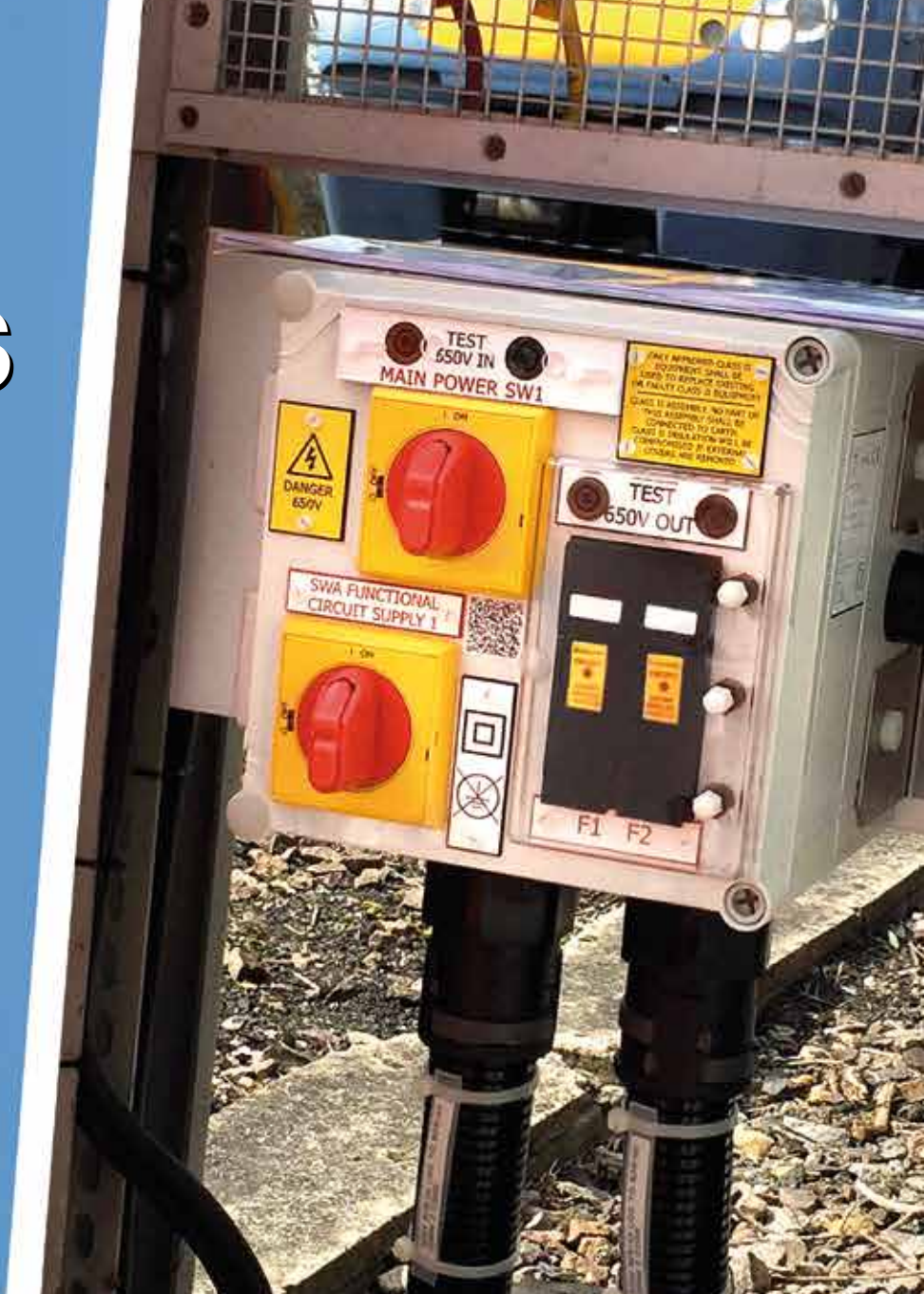


# Legacy Solutions



# Content

## Class II Switchgear

- 1-7 Introduction
- 8-9 Micro FSP Product Selector
- 10-31 Micro FSP's (PADS Approved)
- 32-42 Connection Boxes (PADS Approved)
- 43-45 Transfleckt Cable Monitoring
- 46-50 Class II Power Blocks (PADS Approved)

## Integrated Backplates

- 51-53 Introduction
- 54-55 Integrated Backplate Product Selector
- 56-60 Integrated Backplate Configurations

## Integrated Annex

- 61-63 Integrated Annex Configurations
- 64-66 Mounting Options

## DITA

- 67-71 Distribution Interface Transformer Assembly (DITA)
- 72-74 DITA Circuits & Applications

## Class II Transformers

- 76-83 Aluminium Transformers (PADS Approved)
- 84-91 Copper Transformers (PADS Approved)
- 92-97 Copper TJ Rectifiers (PADS Approved)
- 98-100 Legacy Mounting Brackets (PADS Approved)

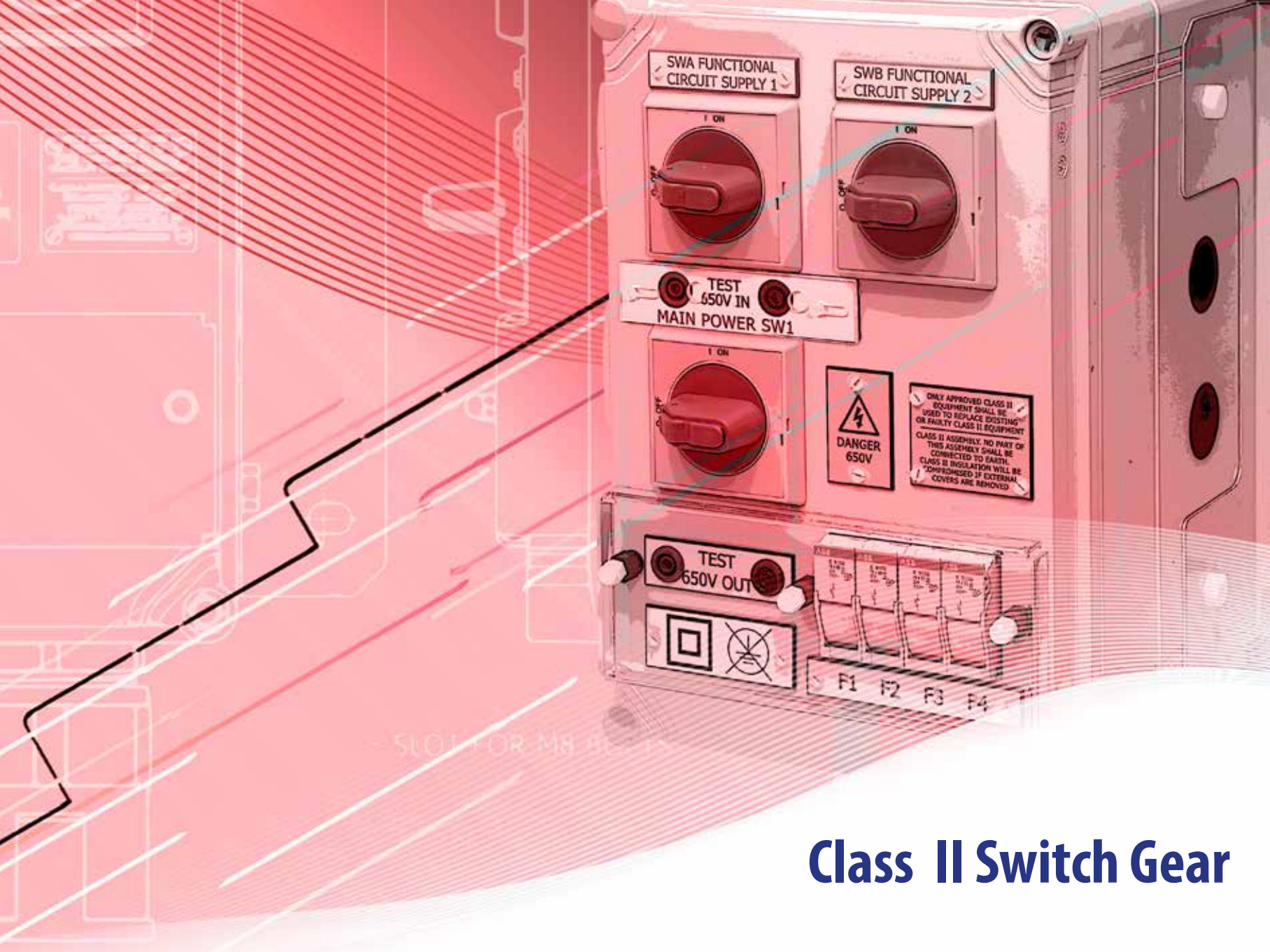
## Earthing Solutions

- 104-105 Earth Bars
- 106-107 CADWELD Plus
- 108-115 Earthing Components
- 116 GEM (Ground Enhancement Material)

## Cable Protection

- 120-122 Conduit (PADS Approved)
- 123 End of Line Compression Fitting
- 124-129 Cable Accessories (PADS Approved)
- 130 Tool Kit (PADS Approved)





~ SLOT FOR M8 BOLT ~

# Class II Switch Gear



SLOT FOR M8 BOLTS



## Before Micro FSP Installation



## After Micro FSP Installation















# Introduction

iLECSYS Rail have long championed the benefits of Class II modular designs using modern, proven materials. In keeping with this philosophy, iLECSYS Rail have a range of products designed specifically for the fast and efficient upgrade of 'Legacy' location cases.

This section covers a range of Class II products designed to assist in the upgrade of an existing 'Legacy' location case. All assemblies are designed to provide safe isolation and distribution of circuits as part of Network Rail's Class II based signalling power distribution systems in accordance with NR/L2/ELP/27410 Issue 2. All products adhere to the following criteria:

- Class II Double Insulated Non-Metallic Construction
- Class II Specification in accordance with NR/L2/ELP/27409 Issue 2
- Assembly Insulation Dielectric Strength Certified to 10KV in accordance with BSEN 61439-1:2011
- Compatible with Aluminium (Al) and Copper (Cu) Cable
- Optional Surge Protection Available on certain models
- Lightweight and Easy to Install, Conforms to BRS SM 440 Mounting
- Compatible with existing Legacy Circuits
- Optional end of line unit with 'Transflect' feeder monitoring
- All connections between CB Boxes and Micro FSPs, must be made using Network Rail approved conduit systems, line bushes or cable glands

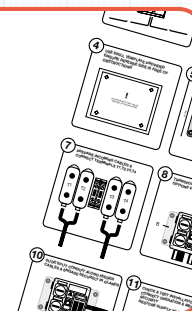
## KEY

 Universal Brackets Suitable for BRS/ SN440 Mounting or Standard Legacy Backboard	 Rated to 650V	 Class II Specification in accordance with NR/L2/ELP/27409	 Earth Free system
 IP4X Ingress Protection	 Full CE Certification	 Suitable for Copper or Aluminium cable	 Circuit Configuration
 Suitable for use with 2 core cable	 Suitable for use with 4 core cable	 Suitable for use with 4 core armoured cable	 Suitable for use with 3 core armoured cable

**Installation is as easy as 1, 2, 3....**

See how easy it is to install a micro FSP using our 12 step installation guide.

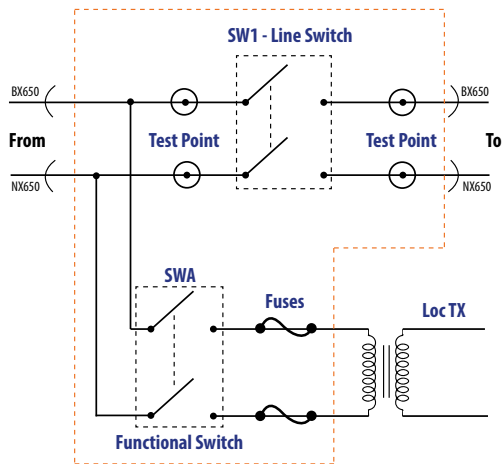
See Page 30



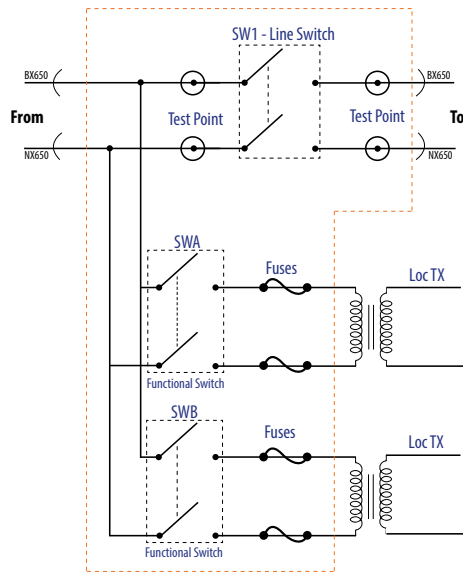


# New Legacy Circuits

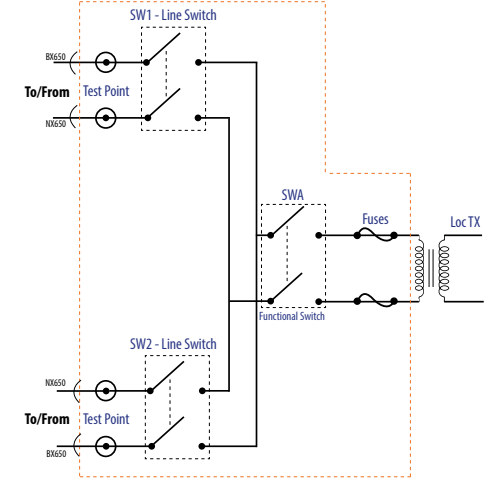
## Legacy 1 Switch Circuit



## Legacy 2 Switch Circuit



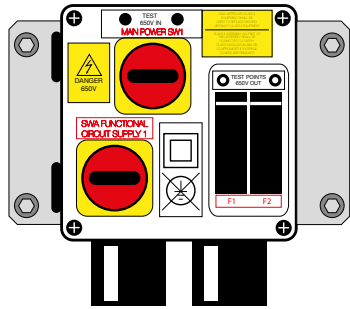
## Ring Circuit



# Incoming / Outgoing Feeder Cable

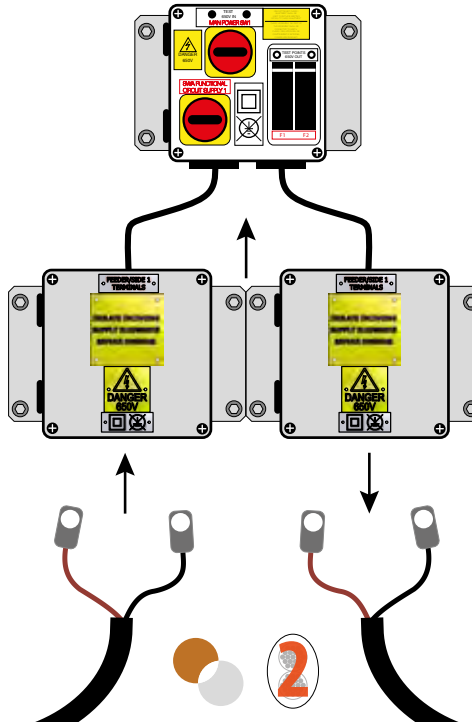
Inconsistent incoming/outgoing feeder cable types and material usually causes a problem, iLECSYS Rail have designed a range of Connection Boxes to accommodate various incoming/outgoing feeder cables. All connection boxes are fully Class II and ensure a safer connection between the incoming cable and Micro FSP unit.

## 2 Core Aluminium or Copper



If your incoming feeder cable is 2 Core Al or Cu cable then this can be connected directly into the Micro FSP unit without the requirement of a Connection Box

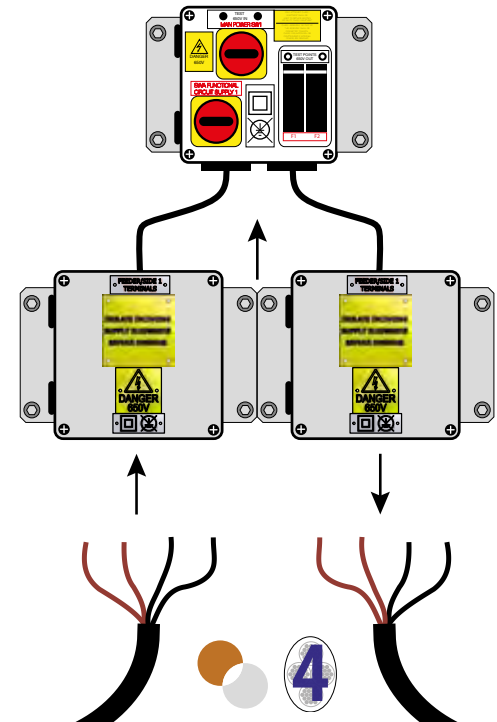
## 2 Core Aluminium or Copper Pre Fitted with Connection Lugs



- 2 Core Feeder Cable
- Aluminium or Copper
- Pre-Lugged

Please see pages 36 - 37

## 4 Core Aluminium or Copper

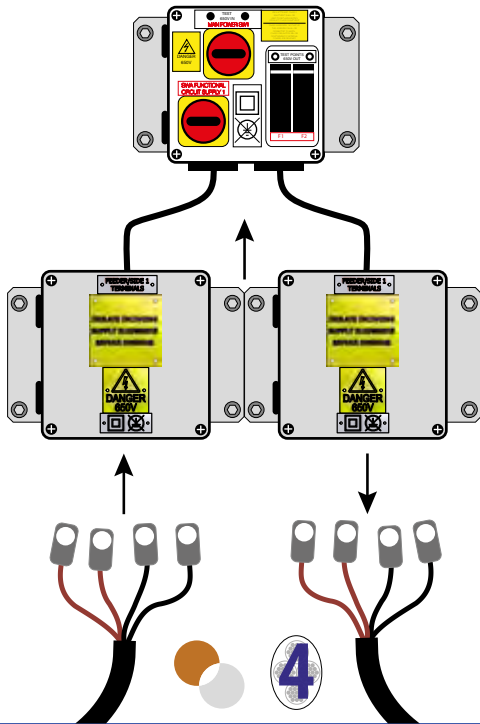


- 4 Core Feeder Cable
- Aluminium or Copper

Please see pages 34 - 35

# Micro / Connection Box Mounting Options

## 4 Core Aluminium or Copper Pre Fitted with Connection Lugs

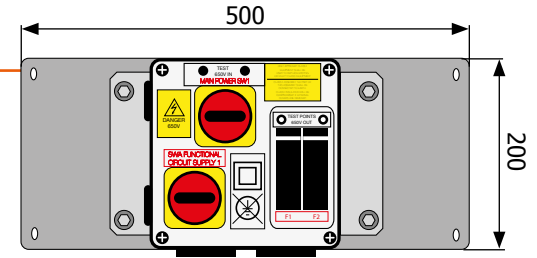


- 4 Core Feeder Cable
- Aluminium or Copper
- Pre - Lugged

Please see pages 38 - 39

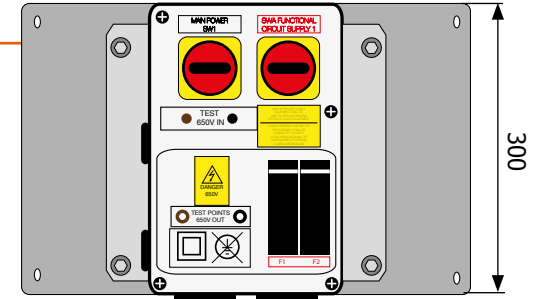
### PADS No: 091/099135 FSP/HL-INT/BP200

This nylon coated mounting option has been designed to attach a single 200x200mm Micro FSP or Connection Box. The backplate has been designed to interface with standard bar work.



### PADS No: 091/099136 FSP/HL-INT/BP300

This nylon coated mounting option has been designed to attach a single 200x300mm Micro FSP or Connection Box. The backplate has been designed to interface with standard bar work.

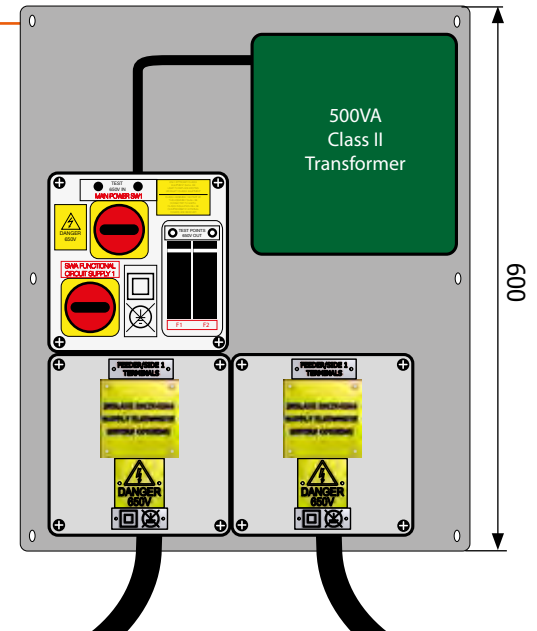


### FSP/HL-INT/BP600

For the complete solution and ease of installation this nylon mounting plate has been designed to attach either a 200x200 or 200x300 Micro FSP.

Incoming and outgoing feeder connection boxes can be directly mounted below the Micro FSP. A wide range of different incoming/outgoing feeder cable types can be accommodated by using this option.

A Class II aluminium 500VA transformer can also be fitted alongside the Micro FSP and connection box/boxes.



# Use the product selector to find your perfect solution

		FSP04/PL-CII/1SW-SL-IEC50	FSP04/PL-CII/1SW-SL50	FSP04/PL-CII/1SW-SL-IEC95	FSP04/PL-CII/1SW-SL95	FSP04/PL-CII/1SW-SL-IEC120	FSP04/PL-CII/1SW-SL120	FSP04/PL-CII/2SW-SL-IEC95	FSP04/PL-CII/2SW-SL95	FSP04/PL-CII/2SW-SL-IEC120
Existing Circuit	LEGACY	✓	✓	✓	✓	✓	✓	✓	✓	✓
	RING									
Feeder Cable Size	6-50mm <sup>2</sup>	✓	✓							
	16-95mm <sup>2</sup>			✓	✓			✓	✓	
	35-120mm <sup>2</sup>					✓	✓			✓
Functional Supply Fuse Carriers	BS88-2 CAMaster		✓		✓			✓	✓	
	IEC60269 (10x38mm)	✓		✓		✓		✓		✓
Functional Supplies & Transformer/s		1	1	1	1	1	1	2	2	2
Dimensions (mm)	200 x 200 x 225 (W) x (H) x (D)	✓	✓	✓						
	200 x 300 x 225 (W) x (H) x (D)				✓	✓	✓	✓		300 x 300 x 225 ✓
Suitable for Cu or Al Cable	Copper (Cu)	●	●	●	●	●	●	●	●	●
	Aluminium (Al)	○	○	○	○	○	○	○	○	○
Page		10	11	12	13	14	15	16	17	18



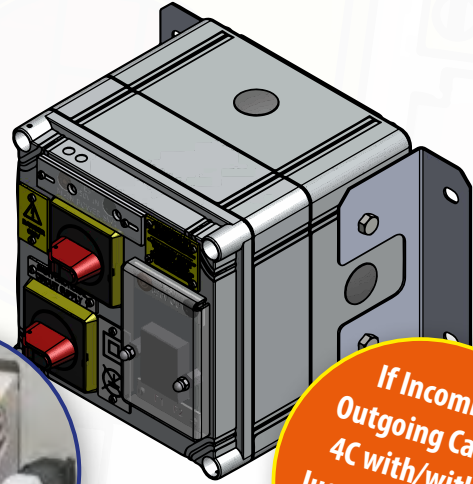
	FSP04/PL-CII/1SW-SL120	(FSP02) PL-CII/1SW-SL-IEC95	(FSP02) PL-CII/1SW-SL95	(FSP02) PL-CII/1SW-SL-IEC120	FSP04/PL-CII/1SW-SL120	FSP04/PL-CII/1SW-SL-IECBS	(FSP02) PL-CII/1SW-SLBS	FSP04/PL-CII/1SW-SLBS	FSP04/PL-CII/1SW-SL50BT	FSP04/PL-CII/1SW-SL95BT	FSP04/PL-CII/1SW-SL120BT		
	✓								✓	✓	✓		
		✓	✓	✓	✓				✓				
						Feeder Cable Via FSP04/PL-CII/1SW-SL50BT FSP04/PL-CII/1SW-SL95BT FSP04/PL-CII/1SW-SL120BT			✓				
		✓	✓									✓	
	✓			✓	✓								✓
	✓		✓		✓			✓	✓	Functional Supply Switching & Fusing via FSP04/PL-CII/1SW-SL-IECBS FSP04/PL-CII/1SW-SLBS (FSP02) PL-CII/1SW-SLBS			
		✓		✓		✓							
	2	1	1	1	1	1	1						
	300 x 300 x 225									200 x 200 x 140	200 x 200 x 140	200 x 300 x 140	
		✓	✓	✓	✓				✓				
	●	●	●	●	●	●	●	●	●	●	●		
	○	○	○	○	○	○	○	○	○	○	○		
	19	20	21	22	23	24	25	26	27	28	29		

# PADS No: 091/099110

## FSP04/PL-CII/1SW-SL-IEC50



- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Line Isolator
- One Switched and Fused Output Functional Supply
- Functional Supply Fuse Carriers IEC60269 (A.B.B. 10x38mm)
- Front Cover Hinged on Left Hand Side
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables 6-50mm<sup>2</sup>
- Dimensions (W x H x D mm) - 200 x 200 x 225 (296 W including mounting ears)
- Weight - 5kg



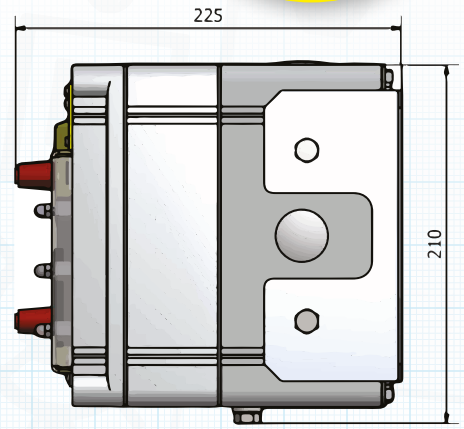
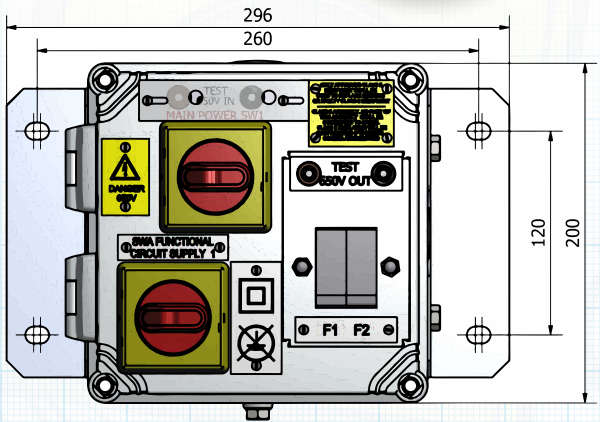
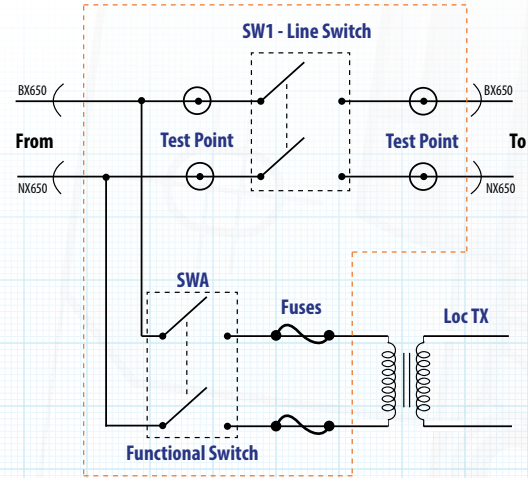
**If Incoming/Outgoing Cable is 4C with/without lugs or 2C with lugs please see page 6**

Scan QR Code for



PADS Certificate

### Legacy 1 Switch Circuit

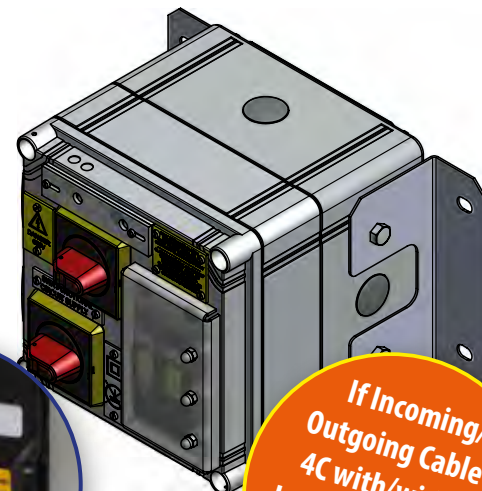


# PADS No: 091/099121

## FSP04/PL-CII/1SW-SL50



- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Line Isolator
- One Switched and Fused Functional Supply
- Functional Supply Fuse Carriers BS88-2 (CAMaster)
- Front Cover Hinged on Left Hand Side
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables 6-50mm<sup>2</sup>
- Dimensions (W x H x D mm) - 200 x 200 x 225 (296 W including mounting ears)
- Weight - 5kg



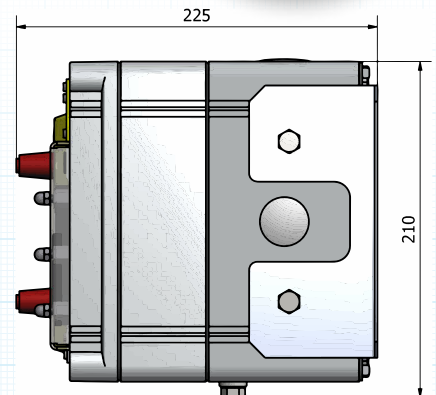
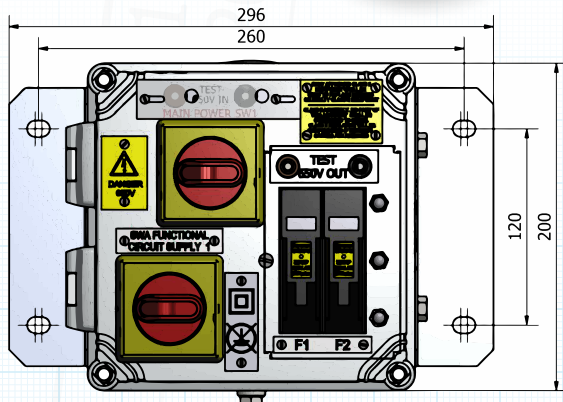
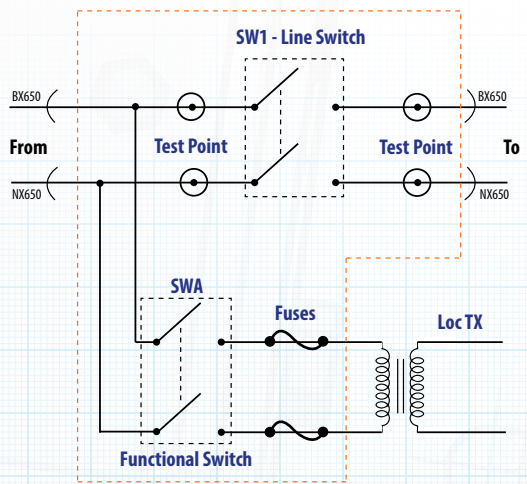
**If Incoming/Outgoing Cable is 4C with/without lugs or 2C with lugs please see page 6**

Scan QR Code for



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### Legacy 1 Switch Circuit

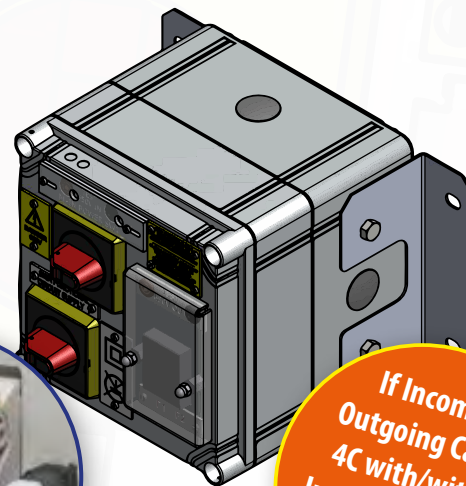


# PADS No: 091/099112

## FSP04/PL-CII/1SW-SL-IEC95



- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Line Isolator
- One Switched and Fused Output Functional Supply
- Functional Supply Fuse Carriers IEC60269 (A.B.B. 10x38mm)
- Front Cover Hinged on Left Hand Side
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables 16-95mm<sup>2</sup>
- Dimensions (W x H x D mm) - 200 x 200 x 225 (296 W including mounting ears)
- Weight - 5kg



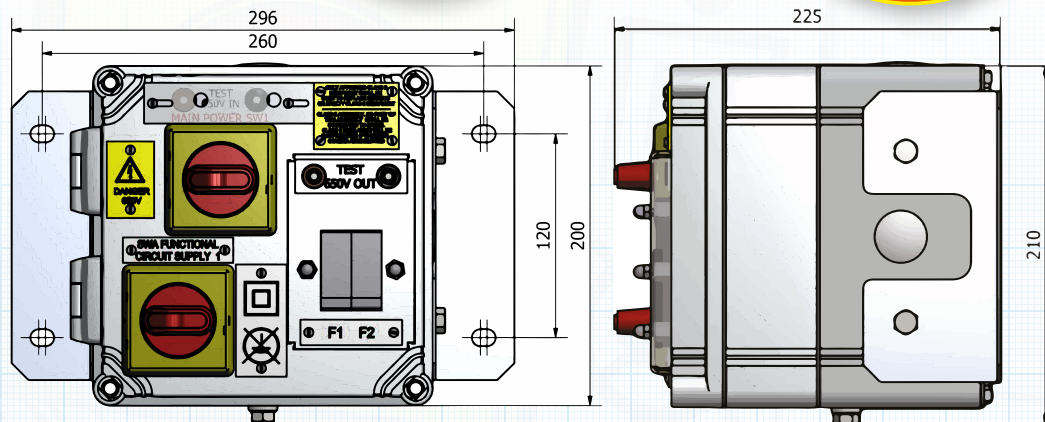
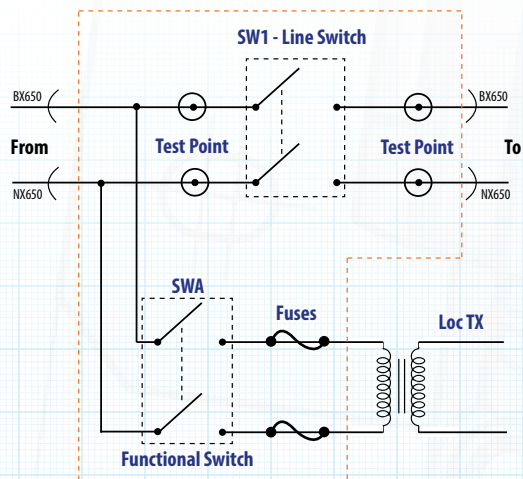
If Incoming/  
Outgoing Cable is  
4C with/without  
lugs or 2C with lugs  
please see page 6

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### Legacy 1 Switch Circuit



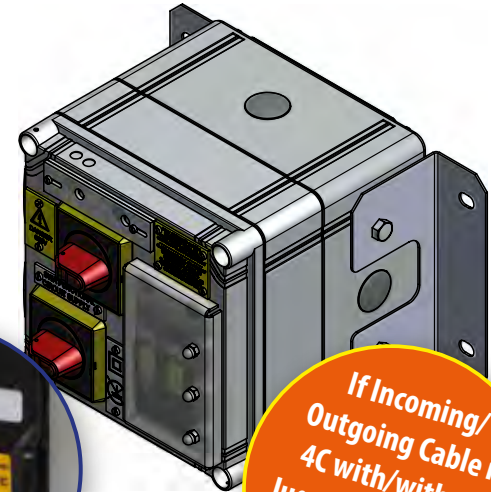


# PADS No: 091/099111

## FSP04/PL-CII/1SW-SL95



- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Line Isolator
- One Switched and Fused Output Functional Supply
- Functional Supply Fuse Carriers BS88-2 (CAMaster)
- Front Cover Hinged on Left Hand Side
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables 16-95mm<sup>2</sup>
- Dimensions (W x H x D mm) - 200 x 200 x 225 (296 W including mounting ears)
- Weight - 5kg



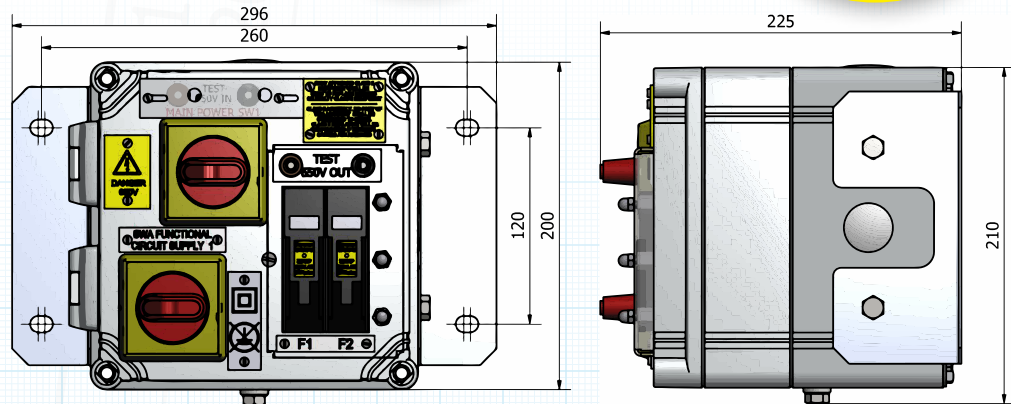
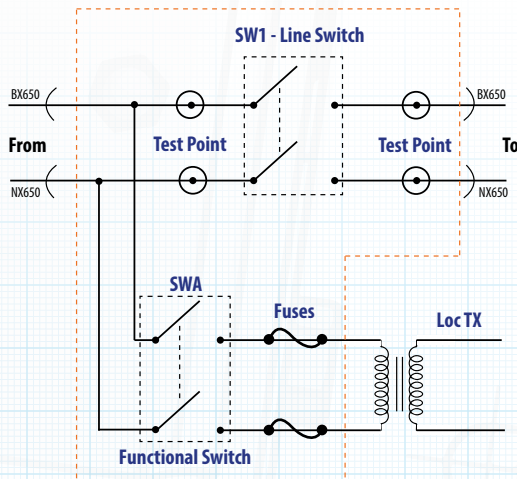
*If Incoming/Outgoing Cable is 4C with/without lugs or 2C with lugs please see page 6*

Scan QR Code for



PADS Certificate

### Legacy 1 Switch Circuit

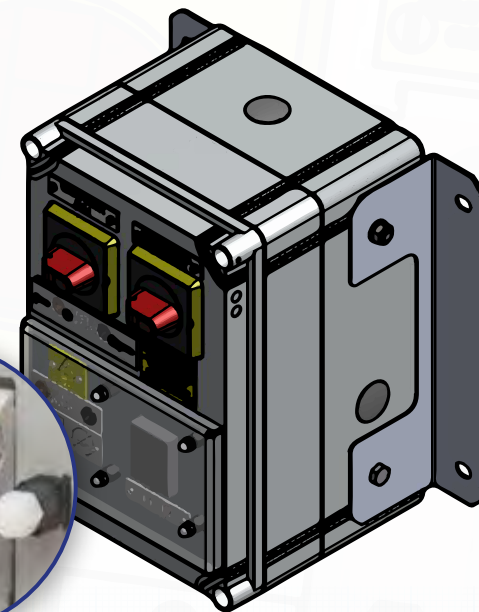


# PADS No: 091/099116

## FSP04/PL-CII/1SW-SL-IEC120



- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Main Power IN/OUT Isolator
- One Switched and Fused Output Functional Supply
- Functional Supply Fuse Carriers IEC60269 (A.B.B. 10x38mm)
- Front Cover Hinged on Left Hand Side
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables 35-120mm<sup>2</sup>
- Dimensions (W x H x D mm) - 200 x 300 x 225 (296 W including mounting ears)
- Weight - ~8kg

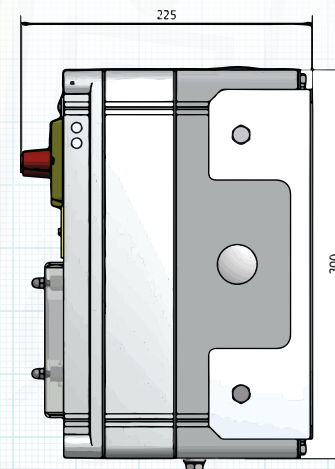
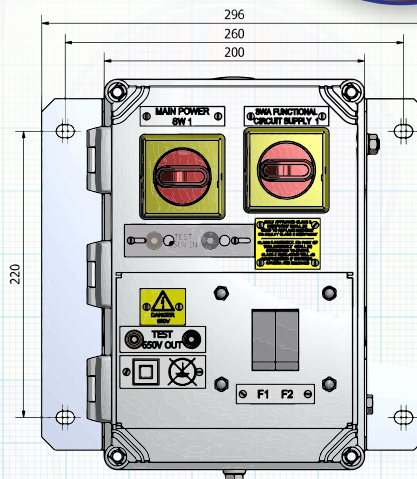
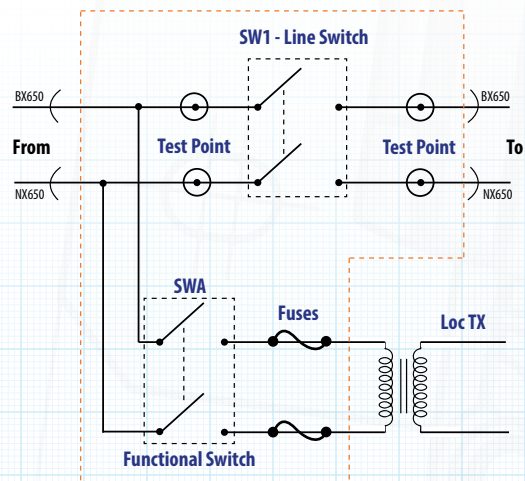


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### Legacy 1 Switch Circuit

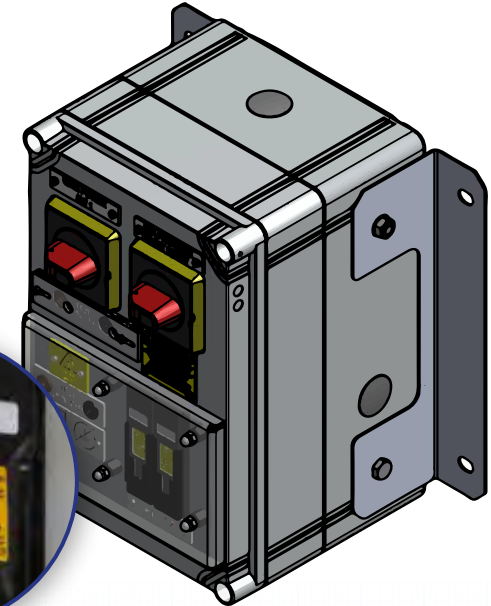


# PADS No: 091/099120

## FSP04/PL-CII/1SW-SL120



- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Line Isolator
- One Switched and Fused Functional Supply
- Functional Supply Fuse Carriers BS88-2 (CAMaster)
- Front Cover Hinged on Left Hand Side
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables 35-120mm<sup>2</sup>
- Dimensions (W x H x D mm) - 200 x 300 x 225 (296 W including mounting ears)
- Weight - ~8kg

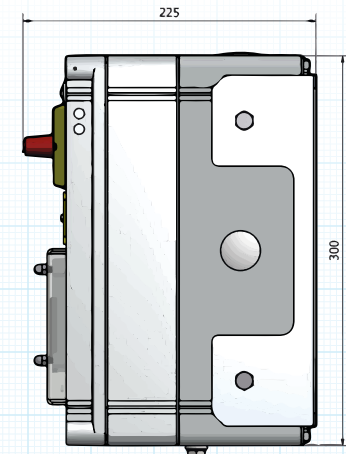
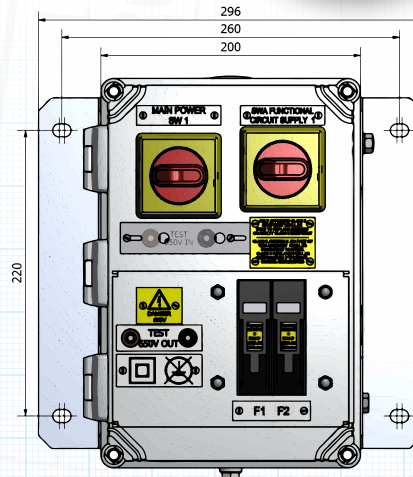
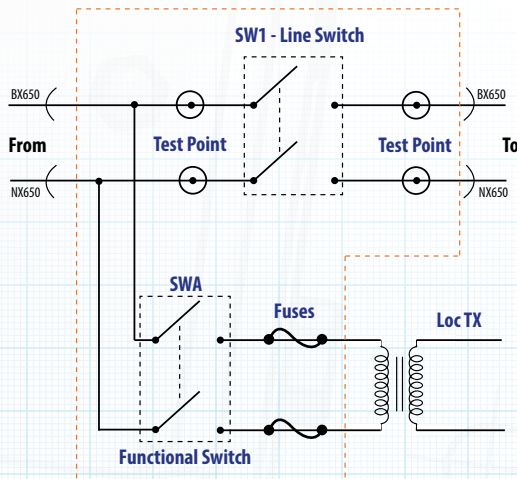


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PADS Certificate

### Legacy 1 Switch Circuit

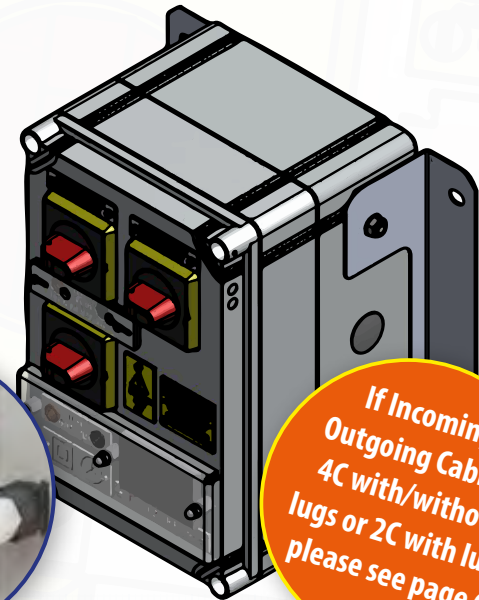


# PADS No: 091/099109

## FSP04/PL-CII/2SW-SL-IEC95



- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Line Isolator
- Two Switched and Fused Functional Supplies
- Functional Supply Fuse Carriers IEC60269 (A.B.B. 10x38mm)
- Front Cover Hinged on Left Hand Side
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables 16-95mm<sup>2</sup>
- Dimensions (W x H x D mm) - 200 x 300 x 225 (296 W including mounting ears)
- Weight - ~8kg



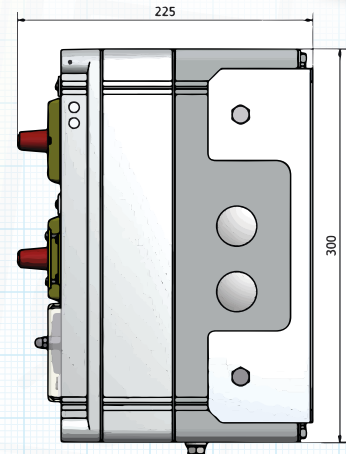
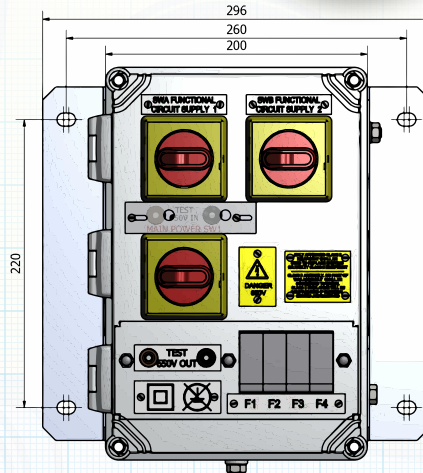
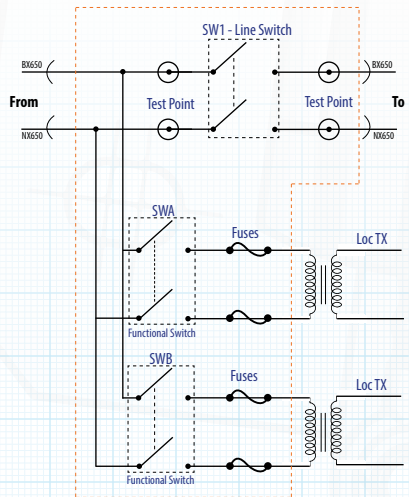
**If Incoming/Outgoing Cable is 4C with/without lugs or 2C with lugs please see page 6**

Scan QR Code for



PADS Certificate

### Legacy 2 Switch Circuit



PADS No: 091/099109  
Certificate No: PA05/06087  
Legacy-8/15-v1.0

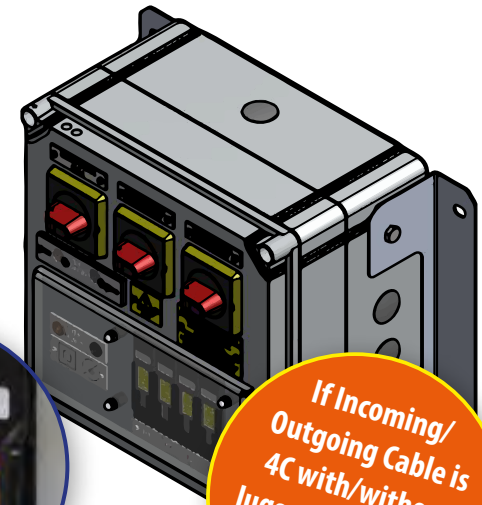


# PADS No: 091/099122

## FSP04/PL-CII/2SW-SL95



- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Line Isolator
- Two Switched and Fused Functional Supplies
- Functional Supply Fuse Carriers BS88-2 (CAMaster)
- Front Cover Hinged on Left Hand Side
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables 16-95mm<sup>2</sup>
- Dimensions (W x H x D mm) - 300 x 300 x 225 (396 W including mounting ears)
- Weight - ~8kg



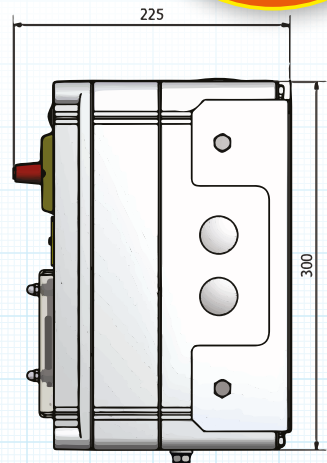
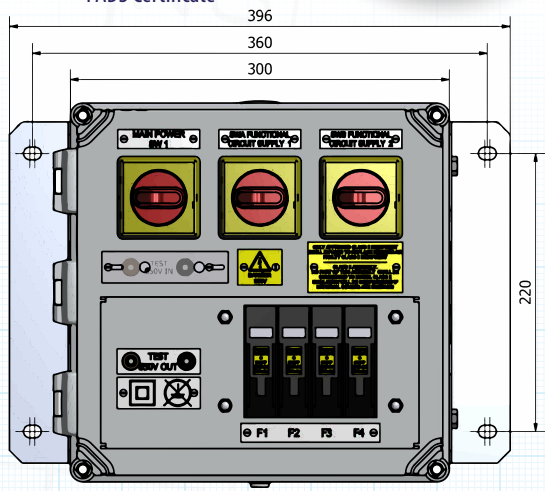
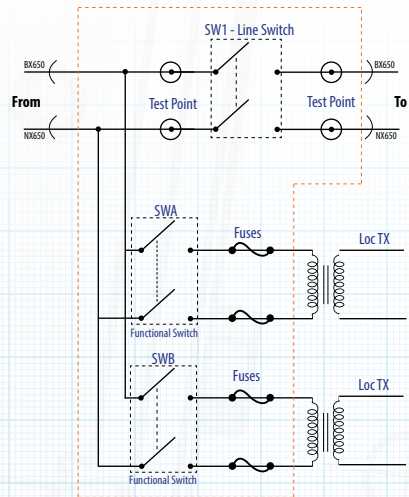
*If Incoming/Outgoing Cable is 4C with/without lugs or 2C with lugs please see page 6*

