

# Improved safety and reliability from Merlin Gerin



**Distribute electricity safely and reliably through shielded indoor/outdoor distribution switchgear.**

**Merlin Gerin low voltage distribution shielded fusegear meets your application requirements with IP2X operator protection.**

Originally launched in 1985 the shielded range replaced “open feeder pillars” offering increased safety features and with the addition of circuit breakers allows for flexibility including remote operation and control.

Important benefits have been achieved by segregating fuseways and busbars and individually shrouding each outgoing circuit, providing operator protection to IP2X BSEN 60529. Manufactured from a flame retardant material, allowing full protection and ease of use, as well as safe cabling of any circuit with the adjacent fuseway live.

For additional protection and ease of use, Shielded fuse carriers incorporate a “through grip” fuse handle for removal and insertion, and requiring no tools for fuselink replacement.

The shielded range for indoor and outdoor applications and substation packages tailored to meet customer requirements.

## Features

- Free standing or transformer mounted
- Indoor/outdoor solutions
- Busbar and disconnectors up to 3200A
- Fuseways 400A, 630A and 800A
- Moulded case circuit breakers up to 1250A
- Air circuit breakers up to 3200A
- Combined circuit breaker and fuseway units
- Metering facilities and accessories
- Weatherproof/Vandalproof enclosures up to IP54

## Benefits

### Safety to personnel

IP2X protection under normal working conditions

### Adaptability

Compact and modular design

### Durability

Indoor and outdoor service and proven performance in temperate and tropical climates

### Cost Advantage

Ease of installation/use and low maintenance

### Reliability

Customised applications  
Transformer mounted or free standing  
- proven outdoor service

### Standards

|      |         |            |
|------|---------|------------|
| ASTA | BS 5486 | EN 60439   |
| EATS | 37-2    | BSEN 60529 |

### Quality Assurance

ISO 9001, BS5750



# Application solutions

Merlin Gerin LV distribution units can be customised to form part of a total package solution in conjunction with the wider range of switchgear products for residential, commercial and retail developments. For example, package or unit sub stations comprising of a LV distribution feeder pillar, fuse cabinet or board, MV switches, circuit breakers, ring main units and a transformer.

## Fuse cabinet

The cabinet comprises of up to five outgoing fuseways and incoming disconnector or a combination of fuseways and mccb's up to 1250A. The outdoor enclosure is rated to IP33, is transformer mounted and can be used side by side with MV switchgear on a unit sub station package.



Housing

## Feeder pillars

Indoor or outdoor application to IP33 as standard or to IP54 with the addition of fitted ventilation and door gaskets. The feeder pillar can be transformer mounted with up to 15 outgoing fuseways or free-standing with 14 fuseways and cable connected. Shielded fuseways are rated to 800A and have the flexibility to combine with, air circuit breakers or moulded case circuit breakers and disconnectors dependant on customer requirement.

For easy access, feeder pillars and fuse cabinets have removable front cross member and individually supported gland plates, are vermin proof and can accommodate larger cables by mounting the enclosure on fabricated roots and plinths.



Retail

## Fuseboards

Providing IP2X operator protection with all fuse handles in place, these can be either transformer or floor mounted with the option for top or bottom cable entry. The fuseboards are for indoor application only whilst offering the same versatility as the feeder pillar for instrumentation and outgoing and incoming circuit requirements.



Commercial



## Disconnectors

The Shielded fusegear utilises our Saif disconnectors. Manufactured as single phase units, they can be mounted in the standard vertical three phase and neutral assembly, or horizontal for special applications. The neutral is a bolted type and uses the same mouldings as the phases and are also rated at 50% of phase rating. Three types are available type 3000, 2000 and 1000.

They are tin plated as standard (suffix T) but may be silver plated (suffix S) to give enhanced ratings. Disconnectors are opened and closed with the special operating handle and are for fully shrouded operator protection to IP2X of BSEN 60529, in the open and closed positions and for all normal operations. The disconnector and operating handle can only be removed when:

- contacts are fully closed and locked closed
- fully open and locked open

Disconnectors are extensively used within the Electricity Supply Industry. Padlocking and a range of current transformers are available. Load switching circuit breaker solutions are available.

