



ISOLATION TRANSFORMERS

USER'S HANDBOOK

MAT 194 November 2021

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CONFORMITY DECLARATION

The Manufacturer,



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under its own responsibility and in the person of its Legal Representative

DECLARES

that the product:

**SINGLE-PHASE & THREE-PHASE
ISOLATION TRANSFORMER**

identified with the codes:

TXXXXXXXXXXXXXXX) - YXXXXXXXXXXXXXX

provided that it is installed, maintained and used for the purpose for which it has been designed and built, according to good professional practice and in conformity with the Manufacturer's instructions,

COMPLIES

with the requirements contained in the **CE EUROPEAN DIRECTIVE:**

- **2014/35/EU (LOW VOLTAGE)**
- **2011/65/EU (ROHS RECAST)**

as complying with the relevant parts of the harmonised **STANDARDS:**

- **EN60076 (POWER TRANSFORMERS)**
- **EN61558 (when applicable) (SAFETY OF POWER TRANSFORMERS, POWER SUPPLIES, REACTORS AND SIMILAR PRODUCTS)**

The Manufacturer also

DECLARES

that the units are built with suitable quality components and that the manufacturing process is constantly verified in accordance with the Quality Control Plans which the Company applies in compliance with the ISO 9001:2015 Standards.

The Company's commitment towards environmental issues and safety at work matters is guaranteed by the certification of the Management System according to the ISO14001:2015 and ISO45001:2018 Standards.

The General Sales Conditions, which include the warranty terms, can be downloaded either via the QR code or from the website www.next.ortea.com



1 INTRODUCTION

This Manual contains the information necessary to ensure correct installation and operation, efficient maintenance and safety for the personnel involved with the unit performance. The transformers described in this manual must be used exclusively for the purpose for which they have been designed and manufactured. Installation must be done according to the instructions provided with this handbook. Any other use has to be considered as inappropriate and therefore dangerous. The Manufacturer shall not be held liable for any damage to people and belongings due to incorrect use or installation. In case of doubt and for any other necessity, please contact the nearest authorised Service Centre.

This Manual is as an integral part to the isolation transformer and the instruction therein must be carefully followed. Manual and all attached documentation ought to be filed for further consultation in a place available and known to the user and the maintenance personnel. This Manual must be kept for the entire life of the isolation transformer.

1.1 INFORMATION PROPERTY

This Manual and any attached documentation are covered by copyright and the Manufacturer maintains all the reserved rights. It is compulsory to inform the Manufacturer's Head Office and ask for authorisation before proceeding with any release or reproduction. The Manufacturer shall not be held liable or responsible in any way for unauthorised copies, alterations or additions to the text or to the illustrated parts of this document. Any modification involving company logo, certification symbols, names and official data is strictly forbidden. ***In order to obtain better performance, the product described in the present handbook can be altered at any date and without prior notice.***

1.2 REFERENCE NORMATIVE

The stabilisers described in this Manual are designed and built in compliance with:

- 2014/35/EU (Low Voltage European Directive)
- EN60076 Standard (Power transformers)
- EN61558 Standard (Safety of power transformers, power supplies, reactors and similar products)

Furthermore, the Manufacturer's Managing System is compliant with and duly approved according to:

- ISO9001:2015 (Quality)
- ISO14001:2015 (Environmental issues)
- ISO45001:2018 (Health & Safety at work)

⚠ WARNING INFORMATION AND INSTRUCTIONS PROVIDED BY THIS MANUAL ADD TO AND NEITHER REPLACE NOR AMEND ANY STANDARDS, REGULATIONS, DECREES, DIRECTIVES OR LAWS CONCERNING ENVIRONMENTAL AND SAFETY AT WORK AWARENESS ENFORCED BOTH INTERNATIONALLY AND IN THE COUNTRY OF INSTALLATION.

1.3 DEFINITIONS

⚠ WARNING MESSAGE RELEVANT TO POTENTIALLY HAZARDOUS SITUATIONS WHICH MIGHT INDUCE MINOR INJURIES IF IGNORED OR NEGLECTED. THE SAME SIGNAL CAN BE USED TO HIGHLIGHT HAZARDS WHICH MIGHT CAUSE DAMAGE TO THE UNIT OR TO POINT OUT IMPORTANT INFORMATION.

