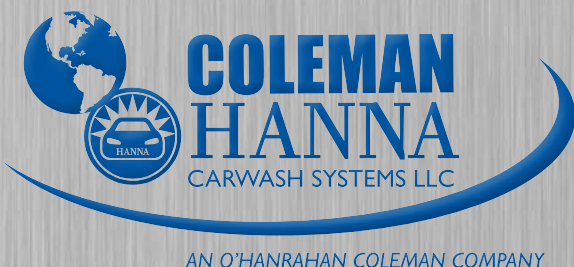




Concorde Dryers

Service Manual



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1.0 Introduction

1.1 Design Features

The Concorde Drying System consists of top blowers for higher profile vehicles, while side blowers are designed to remove water from the mid and lower portions of the car. Because of the various requirements and demands of today's customer, Hanna produces both clockwise and counterclockwise blower configurations with different angled nozzles. These are connected by an adjustable flange and clamp system, which can enable the end user to orientate for various dimensional drying ranges.

Available in both a stainless steel and co-polymer configuration, Hanna's design eliminates unacceptable corrosion that would affect any long-term structural integrity. The Concorde has powder coated, high tensile steel impellers that are of the backward inclined airfoil type.

All Concorde models have a single 7.5-inch diameter nozzle and a 15 HP motor. The impellers produce very high air efficiency and volume while maintaining the velocity required for excellent drying. The Concorde is a high-volume low-pressure dryer that takes advantage of round ducting and machined nozzles to produce a simple, but highly effective dryer. Also moving parts have been kept to a minimum for reduced maintenance needs.

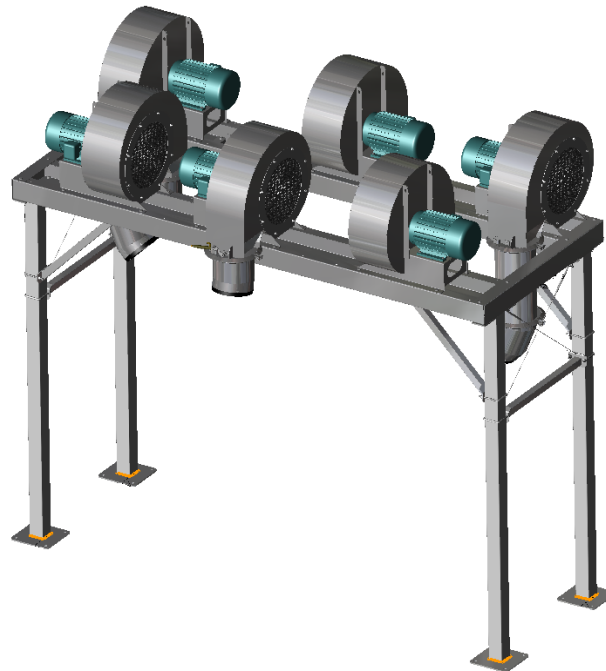


Figure 1-1 6-Motor Overhead Stainless Steel Blower

1.4 Basic Operation

The Hanna Concorde Drying system is only available with a 15 horsepower producer in voltages that support both 50 and 60 hertz. Each nozzle is totally independent using one producer and one cone. The Concorde is not of the common plenum type, so there is not interaction between the producers. When the motors are started, the nozzle immediately has airflow.

As with any air dryer, the Concorde has a high inertia-starting load that should be started no more than 15 times an hour. To accomplish this, you may consider starting the dryer while the vehicle is in the wash section of the car wash or using a look-ahead feature on your computer to keep the dryer running if there is another vehicle entering the wash.

Due to the high efficiency of the backward inclined airfoil impellers and the low-loss ducting used, the Concorde will continue to have a significant air flow for some time after the motor is turned off.

1.3 Air Restrictor

The Concorde has a Restrictor Gate on the top and top/side models that reduce airflow to pick-up beds as well as convertibles. Hanna uses an airfoil restrictor that does not affect the high volume airflow for drying, but will restrict the airflow to approximately 30 percent when actuated. It is located on the outlet of the producer and is activated by a small air cylinder. The computer and a four-way solenoid valve, which has a 24 VAC coil, controls the cylinder movement. Adjust the exhaust flow out of the solenoid valve to provide a smooth, open and close movement of the air restrictor. The solenoid should be operated at 80 to 100 PSI.

