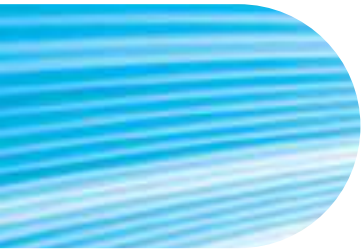
DORMAN SMITH

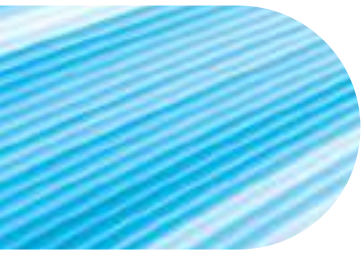
Modis Ultra

LV Distribution System

OVER 130 YEARS OF ELECTRICAL EXCELLENCE

DORMAN SMITH





OVER 130 YEARS OF ELECTRICAL EXCELLENCE

Dorman Smith Switchgear Limited

With over 130 years of experience in switchgear design and production Dorman Smith Switchgear Limited continues to provide high quality equipment for low-voltage electrical distribution and circuit protection.

Our product range begins with single-pole and neutral distribution board systems and continues up to custom designed, factory built low-voltage electrical switchboards for a broad range of commercial, industrial and retrofit applications.

We continue to build on our extensive technical knowledge and awareness of customer and market demands, operating conditions and current regulations.

This breadth of experience supports the development and manufacturing techniques of our electrical products to exceed the industry standards.

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Modis Ultra
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Key Features

Dorman Smith Switchgear Limited is pleased to introduce the new Modis Ultra, fully verified, LV Switchboard range.

Compliance

Switchboard	EN 61439-2
ACBs	EN 60947-2
MCCBs	EN 60947-2
MCBs	EN 60898
RCBOs	EN 61009
RCCBs	EN 61008
Fuse Switch	EN 60947-3

Design Verification to IEC / BS EN 61439 by testing

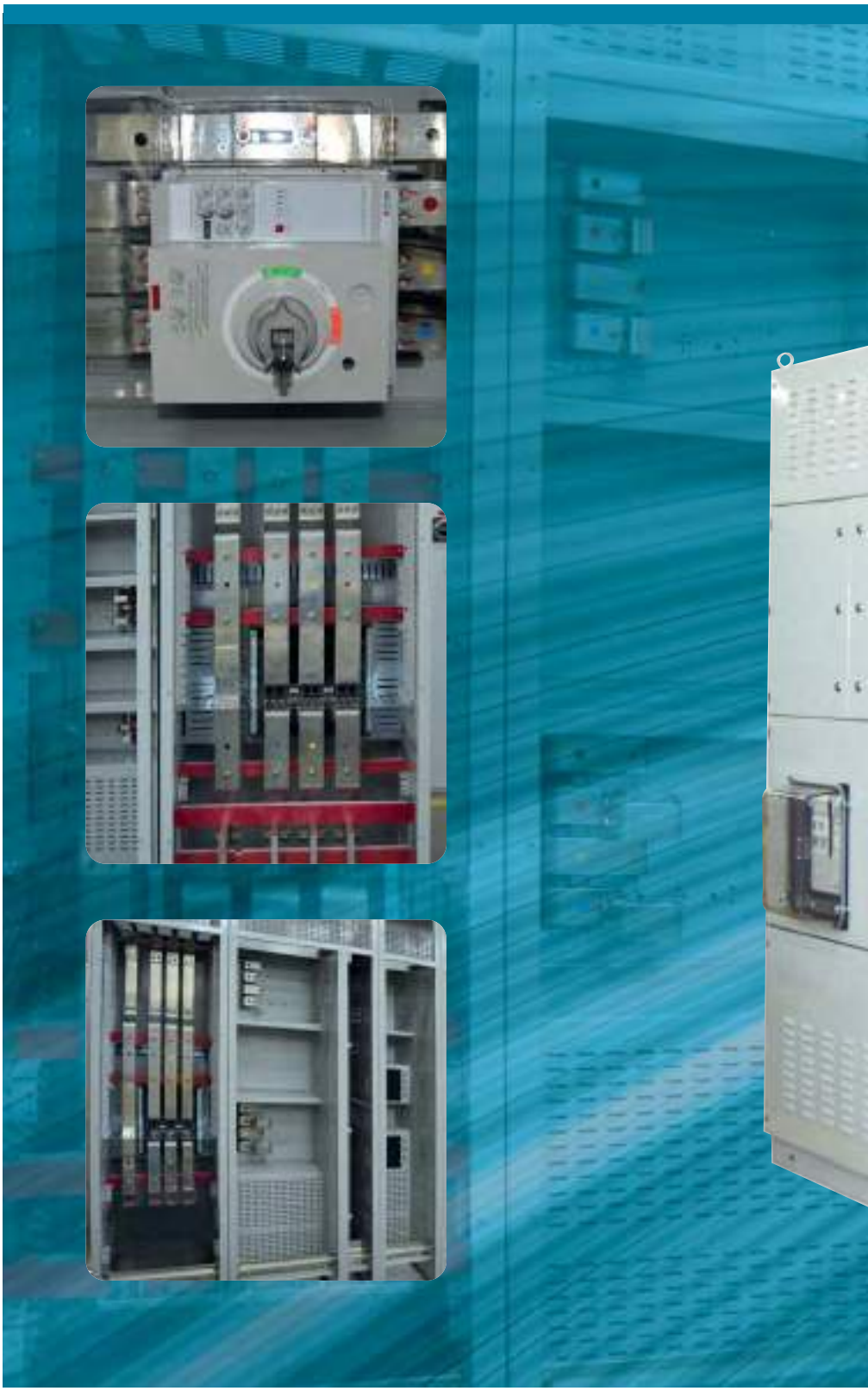
* Temperature at an ambient of 50 deg C.

