700** **PM700P** **PM710** **PM750**
Description	Panel/Door mounted digital multifunction meter as used in KQ250MET metering kit
Applications	Panel instrumentation, submetering, harmonic monitoring, in compliance with part L2 of the building regulations.
Specification	IEC 61036 class 1 (real energy) IEC 61036 class 2 (reactive energy)
Readings	Voltage of each phase, current in each phase Real, active, apparent power per phase Frequency powerfactor Active, apparent, relative energy (kwh, KVaR, KVArh) current demand power demand min/max of instantaneous reading Voltage total harmonic distortion Current total harmonic distortion
Supply	Three phase star connected or single phase
Auxiliary supply	110 to 415 ± 10% Vac 125 to 250 ± 20% Vdc
Frequency	45-65 Hz
Current	5A secondary from current transformer range 5 to 65534A
Pulse output (PM700P)	Static output (240 ± 10% Vac or 300 ± 10% Vdc, 100mA max) 2.41kV rms isolated
Communication RS 485 port (PM710)	2-wire, up to 19200 bauds, modbus RTU SELV circuit, 6kV impulse (double insulation)
Protection	IP52 front display IP30 meter body
Temperature range	-10°C to +50°C
Relative humidity	95%RH at 50°C
Terminals	0.5-6mm^2
Mounting	Front panel DIN96
Dimensions	96x96x88mm (meter with display) 96x96x50mm (behind mounting surface)

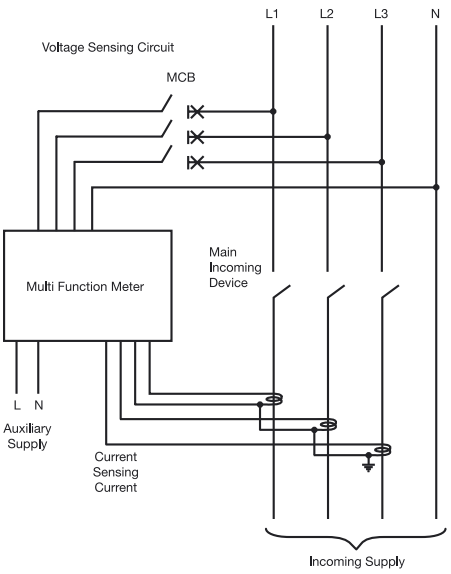


Multi function meter

Reference	**CEM01**
Description	Multi function meter
Application	This meter may be used to measure the energy used by an electrical load in compliance with part L2 of the building regulations. It is particularly easy to fit when the circuit components are DIN rail mounted.
Specification	IEC 1010 class 2
Readings	Readings displayed Voltage of each phase Current in each phase kilowatts taken by each phase and the total total kilowatt-hours absorbed by the loads total kVArh absorbed by the loads power factor of each phase
Supply	Three phase, star connected or single phase
Inputs Voltage	250V nominal, 264V maximum
Frequency	20 - 800 Hz
Current	5A from secondary of current transformers Display can be set for the following current transformer ratios 5/5 75/5 200/5 500/5 1200/5 2000/5 25/5 80/5 250/5 600/5 1250/5 2500/5 40/5 100/5 300/5 750/5 1500/5 3200/5 50/5 120/5 320/5 800/5 1600/5 4000/5 60/5 150/5 400/5 1000/5 1800/5
Pulse output	Set of normally open contacts provide an output of one pulse per kWh Pulse duration 0.4 - 0.5 seconds Contact rating 27V ac or dc, 20mA
Auxiliary supply	200 - 240V 50Hz
Protection	IP20 Do not expose display to direct sunlight
Temperature range	-10°C to +40°C
Relative humidity	90% RH maximum. No condensation must fall on the meter
Terminals	Tunnel type, 0.5 - 2.5mm^2
Mounting	On symmetrical DIN rail
Dimensions	Width 106mm (6 modules) Height 90mm Depth 58mm

Metering kit

Reference	**KQ250MET**
Description	Multi function metering kit for KQ 3 phase B type distribution boards
Function	This metering kit is designed to be field installable to any Square D LoadCentre KQ B type distribution board allowing the contractor to provide a full metering facility without the need to purchase a special bespoke board. One kit for all ratings.
Format	This kit comprises an extension box to be fixed to the bottom of the KQ distribution board. All fixings are supplied. All components except three single pole MCBs are supplied fully fitted and wired. The MCBs are supplied but require to be fitted on the distribution stack and connected to prepared tails.
Components	PM750 multi function meter Three current transformers Three single pole MCBs Wiring looms
Readings	For the readings provided see details of the PM700P meter
Current rating	The kit is rated at 250A and is suitable for all ratings of incomer
Voltage rating	415V nominal, 455V maximum. 3 phase 4 wire 50-60 Hz
Output	Pulse output contact is available. Contact rated at 27V 20mA ac or dc.
Dimensions	Width 456mm Height 450mm Depth 127mm



Individual enclosures

Sheet steel	
Description	Range of wall mounting sheet steel enclosures containing symmetrical DIN rail for fitting DIN profile products
Protection	IP30 to IEC529
Covers	Screw fixing with facilities for sealing
Finish	Square D blue grey epoxy paint
Knockouts	One 25mm knockout at each end

References	**SDEN3**	**SDEN4**	**SDEN5**
Nº. of 18mm modules	3	4	5
Height	200	250	250
Width	101	123	123
Depth	63	63	63

Insulated case (IP40)	
Description	Range of wall mounting insulated enclosures containing symmetrical DIN rail for fitting DIN profile products
Protection	IP40 to IEC529
Covers	Screw fixing with opaque front door opening upwards
Finish	Self extinguishing material, white colour to RAL 9003
Terminals blocks	Two earth – neutral blocks having 4 terminals (8 for SDEN8P)

References	**SDEN4P**	**SDEN6P**	**SDEN8P**
No of 18mm modules	4	6	8
Height	200	200	200
Width	112	148	184
Depth	94	94	94
Weight g	305	370	435

Insulated case (IP54)	
Description	Wall mounting insulated enclosure containing symmetrical DIN rail for fitting DIN profile products
Protection	IP54 to IEC529
Covers	Screw fixing with clear front door opening upwards
Finish	Self extinguishing material, white colour to RAL 9003
Terminals blocks	Two earth – neutral blocks having 4 terminals

References	**RSD4IP54**
No of 18mm modules	4
Height	200
Width	110
Depth	112
Weight g	350

References	**SQODNBP**	**KQBP25**
Description	Blanking plate for unused ways in all enclosures, 5 modules	
Pack quantity	1	25

Twinbreak

Ratings	20A	32A	63A	100A	125A	160A
Standard			BSEN60947-3 I.E.C. 947-3			
Rated current Ie	20A	32A	63A	100A	125A	160A
Voltage Ue/Uimp 50/60Hz			415/500/6kV			
Rated short time withstand Icw	416A	416A	756A	1300A	1300A	1300A
Rated short circuit making capacity Icm	1.35kA	1.35kA	1.35kA	3.5kA	3.5kA	3.5kA
Rated short circuit breaking capacity Icn	50kA	50kA	50kA	50kA	50kA	50kA
Utilisation category	AC20/21/22A/23B				AC20/21/22B	
Kilowatt rating	11kW	15kW	30kW	55kW	55kw	55kW
Mechanical endurance			As per BSEN60947-3			
Electrical endurance			As per BSEN60947-3			
Rated service temperature			40°C			