## Cable termination

Shielded fuseways are suitable for either mechanical connectors or cable lugs and they can be arranged in four positions to eliminate phase core crossovers. Large cables can be accommodated.



# Circuit breaker solutions

Circuit breakers provide application solutions giving greater flexibility for LV distribution.

With traditional sub-stations, transformer overload protection is provided by the medium voltage unit on the primary side of the transformer. If the overload is one phase of the LV then the protection provided by the MV is minimal.

Therefore, in networks where loadings are not very predictable this can be an unacceptable situation. An incoming circuit breaker can provide genuine overload protection and be able to switch the total LV load in a single, safe operation, whilst the circuit breaker protects the transformer from premature ageing due to persistent overloading.

Outgoing circuit breakers also offer better flexibility and protection especially where a large LV supply is required.

Merlin Gerin range of air and moulded case circuit breakers are rated from 250A to 3200A when combined within the LV feeder pillar with Shielded fuseways and disconnectors.

A comprehensive range of accessories is available for the Compact C and Masterpact circuit breakers including motor mechanisms and dialpact auxiliaries which allow for remote operation and control through SCADA.

## Finishing process

The coating for the enclosures and other exterior steel structures encompasses several coating processes. These include being degreased in vaporised solvents before being shot blasted and metal sprayed and costed in electrostatically charged powder paint.

Fusion of the paint is achieved by baking in a curing oven for a hard high gloss finish.

The standard colour is dark grey, shade 632 of BS 381C.



Switching on incoming circuit-breaker



Fuseboards with incoming circuit breaker and outgoing fuseways.



Fuse cabinet with 2 x 630A Shielded fuseways and up to 1250A outgoing mccb.



Flexible supply for larger ratings, combine acb and Shielded fuseways within a Feeder Pillar.

# Shielded accessories



Padlocking device fitted to incoming disconnector

## Padlocking devices

For vertically mounted disconnectors which can be fitted in open or closed positions and for shielded fuseways to lockoff the busbar and cable termination's.

## Generator connection

For temporary supplies to be connected to the busbars. IP2X operator protection when fuse handles are in place.

## Incoming metering

Test certificate indicating ratio error and phase angle are available for classes 1.0 and 1.5.



Incoming metering

## Neutral link

Allows for easy disconnection of neutral for testing purposes as opposed to direct termination of the neutral busbar.

## Cable clamps

Mechanical cable clamps available for 3 to 4 core cables, 70 to 300mm<sup>2</sup>. Eliminates the need of crimping gear and to check the torque of the termination. The double headed shear bolt ensures joints can be disconnected.

## Outgoing metering

Metering of outgoing supplies is possible with the addition of C.T's to the individual cable termination's.



Load monitoring of outgoing circuits

## Instrument panel

Customised to accommodate a variety of instruments and fittings.

## Additional accessories

Ammeters / voltmeters max. demand indicators anti condensation heaters 13A RCD socket outlets, test plugs, test terminal blocks, internal lights, street lighting circuits and extension trunking / plinths.



Instrument panel accessories

# Shielded selection guide

## Shielded pillars

| Doors | Dimensions (mm)  |      | Maximum number of fuseways |                        |                  |                        |
|-------|------------------|------|----------------------------|------------------------|------------------|------------------------|
|       | A                | B    | Type 2400 & 1600           |                        | Type 800         |                        |
|       | Cable Connected  |      | PCC<br>630 & 400           | PCR & PCL<br>630 & 400 | PCC<br>630 & 400 | PCR & PCL<br>630 & 400 |
| 1     | 740              | 710  | -                          | 1                      | 2                | 3                      |
| 2     | 1020             | 990  | 2                          | 4                      | 4                | 5                      |
| 2     | 1300             | 1270 | 6                          | 6                      | 7                | 7                      |
| 2     | 1580             | 1550 | 8                          | 8                      | 9                | 10                     |
| 2     | 1860             | 1830 | 10                         | 11                     | 11               | 12                     |
| 2     | 2140             | 2110 | 12                         | 13                     | 13               | 14                     |
|       | Flange Connected |      | PFC<br>630 & 400           | PFR<br>630 & 400       | PFC<br>630 & 400 | PFR<br>630 & 400       |
| 1     | 740              | 710  | 4                          | 4                      | 4                | 4                      |
| 2     | 1020             | 990  | 6                          | 6                      | 6                | 6                      |
| 2     | 1300             | 1270 | 8                          | 8                      | 8                | 8                      |
| 2     | 1580             | 1550 | 10                         | 11                     | 10               | 11                     |
| 2     | 1860             | 1830 | 12                         | 13                     | 12               | 13                     |
| 2     | 2140             | 2110 | 14                         | 15                     | 14               | 15                     |