Scan QR Code for



PADS Certificate

### Legacy 2 Switch Circuit

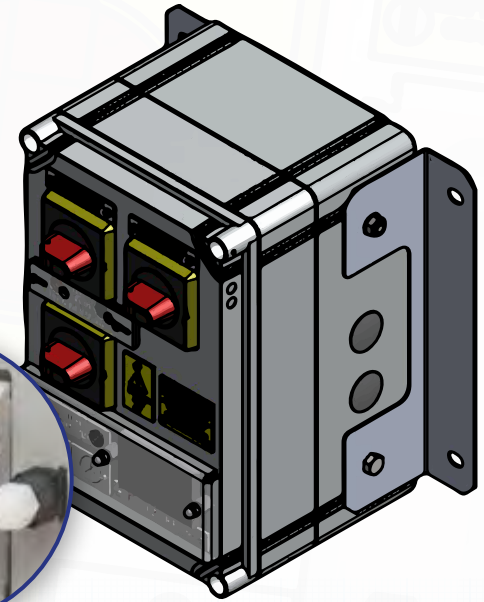


# PADS No: 091/099117

## FSP04/PL-CII/2SW-SL-IEC120



- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Line Isolator
- Two Switched and Fused Functional Supplies
- Functional Supply Fuse Carriers IEC60269 (A.B.B. 10x38mm)
- Front Cover Hinged on Left Hand Side
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables 35-120mm<sup>2</sup>
- Dimensions (W x H x D mm) - 200 x 300 x 225 (296 W including mounting ears)
- Weight - ~8kg

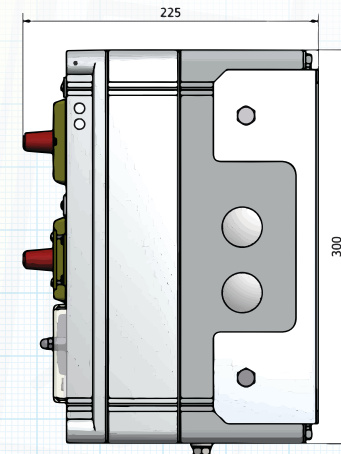
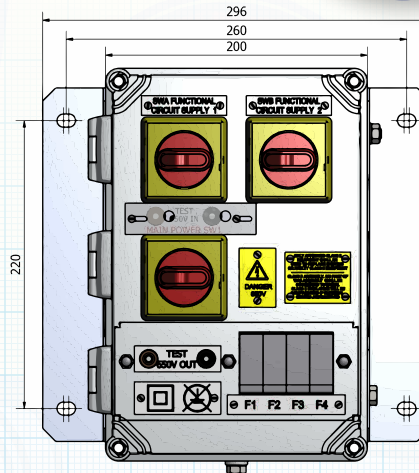
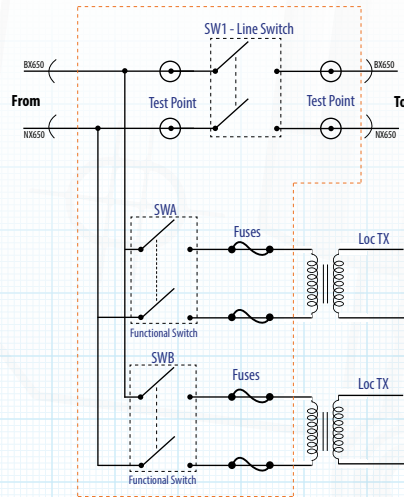


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PADS Certificate

### Legacy 2 Switch Circuit



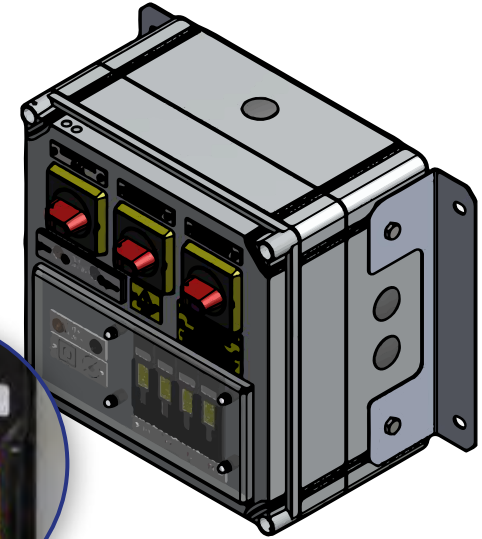
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Certificate No: PA05/06087  
Legacy-8/15-v1.0

# PADS No: 091/099125

## FSP04/PL-CII/2SW-SL120



- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Line Isolator
- Two Switched and Fused Functional Supplies
- Functional Supply Fuse Carriers BS88-2 (CAMaster)
- Front Cover Hinged on Left Hand Side
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables 35-120mm<sup>2</sup>
- Dimensions (W x H x D mm) - 300 x 300 x 225 (396 W including mounting ears)
- Weight - ~8kg

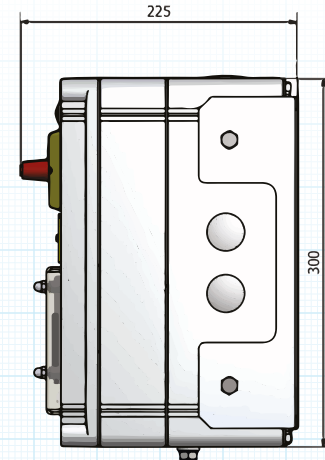
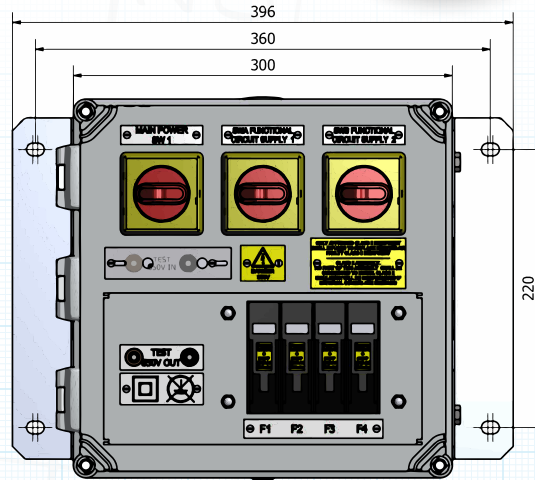
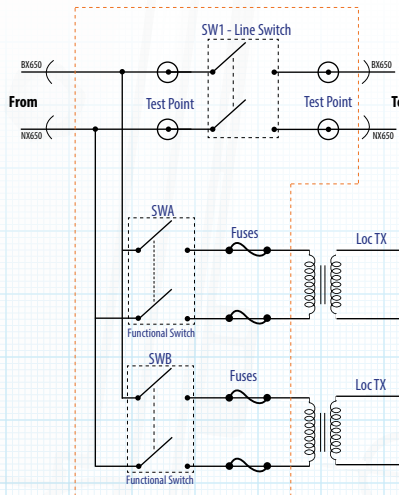


Scan QR Code for



PADS Certificate

### Legacy 2 Switch Circuit

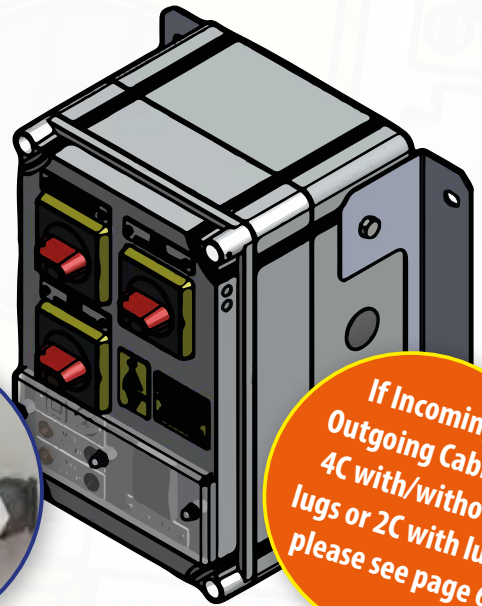


# PADS No: 091/099118

## (FSP02) PL-CII/1SW-SL-IEC95



- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Ring Power IN/OUT Isolators
- One Switched and Fused Functional Supply
- Functional Supply Fuse Carriers IEC60269 (A.B.B. 10x38mm)
- Front Cover Hinged on Left Hand Side
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables 16-95mm<sup>2</sup>
- Dimensions (W x H x D mm) - 200 x 300 x 225 (296 W including mounting ears)
- Weight - ~8kg



**If Incoming/Outgoing Cable is 4C with/without lugs or 2C with lugs please see page 6**

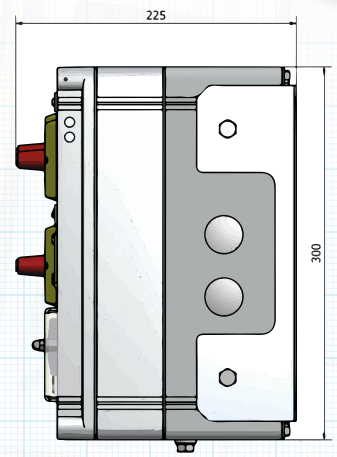
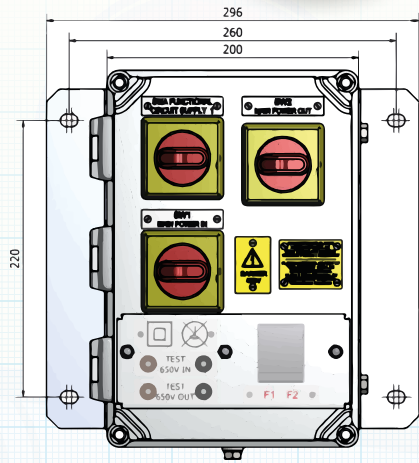
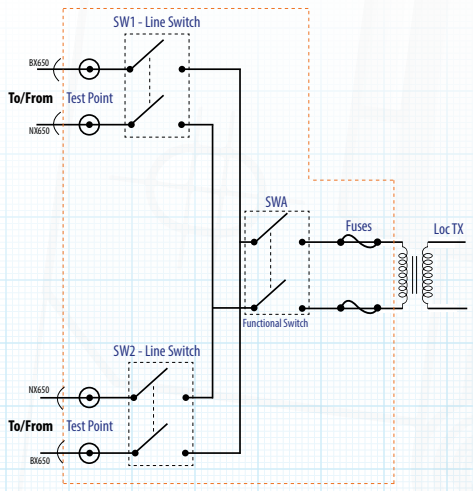


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PADS Certificate

### Ring Circuit





# PADS No: 091/099126

## (FSP02) PL-CII/1SW-SL95



- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Ring Power IN/OUT Isolators
- One Switched and Fused Functional Supply
- Functional Supply Fuse Carriers BS88-2 (CAMaster)
- Front Cover Hinged on Left Hand Side
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables 16-95mm<sup>2</sup>
- Dimensions (W x H x D mm) - 200 x 300 x 225 (296 W including mounting ears)
- Weight - ~8kg



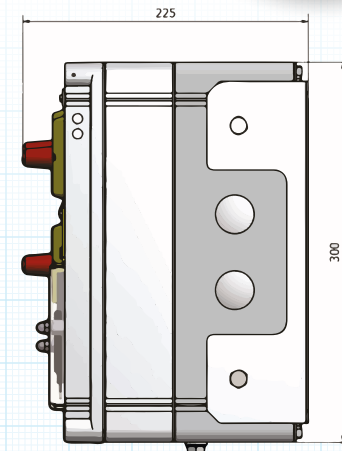
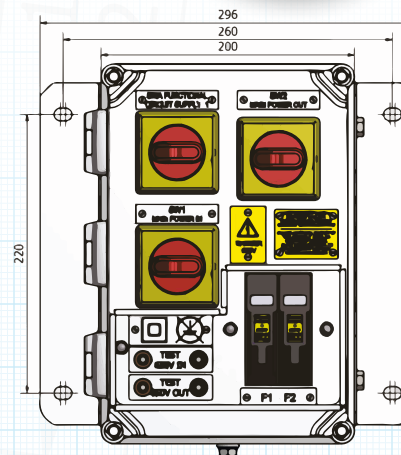
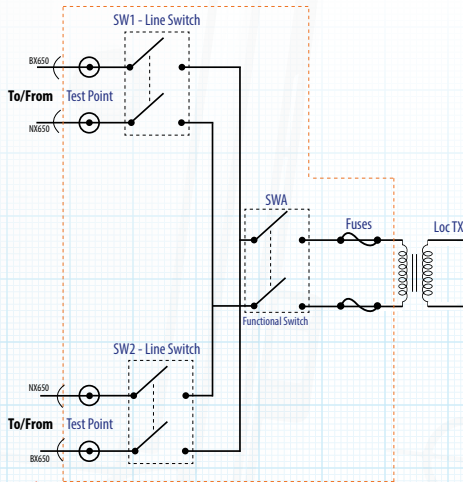
*If Incoming/Outgoing Cable is 4C with/without lugs or 2C with lugs please see page 6*

Scan QR Code for



PADS Certificate

### Ring Circuit



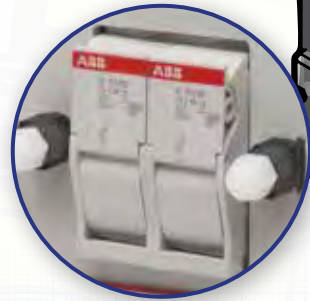
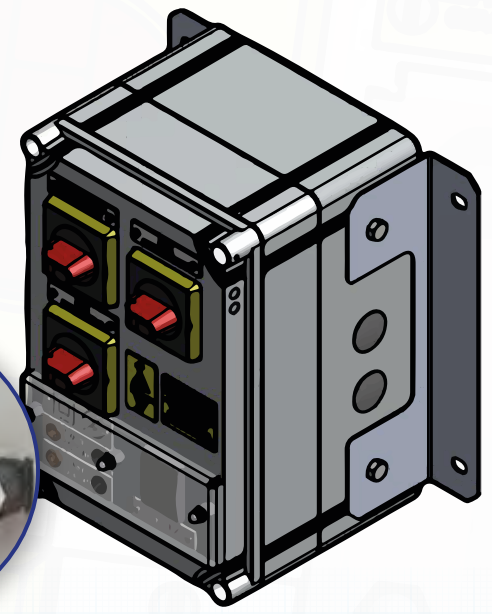
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Certificate No: PA05/06087  
Legacy-8/15-v1.0

# PADS No: 091/099119

## (FSP02) PL-CII/1SW-SL-IEC120

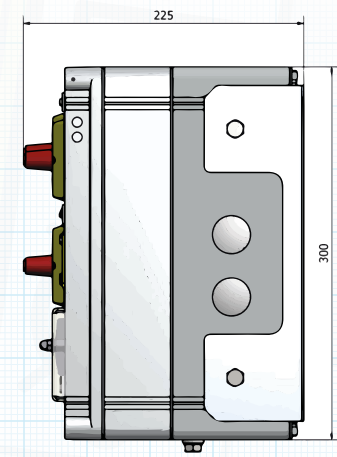
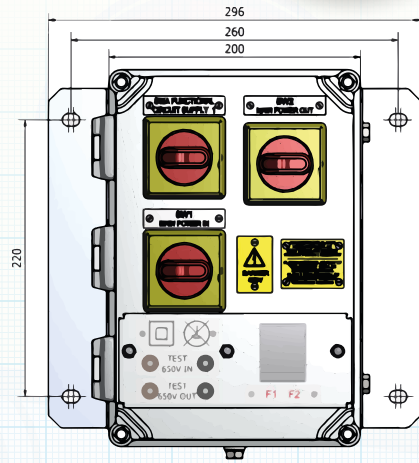
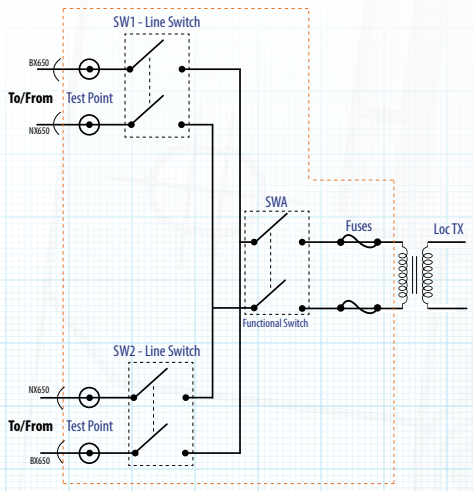


- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Ring Power IN/OUT Isolators
- One Switched and Fused Functional Supply
- Functional Supply Fuse Carriers IEC60269 (A.B.B. 10x38mm)
- Front Cover Hinged on Left Hand Side
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables 35-120mm<sup>2</sup>
- Dimensions (W x H x D mm) - 200 x 300 x 225 (296 W including mounting ears)
- Weight - ~8kg



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 PADS Certificate

### Ring Circuit

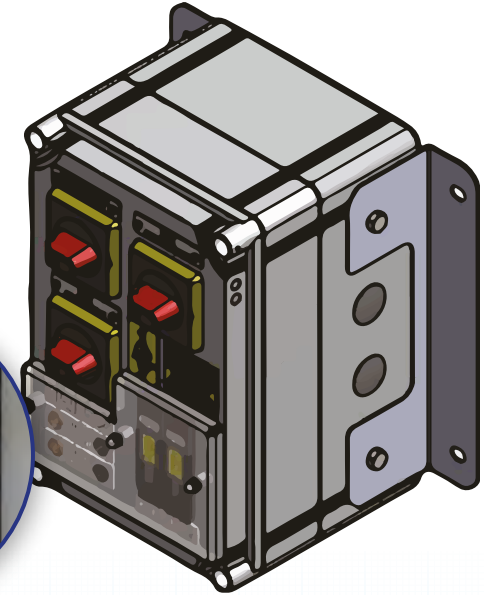




# PADS No: 091/099127

## (FSP02) PL-CII/1SW-SL 120

- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Ring Power IN/OUT Isolator
- One Switched and Fused Functional Supply
- Functional Supply Fuse Carriers BS88-2 (CAMaster)
- Front Cover Hinged on Left Hand Side
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables 35-120mm<sup>2</sup>
- Dimensions (W x H x D mm) - 200 x 300 x 225 (296 W including mounting ears)
- Weight - ~8kg

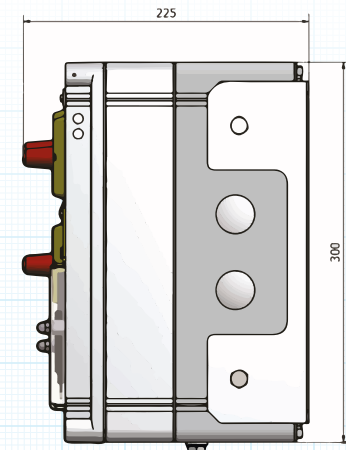
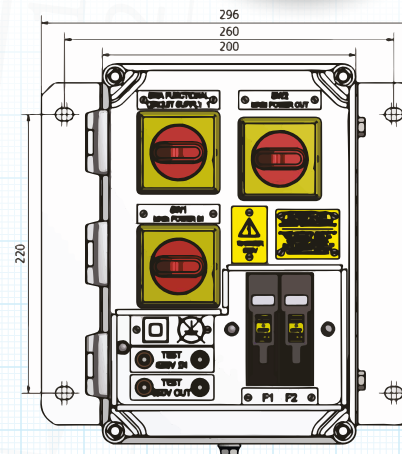
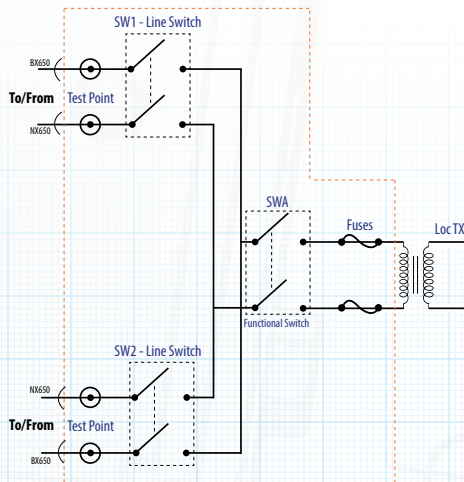


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### Ring Circuit



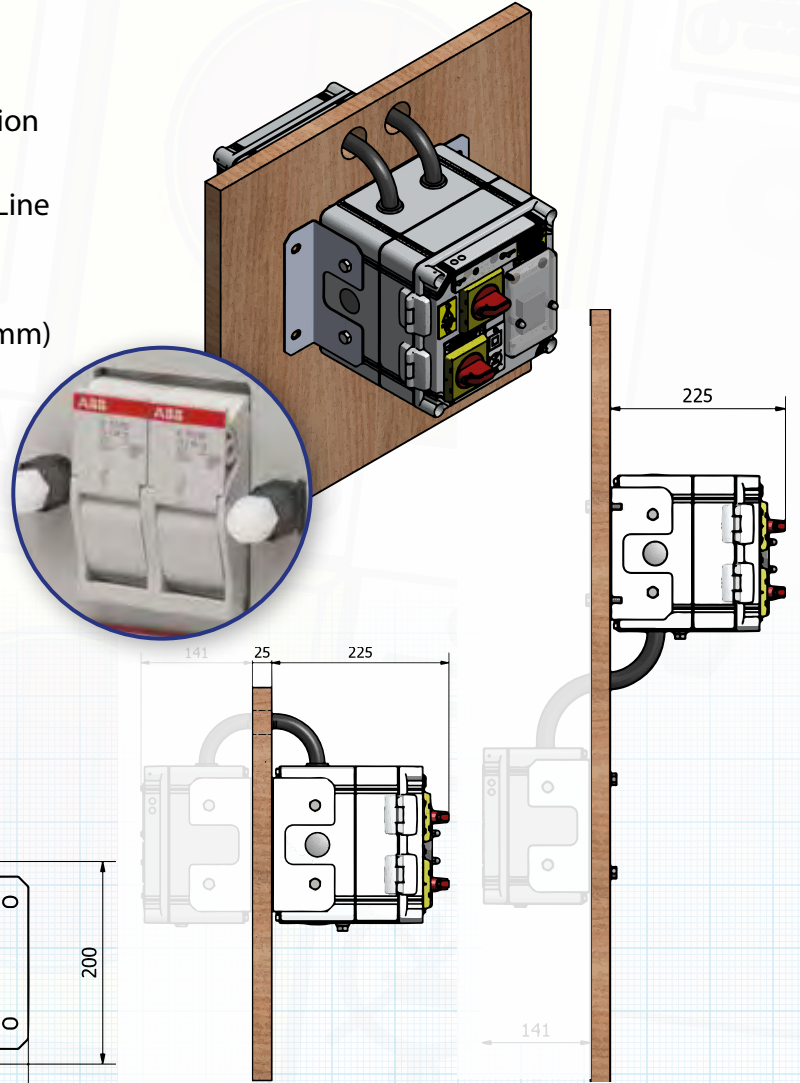
# PADS No: 091/099113

## FSP04/PL-CII/1SW-SL-IECBS

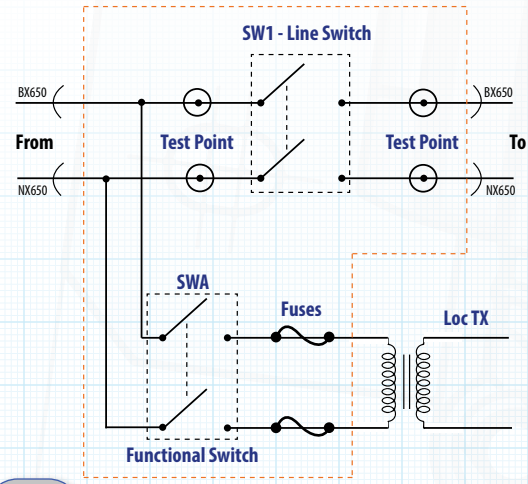
To be used in conjunction with FSP04/PL-CII/1SW-SL50BT, FSP04/PL-CII/1SW-SL95BT or FSP04/PL-CII/1SW-SL120BT depending on feeder cable size



- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Line Isolator
- One Switched and Fused Output Functional Supply
- Functional Supply Fuse Carriers IEC60269 (A.B.B. 10x38mm)
- Front Cover Hinged on Left Hand Side
- Feeder Cables via rear unit as shown above
- Dimensions (W x H x D mm) - 200 x 200 x 225 (296 W including mounting ears)
- Weight - 5kg



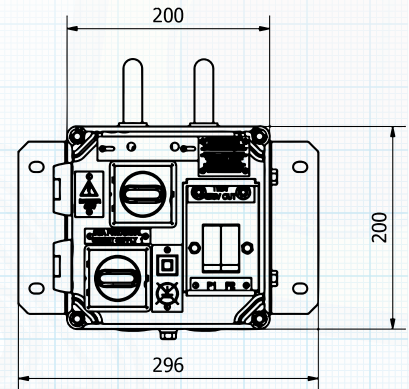
### Legacy 1 Switch Circuit



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PADS Certificate

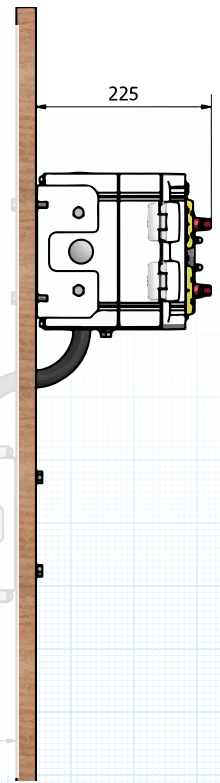
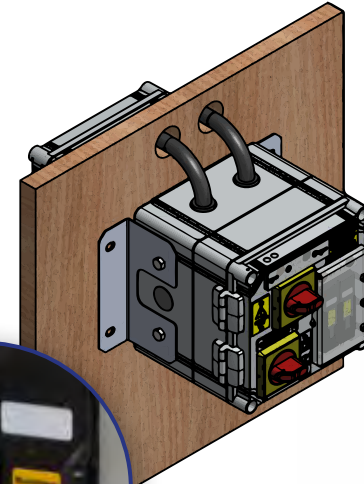


# PADS No: 091/099123

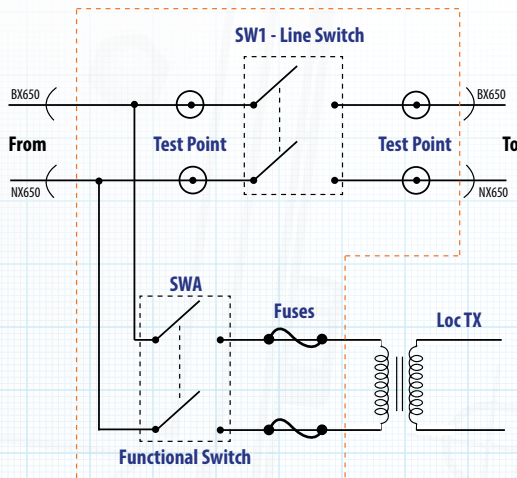
## FSP04/PL-CII/1SW-SLBS

To be used in conjunction with FSP04/PL-CII/1SW-SL50BT, FSP04/PL-CII/1SW-SL95BT or FSP04/PL-CII/1SW-SL120BT depending on feeder cable size

- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Line Isolator
- One Switched and Fused Output Functional Supply
- Functional Supply Fuse Carriers BS88-2 (CAMaster)
- Front Cover Hinged on Left Hand Side
- Feeder Cables via rear unit as shown above
- Dimensions (W x H x D mm) - 200 x 200 x 225 (296 W including mounting ears)
- Weight - 5kg



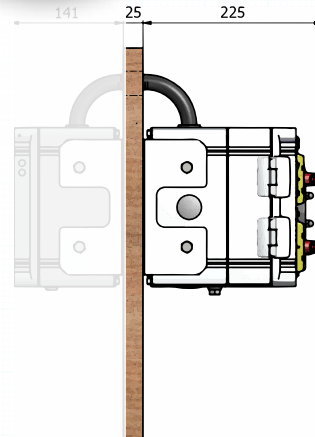
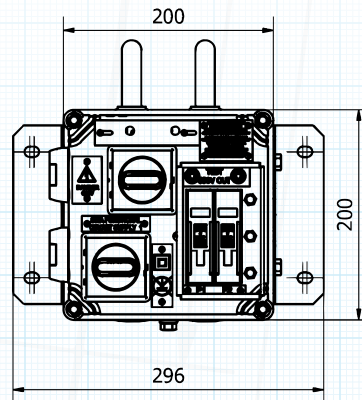
### Legacy 1 Switch Circuit



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# PADS No: 091/099128

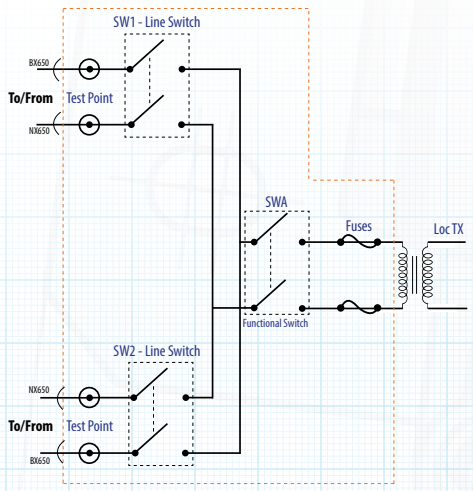
## (FSP02) PL-CII/1SW-SLBS

To be used in conjunction with FSP04/PL-CII/1SW-SL50BT, FSP04/PL-CII/1SW-SL95BT or FSP04/PL-CII/1SW-SL120BT depending on feeder cable size



- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Ring Power IN/OUT Isolators
- One Switched and Fused Functional Supply
- Functional Supply Fuse Carriers BS88-2 (CAMaster)
- Front Cover Hinged on Left Hand Side
- Feeder Cables via rear unit as shown above
- Dimensions (W x H x D mm) - 200 x 300 x 225 (296 W including mounting ears)
- Weight - ~8kg

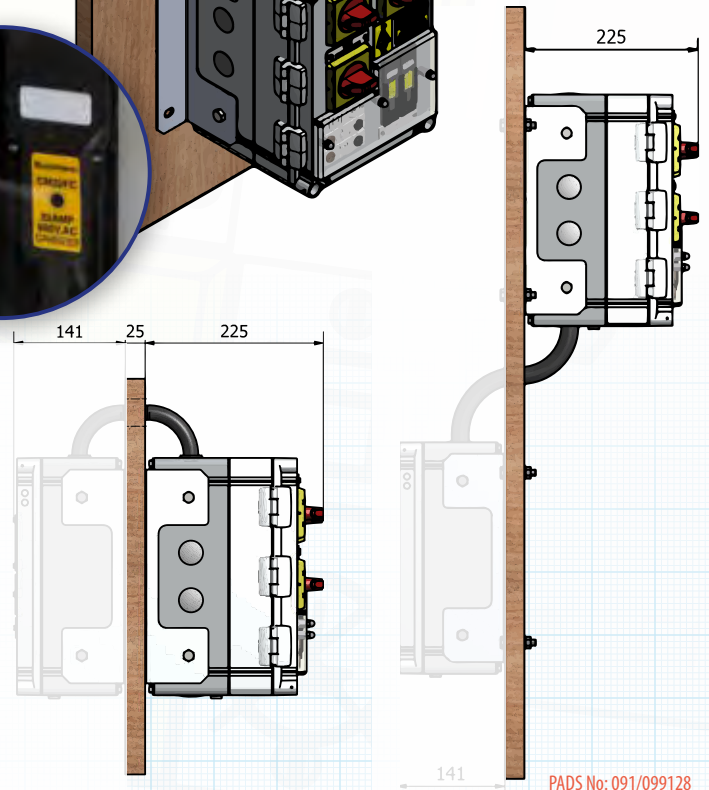
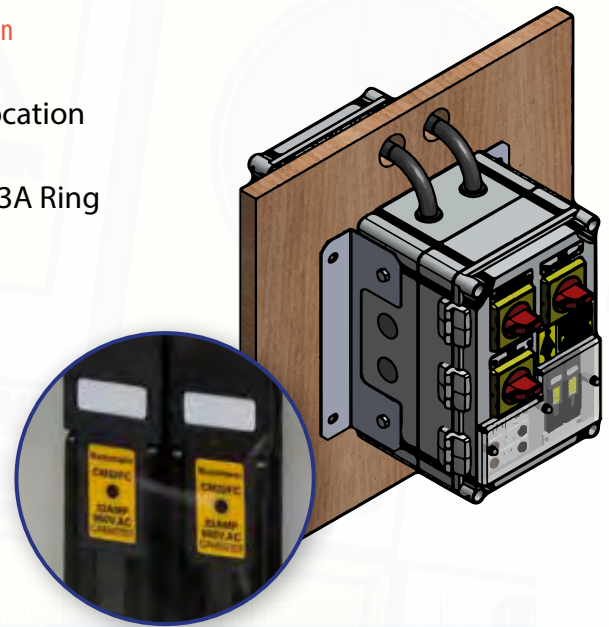
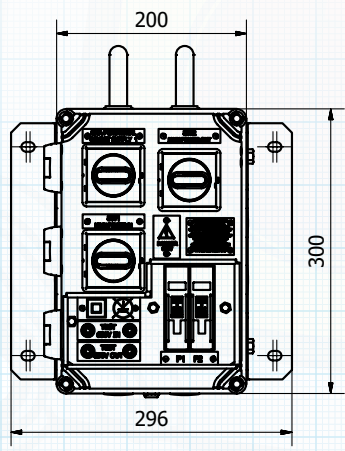
### Ring Circuit



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PADS Certificate



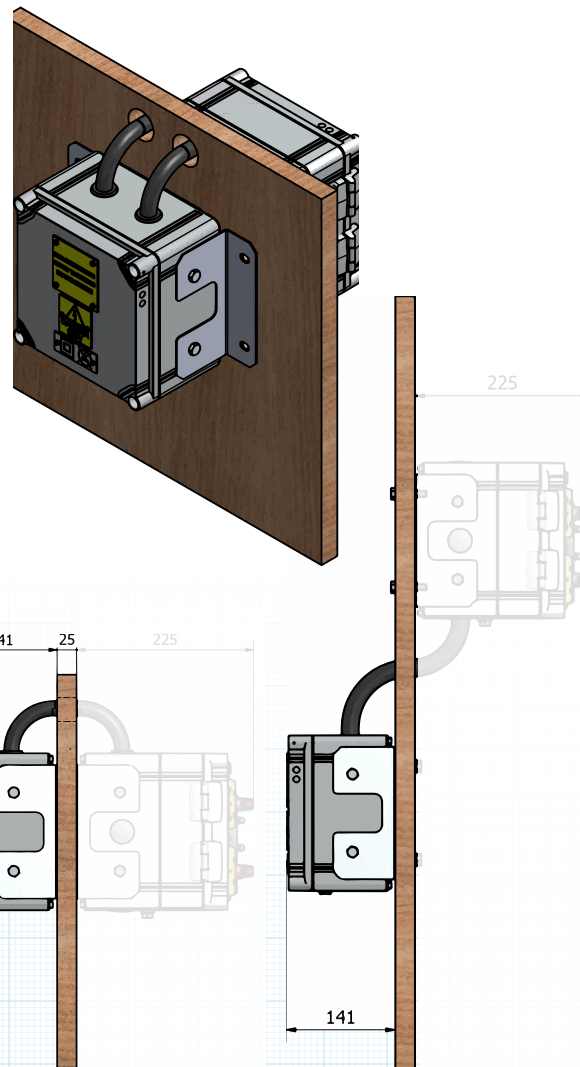


# PADS No: 091/099124

## FSP04/PL-CII/1SW-SL50BT

To be used in conjunction with FSP04/PL-CII/1SW-SL-IECBS, FSP04/PL-CII/1SW-SLBS or (FSP02) PL-CII/1SW-SLBS

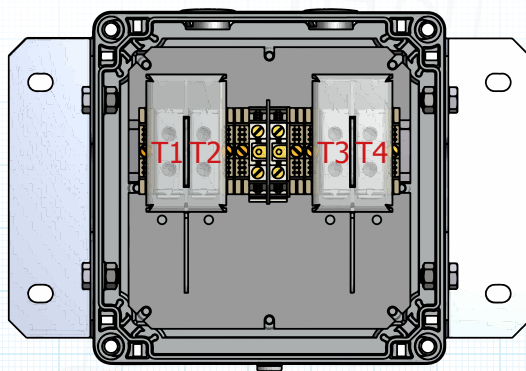
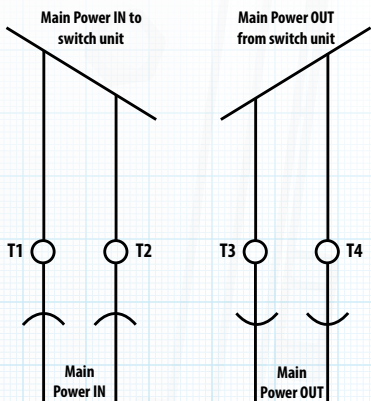
- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Line Isolator
- Switching via front unit as shown above
- Front Cover Hinged on Left Hand Side
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables 6-50mm<sup>2</sup>
- Dimensions (W x H x D mm) - 200 x 200 x 140 (296 W including mounting ears)
- Weight - 3kg



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PADS Certificate





# PADS No: 091/099114

## FSP04/PL-CII/1SW-SL95BT

To be used in conjunction with FSP04/PL-CII/1SW-SL-IECBS, FSP04/PL-CII/1SW-SLBS or (FSP02) PL-CII/1SW-SLBS

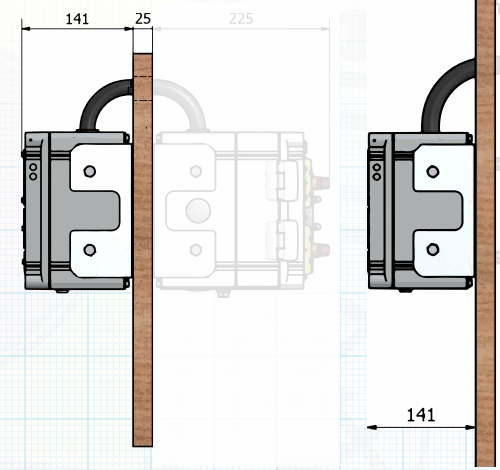
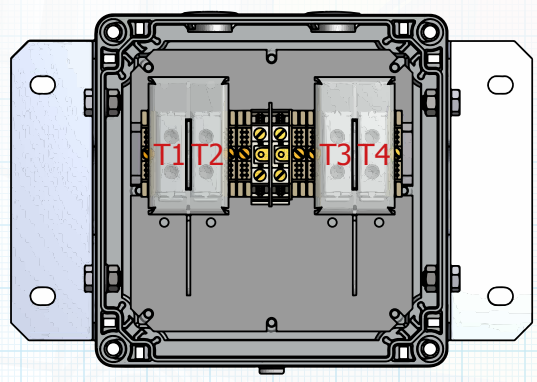
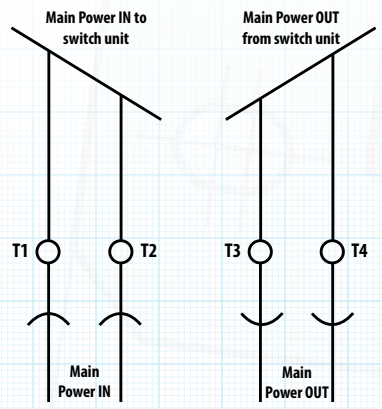
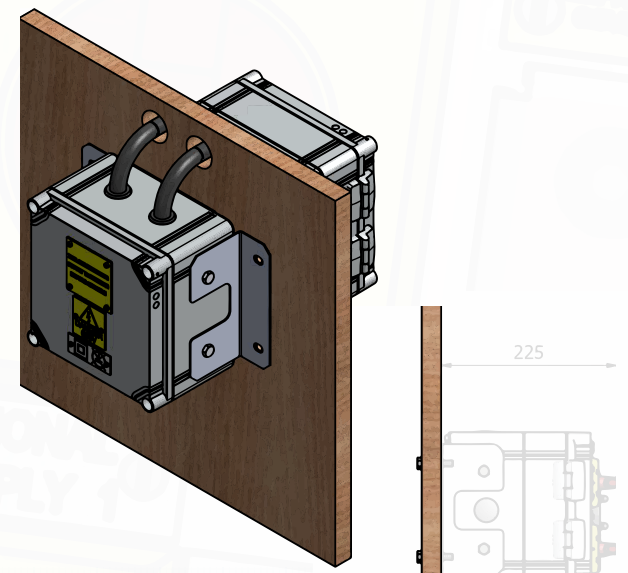


- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Line Isolator
- Switching via FSP01/PL-CII/1SW-SL-IEC/95-B5
- Front Cover Hinged on Left Hand Side
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables 16-95mm<sup>2</sup>
- Dimensions (W x H x D mm) - 200 x 200 x 140 (296 W including mounting ears)
- Weight - 3kg

Scan QR Code for



PADS Certificate



# PADS No: 091/099115

## FSP04/PL-CII/1SW-SL120BT

To be used in conjunction with FSP04/PL-CII/1SW-SL-IECBS, FSP04/PL-CII/1SW-SLBS or (FSP02) PL-CII/1SW-SLBS

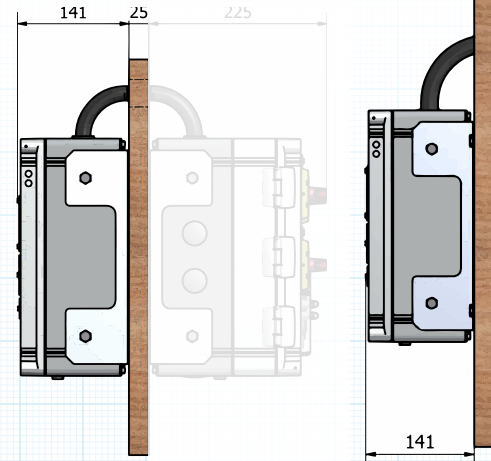
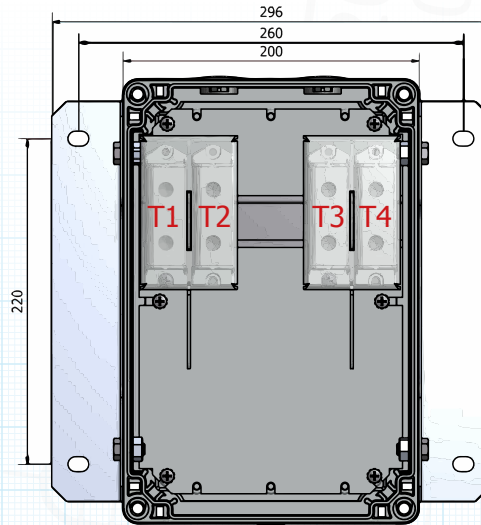
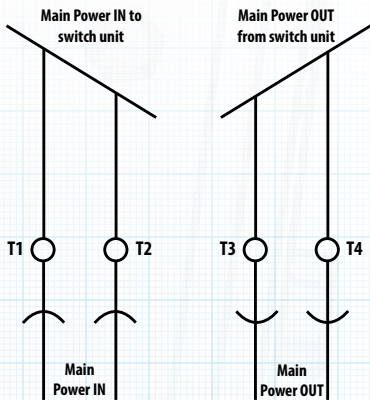
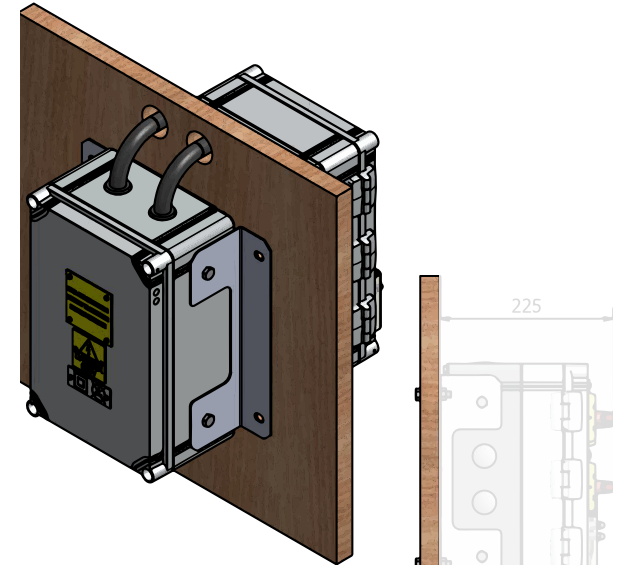


- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Class II Distribution Unit Rated to 690V Fitted with 63A Line Isolator
- Switching via FSP01/PL-CII/1SW-SL-IEC/95-BS
- Front Cover Hinged on Left Hand Side
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables 35-120mm<sup>2</sup>
- Dimensions (W x H x D mm) - 200 x 300 x 140 (296 W including mounting ears)
- Weight - 4kg

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# Micro FSP Installation Guide

- 1 ISOLATE INCOMING SUPPLIES**
- 2 CHECK NO VOLTAGE PRESENT WITHIN THE LOCATION CASE**
- 3 IDENTIFY, DISCONNECT & REMOVE SHROUDS AND CABLE CONNECTIONS FROM LINE LINKS**
- 4 USE DRILL TEMPLATE PROVIDED ENSURE REVERSE SIDE IS FREE OF OBSTRUCTIONS**
- 5 MOUNT 'CLASSIC' ON BACKPLATE**
- 6 INSPECT EXISTING FEEDER CABLES AND SLIP INTO 1 PART OF SPLIT CONDUIT**

PLACE SECOND PART OF SPLIT CONDUIT OVER THE FIRST ENSURING THE SPLIT IS ON THE OPPOSING SIDE
- 7 PREPARE INCOMING CABLES & CONNECT TERMINALS T1,T2,T3,T4**
- 8 TRANSFORMER SUPPLY CABLE ENTRY OPTIONS VIA FLEXIBLE CONDUIT**
- 9 CONNECT CLASS II HYBRID TRANSFORMER SUPPLY TO T5 & T6**
- 10 SLIDE SPLIT CONDUIT ALONG FEEDER CABLES & ENGAGE SECURELY IN GLANDS**
- 11 CHECK & TEST INSTALLATION FOR CORRECT OPERATION & MECHANICAL SECURITY RESTORE SUPPLY TO CABINET**
- 12 OPERATE MAIN POWER SW1 & CHECK VOLTAGE AT TEST POINTS**

# CASE STUDY Bury St Edmunds



## Remit

To retrofit four Class II Micro FSPs into existing Legacy location cases. To identify requirements and develop working methods for a safe and efficient installation.

## Constraints

Reduce electrical risk, remove mechanical handling, consider existing cable and switchgear condition and internal dimensional constraints.

## Solution

Develop an innovative Micro FSP unit to replace existing LOC and line links. Switchgear was installed in a swift and timely manner during an overnight possession as well as adding extra protection to existing cables via conduit and glands.

## Conclusion

The project was the first of its kind and was delivered on time with no delays and at a reduced cost. Introducing a Class II solution to the Legacy circuit has increased electrical safety surrounding the 650V distribution within the location. A significant improvement was measured at the local Bender Protection monitor after the install.



New and old cable. Legacy Al cable on the right interfacing with new Cu unarmoured cable on the left



# Connection Boxes & Earth Connection Boxes

		FSP-CII/CB/J50	FSP-CII/CB/I120	FSP-CII/CB/IC-35	FSP-CII/CB/IC-120	FSP-CII/CB/AC-35	FSP-CII/CB/AC-120
Number of Cores	2 Core			✓	✓		
	4 Core	✓	✓			✓	✓
Feeder Cable Size	Up to 35mm <sup>2</sup>			✓		✓	
	Up to 50mm <sup>2</sup>	✓					
	Up to 120mm <sup>2</sup>		✓		✓		✓
Pre-Lugged Cable	Yes			✓	✓	✓	✓
	No	✓	✓				
Suitable for Cu or Al Cable	Copper (Cu)	●	●	●	●	●	●
	Aluminium (Al)	○	○	○	○	○	○
Page		34	35	36	37	38	39

## For Armoured Cable

If incoming feeder cable is Armoured the Earth Connection Boxes provides a safe separation of the earth wire and the Micro FSP Unit maintaining a Class II system without compromising the earth continuity.

ECB's are available to accommodate M40 & M50 Al or Cu cable



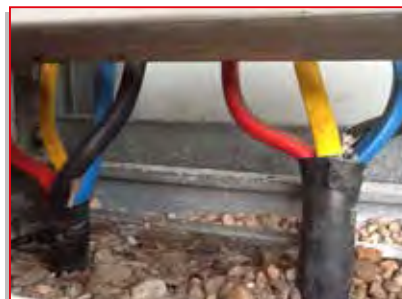
41



42



If existing incoming feeder cable is pre-fitted with lugs this can be used with our Class II connection boxes



Exposed incoming cable will be protected using flexible conduit and secured safely into the connection box using a compression gland



Connection Boxes are used to replace the above arrangement by housing all incoming feeder cables in a Class II, touch safe enclosure.



If incoming feeder is armoured cable please refer to part numbers FSP/ECB/M40 & FSP/ECB/M50 Please see pages 40-42

# CLASS II YOUR LOC

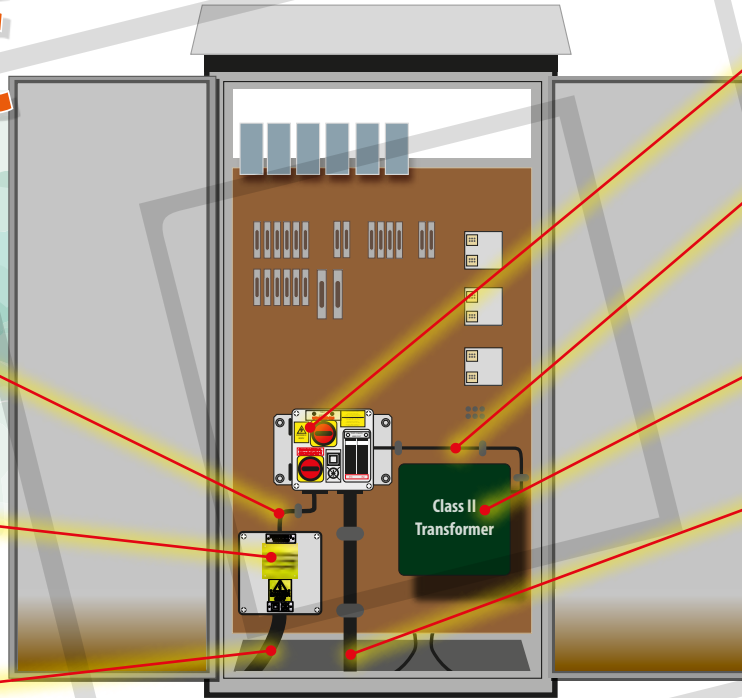
16mm cable runs from connection box to Micro FSP. For best results use clips to secure cable - see 'cable protection' section

If incoming cable is 4 core with/without lugs or 2 core with lugs use Class II connection box. Suitable for Al or Cu cable.

Incoming Feeder Cable

If incoming feeder cable is armoured then use a ECB box.

