

## Mains Distribution Assemblies for Construction Sites

B series Mains Distribution Assemblies for Construction Sites (MDAs) have been developed over the past 30 years and used on the majority of major UK construction projects in that period, including Heysham, Torness and Sizewell Nuclear Power Stations in the 1970s and 1980s, the Channel Tunnel and Channel Tunnel Rail Link, Canary Wharf, Jubilee Line Extension, Terminal 5, as well as current projects such as the Olympics and Crossrail.

MDAs are designed and manufactured in accordance with BS EN 60439-4 and key elements of the designs have been independently type tested, including bus bar systems, lifting arrangements, corrosion resistance, shock and vibration withstand, etc.

A range of standard models is stocked from 100A to 1600A rating (see back page for details) but we are able to make specific assemblies using a range of 8 standard enclosures in current ratings from 100A to 3200A. Assemblies up to and including 400A rating are available in wall mounting enclosures with optional stands. At ratings above 400A all enclosures are free-standing, double-sided.

### Enclosures

B series MDA enclosures are manufactured from heavy gauges of mild steel sheet and incorporate projecting canopies, side hinged doors and removable gland plates in the underside of enclosures for incoming and outgoing cables. Smaller enclosures are fabricated from 1.5mm thickness steel and larger sizes from 2mm. Doors and canopies are manufactured from up to 2.5mm thickness steel depending on size.

All doors have a tamper proof, screw-fixed padlock facility which can be removed when site conditions require unencumbered access to switchgear compartments. When doors are open, screw fixed shield plates prevent access to live parts.

Enclosures are finished by a pre-treatment and painting system which is Type Tested to BS EN 60439-4 for corrosion protection in heavily polluted environments. In practice, this should result in a 5 to 10 year enclosure life in a typical Construction application. Special finishes are available for extreme environments or where a longer life is required.

Wall mounting enclosures (up to 400A rating) are available in a range of four sizes and provide protection to IP54 with optional galvanized stands for free-standing applications. Free standing enclosures (400A and above) are available in a range of four sizes and provide protection to IP44. Lifting arrangements for free standing assemblies have all been type tested to prove fitness for purpose.

Please see over the page for details of the switchgear that can be incorporated into the different enclosure sizes, as well as enclosure dimensions, cable termination capacities, protection options, etc.



B2 series 125A MDA with time clock controlled contactors



B7 series 1600A MDA without stand extension fitted

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## **Switchgear**

Virtually all switchgear used across the range of MDAs is supplied by Schneider Electric. This world class range of equipment ensures MDAs have the highest level of performance, reliability and range. In the few areas where Schneider equipment is not used, other leading brands of switchgear are utilised.

## **Incoming Terminals**

The incoming supply cable terminates directly on to the incoming switch / MCCB on MDAs utilising B1 to B5 series enclosures. The B52, B6 and B7 all incorporate separate incoming termination chambers fitted with heavy duty copper bar terminals enabling multiple incoming cables to be terminated (refer to the adjacent chart for cable acceptance of all standard MDAs).

## **Incoming Devices**

Rated at 100A, 125A, 200A, 250A, 400A, 630A, 800A, 1250A, 1600A, 2000A and 2500A, TP+N or 4P, all padlockable in the OFF position. A range of different devices can be fitted including Switch Disconnectors, Switchfuses and MCCBs with or without Variable Time and Current RCD or Earth Fault protection.

Where stand-by generators are required to provide power in the event of a mains failure, fully inter-locked Auto Mains Failure systems or Manual Changeover Switches can be incorporated into the incoming arrangement. Bus couplers can also be incorporated enabling generators to supply Essential Supplies only.

## **Bus Bars**

Up to 200A rating, distribution switchgear is generally via MCBs mounted within type tested pan assemblies with a short circuit rating of 16kA.

Higher current MDAs (400A and above) have ASTA Certified Bus Bar arrangements. The 400A arrangement is certified at 25 kA, the 800A at 46 kA and the 2000A at 50 kA. Full test details can be provided on request or downloaded from our website ([www.blakley.co.uk](http://www.blakley.co.uk)). Other bus bar rating designs are derived from the certified systems.

## **Distribution**

B series MDAs are designed to accommodate a very wide range of hard wired and plug-in distribution arrangements and can incorporate many different combinations of isolation, protection and control devices. The different combinations of devices are virtually limitless and we detail in the table opposite the approximate scope of B1 to B7 assemblies.

## **Metering and Instrumentation**

A range of Public and Private metering equipment can be incorporated into MDAs.

