Technical Construction File

File No：TCF25011413

According to

2006/42/EC Machinery Directive
2014/30/EU Electromagnetic Compatibility Directive

related to the

Industrial Oven

MODEL：TECH 8050

presented by
TECHNO BEL INDIA
#37, Thirumagondanahalli, Village ,
Neralur Post, Attebele, Hobli, Anekel TQ,
Hosur Main Road,
Bangalore - 562017.Karnataka.

Content

1. General description

This machine is a kind of Industrial Oven.

Basically, this kind of machine belongs to general machine and with low risk when using it. All possible risks have been analysis in the risk assessment report and been prevent by suitable ways.

The main risk of this kind of machine could be:
- The risk of access to the moving parts.
- The risk of access to the power transmission elements.

In order to prevent the main risks mentioned above, the protection guarding system are provided, and all the detail safety provision are constructed in accordance with the requirement of EN ISO 12100:2010, EN 60204-1:2018, EN 746-1:1997+A1:2009, EN ISO 13577-2：2023，EN IEC 61000-6-1:2019 ，EN IEC 61000-6-8:2020.

In order to ensure the conformity for CE marking for these machines, some main European and/or International standards have been used to made assessment of conformity, they are：

-EN ISO 12100:2010 for checking of mechanical structures and carrying out risk assessment;
-EN 746-1:1997+A1:2009
-EN ISO 13577-2:2023

-EN 60204-1:2018 for checking of electrical equipment;

−EN IEC 61000-6-1:2019 ， EN IEC 61000-6-8:2020. for checking of Electromagnetic Compatibility;

The test reports for these applicable standards in detail have been included in the relevant sub-clauses of this technical construction file.

2. Variations of the series products

Regarding the whole family of the series, they can be divided into various groups according to their main features. They are:TECH 8050

All models are with the same machine structure but with some small differences as described as the following:
1. The weight is different.
2. The power and dimension are different.

To present the conformity of this series machine with Machinery Directive, we discuss the conformity systematically with the relative Directive and standards for TECH 8050 as a basic evaluation in clause.

3. List of applicable regulations and standards

Regulations

- Machinery Directive: 2006/42/EC
- Electromagnetic Compatibility Directive 2014/30/EU

Standards

- EN ISO 12100: 2010

Safety of machinery — General principles for design — Risk assessment and risk reduction.

- EN 60204-1:2018

Safety of machinery —Electrical equipment of machines —Part 1: General requirements

- EN IEC 61000-6-1:2019

Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity for industrial environments

- EN IEC 61000-6-8:2020

Electromagnetic compatibility (EMC) — Part 6-4: Generic standards — Emission standard for industrial environments

4. Quality control system

In order to ensure the conformity of the series production, the TECHNO BEL INDIA . has taken the related procedures mentioned below：

（1）Apply for the consultant form the qualified body in POLAND.
The MANUFACTURER has applied for the consultant from Technical Inspection Certification.
The complete technical construction file（TCF）have been established before applying for the CE marking certificate.

（2）Carryout the inspection for parts and components according to the TCF
Before the assemblies of the series production, the QC engineers of MANUFACTURER has to check and inspect the technical specifications and intended functions of parts and components to ensure the correct use of them according to the contents of TCF and principle described in the related technical information.

（3）Carryout the inspection ＆ testing for the products before packing
Before packing the products, the QC engineers of MANUFACTURER have to do the necessary inspection and testing to ensure the conformity of related requirements. In particular, they should do the testing and inspection of electrical characteristics and outer feature.

（4）Carryout the inspection for the package.
After finishing the necessary inspection and testing for the products, an inspection for the packing has to be done to ensure the necessary elements being included in this packing before shipment.

（5）Provision for the change of design
Any change of the products described in this TCF must be checked in detail and written down again in the TCF by the designer of MANUFACTURER if the change may effects the related electrical or mechanical characteristics.

（6）Provision for the Quality Assurance
For the provisions of internal control measures to ensure the conformity of series production of the machines, MANUFACTURER has built an internal quality control system in accordance with the international standard of ISO-9001.

5. Declaration of conformity

TECHNO BEL INDIA

#37, Thirumagondanahalli, Village ,
Neralur Post, Attebele, Hobli, Anekel TQ,
Hosur Main Road,
Bangalore - 562017.Karnataka.

EC DECLARATION OF CONFORMITY

We, TECHNO BEL INDIA

Add：#37, Thirumagondanahalli, Village ,
Neralur Post, Attebele, Hobli, Anekel TQ,
Hosur Main Road,
Bangalore - 562017.Karnataka.

hereby declare that:

Product name: Industrial Oven
Brand：TECHNO BEL
Model:TECH 8050

Serial number (optional):805041048

Meets all relevant requirements of the following EU Directives;

Machinery Directive 2006/42/EC
Electromagnetic Compatibility Directive 2014/30/EU

Harmonized standard applied:

EN ISO 12100: 2010, EN 60204-1: 2018
EN 746-1: 2023, EN ISO 13577-2: 2023,
EN IEC 61000-6-1: 2019 , EN IEC 61000-6-8: 2020

In case of any alteration of the products, not agreed upon by us, this declaration will lose it's validity.

Place of issue: Bangalore
Name and function of authorised person: **BALAJI KS**

Date: 02/01/2025

CE

MANUFACTURER STAMP AND SIGNATURE

6. Essential health and safety requirements checklist

Clause	Requirement-Test	Verdict and Result-Remark
1	Essential health and safety requirements	-
1.1	General remarks	-
1.1.1	Definitions	-
1.1.2	Principles of safety integration	-
a)	Machinery must be designed and constructed so that it is fitted for its function, and can be operated, adjusted and maintained without putting persons at risk when these operations are carried out under the conditions foreseen but also taking into account any reasonably foreseeable misuse thereof.	Pass. These requirements have been complied with.
	The aim of measures taken must be to eliminate any risk throughout the foreseeable lifetime of the machinery including the phases of transport, assembly, dismantling, disabling and scrapping.	Pass. These requirements have been complied with.
b)	In selecting the most appropriate methods, the manufacturer or his authorized representative must apply the following principles, in the order given:	-
	- eliminate or reduce risks as far as possible (inherently safe machinery design and construction),	Pass. Effective means have been carried out for this purpose.
	- take the necessary protective measures in relation to risks that cannot be eliminated	Pass. It meets the requirements after checking.
	- inform users of the residual risks due to any shortcomings of the protective measures adopted, indicate whether any particular training is required and specify any need to provide personal protective equipment.	Pass. It meets the requirements after checking.
c)	When designing and constructing machinery and when drafting the instructions, the manufacturer or his authorized representative must envisage not only the intended use of the machinery but also any reasonably foreseeable misuse thereof	Pass. It meets the requirements after checking.
	The machinery must be designed and constructed in such a way as to prevent abnormal use if such use would engender a risk. Where appropriate, the instructions must draw the user's attention to ways – which experience has shown might occur – in which the machinery should not be used.	Pass. These requirements have been complied with, and the related information also has been provided within the instruction manual.
d)	Machinery must be designed and constructed to take account of the constraints to which the operator is subject as a result of the necessary or foreseeable use of personal protective equipment.	Pass. These requirements have been taken into account during the design of this machine.
e)	Machinery must be supplied with all the special equipment and accessories essential to enable it to be adjusted, maintained and used safely.	Pass. These requirements have been complied with.
1.1.3	Materials and products	-
	The materials used to construct machinery or	Pass.

Clause	Requirement-Test	Verdict and Result-Remark
	products used or created during its use must not endanger persons' safety or health. In particular, where fluids are used, machinery must be designed and constructed to prevent risks due to filling, use, recovery or draining	They cannot endanger exposed person's safety or health.
1.1.4	Lighting	-
	Machinery must be supplied with integral lighting suitable for the operations concerned where the absence thereof is likely to cause a risk despite ambient lighting of normal intensity	Not applicable.
	Machinery must be designed and constructed so that there is no area of shadow likely to cause nuisance, that there is no irritating dazzle and that there are no dangerous stroboscopic effects on moving parts due to the lighting	Pass. It meets the requirements after checking.
	Internal parts requiring frequent inspection and adjustment, and maintenance areas must be provided with appropriate lighting.	Not applicable.
1.1.5	Design of machinery to facilitate its handling	-
	Machinery or each component part thereof must:	-
	- be capable of being handled and transported safely	Pass. It meets the requirements after checking.
	- be packaged or designed so that it can be stored safely and without damage	Pass. It meets the requirements after checking.
	During the transportation of the machinery and/or its component parts, there must be no possibility of sudden movements or of hazards due to instability as long as the machinery and/or its component parts are handled in accordance with the instructions	-
	- either be fitted with attachments for lifting gear, or	Not applicable.
	be designed so that it can be fitted with such attachments, or	Not applicable.
	be shaped in such away that standard lifting gear can easily be attached	Not applicable.
	Where machinery or one of its component parts is to be moved by hand, it must:	-
	- either be easily movable, or	Pass.
	- be equipped for picking up and moving safely.	Pass.
	Special arrangements must be made for the handling of tools and/or machinery parts which, even if lightweight, could be hazardous.	Pass.
1.1.6	Ergonomics	-
	Under the intended conditions of use, the discomfort, fatigue and physical and psychological stress faced by the operator must be reduced to the minimum possible, taking into account ergonomic principles such as:	-

Clause	Requirement-Test	Verdict and Result-Remark
	allowing for the variability of the operator's physical dimensions, strength and stamina	Pass
	providing enough space for movements of the parts of the operator'sbody,	Pass
	avoiding a machine-determined work rate,	Pass
	avoiding monitoring that requires lengthy oncentration,	Pass
	adapting the man/machinery interface to the foreseeable characteristics of the operators.	Pass
1.1.7	Operating positions	
	The operating position must be designed and constructed in such away as to avoid any risk due to exhaust gases and/or lack of oxygen.	Pass The designed and constructed is complied with
	If the machinery is intended to be used in a hazardous environment presenting risks to the health and safety of the operator or if the machinery itself gives rise to a hazardous environment, adequate means must be provided to ensure that the operator has good working conditions and is protected against any foreseeable hazards.	Not applicable the machinery is not intended to be used in a hazardous environment
	Where appropriate, the operating position must be fitted with an adequate cabin designed, constructed and/or equipped to fulfil the above requirements	Pass
	The exit must allow rapid evacuation.Moreover, when applicable, an emergency exit must be provided in a direction which is different from the usual exit.	Pass
1.1.8	Seating	
	Where appropriate and where the working conditions so permit, work stations constituting an integral part of the machinery must be designed for the installation of seats	Not applicable
	If the operator is intended to sit during operation and the operating position is an integral part of the machinery, the seat must be provided with the machinery.	Not applicable
	The operator's seat must enable him to maintain a stable position. Furthermore, the seat and its distance from the control devices must be capable of being adapted to the operator.	Not applicable
	If the machinery is subject to vibrations, the seat must be designed and constructed in such away as to reduce the vibrations transmitted to the operator to the lowest level that is reasonably possible. The seat mountings must withstand all stresses to which they can be subjected. Where there is no floor beneath the feet of the operator, footrests covered with a slip-resistant material must be provided.	Not applicable

