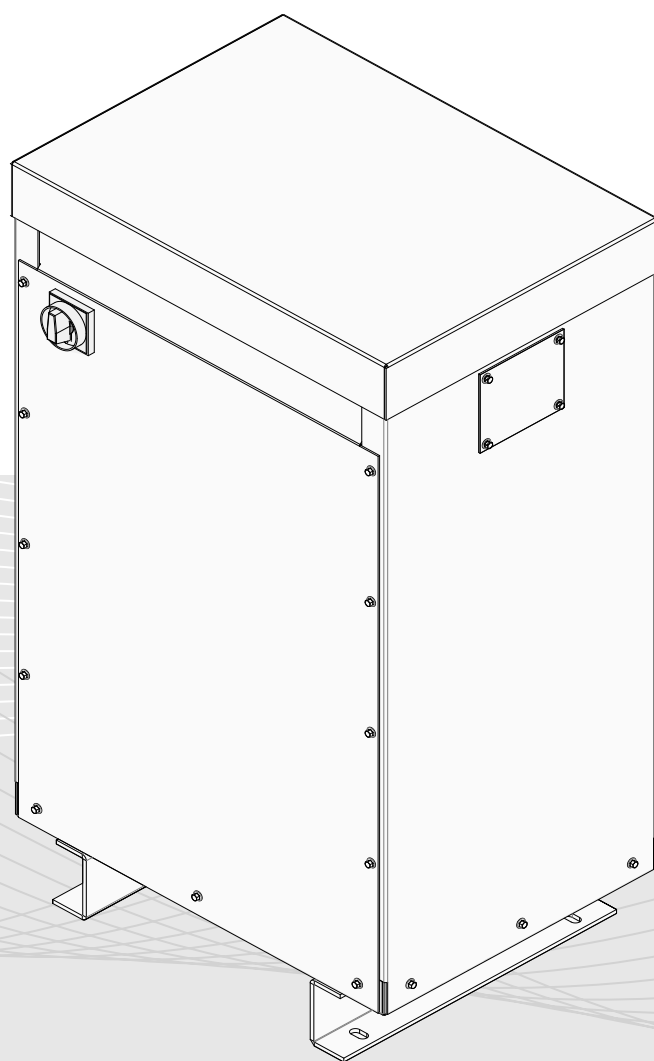


O&M MANUAL

Class I PSP/ASP Transformer 3ph Lightweight
Aluminium Range



■ 400/650VAC ■ 400/400VAC ■ 650/650VAC

English

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1	N.D.H.	24/04/17	B.M.	24/04/17	O&M Manual Creation
2	C.J.W.	15/08/22	N.D.H.	15/08/22	Dd0 & Yd11 Variants Added
3	C.J.W.	21/07/23	N.D.H.	21/07/23	Product Acceptance Numbers Added. Torque Settings Added.
4	C.J.W.	31/08/23	B.M.	31/08/23	Changes to Wiring Diagrams
5	C.J.W.	04/12/24	N.D.H.	04/12/24	New Voltages, Power Ratings and Vector Group
5.1	C.J.W.	08/01/25	N.D.H.	02/06/25	PA Numbers Added for Additional Voltage Variants.

1. INTRODUCTION

1.1 SAFETY NOTES

SAFETY PRECAUTIONS	
GENERAL	The need for Personal Protection Equipment (PPE) must be assessed prior to undertaking installation or maintenance operations.
HEAVY EQUIPMENT	All manual handling must be in accordance with the Manual Handling Operations Regulation 1992
LETHAL VOLTAGES	Electrical power within this system/equipment is at a level considered, by the low voltage directive 73/23/EEC, to be sufficient to kill. Always assume conductors are live until proved dead. Before attempting any maintenance task, ensure that equipment is isolated from electrical supply. When the electrical supply cannot be isolated, testing/maintenance tasks are to be undertaken only by personnel who are aware of the dangers involved and after all necessary precautions have been taken.
WORKING PRACTICES	Unauthorized interruption of the system may endanger the safe operation of the railway. Before attempting any maintenance on the equipment, obtain the necessary permission from the relevant authority. Ensure the consequence of any interruption has been fully considered and understood. If a component or equipment becomes overheated or burnt, a toxic fume hazard may exist. Isolate the power to the equipment, ventilate the area and allow the equipment time to cool before carrying out repairs. This equipment does not liberate any toxic or injurious gases during normal operation. When working on equipment, especially in the confines of a case, do not wear metal rings, bracelets, watches, etc. These articles can cause personal injury or damage to equipment by becoming entangled in components or causing a short circuit.

1.2 PURPOSE

This O&M Manual defines the operating & Installation guidelines for the ATL Transformers, 10 - 150KVA range of aluminium 400/650V, 400/400V & 650/650VAC PSP/ASP transformer ranges for use within a standard Network Rail approved Principal Supply Point.

1.3 GUARANTEE

The function and safety of the equipment is only guaranteed if the warning and safety instructions included in this manual are adhered to.

