Guidance in Specifying Distribution Products

The more information that we are provided with about your installation and the product that you require, the greater the likelihood that we will supply you with exactly what you need. Therefore, when we are quoting for special assemblies, in addition to the main switchgear or controlgear to be incorporated, guidance on the following points is of great assistance. However, in the absence of detailed information or specific requirements, we assume the equipment is for use in the UK and we endeavour to make quotations as clear as possible about the specification of the product that is being offered.

Installation Characteristics
What is the Prospective Short Circuit Current at the point of installation? (See Overcurrent section below.)
For general assemblies please advise if the average ambient temperature is below -5°C or above 35°C.
For Assemblies for Construction Sites [ACS] to BS EN 61439-4 is the standard temperature range of -25°C to +35°C acceptable? Are thermostatically controlled anti-condensation heaters required?
Is the relative humidity above 90°? Is the altitude above 2000M? Is the atmosphere polluted?

Enclosures
Is the enclosure to be free-standing or wall mounting?
If free-standing, is it to be bolted down and will there be access to all four sides?
Where are the cable entry and exit points to be positioned? (Top, bottom, sides.)
What IP rating is required? See separate Tech Data Sheet on IP ratings and also refer below ##.
If access doors are fitted, are they to be fastenable or lockable? If lockable, by key or padlock? Also see below re: emergency isolation.
Is the enclosure to be made from steel or is it to be all-insulated?
If the enclosure is made from steel:

(i) is it to be made from mild steel or stainless steel (please specify the grade of stainless)
(ii) is a specific gauge (thickness) of metal required
(iii) is there a specific type of finish required (see separate Tech Data sheet on Finishing)
(iv) if a painted finish, is a specific shade required for the top coat?

If the enclosure is to be all-insulated, is it to be made from a specific material i.e. polycarbonate, GRP, etc.

IP Ratings.
We can make steel enclosures with IP ratings of up to IP66. However, it is important to bear in mind that very high IP ratings are only maintained in the long term if doors are properly closed and fastened and regular maintenance work is carried out, such as the replacement of damaged gaskets. It is also worth bearing in mind that IP66 permits no ingress of dust at all. If there is a genuine requirement for IP65 or IP66 enclosures, then the use of switchgear that does not require doors or covers to be opened for routine operation should be considered. If limited dust ingress is acceptable, then lower IP ratings, such as IP54, IP55 or IP56 should be considered, housing conventionally operated switchgear.

Cabling
What are the sizes and types of the incoming and outgoing cables? Termination room is generally in accordance with BS5372. For bottom entry, what distance is required from the ground to the underside of the gland plates? Is special cable to be incorporated within the assembly i.e. LSF/LSOH?

Terminations
When dedicated termination arrangements are incorporated (usually incoming stud terminals / bus bars), it is assumed a cable with a 90°C operating temperature will be installed. When terminating directly on to switchgear to BS EN 60947, cables should be sized in accordance with a maximum conductor operating temperature of 70°C. Please refer to chart on page 3 for details of termination facilities, torque settings, etc., for standard B series MDAs rated up to 1600A.

Isolation
Do Assemblies For Construction Sites (ACS) require an incoming switch disconnector, fused switch or MCCB?
BS EN 61439-4 requires that an ACS is fitted with a means of isolation (a switch, as a minimum).
Do incoming switches need to be accessible at all times for emergency isolation?
BS EN 61439-4 states that the actuator of the main switch (or equivalent device) shall be easily accessible.
Does the switch need to be lockable in the OFF position?
BS EN 61439-4 states that means needs to be provided for securing the switch in the open position. The incoming switchgear compartments of Blakley ACSs are pre-drilled for padlock hasps, enabling the main switch to be made inaccessible when switched OFF (a padlock, hasp and fixings are provided). Main switches are also fitted with dolly locking devices, enabling locking off to be independent of the door. Distribution compartment doors also have a padlock facility.

Bus Bar Systems
Up to 250A rating, distribution switchgear is generally via MCBs mounted within type tested pan assemblies with a short circuit rating of 16kA. Higher current ACSs (400A and above) have ASTA Certified Bus Bar arrangements. The 400A arrangement is certified at 25 kA, the 800A at 46 kA and the 1600A at 50 kA. Full test details can be provided on request. Other bus bar rating designs are derived from the certified systems.

As a minimum, bus bar systems are continuously rated at the nominal rating of the incoming device, at an ambient of 35°C.

