Heatless Desiccant Dryer User Manual

Models TW41 - TW3001

Parker Airtek

ENGINEERING YOUR SUCCESS.

Introduction

These instructions must be thoroughly read and understood before installing and operating this product. Failure to operate this product in accordance with the instructions set forth in this manual can lead to unsafe operating conditions and may void warranty. For additional information, refer to this manual or contact the factory for recommendations. Please have the dryer serial number and model ready when contacting the factory.

This product contains proprietary software. Access to the software is not permitted for any reason without express written approval of Parker Hannifin.

Factory Contact Information

Phone 1-800-343-4048
For pricing, availability, and purchase orders: GSForders@parker.com
For technical support and aftermarket: GSFsupport@parker.com
For product applications and technical sales: FAFQuotes@parker.com

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SAFETY AND PRECAUTIONS

Use EXTREME CAUTION when working in the vicinity of the dryer. Adhere to all warning labels on dryer.

Relieve pressure before servicing dryer or associated equipment.

Disconnect power before servicing dryer.

Always wear eye protection when in the vicinity of the dryer. Ear protection is recommended, especially if the dryer is being operated without mufflers. Even when mufflers are used, a desiccant vessel blowing down to atmosphere will raise particles, create more noise than during “normal” operation and may startle an individual not familiar with this portion of the operation.

In the case of an overpressure situation there is a safety relief valve installed on each desiccant vessel designed to protect the equipment. If the valves are pointed in a hazardous location to operators after dryer installation, they should be piped to a safe location.

Dryers are designed for fail safe operation. In the event of a power failure, the inlet valves will fail in the open or last position and the exhaust valves will fail closed. Compressed air will continue to flow through the dryer. When power is restored, the cycle will continue on from where it left off at the time of the power loss.

Automatic or manual drain valves will eject water, oil, particulates, and air under partial pressure when operated. Proper precautions must be taken.

Condensate drainage from compressed air systems may contain oil or other contaminants. Follow all applicable regulations for safe handling and disposal.

Various component failures could cause large air loss and subsequent pressure drop. Preventative maintenance should be performed to reduce this possibility. If this situation occurs, bypass the dryer immediately to restore flow and pressure.

Activated alumina dust is considered a nuisance dust. Proper precautions should be taken when handling desiccant. For more information and for other types of desiccant, refer to the applicable Safety Data Sheet. For disposal of used desiccant, refer to the local codes and regulations.

NOTE: desiccant contaminated with oil or other foreign substances may be covered under disposal regulations for the contaminant.

INSTALLATION

Inspect the dryer upon receipt for any damage that may have occurred during shipment.

Each desiccant dryer is supplied with a User Manual, dryer general arrangement drawing, and ASME pressure vessel U1A data reports (where applicable).

The initial charge of desiccant is included with the dryer. Ensure vessels are filled with desiccant prior to startup.

Models 2001 and larger include desiccant shipped separately in 25lb bags to be installed by the user at the site.

Smaller dryers are shipped with desiccant installed.

Exhaust mufflers are supplied for each dryer. A quantity of two mufflers are shipped attached to the dryer, uninstalled, for models 41 and larger. Mufflers should not be installed until after startup to allow excess desiccant dust to be cleared from the dryer and not prematurely clog the new mufflers.

The dewpoint sensor (advanced controller only) is shipped in a small container attached to the dryer. Take care not to misplace before installing.

If placed in storage, store in a location protected from the environment. If stored outside, it is recommended that the dryer be underneath a shelter and be shrink wrapped or crated to protect against rain. Desiccant dryers should not be stored in a location exposed to freezing temperatures or direct sunlight. Dryers designed for outdoor use should not be placed outside until ready for operation. All plugs and flange covers should remain in place until the dryer is ready to be installed. Desiccant bags should remain in original closed packaging and be stored in a dry environment until dryer is ready for operation. Dryers with desiccant installed should be stored in a dry environment. The dryer should be moved using a pallet jack or fork truck. Desiccant dryers are tall and top heavy. Use caution while moving the equipment to avoid tipping over. Many dryers have desiccant vessels equipped with lifting lugs.

DO NOT USE THE VESSEL LIFTING LUGS TO LIFT THE DRYER. They are only used to lift an empty vessel and are not designed to hold the weight of the equipment.

Install in an area with an ambient temperature range of 40°F to 100°F. The area should be well lit and ventilated. It is recommended to leave a minimum of four feet around all sides of the dryer for maintenance. Ensure that the dryer is stable and properly secured on a vibration free floor before operation.

If installed outdoors, the desiccant dryer should be installed in an area protected from the effects of weather. Locate under a roof if possible. Avoid direct sunlight so that the control display does not become damaged and can be clearly read. If installed in an area with below freezing temperatures, proper heat trace and freeze protection must be added to the equipment.

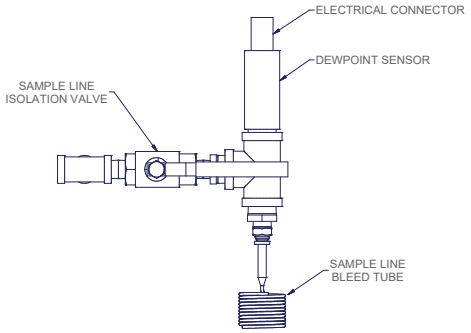
There are several connection points on the dryer. Make sure each connection is made prior to startup.

1. **Air in connection –** Will be marked on the dryer with a tag. Use piping suitable for the pressure and temperature class.

2. **Air out connection –** Will be marked on the dryer with a tag. Use piping suitable for the pressure and temperature class.

3. **Prefilter drain connection –** Located near the prefilter and labeled. Drain discharge is under pressure equal to the system and must use piping suitable for the pressure and temperature class if piped to another location. A coalescer type prefilter must be installed before the desiccant dryer if not supplied with the dryer. It is critical to the performance of the dryer to protect the desiccant bed from oil bulk moisture contamination.

4. Dewpoint sensor - ISO 8573-1 Class 1 Dryers: On a new dryer, depending on the installation, it can take anywhere from a week to several weeks to dry out the system components and desiccant to the dryer's target dewpoint of -93F(-70C). Expect the dryer output to reach -40°F (-40°C) within a few hours, and -80°F (-60°C) within a week.



5. Power supply – Use power cable provided (standard controllers) or bring power to the DIN connect located underneath control panel enclosure (advanced controller). Verify voltage and frequency of power supply matches dryer design by checking the serial label.

WARNING! Failure to wire the power properly may result in a "HOT" panel which could result in injury or death. Check all power connections before applying power.

Basic Controller – The basic controller comes with a 3 pronged plug which can be inserted into a standard outlet.

Advanced Controller – The DIN connector terminals are clearly marked and must be wired as follows

Pin 1 – HOT
Pin 2 – NEUTRAL
GROUND

The DIN connector insert can be rotated to direct the wiring to the desired orientation

Mufflers are included with the dryer to reduce noise level only. They are not required for normal operation and should not be installed for initial startup. The exhaust may be piped to another location to further reduce noise, but must not restrict purge air or dryer performance will suffer.

The following considerations must be taken when piping the exhaust:

TO 10 FEET, SAME PIPE DIAMETER SIZE AS DRYER EXHAUST VALVE

TO 25 FEET, ONE PIPE DIAMETER SIZE LARGER THAN DRYER EXHAUST VALVE

TO 50 FEET, TWO PIPE DIAMETER SIZES LARGER THAN DRYER EXHAUST VALVE

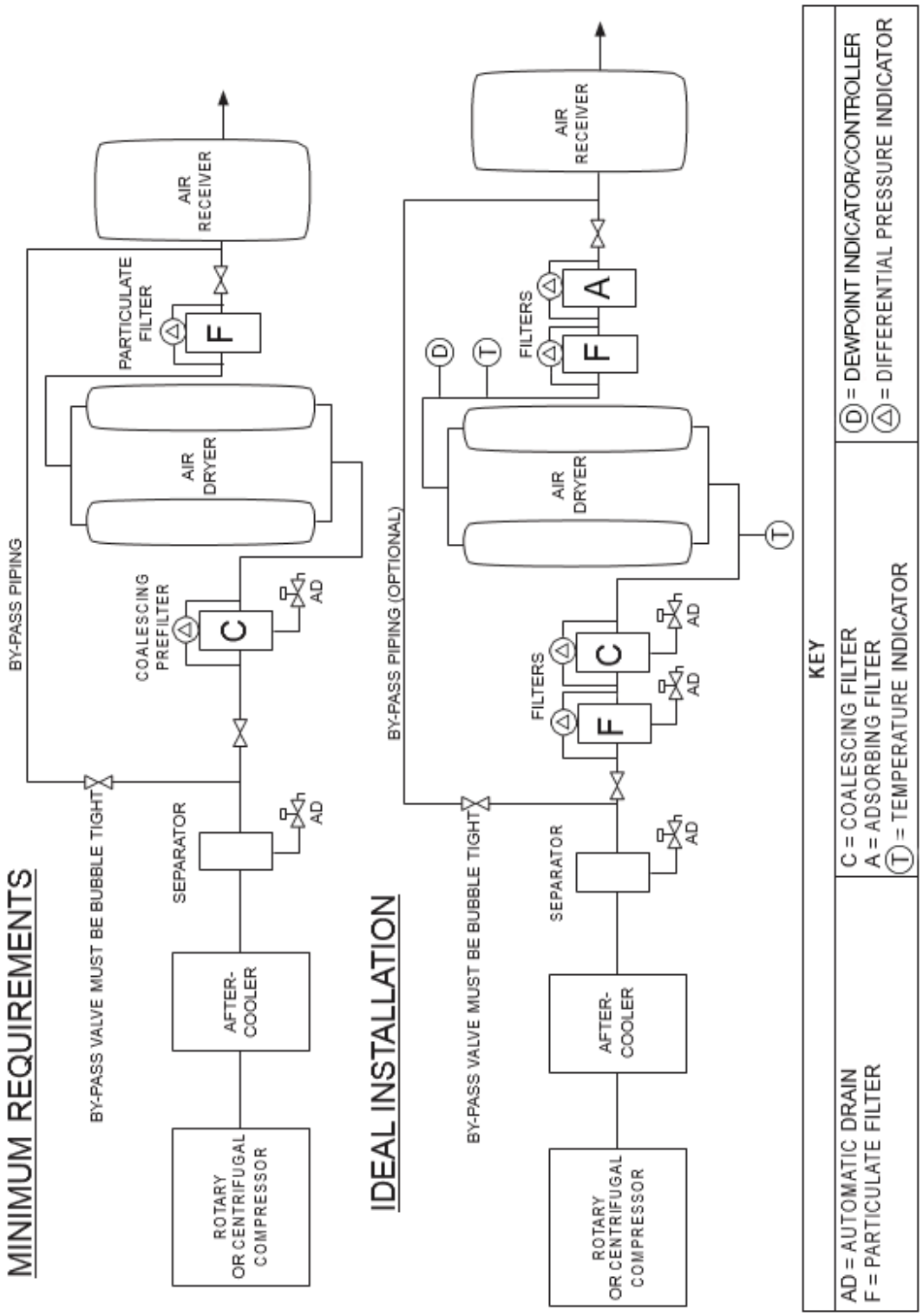
TO 100 FEET, THREE PIPE DIAMETER SIZES LARGER THAN DRYER EXHAUST VALVE

Each elbow installed in the exhaust piping is equivalent to 10 feet of pipe. If the exhaust piping is vertical, a drip line must be installed to remove moisture. It is recommended to pipe the exhausts separately for ease of maintenance and troubleshooting.

It is highly recommended to install bypass valves and piping around the dryer and filters to use during routine dryer maintenance.

RECOMMENDED INSTALLATION

CLEAN DRY, CONTAMINANT FREE AIR



GENERAL OPERATION

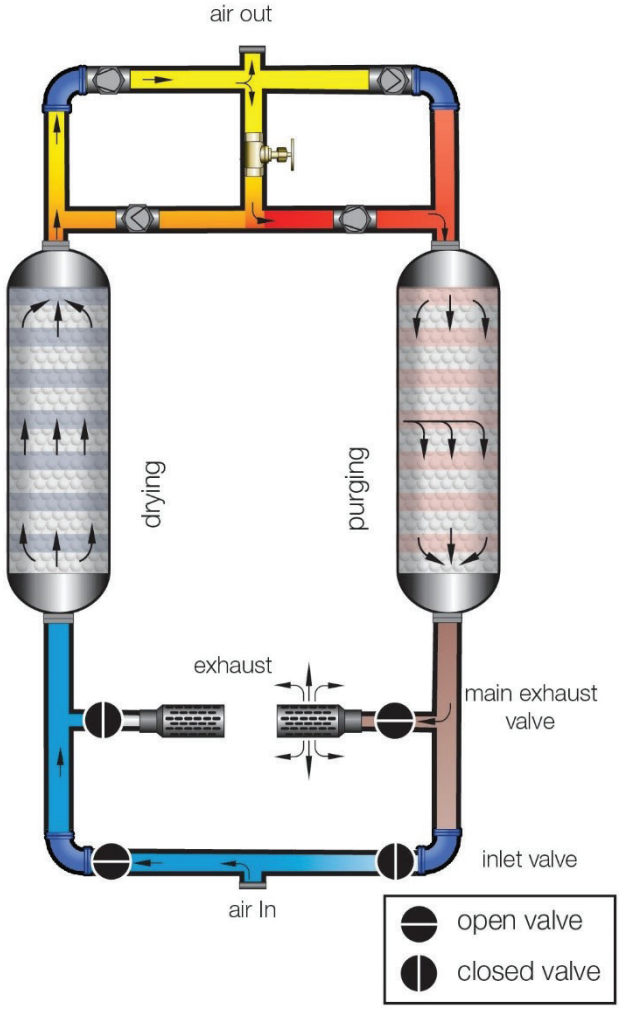
The heatless desiccant dryer is designed to remove moisture in water vapor form, from compressed air to yield dewpoints of -40°F or better. The twin tower design allows constant drying of compressed air through one adsorption vessel while the other vessel desiccant bed regenerates by pressure swing adsorption.

Compressed air is directed through the inlet valve and up through the drying desiccant vessel where moisture is adsorbed by the desiccant. The low dewpoint dry air is then directed through the outlet check valve and downstream for use.

Regeneration of the saturated desiccant vessel bed is begun by blowing down the saturated vessel bed. The quick change from line pressure to atmosphere causes moisture to detach itself from the desiccant and be exhausted. The regeneration cycle is continued by directing 15% of the dry compressed air through a purge valve and orifice. The purge air is expanded to atmosphere, passed down through the saturated bed removing moisture, and then exits the dryer through the exhaust valve and muffler.

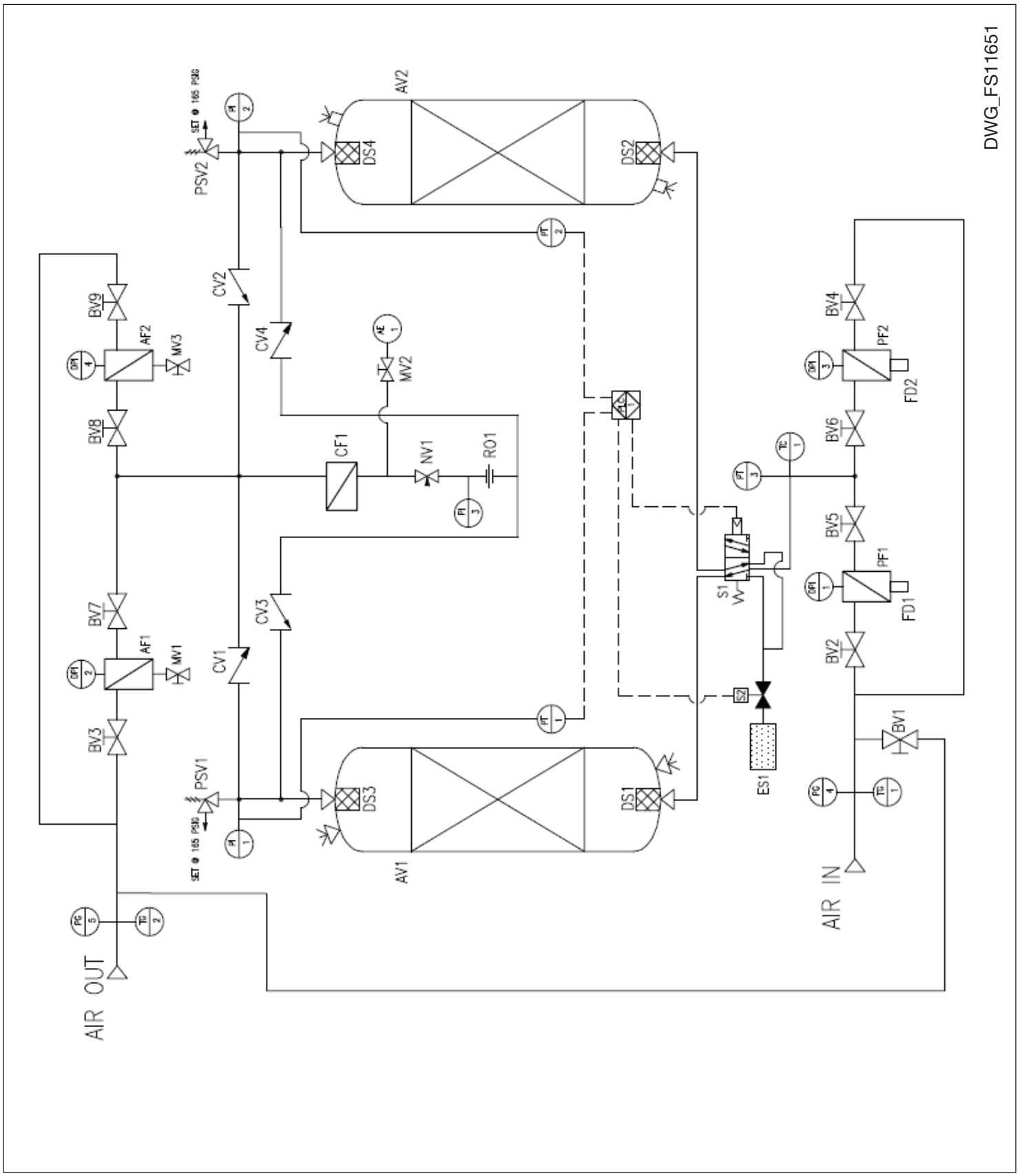
Once regeneration is completed, the offline desiccant vessel is slowly pressurized to line pressure. The dryer is ready for switchover, at which point compressed air will be directed though the newly regenerated desiccant bed for drying and the opposite desiccant vessel begins regeneration. This cycle continues automatically.

The dryer inlet, exhaust, and repressurization valves are controlled by solenoid valves, which are controlled by the dryer PLC. The PLC operates opens and closes the valves by a programmed timing sequence. The PLC is equipped with various timing cycles to maximize the dryer efficiency. It is also possible to operate the dryer on dewpoint demand or compressor demand cycle instead of a timing cycle.

