

USE AND MAINTENANCE MANUAL

Heat-shrinking tunnel

T450 - T650E - T650

MANUAL CODE:	DM210230
CREATION DATE:	03.03.2006
RELEASE:	1.0
RELEASE DATE:	26.04.2007


ENGLISH



FOREWORD

In thanking you for the preference given us, SMIPACK S.p.A. is glad to welcome you to its wide circle of Clients and wishes that the use of this machine will be for you reason for full satisfaction.

This manual can be used for models **T450 - T650E - T650** and was prepared with the aim to allow you to operate on the various components, explain the various operations for

maintenance and operation. Where not expressly indicated by the  , instructions refer to all the above mentioned models.

In order to guarantee a satisfactory level of efficiency, life and performance of the machine, we urge you to scrupulously observe the instructions contained in this manual.



PLEASE READ CAREFULLY AND FULLY THIS MANUAL BEFORE INSTALLING THE MACHINE.

THIS MANUAL IS AN INTEGRAL PART OF THE PRODUCT AND MUST ALWAYS ACCOMPANY THE SAME UP TO ITS DISMANTLING.

SMIPACK S.p.A. is absolutely not responsible for any direct or non direct consequence due to proper or non proper use of this publication or of the system software and has got right to make technical modification on his system and on his manual without advising the users.

SMIPACK S.p.A. - Viale Vittorio Veneto, 4 - 24016 San Pellegrino T. (BG) - Italy - Tel. +39.0345.40400 - Fax +39.0345.40409.

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1. REGULATIONS AND GENERAL INSTRUCTIONS

1.1 HOW TO CONSULT AND USE THIS MANUAL

Keeping of this manual

- This manual constitutes integral part of the machine and thus must be kept for as long as the machine is in the user's possession or, if that be the case, handed over to any other user or subsequent owner.
- Use this manual in a way that will not damage all or part of its contents.
- Do not remove, tear or rewrite parts of this manual for any reason.
- Ensure that any amendment to this manual sent to you is incorporated in the manual itself.

Consultation of the manual

The consultation of this manual is made easy by the insertion, in the first pages, of a summary, which allows those consulting it to immediately locate the topic required and, in the last pages, of an analytical index. The chapters are ordered following such a structure to facilitate the research of the required information.

Method of updating the manual in case of modifications to the machine

The descriptions and drawings contained in the present manual are intended as non refutative. SMIPACK S.p.A. reserves the right at any moment to apport modifications to its machines (while keeping their essential characteristics), for the purpose of improving their functionality and commercial and aesthetic value, with no obligation to update manuals and previous production except in exceptional cases.

Any updating or integration of the manual are to be considered as integral parts of the manual. We would like to thank you in advance for all the suggestions that you may want to forward to us in order to bring about further improvements to the machine.

1.2 WARRANTY CONDITIONS

The machine is sent to the Client ready to be installed, and having passed, at our factory, all expected tests and trials, in compliance with the current regulations. Within the guarantee period SMIPACK S.p.A. undertakes to remove any eventual flaws and defects, on the condition that the machine has been correctly used, and that the indications found in its manuals have been respected. The warranty has a validity of 365 days from the date of purchase and covers all the materials and manufacturing defects found by the builder. The warranty is valid only for the original buyer and subject to the condition that the warranty certificate is duly filled in all its sections and posted within 20 days from the date of purchase. The warranty is no longer valid if the machine has been damaged through accident, misuse, breakdowns due to atmospheric agents, maintenance operations or modifications carried out by unauthorised personnel or not belonging to the servicing department of SMIPACK S.p.A. Consumption materials, parts subject to normal wear and tear, transport from the user to the servicing centre or vice-versa as well as labour are excluded from the warranty and therefore are to be paid by the Buyer.

1.3 LEGAL REFERENCES

The machine "heat-shrinking tunnel" complies to the Legislative Provisions of the law that regulates the following Directives:

European Directives on machinery and/or assemblies

- 98/37/EC - On the approximation of the laws of the Member States relating to machinery
- 73/23/EEC and 93/68/EEC - Low voltage directive
- 89/336/EEC and 92/31/EEC - Electromagnetic compatibility

Technical standards applied on machinery and assemblies:

- EN 422 - Safety of rubber and plastics machines - Blow moulding machines intended for the

- production of hollow articles - Requirements for design and construction
- EN ISO 12100-1 - Safety of machinery - basic concepts, general principles for design: terminology and methods
 - EN ISO 12100-2 - Safety of machinery - basic concepts, general principles for design: technical principles and specifications
 - EN 292-2 A1 - Safety of machinery - basic concepts, general principles for design: technical principles and specifications
 - EN 294 - Safety of machinery - Safety distances to prevent danger zones from being reached by the upper limbs
 - EN 60204-1 - Electrical Equipment of Machines
 - EN 418 - Emergency stop
 - EN 349 - Safety of machinery - Minimum gaps to avoid crushing of parts of the human body
 - EN 1050 - Safety of machinery - Risk assessment
 - EN 811 - Safety of machinery - Safety distances to prevent danger zones from being reached by the lower limbs
 - EN 894 -1 - Safety of machinery - Ergonomic requirements for the design of displays and control actuators - part 1: human interaction with displays and control actuators
 - EN 894-2 - Safety of machinery - Ergonomic requirements for the design of displays and control actuators - part 2: displays
 - EN 894-3 - Safety of machinery - Ergonomic requirements for the design of displays and control actuators - part 3: control actuators
 - EN 953 - Safety of machinery - General requirements for the design and construction of fixed and movable guards
 - prEN 50099-1 - Safety of machinery - Signalling and marking principles - part 1: visual, audible and tactile signals

1.4 REMARKS ON GENERAL SAFETY

The operator, before starting to work with this machine, must have acquired enough knowledge on the location, function of the controls, characteristics of the machine, and must have read this manual in all its entirety.

The employer must see to it that its personnel is informed on the following topics relative to the safe usage of the machine:

- Accidents risks.
- Devices meant for the safety of the operator.
- General accidents prevention rules as provided by international directives and by the laws of the country of destination of the machines.

It is necessary to comply to the following general precautions:

- Do not install the machine in areas posing a risk of explosion or fire.
- Do not temper with, remove or modify the safety devices; in such cases SMIPACK S.p.A. declines any responsibility on the safety of its machines.
- Do not modify parts of the machine to install other devices without prior authorization by SMIPACK S.p.A.; in case of unauthorized modifications the former will not be held responsible for any possible consequences.
- Do not operate the machine in automatic mode with the fixed or mobile protections removed.
- Do not open the fuse blocks with the mains on.
- Do not intervene on switches, valves and sensors without authorization.
- Do not intervene on the moving parts even without the aid of objects or tools.
- Do not manually oil or grease any moving part.
- Before carrying out any work on the electrical installation, ensure that the voltage has been disconnected.
- After an adjustment or security operation, restore the state of the machine with active protections.













ATTENTION!

The operator, the maintenance and cleaning personnel must scrupulously adhere to both the regulations for the prevention of accidents and the safety regulations of the Country of destination of the machine and the plant, besides the instructions, warnings and general rules concerning the safety included in this manual.

During maintenance or repair work on the machine, the latter has to be shut down, and the special signals (MACHINE OFF FOR MAINTENANCE, DO NOT START, etc...) have to be used. Make sure that the switches are not re-inserted by unauthorized personnel.

1.5 LEGEND

All instructions and notes contained in this manual are graphically represented in the following way:

	ATTENTION: READ CAREFULLY BEFORE OPERATING.
	DANGER OF ELECTROCUTION: HIGH VOLTAGE ZONE.
	DANGER OF ELECTROCUTION: EARTHING IS COMPULSORY.
	DANGER OF ELECTROCUTION: REMOVE VOLTAGE BEFORE PERFORMING THE INDICATED OPERATIONS.
	DANGER OF BURNING DUE TO HIGH TEMPERATURE SURFACES.
	WARNING! DON'T TOUCH.
	DO NOT CARRY OUT MAINTENANCE WITH MEMBERS IN MOVEMENT.
	WARNING! BEFORE OPERATING, CHECK THAT THE MACHINE TYPE IS THE ONE THAT HAS BEEN BOUGHT.

2. TUNNEL INSTALLATION

2.1 DESCRIPTION OF THE MACHINE

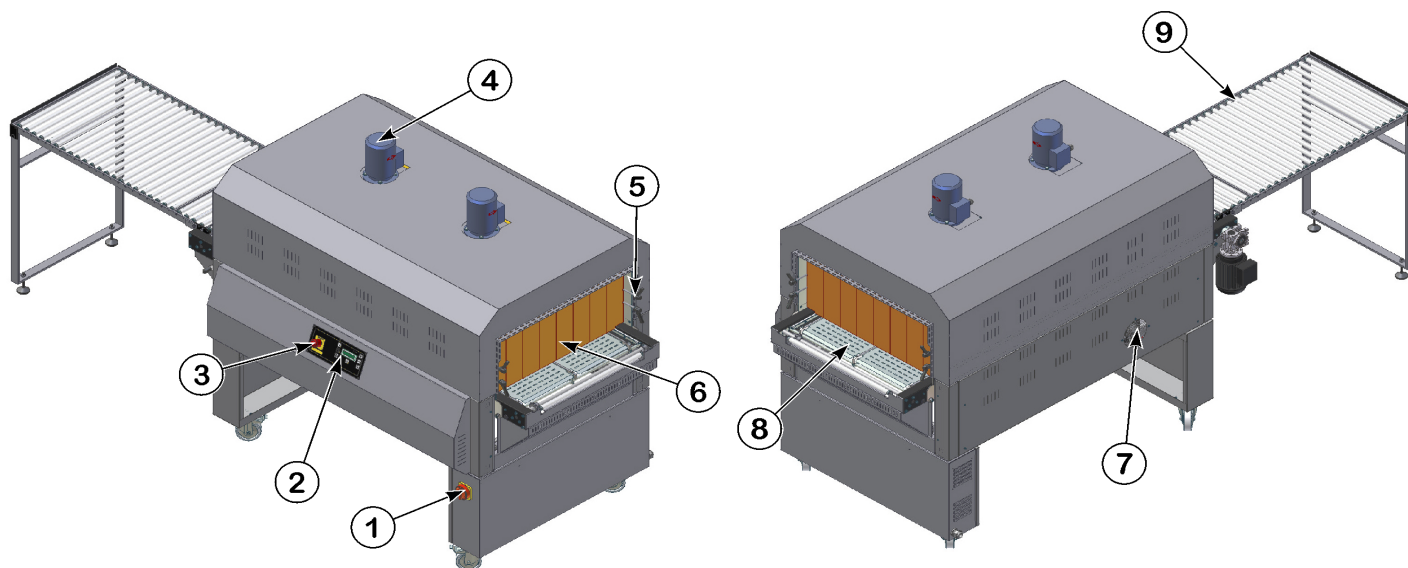


Fig. 2.1.1

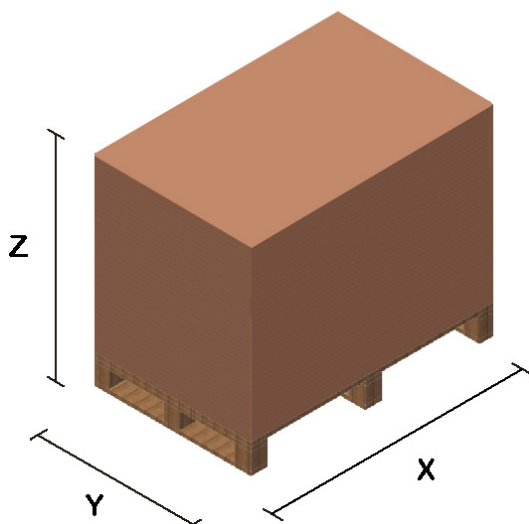
Tab. 2.1.1


1	MAIN SWITCH
2	ELECTRONIC CARD
3	EMERGENCY PUSH-BUTTON
4	FANS MOTOR
5	DEFLECTORS

6	THERMAL CHAMBER
7	COOLING FANS
8	BELT
9	ROLLER-WAY (OPTIONAL)
10	

2.2 WEIGHT AND DIMENSIONS OF THE PACKED TUNNEL

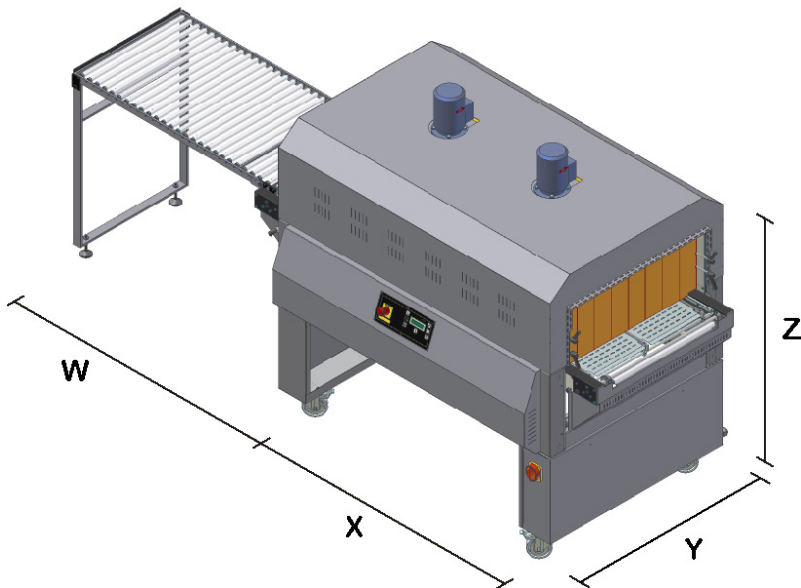
Fig. 2.2.1



	T450	T650E	T650
X	1420 mm	1490 mm	2280 mm
Y	1030 mm	1220 mm	1220 mm
Z	1555 mm	1725 mm	1725 mm
Weight Kg.	223	315	450

2.3 WEIGHT AND DIMENSIONS OF THE TUNNEL

Fig. 2.3.1

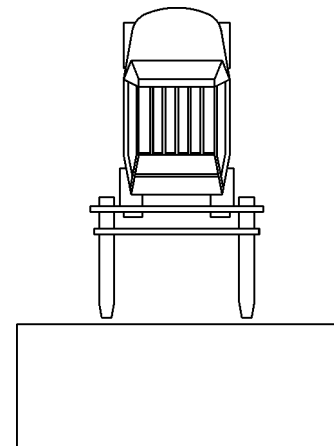


	T450	T650E	T650
X	1310 mm	1390 mm	1910 mm
Y	875 mm	1090 mm	1090 mm
Z	1440 mm	1565 mm	1565 mm
W	500 mm	1010 mm	1010 mm
Weight Kg.	187	241	350

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2.4 TRANSPORT AND UNPACKING

SMIPACK S.p.A. in function of the means of transport and of the type of products to be shipped utilizes packagings adequate to guarantee the integrity and preservation during transportation. It is recommended to handle with great care the machine during transport and positioning. The forwarder is responsible for every damage that may occur during transport. Unpack the unit making sure not to damage any exposed parts. The lifting of the machine module must be carried out by means of hoisting systems operating from below; due to the packaging modalities, it is not possible to use hoisting systems operating from above. Lift the machine from the longer side and adjust the forks of the forklift at the maximum distance from each other.



ATTENTION!

Before handling make sure that the hoisting equipment are suitable to lift the load that has to be handled.

In the case of long storing, place the machine in a sheltered environment with a temperature between -15°C and +55°C degree of humidity, variable between 30% and 90% without condensation.

2.5 ASSEMBLY OF THE MACHINE FP560/A AND FP870A WITH THE TUNNEL

After having unpacked the tunnel join the machine's conveyor belt to the tunnel's belt. Insert the hooks of the machine's belt **1** onto the roller **2** placed in the tunnel entrance.