Incoming ARMoured cable



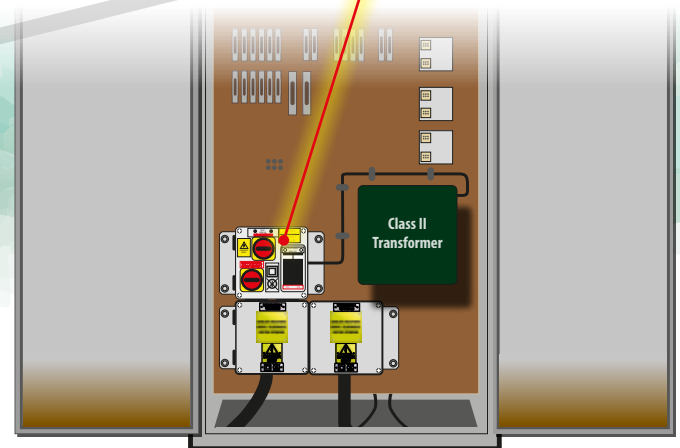
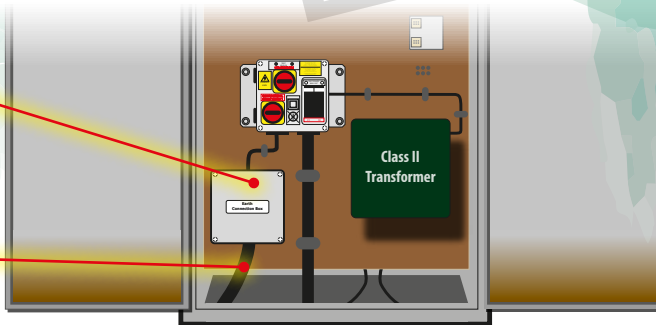
Micro FSP Unit to Replace existing RS200 Line Links

Functional supply cable. 2.5mm cable runs from Micro FSP to Class II transformer. Cable to be housed in flexible conduit

Class II transformer. Suitable for AL or Cu cable - see 'Transformers' section

Outgoing Feeder Cable.

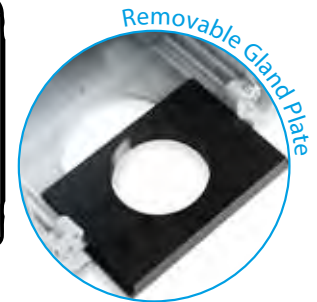
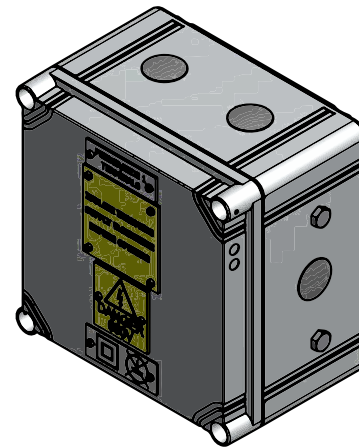
Please note that if outgoing cable is 4 core with/without or 2 core pre-lugged then a CB box is required on outgoing feeder cable



# PADS No: 091/099129

## FSP-CII/CB/50

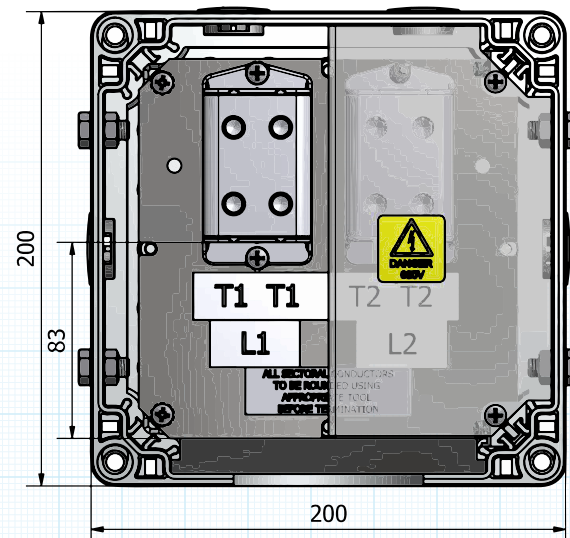
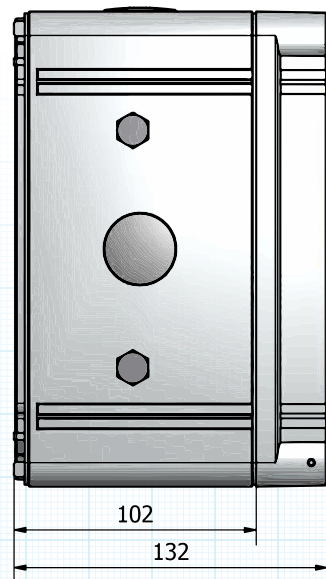
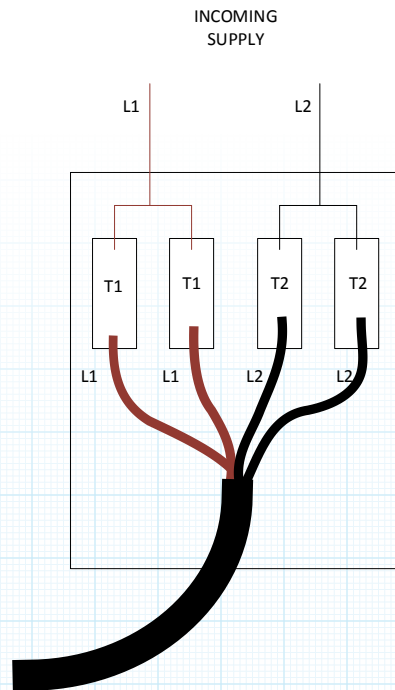
- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Suitable for 4 Core Aluminium (Al) or Copper (Cu) unarmoured incoming/outgoing feeder cable up to 50mm
- If outgoing feeder cable is 4 Core with/without lugs or 2 Core pre-lugged then separate Connection Box (CB) will be needed
- Pre-fitted with 2 x KE-67 Ensto distribution blocks
- Dimensions (W x H x D mm) - 200 x 200 x 132 (296 W including optional mounting ears)
- Weight - 5kg



Scan QR Code for



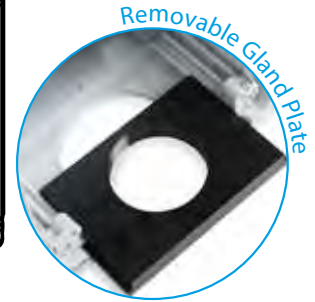
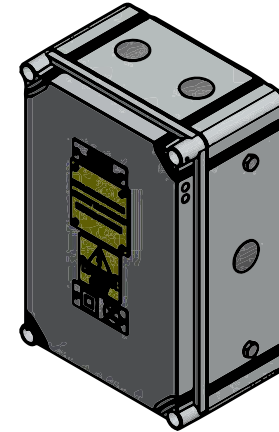
PADS Certificate



# PADS No: 091/099130

## FSP-CII/CB/120

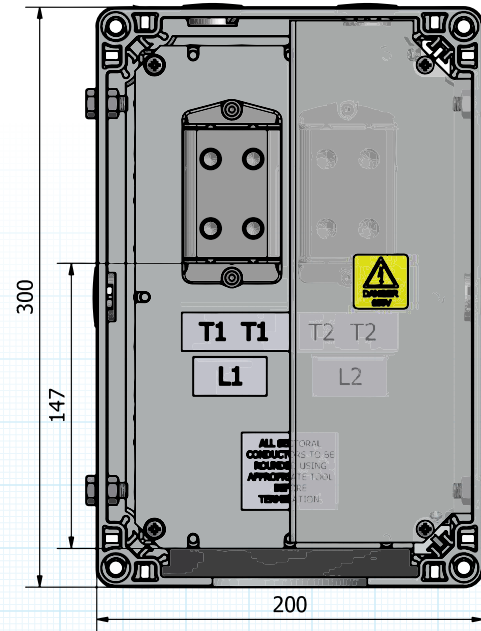
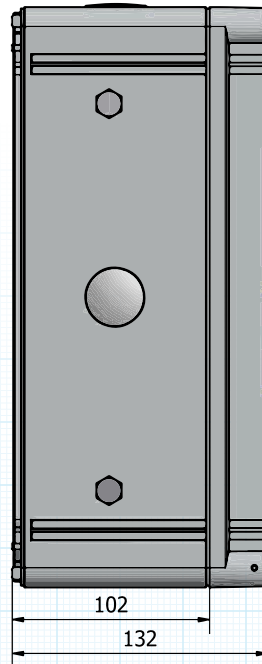
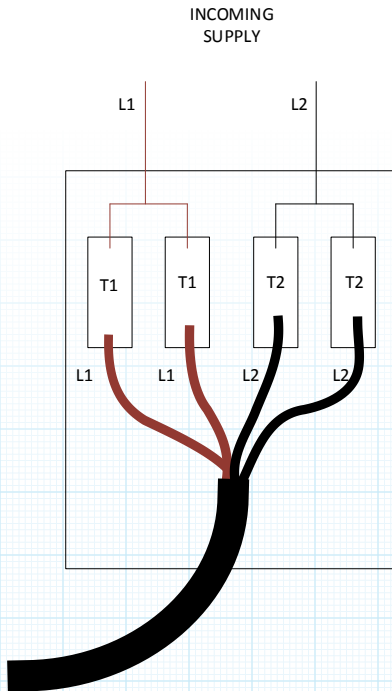
- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Suitable for 4 Core Aluminium (Al) or Copper (Cu) unarmoured incoming/outgoing feeder cable up to 120mm
- If outgoing feeder cable is 4 Core with/without lugs or 2 Core pre-lugged then separate Connection Box (CB) will be needed
- Pre-fitted with 2 x KE-68 Ensto distribution blocks
- Dimensions (W x H x D mm) - 200 x 300 x 132 (296 W including optional mounting ears)
- Weight - 7kg



Scan QR Code for



PADS Certificate





# PADS No: 091/099131

## FSP-CII/CB/2C-35

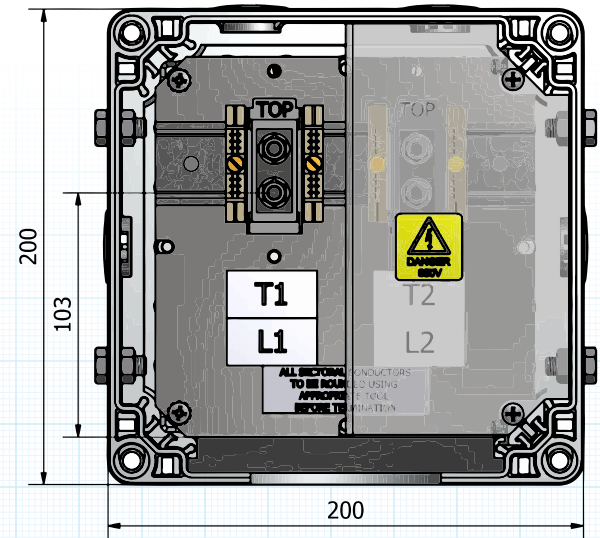
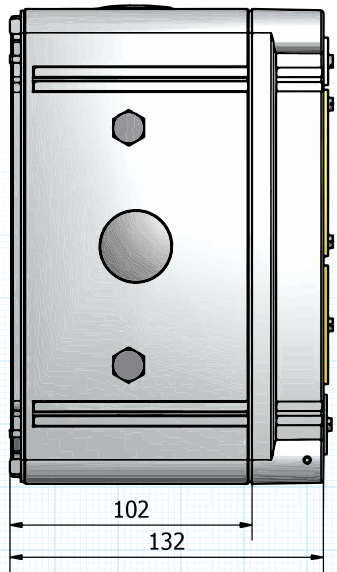
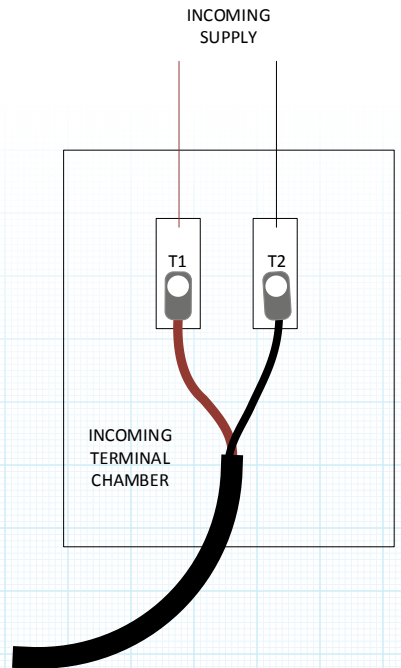
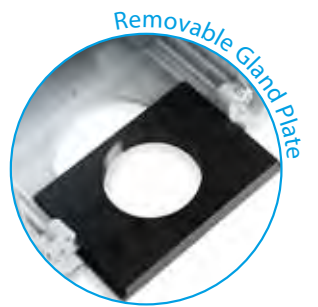
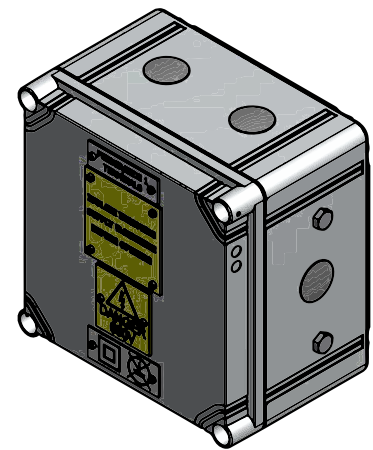


- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Suitable for 2 Core Aluminium (Al) or Copper (Cu) pre-lugged unarmoured incoming/outgoing feeder cable up to 35mm
- If outgoing feeder cable is 4 Core with/without lugs or 2 Core pre-lugged then separate Connection Box (CB) will be needed
- Pre-fitted with 2 x M35/26.FF ABB terminal blocks. Suitable for 2 x M6 studs
- Dimensions (W x H x D mm) - 200 x 200 x 132 (296 W including optional mounting ears)
- Weight - 5kg

Scan QR Code for



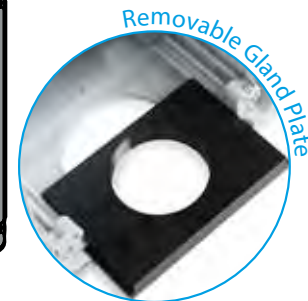
PADS Certificate



# PADS No: 091/099132

## FSP-CII/CB/2C-120

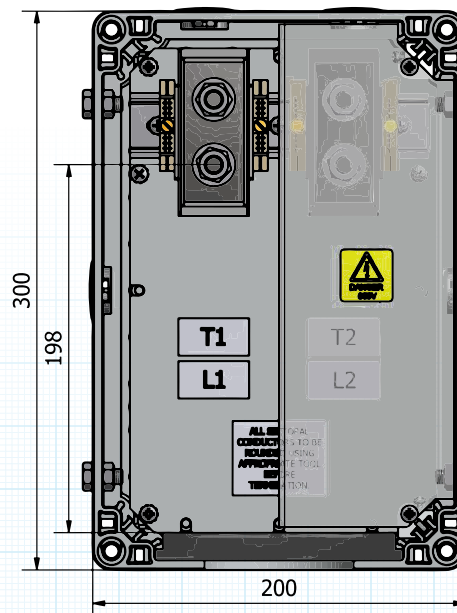
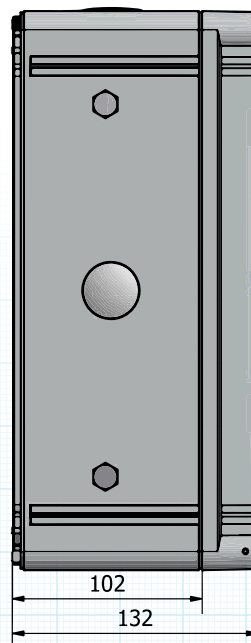
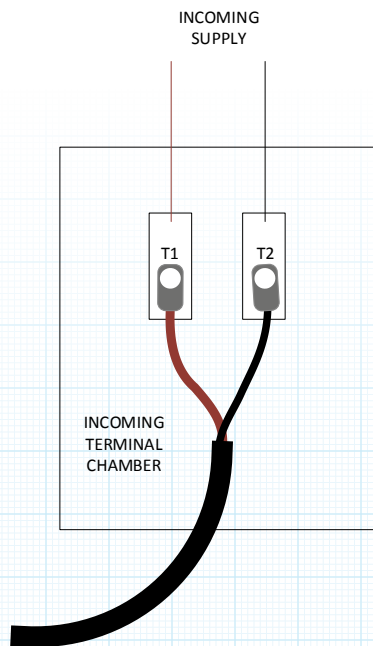
- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Suitable for 2 Core Aluminium (Al) or Copper (Cu) pre-lugged unarmoured incoming/outgoing feeder cable up to 120mm
- If outgoing feeder cable is 4 Core with/without lugs or 2 Core pre-lugged then separate Connection Box (CB) will be needed
- Pre-fitted with 2 x M300/42.FF ABB terminal blocks. Suitable for 2 x M10 studs
- Dimensions (W x H x D mm) - 200 x 300 x 132 (296 W including optional mounting ears)
- Weight - 7kg



Scan QR Code for



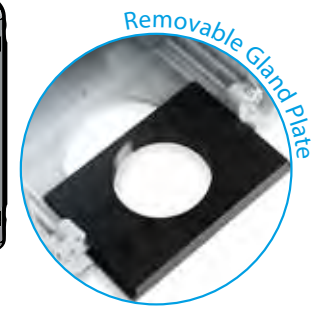
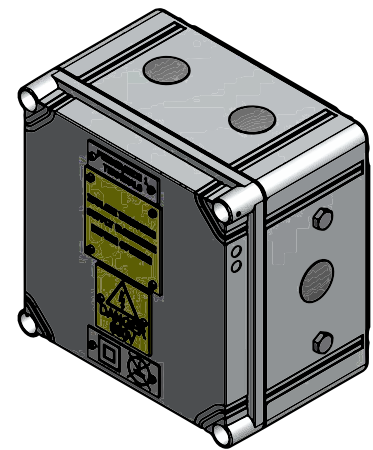
PADS Certificate



# PADS No: 091/099133

## FSP-CII/CB/4C-35

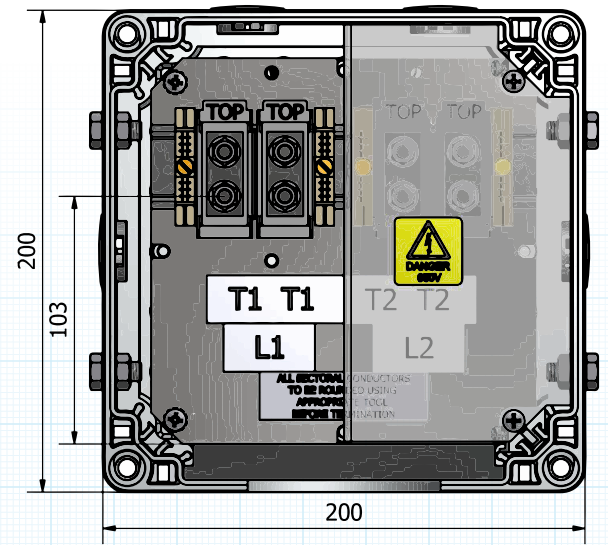
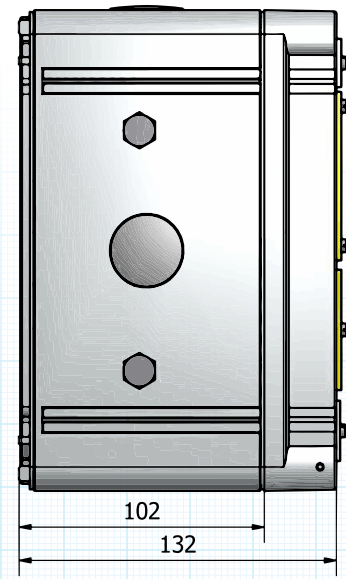
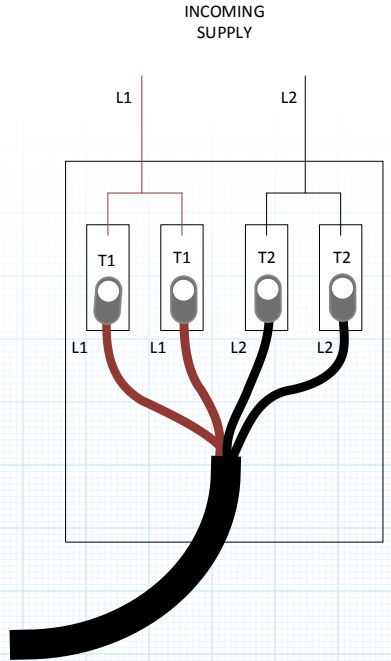
- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Suitable for 4 Core Aluminium (Al) or Copper (Cu) pre-lugged unarmoured incoming/outgoing feeder cable up to 35mm
- If outgoing feeder cable is 4 Core with/without lugs or 2 Core pre-lugged then separate Connection Box (CB) will be needed
- Pre-fitted with 4 x M35/26.FF ABB terminal blocks. Suitable for 2 x M6 studs
- Dimensions (W x H x D mm) - 200 x 200 x 132 (296 W including optional mounting ears)
- Weight - 5.5kg



Scan QR Code for



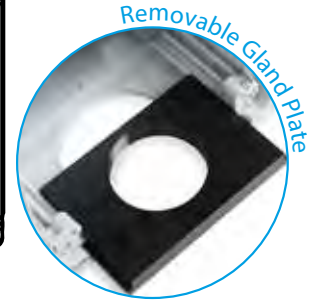
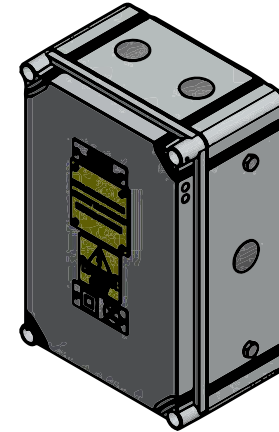
PADS Certificate



# PADS No: 091/099134

## FSP-CII/CB/4C-120

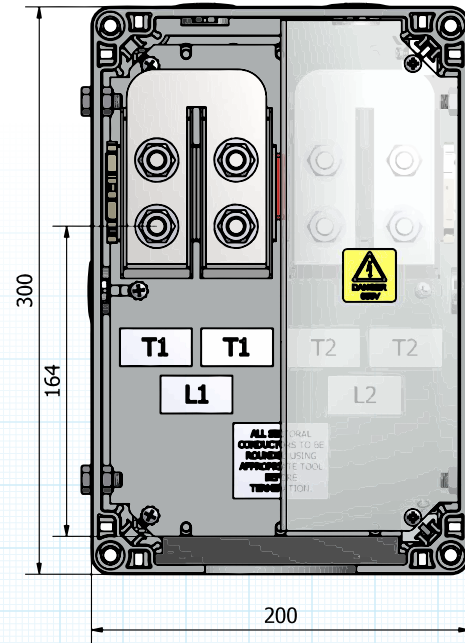
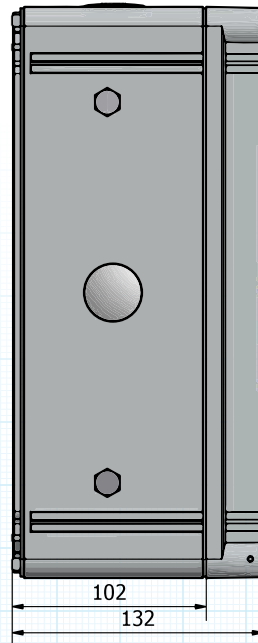
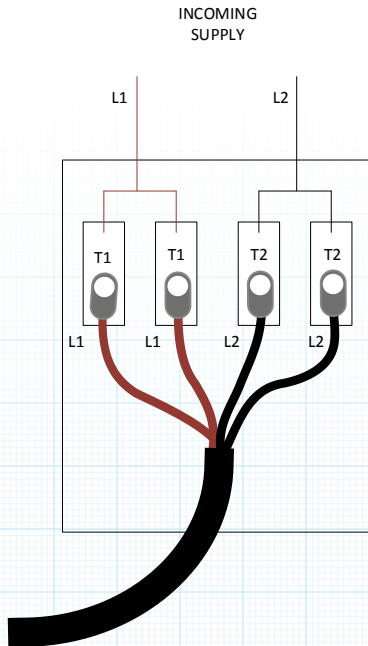
- Suitable for Fast and Efficient Upgrade of 'Legacy' Location Cases or New Installations
- Suitable for 4 Core Aluminium (Al) or Copper (Cu) pre-lugged unarmoured incoming/outgoing feeder cable up to 120mm
- If outgoing feeder cable is 4 Core with/without lugs or 2 Core pre-lugged then separate Connection Box (CB) will be needed
- Pre-fitted with 4 x M300/42.FF ABB terminal blocks. Suitable for 2 x M10 studs
- Dimensions (W x H x D mm) - 200 x 300 x 132 (296 W including optional mounting ears)
- Weight - 7.5kg



Scan QR Code for



PADS Certificate





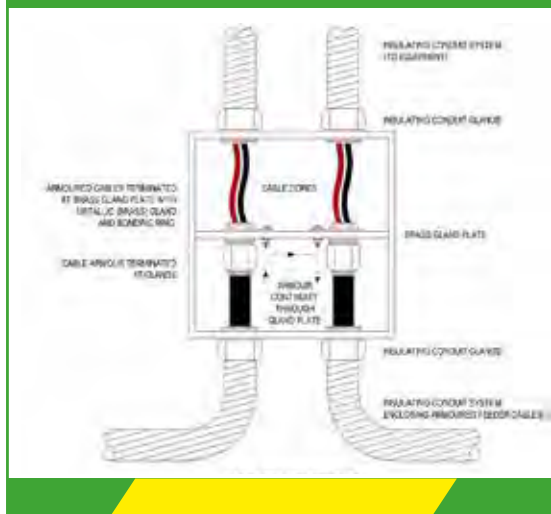
# Earth Connection Boxes

A Earth Connection Box (ECB) should be used when the incoming feeder is 2/3 Core ARMoured cable.

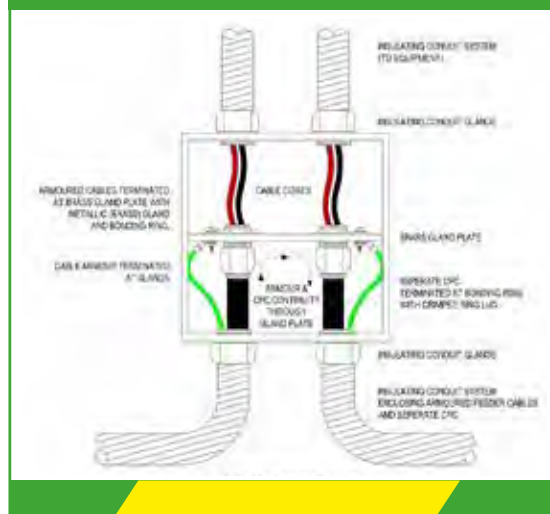
An integral brass continuity/gland plate ensures equipotential value between armoured feeder cables and provides a secure internal connection point for separate CPC's. The overall assembly uses a class II double insulated enclosure that can be mounted directly or connected via Network Rail approved conduit and gland systems. The assembly ensures safe separation between any earth based feeder cable systems and the Class II switchgear.

ECB Boxes can be found on pages 41-42

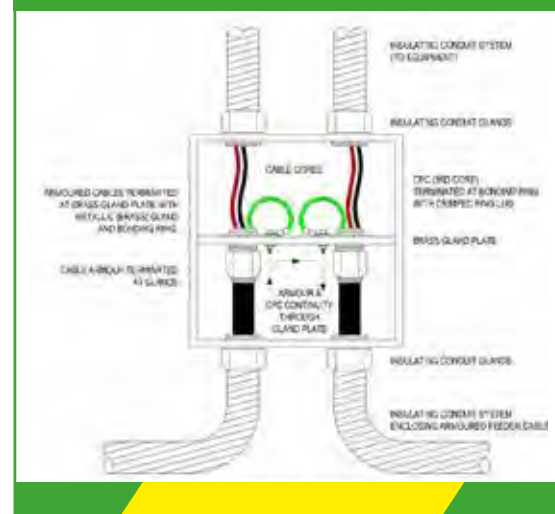
## Maintaining Continuity of Armour on a 2 Core Armoured Cable



## Maintaining continuity of armour and CPC on a 2 Core armoured cable with separate CPC



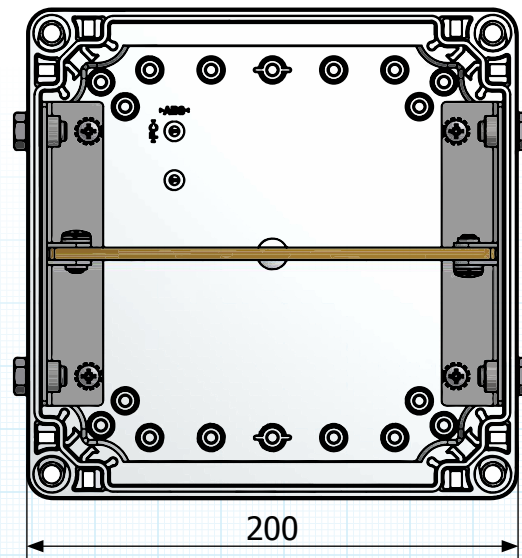
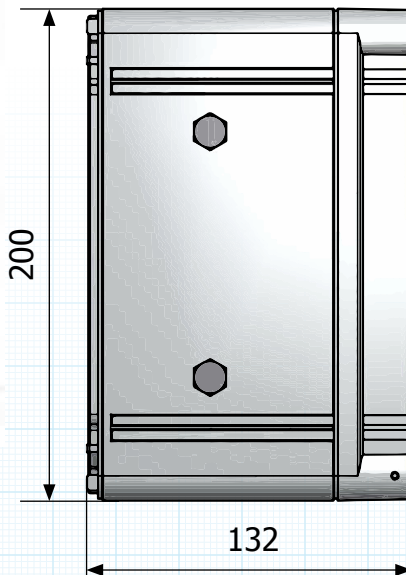
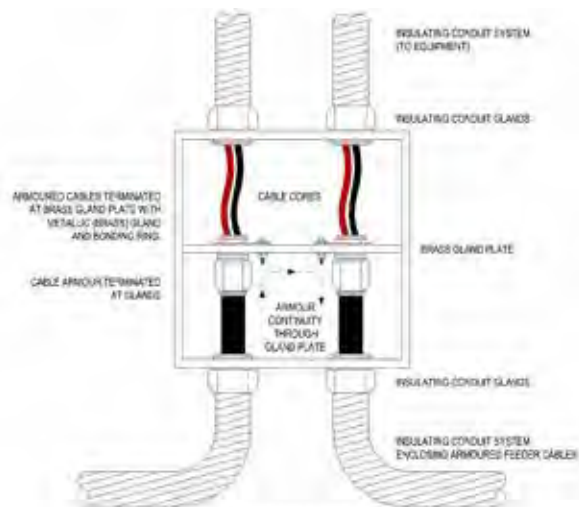
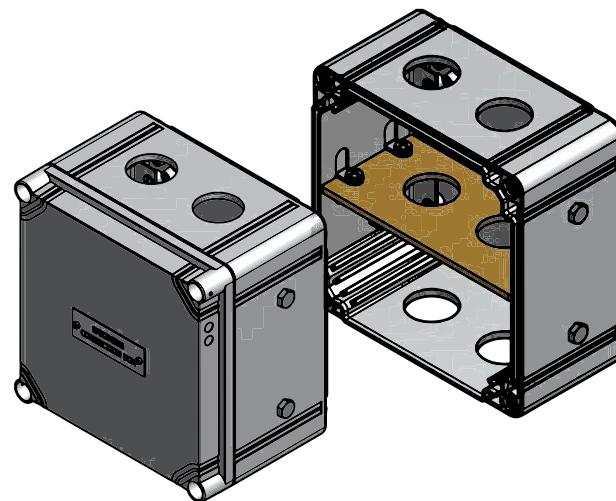
## Maintaining continuity of armour and CPC on a 3 Core armoured cable



# FSP-CII/ECB/M40



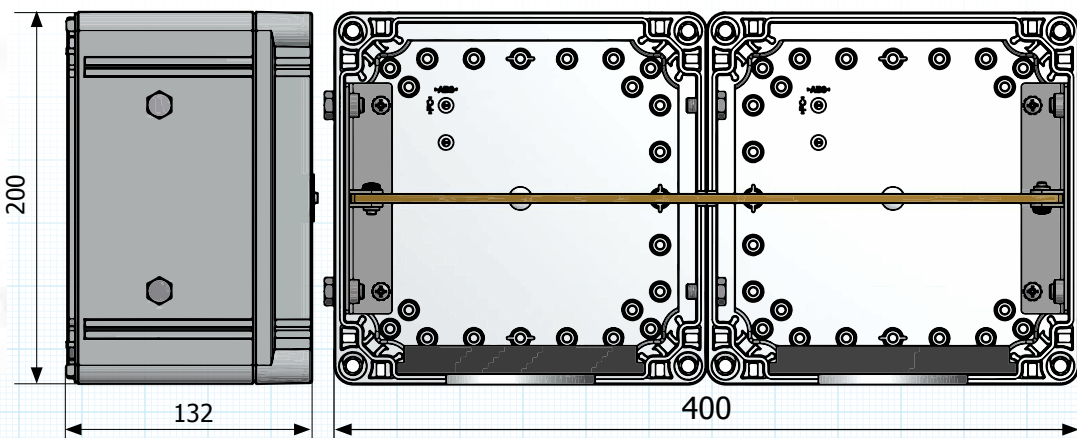
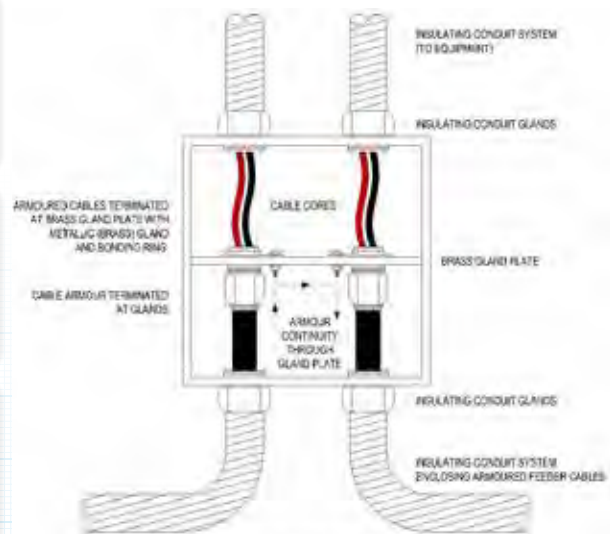
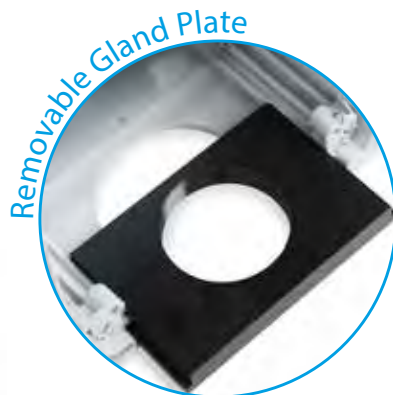
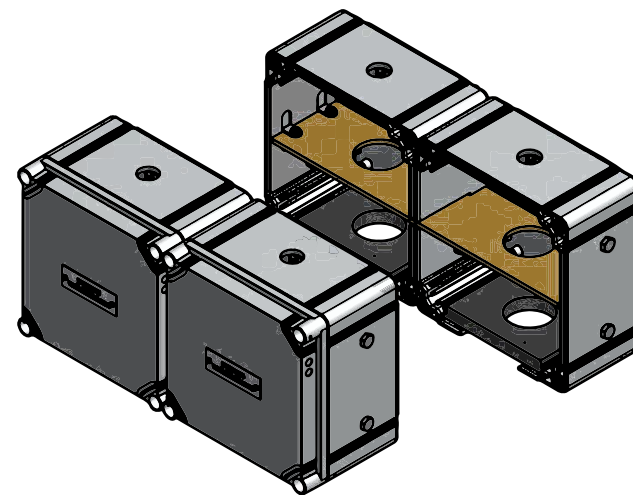
- Suitable 2 Core or 3 Core Armoured incoming feeder Cable
- The unit provides safe separation of the earthing conductor and allows 2 core integration with Class II switchgear
- Dimensions (W x H x D mm) - 200 x 200 x 132 (296 W including mounting ears)
- Weight - 4kg



ECB Enclosure is also suitable for 2 Core armoured cable with separate CPC and 3 Core armoured cable. See page 40 for wiring examples

## FSP-CII/ECB/M50

- Suitable 2 Core or 3 Core Armoured incoming feeder Cable
- The unit provides safe separation of the earthing conductor and allows 2 core integration with Class II switchgear
- Dimensions (W x H x D mm) - 400 x 200 x 132 (496 W including optional mounting ears)
- Weight - 7kg



ECB Enclosure is also suitable for 2 Core armoured cable with separate CPC and 3 Core armoured cable. See page 40 for wiring examples

# Transfлект

## Fault Location and Theft Detection for Signalling Power Feeders

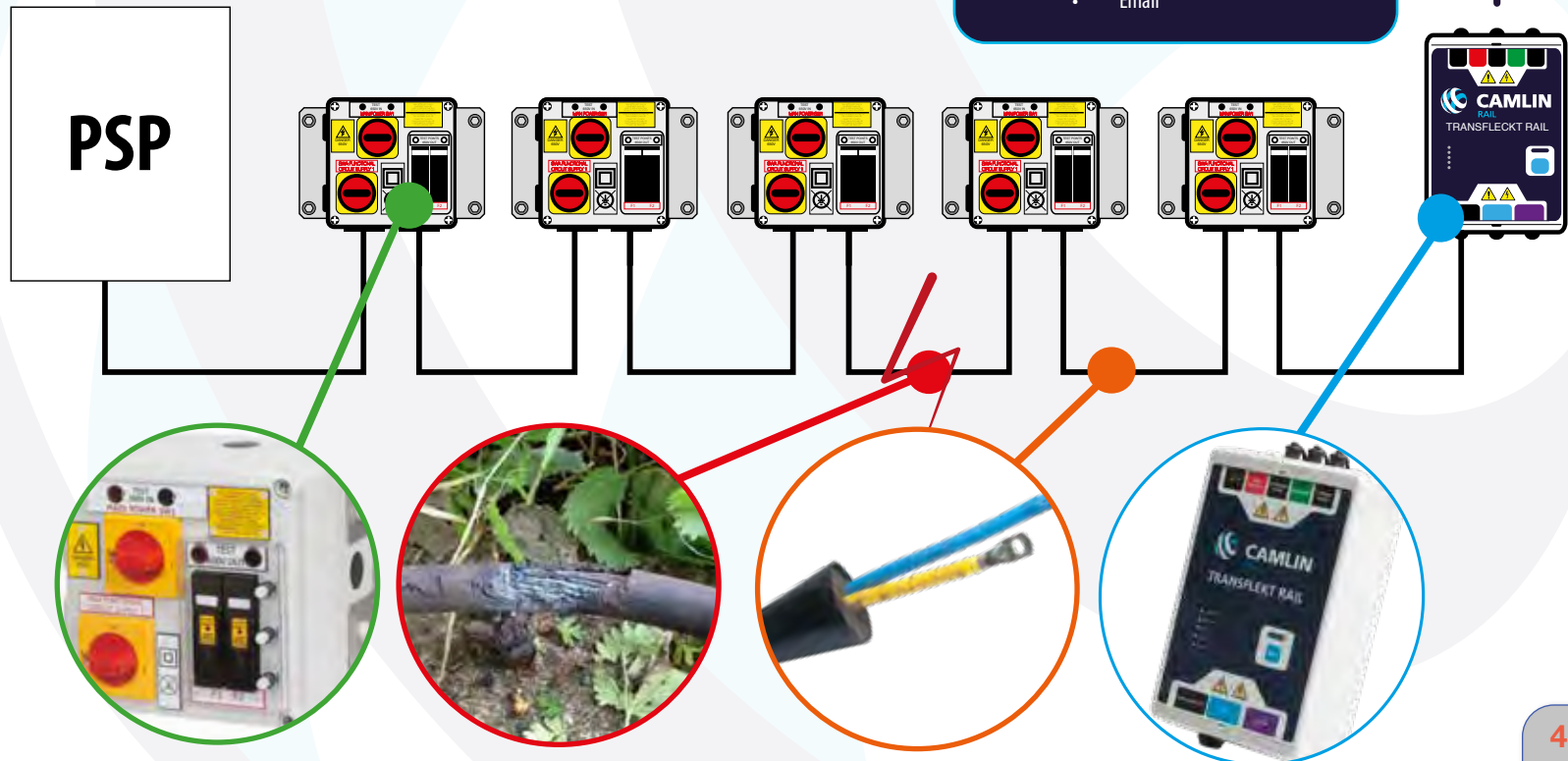
### Time Domain Reflectometry (TDR)

TDR uses the same principle as radar to identify, characterise and locate faults on cables with more than one conductor. It operates by sending a pulse down the cable, any changes in the impedance of the cable will result in reflections being sent back down the cable. Any connection, change of cable type, break in the cable or fault

will cause a change in impedance. Each type of change has a different effect on the display of the TDR; a positive reflection shows a higher impedance, a lower reflection shows a lower impedance. In using a TDR you are not only capable of identifying faults on the cable but also find the distance to the fault.

### Transfлект – Online cable monitoring

- Uses TDR principles to routinely test the cable
  - Identifies changes to the cable/system
  - Faults
  - Cable cuts/damage
  - Cable splices
  - Water Ingress
- Monitors Voltage/Current levels
- Monitors temperature
- Full remote control and configuration of system
  - Web based
  - Server application
- Server sends Alarm or warning messages based on cable events, loss of voltage etc.
  - SMS
  - Email



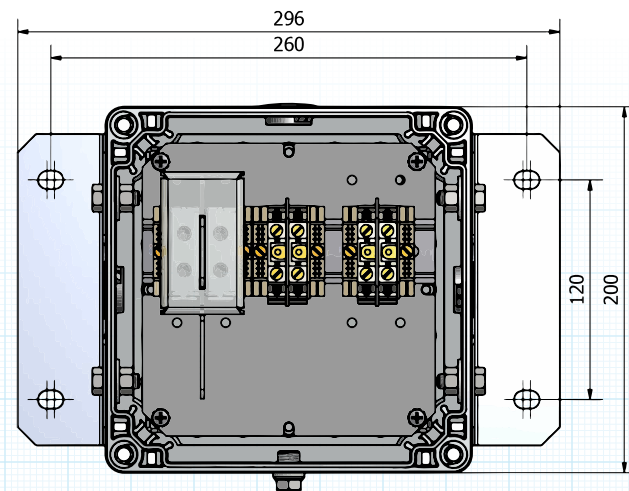
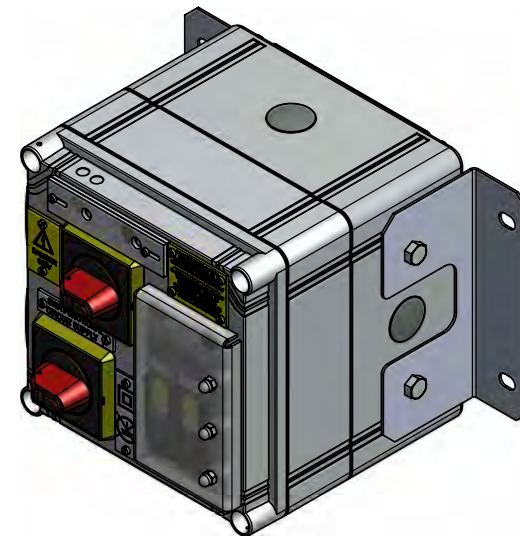
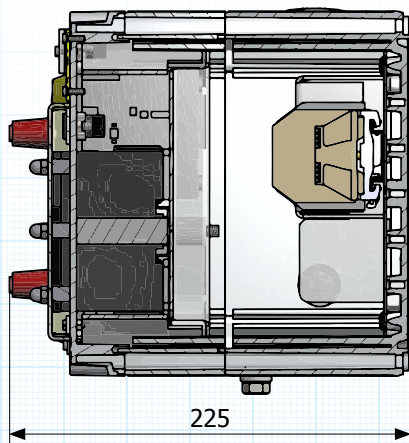
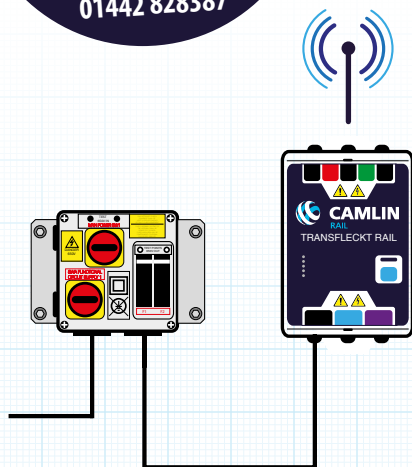


## FSP04/PL-CII/1SW-SL50/TR

## FSP04/PL-CII/1SW-SL95/TR

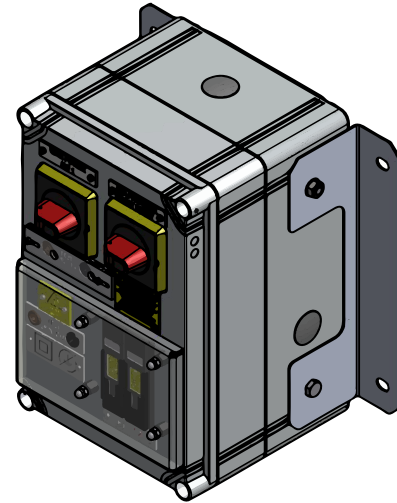
- Suitable 2 Core or 3 Core Armoured incoming feeder Cable
- The unit provides safe separation of the earthing conductor and allows 2 core integration with Class II switchgear
- Dimensions (W x H x D mm) - 200 x 200 x 225 (296 W including optional mounting ears)
- Weight - 5kg

**This Mico FSP is designed to be used alongside the Transfлект monitoring system.**  
For more information please contact one of our friendly experts on 01442 828387

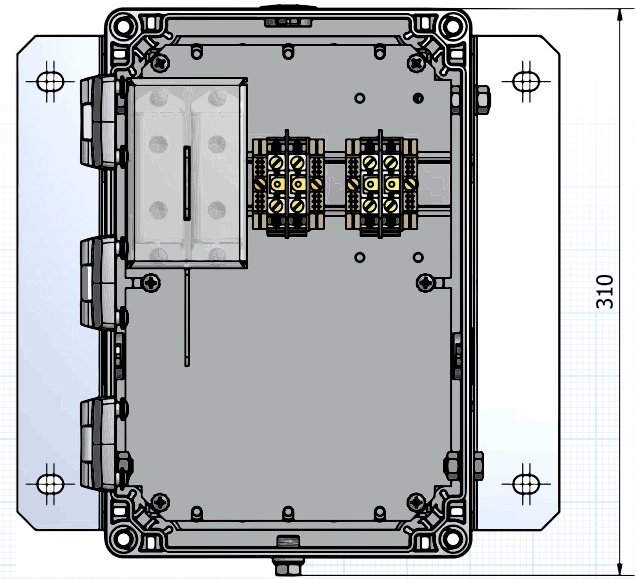
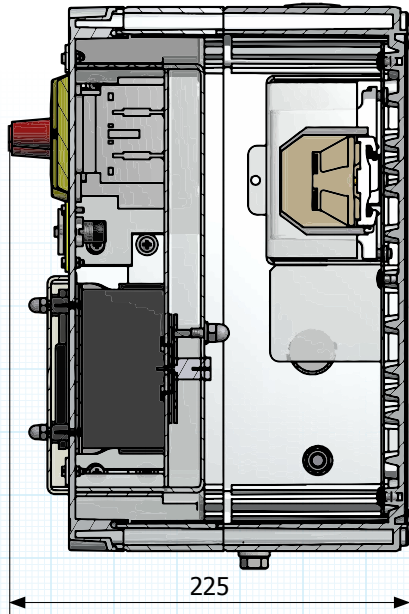
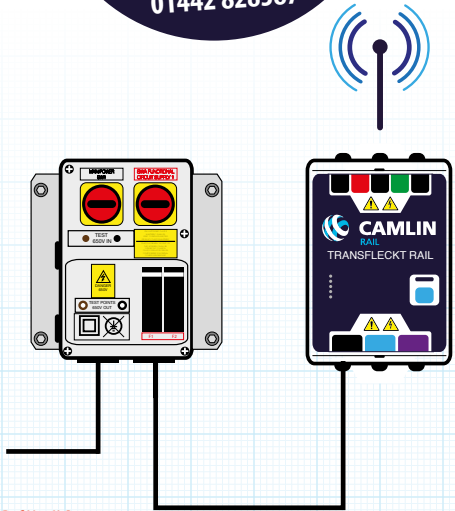


# FSP04/PL-CII/1SW-SL120/TR

- Suitable 2 Core or 3 Core Armoured incoming feeder Cable
- The unit provides safe separation of the earthing conductor and allows 2 core integration with Class II switchgear
- Dimensions (W x H x D mm) - 200 x 300 x 225 (296 W including optional mounting ears)
- Weight - 8kg



**This Mico FSP is designed to be used alongside the Transflekt monitoring system.**  
For more information please contact one of our friendly experts on 01442 828387



Ref No: ILS100047  
Certificate No: PA05/06087 - on trial  
Legacy-8/15-v1.0

# Compact 300 Class II Power Block

**PADS No: 054/213858**

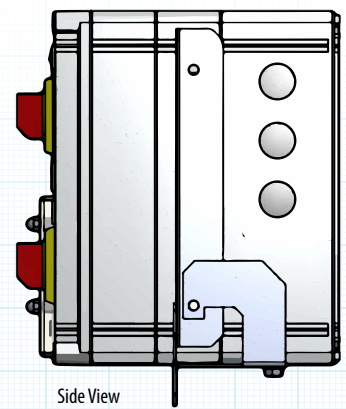
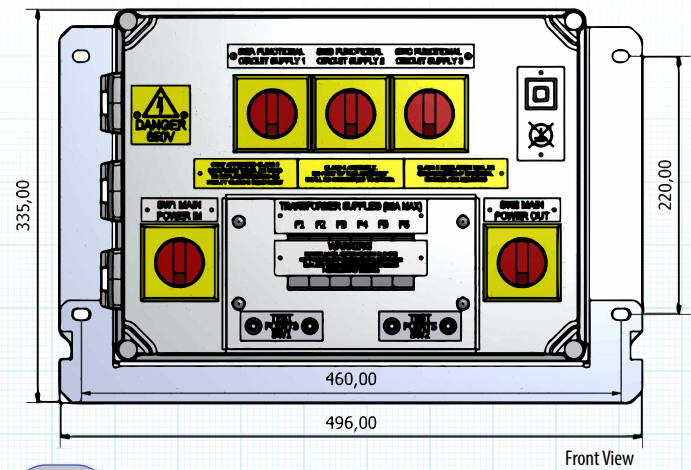
- Isolation and Distribution Enclosure for 650V Signalling Systems, Rated Current 63A
- Units Available in a Range of Versions Covering Most Applications Found on the Signalling Infrastructure with a Range of Cable Termination & Segregation Options
- Available as 1 / 2 / 3 Switch Versions
- Functional Supply Fuse Carriers IEC60269 (A.B.B. 10x38mm)
- Optional Surge Protection Available
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables. Maximum Cable Size: 35mm<sup>2</sup>
- Dimensions (W x H x D mm) - 400 x 300 x 197 (496 W x 335 H including mounting bracket)
- Weight - 10kg