⚠ DANGER MESSAGE RELEVANT TO POSSIBLE OR PROBABLE HAZARDOUS SITUATIONS WHICH MIGHT INDUCE SERIOUS OR EVEN FATAL HARM IF IGNORED OR NEGLECTED.

Note Additional information to better understand the unit operation.

2 ENVIRONMENTAL NOTES

Being the transformer a fixed industrial appliance, the WEEE Directive cannot be applied. Nevertheless, because of the Company's environmental commitment, the user is strongly recommended to follow responsible end-of-life measures. The dismissed transformer must be disposed of through channels that can assure the separation of recyclable materials and components in conformity with the relevant rules and regulation enforced in the Country of installation. If in doubt, please contact the Manufacturer's HQ and ask for instructions. An appropriate disposal procedure will reduce the environmental impact and the exploitation of natural resources. The product does not contain CFCs, HCFCs, asbestos, oil, fuel, liquid or gaseous substances. Please recycle the packaging materials (cardboard and/or wood). At the end of the service, before disposing of the unit, remove the nameplate and make the appliance unusable by cutting the internal connections.

3 HEALTH & SAFETY

3.1 NOTES FOR THE OPERATOR

⚠ DANGER THE VOLTAGE INSIDE THE EQUIPMENT IS DANGEROUS. ACCESS TO THE COMPONENTS FOR INSTALLATION, SETTING, INSPECTION AND MAINTENANCE MUST BE GRANTED ONLY TO QUALIFIED PERSONNEL IN CHARGE OF IT AND INFORMED OF THE RELEVANT RISKS. DO NOT OPERATE WITHOUT SAFETY TOOLS. DO NOT WORK ON THE TRANSFORMER UNLESS IT IS DE-ENERGISED.

The following safety general instructions are based on experience and common sense, but cannot describe or foresee all the possible situations. Basic safety procedures must be continuously applied and known by whoever happens to deal with the transformer. In order to ensure full knowledge of properties and characteristics of the unit, this Manual must be read and comprehended by those who supervise and maintain it.

- Check that the unit is always properly earthed.
- Warn anybody who might be in the vicinity of the transformer before energizing the unit.
- Always operate in good lighting.
- Do not allow unauthorized personnel to operate on the unit for no reason whatsoever.
- Always use suitable safety means such as isolating tools and footboards, isolating gloves, etc.
- NEVER operate the unit without the provided protections against accidental contact, unless specifically indicated in the maintenance instructions in this Manual.
- Do not climb on top of the cabinet.
- Do not accumulate goods around or above the cabinet.

The transformer is housed in a cabinet with screwed in panels. In normal working conditions, the unit must operate only when the enclosure is completely closed. The transformer cannot be accessed without opening the cubicle with specific means. The protection against direct contact is therefore inherently obtained.

Any anomaly must be promptly signaled.

3.2 NOTES FOR MAINTENANCE

⚠ DANGER BEFORE RUNNING ANY MAINTENANCE OR REPAIRING ROUTINE, DISCONNECT THE UNIT BY OPENING THE UPSTREAM GENERAL BREAKER AND LOCK THE BREAKER WITH A PADLOCK THE KEYS OF WHICH MUST BE KEPT BY THE MAINTENANCE SUPERVISOR UNTIL THE END OF THE PROCEDURE.

- Do not perform maintenance while the transformer is working.
- Whenever possible, do not use hand instead of suitable tools in order to work on the unit.
- Do not use bars, cables, plates or internal components as support or handhold.
- Check that mechanical and electrical connections are properly tightened at the end of the routine.
- Do not remove, alter or damage nameplates, warnings of any identification tags or labels.
- Before re-energising, always restore the protection that have been removed for maintenance.

In case of doubts on the operational features or on the necessary maintenance procedures, please contact the Manufacturer or an authorised Service Centre.

Tampering on the unit relieves the Manufacturer from any responsibilities and makes the User solely responsible towards the competent bodies concerning accident prevention. The Manufacturer shall not be liable in case of:

- failure to follow the specified instructions
- alteration (even slight) of the unit resulting in a modification of its functioning and operational features
- failure to comply with the health and safety at work measures
- use of not original spare parts (unless specifically authorized by the Manufacturer)

During maintenance and repairing procedures, the enclosure is likely to be open. Consequently, some residual dangers persist, due to the impossibility of eliminating the sources as implicit in the working procedures.