Assembly of FP870A with T650E

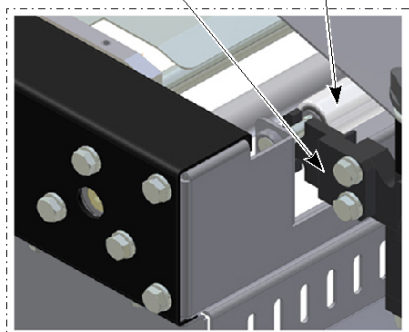
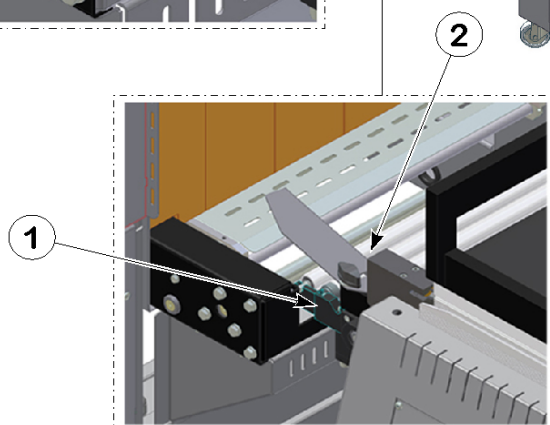
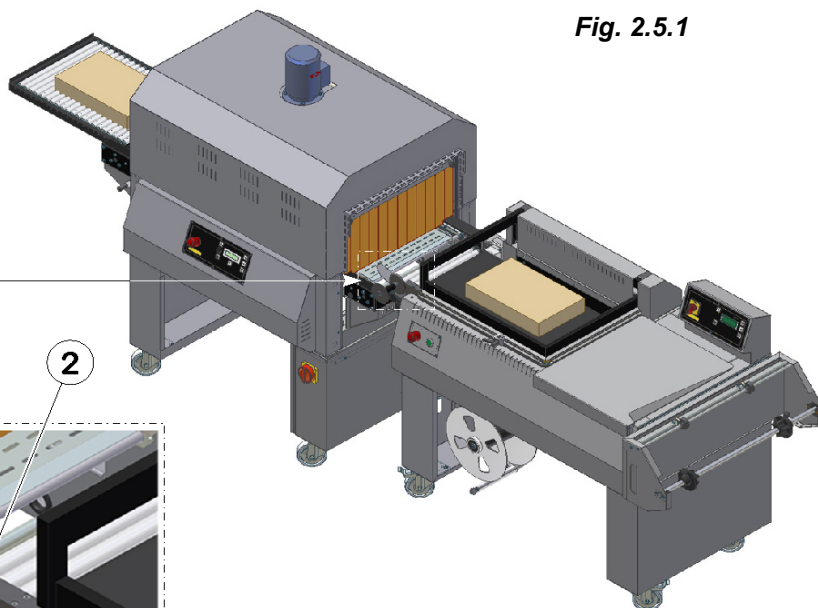


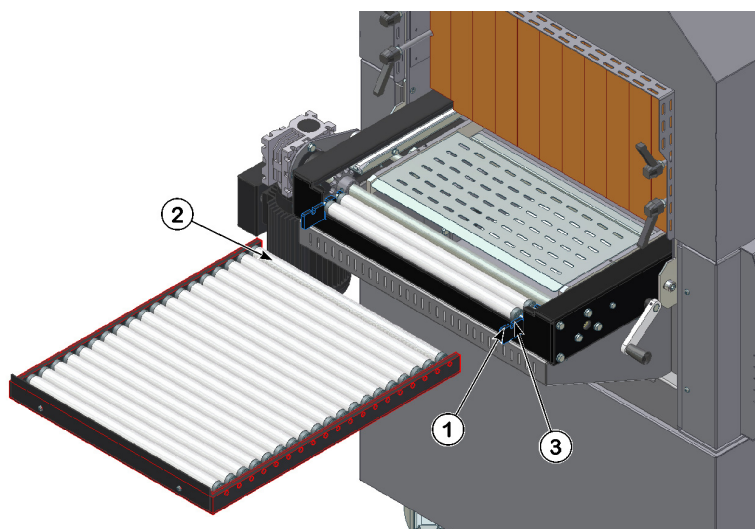
Fig. 2.5.1



Assembly of FP560/A with T450

2.6 POSITIONING TUNNEL ROLLER T450

Fig. 2.6.1



Insert the roller conveyor belt into **1** the attachments of the tunnel's conveyor belt and lock it with the roller **2** in the special holes **3**. In assembly phase do not push the roller conveyor belt sideways because the attachments could be damaged **1**.

Just make it slide as shown by the arrow in the figure.



2.7 POSITIONING THE TUNNEL ROLLER CONVEYOR BELT T650

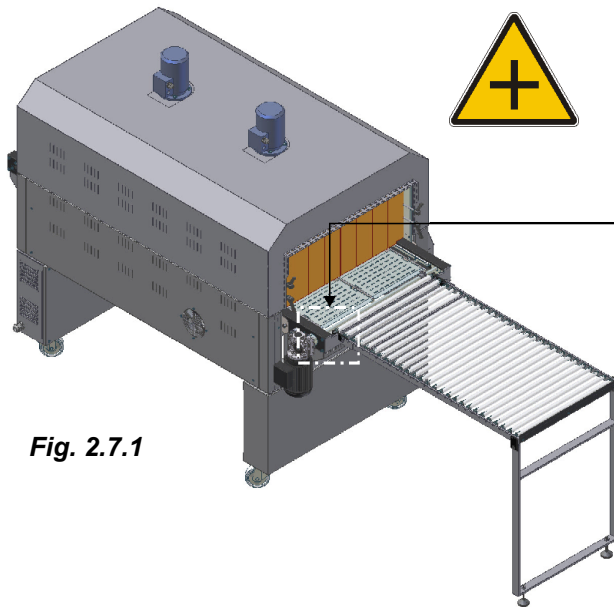
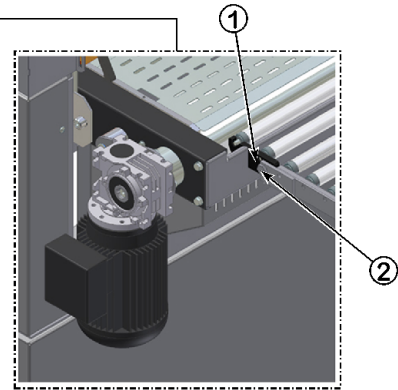


Fig. 2.7.1

Insert the roller conveyor belt into the external side 1 of the tunnel's conveyor belt and lock it with the supplied screws 2. Make sure that the roller conveyor belt is level on the ground when the tunnel's belt is tilted.



2.8 DEMOLITION AND DISPOSAL

The tunnel does not contain dangerous components or substances that require particular removal procedures. After the tunnel has been dismantled you must get rid of the various materials according to the rules and regulations of the Country in which the tunnel has to be disposed of.

2.9 ELECTRICAL CONNECTIONS



ALL OPERATIONS FOR THE CONNECTION TO THE MAINS MUST BE CARRIED OUT WITH NO VOLTAGE APPLIED TO THE TUNNEL.

EARTHENING IS COMPULSORY!

The connection of the tunnel to the mains must be performed in compliance with the regulations in force in the country of the user. Check that the tunnel frequency and supply voltage values (see data plate on the rear side of the tunnel) correspond to the main's value.




ATTENTION!

IF THE ELECTRONIC CARD HAS TO BE EXTRACTED, REMEMBER TO REMOVE THE VOLTAGE AND TO WAIT AT LEAST 5 MINUTES BEFORE OPERATING.



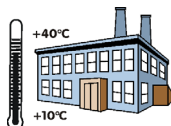
2.10 TECHNICAL DATA FOR THE ELECTRIC CONNECTION

Tab. 2.10.1

	T450	T450	T650E	T650E	T650	T650
RATED VOLTAGE	380-415 V ~	220-240 V ~	380-415 V ~	220-240 V ~	380-415 V ~	220-240 V ~
RATED FREQUENCY	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz	50-60 Hz
RATED POWER	8000 W	8000 W	9500 W	9500 W	15800 W	15800 W
RATED CURRENT	11.5 A	21 A	15 A	26 A	23 A	40A

2.11 CONDITIONS OF USE

THE MACHINE NEEDS AN INSTALLATION IN A CLOSED AND WELL AIRED SURROUNDING, WHERE THERE ARE NOT ANY EXPLOSION OR FIRE DANGEROUS. THE MINIMUM LIGHTING MUST BE 300 LUX.



Make sure that there is enough space for easy application and maintenance. Position the machine in the planned space with no humidity, flammable materials, gas, and explosives and making sure that it is level on the floor.

We suggest operating temperatures varying from +10°C to +40°C with a relative humidity from 30% to 80% with no condensation.

The airborne noise is lower than 70 dB.

MACHINE PROTECTION DEGREE = IP33



ATTENTION!

The pressure and the plate acoustical power of the machine can change depending on the material of containers to be packaged. Therefore, the user must perform an assessment on the noise exposure of his personnel in accordance with the types of packages worked, so as to equip his operators with suitable personal protection equipment.

3. INFORMATION ON THE TUNNEL

The T series tunnel has been designed to heat shrink the film.

The tunnel's conveyor belt is connected to the machine's belt FP end BP. For a good packaging, film sealing must take place at half the product height. The raising (or the lowering) of the belt implicates the regulation of the tunnel's curtain, this is necessary as it is essential not to disperse heat during the heat-shrinking operation.

Adjust the height of the T650 tunnel and lock the belt with the two screws 1.

3.1 TUNNEL IDENTIFICATION

Fig. 3.1.1

SmiPack [®]		San Pellegrino Terme (BG) - Italy -			
CE	Year	AC INPUT			
		V~	Hz	W	A
Mod.					

On the rear of every tunnel there is a data plate showing the EC marking, the main technical data such as model, serial number, power, etc., that will be notified to the builder in case of problems.

3.2 SHRINKING

Film shrinking is obtained in the oven and is produced by the forced circulation of hot air around the packaging. Air heating is obtained by making the same go through a group of thermo-controlled resistors: a centrifugal fan moves the air. If the sealing breaks during the shrinking it is possible to increase the speed of the belt or to lower the temperature of the resistors by acting on the tunnel's control panel. Air heating is obtained by making the same go through a group of thermo-controlled resistors: a centrifugal fan moves the air. If the sealing breaks during the shrinking it is possible to increase the speed of the belt or to lower the temperature of the resistors by acting on the tunnel's control panel.

3.3 DEFLECTOR REGULATION

The tunnels T450 and T650E are equipped with two couples of deflectors, whereas the tunnel T650 is equipped with four couples of deflectors. The deflectors A reduce the hot air flow conveyed under the product. The deflectors B convey the hot air flow coming from the deflector A.

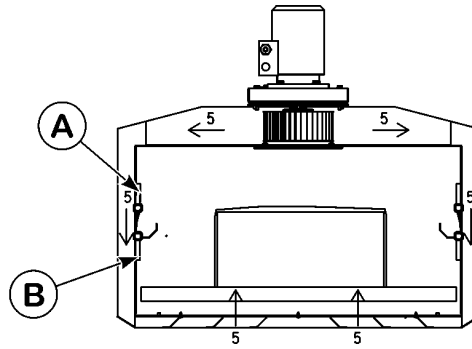


Fig. 1

The deflector A is closed and the air flow is totally conveyed under the product to be packaged. If there were any bubbles at the low side of the product or the film should tear, the air flow should be decreased by opening the deflectors A, as indicated in fig.2 and fig.3.

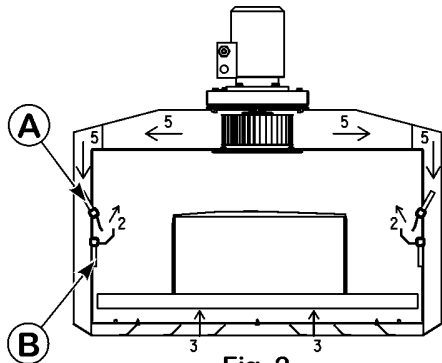


Fig. 2

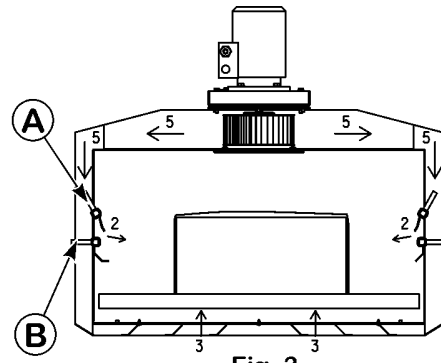


Fig. 3

The deflector A is open and the position of the deflector B allows you to convey a part of the hot air flow towards the upper part of the thermal chamber.

The deflector A is open and the position of the deflector B allows you to convey the hot air flow also towards the lateral part of the product, so as to improve the heat-shrinking along the product sides.

A label explaining the deflectors operation is present on the machine, near the deflectors (see Fig. 4).

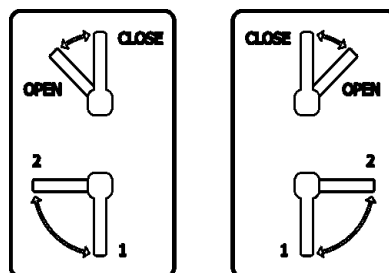


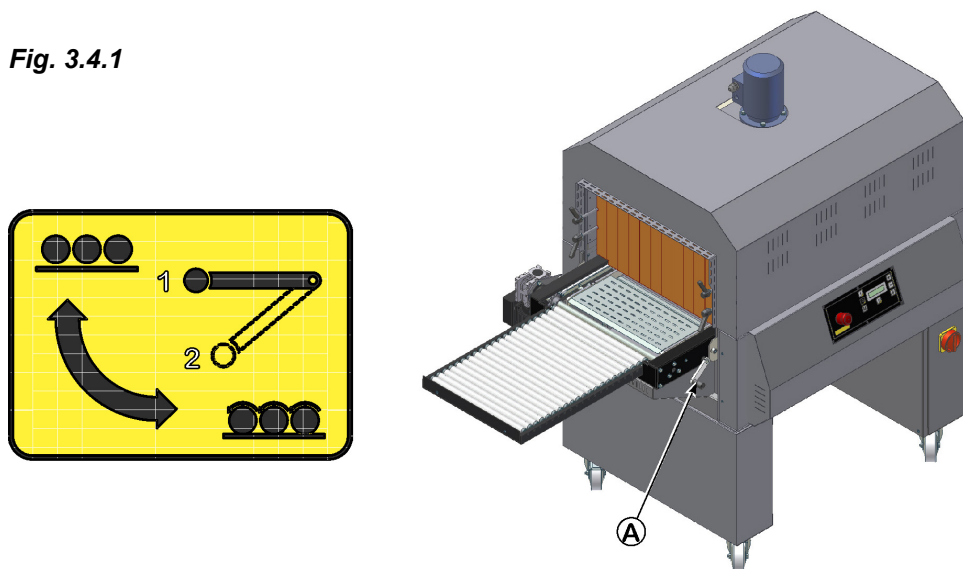
Fig. 4

3.4 TURNING ROLLERS ADJUSTMENT T450

The product is normally conveyed by turning rollers, which grants a more homogeneous film shrinking and a better packaging.