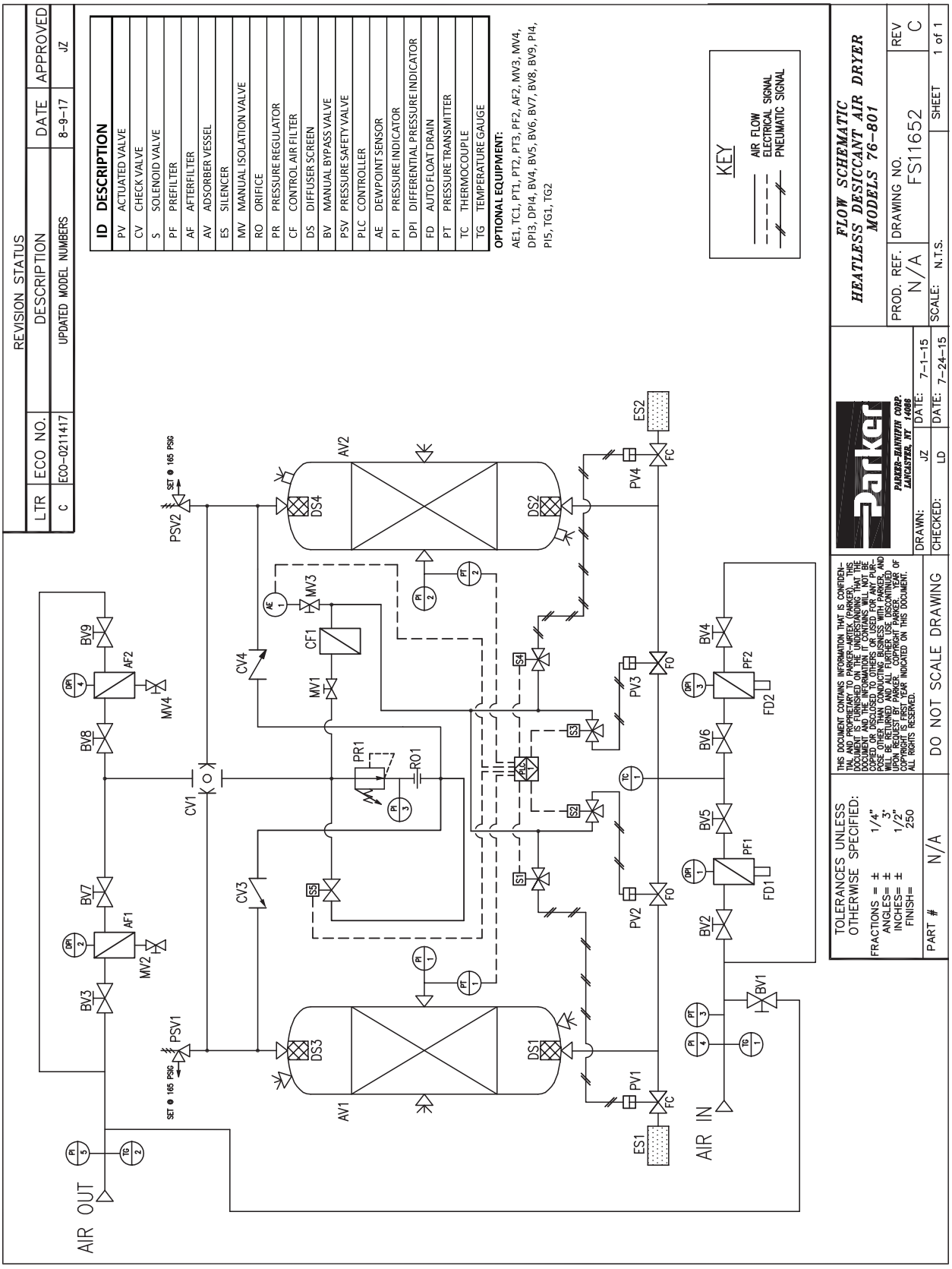


TW Desiccant Dryer Operation

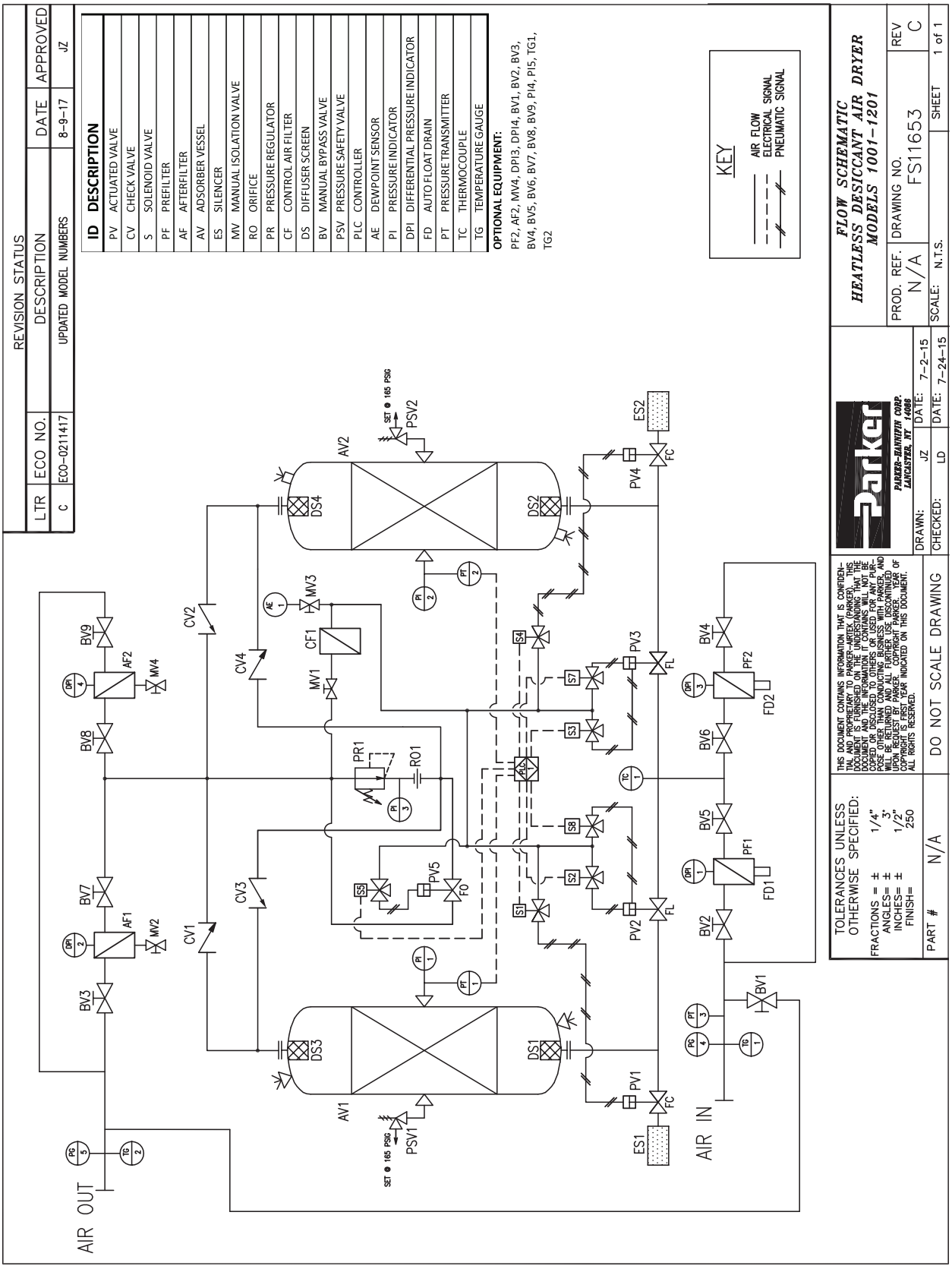
FLOW SCHEMATIC MODELS TW41-56



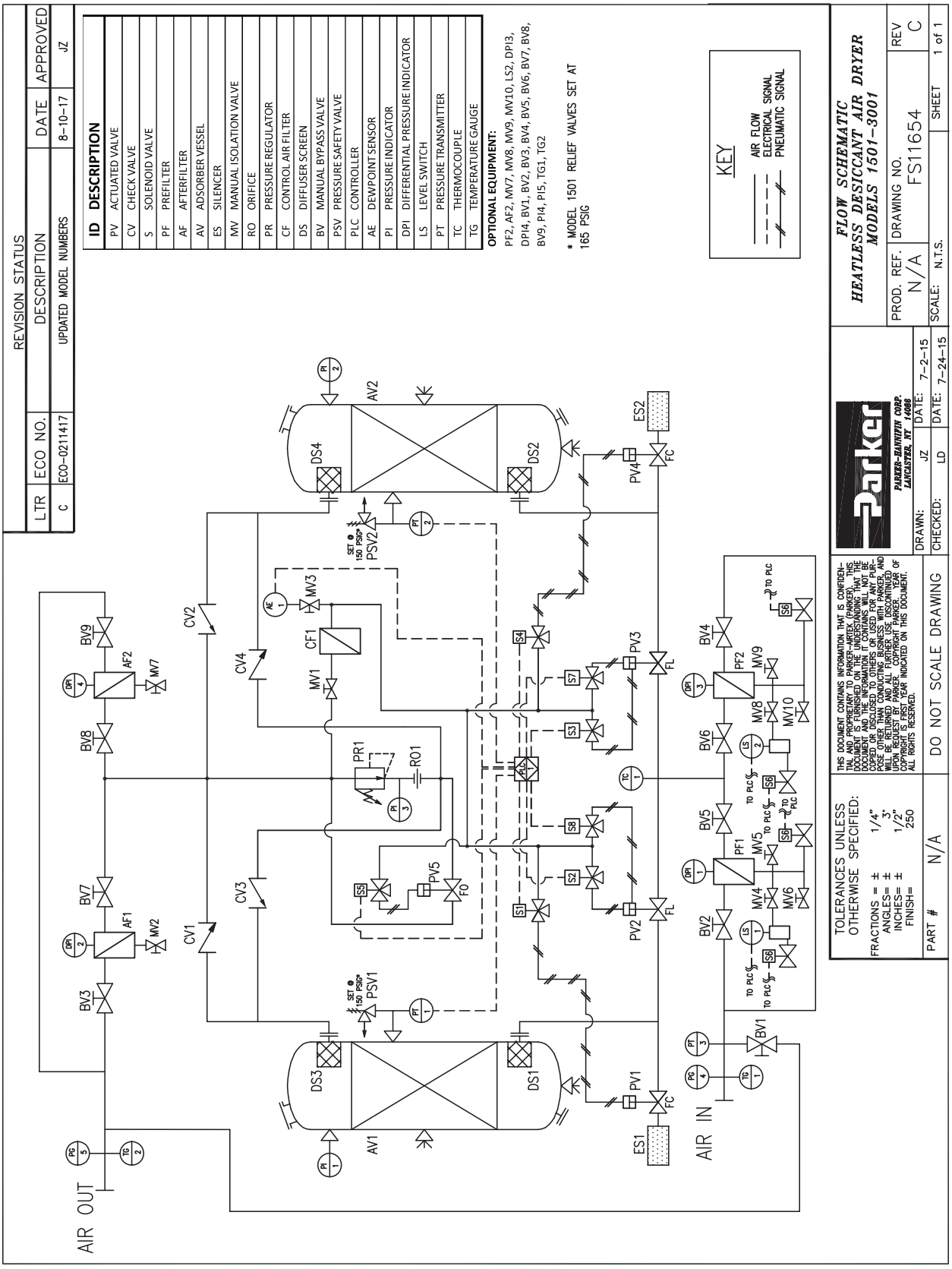
FLOW SCHEMATIC MODELS TW76-801



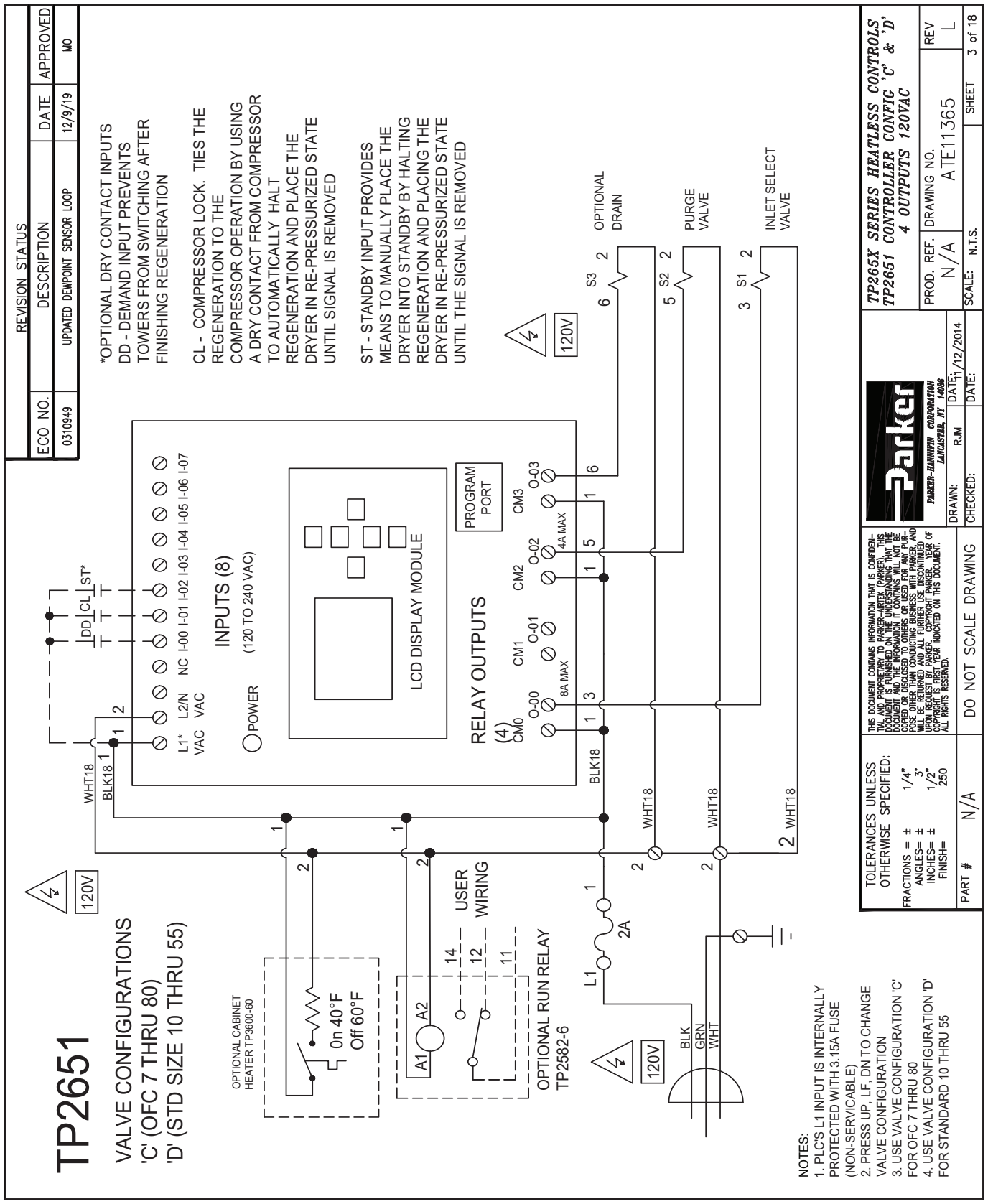
FLOW SCHEMATIC MODELS TW1001-1201



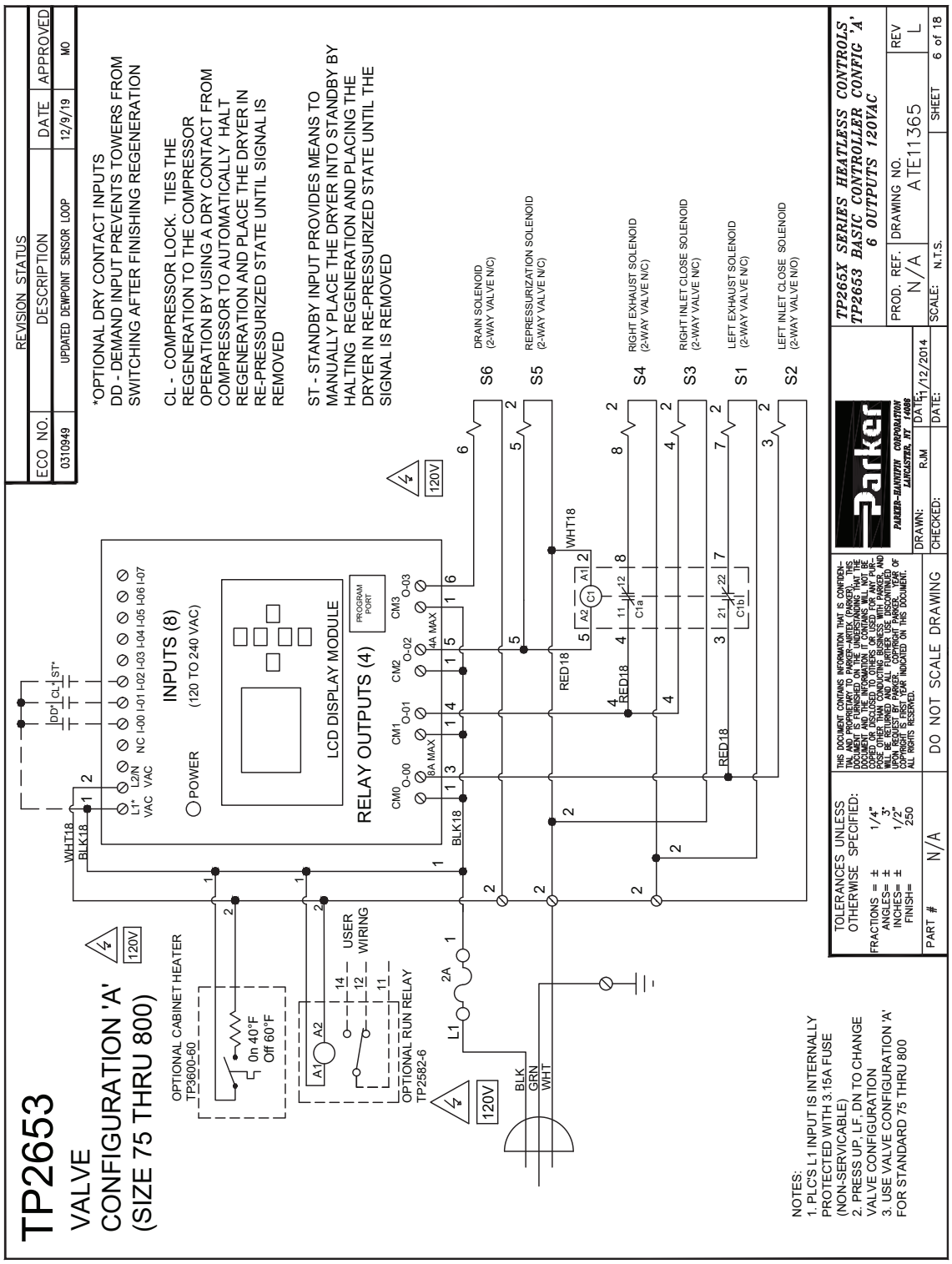
FLOW SCHEMATIC MODELS TW1501-3001



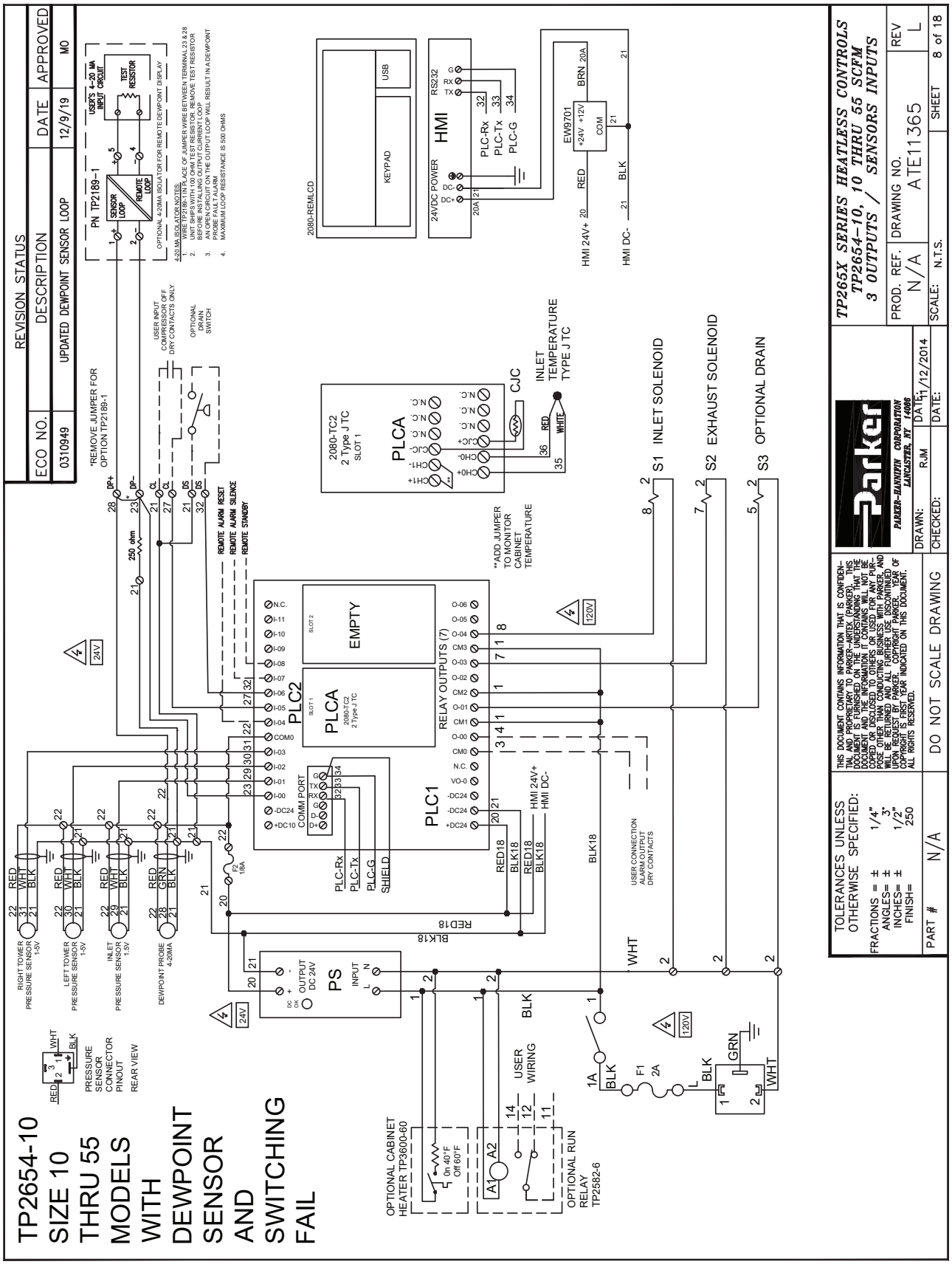
WIRING DIAGRAM STANDARD CONTROLLER MODELS TW41-56



WIRING DIAGRAM STANDARD CONTROLLER MODELS TW76-801

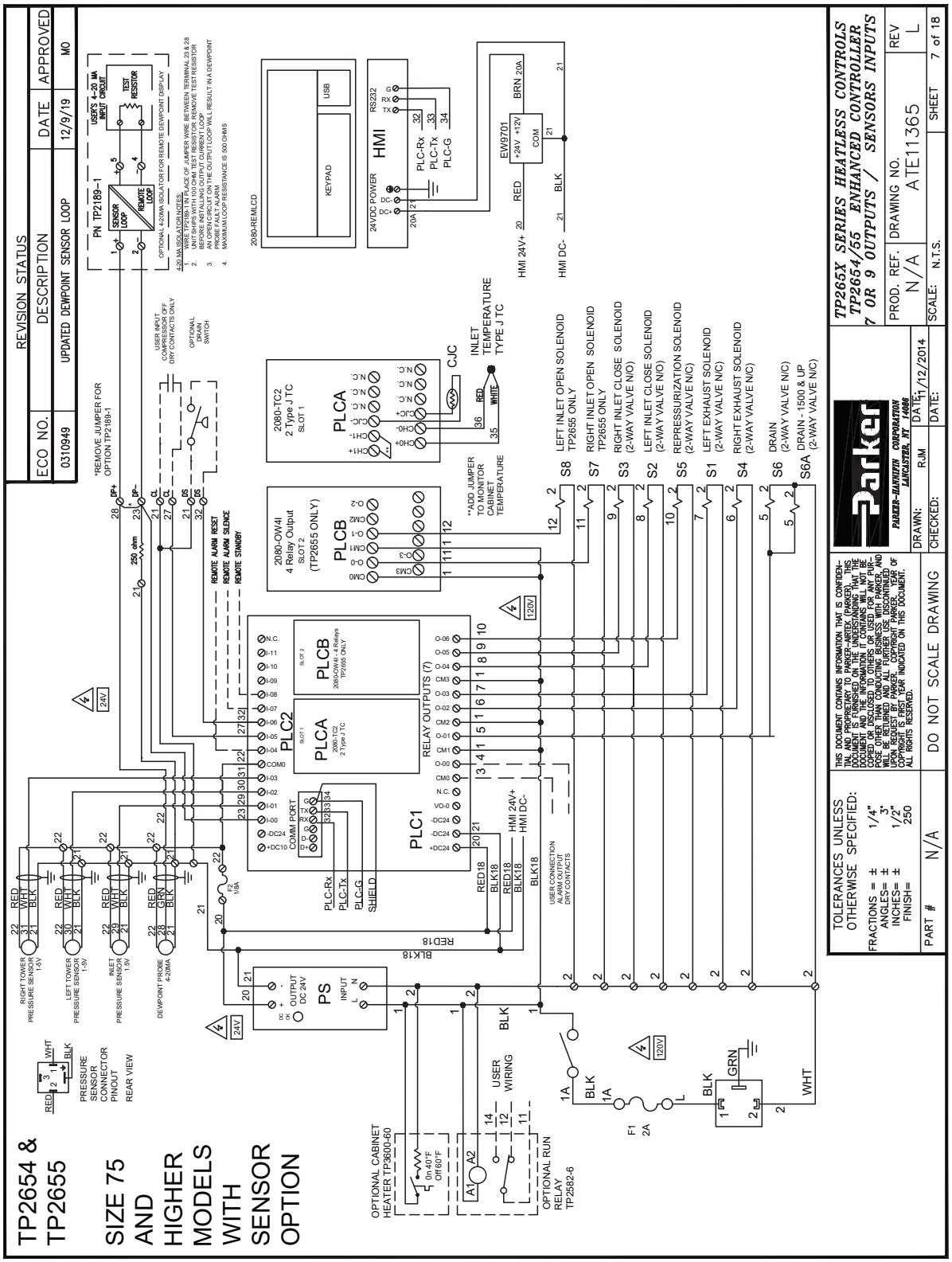


REF: DWG ATE11365 REV H



REF: DWG ATE11365 TP2654-10

WIRING DIAGRAM ADVANCED CONTROLLER MODELS 76-3001



START UP

Verify all piping and electrical connections are secure. Do not power the dryer at this time.
Start the compressor and pressurize the air system, bypassing the dryer.