Quadbreak

Ratings	63A	100A	160A	200/250A	315/400A	500A	630A	800A
Standard			BSEN60947-3 I.E.C. 947-3					
Rated current Ie	63A	100A	160A	200/250A	315/400A	500A	630A	800A
Voltage Ue/Uimp 50/60Hz				415/500/8kV				
Rated short time withstand Icw	3.4kA	3.4kA	3.4kA	5.23kA	12kA	12kA	12kA	12kA
Rated short circuit making capacity Icm	5kA	5kA	5kA	8kA	24kA	24kA	24kA	24kA
Rated short circuit breaking capacity Icn	50kA	50kA	50kA	50kA	50kA	50kA	50kA	50kA
Utilisation category	AC20/21/22/23A				AC20/21/22/23B			AC20/21/22B
Kilowatt rating	30kW	55kW	90kW	110/130kW	175/220kW	250	300kW	-
Mechanical endurance				As per BSEN60947-3				
Electrical endurance				As per BSEN60947-3				
Rated service temperature				40°C				

I-Line fuse switch units

Ratings	32A	63A	100A	160A	250A	400A
Standard				BSEN60947-3		
Rated current Ie	32A	63A	100A	160A	250A	400A
Voltage Ue/Uimp 50/60Hz	690/1000/8kV				690/1000/12kV	
Rated short time withstand Icw				As per BSEN60947-3		
Rated short circuit making capacity Icm				50kA		
Rated short circuit breaking capacity Icn				50kA		
Utilisation category				AC21/22/23B		
Kilowatt rating	30kW	30kW	55kW	59kW	147kW	220kW
Mechanical endurance				As per BSEN60947-3		
Electrical endurance				As per BSEN60947-3		
Rated service temperature				35°C		

Section 07
Contents
Dimensions

Dimensions (mm)

Domae consumer units

Insulated units

Reference number	Dimensions Height	Width	Depth
DOM2CU	240	189	127
DOM4CU	240	224	127
DOM6CU	240	260	127
DOM8CU	240	296	127
DOM12CU	240	368	127
DOM16CU	240	440	127

Metal units

Reference number	Dimensions Height	Width	Depth
DOM4MCU	247	222	111
DOM6MCU	247	258	111
DOM8MCU	247	294	111
DOM12MCU	247	366	111
DOM16MCU	247	438	111

Dimensions (mm)

Qwikline II consumer units

Insulated units

Reference number	Number of ways	Type	Dimensions A	B	
SQO2	2	Standard	189	126	
SQO4	4	Standard	224	162	
SQO6	6	Standard	260	198	
SQO8	8	Standard	296	234	
SQO12	12	Standard	368	306	
SQO16	16	Standard	440	378	
SQO23	24	Standard	368	306	Height = 480
SQO204	2+4	Dual	296	234	
SQO303	3+3	Dual	296	234	
SQO402	4+2	Dual	296	234	
SQO406	4+6	Dual	368	306	
SQO505	5+5	Dual	368	306	
SQO604	6+4	Dual	368	306	
SQO703	7+3	Dual	368	306	
SQO707	7+7	Dual	440	378	
SQOS2R4	2+4	Split	296	234	
SQOS3R3	3+3	Split	296	234	
SQOS4R2	4+2	Split	296	234	
SQOS4R6	4+6	Split	368	306	
SQOS5R5	5+5	Split	368	306	
SQOS6R4	6+4	Split	368	306	
SQOS7R3	7+3	Split	368	306	
SQOS7R7	7+7	Split	440	378	

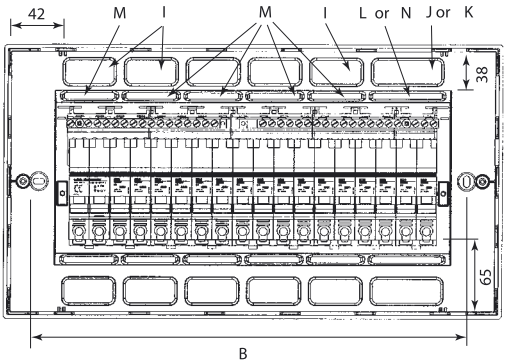
Cable access points

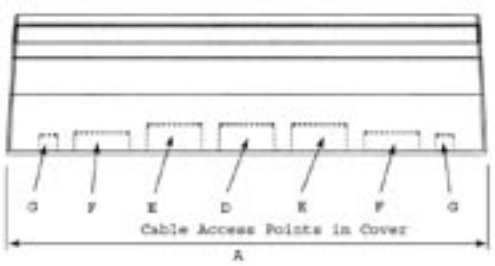
Type	D	E	F	G	H	I	J	K	L	M	N
2 way		6		4	6	2	2		2	a2	
4 way		6		4	8	4				4	
6 way	2	8		4	4	6				6	
8 way	2	4	4	4	4	6	2		2	6	
12 way	4	6	2	4	4	10				10	
16 way	6	4	4	4	4	10		2		10	2

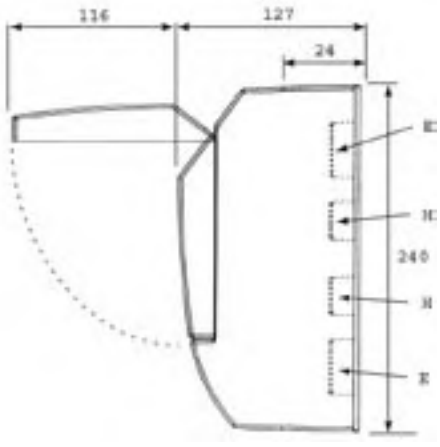
Note: 24 way unit is made up of 2, stacked, 12 way enclosures.
Knockout quantities for Split load and Dual incomer units are obtained by adding the total number of outgoing ways, plus 2 then relating to the table, eg. 7 + 7 ways + 2 =16/16 way knockout quantity.

Cable entry size

	Entry sizes		
D	23 x 51	J	25 x 30
E	15 x 38	K	25 x 65
F	15 x 51	L	13 x 30
G	13 x 16	M	13 x 48
H	15 x 25	N	13 x 65
I	25 x 48		