Clause	Requirement-Test	Verdict and Result-Remark
1.2	Controls	-
1.2.1	Safety and reliability of control systems	-
	in such away as to prevent hazardous situations from arising. Above all, they must be designed and constructed in such away that:	Pass. The control system for this machine is safe and reliable.
	they can withstand the intended operating stresses and external influences	Pass.
	- a fault in the hardware or the software of the control system does not lead to hazardous situations,	Pass.
	errors in the control system logic do not lead to hazardous situations,	Pass
	reasonably foreseeable human error during operation does not lead to hazardous situations.	Pass
	the machinery must not start unexpectedly,	Pass
	the parameters of the machinery must not change in an uncontrolled way, where such change may lead to hazardous situations	Pass
	the machinery must not be prevented from stopping if the stop command has already been given,	Pass
	no moving part of the machinery or piece held by the machinery must fall or be ejected,	Pass
	automatic or manual stopping of the moving parts, whatever they maybe, must be unimpeded,	Pass
	the protective devices must remain fully effective or give a stop command	Pass
	the safety-related parts of the control system must apply in a coherent way to the whole of an assembly of machinery and/or partly completed machinery	Pass
	For cable-less control, an automatic stop must be activated when correct control signals are not received, including loss of communication.	Not applicable It is not a cable-less control
1.2.2	Control devices	-
	Control devices must be:	-
	- clearly visible and identifiable, using pictograms where appropriate,	Pass. These requirements have been complied with.
	-positioned in such away as to be safely operated without hesitation or loss of time and without ambiguity,	Pass. Appropriate positions have been taken into account during design.
	- designed in such away that the movement of the control device is consistent with its effect,	Pass.
	-located outside the danger zones, except where necessary for certain control devices such as an emergency stop or ateach pendant,	Pass. All control devices have been located outside the danger zones.
	-positioned in such away that their operation cannot cause additional risk,	Pass. All operation of control devices

Clause	Requirement-Test	Verdict and Result-Remark
		can’t cause additional risk.
	- designed or protected in such away that the desired effect, where a hazard is involved, can only be achieved by a deliberate action,	Pass. This requirement has been complied with.
	-made in such away as to withstand foreseeable forces; particular attention must be paid to emergency stop devices liable to be subjected to considerable forces.	Pass. This requirement has been complied with.
	Where a control device is designed and constructed to perform several different actions, namely where there is no one-to one correspondence, the action to be performed must be clearly displayed and subject to confirmation, where necessary.	Not applicable
	Control devices must be so arranged that their layout, travel and resistance to operation are compatible with the action to be performed, taking account of ergonomic principles.	Pass
	Machinery must be fitted with indicators as required for safe operation. The operator must be able to read them from the control position.	Not applicable
	From each control position, the operator must be able to ensure that no-one is in the danger zones, or the control system must be designed and constructed in such away that starting is prevented while someone is in the danger zone.	Not applicable
	If neither of these possibilities is applicable, before the machinery starts, an acoustic and/or visual warning signal must be given. The exposed persons must have time to leave the danger zone or prevent the machinery starting up.	Pass.
	If necessary, means must be provided to ensure that the machinery can be controlled only from control positions located in one or more predetermined zones or locations.	Not applicable
	Where there is more than one control position, the control system must be designed in such away that the use of one of them precludes the use of the others, except for stop controls and emergency stops.	Not applicable.
	When machinery has two or more operating positions, each position must be provided with all the required control devices without the operators hindering or putting each other into a hazardous situation.	Not applicable
1.2.3	Starting	-
	It must be possible to start machinery only by voluntary actuation of a control provided for the purpose	Pass.
	The same requirement applies:	-
	- when restarting the machinery after stoppage,	Pass.

Clause	Requirement-Test	Verdict and Result-Remark
	whatever the cause	
	- when effecting a significant change in the operating conditions	Pass.
	However, therestarting of the machinery or a change in operating conditions maybe effected by voluntary actuation of a device other than the control device provided for the purpose, on condition that this does not lead to a hazardous situation.	-
	For machinery functioning in automatic mode, the starting of the machinery, restarting after a stoppage, or a change in operating conditions may be possible without intervention, provided this does not lead to a hazardous situation.	Pass.
	Where machinery has several starting control devices and the operators can therefore put each other in danger, additional devices	Not applicable
	must be fitted to rule out such risks. If safety requires that starting and/or stopping must be performed in a specific sequence, there must be devices which ensure that these operations are performed in the correct order.	Pass.
1.2.4	Stopping device	-
	Normal stopping	-
	Each machine must be fitted with a control whereby the machine can be brought safety to a complete stop	Pass. A normal stop control has been provided.
	Each workstation must be fitted with a control device to stop some or all of the functions of the machinery, depending on the existing hazards, so that the machinery is rendered safe.	Pass. A normal stop control has been provided.
	The machinery's stop control must have priority over the start controls.	Pass. It has priority over the start control.
	Once the machinery or its hazardous functions have stopped, the energy supply to the actuators concerned must be cut off.	Pass.
	Operational stop	
	Where, for operational reasons, a stop control that does not cut off the energy supply to the actuators is required, the stop condition must be monitored and maintained.	Not applicable
	Emergency stop	-
	Machinery must be fitted with one or more emergency stop devices to enable actual or impending danger to be averted.	Pass.
	The following exceptions apply:	-
	- machinery in which an emergency stop device would not lessen the risk, either because it would not reduce the stopping time or because it would	Not applicable

Clause	Requirement-Test	Verdict and Result-Remark
	not enable the special measures required to deal with the risk to betaken,	
	portable hand-held and/or handguided machinery.	
	The device must:	-
	- have clearly identifiable, clearly visible and quickly accessible control devices,	Not applicable
	- stop the hazardous process as quickly as possible, without creating additional risks,	Not applicable
	- where necessary, trigger or permit the triggering of certain safeguard movements.	Not applicable
	Once active operation of the emergency stop device has ceased following a stop command, that command must be sustained by engagement of the emergency stop device until that engagement is specifically overridden; it must not be possible to engage the device without triggering a stop command; it must be possible to disengage the device only by an appropriate operation, and disengaging the device must not restart the machinery but only permit restarting.	Not applicable
	The emergency stop function must be available and operational at all times, regardless of the operating mode.	Not applicable
	Emergency stop devices must be a back-up to other safeguarding measures and not a substitute for them.	Not applicable
1.2.4.4	Assembly of machinery	
	In the case of machinery or parts of machinery designed to work together, the machinery must be designed and constructed in such away that the stop controls, including the emergency stop devices, can stop not only the machinery itself but also all related equipment, fits continued operation maybe dangerous.	Pass
1.2.5	Selection of control or operating modes	-
	The control or operating mode selected must override all other control or operating modes, with the exception of the emergency stop.	Not applicable
	If machinery has been designed and constructed to allow its use in several control or operating modes requiring different protective measures and/or work procedures,	Not applicable. No this kind of mode selection has been found.
	it must be fitted with a mode selector which can be locked in each position. Each position of the selector must be clearly identifiable and must correspond to a single operating or control mode.	Not applicable
	The selector maybe replaced by another selection method which restricts the use of certain functions of the machinery or certain categories of operator	Not applicable. No this kind of mode selection has been found.
	If, for certain operations, the machinery must be	Not applicable.

Clause	Requirement-Test	Verdict and Result-Remark
	able to operate with its protection devices neutralized, the control or operating mode selector ust simultaneously	No this kind of mode selection has been found.
	- disable all other control or operating modes,	Not applicable.
	- permit operation of hazardous functions only by control devices requiring sustained action,	Not applicable.
	- permit the operation of hazardous functions only in reduced risk conditions	Not applicable.
	- permit the operation of hazardous functions only in reduced risk conditions while preventing hazards from linked sequences,	Not applicable.
	prevent any operation of hazardous functions by voluntary or involuntary action on the machine's sensors.	Not applicable. No this kind of mode selection has been found.
	If these four conditions cannot be fulfilled simultaneously, the control or operating mode selector must activate other protective measures designed and constructed to ensure a safe intervention zone.	Not applicable
	In addition, the operator must be able to control operation of the partshe is working on from the adjustment point.	Not applicable
1.2.6	Failure of the power supply	-
	The interruption, re-establishment after an interruption or fluctuation in whatever manner of the power supply to the machinery must not lead to a dangerous situation	Pass. No any dangerous situation has been found.
	Particular attention must be given to the following points:	-
	- the machinery must not start unexpectedly	Pass.
	- the parameters of the machinery must not change in an uncontrolled way when such change can lead to hazardous situations,	Pass.
	- the machinery must not be prevented from stopping if the command has already been given,	Pass.
	no moving part of the machinery or piece held by the machinery must fall or be ejected,	Pass
	- automatic or manual stopping of the moving parts whatever they maybe must be unimpeded	Pass.
	- the protective devices must remain fully effective or give a stop command.	Pass.
1.3.1.	Risk of loss of stability	-
	Machinery and its components and fittings must be stable enough to avoid overturning, falling or uncontrolled movements during transportation, assembly, dismantling ,and any other action involving the machinery.	Pass
	If the shape of the machinery itself or its intended installation doesn't offer sufficient stability,	Pass

Clause	Requirement-Test	Verdict and Result-Remark
	appropriate means of anchorage must be incorporated and indicated in the instructions	
1.3.2	Risk of break-up during operation	-
	The various parts of machinery and their linkages must be able to withstand the stress to which they are subject when used when as foreseen by the manufacturer	Pass. All parts of the machine can withstand related stress when they are used.
	The durability of the materials used must be adequate for the nature of the working environment foreseen by the manufacturer or his authorized representative , in particular as regards the phenomena of fatigue, ageing, corrosion and abrasion	Pass. All materials used for this machine are appropriate for their intended use.
	The instructions must indicate the type and frequency of inspections and maintenance required for safety reasons. They must, where appropriate, indicate the parts subject to wear and the criteria for replacement.	Pass. The related information have been provided within the instruction manual.
	Where arisk of rupture or disintegration remains despite the measures taken, the parts concerned must be mounted, positioned and/or guarded in such away that any fragments will be contained, preventing hazardous situations.	Pass.
	Both rigid and flexible pipes carrying fluids, particularly those under high pressure, must be able to withstand the foreseen internal and external stresses and must be firmly attached and/or protected to ensure that no risk is posed by a rupture.	Pass. All these requirements have been complied with.
	Where the material to be processed is fed to the tool automatically, the following conditions must be fulfilled to avoid risks to the persons exposed：	-
	- when the work piece comes into contact with the tool the later must have attained its normal working conditions	Not applicable.
	- when the tool starts and/or stops the feed movement and the tool movement must be coordinated	Not applicable.
1.3.3	Risked due to falling or ejected objects	-
	Precautions must betaken to prevent risks from falling or ejected object	Pass
1.3.4	Risks due to surfaces, edges or angles	-
	In so far as their purpose allows, accessible parts of the machinery must have no sharp edges, no sharp angles, and no rough surfaces likely to cause injury	Pass. This requirement has been complied with.
1.3.5	Risks related to combined machinery	-
	Where the machinery is intended to carry out several different operations with the manual removal of the piece between each operation, it	Not applicable. This machinery does not carry out with the manual removal of the

Clause	Requirement-Test	Verdict and Result-Remark
	must be designed and constructed in such away as to enable each element to be used separately without the other element constituting a danger or risk for the exposed person	piece.
	For this purpose, it must be possible to start and stop separately and elements that are not protected	Not applicable.
1.3.6	Risks related to variations in operating conditions	-
	When the machine is designed to perform operations under different conditions of use, it must be designed and constructed in such away that selection and adjustment of these conditions can be carried out safely and reliably	Pass
1.3.7	Prevention of risks related to moving parts	-
	The moving parts of machinery must be designed, built and laid out to avoid hazards or, where hazards persist, fixed with guards or protective devices in such away as to prevent all risk of contact which could lead to accidents	Pass. This kind of contacts have been prevented by appropriate guards.
	All necessary steps must betaken to prevent accidental blockage of moving parts involved in the work. In cases where, despite the precautions taken, a blockage is likely to occur, the necessary specific protective devices and tools must, when appropriate, be provided to enable the equipment to be safely unblocked.	Pass. All necessary steps have been taken.
	The instructions and, where possible, a sign on the machinery shall identify these specific protective devices and how they are to be used.	Not applicable. No this kind of need.
1.3.8	Choice of protection against risk related to moving parts	-
	Guards or protection devices used to protect against the risks related to moving parts must be selected on the basis of the type of risk	Pass. It is in accordance with the risk assessment.
	The following guidelines must be used to help make the choice	-
	A. Moving transmission parts Guards designed to protect exposed persons against the risks associated with moving transmission parts must be：	-
	- either fixed, complying with requirements 1.4.1 and 1.4.2.1 or	See the related clauses.
	- interlocking movable guards as referred to in section 1.4.2.2.	See the related clauses.
1.3.8.2	Moving parts involved in the process	
	Guards or protective devices designed to protect persons against the hazards generated by moving parts involved in the process must be:	-
	- either fixed guards as referred to in section 1.4.2.1, or	See the related clauses.