DANGER	INDICATIONS
CRUSHING	Handling the unit must be done exclusively by means of the tools described in the relevant chapter. Handling and lifting operations must be carried out by skilled and trained personnel only.
ELECTROCUTION	During normal working operation, the danger does not exist. Carry out maintenance routines only after having disconnected the unit. Should it be necessary to test an energized unit, segregate the area so that only skilled personnel can operate, still in compliance with all the health and safety requirements set forth by the Rules and Regulations enforced in the Country of installation.
FIRE	Open the interrupting device upstream the unit and use CO ₂ fire extinguishers. Do not use water to extinguish fire.
HUMAN ERROR	Installation, start-up, setting, inspection, maintenance and repairing operations must be carried out by skilled, qualified and authorized personnel only, aware of the relevant risks. Read this Manual carefully and thoroughly before operating on the transformer. Altering the configuration or replacing one or more parts without the Manufacturer's authorization is strictly forbidden.
FAILURE TO CARRY OUT MAINTENANCE	Carry out the maintenance routine as prescribed in this Manual. The Manufacturer shall not be held liable in any way for damage to people and belongings caused by failure in performing maintenance on the unit.

DANGER	INDICATIONS
LACK OF INFORMATION	While carrying out the maintenance routine, ensure that the unit cannot be energised without the maintainer's awareness. To this purpose, padlock the upstream interrupting device and affix warning signs.

3.3 BEHAVIOUR

The personnel dealing with the transformer shall operate strictly in conformity with the requirements set forth by the health and safety at work Rules and Regulations enforced in the Country of installation. Provided that everything is carried out according to the instructions in this Manual, the unit is designed in order to work and be maintained without risks for people or the environment. The isolation transformer does not require maneuvering or command drives. However, the personnel dealing with it must be aware of its characteristics, maintenance routines and troubleshooting procedures. The full comprehension of this Manual is therefore critical.

⚠ DANGER TAMPERING AND/OR UNAUTHORISED REPLACEMENT OF ONE OR MORE COMPONENTS, USING ACCESSORIES, TOOLS OR MATERIAL NOT RECOMMENDED AND/OR NOT APPROVED BY THE MANUFACTURER MIGHT BE DANGEROUS AND CAUSE ACCIDENTS. SAID ACTIONS RELIEVE THE MANUFACTURER FROM ANY CIVIL AND/OR PENAL RESPONSIBILITIES.

3.3.1 Correct behaviour

- follow the instructions provided by the use and maintenance Manual
- respect the recommended maintenance frequency and keep a record of the performed interventions
- disconnect the unit in case of inspection, maintenance or repairing routines
- use suitable PPEs (Personal Protective Equipment) when dealing with the unit
- promptly inform the unit supervisor about functioning anomalies (suspected malfunctioning, incorrect operation or failure; excessive noise; etc.) and if necessary put the unit out of order.

3.3.2 Incorrect behaviour






Any use that contrasts with what stated above and any of the operations listed below can be defined as 'incorrect':

- arbitrary alteration of the working parameters. In case changes are required, please contact the Manufacturer or an authorized Service Centre
- use of improper or unsuitable energy sources
- failure to comply with the maintenance instructions or incorrect maintenance
- use of unsuitable or unauthorized not original spare parts
- alteration of the safety devices and/or unit tampering
- performance of inspection, maintenance or repairing routines without disconnecting the unit

⚠ WARNING THE MANUFACTURER SHALL NOT BE HELD LIABLE DUE TO ANY DAMAGE TO PEOPLE AND BELONGINGS ARISING FROM INCORRECT USE AS ABOVE DEFINED.