However, some films might tear if the rollers turn, because of the strict adherence of the film to the rollers. In order to find the best solution for each kind of film, the tunnel T450 can handle the product both with turning rollers and with fixed rollers. By means of lever **A**, situated on the outlet conveyer, it is possible to make the following adjustments:

Fig. 3.4.1

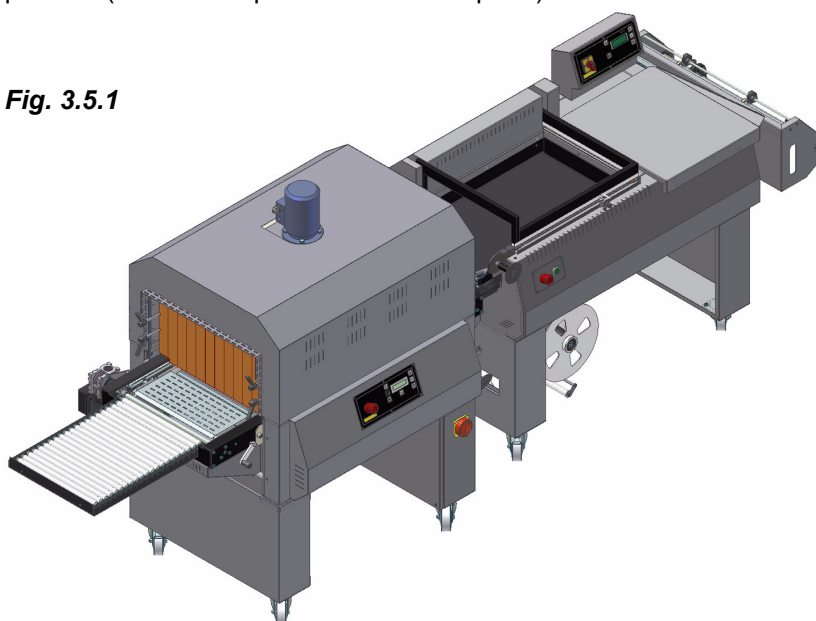


- 1 • By keeping the lever in horizontal position, the rollers remain fixed.
- 2 • By turning the lever downwards, the rollers turn.

3.5 OPERATING THE MACHINE WITH THE OVEN IN HEAT SHRINKING MODE

Once the sealing on the packaging machine has concluded, the machine's conveyor belt transports the product onto the tunnel's belt. The pack enters the tunnel for the heat shrinking process. The electronic card positioned on the tunnel commands all the variables of this process (internal temperature and belt speed).

Fig. 3.5.1



In the end, the heat-shrunk product moves out of the tunnel and runs on the roller.
 In case of emergency, stop the machine by pressing the **STOP** push-button. Then open the curtains so that the tunnel cools down quicker. If necessary start the cooling procedure (See Par. 5-2). Restore the tunnel's normal operation as soon as possible.

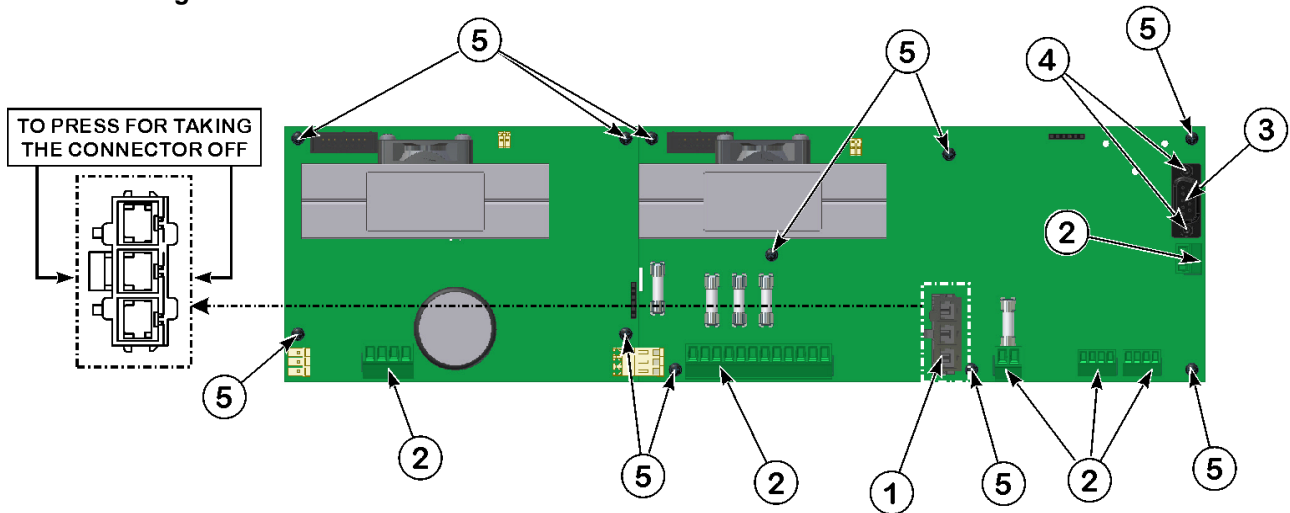


3.6 ELECTRONIC BOARD REMOVAL

If it is necessary to replace the electronic board, please proceed as follows (see Fig. 3.6.1):
 Disconnect the voltage and wait for at least 5 minutes before starting any operation.

- Remove the connector **1** by pressing by the sides, as indicated on the label.
- Remove the connectors **2** on the board, paying attention not to use the cable, but the connector itself.
- In order to remove the connector **3**, unscrew the screws **4**.
- By means of the specific spanner, unscrew the screws **5** which tighten the board to the machine.

Fig. 3.6.1



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3.7 DIRECTION OF ROTATION OF THE HEAT-SHRINKING FANS



In case of maintenance of the fans motor, check the correct connection of the power supply cable: the direction of rotation of the fan must be the same as the one indicated on the adhesive label (see Fig. 3.7.1)

Fig. 3.7.1



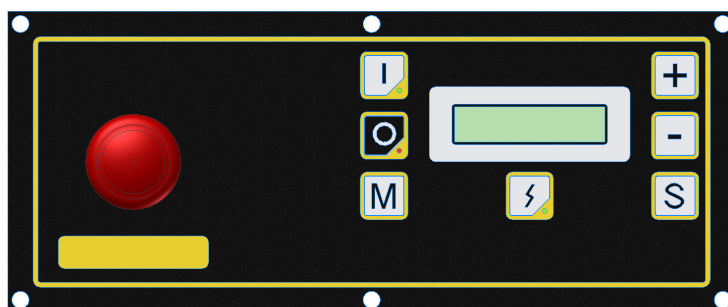
3.8 TUNNEL LIMITATIONS AND SPECIFICATIONS OF USE

DANGEROUS AREAS:










- Do not touch the inside of the oven during or immediately after a packaging. Danger of burns due to the residual heat.
- Do not use the machine if the fans break.
- Do not touch the fan in movement or use the machine without curtains.



4. PREPARATION TO THE USE OF THE TUNNEL



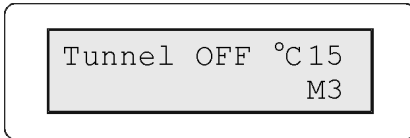
4.1 DESCRIPTION OF THE PUSH-BUTTONS

	Machine start-up and switch-off
	Emergency push-button
	It connects power, after the machine start-up; the led on indicates that the power supply is correct.
	It activates the operation of the programme in use.
	It stops the packaging cycle and activates the oven cooling procedure.
	It displays the parameters of the programme menus.
	- It selects the available memories - It stores the modified data in the programme menu
	It increases the value of the selected parameter
	It decreases the value of the selected parameter

4.2 MACHINE START UP

Turn the main switch situated on the machine foot **ON**. At first, the machine model and the software are displayed for a few seconds, then the following message will be displayed:



Fig. 4.2.1



The first line displays the oven state and the current temperature, whereas the second line displays the memory in use.

The machine states that can be displayed are:

- Oven OFF: the power is activated, but the oven and the belt are off
- Oven ON: the oven and the belt are on
- Free passage: the belt is on, but the oven heating is off
- Cooling: the oven is off, but the belt and the ventilation are on, so that the oven can cool down.

In order to start-up the machine, press the push-button  and then .


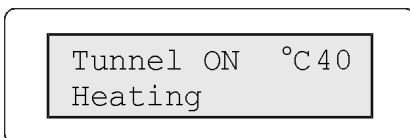
During the heating phase, the led of the push-button  is intermittent and the belt runs at minimum speed rate; the machine display will indicate the heating state (see Fig.)

Fig. 4.2.2





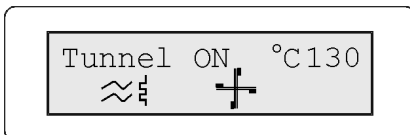

When the oven has almost reached the temperature set in the Parameters Menu (oven temperature), the word "heating" will disappear and the electronic board will display the symbol  on the left, which indicates that the heating elements are active at that moment and the symbol  in the middle of the board, which indicates that the ventilation motor is on (see Fig. 4.2.3).

Fig. 4.2.3



When the oven reaches the pre-set temperature, the machine will be ready for use.

When the oven is hot, the machine can be turned off only by pushing the push-button , in order to activate the cooling procedure by means of the fans and of the belt movement.


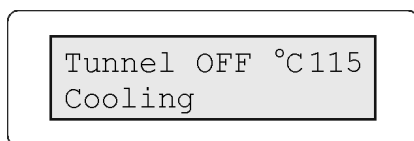
During the cooling phase, the led of the push-button  is intermittent and the following message will be displayed:

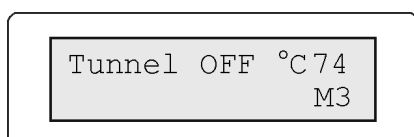
Fig. 4.2.4



When the temperature is below 80°C, the fan will stop, whereas the belt will continue running until the temperature is below 75°C.

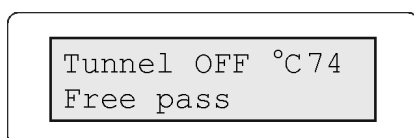
When the machine has cooled down, the following message will be displayed:

Fig. 4.2.5



If the free passage mode is set, the following message will be displayed:

Fig. 4.2.6




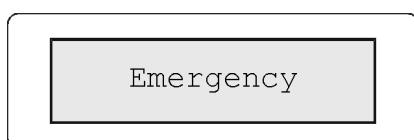

The machine packaging cycle can be stopped by pressing the emergency button. The following emergency message (see Fig.4.2.7) will be displayed and the led of the push-button  will be intermittent and will emit an acoustic signal.

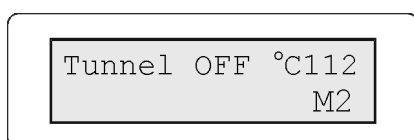
Fig. 4.2.7



In order to stop the acoustic signal, it is necessary to restore the machine normal operation, by releasing the emergency button and by pressing the push-button .

The electronic board will display the following message:

Fig. 4.2.8



4.3 MEMORY ADJUSTMENT

The microprocessor allows you to save 6 programmes (M1,M2,M3,M4,M5, free passage), according to the packet dimensions or to the film in use.

In order to select the memory to be used, press the key , then you can go through the

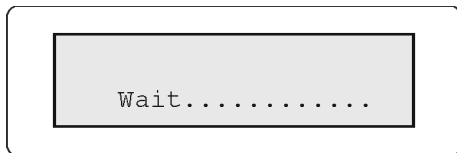
available memories by means of the keys **+** and **-**.

Proceed as follows:

- 1 • Select a memory (i.e. M2)
- 2 • Press the key **S** in order to enter the parameters menu and select the key **S** again, in order to display the machine adjustment parameters (see paragraph Parameters menu).
- 3 • Adjust the parameters by selecting the keys **+** and **-**.
- 4 • Save the values set in the menu:

In order to store the parameters, press the key **M**; if you do not press the key 5-6 seconds, the programme will save the modifications automatically. After recording the data, the following message will be displayed for a few seconds.:

Fig. 4.3.1



4.4 PARAMETERS MENU

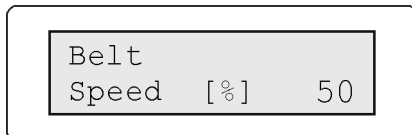
Press the key **S** in order to enter the Menu of the machine adjustment parameters.

If you press the key **S** in the menu, the following parameters will be displayed:

1 • Belt speed

This parameter allows you to adjust the belt speed from 0 to 100 (% value); for minimum and maximum speed, please see the below table.

Fig. 4.4.1



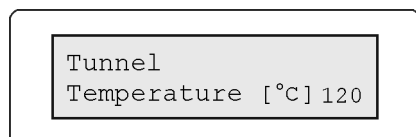
Tab. 4.4.1

Machine model	1% (minimum speed)	100% (maximum speed)
T450	2,8 m/min	9,4 m/min
T650E	1,8 m/min	6,2 m/min
T650	2,8 m/min	9,4 m/min

2 • Oven temperature

Menu for the oven temperature adjustment

Fig. 4.4.2

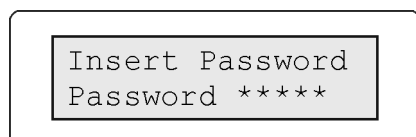


The temperature can be adjusted from 85°C to 200°C, by increasing it by 1°C at a time.

4.5 HIDDEN MENU

By pressing the keys **+** and **-** simultaneously, you enter the hidden menu with the adjustment parameters which were set during the machine commissioning.

Fig. 4.5.1



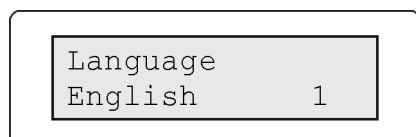
If you enter the password PROGR you have access to the adjustment of the below mentioned parameters:

(In order to enter the password, please select the letters with the keys **+** and **-**; each letter must be confirmed by pressing the key **M**)

1 • Language

Menu to select the language

Fig. 4.5.2



By using the keys **+** and **-** it is possible to display all available languages (English, French, German, Spanish, Portuguese, Dutch, Czech, Polish, Hungarian).

4.6 PARAMETERS STORAGE IN THE HIDDEN MENU

In order to save any modifications in the hidden menu, please press the key **M** .

5. ROUTINE MAINTENANCE



PRECAUTIONS DURING ROUTINE MAINTENANCE.

Before starting any maintenance operation, described in this chapter, unless otherwise required, switch the machine off, switch the voltage off, acting on the main switch and pull out the power supply cable from the mains.

5.1 NATURE AND FREQUENCY OF MAINTENANCE CHECKS AND OPERATION

Tab. 5.1.1

DAILY MAINTENANCE CHART (12 HOURS OF WORKING)	
BELT UNIT AND THERMAL CHAMBER UNIT	REMOVE THE FILM RESIDUES FROM THE THERMAL CHAMBER
	REMOVE THE FILM RESIDUES FROM THE FANS, FROM THE DEFLECTORS AND FROM THE BELT ROLLERS
BELT UNIT AND THERMAL CHAMBER UNIT	MAKE SURE THERE IS NO BLOCKAGE IN THE AIR PASSAGES
GENERAL CLEANING	TURN OFF THE MACHINE VOLTAGE. CLEAN THE MACHINE WITH A WET CLOTH; AVOID THE MACHINE COMING INTO CONTACT WITH WATER. IF YOU WET THE MACHINE ACCIDENTALLY, DRY IT CAREFULLY, BEFORE STARTING PRODUCTION AGAIN.

Tab 5.1.2

HALF-YEAR MAINTENANCE CHART (1500 HOURS OF WORKING)	
BELT UNIT	MAKE SURE THAT THE BELT IS WORKING PERFECTLY
	LUBRICATE THE CHAIN WITH AN ADEQUATE LUBRICANT (SEE PARAGRAPH 5.2)
	CHECK IF THE BEARINGS ARE NOISY AND IF THERE IS ANOMALOUS HEATING
EXTERNAL PROTECTIONS UNIT	MAKE SURE THERE IS NO BREAKAGE ON THE CURTAINS



Before removing possible impurities deposited on the hot parts wait until the machine has cooled down.