Internal Arc Containment to IEC 61641

Modis Ultra design successfully tested and certified to 65kA for 300ms.

IEEE 693:2005

Modis Ultra successfuly tested and certified to High Seismic level 0.5g (earthquake vibrations).



Busbar

The Modis Ultra busbar system is 4-pole with a fully rated neutral available in 1250A, 1600A, 2500A, 3200A & 4000A ASTA certified busbars have a fault withstand rating of 50kA for 3 seconds and 65kA for 3 seconds.

Form

The Modis Ultra system is designed with Form 4a Type 2 or Form 4b Type 6 separation as standard with front or rear cabling access options. Type 7 separation is available upon request.

Frames

Three different frame widths and two different frame depth options available. All frames have a standard height for modular design.

Ingress Protection

The Modis Ultra system has a standard rating of IP43 with IP54 option available upon request.

Components

Frames

The Modis Ultra system houses all devices and busbars within rigid welded or bolted frames. Frames are available in 400, 600, 800, 1000, and 1200mm widths, 800, 1000 or 1200 mm depths and a standard height of 2300mm.

The Modis Ultra system is designed for installation in enclosed locations where space is a premium. The standard cubicles are IP43 with the option to upgrade to IP54 if required. The frames are painted in light grey RAL 7035 epoxy polyester film.

Busbars

The busbar systems are four-pole with a fully rated neutral and are available in 1250A, 1600A, 2500A, 3200A and 4000A options.

All systems are tested for temperature rise and short circuit withstand:
1250A tested at 50kA for 3s
1600A tested at 50kA for 3s
2500A tested at 50kA for 3s
3200A tested at 50kA for 3s
4000A tested at 65kA for 3s

The busbars are manufactured from HDHC tin plated copper and are mounted on a patented, insulated and reinforced support. All connections to the busbar are clamped with no drilling required. This makes the busbar system easy to connect saving time during build and installation. Busbars can be mounted at the top or bottom of each frame depending on the required cable entry point.

Busbar cross-sectional area

Designation	Current rating (A)	No. of Laminations	Size (W x D mm)	mm²
Modis Ultra	1250A	2	30 x 10	600
Modis Ultra	1600A	2	50 x 10	1000
Modis Ultra	2500A	2	100 x 10	2000
Modis Ultra	3200A	2	150 x 10	3000
Modis Ultra	4000A	4	100 x 10	4000

Components

Protective Earth Conductors
Modis Ultra switchboard is fitted with a horizontal earth conductor mounted either at the top or the bottom of the frame depending on the cable entry. The conductor runs the full length of the system and is sized according to the fault withstand of the busbar system.
Pre-punched holes in the conductor allow quick and reliable connections and thereby reducing the installation time whilst maintaining a high level of confidence in the integrity of the joints.

Termination
The Modis Ultra switchboard offers good all-round access and has the option of front or rear access for cabling. Removable gland plates make cable glanding quick and safe. Removable barriers simplify cable connection and termination for outgoing devices.