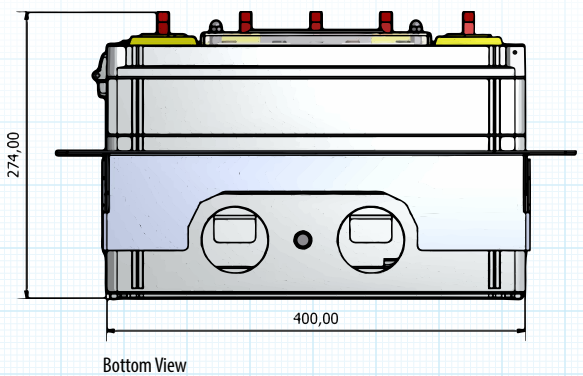
Scan QR Code for



PADS Certificate



Side View



Bottom View

# Compact 400 Class II Power Block

**PADS No: 054/213859**

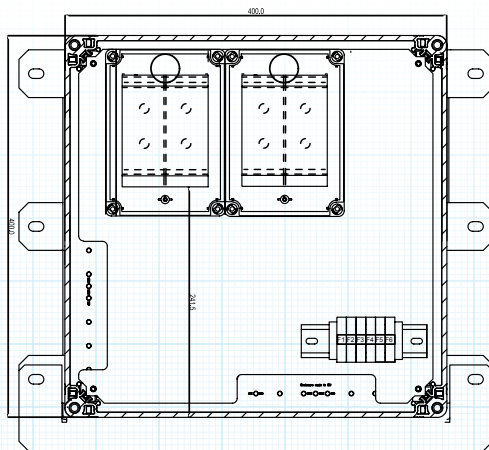
- Isolation and Distribution Enclosure for 650V Signalling Systems, Rated Current 63A
- Units Available in a Range of Versions Covering Most Applications Found on the Signalling Infrastructure with a Range of Cable Termination & Segregation Options
- Available as 1 / 2 / 3 Switch Versions
- Functional Supply Fuse Carriers IEC60269 (A.B.B. 10x38mm)
- Optional Surge Protection Available
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables. Maximum Cable Size: 120mm<sup>2</sup>
- Dimensions (W x H x D mm) - 400 x 400 x 276 (496 W x 435 H including mounting bracket)
- Weight - 11kg



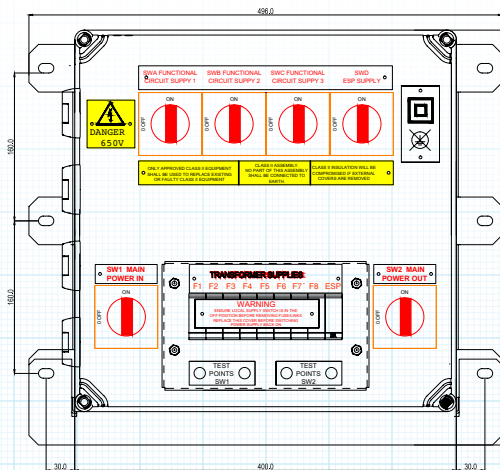
Scan QR Code for



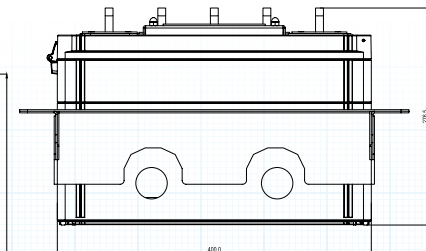
PADS Certificate



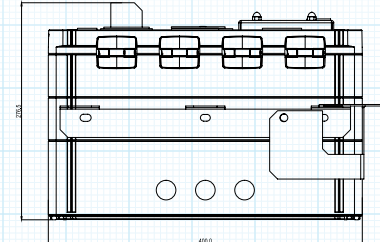
Inside View



Front View



Side View



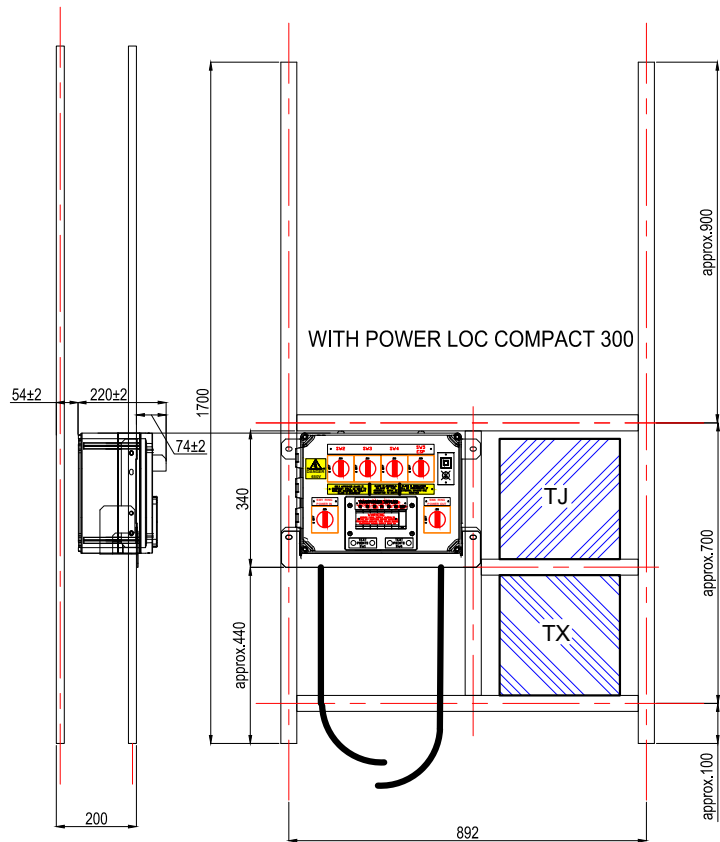
Bottom View

PADS No: 054/213859  
Certificate No: PA05/05344  
Legacy-8/15-v1.0

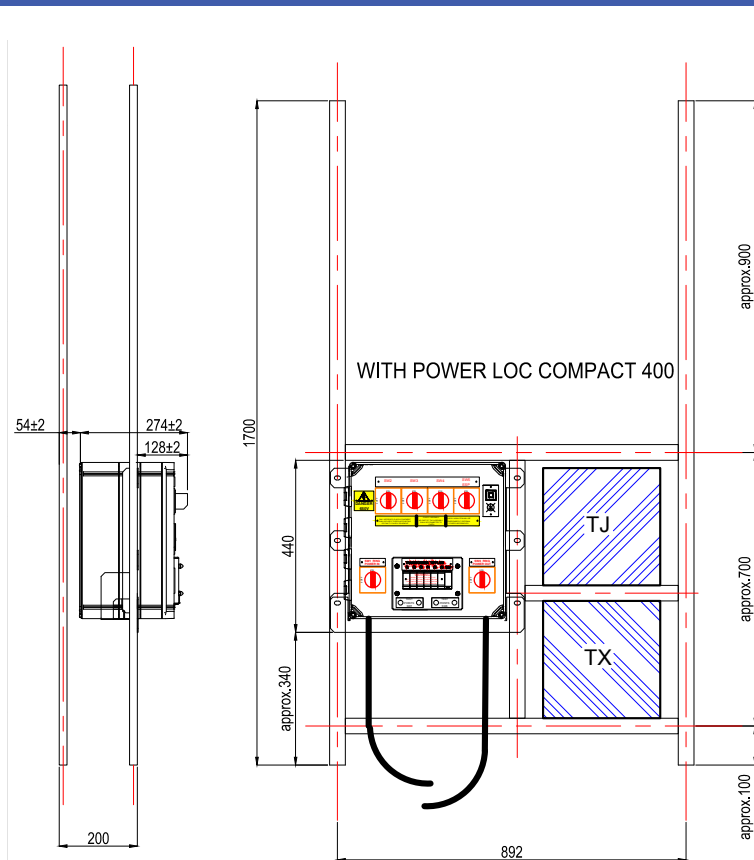


# Typical Location Case Layout

## With Compact 300 Class II Power Block



## With Compact 400 Class II Power Block



# 3 Switch Class II Power Block

**PADS No: 054/213853**

- Isolation and Distribution Enclosure for 650V Signalling Systems, Rated Current 63A
- Full Class II Specification. Assembly Insulation Dielectric Strength Certified to 10kV
- Available as 1 / 2 / 3 Switch Versions
- Functional Supply Fuse Carriers BS88-2 (CAMaster)
- Optional Surge Protection Available
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables. Maximum Cable Size: 120mm<sup>2</sup>
- Dimensions (W x H x D mm) - 400 x 500 x 275 (496 W x 535 H including mounting bracket)
- Weight - 12kg

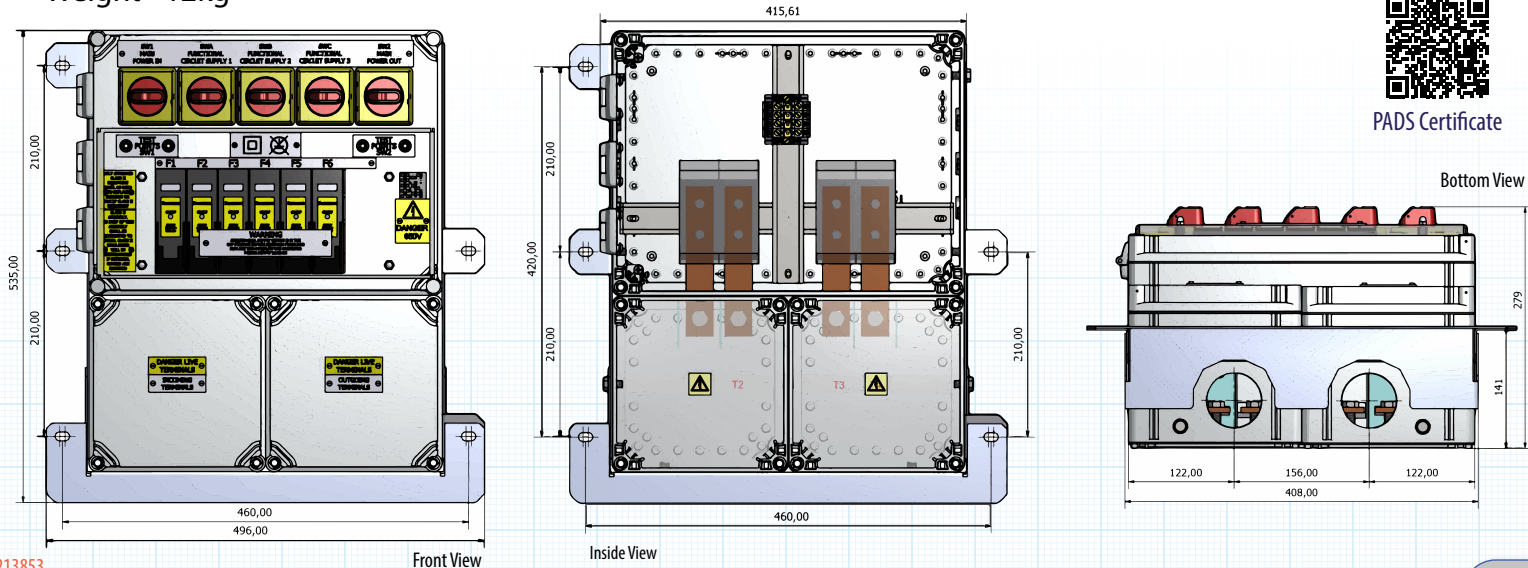


Scan QR Code for



PADS Certificate

Bottom View



## 3 Switch Class II Power Block - with ESP

**PADS No: 054/213854**

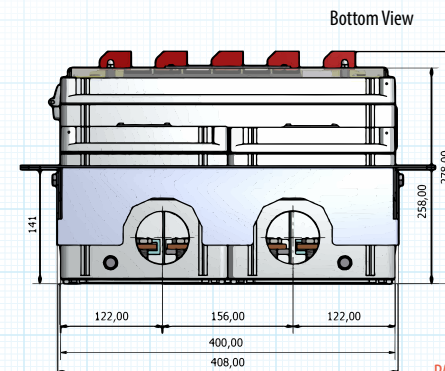
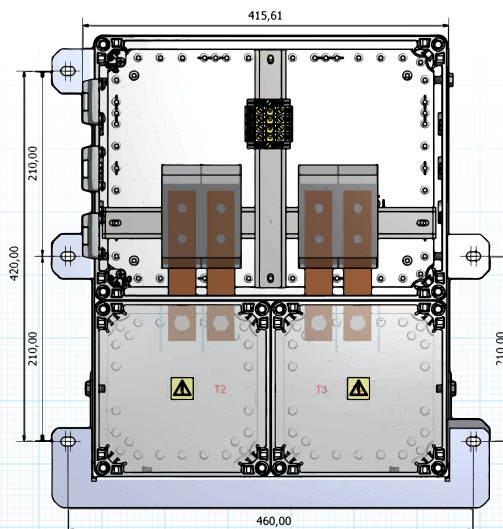
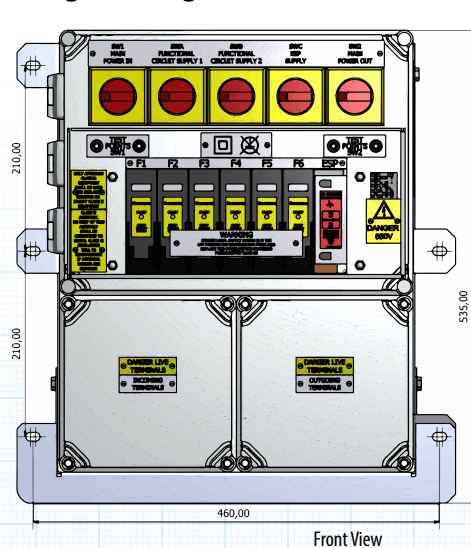
- Isolation and Distribution Enclosure for 650V Signalling Systems, Rated Current 63A
- Full Class II Specification. Assembly Insulation Dielectric Strength Certified to 10kV
- Available as 1 / 2 / 3 Switch Versions
- Functional Supply Fuse Carriers BS88-2 (CAMaster)
- Supplied with ESP
- Suitable for Copper (Cu) or Aluminium (Al) 2C Feeder Cables. Maximum Cable Size: 120mm<sup>2</sup>
- Dimensions (W x H x D mm) - 400 x 500 x 275 (496 W x 535 H including mounting bracket)
- Weight - 12kg



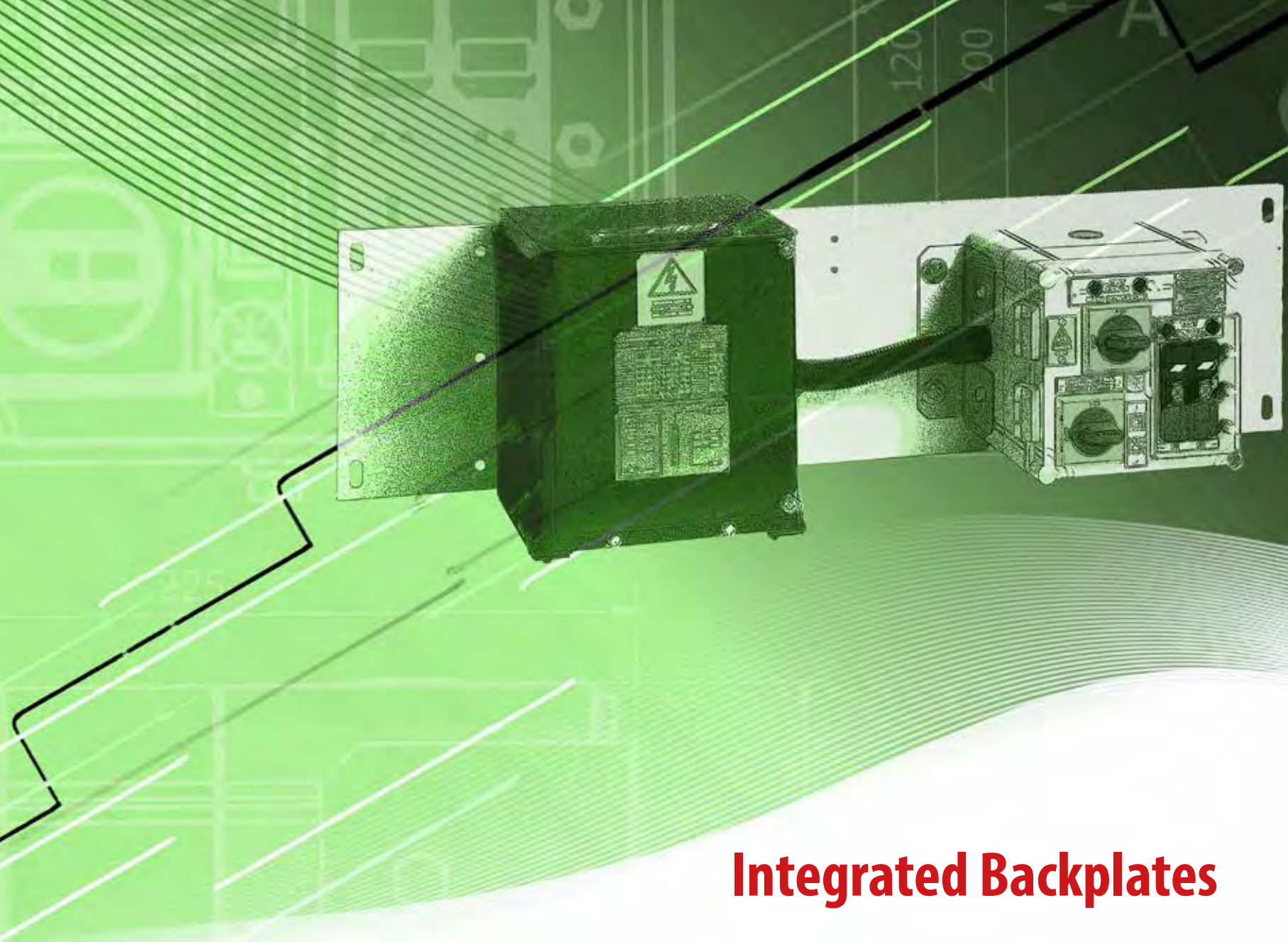
Scan QR Code for



PADS Certificate







## **Integrated Backplates**



# Integrated BackPlates

iLECSYS Rail have designed a range integrated Class II 650V/110V backplate assemblies to minimise the construction time when carrying out Class II installations within Legacy Locations.





# Constructable Class II

The plate configurations will support the full range of approved MICRO FSPs when used in conjunction with the ATL Class II Transformers.

These units are aimed to simplify the design process for constructing Class II within legacy location cases. The plate sizes will align to the existing standard dimensions within half and Full Location cases and are supplied with a set of M8 fixings to adapt for certain types of internal case supports.

The configured Class II 650/110V plate assemblies

come fully factory tested. A QR Quick reference code shows information such as; PADS number, part number and weight. This can also be linked to a site specific schematic. In this instance each plate assembly is marked externally with the Loc number.

The pre-configured plate reduces site construction time as well as reducing time for testing. It also reduces risk in terms of product clash on the night. Pre-punched holes can be provided for existing legacy equipment such as heaters and fuse holders.

# Integrated Solutions

		FSP-INT/650-110/FL-50-500VA	FSP-INT/650-110/FL-95-500VA	FSP-INT/650-110/FL-120-500VA	FSP-INT/650-110/FL-50-1KVA	FSP-INT/650-110/FL-95-1KVA	FSP-INT/650-110/FL-120-1KVA
Existing Circuit	LEGACY	✓	✓	✓	✓	✓	✓
Feeder Cable Size	Up to 50mm <sup>2</sup>	✓			✓		
	Up to 95mm <sup>2</sup>		✓			✓	
	Up to 120mm <sup>2</sup>			✓			✓
Functional Supply Fuse Carriers	BS88-2	✓	✓	✓	✓	✓	✓
	CAMaster	✓	✓	✓	✓	✓	✓
LOC Size	Full LOC	✓	✓	✓	✓	✓	✓
	Half LOC						
Transformer Output		<b>500VA</b>	<b>500VA</b>	<b>500VA</b>	<b>1KVA</b>	<b>1KVA</b>	<b>1KVA</b>
Suitable for Cu or Al Cable	Copper (Cu)	●	●	●	●	●	●
	Aluminium (Al)	○	○	○	○	○	○
Page		56	56	56	57	57	57

	FSP-INT/650-110/FL-50-1.5KVA	FSP-INT/650-110/FL-95-1.5KVA	FSP-INT/650-110/FL-120-1.5KVA	FSP-INT/650-110/FL-CB120-1.5KVA	FSP-INT/650-110/HL-CB50-500VA	FSP-INT/650-110/HL-CB120-500VA	FSP-INT/650-110/HL-95-500VA
	✓	✓	✓	✓	✓	✓	✓
	✓				✓		
		✓					✓
			✓	✓		✓	
	✓	✓	✓	✓	✓	✓	✓
	✓	✓	✓	✓			
					✓	✓	✓
	<b>1.5KVA</b>	<b>1.5KVA</b>	<b>1.5KVA</b>	<b>1.5KVA</b>	<b>500VA</b>	<b>500VA</b>	<b>500VA</b>
	●	●	●	●	●	●	●
	○	○	○	○	○	○	○
	58	58	58	59	59	59	59



Part No.	Switchgear Unit	Transformer	Backplate Size	Feeder Cable Size
<b>FSP-INT/650-110/FL-50-500VA</b>	<b>091/099121</b>	<b>054/214892</b>	<b>925 x 250mm</b>	<b>Up to 50mm<sup>2</sup></b>
<b>FSP-INT/650-110/FL-95-500VA</b>	<b>091/099111</b>	<b>054/214892</b>	<b>925 x 250mm</b>	<b>Up to 95mm<sup>2</sup></b>
<b>FSP-INT/650-110/FL-120-500VA</b>	<b>091/099120</b>	<b>054/214892</b>	<b>925 x 250mm</b>	<b>Up to 120mm<sup>2</sup></b>

- Class II Distribution Unit rated to 690V fitted with 63A Main Power IN/OUT Isolator.
- Suitable for integration in standard full width LOC case
- Functional Supply Fuse Carriers to be BS88-2
- Class II Hybrid Isolation transformer rated to 500VA
- Mounted on a nylon coated backplate.
- Front Cover Hinged on Left Hand Side
- Suitable to Copper (Cu) or Aluminium (Al) 2C Feeder Cables up to 120mm<sup>2</sup>

**FSP-INT/650-110/FL-50-500VA**  
**FSP-INT/650-110/FL-95-500VA**



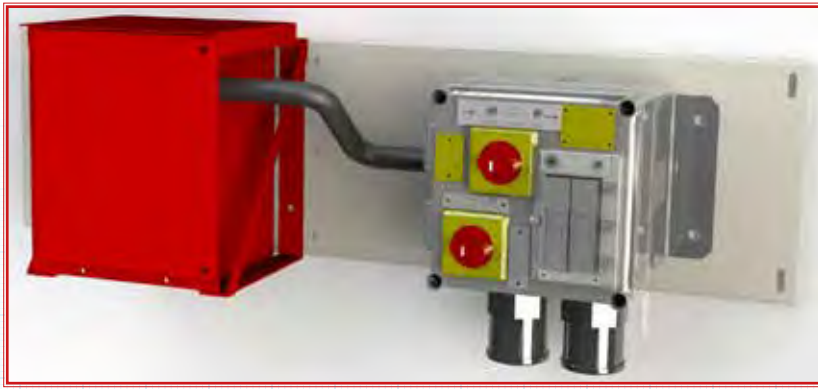
**FSP-INT/650-110/FL-120-500VA**



Part No.	Switchgear Unit	Transformer	Backplate Size	Feeder Cable Size
<b>FSP-INT/650-110/FL-50-1KVA</b>	<b>091/099121</b>	<b>054/214900</b>	<b>925 x 250mm</b>	<b>Up to 50mm<sup>2</sup></b>
<b>FSP-INT/650-110/FL-95-1KVA</b>	<b>091/099111</b>	<b>054/214900</b>	<b>925 x 250mm</b>	<b>Up to 95mm<sup>2</sup></b>
<b>FSP-INT/650-110/FL-120-1KVA</b>	<b>091/099120</b>	<b>054/214900</b>	<b>925 x 250mm</b>	<b>Up to 120mm<sup>2</sup></b>

- Class II Distribution Unit rated to 690V fitted with 63A Main Power IN/OUT Isolator.
- Suitable for integration in standard full width LOC case
- Functional Supply Fuse Carriers to be BS88-2
- Class II Hybrid Isolation transformer rated to 1KVA
- Mounted on a nylon coated backplate.
- Front Cover Hinged on Left Hand Side
- Suitable to Copper (Cu) or Aluminium (Al) 2C Feeder Cables up to 120mm<sup>2</sup>

**FSP-INT/650-110/FL-50-1KVA**  
**FSP-INT/650-110/FL-95-1KVA**



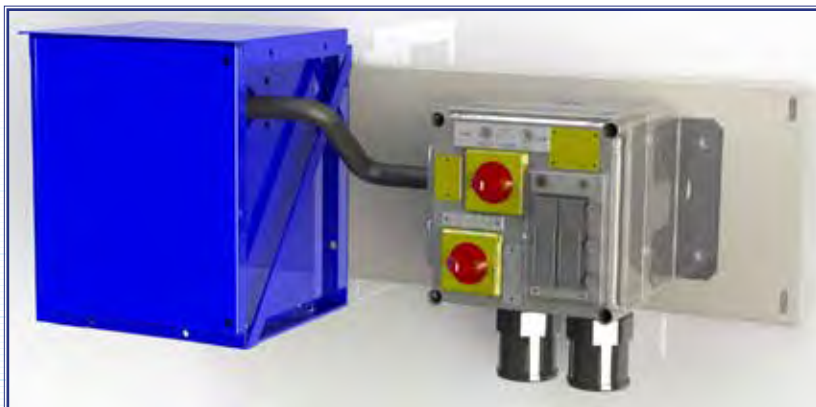
**FSP-INT/650-110/FL-120-1KVA**



Part No.	Switchgear Unit	Transformer	Backplate Size	Feeder Cable Size
<b>FSP-INT/650-110/FL-50-1.5KVA</b>	<b>091/099121</b>	<b>054/214893</b>	<b>925 x 250mm</b>	<b>Up to 50mm<sup>2</sup></b>
<b>FSP-INT/650-110/FL-95-1.5KVA</b>	<b>091/099111</b>	<b>054/214893</b>	<b>925 x 250mm</b>	<b>Up to 95mm<sup>2</sup></b>
<b>FSP-INT/650-110/FL-120-1.5KVA</b>	<b>091/099120</b>	<b>054/214893</b>	<b>925 x 250mm</b>	<b>Up to 120mm<sup>2</sup></b>

- Class II Distribution Unit rated to 690V fitted with 63A Main Power IN/OUT Isolator.
- Suitable for integration in standard full width LOC case
- Functional Supply Fuse Carriers to be BS88-2
- Class II Hybrid Isolation transformer rated to 1.5KVA
- Mounted on a nylon coated backplate.
- Front Cover Hinged on Left Hand Side
- Suitable to Copper (Cu) or Aluminium (Al) 2C Feeder Cables up to 120mm<sup>2</sup>

**FSP-INT/650-110/FL-50-1.5KVA**  
**FSP-INT/650-110/FL-95-1.5KVA**



**FSP-INT/650-110/FL-120-1.5KVA**



Part No.	Switchgear Unit	Transformer	Backplate Size	Feeder Cable Size
<b>FSP-INT/650-110/FL-CB120-1.5KVA</b>	<b>091/099121</b>	<b>054/214893</b>	<b>925 x 250mm</b>	<b>Up to 120mm<sup>2</sup></b>
<b>FSP-INT/650-110/HL-CB50-500VA</b>	<b>091/099111</b>	<b>054/214892</b>	<b>500 x 600mm</b>	<b>Up to 95mm<sup>2</sup></b>
<b>FSP-INT/650-110/HL-CB120-500VA</b>	<b>091/099120</b>	<b>054/214892</b>	<b>500 x 600mm</b>	<b>Up to 120mm<sup>2</sup></b>
<b>FSP-INT/650-110/HL-95-500VA</b>	<b>091/099121</b>	<b>054/214892</b>	<b>500 x 425mm</b>	<b>Up to 95mm<sup>2</sup></b>

- Class II Distribution Unit rated to 690V fitted with 63A Main Power IN/OUT Isolator.
- Suitable for integration in standard full width LOC case
- Functional Supply Fuse Carriers to be BS88-2
- Class II Hybrid Isolation transformer rated to 1KVA
- Mounted on a nylon coated backplate.
- Front Cover Hinged on Left Hand Side
- Suitable to Copper (Cu) or Aluminium (Al) 2C Feeder Cables up to 120mm<sup>2</sup>

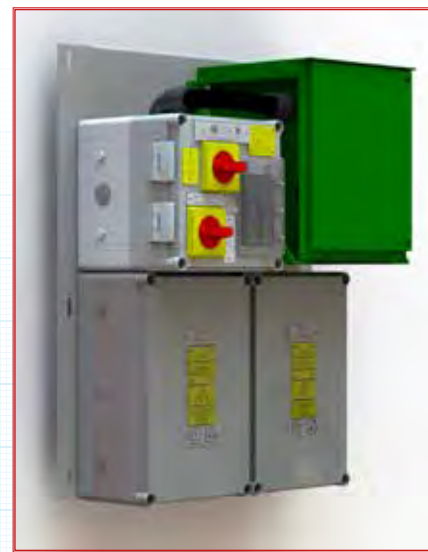
**FSP-INT/650-110/HL-95-500VA**



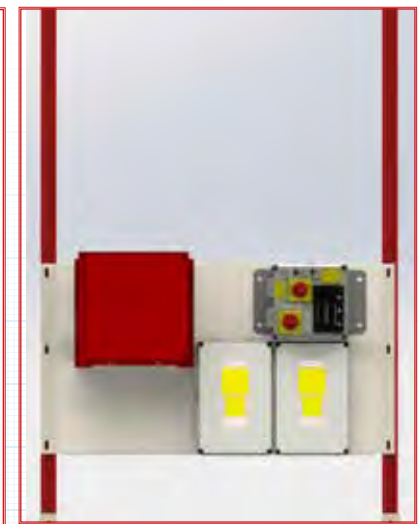
**FSP-INT/650-110/HL-CB50-500VA**



**FSP-INT/650-110/HL-CB120-500VA**



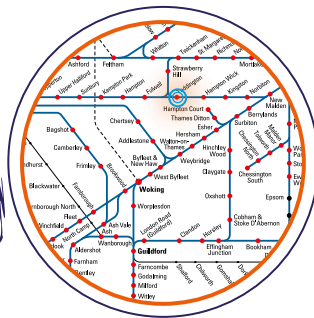
**FSP-INT/650-110/FL-CB120-1.5KVA**





# CASE STUDY

## Teddington



### Remit

To retrofit a Class II Integrated Backplate into an existing high priority location case. To identify requirements and develop working methods for a safe and efficient installation.

### Constraints

To integrate Class II within the existing Legacy location whilst retaining the admiralty tray supporting the signalling circuit ducting.

### Solution

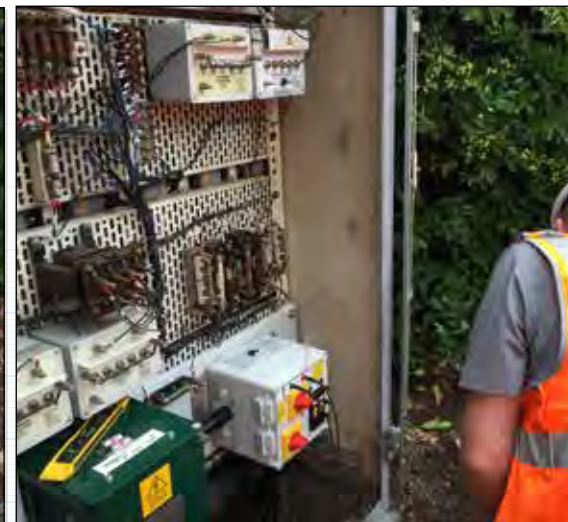
Using the integrated Legacy backplate mounted on pre-fitted M8 studs allowed for a rapid fitment of the Class II equipment.

### Conclusion

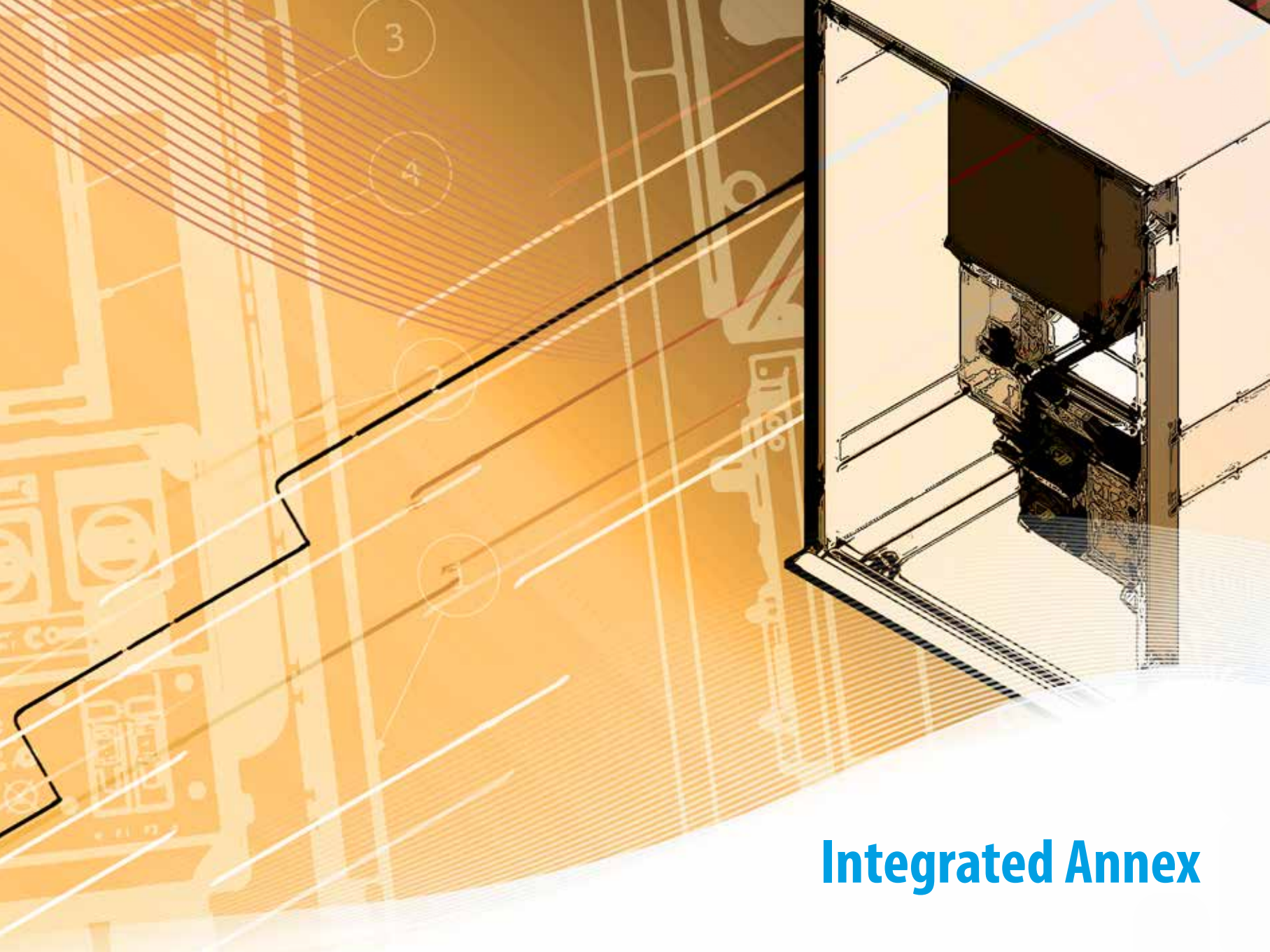
The installation was made Class II in less than two hours with minimal mechanical work within the case. The pre-tested Class II integrated plate assembly saved valuable site time in wiring and testing.



Before



After

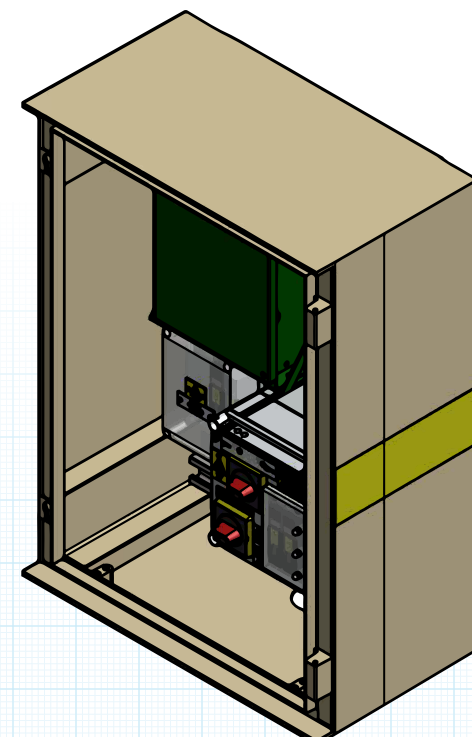
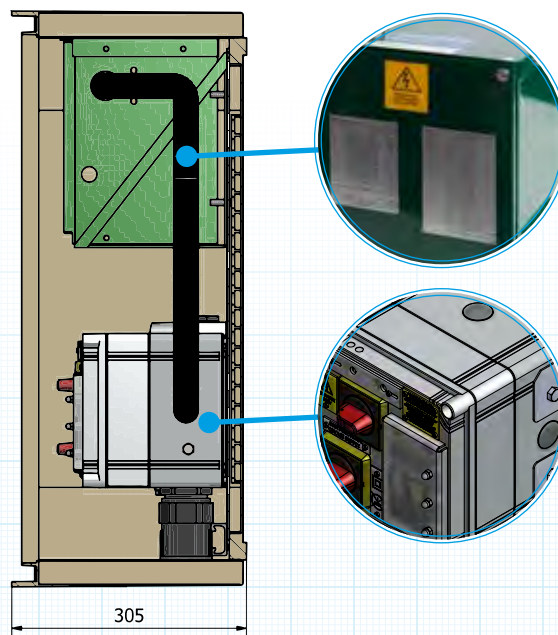
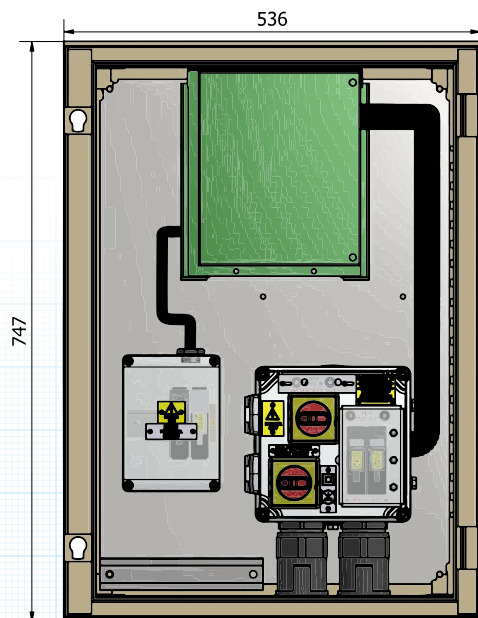


# Integrated Annex



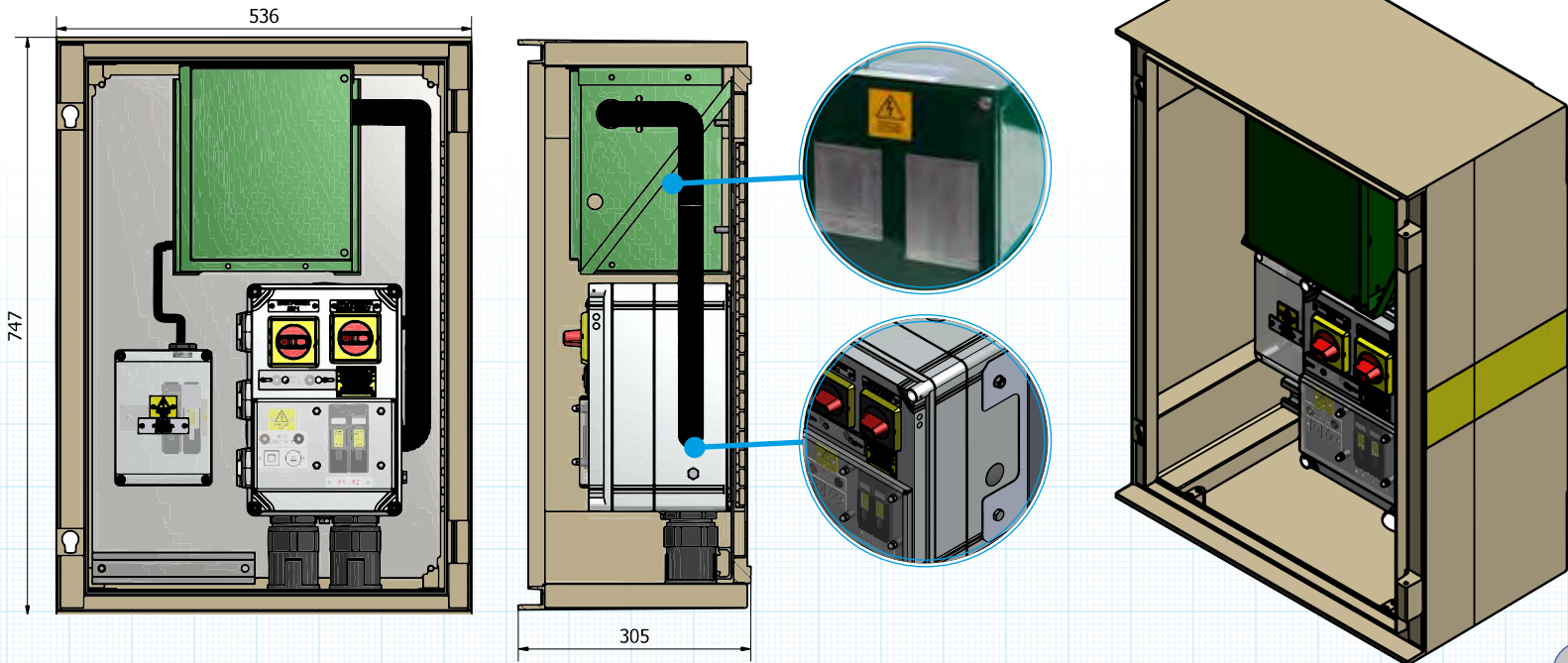
Part No.	PADS Approved Enclosure	Fuse Type	TX Quantity	VA Rating	Feeder Cable Size	Weight (kg)
<b>INT/1SW-SL95-1/500</b>	<b>086/010803</b>	<b>BS88</b>	<b>1</b>	<b>500</b>	<b>Up to 95mm<sup>2</sup></b>	<b>28</b>

- Class II Distribution Unit rated to 690V fitted with 63A Main Power IN/OUT Isolator.
- Available for all FSP04 models up to 95mm<sup>2</sup>
- Functional Supply Fuse Carriers to be BS88-2
- Class II Hybrid Isolation transformer rated to 500VA (**054/214892**) mounted on Legacy Brackets (**054/214897**)
- Housed in GRP PADS Approved (086/010803) Enclosure. 747 (H) x 536 (W) x 300 (D)mm
- Front Cover Hinged on Left Hand Side
- Suitable to Copper (Cu) or Aluminium (Al) 2C Feeder Cables up to 95mm<sup>2</sup>



Part No.	PADS Approved Enclosure	Fuse Type	TX Quantity	VA Rating	Feeder Cable Size	Weight (kg)
<b>INT/1SW-SL120-1/500</b>	<b>086/010803</b>	<b>BS88</b>	<b>1</b>	<b>500</b>	<b>Up to 120mm<sup>2</sup></b>	<b>31</b>

- Class II Distribution Unit rated to 690V fitted with 63A Main Power IN/OUT Isolator.
- Functional Supply Fuse Carriers to be BS88-2
- Class II Hybrid Isolation transformer rated to 500VA (**054/214892**) mounted on Legacy Brackets (**054/214897**)
- Assembly available for both FSP04, FSP01 & FSP02 types
- Housed in GRP PADS Approved (086/010803) Enclosure. 747 (H) x 536 (W) x 300 (D)mm
- Front Cover Hinged on Left Hand Side
- Suitable to Copper (Cu) or Aluminium (Al) 2C Feeder Cables up to 120mm<sup>2</sup>

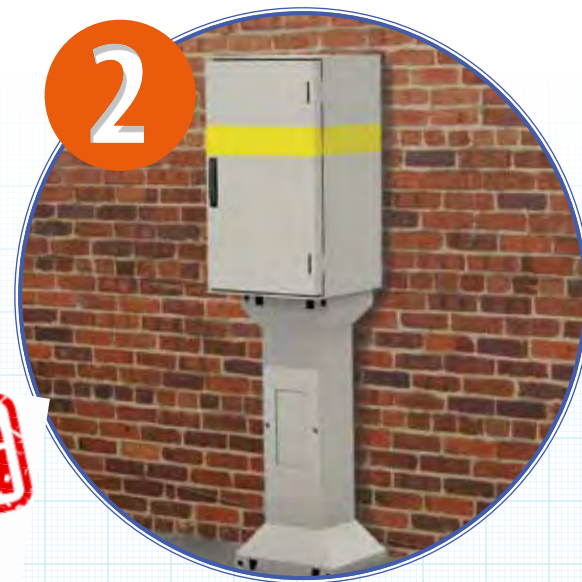
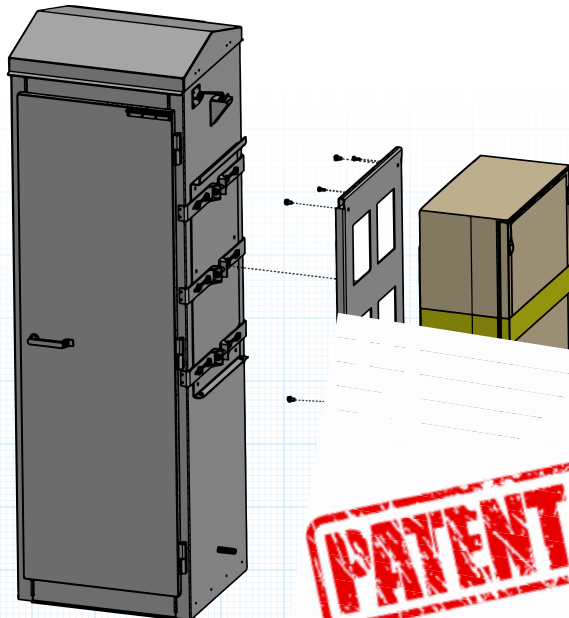




# Mounting Options

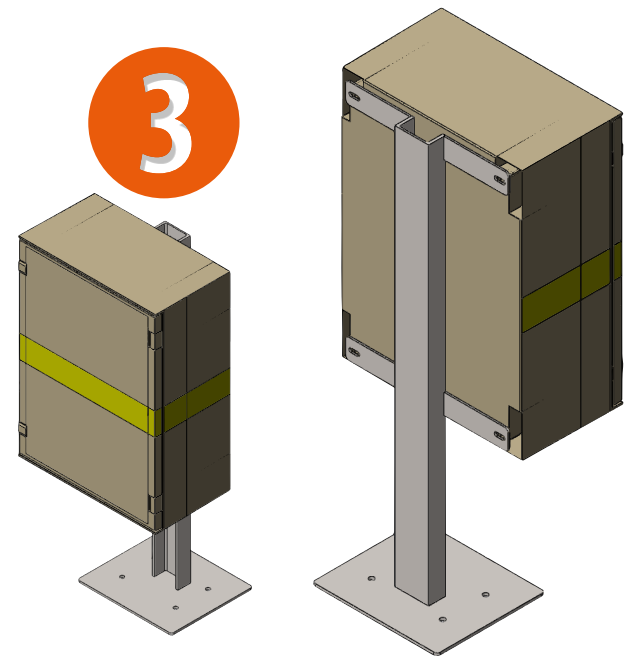
## Universal Bracket System Patent Pending

The bracket system will allow for the fast, efficient, cost effective installation of an Integrated FSP. The system can be used in many situations and environments. The brackets can be mounted to both Location Cases (Picture 1) and existing structures (Picture 2). The benefit of using this system is that preparation can be completed long before the final installation date. The FSP can then be simply hooked onto the pre-installed bracket.



## Free-Standing Mounting Stake

The mounting stake will allow for the integrated FSP to be positioned away from the existing LOC. The benefit of using this option, is that if the existing LOC case is structurally unsound or inaccessible, the FSP can be fitted without compromising the existing LOC. The stake is made from galvanised steel and should be mounted onto a solid base.



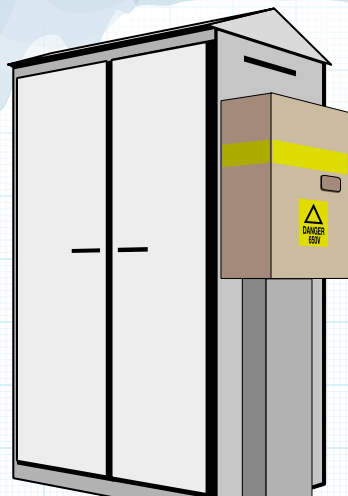
## GFRP Handrail Solution

The integrated FSP can be mounted on a fully PADS approved, non-conductive GFRP (Glass Fibre Reinforced Polyester) handrail or platform. iLECSYS Rail's turnkey solution can be configured and adapted so suit most locations. Due to the nature of GFRP there is no need for earth bonding. The handrails are lightweight allowing for easy delivery, assembly and installation.