MCCB Ratings
The nominal ratings assigned to MCCBs to BS EN 60947-2 are based on operation in free air. When they are housed in non-vented enclosures (IP44 and higher), devices derate by up to 25%, dependent on the type of device, the form of enclosure construction and the combination of MCCBs incorporated. For distribution circuits within standard MDAs, the overall temperature rise limits permitted by BS EN 61439 should not be exceeded if the Rated Diversity Factors in BS EN 61439-4 Table 101 are applied to the enclosed ratings, as below:

Type of Load	Assumed Loading Factor
Distribution - 4 and 5 circuits	0.8
Distribution - 6 to 9 circuits	0.7
Distribution - 10 or more circuits	0.6

Overcurrent and Short Circuit Protection
If a main Incoming MCB or MCCB is required, can this also perform the function of the Main Isolator?
Can cascading be employed to optimise the cost and size of equipment on installations with a high PSCC?
Is short circuit protection discrimination required between different levels of distribution in a scheme?
As standard we incorporate Schneider switchgear. Other makes can sometimes be accommodated although there is often an impact on cost and delivery. Refer to our separate Tech Data sheet on Schneider MCCBs and MCBs for further information on Cascading, Distribution and MCCB Adjustability ranges.
If an MCB Pan Assembly (an MCB board interior) is to be incorporated within a switchboard where the main protective device is rated higher than 250A, the MCB pan assembly must be protected by an MCCB rated at up to 250A, located within the same board.
MCCBs and MCBs that feed inductive loads (transformers, motors, etc.) need to have a suitable instantaneous trip characteristic (MCBs to be Type “D”; MCCBs to have an instantaneous trip setting of at least 10 times In).
On circuits fed from the secondary of small power transformers, overcurrent protection for distribution circuits should be incorporated on the secondary side of the transformer and not on the primary.
The overcurrent protection provided for Single-phase Centre Tapped to Earth and Earth Free circuits should be Double-pole and not Single-pole, as there are two live lines and not a line and neutral.

RCD Protection
Is RCD protection required on incoming and outgoing switchgear? In most cases, we would strongly recommend the deployment of High Sensitivity RCDs on individual outgoing circuits rather than protecting incomers of such assemblies.
What sensitivity RCD protection is required? Where supplementary basic protection is required the sensitivity must be 30 mA or more sensitive with undelayed response.
Is the RCD protection to incorporate Time Delay? Time delay is essential to achieve discrimination between different layers of RCD - but must not be incorporated where supplementary basic protection is required i.e. where 30 mA RCDs are provided.
If MCCBs are to incorporate RCD protection are the MCCBs to be TP with a solid neutral or 4 pole with a switched neutral? Switched neutrals are recommended when feeding domestic type loads, in order to isolate neutral-earth faults.

Socket Outlets to BS EN 60309-2
What current rating sockets are to be fitted? They are available at 16A, 32A, 63A and 125A.
What pin configurations are to be fitted? They are available in 2P, 2P+E, 3P+E and 3P+N+E.
What voltages are required? They are available in 24V, 42V, 110V, 240V, 415V, 500V and 750V.
Are the sockets to be switched and interlocked? On construction sites, all sockets rated above 32A should be interlocked so that the plug cannot be withdrawn on-load or inserted on to a fault - BS7375 refers.
Are IPX4 or IPX7 sockets required? This will often govern, or be governed by, the IP rating of the overall assembly.

Transformers
Specify the rating and voltage of transformers to feed sockets mounted to our assembly or fed from it, as well as the associated circuit protection.

Miscellaneous
At time of inquiry please specify all Test, Inspection and Certification requirements. In addition, information about off-loading facilities on site will enable us to make suitable allowances for transportation.

Customer Connections for Standard B Series Mains Distribution Assemblies

Standard B7 Details

Device / Schneider Swithgear	Rating Amps	Max Cable Size mm²	Cembre Standard Lug	Cembre Narrow Palm	Schneider Narrow Palm	Stud Size	Recommended Tightening Torque Nm
			Cable Lug / Cable Size mm²				
Incoming Bus-Bar	1600	6x 400 Singles or 3x 400 4C	≥50 ≤630	NA	NA	M16	91
Incoming Earth		2x 400 Singles					79
Distribution NSX MCCB	16 to 100	120 4C	≤95	NA	120	M6	10
Distribution NSX MCCB	125 to 160	150 4C	≤95	≥120 ≤150	150	M8	15
Distribution NSX MCCB	200 to 250	185 4C	≤95	≥120 ≤185	185	M8	15
Distribution NSX MCCB	400	240 4C	≤150	≥185 ≤240	240	M10	50
Distribution NSX MCCB	630	300 4C	≤150	≥185 ≤240	300	M10	50
Distribution NSX MCCB	800	300 4C	≤300	NA	NA	M10	28
Distribution Earth Bar	1600	16x 185	≤185	NA	NA	16x M12	32
Dist Pan Assy Acti9 iC60H MCB	2 to 25	25	NA	NA	NA	NA	2
Dist Pan Assy Acti9 iC60H MCB	32 to 63	35	NA	NA	NA	NA	3.5