Internal Segregation
The Modis Ultra system has been designed to exceed the requirements of EN 61439-2 with regard to providing Form 4a Type 2 or Form 4b Type 6 separation options. The system is designed for front and rear access and has an IP43 protection as standard.

DORMAN SMITH

Modis Ultra

Product Technical Specification

Manufacturer	Dorman Smith Switchgear Limited
Quality Certification	ISO 9001:2015
Product	LV Switchboard (fully verified)
Standards	BS EN 61439-2 IEC / TR 61641 EN 61439-2 IEEE 693:2005 IEC 61439-2
Forms of separation	Complies with Form 4, British National Annex accommodated
Designation	Fully verified
External IP rating	IP43 or IP54 to IEC 60529
Internal IP rating	IP2X minimum to the above named standard
Frame structure	3mm gauge folded, painted pre-plated steel
Cover plate structure	1.6mm screw fixed, painted pre-plated steel (2mm available on request)
Integral segregation	Painted steel sheet, perforated sheet steel and transparent polycarbonate sheet
Cabling access	Suitable for front or rear access. Cable entry via the top or optional bottom gland plates
Busbar material	HDHC tin plated copper. Multiple laminations per phase
Busbar mounting	4-pole air insulated in glass fibre re-enforced moulded supports
Busbar shielding	Non-conductive rigid insulated barrier or rigid sheet steel barriers
Maximum current and fault withstand ratings	1250A to 3200A: 50kA for 3 seconds, 4000A: 65kA for 3 seconds Internal Arc Containment 65kA for 300ms Seismic testing to high level (0.5g) for earthquake vibrations
Independent switchboard certification:	Strength of materials and parts Mechanical Impact - IK10 Degree of protection of enclosures Clearance Creepage distances Protection against electric shock Dielectric properties Temperature rise at 50 deg C ambient Short circuit withstand strength Electromagnetic compatibility Mechanical operation
Earthing	Two earth bars fitted as standard and sized based on type tested designs. Earth continuity of cladding is maintained by specifically designed fixing screws and earth bonding cables
Rated Operational voltage	400/415V
Power frequency withstand voltage	2500V
Rated operational current	Project specific
Paint finish	Light Grey RAL 7035 semi-gloss
Paint depth	60/80 microns
Paint process	Four stage paint process that includes chemical spray degreasing, iron phosphate coating, automatic electro-static epoxy polyester film application and curing in a high temperature oven

Internal Devices

Summary

The Modis Ultra switchboards accommodate the Dorman Smith range of withdrawable Air Circuit Breakers up to 4000A in TP&N or 4-pole versions as the standard option for incoming device. The outgoing devices can be either fixed or plug-in MCCBs in TP&N or 4-pole up to 800A. All devices are installed with door-interlocking handles for operational safety. The busbar system has been tested to the breaking capacity of the devices ensuring correct fault withstand protection at all levels of the installation.

ACBs

The new Loadline R range of air circuit breakers utilise leading-edge technology and feature a number of innovations which makes this family of products ideal as the incoming device in the Modis Ultra system. All devices comply with EN 60947-2 standard and are available in three different frame sizes and with current ratings of 630A to 6300A. ACBs are available as three or four-pole, fixed or withdrawable and have a range of accessories from simple key locks to intelligent trip units with data measuring and communication facilities.

Fuse Combination Units

The Loadswitch fuse combination units have been designed to meet customer needs for straight forward installation, ease of cabling connection and exceeding the EN 60947-3 standard. The full uninterrupted duty ensures that these units will maintain full rated load indefinitely. With category of AC23A and short-circuit capacity of 80kA, the Loadswitch fuse combination units can be installed with confidence on any inductive or resistive load.

MCCBs

The Loadline range of MCCBs are available in current ratings from 20A to 1600A and have an extensive range of complementary accessories. All devices comply with EN 60947-2 standard and are available in thermal/magnetic and electronic varieties. Electronic MCCBs are category B for utilisation selectivity.

MCBs

The Dorman Smith Loadcentre range of MCBs provide you with the option of B,C or D characteristic breakers from 6A to 63A. These MCBs are available in one to four-pole options and have a range of complementary RCBOs and RCCBs to meet your specific requirements. The Loadcentre range is the premier choice for final circuit protection within the Modis Ultra switchboard system.