## Shielded boards

| Dimensions (mm) |                  | Maximum number of fuseways |                  |                        |                  |                        |
|-----------------|------------------|----------------------------|------------------|------------------------|------------------|------------------------|
| A               | B                | Type 2400 & 1600           |                  | Type 800               |                  |                        |
|                 | Cable Connected  |                            | BCC<br>630 & 400 | BCR & BCL<br>630 & 400 | BCC<br>630 & 400 | BCR & BCL<br>630 & 400 |
| 810             | 710              | -                          | 1                | 2                      | 3                |                        |
| 1090            | 990              | 2                          | 4                | 4                      | 5                |                        |
| 1370            | 1270             | 6                          | 6                | 7                      | 7                |                        |
| 1650            | 1550             | 8                          | 8                | 9                      | 10               |                        |
| 1930            | 1830             | 10                         | 11               | 11                     | 12               |                        |
| 2210            | 2110             | 12                         | 13               | 13                     | 14               |                        |
|                 | Flange Connected |                            | BFC<br>630 & 400 | BFR<br>630 & 400       | BFC<br>630 & 400 | BFR<br>630 & 400       |
| 810             | 710              | 4                          | 4                | 4                      | 4                |                        |
| 1090            | 990              | 6                          | 6                | 6                      | 6                |                        |
| 1370            | 1270             | 8                          | 8                | 8                      | 8                |                        |
| 1650            | 1550             | 10                         | 11               | 10                     | 11               |                        |
| 1930            | 1830             | 12                         | 13               | 12                     | 13               |                        |
| 2210            | 2110             | 14                         | 15               | 14                     | 15               |                        |

## Shielded cabinets

| Type                   | 1600 CFR       | 1600 CFC       | 800 CFC        |
|------------------------|----------------|----------------|----------------|
| Dimension A (mm)       | 776            | 656            | 656            |
| Dimension B (mm)       | 430            | 310            | 310            |
| Dimension C (mm)       | 460            | 460            | 370            |
| Disconnecter type      | 2000S or 2000T | 2000S or 2000T | 1000S or 1000T |
| Maximum number of ways | 5              | 4              | 4              |

### Key

|             |                                   |                                    |
|-------------|-----------------------------------|------------------------------------|
| P - Pillar  | C - Cable connected               | C - Incoming unit centre mounted   |
| B - Board   | F - Flange mounted                | R - Incoming unit mounted on right |
| C - Cabinet | L - Incoming unit mounted on left |                                    |