3.4 PERSONAL PROTECTIVE EQUIPMENT (PPE)

While dealing with the isolation transformer, the user must have and use suitable PPEs, in conformity with the safety requirements enforced in the Country of installation and with the relevant European Directives. The Manufacturer strongly recommends to dress suitably, avoiding clothes that might get caught up, wide sleeves, synthetic material, scarves and ties. Necklaces, bracelets, metallic wristwatches and similar object should also be avoided. In the table below, the recommended PPEs are listed:

		USER	MAINTAINER	DANGER	CONSEQUENCE
	SAFETY SHOES	✱	✱	Bumping, tripping, slipping, crushing limbs	Bruises, abrasions, cuts, sprains, dislocations, fractures
	SAFETY GLOVES	✱	✱	Hand contact with sharp surfaces or edges	Bruises, abrasions, cuts
	SAFETY DIELECTRIC GLOVES		✱	Contact with live parts when testing an energized unit	Elettrocution
	ANTI-ARC VISOR		✱	Contact with projectile and radiation from electric arc	Eye injury, eyesight loss or limitation
	GENERIC ANTI-DUST MASK		✱	Particulate and/or dust inhalation	Respiratory disorders

⚠ WARNING A VISITOR CAN APPROACH A WORKING UNIT ONLY IF THE LATTER IS COMPLETELY CLOSED. SHOULD THE INTERNAL COMPONENTS BE SHOWN, REGARDLESS OF THE PROTECTION AGAINST ACCIDENTAL CONTACT, THE UNIT WILL HAVE TO BE SWITCHED OFF. OTHERWISE, THE VISITOR SHALL BE MAINTAINED AT A SAFETY DISTANCE BY MEANS OF PHYSICAL BARRIERS.

4 HANDLING

4.1 PACKAGING

Isolating transformers can be shipped fixed on a pallet and wound in plastic film or packed in a wooden crate with seaworthy vacuum bag. Each unit is provided with a label indicating nominal data, consignee data and purchasing order details.

4.2 RECEPTION

At reception, check the integrity of the packaging and the absence of evident damage occurred during transport. If the inspection reveals damage or faulty handling, please write nature of damage, date and signature on the transport documents and inform the Headquarters about the occurred damage

Once the good condition of the delivery has been established, unpack the unit and check it.

In the unlikely event of damage, notify immediately the Manufacturer in writing.

4.3 STORAGE

Should the unit be stored, ensure that it is kept sheltered from rain, snow, excessive humidity and adverse climatic conditions (polluted or salty atmosphere, parasites, etc.) at a temperature between 0°C and 40°C.

4.4 MOVING THE UNIT

⚠ WARNING *THE UNIT MUST BE KEPT IN VERTICAL POSITION. LAYING THE TRANSFORMER ON ITS SIDE MIGHT CAUSE SERIOUS DAMAGE AND COMPROMISE THE FUNCTIONALITY.*

Unloading and moving operations are under the User's responsibility. Take the utmost care in order to avoid damage to whoever might be around the unit, to the unit itself and to belongings or other equipment on the installation site. Unloading and moving operations can be performed via either cranes fitted with chains/lifting brackets or forklift trucks. The lifting devices must be suitable to the unit weight, in good conditions and regularly checked and maintained.

⚠ WARNING *DO NOT MOVE THE TRANSFORMER BY PUSHING OR PULLING THE COILS. THIS MIGHT RESULT IN A PERMANENT DAMAGE OF THE TRANSFORMER. DO NOT RELY ON THE CABINET FOR LIFTING OR MOVING: ANY MOVEMENT MUST BE PERFORMED ANCHORING THE LIFTING DEVICE TO THE TRANSFORMER. FAILING TO LIFT THE TRANSFORMER CORRECTLY MIGHT RESULT IN DAMAGE TO PROPERTIES AND/OR CAUSE PERSONAL INJURIES.*