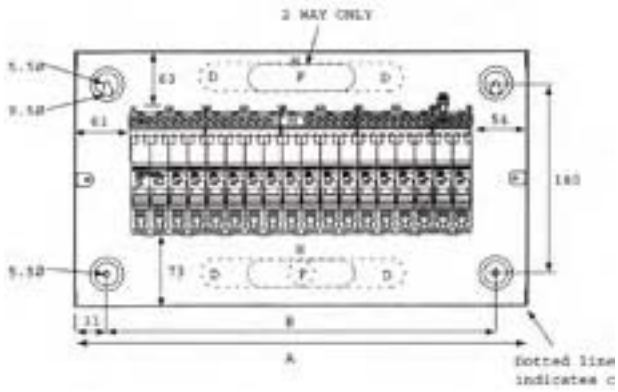


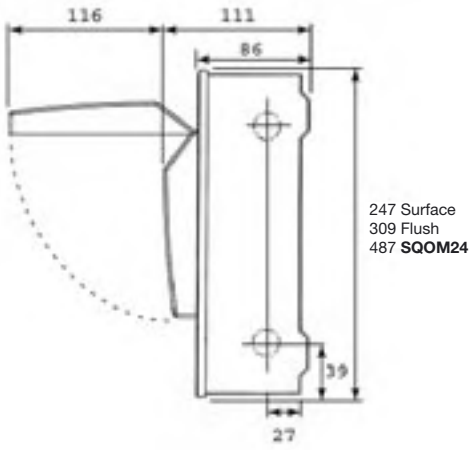
SQO23 480mm high

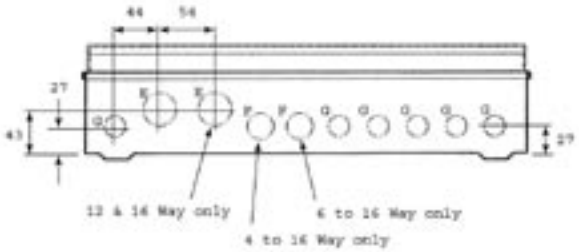
Metal units

Reference number	Number of ways	Type	Dimension A	Number of knockouts D 250 x 76	E 30	F 25	G 20	H 250 x 192
SQOM2	2	Standard	181	-	2	2	8	-
SQOM4	4	Standard	217	2	2	2	8	-
SQOM6	6	Standard	253	-	2	4	8	
SQOM8	8	Standard	289	-	2	4	10	2
SQOM12	12	Standard	361	4	4	4	12	-
SQOM16	16	Standard	433	4	4	4	16	-
SQOM24	24	Standard	487	6	4	4	8	-
SQOM2F	2	Flush	248	-	2	2	8	-
SQOM4F	4	Flush	284	2	2	2	8	-
SQOM6F	6	Flush	320	-	2	4	8	2
SQOM8F	8	Flush	356	-	2	4	10	2
SQOM12F	12	Flush	428	4	4	4	12	-
SQOM16F	16	Flush	500	4	4	4	16	-
SQOMS4R6	4+6	Split	378	4	4	4	12	-
SQOMS5R5	5+5	Split	378	4	4	4	12	-
SQOMS6R4	6+4	Split	378	4	4	4	12	-
SQOMS7R7	7+7	Split	450	4	4	4	16	-
SQOM406	4+6	Dual	378	4	4	4	12	-
SQOM505	5+5	Dual	378	4	4	4	12	-
SQOM604	6+4	Dual	378	4	4	4	12	-
SQOM707	7+7	Dual	450	4	4	4	16	-
SQOM60501	6+5+1	Multi tariff	450	4	4	4	16	-
SQOM70401	7+4+1	Multi tariff	450	4	4	4	16	-
SQOM80301	8+3+1	Multi tariff	450	4	4	4	16	-