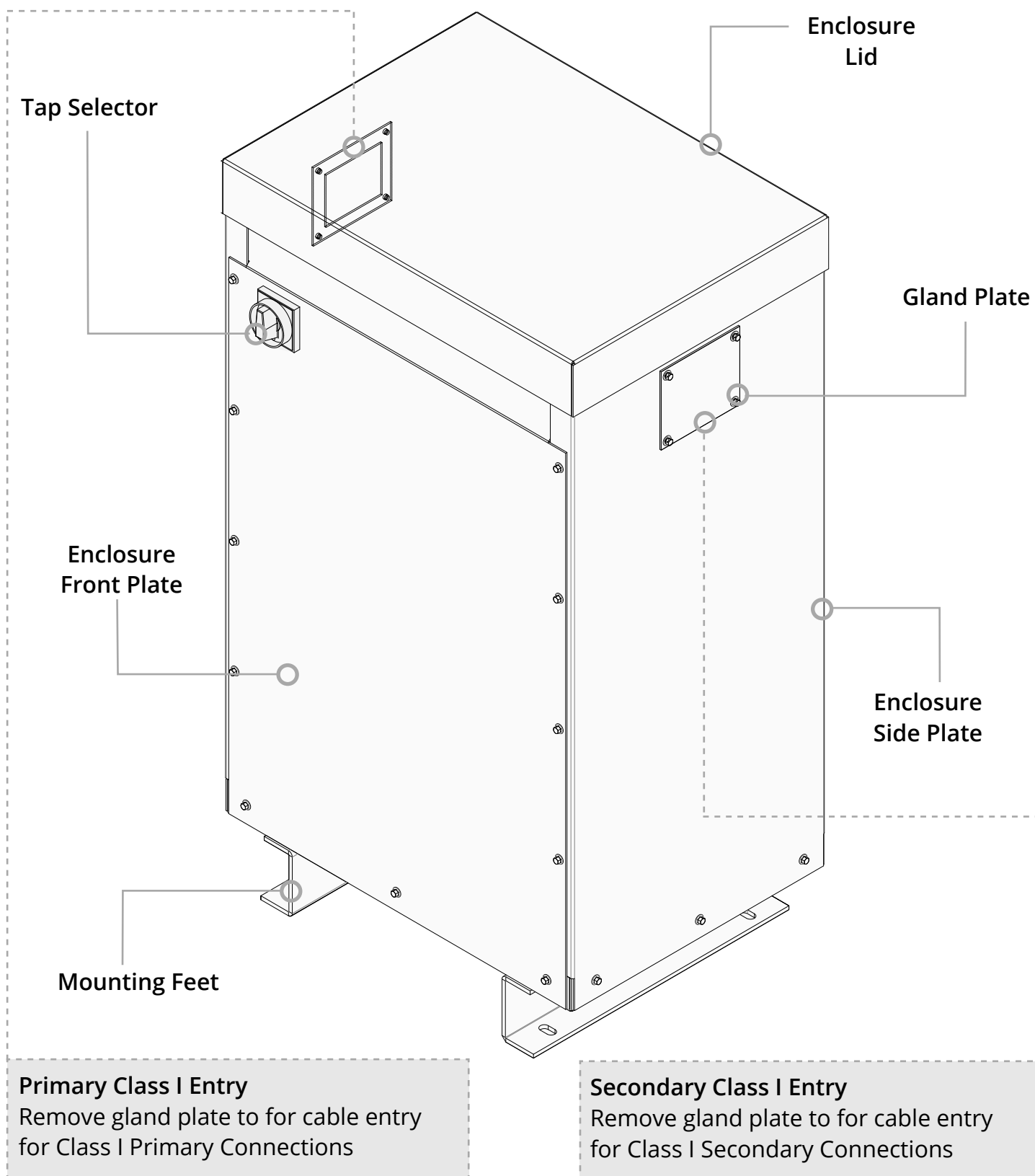
ATL Transformers Ltd is not liable for any personal injury or damage to property that occurs as a result of the warning and manual being disregarded.

ATL Transformers Ltd does not accept any liability or warranty for damage due to the use of non-approved spare parts and accessories.

2. PRODUCT DESCRIPTION

2.1 KEY PSP/ASP eco-rail® FEATURES

The enclosed transformer has an ingress protection level of IP32 and is suitable for indoor Railway Installations. Primary & Secondary Class I terminals are segregated within separate terminals on the transformer. The Transformer features a tap changer which allows quick and simple tap selection.



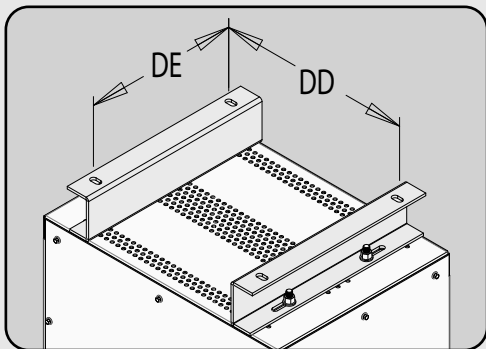
2.2 PRODUCT OPERATION

Supplied as standard for Class I distribution systems this range of transformers are designed to be fed from a nominal 50Hz (+4% to -6%) supply voltage. Input and output cables are to be routed through the gland plates provided with suitable conduit and glands, terminated above the transformer Internally to the screw clamp terminals provided. Conduit should meet the requirements of NR/L2/SIGELP/27410 Issue 2 & NR/L2/SIGELP/27421 & 27422.

- On class I models an earth terminal is provided and shall always be connected to the protective earth network.
- Cable glands shall always be removed where hole profiles for conduit are being made. Never drill holes on transformer panels in situ as swarf can enter the enclosure and short circuit the magnetics when energized.
- All cabling should meet the requirements of NR standards: NR/L2/SIGELP/27410 Issue 2 and NR/L2/SIGELP/27421 & 27422

3. PRODUCT INSTALLATION

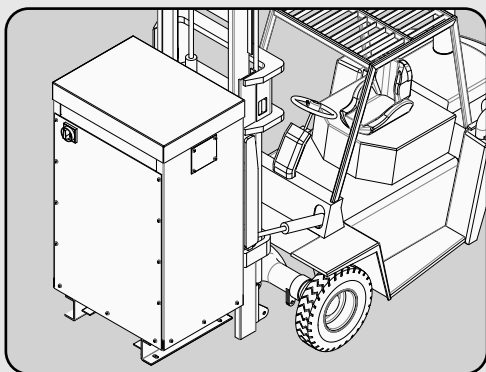
3.1 MOUNTING WITHIN APPARATUS HOUSING



1. Dimensioning

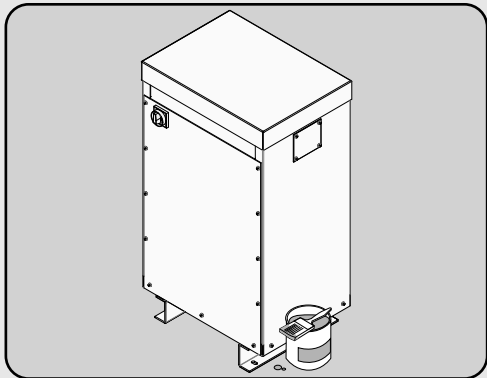
The transformers shown in general arrangement drawings in Appendix A are designed to be securely fixed to a secure and level base. If Integrating within switch panel ensure that the plinth bar work is capable of bearing the weight of the transformer. Footprint and fixing points are summarised with the tables of Appendix

A. Always ensure that there is 100mm clearance around the transformer taking care not to obstruct or impede on the transformers cooling louvres.