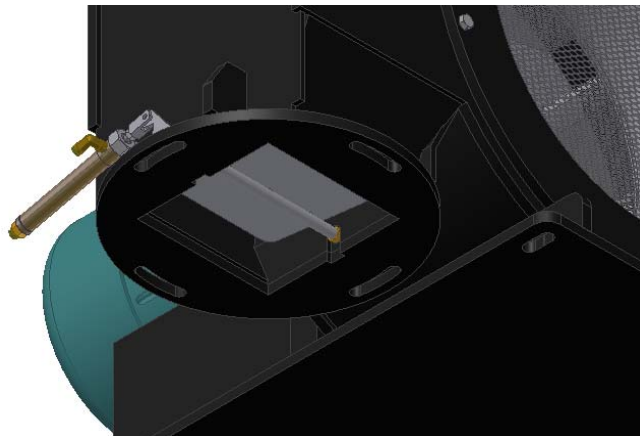


Figure 1-2 Air Restrictor with Cylinder

1.4 Variable Frequency Drive

A variable frequency drive is an additional option to all overhead blowers for optimization of the three-phase motors. Placed in the MCC, this electronic device can control the airflow by adjusting the Hertz output of the motor. By lowering the frequency of the motor, the airflow can be reduced.

The VFD will allow the Concorde to be pre-programmed and controlled by the computer. Thus you may choose to have a program button on your controller for high profile vehicles such as vans and another program button for pickup trucks. This will allow you to restrict the airflow at two different rates and set the timing of the conveyor to dry part of the vehicle before reducing the airflow.

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2.0 Safety

Keep the following safety rules in mind when installing and using Hanna Car Wash System Equipment:

NOTE: *Always follow local and national trade codes when installing any equipment.*

- Always disconnect power from any electrical device or component prior to servicing.
- Unplug the unit or use proper lock-out procedures so that no one can inadvertently turn the power on while you are working on that equipment.
- Always power down the control box before unplugging or plugging in quick disconnects.
- Use caution when maintaining any piece of equipment.
- Wear protective clothing and eyewear when using power tools.
- Direct discharge of high-pressure water and chemicals away from you and other persons, or direct it into approved containers.
- Keep equipment clean for proper operation.
- Keep hands or any body parts away from equipment while in operation.
- If you need to disassemble a part for service or repair, re-assemble equipment according to instructions.
- Be sure all components are firmly screwed or latched into position.
- Observe safety and handling instructions of the chemical manufacturers.
- Wear protective clothing and eyewear when dispensing or working with chemicals or other potentially hazardous materials.

1.2 Cautions, Warnings, and Notes

Throughout this manual there are various messages concerning safety – please heed these warnings!

2.1.1 Cautions

Cautions warn against a potential hazard that, if not avoided, may result in minor or moderate injury. Caution signs also alert against unsafe practices that may cause property damage.



CAUTION: *DO NOT TOUCH THE BLUE BUTTON! IT IS THE SYSTEM BUTTON AND USED FOR CONFIGURATION.*

2.1.2 Warnings

Warning messages warn against a potential hazard that, if not avoided, may result in serious injury or death.



WARNING: *DO NOT REMOVE PLUGS UNDER ELECTRICAL POWER. MAIN ELECTRICAL POWER MUST BE SHUT OFF BEFORE DISCONNECTING OR CONNECTING ANY PLUG OR CABLE ON THE SPRAY HEAD.*

2.1.3 Notes

Note means reader take note. Notes contain helpful suggestions.