Blakley Electrics are approved suppliers of stand alone CT Chambers for a number of DNOs. CT Chambers and metering equipment (including smart meters with comms equipment) can be incorporated into larger MDAs, subject to DNO approval. For private metering applications, kWhr meters can be incorporated onto main incomers and outgoing sub-circuits, feeding an integral data collection unit which can be accessed via the web. For billing purposes, MID approved meters can be incorporated. See Data Sheets ref. TMPDS29 and TMPDS33 for further information on CT Chambers and Sub-metering equipment.

## **Power Factor Correction**

The incorporation of Automatic Power Factor Correction equipment can reduce the size of supply required for a project, it can reduce availability charges and eliminate penalties for poor power factor. PFC equipment can be incorporated into main incoming MDAs or it can be supplied as a stand alone assembly. See Data Sheet ref. TMPDS25 and Tech Data Sheet TDS8 for further information on power factor correction equipment. Also see the Blakley Calculator (on the website) to assist in calculating the rating of PF equipment required.

## **Time Clock Control**

In order to reduce overall electricity consumption, many sites now require automatic control of supplies for site lighting and to site offices, to reduce consumption at night and at the weekends. This can be achieved in many different ways and we have provided a number of different solutions using time clocks, including assemblies with wireless remote override. Data Sheet ref. TMPDS24 details a typical arrangement but other systems can be supplied, which can incorporate movement detectors as well as time clocks. The Blakley Calculator (on the website) enables sites to calculate the savings made by switching off lights "out of hours".