Modis Ultra

Measurement and Control

Digital Metering Systems

The Modis Ultra switchboard system can accept a comprehensive range of fully programmable, highly accurate multi-function digital metering systems for all power monitoring applications. The digital meters can measure, clearly display and communicate true RMS values, power quality data and total harmonic distortion of the installation. To meet specific user requirements we offer a variety of communication output options, case styles and LED or LCD displays.

Kilowatt Hour Energy Meters

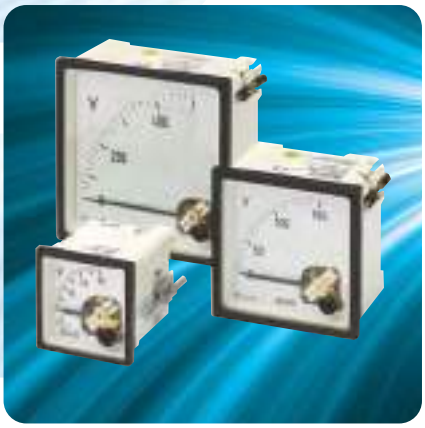
A range of panel mounted and DIN-rail mounted meters are available for monitoring energy consumption. Self-contained meters offer combined kWh or kVArh energy measurement with pulsed or analogue output options and selectable CT and VT ratios. This style replaces the rotating disc meters and separate instantaneous watt meters.

Protector Trip Relays

This range of devices includes electronic control products for the continuous monitoring of many electrical parameters and the protection of the associated circuits. Designed to fit a wide variety of applications, this range offers both technologically advanced and traditional products. Included within the portfolio are multi-functional microprocessor based systems and single parameter units for measuring earth leakage, ground fault current, vector shift and rate of change of frequency (ROCOF).

Meter Relays and Digital Indicators

Dorman Smith provides a range of meter relays and digital indicators for measuring, monitoring and control of a variety of electrical and process parameters. Meter relays are ideal for process control and load-shedding applications, combining an indicator with set points which operate alarm and control circuits when the signal deviates from the set limits. This range includes digital and analogue meter relays, digital bar graph indicators and controllers. These instruments have been specifically designed for use in control panels and switchboards, monitoring systems, power generation and control applications.



Analogue Instruments

High quality analogue instruments designed to measure an extensive range of electrical and electronic parameters are often the preferred choice for panel instrumentation. These instruments are precision engineered and are robust, ensuring accurate measurement and display in the most demanding environments. The Dorman Smith range offers various styles, sizes and specifications to meet the exacting needs of industrial installations.

Transient Voltage Surge Suppression

Modis Ultra

Modular Distribution Surge Protectors

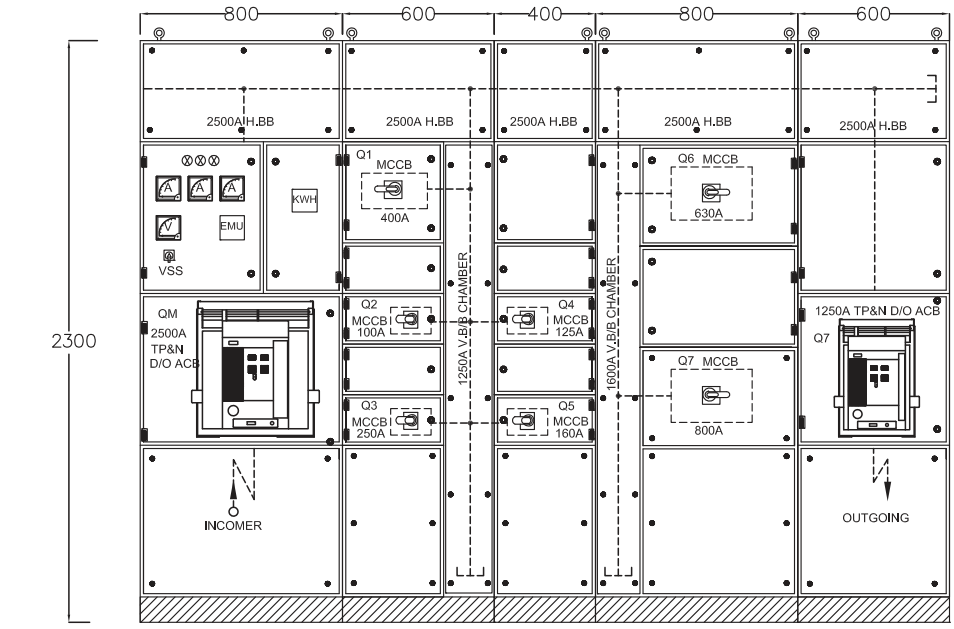
The Modis Ultra system supports several forms of TVSS, including modular distribution surge protection for single and three-phase power systems. Dorman Smith can offer TVSS with high surge handling capabilities of 90, 150 and 300kA, which are intended for high lightning exposure areas and for the protection of critical systems where long life and low maintenance are important factors. Type I and type II units available to meet different surge supression requirements.