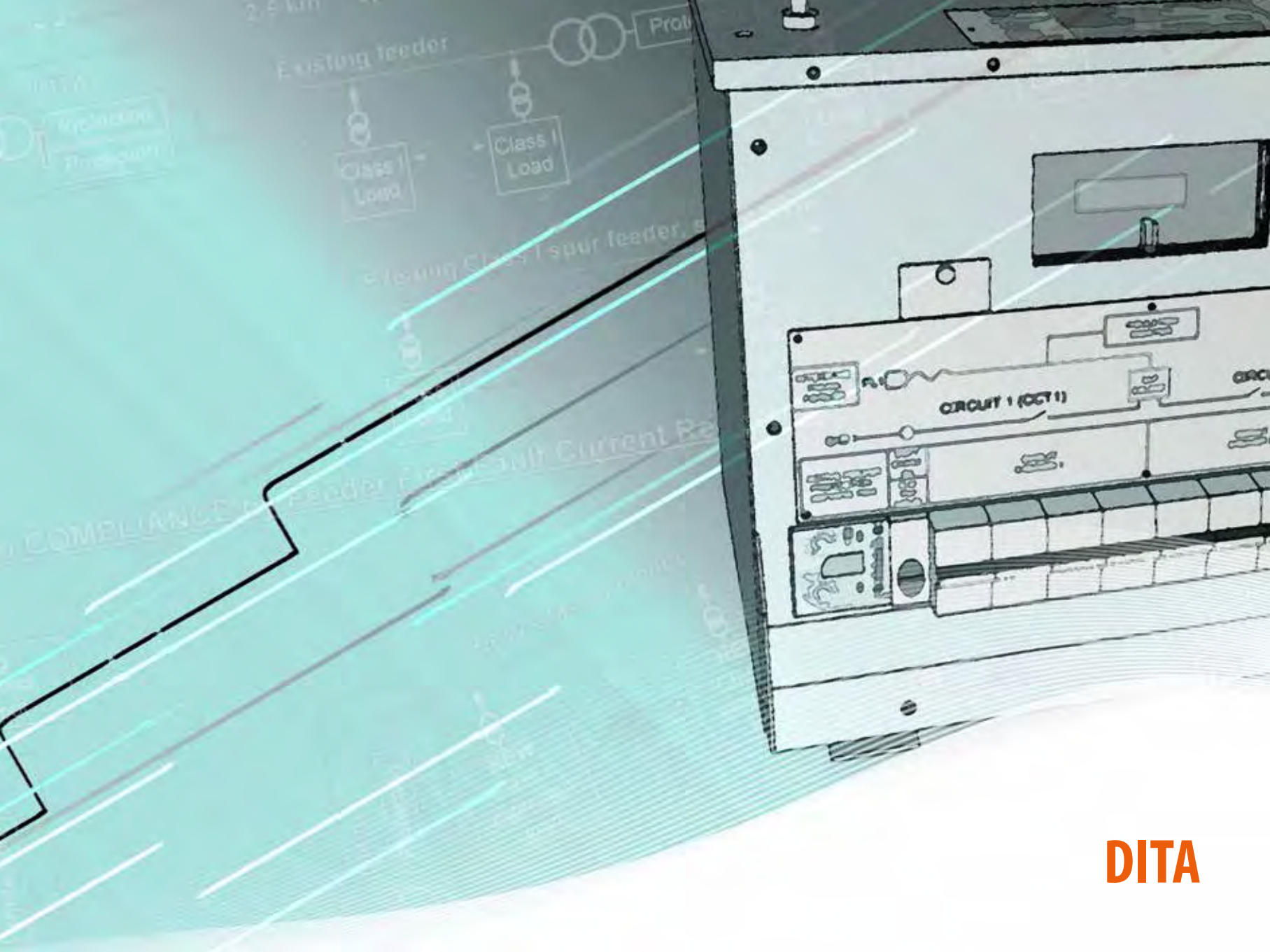




**PATENT PENDING**







**DITA**



# Distribution Interface Transformer Assemblies (DITA)

## Provides

- **Segregation between a Class I and a Class II installation to preserve the integrity of a Class II based feeder when interfaced with a Class I feeder.**

This is critical where the Class I system has been installed for a number of years and may not be compliant with the requirements of BS7671

- **Segregation of feeders and spurs/branches to separate a signalling power system into two isolated sections.**

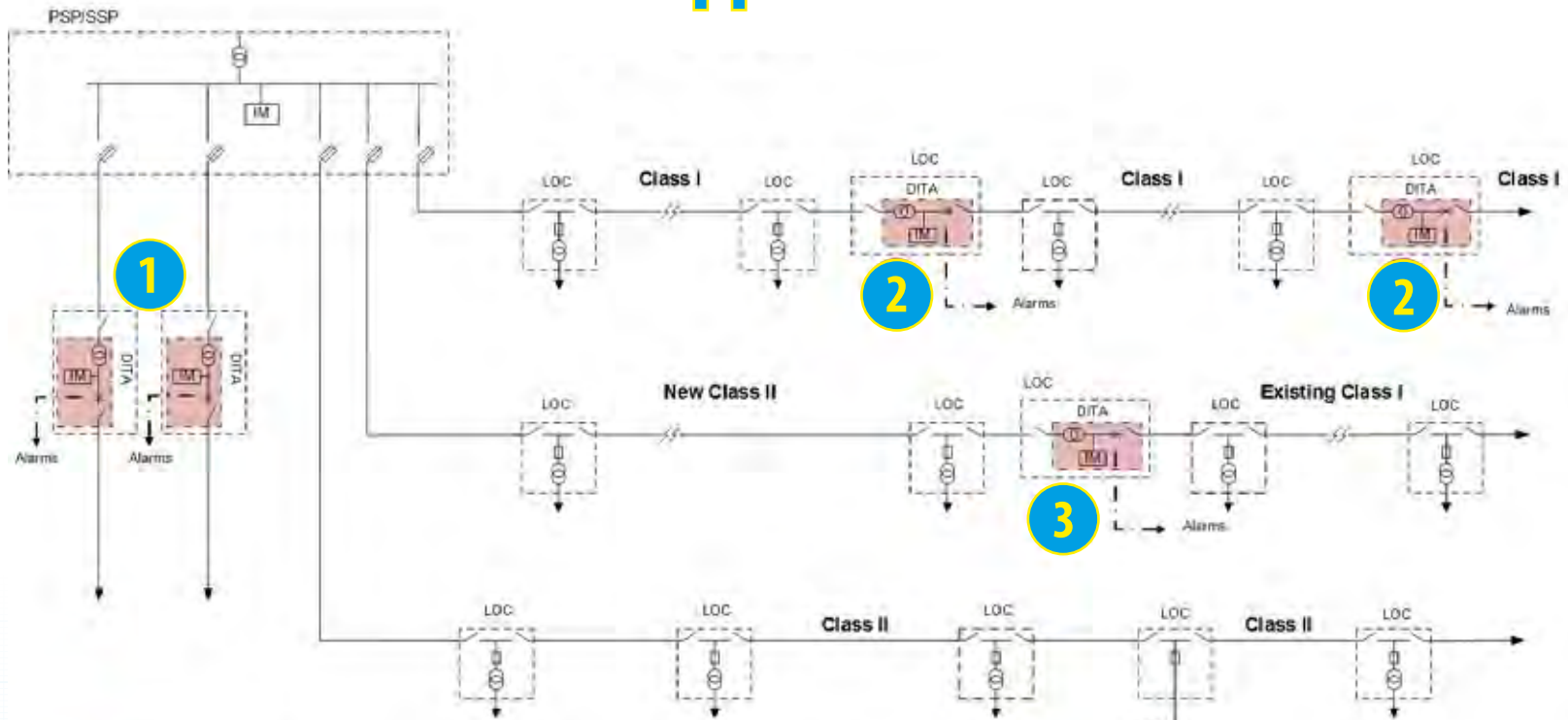
This provides safety benefits by reducing dangerous touch voltage potentials in each section as a consequence of reducing leakage capacity

- **Increase availability of legacy signalling power system by sectioning and alarm monitoring.**

Alarms include insulation monitoring and electronic feeder protection status.

- **Available for 650V, 400/440V and 230V systems.**

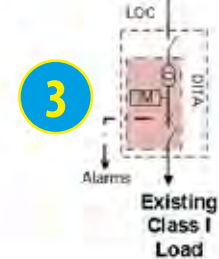
# DITA Applications



**1** Feeder leakage capacitance separated. Reduces dangerous touch potentials. Each circuit provided with insulation monitor, electronic protection and alarms.

**2** Segregation of a long feeder into smaller electrical sections. Leakage capacitance in each section smaller. Reduces dangerous touch potentials. Availability improved by sectioning feeder and alarm provision. Each DITA provided with insulation monitor, electronic protection and alarms.

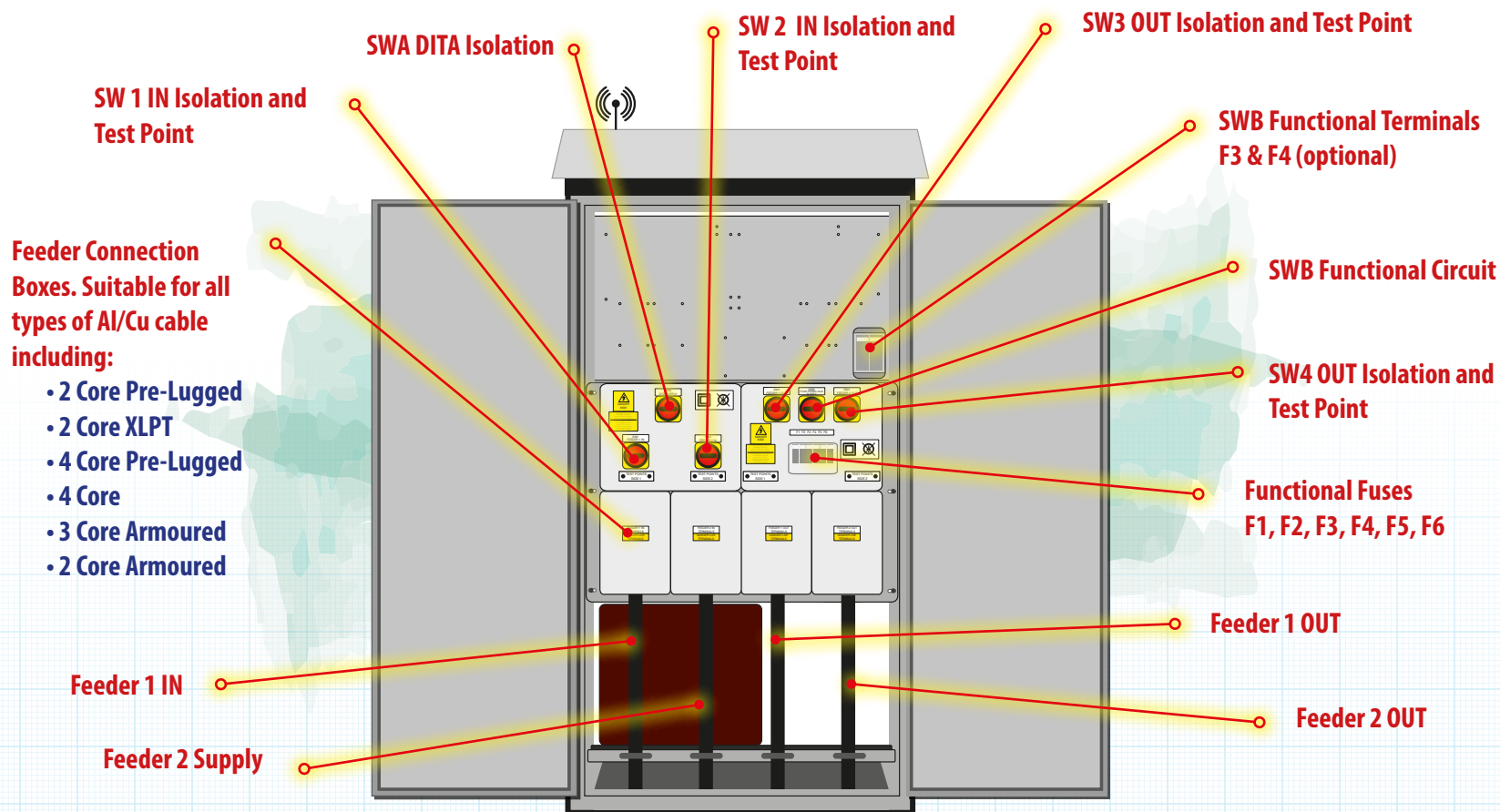
**3** Segregation between Class II and existing Class I installations. New Class II feeder is isolated from existing Class I load. Availability of main system improved by segregation of legacy system. Each DITA provided with insulation monitoring, electronic protection and alarms.



# DITA INTEGRATED ASSEMBLY

## Power Side

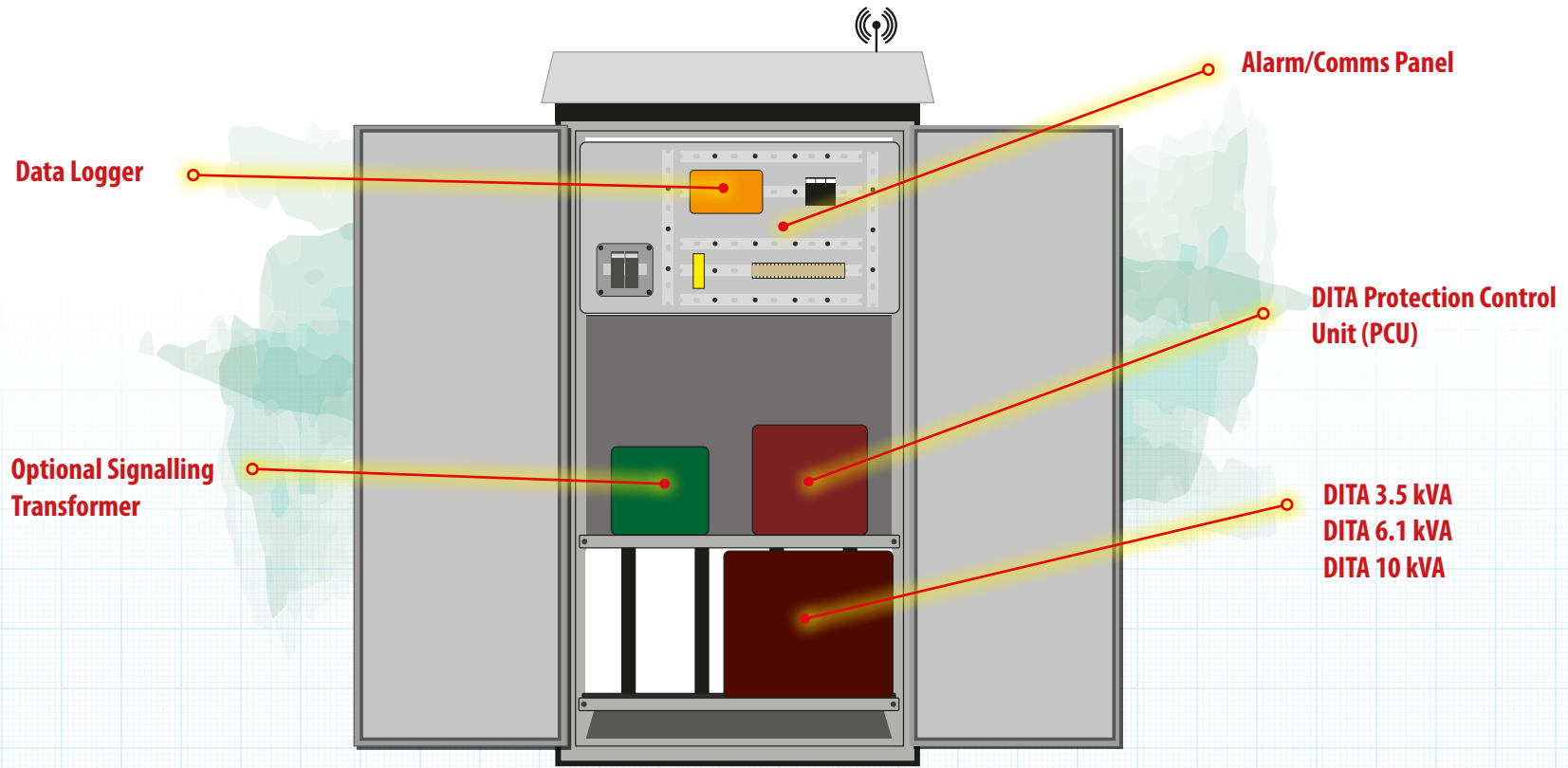
- Full Class II Switchgear specification in accordance with NR/SIGELP/27419
- Interfaces with all types of existing and new cable



# DITA INTEGRATED ASSEMBLY

## Instrumentation & Comm's

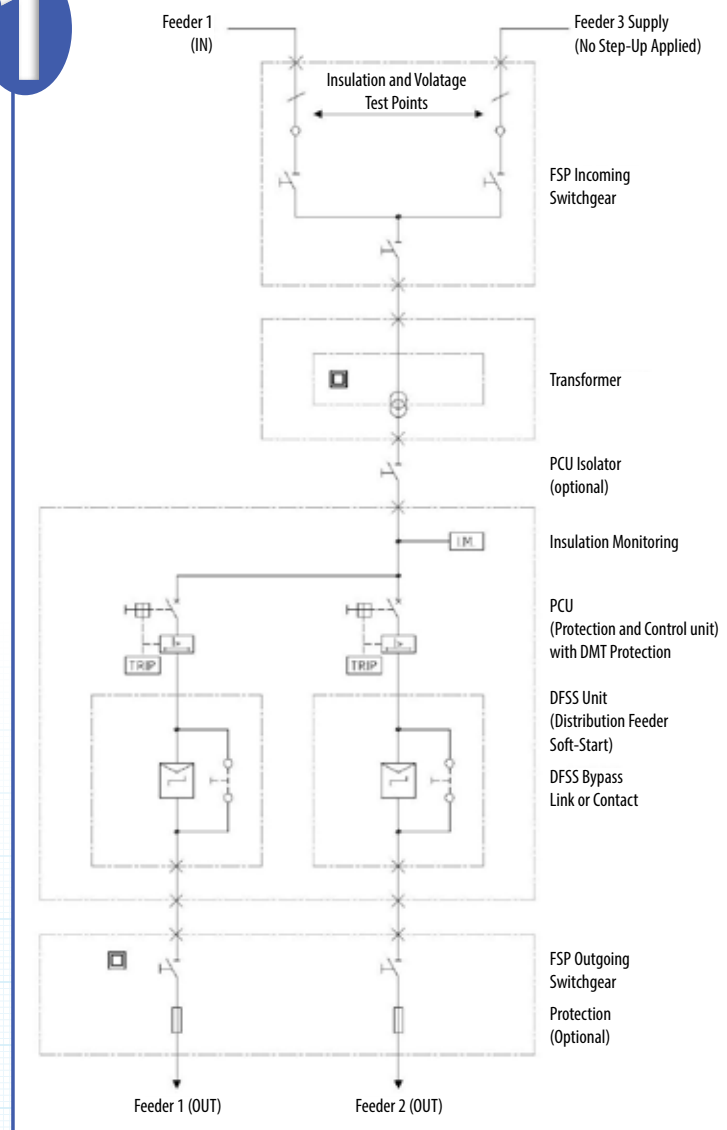
- PSU module features insulation monitoring, soft start technology and active feeder protection
- A comprehensive range of alarm and communication packages available



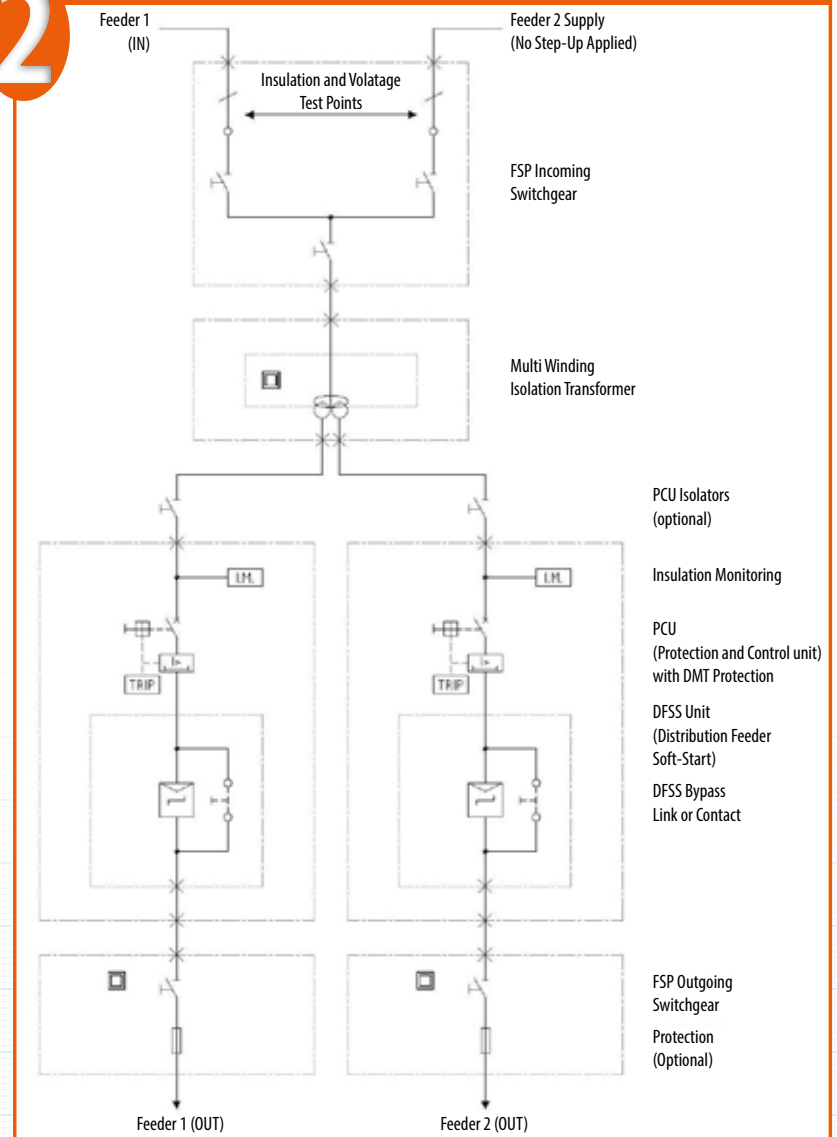


# Typical DITA Circuits and Applications

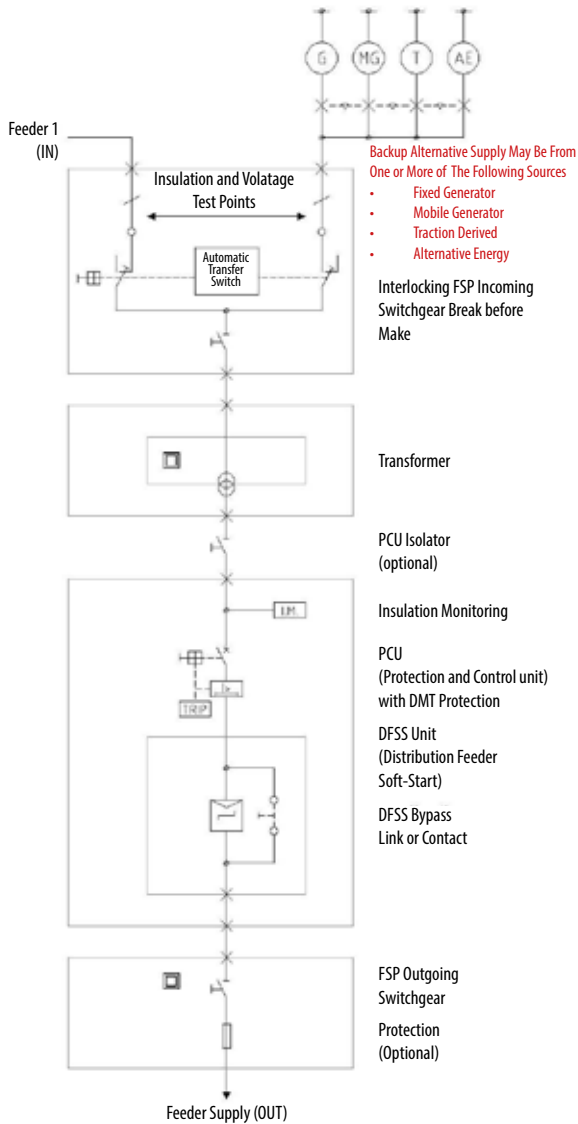
1



2



3



1

## Dual Output DITA in a Split Feeder Configuration with a Single Insulation Monitor

2

## Dual Output DITA in a Split Feeder Configuration with Dual Insulation Monitors

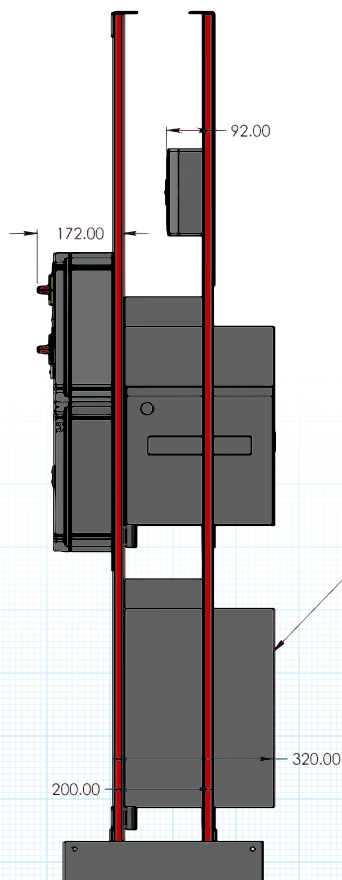
3

## DITA Arrangement with Alternative Energy Sources and Automatic Transfer Switch (ATS)

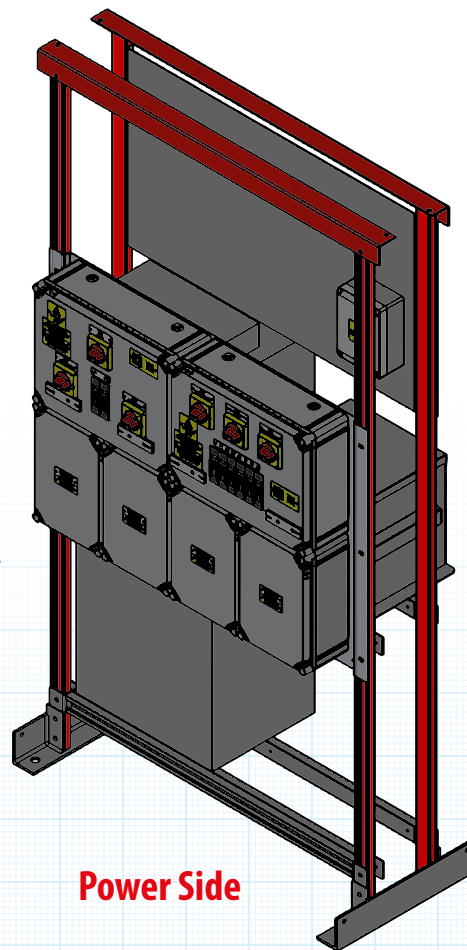
# Open Frame DITA Assembly for Mounting within REB or PSP Building



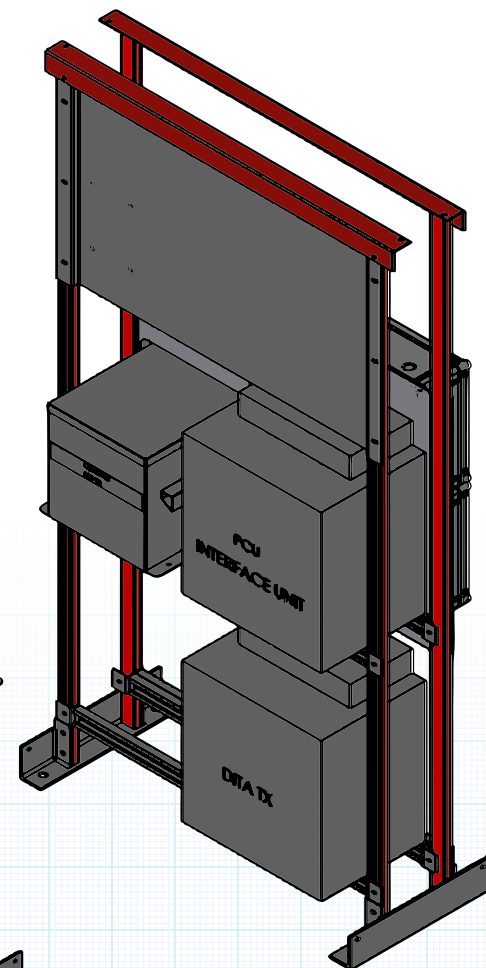
The open frame DITA assembly is available as two Class II tested backplate assemblies. Units are provided with pre-wired plug couplers to allow site connection of DITA and PSU.



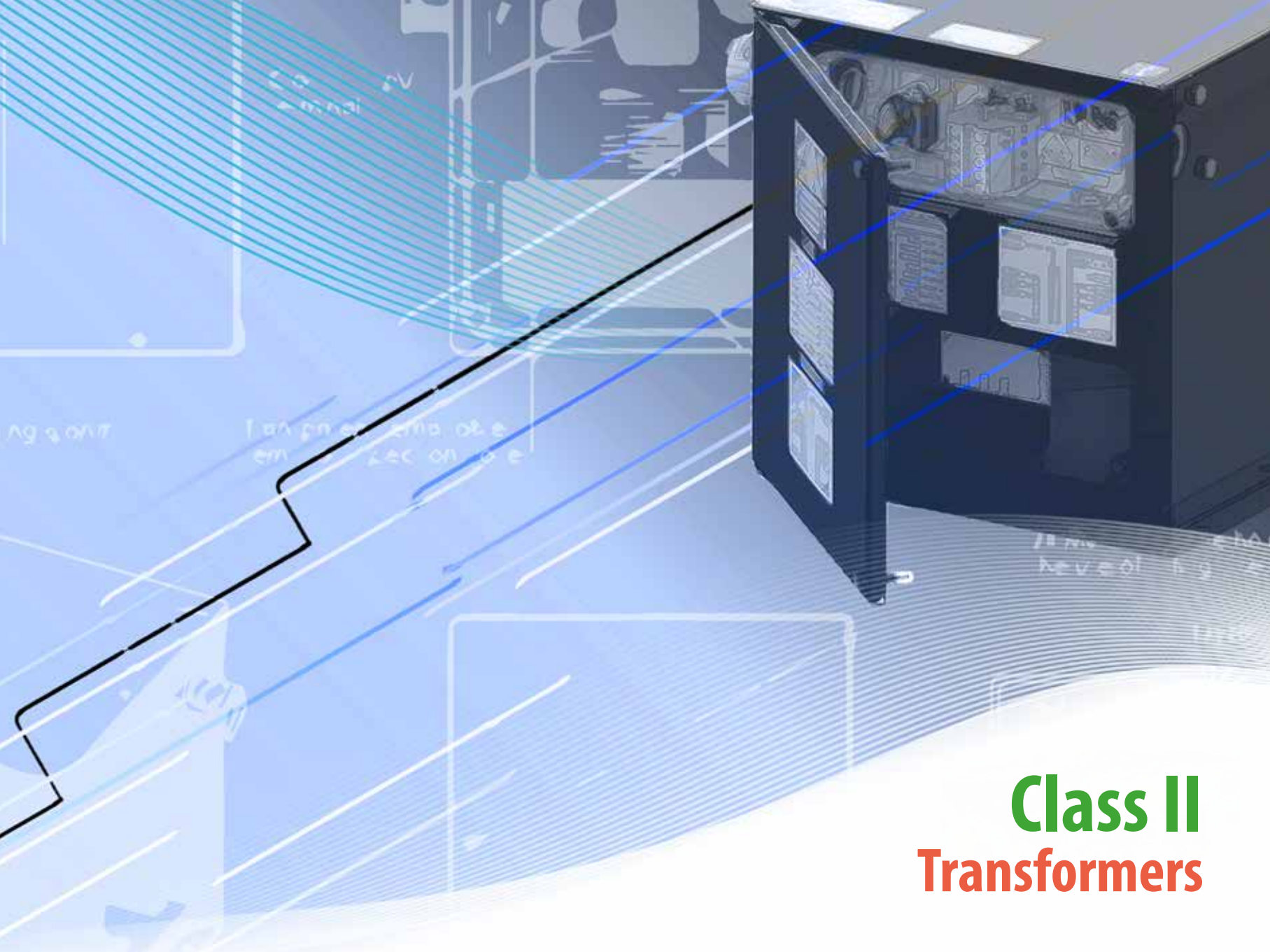
DITA TX Mounted so that it can move into the opposite space for weight distribution by an amount determined by position of the feeder cables.



**Power Side**



**Instrumentation & Comm's**



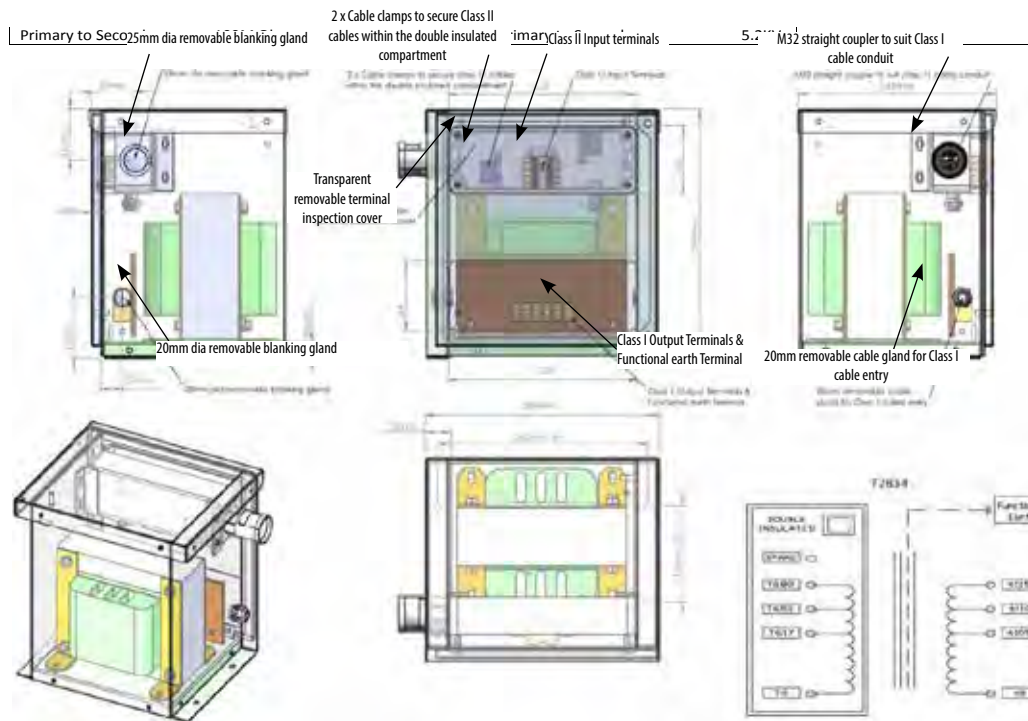
# **Class II Transformers**



## Aluminium

## 1KVA CLASS II HYBRID ISOLATION Transformer

PADS No: 091/049118



Part No	PADS No	System Type	VA	Input +/-5%	Output +/-5%	Range
T2966	091/049118	Class I & II	1000	650V	110V	eco-rail® Aluminium

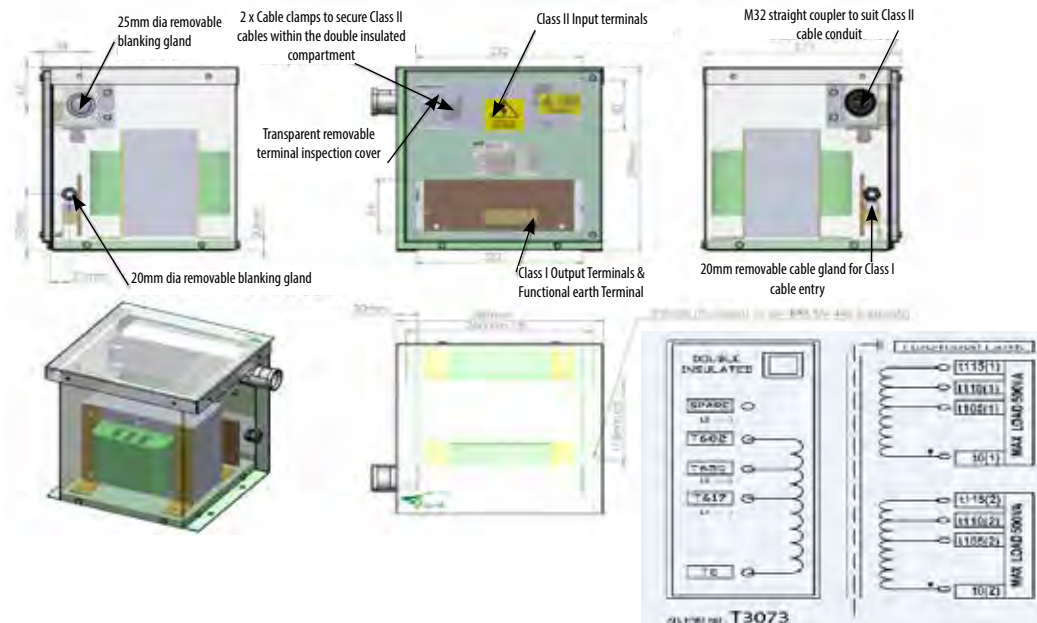
Primary resistance 617V tap @20°C	7.4Ω
Primary resistance 650V tap @20°C	7.9Ω
Primary resistance 682V tap @20°C	8.4Ω
Electrical Specification	T2966
Secondary resistance 105V tap @20°C	0.17Ω
Secondary resistance 110V tap @20°C	0.171Ω
Secondary resistance 115V tap @20°C	0.181Ω
Primary Voltages	617-650-682 VAC
Primary Full Load Current	1.66-1.57-1.50 A
Secondary Voltages	0-105-110-115 VAC
Secondary Full Load Current	9.09A
No load current 682V tap	36.52mA
No load losses	10.66 Watts
Full Load Loss	42.2 Watts
Efficiency 80% full load	96.3%
Efficiency 100% full load	96.0%
% Impedance	3.86%
Primary Inductance	27.82 mH
X/R Ratio	0.52
Inrush x times rated current	X 4.7
Inrush Current	7.5 Amps
i²t	2.3
Altitude	<2000 meters above sea level
Secondary inductance	0.81mH
Regulation	3.17%
Prospective fault current	210 Amps
Duration of prospective fault current	3.9 seconds
Temperature rise	80°C
Total Weight	22Kg
Operating Ambient Temperature	-20°C to + 60°C
Recommended Primary Fuse	4A BS88 & 10x38 gG IEC 60269-1&2
Recommended Maximum Secondary Fuse	15A BS88 & 10x38 gG IEC 60269-1&2
Primary & Secondary Terminals	Screw Clamp 0.5-10mm²
Functional Earth Terminal	Screw Clamp 0.5-10mm²
Insulation Resistance (500V)	
Primary to Core	>100M Ohms
Secondary to Core	>100M Ohms
Primary to Secondary	>100M Ohms
Dielectric Strength	
Primary to Core	5.2KV
Secondary to Core	5.2KV
Primary to Secondary	5.2KV
Impulse Withstand	8KV

# 1KVA CLASS II HYBRID ISOLATION DUAL OUTPUT Transformer

PADS No: 091/049123

Aluminium

Primary resistance 617V tap @20°C	6.28Ω
Primary resistance 650V tap @20°C	6.68Ω
Primary resistance 682V tap @20°C	6.99Ω
Electrical Specification	T3073
Coil 1 Secondary resistance 105V tap @20°C	0.385Ω
Coil 1 Secondary resistance 110V tap @20°C	0.395Ω
Coil 1 Secondary resistance 115V tap @20°C	0.410Ω
Coil 2 Secondary resistance 105V tap @20°C	0.425
Coil 2 Secondary resistance 110V tap @20°C	0.446
Coil 2 Secondary resistance 115V tap @20°C	0.466
Primary Voltages	617-650-682 VAC
Primary Full Load Current	1.65-1.57-1.49 A
Secondary Voltages	2 x (0-105-110-115 VAC)
Each Coil Secondary Full Load Current	4.55A
No load current 650V tap	42.8mA
No load losses	13.91 Watts
Full Load Loss	47.1 Watts
Efficiency 80% full load	95.79%
Efficiency 100% full load	95.5%
% Impedance	3.76%
Primary Inductance	21.14 mH
X/R Ratio	0.40
Inrush x times rated current	X 1.66
Inrush Current	2.6 Amps
I²t	2.21
Altitude	<2000 meters above sea level
Secondary inductance	1.23mH
Regulation	3.33%
Prospective fault current	111 Amps
Duration of prospective fault current	4.5 seconds
Temperature rise	75°C
Total Weight	24Kg
Operating Ambient Temperature	-20°C to + 60°C
Recommended Primary Fuse	4A BS88 & 10x38 gG IEC 60269-1&2
Recommended Maximum Secondary Fuse	15A BS88 & 10x38 gG IEC 60269-1&2
Primary & Secondary Terminals	Screw Clamp 0.5-10mm²
Functional Earth Terminal	Screw Clamp 0.5-10mm²
Insulation Resistance (500V) Primary to Core >100M Ohms Secondary to Core >100M Ohms Primary to Secondary >100M Ohms	Impulse Withstand 8KV
Dielectric Strength Primary to Core 5.2KV Secondary to Core 5.2KV Primary to Secondary 5.2KV	

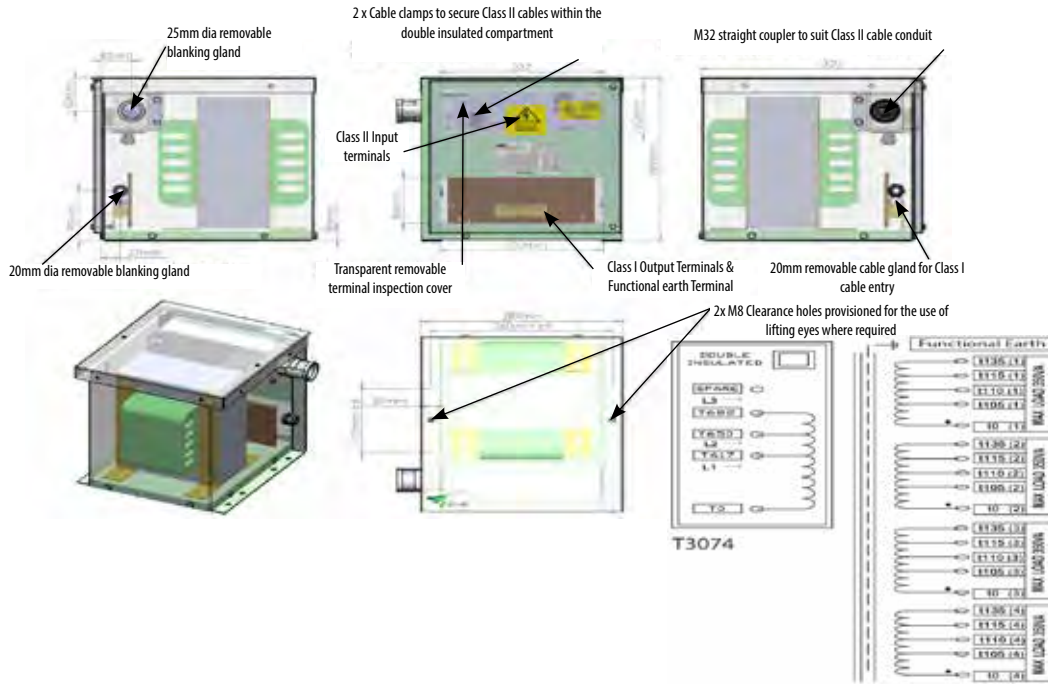


Part No	PADS No	System Type	VA	Input +/-5%	Output +/-5%	Range
T3073	091/049123	Class I & II	1000 (D)	650V	110V	eco-rail® Aluminium

# Aluminium

## 1.4KVA CLASS II HYBRID QUADRUPLE OUTPUT Transformer

PADS No: 091/049154



Part No	PADS No	System Type	VA	Input +/-5%	Output +/-5%	Range
<b>T3074</b>	<b>091/049154</b>	<b>Class I &amp; II</b>	<b>1400 (Quad)</b>	<b>650V</b>	<b>110V</b>	<b>eco-rail® Aluminium</b>

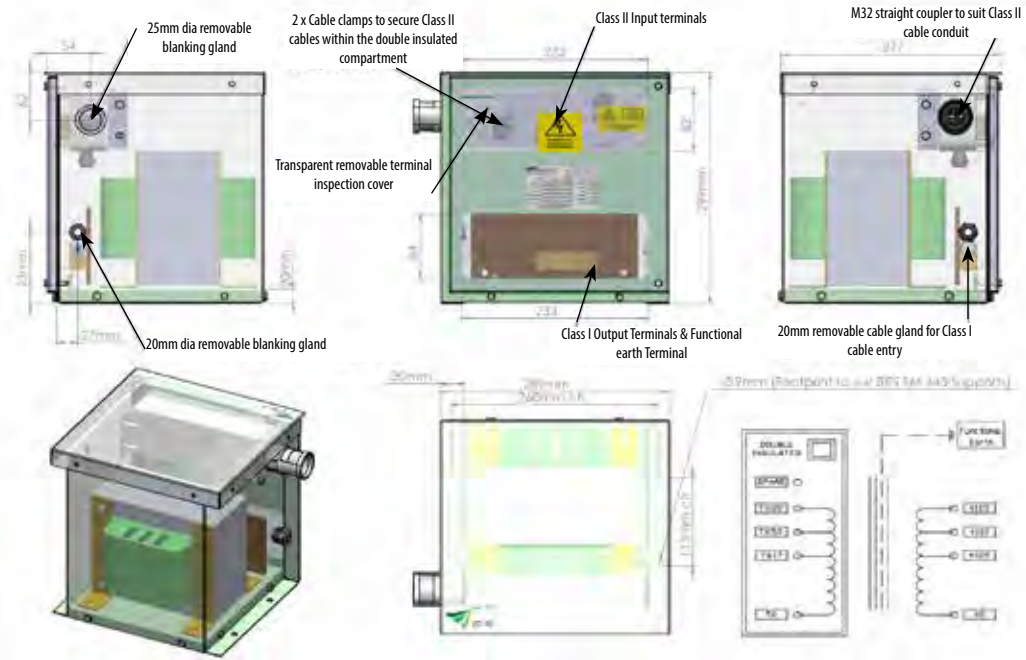
Primary resistance 617V tap @20°C	5.67Ω
Primary resistance 650V tap @20°C	5.97Ω
Primary resistance 682V tap @20°C	6.28Ω
Electrical Specification	T3074
Coil 1 Secondary resistance 110V tap @20°C	0.38Ω
Coil 2 Secondary resistance 110V tap @20°C	0.41Ω
Coil 3 Secondary resistance 110V tap @20°C	0.46Ω
Coil 4 Secondary resistance 110V tap @20°C	0.50Ω
Primary Voltages	617-650-682 VAC
Primary Full Load Current	2.31-2.2-2.09 A
Secondary Voltages	4 X (0-105-110-115) VAC
Secondary Full Load Current@ 110V tap each coil	3.18A
No load current 650V tap	44.93mA
No load losses	15.01 Watts
Full Load Loss	64.99 Watts
Efficiency 80% full load	95.97%
Efficiency 100% full load	95.56%
% Impedance	4.89%
Primary Inductance	21.04 mH
X/R Ratio	0.61
Inrush x times rated current	X 1.8
Inrush Current	3.94 Amps
i²t	3.51
Altitude	<2000 meters above sea level
Secondary inductance	2.46mH
Regulation	3.66%
Prospective fault current	78 Amps
Duration of prospective fault current	12.6 seconds
Temperature rise	107°C
Total Weight	30Kg
Operating Ambient Temperature	-20°C to + 60°C
Recommended Primary Fuse	4A BS88 & 10x38 gG IEC 60269-1&2
Recommended Maximum Secondary Fuse	6A BS88 & 10x38 gG IEC 60269-1&2
Primary & Secondary Terminals	Screw Clamp 0.5-10mm²
Functional Earth Terminal	Screw Clamp 0.5-10mm²
Insulation Resistance (500V)	
Primary to Core	>100M Ohms
Secondary to Core	>100M Ohms
Primary to Secondary	>100M Ohms
Dielectric Strength	
Primary to Core	5.2KV
Secondary to Core	5.2KV
Primary to Secondary	5.2KV
Impulse Withstand	6KV

# Aluminium

## 1.5KVA CLASS II HYBRID ISOLATION Transformer

PADS No: 091/049119

Primary resistance 617V tap @20°C	4.14Ω
Primary resistance 650V tap @20°C	4.34Ω
Primary resistance 682V tap @20°C	4.65Ω
Electrical Specification	T3065
Secondary resistance 105V tap @20°C	0.11Ω
Secondary resistance 110V tap @20°C	0.12Ω
Secondary resistance 115V tap @20°C	0.124Ω
Primary Voltages	617-650-682 VAC
Primary Full Load Current	2.48-2.36-2.23 A
Secondary Voltages	0-105-110-115 VAC
Secondary Full Load Current	13.64A
No load current 650V tap	46.29mA
No load losses	14.0 Watts
Full Load Loss	60.12 Watts
Efficiency 80% full load	96.5%
Efficiency 100% full load	96.15%
% Impedance	4.6%
Primary Inductance	29.15 mH
X/R Ratio	0.88
Inrush x times rated current	X 3.47
Inrush Current	8.20 Amps
i <sup>2</sup> t	4.64
Altitude	<2000 meters above sea level
Secondary inductance	0.85mH
Regulation	3.14%
Prospective fault current	286 Amps
Duration of prospective fault current	5.2 seconds
Temperature rise	93.7°C
Total Weight	26Kg
Operating Ambient Temperature	-20°C to + 60°C
Recommended Primary Fuse	4A BS88 & 10x38 gG IEC 60269-1&2
Recommended Maximum Secondary Fuse	20A BS88 & 10x38 gG IEC 60269-1&2
Primary & Secondary Terminals	Screw Clamp 0.5-10mm <sup>2</sup>
Functional Earth Terminal	Screw Clamp 0.5-10mm <sup>2</sup>
Insulation Resistance (500V)	Impulse Withstand 8KV
Primary to Core >100M Ohms	
Secondary to Core >100M Ohms	
Primary to Secondary >100M Ohms	
Dielectric Strength	
Primary to Core 5.2KV	
Secondary to Core 5.2KV	
Primary to Secondary 5.2KV	



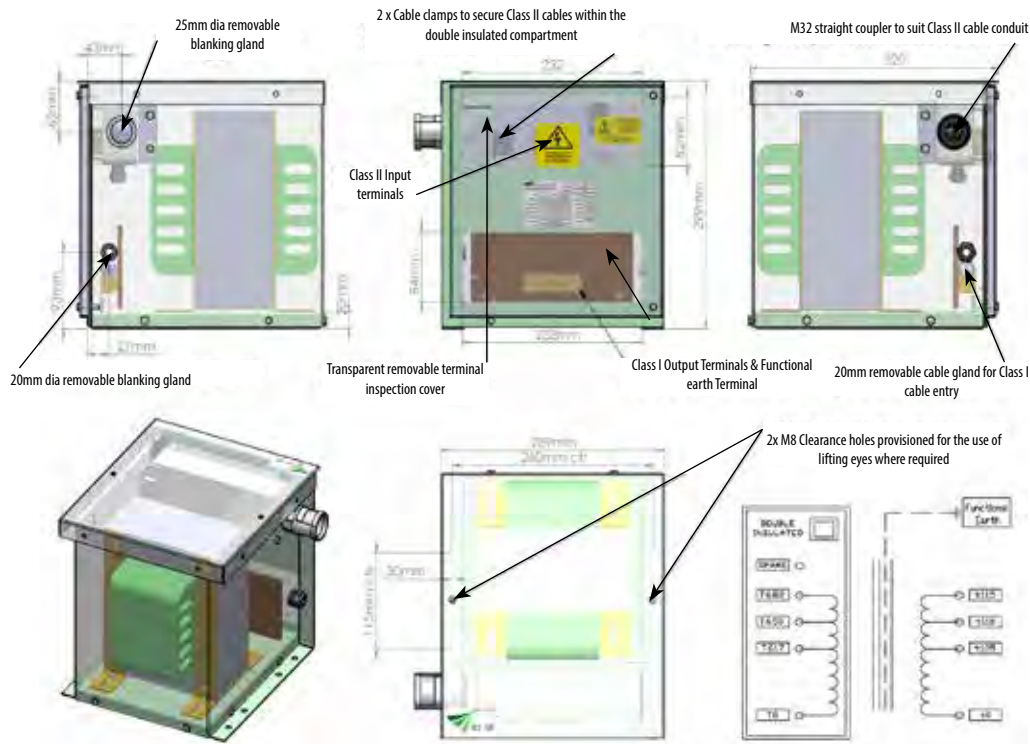
Part No	PADS No	System Type	VA	Input +/-5%	Output +/-5%	Range
T3065	091/049119	Class I & II	1500	650V	110V	eco-rail® Aluminium