NOTE: *This parameter should NOT be changed when attempting to make system adjustments.*

3.0 Installation

3.1 Installation Requirements

- Power: United States 120 VAC – 15 Amp (prefer Isolated).
- 3 Phase 208-460 60Hz (see motor plate for 50 Hz)
- Controller Functions: One output function is required from the existing controller to operate the dryers and one function to operate each of the top nozzle restrictor gates. Top side restrictors can be operated with a top nozzle restrictor function that is located close to a top nozzle.
- Dimensions:
Please refer to the provided drawings in for available dimensions

3.2 General Requirements

- Before getting started, you must find the proper location for your new Concorde Drying System. We recommend a minimum of 130 in. clear area for proper operation of Concorde air dryers.
- The clear area is defined as any space that allows the airflow to impinge the vehicle, but will not interfere with or be interfered with by other devices. This allows the airflow to reach out as much as 60 in. toward the front and 60 in. toward the rear of each vehicle.
- The overhead system must be at least 24 in. before the trap door of the conveyor with a 48 in. drip space between the air dryer frame and last piece of equipment as a minimum requirement.
- A width clearance of 148 in. is needed for the overhead dryer structure.

3.3 Installation Checklist

This section lists all of the components and parts that are required and supplied by Hanna and optional items that you may wish to have for installation of the equipment.

3.4 Installation

CAUTION: *When using a forklift to install equipment, be careful to follow OSHA and general safety rules and regulations to insure personal safety.*

Read this manual prior to opening crates or installing equipment.

Carefully open crates and identify the individual parts for assembly using the enclosed checklist. If there are any missing parts, notify your Hanna distributor immediately (see warranty information in Chapter 3.0).

After assembling the headers and side frames, place the producers in the headers. When all producers for your configuration have been set in place, take the time to recheck all the layout dimensions. Also double-check air gate mechanisms for any suspicious defects.

Raise the headers, install legs and bracing, then anchor the producers to the floor using 1/2" diameter anchors not less than 4-1/2" long.

Attach the ductwork to the producers.

Note: *It is highly recommended that anti-seize compound be used with all threads when assembling the stainless steel components to eliminate galling for the threads. Light oil will not work for this application, as when parts are disassembled after the oil has dried, galling will occur.*

For stainless steel models, connect the duct together, line up the flanges and install the clamp around the flanges and tighten the clamps in place. Make sure that the clamps on the producers have the hinge and connecting bolts facing the entrance and exit of the car wash. This is so they do not reduce vehicle clearance.

For polymer models, bolt ducts directly to producer while being careful not to over-tighten the bolts.

Electrical Installation

Electrical-3 Phase Motor Wiring

The electrical connections between the motor and the Motor Control Center (MCC) must conform to the National Electrical Code domestically as well as any local codes that may apply. Internationally, the wiring installation must conform to the local codes.

If Hanna provided an MCC, the drawing on the inside of its door and will provide the information required to connect the MCC to each motor.

Each motor should have the following as a minimum:

Circuit Breaker or Fused Disconnect

- For short circuit protection and to protect the wiring

Motor Overload or Protector

- For Motor Overload

Safety Lockout

- A lockable disconnect for the safety of service personnel

Wire Size

- The wire size should take into consideration for voltage drop from the motor controls to the motor. One additional wire size can help a great deal with long runs.

Hand Off Auto Switch

- Each motor should have a Hand off Auto Switch for normal operation and testing.

Electrical Reference Data

Use this information from the NEC Table 4300-150 for sizing wire and switch gear. Voltage loss should be calculated for runs over 50 feet, which could increase the wire size required.

**Full Load Amps
For Sizing Wire**

Voltage	15 HP
200	48.3
208	46.2
230	42.0
460	21.0
575	17.0

Restrictor Solenoid Coil

Voltage: 24 VAC

Power: 15 Watts Each

Pneumatic Control

If the restrictor is used, connect the control valve to the cylinder as the chart indicates below.