Note: Rear of enclosure = 242mm high



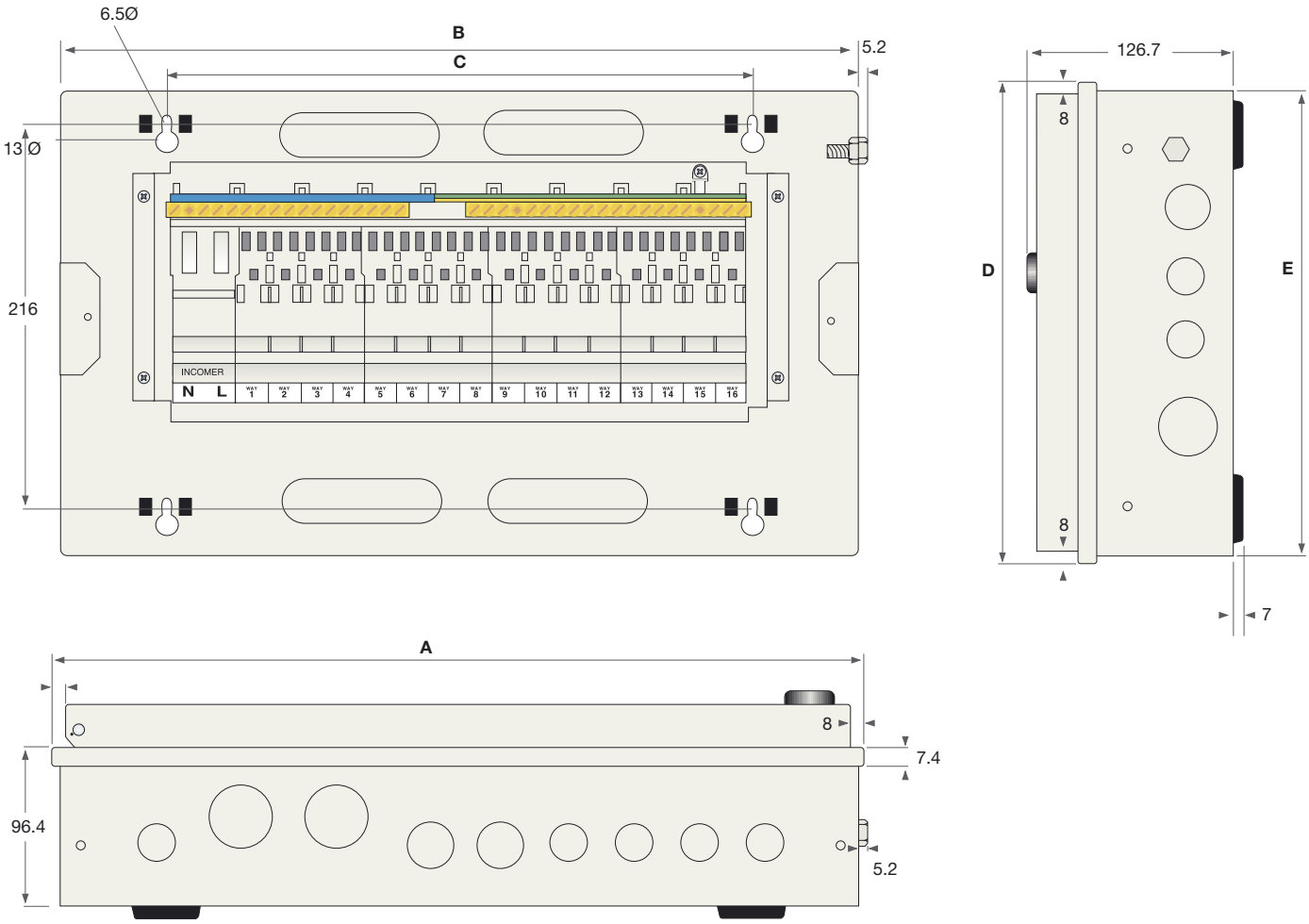




A type distribution board

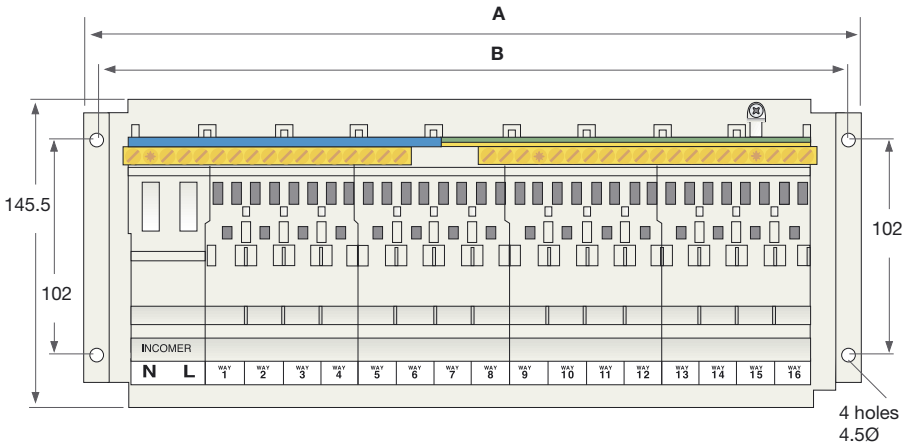
Reference number	Dimensions A	B	C	D	E	Depth
KQ125A6	266	260	140	270	264	
KQ125A8	321	315	195	270	264	
KQ125A12	376	370	250	270	264	
KQ125A16	456	450	330	270	264	
KQ125A24*	376	370	250	500	494	
KQ125A4SL6	376	370	250	270	264	
KQ125A5SL5	376	370	250	270	264	
KQ125A4SL8	456	450	330	270	264	
KQ125A6SL6	456	450	330	270	264	
KQAE16	456	450	330	270	264	
KQA12S12*	470	-	380	484	-	139

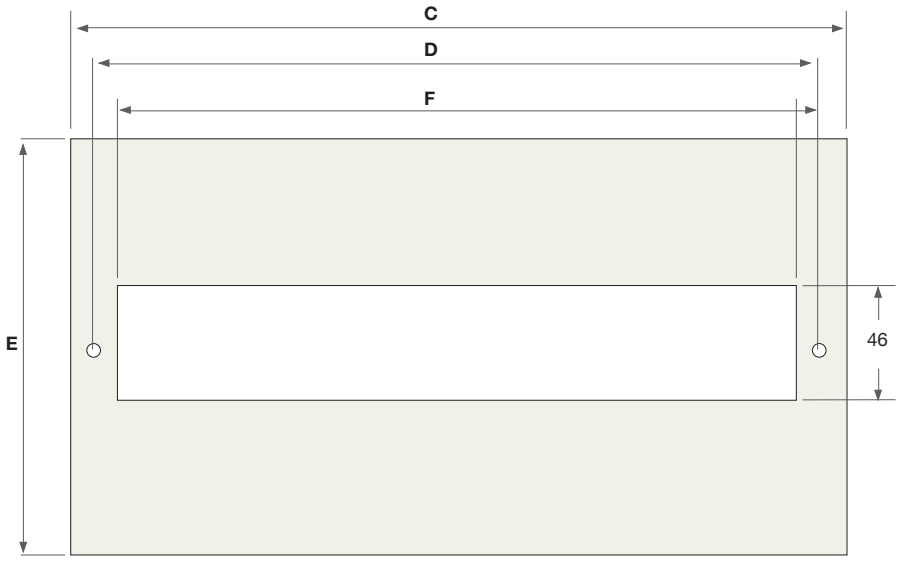
* 2 row unit



A type interior and cover

Reference number	Dimensions A	B	C	D	E	F
KQ125INTAC6	190.8	178.1	-	-	188	145
KQ125INTAC8	226.8	214.1	-	-	188	181
KQ125INTAC12	298.8	286.1	-	-	188	253
KQ125INTAC16	370.8	358.1	-	-	188	325
KQ125INTCD6	-	-	193.2	158.9	270	145
KQ125INTCD8	-	-	229.2	194.9	270	181
KQ125INTCD12	-	-	301.2	266.9	270	253
KQ125INTCD16	-	-	373.2	338.9	270	325





All “INTC” Internal covers are 20.6mm deep

B type distribution board - 125A

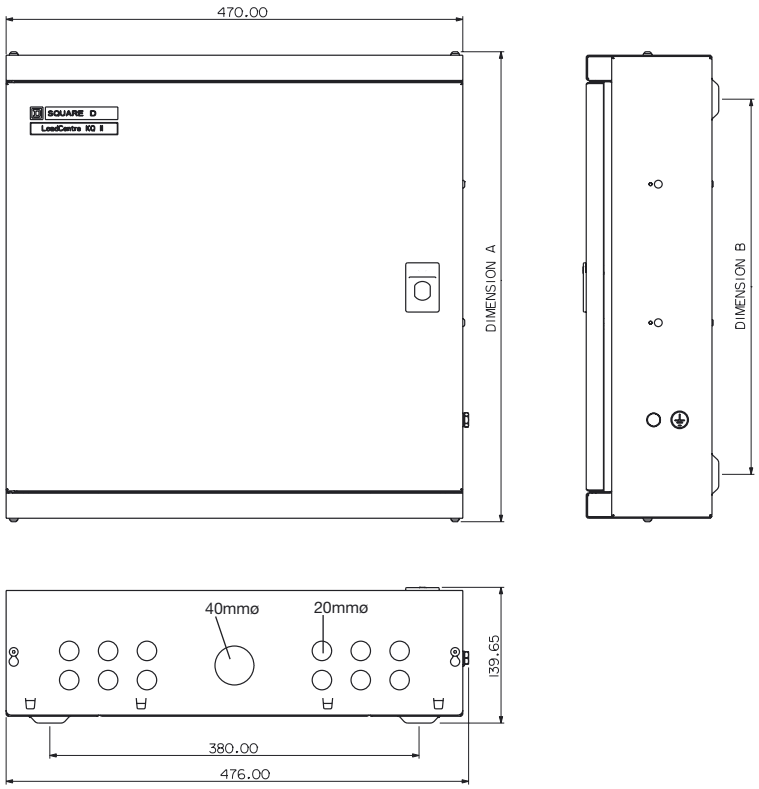
Reference number	Dimensions A	B
KQ12B125	484	386
KQ18B125	484	386
KQ24B125	538	440
KQ36B125	700	602
KQ48B125	808	710
KQ54B125	808	710
KQ72B125	970	872

B type distribution board - 250A

Reference number	Dimensions A	B
KQ12B250	754	386
KQ18B250	754	386
KQ24B250	808	440
KQ36B250	970	602
KQ48B250	1078	710
KQ54B250	1078	710
KQ72B250	1240	872