2. Lifting

Safe lifting practices should be observed when handling heavy transformers. These units can be lifted using a forklift or pallet truck, ensure that the transformer is secure before transporting. Please refer to weights in Appendix A and consult the manufacturer's forklift/pallet truck manual before lifting.



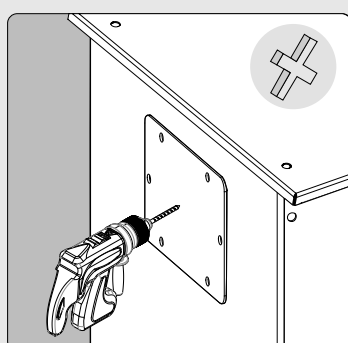
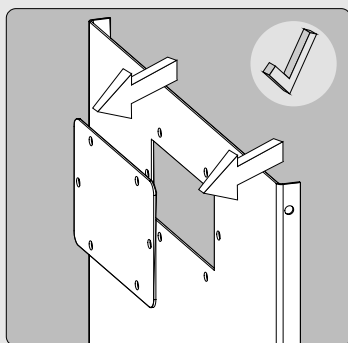
3. Repercussions

Due diligence and care should be taken not to damage any installed cable entry glands or couplings during the installation process as this could compromise the safety integrity of the unit. In the event that the paint finish is damaged during installation a touch up pen is available for aesthetics however paint is supplementary to the base material and not critical to the units operational integrity.

3.2 CABLE CONNECTION

Primary & Secondary terminals are accessible within the enclosure by removal of the transformer lid. Cables glands are provided either side of the enclosure for cable access and are removeable for customization of gland and cable entry requirements.

- On class I models an earth terminal is provided and shall always be connected to the protective earth network.
- Cable glands shall always be removed where hole profiles for conduit are being made. Never drill holes on transformer panels in situ as swarf can enter the enclosure and short circuit the magnetics when energized.
- Cables should be installed correctly and not resting on top of the transformer core. Adequate bend radius's should be observed on the installed cables and all terminals checked for good compression prior to energization.
- All cabling should meet the requirements of NR standards: NR/L2/SIGELP/27410 Issue 2 and NR/L2/SIGELP/27421 & 27422



CAUTION When Drilling

When drilling into input and output gland plates, always remove the plate before drilling. Drilling without removing the gland plate can result in metal swarf and debris entering the transformer windings which can cause electrical shorts and overheating.

3.2.1 TORQUE SETTINGS OF TERMINALS

Within the enclosure of the PSP transformer, there are terminals situated on top of the clamps of the transformer, depending on what the voltages and rating the torque settings may change for input and output, please refer to the table for the minimum and maximum torque required.

Torque Settings for Terminals (applies to all vector groups):

Rating	400/650V				400/400V			
	Min Torque (Input)	Max Torque (Input)	Min Torque (Output)	Max Torque (Output)	Min Torque (Input)	Max Torque (Input)	Min Torque (Output)	Max Torque (Output)
10KVA	1.2 Nm	2.4 Nm	1.2 Nm	2.4 Nm	1.2 Nm	2.4 Nm	1.2 Nm	2.4 Nm
20KVA	1.2 Nm	2.4 Nm	1.2 Nm	2.4 Nm	1.2 Nm	2.4 Nm	1.2 Nm	2.4 Nm
25KVA	1.2 Nm	2.4 Nm	1.2 Nm	2.4 Nm	2.5 Nm	3 Nm	2.5 Nm	3 Nm
30KVA	3.2 Nm	3.7 Nm	3.2 Nm	3.7 Nm	2.5 Nm	3 Nm	2.5 Nm	3 Nm
35KVA	3.2 Nm	3.7 Nm	3.2 Nm	3.7 Nm	2.5 Nm	3 Nm	2.5 Nm	3 Nm
40KVA	3.2 Nm	3.7 Nm	3.2 Nm	3.7 Nm	2.5 Nm	3 Nm	2.5 Nm	3 Nm
50KVA	3.2 Nm	3.7 Nm	3.2 Nm	3.7 Nm	3.2 Nm	3.7 Nm	3.2 Nm	3.7 Nm
60KVA	3.2 Nm	3.7 Nm	3.2 Nm	3.7 Nm	3.2 Nm	3.7 Nm	3.2 Nm	3.7 Nm
80KVA	3.5 Nm	6 Nm	3.2 Nm	3.7 Nm	3.5 Nm	6 Nm	3.5 Nm	6 Nm
90KVA	3.5 Nm	6 Nm	3.2 Nm	3.7 Nm	3.5 Nm	6 Nm	3.5 Nm	6 Nm
100KVA	6 Nm	12 Nm	3.2 Nm	3.7 Nm	6 Nm	12 Nm	6 Nm	12 Nm
110KVA	6 Nm	12 Nm	3.2 Nm	3.7 Nm	6 Nm	12 Nm	6 Nm	12 Nm
120KVA	6 Nm	12 Nm	3.2 Nm	3.7 Nm	6 Nm	12 Nm	6 Nm	12 Nm
Rating	650/650V							
	Min Torque (Input)	Max Torque (Input)	Min Torque (Output)	Max Torque (Output)				
10KVA	1.2 Nm	2.4 Nm	1.2 Nm	2.4 Nm				
20KVA	1.2 Nm	2.4 Nm	1.2 Nm	2.4 Nm				
25KVA	2.5 Nm	3 Nm	2.5 Nm	3 Nm				
30KVA	2.5 Nm	3 Nm	2.5 Nm	3 Nm				
35KVA	2.5 Nm	3 Nm	2.5 Nm	3 Nm				
40KVA	2.5 Nm	3 Nm	2.5 Nm	3 Nm				
50KVA	3.2 Nm	3.7 Nm	3.2 Nm	3.7 Nm				
60KVA	3.2 Nm	3.7 Nm	3.2 Nm	3.7 Nm				
80KVA	3.5 Nm	6 Nm	3.5 Nm	6 Nm				
90KVA	3.5 Nm	6 Nm	3.5 Nm	6 Nm				
100KVA	6 Nm	12 Nm	6 Nm	12 Nm				
110KVA	6 Nm	12 Nm	6 Nm	12 Nm				
120KVA	6 Nm	12 Nm	6 Nm	12 Nm				

All torque settings taken from the terminal manufacturers recommended settings.