5.2 LUBRIFICATION

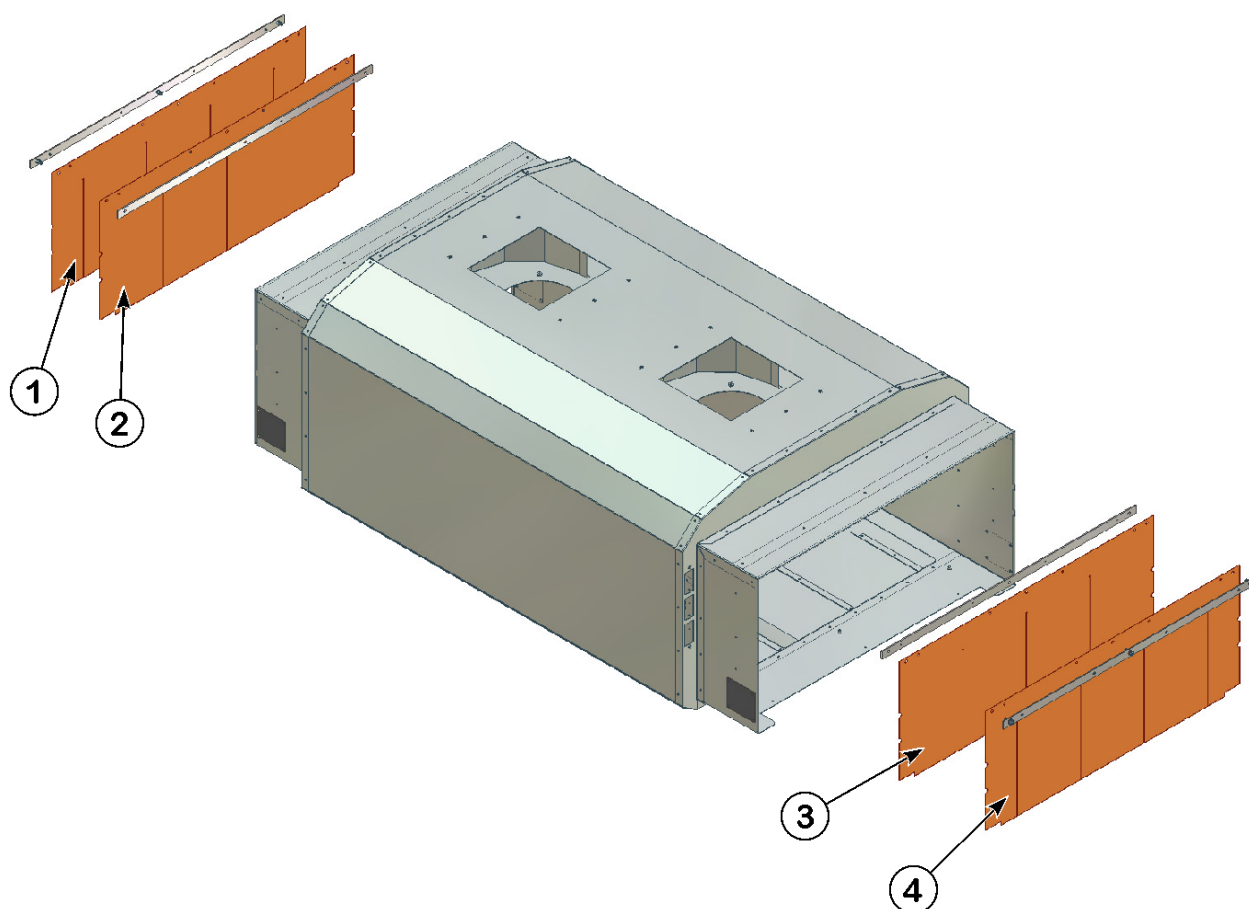
Correct lubrication is particularly important for the tunnel safe operation.

The recommended lubricant for the belts chains is **Mobil Pyrolube 830**, a synthetic, ester based lubricant, for high temperature chains (up to 230°C). It can be applied to the chain by using a brush or it can be dropped or sprayed to the chain (even with a timer).

6. LIST OF SPARE PARTS

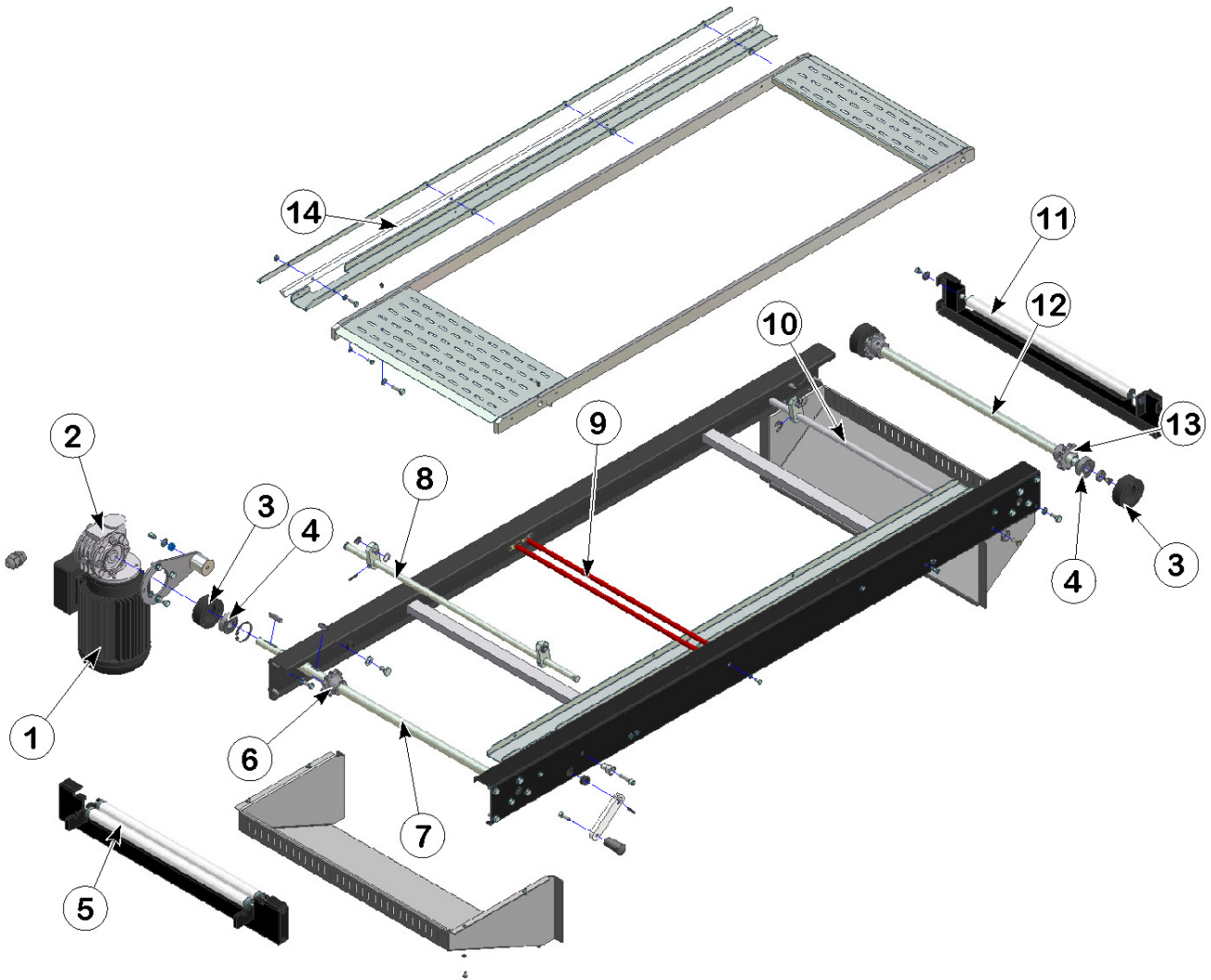
In order to be able to appropriately carry out routine maintenance, it is necessary to always have available the following set of accessories and spare parts:

1• Thermal chamber group



Pos.	DESCRIPTION SPARE PARTS	T450	T650E	T650	N.
1	INLET CURTAIN	MA215612	MA233427	MA233424	1
2	INLET CURTAIN	MA215614	MA233426	MA233425	1
3	OUTLET CURTAIN	MA215613	MA233425	MA233425	1
4	OUTLET CURTAIN	MA215611	MA233424	MA233424	1

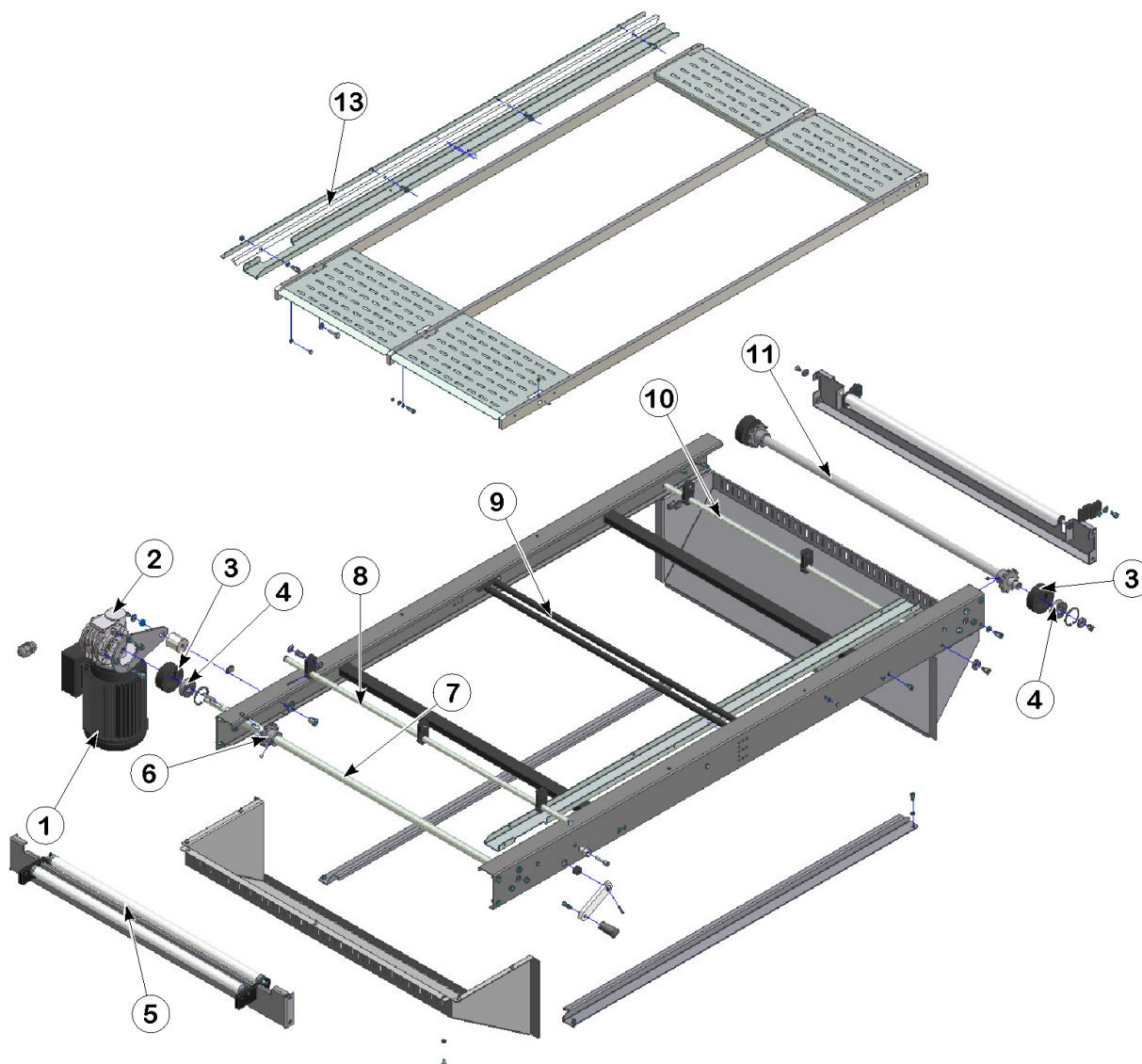
2• Belt group T450 - MY270012



ENGLISH

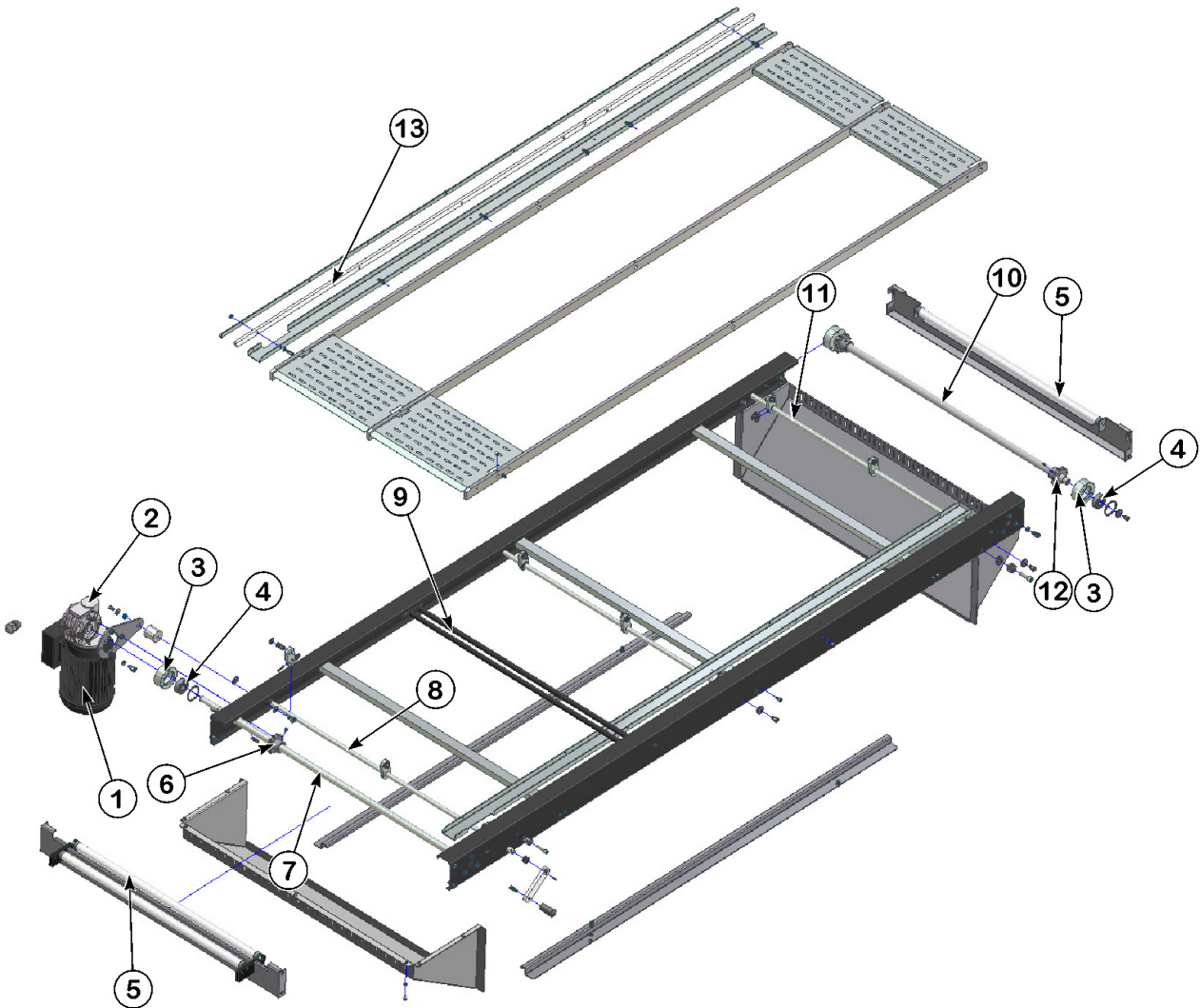
Pos.	DESCRIPTION SPARE PARTS	CODE	N.
1	MOTOR	EM600175	1
2	GEAR BOX	EM650310	1
3	FLANGE	MA112112	4
4	BEARING	MF801062	2
5	ROLLER GROUP	MH200037	2
6	PINION	MA401549	2
7	SHAFT	MA112705	1
8	ROD	MA112052	1
9	CHAIN GROUP	MH290008	1
10	ROD	MA112052	1
11	ROLLER GROUP	MH200061	1
12	SHAFT	MA112045	1
13	PINION	MA401548	2
14	CHAIN GUIDE	MA231902	2