Slowly pressurize the dryer by opening the inlet isolation valve. It is important to allow the dryer to slowly pressurize to prevent fluidization of the desiccant bed. Rapid pressurization can also cause damage to the vessel internal screens and filter elements.

Slowly open the dryer outlet isolation valve. Close the bypass valve.

The dryer must be started without the mufflers installed. This will expedite removal of excess desiccant dust and prevent premature clogging of the mufflers.

CAUTION: USE EAR AND EYE PROTECTION WHEN OPERATING THE DRYER WITHOUT MUFFLERS. EXCESSIVE NOISE WILL BE CREATED. DUST AND PARTICLES FROM THE SURROUNDING AREA MAY BECOME AIRBORNE. OPERATION WITHOUT MUFFLERS EXCEEDS OSHA LIMITS.

Power up the dryer. Verify timing cycle is set correctly. If you do not want the dryer to begin cycling automatically, close the control air ball valve to keep the inlet and exhaust switching valves in the same position.

Open the control air ball valve. Apply power to the controller to start the dryer. The cycle will begin with blowdown of one of the vessels and drying on the other vessel.

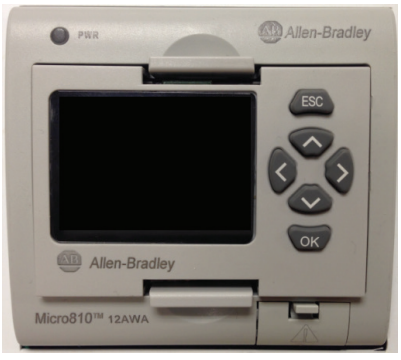
Verify the purge pressure setting is correct for the operating conditions. The purge pressure setting cannot be reduced from the factory setting while using the compressor lock or dewpoint demand features.

After several cycles the mufflers can be installed on the dryer exhaust valves.

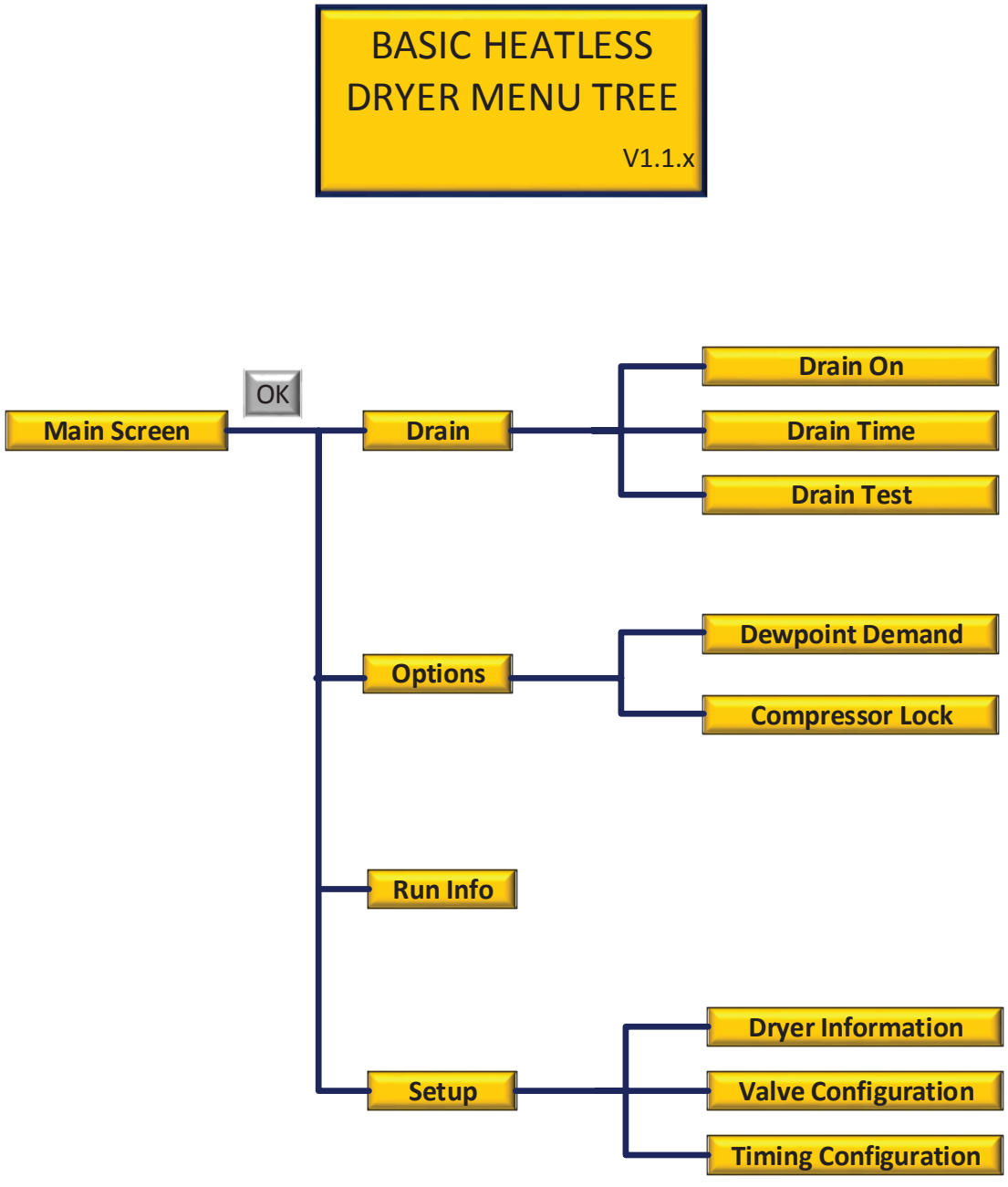
STANDARD CONTROLLER

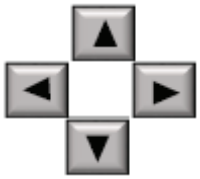
The standard controller is an Allen Bradley PLC with a text LCD display screen.
The controller is factory programmed with the proper valve and timing configurations for the dryer model.
The controller keypad is accessed by opening the enclosure door. The LCD is backlit and times out 30 seconds (not adjustable) after the last key is pressed.

Always close and secure the enclosure door when not using!



Basic Heatless Dryer Menu Tree



	Press to enter the menus and select and store settings.
	Press to go backwards in the menu tree and to abort setting changes.
	Use the arrow keys to scroll thru menus and change settings. Note: Pressing the right arrow key from the main screen will result in aborting regeneration of the offline tower and proceeding repressurization. (See Manual Stepping section)

Operating Screens

Main Operating Screen

```
TOWER  L R TR
DRYING <   3m23s
REGEN    < 2m53s
REPRES
```

- Default screen.
- Displays the drying, regeneration, and repressurization time remaining in the cycle.
- The arrows indicate which tower is drying and which is in regeneration or repressurization state.

Dryer Information Screen

```
(c)2017 PARKER
  HANNIFIN CORP
ID: TP2651-53
 V: 1.1.x (A,1)
```

- Displays the controller Model ID, firmware version, and Configuration Code during power up.
- Can also be accessed from the Setup menu.
- Valve and timing configuration shown in () next to firmware

Run Information Screen

```
[Run Info]
000000.0 HOURS
00000000 CYCLES
          [ESC]
```

- Displays the hours of operation and the total numbers of drying cycles since the dryer was first turned on.
- These values cannot be reset or other-wised changed.
- This screen can be accessed thru the menus or by pressing the **left arrow** key.

Cycle Lock Active Screen	
DEWPOINT DEMAND LEFT DRYING 11h33m13s <ESC> To Ignore	- Controlled by external dewpoint demand system. - Displayed as long as the Dewpoint Demand input is closed at end of regeneration. - Maximum drying time is 12 hours before switching to the opposite tower. - Timer value indicates time left until switchover. - Press **ESC** to switch towers immediately.

Compressor Lock Active Screen	
WAITING FOR COMPRESSOR <ESC> To Exit	- Saves purge air while compressor is off by syncing dryer regeneration to compressor - Displayed as long as the Compressor Lock input is closed during regeneration. - Pauses regeneration until the Compressor Lock input opens. - Press **ESC** to finish current regeneration cycle.

Menu Screens

Main Menu	
[Menus] >Drain Options Run Info [Menus] >Setup	- Accessed by pressing the **[OK]** key from the main screen - Select from the following: Drain – Drain timing and test function Options – User configurable settings Run Information – Dryer hours of operation and cycle count Setup Sub Menus – Dryer Information, and Dryer settings - Press **[ESC]** to return to Main Screen

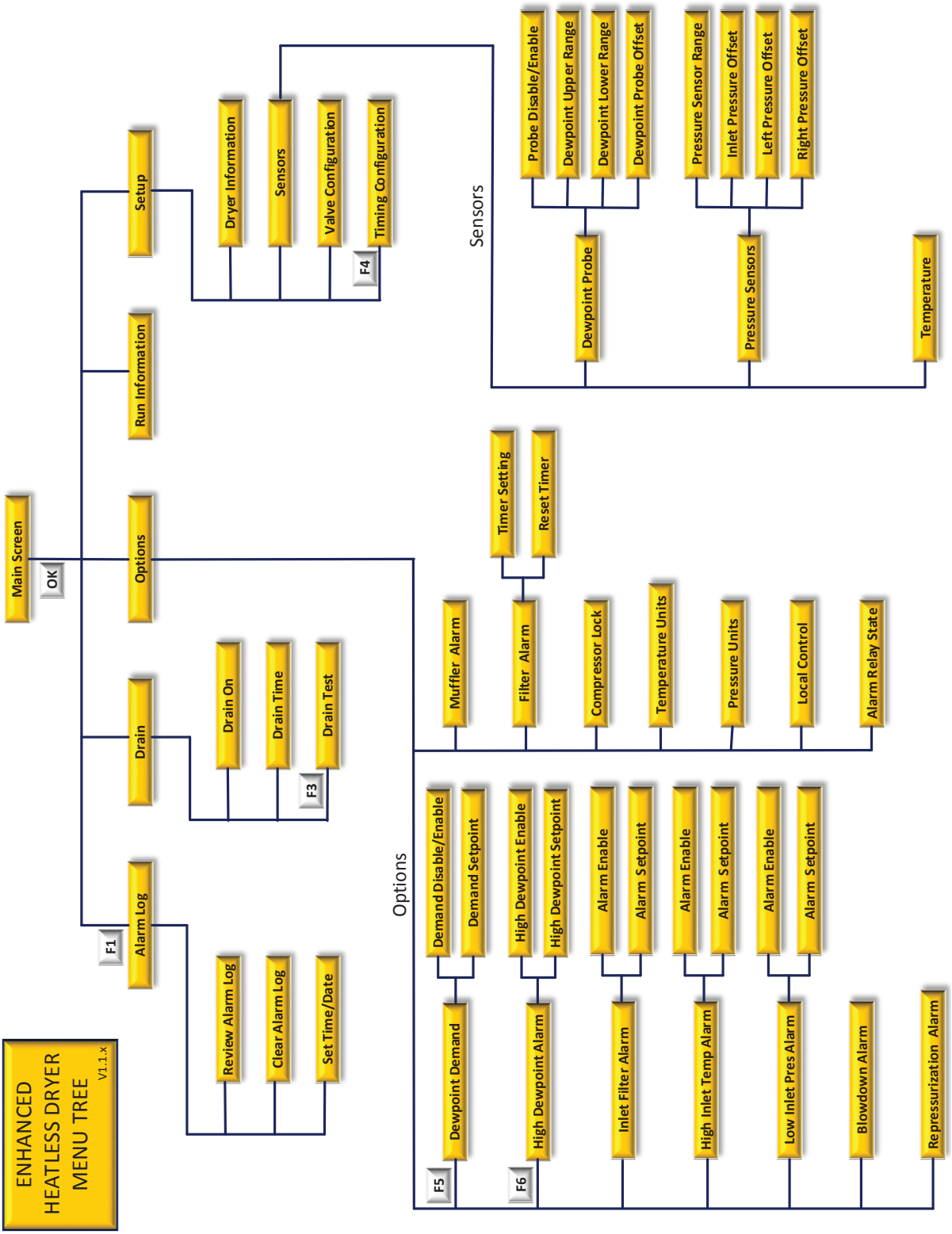
Drain Menu (Applies only to dryers with timed drain valve installed)	
[Drain] >Drain On Drain Time Drain Test	- Select from the following Drain On – Drain duration setting Drain Time – Drain cycle time setting Drain Test – Push to test function
Drain On Setting (Applies only to dryers with timed drain valve installed)	
[Drain On] Seconds: 2 1 to 10 [OK] [ESC]	- Select how long the pre-filter timed drain valve is open. - Settable from 1 to 10 seconds. - The default setting is 2 seconds.
Drain Time Setting (Applies only to dryers with timed drain valve installed)	
[Drain Time] Minutes: 10 1 to 60 [OK] [ESC]	- Select how often the pre-filter timed drain valve opens. - Settable from 1 to 60 minutes. - The default setting is 10 minutes.

Drain Test (Applies only to dryers with timed drain valve installed)	
[Drain Test] Drain Open [OK] [ESC]	- Press **[OK]** to open the timed drain valve. - The valve will open for the duration set on the Drain On Setting Screen. - Drain state on display will change from Closed to Open.

Options Menu	
[Options] Dewpt Demand >Compres Lock	- Select from the following: Dewpoint Demand – Enable contact closure input to syncs with external dewpoint demand system. Compressor Lock – Enable contact closure input to sync with compressor.
Dewpoint Demand Setting	
[Dewpt Demand] >Enabled Disabled [OK] [ESC]	- Select **Enabled** or **Disabled** - Default is **Enabled** - Must be wired to external dewpoint demand system's isolated dry contacts. - Delays tower switchover until switch input opens.
Compressor Lock Setting	
[Compres Lock] >Enabled Disabled [OK] [ESC]	- Select **Enabled** or **Disabled** - Default is **Enabled** - Must be wired to external compressor's isolated dry contacts. - Dryer will pause regeneration while switch input is closed.

Setup Menu	
[Setup] >Info Valve Config Timing Config	- Select from the following: Dryer model and firmware revision information Valve Configuration Factory setting Cycle Timing Configuration Setting
Valve Configuration Setting	
[Valve Config] Config:A *LOCKED TP2653 60-800 [OK] [ESC]	- Displays the valve configuration setting for the dryer. - This setting is preset at the factory for the specific dryer model. - Setting is Locked and must not be changed.
Timing Configuration Setting	
[Timing Config] Config: 1 10 MIN 100% [OK] [ESC]	- Displays timing cycle needed for the air demand flowing through the dryer. - The configuration is pre-set at the factory for the specific dryer model. - Do not change this setting without an understanding of its effects on dewpoint. **(See Timing Configuration section)**

Enhanced Heatless Dryer Menu Tree

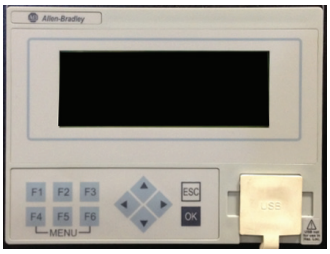


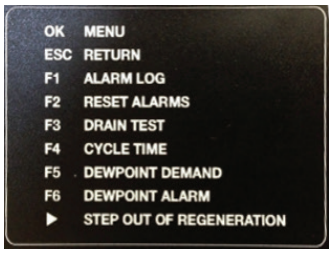
ADVANCED CONTROLLER (optional models 41-801, standard models 1001-3001)

The advanced controller is an Allen Bradley PLC® with a LCD HMI display. The controller is factory programmed with the proper valve and timing configurations for the dryer model.

The LCD includes a multicolored backlight. The backlight will flash RED during an active alarm, or GREEN if the dewpoint demand is satisfied. The default backlight is WHITE, and will change to BLUE as the cabinet temperature rises. This is an indication of higher than normal ambient temperature. If the cabinet temperature continues to rise, the display backlight will change from constant to flashing.

The controller keypad is accessed by opening the enclosure door. Always close and secure the enclosure door when not using!





Navigation Keys

OK	Press to enter the menus and select and store settings.
ESC	Press to go backwards in the menu tree and to abort setting changes.
▲ ◀ ▶ ▼	Use the arrow keys to scroll thru menus and change settings. Note: Pressing the **right arrow key** from the main screen will result in aborting regeneration of the offline tower and proceeding repressurization. **(See Manual Stepping section)**
F1	Silences active alarms screen and turns off alarm relay. Press to view Alarm Log after silencing active alarms.
F2	Press to reset all active alarms.
F3	Press to display Drain Test Screen.
F4	Press to display Cycle Timing Screens.
F5	Press to display Dewpoint Demand Settings.
F6	Press to display Dewpoint Alarm Settings.

Operating Screens

Main Operating Screen

```
DEWPOINT    -40ºF ES:53%
INLET       100ºF 100psi
L DRYING    3m23s 100psi
R REGEN     2m53s   0psi
```

- Default screen.
- Displays the drying, regeneration, and repressurization time remaining in the cycle.
- Displays dewpoint value, energy savings, and active alarm messages on top line.
- Displays inlet pressure and temperature on second line.
- Display tower pressures next to left and right tower.

Model Information Screen

```
(c)2017 PARKER
  HANNIFIN CORP
     ID: TP2654
VERSION: 1.1.x (F,1,1)
```

- Displays the controller Model ID, firmware version, and Configuration Code during power up.
- Can also be accessed from the Setup menu.
- Valve, timing, and pressure configuration shown in () next to firmware.

Run Information Screen

```
[Run Information]
 RUN TOTAL:000000.0 HRS
POWER SAVE:000000.0 HRS
    CYCLES:00000000
```

- Displays the hours of operation, hours in power save state, and the total numbers of drying cycles since the dryer was first turned on.
- These values cannot be reset or other-wised changed.
- This screen can be accessed thru the menus or by pressing the **left arrow** key.

Dewpoint Demand Active Screen

```
    DEWPOINT DEMAND
LEFT DRYING: 11h33m13s
DEWPOINT: -43ºF
     <ESC> To Ignore
```

- Displayed as long as the dewpoint is below the Dewpoint Demand setting at end of regeneration.
- Backlight changes to green.
- Displays current dewpoint and time left until switchover.
- Maximum drying time is 12 hours before switching to the opposite tower.
- Press **ESC** to switch towers immediately.

Compressor Lock Active Screen

```
        WAITING
          FOR
      COMPRESSOR
 <ESC> To Finish Cycle
```

- Saves purge air while compressor is off by syncing dryer regeneration to compressor.
- Displayed as long as the Compressor Lock input is closed during regeneration.
- Press **ESC** to finish current regeneration cycle.

Operating Screens

Main Menu

```
[Menus]
>Alarm Log
 Drain
 Options
```

```
[Menus]
 Run Information
 Setup
```

- Select from the following:
  - Alarm Log Menu
  - Drain Menu
  - Options Menu
  - Run Information – Dryer hours of operation and cycle count
  - Setup Menu
- Press **[ESC]** to return to Main Screen

Alarm Log Menu

```
[Alarm Log]
>Review Alarm Log
 Clear Alarm Log
 Set Time/Date
```

- Access by hitting **[F1]** after silencing active alarm or from Main Menu
- Select from the following:
  - Review Alarm Log to scroll thru the last 30 alarms.
  - Clear Alarm Log to delete alarm history.
  - Set Time/Date to set the time and date.

Review Alarm Log

```
[Review Alarm Log]
 04/12/2015  12:12:00
 HIGH DEWPOINT
  [UP]   [DN]   [ESC]
```

- Displays description with date and time of alarm.
- Use the **UP** and **DOWN** keys to scroll thru the log.
- Shows the last **30 alarms.**

Clear Alarm Log

```
[Erase Alarm Log]
Erase Alarm Log?

 [ESC] = NO, [OK] = YES
```

- Select **[OK]** to permanently erase the alarms from the alarm log.

Set Time/Date

```
[Set Time/Date]
     MM/DD/YYYY HH:MM
Mon  01/02/2016 12:34
[U][D][R][L] [ESC] [OK]
```

- Set the time and date in 24-hour format.
- Use **LEFT** and **RIGHT** keys to navigate the digits.
- Use **UP** and **DOWN** keys to change values.