Solenoid Valve	Cylinder Port	Pressure Line	Other
Port A	Cylinder End		
Port B	Rod End		
Port P		xxxx	
Port S			No Connection
Port R			No Connection

Check Sheet

Dryer Check List

- ___ Dryer Positioned as shown on drawing
- ___ Dryer anchored on floor
- ___ Ducts are connected securely with clamps or bolts
- ___ Verify Restrictor operation when used
- ___ Computer Function & Override
- ___ Air connections cylinder not extended with air pressure of 100 PSI
- ___ Air Pressure to solenoid is 80 to 100 PSI
- ___ Flow Control on Solenoid adjusted for extend smooth and easy movement
- ___ Flow Control on Solenoid adjusted for retract smooth and easy movement

Start-Up Procedure

- ___ Check Voltages
- Phase A to B _____ VAC
- Phase B to C _____ VAC
- Phase A to C _____ VAC
- Phase A to N _____ VAC
- Phase B to N _____ VAC
- Phase C to N _____ VAC

NOTE: Please stay clear of the airway when running the producers for the first 5 minutes to reduce the chance of personal injury.

- ___ Check Rotation

NOTE: Impeller rotation spacing maybe checked by the following methods:

1. Removing attenuator and visually check rotation.
2. The use of a small plastic tie wrap on the fan end of the motor can show the direction of rotation as the fan hits it.
3. Rotation can be checked before the first duct is installed if the electrical is complete first.

Check Full Load Amperage

Phase A _____ Amps

Phase B _____ Amps

Phase C _____ Amps

3.5 Addendum to Installation (Polymer Concorde Only)

Spacer brackets have been included in some models overhead systems. More specifically, with overhead systems wherever the blower is mounted at the end of the support structure. Marked with part number 608050, these spacer brackets should be placed under one side of the blower unit for leveling purposes. One side of the blower will be mounted on the side support bracket, and the other side will be mounted on the spacer plate (608050).

4.0 Parts and Maintenance

4.1 General Maintenance

The Concorde Air Dryer System requires periodic inspection and maintenance. However, there are only a few items that should be inspected on a regular basis. Although we do cover some of these aspects in this document, always refer to the manual that came with your particular motor.

4.2 Lubrication

The Concorde Dryer requires very little lubrication during its operational life. The motors should be greased per the motor manufacturer's recommendations.

The oiler for the restrictor cylinder needs only to be refilled as it becomes empty. The oiler should lubricate one drop of oil every 10 to 15 times it is actuated. Table 4-1 gives an example of a typical lubrication table.

Table 4-1 Example of a Lubrication Schedule

Lubrication Schedule	
Date	Description

4.3 Instructions for Removal and Installation of Impellers

Please read the warning message (Figure 4-1) for impeller removal and installation. For removal, do NOT use a puller; there is a removal tool available (PN 809778). For installation, NEVER use anti-seize on the tapered hub.



Figure 4-1 *Taper-Lock Warning Message*

4.3.1 Removing the Impeller

1. Please observe all safety precautions before starting any maintenance.
2. Remove the four bolts for the faceplate screen and remove screen.
3. Remove eight bolts for the intake ring and remove ring.
4. Remove intake cone.

You will now see the taper-lock bushing.

5. Remove the four bolts on the taper-lock bushing.

6. Take your taper-lock removal tool (HPN 809778) and place it across the taper-lock bushing.
7. Use two of the bolts you removed from the taper-lock bushing to secure the removal tool to the bushing. You will need to add jam nuts to secure the bolts.
8. Place the other two bolts into the threaded holes of the bushing. Make sure to use tapping oil on bolts. Tighten until snug, and then tighten to 65 lbs of torque.
9. Slide the punches into the removal tool.
10. Hammer the punches on each side a couple of hits. Retighten the bolts to 65 lbs of torque again. Keep hammering and tightening until the bushing pops loose.

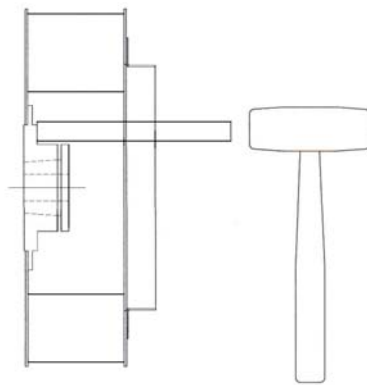


Figure 4-2 Impeller Release

11. Drive a screwdriver into the slots on the hub just enough to pull it off.
12. Pull off the impeller.

NOTE: Toss out the four bolts used to tighten the bushing. You will need to use NEW bolts for any re-installation of parts.