3• Belt group T650E - MY270022



Pos.	DESCRIPTION SPARE PARTS	CODE	N.
1	MOTOR	EM600175	1
2	GEAR BOX	EM650311	1
3	FLANGE	MA112112	4
4	BEARING	MF801062	4
5	ROLLER GROUP	MH200046	2
6	PINION	MA401549	2
7	SHAFT	MA112709	1
8	ROD	MA112516	1
9	CHAIN GROUP	MH290010	1
10	ROD	MA112178	1
11	SHAFT	MA112176	1
12	ROLLER GROUP	MH200062	1
13	CHAIN GUIDE	MA231902	2

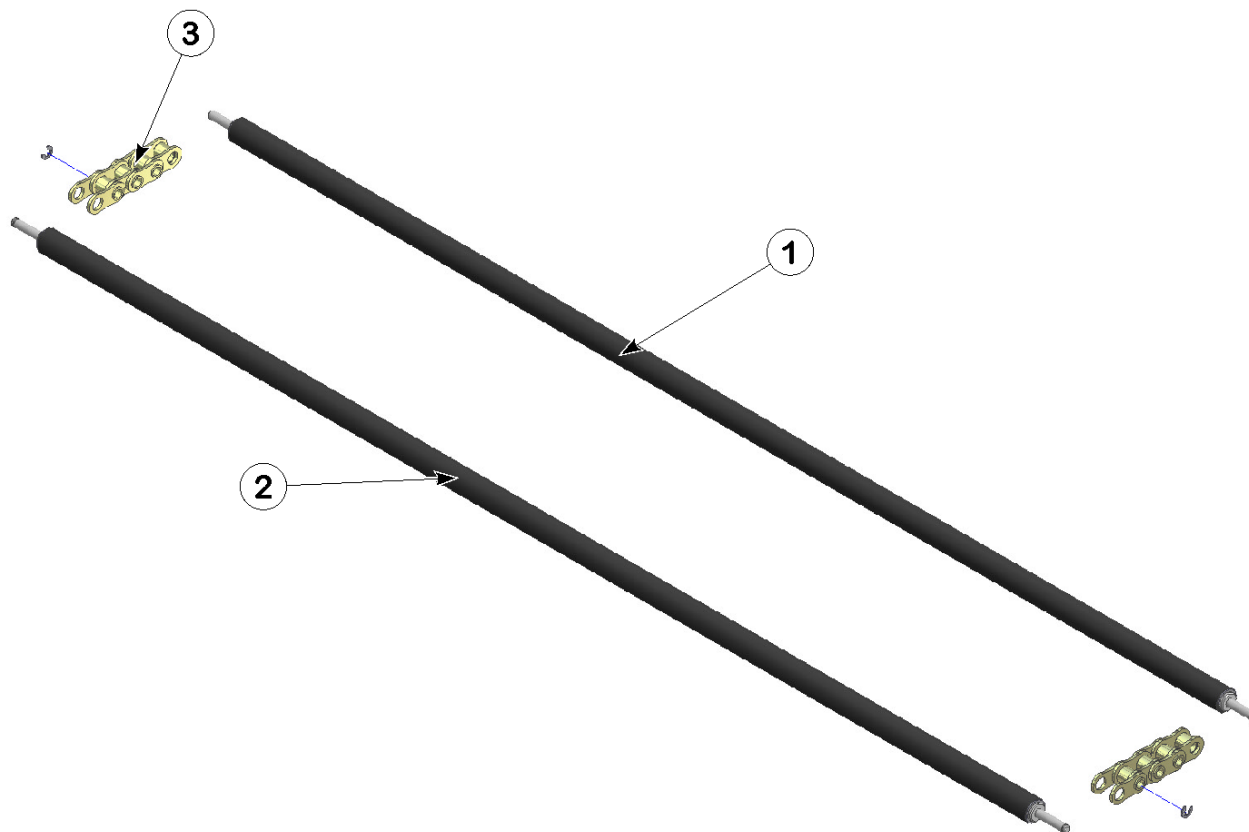
4• Belt group T650 New - MY270021



ENGLISH

Pos.	DESCRIPTION SPARE PARTS	CODE	N.
1	MOTOR	EM600175	1
2	GEAR BOX	EM650310	1
3	FLANGE	MA112112	4
4	BEARING	MF801062	4
5	ROLLER GROUP	MH200046	3
6	PINION	MA401549	2
7	SHAFT	MA112709	1
8	ROD	MA112516	1
9	CHAIN GROUP	MH290009	1
10	SHAFT	MA112176	1
11	ROD	MA112178	2
12	PINION	MA401548	2
13	CHAIN GUIDE	MA231902	2

5• Chain group

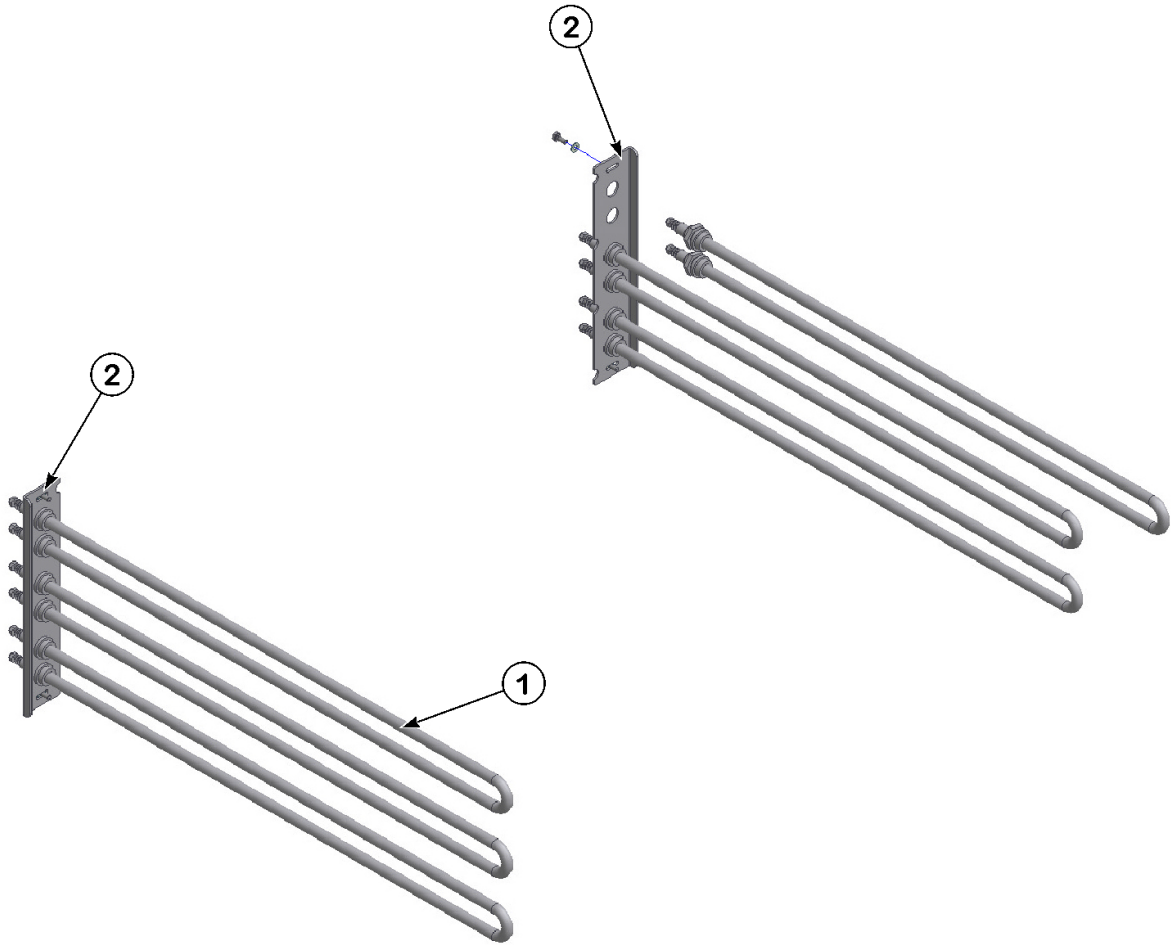


Pos.	DESCRIPTION SPARE PARTS	T450	N.
1	RUBBER ROLLER	MA701243	10
2	RUBBER ROLLER	MA701242	93
3	CHAIN GROUP	MA701564	1

Pos.	DESCRIPTION SPARE PARTS	T650E	N.
1	RUBBER ROLLER	MA701582	10
2	RUBBER ROLLER	MA701583	93
3	CHAIN GROUP	MA701564	1

Pos.	DESCRIPTION SPARE PARTS	T650	N.
1	RUBBER ROLLER	MA701582	14
2	RUBBER ROLLER	MA701583	132
3	CHAIN GROUP	MA701584	1

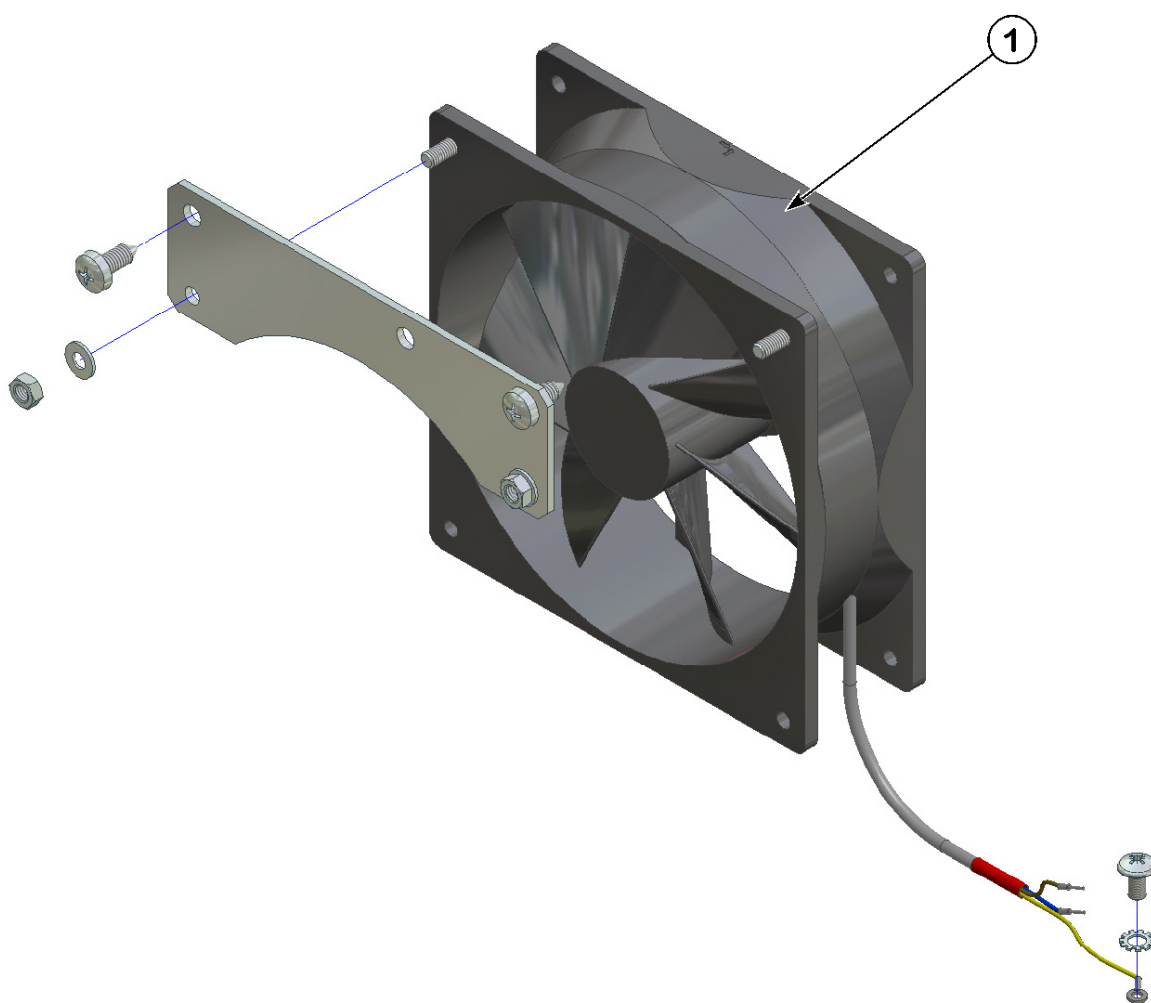
6• Heating elements group



ENGLISH

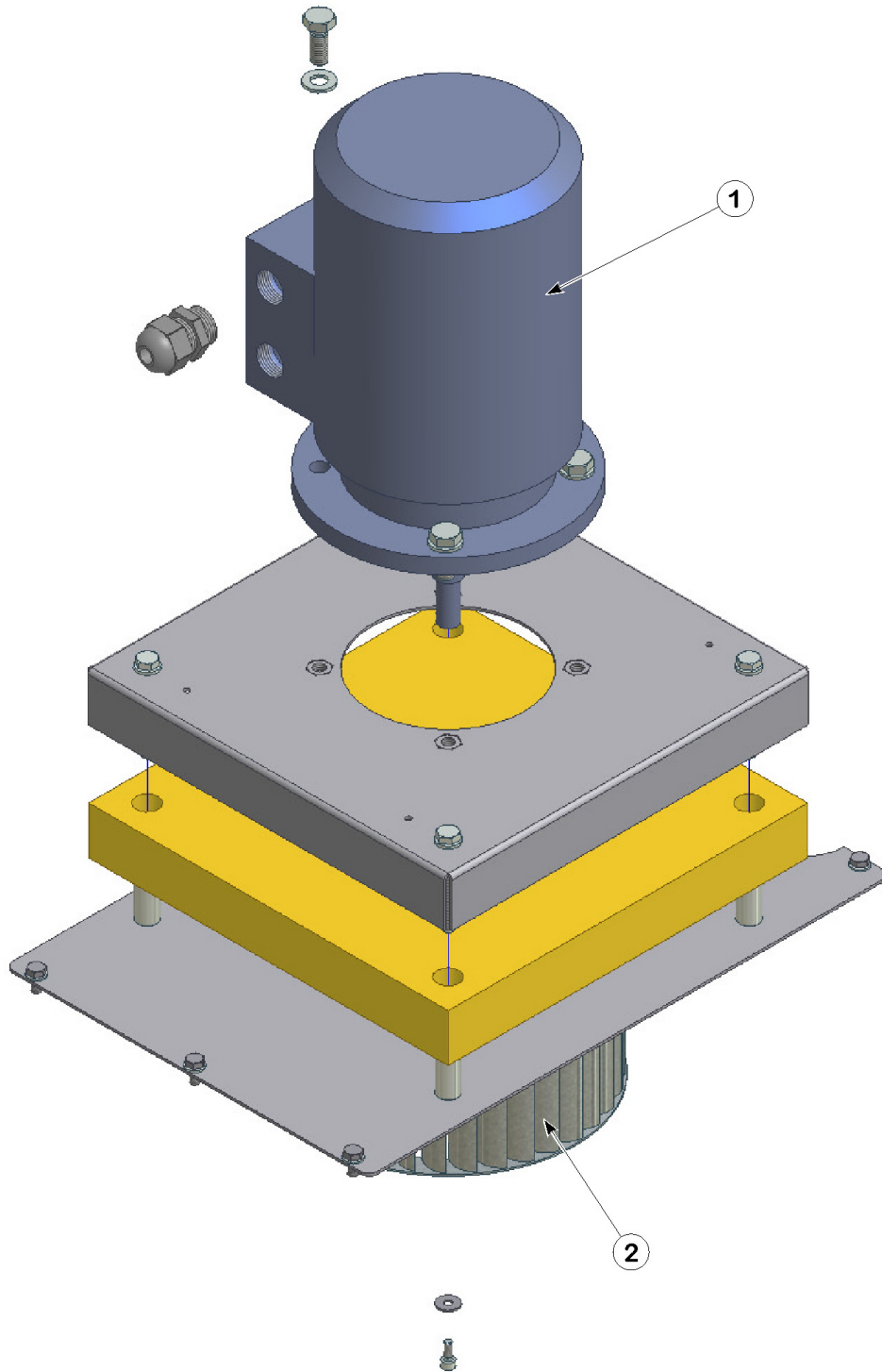
Pos.	DESCRIPTION	T450 MH180001	N.	T650E MH180012	N.	T650 MH180001	N.
1	HEATING ELEMENT	MA106977	6	MA112511	6	MA106977	12
2	PLATE	MA216080	2	MA216080	2	MA216080	4