Distribution Surge Protector

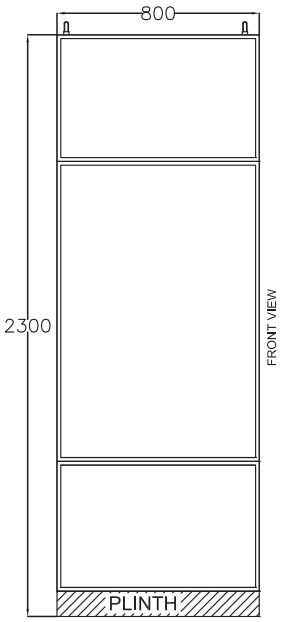
A series of general purpose, hard-wired, single and three-phase distribution surge protectors with 30kA of surge capacity, a two stage (redundant) protection and pre-failure indication are available. Some models are available with relay contacts that enable remote monitoring of the phase protection status.

Sub-Panel Protectors

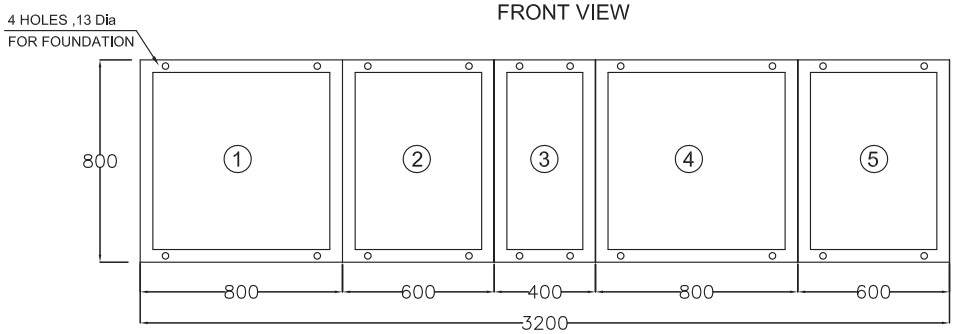
The compact, 10kA rated, 6651C Protector has been designed for sub-distribution panels that supply critical hardware items; such as computers, PABX systems, network file servers and mainframes. This hard-wired surge suppression device is hard-wired and has redundant protection and offers full status monitoring in single and three-phase systems.



FRONT VIEW



SIDE VIEW



FOUNDATION VIEW

Forms of Separation

Fundamentals of Separation

In accordance with the BS EN 61439-2 standard the various assembly elements such as; busbars, functional units and terminals can be claimed as adequately separated providing one or more of the following criteria are met:

1. Protection against contact with hazardous parts. The degree of protection shall be at least IPXXB.

2.Protection against the passage of foreign objects. The degree of protection shall be at least IP2X.

The form of separation used in an assembly shall be subject to an agreement between the manufacturer and the end user.

Typical Applications

Form 1 – No Separation

This form is acceptable where the switchboard is in a secure location and where its failure will cause little or no additional disruption to other areas fed by the switchboard.

Form 2 – Separation of busbars from individual functional units

Form 2 applications may be identical to Form 1. The main distinction is that a fault in the switchboard need not affect all functional units fed from the same busbar.

