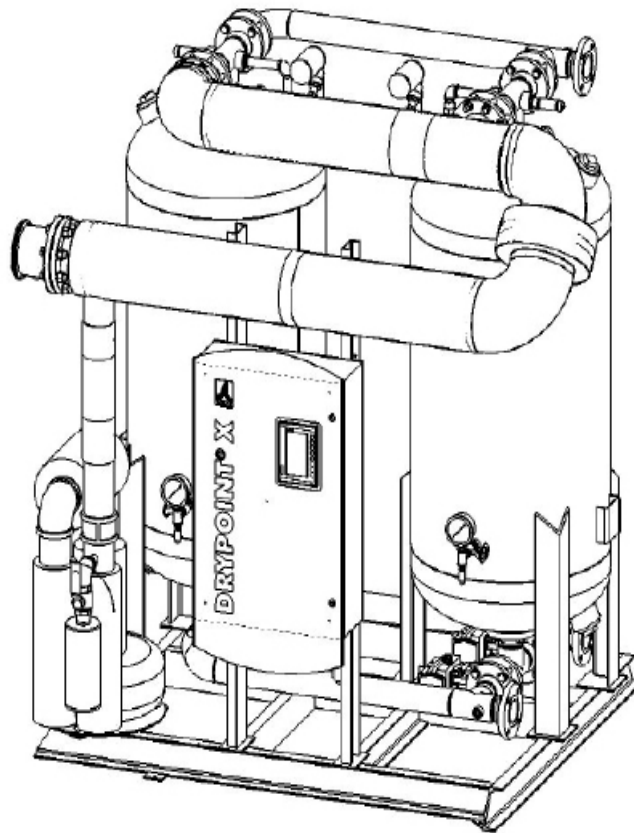


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# Installation and Operating Manual

## Heated Blower Purge Regenerated Dryer



### DRYPOINT® XFe & XFi Series

Models 800-6000

**READ MANUAL FIRST BEFORE INSTALLATION AND OPERATION**









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# 1. SAFETY AND SYSTEM PRECAUTIONS

## 1.1 Definition of the Safety Symbols

					
Before attempting any service, please read the manual	<b>General Warning:</b> Risk of damage or injury	<b>Electrical Hazard:</b> Possibility of electro-cution	<b>Warning:</b> Under pressure	<b>Warning:</b> High temperature	<b>Warning:</b> Non-breathable air
					
<b>Warning:</b> Water cannot be used to extinguish fire	<b>Warning:</b> Do not operate if parts are missing or have been tampered with	<b>Warning:</b> Machine level noise may exceed 85 dBA	<b>Warning:</b> Personal protection required	<b>Warning:</b> All work to be performed by qualified personnel only	Operations that can be performed by qualified operators <sup>1</sup>
					
Compressed air inlet connection		Compressed air outlet connection		Connection point for condensate drain	

<sup>1</sup> Only experienced and trained personnel familiar with all of the relevant laws, rules and regulations, capable to perform the needed activities and to identify and avoid possible dangerous situations while handling, installing, using and servicing the machine.

## 1.1 Operational Warnings

### WARNING: VESSELS UNDER PRESSURE



- + In most countries, states, cities and/or local municipalities the installation, operation and maintenance of devices where pressure vessels are in use are subject to local boiler and pressure vessel regulations.
- + The end user is responsible for following all of the relevant laws, rules and regulations and ensuring that only experienced and trained personnel install and/or operate the dryer.
- + In most countries, states, cities and/or local municipalities the installation may only be carried out by a licensed installation company. Inspections must be carried out by a qualified and licensed third-party firm in accordance with all applicable laws, rules and regulations for the region where the dryer is installed.
- + The pressure vessels used in this device are built according to the American Society of Mechanical Engineers (ASME) standard Section 8, Division 1.

### COMPRESSED AIR WARNING:

Compressed air is a highly dangerous energy source.



- + Never work on the dryer while components are under pressure.
- + Never point the compressed air stream or the condensate drain outlet in a direction that may cause bodily harm.

The end user is responsible for the installation of the dryer as laid out in this manual. If proper commissioning steps are not followed, the warranty will be void and dangerous situations involving injury or death and/or damages to the machine could occur.

### HOT SURFACE WARNING:

Heated desiccant dryers have hot surfaces that can cause severe burns.



- + Never touch any component of a heated desiccant dryer without first knowing and confirming the actual temperature of the surface.

The end user is completely responsible for providing the appropriate protection against any contact with the dryer.





Only qualified personnel can use and service electrically powered devices. Before attempting any maintenance:

- + Ensure that no part of the machine is powered and is locked out of the electrical mains by following proper “Lock-out, Tag-out” procedures and requirements.
- + Ensure that no part of the dryer is under pressure by isolating the dryer from the compressed air system.



Any change to the machine or to the standard operating parameters (see Section 3.1), if not previously verified and authorized by the manufacturer, in addition to creating a potentially dangerous situation, will void the warranty.



Do not use water to extinguish fire on the dryer or in the surrounding area.

## 2. INSPECTION AND INSTALLATION

All dryers are tested and inspected at the factory prior to shipping. Thoroughly inspect and verify the integrity of the packaging upon receipt and note any damage on the freight bill. Place the unit as close as possible to the installation point before unpacking the contents and inspect for concealed damage. Freight claims are to be filed with the carrier immediately and the manufacturer’s technical service department notified thereafter.

- + To move the packaged unit, we suggest the use of a suitable crane or forklift. We do not recommend moving the unit by any hand operated or manual mechanism.
- + Handle with care. Heavy blows could cause irreparable damage.
- + Even when packaged, keep the machine protected from severe weather.



The packaging materials are recyclable. Each material must be properly disposed in a manner complying with the rules and regulations of the local municipality government.

## 3. TECHNICAL SPECIFICATIONS AND GENERAL FUNCTION

### 3.1 Technical Data by Model Size



Nominal dryer ratings adhere to the following inlet conditions @ seal level per ISO 7183, Table 2, Option A2:

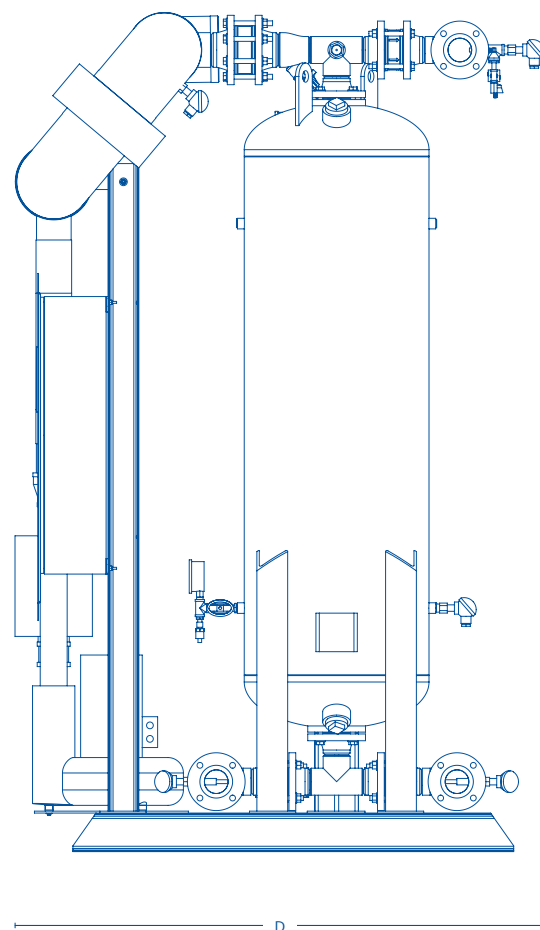
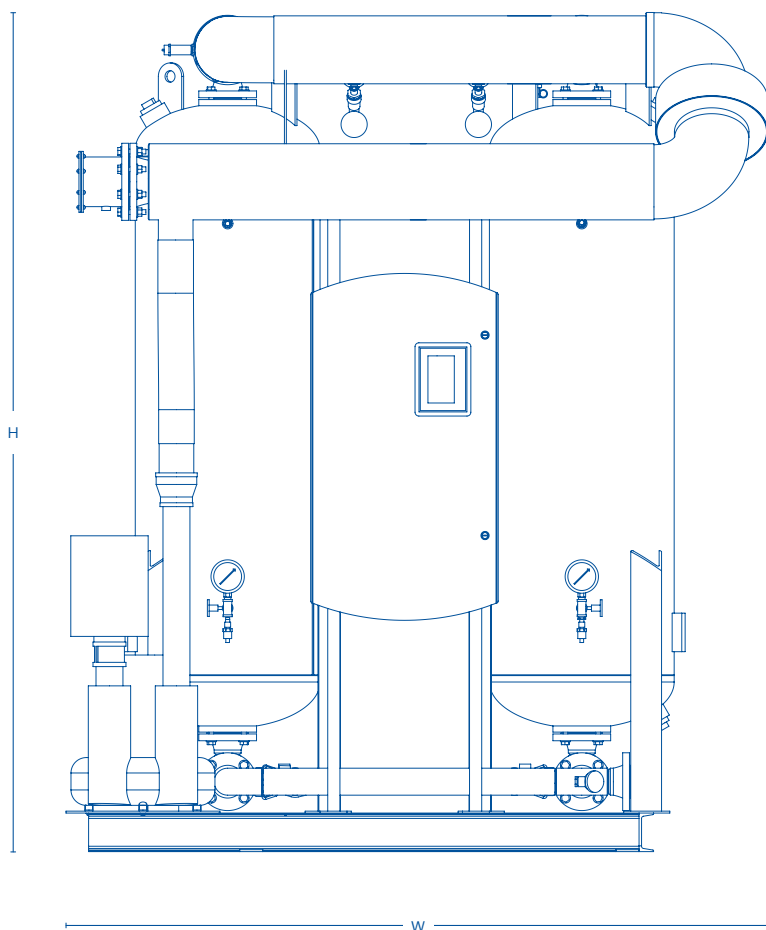
- + Inlet Compressed Air Temperature 100 °F (38 °C)
- + Inlet Compressed Air Pressure 100 psig (7 bar)
- + Ambient Air Temperature 85 °F (30 °C)
- + Inlet Compressed Air Relative Humidity 100% (Saturated)

