Owner's Manual
of the
RED LINE
DELTA Series
powder recovery booth
INTRODUCTION

Dear Sirs,

The RED LINE DELTA Series powder recovery booth you have purchased is one of the finest powder recovery systems. It is based on the state-of-art filter cartridge type powder recovery technology, which is today considered to be the most efficient means of recovery of oversprayed powder.

Please do go through this Owner's Manual so that you may maximize the utility of this system.

Should you require any further assistance or information on RED LINE DELTA Series powder recovery booths or any other RED LINE powder coating application equipment or system, please feel absolutely free to write to us directly or contact your nearest local Authorized RED LINE Sales & Service Center. It will be our pleasure to be of assistance to you.

We wish you all success.

With warm regards,

Himanshu Shah, Director
RED LINE INDUSTRIES LIMITED
HOW YOUR POWDER RECOVERY SYSTEM WORKS

The powder overspray recovery system is located in the rear section of the powder spray booth (on the face opposite to the spray section). The front section is the coating booth. The work-pieces, duly jigged are hung on the jig-holder in the coating booth (manually or on a conveyor) and sprayed with powder. A specially designed low-pressure, high capacity fan sucks air and the powder overspray through the coating booth to the recovery system in a horizontal flat airflow pattern. Most of the powder particles are not permitted passage through the filter cartridges. The remaining powder particles, if any are trapped in the final filters, allowing virtually clean air to the shop-floor atmosphere through the fan system. Electronically controlled high-pressure reverse pulse air jets located above each filter cartridge regularly and automatically clean the powder-laden filter cartridges. This throws the powder from the filter cartridges back into the powder spray booth and is collected in the powder bin located under the booth. This process, known as cartridge scavenging is a continuous and on-line process. The collected powder can be sieved and reused.
SEQUENCE OF OPERATION

The powder recovery system in your RED LINE DELTA Series powder spray booth is fully automated and once set needs no further adjustments.

The control panel has four controls requiring operator interaction:

- An ON-OFF switch for the illumination of the coating booth
- An ON-OFF switch for the electronic control unit, which controls the high-pressure reverse pulse, air-jets.
- A pressure regulator to control the air pressure of the compressed air through the reverse pulse air jets
- A starter for the three phase air suction fan motor

Power supply required: 380-440 V AC 50 Hz 3 phase with neutral and earthing
Compressed air required: 5 M³/hr at 4 kg/cm² pressure

1. After the compressed air supply tubing is connected to the inlet air nozzle at the base of the control panel and the power supply is connected as required, then:

2. Switch on the light in the booth

3. Turn the pressure regulator clockwise till the pressure gauge indicates a pressure of between 4 kg/cm² and 5 kg/cm²

4. Switch on the reverse pulse air jets

5. Periodically (every 30-40 seconds or as set, based on production needs), you will hear a loud ‘whoosh’ lasting for a fraction of a second. These are reverse pulse air-jets in operation as they clean the filters (one at a time). Except for the air suction fan, your booth is now ready for operation.

6. Please do not switch the air suction fan OFF while the reverse pulse air-jets are one because this may cause the powder thrown off of the filters to tend to escape from the front of the coating booth. When switching OFF for the day or for an extended period of time (say, in excess of 15-20 minutes), please always switch OFF the reverse pulse air-jets first and then switch OFF the air suction fan motor.

7. Due to the hygroscopic nature of powder, it is always recommended that the booth (and the filter cartridges) be cleaned at the end of every shift (when the system is not to be used overnight). This cleaning process is the same as that employed during colour change (explained later).
COLOUR CHANGE

It is strongly recommended that a separate set of filter cartridges be reserved for every colour being used. This is because filter cartridges can never be totally cleansed of all powder particles and if the same set is used for a second colour, inter-colour contamination is likely to occur.

Preparing the booth to accept a new colour involves cleaning the booth and cleaning and replacing the filter cartridges (replacing the entire filter recovery housing).

In case the same filter cartridges are to be used for the next batch (allowing a certain amount of inter-colour contamination), please follow the following steps:

1. Leave the air-suction fan and the reverse pulse air-jets ON for a few minutes after the coating work is over. This will allow a majority of the powder in the filter cartridges to drop off into the booth.

2. Using a lint-free and fiber-free cloth or a nylon brush, sweep all the powder off the walls and floor of the booth into the powder bin under the filter cartridges.

3. Unscrew each filter cartridge and place it above the powder bin. With a soft nylon brush, thoroughly clean the filter cartridges.

4. Once all the filter cartridges have been so cleaned, use compressed air to remove any and all residual powder particles from the filter cartridges.