Clause	Requirement-Test	Verdict and Result-Remark
	- interlocking movable guards as referred to in section 1.4.2.2, or	See the related clauses.
	protective devices as referred to in section 1.4.3, or	
	a combination of the above.	
	However, when certain moving parts directly involved in the process can't be completely or partially inaccessible during operation owing to operations requiring near-by operator intervention, where technically possible such parts must be fitted with：	-
	-fixed guards or interlocking movable guards preventing access to those sections of the parts that are not used in the work,	Pass
	- adjustable guards as referred to in section 1.4.2.3 restricting access to those sections of the moving parts where access is necessary.	See the related clauses.
1.3.9	Risks of uncontrolled movements	
	When apart of the machinery has been stopped, any drift away from the stopping position, for whatever reason other than action on the control devices, must be prevented or must be such that it does not present a hazard	Not applicable
1.4	Required characteristics of guards and protection devices	-
1.4.1	General requirement	-
	Guards and protection devices must:	-
	- be of robust construction	Pass.
	- be securely held in place,	Pass.
	- not be easy to bypass or render non-operational	Pass.
	- be located at an adequate distance from the danger zone	Pass.
	- cause minimum obstruction to the view id the production process	Pass.
	- In addition, guards must, where possible, protect against the ejection or falling of materials or objects and against emissions generated by the machinery.	Pass.
1.4.2	Special requirements for guards	-
1.4.2.1	Fixed guards	-
	Fixed guards must be fixed by systems that can be opened or removed only with tools.	Pass. They all be securely held in place.
	They must be fixed by system that can be opened only with tools	Pass. They all can be opened only with tools.
	Their fixing systems must remain attached to the guards or to the machinery when the guards are removed.	Pass

Clause	Requirement-Test	Verdict and Result-Remark
	Where possible, guards must be unable to remain in place without their fixings	Not applicable.
1.4.4.2	Interlocking movable guards must:	-
	as far as possible remain attached to the machinery when open,	-
	be designed and constructed in such away that they can be adjusted only by means of an intentional action. [See 3rd hyphen of old 1.4.2.2 B]	Not applicable
	Interlocking movable guards must be associated with an interlocking device that	-
	prevents the start of hazardous machinery functions until they are closed, and	-
	gives a stop command whenever they are no longer closed.	-
	Where it is possible for an operator to reach the danger zone before the risk due to the hazardous machinery functions has ceased, movable guards must be associated with a guard locking device in addition to an interlocking device that	-
	prevents the start of hazardous machinery functions until the guard is closed and locked, and	Not applicable
	keeps the guard closed and locked until the risk of injury from the hazardous machinery functions has ceased.	Not applicable
	Interlocking movable guards must be designed in such away that the absence or failure of one of their components prevents starting or stops the hazardous machinery functions	Not applicable
1.4.2.3	Adjustable guards restricting access	-
	Adjustable guards restricting access to those areas of the moving parts strictly necessary for the work must:	-
	- be adjustable manually or automatically according to the type of work involved	Not applicable
	- be readily adjustable without the use of tools	Not applicable
	- reduce as far as possible the risk of ejection	Not applicable
1.4.3	Special requirements for protection devices	-
	Protection devices must be designed and incorporated into the control system so that:	-
	- moving parts can’t startup while they are within the operator’s reach	Not applicable
	- the exposed person can’treach moving parts once they have started up	Not applicable
	- they can be adjusted only by means of an intentional action, such as the use of a tool, etc.	Not applicable
	-the absence or failure of one of their components prevents starting or stops the moving parts	Not applicable
1.5	Protection against other hazards	-
	Electricity supply	-

Clause	Requirement-Test	Verdict and Result-Remark
	Where machinery has an electricity supply it must be designed, constructed and equipped so that all hazards of an electrical nature are or can be prevented	Pass
	The safety objectives set out in Directive 73/23/EEC shall apply to machinery. However, the obligations concerning conformity assessment and the placing on the market and/or putting into service of machinery with regard to electrical hazards are governed solely by this Directive.	Pass
1.5.2	Static electricity	-
	Machinery must be so designed and constructed as to prevent or limit the build-up of potentially dangerous electrostatic changes and/or be fitted with a discharging system	Pass .
1.5.3	Energy supply other than electricity	-
	Where machinery is powered by an energy other than electricity, it must be so designed, constructed and equipped as to avoid all potential hazards associated with these types of energy	Pass. No any additional hazard has been found for energy supply.
1.5.4	Error of fitting	-
	Errors likely to be made when fitting or refitting certain parts which could be a source of risk must be made impossible by the design and construction of such parts or, failing this, by information given on the parts themselves and/or their housings. The same information must be given on moving parts and/or their housings where the direction of movement needs to be known in order to avoid a risk.	Pass.
	Where necessary, the instructions must give further information on these risks.	Pass.
	Where a faulty connection can be the source of risk, incorrect connections must be made impossible by design or, failing this, by information given on the elements to be connected and, where appropriate, on the means of connection	Pass. All related information have been provided within the instruction manual.
1.5.5	Extreme temperatures	-
	Step must betaken to eliminate any risk of injury caused by contact with or proximity to machinery parts or materials at high or very low temperatures	Pass. Sufficient safety protection for extreme temperatures has been provided.
	The necessary steps must also betaken to avoid or protect against the risk of hot or very cold material being ejected.	Pass
1.5.6	Fire	-
	Machinery must be designed and constructed to avoid all risk of fire or overheating posed by the machinery itself or by gases, liquids, dusts, vapors or the other substances produced or used by the	Pass. The design and construction of this machine are in conformity with these requirements.

Clause	Requirement-Test	Verdict and Result-Remark
	machinery	
1.5.7	Explosion	-
	Machinery must be designed and constructed to avoid any risk of explosion posed by the machinery itself or by gases, liquids, dusts, vapors or other substances produced or used by the machinery	Pass. The design and construction of this machine are in conformity with these requirements.
	Machinery must comply, as far as the risk of explosion due to its use in a potentially explosive atmosphere is concerned, with the provisions of the specific Community Directives.	
1.5.8	Noise	-
	Machinery must be designed and constructed in such away that risks resulting from the emission of airborne noise are reduced to the lowest level, taking account of technical progress and the availability of means of reducing noise, in particular at source.	Pass. The design and construction of this machine are in conformity with this requirements.
	The level of noise emission maybe assessed with reference to comparative emission data for similar machinery.	Pass
1.5.9	Vibration	-
	Machinery must be so designed and constructed that risks resulting from the vibrations produced by the machinery are reduced to the lowest level, taking account of technical progress and the availability of means of reducing vibration, in particular at source	Pass
	The level of vibration emission maybe assessed with reference to comparative emission data for similar machinery.	Pass
1.5.10	Radiation	-
	Undesirable radiation emissions from the machinery must be eliminated or be reduced to levels that do not have adverse effects on persons	Not applicable
	Any functional ionising radiation emissions must be limited to the lowest level which is sufficient for the proper functioning of the machinery during setting, operation and cleaning. Where a risk exists, the necessary protective measures must betaken.	Not applicable
	Any functional non-ionising radiation emissions during setting, operation and cleaning must be limited to levels that do not have adverse effects on persons.	Not applicable
1.5.11	External radiation	-
	Machinery must be so designed and constructed that external radiation doesn’t interfere with its operation	Not applicable
1.5.12	Laser equipment	-
	Where laser equipment is used, the following	Not applicable

Clause	Requirement-Test	Verdict and Result-Remark
	provisions should betaken into account;	
	- laser equipment on machinery must be designed and constructed so as to prevent any accidental radiation	Not applicable.
	- laser equipment on machinery must be protected so that effective radiation, radiation produced by reflection or diffusion and secondary radiation don't damage health	Not applicable.
	-optical equipment for the observation or adjustment of laser equipment on machinery must be such that no health risk is created by the laser rays	Not applicable.
1.5.13	Emissions of hazardous materials and substances	-
	Machinery must be designed and constructed in such away that risks of inhalation, ingestion, contact with the skin, eyes and mucous membranes and penetration through the skin of hazardous materials and substances which it produces can be avoided.	Not applicable.
	Where ahazard cannot be eliminated, the machinery must be so equipped that hazardous materials and substances can be contained, evacuated, precipitated by water spraying, filtered or treated by another equally effective method.	Not applicable
	Where the process is not totally enclosed during normal operation of the machinery, the devices for containment and/or evacuation must be situated in such away as to have the maximum effect.	Not applicable.
1.5.14	Risk of being trapped in a machine	-
	Machinery must be so designed, constructed or fitted with a means of preventing a exposed person from being enclosed within it or, if that is impossible, with a means of summoning held	Not applicable
1.5.15	Risk of slipping, tripping or falling	-
	Parts of the machinery where persons are liable to move about or stand must be designed and constructed to prevent persons slipping, tripping or falling on or off these parts	Not applicable
	Where appropriate, these parts must be fitted with handholds that are fixed relative to the user and that enable them to maintain their stability.	Not applicable
1.5.16	Lightning	
	Machinery in need of protection against the effects of lightning while being used must be fitted with a system for conducting the resultant electrical charge to earth.	Not applicable
1.6	Maintenance	-
1.6.1	Machinery maintenance	-
	Adjustment, lubrication And maintenance points	Pass.

Clause	Requirement-Test	Verdict and Result-Remark
	must be located outside danger zones	
	It must be possible to carry out adjustment, Maintenance, repair, cleaning and servicing Operations while machinery is at a stand still	Pass.
	If one or more of the above conditions cannot be satisfied for technical reasons, measures must be taken to ensure that these operations can be carried out safely (see section 1.2.5).	Not applicable. No this kind of situation.
	In the case of automated machinery and, where necessary, other machinery, a connecting device for mounting diagnostic fault-finding equipment must be provided.	Not applicable
	Automated machinery components which have to be changed frequently	Pass.
	must be capable of being removed and replaced easily and safely. Access to the components must enable these tasks to be carried out with the necessary technical means in accordance with a specified operating method	Pass. All operation methods have been specified by the manufacturer.
1.6.2	Access to operating position and servicing points	-
	Machinery must be designed and constructed in such away as to allow access in safety to all areas where intervention is necessary during operation, adjustment and maintenance of the machinery.	Pass. Appropriate guards and safety control devices have been used.
1.6.3	Isolation of energy sources	-
	All machinery must be fitted with means to isolate it from all energy sources	Pass. The power switch has been used.
	Such isolators must be clearly identified	Pass. It has been identified clearly.
	They must be capable of being locked if reconnection could endanger exposed persons	Pass
	In the case of machinery supplied with electricity through a plug capable of being plugged into a circuit, separation of the plug is sufficient	Not applicable
	The isolator must be capable of being locked also where an operator is unable, from any of the points to which he has access, to check that the energy is still cut off	Pass.
	In the case of machinery capable of being plugged into an electricity supply, removal of the plug is sufficient, provided that the operator can check from any of the points to which he has access that the plug remains removed.	Pass.
	After the energy is cut off, it must be possible to dissipate normally any energy remaining or stored in the circuits of the machinery without risk to persons.	Not applicable. No this kind of situation.
	As an exception to the requirement laid down in the previous paragraphs, certain circuits may remain connected to their energy sources in order, for	Not applicable