SCFM is defined as the flow rate of free air in cubic feet per minute measured at 14.5 psia (1.013 bar) at 68 °F (20 °C) temperature with 0% relative humidity (0 WVP).

DRYPOINT® XF	
Standard Outlet Pressure Dew Point*	-40°F
Min. / Max. Ambient Temperature	40°F / 120°F
Min. / Max. Inlet Air Temp	40°F / 120°F
Min. / Max. Inlet Air Pressure	60psig / 150psig
Electrical Power Supply	460Vac / 3ph / 60Hz
Standard Desiccant Type	1/8" Activated Alumina

\*Standard dew point performance based on nominal conditions.





DRYPOINT® XF	Model Size	800	1000	1200	1500	1800	2300
Flow Rate	scfm	800	1000	1200	1500	1800	2300
Inlet / Outlet Connection	150# ANSI Flange	2.5	2.5	3	3	4	4
Height (H)	in.	103	103	1109	93	112	105
Width (W)	in.	77	78	89	90	89	118
Depth (D)	in.	56	58	65	66	69	96
Empty Weight	Lbs.	3,600	4,050	4,700	5,852	6,957	8,763
Max. Power Consumption	kW	23.7	30.6	35.1	50.3	56.3	65.7
Avg. Power Consumption*	kW	15.8	19.9	24.0	30.0	35.8	43.5

DRYPOINT® XF	Model Size	2800	3300	4000	5000	6000
Flow Rate	scfm	2800	3300	4000	5000	6000
Inlet / Outlet Connection	150# ANSI Flange	4	6	6	6	6
Height (H)	in.	114	117	138	136	127
Width (W)	in.	130	140	133	147	158
Depth (D)	in.	186	101	105	1072	97
Empty Weight	Lbs.	10,539	12,419	16,089	16,089	23,456
Max. Power Consumption	kW	76.7	86.7	101.7	127.5	148.5
Avg. Power Consumption*	kW	50.5	58.0	68.1	82.7	97.5

\*The average power consumption is based on timed cycle operation mode.



### 3.2 Correction Factors

Sizing must be done by a product specialist, please consult your BEKO Technologies representative for details and sizing assistance.

### 3.3 General Function

The DRYPOINT® XF heated desiccant dryer series are fitted with two pressure vessels, positioned parallel to one another and filled with adsorption material (½" Activated Alumina as standard). While the compressed air is dried in one vessel, the saturated desiccant is regenerated in the second.

The saturated inlet air is cycled through each of the two desiccant beds in an alternating sequence. One bed is online at full line pressure and air flows upward through the vessel where the desiccant extracts and retains water vapor, thereby lowering the dew point before exiting the vessel to the air distribution system. This is the drying bed.

The other bed is then considered to be in an off-line state and is being regenerated by heat from a blower that forces air across an inline heater into the regeneration Vessel under atmospheric pressure. This heated dry air flows through the Vessel, desorbs water from the moisture laden desiccant, before exiting the bottom of the Vessel. This moist air passes through exhaust valve and is vented to open atmosphere. Because this method of regeneration uses heat, the desiccant needs to be cooled before it can be used again as the drying bed.

Cooling is done in 2 phases. In phase 1, while the heater turns off (after heat regeneration is complete), the blower remains on and cools the heater down to a preset temperature. After the temperature is reached, the purge control valve opens and desiccant bed cooling takes place during phase 2. The purge air also passes the exhaust valves and is vented to open atmosphere.

Just before the freshly regenerated bed is brought to an on-line state to become the drying bed, it is slowly pressurized from atmospheric pressure up to line pressure. This is the re-pressurization step that prevents desiccant bed fluidization (bed lifting) and dusting.

Before desiccant bed switch over, the dryer will parallel flow through both vessels. This helps mitigate temperature and/or dew point spikes that can occur during a direct vessel switchover.

The desiccant beds will now switch functions where the fresh desiccant bed is now drying and the saturated bed is now regenerating.

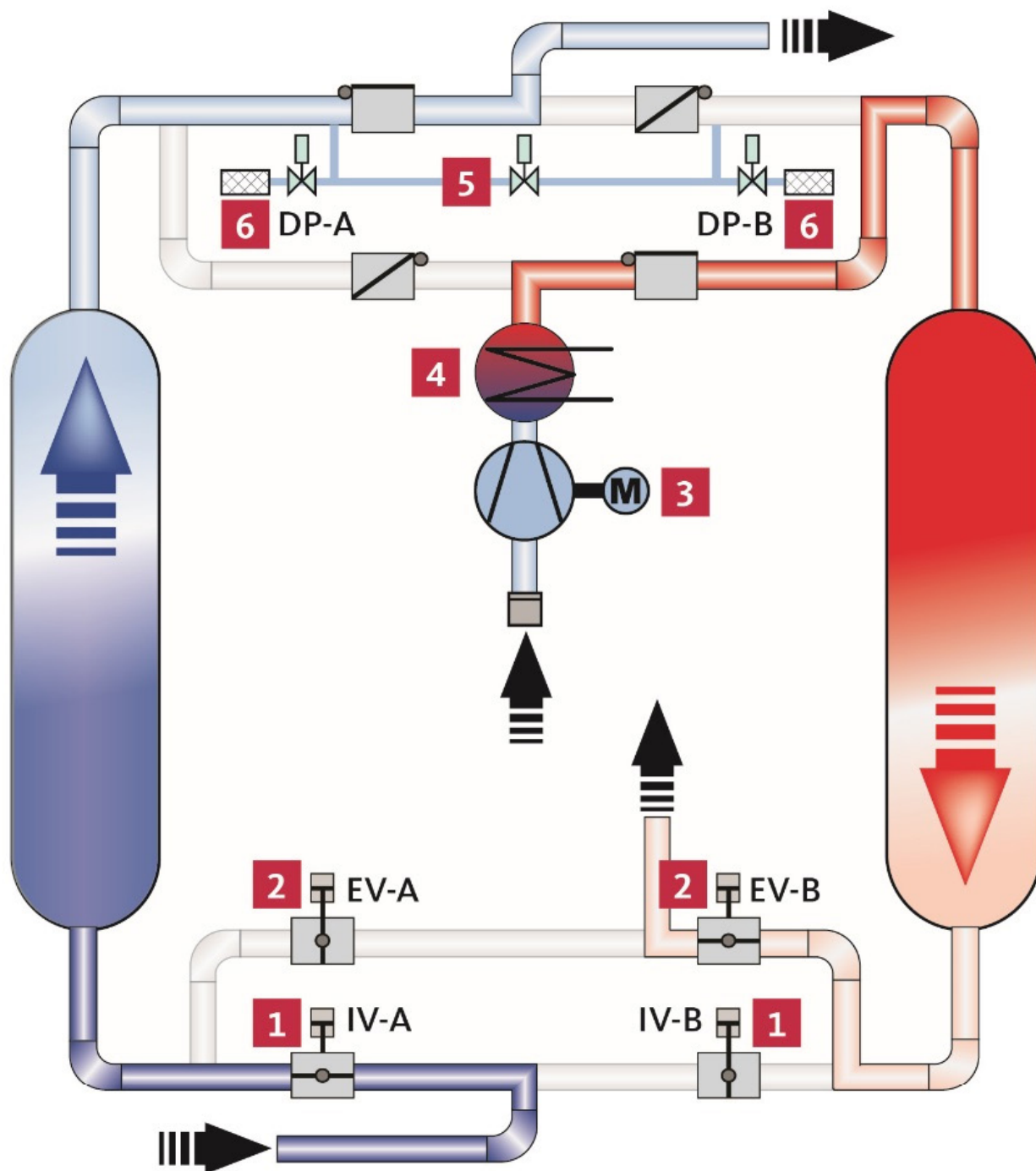
This cycle will continue automatically unless the dryer is shut down.