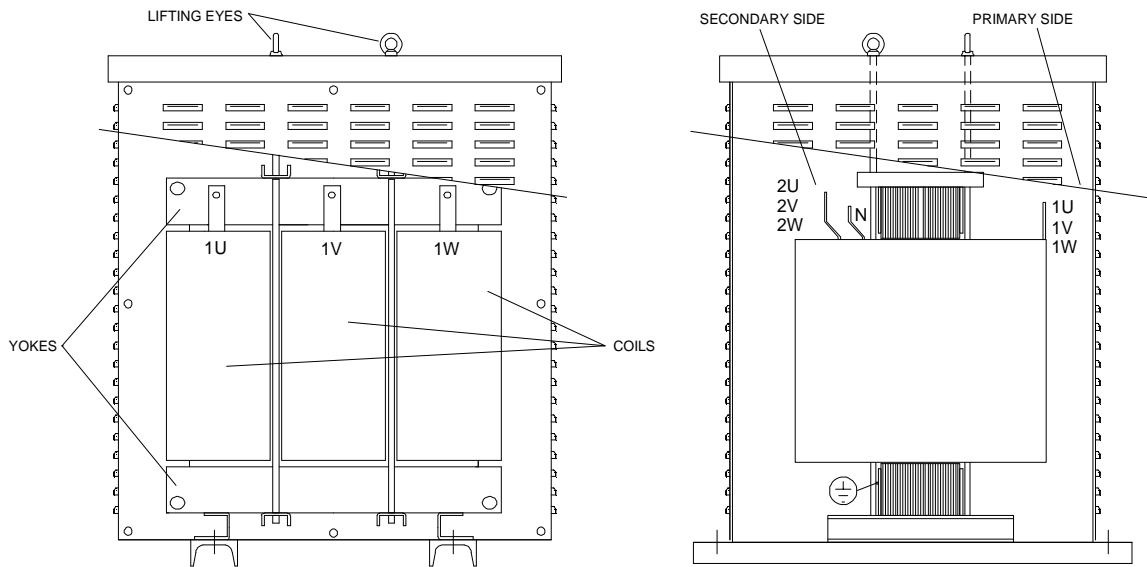
⚠ DANGER *HANDLING OPERATIONS MUST BE CARRIED OUT ONLY BY AUTHORISED, SUITABLY TRAINED PERSONNEL PROVIDED WITH THE NECESSARY PERSONAL PROTECTIVE EQUIPMENT (PPE). ALWAYS OPERATE IN CONFORMITY WITH THE SAFETY AT WORK RULES AND REGULATIONS ENFORCED IN THE COUNTRY OF INSTALLATION AND WITH THE INSTRUCTION MANUALS OF THE TOOLS USED. THE MANUFACTURER SHALL NOT BE HELD LIABLE FOR ANY DAMAGE THAT MIGHT OCCUR TO PEOPLE OR BELONGINGS DUE TO FAILURE IN COMPLYING WITH WHAT STATED ABOVE DURING UNLOADING AND MOVING OPERATIONS.*

5 INSTALLATION & COMMISSIONING

Unless otherwise agreed and stated, isolation transformer are designed for indoor installation and housed in IP21 cabinets.

Please refer to the nameplate for the technical data.

5.1 GENERAL REPRESENTATION



5.2 SITE CHOICE

The transformers must be installed so that they cannot be tampered with by unauthorised personnel.

The installation site must comply with the basic requirements listed below:

- unless otherwise agreed upon, the maximum installation altitude is 1000mt a.s.l.
- the floor or surface must be flat and able to withstand the unit's weight;
- the installation room dimensions and the airing system must ensure that the generated heat can be disposed of. Otherwise, a cooling systems must be arranged;
- the lighting system must be suitable for normal operating and maintenance routines;
- the ground circuit must comply with the relevant applicable rules and regulations;

If not previously arranged during the contracting phases, the unit must not be commissioned in case of:

- corrosive, explosive or flammable atmosphere;
- presence of conductive dust in the environment;
- proximity to radiation sources;
- possibility of floods.
- seismic areas (unless otherwise stated).

Avoid direct heat and contact with liquid, flammable or corrosive materials. Leave enough space around the unit for carrying out connections, maintenance and inspecting operations.

Do not to clog the cabinet air openings.

Check that anti fire devices are available in the area.

5.3 NOISE

The transformers are designed and built in order to minimise the noise level. However, some actions can be taken in order to limit the potential sound transmission and reflection: Install the transformer away from corners, walls and ceiling. If this cannot be achieved, use sound absorbing panel on walls or ceiling. If possible, use flexible conduit for the connections. Install the transformers away from areas where noise can create disturbance.

5.4 ELECTRICAL CONNECTION

⚠ DANGER THE ISOLATION TRANSFORMER IS NOT AND MUST NOT BE USED AS A PROTECTING DEVICE FOR NEITHER THE PLANT NOR THE LOADS. THE ELECTRICAL CONNECTION MUST BE CARRIED OUT BY TRAINED AND QUALIFIED PERSONNEL, AWARE OF THE INVOLVED RISKS. ALWAYS USE SUITABLE TOOLS AND PERSONAL PROTECTIVE EQUIPMENT (PPE). THE OPERATIONS MUST BE CARRIED OUT IN CONFORMITY WITH THE RULES AND REGULATIONS ENFORCED IN THE COUNTRY OF INSTALLATION.