Clause	Requirement-Test	Verdict and Result-Remark
	example, to hold parts, to protect information, to light interiors, etc. In this case, special steps must betaken to ensure operator safety.	
1.6.4	Operator intervention	-
	Machinery must be so designed, constructed and equipped that the need for operator intervention is limited	Pass.
	If operator intervention can't be avoided, it must be possible to carry it out easily and in safety	Not applicable
1.6.5	Cleaning of internal parts	-
	The machinery must be designed and constructed in such away that it is possible to clean internal parts which have contained dangerous substances or preparations without entering them; any necessary unblocking must also be possible from the outside. If it is impossible to avoid entering the machinery, it must be designed and constructed in such away as to allow cleaning to take place safely.	Pass. The design of this machine is allowed to carried out this work.
1.7	Indicators	-
	Information and warnings on the machinery should preferably be provided in the form of readily understandable symbols or pictograms. Any written or verbal information and warnings must be expressed in an official Community language or languages, which maybe determined in accordance with the Treaty by the Member State in which the machinery is placed on the market and/or put into service and maybe accompanied, on request, by versions in any other official Community language or languages understood by the operators. [Compare with 1.7.2 of the old directive]	Not applicable
1.7.1	Information and information devices	
	The information needed to control machinery must be provided in a form that is unambiguous and easily understood. It must not be excessive to the extent of overloading the operator.	Pass.
	Visual display units or any other interactive means of communication between the operator and the machine must be easily understood and easy to use.	Pass.
1.7.2	Warning devices	-
	Where risks remain despite the inherent safe design measures, safeguarding and complementary protective measures adopted, the necessary warnings, including warning devices, must be provided	Pass
1.7.3	Marking of machinery	-
	All machinery must be marked visibly, legibly and indelibly with the following minimum particulars:	-

Clause	Requirement-Test	Verdict and Result-Remark
	- the business name and full address of the manufacturer and, where applicable, his authorized representative,	Pass.
	- designation of the machinery,	Pass.
	- the CE Marking (see Annex III),	Pass.
	- designation of series or type,	Pass.
	serial number, if any,	Pass
	the year of construction, that is the year in which the manufacturing process is completed.	Pass
	It is prohibited to pre-date or post-date the machinery when affixing the CE marking.	Pass
	Furthermore, machinery designed and Constructed for use in a potentially explosive atmosphere must be marked accordingly.	Pass
	Machinery must also bear full information relevant to its type and essential for safe use. Such information is subject to the requirements set out in section 1.7.1.	Pass.
	Where a machine part must be handled during use with lifting equipment, its mass must be indicated legible, indelibly and unambiguously	Not applicable
	The interchangeable equipment referred to in Article 1（2）, third subparagraph, must bear the same information	Pass.
1.7.4	Instruction	-
	All machinery must be accompanied by instructions in the official Community language or languages of the Member State in which it is placed on the market and/or put into service.	Pass
	- The instructions accompanying the machinery must be either ‘Original instructions’ or a ‘Translation of the original instructions’, in which case the translation must be accompanied by the original instructions.	Pass.
	-By way of exception, the maintenance instructions intended for use by specialized personnel mandated by the manufacturer or his authorized representative maybe supplied in only one Community language which the specialized personnel understand.[Compare with old 1.7.4 b]	Pass.
	- The instructions must be drafted in accordance with the principles set out below.	Pass.
1.7.4.1	General principles for the drafting of instructions	
	- (a) The instructions must be drafted in one or more official Community languages. The words ‘Original instructions’ must appear on the language version(s) verified by the manufacturer or his authorized representative.	Pass.

Clause	Requirement-Test	Verdict and Result-Remark
	- (b) Where no 'Original instructions' exist in the official language(s) of the country where the machinery is to be used, a translation into that/those language(s) must be provided by the manufacturer or his authorized representative or by the person bringing the machinery into the language area in question. The translations must bear the words 'Translation of the original instructions'.	Pass.
	- (b) Where no 'Original instructions' exist in the official language(s) of the country where the machinery is to be used, a translation into that/those language(s) must be provided by the manufacturer or his authorized representative or by the person bringing the machinery into the language area in question. The translations must bear the words 'Translation of the original instructions'.	Not applicable
	(c) The contents of the instructions must cover not only the intended use of the machinery but also take into account any reasonably foreseeable misuse thereof.	Pass
	(d) In the case of machinery intended for use by non-professional operators, the wording and layout of the instructions for use must take into account the level of general education and acumen that can reasonably be expected from such operators.	Pass
1.7.4.2	Contents of the instructions	
	Each instruction manual must contain, where applicable, at least the following information:	
	(a) the business name and full address of the manufacturer and of his authorized representative;	Pass
	(b) the designation of the machinery as marked on the machinery itself, except for the serial number (see section 1.7.3);	Pass
	(c) the EC declaration of conformity, or a document setting out the contents of the EC declaration of conformity, showing the particulars of the machinery, not necessarily including the serial number and the signature;	Pass
	(d) a general description of the machinery;	Pass
	(e) the drawings, diagrams, descriptions and explanations necessary for the use, maintenance and repair of the machinery and for checking its correct functioning;	Pass
	(f) a description of the workstation(s) likely to be occupied by operators;	Pass
	g) a description of the intended use of the machinery;	Pass

Clause	Requirement-Test	Verdict and Result-Remark
	(h) warnings concerning ways in which the machinery must not be used that experience has shown might occur;	Pass
	(i) assembly, installation and connection instructions, including drawings, diagrams and the means of attachment and the designation of the chassis or installation on which the machinery is to be mounted;	Pass
	(j) instructions relating to installation and assembly for reducing noise or vibration;	Pass
	(k) instructions for the putting into service and use of the machinery and, if necessary, instruct	Pass
	(l) information about the residual risks that remain despite the inherent safe design measures, safeguarding and complementary protective measures adopted;	Pass
	(m) instructions on the protective measures to be taken by the user, including, where appropriate, the personal protective equipment to be provided	Pass
	(n) the essential characteristics of tools which may be fitted to the machinery;	Pass
	o) the conditions in which the machinery meets the requirement of stability during use, transportation, assembly, dismantling when out of service, testing or foreseeable breakdowns;	Pass
	(p) instructions with a view to ensuring that transport, handling and storage operations can be made safely, giving the mass of the machinery and of its various parts where these are regularly to be transported separately; [Compare with the 10th hyphen of old 1.7.4. (a)]	Pass
	(q) the operating method to be followed in the event of accident or breakdown; if a blockage is likely to occur, the operating method to be followed so as to enable the equipment to be safely unblocked;	Pass
	(r) the description of the adjustment and maintenance operations that should be carried out by the user and the preventive maintenance measures that should be observed;	Pass
	(s) instructions designed to enable adjustment and maintenance to be carried out safely, including the protective measures that should betaken during these operations;	Pass
	(t) the specifications of the spare parts to be used, when these affect the health and safety of operators;	Pass
	(u) the following information on airborne noise emissions:	
	the A-weighted emission sound pressure level at	Pass

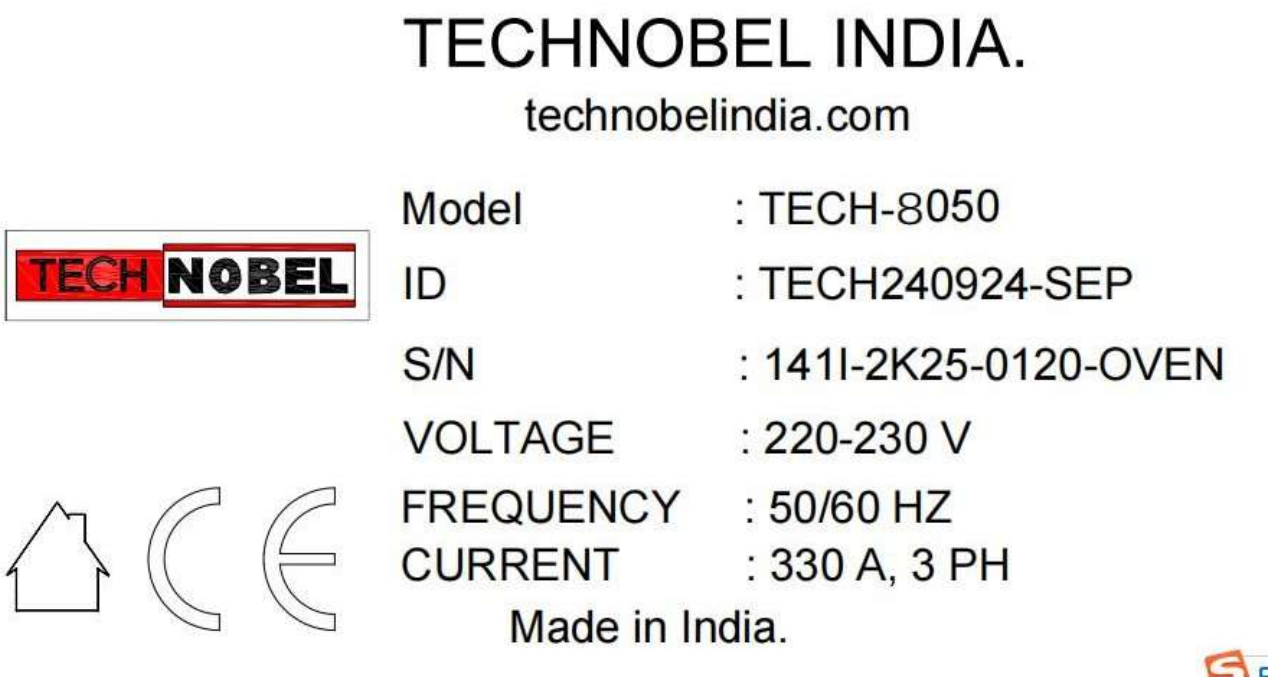
Clause	Requirement-Test	Verdict and Result-Remark
	workstations, where this exceeds 70 dB(A); where this level does not exceed 70 dB(A), this fact must be indicated,	The emission sound pressure level at workstations does not exceed 70 dB(A)
	the peak C-weighted instantaneous sound pressure value at workstations, where this exceeds 63 Pa (130 dB in relation to 20 μPa),	Pass
	the A-weighted sound power level emitted by the machinery, where the A-weighted emission sound pressure level at workstations exceeds 80 dB(A).	the A-weighted sound power level emitted does not exceed 80 dB(A).
	These values must be either those actually measured for the machinery in question or those established on the basis of measurements taken for technically comparable machinery which is representative of the machinery to be produced.	Pass
	In the case of very large machinery, instead of the A-weighted sound power level, the A-weighted emission sound pressure levels at specified positions around the machinery maybe indicated.	Pass
	Where the harmonised standards are not applied, sound levels must be measured using the most appropriate method for the machinery. Whenever sound emission values are indicated the uncertainties surrounding these values must be specified.	Pass
	The operating conditions of the machinery during measurement and the measuring methods used must be described.	Pass
	Where the workstation(s) are undefined or cannot be defined,A-weighted sound pressure levels must be measured at a distance of 1 metre from the surface of the machinery and at a height of 1,6 metre from the floor or access platform. The position and value of the maximum sound pressure must be indicated.	Not applicable the workstation is defined
	Where specific Community Directives lay down other requirements for the measurement of sound pressure levels or sound power levels, those Directives must be applied and the corresponding provisions of this section shall not apply;	Not applicable
	where machinery is likely to emit nonionising radiation which may cause harm to persons, in particular persons with active or non-active implantable medical devices, information concerning the radiation emitted for the operator and exposed persons.	Not applicable
1.7.4.3	Sales literature	
	Sales literature describing the machinery must not contradict the instructions as regards health and safety aspects. Sales literature describing the performance characteristics of machinery must	Pass

Clause	Requirement-Test	Verdict and Result-Remark
	contain the same information on emissions as is contained in the instructions.	
2	Supplementary essential health And safety requirements for certain categories of machinery	Not applicable
2.1.	Foodstuffs machinery and machinery for cosmetics or pharmaceutical products	Not applicable
2.2	Portable hand-held and/or Hand-guided machinery	Not applicable
2.3	Machinery for working Wood and material with similar Physical characteristics	Not applicable
3	Essential health and safety requirement to offset the particular hazards due to the mobility machinery	Not applicable
4	Essential health and safety requirement to offset the particular hazards due to a lifting operation	Not applicable
5	Essential health and safety requirement for machinery intended for underground work	Not applicable
6	Essential health and safety requirement to offset the particular hazards due to the lifting or moving of persons	Not applicable

Annex：Technical Information

A.1 Photos

P2



P3

A.2 Drawing and Manual

See the following pages:

TECHNOBELINDIA

Owner's Manual

Electric Ovens

MODEL: _____

SERIAL NUMBER: _____

TECHNOBELINDIA

(ANISO 9001-2015 AND CE CERTIFIED COMPANY)

(Mfrs: Industrial heaters,Thermocouples,Ovens, Furnaces and EPCprojects.)