All desiccant dryers work using the principle of adsorption: the process by which water vapor is removed from the compressed air being dried. All desiccant material types are adversely affected by oil, aerosols, dirt, rust, scale and liquid water. If contaminated, the desiccant material will lose its adsorption properties. Moreover, during operation, the desiccant releases solid particles as fine powder that are abrasive and can be extremely damaging to downstream components and users.

For this reason, the dryer must be equipped with two high-efficiency CLEARPOINT® filters:

- + **0.01 micron** filtration grade coalescing **pre-filter** with differential pressure gauge and either a float drain or BEKOMAT®
- + **1.0 micron** filtration grade particulate **post-filter** (differential gauge optional) and with a manual drain.





Number	Name
1	Inlet Valve
2	Exhaust Valve
3	Blower

Number	Name
4	Heater
5	Purge Valve
6	Depressurization Valve



### 3.5 Cycle Operation

After proper pressurization of the dryer, the operator may begin the start-up. During the start-up phase, valves IV-A (1) and IV-B (1) are powered open, while, EV-A (2) and EV-B (2) are powered closed for a period of 40-seconds to help guarantee the complete pressurization of the dryer.

- Step 1            The inlet valve IV-B (1) is closed, stopping inlet air to Vessel B. All inlet air is therefore directed to Vessel A where the desiccant material adsorbs the humidity down to the target dew point.
- Step 2            The depressurization valve, DV-B (6) is opened. This depressurizes Vessel B to atmospheric pressure through the exhaust silencers. As the depressurization valves are spring return angle body valves, at the end of the step it will return to its normally closed position.
- Step 3            Next, regeneration exhaust valve EV-B (2) opens.
- Step 4            Blower (3) and heater (4) turn on. The blower forces air across the in-line heater and pushes it into the regeneration Vessel. This heated dry air flows through the Vessel and desorbs water from the moisture laden desiccant, then exits through regeneration exhaust valve EV-B (2).
- Step 5            The heater (4) turns off while the blower (3) remains on and cools the heater. After the set temperature is reached, the blower (3) turns off and purge valve (5) opens and additional desiccant bed cooling takes place. At the end of this step the adsorption material of Vessel B is completely regenerated.
- Step 6            Regeneration exhaust valve EV-B (2) closes, thus the Vessel is repressurized to full working pressure. Purge valve (5) closes once repressurization is complete.
- Step 7            If Dew point Demand is activated, the dryer will remain in the drying state on Vessel A.
- Step 8            Inlet valve IV-B (2) is opened and inlet air enters Vessel B. During this time both IV-B (1) and IV-A (2) are open allowing for parallel flow. This allows for reduced dew point and temperatures spikes for the air leaving the dryer.

**NOTE: The cycles are symmetrical for Vessel A and Vessel B:  
Steps 9 -16 are a repeat of steps 1-8, but with 'A' and 'B' side tags switched.**



## 4. INSTALLATION

### 4.1 Design and Use of the Dryer

This dryer has been designed, manufactured and tested to be used only to separate the humidity normally contained in compressed air; any other use is considered to be improper. The manufacturer is not responsible for any problems arising from the improper use of this machine.

The end user, in any and all cases, is responsible for any resulting damages.

Moreover, the correct use of this machine requires the verification of certain installation conditions, in particular:

- + Voltage and frequency of the electrical power supplied
- + Pressure, temperature, flow rate and chemical composition of the incoming compressed air
- + Ambient temperatures

The dryer is supplied as tested and fully assembled. The only operations left for the end user are the connection to the plant, and filling with desiccant and adjustment of the purge rate in compliance with the instructions given in this manual. Factory settings are at nominal conditions at 100 psig and the stated model flow rate (see Section 3.1).



The purpose of the machine is the separation of water vapor that is present in compressed air. It is not intended to separate oil or other contaminants that are present in compressed air. The dried compressed air output from this dryer cannot be used for respiration purposes of any kind.

### 4.2 Location and Installation



Serious consideration should be given when selecting the installation site for the dryer, as an improper location could directly affect the proper operation of the dryer.



This unit is not suitable to be used in explosive atmospheres, where risk of fire could exist, in the presence of gaseous or solid pollutants or in outdoor applications or areas exposed to the elements.

Do not use water to extinguish fire on the dryer or in the surrounding area.



Machine level noise could be higher than 85 dBA. Install the unit in a dedicated area where people are not normally present. The installer and/or end user is responsible for the correct installation of the dryer in order to prevent excessive noise exposure in the work environment. The installer and/or end user is responsible to install proper safety signs at the installation site.



Technicians that service the machine must wear hearing and eye protection while servicing the dryer. Each employee must select a proper personal protection equipment (PPE) hearing protector such as earmuffs, ear canal caps or earplugs in order to prevent permanent hearing damage or loss.

Minimum Installation Requirements:

- + Select a clean, dry room that is free of dust and protected from atmospheric disturbances.
- + The location must be smooth, horizontally level, able to bear the weight of the dryer and vibration free
- + Minimum ambient temperature of +40 °F
- + Maximum ambient temperature of +120 °F
- + Allow a clearance of at least 3' on all sides of the dryer in order easily facilitate all maintenance needs
- + The dryer is not required to be anchored to the supporting surface
- + Coalescing pre-filter with drain must be installed
- + The location of an air receiver tank will vary depending on compressor type and application conditions



**Incorrect installation may void warranty.**



**NOTE: All piping and electrical connections should be inspected prior to installation to ensure they have maintained their integrity during shipping and locating the dryer.**

First, make the initial connections as follows:



1. Inlet piping including an isolation valve
2. Outlet piping including an isolation valve
3. Coalescing pre-filter and particulate post-filter



We recommend the dryer be installed with a 0.01 micron CLEARPOINT® coalescing pre-filter at the inlet and a 1.0 micron CLEARPOINT® particulate post-filter at the outlet. It is recommended to install both 5.0 micron and 1.0 micron filters upstream of the dryer in order to maintain the operational lifespan of the inlet filter to the dryer. In addition, we recommend the use of a BEKOMAT® zero air loss drain on the pre-filter and at all other condensate collection points, especially those upstream of the dryer.

Locate the coalescing pre-filter as close to the dryer as possible while still maintaining sufficient space for routine maintenance and service. Inlet air entering the dryer must pass through a coalescing pre-filter in order to remove entrained condensate and oil to prevent fouling of the desiccant and maintain standard operation. Any liquid condensate entering the desiccant bed will lead to overloading of the dryer, poor dew point performance and rapid deterioration of the desiccant material. Any oil entering the desiccant bed may permanently reduce the capacity of the desiccant material.

Desiccant dust traveling downstream of the dryer may cause contamination and/or accelerated wear to other components and equipment. Therefore, a particulate post-filter should be provided to prevent desiccant dust from traveling downstream. Activated alumina is considered a nuisance dust and proper precautions should be taken when handling desiccant (refer to applicable MSDS sheet).



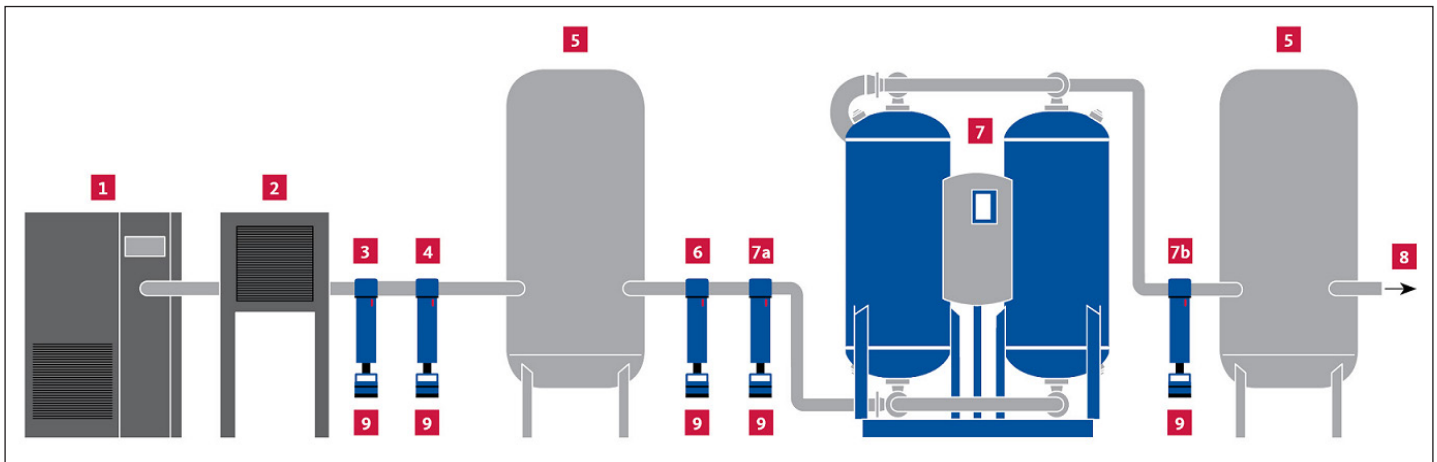
4. **IMPORTANT!** Bypass piping is necessary. Only bubble tight valves should be used.
5. Make the required electrical connections; please refer the type plate of your dryer. The end user is responsible for providing short circuit protection for the dryer.
6. Points of access should be provided upstream and downstream of the dryer for periodic monitoring of dew point, pressure and temperature prior to finalizing the installation. Taking periodic dew point measurements just downstream of the dryer gives the best indication of whether the dryer is performing optimally. We recommend using METPOINT® instrumentation to ensure accurate measurements.
7. All piping must be adequately supported and at least of equal size to the dryer connections.