## Aluminium

## 2KVA CLASS II HYBRID ISOLATION Transformer

PADS No: 091/049120



Primary resistance 617V tap @20°C	2.68Ω
Primary resistance 650V tap @20°C	2.88Ω
Primary resistance 682V tap @20°C	3.09Ω
Electrical Specification	T2967
Secondary resistance 105V tap @20°C	0.071Ω
Secondary resistance 110V tap @20°C	0.075Ω
Secondary resistance 115V tap @20°C	0.078Ω
Primary Voltages	617-650-682 VAC
Primary Full Load Current	3.29-3.12-2.98 A
Secondary Voltages	0-105-110-115 VAC
Secondary Full Load Current	18.18A
No load current 650V tap	33.61mA
No load losses	11.37 Watts
Full Load Loss	63.9 Watts
Efficiency 80% full load	97.3%
Efficiency 100% full load	96.9%
% Impedance	4.64%
Primary Inductance	21.13 mH
X/R Ratio	1.01
Inrush x times rated current	X 3.5
Inrush Current	10.9 Amps
I <sup>2</sup> t	6.23
Altitude	<2000 meters above sea level
Secondary inductance	0.61mH
Regulation	2.7%
Prospective fault current	427 Amps
Duration of prospective fault current	4.6 seconds
Temperature rise	91.8°C
Total Weight	33Kg
Operating Ambient Temperature	-20°C to + 60°C
Recommended Primary Fuse	6A BS88 & 10x38 gG IEC 60269-1&2
Recommended Maximum Secondary Fuse	32A BS88 & 10x38 gG IEC 60269-1&2
Primary & Secondary Terminals	Screw Clamp 0.5-10mm <sup>2</sup>
Functional Earth Terminal	Screw Clamp 0.5-10mm <sup>2</sup>
Insulation Resistance (500V)	
Primary to Core	>100M Ohms
Secondary to Core	>100M Ohms
Primary to Secondary	>100M Ohms
Dielectric Strength	
Primary to Core	5.2KV
Secondary to Core	5.2KV
Primary to Secondary	5.2KV
	Impulse Withstand 8KV

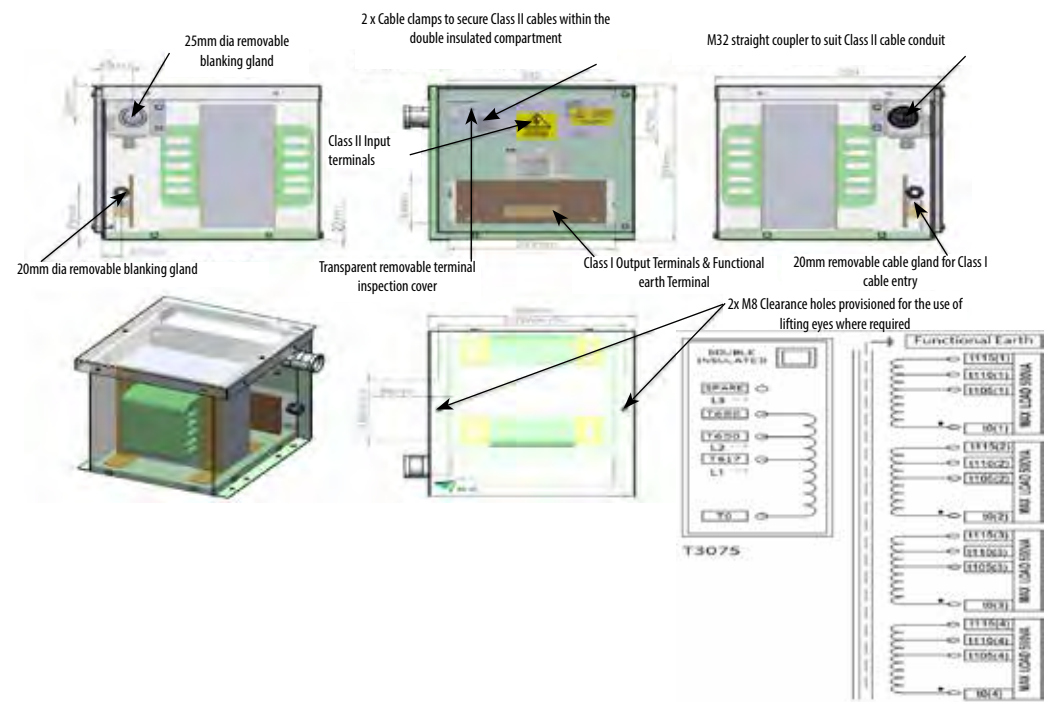
Part No	PADS No	System Type	VA	Input +/-5%	Output +/-5%	Range
T2967	091/049120	Class I & II	2000	650V	110V	eco-rail® Aluminium

# Aluminium

## 2KVA CLASS II HYBRID QUADRUPLE OUTPUT Transformer

PADS No: 091/049116

Primary resistance 617V tap @20°C	3.64Ω
Primary resistance 650V tap @20°C	3.85Ω
Primary resistance 682V tap @20°C	4.05Ω
Electrical Specification	T3075
Coil 1 Secondary resistance 110V tap @20°C	0.26Ω
Coil 2 Secondary resistance 110V tap @20°C	0.29Ω
Coil 3 Secondary resistance 110V tap @20°C	0.32Ω
Coil 4 Secondary resistance 110V tap @20°C	0.35Ω
Primary Voltages	617-650-682 VAC
Primary Full Load Current	3.3-3.13-2.99 A
Secondary Voltages	4 X (0-105-110-115) VAC
Secondary Full Load Current @ 110V tap each coil	4.55A
No load current 650V tap	44.91mA
No load losses	13.13 Watts
Full Load Loss	82.13 Watts
Efficiency 80% full load	96.54%
Efficiency 100% full load	96%
% Impedance	3.98%
Primary Inductance	15.01 mH
X/R Ratio	0.64
Inrush x times rated current	X 6
Inrush Current	18.6 Amps
I²t	5.42
Altitude	<2000 meters above sea level
Secondary inductance	1.75mH
Regulation	3.5%
Prospective fault current	113 Amps
Duration of prospective fault current	9.3 seconds
Temperature rise	106°C
Total Weight	32Kg
Operating Ambient Temperature	-20°C to + 60°C
Recommended Primary Fuse	6A BS88 & 10x38 gG IEC 60269-1&2
Primary & Secondary Terminals	Screw Clamp 0.5-10mm²
Functional Earth Terminal	Screw Clamp 0.5-10mm²
Insulation Resistance (500V)	Impulse Withstand 6KV
Primary to Core >100M Ohms	
Secondary to Core >100M Ohms	
Primary to Secondary >100M Ohms	
Dielectric Strength	
Primary to Core 5.2KV	
Secondary to Core 5.2KV	
Primary to Secondary 5.2KV	

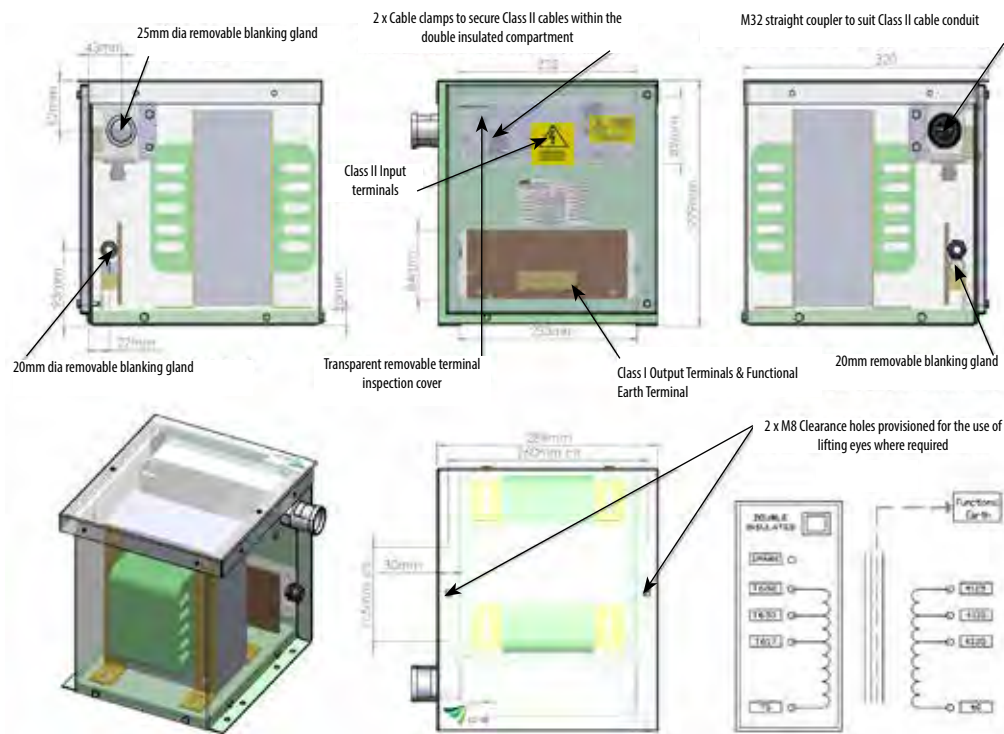


Part No	PADS No	System Type	VA	Input +/-5%	Output +/-5%	Range
T3075	091/049116	Class I & II	2000 (Quad)	650V	110V	eco-rail® Aluminium

Aluminium

**3KVA CLASS II HYBRID ISOLATION Transformer**

PADS No: 091/049121



Primary resistance 617V tap @20°C	1.74Ω
Primary resistance 650V tap @20°C	1.85Ω
Primary resistance 682V tap @20°C	1.95Ω
Electrical Specification	T2968
Secondary resistance 105V tap @20°C	0.044Ω
Secondary resistance 110V tap @20°C	0.046Ω
Secondary resistance 115V tap @20°C	0.048Ω
Primary Voltages	617-650-682 VAC
Primary Full Load Current	4.95-4.70-4.48 A
Secondary Voltages	0-105-110-115 VAC
Secondary Full Load Current	27.3A
No load current 650V tap	72.9mA
No load losses	17.27 Watts
Full Load Loss	94.18 Watts
Efficiency 80% full load	97.3%
Efficiency 100% full load	97%
% Impedance	4.41%
Primary Inductance	12 mH
X/R Ratio	0.95
Inrush x times rated current	X 6.8
Inrush Current	32.2 Amps
I <sup>2</sup> t	9.23
Altitude	<2000 meters above sea level
Secondary inductance	0.35mH
Regulation	2.62%
Prospective fault current	725 Amps
Duration of prospective fault current	3 seconds
Temperature rise	107°C
Total Weight	38Kg
Operating Ambient Temperature	-20°C to +60°C
Recommended Primary Fuse	10A BS88 & 10x38 gG IEC 60269-1&2
Recommended Maximum Secondary Fuse	40A BS88 & 10x38 gG IEC 60269-1&2
Primary & Secondary Terminals	Screw Clamp 0.5-10mm <sup>2</sup>
Functional Earth Terminal	Screw Clamp 0.5-10mm <sup>2</sup>
Insulation Resistance (500V)	
Primary to Core	>100M Ohms
Secondary to Core	>100M Ohms
Primary to Secondary	>100M Ohms
Dielectric Strength	
Primary to Core	5.2KV
Secondary to Core	5.2KV
Primary to Secondary	5.2KV
	Impulse Withstand 8KV

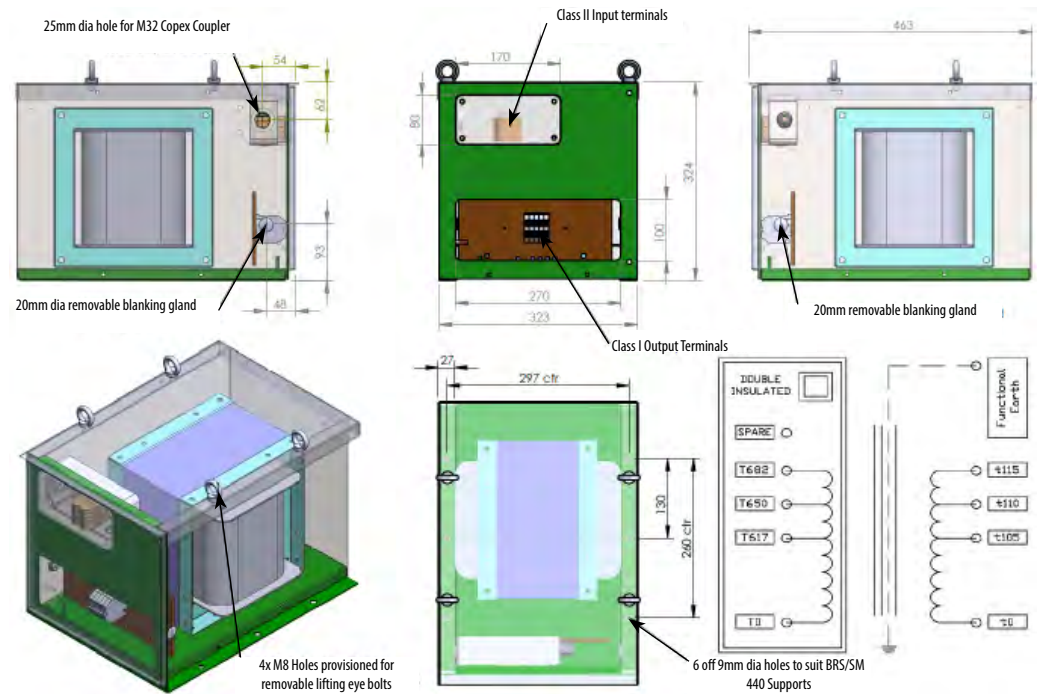
Part No	PADS No	System Type	VA	Input +/-5%	Output +/-5%	Range
T2968	091/049121	Class I & II	3000	650V	110V	eco-rail® Aluminium

# Aluminium

## 5KVA CLASS II HYBRID ISOLATION Transformer

PADS No: 091/049122

Primary resistance 617V tap @20°C	0.82Ω
Primary resistance 650V tap @20°C	0.87Ω
Primary resistance 682V tap @20°C	0.92Ω
Electrical Specification	T2969
Secondary resistance 105V tap @20°C	0.029Ω
Secondary resistance 110V tap @20°C	0.03Ω
Secondary resistance 115V tap @20°C	0.031Ω
Primary Voltages	617-650-682 VAC
Primary Full Load Current	8.18-7.76-7.4 A
Secondary Voltages	0-105-110-115 VAC
Secondary Full Load Current	45.5A
No load current 650V tap	67.38mA
No load losses	25.03 Watts
Full Load Loss	136.23 Watts
Efficiency 80% full load	97.5%
Efficiency 100% full load	97.35%
% Impedance	4.74%
Primary Inductance	8.77 mH
X/R Ratio	1.62
Inrush x times rated current	X4
Inrush Current	31.6 Amps
I <sup>2</sup> t	28.06
Altitude	<2000 meters above sea level
Secondary inductance	0.25mH
Regulation	2.3%
Prospective fault current	1103 Amps
Duration of prospective fault current	3.6 seconds
Temperature rise	69°C
Total Weight	72Kg
Operating Ambient Temperature	-20°C to + 60°C
Recommended Primary Fuse	16A BS88 & 10x38 gG IEC 60269-1&2
Recommended Maximum Secondary Fuse	80A BS88 & 10x38 gG IEC 60269-1&2
Primary & Secondary Terminals	Screw Clamp 0.5-10mm <sup>2</sup>
Functional Earth Terminal	Screw Clamp 0.5-10mm <sup>2</sup>
Insulation Resistance (500V)	
Primary to Core	>100M Ohms
Secondary to Core	>100M Ohms
Primary to Secondary	>100M Ohms
Impulse Withstand	8KV
Dielectric Strength	
Primary to Core	5.2KV
Secondary to Core	5.2KV
Primary to Secondary	5.2KV



Part No	PADS No	System Type	VA	Input +/-5%	Output +/-5%	Range
T2969	091/049122	Class I & II	5000	650V	110V	eco-rail® Aluminium

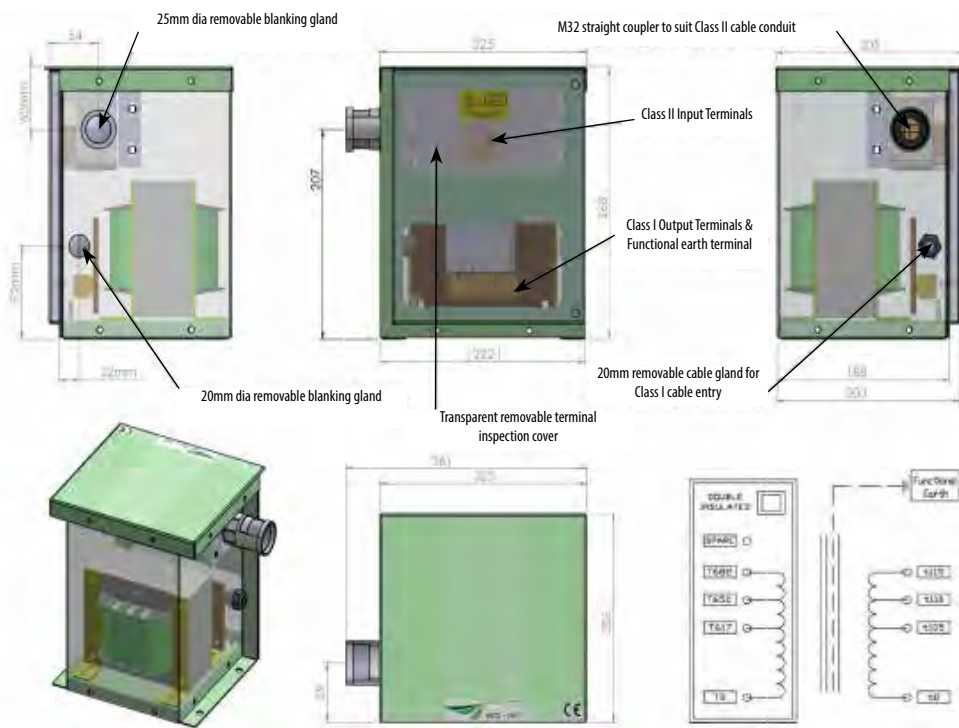


# Copper

## 250VA CLASS II HYBRID ISOLATION Transformer

PADS No: 054/214891

Cert No: PA05/05761



Primary resistance 617V tap @20°C	27.9Ω
Primary resistance 650V tap @20°C	29.46Ω
Primary resistance 682V tap @20°C	30.99Ω
Electrical Specification	T2900
Secondary resistance 105V tap @20°C	0.66Ω
Secondary resistance 110V tap @20°C	0.69Ω
Secondary resistance 115V tap @20°C	0.72Ω
Primary Voltages	617-650-682 VAC
Primary Full Load Current	0.416-0.395-0.38 A
Secondary Voltages	0-105-110-115 VAC
Secondary Full Load Current	2.273A
No load current 650V tap	7.97mA
No load losses	3.75 Watts
Full Load Loss	11.64 Watts
Efficiency 80% full load	95.79%
Efficiency 100% full load	95.55%
% Impedance	3.33%
Primary Inductance	35.76 mH
X/R Ratio	0.18
Inrush x times rated current	(5.2)
Inrush Current	2.056 Amps
I <sup>2</sup> t	0.31
Altitude	<2000 meters above sea level
Secondary inductance	1.05mH
Regulation	2.8%
Prospective fault current	52 Amps
Duration of prospective fault current	8.1 seconds
Temperature rise	24.9°C
Total Weight	12Kg
Operating Ambient Temperature	-20°C to + 60°C
Recommended Primary Fuse	1A BS88 & 10x38 gG IEC 60269-1&2
Recommended Maximum Secondary Fuse	4A BS88 & 10x38 gG IEC 60269-1&2
Primary & Secondary Terminals	Screw Clamp 0.5-10mm <sup>2</sup>
Functional Earth Terminal	Screw Clamp 0.5-10mm <sup>2</sup>
Insulation Resistance (500V) Primary to Core >100M Ohms Secondary to Core >100M Ohms Primary to Secondary >100M Ohms	Impulse Withstand 8KV
Dielectric Strength Primary to Core 5.2KV Secondary to Core 5.2KV Primary to Secondary 5.2KV	

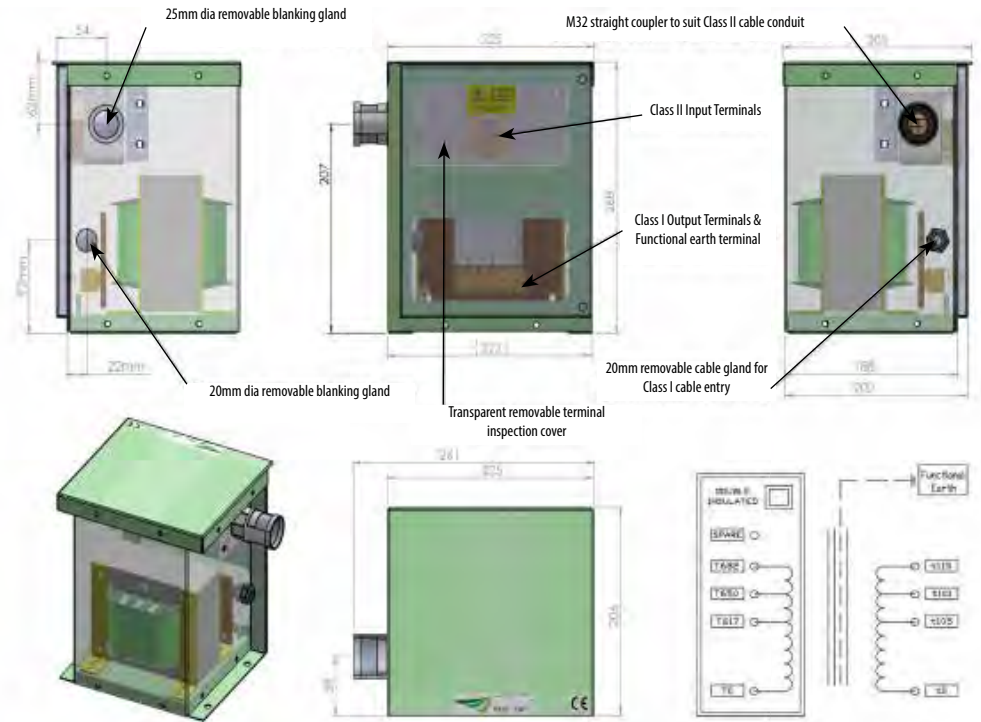
Part No	PADS No	System Type	VA	Input +/-5%	Output +/-5%	Range
T2900	054/214891	Class I & II	250	650V	110V	eco-rail® Copper

# Copper

## 500VA CLASS II HYBRID ISOLATION Transformer

PADS No: 054/214892  
Cert No: PA05/05761

Primary resistance 617V tap @20°C	13.6Ω
Primary resistance 650V tap @20°C	14.32Ω
Primary resistance 682V tap @20°C	15.1Ω
Electrical Specification	T2901
Secondary resistance 105V tap @20°C	0.46Ω
Secondary resistance 110V tap @20°C	0.48Ω
Secondary resistance 115V tap @20°C	0.50Ω
Primary Voltages	617-650-682 VAC
Primary Full Load Current	0.83-0.78-0.75 A
Secondary Voltages	0-105-110-115 VAC
Secondary Full Load Current	4.55A
No load current 650V tap	12.06mA
No load losses	4.77 Watts
Full Load Loss	24.16 Watts
Efficiency 80% full load	95.9%
Efficiency 100% full load	95.4%
% Impedance	4.44%
Primary Inductance	38.7 mH
X/R Ratio	0.34
Inrush x times rated current	(3.27)
Inrush Current	2.56 Amps
I <sup>2</sup> t	0.68
Altitude	<2000 meters above sea level
Secondary inductance	1.13mH
Regulation	3.32%
Prospective fault current	99 Amps
Duration of prospective fault current	11.9 seconds
Temperature rise	30°C
Total Weight	17Kg
Operating Ambient Temperature	-20°C to + 60°C
Recommended Primary Fuse	2A BS88 & 10x38 gG IEC 60269-1&2
Recommended Maximum Secondary Fuse	6A BS88 & 10x38 gG IEC 60269-1&2
Primary & Secondary Terminals	Screw Clamp 0.5-10mm <sup>2</sup>
Functional Earth Terminal	Screw Clamp 0.5-10mm <sup>2</sup>
Insulation Resistance (500V) Primary to Core Secondary to Core Primary to Secondary	>100M Ohms >100M Ohms >100M Ohms
Dielectric Strength Primary to Core Secondary to Core Primary to Secondary	5.2KV 5.2KV 5.2KV
Impulse Withstand	8KV



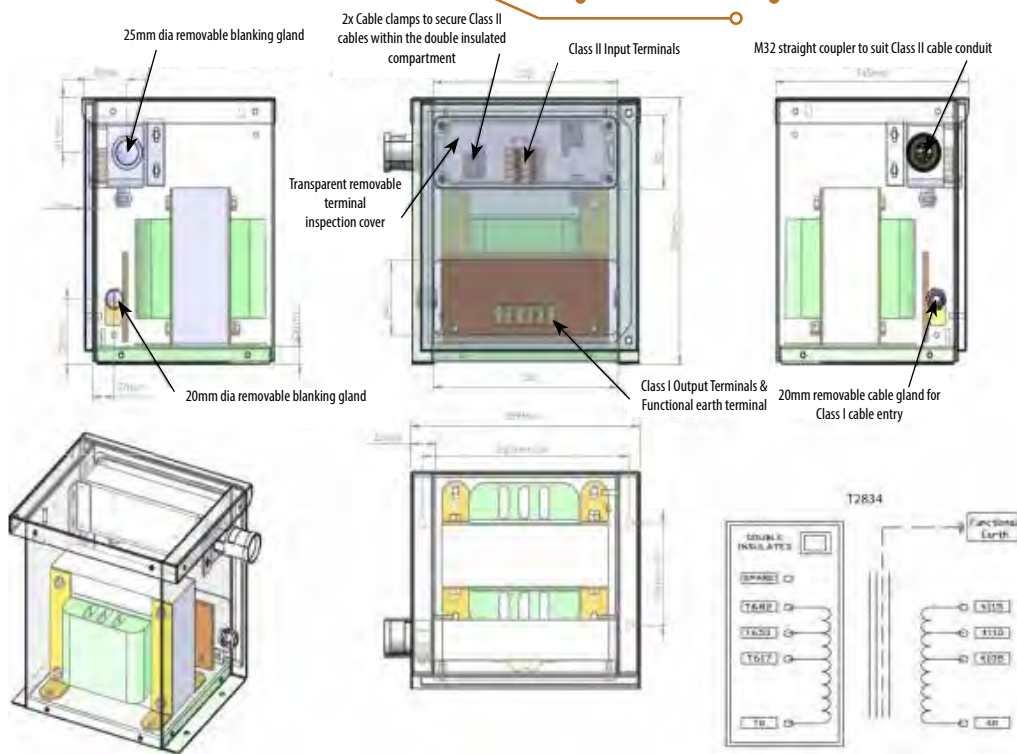
Part No	PADS No	System Type	VA	Input +/-5%	Output +/-5%	Range
<b>T2901</b>	<b>054/214892</b>	<b>Class I &amp; II</b>	<b>500</b>	<b>650V</b>	<b>110V</b>	<b>eco-rail® Copper</b>

# Copper

## 1KVA CLASS II HYBRID ISOLATION Transformer

PADS No: 054/214900

Cert No: PA05/05761



Primary resistance 617V tap @20°C	4.96Ω
Primary resistance 650V tap @20°C	5.1Ω
Primary resistance 682V tap @20°C	5.5Ω
Electrical Specification	T2834
Secondary resistance 105V tap @20°C	0.15Ω
Secondary resistance 110V tap @20°C	0.16Ω
Secondary resistance 115V tap @20°C	0.17Ω
Primary Voltages	617-650-682 VAC
Primary Full Load Current	1.64-1.56-1.49 A
Secondary Voltages	0-105-110-115 VAC
Secondary Full Load Current	9.09A
No load current 650V tap	20.05mA
No load losses	8.3 Watts
Full Load Loss	33 Watts
Efficiency 80% full load	97%
Efficiency 100% full load	96.7%
% Impedance	3.49%
Primary Inductance	23 mH
X/R Ratio	0.67
Inrush x times rated current	(8.5)
Inrush Current	13.26 Amps
I <sup>2</sup> t	2.5
Altitude	<2000 meters above sea level
Secondary inductance	0.38mH
Regulation	3%
Prospective fault current	161 Amps
Duration of prospective fault current	1.7 seconds
Temperature rise	48°C
Total Weight	29Kg
Operating Ambient Temperature	-20°C to + 60°C
Recommended Primary Fuse	4A BS88 & 10x38 gG IEC 60269-1&2
Recommended Maximum Secondary Fuse	15A BS88 & 10x38 gG IEC 60269-1&2
Primary & Secondary Terminals	Screw Clamp 0.5-10mm <sup>2</sup>
Functional Earth Terminal	Screw Clamp 0.5-10mm <sup>2</sup>
Insulation Resistance (500V)	Impulse Withstand 8KV
Primary to Core	>100M Ohms
Secondary to Core	>100M Ohms
Primary to Secondary	>100M Ohms
Dielectric Strength	
Primary to Core	5.2KV
Secondary to Core	5.2KV
Primary to Secondary	5.2KV

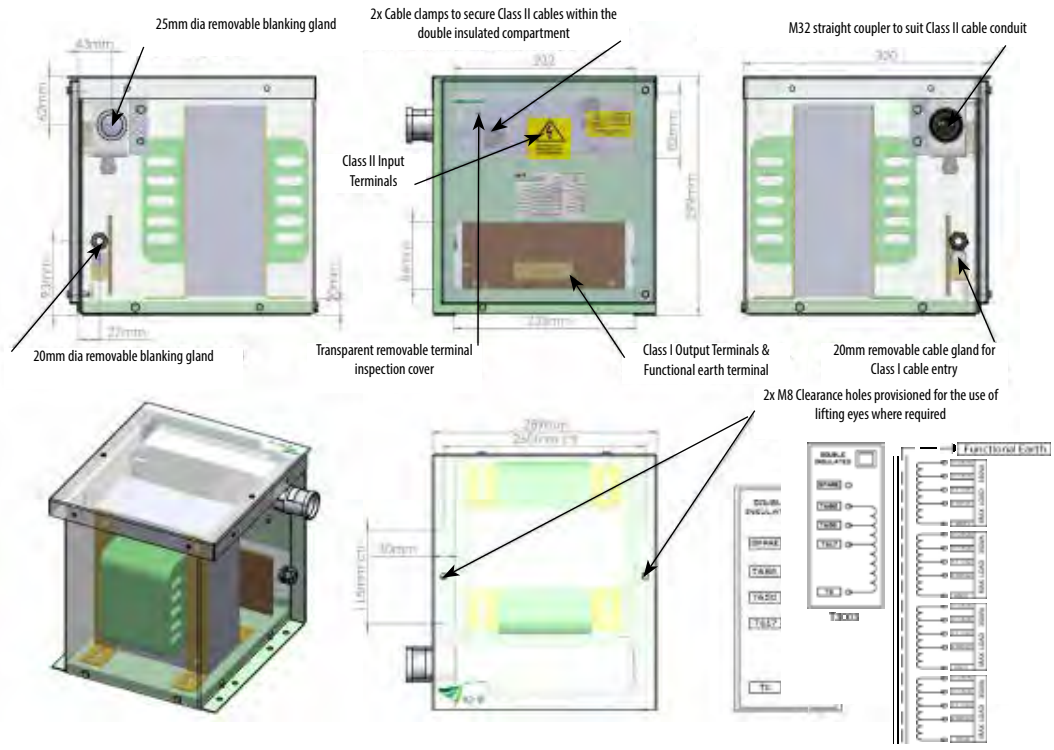
Part No	PADS No	System Type	VA	Input +/-5%	Output +/-5%	Range
T2834	054/214900	Class I & II	1000	650V	110V	eco-rail® Copper



# 1.4KVA CLASS II HYBRID ISOLATION Transformer

PADS No: Under Approval

Primary resistance 617V tap @20°C	3.92Ω
Primary resistance 650V tap @20°C	4.12Ω
Primary resistance 682V tap @20°C	4.32Ω
Electrical Specification	T3003
Secondary resistance 105V tap @20°C each coil	0.352Ω
Secondary resistance 110V tap @20°C each coil	0.372Ω
Secondary resistance 115V tap @20°C each coil	0.388Ω
Secondary resistance 135V tap @20°C each coil	0.44Ω
Primary Voltages	617-650-682 VAC
Primary Full Load Current	2.3-2.18-2.08 A
Secondary Voltages	4x (0-105-110-115-135) VAC
Secondary Full Load Current	3.18A
No load current 650V tap	29.7mA
Rating at each Terminal Output	4x @350VA each
No load losses	12.6 Watts
Full Load Loss	47.3 Watts
Efficiency 80% full load	97.0%
Efficiency 100% full load	96.7%
% Impedance	3.2%
Primary Inductance	12.3 mH
X/R Ratio	0.43
Inrush x times rated current	X(4.9)
Inrush Current	10.68 Amps
I <sup>2</sup> t	2.13
Altitude	<2000 meters above sea level
Secondary inductance	0.36mH
Regulation	3.02%
Prospective fault current	388 Amps
Duration of prospective fault current	3.8 seconds
Temperature rise	59.8°C
Total Weight	39Kg
Operating Ambient Temperature	-20°C to + 60°C
Recommended Primary Fuse	4A BS88 & 10x38 gG IEC 60269-1&2
Recommended Maximum Secondary Fuse	16A BS88 & 10x38 gG IEC 60269-1&2
Primary & Secondary Terminals	Screw Clamp 0.5-10mm <sup>2</sup>
Functional Earth Terminal	Screw Clamp 0.5-10mm <sup>2</sup>
Insulation Resistance (500V)	
Primary to Core >100M Ohms	Impulse Withstand 6KV
Secondary to Core >100M Ohms	
Primary to Secondary >100M Ohms	
Dielectric Strength	
Primary to Core 5.2KV	Impulse Withstand 6KV
Secondary to Core 5.2KV	
Primary to Secondary 5.2KV	



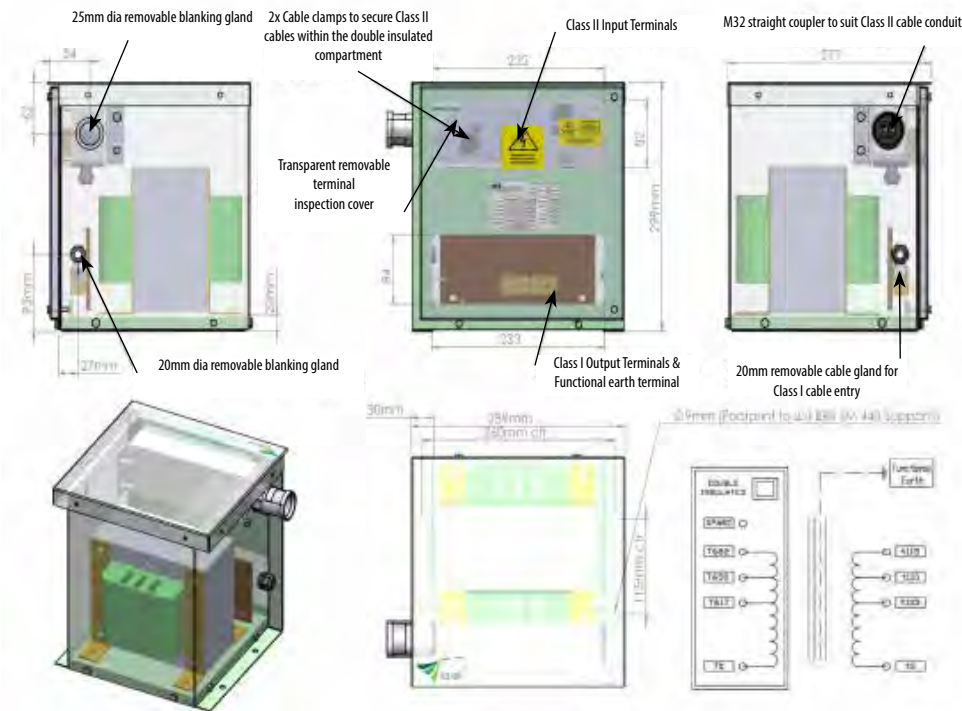
Part No	PADS No	System Type	VA	Input +/-5%	Output +/-5%	Range
<b>T3003</b>	<b>Under Approval Multi Output</b>	<b>Class I &amp; II</b>	<b>1400</b>	<b>650V</b>	<b>4x 110V @ 350VA</b>	<b>eco-rail® Copper</b>



# Copper

## 1.5KVA CLASS II HYBRID ISOLATION Transformer

PADS No: 054/214893  
Cert No: PA05/05761



Part No	PADS No	System Type	VA	Input +/-5%	Output +/-5%	Range
<b>T2902</b>	<b>054/214893</b>	<b>Class I &amp; II</b>	<b>1500</b>	<b>650V</b>	<b>110V</b>	<b>eco-rail® Copper</b>

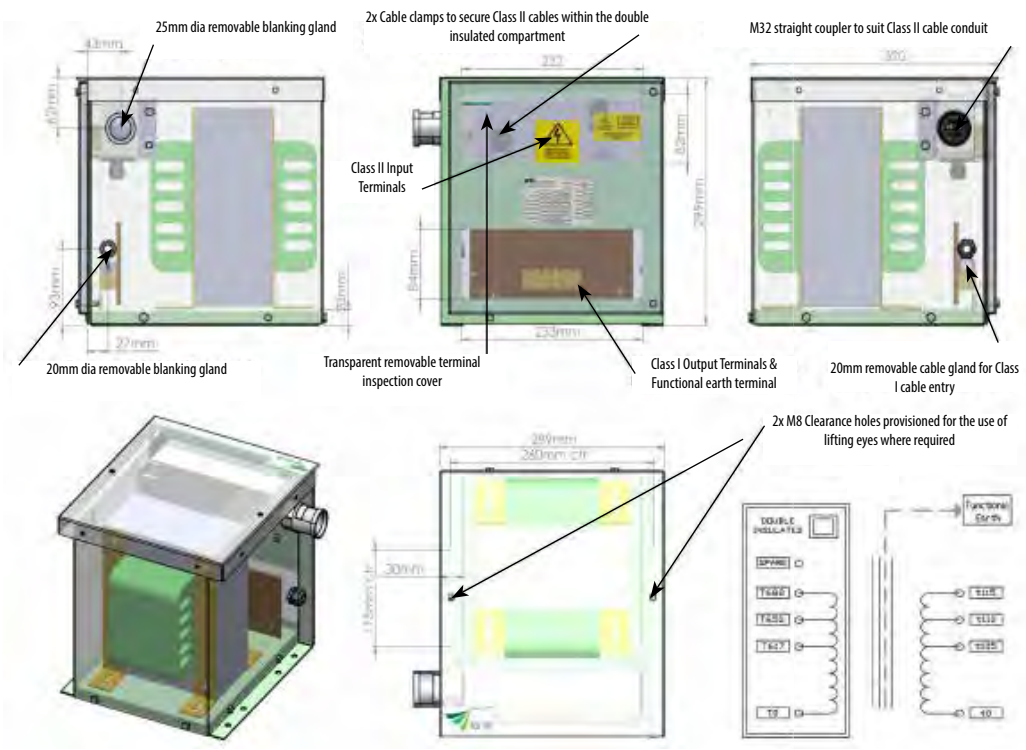
Primary resistance 617V tap @20°C	3.05Ω
Primary resistance 650V tap @20°C	3.25Ω
Primary resistance 682V tap @20°C	3.45Ω
Electrical Specification	T2902
Secondary resistance 105V tap @20°C	0.085Ω
Secondary resistance 110V tap @20°C	0.088Ω
Secondary resistance 115V tap @20°C	0.091Ω
Primary Voltages	617-650-682 VAC
Primary Full Load Current	2.46-2.34-2.23 A
Secondary Voltages	0-105-110-115 VAC
Secondary Full Load Current	13.64A
No load current 650V tap	21.81mA
No load losses	9.659 Watts
Full Load Loss	43.4 Watts
Efficiency 80% full load	97.46%
Efficiency 100% full load	97.19%
% Impedance	2.65%
Primary Inductance	12.5 mH
X/R Ratio	0.54
Inrush x times rated current	(4.6)
Inrush Current	10.77 Amps
I <sup>2</sup> t	5.2
Altitude	<2000 meters above sea level
Secondary inductance	0.36mH
Regulation	2.46%
Prospective fault current	439 Amps
Duration of prospective fault current	8.3 seconds
Temperature rise	63°C
Total Weight	38Kg
Operating Ambient Temperature	-20°C to + 60°C
Recommended Primary Fuse	4A BS88 & 10x38 gG IEC 60269-1&2
Recommended Maximum Secondary Fuse	20A BS88 & 10x38 gG IEC 60269-1&2
Primary & Secondary Terminals	Screw Clamp 0.5-10mm <sup>2</sup>
Functional Earth Terminal	Screw Clamp 0.5-10mm <sup>2</sup>
Insulation Resistance (500V) Primary to Core >100M Ohms Secondary to Core >100M Ohms Primary to Secondary >100M Ohms	Impulse Withstand 8KV
Dielectric Strength Primary to Core 5.2KV Secondary to Core 5.2KV Primary to Secondary 5.2KV	

# Copper

## 2KVA CLASS II HYBRID ISOLATION Transformer

PADS No: 054/214894  
Cert No: PA05/05761

Primary resistance 617V tap @20°C	2.54Ω
Primary resistance 650V tap @20°C	2.69Ω
Primary resistance 682V tap @20°C	2.84Ω
Electrical Specification	T2925
Secondary resistance 105V tap @20°C	0.066Ω
Secondary resistance 110V tap @20°C	0.07Ω
Secondary resistance 115V tap @20°C	0.074Ω
Primary Voltages	617-650-682 VAC
Primary Full Load Current	3.28-3.11-2.97 A
Secondary Voltages	0-105-110-115 VAC
Secondary Full Load Current	18.18A
No load current 650V tap	20.91mA
No load losses	10.8 Watts
Full Load Loss	67.06 Watts
Efficiency 80% full load	97.16%
Efficiency 100% full load	96.76%
% Impedance	3.51%
Primary Inductance	12.63 mH
X/R Ratio	0.66
Inrush x times rated current	(4.72)
Inrush Current	14.68 Amps
I <sup>2</sup> t	5.11
Altitude	<2000 meters above sea level
Secondary inductance	0.37mH
Regulation	3.06%
Prospective fault current	526 Amps
Duration of prospective fault current	9.2 seconds
Temperature rise	72°C
Total Weight	39Kg
Operating Ambient Temperature	-20°C to + 60°C
Recommended Primary Fuse	6A BS88 & 10x38 gG IEC 60269-1&2
Recommended Maximum Secondary Fuse	32A BS88 & 10x38 gG IEC 60269-1&2
Primary & Secondary Terminals	Screw Clamp 0.5-10mm <sup>2</sup>
Functional Earth Terminal	Screw Clamp 0.5-10mm <sup>2</sup>
Insulation Resistance (500V)	
Primary to Core	>100M Ohms
Secondary to Core	>100M Ohms
Primary to Secondary	>100M Ohms
Impulse Withstand	8KV
Dielectric Strength	
Primary to Core	5.2KV
Secondary to Core	5.2KV
Primary to Secondary	5.2KV



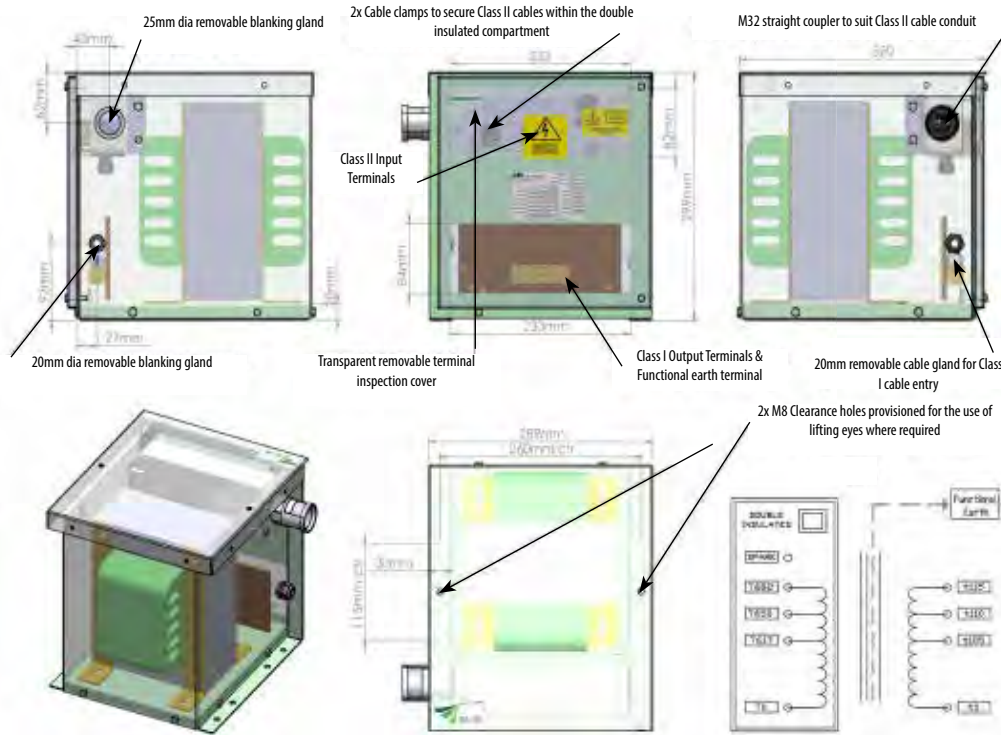
Part No	PADS No	System Type	VA	Input +/-5%	Output +/-5%	Range
T2925	054/214894	Class I & II	2000	650V	110V	eco-rail® Copper

# Copper

## 3KVA CLASS II HYBRID ISOLATION Transformer

PADS No: 054/214895

Cert No: PA05/05761



Primary resistance 617V tap @20°C	1.32Ω
Primary resistance 650V tap @20°C	1.42Ω
Primary resistance 682V tap @20°C	1.52Ω
Electrical Specification	T2903
Secondary resistance 105V tap @20°C	0.042Ω
Secondary resistance 110V tap @20°C	0.043Ω
Secondary resistance 115V tap @20°C	0.045Ω
Primary Voltages	617-650-682 VAC
Primary Full Load Current	4.9-4.66-4.44 A
Secondary Voltages	0-105-110-115 VAC
Secondary Full Load Current	27.3A
No load current 650V tap	52.89mA
No load losses	15.42 Watts
Full Load Loss	81.4 Watts
Efficiency 80% full load	97.7%
Efficiency 100% full load	97.4%
% Impedance	3.45%
Primary Inductance	9.39 mH
X/R Ratio	0.87
Inrush x times rated current	(5.4)
Inrush Current	24.91 Amps
I <sup>2</sup> t	14.84
Altitude	<2000 meters above sea level
Secondary inductance	0.27mH
Regulation	2.3%
Prospective fault current	847 Amps
Duration of prospective fault current	7.9 seconds
Temperature rise	83°C
Total Weight	54Kg
Operating Ambient Temperature	-20°C to + 60°C
Recommended Primary Fuse	6A BS88 & 10x38 gG IEC 60269-1&2
Recommended Maximum Secondary Fuse	40A BS88 & 10x38 gG IEC 60269-1&2
Primary & Secondary Terminals	Screw Clamp 0.5-10mm <sup>2</sup>
Functional Earth Terminal	Screw Clamp 0.5-10mm <sup>2</sup>
Insulation Resistance (500V) Primary to Core >100M Ohms Secondary to Core >100M Ohms Primary to Secondary >100M Ohms	Impulse Withstand 8KV
Dielectric Strength Primary to Core 5.2KV Secondary to Core 5.2KV Primary to Secondary 5.2KV	

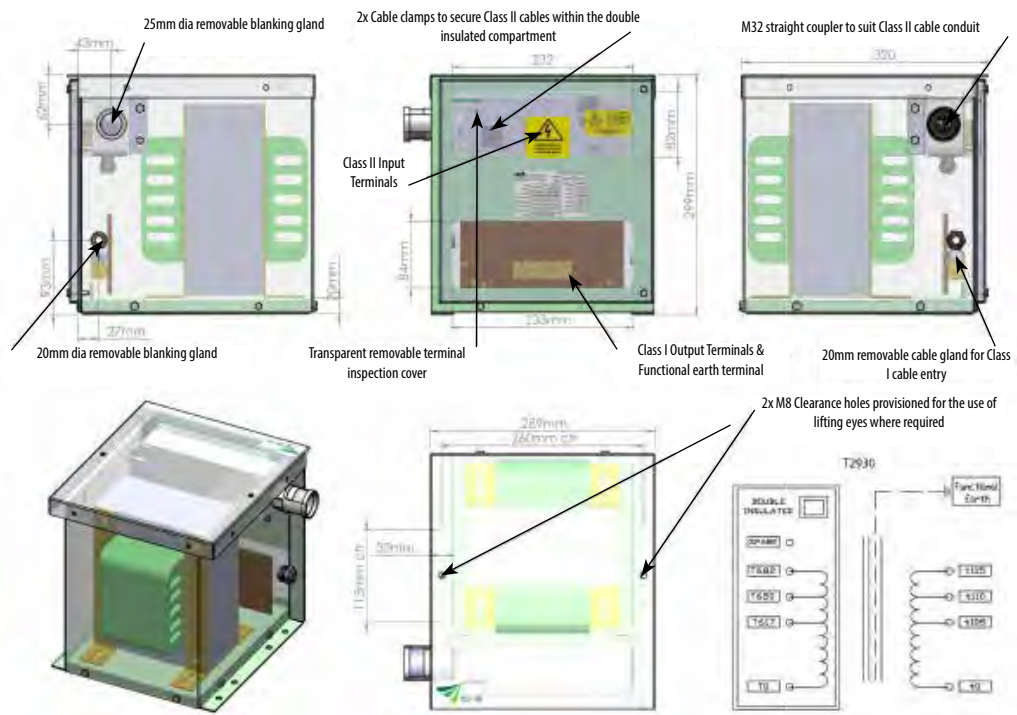
Part No	PADS No	System Type	VA	Input +/-5%	Output +/-5%	Range
T2903	054/214895	Class I & II	3000	650V	110V	eco-rail® Copper

# Copper

## 4KVA CLASS II HYBRID ISOLATION Transformer

PADS No: 054/214896  
Cert No: PA05/05761

Primary resistance 617V tap @20°C	0.78Ω
Primary resistance 650V tap @20°C	0.83Ω
Primary resistance 682V tap @20°C	0.86Ω
Electrical Specification	T2930
Secondary resistance 105V tap @20°C	0.024Ω
Secondary resistance 110V tap @20°C	0.025Ω
Secondary resistance 115V tap @20°C	0.027Ω
Primary Voltages	617-650-682 VAC
Primary Full Load Current	6.6-6.3-6 A
Secondary Voltages	0-105-110-115 VAC
Secondary Full Load Current	36.4A
No load current 650V tap	123mA
No load losses	33.16 Watts
Full Load Loss	109 Watts
Efficiency 80% full load	97.5%
Efficiency 100% full load	97.4%
% Impedance	2.98%
Primary Inductance	7.18 mH
X/R Ratio	1.23
Inrush x times rated current	(2.99)
Inrush Current	18.82 Amps
I <sup>2</sup> t	32.37
Altitude	<2000 meters above sea level
Secondary inductance	0.21mH
Regulation	1.62%
Prospective fault current	1291 Amps
Duration of prospective fault current	9.5 seconds
Temperature rise	59.69°C
Total Weight	69Kg
Operating Ambient Temperature	-20°C to + 60°C
Recommended Primary Fuse	10A BS88 & 10x38 gG IEC 60269-1&2
Recommended Maximum Secondary Fuse	63A BS88 & 10x38 gG IEC 60269-1&2
Primary & Secondary Terminals	Screw Clamp 0.5-10mm <sup>2</sup>
Functional Earth Terminal	Screw Clamp 0.5-10mm <sup>2</sup>
Insulation Resistance (500V)	
Primary to Core	>100M Ohms
Secondary to Core	>100M Ohms
Primary to Secondary	>100M Ohms
Dielectric Strength	
Primary to Core	5.2KV
Secondary to Core	5.2KV
Primary to Secondary	5.2KV