# Shielded selection guide

## Current transformers

| Ratio ----/5<br>application |               | Burden (AV) at accuracy class |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |           |
|-----------------------------|---------------|-------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
|                             |               | Class 5.0                     |           |           |           |           | Class 3.0 |           |           |           |           | Class 1.0 |           |           |           |           | Class 0.5 |           |           |           |           |
| ways                        | disconnectors | 5.5                           | 5.0       | 7.5       | 10        | 15        | 5.5       | 5.0       | 7.5       | 10        | 15        | 5.5       | 5.0       | 7.5       | 10        | 15        | 5.5       | 5.0       | 7.5       | 10        | 15        |
| 200                         |               | available                     | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
|                             | 200           | 200/400                       | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
| 250                         |               |                               | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
|                             | 250           | 250/500                       | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
| 300                         |               |                               | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
|                             | 300           | 300/600                       | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
| 400                         |               |                               | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
|                             | 400           | 400/800                       | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
| 500                         |               |                               | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
|                             | 500           | 500/1000                      | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
| 600                         |               |                               | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
|                             | 600           | 600/12000                     | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
| 800                         |               |                               | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
|                             | 800           |                               | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
|                             |               | 800/1600                      | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
| 1000                        |               |                               | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
|                             |               | 1000/2000                     | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
| 1200                        |               |                               | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
| 1600                        |               |                               | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
| 2000                        |               |                               | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
|                             |               | 1200/2400                     | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
| 2400                        |               |                               | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |
| 3000                        |               |                               | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available | available |

available  
 not available

## Disconnectors

| Details   | Type                         |       |                              |       |                                |       |
|---|------------------------------|-------|------------------------------|-------|--------------------------------|-------|
|   | 3000S                        | 3000T | 2000S                        | 2000T | 1000S                          | 1000T |
| Rated insulation voltage (V)                                    | 660                          | 660   | 660                          | 660   | 660                            | 660   |
| Free air current rating - single phase BSD 5486 and IEC 408 (A) | 3752                         | 3367  | 2720                         | 2520  | 1595                           | 1455  |
| Short time current withstand (kA)                               | 60 for 1.0s<br>40.0 for 3.0s |       | 60 for 1.0s<br>35.5 for 3.0s |       | 35.5 for 1.0s<br>18.0 for 3.0s |       |
| Degree of protection BS60529                                    | IP2X                         |       | IP2X                         |       | IP2X                           |       |
| Isolation distance (mm)   | 19                           |       | 19                           |       | 19                             |       |
| Weight, single pole (kg)  | 8.7                          |       | 6.4                          |       | 4.0                            |       |

## Free air rating of disconnectors

| Type  | Current rating (A) at ambient temperature (°C) |      |      |      |      |      |      |
|-------|--|------|------|------|------|------|------|
|       | 35°  | 40°  | 45°  | 50°  | 55°  | 60°  | 65°  |
| 3000S | 3752   | 3597 | 3437 | 3271 | 3098 | 2917 | 2728 |
| 3000T | 3367   | 3224 | 3076 | 2921 | 2759 | 2588 | 2408 |
| 2000S | 2720   | 2630 | 2530 | 2420 | 2300 | 2180 | 2030 |
| 2000T | 2520   | 2420 | 2310 | 2200 | 2060 | 1920 | 1760 |
| 1000T | 1595   | 1540 | 1485 | 1420 | 1340 | 1260 | 1170 |
| 1000T | 1455   | 1400 | 1330 | 1265 | 1200 | 1125 | 1045 |

