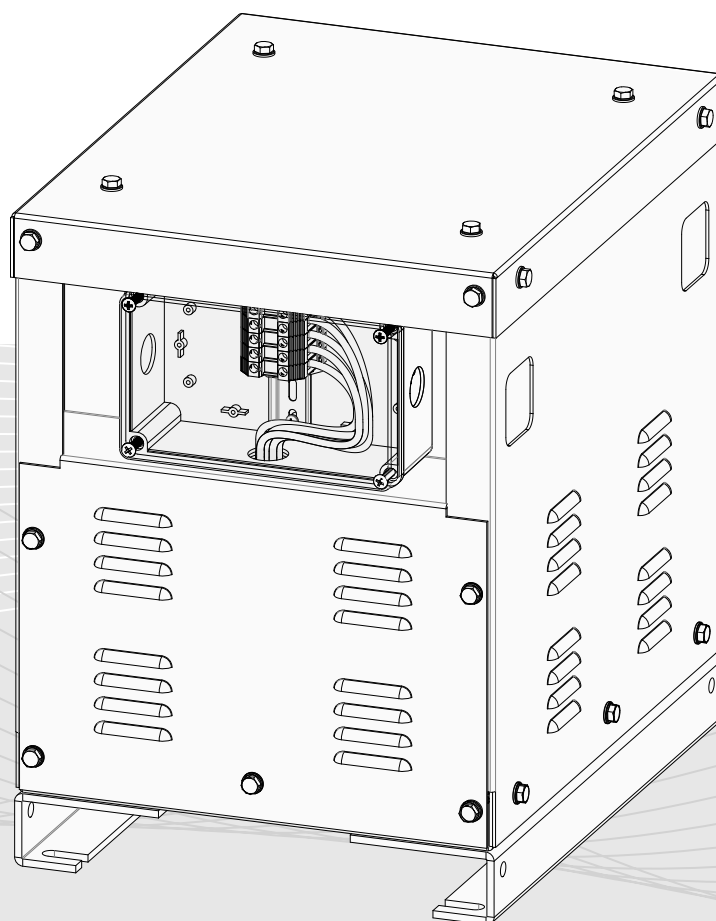




O&M MANUAL

Aluminum Wound Class II Distribution
Interface Transformers for Network Rail
DITA Schemes



English

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Version	Implemented By	Revision Date	Approved By	Approval Date	Reason
1	N.D.H.	17/08/18	N.D.H.	17/08/18	Initial Draft
2	C.J.W.	08/09/20	N.D.H.	08/09/20	Height Dimension changed for 20KVA on Appendix A.
3	C.J.W.	24/01/23	N.D.H.	24/01/23	Torque Details added for Terminals.

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	<p>Electrical power within this system/equipment is at a level considered, by the low voltage directive 73/23/EEC, to be sufficient to kill.</p> <p>Always assume conductors are live until proved dead.</p> <p>Before attempting any maintenance task, ensure that equipment is isolated from electrical supply.</p> <p>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.</p>
WORKING PRACTICES	<p>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.</p> <p>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.</p> <p>This equipment does not liberate any toxic or injurious gases during normal operation.</p> <p>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.</p>

1.2 PURPOSE

This O&M Manual defines the operating & Installation guidelines for the ATL Transformers, 5 - 40KVA range of DITA transformers for use within a standard Network Rail approved Apparatus housing. This transformer is Intended for use as a Class II Distribution Interface Transformer for Network Rail DITA Schemes. Reference should be made to NR/L2/SIGELP/27419 for clarity of the application topologies and scope of use.

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.