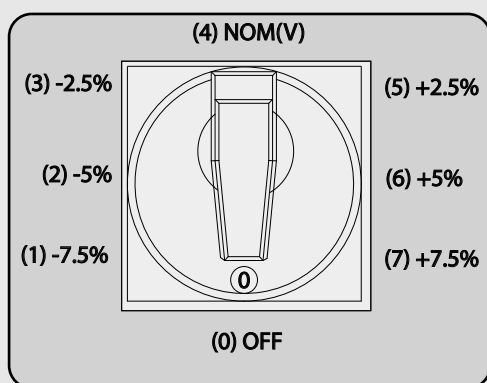
3.3 VOLTAGE SELECTION

INPUT: Monitor the supply voltage with a calibrated DVM to check your distribution is within tolerance +4%/-6%. Connect Supply cables to the provided Input Voltage terminals ensuring they are routed through suitable conduit and secure before energizing the transformer.

OUTPUT: The output tap selector facilitates feeder Voltage adjustment, this can be used to reset, reduce or boost output voltages according to your feeder requirements. Connect Output cables to the provided terminals ensuring they are routed through suitable conduit and secure. Select the required output voltage using the on-board tap selector and reinstate the transformer lid before energizing the transformer.



NOTE: - The on-load tap selector should not be used for isolation and that the transformer should be isolated from the supply before removing covers.



1. On-Load Tap Selector

The Voltage Selector can be found on the front of the enclosure at the top left, the tap selector automatically turns on a 45° and can be turned a full 360° clockwise or anti-clockwise with 8 different settings. Please see the table below for Tap selector identification. For detailed wiring diagram see Appendix C.

Tap Selector Identification:

Number	Taps ±	400/650V	400/400	650/650
1	-7.5%	T601	T370	T601
2	-5%	T617	T380	T617
3	-2.5%	T634	T390	T634
4	NOM (V)	650V	T400	650V
5	+2.5%	T666	T410	T666
6	+5%	T682	T420	T682
7	+7.5%	T699	T430	T699

4. PRODUCT MAINTENANCE

4.1 ROUTINE MAINTENANCE

These units are non serviceable and require observational maintenance only to their Terminals, cables and enclosure panels which must be intact and installed as originally supplied.

Always ensure that there is 100mm clearance around the transformer taking care not to obstruct or impede on the transformers cooling louvres.

Do not place any foreign bodies on top of the enclosure lid or inside the transformer housing.

This does not supersede any maintenance tasks or scheduling procedures network rail deem necessary and set in accordance with. NR/SP/SIG/10661 Signalling Maintenance Task Intervals. Each unit is provided with a serial number and part code reference. This Information is located on the transformer rating plate and should be quoted at any Point where the unit is examined and suspected to be compromised.

4.2 TESTING IN SERVICE

1. Isolate incoming supply, when isolated remove transformer lid and disconnect Input supply and Secondary Output connections.

2. Using a calibrated 500V d.c insulation resistance tester check insulation resistance. Primary to body (Earth) Secondary to body (Earth) & Primary to Secondary.

3. Check incoming supply voltage at protection, If within tolerance Isolate supply at the protection and connect Incoming supply cables onto the respective transformer terminals.

4. Using a DVM and with the transformer energised, safely check at the output terminals secondary tap voltages are within 2% using the tap selector to cycle transformer taps accordingly. Check Secondary tap voltages which should be within 2% of the terminal voltage.

5. Isolate Supply and when safe re-connect Secondary Output cables.

6. Energise the transformer and using a calibrated ammeter check the load current.

Relevant safety checks & testing should be conducted in addition to these checks & in line with Network Rails controlled safety & inspection procedures prior to energizing the transformer.

4.3 MAINTENANCE AFTER FLOODING

Please note that the transformer should be sent back to ATL Transformers if the transformer has sustained flooding

Please see section 7 of this document for contact details.

4.4 SPARE PARTS

Item	Part Reference
TOUCH UP PAINT	RS-PAINT-RAL7032-125ml

5. TRAINING & COMPETENCE

The transformers are to be installed within a Network Rail approved Structure by trained & authorized Network Rail installers only.

All maintenance activities shall be undertaken by trained and authorized Network Rail crews and/or contractors.

6. PRODUCT MAINTENANCE

6.1 DATA SHEET REFERENCE

Refer to manufacturers Datasheets for required specification.

6.2 NR COMPONENT APPROVALS

CUSTOMER	DECLARATION OF CONFORMITY
	NETWORK RAIL
PRODUCT NAME	ATL 400/650V & 415/190V Signalling Power Transformers
ATL DATA SHEETS	AVAILABLE ON REQUEST: DOC REF
NETWORK RAIL CERTIFICATE(S)	PA05/07022

6.3 DECLARATION OF CONFORMITY

ATL Transformers claim conformity for this family of product(s) manufactured at our Manchester facility. In accordance with the specifications referenced below. This declaration is based upon our technical file which contains data supporting our claims.

COMPLIANCE SPECIFICATION(S)	
EC Directives	2006/95/EC Low Voltage Directive
Harmonized Standards	IEC 60076 - Power Transformers
Internal Standards	ISO 9001: 2015 BSI Audited Quality Assurance
Customer Standards/Specifications	BS EN 61558-1:2009 - Safety of power transformers, power supplies, reactors and similar products. NR/L2/SIGELP/30007 Issue3 - Product Specification for Power Transformers for Signalling Systems. IEC 60076 – Power Transformers BR 924A – Air Cooled Power Transformers for Railway Signalling
This declaration is made by: Mr. Neville D Haide (Company Director) ATL Transformers Ltd. Hanson Close, Middleton, Manchester, Lancashire, UK, M24 2HD	
Declaration by: N. Haide	Date 25/03/2015

7. MANUFACTURER CONTACTS

ATL Transformers Ltd
Hanson Close
Hanson Street
Middleton
Manchester
Lancashire
UK
M24 2HD

Tel: +44 (0) 161 653 0902 Monday – Thurs 08:00 – 17:15 Friday 8:00 – 13:00

Web: www.atltransformers.co.uk

Email: sales@atltransformers.co.uk

8. REGULATORY REQUIREMENTS APPLICABLE STANDARDS

BS EN 50122-1 – Railway Applications – Fixed Applications – Part 1 Protective Provisions Relating to Electrical Safety & Earthing.

BS EN 50125-2 – Railway applications. Environmental conditions for equipment. Fixed electrical installations.