Drain Menu (Applies only to dryers with timed drain valve installed)	
[Drain] >Drain On Drain Time Drain Test	- Select from the following: Drain On – Drain duration setting Drain Time – Drain cycle time setting Drain Test – Push to test function
Drain On Setting (Applies only to dryers with timed drain valve installed)	
[Drain On] Seconds: 2 1 to 10 [OK] [ESC]	- Select how long the pre-filter timed drain valve is open. - Settable from 1 to 10 seconds. - The default setting is 2 seconds.
Drain Time Setting (Applies only to dryers with timed drain valve installed)	
[Drain Time] Minutes: 10 1 to 60 [OK] [ESC]	- Select how often the pre-filter timed drain valve opens. - Settable from 1 to 60 minutes. - The default setting is 10 minutes.
Drain Test (Applies only to dryers with timed drain valve installed)	
[Drain Test] Drain Open [OK] [ESC]	- Press **[OK]** to open the timed drain valve. - The valve will open for the duration set on the Drain On Setting Screen. - Drain state on display will change from Closed to Open.

Options Menu	
[Options] >Dewpoint Demand High Dewpoint Alarm Inlet Filter Alarm [Options] High Inlet Temp Alarm Low Inlet Pres Alarm Blowdown Alarm [Options] Repressurization Alarm Muffler Alarm Filter Timer [Options] Compressor Lock Temperature Units Pressure Units [Options] Local/Remote Control Alarm Relay State	- Accessed from main screen by pressing **[OK]** key. - Select from the following: Dewpoint Demand settings High Dewpoint Alarm settings Inlet Filter Alarm settings High Inlet Temperature Alarm settings Low Inlet Pressure Alarm settings Blowdown Alarm Enable setting Repressurization Alarm Enable setting Muffler Alarm Enable Filter Timer Settings and Reset Compressor Lock Enable setting Displayed Temperature Units Setting Displayed Pressure Units setting Local/Remote Control Access Alarm Relay State setting - Use the **UP** and **DOWN** keys to scroll thru the menu items. - Press **[OK]** to select - Press **[ESC]** to go back to main screen

Dewpoint Demand Settings

```
[Dewpoint Demand]
 Demand Disable/Enable
 Demand Set-point
```

- Accessed from Options screen
- Select from the following:
  - Dewpoint demand enable
  - Dewpoint Demand threshold
- **See Dewpoint Demand Section**

Dewpoint Demand Enable Setting

```
[Demand Disable/Enable]
>Enabled
 Disabled
 [OK]            ESC]
```

- Select **Enabled** or **Disabled**
- Default is **Enabled**
- Delays tower switchover until dewpoint rises above threshold.
- **See Dewpoint Demand section**

Dewpoint Demand Set-point Setting

```
[Demand Setpoint]
Setpoint: -40ºF
      -100 thru 20ºF
 [OK]            [ESC]
```

- Set demand threshold from -100 ºF to 20ºF (-73ºC to -4ºC)
- Default is -40ºF (-40ºC) for ISO 8573-1 Class 2 Operation
- Delays tower switchover until dewpoint rises above threshold.
- **See Dewpoint Demand section**

High Dewpoint Alarm Menu

```
[High Dewpoint Alarm]
>High DP Enable
 High DP Setpoint
```

- Accessed from Options screen
- Select from the following:
  - High Dewpoint Alarm Enable
  - High Dewpoint Alarm threshold
- **See Alarm Section - High Dewpoint Alarm**

High Dewpoint Alarm Enable Setting

```
[High DP Enable]
>Alarm Enabled
 Alarm Disabled
  [OK]            ESC]
```

- Select **Enabled** or **Disabled**
- Default is **Enabled**
- **See Alarm Section - High Dewpoint Alarm**

High Dewpoint Alarm Setpoint Settings

```
[High DP Setpoint]
Setpoint: -20ºF
      -80 thru 50ºF
 [OK]            [ESC]
```

- Set alarm threshold from -80ºF to 50ºF (-60ºC to -10ºC)
- Default is -20ºF (-29ºC)
- **See Alarm Section - High Dewpoint Alarm**

Inlet Filter Menu

```
[Inlet Filter Alarm]
>Enable
 Setpoint
```

- Accessed from Options screen
- Select from the following:
  - Inlet Filter Alarm Enable
  - Inlet Filter Alarm threshold
- **See Alarm Section – Inlet Filter Alarm**

Inlet Enable Setting

```
[Inlet Filter Enable]
>Alarm Enabled
 Alarm Disabled
  [OK]            ESC]
```

- Select **Enabled** or **Disabled**
- Default is **Enabled**
- **See Alarm Section – Inlet Filter Alarm**

Inlet Setpoint Settings

```
[Inlet Filter Setpoint]
Setpoint:   8 psi
       0 THRU 15 psi
[OK]            [ESC]
```

- Set alarm threshold from 0 to 15psi (0 to 1.0 bar)
- Default is 8 psi (0.5 bar)
- **See Alarm Section – Inlet Filter Alarm**

High Inlet Temperature Alarm Settings	
[High Input Temp Alarm] >Alarm Enable Alarm Setpoint	- Accessed from Options screen - Select from the following: High Inlet Temperature Alarm Enable High Inlet Temperature Alarm threshold - **See Alarm Section - High Inlet Temperature Alarm**
High Inlet Temperature Alarm Enable Setting	
[Inlet Temp Enable] >Alarm Enabled Alarm Disabled [OK] ESC]	- Select **Enabled** or **Disabled** - Default is **Enabled** - **See Alarm Section - High Inlet Temperature Alarm**
High Inlet Temperature Alarm Setpoint Setting	
[Inlet Temp Setpoint] Setpoint: 101ºF 50 thru 150ºF [OK] [ESC]	- Set alarm threshold from 50ºF to 150ºF (10ºC to 65ºC) - Default is 101ºF (38ºC) - **See Alarm Section - High Inlet Temperature Alarm**

Low Inlet Pressure Alarm Setting	
[Low Input Pres Alarm] >Alarm Enable Alarm Setpoint	- Accessed from Options screen - Select from the following: Low Inlet Pressure Alarm Enable Low Inlet Pressure Alarm threshold - **See Alarm Section - Low Inlet Pressure Alarm**
Low Inlet Pressure Alarm Setting	
[Low Inlet Setpont] >Alarm Enabled Alarm Disabled [OK] ESC]	- Select **Enabled** or **Disabled** - Default is **Enabled** - **See Alarm Section - Low Inlet Pressure Alarm**
Low Inlet Pressure Alarm Setting	
[Low Inlet Setpont] Setpoint: 60 psi 20 thru 100 psi [OK] [ESC]	- Set alarm threshold from 20psi to 100psi (1.4bar to 7.0bar) - Default is 60psi (4bar) - **See Alarm Section - Low Inlet Pressure Alarm**

Blowdown Alarm Setting	
[Blowdown Alarm] >Alarm Enabled Alarm Disabled [OK] ESC]	- Accessed from Options Menu - Select **Enabled** or **Disabled** - Default is **Enabled** - **See Alarm Section - Blowdown Alarm**

Repressurization Alarm Setting	
[Repressurization Alarm] >Alarm Enabled Alarm Disabled [OK] ESC]	- Accessed from Options Menu - Select **Enabled** or **Disabled** - Default is **Enabled** - **See Alarm Section - Repressurization Alarm**

Muffler Alarm Setting

```
[Muffler Alarm]
>Alarm Enabled
 Alarm Disabled
  [OK]
```

- Accessed from Options Menu
- Select **Enabled** or **Disabled**
- Default is **Enabled**
- **See Alarm Section - Muffler Alarm**

Filter Timer Alarm Settings

```
[Filter Timer]
>Timer Setting
 Reset Timer
```

- Accessed from Options Menu
- Select from the following:
  - Filter Timer Setting
  - Reset Filter Timer
- **See Alarm Section – Change Filter Alarm**

Filter Timer Alarm Setting

```
[Filter Timer Setting]
Days: 180
  30 to 360
[OK]    [ESC]
```

- Set alarm timeout from 30 to 360 days
- Default is 180 days
- **See Alarm Section - Change Filter Alarm**

Reset Filter Timer

```
[Reset Filter Timer]
Days Remaining: 23/180
 Reset Filter Timer?
 [ESC] = NO, [OK] =
```

- Reset Filter timer by pressing **[OK]** key
- Displays Days Remaining / Total Days
- **See Alarm Section – Change Filter Alarm**

Compressor Lock Setting

```
[Compres Lock]
>Enabled
 Disabled
[OK]       [ESC]
```

- Accessed from Options Menu
- Select **Enabled** or **Disabled**
- Default is **Enabled**
- **See Compressor Lock Section**

Temperature Units Setting

```
[Temperature Units]
>Fahrenheit
 Celsius
[OK]
```

- Accessed from Options Menu
- Select **Fahrenheit** or **Celsius** temperature units
- Default is **Fahrenheit**

Pressure Units Setting

```
[Pressure Units]
>psi       bar      kPa

 [OK]
```

- Accessed from Options Menu
- Select **psi, bar, or kPa** pressure units
- Default is **psi**

Local/Remote Control Setting	
[Local/Remote Control] >Local and Remote Local Control Only [OK] [ESC]	- Accessed from Options Menu - **Local and Remote** (Default) – Changes can be made from both the user interface and remotely via the Modbus port. - **Local Control Only –** Changes can only be made from the local user interface. Settings are 'read only' via the Modbus port.

Alarm Relay State Setting	
[Alarm Relay] >Normally Open Normally Closed [OK] [ESC]	- Accessed from Options Menu - **Normally Open** (Default) – Closes the alarm contacts during an alarm. - **Normally Closed** – Contacts are closed during normal operation. Contacts open if power is turned off, or an alarm occurs, providing verification that the dryer is both Running and that there are no active alarms.

Setup Menu

```
[Setup]
>Info
 Sensors
 Valve Config
```

```
[Setup]
> Timing Config
```

- Accessed from the Main Menu
- Select from the following:
  - Dryer model and firmware revision information
  - Sensor related settings calibration
  - Valve Configuration Factory setting
  - Cycle Timing Configuration Setting

Sensors Settings Menu

```
[Sensor Settings]
>Dewpoint Probe
 Pressure Sensors
 Inlet Temperature
```

- Accessed from the Main Menu
- Select from the following:
  - Dewpoint Probe enable and calibration settings
  - Pressure Sensors Settings and offset adjustment
  - Inlet Temperature Offset adjustment

Dewpoint Probe Settings Menu

```
[Dewpoint Probe]
>Probe Disable/Enable
 Dewpoint Upper Range
 Dewpoint Lower Range
```

```
[Dewpoint Probe]
> Dewpoint Probe Offset
```

- Select from the following:
  - Dewpoint probe enable
  - Probe upper range setting
  - Probe lower range setting
  - Probe offset adjustment

Dewpoint Probe Enable Setting

```
[Probe Disable/Enable]
>Enabled
 Disabled
 [OK]          [ESC]
```

- Select **Enabled** or **Disabled**
- Default is **Enabled**

Dewpoint Probe Upper Range Calibration Setting

```
[Dewpoint Upper Range]
Upper:   68ºF
   -4ºF thru 86ºF
 [OK]          [ESC]
```

- Set dewpoint probe upper range setting -4ºF to 86ºF (-20ºC to 30ºC)
- Default is -148ºF (-100ºC)

Dewpoint Probe Lower Range Calibration Setting

```
[Dewpoint Lower Range]
Lower:   -148ºF
   -238ºF thru -4ºF
 [OK]          [ESC]
```

- Set dewpoint probe upper range setting -238ºF to -4ºF (-150ºC to -20ºC)
- Default is 68ºF (20ºC)

Dewpoint Probe Offset Calibration Setting

```
[Dewpoint Offset]
Lower:   0 ºF
     -36ºF thru +36ºF
 [OK]          [ESC]
```

- The dewpoint probe value can be offset to correct for minor dewpoint probe inaccuracies.

Pressure Sensors Menu

```
[Pressure Sensors]
>Pressure Sensor Range
 Inlet Pressure Offset
 Left Pressure Offset
```

```
[Pressure Sensors]
 Right Pressure Offset
```

- Select from the following:
  - Sensor pressure range select (200 or 600psi)
  - Inlet pressure sensor offset
  - Left pressure sensor offset
  - Right pressure sensor offset

Pressure Sensor Range Setting

```
[Pressure Sensor Range]
Range: 200psi *LOCKED*
Select 200 or 600psi
   [OK]         [ESC]
```

- Select sensor range **200psi or 600psi**
- Default is **200psi** for standard dryers
- This setting is preset at the factory for the specific dryer model
- Setting is Locked and must not be changed.

Pressure Offset Settings (Inlet, Left, and right tower pressures)

```
[Inlet Pressure Offset]
Offset:  0 psi
        -15 thru +15psi
   [OK]         [ESC]
```

- The Inlet, Left, and Right pressure sensor values can be offset to correct from minor inaccuracies in the pressure reading.

Inlet Temperature Offset Setting

```
[Inlet Temperature]
Offset:  0ºF
      -25 thru +25 ºF
   [OK]         [ESC]
```

- The inlet temperature sensor value can be offset to correct from minor inaccuracies in the temperature reading.

Valve Configuration Setting

```
[Valve Config]
Config:A *LOCKED
TP2653 60-800
[OK]      [ESC]
```

- Displays the valve configuration setting for the dryer.
- Accessed from Setup Menu
- This setting is preset at the factory for the specific dryer model.
- Setting is Locked and must not be changed.

Timing Configuration Setting

```
[Timing Config]
Config: 1
10 MIN 100%
[OK]     [ESC]
```

- Displays timing cycle needed for the air demand flowing through the dryer.
- The configuration is pre-set at the factory for the specific dryer model.
- Do not change this setting without an understanding of its effects on dewpoint. **(See Timing Configuration section)**

Dryer Advanced Control Panel Alarm Screens

Alarm Log Menu

```
[Alarm Log]
>Review Alarm Log
 Clear Alarm Log
 Set Time/Date
```

- Accessed by pressing **[F1]** after silencing alarms or from Main Menu
- Select
  - Review Alarm Log to scroll thru the last 30 alarms
  - Clear Alarm Log to delete alarm history
  - Set Time/Date to set the time and date

Review Alarm Log

```
[Review Alarm Log]
 04/12/2015  12:12:00
 HIGH DEWPOINT
  [UP]   [DN]   [ESC]
```

```
[Review Alarm Log]

       LOG EMPTY
                 [ESC]
```

- Displays description with date and time of alarm.
- Use the **UP** and **DOWN** keys to scroll thru the last 30 alarms
- A message will be displayed indicating if no alarms have occurred since the last time the log was cleared.

Clear Alarm Log

```
[Erase Alarm Log]
Erase Alarm Log?

 [ESC] = NO, [OK] = YES
```

- Select **[OK]** to permanently erase the alarms from the alarm log.

Alarm - Left/Right Tower Failed to Blowdown

```
        ALARM
     LEFT TOWER
  FAILED TO BLOW DOWN
<F1> Silence  <F2> Reset
```

- Depressurization of the left or right tower (as indicated) is incomplete resulting in inefficient regeneration
- Check condition of left exhaust muffler and left exhaust valve for proper operation.
- Alarm must be manually reset by pressing **[F2].**
- The alarm can be disabled from the Option Menu

Alarm - Left/Right Tower Failed to Pressurize

```
        ALARM
     LEFT TOWER
  FAILED TO PRESSURIZE
<F1> Silence  <F2> Reset
```

- Left or right tower (as indicated) failed to pressurize to line pressure within the repressurization time.
- Check for proper operation of repressurization valve and left exhaust valve.
- Note: The towers will not switch until the tower reaches a safe level of pressure.
- Alarm must be manually reset by pressing **[F2].**
- The alarm can be disabled from the Option Menu

Alarm – High Inlet Temperature

```
        ALARM
HIGH INLET TEMPERATURE
  INLET TEMP:  113ºF
<F1> Silence  <F2> Reset
```

- Temperature into the dryer has exceeded the alarm threshold for at least 5 minutes.
- Operating the dryer in this condition can result in a reduction in dewpoint performance.
- Alarm will reset automatically once temperature falls below threshold
- Can be manually reset by pressing **[F2].**
- The alarm can be disabled or the threshold adjusted from the Option Menu

Alarm – Low Inlet Pressure	
ALARM LOW INLET PRESSURE INLET PRES: 35PSI <F1> Silence <F2> Reset	- Air pressure into the dryer is lower than the Low Inlet Pressure threshold. - Operating the dryer in this condition may result in overloading the desiccant with moisture and a reduction in dewpoint performance. - Low inlet pressure can also prevent the air actuated valves from switching, making the dryer inoperable. - Alarm will reset automatically once inlet pressure rises above threshold. - Can be manually reset by pressing **[F2].** - The alarm can be disabled or the threshold adjusted from the Option Menu
Alarm – High Dewpoint	
ALARM HIGH DEWPOINT DEWPOINT: -13ºF <F1> Silence <F2> Reset	- Dewpoint is above High Dewpoint Alarm threshold. - See “High Dewpoint” in Troubleshooting section for possible causes. - Alarm will reset automatically once Dewpoint falls below the threshold - Can be manually reset by pressing **[F2].** - The alarm settings can be accessed by pressing [F6] or from the Options Menu.
Alarm – Sensor Fault	
ALARM SENSOR FAULT LEFT TOWER PRESSURE <F1> Silence <F2> Reset	- Inlet pressure, right tower pressure, left tower pressure, inlet temperature, or dewpoint sensor (as indicated) is not working correctly. - Verify proper wiring of sensor and check that the sensor is not shorted - Alarm must be manually reset by pressing **[F2]** - Left or Right sensor fault prevents towers from switching
Alarm – Change Filters	
ALARM CHANGE FILTERS <F1> Silence <F2> Reset	- Maintenance interval for pre-filter and after-filter has been reached. - It is recommended to replace filter elements every six months to ensure the highest level of performance of the dryer. - Can be manually reset by pressing **[F2].** - The timer interval can be changed and the timer can be reset from the Options Menu
Alarm – Drain Fault	
ALARM DRAIN FAULT <F1> Silence <F2> Reset	- Optional drain switch input indicates drain valve is open for too long - Timeout is five seconds longer than the drain on time setting. - Alarm will reset automatically once the switch opens - Can be manually reset by pressing **[F2].** - Drain timing can be changed from the Drains Menu
Alarm – Left/Right Muffler Clogged	
ALARM LEFT MUFFLER CLOGGED <F1> Silence <F2> Reset	- Left or right tower pressure (as indicated) is too high at end of regeneration. - Check condition of mufflers and replace if necessary. - Note: Always replace both mufflers at the same time. - Alarm must be manually reset by pressing **[F2].** - Alarm can be disabled from the Options Menu
Alarm – Inlet Filter	
ALARM INLET FILTER <F1> Silence <F2> Reset	- Pressure across the Inlet Filter is greater than set point for 5 minutes. - Replace Inlet Filter. - Alarm must be manually reset by pressing **[F2].** - Alarm can be disabled from the Options Menu
Alarm – Switching Failure	
ALARM SWITCHING FAILURE <F1> Silence <F2> Reset	- Left/Right tower pressure is 15 psi below inlet pressure during regeneration. - Check all valves. - Alarm must be manually reset by pressing **[F2].** - Alarm cannot be disabled.

TIMING CONFIGURATION

The control panel allows the user to select different timing configurations depending on the air demand flowing through the dryer. Using timing configurations '2' and '3' during periods of light loading reduces the amount of purge air loss, saving energy. Timing configurations '4', '5', and '6' are special short cycle designs for specific models. The timing configuration is pre-set at the factory for the specific dryer model. Not all timing configurations are available for each valve configuration.

Time Configuration	Operating Flow	Cycle Time	Per Tower		
			Drying	Regen	Repress
1	100%	10 min	5 min	4 min 20 s	40 s
2	75%	15 min	7 min 30 s	4 min 20 s	3 min 10 s
3	50%	20 min	10 min	4 min 20 s	5 min 40 s
4	special	4 min	2 min	1 min 20 s	40 s
5	special	5 min	2 min 30 s	1 min 50 s	40 s
6	special	6 min	3 min	2 min 30 s	30 s

COMPRESSOR LOCK OPERATION

The Compressor Lock feature is an energy savings feature that stops the dryer from using purge air by pausing the regeneration and drying cycle while the compressor is not running. The dryer controller must be wired to the compressor as indicated on the dryer wiring diagram. The compressor lock feature must be set to Enabled. This will override the timing configuration.

DEWPOINT DEMAND OPERATION

The Dewpoint Demand feature is an energy savings feature that extends the drying cycle while the user defined dewpoint requirements are met. The offline desiccant vessel completes its regeneration as normal and waits in stand by for the dewpoint to degrade to the analyzer setpoint and then switches over. By extending the cycle, less purge air consumed over a period of time. For dryers equipped with a standard controller, a user supplied external dew-point analyzer must be wired to the control panel as indicated on the wiring diagram. The Power Lock feature must be set to Enabled. This will override the timing configuration.

MANUAL STEPPING

This feature is designed to improve maintenance and troubleshooting of the dryer. Pressing the [>] button at the main screen will step the dryer out of regeneration and cause the dryer to immediately repressurize. Using this feature may yield worse than desired dewpoint until the dryer is allowed to cycle uninterrupted. It is for this reason that this function only be used for troubleshooting the dryer. For safety, it is not possible to step out of repressurization.

COMMUNICATIONS (ADVANCED CONTROLLER ONLY)

Ethernet Communications - The dryer comes standard with an Ethernet Modbus TCP/IP interface located along the bottom edge of the PLC. The port comes preconfigured in DHCP mode. The MAC address is located on the front of the PLC located inside the control box and can be used to map the PLC to a static IP address within the DHCP server.

CONFIGURING STATIC IP ADDRESS (ADVANCED CONTROLLER ONLY)

The static IP address can be configured by accessing the low-level system menus of the PLC

1) From the main screen, press the OK and ESC button simultaneously to exit to the PLC's system menus.

2) Switch from RUN mode to PROGRAM mode
   a. Select "Mode Switch" and hit OK
   b. Select the UP or DOWN key to change to "PROG"
   c. Hit OK to select

3) Go to ADVANCED> ENET Cfg>IP Address Settings
   a. Use the UP key to go to "Advanced Settings" and select OK.
   b. Use the UP key to go to "IP Address Settings" and select OK.
   c. Use the Arrow keys to set the following:
      i. Change ENET Mode to Static
      ii. Set IP Address
      iii. Set Subnet Mask
      iv. Set Gateway Address if required.
   d. Select "Save Settings" **IMPORTANT! Do not skip this step.**

4) Verify Settings
   a. Use the UP key to go to "Advanced Settings" and select OK.
   b. Use the UP key to go to "ENET Cfg" and select OK.
   c. Select "ENET Status" to verify the new settings.