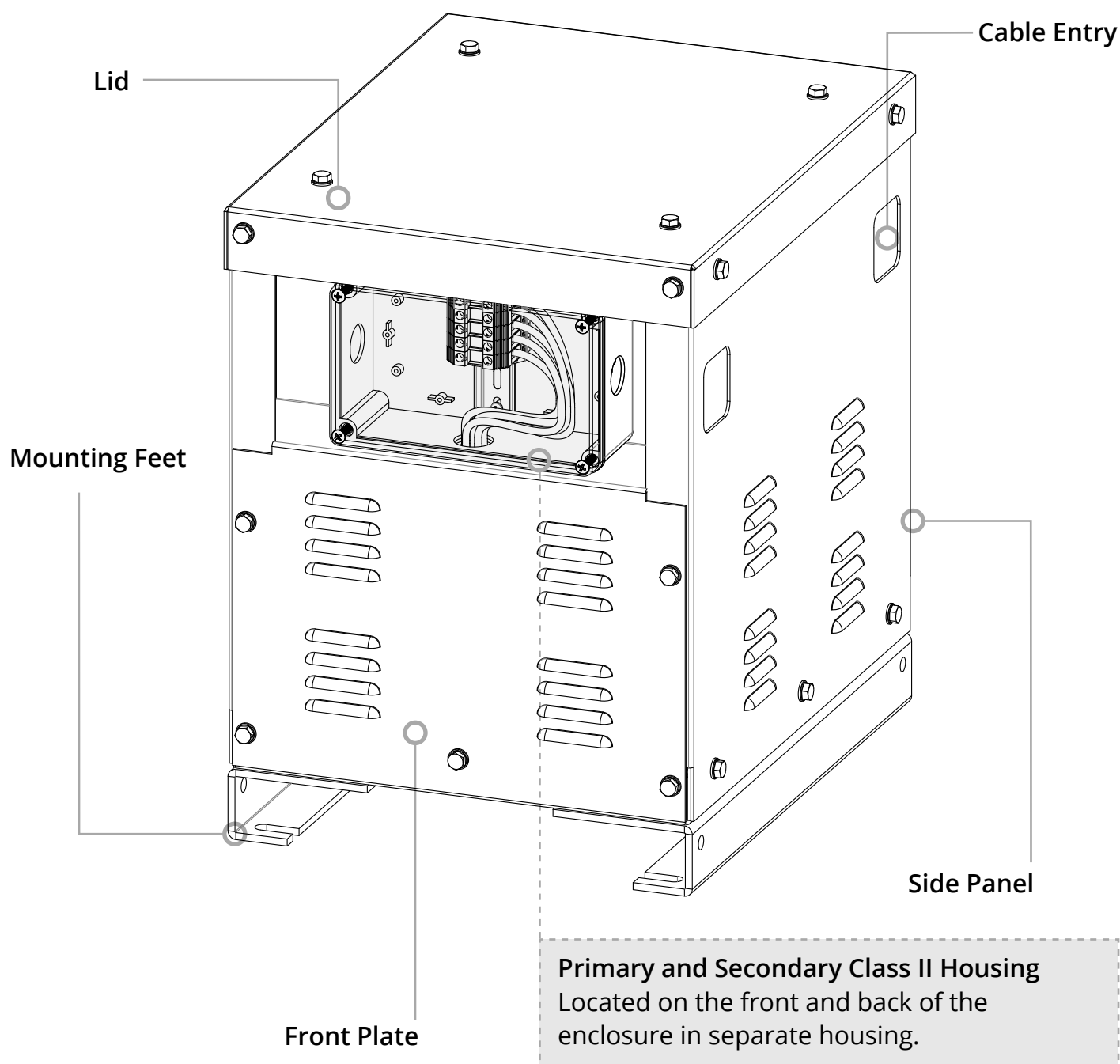
2. PRODUCT DESCRIPTION

2.1 KEY FEATURES

The enclosed transformer fits within a Network Rail approved Apparatus Housing. The 5KVA-40KVA transformers are in ingress protection of IP32 enclosures. Larger power ratings are available suitable for installation with a separate dedicated Apparatus Housing either half or full LOC case.

Primary & Secondary Class II terminals are housed within separate double insulated enclosures within and feature a protective inspection cover that enables cables to be traced from the point of entry and facilitates inspection of terminals under load. Class II terminal housing is clearly marked with a class II symbol & warning label.

Optional gland entry zones for both class II output and Class II input cables are available on either side of the enclosure & terminal housings for single output specifications. Dual Output specifications have separate output terminal housings with a single-entry point.

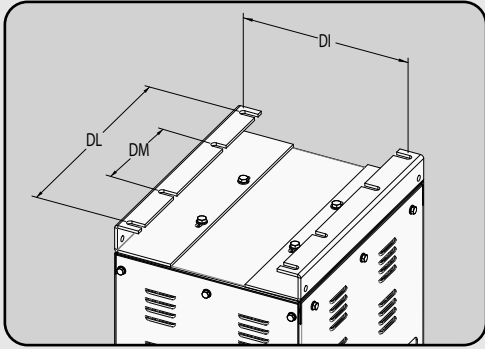


2.2 PRODUCT OPERATION

The Class II DIT transformer is designed to be fed from two wires from the Nominal Supply Voltage ($\pm 10\%$) Supply at a nominal 50Hz (+4% to -6%).