#37,THIRUMUNDANAHALLYVILLAGE,NERALURPOST,ATTIBELEHOBLI,ANEKAL TALUK

HOSURMAIN ROAD,562107,Mobile:9632235361

E-mail:info@technobelindia.com,Website: www.technobelindia.com

TABLE OF CONTENTS

TECHNOBEL, INC. WARRANTY

Industrial Oven Products

1. Unless separately agreed to otherwise, Warranty is for one (1) year, free from defects of faulty material or workmanship, effective from Buyer's receipt of goods and services.
2. Warranty does not include maintenance items (door gaskets, fan belts, thermocouples, etc.).
3. TECHNOBEL INDIA, Inc. will replace or repair equipment proving defective in material or workmanship. Defective parts need to be shipped back to TECHNOBEL INDIA, Inc. for inspection, at Buyers cost.
4. Failure due to abuse, overloading, maintenance neglect, exposure to corrosive or abrasive materials, operation under any degree of dampness, or improper use shall not be subject to this warranty.
5. Any modification to equipment or systems without TECHNOBEL INDIA, Inc.'s written consent voids this warranty.
6. Standard warranty does not include labor to remove and/or install defective equipment.
7. If TECHNOBEL INDIA, Inc.'s service is required for assistance on a warranty claim, labor will be charged at prevailing rate plus travel expenses.
8. TECHNOBEL INDIA, Inc. shall not be liable for loss of profits, delays or expenses incurred by failure of said parts, whether incidental or consequential.
9. TECHNOBEL INDIA, Inc. shall not be liable for failure of the goods to comply with federal, state or local laws.
10. TECHNOBEL INDIA, Inc.'s warranty becomes null and void if payment in full is not received for goods and services.
11. See TECHNOBEL INDIA, Inc.'s **GENERAL TERMS AND CONDITIONS** for additional warranty detail.

INTRODUCTION

Thank you for choosing TECHNOBEL INDIA, Inc. for your process heating needs. This manual has been prepared by TECHNOBEL INDIA engineers for use in familiarizing personnel with the design, installation, operation and maintenance of your TECHNOBEL INDIA Industrial Oven. Information presented herein should be given careful consideration to assure safe, optimum performance of the equipment. This manual should always be accessible to the operators for quick reference.

This industrial oven has been designed and manufactured in accordance with applicable National Codes and Standards in effect as of the date of manufacture. It is the responsibility of the end user to update equipment as necessary to comply with future code changes or revisions.

This manual should be used in conjunction with the drawing(s), data sheets, and component manufacturer's literature attached hereto that clarify specific features, installation, utility connections, operation, etc.

If you have any questions regarding this manual or the use of your TECHNOBEL INDIA Industrial Oven, please contact our Industrial Oven department by phone at (419) 502-2780 or by email at ovensales@TECHNOBEL INDIAinc.com. ***NOTE*:** The information in this manual is subject to change without notice and does not represent an obligation on the part of TECHNOBEL INDIA, Inc. TECHNOBEL INDIA does not assume any responsibility for any errors that may appear in this manual and under no circumstances will TECHNOBEL INDIA be held liable for technical or editorial omissions made herein, nor for direct, indirect, special, incidental, or consequential damages resulting from the use or defect of this manual.

NOTICE: No installation or operation of this equipment should take place until this manual has been studied and understood by the person(s) responsible.

Manual Specific Safety Symbol Definitions	
	Safety Instruction where an electrical hazard is involved.
	Safety instruction where non-compliance would affect safety.
	Safety instruction where non-compliance could potentially cause an explosion.
	Safety instruction where non-compliance could potentially cause a fire.
	Safety instruction relating to safe operation of the equipment (ATTENTION).
	Safety instruction where non-compliance could potentially result in a pinch point or a dethyristoription of a known existing pinch point.
	Safety instruction where non-compliance could potentially result in a pinch point or a dethyristoription of a known existing pinch point.
DANGER	Indicates a hazardous situation which, if not avoided, will result in death or serious injury. The signal word "DANGER" is to be limited to the most extreme situations. DANGER [signs] should not be used for property damage hazards unless personal injury risk appropriate to these levels is also involved.
WARNING	Indicates a hazardous situation which, if not avoided, could result in death or serious injury. WARNING [signs] should not be used for property damage hazards unless personal injury risk appropriate to this level is also involved.
CAUTION	Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury. CAUTION [signs] without a safety alert symbol may be used to alert against unsafe practices that can result in property damage only.
NOTICE	Is used to dethyristoribe preferred to address practices not related to personal injury.
Equipment Specific Safety Definitions	
	**DANGER:** Hazardous voltage will cause severe injury or death. LOCK OUT POWER before servicing.
	**WARNING:** Potential arc flash hazard.
	**CAUTION:** Hot surface. Do not touch.
	**WARNING:** Moving equipment may cause severe injury. Keep Away.

CONTENT DEFINITIONS:

Arc Flash: An arc flash is a phenomenon where a flashover of electric current leaves its intended path and travels through the air from one conductor to another, or to ground. The results are often violent and when a human is in close proximity to the arc flash, serious injury and even death can occur.

Circulating Fan: The fan used to “move” the air around the workspace in order to more evenly distribute and more efficiently transfer the heat from the heat source to the material.

Class A Oven: Ovens that can be utilized in processes with solvents present, volatile materials or other flammable or combustible contents. NFPA 86 cites several materials requiring the Class A rating, specifically including:

- Paints, powders, inks and adhesives from finishing processes such as dipped, coated, sprayed and impregnated materials
- The substrate material
- Wood, paper and plastic pallets, spacers or packaging materials
- Polymerization or other molecular arrangements. Potentially flammable materials such as quench oils, waterborne finishes, cooling oil, or cooking oils that present a hazard are ventilated according to Class A standards.

Class B Oven: Oven and furnaces in which no flammable volatiles or combustible materials are present in the work space.

Differential Flow Switch: A switch that is activated by the flow of a gaseous or liquid fluid. This flow is detected by measuring pressure at two different points to produce a pressure differential across the sensor.

Exhaust Fan:A fan used to remove air with contaminants from the work space through a duct to outside of the plant. This air may also include products of combustion.

Heater Box:The insulated box containing the burner or heating elements and circulating fan(s). The heater box is USUALLY found on top of the workspace. No material may be placed in the heater box.

Interlocks: Are devices for preventing a mechanism from being set into action when another mechanism is in such a position that the two operating simultaneously might produce undesirable results.

Limit Switch: A switch that actuates when an operating limit has been reached.

THYRISTOR: Silicone Control Rectifier, used to control output to the heating elements.

Safety Device: An instrument, a control or other equipment that acts, or initiates action, to cause the oven to revert to a safe condition in the event of equipment failure or other hazardous event.

Temperature Controller: A device that measures the temperature and automatically controls the input of heat into the oven.

SECTION 1 – GENERAL INFORMATION

1-1 PRODUCT DETHYRISTORIPTION

This oven is an electrically heated system. Resistance electric heating elements are mounted in the heater box which is directly attached to the oven. The casing is an insulated mild steel shell. When possible, all of the electrically heated system components are installed directly onto the oven heater box. Temperature is controlled by thermocouple actuated electronic temperature controllers.

Process heating applications involve a combination of time and temperature to achieve desired material properties. Although the process can sometimes be pre-determined based on heat transfer calculations and empirical data, these values are an engineering estimate at best. The precise combination of time and temperature, for a specific application, is best determined through actual trial use. By accurately monitoring time, temperature, and material properties closely, in a controlled environment, optimum process parameters can be safely and accurately determined.

1-2 SAFETY

WARNING: Only properly trained and qualified operators may use this equipment. Improper use may cause equipment damage, injury or death. Oven control systems are designed to react to system and operator input. Be sure to understand the system reaction before making any system adjustments.

Typically an oven is purchased for a specific application. If the application for this equipment has changed, or you have reason to doubt the adequacy of the equipment for the application, consult your TECHNOBEL INDIA, Inc. representative for proper use.

DANGER

- Explosion or fire may result from misapplication of this equipment. Know the properties of the materials you are putting into the oven and be sure they can be heated safely at elevated temperature.

Applications that may introduce flammable solvents or combustible materials into an oven require special nonstandard safety features. The National Fire Protection Agency (NFPA) designates these as "Class A" Ovens.

- Materials with auto-ignition temperatures below the oven operating temperature should never be introduced into the oven.

- This equipment is not suitable for installations in electrically classified hazardous areas.

• Disconnect and lockout electrical power and all other sources of energy before performing maintenance. Know where arc flash is possible and take proper precautions.

- Be sure any fan shafts have stopped rotating. Keep body, hands and foreign objects away from the inlet and outlet, and the other moving parts of the fan such as shafts, belts and pulleys.

- Do not stand in front of explosion relief areas.

WARNING

- Do not operate the oven above its rated maximum temperature.
- Do not store contents or materials on top of, or directly against, the unit. Fire may result.

CAUTION

- Do not leave the oven in operation unattended. Property damage or injury to personnel may result.
- **Maintain cleanliness inside and around the unit**. Plenums and ducts may be subjected to a build-up of flammable deposits, fluid, or combustible debris that may be **fire hazards**.

- Use caution when opening doors to avoid breathing air from inside the oven. Heated air can burn lungs. • Do not breathe air from exhaust vent.

- This equipment is to be operated by trained personnel only.
- The oven's outer skin may be hot and burns could result. Use caution.
- When heating materials that generate hazardous vapors, venting or exhausting of the unit is required.
- This equipment may create a confined space hazard. The user is responsible for analyzing the installation in order to make a determination, posting warnings and complying with applicable OSHA standards pertaining to confined space hazards.
- Do not operate fans without belt & bearing guards in place as bodily injury may result. Always disconnect and lockout power before removing covers or guards.

- Pinch points may exist at door(s). Keep hands and arms clear.
- Vertical lift doors must be blocked before entering the oven.

Toreduce the possibility of injury to personnel operating, or in the vicinity of the oven, warning signs are posted at potential hazard points on the equipment. Examine the equipment and become familiar with potential hazard areas. Instruct all personnel to be aware of these areas and to heed all posted caution and warning signs.

Properly rated fire extinguishers should be located near the oven. Extinguishers should be inspected periodically in accordance with NFPA 10, "Standard for Portable Fire Extinguishers."

After complete installation of the equipment, a safety study should be made of the application and additional guards and warnings should be installed and posted as necessary. Any code requirements are the responsibility of the user and not that of TECHNOBEL INDIA, Inc. Violation of the above safety rules hereby removes all product liability claims from TECHNOBEL INDIA, Inc.

NOTICE: It is the responsibility of the owner to comply with all safety standards, including OSHA and other Federal, State, and Local codes or regulations.

1-3 PPE (PERSONAL PROTECTIVE EQUIPMENT)

PPE (Personal Protective Equipment) required will be site and process specific. TECHNOBEL INDIA, Inc. recommends conducting a detailed study of your installation and process to determine what PPE will be required for safe operation.

Hearing Protection: According to OSHA protection against the effects of noise exposure shall be provided when the sound levels exceed those determined as unsafe.

Safety Glasses: It is never recommended to enter the workspace with the circulating fan(s) running. However, if anyone must do so for any reason, safety glasses MUST be worn.

Steel Toe Boots (Metatarsals): Nothing inherent to the oven or its process should require foot protection aside from the loading and unloading of the material from the oven. Use proper plant safety considerations for material handling and PPE.