# Appendix

| General technical information<br>Details   |                    | Pillars  |         |         | Boards   |         |         | Cabinets |        |
|--|--------------------|----------|---------|---------|----------|---------|---------|----------|--------|
|  |                    | 2400     | 1600    | 800     | 2400     | 1600    | 800     | 1600     | 800    |
| <b>Enclosures and protection BSEN 60529 and IEC 529</b>  |                    |          |         |         |          |         |         |          |        |
| weatherproof, vermin proof and ventilated  | (IP33)             | standard |         |         | no       |         |         | standard |        |
| dust proof with fitted ventilation   | (IP54)             | optional |         |         | no       |         |         | no       |        |
| Indoor mounting frame  | (IP2X)             | no       |         |         | standard |         |         | no       |        |
| personnel protection   |                    | IP2X     |         |         | IP2X     |         |         | IP2X     |        |
| <b>Disconnectors and mounting</b>  |                    |          |         |         |          |         |         |          |        |
| incoming disconnector type   | type               | 3000     | 2000    | 1000    | 3000     | 2000    | 1000    | 2000     | 1000   |
| incoming neutral type  | type               | 1500     | 1000    | 500     | 1500     | 1000    | 500     | 1000     | 500    |
| mounting vertical(V) horizontal(H)   |                    | V        | V       | V       | V        | V       | V       | V        | V      |
| connection flange(F) cable(C)  |                    | F or C   | F or C  | F or C  | F or C   | F or C  | F or C  | F only   | F only |
| <b>Rated short time current withstand current BS5486 and IEC439</b>                            |                    |          |         |         |          |         |         |          |        |
| flange connected 1 second  | (kA)               | 50       | 50      | 35.5    | 50       | 50      | 35.5    | 50       | 35.5   |
| flange connected 3 seconds   | (kA)               | -        | 35.5    | 18      | -        | 35.5    | 18      | 35.5     | 18     |
| cable connected 1 second   | (kA)               | 60       | 60      | 35.5    | 60       | 60      | 35.5    | -        | -      |
| cable connected 3 seconds  | (kA)               | 40       | 35.5    | 18      | 40       | 35.5    | 18      | -        | -      |
| <b>Minimum creepage and clearance distance</b>   |                    |          |         |         |          |         |         |          |        |
| with type 800 ways phase to phase  | (mm)               | 25       |         |         | 25       |         |         | 25       |        |
| with type 800 ways phase to earth  | (mm)               | 19       |         |         | 19       |         |         | 19       |        |
| with type 630 ways phase to phase  | (mm)               | 25       |         |         | 25       |         |         | 25       |        |
| with type 630 ways phase to phase  | (mm)               | 19       |         |         | 19       |         |         | 19       |        |
| with type 400 ways phase to phase  | (mm)               | 19       |         |         | 19       |         |         | 19       |        |
| with type 800 ways phase to phase  | (mm)               | 19       |         |         | 19       |         |         | 19       |        |
| <b>Standards listed are applicable to all Types and ratings</b>                                |                    |          |         |         |          |         |         |          |        |
| standards are complied with:   | (EN)               | 60439    |         |         | 60439    |         |         | 60439    |        |
|  | (IEC)              | 439      |         |         | 439      |         |         | 439      |        |
|  | (EA)               | 37-2     |         |         | 37-2     |         |         | 37-2     |        |
| <b>Maximum size of disconnector cable incoming</b><br>(terminal screws: phase and neutral M16) |                    |          |         |         |          |         |         |          |        |
|  | (mm <sup>2</sup> ) | 14xSC960 | 7xSC960 | 4xSC960 | 14xSC960 | 7xSC960 | 4xSC960 | -        | -      |
|  |                    | -        | 2x4C400 | 1x4C400 | -        | 2x4C400 | 1x4C400 | -        | -      |
|  |                    | -        | 4x4C300 | 3x4C300 | -        | 4x4C300 | 3x4C300 | -        | -      |
| <b>Maximum size of outgoing fuseway cable</b>  |                    |          |         |         |          |         |         |          |        |
| type 800(terminal screws: phase and neutral M16 and neutral M12)                               | (mm <sup>2</sup> ) | 4C300    | 4C300   | 4C300   | 4C300    | 4C300   | 4C300   | 4C300    | 4C300  |
|  |                    | SC600    | SC600   | SC600   | SC600    | SC600   | SC600   | SC600    | SC600  |
| type 630(terminal screws: phase and neutral M16 and neutral M12)                               | (mm <sup>2</sup> ) | 4C300    | 4C300   | 4C300   | 4C300    | 4C300   | 4C300   | 4C300    | 4C300  |
| type 400(terminal screws: phase and neutral M16 and neutral M12)                               | (mm <sup>2</sup> ) | 4C300    | 4C300   | 4C300   | 4C300    | 4C300   | 4C300   | 4C300    | 4C300  |