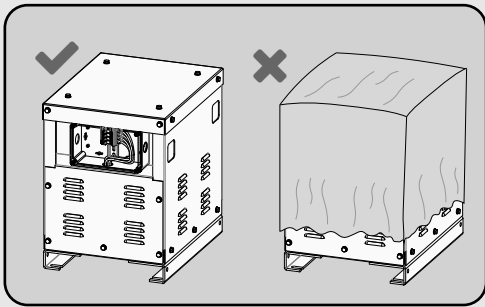
3. PRODUCT INSTALLATION

3.1 MOUNTING WITHIN APPARATUS HOUSING



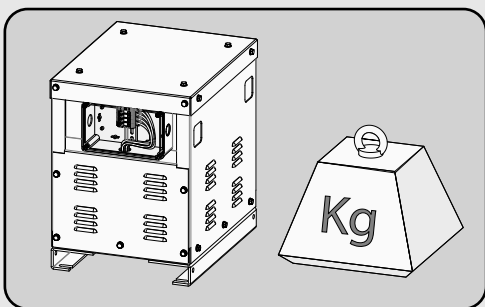
1. Dimensioning

The Transformers shown in the general arrangement drawings in Appendix A are designed to be secured onto standard Apparatus housing bar-work footprint. The use of an optional base tray to mount the Tx within the Apparatus housing is also permitted. See Appendix A, Dimension references: I, L & M.



2. Temperature

The Apparatus housing where the Tx is installed **must not** exceed an internal 60°C ambient during transformer operation. Adequate airflow around the transformer should be provisioned and enclosure louvers should never be blocked at any time.



3. Weight & Load

The weight of these transformers detailed within datasheets warrants adequate approved bar work and consideration by the integrator for the load. In all cases bar work should meet the requirements of Network Rail issued standards.

3.2 CABLE CONNECTION

Primary & Secondary: The Class II supply cables are to be terminated within the double insulated terminal compartments provisioned within the main body enclosure using M25 approved conduit and straight connectors. Cable ends should be terminated to the provided terminal blocks which are designed to accept a B2 cable to NR/PS/SIG/00005 Standard. Conduit should meet the requirements of NR/L2/SIGELP/27410 Issue 2 & NR/L2/SIGELP/27421 & 27422.

Optional Cable entry points are provided at either side of the main body enclosure for Class II cable routing.

All cabling should meet the requirements of NR standards:
NR/L2/SIGELP/27410 Issue 2 and NR/L2/SIGELP/27421 & 27422

Torque Settings for Terminals (**applies to all voltage variants**):

Rating	Min Torque	Max Torque
5KVA	2.5 Nm	3 Nm
10KVA	2.5 Nm	3 Nm
15KVA	2.5 Nm	3 Nm
20KVA	2.5 Nm	3 Nm
30KVA	3.2 Nm	3.7 Nm
40KVA	3.2 Nm	3.7 Nm

3.3 VOLTAGE SELECTION

INPUT: Monitor the supply voltage with a calibrated DVM and take an average value over 3 minutes. Connect supply to the nearest input voltage terminal provided.

OUTPUT: The output terminals facilitate fine voltage adjustment and the relevant terminal should be used to achieve an output voltage of 650VAC (230VAC OR 400VAC) $\pm 2\%$ under load. Ensure that the output voltage is achieved within the range of $\pm 2\%$.

NR/L2/SIGELP/27410 Issue 2 and NR/L2/SIGELP/27421 & 27422

4. PRODUCT MAINTENANCE

4.1 ROUTINE MAINTENANCE

These units are non-serviceable and require observational maintenance to the Class II terminals and protective covers which must be intact and installed as originally supplied. Inspection of louvres should be made to ensure no blockages are present preventing aspiration within the enclosure. 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

These units are non-serviceable and require observational maintenance to the Class II terminals and protective covers which must be intact and installed as originally supplied. Inspection of louvres should be made to ensure no blockages are present preventing aspiration within the enclosure. 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.



WARNING

The clear inspection covers on both primary & secondary terminal housings **MUST** be fitted and secured in the correct orientation following cable termination and shall not be mixed. The inspection cover is notched so as not to locate easily in an incorrect orientation, the fitting of this part correctly after any work within the terminal compartment is essential in maintaining the insulation integrity and safety of the transformer.