	Scope of B1 to B7 MDAs							
	B1	B2	B3	B4	B5	B52	B6	B7
Incoming Device Options (4P unless stated otherwise)	<ul style="list-style-type: none"> <li>• 100A Isolator</li> <li>• 100A 100mA RCD</li> <li>• 100A MCB</li> </ul>	<ul style="list-style-type: none"> <li>• 100A or 200A Isolator</li> <li>• 100A 100mA RCD</li> <li>• 100A MCB with or without Variable RCD</li> <li>• 225A MCCB with or without Variable RCD</li> </ul>	<ul style="list-style-type: none"> <li>• 100A or 200A Isolator</li> <li>• 100A 100mA RCD</li> <li>• 100A MCB with or without Variable RCD</li> <li>• 225A MCCB with or without Variable RCD</li> </ul>	<ul style="list-style-type: none"> <li>• 400A Isolator</li> <li>• 400A Switchfuse</li> <li>• 400A MCCB with or without Variable RCD</li> </ul>	<ul style="list-style-type: none"> <li>• 400A Isolator</li> <li>• 400A Switchfuse, TP</li> <li>• 400A MCCB with or without Variable RCD</li> </ul>	<ul style="list-style-type: none"> <li>• 400A or 630A Isolator</li> <li>• 400A or 630A Switchfuse</li> <li>• 400A or 630A MCCB, with or without Variable RCD</li> <li>• AMF / MCO</li> </ul>	<ul style="list-style-type: none"> <li>• 630A or 800A Isolator</li> <li>• 630A or 800A Switchfuse</li> <li>• 630A or 800A MCCB, with or without Variable RCD</li> <li>• AMF / MCO</li> </ul>	<ul style="list-style-type: none"> <li>• Isolator from 1000A to 3200A</li> <li>• MCCB from 1000A to 3200A with or without RCD or EF protection</li> <li>• AMF / MCO</li> </ul>
Max Incoming Cable	1 x 35mm <sup>2</sup> 4C	100A - 1 x 35mm <sup>2</sup> 4C 200/225A - 1 x 70mm <sup>2</sup> 4C	100A - 1 x 35mm <sup>2</sup> 4C 200/225A - 1 x 95mm <sup>2</sup> 4C	1 x 240mm <sup>2</sup> 4C	1 x 240mm <sup>2</sup> 4C	2 x 240mm <sup>2</sup> 4C	8 x 300mm <sup>2</sup> 1Cs (2 per phase) 2 x 300mm <sup>2</sup> 4Cs	24 x 630mm <sup>2</sup> 1Cs (6 per phase) 2 x 400mm <sup>2</sup> 4Cs
Distribution Switchgear Options	<ul style="list-style-type: none"> <li>• 4W TP MCB Pan Assembly</li> <li>• 4 x TP MCBs + 4 x 4P RCDs</li> </ul>	<ul style="list-style-type: none"> <li>• 8W TP MCB Pan Assembly</li> <li>• 12W TP MCB Pan Assembly</li> <li>• 8 x TP MCBs + 8 x 4P RCDs</li> </ul>	<ul style="list-style-type: none"> <li>• 2 x TP MCCBs + 8W TP MCB Pan Assembly</li> <li>• 2 x TP MCCBs + 12W TP MCB Pan Assembly</li> <li>• 12 x TP MCBs + 12 x 4P RCDs</li> </ul>	<ul style="list-style-type: none"> <li>• 4 x TP MCCBs + 8W TP MCB Pan Assembly #</li> <li>• 16 x TP MCBs + 16 x 4P RCDs # - See note re: protecting Pans</li> </ul>	Up to 12 no. TP MCCBs or 8 no. 4P MCCBs rated at up to 250A, with or without RCD protection.	Up to 12 no. TP MCCBs or 8 no. 4P MCCBs rated at up to 250A, with or without RCD protection.	Up to 16 no. TP MCCBs or 12 no. 4P MCCBs rated at up to 250A, with or without RCD protection. Distribution MCCBs up to 630A rating can be fitted. Please refer inquiries and include the cable sizes to be terminated.	Up to 16 no. TP MCCBs or 12 no. 4P MCCBs rated at up to 250A, with or without RCD protection, per Distribution Section. Distribution MCCBs up to 2500A rating can be fitted. Please refer inquiries and include the cable sizes to be terminated.
Socket Options	As a high number of sockets can be incorporated, please detail socket and protection requirements at time of inquiry. BS7671 Regulation 704.410.3.10 states that on Construction Sites mains voltage sockets up to 32A rating must be protected by a 30mA RCD to provide supplementary Basic (Direct Contact) protection. Regulation 704.411.3.2.1 states that mains voltage sockets rated above 32A must be protected by an RCD with a sensitivity not exceeding 500mA. BS7375 states that on Construction Sites all socket outlets rated above 32A must be interlocked to prevent insertion or withdrawal of plugs on load.							
Dimensions H x W x D mm	452 x 627 x 165 H = 1304 on Stand	654 x 735 x 165 H = 1304 on Stand	865 x 735 x 282 H = 1304 on Stand	1050 x 980 x 332 H = 1600 on Stand	1372 x 1105 x 562 Height to gland plates: 500mm	1480 x 1314 x 562 Height to gland plates: 500mm	1645 x 1753 x 688 Height to gland plates: 630mm	2370 x 1888 x 824 Height to gland plates: 900mm
Typical Wt,	20 kgs	30 kgs	60 kgs	125 kgs	200 kgs	225 kgs	250 kgs	600 kgs
Short Circuit Rating	At time of inquiry please specify the PSC rating at the point of installation and we will incorporate switchgear to suit. Alternatively we can advise the standard short circuit rating of an MDA at the time of inquiry. Please note: if MCBs are incorporated, the maximum short circuit rating of the MDA will be 30 kA.							
Pan Assemblies	A Pan Assembly can be incorporated within the main distribution compartments of an MDA or it can be fitted into a separate, external enclosure of larger MDAs. The bus bars of pans are rated at 225A and must therefore be protected by a suitably rated MCCB with or without RCD. Pan Assemblies accept Merlin Gerin C60H series MCBs to BS EN 60947-2; SP, DP or TP; rated at up to 63A; Types "B", "C" or "D". Pans also accept SP RCBOs up to 45A and VIGI Add-on RCDs that convert MCBs to MCB/RCDs. All MCBs have an unconditional short circuit rating of 15 kA. Please refer to our Customer Service Centres for details of enhanced short circuit protection through Cascading.							
Other Options	MDAs can incorporate the following additional equipment: PF Correction; Lightning / Surge Protection; Bus Couplers; Thermostatically controlled anti-condensation heaters; Test sockets; Photocell or time clock controlled lighting contactors, etc							
Standards	MDAs are designed and manufactured in accordance with BS EN 60439-4 and incorporate high quality components to the following Standards: MCCBs to BS EN 60947-2; Pan Assemblies to BS EN 60493-3; MCBs to BS EN 60898; Switchfuses and Switch Disconnectors to BS EN 60947-3; Variable RCDs to BS 4293; RCDs to BS EN 61008; RCBOs to BS EN 61009; Socket Outlets to BS EN 60309-2; RLV Transformers to BS EN 61558 Parts 1, 4 and 23.							

## Stock Mains Distribution Assemblies for Construction Sites

B series Mains Distribution Assemblies (MDAs) are stocked in a range from 100A to 1600A. Detailed below are the part numbers and outline specification of stocked products.