7• Fan group



Pos.	DESCRIPTION	T450	N.	T650E	N.	T650	N.
1	FAN					EK020022	2

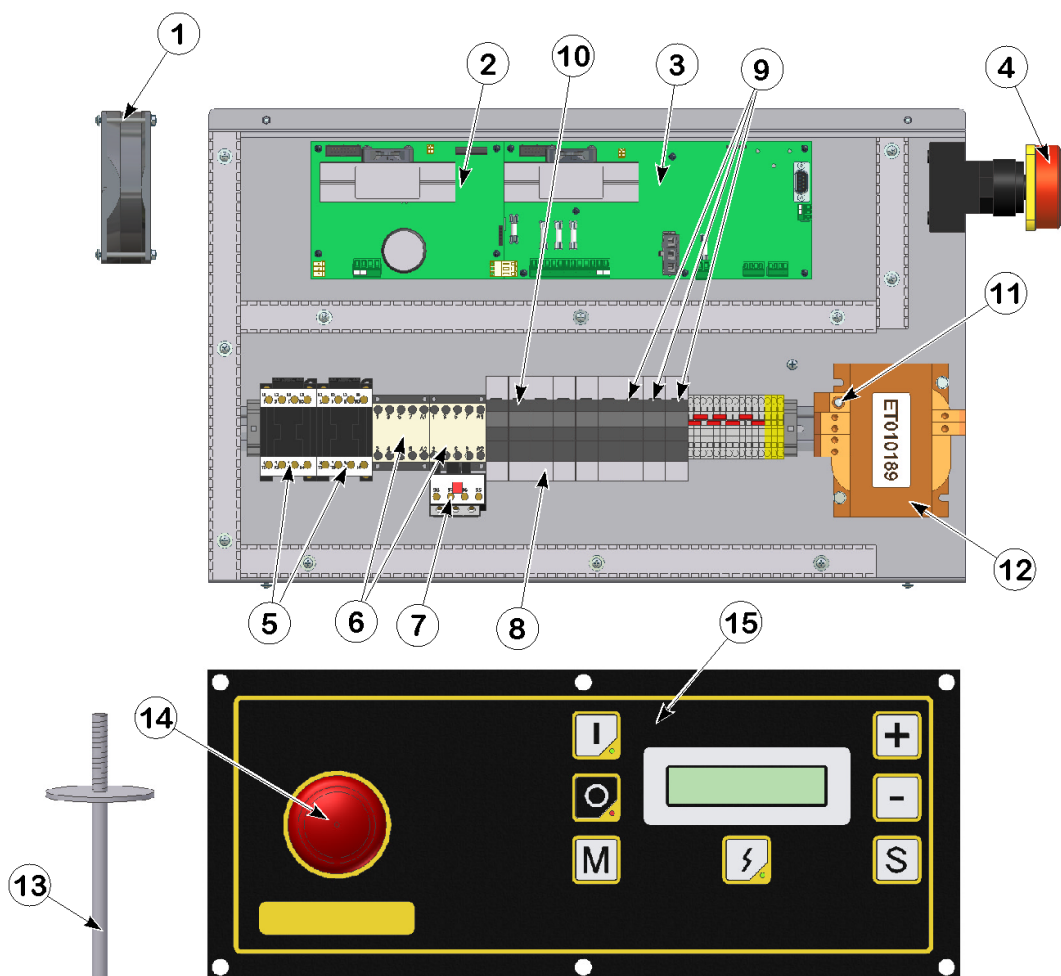
8 • Thermal chamber ventilation group



ENGLISH

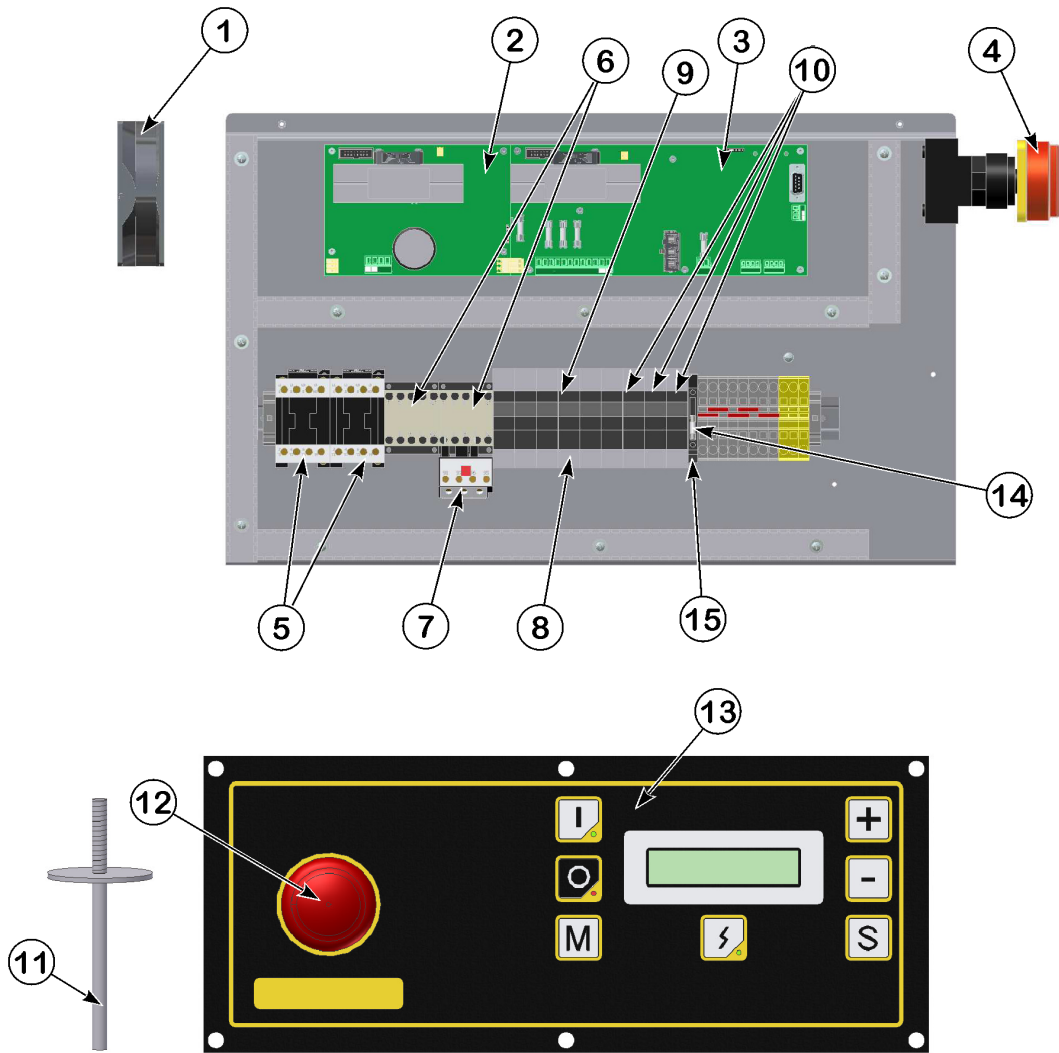
Pos.	DESCRIPTION	T450 MH190002	N.	T650E MH190002	N.	T650 MH190002	N.
1	MOTOR	EM600014	1	EM600014	1	EM600014	2
2	FAN	MF900757	1	MF900757	1	MF900757	2

9• Electrical diagram group T450 - T650E



Pos.	DESCRIPTION SPARE PARTS	CODE	N.
1	FAN	EK020022	1
2	FLEXTRON INVERTER	KZ010143	1
3	FLEXTRON-POWER BASE	KZ010141	1
4	SWITCH	EP010139	1
5	RELAY SWITCH	EE100110	2
6	RELAY SWITCH	EE100073	2
7	RELAY	EE300107	1
8	FUSE SOCKET	EE500065	3
9	FUSE	EE500012	3
10	FUSE	EE500011	6
11	FUSE	EE500054	1
12	TRANSFORMER	ET010189	1
13	TERMOHEATING ELEMENT	EE400008	1
14	PUSH BUTTON CONTACT	EP010198 EP010200	1 1
15	FLEXTRON-MASTER	KZ010135	1

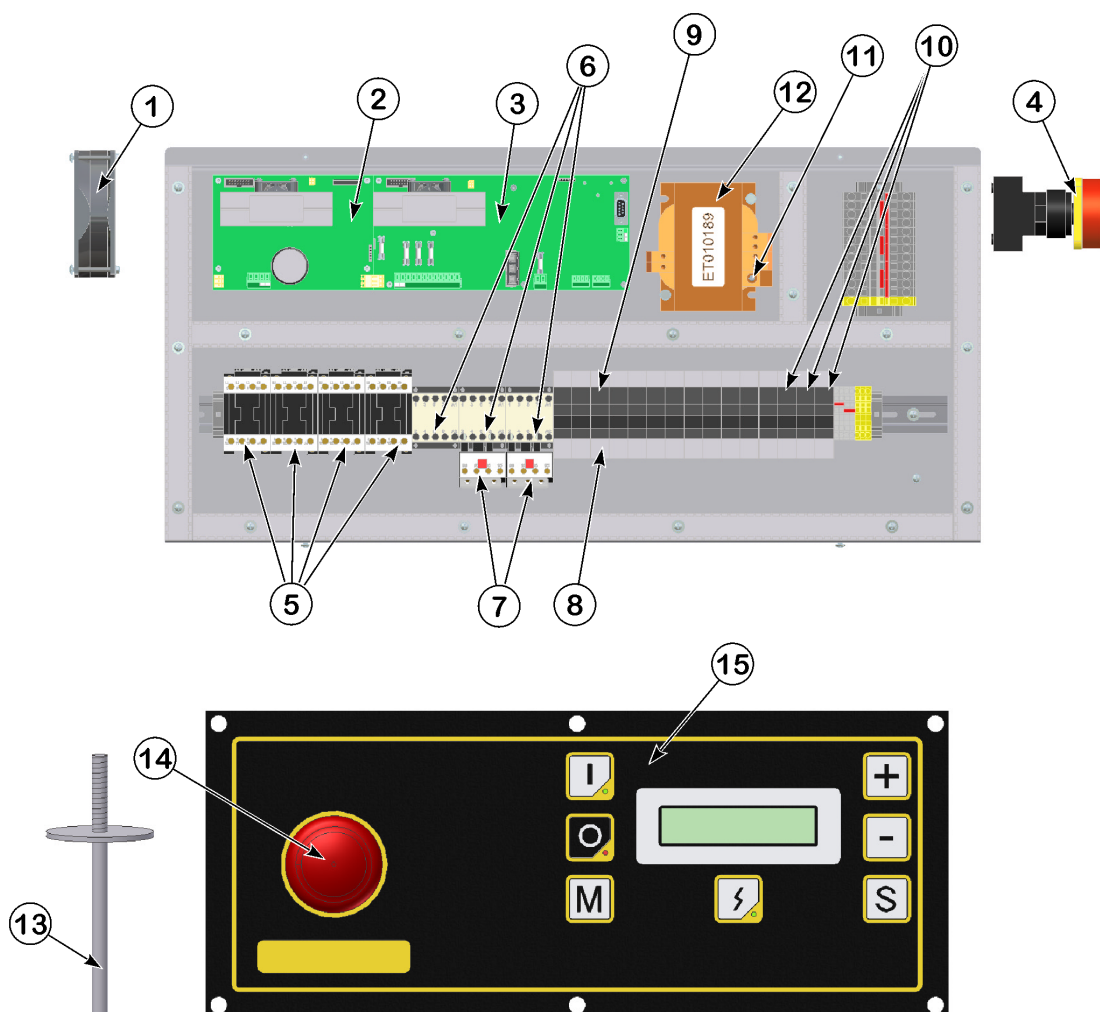
10 • Electrical diagram group T450 - T650E 230V 3PH



ENGLISH

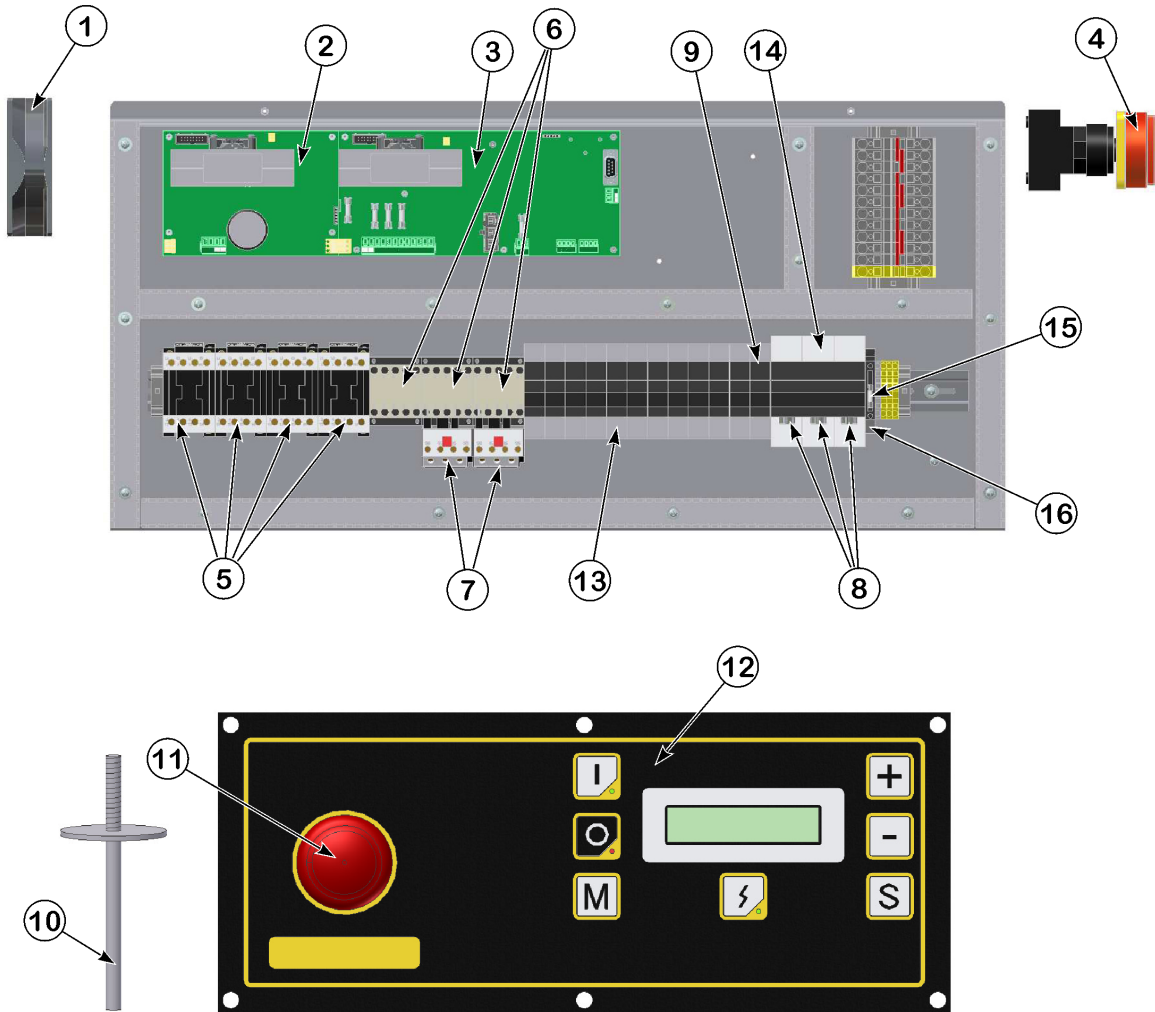
Pos.	DESCRIPTION SPARE PARTS	CODE	N.
1	FAN	EK020022	1
2	FLEXTRON INVERTER	KZ010143	1
3	FLEXTRON-POWER BASE	KZ010141	1
4	SWITCH	EP010139	1
5	RELAY SWITCH	EE100110	2
6	RELAY SWITCH	EE100073	2
7	RELAY	EE300108	1
8	FUSE SOCKET	EE500065	3
9	FUSE	EE500012	6
10	FUSE	EE500014	3
11	TERMOHEATING ELEMENT	EE400008	1
12	PUSH BUTTON CONTACT	EP010198 EP010200	1 1
13	FLEXTRON-MASTER	KZ010135	1
14	FUSE	EE500029	1
15	FUSE SOCKET TERMINAL	EK200004	1