4.3.2 Installation of the Impeller

1. Please observe all safety precautions before starting any maintenance.
2. Install the impeller onto the motor shaft and hub. The impeller rotates in the direction of the arrow (Figure 4-4).

NOTE: Impellers turn in either a clockwise or a counterclockwise direction (Figure 4-4), depending on the location of the exhaust. If you are installing the same impeller onto the same producer, there should be no problem of installing the correct impeller. If you are installing a new impeller, you must make sure that you have the correct impeller.

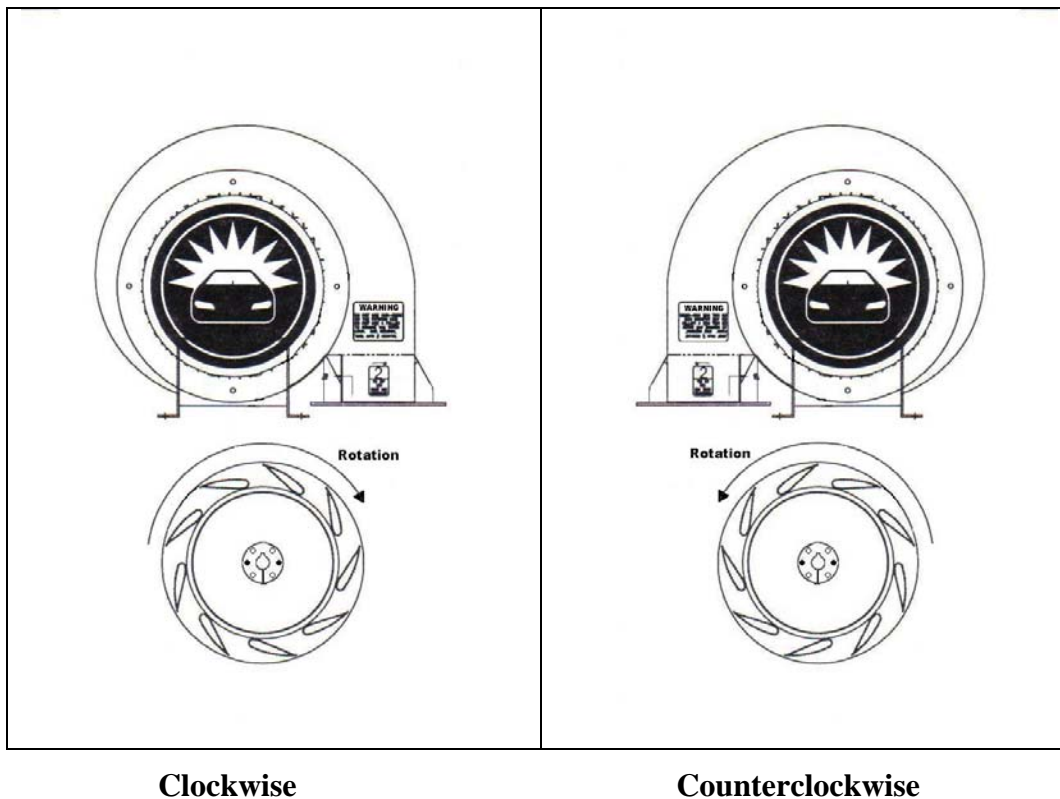


Figure 4-3 Impeller Rotation

A small engraving located on the inner ring of the impeller will tell you if the direction is clockwise or counterclockwise. This will be signified as 'CW' or 'CCW'.

3. Take the taper-lock bushing and hammer a screwdriver or wedge into the slot.
4. Place the bushing (with screwdriver still installed) into the hub and motor shaft. Make sure the bushing is just a fraction higher than the motor shaft.
5. Install four NEW bolts loosely into the bushing. Make sure you use a tapping oil to prevent galling.
6. Remove screwdriver from the bushing.
7. Tighten the four bolts evenly. Tighten securely with 65 lbs of torque.
8. Install cone and inlet screen.
9. Make sure to rotate the impeller by hand to make sure it does not come in contact or rub against the cone or any other parts of the assembly.
10. Run the dryer and listen for any contact of the impeller and cone.