BS EN 50125-3 – Railway applications. Environmental conditions for equipment. Equipment for signalling and telecommunications.

BS EN 60529 – Degrees of protection provided by enclosures.

BS EN 62262 – Degrees of protection provided by enclosures for electrical equipment against mechanical impacts (IK code).

BS EN 61558 – Safety of power transformers, power supplies, reactors and similar products.

BS EN 62262 – Degrees of protection provided by enclosures for electrical equipment against mechanical impacts (IK code).

NR/L1/ELP/27000 – Asset Management Policy for Electrical Power assets.

NR/L2/SIGELP/27408 – Product Specification for Signalling Power Distribution Cables

NR/GN/ELP/27315 – Management of Power Supplies for Telecoms Equipment.

NR/L2/SIGELP/27410 Issue 2

NR/L2/SIGELP/27421 & 27422 - Flexible Conduits & Glands

NR/L2/SIGELP/27410 – Specification for Class II Based Signalling Power distribution systems.

NR/L2/SIG/11201 – Signalling Design Handbook.

NR/L2/SIG/30050 - Functional Signalling Power Circuits.

NR/L3/SIG/10663 – Signal Maintenance Specifications.

NR/SP/SIG/11221 – Signalling Works Testing.

NR/SP/SIG/11231 – Signalling Maintenance Testing Handbook.

NR/L2/ELP/21120 – E & P Records Management Process.

9. FREQUENTLY ASKED QUESTIONS

1) What tools are required to access the Transformer for termination?



WARNING

Ensure supply is Isolated before removing the Lid or Gland Plates. Ensure that the Gland Plates and Lid are bolted back on before exerting power supply.

- **To access Terminals:**

To access Terminals the bolts securing the enclosure lid/gland plates door must be unscrewed using an M8-M10 spanner or Socket.

The terminals are located on top of the transformer on the angled brackets and are labelled accordingly to the wiring schematic in Appendix C.

If Ferrules are not being used cables should be stripped 10mm and secured into the terminals. For recommended torque settings, see [3.2 Cable Connection](#)



NOTE: - All enclosure covers/plates must be replaced after terminating cables to maintain protection.

All electrical termination is by flat head terminal driver.

Cables are connected directly onto the terminals of the transformer, these are located on top of the transformer inside the enclosure and are clearly marked.

2) Where do I connect the cables?

- The cables are connected on the terminals of the Primary, these are located on top of the transformer inside the transformer, the same for the secondary terminals they're located on top of the transformer inside the enclosure.

3) How do I gain access to the different sections of the assembly?

- This unit is designed to offer access to terminals only for installation purposes. The terminals are accessible via removing the lid or the gland plates on either side of the enclosure.

4) What is the procedure for installing & connecting cables?

- All cables shall be installed in accordance with NR Installation handbook.

5) Is there a start-up or switch on procedure?

- The assembly must be installed, commissioned & tested in accordance with NR Installation handbook by qualified person/s before power is applied to any part of the system.

6) The assembly is damaged or not functioning correctly, who shall I Contact for spare or replacement parts?

- Contact:
ATL Transformers Ltd - details are given in section 7 of this document.

10. PRODUCT WARRANTY

These products are under ATL's standard warranty which is 12 months. Product warranty document is available upon request.

11. END OF LIFE DISPOSAL

All Electrical equipment must be disposed of in accordance with the Wee Directive 2002/96/EG.

End of life or completed equipment may be returned to ATL Transformers for Disposal or alternatively must be issued to a certified waste disposal vendor.

12. ECO-RAIL® PSP/ASP TRANSFORMER RANGE

- Table-12.1 400/650V 3ph Delta/Star Lightweight Transformer Product Range

Part No.	Description	Catalogue No.
T2914	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 10,000VA	0054/215074
T2961	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 20,000VA	0054/215075
T3116	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 25,000VA	0054/215076
T2915	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 30,000VA	0054/215077
T3334	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 35,000VA	0054/215078
T2962	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 40,000VA	0054/215079
T3058	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 50,000VA	0054/215080

- Table-12.1 400/650V 3ph Delta/Star Lightweight Transformer Product Range Continued.

Part No.	Description	Catalogue No.
T2963	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 60,000VA	0054/215081
T3027	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 80,000VA	0054/215082
T3801	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 90,000VA	0054/215208
T3758	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 100,000VA	0054/215108
T3802	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 110,000VA	0054/215209
T3143	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 120,000VA	0054/215083

- Table-12.2 400/650V 3ph Delta/Delta Lightweight Transformer Product Range

Part No.	Description	Catalogue No.
T3699	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 10,000VA	0054/215084
T3700	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 20,000VA	0054/215085
T3701	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 25,000VA	0054/215086
T3702	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 30,000VA	0054/215087
T3719	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 35,000VA	0054/215088
T3703	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 40,000VA	0054/215089
T3704	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 50,000VA	0054/215090
T3705	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 60,000VA	0054/215091
T3706	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 80,000VA	0054/215092
T3803	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 90,000VA	0054/215210
T3722	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 100,000VA	0054/215109
T3804	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 110,000VA	0054/215211
T3707	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 120,000VA	0054/215093

- Table-12.3 400/650V 3ph Star/Delta Lightweight Transformer Product Range

Part No.	Description	Catalogue No.
T3709	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 10,000VA	0054/215094
T3710	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 20,000VA	0054/215095
T3711	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 25,000VA	0054/215096
T3712	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 30,000VA	0054/215097
T3720	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 35,000VA	0054/215098
T3713	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 40,000VA	0054/215099

- Table-12.3 400/650V 3ph Star/Delta Lightweight Transformer Product Range Continued.