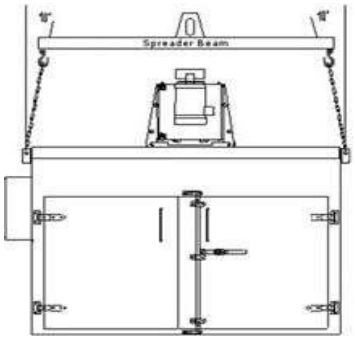
Gloves/Sleeves: If unloading hot material always wear high temperature gloves. If the material being loaded/ unloaded is sharp, protective gloves should be worn.

Temperature/Flame Resistant Clothing: If the material is being unloaded hot, wear the appropriate clothing. This may include temperature resistant sleeves, jacket, pants or any combination of the aforementioned clothing.

Fall Protection: Normal operation of the oven will not require the operator to be on top of the equipment, however, some maintenance and troubleshooting may require personnel to be more than 6' off of the ground. If this is the case, proper fall protection must be used at all times.

1- 4 RECEIVING & HANDLING

Special care must be taken in handling this equipment due to its configuration, size, and weight.



1- 4.1 RIGGING

Lifting lugs are provided at the top (4) corners of most TECHNOBEL INDIA Ovens. It is important to note that rigging cables or chains must not exceed a maximum angle of 10 degrees from vertical (see *Figure 1*). Use a spreader beam, or rigging of adequate length to avoid damage to the equipment. Please refer to any assembly drawings for specific assembly and rigging instructions.

Figure 1: *Typical Rigging*

1- 4.2 RECEIVING INSPECTION

Before removing banding and/or packaging materials, locate the packing slip. The packing slip contains a complete list of all materials shipped. Verify completeness of shipment against packing slip for each item. Inspect each item for damage that could have occurred during shipment.

On collect shipments, all claims for shipping damage must be made against the carrier by the purchaser. All shipments received "short or damaged" must be noted on the freight bill when signed by the receiver. The delivering carrier may deny a claim if not noted on the freight bill when signed by the receiver. However, if damage is concealed, and not discovered at the time of delivery, an inspection must be requested to the delivering carrier within 24 hours.

All claims for shortages against the packing list must be made against TECHNOBEL INDIA, Inc. within 48 hours of receipt. Claims for replacement materials and equipment submitted after 48 hours of receipt will be invoiced to the customer.

SECTION 2 – INSTALLATION

Prior to installation, the owner should consult their insurance underwriters for recommendations and requirements regarding the installation and maintenance of industrial ovens.

2-1 LOCATION

Standard TECHNOBEL INDIA ovens are designed for indoor use only. Installation in unheated areas or areas without climate control may result in non-uniform temperatures or the inability to attain desired temperature. Condensation may also occur, which could damage the oven.

Due to the inherent hazards of heat processing equipment, including the possibility of fire, property damage, and personal injury, selection of the oven's location must be carefully planned. In planning the location, consideration should be given to the following:

PERSONNEL SAFETY:

CAUTION: Avoid installations near exits or main aisles to minimize the risk to personnel associated with fire, explosion, or asphyxiation.

FLOOR: The oven should always be placed on a non-combustible surface with adequate load capacity. Consideration must be given to the weight of the oven, weight of the materials being processed, and the weight of any carts or fixtures.

PROXIMITY:

DANGER: Do not locate the oven against walls. To protect adjacent structures and equipment from excessive temperatures, provide an air space of approximately 12" around the unit. If 12" cannot be achieved, TECHNOBEL INDIA requires a minimum airspace of at least 4". Ensure there is adequate distance for the door(s) to fully open. Consider maintenance access to controls, thermocouples, filters, and heaters. Consideration should also be given to the proximity of adjacent storage areas, particularly those that may include flammable liquids or gasses, or combustible materials as these vapors or materials may be drawn into the oven through circulating fan(s) or exhaust vent(s).

VENTILATION: The unit should be located so that air circulation around the equipment is not restricted. Do not block fresh air inlets or exhaust outlets. Particular consideration should also be given to all fans and motors. Avoid installations in basements or other areas with restricted fresh air.

2-2 LEVELING & ANCHORING

Set the oven on a level, non-combustible, surface. The unit should be leveled both side to side and front to back in reference to the base of the unit. If necessary, shim or grout the unit. Leveling is important to insure proper door alignment and swing. Anchor the oven with expansion anchors through the holes provided. Use anchors 1/8" smaller than the holes provided.

2-3 EXHAUSTING & VENTING

If the oven was purchased with a vent option, a number of acceptable connection methods are available to exhaust the oven. To avoid exposure to operating personnel, the owner must determine a suitable vent/ exhaust method based on the toxicity, amount, and weight of vapor being generated. Consult local stack emission restrictions if the vapors being exhausted may affect air quality.

Connection to an existing plant fume removal system is the preferred vent connection method. The vent connection is 5" OD duct. A sheet metal slip-on, draw band connection is adequate. At installations where a plant exhaust system is unavailable, a "chimney" connection is also an acceptable method to remove lower concentrations of lighter vapors. An outdoor vertical section of duct, of adequate height to produce a chimney effect, has proven successful in many applications. A rain cap is required on outdoor stacks.

Use the blast gate provided to attain an optimum combination of vapor exhaust and unit temperature. This may be especially important when trying to attain relative operating temperatures.

Ovens may be equipped with a powered exhaust fan. The exhaust fan may also be required to remove flammable vapors in the case of NFPA 86 Class A ovens. The fan outlet must be connected to an exhaust stack of adequate size for discharge to an outside location. Exhaust stacks are to be installed in accordance with applicable state and local codes and regulations. The shortest and most direct path should always be used. Stack temperatures are the same as oven temperatures and care must therefore be taken to protect building materials from the hot exhaust stack. Stacks passing through combustible walls or roof must be insulated. Stacks must be constructed of sheet metal or stove pipe with tight seams and laps in the direction of air flow. Never install dampers or restrictions that can impede flow. Stacks installed lower than 8 feet off the floor must be insulated to protect personnel. For Class A ovens handling flammable solvents, the exhaust rate must be checked against the minimum safe exhaust rate shown on the oven data plate.

2-4 ELECTRICAL INSTALLATION

Electrical connections should be made by a qualified electrician in accordance with NFPA 70, The National Electric Code. The installation must also meet the requirements of any applicable state and local codes.

Oven models shipped as single units are factory wired complete. Connect power to the main disconnect switch using wire of adequate size to carry the full load current rating of this device. Secure all connections and ground the unit adequately. A grounding lug is provided in the main control panel.

After wiring is complete, make a final check of all electrical connections to confirm that none have vibrated loose in transit from TECHNOBEL INDIA. Tight power connections will reduce component failure due to poor contact.

Check the fan(s) for proper rotation direction. An arrow on each blower housing indicates proper direction of rotation. The installer should also verify that the fan drive components (belt and pulleys) have not become misaligned or loose during shipment. Excessive noise and/or vibration may be the result of loose or misaligned drive components.

Ovens shipped disassembled due to size may require additional field wiring. Refer to installation and wiring drawings at the end of this manual as applicable.

Verify the settings on any pressure switches and the outputs from any regulators agree with the site settings listed on the appropriate drawings and component literature. Be sure to correct any settings before attempting to heat the oven.

2-5 PRIOR TO START-UP

Prior to releasing the oven to production, all safety systems MUST be inspected and tested for function and operation. Safeties installed on your TECHNOBEL INDIA oven include, but may not be limited to, a High-Limit
Temperature Controller and a differential air pressure switch. To check operation of a safety circuit, force the input criteria into a failure state and verify the oven reacts correctly.

Example: High-Limit Temperature Controller – While the oven is operating, adjust the high-limit setting to a temperature lower than the current oven temperature. The heating circuit for the oven should be disabled immediately.

Once the safety systems have been checked and proper operation verified, document all component settings for the unit. These settings should be kept with your operating instructions for reference during maintenance and annual safety inspections. Documentation of this information and annual inspection of the system is required per NFPA 86.

SECTION 3 – OPERATION & USE

3-1 GENERAL OPERATING PROCEDURES

Operators must be adequately trained in start-up and shut-down procedures, as well as the oven's safety features. It is the owner's responsibility to insure that operators are also familiar with the oven's intended application and aware of the design limitations of the equipment in order to avoid misapplication.

For optimum performance, do not overload the oven. Restricted airflow caused by too densely, or improperly packed parts will adversely affect temperature uniformity. Leave space between parts on shelves or racks to allow air to move freely between the parts. If possible, stagger parts in order to minimize dead spots in the airflow pattern.

For safety, temperature uniformity, and operating efficiency, proper balance of exhaust and fresh air are essential. If applicable, adjust intake and exhaust damper(s) enough to prevent fouling of the work. For Class A ovens handling solvents, the exhaust rate must be confirmed to be at least the minimum listed on the data plate. If the process generates significant amounts of smoke or moisture, it is necessary to exhaust enough air to remove these materials. When exhaust is increased fresh air intake must also be increased. Failure to provide adequate fresh air will result in air being drawn into the oven via the door gaskets, thus creating cold spots within the oven workspace. Excessive exhaust or inadequate fresh air intake can also create negative pressure in the oven. When the fresh air intake dampers are properly adjusted, there should be a slight leaking of hot air out of the door gaskets.

Operating instructions specific to this equipment are detailed in the **Appendix, section 6-1**.

NOTE: Minimum operating temperature for standard models is 200°F (93°C). Temperature control below this this minimum may be erratic. Consult TECHNOBEL INDIA for applications requiring operation below minimum.

3-2 EMERGENCY SHUT-DOWN

Your TECHNOBEL INDIA, Inc. oven has been engineered and built to the highest industry standards. Only in the unlikely event of equipment malfunction or emergency, should the following steps be performed:

1. Press the red “Emergency Stop” button. If access to the emergency stop button is limited, or the oven does not have an emergency stop button, turn off the electrical disconnect providing power to the unit.
2. Depending on the severity of the issue, evacuate or restrict access to the area until the issue has been resolved.
3. When it is deemed safe to resume operation, twist the red emergency stop button to release it. The button should “pop-up” indicating its disengagement. Then follow normal start-up procedures.

SECTION 4 - MAINTENANCE

4-1 GENERAL

Industry experience indicates that improper maintenance is another leading cause of equipment failure, often resulting in property damage or injury to personnel. To maximize service life and assure safe, optimum, performance of this equipment, the owner should develop and follow a preventative maintenance program.

WARNING: Do not attempt any maintenance on this equipment unless all sources of energy are disconnected and locked out. Before performing work on fan(s), special caution must also be taken to secure the wheel.

4-2 MAINTENANCE ITEMS

This list of maintenance items is a general overview of the minimum items that may need to be addressed on your industrial oven. The actual list may vary depending on the specific equipment provided. The owner should make the final determination on maintenance intervals and tasks to be performed while considering the working environment. Please review the supplied component literature for further detail and potential additional maintenance items.

NOTE: Maintenance items should only be completed by a qualified technician. All verified data and settings should be documented, at least annually.

Maintenance Items	Frequency

	Daily	Monthly	6 Months	Annual
Inspect the oven workspace, and if applicable, the fan(s), ductwork, and vent stack for accumulation of foreign matter. Clean as required.				
Inspect oven door(s) for gasket wear and tear. Replace as needed.				
Test and calibrate all L.E.L. (lower explosive limit) monitors.				
Inspect electrical connections and components periodically for tightness and signs of wear				
Oil the pivot joint and apply grease to the latch spring and cam on the door(s).				
Inspect circulating and exhaust fan(s). Tighten set-thyristorews between bearings and shaft, and also wheel set-thyristorews on all circulating and exhaust fans.				
Check for belt tension and wear on belt driven fans. Replace belt as needed.				
Lubricate fan(s) shaft bearings every 500 hours of operation.As standard, no special heat resistant grease is required.				
Test pressure switch settings by checking the switch movements against pressure settings and comparing these with the actual impulse pressure.				
Motors should be lubricated at least every 5,500 hours of service.				
Confirm exhaust rate at the stack outlet with the oven nameplate or drawing attached hereto. Inspect exhaust stack for cleanliness and integrity.				
All pressure and explosion relief devices must be visually inspected to ensure they are unobstructed and properly labeled.				
Measure full load amperage on each heater leg and compare to the schematic.				
All safety interlocks and devices should be tested for proper function. Refer to schematics.				
Verify proper function of Limit Controller (High-Limit Temperature Controller).				
Calibrate recording devices per component literature.				
Validate all thermocouples / RTD's. Replace as necessary.				
Conduct operator training course or refresher course.				