Check incoming supply voltage is within $\pm 10\%$ of the nominal a.c voltage and connect to the respective tap (using method specified in section 3.3).

Reconnect secondary load and using a calibrated ammeter check the load current. The load current should not exceed the value shown on the data sheet in Appendix A.

Check secondary tap voltages.

Terminal voltages should be within 2% of the terminal voltage. Adjust secondary taps if necessary.

Relevant safety checks & testing should be conducted in addition to these checks & in line with Network Rail's 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-RAL6005-125ml

5. TRAINING & COMPETENCE

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

All maintenance activities shall be undertaken by trained and authorized Network Rail crews and/or contractors familiar with the Class II system installation.

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
ATL DATA SHEETS	Appendix A
ATL DATA SHEETS	PA 05/ 06592

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	BS EN 61558-1:2009, IEC60076
Internal Standards	ISO 9001: 2008 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. NR/L2/SIGELP/27419 Issue1 – Product Specification for Distribution Interface Transformer Assemblies (DITA) for Signalling Power Distribution Systems
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 20/04/17

7. MANUFACTURER CONTACTS

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

Tel: +44 (0) 161 653 0902 Monday – Friday 08:00 – 18:00
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.

Low Voltage Directive 2006/95/EC. EMC Directive 2004/108/EC.

NR/L2/SIGELP/30007 Issue3 - Product Specification for Power Transformers for Signalling Systems.

NR/L2/SIGELP/27419 Issue1 – Product Specification for Distribution Interface Transformer Assemblies (DITA) for Signalling Power Distribution Systems.

9. FREQUENTLY ASKED QUESTIONS

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



WARNING

Ensure supply is Isolated before removing the Class II Compartments Protective Cover. Never attempt to replace Nylon screws or fasteners with metal screws or fasteners.

- **To access Class II Terminals:**

Remove Inspection cover from the Class II double insulated terminal compartments using Phillips head driver, route cable conduit into the respective terminal housings via the provided gland entry points. Once cable conduit is secured in place terminate 2 core cables to the respective voltage terminals using a Flat head terminal driver. See 3.2 for torque information regarding terminals.



NOTE: - All terminal housing covers must be replaced in the correct orientation after terminating cables to maintain protection.

2) Where do I connect the cables?

- The cables are connected in the case of the Primary and secondary, to the terminals within the Double insulated compartments, externally accessible to the main housing body. Both primary & Secondary terminals are accessible via removable protective covers.

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

- This unit is a Fully Class II assembly and designed to offer access to terminals only for installation purposes.
- Access within the main body enclosure is strictly prohibited for safety reasons.

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. CLASS II TRANSFORMER RANGE