Split metering distribution boards

Reference number	Dimensions A	B
All References	1270	982

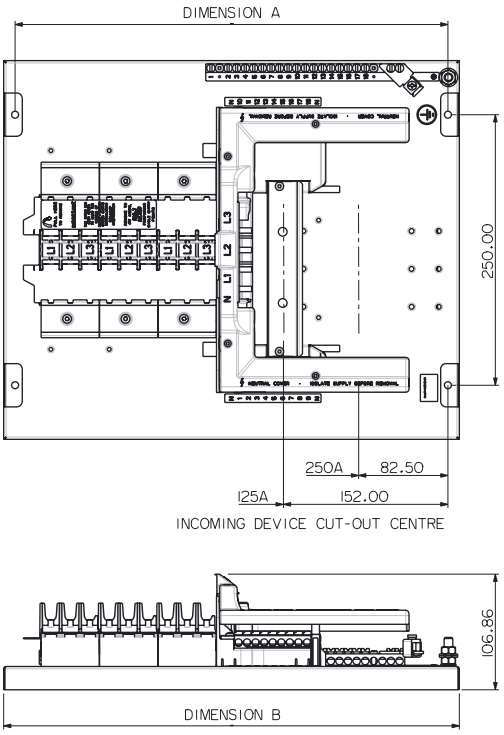


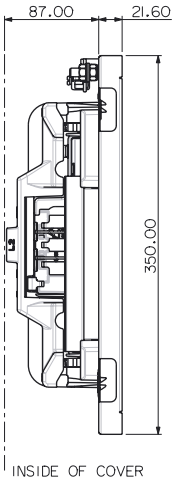
B type interior - 125A

Reference number	Dimensions A	B
KQ12B125INT	325	346
KQ18B125INT	400	421
KQ24B125INT	450	471
KQ36B125INT	550	571
KQ48B125INT	650	671
KQ54B125INT	725	746
KQ72B125INT	875	896

B type interior - 250A

Reference number	Dimensions A	B
KQ12B250INT	325	386
KQ18B250INT	400	421
KQ24B250INT	450	471
KQ36B250INT	550	571
KQ48B250INT	650	671
KQ54B250INT	725	746
KQ72B250INT	875	896





Connections

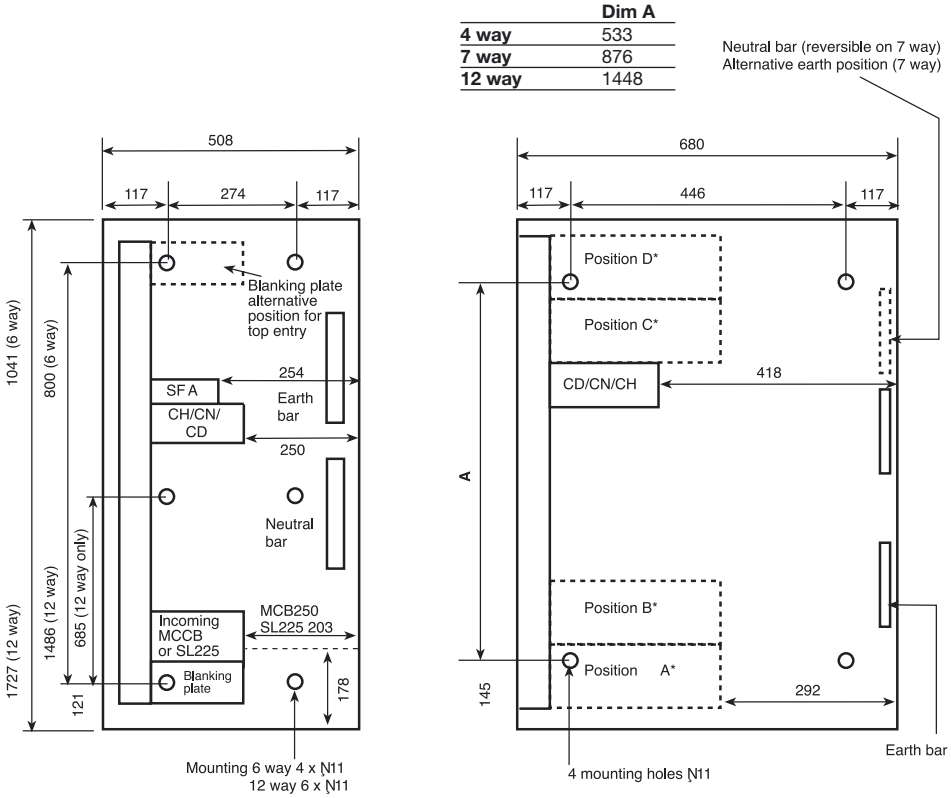
1, 2 pole	16-32A	2.5-25mm²
	40-100A	2.5-50mm²
3 pole	16-100A	M6 bolt
	125-250A	M8 bolt
	400A	50-300mm²
Switch disconnector	400A	M12 bolt

Earth and neutral bars

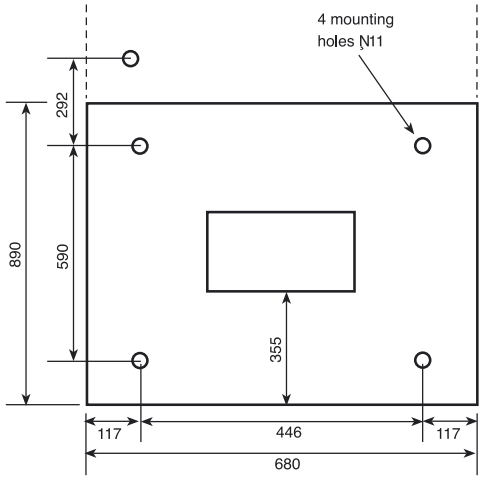
Earth bonding connection	M6 bolt
Earth bar connection holes	14x6.5ø, 2x8.5ø, 3x10.5ø, 3x3.9ø
Main neutral connection	M8 bolt
Neutral bar connection holes	10x6.5ø, 2x8.5ø, 3x3.9ø

Size 1 250A Depth: 184 Size 1 400A Depth: 258

	Dim A
4 way	533
7 way	876
12 way	1448



MFS400



MCCB connections

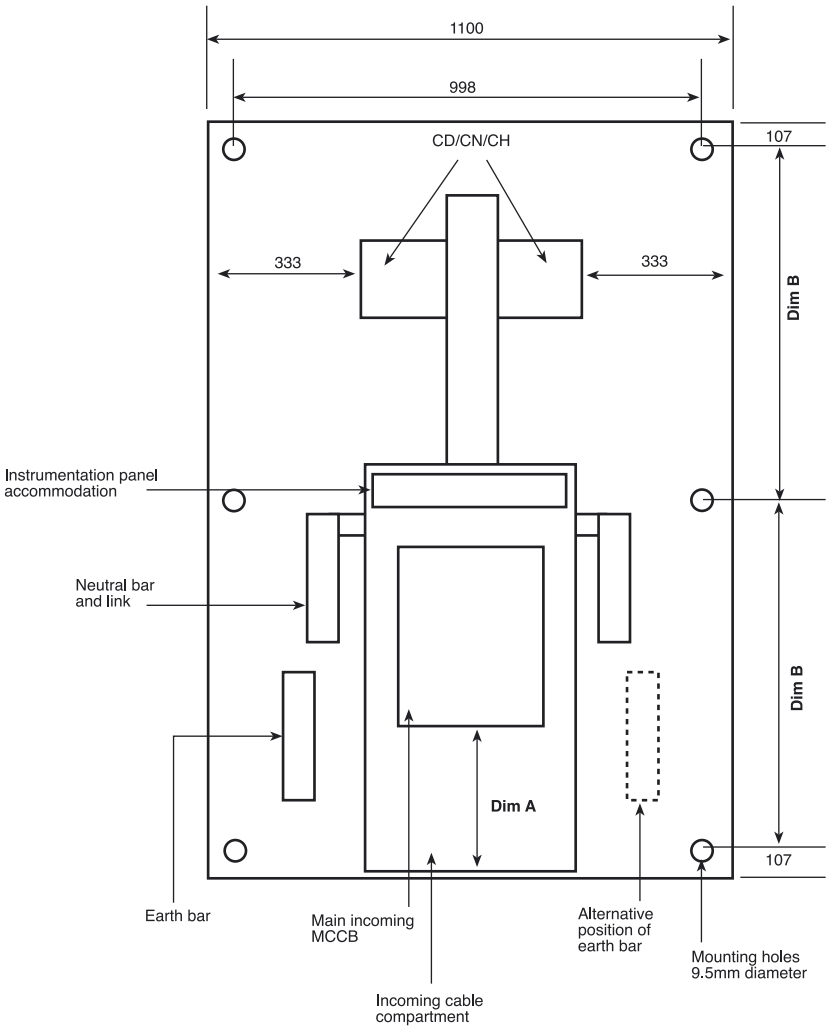
1, 2 pole	16 - 32A	2.5 - 25mm²
	40 - 100A	2.5 - 50mm²
3 pole	16 - 100A	M6 bolt
	125 - 250A	M8 bolt
SLA	250 - 400A	50 - 300mm² (1)
SMA	300 - 630A	3 x 95 - 240mm² (2)
Main lugs (ML)		240 - 500mm²