Form 3 – Separation of busbars from functional units and individual functional units are separate from each other, however they share a common termination

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

Form 4 – Separation of busbars from functional units. Individual functional units are separate from one another, including at their termination point

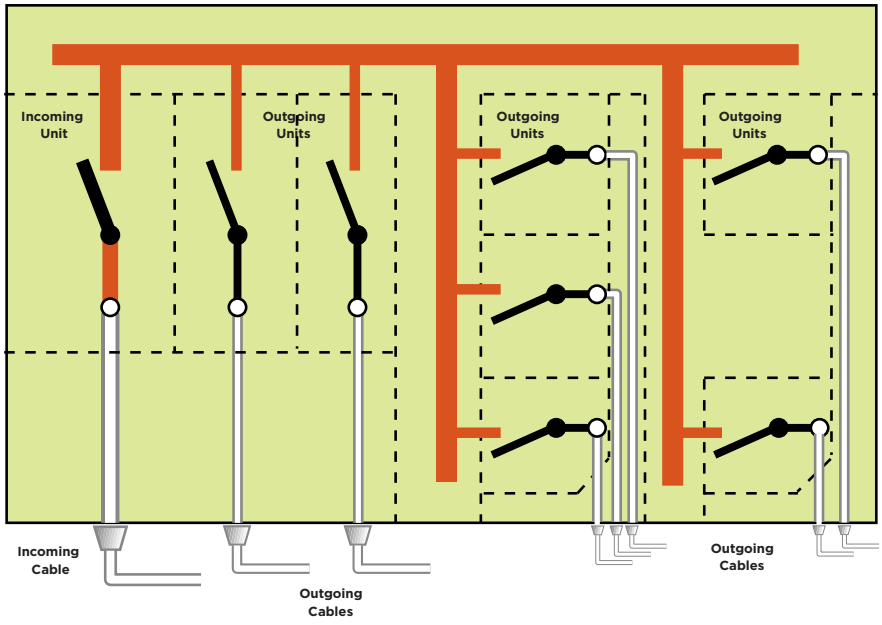
Form 4 applications are similar to Form 3, however in this form all terminations are separated and it is possible to isolate a single functional unit.

Sub-categories of Forms of Separation

Main Criteria	Sub-Criteria	Form	Type	Construction
No separation		1		
Separation of busbars from the functional units	Terminals for external conductors not separated from busbars	2a		
	Terminals for external conductors separated from busbars	2b	1	Busbar separation by insulated coverings
			2	Busbar separation by rigid barriers
Separation of the busbars from the functional units and separation of all functional units from one another. Separation of the terminals for external conductors from functional units, but not from each other.	Terminals for external conductors not separated from busbars	3a		
	Terminals for external conductors separated from busbars	3b	1	Busbar separation by insulated coverings
			2	Busbar separation by rigid barriers
Separation of busbars from the functional units and separation of all functional units from one another including terminals for external conductors, which are an integral part of the functional unit.	Terminals for external conductors in the same compartment as the associated functional unit.	4a	1	Busbar separation by insulated coverings. Cables may be glanded elsewhere.
			2	Busbar separation by rigid barriers. Cables may be glanded elsewhere.
			3	All separation by rigid barriers. The termination for each functional unit has its own integral glanding facility.
	Terminals for external conductors not in the same compartments as the associated functional unit, but in individual, separate, enclosed protected space or compartment.	4b	4	Busbar separation by insulated coverings. Cables may be glanded elsewhere.
			5	Busbar separation by rigid barriers. Terminals may be separated by insulated coverings and glanded in common cabling chambers.
			6	All separation by rigid barriers. Cables are glanded in common cabling chambers.
			7	All separation by rigid barriers. The termination for each functional unit has its own integral glanding facility.