- Table-12.1 Class II DIT Range in IP32 Enclosures

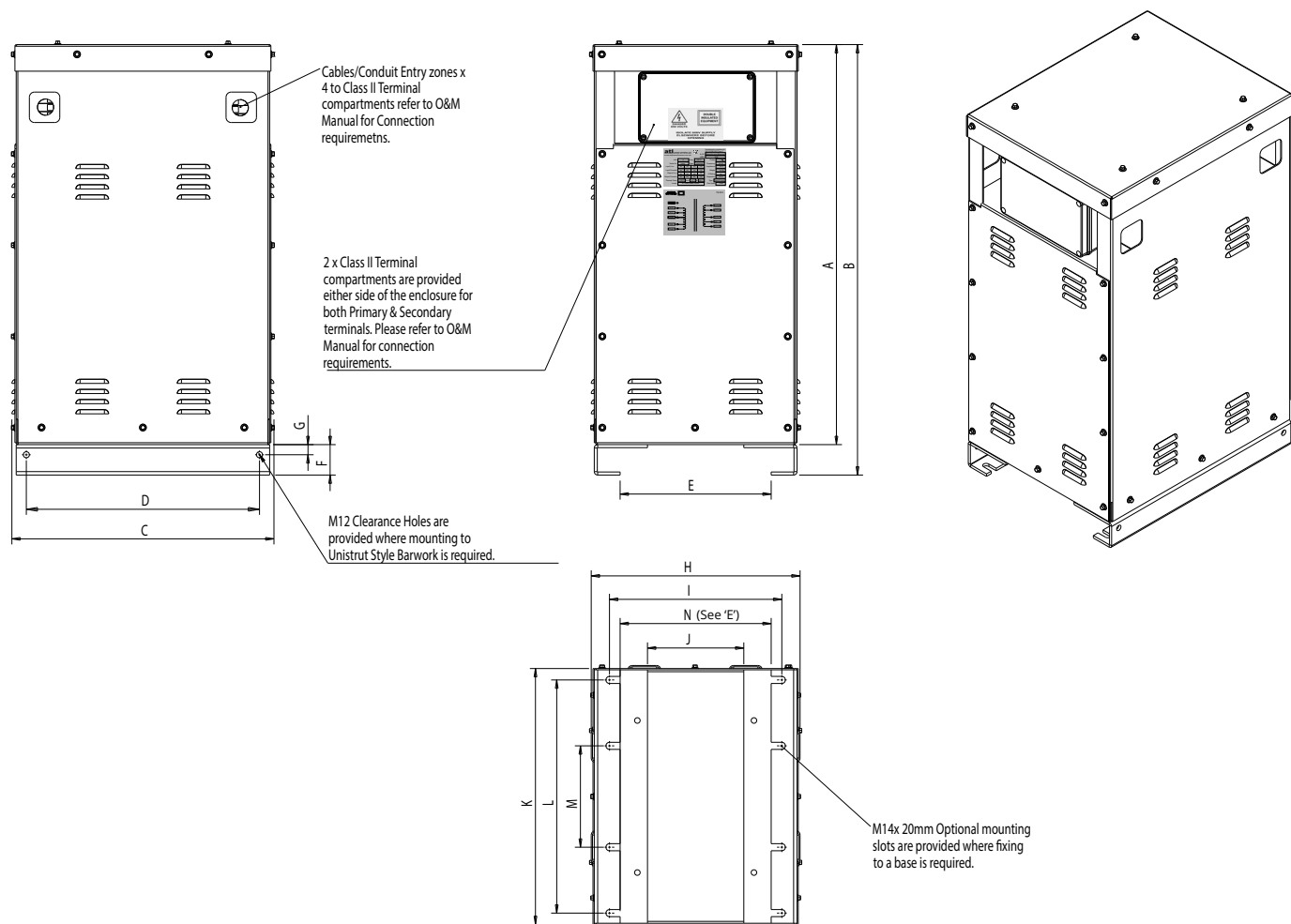
Part No.	Description	Catalogue No.
T3258	5KVA 650VAC / 650 VAC	PA 05/ 06592
T3258-1	5KVA 400VAC / 400 VAC	PA 05/ 06592
T3258-2	5KVA 230VAC / 230 VAC	PA 05/ 06592
T3258-3	5KVA 650VAC / 2 X 650 VAC Dual Output	PA 05/ 06592
T3258-4	5KVA 400VAC / 2 X 400 VAC Dual Output	PA 05/ 06592
T3258-5	5KVA 230VAC / 2 X 230 VAC Dual Output	PA 05/ 06592
T3259	10KVA 650VAC / 650 VAC	PA 05/ 06592
T3259-1	10KVA 400VAC / 400 VAC	PA 05/ 06592
T3259-2	10KVA 230VAC / 230 VAC	PA 05/ 06592

• Table-12.1 Class II DIT Range in IP32 Enclosures Continued.