Before any attempt is made to operate the dryer, the operator must thoroughly read and understand this installation and operation manual.



### 4.3 Optimal Installation Diagram



1	Air Compressor
2	After Cooler
3	CLEARPOINT® Inline Water Separator
4	CLEARPOINT® 5.0 Micron (Grade C) Filtration
5	Receiver Tank
6	CLEARPOINT® 1.0 Micron (Grade F) Filtration
7	DRYPOINT® XF Desiccant Dryer with CLEARPOINT® Pre and Post-filtration (7a & 7b)
8	Dry Air Outlet
9	Condensate Drainage Points for BEKOMAT®

**Optimal** installation is with moderately sized receivers at the inlet and outlet side of the dryer. This allows for the additional free cooling and moisture collection and more consistent dryer inlet flow provided by an upstream receiver, while providing the most reliable shop air supply due to the downstream receiver.

Under no circumstances should the peak demand air flow exceed the maximum rated air flow of the dryer.

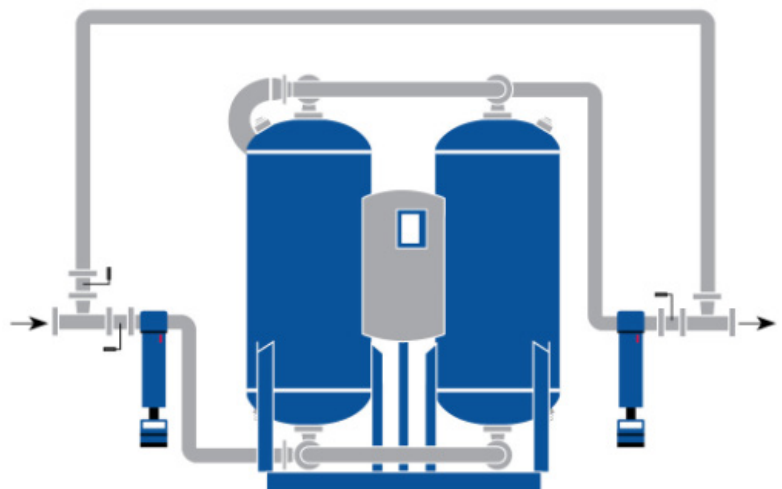


**We recommend the dryer be installed with a 0.01 micron CLEARPOINT® coalescing pre-filter at the inlet and a 1 micron CLEARPOINT® particulate post-filter at the outlet. It is recommended to install both 5 micron and 1 micron filters upstream of the dryer in order to maintain the operational lifespan of the inlet filter.**

### 2.4 Mounted Filters with Bypass

Mounted pre- and post-filters with a bypass are the dryer is an optional setup for DRYPOINT XF. The three valve system bypass allows for the flow of air to be uninterrupted while servicing or completing preventative maintenance such as:

- + Exchange pre- and post- filters
- + Services exhaust silencers
- + Change desiccant





## 5. DRYER OPERATION

### 5.1 Start-Up

#### 5.1.1 Verification Prior to Start-up



Verify that the operating parameters match with the acceptable ranges indicated on the data plate of the dryer (voltage, frequency, air pressure, air temperature, ambient temperature, etc.). This is not the same as the ASME UW plate on the vessels and may be lower than what is stamped on the ASME UW plate.

Before delivery, each dryer is submitted to accurate tests simulating real operating conditions. Nevertheless, the unit could be damaged during transportation. Therefore, we suggest checking the integrity of the dryer upon arrival (see page 4) and observing the dryer during the first hours of operation.



**The start-up must be performed by qualified personnel only: trained and approved by BEKO Technologies, Corp.**

It is mandatory that the engineer in charge will verify safe operational conditions complying with the local safety and accident prevention requirements.

The same engineer will be responsible for the proper and safe operation of the dryer. Never operate the dryer if all panels are not properly in place or if any componentry is missing or appears damaged.



Service to be performed by qualified personnel only. The end user is responsible to ensure that the dryer will never be operated with pressure that exceeds the maximum pressure rating of the unit. Operating the dryer at a pressure higher than the maximum rating could be dangerous for both the operator and the machine.

The inlet air temperature and air flow rate entering the dryer must be within the limits indicated on the data plate.

Installation precautions must be taken in order to limit the vibration that can occur during the operation of the dryer. Therefore, we recommend using flexible connecting pipes that are able to insulate the dryer from possible vibrations originating from the pipe line.



The connection to the main power is to be carried out by qualified personnel, and the safety protocol must comply with local rules and laws.

Before connecting the unit to the electric power, verify that the voltage and the frequency available on the mains correspond to the data on the data plate of the dryer. In terms of voltage, a  $\pm 5\%$  tolerance is acceptable. The wire size feeding the dryer must comply with the consumption of the dryer, while keeping into account also the ambient temperature, the conditions of the main power junction box, the length of the wire, and the requirements enforced by the local power company.



It is mandatory to ensure the connection to the ground terminal.



The condensate is discharged at the same pressure as the air entering the dryer. Never point the condensate drain in a direction that may cause bodily harm.

Connect and properly fasten the condensate drain to a collection system or container. The outlet condensate hose cannot be connected to pressurized systems.





## DO NOT DISPOSE OF CONDENSATE INTO THE ENVIRONMENT

The condensate collected in the dryer contains oil particles released into the air stream by the compressor. Dispose of the condensate in a manner compliant with all local, state and Federal rules and regulations. We highly recommend the installation of either a QWIK-PURE® or ÖWAMAT® oil-water separator at the final collection point for all condensate discharge lines within the facility (i.e. from the main header).

### 5.1.2 Desiccant Fill Procedure

The DRYPOINT XF heated dryers may be delivered without a complete desiccant fill in either vessel. This is done for ease of transportation and, the dryers higher center of gravity after it is filled. Desiccant filling should only be done by an experience professional. Personal protection equipment (PPE) must be used when filling desiccant into a dryer such as: dust mask, proper full cover eye protection and protective clothing including gloves.



1. Make sure the dryer is properly placed in the installation location. The unit should be bolted down before filling.
2. Power to the dryer must be disconnected and the unit should have no pressure. Verify the Vessel pressure gauge read zero (0) psig.
3. It may be necessary to remove the pressure relief valves to gain access to the desiccant fill ports. DO this if necessary.
4. Fill the dryer with the correct amount of desiccant according to the chart below: 'Desiccant Fill Chart' (a funnel may help in this process)
5. Replace the fill port plug of blind flange using proper bolt torque procedure in the case of a flanged port. Thread sealant or non-asbestos gaskets must also be used.
6. Re-tape the threading on the pressure relief valves with a Teflon sealing tape and replace, taking care not to over torque, which can damage the valve.
7. Verify there are no leaks at the pressure relief valve location.

Approximate Desiccant Fill Chart: Desiccant per Vessel (in Lbs)

Model No.	
XF 800	630
XF 1000	785
XF 1200	945
XF 1500	1,185
XF 1800	1,420
XF 2300	1,820
XF 2800	2,195
XF 3300	2,590
XF 4000	3,130
XF 5000	3,910
XF 6000	4,690

Filling the dryer with desiccant creates dust that can cause damage to downstream components such as valves and, shorten the life of the dryer's post-filter. Therefore, after filling the dryer following the desiccant fill procedure, it is important to properly remove dust. Consult factory for more information.



### 5.1.3 Start-up Procedures



During the first start-up or start-up after a long period of inactivity or following maintenance, the technician must comply with the instructions below.

**The start-up must be performed by qualified personnel only: trained and approved by BEKO Technologies, Corp.**



The employee that operates the machine must wear hearing and eye protection before operating the dryer. Each employee must select a proper personal protection device (PPD) hearing protector such as earmuffs, ear canal caps or earplugs in order to prevent permanent hearing damage or loss.