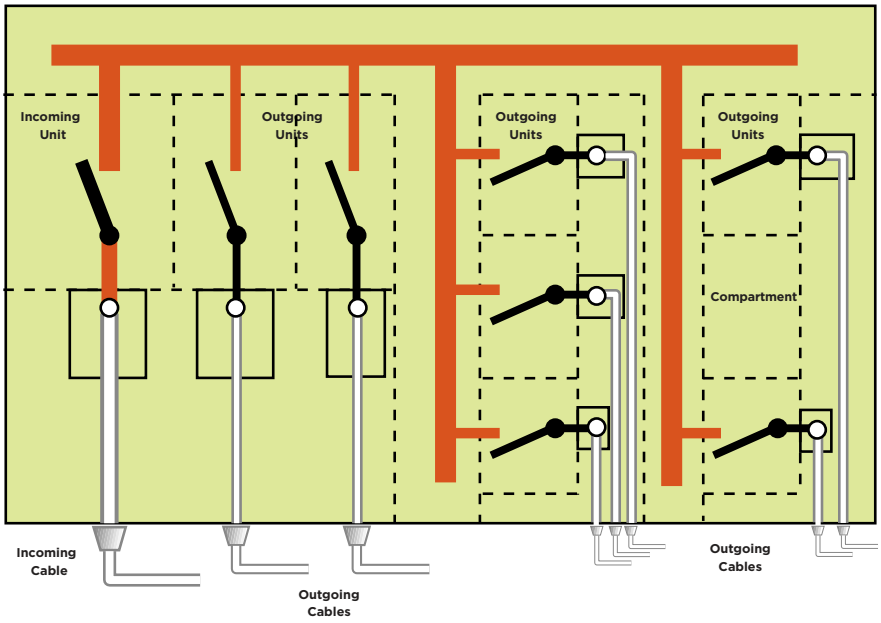
Form 4a Type 2

Form 4a Type 2

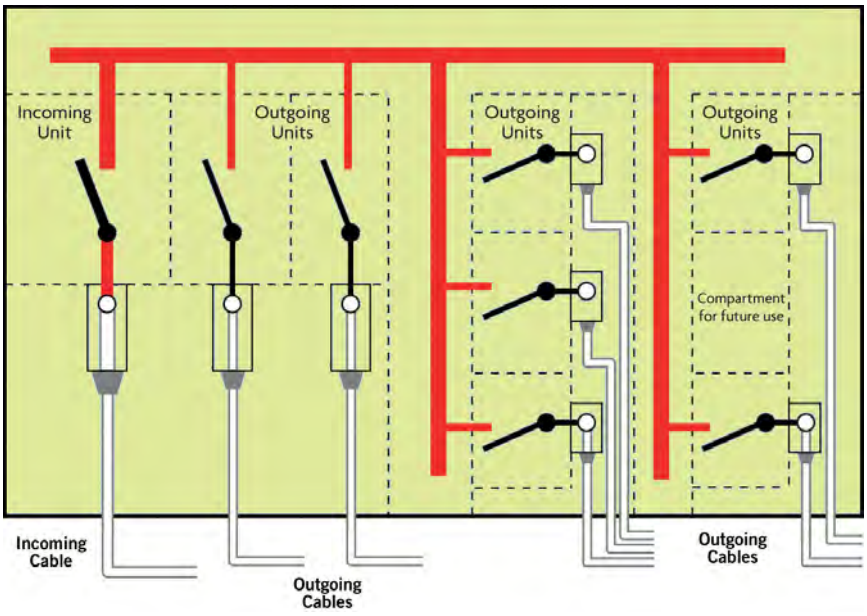


Form 4b Type 6 and Form 4b Type 7

Form 4b Type 6



Form 4b Type 7



Ingress Protection

The EN 60529 standard describes a system for classifying degrees of protection against the ingress of foreign bodies and harmful liquids. It is intended that this standard is applied to enclosures of low voltage (LV) electrical equipment. The classification scheme comprises of a designated prefix of "IP" followed by two numerals.

The first numeral designates the degree of protection with regard to solid objects; the second numeral indicates the degree of protection against the ingress of liquid.

Compliance to the standard is intended to:

1) Protect persons against access to hazardous parts inside the enclosure and protect the equipment inside against the ingress of solid foreign objects.

2) Protect the equipment inside the enclosure against harmful ingress of liquids.

Solid foreign objects		
IP	**Protection**	**Equivalent**
0	No protection	
1	Full entry of 50mm sphere, but no contact with hazardous parts.	Back of hand
2	Full entry of 12.5mm sphere not allowed, but no contact with hazardous parts with jointed test finger.	Finger
3	2.5mm diameter access probe shall not enter.	Tool
4	1mm diameter access probe shall not enter.	Wire
5	Limited ingress of dust (no harmful deposit).	Wire
6	Total protection against dust ingress.	Wire
X	Not tested	

Liquid		
IP	**Protection**	**Equivalent**
0	No protection	
1	Against vertically falling water drops	Vertical drips
2	As in 1, but with enclosure tilted 15 degrees from vertical	Slanted dripping
3	Against spay to 60 degrees from vertical	Limited spray
4	Against splashing from any direction	Splashing
5	Against low pressure jets from any direction	Hosing jets
6	Against strong jets from any direction	Power hosing
7	Against immersion up to one metre	Temporary immersion
8	Against prolonged immersion under pressure	Continuous immersion
X	Not tested	

For assemblies for indoor use, where there is no requirement for the protection against the ingress of water, the following IP ratings are preferred: IP00, IP2X, IP3X, IP4X, IP5X or IP6X.

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