Part No.	Description	Catalogue No.
T3259-3	10KVA 650VAC / 2 X 650 VAC Dual Output	PA 05/ 06592
T3259-4	10KVA 400VAC / 2 X 400 VAC Dual Output	PA 05/ 06592
T3259-5	10KVA 230VAC / 2 X 230 VAC Dual Output	PA 05/ 06592
T3260	15KVA 650VAC / 650 VAC	PA 05/ 06592
T3260-1	15KVA 400VAC / 400 VAC	PA 05/ 06592
T3260-2	15KVA 230VAC / 230 VAC	PA 05/ 06592
T3260-3	15KVA 650VAC / 2 X 650 VAC Dual Output	PA 05/ 06592
T3260-4	15KVA 400VAC / 2 X 400 VAC Dual Output	PA 05/ 06592
T3260-5	15KVA 230VAC / 2 X 230 VAC Dual Output	PA 05/ 06592
T3257	20KVA 650VAC / 650 VAC	PA 05/ 06592
T3257-1	20KVA 400VAC / 400 VAC	PA 05/ 06592
T3257-2	20KVA 230VAC / 230 VAC	PA 05/ 06592
T3257-3	20KVA 650VAC / 2 X 650 VAC Dual Output	PA 05/ 06592
T3257-4	20KVA 400VAC / 2 X 400 VAC Dual Output	PA 05/ 06592
T3257-5	20KVA 230VAC / 2 X 230 VAC Dual Output	PA 05/ 06592
T3278	30KVA 650VAC / 650 VAC	PA 05/ 06592
T3278-1	30KVA 400VAC / 400 VAC	PA 05/ 06592
T3278-2	30KVA 230VAC / 230 VAC	PA 05/ 06592
T3278-3	30KVA 650VAC / 2 X 650 VAC Dual Output	PA 05/ 06592
T3278-4	30KVA 400VAC / 2 X 400 VAC Dual Output	PA 05/ 06592
T3278-5	30KVA 230VAC / 2 X 230 VAC Dual Output	PA 05/ 06592
T3275	40KVA 650VAC / 650 VAC	PA 05/ 06592
T3275 -1	40KVA 400VAC / 400 VAC	PA 05/ 06592
T3275 -2	40KVA 230VAC / 230 VAC	PA 05/ 06592
T3275 -3	40KVA 650VAC / 2 X 650 VAC Dual Output	PA 05/ 06592
T3275 -4	40KVA 400VAC / 2 X 400 VAC Dual Output	PA 05/ 06592
T3275 -5	40KVA 230VAC / 2 X 230 VAC Dual Output	PA 05/ 06592

APPENDICES

GENERAL ARRANGEMENTS



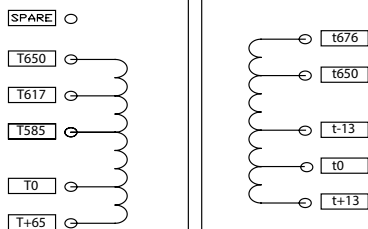
Model	Dimension (mm)													Weight (kg)
	A	B	C	D	E	F	G	H	I	J	K	L	M	
5KVA	479	539	519	460	298	60	20	412	354	160	505	460	200	93
10KVA	689	749	519	460	298	60	20	412	340	190	505	460	200	150
15KVA	789	849	519	460	298	60	20	412	340	190	505	460	200	195
20KVA	789	849	519	460	298	60	20	412	340	190	505	460	200	253
30KVA	994	1055	519	460	594	60	20	712	636	307	505	460	200	308
40KVA														370

APPENDICES

LABEL DETAILS

LABEL 1

DOUBLE INSULATED 



LABEL 2

atl TRANSFORMERS LTD
MANCHESTER, M24 2HD, TEL: 0161 653 0902
www.atltransformers.co.uk

Manufactured in accordance to
NR/L2/SIGELP/3007 Issue 3

AL/CU NRPA Aluminum Wound

kVA	5	Duty	100 %	Phase	1 ~
Serial No	xxxxx	Date	09/04/2018	Frequency	50 Hz
Input V a.c	0	105	110	115	Impedance
Input Currents	0	47.6	45.5	43.4	Weight
Output V a.c	0	228	240	252	IP Rating
Output Currents	0	21.9	20.8	19.8	Regulation
Thermal Class	H (180°C)	t _{amin}	-20 °C	t _a	+60 °C
Inrush	6.12 times Rated current				
				Type	Class II Hybrid
				Elec Spec	T3288

LABEL 3



LABEL 4



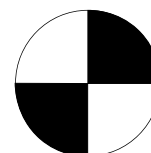
LABEL 5



LABEL 6

TESTED	
DATE	INITIALS

LABEL 7



Label	Description	Location
1	Electrical Specification Wiring Diagram	Enclosure Front Plate
2	Electrical Specification Rating Plate	Enclosure Front Plate
3	Danger - Isolate Supply	Primary & Secondary Housing Lid
4	ATL Transformers Eco-Rail® Logo	Enclosure Lid
5	CE Mark	Enclosure Lid
6	Tested Label - Date & Initials	Transformer
7	Centre of Gravity Symbol	Enclosure Lid

