ITALWEBER
ELETTRA




Cast resin transformer

Installation, operation and manteinance

Dear Sirs,
We want to thank you for purchasing one of our Cast Resin transformer, we are sure that our products will satisfied all your expectative about quality and performance as you requested us.
We invite you to read this technical manual that will help you to understand all the necessary elements for proper installation and right maintenance about of your Cast Resin Transformer,

Our technical office we remain at your complete disposal for any of your inquiries and further information you will need.
Best Regards.

Welcome in our Company

Italweber Elettra : Experience

Italweber Elettra Is a leader in low and medium voltage electrical machine with great experience fourty years long in domestic and industrial field
The company manufacture a completely range of electro technical products, starting from small transformers for panel up to medium voltage products, our range include stabilizer and power supply, and special machine for converters and UPS our strength is the competence and knowledge that comes from the application experience.

Italweber Elettra : Reliability

The average annual production force consists of several tens of thousands of pieces,
whose technical requirements and reliability are guaranteed by the criteria adopted with the ISO 9001 : 2015 Quality System, and 14001 : 2015
Italweber Elettra production is based on ease of use, choice of
high quality materials and a modern production facility.

Italweber Elettra : Quality

Italweber Elettra is also known in several European and international countries:
short delivery times of goods, exhaustive formalization of offers,
an effective post-sales service and technical assistance
make our Company a real collaborative and successful partner.
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1. Safety instructions

The transformer in electrical machine and during its working it is subjected to electrical voltage. An incorrect utilization will be dangerous for safety.

If the transformer is installed according to this instructions it will not cause any risk for the surrounding environment and for people.

The technician in charge for the start-up and for maintenance has to be qualified and he has to be able to understand electrical sheets and symbols placed on the transformer.

The responsibility of a non-correct installation or wrong start - up done without taking care of safety instructions will be assigned to the customer.

We suggest you to read carefully this manual before doing the transport; the installation and start - up.

The transformer is designed and manufactured according to customer specification and it has to work with the same conditions, otherwise contact the Manufacturer.

Prepare all the necessary tools and implements.
The plugs and the terminals have been made to connect loads with flexible cables or bars.
Do not make non-allowed connections.
Do not remove the housing or enclosure (where present) when transformer is working.
Do not supply the transformer before having earthed this one.
People with a peacemaker must stay at a distance of at least 3m from the working area
of the transformer because of the presence of magnetic fields.

2. Standard references

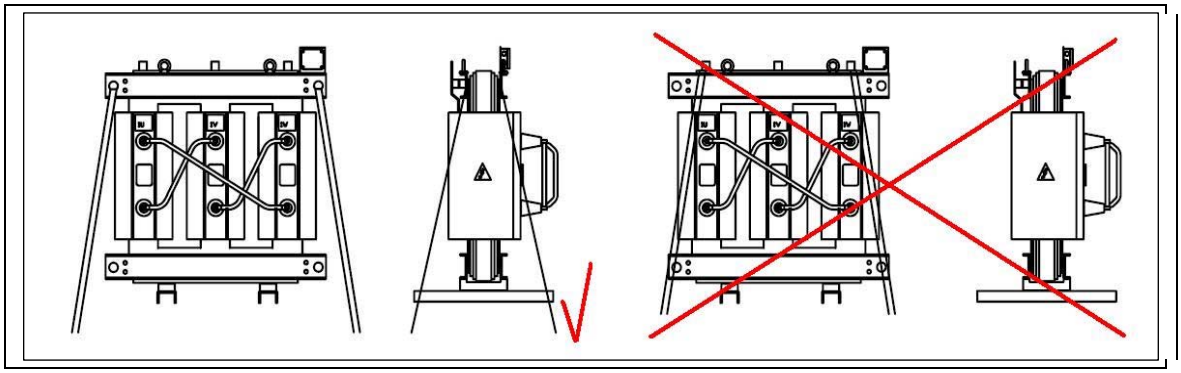
- CEI 14-4 / 1 - 2 / IEC 76-1- 2
Power Transformers
- CEI 14-8 IEC 726 / CEI EN 60076-1
Dry-type Power Transformers
- Directory 89 / 336 / EEC - Directory 73 / 23 / EEC
Safety e Electromagnetic Compatibility

The content of this technical dossier is updated to the last edition.
The Manufacturer can modify technical specification of the product without notice.