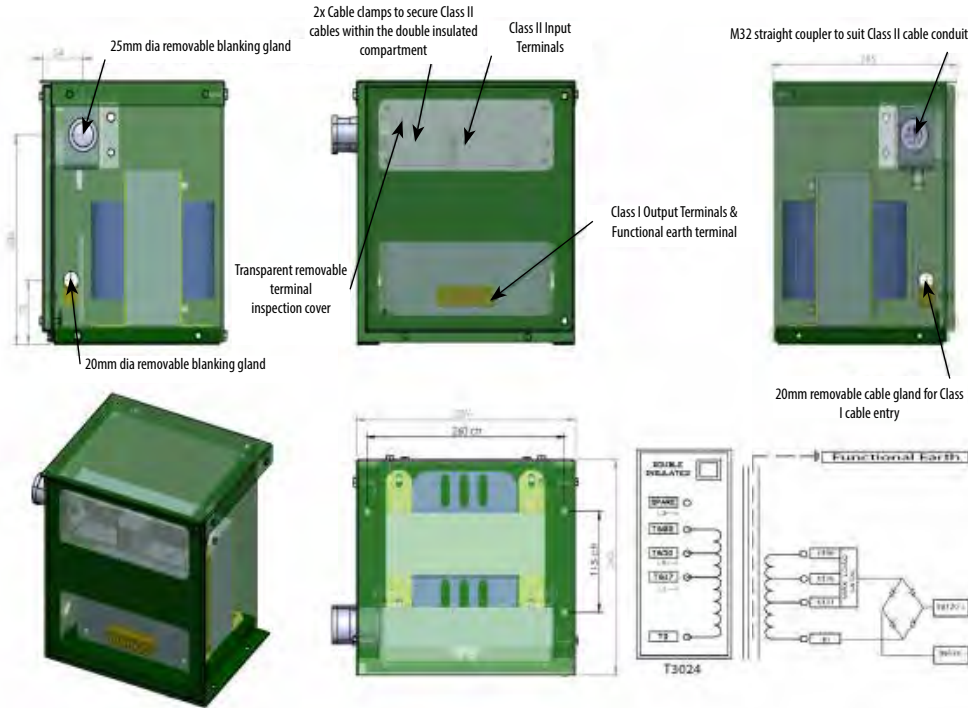


Part No	PADS No	System Type	VA	Input +/-5%	Output +/-5%	Range
<b>T2930</b>	<b>054/214896</b>	<b>Class I &amp; II</b>	<b>4000</b>	<b>650V</b>	<b>110V</b>	<b>eco-rail® Copper</b>



# Copper TJ

## 650VAC/120VDC @5A CLASS II HYBRID Transformer Rectifier PADS No: Under Approval



Primary resistance 617V tap @20°C	9Ω
Primary resistance 650V tap @20°C	9.6Ω
Primary resistance 682V tap @20°C	10Ω
Electrical Specification	T3024
Secondary resistance 105V tap @20°C	0.35Ω
Secondary resistance 110V tap @20°C	0.37Ω
Secondary resistance 115V tap @20°C	0.38Ω
Primary Voltages	617-650-682 VAC
Primary Full Load Current	1.12-1.06-1.01 A
Secondary Voltages	131-136-140 VAC
Secondary Full Load Current	5A
No load current 650V tap	16.9mA
No load losses	6.8 Watts
Full Load Loss	27 Watts
Efficiency 80% full load	96.5%
Efficiency 100% full load	96.2%
% Impedance	3.2%
Primary Inductance	24.11 mH
X/R Ratio	0.42
Inrush x times rated current	(5)
Inrush Current	5.32 Amps
I <sup>2</sup> t	1.94
Altitude	<2000 meters above sea level
Secondary inductance	1.07mH
Regulation	2.95%
Prospective fault current	156 Amps
Duration of prospective fault current	7.0 seconds
Temperature rise	70°C
Total Weight	23.5Kg
Operating Ambient Temperature	-20°C to + 60°C
Recommended Primary Fuse	2A BS88 & 10x38 gG IEC 60269-1&2
Primary & Secondary Terminals	Screw Clamp 0.5-10mm <sup>2</sup>
Functional Earth Terminal	Screw Clamp 0.5-10mm <sup>2</sup>
Insulation Resistance (500V)	
Primary to Core	>100M Ohms
Secondary to Core	>100M Ohms
Primary to Secondary	>100M Ohms
Dielectric Strength	
Primary to Core	5.2KV
Secondary to Core	5.2KV
Primary to Secondary	5.2KV
Impulse Withstand	8KV

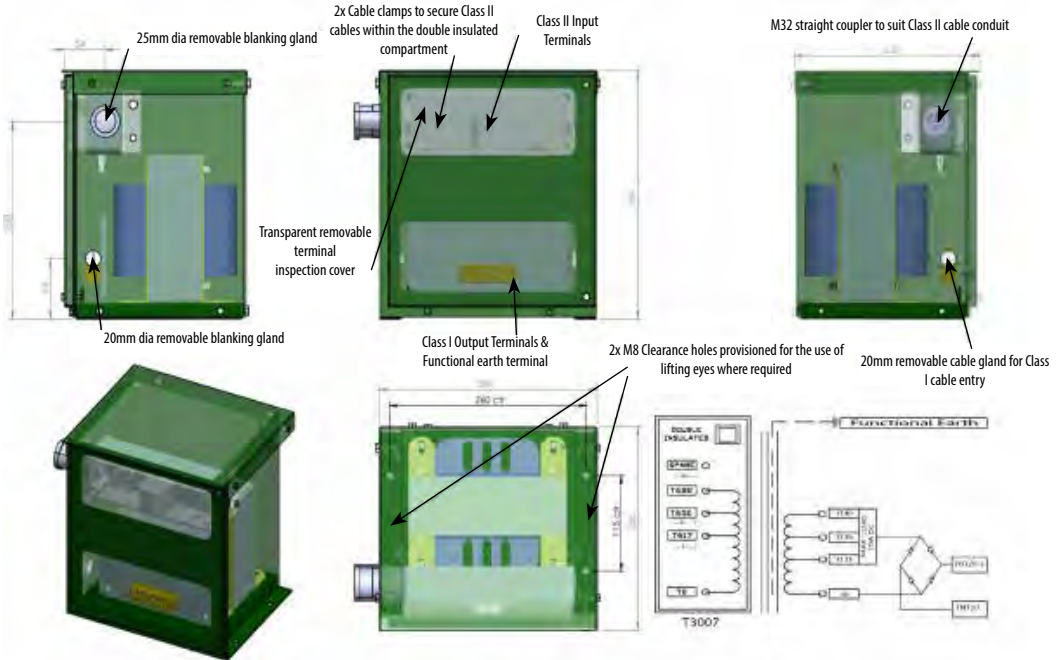
Part No	PADS No	System Type	VA	Input +/-5%	Output +/-5%	Range
T3024	Under Approval Rectifier (Tj)	Class I & II	5A	650V	120V D.C	eco-rail® Copper

# Copper TJ

## 650VAC/120VDC @10A CLASS II HYBRID Transformer Rectifier

PADS No: Under Approval

Primary resistance 617V tap @20°C	3Ω
Primary resistance 650V tap @20°C	3.2Ω
Primary resistance 682V tap @20°C	3.4Ω
Electrical Specification	T3007
Secondary resistance 105V tap @20°C	0.145Ω
Secondary resistance 110V tap @20°C	0.150Ω
Secondary resistance 115V tap @20°C	0.155Ω
Primary Voltages	617-650-682 VAC
Primary Full Load Current	2.24-2.12-2.02 A
Secondary Voltages	131-136-140 VAC
Secondary Full Load Current	10A
No load current 650V tap	26.78mA
No load losses	12.145 Watts
Full Load Loss	40.935 Watts
Efficiency 80% full load	97.26%
Efficiency 100% full load	97.1%
% Impedance	2.5%
Primary Inductance	10.98 mH
X/R Ratio	0.55
Inrush x times rated current	(9.8)
Inrush Current	20.8 Amps
i <sup>2</sup> t	8.69
Altitude	<2000 meters above sea level
Secondary inductance	0.49mH
Regulation	2.13%
Prospective fault current	429 Amps
Duration of prospective fault current	4.6 seconds
Temperature rise	67°C
Total Weight	40Kg
Operating Ambient Temperature	-20°C to + 60°C
Recommended Primary Fuse	4A BS88 & 10x38 gG IEC 60269-1&2
Recommended Maximum Secondary Fuse	75A BS88 & 10x38 gG IEC 60269-1&2
Primary & Secondary Terminals	Screw Clamp 0.5-10mm <sup>2</sup>
Functional Earth Terminal	Screw Clamp 0.5-10mm <sup>2</sup>
Insulation Resistance (500V) Primary to Core >100M Ohms Secondary to Core >100M Ohms Primary to Secondary >100M Ohms	Impulse Withstand 8KV
Dielectric Strength Primary to Core 5.2KV Secondary to Core 5.2KV Primary to Secondary 5.2KV	

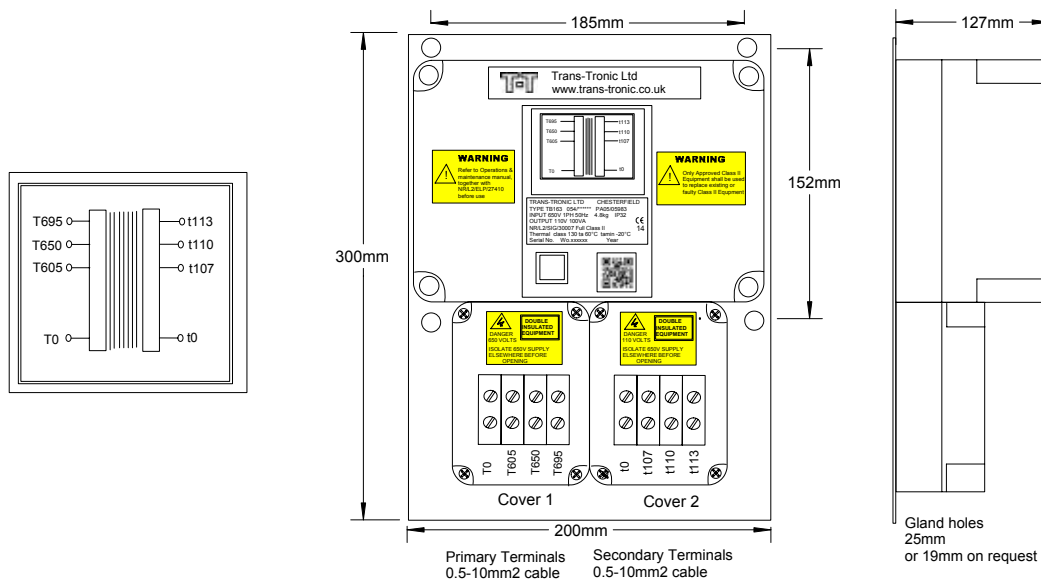


Part No	PADS No	System Type	VA	Input +/-5%	Output +/-5%	Range
T3007	Under Approval Rectifier (TJ)	Class I & II	10A	650V	120V D.C	eco-rail® Copper

## Copper

## Full Class II Isolating Transformer for Non-Critical Auxiliary Circuits

PADS No: 054/212373



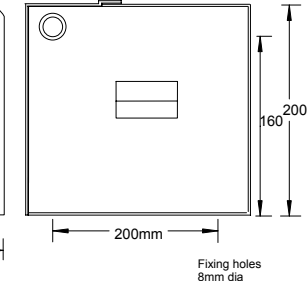
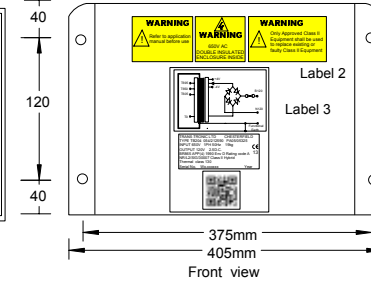
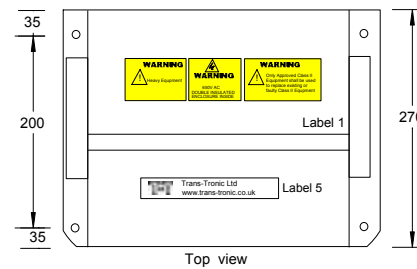
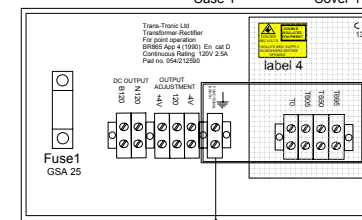
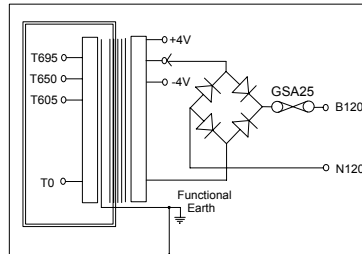
Primary Input Class II	T0-T605-T650-T695
Secondary Output Class II	T0-T107-T110-T113
Full Load Rating	100VA
Primary Terminals	Screw Up Clamp 0.5-10mm <sup>2</sup>
Secondary Terminals	Screw Up Clamp 0.5-10mm <sup>2</sup>
Enclosure	IP32
Efficiency	94% @ 80% Load
Regulation	6.0%
Impedance	9.6%
No Load Loss	1.5 Watts
Full Load Loss	8.0 Watts
Primary Resistance @ 20°C	114 ohms @ 650V
Primary Inductance	953mH @ 650V
Secondary Resistance @ 20°C	3.2 ohms @ 110V
Secondary Inductance	31mH @ 110V
Input Current @ Full Load Rating	0.18A @ 605V 0.17A @ 650V 0.16A @ 695V
Maximum Input Current @ Full Load Rating	0.22A @ 605V 0.21A @ 650V 0.20A @ 695V
Output Current @ Full Load Rating	0.91A
Maximum Output Current @ Full Load Rating	1.09A
Peak Inrush Current	9.5x FLC (1.6A at 650V)
I <sup>2</sup> t	0.02 A <sup>2</sup> S
X/R Ratio	1.3
Prospective Short Circuit Output Current @ 20°C	9.6A for 5 Seconds
Operating Ambient Temperature	-20°C to +60°C
Humidity	Up to 100% RH
Altitude	<2000 Metres Above Sea Level
Recommended Fuse Protection	2A BS88 & 10x38 gG IEC 60269-1&2
Insulation Resistance (500V)	
Primary to Core	>100M Ohms
Secondary to Core	>100M Ohms
Primary to Secondary	>100M Ohms
Impulse Withstand	8KV
Dimensions	185x127x300mm High
Weight	4.8Kg
Colour	RAL 7035

Part No	PADS No	System Type	VA	Input +/-5%	Output +/-5%	Range
TB163	054/212373	Class I & II	100VA	650V	110V	Trans-Tronic

Primary Input Class II	T0-T605-T650-T695
Output Class I	B120 N120 with +4V Taps 2.5A Continuous
Primary Terminals	Screw Up Clamp 0.5-6mm <sup>2</sup>
Secondary Terminals	Screw Up Clamp 0.5-10mm <sup>2</sup>
Functional Earth	Screw Up Clamp 0.5-10mm <sup>2</sup>
Enclosure	IP32
Suitable for Driving	1 x Style 63 Point Motors 1 x HW2xxx Series 1 x HPSS Point Motors 2 x Clamp Lock Point Motors
Primary Resistance	11.8ohms @ 650V
Primary Inductance	22mH
Secondary Resistance	0.44ohms
Secondary Inductance	1.2mH
Duty Cycle 1	35A Surge for 0.1 Seconds 20A Clutch Slipping 0.4 Sec 15A Drive for 10 Seconds Every 1 Minutes
Duty Cycle 2	35A Surge for 0.1 Seconds 20A Clutch Slipping 0.4 Sec 10A Drive for 10 Seconds Every 2 Minutes
Duty Cycle 3	35A Surge for 0.1 Seconds 20A Clutch Slipping 0.4 Sec 12A Drive for 10 Seconds Every 3 minutes
Input Current @ 650V	0.63A @ 2.5A Continuous Out 2.6A @ 10A Drive Output 5.1A @ 20A Clutch Slip Out
Output Voltage	No Load <134V 10A DC Out 120+2V 20A DC Out >110V
Peak Inrush Current	9.6x FLC (25A at 230V)
I <sup>2</sup> t	4.7 A <sup>2</sup> S
X/R Ratio	0.35
Operating Ambient Temperature	-20°C to +60°C
Humidity	Up to 100% RH
Altitude	<2000 Metres Above Sea Level
Recommended Fuse Protection	BS88 & 10x38g IEC 60269-1&2 4A 10-12A Drive
Insulation Resistance (500V)	
Primary to Core	>100M Ohms
Secondary to Core	>100M Ohms
Primary to Secondary	>100M Ohms
Dielectric Strength	Primary to Body 5.2Kv Secondary to Body 2.8Kv Primary to Secondary 5.2Kv
Dimensions	405x270x200mm High
Weight	19Kg
Colour	BS381c Shade 632

## 650/120V @2.5A DC CLASS II HYBRID Transformer Rectifier PADS No: 054/212590

Copper  
TJ



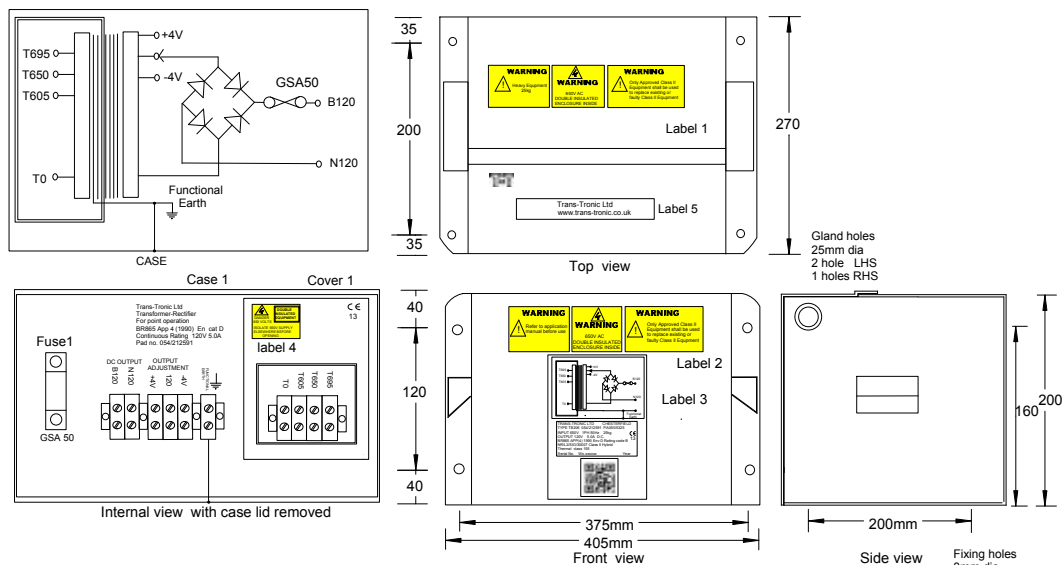
Part No	PADS No	System Type	Input +/-5%	Output +/-5%	Range
<b>TB203</b>	<b>054/212590</b>	<b>Class I &amp; II</b>	<b>650V</b>	<b>120V</b>	<b>Trans-Tronic</b>



# Copper TJ

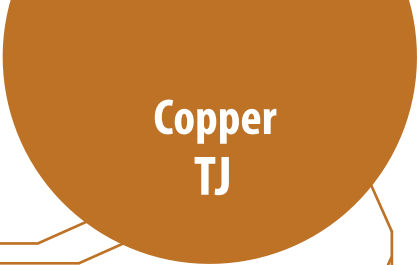
## 650/120V @5A DC CLASS II HYBRID Transformer Rectifier

PADS No: 054/212591



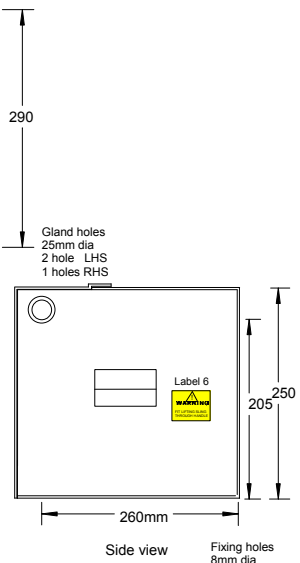
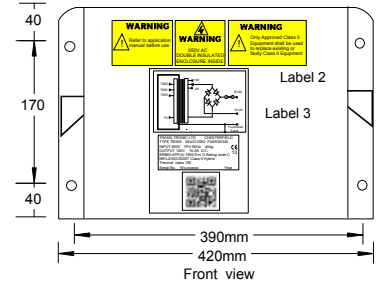
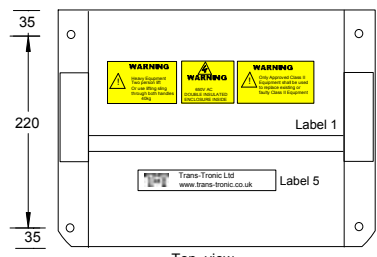
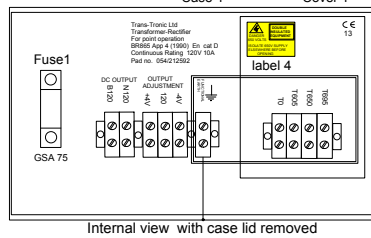
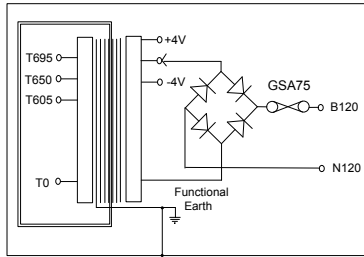
Primary Input Class II	T0-T605-T650-T695	
Output Class I	B120 N120 with +4V Taps 2.5A Continuous	
Primary Terminals	Screw Up Clamp 0.5-6mm <sup>2</sup>	
Secondary Terminals	Screw Up Clamp 0.5-10mm <sup>2</sup>	
Functional Earth	Screw Up Clamp 0.5-10mm <sup>2</sup>	
Enclosure	IP32	
Suitable for Driving	2 x Style 63 Point Motors 2 x HW2xxx Series 2 x HP55 Point Motors 4 x Clamp Lock Point Motors 1 x Hydrive Point Motor	
Primary Resistance	4.8ohms @ 650V	
Primary Inductance	12mH	
Secondary Resistance	0.19ohms	
Secondary Inductance	0.65mH	
Duty Cycle 1	70A Surge for 0.1 Seconds 30A Clutch Slipping 0.4 Sec 20A Drive for 10 Seconds Every 1 Minutes	
Duty Cycle 2	70A Surge for 0.1 Seconds 40A Clutch Slipping 0.4 Sec 20A Drive for 10 Seconds Every 2 Minutes	
Duty Cycle 3	70A Surge for 0.1 Seconds 40A Clutch Slipping 0.4 Sec 24A Drive for 10 Seconds Every 3 minutes	
Input Current @ 650V	1.31A @ 5.0A Continuous Out 5.1A @ 20A Drive Output 10.2A @ 40A Clutch Slip Out	
Output Voltage	No Load <134V 20A DC Out 120+2V 40A DC Out >110V	
Peak Inrush Current	9.2xFLC (47A t 650V)	
I <sup>2</sup> t	17 A <sup>2</sup> S	
X/R Ratio	0.51	
Operating Ambient Temperature	-20°C to +60°C	
Humidity	Up to 100% RH	
Altitude	<2000 Metres Above Sea Level	
Recommended Fuse Protection	BS88 & 10x38gG IEC 60269-1&2 6A	
Insulation Resistance (500V)	Primary to Core >100M Ohms Secondary to Core >100M Ohms Primary to Secondary >100M Ohms	Impulse Withstand 8KV
Dielectric Strength	Primary to Body 5.2Kv Secondary to Body 2.8Kv Primary to Secondary 5.2Kv	
Dimensions	405x270x200mm High	
Weight	25Kg	
Colour	BS381c Shade 632	

Part No	PADS No	System Type	Input +/-5%	Output +/-5%	Range
TB206	054/212591	Class I & II	650V	120V	Trans-Tronic



# 650/120V @10A DC CLASS II HYBRID Transformer Rectifier PADS No: 054/212592

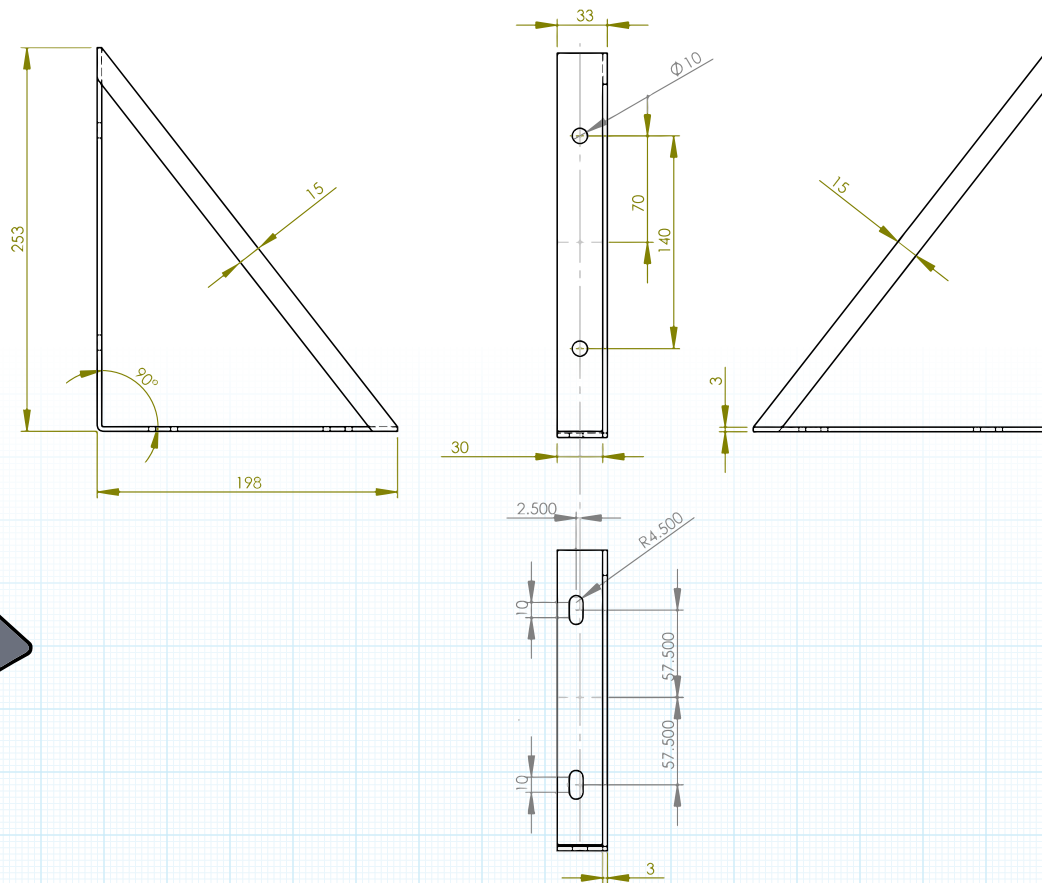
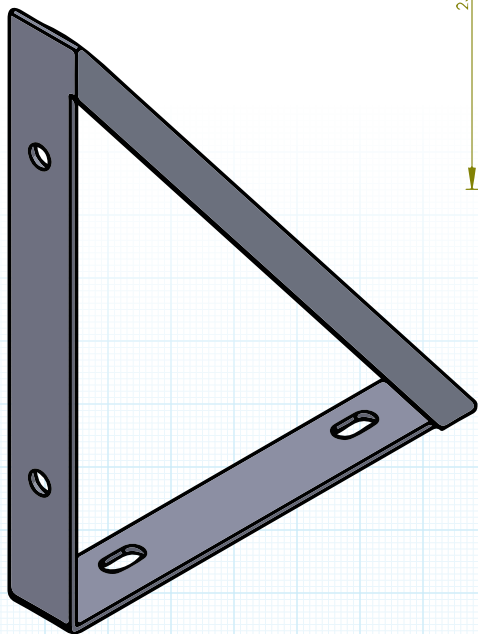
Primary Input Class II	T0-T605-T650-T695
Output Class I	B120 N120 with +4V Taps 10A Continuous
Primary Terminals	Screw Up Clamp 0.5-6mm <sup>2</sup>
Secondary Terminals	Screw Up Clamp 0.5-16mm <sup>2</sup>
Functional Earth	Screw Up Clamp 0.5-16mm <sup>2</sup>
Enclosure	IP32
Suitable for Driving	4 x Style 63 Point Motors 4 x HW2xxx Series 4 x HPSS Point Motors 8 x Clamp Lock Point Motors 2 x Hydrive Point Motors
Primary Resistance	2.01ohms @ 650V
Primary Inductance	10.6mH
Secondary Resistance	0.090 ohms
Secondary Inductance	0.52mH
Duty Cycle 1	140A Surge for 0.1 Seconds 60A Clutch Slipping 0.4 Sec 20A Drive for 10 Seconds Every 1 Minutes
Duty Cycle 2	140A Surge for 0.1 Seconds 80A Clutch Slipping 0.4 Sec 40A Drive for 10 Seconds Every 2 Minutes
Duty Cycle 3	140A Surge for 0.1 Seconds 80A Clutch Slipping 0.4 Sec 48A Drive for 10 Seconds Every 3 minutes
Input Current @ 650V	2.6A @ 10A Continuous Out 10.0A @ 40A Drive Output 19.8A @ 80A Clutch Slip Out
Output Voltage	No Load <134V 40A DC Out 120+2V 80A DC Out >110V
Peak Inrush Current	9.3x FLC (94A at 650V)
I <sup>2</sup> t	66 A <sup>2</sup> S
X/R Ratio	0.76
Operating Ambient Temperature	-20°C to +60°C
Humidity	Up to 100% RH
Altitude	<2000 Metres Above Sea Level
Recommended Fuse Protection	BS88 & 10x38gG IEC 60269-1&2 10A for 40A Drive, 12A for 48A Drive
Insulation Resistance (500V)	Primary to Core >100M Ohms Secondary to Core >100M Ohms Primary to Secondary >100M Ohms
Dielectric Strength	Impulse Withstand 8KV Primary to Body 5.2Kv Secondary to Body 2.8Kv Primary to Secondary 5.2Kv
Dimensions	420x290x250mm High
Weight	40Kg
Colour	BS381c Shade 632



Part No	PADS No	System Type	Input +/-5%	Output +/-5%	Range
<b>TB209</b>	<b>054/212592</b>	<b>Class I &amp; II</b>	<b>650V</b>	<b>120V</b>	<b>Trans-Tronic</b>

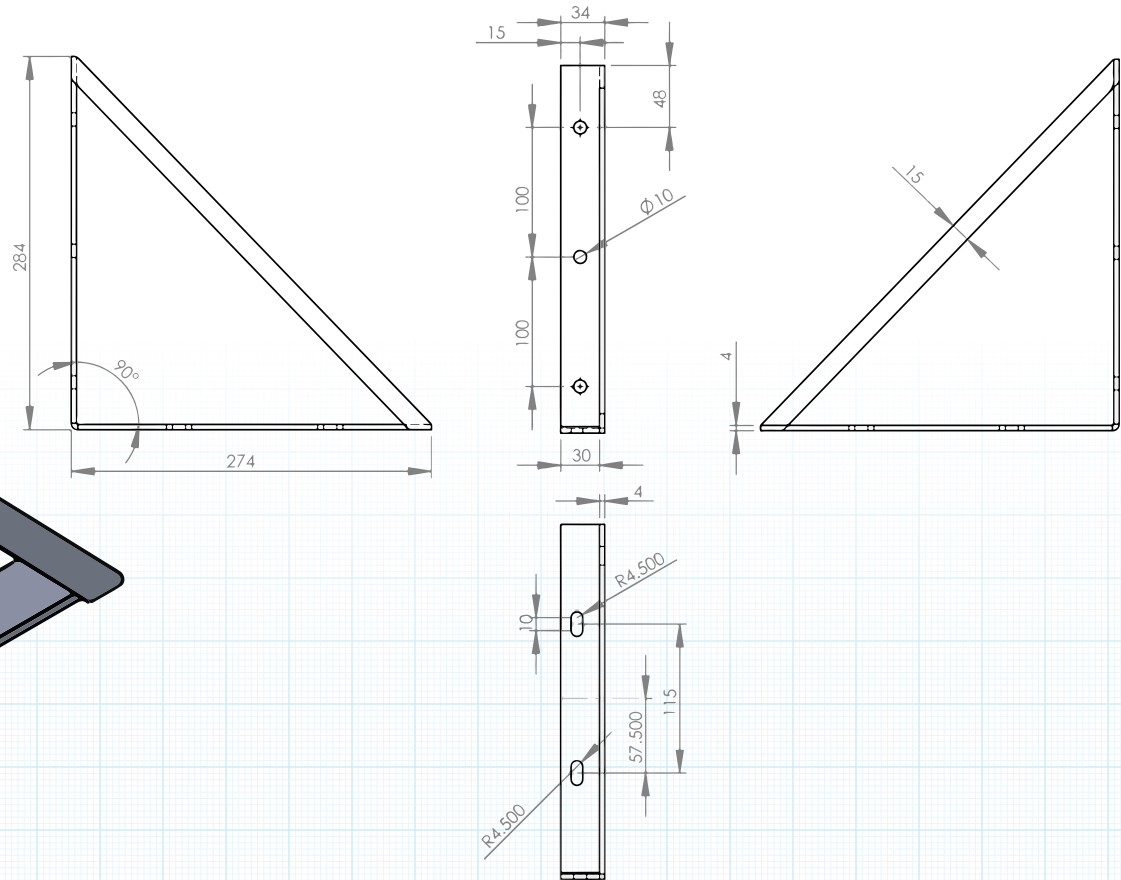
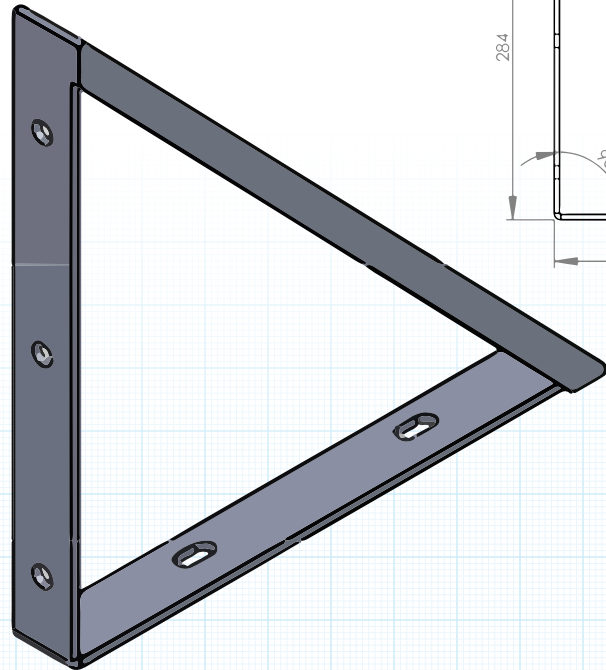
# Legacy Mounting Brackets for 250VA - 500VA Transformers

Part No	PADS No	For Use With
D1496-1	054/2148097	250VA
		500VA



# Legacy Mounting Brackets for 1KVA - 1.5KVA Transformers

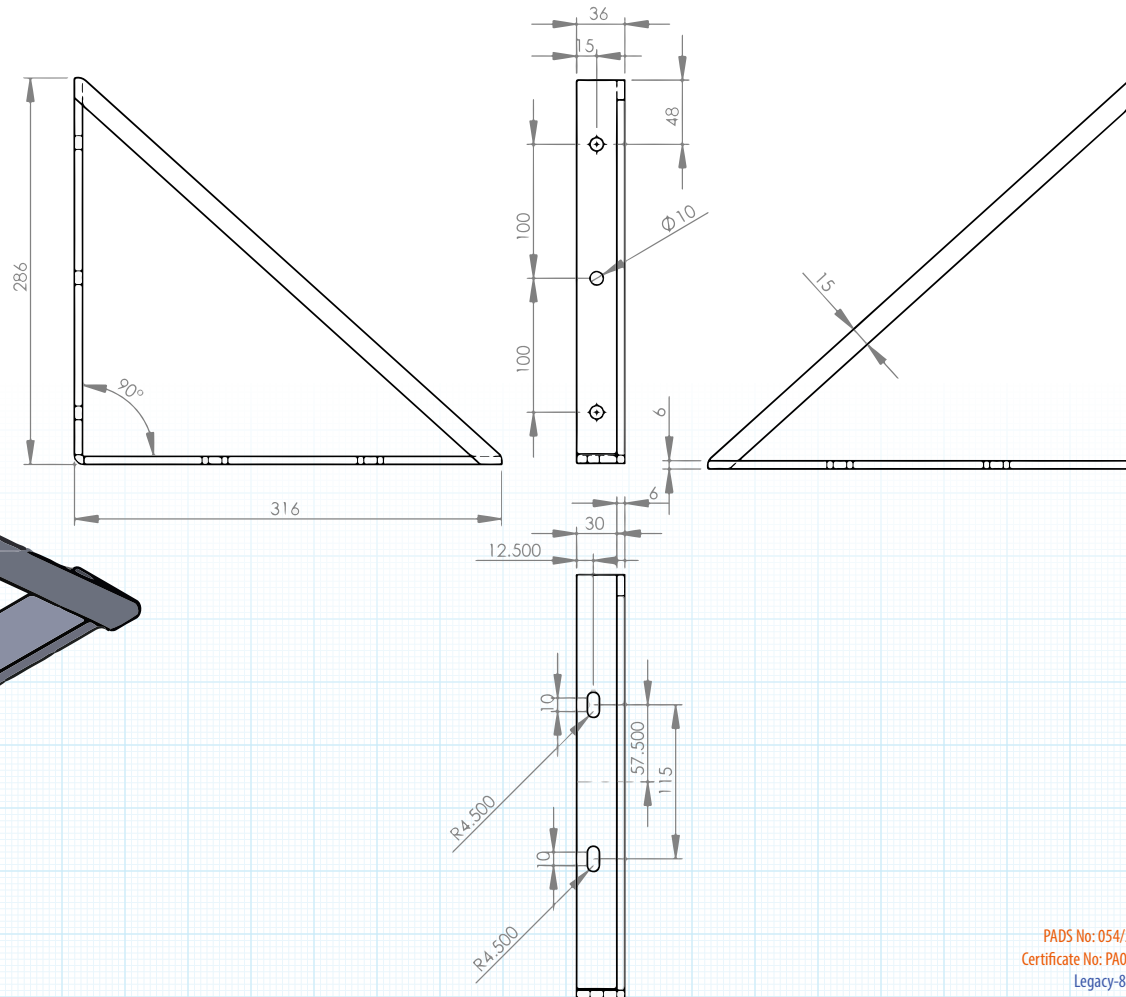
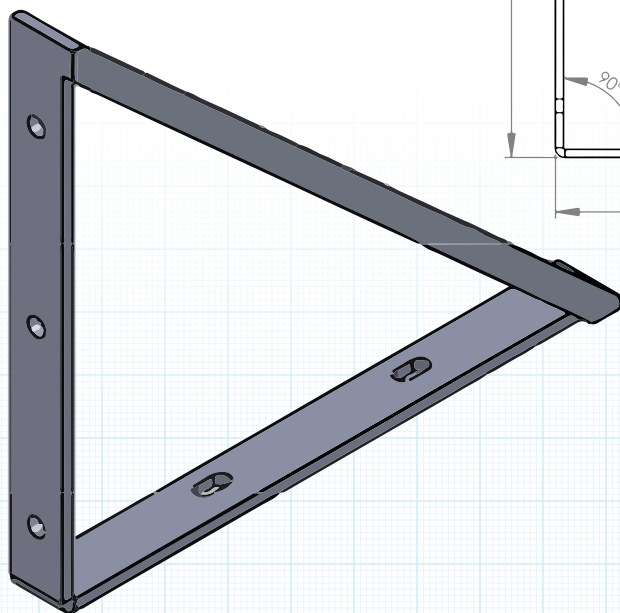
Part No	PADS No	For Use With
<b>D1496-2</b>	<b>054/2148098</b>	<b>1KVA</b>
		<b>1.5KVA</b>
		<b>5A Rectifiers</b>

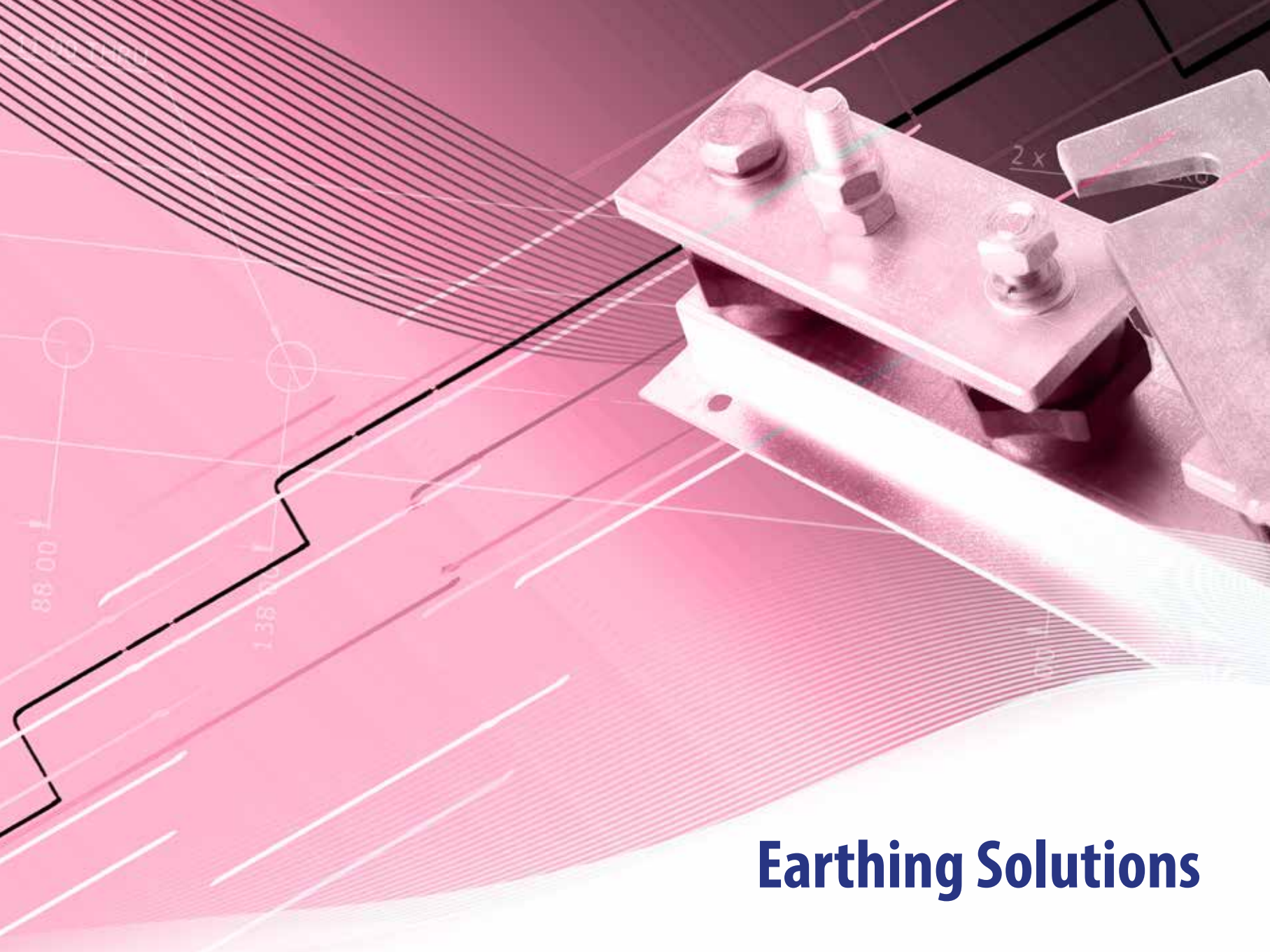




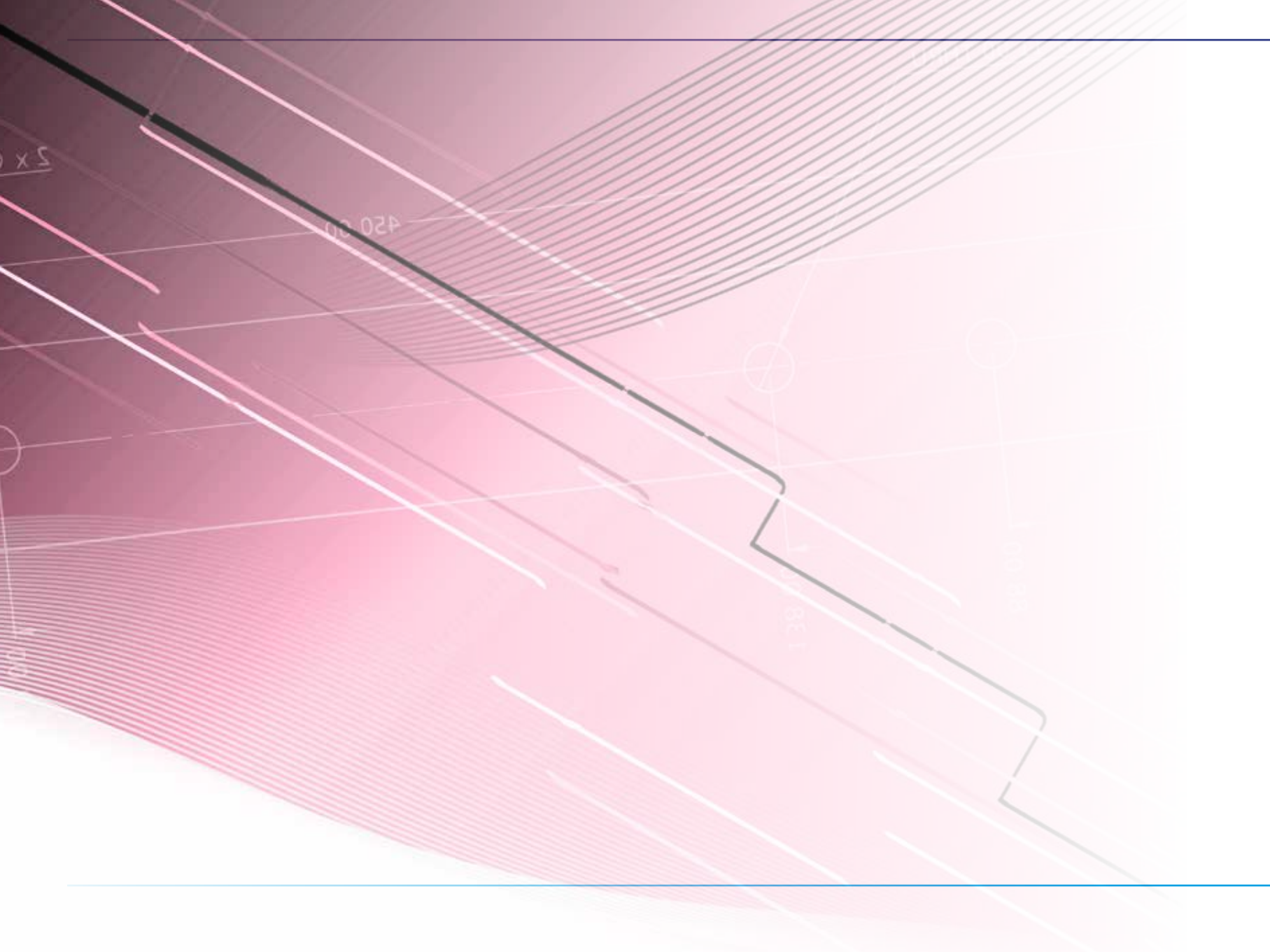
# Legacy Mounting Brackets for 2KVA - 4KVA Transformers & 10A Rectifiers

Part No	PADS No	For Use With
<b>D1496-3</b>	<b>054/2148099</b>	<b>2KVA (Cu)</b>
		<b>3KVA (Cu)</b>
		<b>4KVA (Cu)</b>
		<b>10A Rectifiers</b>





# Earthing Solutions

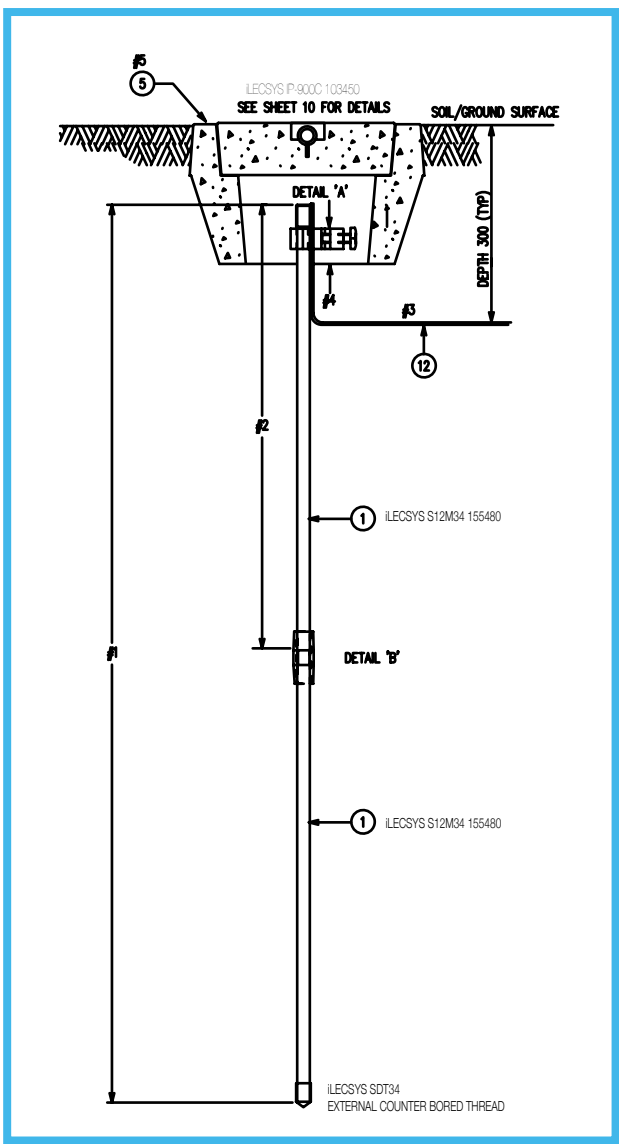


# Earthing Introduction

Earthing components must offer both a low resistance to earth and have excellent corrosion resistance as they will be buried in the ground for many years. The range of earthing products from iLECSYS Rail includes earth bars, rods, plates, clamps and inspection pits which are all designed in line with BS7340.



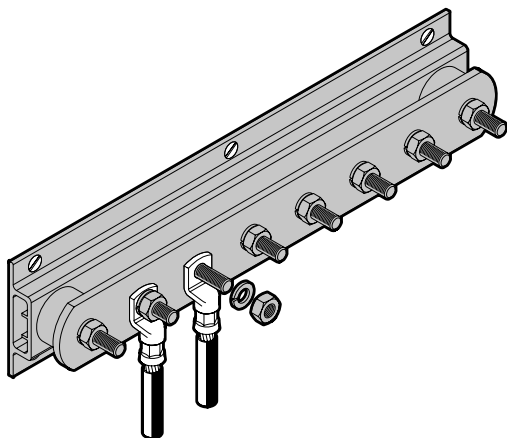
**CADWELD  
PLUS**  
Page 106





# Earthing Bars

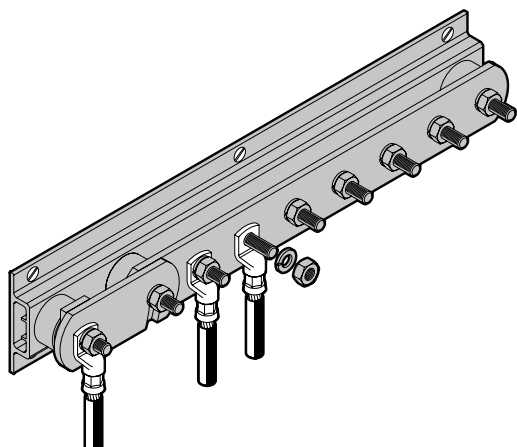
Earth Bars & Links can provide a convenient common earthing point for electrical installations. Copper earth bars are available with no disconnecting link and also with a single or twin link. This means the earth bars can be isolated for testing. Manufactured from 50x6mm copper with M10 termination screws.