If the stocked configurations are not suitable for your project, please contact our Customer Service Centres and we would be pleased to quote you for assemblies configured to your exact requirements. Alternatively complete the MDA inquiry questionnaire (available on our website, [www.blakley.co.uk](http://www.blakley.co.uk)), complete the details and we will be pleased to quote you by return.

Part	Type	Incoming (TP+N except #)	Outgoing
S140495	B1/I125-4P/MGPA4, Wall Mounting	125A Switch, 4P #	MCB Pan Assembly, 4W TP+N, all ways blanked
S140491	B1/RCD100/MGPA4, Wall Mounting	100A 100mA RCD, 4P #	
S140492	B2/I125-4P/MGPA8, Wall Mounting	125A Switch, 4P #	MCB Pan Assembly, 8W TP+N, all ways blanked
S140496	B2/RCD100/MGPA8, Wall Mounting	100A 100mA RCD, 4P #	
S140497	B2/VELS125/MGPA8, Wall Mounting	125A MCB + Variable RCD	
S140441	B2/I125-4P/MGPA8/TC-CC6, Wall Mounting (see data sheet TMPDS 24 for full details)	125A Switch, 4P #	MCB Pan Assembly, 8W TP+N c/w 8 x 32A TP MCBs and 6 x TP contactors, time clock controlled.
S140479	B2/I200-4P/MGPA12	200A Switch, 4P	MCB Pan Assembly, 12W TP+N, all ways blanked
S140494	B3/MC200/MC2/MGPA8, Wall Mounting	200A MCCB	Facility for 2 x TP MCCBs plus an MCB Pan Assembly, 8W TP+N, all ways blanked
S140493	B3/VELS200/MC2/MGPA8, Wall Mounting	200A MCCB + Variable RCD	
S140498	B3/MC200/MC2/MGPA12, Wall Mounting	200A MCCB	Facility for 2 x TP MCCBs plus an MCB Pan Assembly, 12W TP+N, all ways blanked
S140499	B3/VELS200/MC2/MGPA12, Wall Mounting	200A MCCB + Variable RCD	
S140290	B4/MC400-4P/MC3-RCD/MGPA12 Wall Mounting	400A MCCB, 4P ##	1 x 250A 4P MCCB + variable RCD ## 1 x 160A 4P MCCB + variable RCD ## 1 x 160A 4P MCCB + variable RCD feeding an MCB Pan Assembly, 12W TP&N, all ways blanked
S140593	Galvanized Stand for B1 to B3 MDAs	Part S140809	Galvanized Stand for B4 MDA
S140261	B52/ITC/MC630-4P/MC5-RCD/MGPA8 Free-standing, double-sided	630A MCCB, 4P ##	2 x 250A 4P MCCBs + variable RCD ## 2 x 160A 4P MCCBs + variable RCD ## 1 x 160A 4P MCCB + variable RCD feeding an MCB Pan Assembly, 8W TP&N, all ways blanked
S140285	B6/ITC/MC800-4P/MC7-RCD/MGPA12 Free-standing, double-sided	800A MCCB, 4P ##	2 x 400A 4P MCCBs + variable RCD ## 2 x 250A 4P MCCBs + variable RCD ## 2 x 160A 4P MCCBs + variable RCD ## 1 x 160A 4P MCCB + variable RCD feeding an MCB Pan Assembly, 12W TP&N, all ways blanked
S140308	B7/ITC/MC1600-4P/MC8-RCD/MGPA12 Free-standing, double-sided	1600A MCCB, 4P ##	1 x 800A 4P MCCB + variable RCD ## 1 x 630A 4P MCCB + variable RCD ## 2 x 400A 4P MCCBs + variable RCD ## 2 x 250A 4P MCCBs + variable RCD ## 2 x 160A 4P MCCBs + variable RCD ## 1 x 160A 4P MCCB + variable RCD feeding an MCB Pan Assembly, 12W TP&N, all ways blanked

## - MCCBs are adjustable on site from 100% to 40% of their In rating i.e. 160A-64A, 250A-100A, 400A-160A, 630A-250A, 800A-320A. See data sheets TMPDS 8 and 9 for detailed information on the range of B1 to B7 series MDAs and see data sheets TMPDS 19, 21, 23 and 26 for specific information on the stock 400A, 630A, 800A and 1600A MDAs.

Blakley Electrics manufactures the full range of Site Electrics Equipment, including: Site Intake Assemblies to house DNO Service Head and Metering; CT Chambers; High Current RCDs from 100A to 2500A; MDAs with full Form 4 Segregation; Assemblies for Tunnellers; Site Transformers; 110V Power and Lighting Equipment. Our Customer Service Centres and Engineering Department would be pleased to discuss specific applications.

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