11 • Electrical diagram group T650



Pos.	DESCRIPTION SPARE PARTS	CODE	N.
1	FAN	EK020022	1
2	FLEXTRON INVERTER	KZ010143	1
3	FLEXTRON-POWER BASE	KZ010141	1
4	SWITCH	EP010139	1
5	RELAY SWITCH	EE100110	4
6	RELAY SWITCH	EE100073	3
7	RELAY	EE300107	2
8	FUSE SOCKET	EE500065	5
9	FUSE	EE500011	12
10	FUSE	EE500014	3
11	FUSE	EE500054	1
12	TRANSFORMER	ET010189	1
13	TERMOHEATING ELEMENT	EE400008	1
14	PUSH BUTTON	EP010198	1
	CONTACT	EP010200	1
15	FLEXTRON-MASTER	KZ010135	1

12• Electrical diagram group T650 230V 3PH

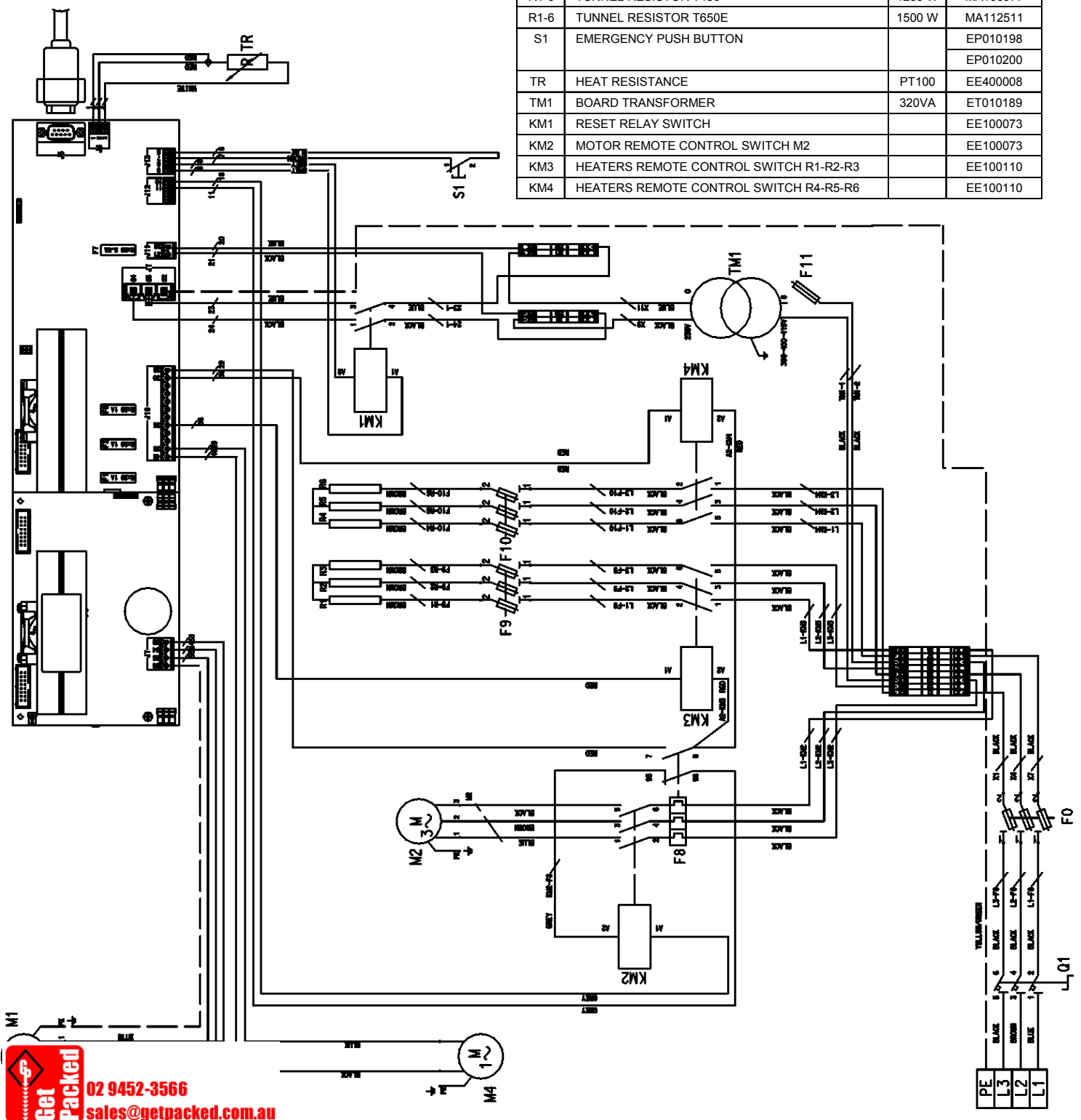


ENGLISH

Pos.	DESCRIPTION SPARE PARTS	CODE	N.
1	FAN	EK020022	1
2	FLEXTRON INVERTER	KZ010143	1
3	FLEXTRON-POWER BASE	KZ010141	1
4	SWITCH	EP010178	1
5	RELAY SWITCH	EE100110	4
6	RELAY SWITCH	EE100073	3
7	RELAY	EE300108	2
8	FUSE	EE500012	12
9	FUSE	EE500017	3
10	TERMOHEATING ELEMENT	EE400008	1
11	PUSH BUTTON CONTACT	EP010198 EP010200	1 1
12	FLEXTRON-MASTER	KZ010135	1
13	FUSE SOCKET	EE500065	4
14	FUSE SOCKET	EE500174	1
15	FUSE	EE500029	1
16	FUSE SOCKET TERMINAL	EK200004	1

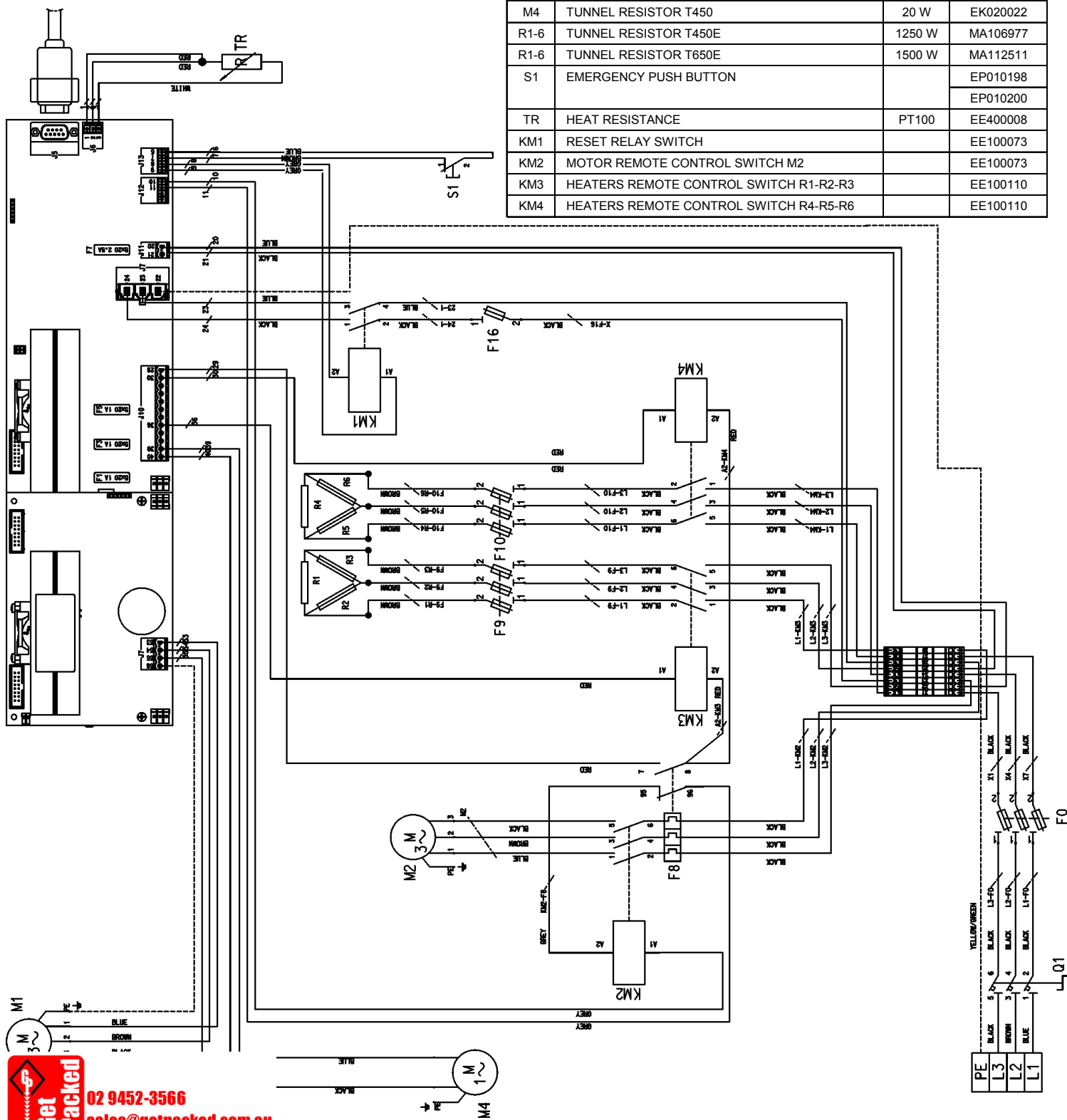
13 • Wiring diagram T450 - T650E

MODEL T450 - T650E		VALUES	CODE
F0	GENERAL FUSE	16 A	EE500012
F1	MACHINE PANEL COOLING FAN FUSE	1A	KD200034
F3	RELAY SWITCH FUSE R1-R2-R3	1A	KD200034
F5	RELAY SWITCH FUSE R4-R5-R6	1A	KD200034
F7	FEED FUSE AUX	2,5A	KD200022
F8	MOTOR THERMAL RELAY M2	0,6-1A	EE300107
F9	RESISTORS FUSE R1-R2-R3	10A	EE500011
F10	RESISTORS FUSE R4-R5-R6	10A	EE500011
F11	TRANSFORMER FUSE	1A	EE500054
Q1	MAIN SWITCH	32A	EP010139
M1	CONVEYOR BELT MOTOR	180 W	EM600175
M2	SHRINKING FAN MOTOR	250 W	EM600014
M4	COOLING FAN MOTOR	20 W	EK020022
R1-6	TUNNEL RESISTOR T450	1250 W	MA106977
R1-6	TUNNEL RESISTOR T650E	1500 W	MA112511
S1	EMERGENCY PUSH BUTTON		EP010198 EP010200
TR	HEAT RESISTANCE	PT100	EE400008
TM1	BOARD TRANSFORMER	320VA	ET010189
KM1	RESET RELAY SWITCH		EE100073
KM2	MOTOR REMOTE CONTROL SWITCH M2		EE100073
KM3	HEATERS REMOTE CONTROL SWITCH R1-R2-R3		EE100110
KM4	HEATERS REMOTE CONTROL SWITCH R4-R5-R6		EE100110



14 • Wiring diagram T450 - T650E 230V 3PH

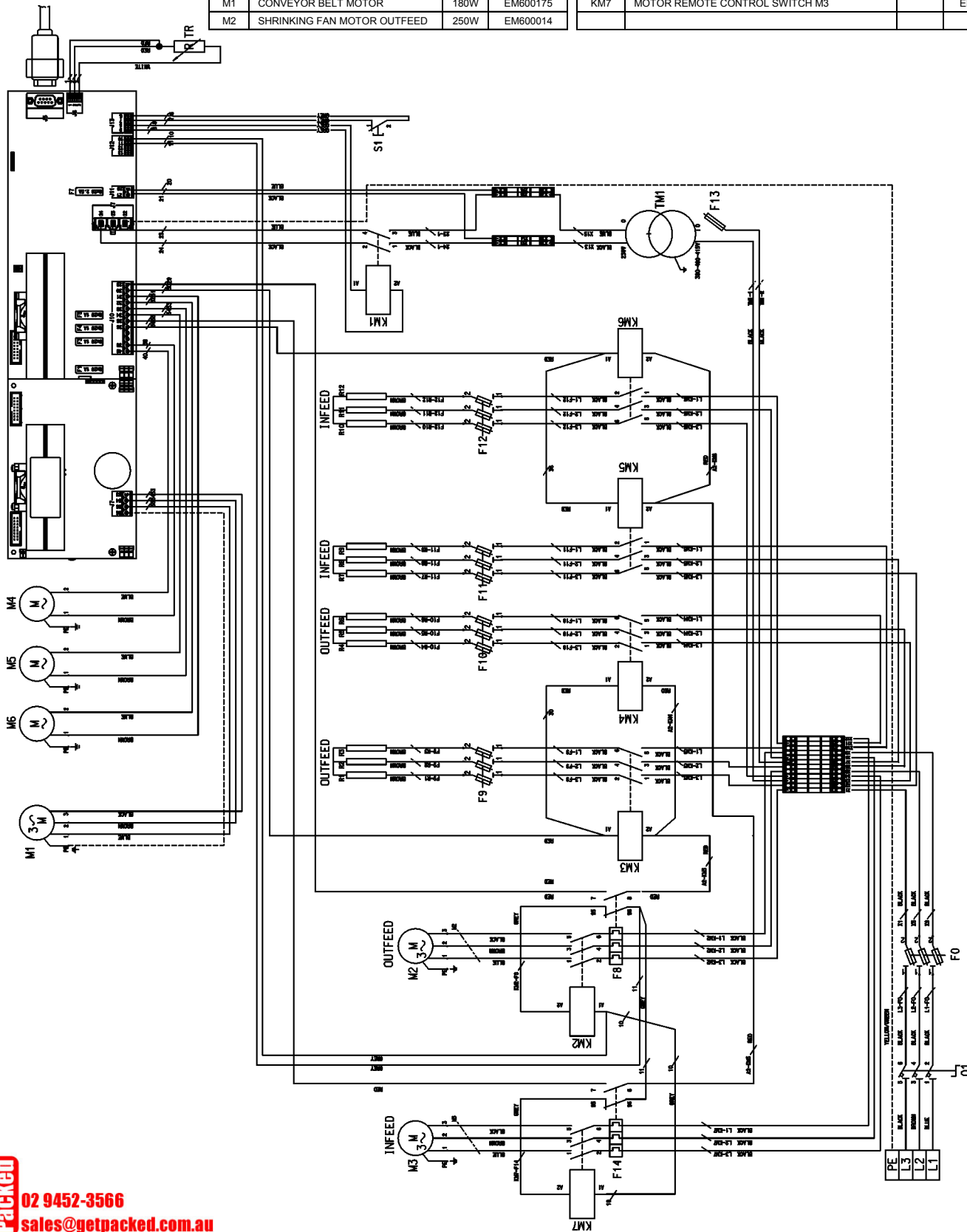
MODEL T450 - T650E 230V 3PH		VALUES	CODE
F0	GENERAL FUSE	25 A	EE500014
F1	MACHINE PANEL COOLING FAN FUSE	1A	KD200034
F3	RELAY SWITCH FUSE R1-R2-R3	1A	KD200034
F5	RELAY SWITCH FUSE R4-R5-R6	1A	KD200034
F7	FEED FUSE AUX	2,5A	KD200022
F8	MOTOR THERMAL RELAY M2	1,4-2,3A	EE300108
F9	RESISTORS FUSE R1-R2-R3	16A	EE500012
F10	RESISTORS FUSE R4-R5-R6	16A	EE500012
F16	PRINTED CIRCUIT BOARD FUSE	2A	EE500029
Q1	MAIN SWITCH	32A	EP010139
M1	CONVEYOR BELT MOTOR	180 W	EM600175
M2	SHRINKING FAN MOTOR	250 W	EM600014
M4	TUNNEL RESISTOR T450	20 W	EK020022
R1-6	TUNNEL RESISTOR T450E	1250 W	MA106977
R1-6	TUNNEL RESISTOR T650E	1500 W	MA112511
S1	EMERGENCY PUSH BUTTON		EP010198 EP010200
TR	HEAT RESISTANCE	PT100	EE400008
KM1	RESET RELAY SWITCH		EE100073
KM2	MOTOR REMOTE CONTROL SWITCH M2		EE100073
KM3	HEATERS REMOTE CONTROL SWITCH R1-R2-R3		EE100110
KM4	HEATERS REMOTE CONTROL SWITCH R4-R5-R6		EE100110