5) Switch back to RUN mode. **IMPORTANT! Do not skip this step.**

6) Turn the power off then back on using the power switch located below on the bottom of the control box.

RS232 or RS485 Communications

If the dryer must be connected to an RS485 network or RS232 port, use a Modbus Gateway device such as SW2400-MOD.

CONFIGURING SW2400-MOD MODBUS-TCP TO MODBUS-RTU OPTION (ADVANCED CONTROLLER ONLY)

Before proceeding, set the IP settings in the dryer to the following:
(Refer to CONFIGURING STATIC IP ADDRESS)

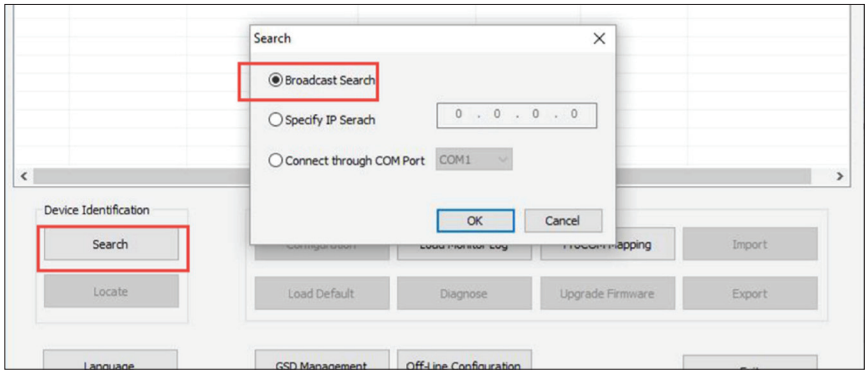
Mode:	STATIC
IP Address:	192.168.1.200
Subnet Mask:	255.255.255.0
Gateway:	0.0.0.0
DNS:	0.0.0.0

The software that comes with the gateway is used to change the configuration

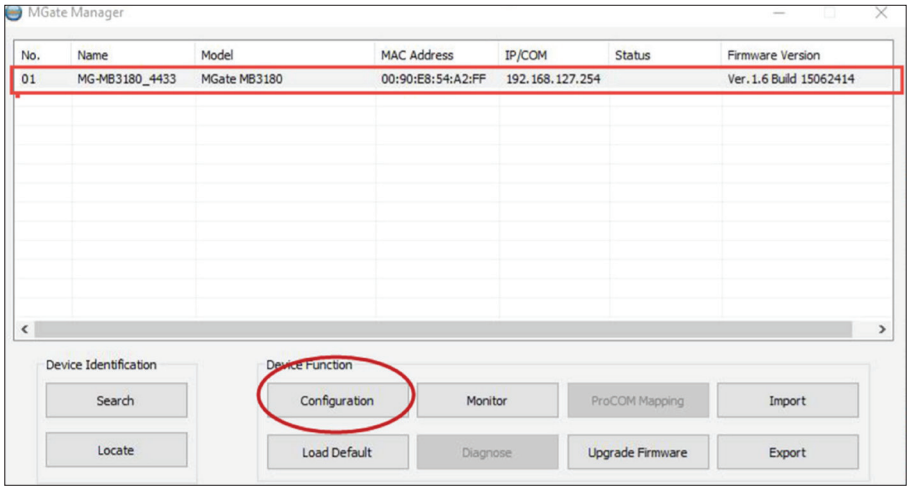
1) Install the MGate Manager software included on the CD that came with the gateway

2) Connect the Gateway to the Ethernet and power up the device

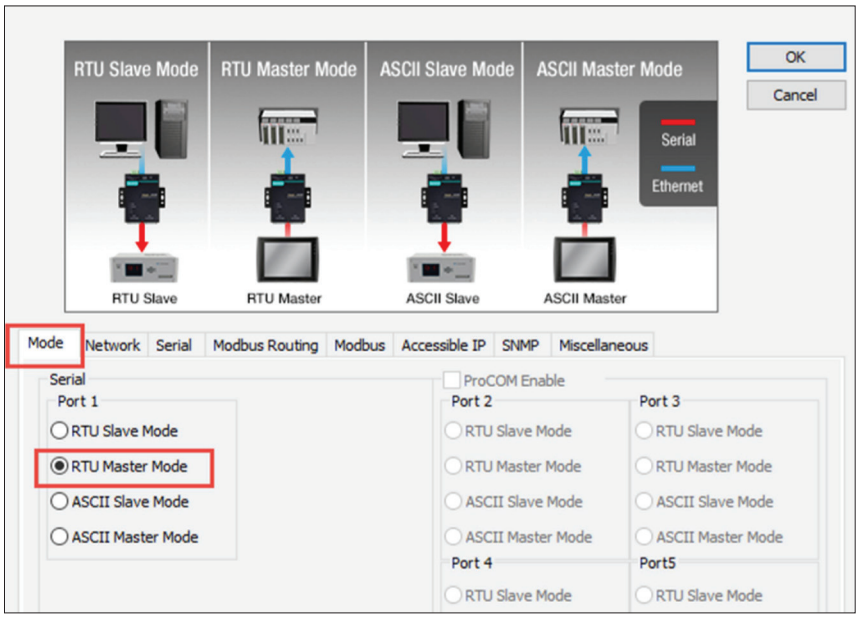
3) Select Search and choose Broadcast Search to find the device on the network



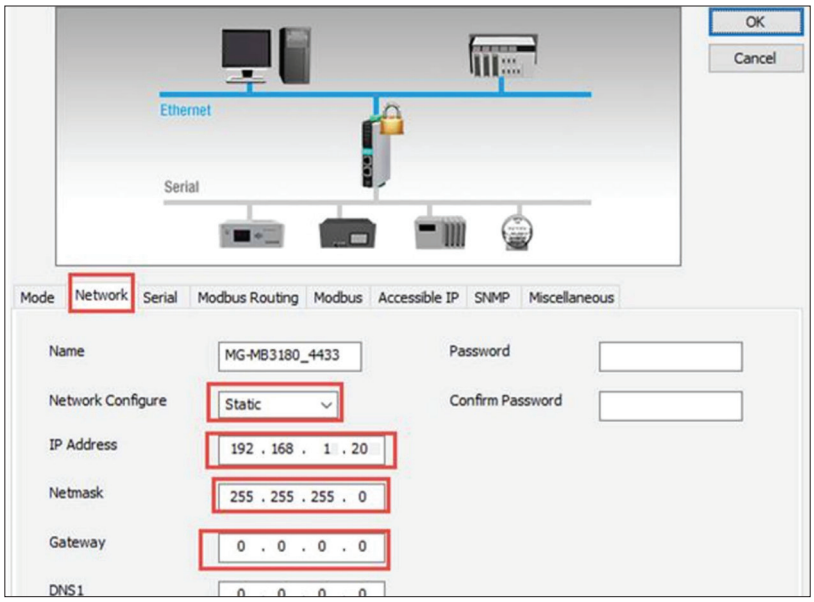
4) Highlight the device and select Configuration



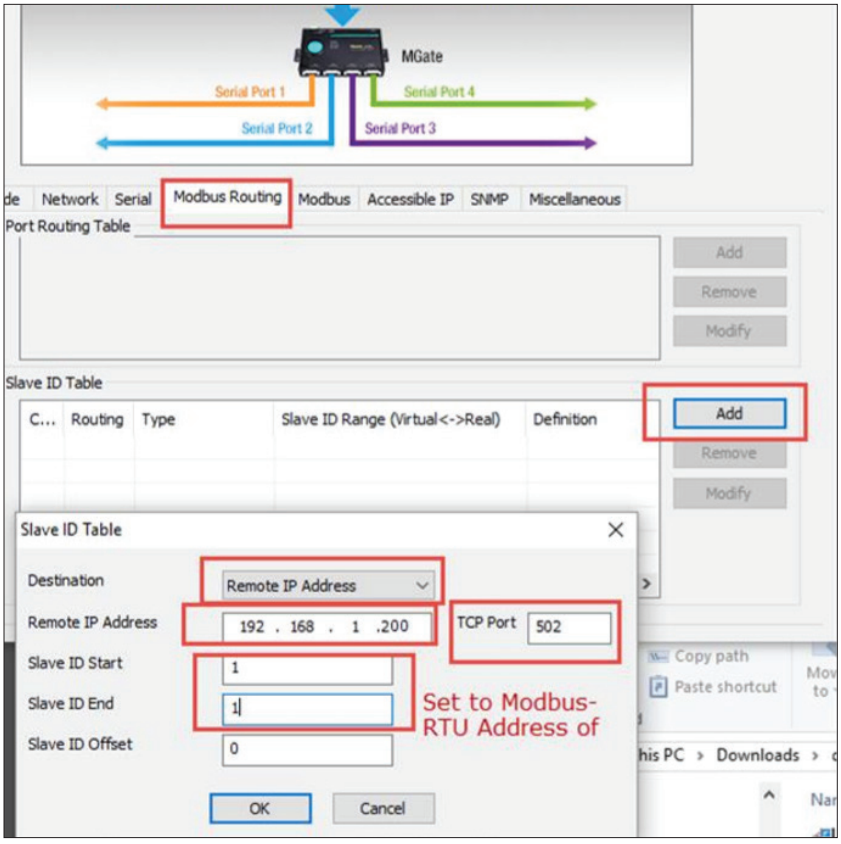
5) Select RTU Master Mode



6) Configure Network as follows:



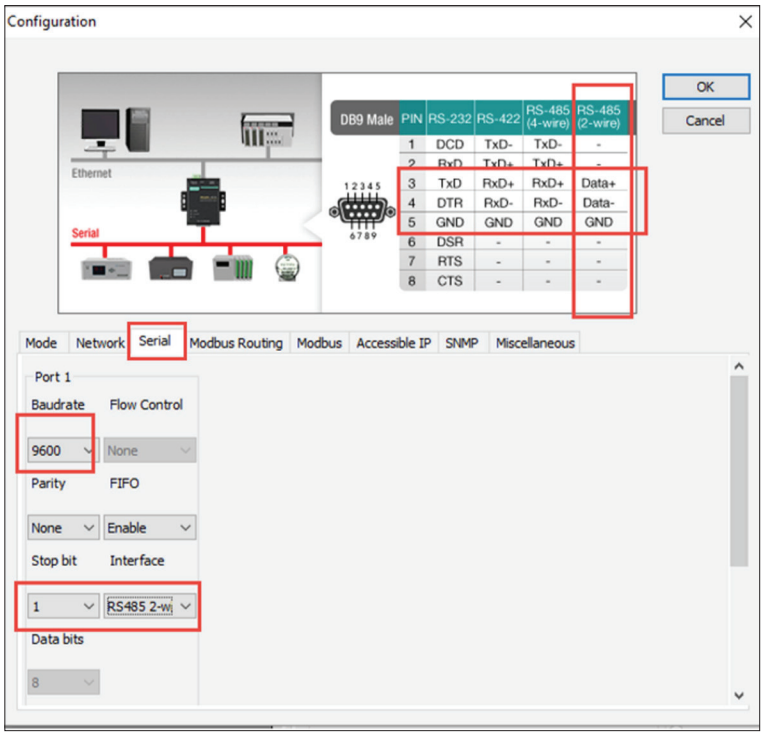
7) Modbus Routing



The example shows the settings for a dryer which has been assigned a slave address of 1. Set the Slave ID Start and Slave ID End settings to the slave address that your network administrator has assigned to the dryer on your MOD-BUS-RTU network. Both settings must be the same. If more than one piece of equipment in on the network, they must all have their own unique address.

8) Serial Port Configuration

Set the serial port settings to match your RS485 network



No further settings are required to the device gateway

Note: Once you have everything working, you can use the EXPORT and IMPORT keys on the initial configuration screen to save your settings to easily replicate them on another dryer on the network (don't forget to select a unique slave address for each dryer)

PLC Modbus Address	R/W	Function	Units	Min	Max	Def.	Notes
00001	W	Alarm Setting - Clear all alarms	state	0	1	-	1 = Clears all alarm bits
00002	W	Control Setting - Test Drains	state	0	1	-	1 = Test drains
00003	R/W	Control Setting - Variable Cycling Time Enable	state	0	1	1	0 = disabled, 1 = enabled
00004	R/W	Control Setting - Compressor Lock Input Enable	state	0	1	1	0 = disabled, 1 = enabled
00005	R/W	Control Setting - Dewpoint Sensor Enable	state	0	1	1	1 = sensor installed
00006	R/W	Alarm Setting - Dewpoint Alarm Enable	state	0	1	1	0 = disabled, 1 = enabled
00007	R/W	Alarm Setting - High Inlet Temp Alarm Enable	state	0	1	1	0 = disabled, 1 = enabled
00008	R/W	Alarm Setting - Low Inlet Pressure Alarm Enable	state	0	1	1	0 = disabled, 1 = enabled
00009	R/W	Alarm Setting - Blowdown Alarm Enable	state	0	1	1	0 = disabled, 1 = enabled
00010	R/W	Alarm Setting - Repressurization Alarm Enable	state	0	1	1	0 = disabled, 1 = enabled
00011	R/W	Alarm Setting - High Muffler Pressure Enable	state	0	1	1	0 = disabled, 1 = enabled
00012	W	Alarm Setting - Reset Filter Days Timer	state	0	1	-	1 = Resets filter days
00013	R/W	Control Setting - Alarm Relay State Control	state	0	1	0	0 = Normally Open, 1 = Normally Closed
00014	W	Reset Cabinet Temperature Min/Max Registers	state	-	1	-	1 = Reset regtisters
00015	W	Manually Step to End of Regneration	state	-	1	-	1 = Step out of regneration
00016	R/W	Silence Alarm	state	-	1	-	1 = Silence relay and alarm display
00017	R/W	Alarm Setting - Inlet Filter Alarm Enable	state	0	1	1	0 = disabled, 1 = enabled
10001	R	Alarm - Left Blowdown	state	0	1	-	1 = Alarm
10002	R	Alarm - Right Blowdown	state	0	1	-	1 = Alarm
10003	R	Alarm - Left Repressurization	state	0	1	-	1 = Alarm
10004	R	Alarm - Right Repressurization	state	0	1	-	1 = Alarm
10005	R	Alarm - High Inlet Temp	state	0	1	-	1 = Alarm
10006	R	Alarm - Low Inlet Pressure	state	0	1	-	1 = Alarm
10007	R	Alarm - High Dewpoint	state	0	1	-	1 = Alarm
10008	R	Alarm - Left Tower Pressure Sensor Fault	state	0	1	-	1 = Alarm
10009	R	Alarm - Right Tower Pressure Sensor Fault	state	0	1	-	1 = Alarm
10010	R	Alarm - Inlet Pressure Sensor Fault	state	0	1	-	1 = Alarm
10011	R	Alarm - Dewpoint Sensor Fault	state	0	1	-	1 = Alarm
10012	R	Alarm - Inlet Temperature Sensor Fault	state	0	1	-	1 = Alarm
10013	R	Alarm - Filter Timer	state	0	1		1 = Alarm
10014	R	Alarm - Drain Switch	state	0	1	-	1 = Alarm
10015	R	Alarm - High Left Muffler Pressure	state	0	1	-	1 = Alarm
10016	R	Alarm - High Right Muffler Pressure	state	0	1	-	1 = Alarm
10017	R	Status - Repressurizing	state	0	1	-	1 = Repressurizing Offline Tower
10018	R	Status - Regenerating	state	0	1	-	1 = Regenerating Offline Tower
10019	R	Status - Currently in extended drying	state	0	1	-	1 = variable drying time conditions met
10020	R	Status - Compressor Lock Active	state	0	1	-	1 = Regenerating paused due to compressor lock input
10021	R	Output - Alarm Relay	state	0	1	-	1 = Alarm relay contacts are closed
10022	R	Output - Drain Valve	state	0	1	-	1 = Drain is open
10023	R	Output - Right Exhaust Valve	state	0	1	-	1 = Left Exhaust Valve is open
10024	R	Output - Left Exhaust Valve	state	0	1	-	1 = Right Exhaust Valve is open
10025	R	Output - Left Inlet Close Solenoid	state	0	1	-	1 = Left Inlet Close Solenoid
10026	R	Output - Right Inlet Close Solenoid	state	0	1	-	1 = Right Inlet Close Solenoid
10027	R	Output - Repressurization Valve	state	0	1	-	1 = Repressurization Valve is open
10028	R	Output - Right Inlet Open Solenoid	state	0	1	-	1 = Right Inlet Open Solenoid (TP2655 Only)
10029	R	Output - Left Inlet Open Solenoid	state	0	1	-	1 = Left Inlet Open Solenoid (TP2655 Only)
10032	R	Input - Remote Alarm Reset (Option)	state	0	1	-	1 = Remote Alarm Reset Contacts are closed
10033	R	Input - Compressor Lock	state	0	1	-	1 = Compressor Lock Input is present
10034	R	Input - Drain Switch (Optional)	state	0	1	-	1 = drain cylindar is full
10035	R	Input - Remote Alarm Silence (Option)	state	0	1	-	1 = Remote Alarm Relay Silence Contacts are closed

PLC Modbus Address	R/W	Function	Units	Min	Max	Def.	Notes
10036	R	Status - Alarm	state	0	1	-	1 = New Alarm Condition has occurred
10037	R	Status - Pressure OK	state	0	1	-	1 = Pressures are OK to switch
10038	R	Status - Remote Control Allowed	state	0	1	-	0 = Remote commands are ignored
10039	R	Status -Remote Standby (Option)	state	0	1	-	1 = Remote Standby input is close
10040	R	Status - Controller Running in Demo Mode	state	0	1	-	0 = Normal Mode, 1 = Demo Mode
10041	R	Alarm - Inlet Filter Pressure	state	0	1	-	1 = Alarm
10042	R	Alarm - Switching Fail	state	0	1	-	1 = Alarm
30001	R	Dewpoint in °F	°F	-148	68	-	
30002	R	Dewpoint in °C	°C	-100	20	-	
30003	R	Inlet Temperature in °F	°F	-348	9999	-	9999 = thermocouple open fault
30004	R	Inlet Temperature in °C	°C	-210	9999	-	9999 = thermocouple open fault
30005	R	Inlet Pressure in psi	psi	0	200	-	
30006	R	Inlet Pressure in kPa	kPa	0	1378	-	
30007	R	Tower Pressure - Left Tower in psi	psi	0	200	-	
30008	R	Tower Pressure - Left Tower in kPa	kPa	0	1378	-	
30009	R	Tower Pressure - Right Tower in psi	psi	0	200	-	
30010	R	Tower Pressure - Right Towerin kPa	kPa	0	1378	-	
30011	R	Cabinet Temperature in °F	°F	-348	9999	-	9999 = jumper missing
30012	R	Cabinet Temperature in °C	°C	-210	9999	-	9999 = jumper missing
30013-30014	R	Regeneration Timer	Secs	0	-	-	Double Integer
30015-30016	R	Repressurization Timer	Secs	0	-	-	Double Integer
30017-30018	R	Drying Timer	Secs	0	-	-	Double Integer
30019	R	Filter Days Remaining	Days	0	-	-	See 40005
30020	R	Valve Configuration	°C	1	6	1,2	
30021-30022	R	Total Run Hours	1/10 hr	0	9999999	-	Double Integer
30023-30024	R	Total Hours in Dewpoint Demand	1/10 hr	0	9999999	-	Double Integer
30025-30026	R	Total Count	Count	0	999999	-	Double Integer
30027	R	Pressure Range Setting	-	1	2	-	1 = 200psi, 2 = 600psi
30028	R	Cabinet Temperature Tracking - Minimum Temperature	°F	-999	999	-	Use to 00014 reset
30029	R	Cabinet Temperature Tracking - Maximum Temperature	°F	-999	999	-	Use to 00014 reset
30030	R	Inlet Differential Pressure	psid	0	200	-	
30031	R	Tower Differential Pressure	psid	0	200	-	
40001	R/W	Control Set - Variable Cycle Dewpoint Threshold	°F	-100	20	-40	
40002	R/W	Alarm Set - High Dewpoint	°F	-80	50	-20	
40003	R/W	Alarm Set - Low Inlet Pres	psi	20	100	60	
40004	R/W	Alarm Set - High Inlet Temperature	°F	50	150	101	
40005	R/W	Alarm Set - Filter Days	days	0	365	180	
40006	R/W	Control Set - Drain Interval	Mins	1	60	10	If switch is disabled then open drain after X minutes
40007	R/W	Control Set - Drain Duration	Secs	1	10	5	Open drain for x seconds after switch closes or timeout
40008	R/W	Control Set - Timing Configuration	-	1	6	1	1 = 10min, 2 = 15 min, 3 = 20 min, 4 = 4 min, 5 = 5 min, 6 = 6 min
40009	R/W	Inlet Temperature Offset	°F	-25	25	0	
40010	R/W	Inlet Pressure Offset	psi	-15	15	0	
40011	R/W	Left Pressure Offset	psi	-15	15	0	
40012	R/W	Right Pressure Offset	psi	-15	15	0	
40013	R/W	Dewpoint Offset	°F	-36	36	0	
40014	R/W	Dewpoint Range Minimum	°F	-238	-4	-148	
40015	R/W	Dewpoint Range Maximum	°F	-4	86	68	
40016	R/W	Alarm Set - Inlet Filter Pressure	psid	8	0	15	

SHUT DOWN

Open dryer bypass valve. Close outlet isolation valve, and then inlet isolation valve.

Allow dryer to run. The normal cycle will allow both desiccant vessels to blowdown.

Turn off power to the control panel.

Open the manual drain valve on the afterfilter or control air filter to allow full depressurization of the dryer. Verify all pressure is removed from equipment and power is disconnected before servicing. If a dewpoint sensor is installed and the dryer will be out of service for an extended period of time, remove the sensor and place in a safe, dry location. The sensor will be damaged if exposed to prolonged periods of saturated conditions.

MAINTENANCE

CAUTION:

Use caution when near the dryer and wear eye protection. Hearing protection is recommended. Dryer maintenance should only be performed by trained personnel. Always shutdown the dryer, relieve all pressure, and disconnect power before servicing.

