GUIDE TO LV SWITCHGEAR
&
FORMS OF SEPARATION
CONTENTS

PRODUCT EXAMPLES – Mobile Battery Charging Unit.......................... 3
PRODUCT EXAMPLES – Form 4 Type 5 PDU - C/W Isolating Transformer........... 3
PRODUCT EXAMPLES – 630A Power Distribution Unit.....................................4
PRODUCT EXAMPLES – 1250A Enclosed DC Isolator.......................................4
PRODUCT EXAMPLES – 1250A ‘L Shaped’ LV Switchboard Form 4 Type 2........... 5
PRODUCT EXAMPLES – 2500A ‘L Shaped’ LV Switchboard................................5
PRODUCT EXAMPLES – 800A Dual Incoming LV Switchboard............................6
Forms of Separation .................................................................................7
Form 1.....................................................................................................7
Form 2.....................................................................................................8
Form 2A....................................................................................................8
Form 2B Type 1.........................................................................................8
Form 2B Type 2........................................................................................9
Form 3.....................................................................................................9
Form 3A....................................................................................................9
Form 3B Type 1.........................................................................................10
Form 3B Type 2........................................................................................10
Form 4.....................................................................................................11
Form 4A Type 1.........................................................................................11
Form 4A Type 2........................................................................................12
Form 4A Type 3........................................................................................12
Form 4B Type 4.........................................................................................13
Form 4B Type 5........................................................................................13
Form 4B Type 6........................................................................................14
Form 4B Type 7........................................................................................14
IP Ratings..................................................................................................15
IP Ratings cont.........................................................................................16
PRODUCT EXAMPLES - MOBILE BATTERY CHARGING UNIT

PRODUCT EXAMPLES - FORM 4 TYPE 5 PDU - C/W ISOLATING TRANSFORMER
Form 4 Type 5 PDU
C/W Isolating Transformer

PRODUCT EXAMPLES - 630A POWER DISTRIBUTION UNIT

630A Power Distribution Unit
Outgoing Ways Individually Metered

PRODUCT EXAMPLES - 1250A ENCLOSED DC ISOLATOR
1250A Enclosed DC Isolator
C/W Monitoring Relay & Shunt Trip

Product Examples – 1250A ‘L Shaped’ LV Switchboard Form 4 Type 2

With Auto Change Over System & Surge Suppression

Product Examples – 2500A ‘L Shaped’ LV Switchboard

2500A ‘L Shaped’ LV Switchboard
C/W 300Kvar PFC & Auto Change Over System
‘L Shaped’ to suit Space Restriction
PRODUCT EXAMPLES – 800A DUAL INCOMING LV SWITCHBOARD

800 Dual Incoming LV Switchboard
FORMS OF SEPARATION

FORM 1
An enclosed assembly to provide protection against contact with internal parts, where no internal separation is provided.

FORM 2
As Form 1, but with separation of all functional units from one another

FORM 3
As Form 2, but with separation of all functional units from one another

FORM 4
As Form 3, but the incoming and outgoing terminals are also required to be separated from the Busbar system, and from one another

FORM 1
Covers overall assemblies which are enclosed, to provide protection against contact with any internal live parts or components, but where no internal separation is provided for functional units or terminations. Busbars are not separated from other functional units. Functional units are not separated from other functional units. Functional units are not separated from any incoming or outgoing termination. Busbars are not separated from any incoming or outgoing terminations.
**FORM 2**
Covers overall assemblies which are enclosed, to provide protection against contact with any internal live parts or components, but where there is internal separation of the busbars from functional units.
- Busbars are separated from the functional units
- Functional units are not separated from other functional units

**FORM 2A**
As form 2 but: Terminals are not separated from the busbars or each other.
The Actual means of separation is not defined in the standard

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**FORM 2B TYPE 1**
As form 2 but: Busbar separation is achieved by insulated coverings, e.g. PVC sleeving, wrapping or coating.
- Terminals are therefore separated from the busbars, but not from functional units or each other.

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FORM 2B TYPE 2

As from 2 but: Busbar separation is achieved by metallic or non metallic rigid barriers or partitions.
Terminals are therefore separated from the busbars, but not from functional units or each other.