(1) Requires 3/8" hexagon key
(2) Requires 1/4" hexagon key

Earth and neutral bars

Earth bonding connection	M10 bolt
Earth bar connection holes	
6 way & 10 way boards	10 x 7.1ø, 3 x 3.7ø
14 way & 18 way boards	20 x 7.1ø, 1 x 11.5ø, 6 x 3.7ø
Main neutral connection	M12 bolt
Neutral bar connection holes	14 x 8ø, 10 x 6ø, 8 x 3.9ø

Size 2 630A Depth: 258



Module ways	Fixing centres Dim B	Height
6	566	1350
10	681	1579
14	795	1807
18	909	2036

	Dim A
SLA	330
SMA	295
Lugs	568

MCCB connections

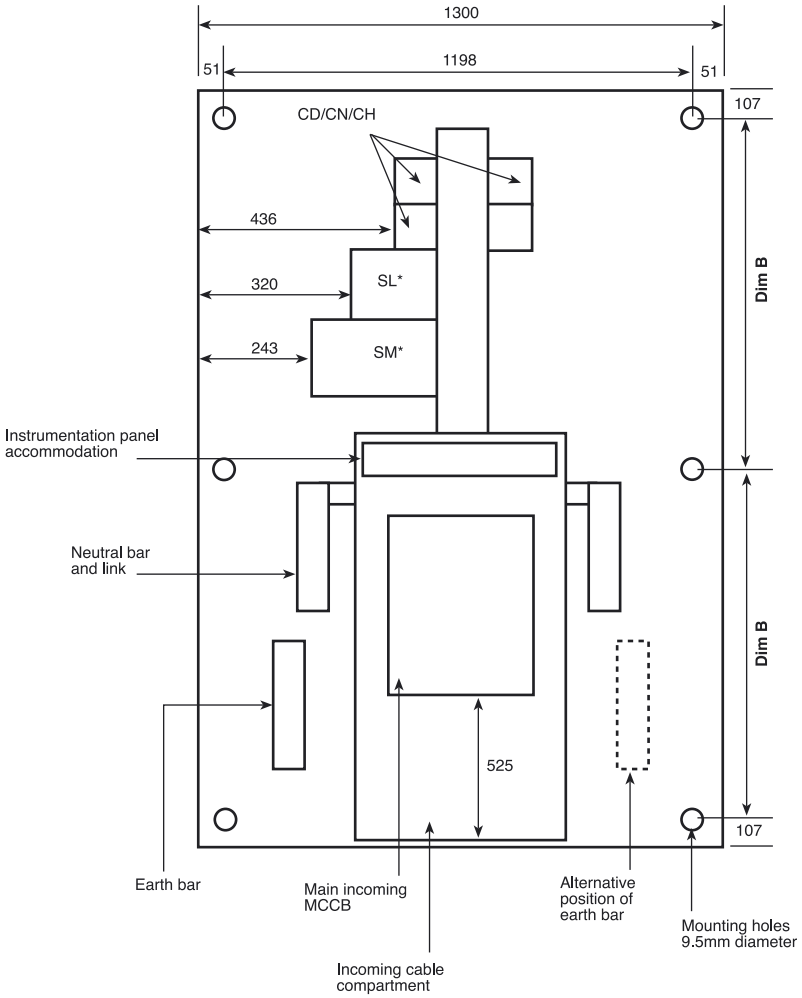
1, 2 pole	16 - 32A	2.5 - 25mm²
	40 - 100A	2.5 - 50mm²
3 pole	16 - 100A	M6 bolt
	125 - 250A	M8 bolt
SLA	250 - 400A	50 - 300mm² (1)
SMA	300 - 630A	3 x 95 - 240mm² (2)
Main lugs (ML)		240 - 500mm²

(1) Requires 3/8" hexagon key
(2) Requires 1/4" hexagon key

Earth and neutral bars

Earth bonding connection	M10 bolt
Earth bar connection holes	
6 way & 10 way boards	10 x 7.1ø, 3 x 3.7ø
14 way & 18 way boards	20 x 7.1ø, 1 x 11.5ø, 6 x 3.7ø
Main neutral connection	M12 bolt
Neutral bar connection holes	14 x 8ø, 10 x 6ø, 8 x 3.9ø

Size 3 800A Depth: 258



Module ways	Fixing centres B	Height
6	681	1579
10	795	1807
14	909	2036
18	1024	2265