5. Once the insides of the booth and the filter cartridges have been cleaned, the filter cartridges may be refitted.

6. Roll out the powder bin from under the booth and empty it of all powder. Clean it with a brush/cloth and compressed air before returning it to its position under the booth.

The powder spray booth is now ready for use with a different powder.

In case the filter cartridges are to be replaced with a new set at the time of colour change, follow the following steps:

1. Follow step 1 above

2. Switch OFF the reverse pulse air-jets and using compressed air, clean the inside walls and floor of the booth so that all excess powder is now collected in the filter cartridges.

3. Follow step # 4 above and remove the filter cartridges from the booth.

4. Using a lint-free cloth or nylon brush, clean the insides of the booth.

5. Follow step 7 above.

6. Screw in a fresh set of clean filter cartridges.

7. The powder booth is now ready for the next colour. The filter cartridges that were removed from the booth may now be cleaned at leisure using a nylon brush and compressed air in a secluded place to make them ready for using when their colour is required to be sprayed.
MAINTENANCE & TROUBLE-SHOOTING

The entire recovery system is maintenance-free and should not create any downtimes or interruptions to your production.

- In case of any malfunction, first please check that the input power supply and compressed air supply is as needed.

- In case one or more of the reverse pulse air-jets is malfunctioning, open the control panel. The electronic control unit, from where the wires lead out to the reverse pulse air-jets, has been provided with LEDs - one for each reverse pulse air-jet. The relevant LED will indicate the availability of control signal (in a predetermined and preset sequence) to the reverse pulse air-jets with a gap of 30 to 40 seconds between signals. If this is happening, the electronic control unit is functioning satisfactorily.

- Special solenoid valves (coil voltage: 220-230 V AC) mounted in the scavenging head above the filter cartridges control the air-flow through the reverse pulse air-jets. Wires from the electronic control unit lead to these solenoid valves. Disconnect the wires from the solenoid valve that is malfunctioning and give this solenoid valve an independent 220-230 V AC supply. If the valve is not operating, please replace with a new valve back into the system and resume work.

- In case one or more LEDs do not indicate the availability of the control signal at the control unit end, remove the relevant wire from the connector on the unit and reconnect it to the next available port. Shift the sequencing pin-plug (located at the center of the control unit) to the next pin or by as many pins as the number of new ports employed. Each control unit will have at least 2 free and spare ports available. The system will now operate with the new sequencing circuit.

- In case the entire electronic unit is not functioning, please check the power input to the unit and the fuse. Replace fuse if blown.

- In case one of the reverse pulse air-jets does not switch off (compressed air continuously passes through it), that solenoid valve needs to be removed from the system, dismantled and cleaned as its plunger movement has been restricted with dust particles carried in with the compressed air.

- The filter cartridges have an effective life of approx. 4000-6000 hours of use while the final filters if fitted should last for approx. 1000 hours before needing replacement. Final filters can easily be replaced by unscrewing the old ones and re-screwing in the new ones.

- Final filters should be cleaned weekly or at most fortnightly by removing them and blowing compressed air in the ‘reverse direction’ to remove the collected and clogged powder from the filters.
OWNER'S MANUAL

RED LINE
electric small lab box oven
INTRODUCTION

Congratulations on your purchase of the RED LINE powder coating electric lab oven.

It is built tough to give your products uniform high quality powder cureings consistently, piece after piece, year after year.

Before using this equipment, please read this Owner’s Manual completely. It will save you time, money and unnecessary effort in the future.

We know you will be thoroughly satisfied with your RED LINE powder coating equipment. In case you ever require any assistance or information on this machine at any time, please do not hesitate to contact us directly or your nearest Authorized RED LINE Sales & Service Center. It will be our pleasure to be of assistance to you.

For further information on the full range of RED LINE powder coating equipments, systems and complete plants, do visit our website or write us or contact your nearest Authorized RED LINE Sales & Service Center.

We wish you all success.

With regards,

Himanshu Shah, Director
RED LINE INDUSTRIES LIMITED
CAUTION AND CARE:

First and foremost, it is very important for you, as the user, to understand that although a great deal of attention has been given to various safety factors and considerations, the ultimate responsibility of using and treating this machine responsibly and with care lies with you.

Please note: that this is meant only for curing powder coatings AND NOT FOR ANY OTHER PURPOSE.

ALWAYS …
- Read this manual completely before starting and every time you need to refer for additional information
- Ensure the oven is grounded through the ground lead provided in the power cable
- Wear leather footwear and non-insulating gloves (if any) when using any electrostatic powder coating equipment
- Remember to switch off the oven before opening the doors
- Keep the air vent located on top of the oven open to at least a quarter position to allow any volatiles to escape out of the oven
- In case of doubt, contact your local dealer or service centre or us directly

NEVER …
- Powder cutting temperatures achieved inside this oven are very high (in the range of 200-250°C) – enough to burn you or parts of your body. Hence it is very important that you do not touch any part inside the oven while it is hot.
- Never open the oven while the heaters are on.
- Inhale the powder that is sprayed. If the powder recovery system is not efficient to suck away all oversprayed powder, either get that handled or at least ensure that an appropriate air-filter is made available for the workers to breath in clean air.
- Shut completely the air vent on top of the oven.