FORM 3

Defines overall assemblies which are enclosed to provide protection against contact with internal live parts and components, and in which there is internal separation of the busbars from functional units from each other.
Busbars are separated from functional units
Functional units are separated from each other
Functional units are separated from incoming and outgoing terminals
Incoming and outgoing terminals are not separated from each other

FORM 3A

As form 3 but: Terminals are not separated from the busbar or each other
The actual means of separation is not defined in the Standard.
FORM 3B TYPE 1
As from 3 but: Busbar separation is achieved by insulated coverings, e.g. PVC sleeving, wrapping or coating. Terminals are therefore separated from the busbars, but not from each other.

FORM 3B TYPE 2
As form 3 but: Busbar separations is achieved by metallic or non-metallic rigid barriers or partitions. Terminals are therefore separated from the busbars, but not from each other.
FORM 4
Covers overall assemblies which are enclosed to provide protection against contact with internal live parts and components, and in which there is internal separation of the Busbar systems from functional units, and separation of all functional units from each other. Incoming and outgoing terminals are also required to be separated from the busbars and from each other.

Busbars are separated from functional units
Functional units are separated from each other
Terminations to functional units are separated from each other

FORM 4A TYPE 1
As from 4 but: Busbar separation is achieved by insulated coverings, e.g. PVC sleeving, wrapping or coating.
Cables are terminated within the same compartment as the associated functional unit.
Cables may be glanded elsewhere, e.g. in a common cabling chamber
FORM 4A TYPE 2
As form 4 but: Busbar separation is achieved by metallic or non metallic rigid barriers or partition. Cables are terminated within the same compartment as the functional unit. Cables may be glanded elsewhere e.g. in a common cabling chamber.

FORM 4A TYPE 3
As form 4 but: Busbar separation is achieved by metallic or non metallic rigid barriers or partitions. Cables are terminated within the same compartment as the functional unit. The termination for each functional unit has its own integral glanding facility.
FORM 4B TYPE 4
As form 4 but: Busbar separation is achieved by insulated coverings, e.g. PVC sleeving, wrapping or coating. Terminals are external to the functional unit and separated by insulated coverings, e.g. PVC Boots. Cables may be glanded elsewhere, e.g. in a common cabling chamber.

FORM 4B TYPE 5
As form 4 but: Busbar separation is achieved by metallic or non-metallic rigid barriers or partitions. Terminals are external to the functional unit compartment and separated by insulated coverings, e.g. PVC boots. Cables may be glanded elsewhere, e.g. in a common cabling chamber.
FORM 4B TYPE 6
As form 4 but: All separation is achieved by metallic or non-metallic rigid barriers or partitions.
Terminals are external to the functional unit compartment and enclosed in their own compartment by means of rigid barriers or partitions.
Cables may be glanded elsewhere, e.g. in a common cabling chamber.

FORM 4B TYPE 7
As form 4 but: All separation requirements are achieved by metallic or non-metallic rigid barriers or partitions.
Terminals are external to the functional unit compartment and are enclosed in their own compartment by means of rigid barriers or partitions complete with integral glanding facility.
IP RATINGS

0
No protection

1
Protected against vertically falling drops of water

2
Protected against vertically falling drops of water with enclosure tilted 15° from the vertical

3
Protected against sprays to 60° from the vertical - limited ingress permitted

4
Protected against water splashed from all directions - limited ingress permitted

5
Protected against low pressure jets of water from all directions - limited ingress permitted

6
Protected against strong jets of water e.g. For use on ship decks - limited ingress permitted

7
Protected against the effects of immersion between 15cm and 1m

8
Protected against long periods of immersion under pressure
A. Penetration of 50mm diameter sphere up to guard face must not contact hazardous parts.

B. Test finger penetration to a maximum of 80mm must not contact hazardous parts.

C. Wire of 2.5mm diameter x 100mm long must not contact hazardous parts when spherical stop face is partially entered.

D. Wire of 1mm diameter x 100mm long must not contact hazardous parts when spherical stop face is partially entered.