***NOTE*:** Air streams containing particulate or chemicals can cause abrasion or corrosion of fan parts. When such wear is discovered, a decision must be made as to whether to rebalance or replace the wheel.

4-3 SERVICE & REPLACEMENT PARTS

For service or replacements parts, please contact TECHNOBEL INDIA's Customer Service Department by calling *419-625-4014, ext. 4012* or emailing *customerservice@TECHNOBEL INDIAinc.com*. Please be prepared to provide both your SERIAL NUMBER and MODEL NUMBER when ordering. A list of replacement parts may be found in the Appendix, section 6-3.

SECTION 5 – TROUBLESHOOTING

PROBLEM	CAUSE(S)	SOLUTION
Control panel does not have power	No power supplied to the control panel	Verify main disconnect switch is on
	Blown fuse(s)	Verify continuity of the fuses before and after the main transformer
	Emergency Stop button is engaged	Verify the initial reason for the emergency stop. If reason has been corrected, release the Emergency Stop.
Safety interlock will not prove ***(Interlock Proven light not illuminated)***	Circulating or exhaust fan(s) airflow switches are not making contact	Check the inputs to and output from switches
		Check air filter if applicable
		Verify direction of fan rotation against fan label
	High-temperature limit controller alarm active	Temperature is above designated high temperature limit set-point
		Reset limit controller
		If controller wont reset after temperature falls below setpoint, replace controller
Oven will not heat, heats slow, or will not reach set temperature	Power loss	Check incoming power to control panel from source. If line voltage is not present, check and make necessary corrections at source.
		Check voltage on load side of fuses and replace if needed.
		Check voltage on load side of heater relay/contactor or THYRISTOR while controller is calling for heat. If full voltage is present on all phases, check heaters for open circuit.
	Control power loss	Check input to heater relay/contactor or THYRISTOR. When temperature controller calls for heat, contactor or relay coils should have 220V control voltage across the coil. THYRISTOR's should have 4-~20mA. Refer to schematic.
		Replace heater relay/contactor or THYRISTOR if above-cited control power is available and line side voltages appear while load side voltages do not appear.
	Thermocouple burned out	Replace thermocouple
	Open heaters	Check heater resistances with ohm meter and replace open heaters.
	Blown fuses	Check all heater fuses. Replace as necessary.
	Open phase	Check three-phase power at load end of heater relay/contactor or THYRISTOR.
	Failed or damaged heater elements	Replace heater elements
	Circulating fan(s) rotating in wrong direction	Verify fan rotation against fan direction label. If fan is rotating in the wrong direction, there is an incorrect phase sequence. To correct, reverse any two leads anywhere from source to fan motor.

PROBLEM	CAUSE(S)	SOLUTION
Oven will not heat, heats slow, or will not reach set temperature	Temperature Controller	Check temperature controller for error messages and adjustments. Refer to temperature controller manual.
		If known, set P, I, D, constants on Temperature Controller. If unknown, initiate auto tune sequence. Refer to temperature controller manual for auto tune instructions.
		Check output of temperature controller to see if it cycles. If output power is continuously present when controller does not call for power, replace temperature controller.
	Door switch	If door is not securely closed, door switch will disable heat - close door. If door is closed, inspect door switch for proper function. Replace if necessary.
Oven exceeds desired temperature (overheats)	Temperature Controller	Check temperature controller for error messages and adjustments. Refer to temperature controller manual.
		If known, set P, I, D, constants on Temperature Controller. If unknown, initiate auto tune sequence. Refer to temperature controller manual for auto tune instructions.
		Check output of temperature controller to see if it cycles. If output power is continuously present when controller does not call for power, replace temperature controller.
	Heater control failure	Check heater relay, contactor, or THYRISTOR for shorted or welded contacts. Fix or replace as necessary.
Limit Controller High-Temp. Alarm will not turn off	High-Temp. condition exists	Wait for temperature to go below high-temp. set-point
	Limit Controller	Reset Limit Controller. If temperature is below set-point and alarm will not turn off when manually reset, replace Limit Controller.
	Hysteresis value	Hysteresis value is factory set at 20. Temperature must go 20°F. below Limit Controller set-point, before high-limit alarm can be rest. Verify Hysteresis value hasn't been changed.
	Limit Controller set wrong	Verify parameters and correct as necessary.
	Thermocouple	Inspect thermocouple. Replace if necessary
Circulating fan will not start	Motor failure or control power loss	Check fuses. Replace if needed.
		Check load side voltages on overload relay with fan control on. If three-phase imbalance voltage appears, service fan motor.
		Check 220V power across starter coil Al - A2 with fan control on. If power appears and starter does not energize, replace starter.
	Faulty Circulating Fan Start Switch	Inspect wiring to switch. Verify all connections are secure. Tighten as necessary. If all wiring is secure, replace switch.
Circulating fan running slow & sluggish	Phase missing	Check fuses. Replace if needed.
		Check for balanced three-phase power from source and correct as necessary.

PROBLEM	CAUSE(S)	SOLUTION
Excessive fan noise or vibration	Loose mounting bolts, setthyristorews, bearings or couplings.	Tighten hardware to the proper torque
	Fan shaft bearings	Lubricate or replace
	Fan motor	Lubricate motor
	Misaligned or excessive wear of couplings, bearings or misaligned or unbalanced motor.	Replace couplings and bearings, and realign balanced shaft and wheel.
	Accumulation of foreign matter on the wheel or wear/erosion of the wheel.	Clean or replace fan wheel depending on extent of damage

SECTION 6 – APPENDIX

The Appendix of this manual contains installation and operation specific information. If your installation requires non-standard information requirements, such as calibration certifications or equipment specific data, it will be found at the end of this section.

6-1 OPERATING INSTRUCTIONS 6-2 OPTIONAL EQUIPMENT 6-3 REPLACEMENT PARTS

Also included with this manual:

1. DRAWINGS 2. ELECTRICAL SCHEMATICS 3. COMPONENT LITERATURE

6-1 OPERATING INSTRUCTIONS

Standard ovens are shipped from the factory with control parameters set-up for typical heating applications. The following operating procedures apply to all standard models. It is recommended that the owner post a copy of these instructions at the unit. Refer to the supplied component literature for further set-up and operation details.

NOTE: It is important to also read Appendix 6-2, Optional Equipment prior to initial start-up.

CAUTION: Do not leave this equipment in operation unattended.

START-UP

1. Turn the main power disconnect switch to the “ON” position.
2. Push the “CONTROL POWER ON” button
3. Push the “CIRCULATING FAN START” button.
4. If applicable, push the “EXHAUST FAN START” button
5. Once the fan(s) are running and all internal safeties are verified, the “INTERLOCKS PROVEN” light will be illuminated.
6. Using the Temperature Controller (also known as Process Controller) set the desired operating temperature. The controller will display two temperatures. The upper temperature indicates the current oven temperature. The lower temperature indicates the set temperature. Refer to the applicable controls specific to your unit:
    a. **Eurotherm 3216** Temperature Controllers: To set the operating temperature; simply push the “Mode” up or down arrows to the desired temperature.
    b. **Eurotherm Nanodac** Temperature Controllers: Press the **THYRISTOROLL** button twice, once to highlight the SP field and once more to select the SP field. Once selected a set of arrows ⬍ will be shown in the right side of the highlighted field. Use the arrows to set the desired temperature, then press the THYRISTOROLL button to store the value. Lastly, press the PAGE button to exit the selection.
7. Push the “HEAT ENABLE” button. Once the heat is enabled, the oven will heat to set-point.

NOTICE: The Limit Controller(s) have been factory set 20°F (11°C) above the maximum operating temperature. Never raise above this temperature or damage may occur. The high-limit set-point may be lowered at the owner’s dithyristoretion; however it should always exceed the Temperature Controller set-point by 20°F (11°C).

SHUT-DOWN

1. Push the “HEAT DISABLE” button.
2. High-temperature fans cool themselves while they are running. To avoid damage to fan(s), allow the oven to cool below 200°F (93°C) before terminating fan operation. To help cool the unit quicker, open the oven doors.
3. Push the “CIRCULATING FAN STOP” button(s).
4. Push the “EXHAUST FAN STOP” button.

5. Push the “CONTROL POWER OFF” button.
6. *Optional*: Turn the main power disconnect switch to the “OFF” position. This disconnects the main power feed to the control panel.

GENERAL CONTROL INSTRUCTIONS

This document is a general guide to assist TECHNOBEL INDIA customers in becoming familiar with their Eurotherm Temperature Controllers. Guide does not replace respective owner’s manuals and anyone using the products mentioned herein should review the owner’s manual prior to use. Further, user is responsible for setting up and configuring these devices to meet their application requirements.

BUTTON LEGEND:

TO CHANGE THERMOCOUPLE TYPE:

- Press and hold the **PAGE** button until **LEv3** shows in the upper display and **GOTO** shows in the lower display. Release the **PAGE** button.
- The word **CODE** will be shown in the lower display and a **“0”** will be shown in the upper display
- Press the **UP** and **DOWN** arrows and change the **“0”** to a **“3”**
- Press the **PAGE** button until **INPUT** is shown in the lower display.
- Press the **THYRISTOROLL** button until **IN.TYP** is shown in the lower display and the current type is shown in the upper display **(J.TC)**
- Press the **UP** and **DOWN** arrows and change to desired units type
- Press the **THYRISTOROLL** button to save
- Press and hold the **PAGE** button again and until **CONF** is in the upper display and **GOTO** is in the lower display
- Press the **UP** and **DOWN** arrows and change **LEv3** to **LEv1** ❑ Controller will cycle power and automatically restart.

TO CHANGE ENGINEERING UNITS (°F TO °C):

- Press and hold the **PAGE** button until **LEv1** shows in the upper display and **GOTO** shows in the lower display. Select access level will thyristoroll through the lower display.
- Press the **UP** and **DOWN** arrows and change **LEv1** to **LEv2**

- ❑ The word **CODE** will be shown in the lower display and a **"0"** will be shown in the upper display ❑ Press the **UP** and **DOWN** arrows and change the **"0"** to a **"2"**
- ❑ Press the **THYRISTOROLL** button until **UNITS** is shown in the lower display and the current units are shown in the upper display
- ❑ Press the **UP** and **DOWN** arrows and change to desired units **°F**

INSTRUCTIONS - Temperature Controller: 3216

Dethyristoription: The 3216 Process Controller is a 1/16-DIN highly precise temperature controller. **Purpose**: Provide precise temperature control

TO CHANGE SET-POINT: Press the **UP** and **DOWN** arrows until desired set-point is reached

TO VIEW THE WORKING OUTPUT:

- ❑ Press the **THYRISTOROLL** (2nd from the left) button
- ❑ Press the **UP** and **DOWN** arrows, value will show between **0-100%**

  ***NOTE**: If heat output is on **OP1** or **OP2** will show in the upper left hand corner of the controller*

TO AUTOTUNE THE CONTROLLER:

- ❑ Press and hold the **PAGE** (1st on the left) button until **LEv1** shows in the upper display and **GOTO** shows in the lower display. Select access level will thyristoroll through the lower display.
- ❑ Press the **UP** and **DOWN** arrows and change **LEv1** to **LEv2**
- ❑ The word **CODE** will be shown in the lower display and a **"0"** will be shown in the upper display
- ❑ Press the **UP** and **DOWN** arrows and change the **"0"** to a **"2"**
- ❑ Press the **THYRISTOROLL** button until **A.TUNE** is shown in the lower display and **OFF** is shown in the upper display
- ❑ Press the **UP** and **DOWN** arrows and change the **OFF** to **ON**

  ***NOTE**: When Autotune is running **TUNE** will flash in the upper display. When this stops flashing the Autotune is complete.*

INSTRUCTIONS - Limit Controller: 3216i

Dethyristoription: The 3216i is a 1/16-DIN FM approved alarm indicator with one FM Approved form C relay output. Terminals AA, AB, and AC are dedicated to this Alarm. **Purpose**: If an alarm set-point is exceeded or a sensor failure occurs, the alarm relay will change state. Once the sensor fault and PV return to a safe state and have been acknowledged the relay will return to their original state.