AVOID …
- Using locally produced replacement parts – this may prove to be cheaper in the short term but may damage the machine and force higher expenditure later.
FIRST START UP

INFRASTRUCTURAL REQUIREMENTS:

ELECTRICAL POWER CONNECTION: 220/240 V AC, 50Hz, SINGLE PHASE WITH GROUND (OTHER VOLTAGE IF SPECIFIED AT THE TIME OF ORDERING)

PRODUCT DESCRIPTION:

THE RED LINE ELECTRIC SMALL LAB BOX OVEN HAS A DOUBLE WALLED CONSTRUCTION MADE OF MILD STEEL. THE GAP BETWEEN THE WALLS IS PACKED WITH HIGH PERFORMANCE GLASSWOOL INSULATION MATERIAL TO MINIMIZE HEAT LOSSES THROUGH THE WALLS.

THE FRONT DOOR, TOO, IS DOUBLE WALLED AND GLASSWOOL-INSULATED. IT COMES WITH 2 HEAVY DUTY HINGES AND A LATCH FOR A POSITIVE LOCK AT THE TIME OF CLOSING THE DOOR.

THE OVEN IS PROVIDED WITH SHELF-RUNNERS ALONG THE INSIDE OF BOTH THE WALLS TO HOLD SHELVES. ADEQUATE SHELVES ARE ALSO PROVIDED.

THIS SMALL BOX OVEN HAS A TEMPERATURE RATING OF 250°C. THE SOURCE OF HEAT ENERGY ARE HEATERS PROVIDED UNDER THE FLOOR INSIDE THE OVEN.

TEMPERATURE CONTROL IS PROVIDED USING A DIGITAL TEMPERATURE CONTROLLER CUM INDICATOR (UNLESS OTHERWISE SPECIFIED).

THE RED LINE ELECTRIC BOX OVEN IS SUPPLIED READY-TO-OPERATE. ALL YOU NEED TO DO TO START WORK IS …

1. CHECK YOUR POWER SUPPLY VOLTAGE MATCHES THE REQUIREMENT OF THE MACHINE
2. WHEN YOU UNPACK THE OVEN, THE AIR-VENT (SUPPLIED SEPARATELY AND TIED INSIDE THE OVEN) NEEDS TO BE FITTED ON TOP OF THE OVEN. THIS IS EASILY DONE USING THE 3 SCREWS PROVIDED FOR THIS PURPOSE
3. TRAYS HAVE BEEN PROVIDED FOR THE OVEN. PLEASE REMOVE THEM FROM INSIDE THE OVEN AT THE TIME OF FIRST UNPACKING
4. CONNECT A POWER PLUG (IF NOT PROVIDED OR THE ONE PROVIDED DOES NOT MATCH YOUR COUNTRY’S PLUG-SOCKET SYSTEM) TO THE END OF THE POWER CORD. PLEASE NOTE THAT 3 WIRES ARE PROVIDED – NORMALLY RED FOR PHASE (OR LIVE), BLACK FOR NEUTRAL AND GREEN FOR EARTHING (OR GROUND).
5. PLUG THE POWER CORD TO YOUR AVAILABLE POWER SUPPLY.
6. SWITCH ON THE MAINS POWER SUPPLY TO THE MACHINE FROM THE POWER OUTLET
7. WHEN SWITCHING ON FOR THE FIRST TIME OR AFTER AN EXTENDED PERIOD OF TIME, THE OVEN MAY EMIT SOME SMOKE. THIS IS BURNING OF IMPURITIES INCLUDING DUST OR EVAPORATION OF SETTLED MOISTURE ON OR NEAR THE HEATERS.
OPERATING INSTRUCTIONS

1. Place the oven on a level surface

2. Open the door and clean the interiors using compressed air

3. Switch the system ON using the power switch on the control panel

4. Set the required temperature using the temperature controller. This is done by pressing the 'set' switch and turning the knob (clockwise to increase and anti-clockwise to decrease). When the required setting is displayed, release the 'set' switch. The indicator will now indicate the present temperature inside the oven.

5. Turn the heater control knob clockwise to ‘medium’ position

6. When the temperature reaches the set value, the controller will trip the heaters. Thereafter, the controller will trip on and off the heaters to maintain the temperature inside the oven at and around the set temperature.
ELECTRICAL WIRING DIAGRAM OF THE RED LINE ELECTRIC BOX LAB OVEN
OWNER'S MANUAL

RED LINE
electric small lab box oven
INTRODUCTION

Congratulations on your purchase of the RED LINE powder coating electric lab oven.