#### Start-up Sequence

- + Please read and understand the entire manual before operating the dryer
- + Verify the factory settings
- + Verify the wiring diagrams that pertain to your unit and ensure the correct power supply is connected
- Do not energize the circuit at this time**
- + Verify that proper short circuit protection has been provided following all applicable codes and regulations
- + Verify that all the steps of in the previous chapters relating to installation have been observed
- + Verify that the connection to the compressed air system is correct
- + Verify that the condensate drain pipe is properly fastened and connected to a collection system or container
- + Remove any packaging and other material that might obstruct the area around the dryer

Before starting the dryer your compressor should be running, your compressed air system pressurized and the dryer bypassed and not yet pressurized.



1. With the dryer bypassed and in isolation (see Section 4.2 & Section 4.4)
2. Ensure that purge exhaust valves are in closed position; this may have to be performed manually as the result of there being no air in the system in order to drive the pilot air into the valves.
3. **SLOWLY** open the inlet isolation valve allowing compressed air into the dryer. It is critical that the dryer be pressurized slowly to prevent fluidization of the desiccant bed. Keep the outlet isolation valve closed at this time.
4. **SLOWLY** open the outlet isolation valve. All bypass and isolation valves are now in their open positions and compressed air is flowing through both Vessels.
5. Close the dryer bypass valve. The bypass valve must be bubble tight to prevent any moisture from contaminating the dry air outlet from the dryer.
6. Plug in the dryer and energize the electrical circuit – the dryer is now ON.
7. Verify that the controller is on.
8. Check all piping for compressed air leaks.
9. Test the condensate drain on the pre-filter.
10. After 1-minute from start-up the adsorption Vessel B will be depressurized.
11. The pressure swing cycle occurs every 4 hours (outlet dew point of -40°F).

**NOTE: During the first few cycles in operation, the dew point cannot be guaranteed because the adsorption material can contain humidity from storage.**



#### 5.1.4 General Operation Information

- + The dryer may require up to 48-hours of operation to reach normal operating outlet dew point. Therefore, indicators and alarms related to outlet dew point, do not need to be recognized during this time.
- + The dryer will not perform as intended without properly sized and installed pre-filtration, condensate drainage and correct purge flow adjustment.
- + After the initial start-up, some dusting may occur. This is normal and will diminish with time, although may accelerate the first maintenance interval of the exhaust valves, exhaust silencers and post-filter element.
- + Exhaust valves and silencers may have to be replaced due to dusting from shipping and the initial start-up to ensure proper operation. Post-filter elements should also be part of a regular preventative maintenance schedule.
- + Never service the dryer or filters without first relieving pressure from the dryer.
- + Never service the dryer without first allowing time for cooling to ambient conditions.
- + A desiccant dryer should never be pressurized or depressurized suddenly. This will cause fluidizing and dusting of the desiccant bed.
- + The dryer is designed for a maximum operating pressure as listed in Section 3.1.



## 5.2 Purge Valve Adjustment

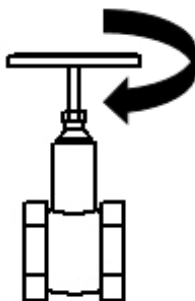
The purge flow control valve must be set according to the inlet pressure of the dryer. The valve must be opened to the corresponding number of turns referenced in the table below.

+ **Always base the pressure adjustment on the lowest operating pressure of the system**

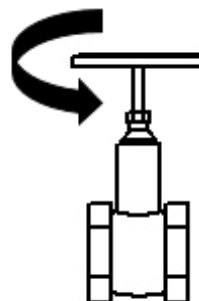
The procedure for adjusting the purge flow control valve is as follows:



Rendered drawing of purge  
flow control valve



Turn knob clockwise  
(to the right) to close



Turn knob counter clockwise  
(to the left) to open



1. Begin by fully closing the valve. Rotate the knob clockwise until rotation stops.
2. If no reference mark exists, use a permanent marker to make two aligned markings on the valve stem and valve body indicating the closed position.
3. Referencing a calibrated flow meter, rotate the knob counter clockwise in 1/8 turn (45 degree) increments until the desired flow rate has been achieved, counting each time a full rotation has been made.
4. Record the standard system pressure and valve setting in this manual for future reference. A blank table has been provided below for this purpose.
5. At a minimum, the purge control valve must allow enough airflow to fully repressurize the dryer during the 4 minute repressurization phase. This should be verified using the lowest observed system dryer inlet pressure.

### Purge Adjustment Table

Dryer	Purge Flow Rate [scfm]
XF 800	131
XF 1000	164
XF 1200	196
XF 1500	246
XF 1800	295
XF 2300	376
XF 2800	458
XF 3300	540
XF 4000	655
XF 5000	818
XF 6000	982

Model: \_\_\_\_\_

Serial Number: \_\_\_\_\_

Inlet Pressure: \_\_\_\_\_

Purge Rate: \_\_\_\_\_

Purge Valve Setting: \_\_\_\_\_

Consult a factory representative for more information.



### 5.3 ISOLATION AND SHUT DOWN PROCEDURES



Users operating the machine must wear hearing and eye protection. Each employee must select a proper personal protection device (PPD) hearing protector such as earmuffs, ear canal caps or earplugs in order to prevent permanent hearing damage or loss.



#### **Isolation**

1. Allow the dryer to reach its re-pressurization step and fully re-pressurize. Therefore, both Vessels should be fully pressurized.
2. Once fully re-pressurized, power down the dryer.
3. Open the bypass valve.
4. Close the outlet isolation valve.
5. Close the inlet isolation valve.



#### **Depressurization and Shut Down**

1. Open the bypass valve.
2. Close the outlet isolation valve.
3. Close the inlet isolation valve.
4. Allow the dryer to continue to run. During the normal operating cycle both towers will blow down and depressurize.
5. Disconnect the power to the dryer.
6. Open the manual ball valves on any filters with manual ball valves to allow full depressurization. Also, leave manual ball valves on filter open during maintenance and service.



**IMPORTANT!** Always remove all pressure and disconnect all power before servicing the dryer.



To restart the dryer, follow the start-up procedure in Section 5.1: START-UP



## 5.4 Controller Information and Operation

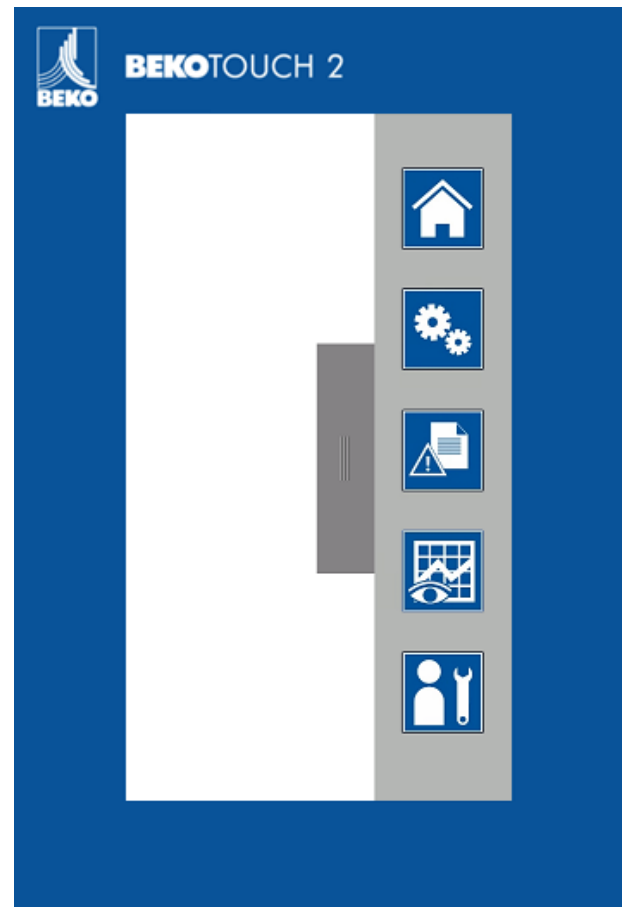
### 5.4.1 Display Overview

The interface between the dryer and the operator is the control panel shown below:

**XFe: Economy Controller**



**XFi: ecoIntelligent Controller**



Home Button



Alarm History



Service & Maintenance



Settings



Histogram

The operation of the dryer is controlled and monitored constantly by the advanced system controller. This is a multi-function device:

- + Displays the operating status and current process step
- + Allows for dryer setting adjustments
- + Provides and records system alerts and troubleshooting tips
- + Charts the system performance such as: heater, blower and dew point (optional on XFe)
- + Tracks the maintenance schedule and provides spare part information



## 5.4.2 Controller Start-up

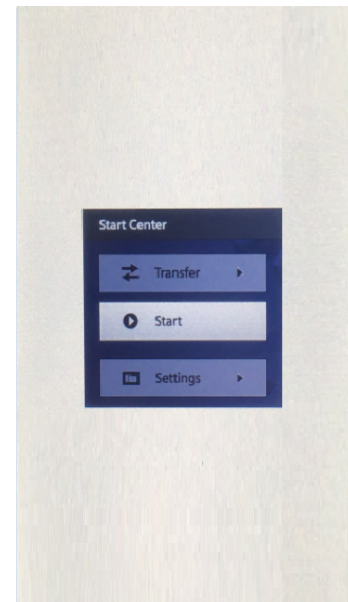
### System Boot-up

When main power is connected to the dryer, the controller start-up sequence begins. This includes a system boot-up process which takes approximately 30 seconds.