5.4.1 Supply

The supplying line must be in conformity with the technical data specified in the nameplate. Unless otherwise agreed during the purchasing process, the transformer is not protected against short-circuit or overload. In compliance with the safety regulations in force, the installation should take place in a system fitted with:

- an interrupting device with capacity referred to the input current upstream the unit

- an interrupting device with capacity referred to the output current downstream the unit
- Additional differential circuit breakers can be installed upstream and downstream the transformer.
The mentioned protections are not included with the standard unit and must be part of the supplying line.

5.4.2 Connections

The enclosure is provided with one or more removable plates for cable entry. Said plates are bolted to the enclosure structure and must be removed in order to allow the connecting cables/bars to reach the transformer. Open the cubicle and locate the connection points. Prepare the connection cables/bars with regard to the current values and make them go through the windows left available by removing the plates. The very first operation is to connect the earth wire to the terminal identified by PE, GRD or ⊕.

⚠ DANGER THE EARTH CONDUCTOR MUST NEVER BE ELECTRICALLY INTERRUPTED NEITHER INSIDE NOR OUTSIDE THE UNIT.

The earth wire cross-section must be chosen in conformity to the regulations in force. Therefore, depending on the phase cable cross-section chosen for the connections, the earth wire cross-section should respect the values in the table below:

PHASE CABLE CROSS-SECTION S [sqmm]	EARTH WIRE MIN CROSS-SECTION [sqmm]
$S \leq 16$	S
$16 < S \leq 35$	16
$35 < S \leq 400$	S/2
$400 < S \leq 800$	200
$S > 800$	S/4

Note If the application of this data determines a not standardised cross-section, the nearest larger one should be chosen.

Connect the incoming line to the input terminals and the outgoing line supplying the load to the output terminals. Terminals are typically identified by one of the combinations listed in the table below:

INPUT	OUTPUT
1U – 1V – 1W – 1N	2U – 2V – 2W – 2N
R – S – T – N	U – V – W – N
A – B – C – N	a – b – c – n

Make the connections respecting the indications written on the terminations avoiding kinks and accidental contact between the cables and the components.

⚠ DANGER SWAPPING THE INPUT CONNECTION WITH THE OUTPUT ONE COULD SERIOUSLY DAMAGE THE TRANSFORMER.

⚠ DANGER DO NOT LAY CABLES, TOOLS OR OTHER MATERIAL ON THE COILS.

Cables and bars must be rigidly fixed in order to avoid dangerous mechanical stress on the terminals.

At the end of the connecting operations, always check the tightness of the connections and carefully close the enclosure.

5.5 START-UP AND OPERATING CHECKS

Before feeding the transformer, please check the following.

- Cleanliness of the surfaces - Remove dust deposits (due to possible long-lasting storage) with low pressure compressed air. Check that the air ducts in the coils are not clogged. Do not introduce any objects in the air ducts.
- Earth connection - Make sure that the transformer is properly grounded.
- Connections - When temperature control devices are installed (thermometer, temperature monitoring units, fan control units, etc.), check that the alarm thresholds are properly set and make sure that said units are perfectly working. According to the insulation class of the transformer, the temperature monitoring unit should be set as in the following table:

INSULATION CLASS	TEMPERATURE SETTING		
	FAN INSERTION	ALARM	TRIP
B	90°C	110°C	120°C
F	110°C	130°C	140°C
H	130°C	150°C	165°C

After having performed all the preliminary controls, the transformer can be energised in off load condition. Unless a specific value is agreed upon in the initial contract, the insertion causes an inrush current which varies from 5 to 20 times the nominal current. This transient period lasts a few periods (indicatively, 100 to 200msecs).

The intervention time of the circuit protection on primary side should be delayed in order to avoid unduly tripping during the current transient.

After positive off load connecting, the load can be applied to the transformer secondary side.


 **WARNING** *UNNECESSARY REPEATED STARTING MANOEUVRES SHOULD BE AVOIDED.*

6 OPERATION

6.1 NAME PLATE

The transformers must be used as per the data recorded on the nameplate.