3. Transport, receipt and storage

Transport

During the transport, the transformer has to be well fixed, please use the holes in the upper fixing metal parts.



Receipt

At final destination, it is recommended to check the transformer in order to verify if any damage has occurred during the transport. In particular, pay attention to:

- LW connection;
- HV insulators;
- Scratches on windings;
- Presence of dirty or humidity;
- Damages on the enclosure;
- Presence of strange objects.

Otherwise will be necessary to issue an "acceptance with reserve" to the transporter company and then immediately inform the Manufacturer.

Storage

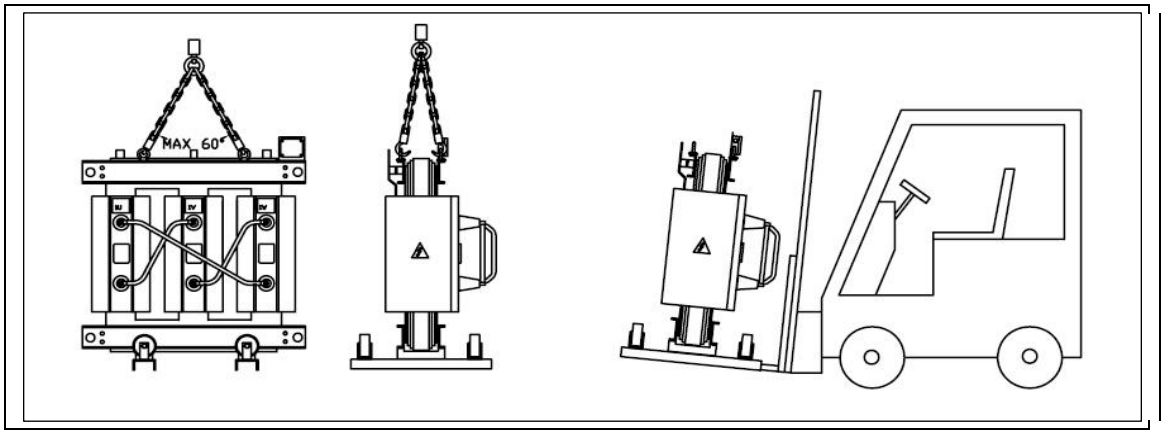
If transformer is not immediately used, the transformer has to be protected against dust, moistness, humidity, water and sun light, anyhow we recommend to use minimum IP 21 protection degrees enclosure.
Normally, transformer is supplied with a protective cellophane packaging. Do not remove this packaging until transformer installation and start – up.