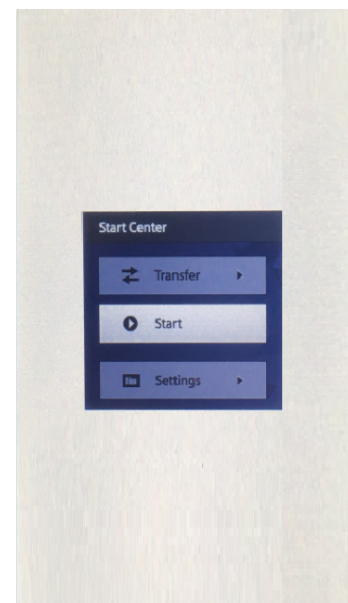
### Start Center

Once the System Boot-up sequence is complete, the **Start Center** window will be displayed. However, this screen is locked and will automatically continue to the **HOME** screen.



### Controller Start-up Complete

The START screen is only displayed for 3 seconds, after which, the HOME screen will be displayed and the controller will automatically begin in Startup before the drying sequence commences.

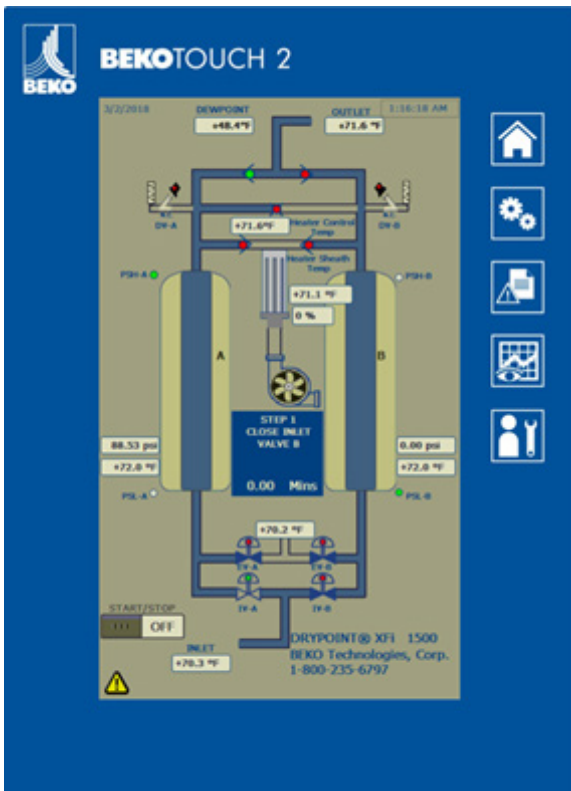




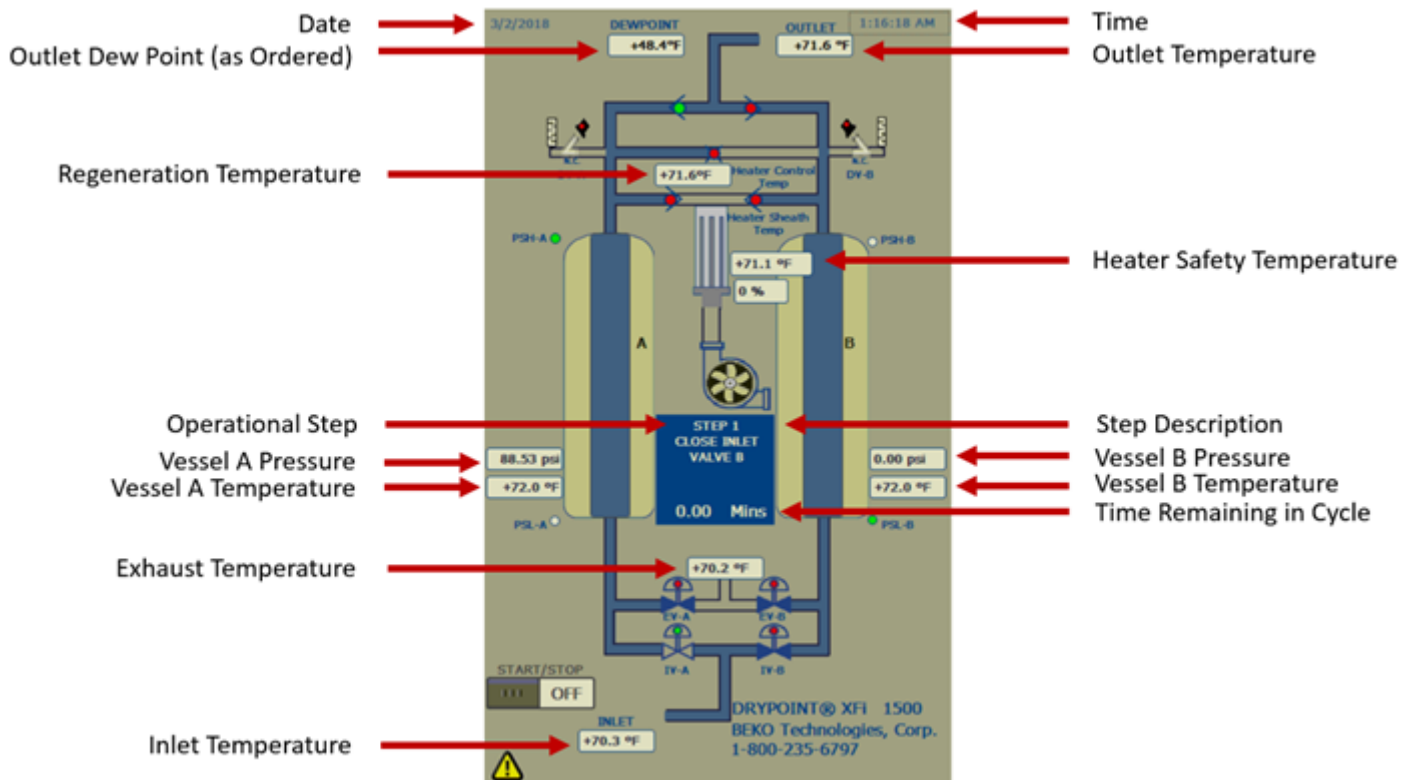
### 5.4.3 Home Screen



## HOME



After the controller startup, the **HOME** screen dryer operation is displayed. This screen can be accessed at any time by pressing the **HOME** button.



The controller provides the system information along with an animation of the drying process based on its current operational sequence. Each step is detailed below along with a screen shot of the process.

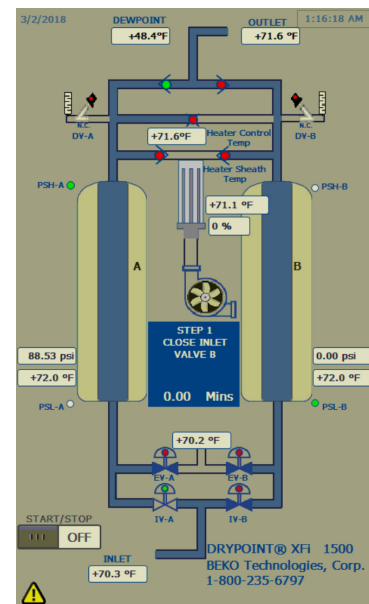


### Startup: System Start-up (40 seconds)

The controller is evaluating its system parameters to determine the correct step on which to start. The system retains its sequence history, so, in the case of a power interruption, the controller will restart on its last step

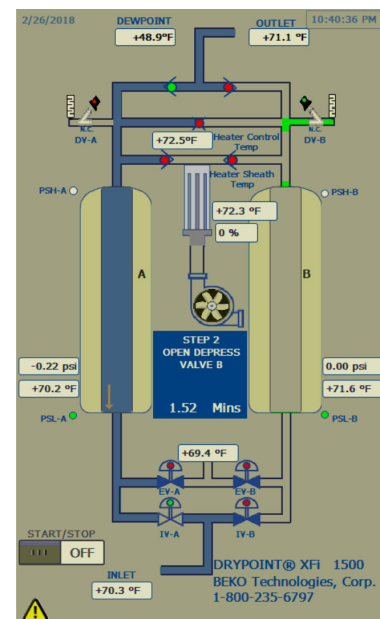
#### Step 1: Vessel B Close Inlet Valve (2.5 seconds)

Vessel B inlet valve closes, stopping inlet air to Vessel B. All inlet air is therefore directed to Vessel A where the desiccant material adsorbs the humidity down to the target dew point



#### Step 2: Vessel B Open Depressurization Valve (2 minutes)

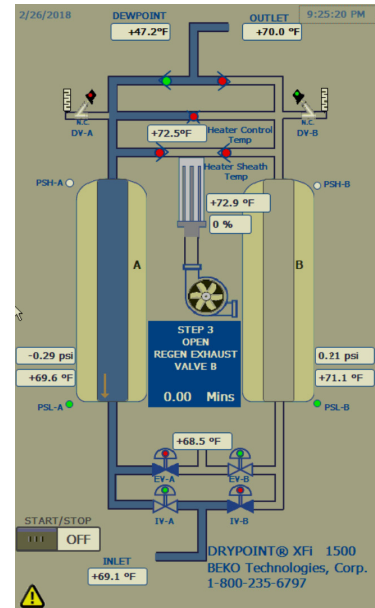
The Vessel B depressurization valve is opened. This depressurizes Vessel B to atmospheric pressure through the exhaust silencers. As the depressurization valves are spring return angle body valves, at the end of the step it will return to its normally closed position.