15 • Wiring diagram T650



MODEL T650			MODEL T650			
CODE	DESCRIPTION	VALUES	CODE	DESCRIPTION	VALUES	
F0	GENERAL FUSE	25A	EE500014	M3	SHRINKING FAN MOTOR INFEED	
F1	COOLING FAN FUSE M4	1A	KD200034	M4	MACHINE PANEL COOLING FAN FUSE	20W
F3	RELAY SWITCH FUSE	1A	KD200034	M5-M6	CHAIN COOLING FAN	20W
F4	FAN FUSE M5-M6	1A	KD200034	R1-12	TUNNEL RESISTOR	1250W
F5	RELAY SWITCH FUSE	1A	KD200034	S1	EMERGENCY PUSH BUTTON	
F7	FEED FUSE AUX	2.5A	KD200022			EP010198
F8	MOTOR THERMAL RELAY M2	0,6-1A	EE300107			EP010200
F9	RESISTORS FUSE R1-R2-R3	10A	EE500011	TR	HEAT RESISTANCE	PT100
F10	RESISTORS FUSE R4-R5-R6	10A	EE500011	TM1	BOARD TRANSFORMER	320VA
F11	RESISTORS FUSE R7-R8-R9	10A	EE500011			ET010189
F12	RESISTORS FUSE R10-R11-R12	10A	EE500011	KM1	RESET RELAY SWITCH	
F13	TRANSFORMER FUSE	1A	EE500054	KM2	MOTOR REMOTE CONTROL SWITCH M2	
F14	MOTOR THERMAL RELAY M3	0,6-1A	EE300107	KM3	HEATERS REMOTE CONTROL SWITCH OUTFEED	
Q1	MAIN SWITCH	32A	EP010139	KM4	HEATERS REMOTE CONTROL SWITCH OUTFEED	
M1	CONVEYOR BELT MOTOR	180W	EM600175	KM5	HEATERS REMOTE CONTROL SWITCH INFEED	
M2	SHRINKING FAN MOTOR OUTFEED	250W	EM600014	KM6	HEATERS REMOTE CONTROL SWITCH INFEED	
				KM7	MOTOR REMOTE CONTROL SWITCH M3	
						EE100073

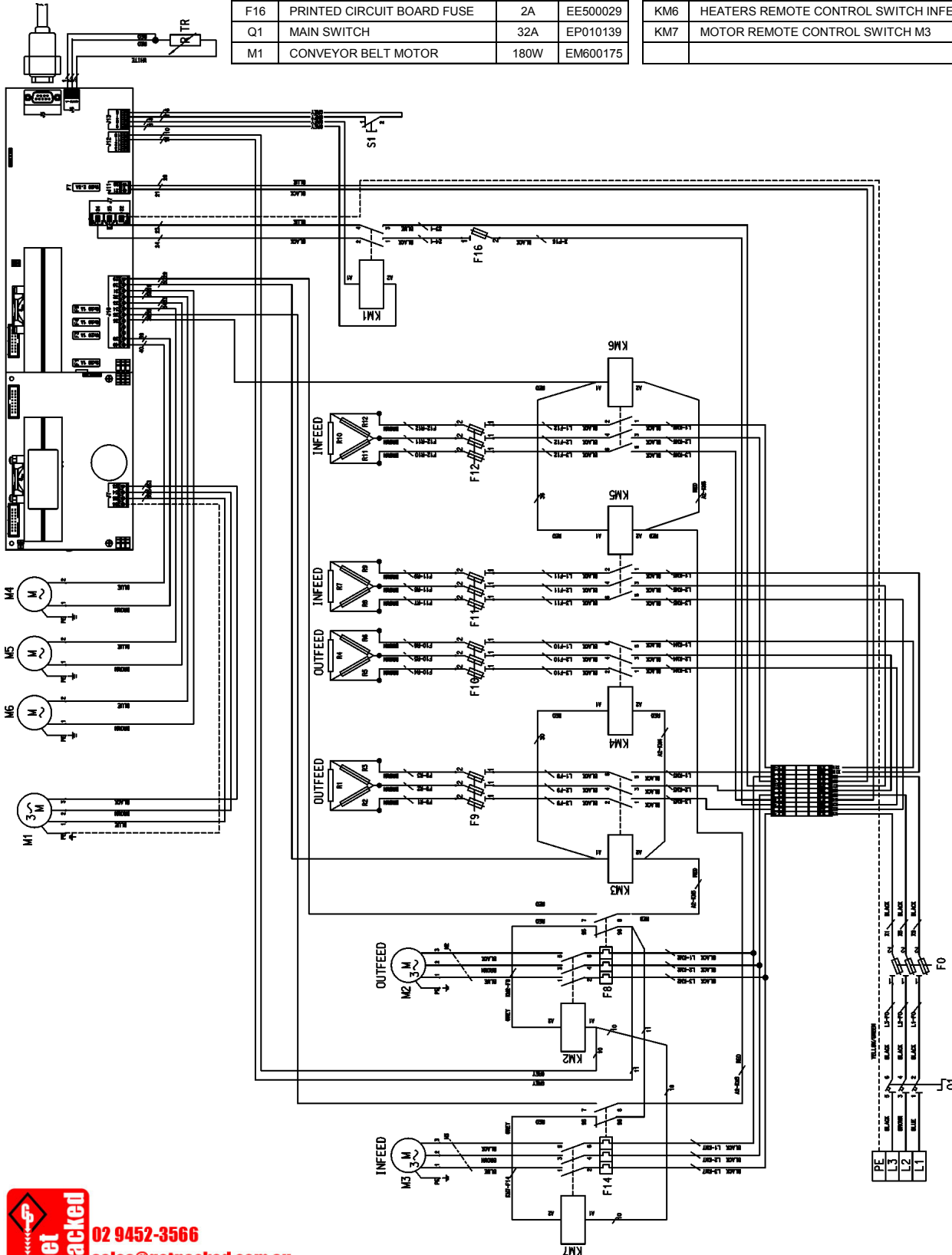


16 • Wiring diagram T650 230V 3PH



MODEL T650 230v 3PH		VALUES	CODE
F0	GENERAL FUSE	50A	EE500017
F1	COOLING FAN FUSE M4	1A	KD200034
F3	RELAY SWITCH FUSE	1A	KD200034
F4	COOLING FAN FUSE M5-M6	1A	KD200034
F5	RELAY SWITCH FUSE	1A	KD200034
F7	FEED FUSE AUX	2.5A	KD200022
F8	MOTOR THERMAL RELAY M2	1,4-2,3A	EE300108
F9	RESISTORS FUSE R1-R2-R3	16A	EE500012
F10	RESISTORS FUSE R4-R5-R6	16A	EE500012
F11	RESISTORS FUSE R7-R8-R9	16A	EE500012
F12	RESISTORS FUSE R10-R11-R12	16A	EE500012
F13	TRANSFORMER FUSE	1A	EE500054
F14	MOTOR THERMAL RELAY M3	1,4-2,3A	EE300108
F16	PRINTED CIRCUIT BOARD FUSE	2A	EE500029
Q1	MAIN SWITCH	32A	EP010139
M1	CONVEYOR BELT MOTOR	180W	EM600175

MODEL T650 230v 3PH		V	W
M2	SHRINKING FAN MOTOR OUTFEED	250W	EM600014
M3	SHRINKING FAN MOTOR INFEEED	250W	EM600014
M4	MACHINE PANEL COOLING FAN FUSE	20W	EK020022
M5-M6	CHAIN COOLING FAN	20W	EK020022
R1-12	TUNNEL RESISTOR	1250W	MA106977
S1	EMERGENCY PUSH BUTTON		EP010198 EP010200
TR	HEAT RESISTANCE	PT100	EE400008
KM1	RESET RELAY SWITCH		EE100073
KM2	MOTOR REMOTE CONTROL SWITCH M2		EE100073
KM3	HEATERS REMOTE CONTROL SWITCH OUTFEED		EE100110
KM4	HEATERS REMOTE CONTROL SWITCH OUTFEED		EE100110
KM5	HEATERS REMOTE CONTROL SWITCH INFEEED		EE100110
KM6	HEATERS REMOTE CONTROL SWITCH INFEEED		EE100110
KM7	MOTOR REMOTE CONTROL SWITCH M3		EE100073



7. ANOMALIES AND FAILURES – HOW TO REMEDY

7.1 POSSIBLE CAUSES AND REMEDIES

Tab. 7.1.1

PROBLEM	CAUSE	SOLUTION
THE TUNNEL DOES NOT HEAT-SHRINK	WRONG DIRECTION OF ROTATION OF THE FANS	CHECK THE DIRECTION OF ROTATION OF THE FANS
	HEAT-SHRINKING NOT SELECTED	CHECK THAT THE HEAT SHRINK SYMBOL APPEARS ON THE DISPLAY
	TEMPERATURE TOO LOW	CHECK TEMPERATURE ON THE DISPLAY
	RESISTORS HEATING UP	WAIT TILL THE RESISTORS REACH THE CORRECT TEMPERATURE
	THE FAN DOES NOT ROTATE	CHECK THE THERMOMAGNETIC SWITCH AND THE MOTOR OPERATION
SHRINKING IS NOT UNIFORM NOR COMPLETE	FILM NOT SUITABLE OR OF POOR QUALITY	REPLACE THE FILM
DURING THE HEAT-SHRINKING BUBBLING REMAINS	FILM WITH NO MICROPUNCHES	MAKE THE FILM GO THROUGH THE SEALER'S MICROPUNCHES
THE SEALING OPENS DURING HEAT-SHRINKING	THE SEALING BLADE IS DIRTY OR DAMAGED	CLEAN THE SEALING BLADE OR REPLACE IT IF DAMAGED
	INCORRECT SEALING VALUE	SET THE SEALER'S SEALING VALUE
	OVEN TOO HOT	REDUCE THE TEMPERATURE AND/OR INCREASE THE CONVEYOUR SPEED

7.2 AUDIO WARNING OF PROBLEMS

Cyclically, the program performs a number of controls. If there are any anomalies, the electronic board will emit an acoustic signal (beep) and the number of the problem is displayed.



Fig. 7.2.1

Once the problem is solved, it will be possible to reset the electronic board display by

pressing the key  or any other key.

Please find here below a list of the problems that may occur and their solutions.

ERROR 1: Oven over-heating error

The sensor has detected a higher temperature than 230°C.

Solution:

Switch the power off and:

- Make sure that the air intakes are not obstructed (turn off the power supply before carrying out any type of cleaning).
- Make sure that the heating elements are operating correctly



- Check the ventilation motor connection and make sure that it is operating correctly.
If the problem continues turn off the power supply and contact the service centre.

ERROR 2: Oven heating error

The oven can not reach the pre-set temperature

Solution:

Switch the power off and:

- Make sure that the oven heating elements are operating correctly
- Check the direction of rotation of the ventilation motor and make sure it is operating correctly

If the problem continues turn off the power supply and contact the service centre.



ERROR 3: Temperature detection error

The temperature sensor might be disconnected or the temperature detection is not stable

Solution:

Switch the power off and:

- Make sure that the temperature sensor is connected and is operating correctly
- Check the earthing line connection

If the problem continues turn off the power supply and contact the service centre.



ERROR 4: Inverter motor error

The inverter has signalled the motor high current

Solution:

Switch the power off and:

- Check the wearing state of the belt and make sure there are no mechanical problems
- Make sure that the inverter motor is operating correctly

If the problem continues turn off the power supply and contact the service centre.



ERROR 5: PCB over-heating error

The PCB temperature is too high

Solution:

Switch the power off and:

- Check that the air intakes are not blocked.
- Make sure that the cooling fan of the electrical panel and of the electronic board is operating correctly

If the problem continues turn off the power supply and contact the service centre.



ERROR 6: Power Base radiator over-heating error

Solution:

Switch the power off and:

- Check that the air intakes are not blocked.
- Make sure that the cooling fan of the Power Base board in the electrical panel is operating correctly.

If the problem continues turn off the power supply and contact the service centre.



ERROR 7: The temperature of the inverter board radiator exceeds the maximum limit

The board radiator temperature is too high

Solution:

Switch the power off and:

- Check that the air intakes are not blocked
- Make sure that the cooling fan of the inverter board in the electrical panel is operating correctly.

If the problem continues turn off the power supply and contact the service centre.



ERROR 8: Calibrating parameters error

The memory data are corrupted

Solution:

- Switch the machine off and then on again

Se il problema persiste togliere l'alimentazione e chiamare il centro assistenza

ERRORE 9: Errore della EEPROM

The memory data are corrupted

Solution:

Switch the machine off and then on again

If the problem continues turn off the power supply and contact the service centre.

ERROR 10: 24V outputs over-current

There is "leakage" or over-current at the 24V outputs

Solution:

Switch the power off and:

- Check the integrity of the power supply cables of the fans and of the reset relay switches
- Check the relay switch correct operation

If the problem continues turn off the power supply and contact the service centre.

**ERROR 11: Inverter diagnostics**

Inverter module in error

Solution:

- Switch the machine off and then on again

If the problem continues turn off the power supply and contact the service centre.

ERROR 12: Belt motor at a standstill

When the belt starts running, the inverter checks the current absorption; if the absorption remains unchanged, an error will be displayed.

Solution:

- Make sure that the belt motor is connected correctly

If the problem continues turn off the power supply and contact the service centre.

ERROR 100 - ERROR 101 - ERROR 110 - ERROR 111

Error caused by the FLEXTRON POWER BASE

Solution:

- check the correct operation of the FLEXTRON POWER BASE.
- check the connection cable, especially the connectors.
- replace the board FLEXTRON POWER BASE.

If the error persists after replacing the FLEXTRON POWER BASE, it might be caused by the CPU board transmitter.

ERROR 200 - ERROR 201 - ERROR 210 - ERROR 211

Error caused by the connection between the FLEXTRON POWER BASE and the FLEXTRON INVERTER.

Solution:

- check the connection cable, especially the connectors.

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