4.4 Producer Spare Parts List

Table 4-2 shows the recommended spare parts to be kept on hand by the Distributor and Owner/Operator.

Table 4-2 Recommended Producer Spare Parts List

Recommended Parts	Part Number	Distributor Carries Part In Stock	Owner/Operator¹ (Distributor Support) Carries Part In Stock	Owner/Operator² (No Distributor Support) Carries Part In Stock
Air Cylinder	351304	YES	NO	NO
Hyundai Motor, 15 HP 208-230/460v, Intl.	365563	YES	NO	NO
Leeson Motor, 15 HP 208-460/3/60 Domestic	367593	NO	NO	NO
Bushing, Taper Lock	284190	YES	NO	NO
Impeller, 60 Hz, CCW	367034	YES	NO	NO
Impeller, 60 Hz, CW	367033	YES	NO	NO
Impeller, 50 Hz, CCW	367031	YES	NO	NO
Impeller, 50 Hz, CW	367032	YES	NO	NO
Inlet Screen (Stainless)	813471	NO	NO	NO
Inlet Screen (Plastic)	807690	NO	NO	NO
Inlet Cone, 60 Hz	367036	YES	NO	NO
Inlet Cone, 50 Hz	367035	YES	NO	NO

1. Recommends what spare parts should be kept on hand by the Car Wash Owner/Operator if there is close support from the distributor and parts are quickly obtainable.
2. Recommends what spare parts should be kept on hand by the Car Wash Owner/Operator if there is NOT close support from the distributor and parts are NOT quickly obtainable.



Figure 4-4 Inlet Screen



Figure 4-5 Impeller

4.5 Recommended Tool Kit

Table 4-3 shows the recommended tools for installation and maintenance of the Concorde Air Dryer.

Table 4-3 Recommended Installation Tools

3/4 in.	Open-End Box Wrench “Gear” Wrench
1/2 in.	Ratchet and Socket Set
9/16 in.	Open-End Box Wrench “Gear” Wrench
1/2 in.	Open-End Box Wrench “Gear” Wrench
7/16 in.	Open-End Box Wrench “Gear” Wrench
---	Flat-tip screwdriver
10 oz	Stanley “Dead Blow” Plastic Mallet
1/2 in.	Drill Bit for Anchor Bolts

4.6 Preventative Maintenance

Periodically check for cracking of the impellers

As the impeller ages, cracking in the metal may occur and cause debris to be thrown out through the nozzle.

Daily check for residue buildup on the inlet screen

Too much buildup on the screen can lead residue entering inside the blower housing.

Periodically check for residue buildup on the impeller blade

Residue buildup can cause an imbalance during operation causing unnecessary vibration.

Clean with solvent or soap and water when needed.

Make sure that the balance weight is firmly intact to the impeller

To assure that the balance weight is firmly intact, the impeller has to be removed to access it on the backside.

4.7 Wiring Diagram for the Hyundai Overhead Motors

This diagram can be found in the electrical box of the motor itself showing proper lead connections for international 50Hz models.