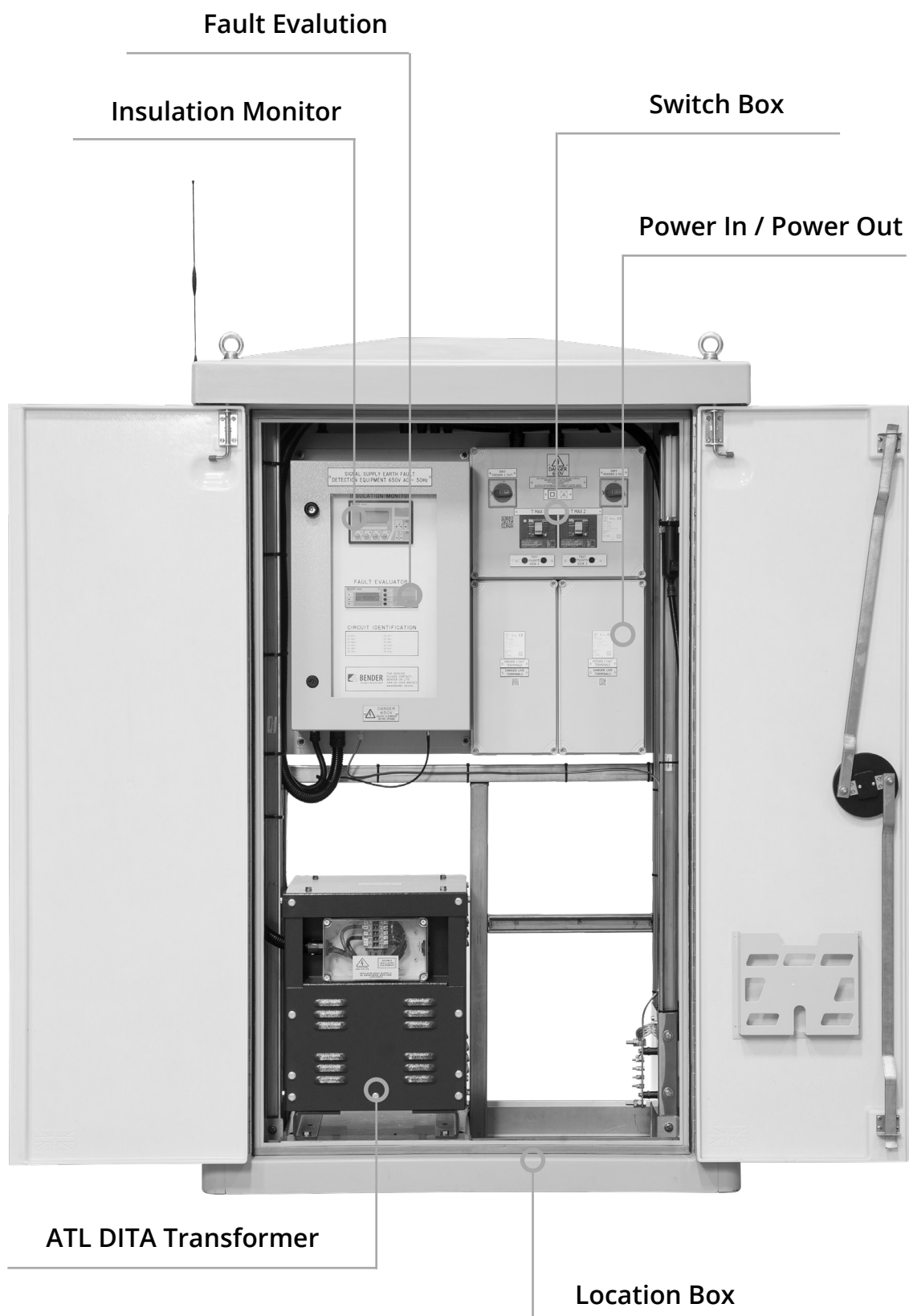
APPENDICES

WIRING DIAGRAMS

Title	Description	Diagram
650 Single Wound	Wiring Diagram for PA05/06592 Input +/- 5 & 10% 650 Output-2/+ 2,4 & 6% 650V T3257 T3258 T3259 T3260 T3275 T3278	
400 Single Wound	Wiring Diagram for PA05/06592 Input +/- 5 & 10% 400 Output-2/+ 2,4 & 6% 400V T3257-1 T3258-1 T3259-1 T3260-1 T3275-1 T3278-1	
230 Single Wound	Wiring Diagram for PA05/06592 Input +/- 5 & 10% 230 Output-2/+ 2,4 & 6% 230V T3257-2 T3258-2 T3259-2 T3260-2 T3275-2 T3278-2	

APPENDICES

DITA ASSEMBLY IN LOCATION BOX



Single Phase Transformers

Three Phase Transformers

Solutions for Rail

DC Chokes

Specialist Assemblies

Power Supplies

Control Gear



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