It is built tough to give your products uniform high quality powder curings consistently, piece after piece, year after year.

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Please note: that this is meant only for curing powder coatings AND NOT FOR ANY OTHER PURPOSE.

ALWAYS …
- Read this manual completely before starting and every time you need to refer for additional information
- Ensure the oven is grounded through the ground lead provided in the power cable
- Wear leather footwear and non-insulating gloves (if any) when using any electrostatic powder coating equipment
- Remember to switch off the oven before opening the doors
- Keep the air vent located on top of the oven open to at least a quarter position to allow any volatiles to escape out of the oven
- In case of doubt, contact your local dealer or service centre or us directly

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- Never open the oven while the heaters are on.
- Inhale the powder that is sprayed. If the powder recovery system is not efficient to suck away all oversprayed powder, either get that handled or at least ensure that an appropriate air-filter is made available for the workers to breath in clean air.
- Shut completely the air vent on top of the oven.

AVOID …
- Using locally produced replacement parts – this may prove to be cheaper in the short term but may damage the machine and force higher expenditure later
FIRST START UP

INFRASTRUCTURAL REQUIREMENTS:

ELECTRICAL POWER CONNECTION: 110V AC, 60Hz, Single phase with ground
(Other voltage if specified at the time of ordering)

PRODUCT DESCRIPTION:

THE RED LINE electric small lab box oven has a double walled construction made of mild steel. The gap between the walls is packed with high performance glasswool insulation material to minimize heat losses through the walls.

THE FRONT DOOR, too, is double walled and glasswool-insulated. It comes with 2 heavy duty hinges and a latch for a positive lock at the time of closing the door.

THE OVEN IS PROVIDED WITH SHELF-RUNNERS ALONG THE INSIDE OF BOTH THE WALLS TO HOLD SHELVES. ADEQUATE SHELVES ARE ALSO PROVIDED.

THIS SMALL BOX OVEN HAS A TEMPERATURE RATING OF 250°C. THE SOURCE OF HEAT ENERGY ARE HEATERS PROVIDED UNDER THE FLOOR INSIDE THE OVEN.

TEMPERATURE CONTROL IS PROVIDED USING A DIGITAL TEMPERATURE CONTROLLER CUM INDICATOR (UNLESS OTHERWISE SPECIFIED).

THE RED LINE electric box oven is supplied ready-to-operate. ALL YOU NEED TO DO TO START WORK IS ...

1. CHECK YOUR POWER SUPPLY VOLTAGE MATCHES THE REQUIREMENT OF THE MACHINE
2. WHEN YOU UNPACK THE OVEN, THE AIR-VENT (SUPPLIED SEPARATELY AND TIED INSIDE THE OVEN) NEEDS TO BE FITTED ON TOP OF THE VEN. THIS IS EASILY DONE USING THE 3 SCREWS PROVIDED FOR THIS PURPOSE
3. TRAYS HAVE BEEN PROVIDED FOR THE OVEN. PLEASE REMOVE THEM FROM INSIDE THE OVEN AT THE TIME OF FIRST UNPACKING
4. CONNECT A POWER PLUG (IF NOT PROVIDED OR THE ONE PROVIDED DOES NOT MATCH YOUR COUNTRY’S PLUG-SOCKET SYSTEM) TO THE END OF THE POWER CORD. PLEASE NOTE THAT 3 WIRES ARE PROVIDED – NORMALLY RED FOR PHASE (OR LIVE), BLACK FOR NEUTRAL AND GREEN FOR EARTH (OR GROUND).
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7. WHEN SWITCHING ON FOR THE FIRST TIME OR AFTER AN EXTENDED PERIOD OF TIME, THE OVEN MAY EMIT SOME SMOKE. THIS IS BURNING OF IMPURITIES INCLUDING DUST OR EVAPORATION OF SETTLED MOISTURE ON OR NEAR THE HEATERS.
OPERATING INSTRUCTIONS

1. Place the oven on a level surface
2. Open the door and clean the interiors using compressed air
3. Switch the system ON using the power switch on the control panel
4. Set the required temperature using the temperature controller. This is done by pressing the ‘set’ switch and turning the knob (clockwise to increase and anti-clockwise to decrease). When the required setting is displayed, release the ‘set’ switch. The indicator will now indicate the present temperature inside the oven.
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ELECTRICAL WIRING DIAGRAM

ELECTRICAL WIRING DIAGRAM OF THE RED LINE ELECTRIC BOX LAB OVEN – 110V AC