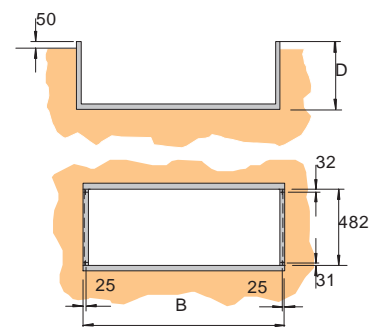
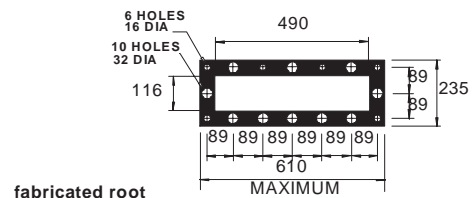
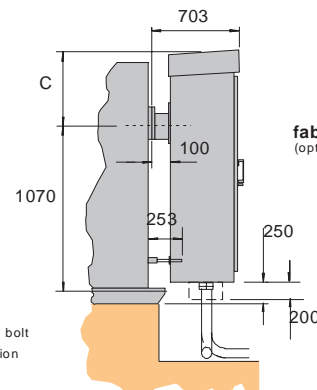
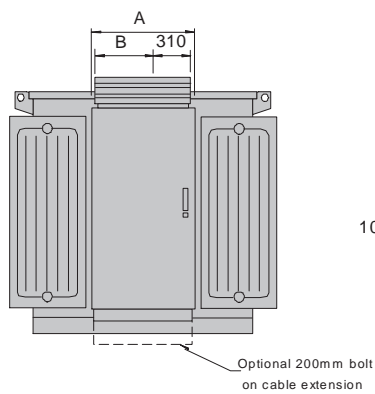
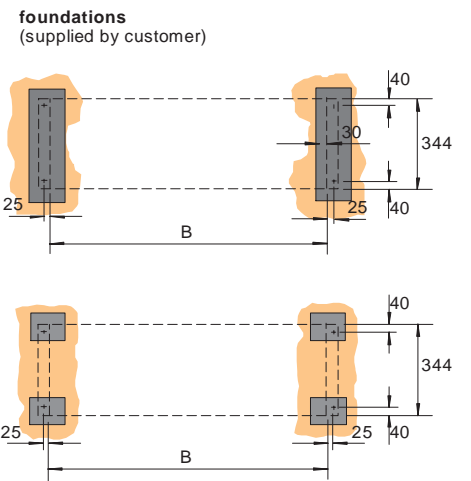
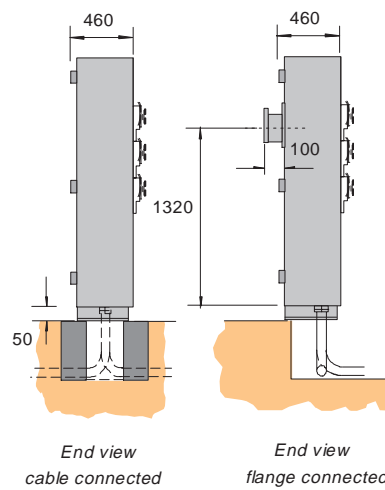
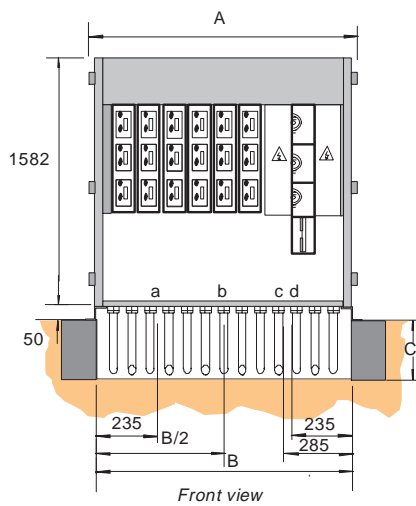
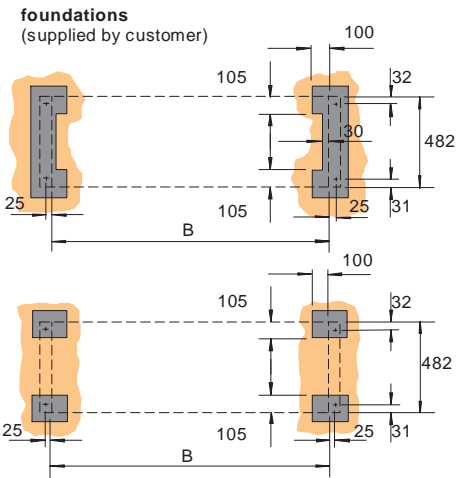
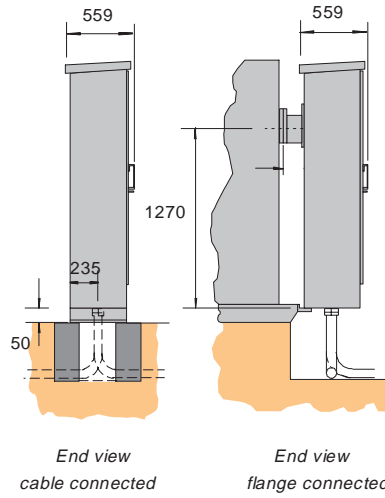
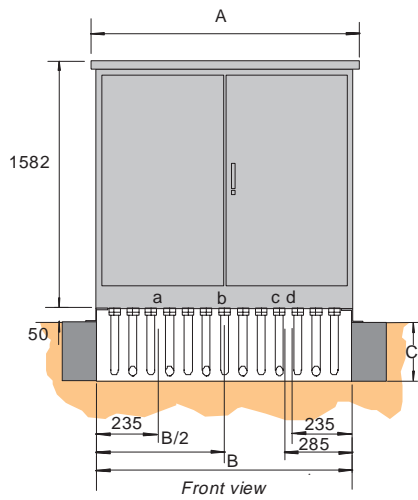
\* all terminations are single fixing per cable lug