Part No.	Description	Catalogue No.
T3714	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 50,000VA	0054/215100
T3715	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 60,000VA	0054/215101
T3716	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 80,000VA	0054/215102
T3805	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 90,000VA	0054/215212
T3650	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 100,000VA	0054/215110
T3806	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 110,000VA	0054/215213
T3717	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 120,000VA	0054/215103

- Table-12.4 400/400V 3ph Delta/Star Lightweight Transformer Product Range

Part No.	Description	Catalogue No.
T3821	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 10,000VA	0054/215214
T3822	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 20,000VA	0054/215215
T3823	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 25,000VA	0054/215216
T3824	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 30,000VA	0054/215217
T3825	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 35,000VA	0054/215218
T3826	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 40,000VA	0054/215219
T3827	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 50,000VA	0054/215220
T3828	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 60,000VA	0054/215221
T3829	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 80,000VA	0054/215222
T3830	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 90,000VA	0054/215223
T3831	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 100,000VA	0054/215224
T3832	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 110,000VA	0054/215225
T3833	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 120,000VA	0054/215226

- Table-12.5 400/400V 3ph Delta/Delta Lightweight Transformer Product Range

Part No.	Description	Catalogue No.
T3834	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 10,000VA	0054/215227
T3835	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 20,000VA	0054/215228
T3836	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 25,000VA	0054/215229
T3837	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 30,000VA	0054/215230
T3838	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 35,000VA	0054/215231

- Table-12.5 400/400V 3ph Delta/Delta Lightweight Transformer Product Range Continued.

Part No.	Description	Catalogue No.
T3839	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 40,000VA	0054/215232
T3840	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 50,000VA	0054/215233
T3841	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 60,000VA	0054/215234
T3842	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 80,000VA	0054/215235
T3843	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 90,000VA	0054/215236
T3844	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 100,000VA	0054/215237
T3845	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 110,000VA	0054/215238
T3846	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 120,000VA	0054/215239

- Table-12.6 400/400V 3ph Star Delta Lightweight Transformer Product Range

Part No.	Description	Catalogue No.
T3847	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 10,000VA	0054/215240
T3848	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 20,000VA	0054/215241
T3849	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 25,000VA	0054/215242
T3850	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 30,000VA	0054/215243
T3851	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 35,000VA	0054/215244
T3852	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 40,000VA	0054/215245
T3853	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 50,000VA	0054/215246
T3854	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 60,000VA	0054/215247
T3855	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 80,000VA	0054/215248
T3856	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 90,000VA	0054/215249
T3857	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 100,000VA	0054/215250
T3858	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 110,000VA	0054/215251
T3859	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 120,000VA	0054/215252

- Table-12.7 650/650V 3ph Delta/Star Lightweight Transformer Product Range

Part No.	Description	Catalogue No.
T3860	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 10,000VA	0054/215253
T3861	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 20,000VA	0054/215254
T3862	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 25,000VA	0054/215255
T3863	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 30,000VA	0054/215256

- Table-12.7 650/650V 3ph Delta/Star Lightweight Transformer Product Range Continued.

Part No.	Description	Catalogue No.
T3864	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 35,000VA	0054/215257
T3865	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 40,000VA	0054/215258
T3866	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 50,000VA	0054/215259
T3867	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 60,000VA	0054/215260
T3868	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 80,000VA	0054/215261
T3869	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 90,000VA	0054/215262
T3870	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 100,000VA	0054/215263
T3871	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 110,000VA	0054/215264
T3873	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 120,000VA	0054/215265

- Table-12.8 650/650V 3ph Delta/Delta Lightweight Transformer Product Range

Part No.	Description	Catalogue No.
T3874	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 10,000VA	0054/215266
T3875	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 20,000VA	0054/215267
T3876	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 25,000VA	0054/215268
T3877	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 30,000VA	0054/215269
T3878	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 35,000VA	0054/215270
T3879	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 40,000VA	0054/215271
T3880	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 50,000VA	0054/215272
T3881	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 60,000VA	0054/215273
T3882	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 80,000VA	0054/215274
T3883	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 90,000VA	0054/215275
T3884	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 100,000VA	0054/215276
T3885	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 110,000VA	0054/215277
T3886	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 120,000VA	0054/215278

- Table-12.9 650/650V 3ph Star Star/Delta Lightweight Transformer Product Range

Part No.	Description	Catalogue No.
T3887	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 10,000VA	0054/215279
T3888	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 20,000VA	0054/215280

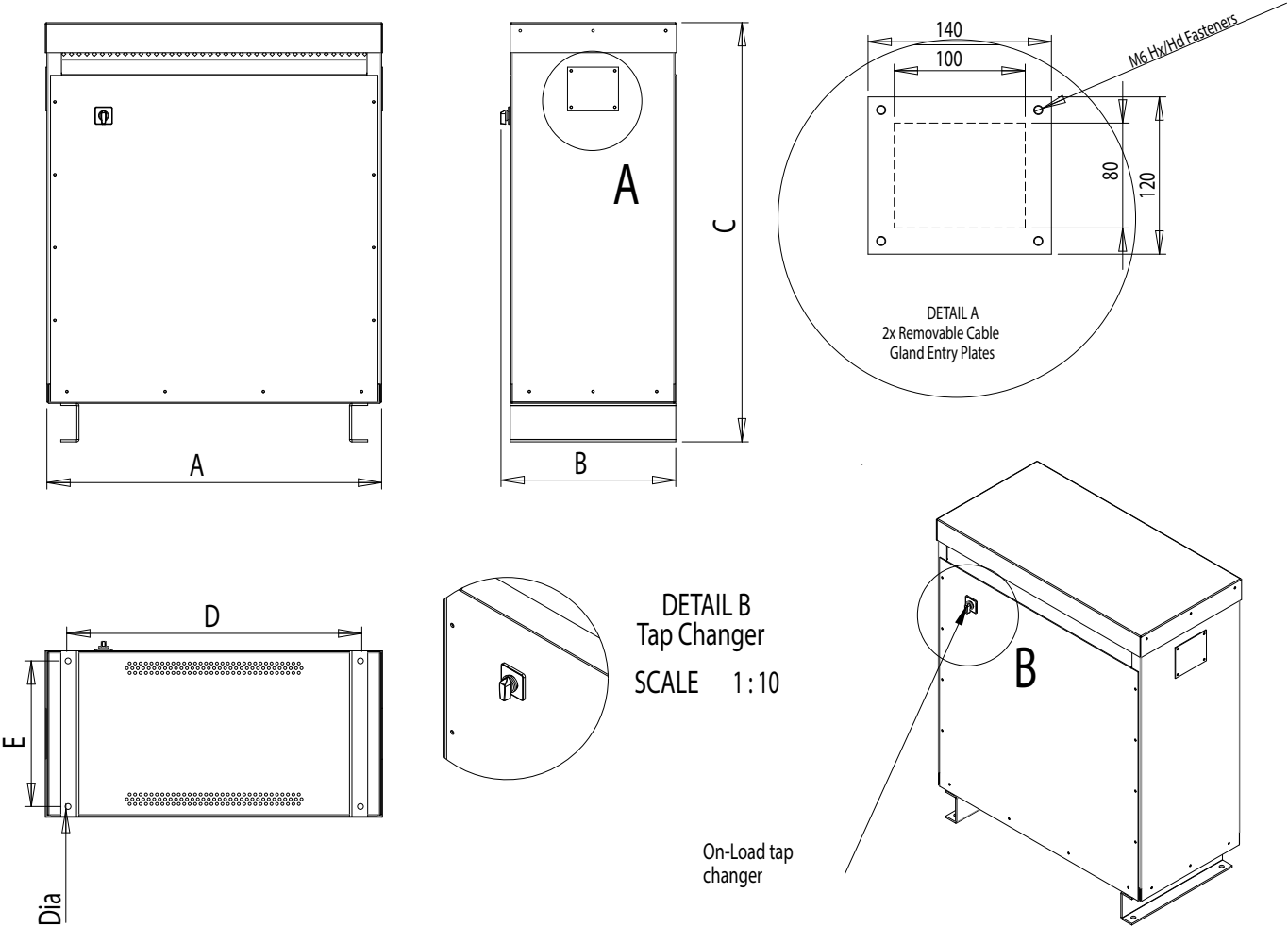
- Table-12.9 650/650V 3ph Star/Delta Lightweight Transformer Product Range