Caution: storage temperature should not be lower than – 25 °C

4. Handling

Lifting

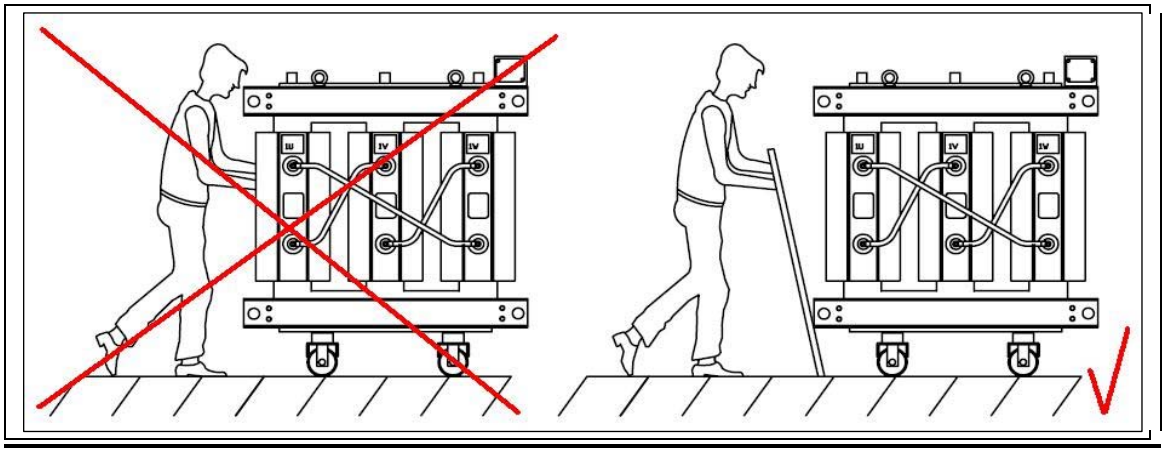
The transformer is normally positioned on wooden pallet, is equipped with eyebolts for vertical lifting. If required the transformer is equipped with wheels for horizontal moving
The handling can be done by lifting with a crane by the eyebolts fixed on the transformer taking care the angle between the lifting chains has to be lower than 60 °.

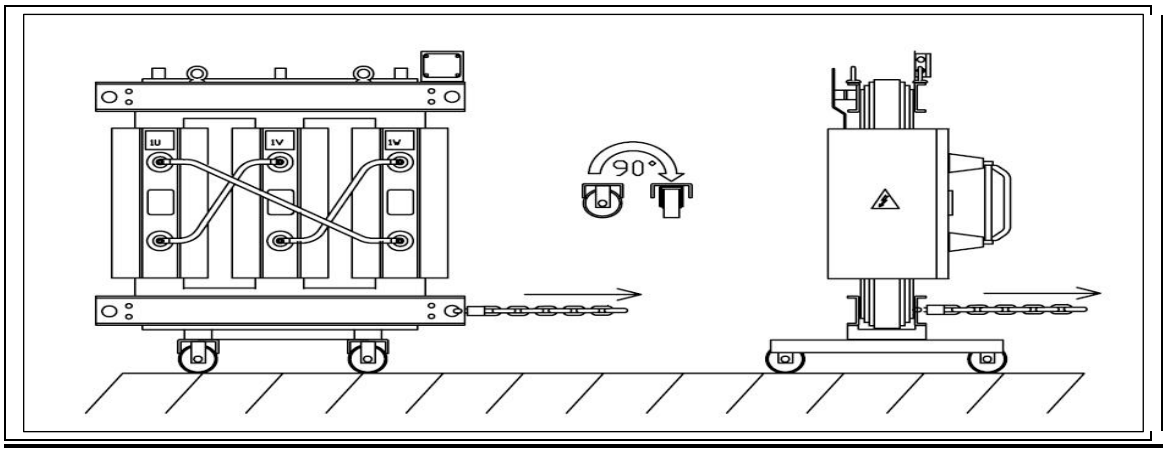


Translation

The handling of the transformer (with or without enclosure) can be made also by translation. Move the transformer by leverage against lower fixing clamp or by means of its towing holes only .
The unit can be moved in two directions, depending on how the wheels are oriented.

Caution: do not move the transformer pushing on the coils!