Standard B6 Details

Device / Schneider Swithgear	Rating Amps	Max Cable Size mm²	Cembre Standard Lug	Cembre Narrow Palm	Schneider Narrow Palm	Stud Size	Recommended Tightening Torque Nm
			Cable Lug / Cable Size mm²				
Incoming Bus-Bar	800	8x 300 Singles or 2x 300 4C	≤300	NA	NA	M12	45
Incoming Earth		2x 300 Singles					32
Distribution NSX MCCB	16 to 100	120 4C	≤95	NA	120	M6	10
Distribution NSX MCCB	125 to 160	150 4C	≤95	≥120 ≤150	150	M8	15
Distribution NSX MCCB	200 to 250	185 4C	≤95	≥120 ≤185	185	M8	15
Distribution NSX MCCB	400	150 4C	≤150	NA	NA	M10	50
Distribution Earth Bar	800	8x 150	≤150	NA	NA	8x M10	18.6
Dist Pan Assy Acti9 iC60H MCB	2 to 25	25	NA	NA	NA	NA	2
Dist Pan Assy Acti9 iC60H MCB	32 to 63	35	NA	NA	NA	NA	3.5

Standard B52 Details

Device / Schneider Swithgear	Rating Amps	Max Cable Size mm²	Cembre Standard Lug	Cembre Narrow Palm	Schneider Narrow Palm	Stud Size	Recommended Tightening Torque Nm
			Cable Lug / Cable Size mm²				
Incoming Bus-Bar	630	2x 240 4C	≤240	NA	NA	M10	28
Incoming Earth		2x 240 Singles				M12	32
Distribution NSX MCCB	16 to 100	150 4C	≤95	NA	120	M6	10
Distribution NSX MCCB	125 to 160	150 4C	≤95	≥95 ≤150	150	M8	15
Distribution NSX MCCB	200 to 250	185 4C	≤95	≥120 ≤185	185	M8	15
Distribution Earth Bar	630	12x 150	≤150	NA	NA	12x M8	9.4
Dist Pan Assy Acti9 iC60H MCB	2 to 25	25	NA	NA	NA	NA	2
Dist Pan Assy Acti9 iC60H MCB	32 to 63	35	NA	NA	NA	NA	3.5

Standard B4 Details

Device / Schneider Swithgear	Rating Amps	Max Cable Size mm²	Cembre Standard Lug	Cembre Narrow Palm	Schneider Narrow Palm	Stud Size	Recommended Tightening Torque Nm
			Cable Lug / Cable Size mm²				
Incoming NSX MCCB	400	240 4C	≤150	≥185 ≤240	240	M10	50
Incoming Earth		240	≤240	NA	NA	M12	32
Distribution NSX MCCB	16 to 100	95 4C	≤95	NA	NA	M6	10
Distribution NSX MCCB	125 to 250	95 4C	≤95	NA	NA	M8	15
Distribution Earth Stud	400	2x 95	≤95	NA	NA	M12	32
Dist Pan Assy Acti9 iC60H MCB	2 to 25	25	NA	NA	NA	NA	2
Dist Pan Assy Acti9 iC60H MCB	32 to 63	35	NA	NA	NA	NA	3.5

Standard B3 Details

Device / Schneider Swithgear	Rating Amps	Max Cable Size mm²	Cembre Standard Lug	Cembre Narrow Palm	Schneider Narrow Palm	Stud Size	Recommended Tightening Torque Nm
			Cable Lug / Cable Size mm²				
Incoming NSX MCCB	200	95 4C	≤95	NA	NA	M8	15
Incoming Earth		95				M12	32
Distribution NSXm MCCB / CBR	16 to 160	70 4C	≤50	70	NA	M6	9
Distribution Earth Stud	160	2x 70	≤70	NA	NA	M12	32
Dist Pan Assy Acti9 iC60H MCB	2 to 25	25	NA	NA	NA	NA	2
Dist Pan Assy Acti9 iC60H MCB	32 to 63	35	NA	NA	NA	NA	3.5

Standard B2 Details

Device / Schneider Swithgear	Rating Amps	Max Cable Size mm²	Cembre Standard Lug	Cembre Narrow Palm	Schneider Narrow Palm	Stud Size	Recommended Tightening Torque Nm
			Cable Lug / Cable Size mm²				
Incoming NSX MCCB	125 to 200	70 4C	≤70	NA	NA	M8	15
Incoming Earth		70				M12	32
Dist Pan Assy Acti9 iC60H MCB	2 to 25	25	NA	NA	NA	NA	2
Dist Pan Assy Acti9 iC60H MCB	32 to 63	35	NA	NA	NA	NA	3.5

Standard B1 Details

Device / Schneider Swithgear	Rating Amps	Max Cable Size mm²	Cembre Standard Lug	Cembre Narrow Palm	Schneider Narrow Palm	Stud Size	Recommended Tightening Torque Nm
			Cable Lug / Cable Size mm²				
Incoming Acti9 Switch / RCCB	100 to 125	35 4C	NA	NA	NA	NA	3.5
Incoming Earth		35	≤35	NA	NA	M12	32
Dist Pan Assy Acti9 iC60H MCB	2 to 25	25	NA	NA	NA	NA	2
Dist Pan Assy Acti9 iC60H MCB	32 to 63	35	NA	NA	NA	NA	3.5

Notes:
The above details are based on Blakley Electrics standard range of B Series Mains Distribution Assemblies (MDAs). Please refer to data sheet DDS100 for further details.