6.2 PROTECTION

 **WARNING** *THE RESIN ON THE COILS DOES NOT PROTECT AGAINST DIRECT OR ACCIDENTAL CONTACTS. IT IS STRICTLY FORBIDDEN TO TOUCH THE TRANSFORMER WHEN ENERGISED.*

Do not open the transformer enclosure when energised.


6.3 AMBIENT TEMPERATURE AND OPERATING TEMPERATURE

The ambient temperature must not exceed maximum 40°C and minimum -5°C, unless otherwise requested in the initial specification. IEC standards indicate that the temperature must not exceed the average daily value of 30°C and the yearly average value of 20°C.

The working temperature rise of the transformer varies in relation to the insulation classes as indicated in the following table:

INSULATION CLASS	TEMPERATURE RISE
B	80°C
F	100°C
H	125°C

6.4 HEAT DISSIPATION

 **WARNING** *DURING ITS NORMAL OPERATION, THE TRANSFORMER GENERATES LOSSES AND THEREFORE HEAT, WHICH MIGHT BRING THE SURFACE OF THE ENCLOSURE TO A TEMPERATURE HIGHER THAN THE AMBIENT ONE. IN ORDER TO PREVENT OVERHEATING AND THEREFORE OPERATING MALFUNCTIONING, THE THERMAL ENERGY PRODUCED BY THE TRANSFORMER MUST BE ADEQUATELY DISSIPATED. THIS ISSUE IS PARTICULARLY IMPORTANT WHEN THE TRANSFORMERS ARE INSTALLED IN PLACES OR BOXES WITH REDUCED DIMENSIONS. IF THIS IS THE CASE, PARTICULAR CARE SHOULD BE TAKEN IN ORDER TO GUARANTEE AN ADEQUATE AIR FLOW THROUGH THE ENCLOSURE.*

7 MAINTENANCE

⚠ DANGER ACCESS TO THE COMPONENTS FOR INSTALLATION, SETTING, INSPECTION AND MAINTENANCE MUST BE GRANTED ONLY TO QUALIFIED PERSONNEL IN CHARGE OF IT. EVERY MAINTENANCE OPERATION MUST BE DONE WHILE THE TRANSFORMER IS DISCONNECTED FROM THE MAINS. ANY OPERATION MUST BE CARRIED OUT IN COMPLIANCE WITH IN FORCE RULES AND REGULATIONS CONCERNING PERSONAL SAFETY AT WORK AND USE OF ADEQUATE PROTECTIVE TOOLS. IT IS THE OWNER'S RESPONSIBILITY TO INSPECT, MAINTAIN AND KEEP THE TRANSFORMER IN GOOD REPAIR.

7.1 CONTROL

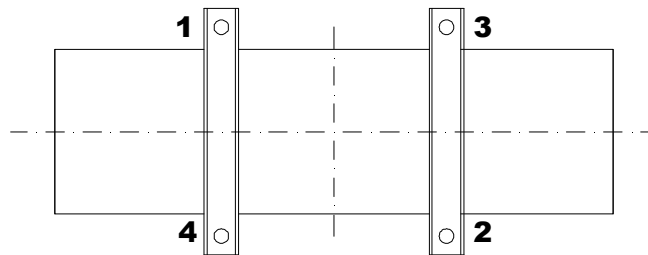
Isolation transformers need little maintenance. However, it is advisable to carry out periodic checks, whose frequency depends on ambient and working conditions. With clean and dry environments, regular and uniform working cycles, the inspection frequency is reported in the table. In case of dusty or humid environment, high and frequent load or temperature variations, the frequency should be doubled.

CONTROL	INTERVENTION FREQUENCY	
	3 MONTHS AFTER STARTING	EVERY 12 MONTHS
Thermistor efficiency	X	X
Cleaning of dust, dirt, moist		X
Mechanical tightening	X	X
Check of temperature monitoring unit (if provided)	X	X

In case of atmospheric discharges, accidental short circuits or other working anomalies, check the insulation level.

7.2 TIGHTNESS CHECK

⚠ WARNING THIS CHECK MUST BE PERFORMED ONLY IN CASE OF ABNORMAL NOISE (SEE TROUBLESHOOTING SECTION). Independently from the tightness torque value, always check that said value is the same for all the connections. When checking the vertical rods, the sequence must be 1-2-3-4 according to what shown in the figure below:



The tightening torque value, measured in Newton-metre [Nm] or kg-metre [kgm], depends on diameter and material of the used rod. Keeping in mind that the relation between Nm and kgm is

$$1 \text{ kgm} = 9.8 \text{ Nm}$$

The indicative torque value to conform with are resumed in the table below.