Consult service manual for additional information on part replacement.

Daily
Check the dewpoint of the compressed air system to ensure it is in good operating condition. Check purge pressure setting, proper prefilter drain operation, and verify no back pressure on regenerating vessel to avoid more serious operating issues.

Semi-annual
Check the condition of the prefilter and afterfilter elements. Verify the differential pressure across the filters. Replace as needed.

Check desiccant quality. Desiccant from a freshly regenerated bed should be white, dry to the touch and of consistent size and shape. Continuous adsorption and desorption causes the performance level of desiccant to decline over time. Oil and contaminants causes reduction in the adsorption ability of the desiccant. It is recommended to replace the desiccant every 3-5 years.

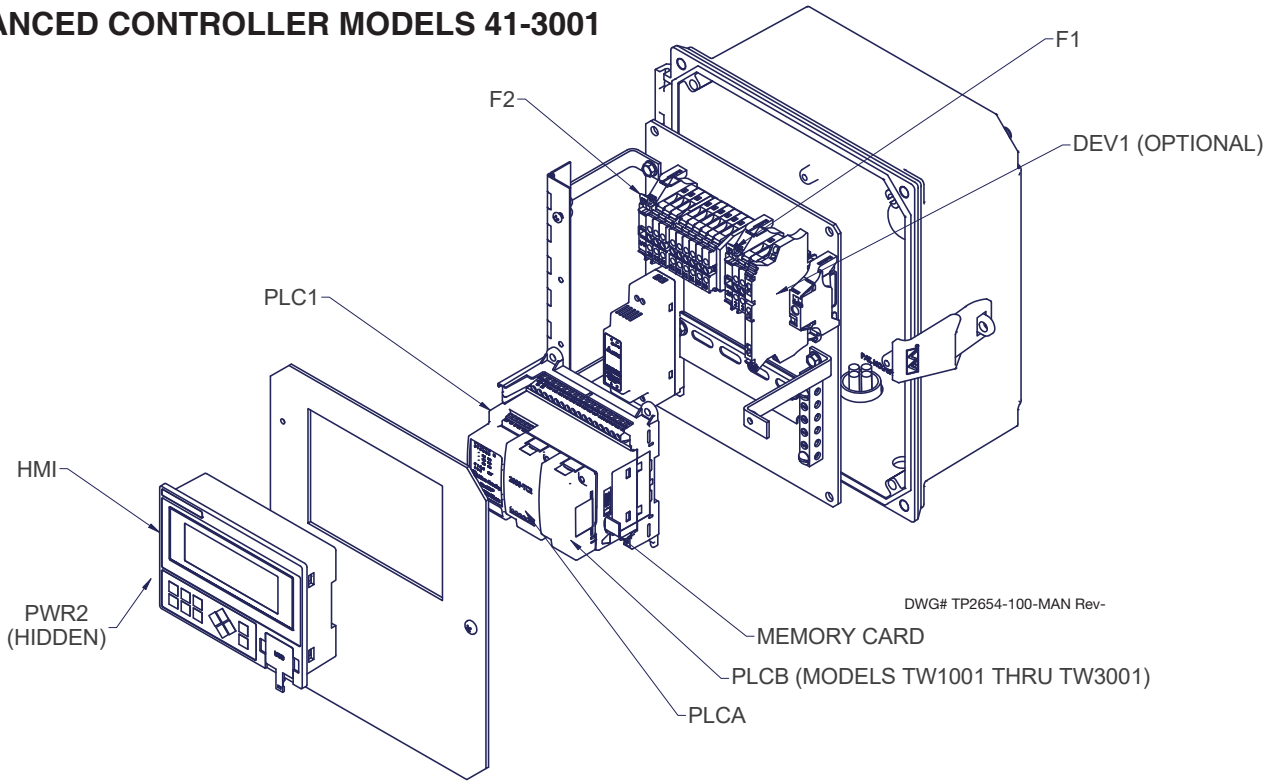
Check exhaust mufflers and verify there is no back pressure in regenerating vessel. If the muffler is clogged, it must be cleaned or replaced.

Annual
Check condition of control air filter element. Replace as needed.

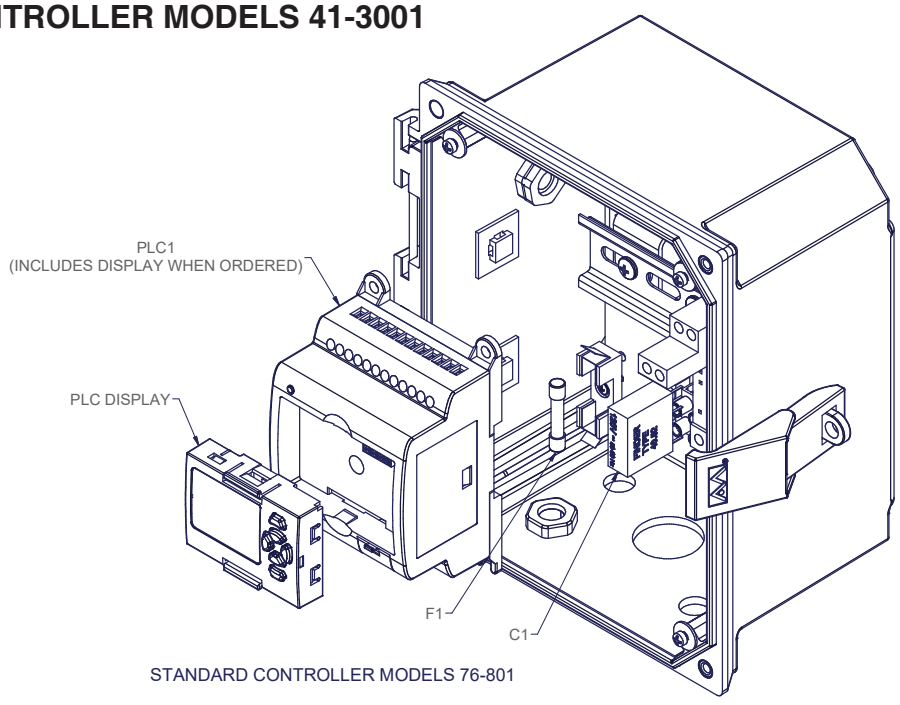
Check condition of all inlet and exhaust switching valves. It is recommended to clean and rebuild the valves to maintain proper working condition.

Check dewpoint sensor and recalibrate as needed.

ADVANCED CONTROLLER MODELS 41-3001



STANDARD CONTROLLER MODELS 41-3001



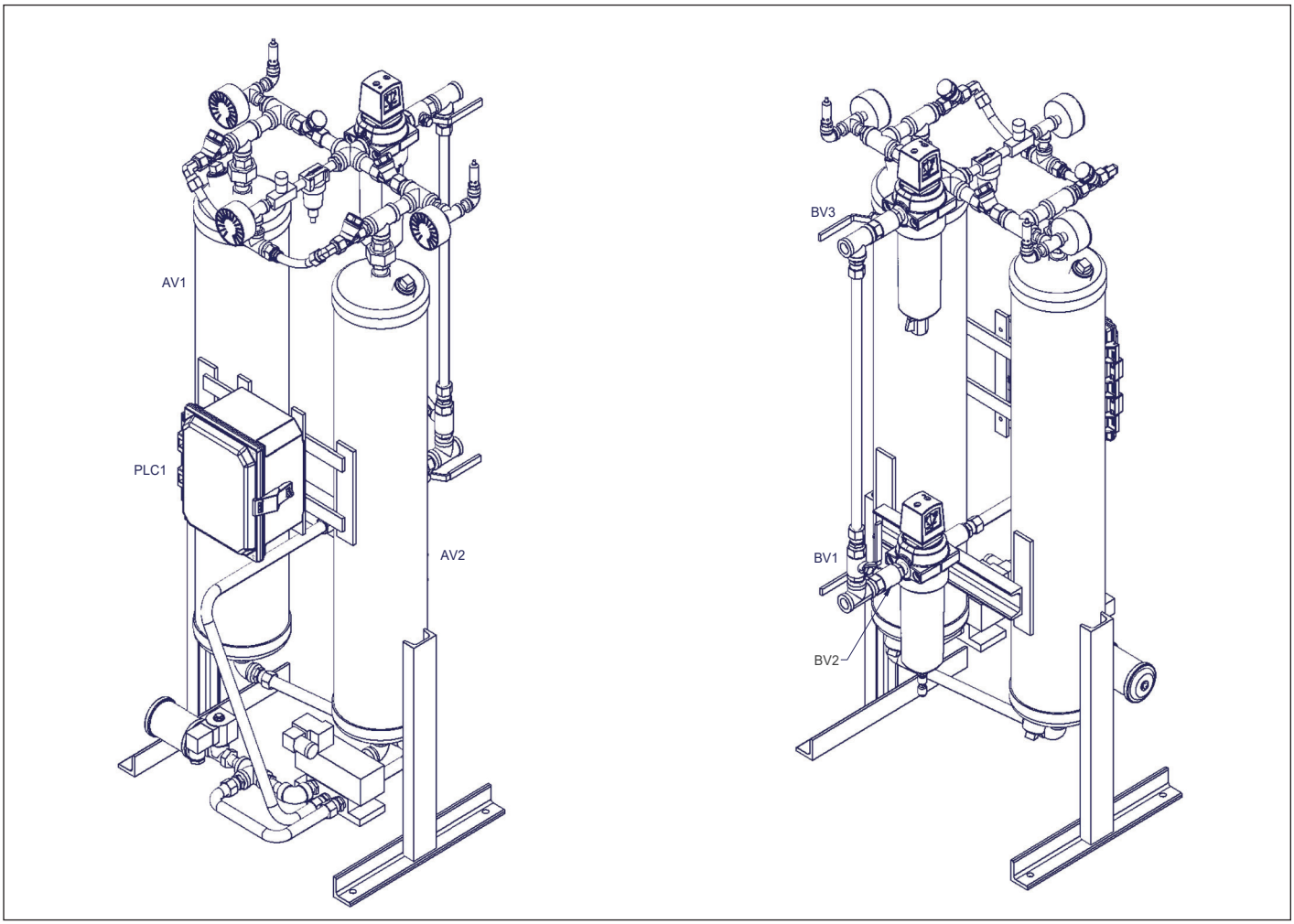
STANDARD CONTROLLER MODELS 76-801

DWG# TP2651-100-MAN Rev-

Heatless Spare Parts List (Flow schematic drawing# FS11651)

	MODEL	TW41	TW56
DESICCANT	**PART ID**	**PART NUMBER**	
DESICCANT 25LB BAGS (QTY)	AV1, AV2	PDA-1/8-25 (2)	PDA-1/8-25 (4)
FILTER ELEMENTS			
PREFILTER ELEMENT (QTY)	PF1, PF2	P015AA	P020AA
AFTERFILTER ELEMENT (QTY)	AF1, AF2	P015AO	P020AO
CONTROL AIR FILTER ELEMENT (QTY)	CF1	TP2201-PE (1)	TP2201-PE (1)
REPAIR KITS			
OUTLET CHK VALVE REPAIR KIT	CV1, CV2	TP7405-AB-RK	TP7407-AB-RK
PURGE CHK VALVE REPAIR KIT	CV3, CV4	N/A	N/A
REPLACEMENT PARTS			
INLET VALVE	PV2, PV3	TP8252-P	TP8277-P
EXHAUST VALVE	P1, PV4	TP8003	TP8003
OUTLET CHECK VALVE	CV1, CV2	TP7405-AB	TP7407-AB
PURGE CHECK VALVE	CV3, CV4	TP7403-AB	TP7403-AB
PURGE VALVE	NV1	TP7025	TP7025
REPRESSURIZATION VALVE	S5	N/A	N/A
CONTROL SOLENOID VALVE	S1, S2, S3, S4	N/A	N/A
AUTO DRAIN	FD1, FD2	2206HX	2206HX
EXHAUST MUFFLER	ES1, ES2	TP4203-1	TP4203-1
CONTROL AIR FILTER	CF1	TP2201-P	TP2201-P
SAFETY RELIEF VALVE	PSV1, PSV2	TP4409-0200	TP4412-0215
PRESSURE GAUGE	PI1, PI2, PI3	LP1020	LP1020
PURGE ORIFICE	RO1	TP7102-1	TP7102-1
FILTER DP GAUGE	DPI1,DPI2,DPI3,DPI4	2198HX	2198HX
PLC & DISPLAY	PLC1	TP2651-H10	TP2651-H10
PLC DISPLAY ONLY		2080-LCD	2080-LCD
RELAY	C1	TP2581-S-120VAC	TP2581-S-120VAC
FUSE, 2 AMP	F1	EF0200-SB	EF0200-SB
MODELS WITH ADVANCED CONTROLLER OPTION			
DEWPOINT PROBE	AE1	TP2190-1-UL	TP2190-1-UL
PLC	PLC1	TP2654-H55-PLC	TP2654-H55-PLC
TEMPERATURE INPUT MODULE	PLCA	2080-TC2	2080-TC2
HMI DISPLAY	HMI	TP2654-H55-HMI	TP2654-H55-HMI
POWER SUPPLY	PWR1	TP2500-PS-24LP	TP2500-PS-24LP
HMI POWER CONVERTER	PWR2	EW9701	EW9701
PRESSURE TRANSMITTER	PT1, PT2, PT3	TP2451	TP2451
INLET THERMOCOUPLE	TC1	TP2083-N4	TP2083-N4
FUSE, 1/8 AMP	F2	EF0012-TD	EF0012-TD
FUSE, 2 AMP	F1	EF0200-2-TD	EF0200-2-TD
MEMORY CARD		TP2681-MEM	TP2681-MEM
REMOTE DEWPOINT ISOLATOR OPTION	DEV1	TP2189-1	TP2189-1
MODELS WITH INSTRUMENTATION OPTION			
PRESSURE GAUGE	PI4, P5	LP1020	LP1020
TEMPERATURE GAUGE	TG1, TG2	LT3250-.25	LT3250-.25

MAN-TW3001AB-SPARE PARTS Rev E


AV1
PLC1
AV2
BV3
BV1
BV2

Heatless Spare Parts List (Flow schematic drawing# FS11652)

	MODEL	TW76	TW101	TW131	TW201	TW251
DESICCANT	**PART ID**			**PART NUMBER**		
DESICCANT 25LB BAGS (QTY)	AV1, AV2	PDA-1/8-25 (4)	PDA-1/8-25 (6)	PDA-1/8-25 (8)	PDA-1/8-25 (10)	PDA-1/8-25 (12)
FILTER ELEMENTS						
PREFILTER ELEMENT (QTY)	PF1, PF2	P025AA (1)	P025AA (1)	P025AA (1)	P030AA (1)	P035AA (1)
AFTERFILTER ELEMENT (QTY)	AF1, AF2	P025AO (1)	P025AO (1)	P025AO (1)	P030AO (1)	P035AO (1)
CONTROL AIR FILTER ELEMENT (QTY)	CF1	TP2201-PE (1)	TP2201-PE (1)	TP2201-PE (1)	TP2201-PE (1)	TP2201-PE (1)
REPAIR KITS						
INLET VALVE REPAIR KIT	PV2, PV3	TP7610-P1-RK	TP7610-P1-RK	TP7610-P1-RK	TP7615-P1-RK	TP7615-P1-RK
EXHAUST VALVE REPAIR KIT	PV1, PV4	TP7510-P1-RK	TP7510-P1-RK	TP7510-P1-RK	TP7510-P1-RK	TP7510-P1-RK
OUTLET CHK VALVE REPAIR KIT	CV1, CV2	TP7407-AB-RK	TP7410-SDX-RK	TP7410-SDX-RK	TP7415-SDX-RK	TP7415-SDX-RK
PURGE CHK VALVE REPAIR KIT	CV3, CV4	N/A	TP7405-AB-RK	TP7405-AB-RK	TP7405-AB-RK	TP7407-AB-RK
REPLACEMENT PARTS						
INLET VALVE	PV2, PV3	TP7610-P1	TP7610-P1	TP7610-P1	TP7615-P1	TP7615-P1
EXHAUST VALVE	P1, PV4	TP7510-P1	TP7510-P1	TP7510-P1	TP7510-P1	TP7510-P1
OUTLET CHECK VALVE	CV1, CV2	TP7407-AB	TP7410-SDX	TP7410-SDX	TP7415-SDX	TP7415-SDX
PURGE CHECK VALVE	CV3, CV4	TP7403-AB	TP7405-AB	TP7405-AB	TP7405-AB	TP7407-AB
PURGE REGULATOR	PR1	TP4605	TP4605	TP4605	TP4605	TP4605
REPRESSURIZATION VALVE	S5	TP8002	TP8002	TP8002	TP8002	TP8002
CONTROL SOLENOID VALVE	S1, S2, S3, S4	TP8101-1D	TP8101-1D	TP8101-1D	TP8101-1D	TP8101-1D
AUTO DRAIN	FD1, FD2	PD15NO	PD15NO	PD15NO	PD15NO	PD15NO
EXHAUST MUFFLER	ES1, ES2	TP4210-1	TP4210-1	TP4210-1	TP4210-1	TP4210-1
CONTROL AIR FILTER	CF1	TP2201-P	TP2201-P	TP2201-P	TP2201-P	TP2201-P
SAFETY RELIEF VALVE	PSV1, PSV2	TP7105	TP7105	TP7105	TP7105	TP7105
PRESSURE GAUGE	PI1, PI2, PI3	LP1020	LP1020	LP1020	LP1020	LP1020
PURGE ORIFICE	RO1	TP4412-0515	TP4418-0520	TP4418-0520	TP4425-0525	TP4431-0515
FILTER DP GAUGE	DPI1,DPI2,DPI3,DPI4	ZD90GL	ZD90GL	ZD90GL	ZD90GL	ZD90GL
PLC & DISPLAY	PLC1	TP2653-H75	TP2653-H75	TP2653-H75	TP2653-H75	TP2653-H75
PLC DISPLAY ONLY		2080-LCD	2080-LCD	2080-LCD	2080-LCD	2080-LCD
RELAY	C1	TP2581-S-120VAC	TP2581-S-120VAC	TP2581-S-120VAC	TP2581-S-120VAC	TP2581-S-120VAC
FUSE, 2 AMP	F1	EF0200-SB	EF0200-SB	EF0200-SB	EF0200-SB	EF0200-SB
MODELS WITH ADVANCED CONTROLLER OPTION						
DEWPOINT PROBE	AE1	TP2190-1-UL	TP2190-1-UL	TP2190-1-UL	TP2190-1-UL	TP2190-1-UL
PLC	PLC1	TP2654-H75-PLC	TP2654-H75-PLC	TP2654-H75-PLC	TP2654-H75-PLC	TP2654-H75-PLC
TEMPERATURE INPUT MODULE	PLCA	2080-TC2	2080-TC2	2080-TC2	2080-TC2	2080-TC2
HMI DISPLAY	HMI	TP2654-H75-HMI	TP2654-H75-HMI	TP2654-H75-HMI	TP2654-H75-HMI	TP2654-H75-HMI
POWER SUPPLY	PWR1	TP2500-PS-24LP	TP2500-PS-24LP	TP2500-PS-24LP	TP2500-PS-24LP	TP2500-PS-24LP
HMI POWER CONVERTER	PWR2	EW9701	EW9701	EW9701	EW9701	EW9701
PRESSURE TRANSMITTER	PT1, PT2, PT3	TP2451	TP2451	TP2451	TP2451	TP2451
INLET THERMOCOUPLE	TC1	TP2083-N4	TP2083-N4	TP2083-N4	TP2083-N4	TP2083-N4
FUSE, 1/8 AMP	F2	EF0012-TD	EF0012-TD	EF0012-TD	EF0012-TD	EF0012-TD
FUSE, 2 AMP	F1	EF0200-2-TD	EF0200-2-TD	EF0200-2-TD	EF0200-2-TD	EF0200-2-TD
MEMORY CARD		TP2681-MEM	TP2681-MEM	TP2681-MEM	TP2681-MEM	TP2681-MEM
REMOTE DEWPOINT ISOLATOR OPTION	DEV1	TP2189-1	TP2189-1	TP2189-1	TP2189-1	TP2189-1
MODELS WITH INSTRUMENTATION OPTION						
PRESSURE GAUGE	PI4, P5	LP1020	LP1020	LP1020	LP1020	LP1020
TEMPERATURE GAUGE	TG1, TG2	LT3250-.25	LT3250-.25	LT3250-.25	LT3250-.25	LT3250-.25

MAN-TW3001AB-SPARE PARTS Rev E

Heatless Spare Parts List (Flow schematic drawing# FS11652)