TO ACKNOWLEDGE / RESET THE ALARM RELAY:

- ❑ The alarm relay is FM approved and must be manually acknowledged. Once the process variable has returned to a safe value and the alarm is acknowledged the relays will automatically reset. The alarm can be acknowledged by pressing the **PAGE** and **THYRISTOROLL** buttons at the same time.

TO CHANGE ALARM SET POINTS:

- ❑ Press the **THYRISTOROLL** button. The display will show the current set point in the upper display and **A1.HI** in the lower display
- ❑ Press the **UP** and **DOWN** arrows until desired set point is reached
- ❑ Press the **PAGE** button to exit

NOTE: *Limit Controller set-point should be 20°F. above maximum operating temperature.*

TO ADJUST THE ALARM HYSTERESIS VALUE:

Hysteresis is the difference between the point at which the alarm switches **ON** and the point at which it switches **OFF**. It is used to prevent relay chatter.

- Press the**THYRISTOROLL** until **A1.HYS** is shown in the lower display the current hysteresis value is shown in the upper display.
- To adjust the hysteresis value, use the **UP** or **DOWN** button; the minimum value is 1.

TECHNOBEL INDIA PARAMETERS FOR EUROTHERM 3216 WITH RELAY OUTPUT			
INPUT			
Name	**Dethyristoription**	**Value**	**Value Dethyristoription**
IN.TYP	Input Type	k Tc	k Thermocouple
UNITS	Display Units	°c	Degrees Fahrenheit
DEC.P	Decimal Points	nnnn	
RNG.HI	Range High Limit	350	
RNG.LO	Range Low Limit	0	
PV.OFS	PV Offset	0	
FILT.T	Filter Time	1.6	
CJC.TYP	CJC Type	AUTO	Automatic Compensation
SB.TYP	Sensor Break Type	ON	
CJC.IN	CJC Temperature	75.75	
PV.IN	Process Variable	75.61	
MV.IN	Millivolt Input Value	0	
RC.FT	ROC Filter Time	1.6	
RC.PV	PV Derivative	- -	
IO1			
Name	**Dethyristoription**	**Value**	**Value Dethyristoription**
1.ID	IO 1 Type	RELY	Relay Fitted
1.FUNC	IO 1 Function	HEAT	Heat Output
1.PLS	Output 1 Minimum Pulse Time	2	
OP2			

Name	Dethyristoription	Value	Value Dethyristoription
2.ID	Output 2 Type	dC.rt	DC Output
2.FUNC	Output 2 Function	NONE	Unconfigured
2.RNG	DC Output Range	4.20	
LA			
Name	**Dethyristoription**	**Value**	**Value Dethyristoription**
L.TYPE	Logic Input Type	NONE	Unconfigured
l.din	Logic Input Function	NONE	Unconfigured
l.sens	Logic Input Sense	nor	
LB			
Name	**Dethyristoription**	**Value**	**Value Dethyristoription**
L.TYPE	Logic Input Type	NONE	Unconfigured
l.din	Logic Input Function	NONE	Unconfigured
l.sens	Logic Input Sense	nor	
ct.inp			
Name	**Dethyristoription**	**Value**	**Value Dethyristoription**
CT.ID	Module Type	NONE	Unconfigured
ct.src	CT Source	NONE	Unconfigured
CT.rng	CT Range	10	
ct.lat	CT Alarm Latch Type	NONE	Unconfigured
ld.alm	Load Current Threshold	OFF	
lk.alm	Leak Current Threshold	OFF	
hc.alm	Overcurrent threshold	OFF	
ld.amp	Load Current	24	
lk.amp	Lead Current	0	
ct.mtr	Current Meter Range	10	

SP			
Name	**Dethyristoription**	**Value**	**Value Dethyristoription**
SP.SEL	Setpoint Select	SP1	Setpoint 1

SP1	Setpoint 1	0	
SP2	Setpoint 2	0	
SP.HI	Setpoint High Limit	600	
SP.LO	Setpoint Low Limit	0	
REM.SP	Remote Setpoint	0	
L-R	Remote Setpoint Select	NO	
SP.RAT	Setpoint rate Limit	OFF	
LOC.T	Local Setpoint Trim	0	
ROP.HI	Setpoint Retrans. High	300	
ROP.LO	Setpoint Retrans. Low	0	
CTRL			
Name	**Dethyristoription**	**Value**	**Value Dethyristoription**
CTRL.H	Heating Type	Pid	Control Output Configured as PID
CTRL.C	Cooling Type	OFF	Unconfigured
PB.UNT	Proportional Band Units	EnG	Engineering Units
A.TUNE	Auto-tune Enable/Disable	OFF	
PB	Proportional Band	30	
TI	Integral Time	360	
TD	Derivative Time	60	
CB.HI	Cutback High	AUTO	
CB.LO	Cutback Low	AUTO	
MR	Manual Reset	0	
LBT	Loop Break Time	OFF	
OP.HI	Output High	100	
OP.LO	Output Low	0	

Safe	Safe Output Power	0	
A-M	Loop Mode	AUTO	
LBR	Loop Break Status	NO	
TU.HI	Tune High Limit	100	
TU.LO	Tune Low Limit	0	
ALARM			
Name	**Dethyristoription**	**Value**	**Value Dethyristoription**
A1.TYP	Alarm 1 Type	NONE	Unconfigured
TIMER			
Name	**Dethyristoription**	**Value**	**Value Dethyristoription**
TM.CFG	Timer Configuration	NONE	Unconfigured
COMMS			
Name	**Dethyristoription**	**Value**	**Value Dethyristoription**
ID	Comms Identity	NONE	Unconfigured

CAL			
Name	**Dethyristoription**	**Value**	**Value Dethyristoription**
PHASE	Calibration Phase	NONE	
VALUE	DC Output reading	-	
GO	Calibration Start	-	
ACCESS			
Name	**Dethyristoription**	**Value**	**Value Dethyristoription**
ID	Customer ID	0	
HOME	Home Display	STD	SP / Manual Power
K.LOCK	Keyboard Lock	NONE	

PASS.C	Feature Passcode	3237	
PASS.2	Feature Passcode 2	3455	

6-2 OPTIONAL EQUIPMENT

This is a general guide. Equipment listed below may or may not be applicable to your specific model. For more information and operating instructions on specific equipment, refer to the supplied component literature. ***NOTE:*** Ensure all switches are turned off prior to turning the main disconnect switch off. Failure to do so may result in damage to controls. **EXHAUST FAN:** Exhaust fan(s) should be left on throughout the entire heating cycle.

1. To turn the exhaust fan(s) **on**, simply push the "EXHAUST FAN START" button(s). To turn the exhaust fan(s) **off**, push the red "EXHAUST FAN STOP" button(s).

   NOTE: High-temperature fans cool themselves while they are running. To avoid damage to the fan, allow the oven to cool below 200°F (93°C) before terminating fan operation.

BATCH TIMER: The batch timer is infinitely adjustable up to 100 hours. It includes an ON/ OFF switch to indicate timed operation and sounds an audible alarm when time has elapsed.

1. For **Eurotherm 3216** Temperature Controls:
   - On the temperature controller, press the **THYRISTOROLL** button until "dWELL" is shown in the lower display and the current time is shown in the upper display. "Set Time Duration" will thyristoroll across the bottom of the thyristoreen.
   - Press the **UP** and **DOWN** arrows to change the hours and minutes. The maximum time is 99 hrs. and 59 mins.
   - On the control panel, physically turn the **Timer selectorswitch** to the **"ON"** position.
   - When timer is running, "RUN" will be illuminated on the bottom of the controllers thyristoreen and "Timer Running" will thyristoroll across the bottom of the thyristoreen.
   - When batch time is complete the alarm horn will sound, "Timer Running" will stop thyristorolling across the bottom of the thyristoreen, and "OP4" will be shown on the lower left corner of the display.
   - To turn off the alarm horn and reset the timer, turn the Timer selector switch to the **"OFF"** position. ***NOTE:*** If the Timer selector switch is turned **OFF** in the middle of a batch time, the timer will reset and start over when the switch is turned back **ON**. Batch time <u>cannot be paused</u> in the middle of a cycle. **CHART RECORDER:** Single pen circular paper chart recorder allows for continuous monitoring of temperature data. Chart recorder comes with (1) Type "J" thermocouple input.

1. To turn the chart recorder on/ off, simply turn the "CHART RECORDER" switch to the "ON" or "OFF" position. The chart recorder should typically be turned on at the beginning of the batch.

DATA LOGGER: Multiple input digital data logger continuously records temperature and other process data. Data logger allows downloading of digital data files through USB or Ethernet connection. Data can also be viewed on a full color display or on a web server when connected to a network. *Note*: There are a couple different ways to retrieve the recorded data.

1. Setup the channels that need to be recorded. Recording is done automatically. The recorded data can then be retrieved in several different time intervals. The amount of data able to be recorded is limited only by memory present

on the data logger. Once the memory fills up the data will begin overwriting the oldest data first. Connect computer or USB to data logger and archive at desired time frame.

2. Data can also be logged to a computer by permanently connecting the data logger to a network and continuously archiving the data.

DOOR SWITCH: Disables heat when the door is opened on electrically heated ovens; holds burner at low fire on fuel-fired ovens. Normal operation, at previously set parameters, is initiated when the door is closed again. The door switch does not require any set-up. Please note that the door switch does not turn the circulating fan off. **RAMP/ SOAK CONTROLLER**: Programmable ramp/ soak temperature controller with capability to store different recipes with multiple segments.

1. Enter or open the desired ramp/ soak program, then run it.

HUMAN MACHINE INTERFACE (HMI): The HMI is a touchthyristoreen user interface with color display that allows control of the oven's functions. The operator has the ability to monitor the oven's status, operate circulating & exhaust fans, enable/ disable heat, load and run recipes, view temperature/ process control data, and much more.

PROGRAMMABLE LOGIC CONTROLLER (PLC): Ideal for processes with numerous inputs and outputs; or requiring automation of material handling equipment. The PLC can also allow for Ethernet connectivity for remote system monitoring.

VACUUM PUMP: Typically includes motor starter circuit and connection to vacuum header pipe. The vacuum pump can be turned on at any time after the control power is turned on.

ZERO SPEED SWITCH FOR FANS: Minimizes nuisance tripping associated with standard airflow switches. APPENDIX 6-2, Optional Equipment We apologize for any inconveniences you are having with your equipment. Below is a minimum list of common parts that may need to be replaced on your TECHNOBEL INDIA Industrial Oven. If the part you need is not listed, please contact our customer service department and we'd be happy to help. Please be prepared to provide both your MODEL AND SERIAL NUMBER when ordering.

Phone: 419-625-4014, ext. 4012

Email: customerservice@TECHNOBEL INDIAinc.com

Part Dethyristoription	Part #
Heating Element, 72 KW, 48" Hairpin, 230 Volts	PCP1281- 230(*volts*)
Transformer, 100VA, 240-480/3/60 (Add "i" to the end of the part number for international series: 208, 380-575/3/50 or 60 Hertz)	PCP1298- 100 (VA)

APPENDIX 6-3, Replacement Parts – **Electric**