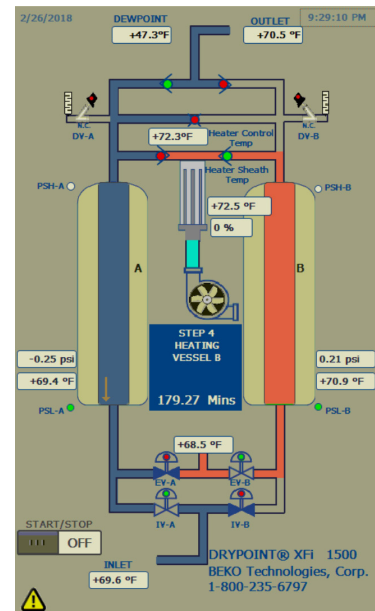
### Step 3: Vessel B Open Regeneration Valve

Vessel B regeneration exhaust valve opens.



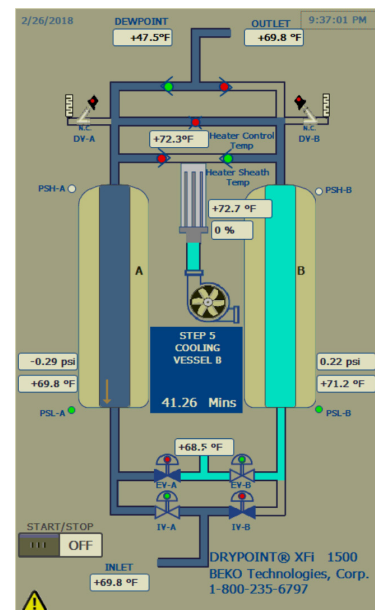
### Step 4: Start Vessel B Heating Period - Regeneration (180 minutes)

The blower and heater turn on. The blower forces air across the in-line heater and pushes it into the regeneration tower. This heated dry air flows through the tower and desorbs water from the moisture laden desiccant, then exits through the regeneration exhaust valve of Vessel B.



### Step 5: Start Vessel B Cooling Period - Cooling (44 minutes)

The heater turns off while the blower remains on and cools the heater. After the set temperature is reached, the blower turns off and the purge valve opens and additional desiccant bed cooling takes place. At the end of this step the adsorption material of vessel B is completely regenerated.

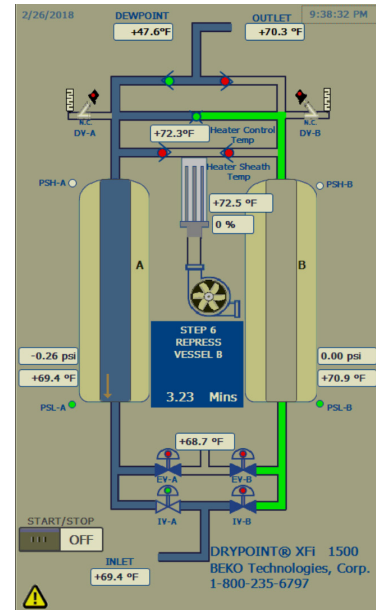




**Step 6:** Vessel B Regeneration Valve Closes - Repressurization (4 minutes)

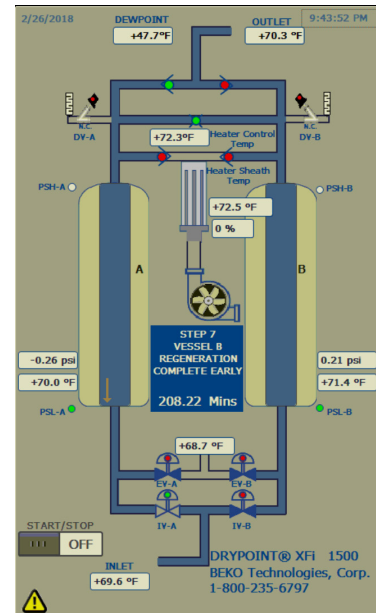
Vessel B Regeneration exhaust valve closes, thus the vessel is repressurized to full working pressure.

Purge valve closes once repressurization is complete



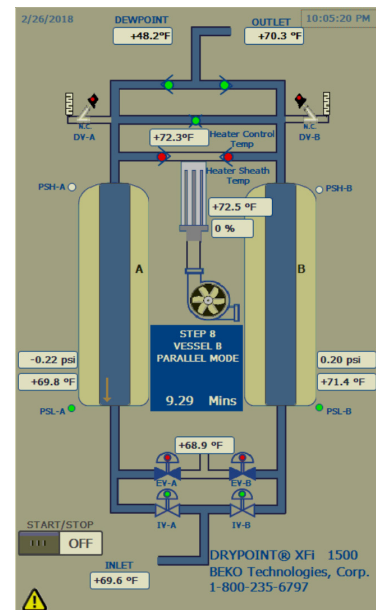
**Step 7:** Vessel B Energy Savings (20 hours max)

If dewpoint demand is installed, the dryer will remain in the drying state on Vessel A.



**Step 8:** Vessel B Parallel Mode (10 minutes)

Vessel B inlet valve is opened and inlet air enters Vessel B. During this time both Vessel inlet valves are open allowing for parallel flow. This allows for reduced dewpoint and temperatures spikes for the air leaving the dryer.





**NOTE: The cycles are symmetrical for Vessel A and Vessel B:**  
**Steps 9 -16 are a repeat of Steps 1-8, but with 'A' and 'B' side tags switched.**

After Step 16, the controller will continue back to Step 1. Note that the Step 7 & 15: Energy Saving function is only applicable if it has been enabled in **SETTINGS** (under the Energy Management option). To enable this, refer to the **SETTINGS** section of the manual.

If a power interruption occurs while the dryer is in operation, the inlet and regeneration valves will not move. The depressurization valve will return normally open and the depressurization valves will return normally closed. Upon power startup, the dryer will remember its sequence step and continue where it left off.

#### 5.4.4 Controller Settings



Within the **SETTINGS** function of the controller, the system can be configured based on several characteristics that will affect the operation of dryer:

- + Global Setting: Date/Time; Language; Units of Measure
- + Parameters: Regeneration Control; Communication; Energy Report (XFi: ecoIntelligent Only)



## Global Settings

### Time/Date

12:00



It is important to set the correct Date and Time for the dryer. Dryer alarms are tied to the systems time stamp so, it is important to have this accurate.

In case of a power is removed from the controller, the Date and Time are maintained in the memory.

### Language



Currently only English is active in the controller.

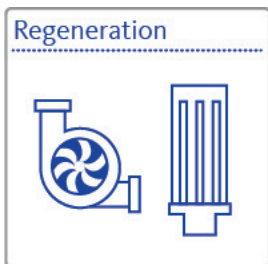
## Parameters

### Admin Settings



This function is locked and not accessible.





## Performance

Regeneration includes functional setting for both the Heating Phase and Cooling Phase.

Adjustment to these set points are locked and only accessible through an administrative password. Changes can only be made within a specified band of performance.

## Dew point Demand (Standard XFi / Optional XFe)

If it can be, Enabled: running in Energy Savings mode or, Disabled: running in fixed time mode.

Outlet Target Dew point; Maximum Cycle Extension; and Alarm settings can be adjusted here.



## Communication

The communication screen shows the default IP address of the PLC, HMI, PROFIBUS and MODBUS.

NOTE: This is only a notes section for the IP address. If the note section is updated here, it will not change the actual IP address. Changing the IP addresses must be done through a web browser.