MCCB connections

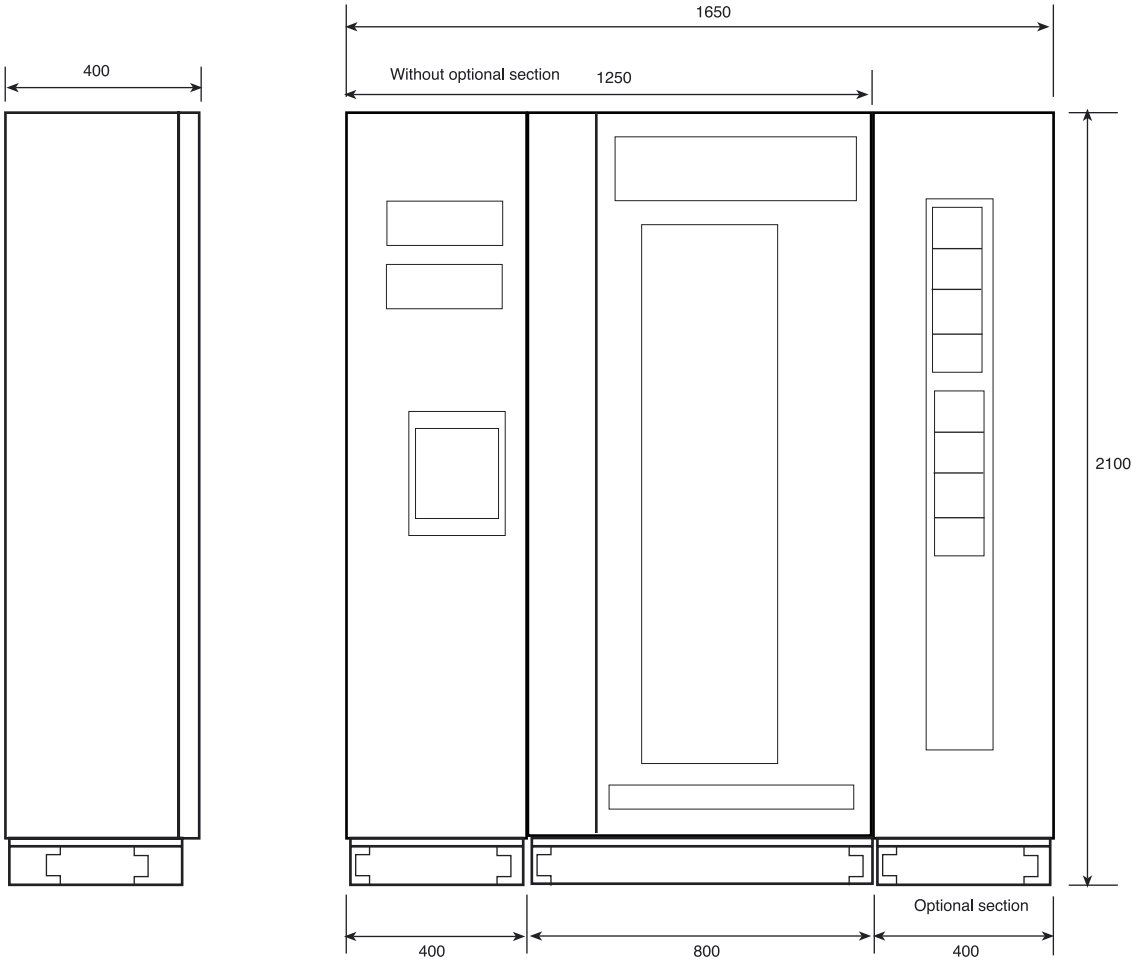
1, 2 pole	16 - 32A	2.5 - 25mm²
	40 - 100A	2.5 - 50mm²
3 pole	16 - 100A	M6 bolt
	125 - 250A	M8 bolt
SLA	Main lugs	50 - 300mm² (1)
SMA	Main lugs	3 x 95 - 240mm² (2)
SNA	Main lugs	4 x 95 - 240mm² (2)

(1) Requires 3/8" hexagon key
(2) Requires 1/4" hexagon key

Earth and neutral bars

Neutral and earth bars fitted as standard. Each has a 14mm hole for incoming and provision for crimp lug connections for outgoing circuits.

Size 4 1600A panelboard, base board



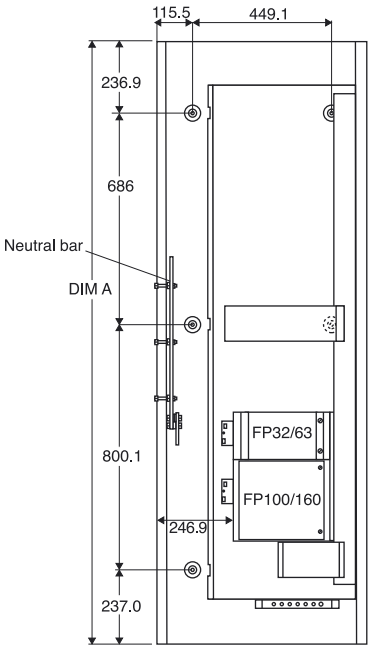
Size 4 2000A panelboard

As above except incoming section width	650mm
Overall width without optional cabling section	1506mm
Overall width with cabling section	1906mm

Dimensions (mm)

I-Line fuse switch panelboards Size 1

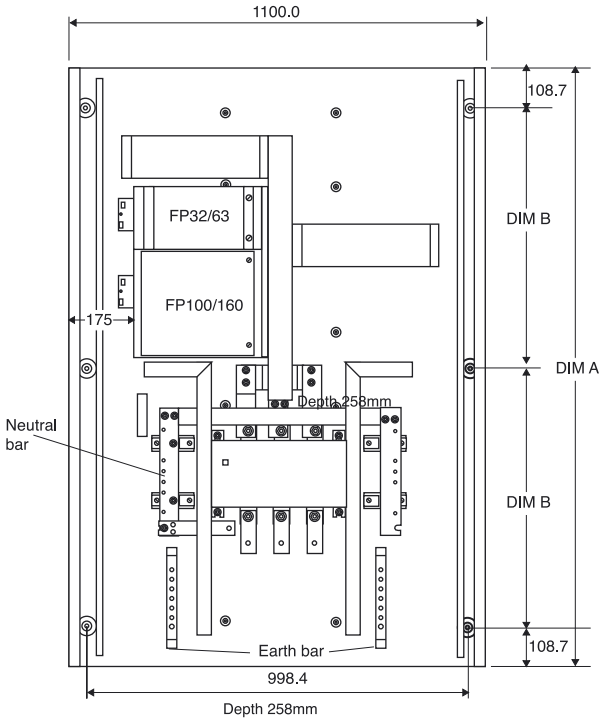
Reference number	Dimensions W	D	Dim A	Weight (Kg)	Incoming cable space
FP40061	680	258	1960	95	336



Dimensions (mm)

I-Line fuse switch panelboards Size 2

Reference number	Incoming cable space	Dimensions Dim A	Dim B	Weight (Kg)
FPS63062	415	1579	681	146
FPS630102	415	1960	871	165
FPS630142	415	2341	1062	184
FPF63062	415	1579	681	146
FPF630102	415	1960	871	165
FPF630142	415	2341	1062	184
FPL63062	545	1579	681	132
FPL630102	545	1960	871	151
FPL630142	545	2341	1062	170

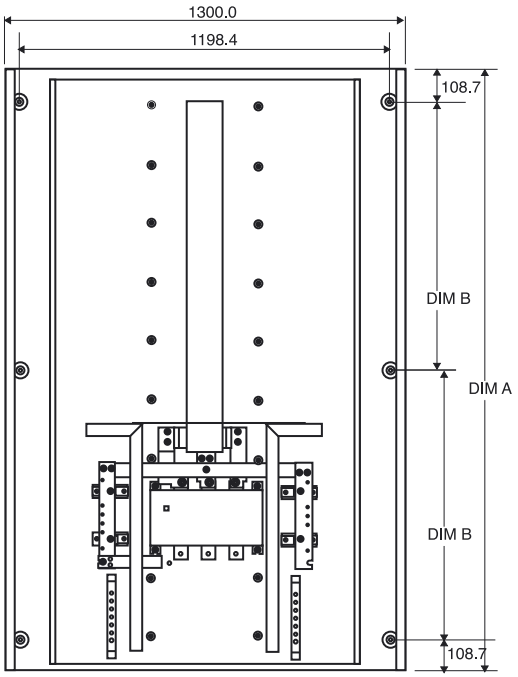


Dimensions (mm)