5. Installation

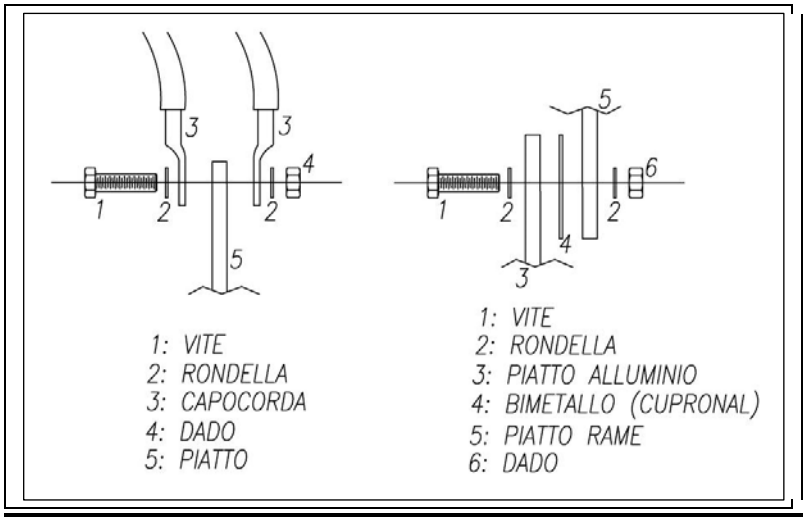
Italweber Elettra, cast-resin transformers are designed for indoor installation and with specific environmental conditions defined by CEI EN 60076-11 norms
- Altitude max 1000 m a.s.l.
  (For higher altitude please contact the Manufacturer);
- Dry ambient without powder or corrosive vapors;
- Well cooling;
- Ambient temperature 0 / + 40°C
  (Max Temperature: 40°C; daily average: 30°C: yearly average: 20°C).

For higher values of ambient temperature (has to be specified in the order) or for working with reduced Load, please see the following table:

maximum ambient temperature	maximum power
40 °C	P
45 °C	0,97 P
50 °C	0,94 P
55 °C	0,90 P

LV connections

Normally, LV terminals are positioned on the upper side of the transformer and can be executed by aluminum or copper plate. The cable connection should be done with tinned-copper cable terminals or with aluminum or copper bars with section related to the nominal current of the transformer.
With bars connections: pay attention when it is necessary to connect copper plate to aluminum plate. In that case it is necessary to use a bimetallic alloy plate between the two conductors. (Cupronal)



HV connections

HV terminals are bolts made of brass and they are part of HV cast resin bobbin. This solution allows to have an easy connection from the top or from the bottom of the transformer with appropriate cable lugs.

Caution: do not replace the brass bolt with bolts made of different material in order to avoid bad connections, some galvanic problems could arise

Mechanical and eletrical fixing torque

Fixing torques for mechanical and electrical connections have to be in accordance with the values in the following table. The connections have to be well done and for the scope, it is suggested to use a torque-wrench, in order to conform all the transformer fixings.

Metric / bolts	Electrical connections (Nm)		Mechanical connections	Wrench
	Iron	Brass	(Nm)	(mm)
M6	10 - 15	5 – 10	20	10
M8	30 - 40	10 – 15	35	13
M10	50 - 60	20 – 30	45	17
M12	60 – 70	40 – 50	60	19
M14	90 – 100	60 – 70	100	22
M16	120 - 130	80 - 90	150	24
M18			200	27
M20			270	30
M22			360	32
M24			460	36

Positioning

If the transformer is in IP00 configuration, (without any enclosure) it is necessary to guarantee:
- Absence of falling drop water or humidity
- Removal of dust or solid residual with an aspirator or an air compressor

If transformer is positioned into a housing or metallic enclosure it necessary to respect the safety distance between the transformer and enclosure walls according with the following table:

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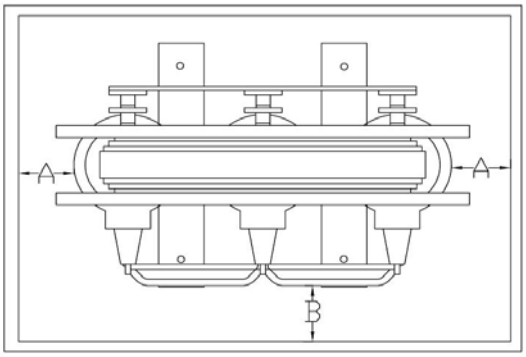

Maximum voltage (kV)	Lenght "A" (mm)	Lenght "B" (mm)
3.6	40	60
7.2	50	90
12	60	125
17.5	80	170
24	120	225

The cast HV coils are considered active winding, for this reason it could be dangerous to stay closer to the transformer if before the main switches is not on OFF position and transformers has been connected to the ground.