Part No.	Description	Catalogue No.
T3889	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 25,000VA	0054/215281
T3890	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 30,000VA	0054/215282
T3891	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 35,000VA	0054/215283
T3892	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 40,000VA	0054/215284
T3893	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 50,000VA	0054/215285
T3894	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 60,000VA	0054/215286
T3895	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 80,000VA	0054/215287
T3896	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 90,000VA	0054/215288
T3897	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 100,000VA	0054/215289
T3898	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 110,000VA	0054/215290
T3899	CLASS I ASP/PSP LIGHTWEIGHT TRANSFORMER 120,000VA	0054/215291

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APPENDICES A

GENERAL ARRANGEMENTS



Aluminium Wound PSP/ASP Transformers							
Model	Dimension (mm)						Weight (kg)
	A	B	C	D	E	Dia	
10KVA	625	454	615	400	450	13	180
20KVA	760	500	1100	465	400	16	280
25KVA	760	500	1100	465	400	16	295
30KVA	760	500	1100	675	400	16	310
35KVA	760	500	1100	675	400	16	330
40KVA	760	500	1100	675	400	16	340
50KVA	920	600	1200	810	455	16	450
60KVA	920	600	1200	810	455	16	500
80KVA	920	600	1200	810	455	16	690
90KVA	920	600	1200	810	455	16	740
100KVA	920	600	1200	810	455	16	780
110KVA	920	600	1200	810	455	16	820
120KVA	920	600	1200	810	455	16	850

APPENDICES B

LABEL DETAILS

LABEL 1

atl TRANSFORMERS LTD MANCHESTER M242HD TEL: 0161 653 0902		Manufactured to NR/L2/SIG/3007	
Elec Spec			
PADS No			
VA	1000	Duty	100 %
Serial No	xxxxx	Date	01/04/2013
Input Voltage		Ins Class	
Input Current		Frequency	
Output Voltage		Impedance	
Output Current		Weight	
		IP Rating	
		Efficiency	

LABEL 2

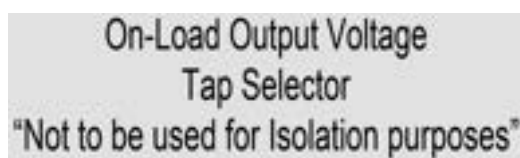


Example Used: 650V.

LABEL 3



LABEL 4



LABEL 5



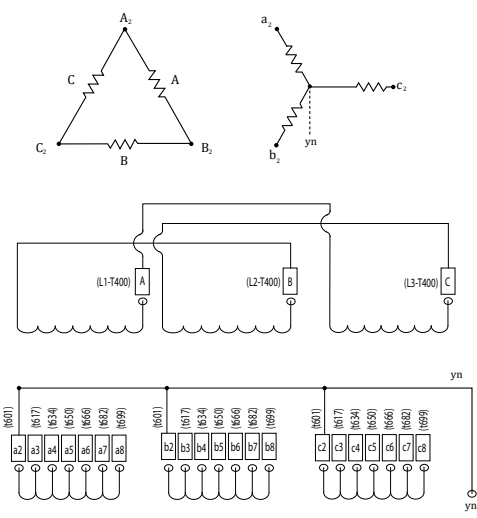
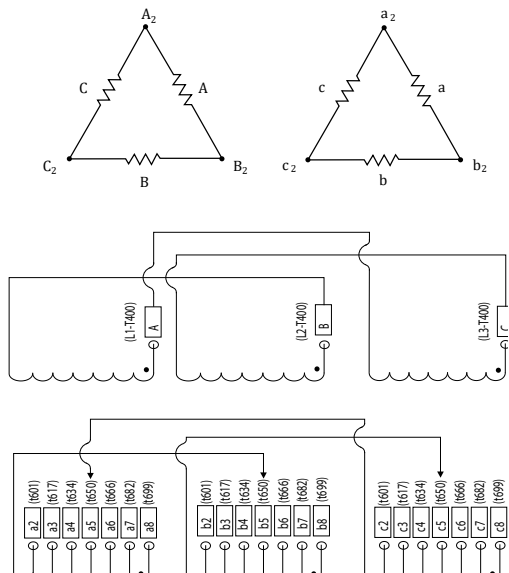
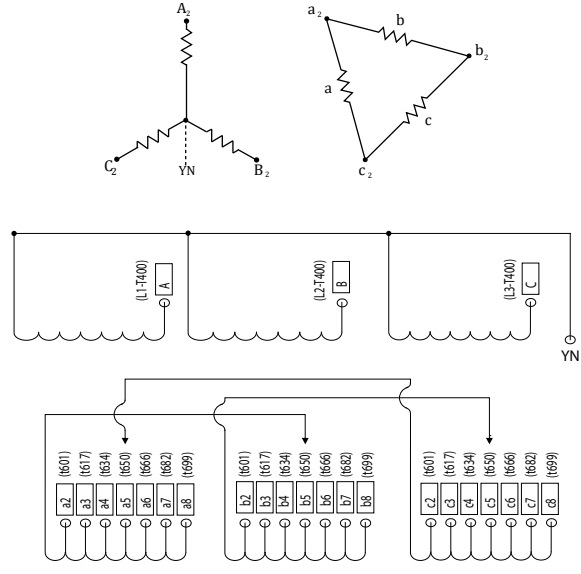
LABEL 6