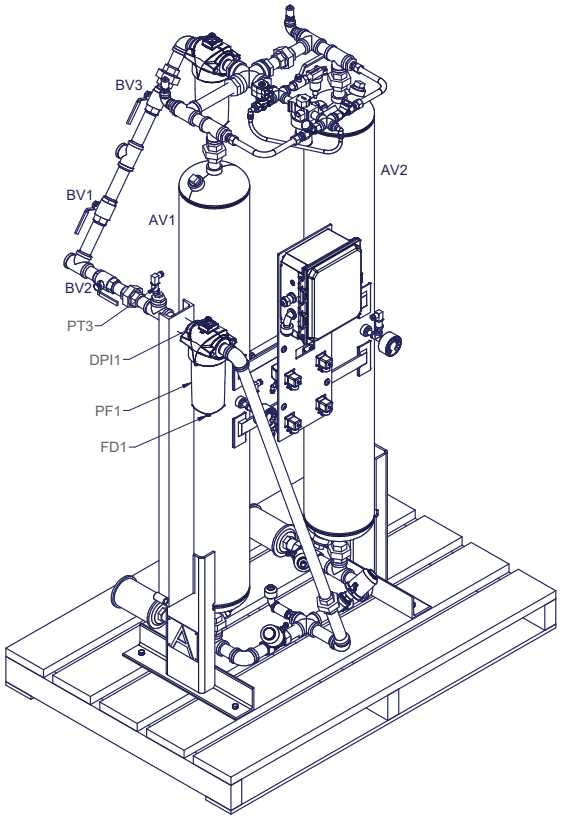
	MODEL	TW76	TW101	TW131	TW201	TW251
DESICCANT	**PART ID**			**PART NUMBER**		
DESICCANT 25LB BAGS (QTY)	AV1, AV2	PDA-1/8-25 (4)	PDA-1/8-25 (6)	PDA-1/8-25 (8)	PDA-1/8-25 (10)	PDA-1/8-25 (12)
FILTER ELEMENTS						
PREFILTER ELEMENT (QTY)	PF1, PF2	P025AA (1)	P025AA (1)	P025AA (1)	P030AA (1)	P035AA (1)
AFTERFILTER ELEMENT (QTY)	AF1, AF2	P025AO (1)	P025AO (1)	P025AO (1)	P030AO (1)	P035AO (1)
CONTROL AIR FILTER ELEMENT (QTY)	CF1	TP2201-PE (1)	TP2201-PE (1)	TP2201-PE (1)	TP2201-PE (1)	TP2201-PE (1)
REPAIR KITS						
INLET VALVE REPAIR KIT	PV2, PV3	TP7610-P1-RK	TP7610-P1-RK	TP7610-P1-RK	TP7615-P1-RK	TP7615-P1-RK
EXHAUST VALVE REPAIR KIT	PV1, PV4	TP7510-P1-RK	TP7510-P1-RK	TP7510-P1-RK	TP7510-P1-RK	TP7510-P1-RK
OUTLET CHK VALVE REPAIR KIT	CV1, CV2	TP7407-AB-RK	TP7410-SDX-RK	TP7410-SDX-RK	TP7415-SDX-RK	TP7415-SDX-RK
PURGE CHK VALVE REPAIR KIT	CV3, CV4	N/A	TP7405-AB-RK	TP7405-AB-RK	TP7405-AB-RK	TP7407-AB-RK
REPLACEMENT PARTS						
INLET VALVE	PV2, PV3	TP7610-P1	TP7610-P1	TP7610-P1	TP7615-P1	TP7615-P1
EXHAUST VALVE	P1, PV4	TP7510-P1	TP7510-P1	TP7510-P1	TP7510-P1	TP7510-P1
OUTLET CHECK VALVE	CV1, CV2	TP7407-AB	TP7410-SDX	TP7410-SDX	TP7415-SDX	TP7415-SDX
PURGE CHECK VALVE	CV3, CV4	TP7403-AB	TP7405-AB	TP7405-AB	TP7405-AB	TP7407-AB
PURGE REGULATOR	PR1	TP4605	TP4605	TP4605	TP4605	TP4605
REPRESSURIZATION VALVE	S5	TP8002	TP8002	TP8002	TP8002	TP8002
CONTROL SOLENOID VALVE	S1, S2, S3, S4	TP8101-1D	TP8101-1D	TP8101-1D	TP8101-1D	TP8101-1D
AUTO DRAIN	FD1, FD2	PD15NO	PD15NO	PD15NO	PD15NO	PD15NO
EXHAUST MUFFLER	ES1, ES2	TP4210-1	TP4210-1	TP4210-1	TP4210-1	TP4210-1
CONTROL AIR FILTER	CF1	TP2201-P	TP2201-P	TP2201-P	TP2201-P	TP2201-P
SAFETY RELIEF VALVE	PSV1, PSV2	TP7105	TP7105	TP7105	TP7105	TP7105
PRESSURE GAUGE	PI1, PI2, PI3	LP1020	LP1020	LP1020	LP1020	LP1020
PURGE ORIFICE	RO1	TP4412-0515	TP4418-0520	TP4418-0520	TP4425-0525	TP4431-0515
FILTER DP GAUGE	DPI1,DPI2,DPI3,DPI4	ZD90GL	ZD90GL	ZD90GL	ZD90GL	ZD90GL
PLC & DISPLAY	PLC1	TP2653-H75	TP2653-H75	TP2653-H75	TP2653-H75	TP2653-H75
PLC DISPLAY ONLY		2080-LCD	2080-LCD	2080-LCD	2080-LCD	2080-LCD
RELAY	C1	TP2581-S-120VAC	TP2581-S-120VAC	TP2581-S-120VAC	TP2581-S-120VAC	TP2581-S-120VAC
FUSE, 2 AMP	F1	EF0200-SB	EF0200-SB	EF0200-SB	EF0200-SB	EF0200-SB
MODELS WITH ADVANCED CONTROLLER OPTION						
DEWPOINT PROBE	AE1	TP2190-1-UL	TP2190-1-UL	TP2190-1-UL	TP2190-1-UL	TP2190-1-UL
PLC	PLC1	TP2654-H75-PLC	TP2654-H75-PLC	TP2654-H75-PLC	TP2654-H75-PLC	TP2654-H75-PLC
TEMPERATURE INPUT MODULE	PLCA	2080-TC2	2080-TC2	2080-TC2	2080-TC2	2080-TC2
HMI DISPLAY	HMI	TP2654-H75-HMI	TP2654-H75-HMI	TP2654-H75-HMI	TP2654-H75-HMI	TP2654-H75-HMI
POWER SUPPLY	PWR1	TP2500-PS-24LP	TP2500-PS-24LP	TP2500-PS-24LP	TP2500-PS-24LP	TP2500-PS-24LP
HMI POWER CONVERTER	PWR2	EW9701	EW9701	EW9701	EW9701	EW9701
PRESSURE TRANSMITTER	PT1, PT2, PT3	TP2451	TP2451	TP2451	TP2451	TP2451
INLET THERMOCOUPLE	TC1	TP2083-N4	TP2083-N4	TP2083-N4	TP2083-N4	TP2083-N4
FUSE, 1/8 AMP	F2	EF0012-TD	EF0012-TD	EF0012-TD	EF0012-TD	EF0012-TD
FUSE, 2 AMP	F1	EF0200-2-TD	EF0200-2-TD	EF0200-2-TD	EF0200-2-TD	EF0200-2-TD
MEMORY CARD		TP2681-MEM	TP2681-MEM	TP2681-MEM	TP2681-MEM	TP2681-MEM
REMOTE DEWPOINT ISOLATOR OPTION	DEV1	TP2189-1	TP2189-1	TP2189-1	TP2189-1	TP2189-1
MODELS WITH INSTRUMENTATION OPTION						
PRESSURE GAUGE	PI4, P5	LP1020	LP1020	LP1020	LP1020	LP1020
TEMPERATURE GAUGE	TG1, TG2	LT3250-.25	LT3250-.25	LT3250-.25	LT3250-.25	LT3250-.25

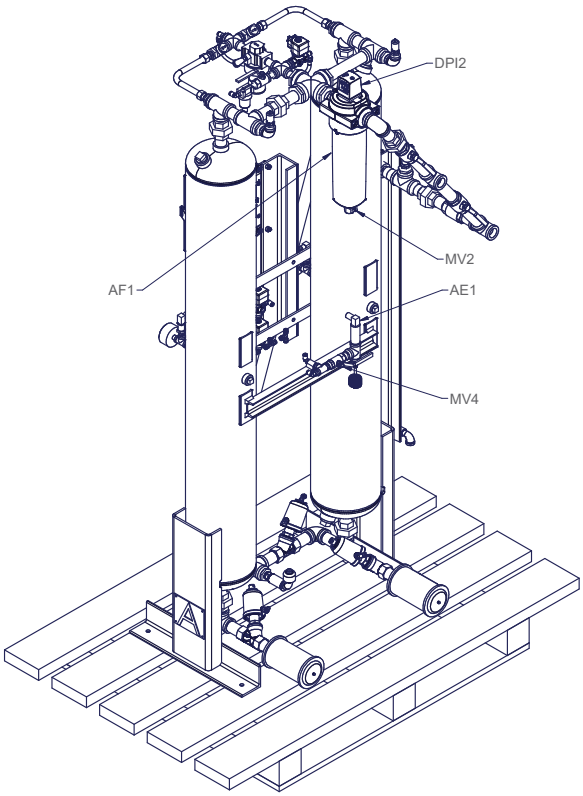
MAN-TW3001AB-SPARE PARTS Rev E

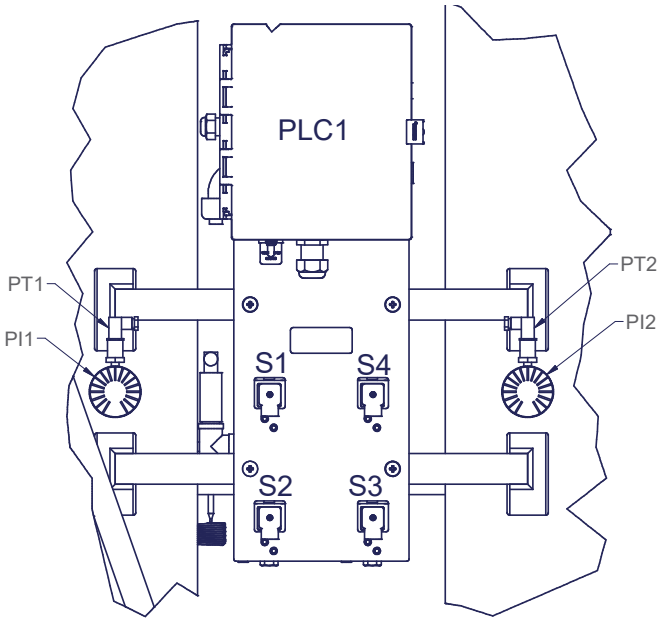
Heatless Spare Parts List (Flow schematic drawing# FS11652)

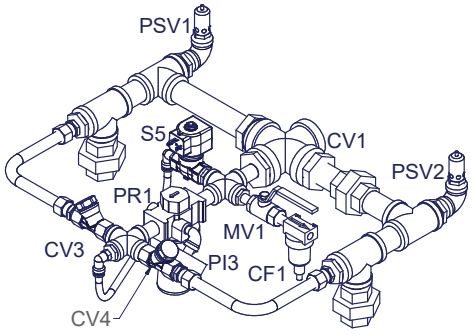
	MODEL	TW301	TW401	TW501	TW601	TW801
DESICCANT	**PART ID**			**PART NUMBER**		
DESICCANT 25LB BAGS (QTY)	AV1, AV2	PDA-1/8-25 (14)	PDA-1/8-25 (20)	PDA-1/8-25 (24)	PDA-1/8-25 (28)	PDA-1/8-25 (38)
FILTER ELEMENTS						
PREFILTER ELEMENT (QTY)	PF1, PF2	P035AA (1)	P040AA (1)	P045AA (1)	P045AA (1)	P050AA (1)
AFTERFILTER ELEMENT (QTY)	AF1, AF2	P035AO (1)	P040AO (1)	P045AO (1)	P045AO (1)	P050AO (1)
CONTROL AIR FILTER ELEMENT (QTY)	CF1	TP2201-PE (1)	TP2201-PE (1)	TP2201-PE (1)	TP2201-PE (1)	TP2201-PE (1)
REPAIR KITS						
INLET VALVE REPAIR KIT	PV2, PV3	TP7615-P1-RK	TP7620-P1-RK	TP7620-P1-RK	TP7620-P1-RK	TP7620-P1-RK
EXHAUST VALVE REPAIR KIT	PV1, PV4	TP7510-P1-RK	TP7515-P1-RK	TP7515-P1-RK	TP7515-P1-RK	TP7515-P1-RK
OUTLET CHK VALVE REPAIR KIT	CV1	TP7415-SDX-RK	TP7420-SDX-RK	TP7420-SDX-RK	TP7420-SDX-RK	TP7420-SDX-RK
PURGE CHK VALVE REPAIR KIT	CV3, CV4	TP7407-AB-RK	TP7407-AB-RK	TP7410-AB-RK	TP7410-AB-RK	TP7410-AB-RK
REPLACEMENT PARTS						
INLET VALVE	PV2, PV3	TP7615-P1	TP7620-P1	TP7620-P1	TP7620-P1	TP7620-P1
EXHAUST VALVE	P1, PV4	TP7510-P1	TP7515-P1	TP7515-P1	TP7515-P1	TP7515-P1
OUTLET CHECK VALVE	CV1	TP7415-SDX	TP7420-SDX	TP7420-SDX	TP7420-SDX	TP7420-SDX
PURGE CHECK VALVE	CV3, CV4	TP7407-AB	TP7407-AB	TP7410-AB	TP7410-AB	TP7410-AB
PURGE REGULATOR	PR1	TP4605	TP4605	TP4605	TP4610	TP4610
REPRESSURIZATION VALVE	S5	TP8002	TP8005	TP8005	TP8005	TP8005
CONTROL SOLENOID VALVE	S1, S2, S3, S4	TP8101-1D	TP8101-1D	TP8101-1D	TP8101-1D	TP8101-1D
AUTO DRAIN	FD1, FD2	PD15NO	PD15NO	PD15NO	PD15NO	PD15NO
EXHAUST MUFFLER	ES1, ES2	TP4210-1	TP4215-1	TP4215-1	TP4215-1	TP4215-1
CONTROL AIR FILTER	CF1	TP2201-P	TP2201-P	TP2201-P	TP2201-P	TP2201-P
SAFETY RELIEF VALVE	PSV1, PSV2	TP7105	TP7105	TP7105	TP7105	TP7105
PRESSURE GAUGE	PI1, PI2, PI3	LP1020	LP1020	LP1020	LP1020	LP1020
PURGE ORIFICE	RO1	TP4431-0515	TP4437-0520	TP4437-0520	TP4443-1020	TP4443-1020
FILTER DP GAUGE	DPI1,DPI2,DPI3,DPI4	ZD90GL	ZD90GL	ZD90GL	ZD90GL	ZD90GL
PLC & DISPLAY	PLC1	TP2653-H75	TP2653-H75	TP2653-H75	TP2653-H75	TP2653-H75
PLC DISPLAY ONLY		2080-LCD	2080-LCD	2080-LCD	2080-LCD	2080-LCD
RELAY	C1	TP2581-S-120VAC	TP2581-S-120VAC	TP2581-S-120VAC	TP2581-S-120VAC	TP2581-S-120VAC
FUSE, 2 AMP	F1	EF0200-SB	EF0200-SB	EF0200-SB	EF0200-SB	EF0200-SB
MODELS WITH ADVANCED CONTROLLER OPTION						
DEWPOINT PROBE	AE1	TP2190-1-UL	TP2190-1-UL	TP2190-1-UL	TP2190-1-UL	TP2190-1-UL
PLC	PLC1	TP2654-H75-PLC	TP2654-H75-PLC	TP2654-H75-PLC	TP2654-H75-PLC	TP2654-H75-PLC
TEMPERATURE INPUT MODULE	PLCA	2080-TC2	2080-TC2	2080-TC2	2080-TC2	2080-TC2
HMI DISPLAY	HMI	TP2654-H75-HMI	TP2654-H75-HMI	TP2654-H75-HMI	TP2654-H75-HMI	TP2654-H75-HMI
POWER SUPPLY	PWR1	TP2500-PS-24LP	TP2500-PS-24LP	TP2500-PS-24LP	TP2500-PS-24LP	TP2500-PS-24LP
HMI POWER CONVERTER	PWR2	EW9701	EW9701	EW9701	EW9701	EW9701
PRESSURE TRANSMITTER	PT1, PT2, PT3	TP2451	TP2451	TP2451	TP2451	TP2451
INLET THERMOCOUPLE	TC1	TP2083-N4	TP2083-N4	TP2083-N4	TP2083-N4	TP2083-N4
FUSE, 1/8 AMP	F2	EF0012-TD	EF0012-TD	EF0012-TD	EF0012-TD	EF0012-TD
FUSE, 2 AMP	F1	EF0200-2-TD	EF0200-2-TD	EF0200-2-TD	EF0200-2-TD	EF0200-2-TD
MEMORY CARD		TP2681-MEM	TP2681-MEM	TP2681-MEM	TP2681-MEM	TP2681-MEM
REMOTE DEWPOINT ISOLATOR OPTION	DEV1	TP2189-1	TP2189-1	TP2189-1	TP2189-1	TP2189-1
MODELS WITH INSTRUMENTATION OPTION						
PRESSURE GAUGE	PI4, P5	LP1020	LP1020	LP1020	LP1020	LP1020
TEMPERATURE GAUGE	TG1, TG2	LT3250-.25	LT3250-.25	LT3250-.25	LT3250-.25	LT3250-.25

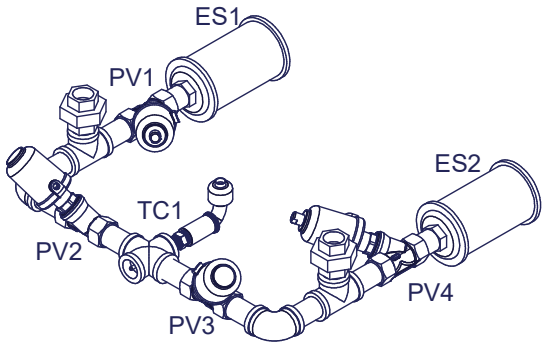
MAN-TW3001AB-SPARE PARTS Rev E









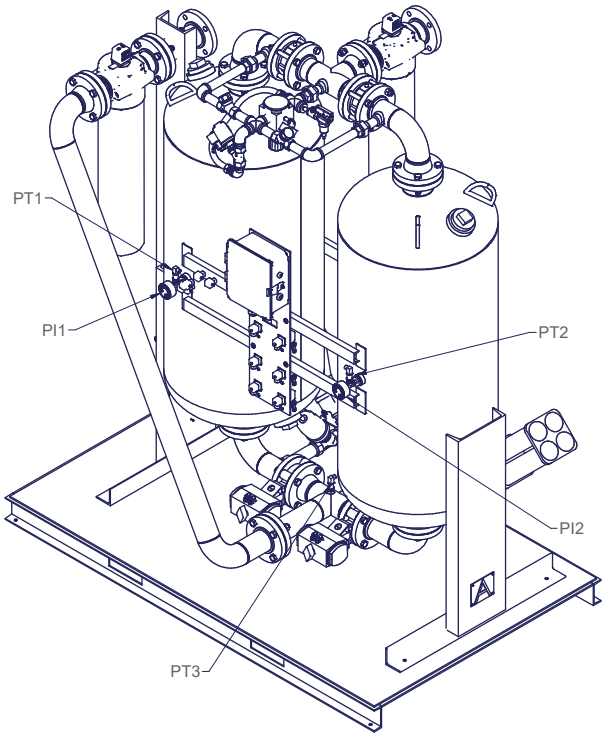


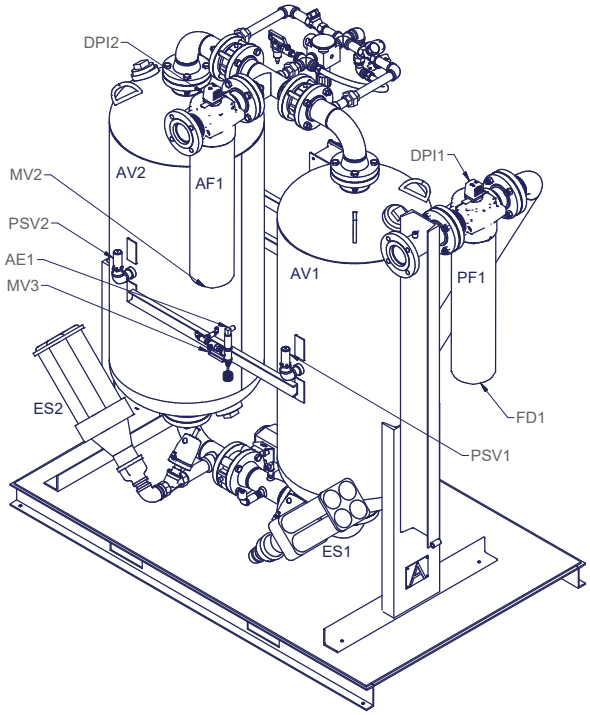
DWG# TW131BY14NNN-MAN Rev-

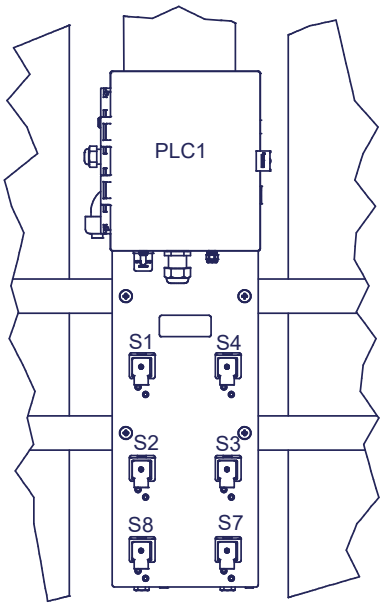
Heatless Spare Parts List (Flow schematic drawing# FS11653)