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Caution: it is absolutely forbidden to touch the cast HV coils during its working!

Examples of enclosure installation

Here follows some pictures illustrating some examples of enclosure installation with cable entry from the top and the bottom side of the enclosure:

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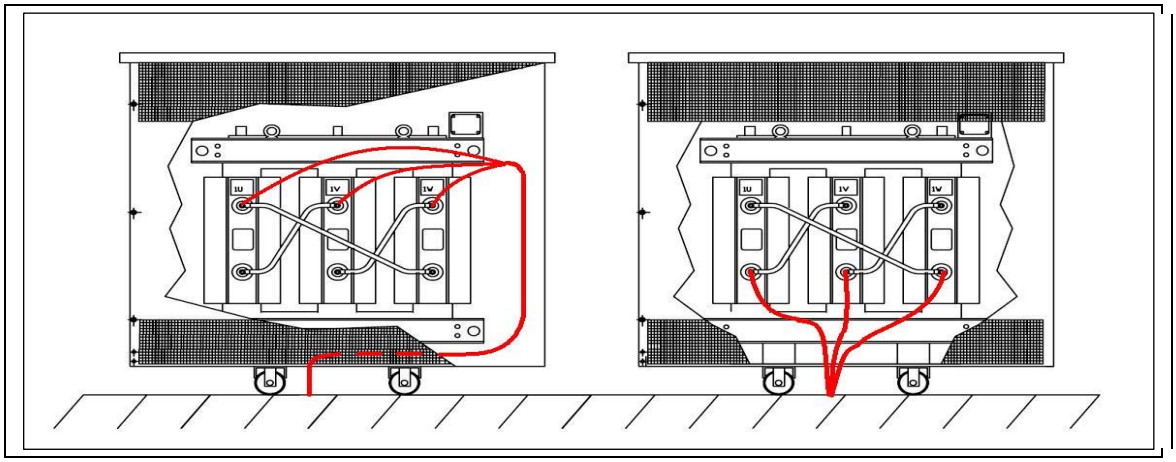
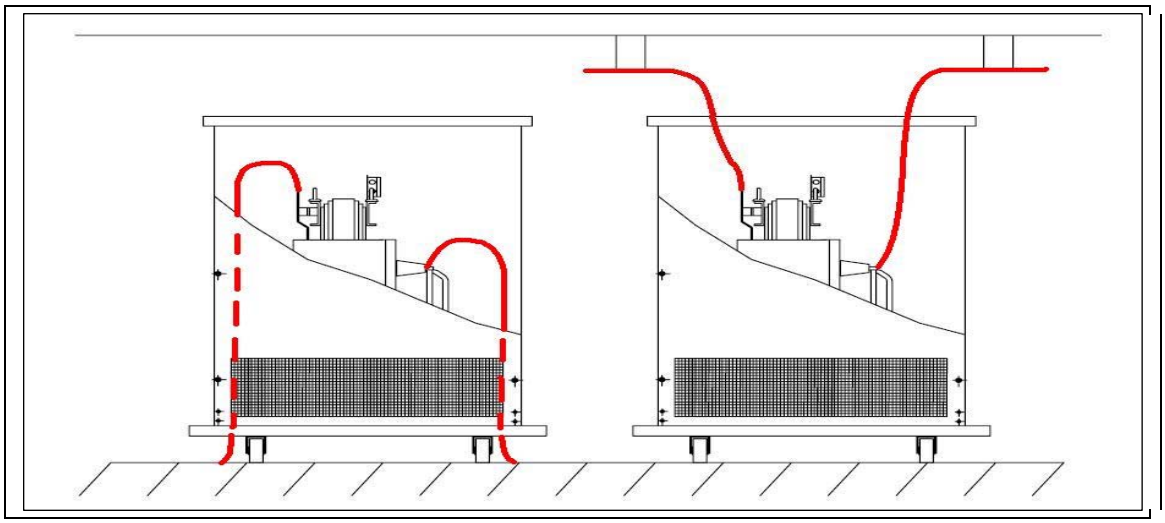
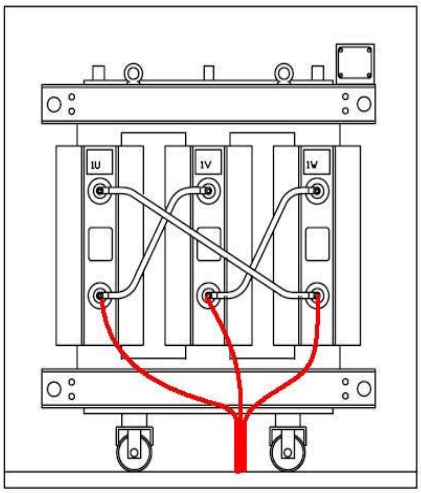
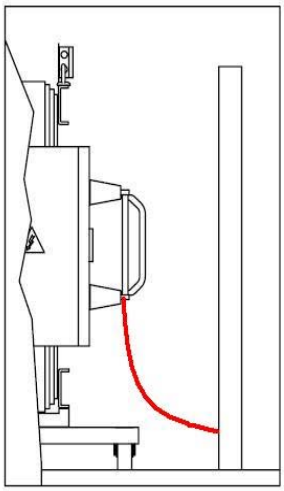