TESTED	
DATE	INITIALS

Label	Description	Location
1	Electrical Specification Rating Plate	Enclosure Front Plate
2	Danger (HV of Transformer) - Isolate Supply	Enclosure Lid
3	Danger - Live Terminals Isolate Supply	Transformer
4	On Load Output Voltage Tap Selector	Enclosure Front Plate
5	CE Mark	Enclosure Lid
6	Tested Label - Date & Initials	Transformer

APPENDICES C

400/650V WIRING DIAGRAMS

Title	Descritpion	Diagram
Delta Star Aluminium	Aluminium Delta Star 3ph Step-Up Transformer Generic Wiring Diagram	
Delta Delta Aluminium	Aluminium Delta Delta 3ph Step-Up Transformer Generic Wiring Diagram	
Star Delta Aluminium	Aluminium Star Delta 3ph Step-Up Transformer Generic Wiring Diagram	

APPENDICES C

400/400V WIRING DIAGRAMS

Title	Descritpion	Diagram
Delta Star Aluminium	Aluminium Delta Star 3ph Isolation Transformer Generic Wiring Diagram	The diagram shows a three-phase transformer with a delta primary and a star secondary. The primary windings are connected in a delta configuration with terminals A₂, B₂, and C₂. The secondary windings are connected in a star configuration with terminals a₂, b₂, and c₂, and a common neutral point labeled 'yn'. Below the transformer, the terminal block connections are shown for phases A, B, and C, with terminals labeled (L1-7400), (L2-7400), and (L3-7400) respectively. The terminal block for phase A has terminals a2, a3, a4, a5, a6, a7, and a8. The terminal block for phase B has terminals b2, b3, b4, b5, b6, b7, and b8. The terminal block for phase C has terminals c2, c3, c4, c5, c6, c7, and c8. A common neutral point 'yn' is also indicated.
Delta Delta Aluminium	Aluminium Delta Delta 3ph Isolation Transformer Generic Wiring Diagram	The diagram shows a three-phase transformer with a delta primary and a delta secondary. The primary windings are connected in a delta configuration with terminals A₂, B₂, and C₂. The secondary windings are also connected in a delta configuration with terminals a₂, b₂, and c₂. Below the transformer, the terminal block connections are shown for phases A, B, and C, with terminals labeled (L1-7400), (L2-7400), and (L3-7400) respectively. The terminal block for phase A has terminals a2, a3, a4, a5, a6, a7, and a8. The terminal block for phase B has terminals b2, b3, b4, b5, b6, b7, and b8. The terminal block for phase C has terminals c2, c3, c4, c5, c6, c7, and c8.
Star Delta Aluminium	Aluminium Star Delta 3ph Isolation Transformer Generic Wiring Diagram	The diagram shows a three-phase transformer with a star primary and a delta secondary. The primary windings are connected in a star configuration with terminals A₂, B₂, and C₂, and a common neutral point labeled 'YN'. The secondary windings are connected in a delta configuration with terminals a₂, b₂, and c₂. Below the transformer, the terminal block connections are shown for phases A, B, and C, with terminals labeled (L1-7400), (L2-7400), and (L3-7400) respectively. The terminal block for phase A has terminals a2, a3, a4, a5, a6, a7, and a8. The terminal block for phase B has terminals b2, b3, b4, b5, b6, b7, and b8. The terminal block for phase C has terminals c2, c3, c4, c5, c6, c7, and c8.

APPENDICES C

650/650V WIRING DIAGRAMS

Title	Descritpion	Diagram
Delta Star Aluminium	Aluminium Delta Star 3ph Isolation Transformer Generic Wiring Diagram	The diagram shows a 3-phase isolation transformer with a delta primary and star secondary. The primary is connected in a delta configuration with terminals A₂, B₂, and C₂. The secondary is connected in a star configuration with terminals a₂, b₂, and c₂, and a neutral point labeled 'yn'. Below the transformer, the terminal blocks are labeled (L1-T650) A, (L2-T650) B, and (L3-T650) C. The terminal block for phase A has terminals a2, a3, a4, a5, a6, a7, and a8. The terminal block for phase B has terminals b2, b3, b4, b5, b6, b7, and b8. The terminal block for phase C has terminals c2, c3, c4, c5, c6, c7, and c8. The neutral point 'yn' is connected to the common terminal of the secondary windings.
Delta Delta Aluminium	Aluminium Delta Delta 3ph Isolation Transformer Generic Wiring Diagram	The diagram shows a 3-phase isolation transformer with a delta primary and delta secondary. The primary is connected in a delta configuration with terminals A₂, B₂, and C₂. The secondary is connected in a delta configuration with terminals a₂, b₂, and c₂. Below the transformer, the terminal blocks are labeled (L1-T650) A, (L2-T650) B, and (L3-T650) C. The terminal block for phase A has terminals a2, a3, a4, a5, a6, a7, and a8. The terminal block for phase B has terminals b2, b3, b4, b5, b6, b7, and b8. The terminal block for phase C has terminals c2, c3, c4, c5, c6, c7, and c8. The primary and secondary windings are connected in a delta-delta configuration.
Star Delta Aluminium	Aluminium Star Delta 3ph Isolation Transformer Generic Wiring Diagram	The diagram shows a 3-phase isolation transformer with a star primary and delta secondary. The primary is connected in a star configuration with terminals A₂, B₂, and C₂, and a neutral point labeled 'YN'. The secondary is connected in a delta configuration with terminals a₂, b₂, and c₂. Below the transformer, the terminal blocks are labeled (L1-T400) A, (L2-T400) B, and (L3-T400) C. The terminal block for phase A has terminals a2, a3, a4, a5, a6, a7, and a8. The terminal block for phase B has terminals b2, b3, b4, b5, b6, b7, and b8. The terminal block for phase C has terminals c2, c3, c4, c5, c6, c7, and c8. The primary and secondary windings are connected in a star-delta configuration.

[illegible]

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