SCREW/ROD	VERTICAL MECHANICAL CONNECTION [Nm]		HORIZONTAL MECHANICAL CONNECTION [Nm]	
	MAIN MAGNETIC CORE	INTEGRATED CHOKE MAGNETIC CORE	MAIN MAGNETIC CORE	INTEGRATED CHOKE MAGNETIC CORE
M6	30	15	60	60
M8	40	15	60	60
M10	40	15	70	70
M12	40	15	80	80
M14	50	20	100	100
M16	60	25	120	120
M16	70	25	140	140
M20	80	30	140	140

8 TROUBLESHOOTING

⚠ DANGER **ACCESS TO THE COMPONENTS FOR INSTALLATION, SETTING, INSPECTION AND MAINTENANCE MUST BE GRANTED ONLY TO QUALIFIED PERSONNEL IN CHARGE OF IT. EVERY MAINTENANCE OPERATION MUST BE DONE WHILE THE TRANSFORMER IS DISCONNECTED FROM THE MAINS. ANY OPERATION MUST BE CARRIED OUT IN COMPLIANCE WITH IN FORCE RULES AND REGULATIONS CONCERNING PERSONAL SAFETY AT WORK AND USE OF ADEQUATE PROTECTIVE TOOLS.**

Prior to starting any inspection, always check that the transformer is correctly connected to the mains.

ANOMALY	POSSIBLE CAUSE	REMEDY
ABNORMAL NOISE	Mechanical connection loosened	Check the tightening of both the vertical rods and the bolts going through upper and bottom yokes (see chapter 4.2).
	Presence of previously undetected harmonics	Re-assess the plant configuration and contact our Technical Dept.
	Vibrations transmitted through the ground or nearby equipment	Check and if necessary replace or install anti-vibration pads
ABNORMAL TEMPERATURE	Overload condition	Bring the loading condition to the nominal value
	Fan failure (if provided)	Replace the fan with a spare one. If provided, check the correct functioning of the temperature monitoring unit.
	Clogged air openings	Clean all the openings from dust. Check that nothing is blocking the air passage (for example, other cabinets, objects, etc.)
ABNORMAL COLOURING OF THE COILS	Overload condition	Bring the loading condition to the nominal value
	Major failure (for example, short-circuit)	Check the plant situation and ask for assistance.

For any queries, please contact the nearest authorised Service facility or the Manufacturer's Service Dept. always mentioning factory part number(code) of the unit, serial number and Purchasing Order or Invoice Number.

MAINTENANCE LOG

⚠ DANGER ACCESS TO THE INTERNAL COMPONENTS FOR INSTALLATION, SETTING, INSPECTION AND MAINTENANCE MUST BE GRANTED ONLY TO QUALIFIED PERSONNEL IN CHARGE OF IT AND INFORMED OF THE RELEVANT RISKS. ANY INTERVENTION MUST BE CARRIED OUT IN COMPLIANCE WITH THE IN FORCE REGULATIONS CONCERNING PERSONAL SAFETY AND USE OF ADEQUATE PROTECTIVE TOOLS.

For a description of the maintenance procedures and frequency, please refer to the relevant Section in the User's Manual. In case of abnormal situations (such as polluting or aggressive environment), the maintenance frequency ought to be increased accordingly.

NOMINAL DATA			
TYPE	CODE	S/N	RATING

ORDINARY MAINTENANCE		
CLEAN	1	GENERAL
	2	AIR INLET
CHECK	3	MECHANICAL FIXTURES
	4	ELECTRICAL CONNECTIONS
	5	TEMPERATURE CONTROL UNIT OPERATION (WHEN APPLICABLE)
	6	THERMAL PROBE STATUS

RECORD (TICK THE RELEVANT BOX)										
1	2	3	4	5	6	7	8	COMPANY	DATE	SIGNATURE

EXTRAORDINARY MAINTENANCE			
DESCRIPTION	COMPANY	DATE	SIGNATURE



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ORTEA SpA INTEGRATED MANAGING SYSTEM IS APPROVED BY LRQA ACCORDING TO
ISO9001 ISO14001 ISO45001:
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