Examples of installation without enclosure





Maximum voltage (kV)	Lenght "A" (mm)
3.6	40
7.2	50
12	60
17.5	80
24	120

It's mandatory to respect the insulation distances in table. LV and HV cables must be well fixed in order to avoid possible fake contacts on insulators.

Cooling

It is very important to assure to the transformer an appropriate cooling; otherwise, it could be subjected to anomalous overheating that can cause the thermal protection trip.
Therefore it is necessary that the enclosure will be installed sufficiently far from the wall in order to assure the correct cooling air-flow into the appropriate enclosure cooling grids. The proper air flow is about 3 - 4 m^3 / min every kW of transformer losses.
In case of transformer without wheels, should be better that transformer is positioned in the way that the bottom metal basement stays above 10-15 cm from the ground, in order to allow the correct air flow into the grids.

Caution: Be careful do not close the enclosure cooling grids of!

6. Start - up

Preliminary operations

Before performing the start - up it is necessary to do some preliminary operations:

- Remove cellophane packing;
- Be sure that the transformer has been installed in a well cooled and clean area;
- If the transformer was not working since many time be sure to remove dust and humidity;
- Fix the wheels (where present) to the floor in order to block the transformer in the installation area;
- Inspect the supply system verifying the input voltage value;

- Verify that the connections of the primary and secondary terminals are made with appropriate cables designed with the transformer rated current;
- Respect the safety distances between the active conductors and the walls / enclosure panels;
- Verify that taps-changer (where present) are all blocked in the same position; respecting the indicated sequence
- Avoid that cables will be positioned on transformer metal parts or on the HV cast coils;
- Connect the PTC or PT100 sensors; as well as thermometer, etc. (where present) respecting the attached auxiliary electrical drawing;
- Be sure that you have not left any tool or other material on the transformer.

Energizing

- MAKE SURE THAT THE TRANSFORMER IS CONNECTED TO EARTHED BEFORE ENERGIZING -

Caution: earth cable must be ≥ 16 mm^2

After having checked the main electrical system and after having made all the operations described in “preliminary operation”, switch ON the circuit breaker on HV side. Then close the LV circuit breaker in order insert load on the transformer.