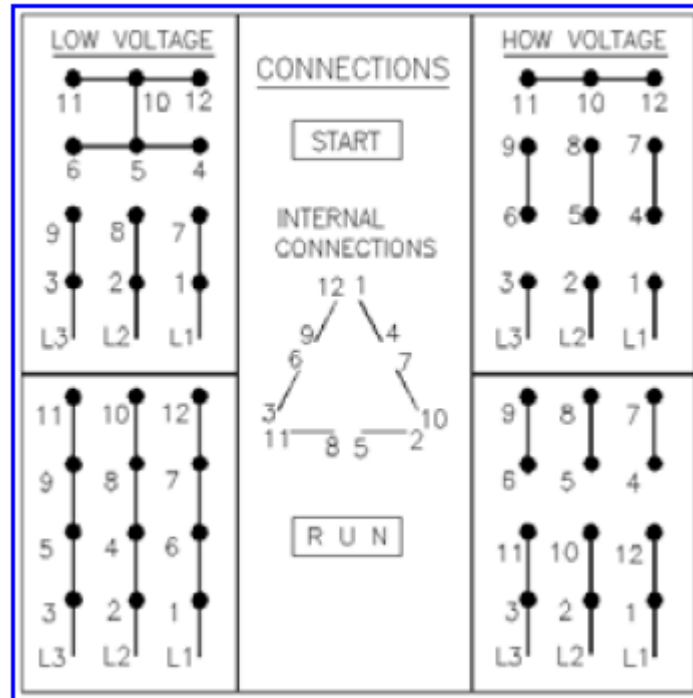


Figure 4-6 Hyundai Wiring Diagram

5.0 Troubleshooting

This chapter helps you solve common air dryer system problems. If you are still unable to find a solution after reading through this section, please call your distributor for technical assistance.

5.1 Problems

<u>Problem</u>	<u>Possible Solutions</u>
<ul style="list-style-type: none"> ▪ EXCESSIVE VIBRATION ▪ MOTOR WONT START ▪ HOT BALL BEARINGS 	<ul style="list-style-type: none"> ▪ This may be caused by the counterweights becoming out of balance or loose. Make sure that the counterweights are firmly mounted located inside of the motor casing ▪ Also make sure there is no debris buildup in the impeller. Any buildup on the impeller blades may case an imbalance during operation ▪ Fuses my have to be looked at and replaced ▪ Check to see that the power supplied agrees with motor nameplate and load factor ▪ Look for broken bars or end rings around the rotor ▪ Maintain proper quantity of grease in bearing. ▪ Check alignment, side and end thrust ▪ Replace bearing, first clean housing thoroughly

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Appendix A

Easy Relay Timer Setting Default and Programming Instruction

Description	Page
Motor Delayed Start Programming	Page 1
Dryer Motor Delayed Start Default Settings	Page 2

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Dryer Motor Delayed Start Programming

Easy Relay Timer Setting Default and Programming Instruction

1. Power Easy Relay On

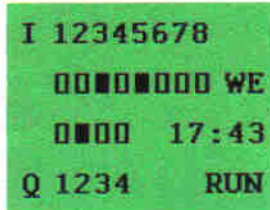


Fig 1

2. Push "OK" Button



Fig 2

3. Using the Center Arrow Rocker Arrow down to "Parameter" Push "OK"



Fig 3

4. The "T" for "T1" Timer One will flash Using the Center Arrow Rocker Arrow left to select timer value to set

5. Using the Center Arrow Rocker Arrow up or down to set the timer value

6. Once desired timer value is set Push "OK"

7. Using the Center Arrow Rocker Arrow up or down to select the timer value to set Repeat Steps 4-6 Push "ESC" to return to normal operation

Dryer Motor Delayed Start Default Settings

Timer Relay #1

(For Dryer Motors 1-4)

T1 Dryer Motor 1 00.01 Seconds
T2 Dryer Motor 2 03.00 Seconds
T3 Dryer Motor 3 06.00 Seconds
T4 Dryer Motor 4 09.00 Seconds
T5 Minimum Run Time 05.00 Minutes
T6 Reset Delay 05.00 Seconds

Timer Relay #2

(For Dryer Motors 5-9)

T1 Dryer Motor 5 12.00 Seconds
T2 Dryer Motor 6 15.00 Seconds
T3 Dryer Motor 7 18.00 Seconds
T4 Dryer Motor 8 21.00 Seconds
T5 Minimum Run Time 05.00 Minutes
T6 Reset Delay 05.00 Seconds

Timer Relay #3

(For Dryer Motors 9-12)

T1 Dryer Motor 9 24.00 Seconds
T2 Dryer Motor 10 27.00 Seconds
T3 Dryer Motor 11 30.00 Seconds
T4 Dryer Motor 12 33.00 Seconds
T5 Minimum Run Time 05.00 Minutes
T6 Reset Delay 05.00 Seconds