## Standard Features & Benefits

- The plastic channel base is entirely corrosion proof - made from high impact uPCV unlike the traditional galvanised steel channel
- Lighter and easier to handle - the use of a modern polymer channel has reduced the weight of the products, making them easier to handle
- Pre-drilled fixing holes for ease of installation

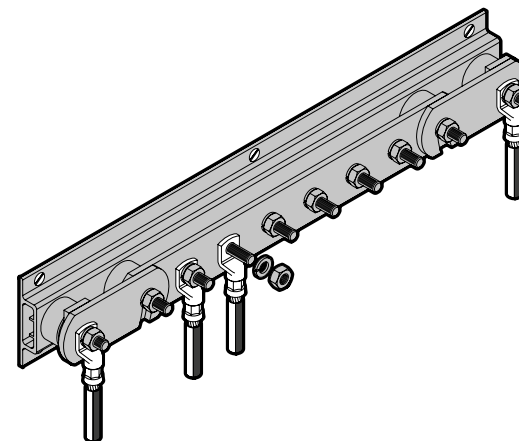
Copper Earth Bar			
Description	Length	Weight (each)	Part No.
<b>6 Way</b>	<b>400mm</b>	<b>1.80 kg</b>	<b>LK245-6</b>
<b>10 Way</b>	<b>650mm</b>	<b>2.80 kg</b>	<b>LK245-10</b>
<b>16 Way</b>	<b>950mm</b>	<b>4.00 kg</b>	<b>LK245-16</b>



### Copper Earth Bar with Single Disconnecting Link

Description	Length	Weight (each)	Part No.
6 Way	475mm	2.30 kg	LK243-6
10 Way	725mm	3.30 kg	LK243-10
16 Way	1025mm	4.50 kg	LK243-16

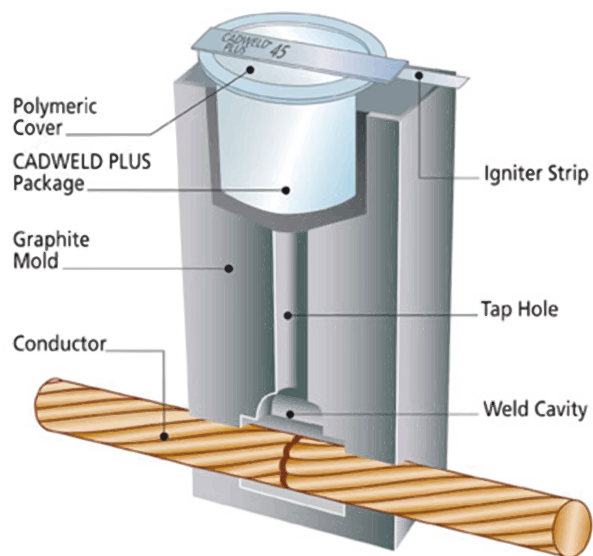
Copper Earth Bar with Twin Disconnecting Link			
Description	Length	Weight (each)	Part No.
6 Way	550mm	2.80 kg	LK207-6
10 Way	800mm	3.80 kg	LK207-10
16 Way	1100mm	5.00 kg	LK207-16



## CADWELD® PLUS

CADWELD PLUS is the latest advancement in exothermic products. Since its development in 1938, CADWELD electrical connections have become recognised as the ultimate connection for rail, cathodic, power and grounding applications.

The revolutionary CADWELD PLUS system is a simplified method of performing exothermically welded electrical connections. The integrated welding material package has streamlined the installation process by eliminating ignition materials - reducing set up time.



## What's Included



- Handle Clamp
- Mold for H Welds
- Mold for welds on 1/2 rods
- Mold for welds on 5/8 rods
- Mold for welds on 3/4 rods
- Set of 33 batting/gaskets
- SKK1 clamp
- Toolset
- Slag removal spade
- Language free instruction sheet

A CADWELD PLUS demonstration can be found online at [www.ilecsysrailonline.co.uk](http://www.ilecsysrailonline.co.uk) or by simply scanning the QR code



# The Benefits of Using CADWELD PLUS

- Withstand repeated fault currents without failing during operation
- Join copper to copper, copper to galvanised or plain steel, copper to bronze/brass/stainless steel, steel to steel etc.
- Current carrying capacity equal to or greater than that of the conductor
- Permanent, molecular bond that will not loosen or corrode, resulting in a connection that with a lifetime equal to that of the installation
- No external power or heat source required
- Minimal installation training required
- Completes welds at distances of up to 6 ft/1.8 meters
- Requires minimum components - no starting material, no disks, no flint igniter's
- Easy to handle, store and transport
- Reduces installation time by 20%
- Has electronic ignition with a CE/UL battery powered controller box that is designed for 600 connections with one set of standard AA batteries, removing the need for special batteries or chargers
- Consists of tamper proof, disposable, moisture
- Quality assurance inspection is easy and visual

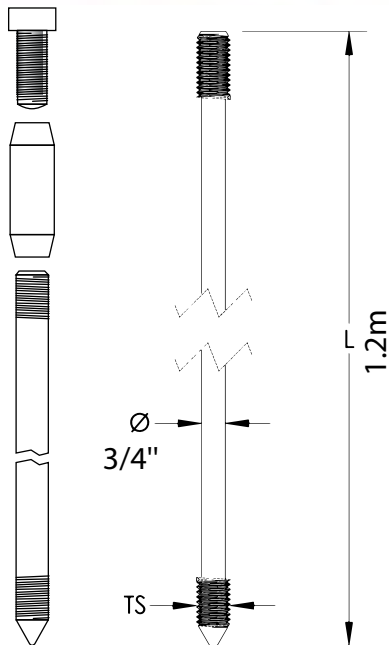
## CADWELD PLUS Control Unit (PLUSCU)

- Battery powered controller box designed for 600 connections with one set of eight standard AA batteries
- Requires no special batteries or charger
- Comes standard with a 6' (1.8 m), high temperature lead
- Connects to the welding material ignition strip with a custom made, purpose-designed termination clip
- Sends a predetermined voltage to the ignition strip and initiates the reaction





# Earthing Bars & Accessories



## Copper Bonded Ground Rod , Sectional - 155480

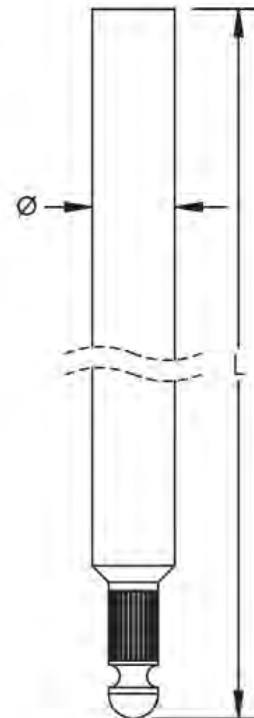
- Cold-rolled threads with continuous, unbroken grain flows preserve copper coating and are stronger than cut threads
- 99.9% Pure electrolytic copper coating
- Molecular bond to nickel-sealed high strength steel core
- Rods have a high carbon steel core and tip that provide superior strength when driving
- Copper coating will not crack when bent or tear when driven
- Minimum copper coating of 10 mils on rods listed to UL®467
- UL logo and control number where applicable stamped on each rod for easy inspection after installation

Part Number	155480
Material	Copper-Bonded Steel
Tensile Strength	552 MPa Min
Thread Location	Pointed and Chamfered Ends
Ground Rod Diameter, Nominal	3/4"
Ground Rod Diameter, Actual (Ø)	17,3 mm
Thread Size (TS)	3/4 UNC
Length (L)	2,1 m
Unit Weight	2.150 kg
Complies With	IEC® EN 62561-2

## Stainless Steel Ground Rod - 158540

- Extensible rod does not require a coupler in order to extend the length of the ground rod

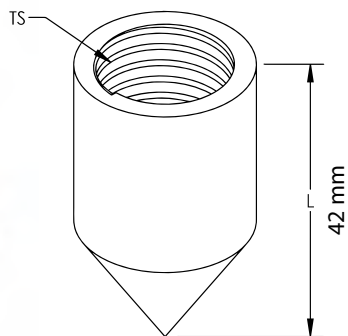
<b>Part Number</b>	<b>158540</b>
Material	Stainless Steel 316
Tensile Strength	483 MPa Min
Tensile Strength	Pointed and Chamfered Ends
Ground Rod Diameter, Actual (Ø)	20 mm
Length (L)	1.5m
Unit Weight	3.7 kg
EAN-13	8711893017571



## Galvanised Steel Ground Rod - 158810

- Type SG galvanised steel extensible round rod
- Steel quality DIN 17100
- Compliant with CEI 7/6
- Nominal diameter: 20mm
- Resistance: >70daN/mm<sup>2</sup>
- Length: 1.5m





## Ground Rod Driving Point - SDT34

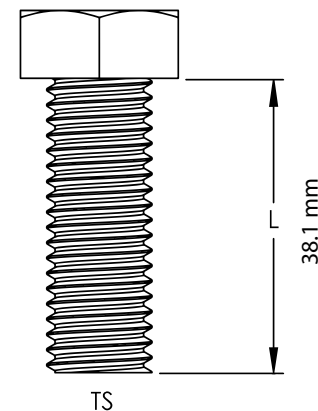
- Threaded ground rod driving tip to assist in driving sectional ground rods into the earth

Part Number	SDT34
Material	Steel
Ground Rod Diameter, Nominal	3/4"
Thread Size (TS)	3/4 UNC
Length (L)	42 mm
Weight (per 25)	0.070 kg

## Ground Rod Driving Stud - 158110

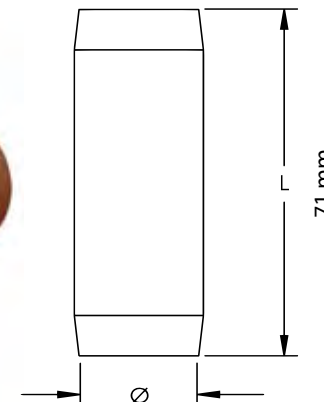
- Used in conjunction with threaded couplers while driving sectional ground rods

Part Number	158110
Material	Steel
Ground Rod Diameter, Nominal	3/4"
Thread Size (TS)	3/4 UNC
Length (L)	38.1 mm
Weight (per 25)	0.126 kg



## Threaded Coupler - SC34 (158050)

- High-strength couplings are threaded and chamfered at both ends for easy driving
- Corrosion-resistant couplings ensure permanent, low resistance copper-to-copper connections



Part Number	SC34
Material	Bronze
Ground Rod Diameter, Nominal	3/4"
Thread Size (TS)	3/4 UNC
Length (L)	71 mm
Unit Weight	0.17 kg

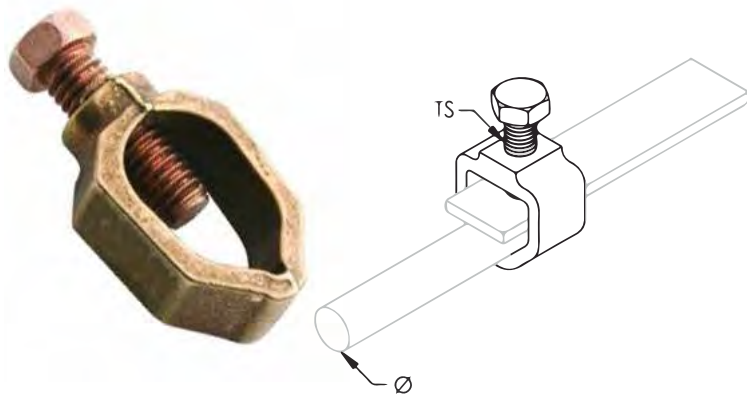
## Tape Conductor (Bare) - TC-EC-2530-50

- Use for lightning protection system down conductor or grounding applications



Part Number	710510
Material	Copper
Width	25 mm
Thickness	3 mm
Length	50 m
Unit Weight	0.671 kg





## Ground Rod Clamp (Rod to Tape) - RTC2051

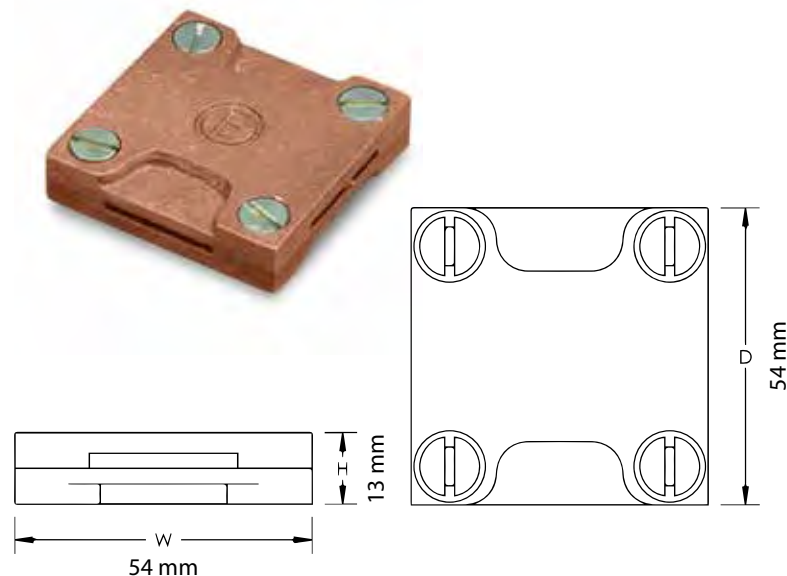
- Mechanical rod to tape clamp allows the conductor to be disconnected from the earthing system

Part Number	RTC2051
Material	Gunmetal, Stainless Steel 304
Thread Size (TS)	M10
Clamp Capacity	51 x 12 mm
Unit Weight	0.310 kg

## Square Tape Clamp - STC253

- Provides connection for cross-run, right angle, "T" and through tape connections

Part Number	STC253
Material	Brass
Tape Size	25 x 3 mm
Depth (D)	54 mm
Height (H)	13 mm
Width (W)	54 mm
Unit Weight	0.2 kg

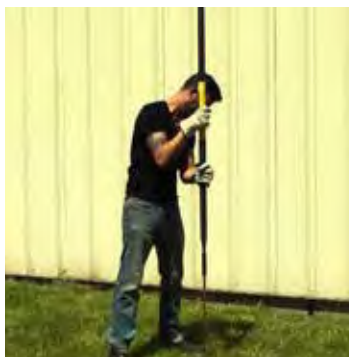


## Ground Rod Driver - EGRD34

This one tool enables driving of rods to ground level, without heavy sledge-hammers or ladders and without deforming the end of the rod. Heavy-duty steel construction provides robustness and excellent driving force, while the soft rubber ergonomic grip provides user comfort.

- Usable on all types of round ground rods: copper -bonded, galvanised, stainless steel
- 17,2 mm (3/4") inserts are interchangeable with standard driver body to enable easy driving of standard rods
- The driver will not deform the end of the rod, making connection of the ground conductor quick and easy
- Integral insert helps prevent the driver from slipping off the rod near ground level
- Convenient retaining collar holds the insert in the tool when not in use
- Self-contained and easy to store
- Saves time and money and dramatically reduces risks of employee injury

The ground rod driver includes driver body with soft rubber grip, insert for driving rods to ground level and retaining collar which holds the insert in place during storage



Scan the QR code to see the ground rod in action

## Earthing Mats - Plain or Lattice

- Copper Plates & Lattices provide a large surface area to dissipate current into the ground



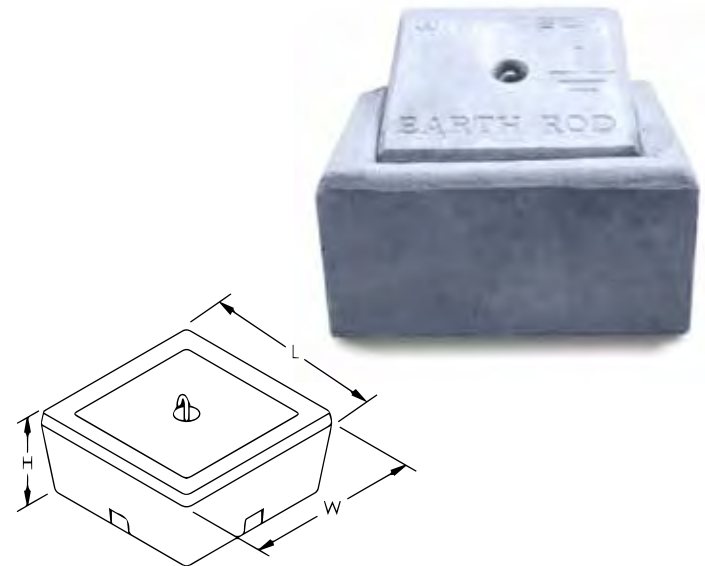
Part Number - Plain	504590 - PC30909
Material	Copper
Width	900 mm
Length	900 mm
Thickness	3 mm
Unit Weight	21.630 kg

Part Number - Lattice	710240 - EML993
Material	Copper
Width	900 mm
Length	900 mm
Thickness	3 mm
Unit Weight	7.20 kg

## Inspection Pits - IP900C

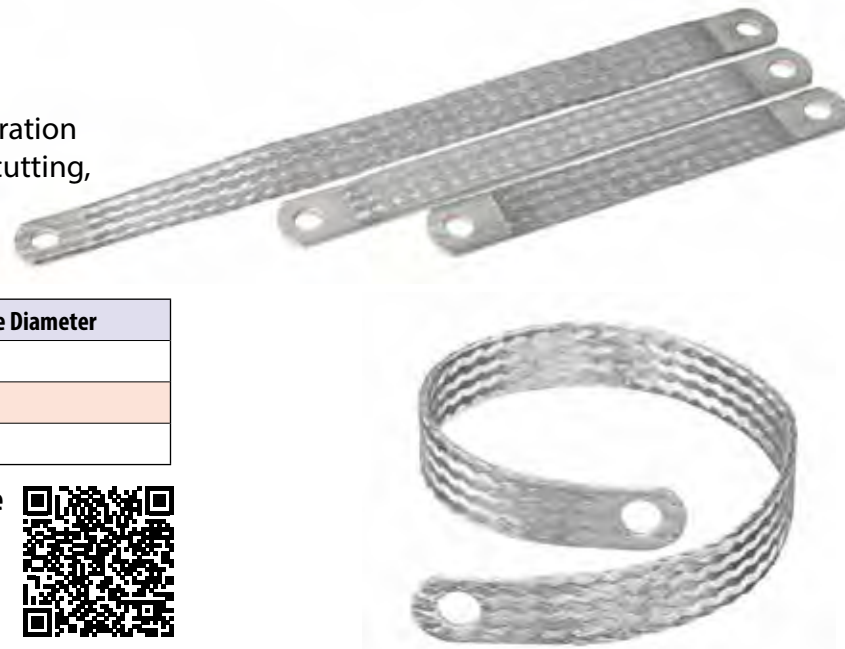
- Concrete design for higher load rating
- Available with a central lifting hook
- Flush-fitting lid with plain surface minimises slipping
- Suitable for most grounding and lightning protection installations

Part Number	IP900C
Material	Concrete
Colour	Grey
Height (H)	152mm
Length (L)	330mm
Width (W)	330mm
Unit Weight	25.9 kg



## Earthing Braids for LOC's

Tinned copper earth braids with integral palms have excellent tensile strength and good resistance to vibration and fatigue. Ready to use, eliminating the need for cutting, stripping, crimping or punching and they do not require the addition of tin or crimped lugs.



Part Number	Length	Width	Hole Diameter
556780	150mm	23mm	M10
556790	200mm	23mm	M10
556810	300mm	23mm	M10

To find out more about Earthing Braids, simply scan the QR code



## Earthing Cables - TRI50 GREEN/YELLOW



Constructed from flexible stranded plain annealed copper wire to BS6360 (Class 5) with plasticised PVC insulation formulated for flexibility and comply with UL, CSA and British Standard tests for spread of flame on a single vertical cable.

Part Number	Nominal Dia - mm <sup>2</sup>	AWG	Nominal Conductor Dia - mm <sup>2</sup>	Nominal Cable Dia - mm <sup>2</sup>	UL Style Number	Copper Strands Per Core	Maximum Current Rating
TRI-50	50	1	10.3	14.75	1284	396/0.4	204

## GEM - Ground Enhancement Material

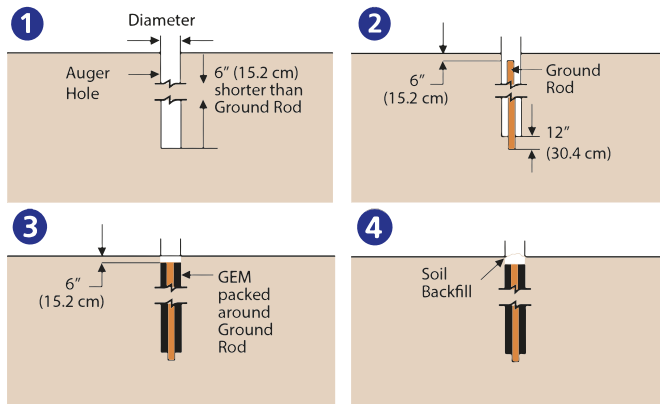
Ground Enhancement Material (GEM) is a superior conductive material that solves your toughest grounding problems. Third-party testing has been completed to verify that GEM conforms to IEC 62561-7. This standard introduces a benchmark for corrosion and electrical performance that has been absent from the industry to date.

GEM contains portland cement, which sets within 3 days and fully cures within 28 days, to become a highly conductive concrete that performs in all soil conditions irrespective of the presence of water. GEM maintains a constant level of superior performance once cured that will not diminish over the life of the grounding system.



## 4 Easy Steps to Success

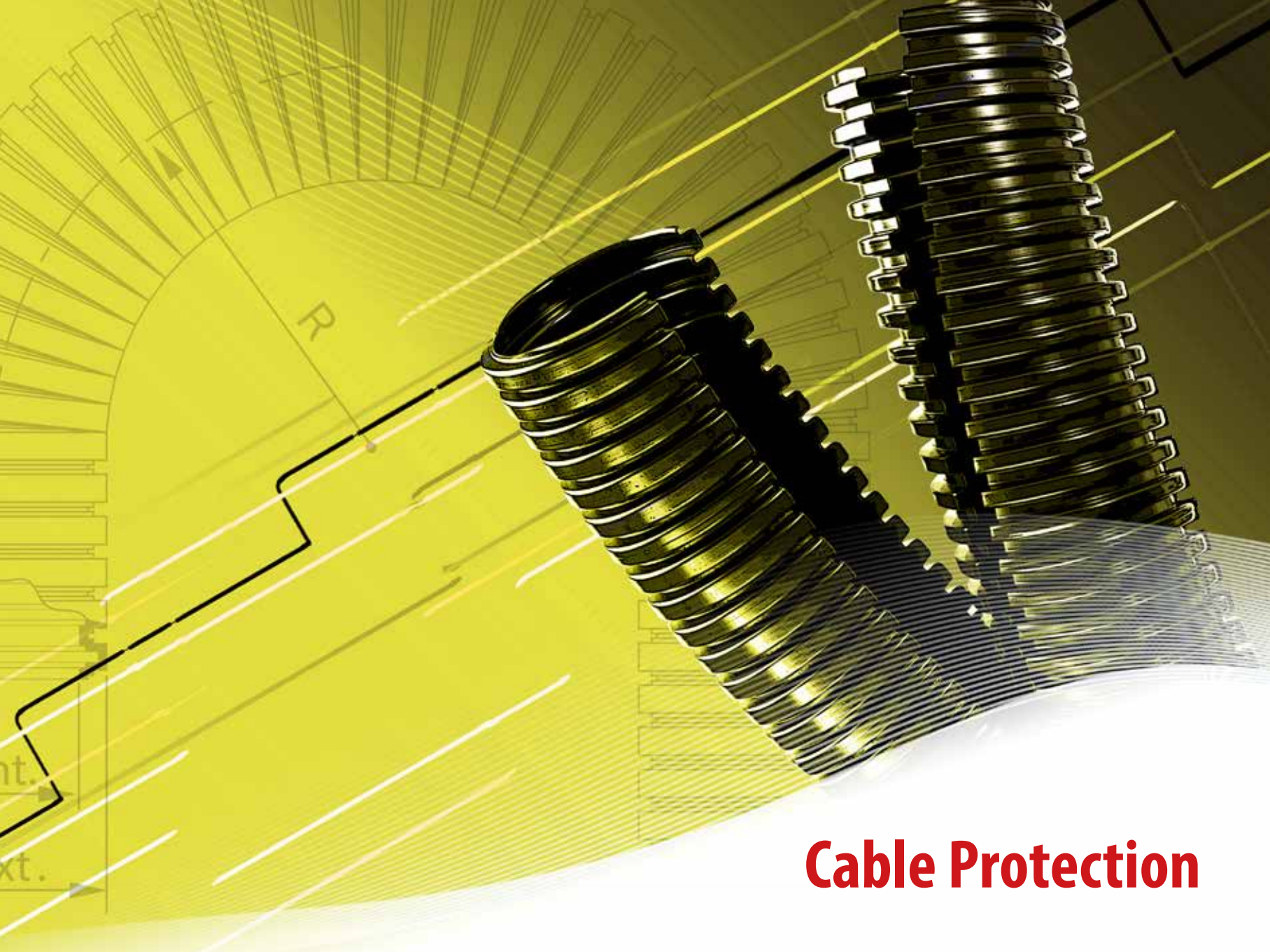
### Ground Rod Backfill Installation



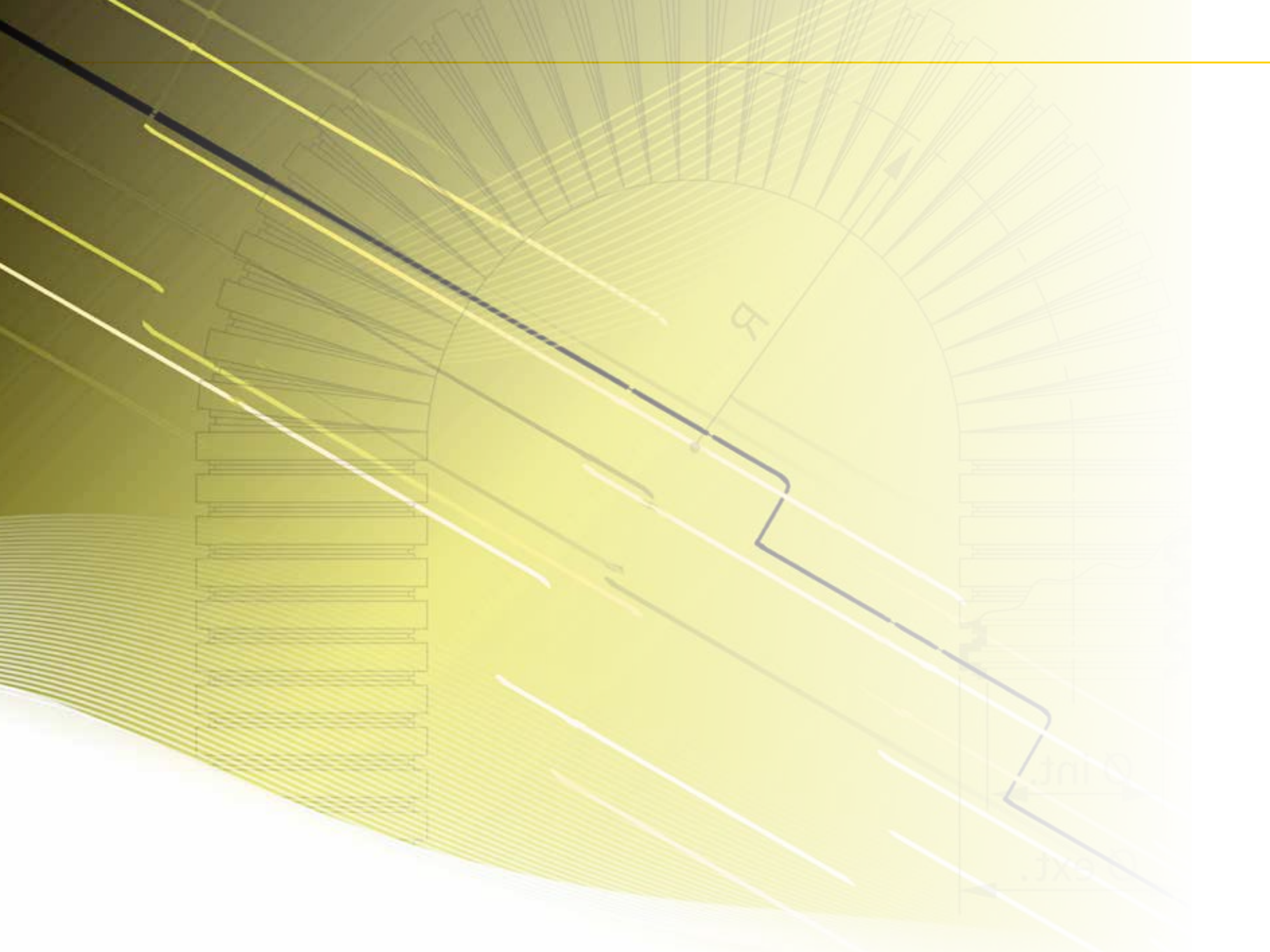
For a more detailed installation guide or for Trench Installation guide please visit [www.ilecsysrailonline.co.uk](http://www.ilecsysrailonline.co.uk) or scan the QR code below







# Cable Protection





# Cable Protection

iLECSYS Rail offers an impressive range of products to enhance your Class II installation. Products such as rodent protection conduit and environmentally sealed glands will allow the new unit to have a higher level of reliability.



**Installation  
Toolkit**  
Page 130



**End of Line  
Compression  
Gland**  
Page 123

- Introduction
- Class II Switchgear
- Integrated Backplates
- Integrated Annex
- DITA
- Transformers
- Earthing
- Cable Protection

# Divisible Conduit System

## Better Security for Track-Related Installations

- Divisible conduit system for use on all track-side applications, machine building and plant construction
- Made from specially modified polyamide 6
- Can be opened and closed again in longitudinal direction at any time
- Divisible conduit is perfect for existing and new installations
- Easy installation - trouble free retrofitting
- Self extinguishing
- Temperature range: -40°C to +105°C in accordance with IEC EN 61386

Part Number	PADS No	Diameter	Length (M)
ILPACOF - 17B - 10	091/099153	M20	10 Metres
ILPACOF - 17B - 25	091/099153	M20	25 Metres
ILPACOF - 17B - 50	091/099153	M20	50 Metres
ILPACOF - 23B - 10	091/099154	M25	10 Metres
ILPACOF - 23B - 25	091/099154	M25	25 Metres
ILPACOF - 23B - 50	091/099154	M25	50 Metres
ILPACOF - 29B - 10	091/099155	M32	10 Metres
ILPACOF - 29B - 25	091/099155	M32	25 Metres
ILPACOF - 29B - 50	091/099155	M32	50 Metres
ILPACOF - 36B - 10	091/099156	M40	10 Metres
ILPACOF - 36B - 30	091/099156	M40	30 Metres
ILPACOF - 48B - 10	091/099157	M50	10 Metres
ILPACOF - 48B - 30	091/099157	M50	30 Metres

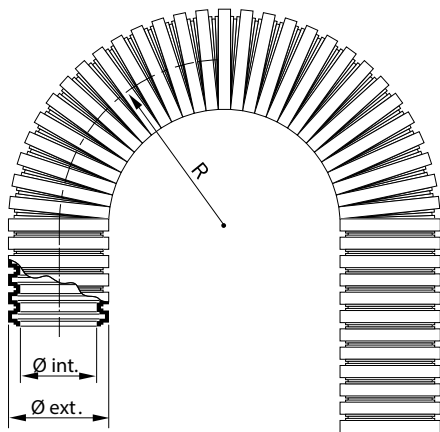


Scan the QR Code to view PADS Certificate

# AGT Solid Conduit

**PADS Number: 086/046141**

- A medium duty, abrasion resistant, highly flexible conduit used for indoor and outdoor electrical installations
- IP68/IP69 in accordance with IEC EN 60529 when used with ORJ O-Ring and PLJ Sealing Washer
- Protected against long term immersion up to a specified pressure.
- Electrically insulating material with a minimum dielectric strength value of 3.5kV.
- Connector pull out resistance- >300N (for an IP68 connector) in accordance with IEC EN 61386
- Self extinguishing
- Temperature range: -40°C to +105°C in accordance with IEC EN 61386



Part Number	Diameter	Ø int. mm	Ø ext. mm	Bending Radius
AGT-17N	M20	16.8	21.2	40
AGT-23N	M25	22.6	28.5	55
AGT-29N	M32	28.3	34.5	65
AGT-36N	M40	36.3	42.5	80
AGT-48N	M50	47.4	54.5	95

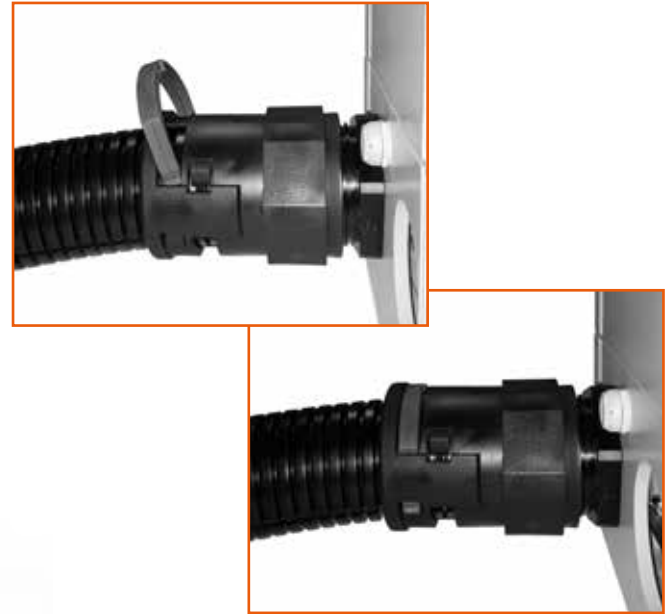


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# Compression Conduit Fittings

- These fittings fit the conduit in the normal way but also have a compression feature allowing cable to be secured within the fitting
- Made from high-grade specially formulated polyamide 6
- Vibration-proof with a very high impact resistance
- High conduit pull out strength
- Easy installation - simply push in place and secure with clips
- Fits a wide range of conduit profiles
- IP66 Ingress Protection



Part Number	PADS No	Diameter
ILBVNZ-M207S	091/099163	M20
ILBVNZ-M253S	091/099164	M25
ILBVNZ-M329S	091/099165	M32
ILBVNZ-M406S	091/099166	M40
ILBVNZ-M508S	091/099167	M50



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# End of Line Compression Fitting

## PADS Number: 086/046165

- The end of line fitting acts as an interface between the end of the conduit in the trough and the cable entering the conduit.
- The end of line compression fitting will prevent small animals and rodents from entering the conduit
- IP68/IP69 when used with ORJ and PLJ sealing rings
- Suitable for cable sizes - 9mm to 35mm
- Temperature range: -40°C to +100°C

Part Number	Diameter	For Cable
ILS100295-001	M25	Cable Diameter 9 - 17mm
ILS100295-002	M32	Cable Diameter 11 - 21mm
ILS100295-003	M40	Cable Diameter 19 - 28mm
ILS100295-004	M50	Cable Diameter 27 - 35mm



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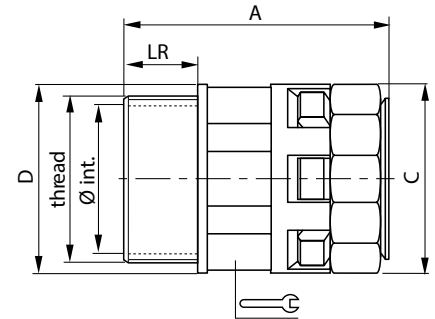



# Conduit Fittings

## MIR-M Straight Metric Thread Connector

**PADS Number: 086/046162**

- Straight fitting with male metric thread according to EN 60423 connector for fixing the ends of flexible corrugated conduits to cable entries
- Made from specially modified polyamide (PA6)
- IP66 Protection. IP68/IP69 when used with ORJ and PLJ sealing rings
- "Easy-click": quick assembly and removal of the conduit without tools
- Temperature range: -40°C to +105°C (+150°C Short term)



Part Number	Thread	ø int. mm	A	C	D		LR
MIR-17M20N	M20	14.5	44	31	30	27	11
MIR-23M25N	M25	18.5	48	37	37	34	12
MIR-29M32N	M32	25.5	52	46	46	42	15
MIR-36M40N	M40	32.0	60	54	54	50	19
MIR-48M50N	M50	42.0	61	69	69	66	19



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## ORJ O-Rings

**PADS Number: 086/046170**

- ORJ O-rings are to be placed on the first groove at the end of the AGT conduit in order to obtain IP68/IP69 rating
- NBR 70 elastomer
- Temperature range: -30°C to +100°C

Part Number	Diameter
ORJ-17	M20
ORJ-23	M25
ORJ-29	M32
ORJ-36	M40
ORJ-48	M50



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## PLJ Sealing Washers

**PADS Number: 086/046171**

- Die-cut sealing washers that allow the entry of cables into enclosures/housings. The washer provides an extra degree of protection between the connector and enclosure/housing
- Made of deformable asbestos-free material
- Temperature range: -40°C to +200°C

Part Number	Diameter
PLJ-M20	M20
PLJ-M25	M25
PLJ-M32	M32
PLJ-M40	M40
PLJ-M50	M50



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Legacy-8/15-v1.0

# NYLOFIX

## Characteristics

### Easy

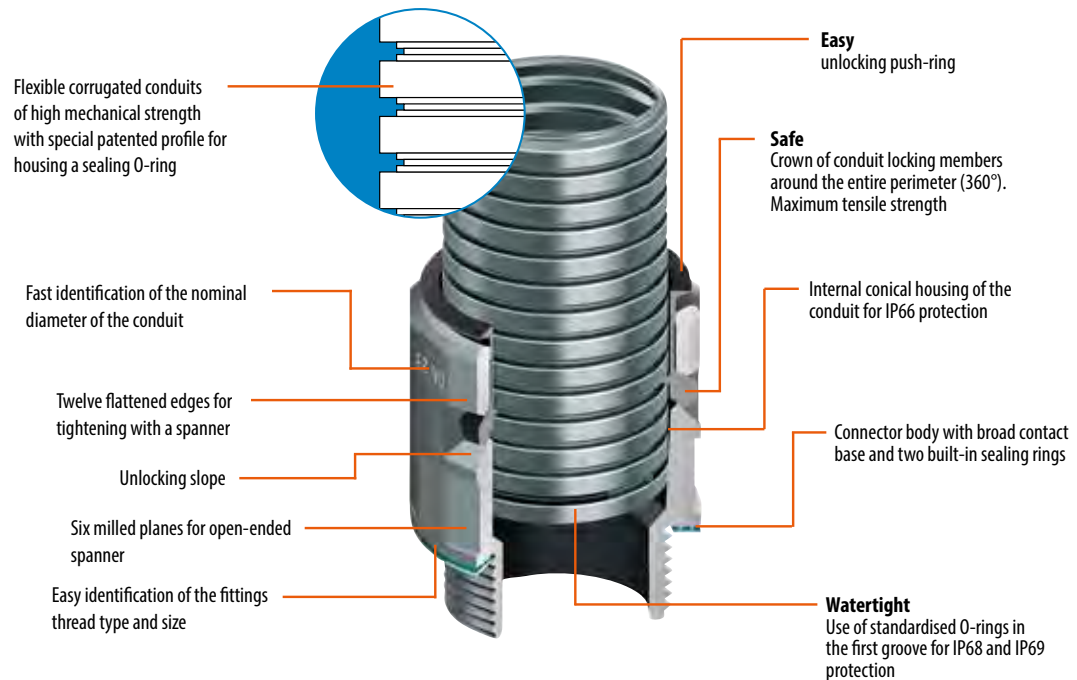
Quick assembly and removal

### Safe

Conduit locking around its entire perimeter

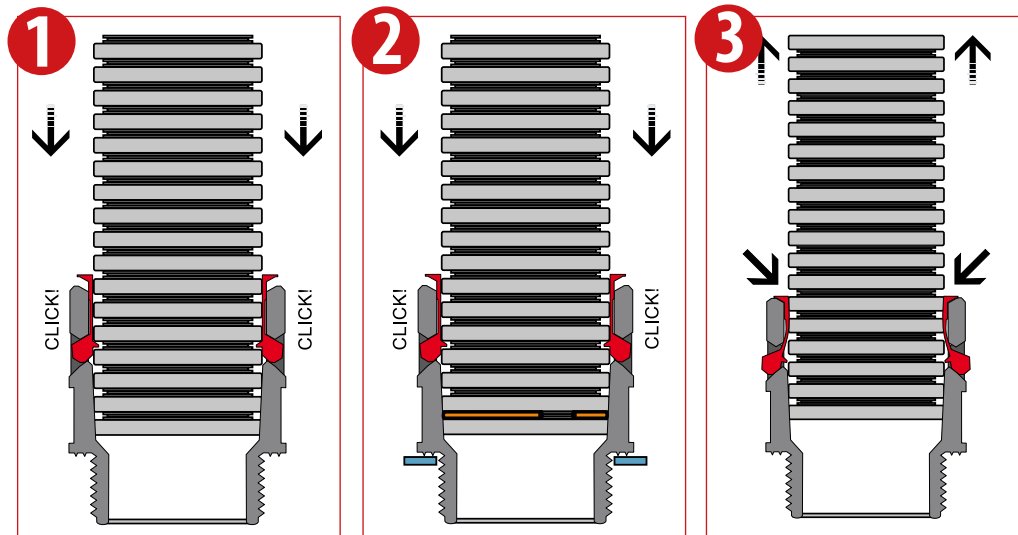
### Watertight

Protection up to IP68/IP69



## Installation Guide

- 1 For IP66 protection, insert the conduit all the way into the connector
- 2 For protection up to IP68/IP69 follow the process explained in step 1, though first inserting an **ORJ O-Ring** on the first groove of the conduit and a **PLJ sealing washer** on the thread at the base of the connector
- 3 It is extremely easy to remove the conduit: press the conduit and the release ring against the body of the connector, and then, keeping the release ring pressed, pull the conduit outwards, twisting it a little. Both connector and conduit can be reused following the two steps above.





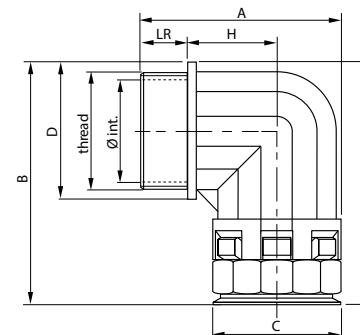
## NEC-M 90° Elbow

### PADS Number: 086/046163

- 90° elbow fitting with male metric thread according to EN 60423 connector for fixing the ends of flexible corrugated conduits to the cable entries.
- Made from specially modified polyamide (PA6)
- IP66 Protection. IP68/IP69 when used with ORJ and PLJ sealing rings
- Self-extinguishing, shock-resistant
- “Easy-click”: quick assembly and removal of the conduit without tools
- Temperature range: -40°C to +105°C (+150°C Short term)



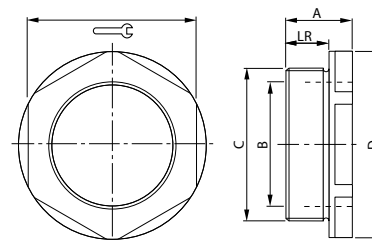
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Part Number	Thread	ø int. mm	A	B	C	D	H	LR
NEC-17M20N	M20	14.5	45	58	30	30	18	11
NEC-23M25N	M25	18.5	53	66	36	37	23	12
NEC-29M32N	M32	25.5	66	76	45	46	27	15
NEC-36M40N	M40	32.0	79	89	54	55	33	19
NEC-48M50N	M50	42.0	92	103	68	69	39	19

## Polyamide Metric Thread Reducers

- Polyamide reducers for changing a male thread into a bigger metric thread
- Made from polyamide reinforced with fibreglass
- Metric (EN 60423) threads
- Temperature range: -30°C to +100°C



Part Number	Description	A	D		LR
473225	M32-M25 Reducer	15	40	36	11
474025	M40-M25 Reducer	16	51	46	10
474032	M40-M32 Reducer	16	48	44	12
475032	M50-M32 Reducer	18	60	55	12
475040	M50-M40 Reducer	18	61	55	13
476340	M63-M40 Reducer	18	75	68	12
476350	M63-M50 Reducer	21	77	70	15

# Conduit Fixing Clips

## BFH Conduit Clip

- One-piece construction, quick mounting due to single hole fixing
- Very high impact resistance, high retention forces
- Optimal axial strain relief due to integrated rib
- High-grade, specially formulated polyamide 6, free from halogens and cadmium
- Temperature range: -40°C to +105°C, +160°C Short term

Part Number	PADS No	For Conduit
ILBFH17-0	091/099178	M20
ILBFH23-0	091/099179	M25
ILBFH29-0	091/099180	M32
ILBFH36-0	091/099181	M40
ILBFH48-0	091/099182	M50



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## GPS Conduit Clip

- One-piece construction, stackable
- Very high impact resistance, high retention forces
- Easy pre-installation by conduit snap-in
- Clasp for easy pre-mounting and final assembly
- Applicable with standard metal C rails
- High-grade, specially formulated polyamide 6, free from halogens and cadmium
- Temperature range: -40°C to +105°C, +160°C Short term

Part Number	PADS No	For Conduit
BGPS-17	091/099173	M20
BGPS-23	091/099174	M25
BGPS-29	091/099175	M32
BGPS-36	091/099176	M40
BGPS-48	091/099177	M50



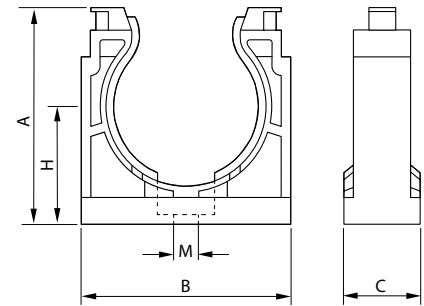
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## SDN Standard Support Clip

**PADS Number: 086/046169**

- Supports for securing sections of corrugated conduits between the various parts of the electrical installation
- Made from specially modified polyamide (PA6)
- Self-extinguishing, shock-resistant
- Possibility of closing the support with a cable tie using the projections on the upper part
- Temperature range: -40°C to +105°C (+150°C Short term)



Part Number	Thread	A	B	C	H	Metric
SDN-17N	M20	32	32	20	18	M5
SDN-23N	M25	41	40	20	23	M6
SDN-29N	M32	47	46	20	26	M6
SDN-36N	M40	57	56	20	32	M6
SDN-48N	M50	70	70	20	39	M6

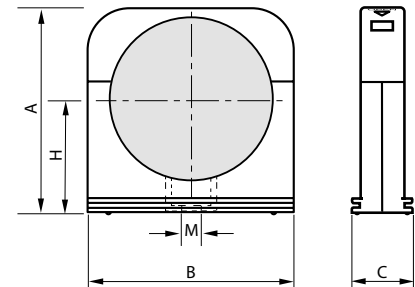


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## SWL Support Clip with Lid

**PADS Number: 086/046168**

- Supports with integrated lid for securing sections of corrugated conduits between the various parts of the electrical installation
- Made from specially modified polyamide (PA6)
- Self-extinguishing, shock-resistant
- With integrated lid
- Temperature range: -40°C to +105°C (+150°C Short term)



Part Number	Thread	A	B	C	H	Metric
SWL-17N	M20	33	31	20	19	M5
SWL-23N	M25	42	40	20	23	M6
SWL-29N	M32	47	46	20	26	M6
SWL-36N	M40	56	56	20	31	M6
SWL-48N	M50	70	70	20	39	M6

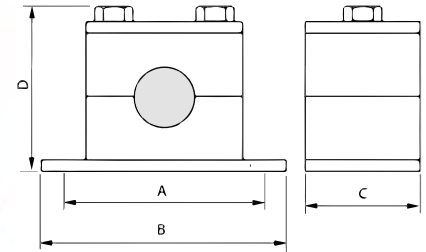


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## STF Heavy Duty Support

**PADS Number: 086/046167**

- Heavy duty supports specially designed for securing sections of corrugated conduits on very demanding applications such as heavy industry and rolling stock
- Steel base plate, cover plate and closing bolts
- Polypropylene clamps
- Stackable and double conduit version under special request



Part Number	Thread	A	B	C	H	Metric
STF-17	M20	64	78	30	44,65	M5
STF-23	M25	73	87	30	50,80	M6
STF-29	M32	86	100	30	66,50	M6
STF-36	M40	86	100	30	66,50	M6
STF-48	M50	100	116	30	75,90	M6



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## CC02 Non-Metallic Conduit Cutter

**PADS Number: 086/046172**

- Suitable for conduit sizes up to 67mm
- Easy to use: Drop the blade into a corrugation and squeeze and twist until conduit is cut 50% through. Cut the remaining 50% without twisting to achieve a square cut
- Suitable for any non-metallic flexible and rigid conduits



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# Installation Toolkit - ILD1130

**PADS Number: 091/099137**

The essential installation toolkit from iLECSYS Rail provides all the tools you are going to need for a speedy and efficient Class II installation. The kit is supplied in a strong robust Peli carry case. For more than 30 years Peli has built a reputation for manufacturing the toughest protector case in the world.



## Included in the Toolkit:

- 524 x 428 x 206mm Peli Case
- Torque Wrench 10-80nM
- 5mm-AF-AK-Socket Allen Key
- 8mm-AF-AK-Socket Allen Key
- 250mm AK Extension Bar
- Conduit Cutter for Non-Metallic Conduit up to 67mm O/D
- Ratchet Tool for Red, Blue, Yellow Crimps
- 4mm Allen key
- 5mm Allen Key
- Lock Box with 100 x M6 Blue Ring Terminals
- Lock Box with 100 x Insulated Hook Blades
- Lock Box with 20 x M8 Stainless Steel Spring Channel Nuts
- Lock Box with 20 x M6 Stainless Steel Spring Channel Nuts
- Lock Box with 50 x M6 Stainless Steel Oversize Washers
- Lock Box with 50 x M8 Stainless Steel Oversize Washers
- Lock Box with 50 x M6 x 20mm Stainless Steel Socket
- Lock Box with 50 x M8 x 20mm Stainless Steel Socket
- Lock Box with 20 x 41.. Square Stainless Steel Washers
- Thread Lock Compound
- Releasable Cable Ties

**Please Note that all products shown above are available to buy separately. Visit [www.ilecsys.co.uk](http://www.ilecsys.co.uk) for all your tooling and consumable needs**



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### Working responsibly



Always be sure the required plans and permits are in place, before you start a job or go on or near the line.



Always use equipment that is fit for its intended purpose.



Never undertake any job unless you have been trained and assessed as competent.



Never work or drive while under the influence of drugs or alcohol.

### Driving



Never use a hand-held or hands-free phone, or programme any other mobile device, while driving.



Always obey the speed limit and wear a seat belt.

### Working with electricity



Always test before applying earths or straps.



Never assume equipment is isolated – always test before touch.

### Working at height



Always use a safety harness when working at height, unless other protection is in place.

### Working with moving equipment



Never enter the agreed exclusion zone, unless directed to by the person in charge.

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