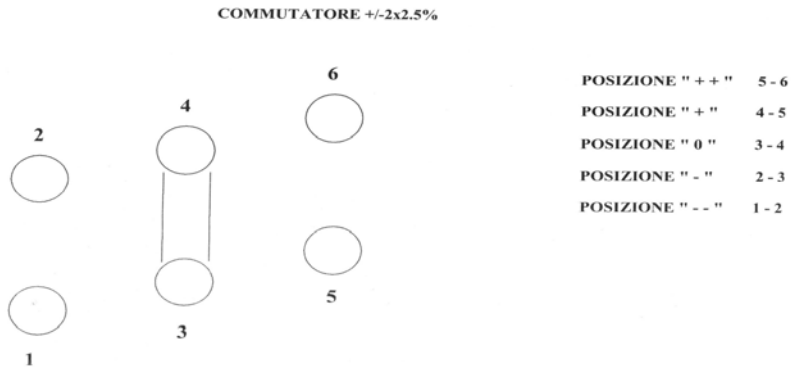
7. Manteinance

Environmental conditions around the transformer always need periodic cleaning, paying attention to disconnect the transformer before doing every kind of operation.

Do not use water or solvent for cleaning the coils and other metallic parts, but use dry-compressed air or much better aspirated air.
If in the place around the transformer there are electrical fans with filters, clean very well the filters or substitute them.

- Check the air channels: they don’t have to be obstructed.
- Check if are present cracks or scratches on the coils.
- Verify the fixing al electrical and mechanical connections.
- If present, check the auxiliary circuits of probes, terminals, etc.

8. Connection drawing

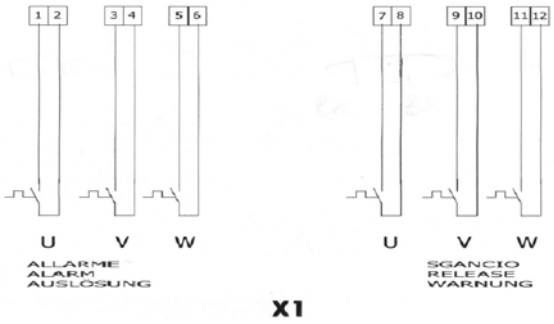


9. Auxiliary connections

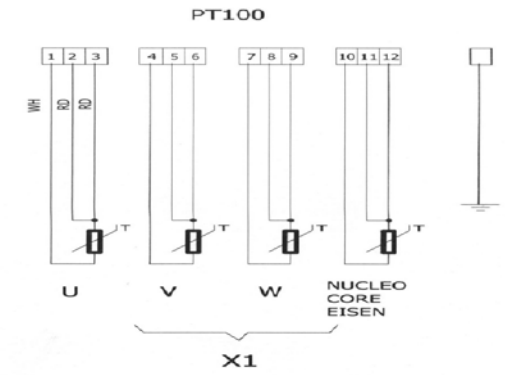
In case of thermal probes the connection has to be done according with follow drawings
In order to avoid interference on probes signal please maintain a right distance between power cables

THERMIC CLASS	ALLARM	TRIP
B	100 °C	130 °C
F	130 °C	150 °C
H	150 °C	170 °C

Programma per centralina termica



THERMIC CLASS	FORCED AIR	ALLARM	TRIP
B	95 °C	120 °C	130 °C
F	110 °C	130 °C	150 °C
H	125 °C	150 °C	170 °C



10. Checks to be carried out

Italweber Elettra forte recommends that you proceed with a maintenance instruction in accordance with the following timing

Test to be done	Timing to check	Tools to be use
MT / BT cable clamping and switching fingers	One year after commissioning	Torque wrench with torque indicated
Check auxiliary terminals	One year after commissioning	Visual and Tester where possible
Alarm and trip of control probes ur	One year after commissioning	Test about controls unit
Clean of dust and insects or other	One six month / year after commissioning	Dry air
Insulation test on MT/BT	One year after commissioning	Megaohmetro Megger

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