| Rating of Shielded equipment |                      |                |              |  |      |      |      |      |      |
|------------------------------|----------------------|----------------|--------------|--|------|------|------|------|------|
| Equipment arrangement        | Enclosure protection | Equipment type | Disconnector | Current rating(A) at ambient temperature(°C) |      |      |      |      |      |
|                              |                      |                |              | 35°  | 40°  | 45°  | 50°  | 55°  | 60°  |
| pillar                       | IP33                 | 2400*†         | 3000S        | 3160   | 3037 | 2910 | 2780 | 2646 | 2508 |
|                              |                      |                | 3000T        | 2780   | 2646 | 2508 | 2365 | 2216 | 2060 |
|                              |                      | 1600           | 2000S        | 2100   | 2000 | 1900 | 1790 | 1650 | 1510 |
|                              |                      |                | 2000T        | 1805   | 1700 | 1600 | 1490 | 1375 | 1260 |
|                              |                      | 800            | 1000S        | 1340   | 1290 | 1240 | 1150 | 1065 | 970  |
|                              |                      |                | 1000T        | 1185   | 1125 | 1065 | 1000 | 935  | 860  |
| board                        | IP54                 | 2400*          | 3000S        | 2814   | 2693 | 2570 | 2444 | 2314 | 2181 |
|                              |                      |                | 3000T        | 2444   | 2314 | 2181 | 2044 | 1903 | 1756 |
|                              |                      | 1600*          | 2000S        | 1950   | 1880 | 1780 | 1635 | 1550 | 1400 |
|                              |                      |                | 2000T        | 1730   | 1635 | 1540 | 1425 | 1300 | 1175 |
|                              |                      | 800            | 1000S        | 1220   | 1135 | 1065 | 1000 | 945  | 890  |
|                              |                      |                | 1000T        | 1065   | 1010 | 955  | 905  | 850  | 800  |
| cabinet                      | IP33                 | 1600           | 2000S        | 2150   | 1975 | 1830 | 1705 | 1600 | 1510 |
|                              |                      |                | 2000T        | 1705   | 1600 | 1510 | 1425 | 1350 | 1270 |
|                              |                      | 800            | 1000S        | 1220   | 1105 | 1025 | 960  | 900  | 835  |
|                              |                      |                | 1000T        | 1050   | 985  | 935  | 880  | 825  | 770  |

\* ratings apply for incoming disconnector only †higher ratings available on request



# Shielded suggested mountings



## Dimensions

A - refer to selection guide

B - refer to selection guide

C - to suit cable bending radius

D - 450mm or 900mm