	MODEL	TW1001	TW1201
DESICCANT	**PART ID**	**PART NUMBER**	
DESICCANT 25LB BAGS (QTY)	AV1, AV2	PDA-1/8-25 (48)	PDA-1/8-25 (58)
FILTER ELEMENTS			
COALESCER ELEMENT (QTY)	PF1, PF2	P055AA (1)	P055AA (1)
PARTICULATE ELEMENT (QTY)	AF1, AF2	P055AO (1)	P055AO (1)
CONTROL AIR FILTER ELEMENT (QTY)	CF1	TP2201-PE (1)	TP2201-PE (1)
REPAIR KITS			
INLET VALVE REPAIR KIT	PV2, PV3	TP7631-BD-HP-RK	TP7631-BD-HP-RK
INLET VALVE ACTUATOR	PV2, PV3	TP7631-BD-HP-A	TP7631-BD-HP-A
EXHAUST VALVE REPAIR KIT	PV1, PV4	TP7515-P1-RK	TP7520-P1-RK
EXHAUST VALVE ACTUATOR	PV1, PV4	N/A	N/A
OUTLET CHK VALVE REPAIR KIT	CV1, CV2	TP7431-SWRK	TP7431-SWRK
PURGE CHK VALVE REPAIR KIT	CV3, CV4	TP7410-AB-RK	TP7415-AB-RK
REPRESS VALVE REPAIR KIT	PV5	TP7610-P1-RK	TP7610-P1-RK
MUFFLER REPLACEMENT CORES	ES1, ES2	TP4230-RK	TP4230-RK
REPLACEMENT PARTS			
INLET VALVE ASSEMBLY	PV2, PV3	TP7631-BD-HP	TP7631-BD-HP
EXHAUST VALVE ASSEMBLY	PV1, PV4	TP7515-P1	TP7520-P1
OUTLET CHECK VALVE	CV1, CV2	TP7431-SW	TP7431-SW
PURGE CHECK VALVE	CV3, CV4	TP7410-AB	TP7415-AB
PURGE REGULATOR	PR1	TP4610	TP4610
REPRESSURIZATION VALVE	PV5	TP7610-P1	TP7610-P1
REPRESS CONTROL SOLENOID	S5	TP8101-D	TP8101-D
CONTROL SOLENOID VALVE	S1,S2,S3,S4,S7,S8	TP8101-1D	TP8101-1D
EXHAUST MUFFLER	ES1, ES2	TP4230-1	TP4230-1
CONTROL AIR FILTER	CF1	TP2201-P	TP2201-P
SAFETY RELIEF VALVE	PSV1, PSV2	TP7105	TP7105
PRESSURE GAUGE	PI1, PI2, PI3	LP1020	LP1020
PURGE ORIFICE	RO1	TP4450-1025	TP4463-1525
AUTO DRAIN	FD1, FD2	PD15NO	PD15NO
DRAIN VALVE	S6	N/A	N/A
FILTER DP GAUGE	DPI1,DPI2,DPI3,DPI4	ZD90GL	ZD90GL
PLC	PLC1	TP2655-H1000-PLC	TP2655-H1000-PLC
TEMPERATURE INPUT MODULE	PLCA	2080-TC2	2080-TC2
OUTPUT MODULE	PLCB	2080-OW4I	2080-OW4I
HMI DISPLAY	HMI	TP2655-H1000-HMI	TP2655-H1000-HMI
POWER SUPPLY	PWR1	TP2500-PS-24LP	TP2500-PS-24LP
HMI POWER CONVERTER	PWR2	EW9701	EW9701
PRESSURE TRANSMITTER	PT1, PT2, PT3	TP2451	TP2451
INLET THERMOCOUPLE	TC1	TP2083-N4-12	TP2083-N4-12
DEWPOINT PROBE	AE1	TP2190-1-UL	TP2190-1-UL
FUSE, 1/8 AMP	F2	EF0012-TD	EF0012-TD
FUSE, 2 AMP	F1	EF0200-2-TD	EF0200-2-TD
MEMORY CARD		TP2681-MEM	TP2681-MEM
REMOTE DEWPOINT ISOLATOR OPTION	DEV1	TP2189-1	TP2189-1
MODELS WITH INSTRUMENTATION OPTION			
PRESSURE GAUGE	PI4, P5	LP1020	LP1020
TEMPERATURE GAUGE	TG1, TG2	LT3250-.25	LT3250-.25

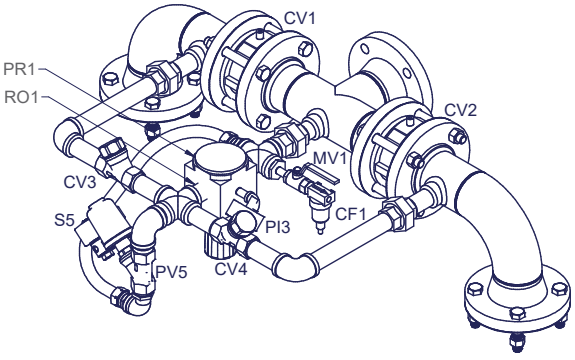
MAN-TW3001AB-SPARE PARTS Rev E

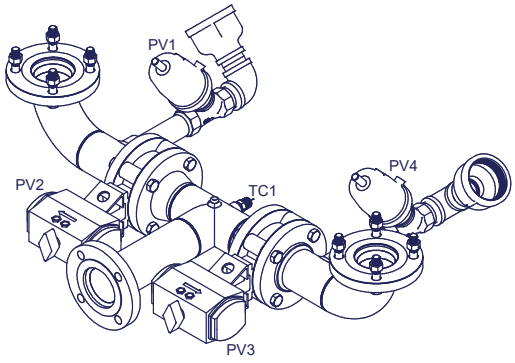






DETAIL A
SCALE 0.2 : 1



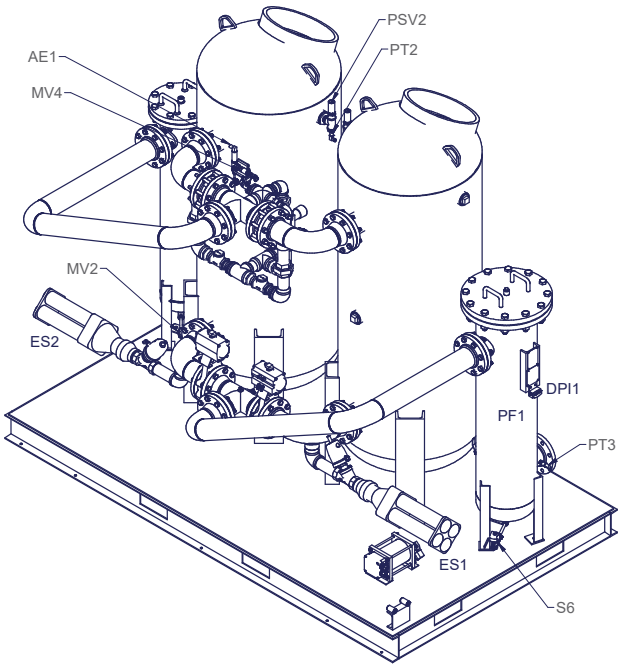


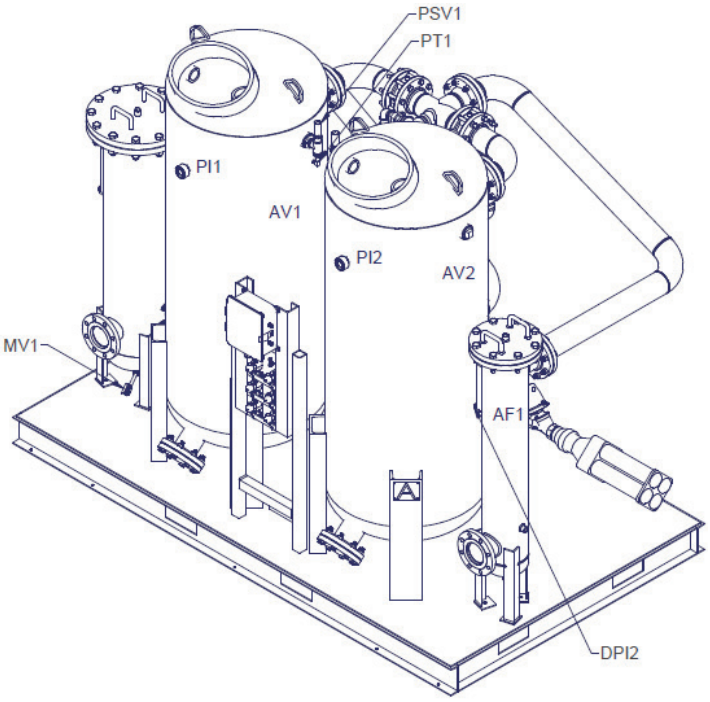
DWG# TW1200FY14NNN-MAN Rev-

Heatless Spare Parts List (Flow schematic drawing# FS11654)

	MODEL	TW1501	TW2001	TW2601	TW3001
DESICCANT	**PART ID**	**PART NUMBER**			
DESICCANT 25LB BAGS (QTY)	AV1, AV2	PDA-1/8-25 (72)	PDA-1/8-25 (96)	PDA-1/8-25 (124)	PDA-1/8-25 (144)
FILTER ELEMENTS					
COALESCER ELEMENT (QTY)	PF1, PF2	JE-C1501 (1)	JE-C2001 (1)	JE-C3001 (1)	JE-C3001 (1)
PARTICULATE ELEMENT (QTY)	AF1, AF2	JE-FC2500-HT (1)	JE-FC3320-HT (1)	JE-FC3320-HT (1)	JE-FC3320-HT (1)
CONTROL AIR FILTER ELEMENT (QTY)	CF1	TP2201-PE (1)	TP2201-PE (1)	TP2201-PE (1)	TP2201-PE (1)
REPAIR KITS					
INLET VALVE REPAIR KIT	PV2, PV3	TP7631-BD-HP-RK	TP7641-BD-HP-RK	TP7641-BD-HP-RK	TP7641-BD-HP-RK
INLET VALVE ACTUATOR	PV2, PV3	TP7631-BD-HP-A	TP7631-BD-HP-A	TP7631-BD-HP-A	TP7631-BD-HP-A
EXHAUST VALVE REPAIR KIT	PV1, PV4	TP7520-P1-RK	TP7520-P1-RK	TP7631-BD-HP-RK	TP7631-BD-HP-RK
EXHAUST VALVE ACTUATOR	PV1, PV4	N/A	N/A	TP7532-B-HP-A	TP7532-B-HP-A
OUTLET CHK VALVE REPAIR KIT	CV1, CV2	TP7431-SWRK	TP7441-SWRK	TP7441-SWRK	TP7441-SWRK
PURGE CHK VALVE REPAIR KIT	CV3, CV4	TP7415-AB-RK	TP7415-AB-RK	TP7431-SWRK	TP7431-SWRK
REPRESS VALVE REPAIR KIT	PV5	TP7610-P1-RK	TP7610-P1-RK	TP7610-P1-RK	TP7610-P1-RK
MUFFLER REPLACEMENT CORES	ES1, ES2	TP4230-RK	TP4230-RK	TP4230-RK	TP4230-RK
REPLACEMENT PARTS					
INLET VALVE ASSEMBLY	PV2, PV3	TP7631-BD-HP	TP7641-BD-HP	TP7641-BD-HP	TP7641-BD-HP
EXHAUST VALVE ASSEMBLY	PV1, PV4	TP7520-P1	TP7520-P1	TP7532-B-HP	TP7532-B-HP
OUTLET CHECK VALVE	CV1, CV2	TP7431-SW	TP7441-SW	TP7441-SW	TP7441-SW
PURGE CHECK VALVE	CV3, CV4	TP7415-AB	TP7415-AB	TP7431-SW	TP7431-SW
PURGE REGULATOR	PR1	TP4615	TP4615	TP4615	TP4615
REPRESSURIZATION VALVE	PV5	TP7610-P1	TP7610-P1	TP7610-P1	TP7610-P1
REPRESS CONTROL SOLENOID	S5	TP8101-D	TP8101-D	TP8101-D	TP8101-D
CONTROL SOLENOID VALVE	S1,S2,S3,S4,S7,S8	TP8101-1D	TP8101-1D	TP8101-1D	TP8101-1D
EXHAUST MUFFLER	ES1, ES2	TP4230-1	TP4230-1	TP4230-1	TP4230-1
CONTROL AIR FILTER	CF1	TP2201-P	TP2201-P	TP2201-P	TP2201-P
SAFETY RELIEF VALVE	PSV1, PSV2	TP7110	TP7120	TP7120	TP7120
PRESSURE GAUGE	PI1, PI2	LP1020	LP1045	LP1045	LP1045
PRESSURE GAUGE	PI3	LP1020	LP1020	LP1020	LP1020
PURGE ORIFICE	RO1	TP4463-1525	TP4475-1530	TP4475-1530	TP4499-1530-F
DRAIN VALVE	S6	TP8002	TP8002	TP8002	TP8002
VESSEL MANWAY GASKET		N/A	FM21216-G	FM21216-G	FM21216-G
FILTER DP GAUGE	DPI1,DPI2,DPI3,DPI4	KBDPG-15	KBDPG-15	KBDPG-15	KBDPG-15
PLC	PLC1	TP2655-H1000-PLC	TP2655-H1000-PLC	TP2655-H1000-PLC	TP2655-H1000-PLC
TEMPERATURE INPUT MODULE	PLCA	2080-TC2	2080-TC2	2080-TC2	2080-TC2
OUTPUT MODULE	PLCB	2080-OW4I	2080-OW4I	2080-OW4I	2080-OW4I
HMI DISPLAY	HMI	TP2655-H1000-HMI	TP2655-H1000-HMI	TP2655-H1000-HMI	TP2655-H1000-HMI
POWER SUPPLY	PWR1	TP2500-PS-24LP	TP2500-PS-24LP	TP2500-PS-24LP	TP2500-PS-24LP
HMI POWER CONVERTER	PWR2	EW9701	EW9701	EW9701	EW9701
PRESSURE TRANSMITTER	PT1, PT2, PT3	TP2451	TP2451	TP2451	TP2451
INLET THERMOCOUPLE	TC1	TP2083-N4-12	TP2083-N4-12	TP2083-N4-12	TP2083-N4-12
DEWPOINT PROBE	AE1	TP2190-1-UL	TP2190-1-UL	TP2190-1-UL	TP2190-1-UL
FUSE, 1/8 AMP	F2	EF0012-TD	EF0012-TD	EF0012-TD	EF0012-TD
FUSE, 2 AMP	F1	EF0200-2-TD	EF0200-2-TD	EF0200-2-TD	EF0200-2-TD
MEMORY CARD		TP2681-MEM	TP2681-MEM	TP2681-MEM	TP2681-MEM
REMOTE DEWPOINT ISOLATOR OPTION	DEV1	TP2189-1	TP2189-1	TP2189-1	TP2189-1
MODELS WITH INSTRUMENTATION OPTION					
PRESSURE GAUGE	PI4, P5	LP1020	LP1045	LP1045	LP1045
TEMPERATURE GAUGE	TG1, TG2	LT3250-.25	LT3250-.25	LT3250-.25	LT3250-.25

MAN-TW3001AB-SPARE PARTS Rev E


AE1
MV4
PSV2
PT2
MV2
ES2
DPI1
PF1
PT3
ES1
S6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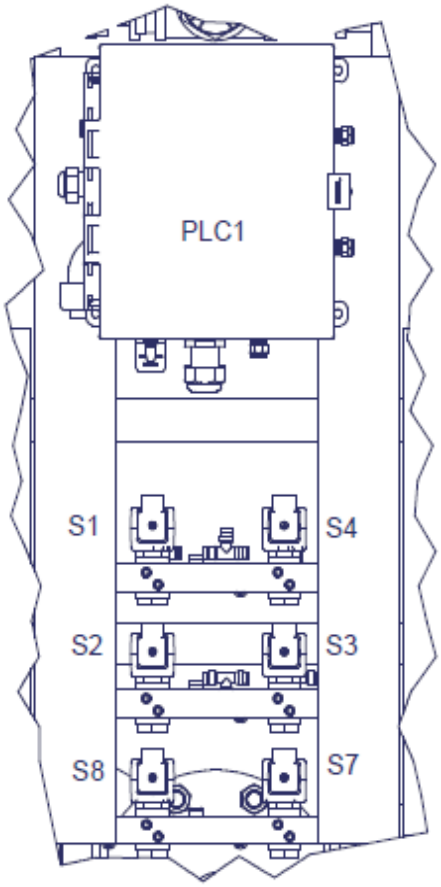
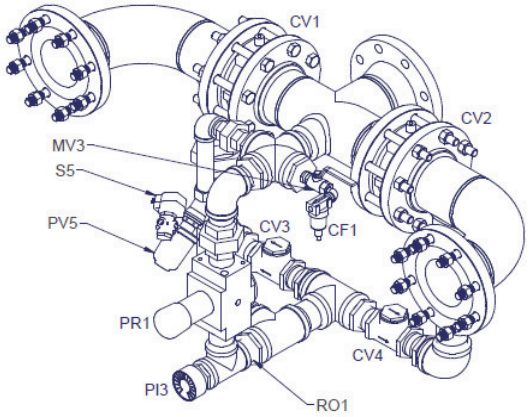
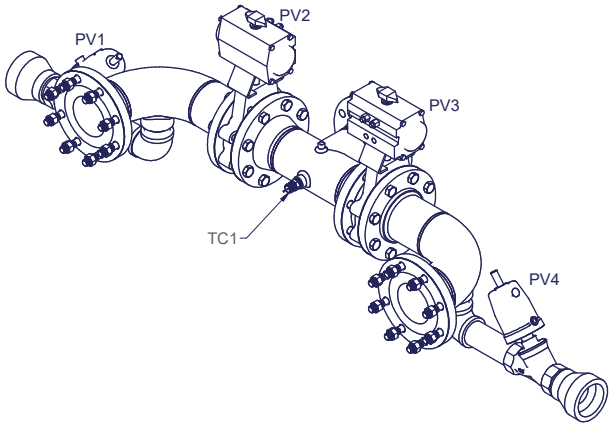
PT1
PI1
AV1
PI2
AV2
MV1
AF1
DPI2


PLC1
S1
S4
S2
S3
S8
S7


CV1
CV2
MV3
S5
PV5
CV3
CF1
PR1
CV4
PI3
RO1


PV2
PV1
PV3
TC1
PV4

TROUBLESHOOTING

Dryer not operating; no lights on

- Blown control fuse: replace fuse
- No power: apply correct power, verify quality of power source
- Controller inoperative: replace controller

Dryer not operating; lights on, dryer does not switch

- Control air valve is closed: open control air valve; check condition of control air filter element
- Dryer in Compressor Lock or Dewpoint Demand mode: Disable Power Lock or Cycle Lock to go back to a standard timing cycle

High Outlet Dewpoint or Moisture Downstream

- Dryer not cycling: see dryer not operating
- Incorrect purge rate: adjust purge setting to value specified on purge tag or manual
- Capacity of dryer exceeded: adjust inlet flow rate, inlet air temperature, and inlet air pressure to within specified operating conditions for the model
- Liquid water present at dryer inlet: check water level in separators, receivers, prefilters, and operation of associated y-strainers and auto drains. Check condition of filter elements or check differential pressure gauges
- Desiccant worn out, contaminated, or insufficient quantity: replace desiccant or add correct amount
- Reduced regeneration: see Back Pressure In Regenerating Tower
- Leaking bypass valve: replace valve
- Undried air from another source mixing downstream of dryer: remedy

Excessive Air Loss On Regenerating Tower

- Purge pressure set too high: check specifications and adjust
- Repressurization solenoid leaking: repair, clean, or replace
- Inlet valve leaking or not functioning: See inlet valve not functioning
- Leaking or inoperative control solenoid: repair or replace
- Defective controller: repair or replace

Exhaust Valve On Drying or Repressurizing Tower Leaking

- Valve dirty: clean valve
- Defectve diaphragms or seals: rebuild valve or replace
- Leaking control solenoid: repair or replace

Excessive Pressure Drop

- Prefilter or afterfilter fully saturated or collapsed: replace element
- Desiccant contaminated with oil: replace desiccant
- Excessive flow: reduce air flow rate to within product specs

Unit Does Not Fully Pressurize

- Purge rate too low: Adjust purge pressure setting
- Exhaust valve leaking: see exhaust valve leaking
- Purge orifice or repressurization valve plugged: clean

Back Pressure In Regenerating Tower

- Clogged mufflers: clean, repair, or replace
- Check valve leaking: clean, repair, or replace
- Purge flow too high: adjust purge pressure
- Leaking inlet valve: See inlet valve not functioning

Inlet or Exhaust Valve Not Functioning

- Bad seals or solenoid: rebuild valves with available kits or replace
- No output from controller: replace fuse or controller
- Valve dirty: rebuild or clean

TROUBLESHOOTING (cont'd)

When factory assistance is required, always provide serial number, model number, and full description of problem.

WARRANTY

Technical Specifica-

Model	Capacity SCFM	Min PSI	Max PSI	Air In/Out Size	Air In/Out Connection	Power	FLA	LBS Desiccant per Vessel	Purge Setting PSI	Purge Air Loss SCFM	Purge Orifice Size	Purge Orifice Color	Operating Weight LBS
41	40	80	150	1/2 IN	NPT	120 VAC	2.0	23	58	6	3/32"	BLUE	190
56	55	80	150	3/4 IN	NPT	120 VAC	2.0	35	42	8.25	1/8"	GOLD	230
76	75	80	150	3/4 IN	NPT	120 VAC	2.0	44	62	11.25	1/8"	GOLD	384
101	100	80	150	1 IN	NPT	120 VAC	2.0	60	31	15	3/16"	GREEN	468
131	130	80	150	1 IN	NPT	120 VAC	2.0	75	45	19.5	3/16"	GREEN	496
201	200	80	150	1 1/2 IN	NPT	120 VAC	2.0	120	37	30	1/4"	RED	692
251	250	80	150	1 1/2IN	NPT	120 VAC	2.0	150	27	37.5	5/16"	BROWN	776
301	300	80	150	1 1/2IN	NPT	120 VAC	2.0	175	35	45	5/16"	BROWN	796
401	400	80	150	2 IN	NPT	120 VAC	2.0	230	31	60	3/8"	YELLOW	1626
501	500	80	150	2 IN	NPT	120 VAC	2.0	300	42	75	3/8"	YELLOW	1735
601	600	80	150	2 IN	NPT	120 VAC	2.0	350	36	90	7/16"	SILVER	1740
801	800	80	150	2 IN	NPT	120 VAC	2.0	475	52	120	7/16"	SILVER	2120
1001	1000	80	150	3 IN	FLG	120 VAC	3.0	600	50	150	1/2"	WHITE	3676
1201	1200	80	150	3 IN	FLG	120 VAC	3.0	725	35	180	5/8"	BLACK	4605
1501	1500	80	150	3 IN	FLG	120 VAC	3.0	900	47	225	5/8"	BLACK	4985
2001	2000	80	135	4 IN	FLG	120 VAC	3.0	1200	42	300	3/4"	LIGHT BLUE	5206
2601	2600	80	135	4 IN	FLG	120 VAC	3.0	1550	59	390	3/4"	LIGHT BLUE	7600
3001	3000	80	135	6 IN	FLG	120 VAC	3.0	1800	34	450	1"	ORANGE	8300

Design Conditions of 100 psig at 100°F inlet air, 40° to 100°F ambient air

To obtain dryer capacity at different operating conditions, multiply nominal capacity X temperature correction factor X pressure correction factor

Maximum Inlet Temperature °F	90	95	100	105	110	115	120
Temperature Correction Factor	1.17	1.15	1.00	0.87	0.76	0.66	0.58

Minimum Inlet Pressu psig	80	90	100	110	120	130
Pressure Correction Factor	0.83	0.91	1.00	1.09	1.17	1.26

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