I-Line fuse switch panelboards Size 3

Reference number	Incoming cable space	Dimensions Dim A	Dim B	Weight (Kg)
FPS80063	365	1579	681	168
FPS800103	365	1960	871	192
FPS800143	365	2341	1062	216
FPF80063	365	1579	681	168
FPF800103	365	1960	871	192
FPF800143	365	2341	1062	216
FPL80043	595	1579	681	153
FPL800103	595	1960	871	177
FPL800143	595	2341	1062	201

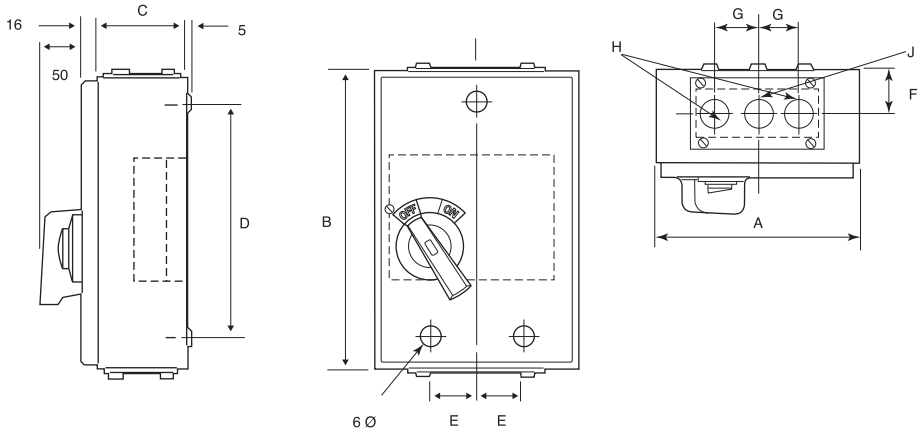
Main incoming terminal for all units: M12 bolt, 38mm pad width



Depth 258mm

Switch disconnector fuse

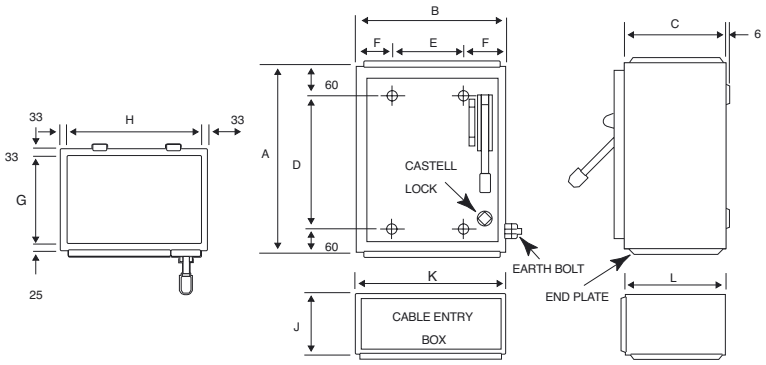
Rating (A)	A	B	C	D	E	F	G	H	J	Terminal capacity (mm^2)	Terminal pad width (mm)	Packed weight (kg)
20	210	240	105	160	50	51	44	20	25	10	-	6
32	210	240	105	160	50	51	44	20	25	10	-	6
63	235	350	105	270	55	51	50	32	32	25	-	8
100	260	400	120	320	65	51	60	40	40	50	-	8
125	292	521	121	421	94.5	51	60	40	40	M8 stud	25	10.5
160	292	521	121	421	94.5	51	60	40	40	M8 stud	25	10.5



Fuse switch disconnector

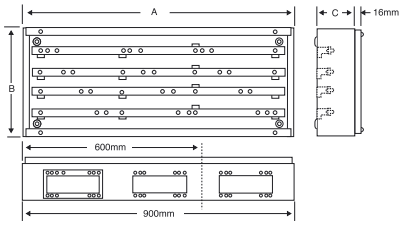
Current rating	Reference number	Switch enclosures (mm) A	B	C	D	E	F	G	H	Packed weight (kg)	Reference number	Cable entry box (mm) J	K	L
63A	**SQB0632K** **SQB0633K** **SQB0632L** **SQB0633L**	380	292	200	260	130	81	142	226	14.5	**SQBX100**	100	292	200
100A	**SQB1002K** **SQB1003K** **SQB1002L** **SQB1003L**	380	292	200	260	130	81	142	226	15.6	**SQBX100**	100	292	200
160A	**SQB1602K** **SQB1603K** **SQB1602L** **SQB1603L**	380	292	200	260	130	81	142	226	15.6	**SQBX160**	150	292	200
200A/ 250A	**SQB2003K** **SQB2502K** **SQB2503K** **SQB2502L** **SQB2503L**	380	340	200	260	180	81	142	274	19.5	**SQBX250**	180	340	200
315A/ 400A 500A	**SQB3153K** **SQB4003K** **SQB4003L** **SQB5003K** **SQB5003L**	455	489	270	335	289	100	212	423	36.2	**SQBX500**	300	489	270
630A 800A	**SQB6303K** **SQB6303L** **SQB8003L**	455	489	270	335	289	100	212	423	36.2	**SQBX630**	400	489	270

800A unit is provided with cable extension pads which are external to the above dimensions. Cable entry box SQBX630 must be used except where fitted to a Quadbreak busbar chamber.



Busbar chambers

Reference number	A	B	C	Packed weight (kg)
SBC106	600	350	120	9.6
SBC109	900	350	120	14.25



Nationwide support on one number - call the Customer Information Centre on

0870 608 8 608

Fax 0870 608 8 606

Schneider Electric's local support

Schneider Electric is committed to supporting its customers at every stage of a project. Our 180 sales engineers, the largest dedicated sales force in the UK electrical industry, operate from 4 customer support centres.

Our sales engineers are skilled at assessing individual requirements and combined with the expert support of our product specialists, will develop the most effective and economical answer taking relevant regulations and standards fully into account.

To access the expertise of the Schneider Electric group, please call 0870 608 8 608. Each customer support centre includes facilities for demonstrations and training, and presentation rooms fully equipped with audio visual and video, providing excellent meeting facilities.

Merlin Gerin

Merlin Gerin is a world leader in the manufacture and supply of high, medium and low voltage products for the distribution, protection, control and management of electrical systems and is focused on the needs of both the commercial and industrial sectors. The newly launched VDI Network Solutions offer provides flexible, configurable ethernet systems for all communication needs.

Square D

Square D is a total quality organisation and its business is to put electricity to work productively and effectively, protecting people, buildings and equipment. Its low voltage electrical distribution equipment, systems and services are used extensively in residential and commercial applications.

Telemecanique

Telemecanique is a UK market leader and world expert in automation and control. It provides complete solutions, with it's range of components, Modicon range of high technology programmable controllers (PLCs), multiple fieldbus and ethernet communication networks, HMI, motion control systems, variable speed drives and communications software. In addition, it offers power distribution through prefabricated busbar trunking.

Local customer support centres

Scotland
Schneider Electric Ltd
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Product showrooms

Industrial systems and solutions showroom
Schneider Electric Ltd, University of Warwick Science Park, Sir William Lyons Road, Coventry CV4 7EZ

Building systems and solutions showroom
Schneider Electric Ltd, Stafford Park 5, Telford, Shropshire TF3 3BL

Energy and Infrastructure systems and solutions showroom
Schneider Electric Ltd, 123 Jack Lane, Hunslet, Leeds LS10 1BS

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