10/16/2017 7:39:22 AM

BEKO SETTINGS > REGENERATION SETTINGS

HEATING PHASE SETTINGS

Lower Bed Heat Target #####

Heater Control #####

Capacity Tolerance #####  $\Delta T$

Add Delays Drop Delays

Bank 1 ##### Bank 1 #####

Bank 2 ##### Bank 2 #####

Bank 3 ##### Bank 3 #####

Bank 4 ##### Bank 4 #####

Bank 5 ##### Bank 5 #####

COOLING PHASE SETTINGS

Lower Bed Cool Target #####

DEWPOINT & HUMIDITY SETTINGS

Dewpoint Demand

Dewpoint Control

Extended Savings Limit #####

Dewpoint Alarm

Dewpoint Alarm Delay

Reset Settings To Defaults

3/27/2017 11:54:46 AM

BEKO SETTINGS > COMMUNICATION

PLC Programmable Logic Controller

192 . 168 . 10 . 150

HMI Human Machine Interface

192 . 168 . 10 . 152

PROFIBUS

0 . 0 . 0 . 0

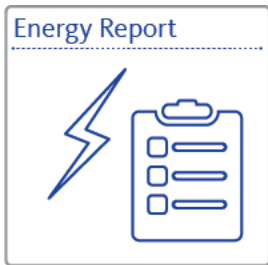
MODBUS

0 . 0 . 0 . 0

Holding Registers Fault Codes Values

40001	Major Regeneration Alarm	0-1
40001	Major Pressure Alarm	0-1
40001	Major Sensor Failure Alarm	0-1
40001	Major Limit Switch Alarm	0-1
40001	Minor Moisture Alarm	0-1
40001	Minor Maintenance Alarm	0-1
40001	Minor Pressure Alarm	0-1
40001	Minor Sensor Failure Alarm	0-1
40001	Minor Temperature Alarm	0-1
40001	Major Temperature Alarm	0-1





### Energy Report (XFi ecoIntelligent only)

Energy Report is where you can track: energy usage of the blower, heater and purge. By entering the energy rate: \$/kW we can calculate the total energy consumption.

With the ecoIntelligent Control (described in Section 5.5.1) we can look at the energy savings of this function vs dryer running in a fixed time cycle.

10/16/2017

8:28:20 AM

BEKO

SETTINGS > ENERGY SAVINGS

Energy Savings

Blower Energy Usage/Yr

###

###

8:28:20 AM 10/16/2017

8:27:46 AM 10/16/2017

8:27:13 AM 10/16/2017

8:26:40 AM 10/16/2017

■

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Trend	Tag connection	Value	Date/time
No P...	SEQUENCE_DB...	#####	10/16/2017 8:28:20
Savin...	SEQUENCE_DB...	#####	10/16/2017 8:27:13

Rate

00.00

Blower KW

00.00 KW

Heater KW

00.00 KW

\$ 00.00

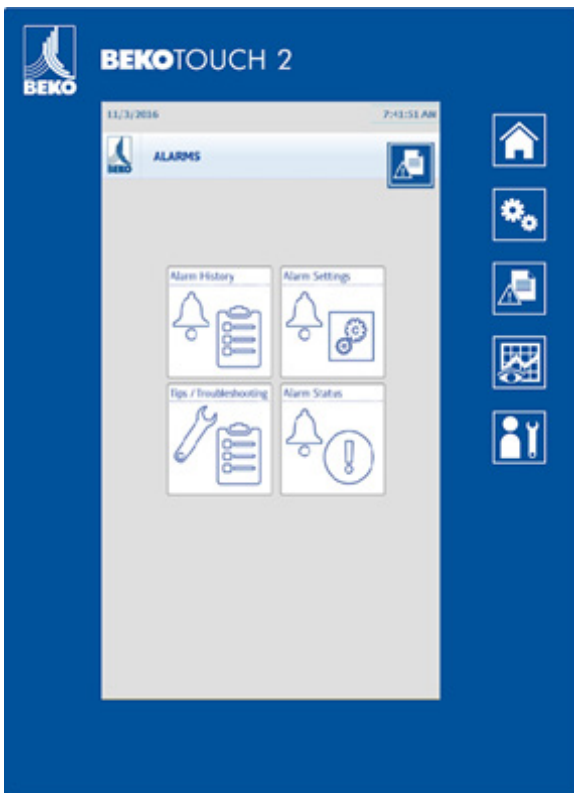
Savings/Yr



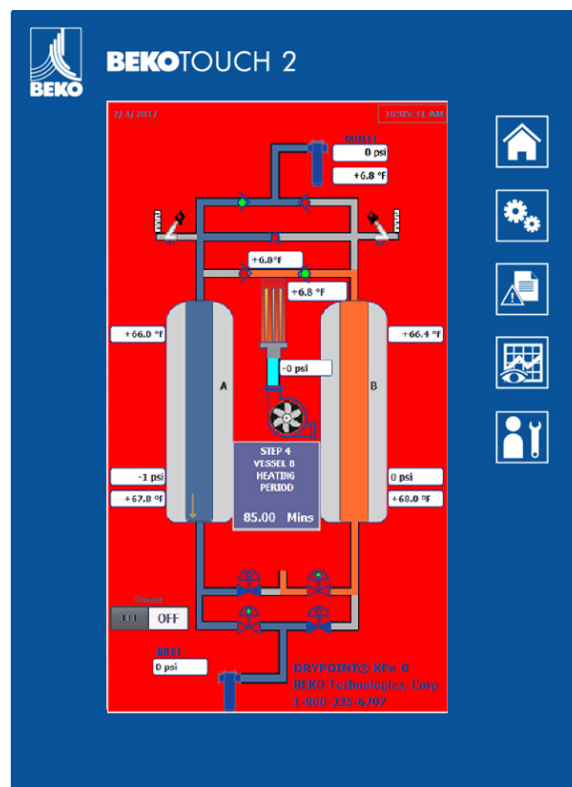
## 5.4.5 Alarms



# ALARMS










The controller has ability to continually monitor specific dryer characteristics along with any ancillary equipment provided it is connected to the controller. If there is a functional issue associated with normal operation, an alarm will be triggered and be displayed as a red background flash on any controller screen:







## Alarm Failure Class

	<b>Regeneration Alarm</b> Regeneration Alarm is an alarm that directly affects the regeneration cycle of the dryer.
	<b>Pressure Alarm</b> Pressure Alarm is an alarm monitored by a pressure switch or pressure transducer.
	<b>Temperature Alarm</b> Temperature Alarm is an alarm monitored by a thermocouple.
	<b>Sensor Failure Alarm</b> Sensor Failure Alarm is a failure in the signal of a sensor to the dryer's controller after a fixed time delay buffer, i.e. the analog value of the sensor has exceeded the standard range.  Pressure and temperature sensor failures will stop the dryer; a moisture failure will not. A dewpoint sensor failure will default the dryer into a fixed time cycle mode.
	<b>Limit Switch Alarm</b> Limit Switch Alarm is an alarm from a limit switch.
	<b>Moisture Alarm</b> Dew point or humidity alarm of process air, cabinet enclosure or ambient conditions.
	<b>Maintenance Alarm</b> Maintenance alarms are based solely on system timers.

## Alarm Failure Types

	<b>Major Alarm</b> A Major Alarm is identified as one that could affect the operational safety of the dryer. Therefore, when triggered, will shut down the dryer operation and cannot restart until the alarm is addressed.
	<b>Minor Alarm</b> A Minor Alarm is identified as one that does not affect the operational safety of the dryer. Therefore, when triggered, the dryer will continue in its operation.



## Regeneration Alarm

Alarm ID	Description
100	<b>Blower Motor Circuit Breaker Tripped -MAJOR-</b> Motor Starter has tripped due to overcurrent or short circuit. Check overload settings and have qualified electrician troubleshoot wiring for faults.
101	<b>Blower Motor Not Running -MAJOR-</b> Blower motor is not running during regeneration, Check blower operation and have qualified electrician troubleshoot wiring for faults.
102	<b>Safety Contactor Failure -MAJOR-</b> A heater safety contactor has malfunctioned, have qualified electrician troubleshoot wiring for faults in circuitry or operation.

## Pressure Alarm

Alarm ID	Description
200	<b>Vessel A High Pressure Alarm -MINOR-</b> Vessel A pressure is higher than normal operation, please monitor for safety.
201	<b>Vessel B High Pressure Alarm -MINOR-</b> Vessel B pressure is higher than normal operation, please monitor for safety.
202	<b>Failure to STEP Alarm -MAJOR-</b> Vessel didn't switch in time. Make sure depressurized vessel is at low threshold. Residual pressure may be present.
203	<b>Loss of Pressure Alarm -MAJOR-</b> Pressure fell below HIGH threshold on process drying side during regeneration, check air delivery from supply/compressor(s).
204	<b>Pressure Not Equal -MAJOR-</b> Pressure fell below HIGH threshold during Standby and/or Parallel, check air delivery from supply / compressor(s).
205	<b>Pressure Equal During Regeneration -MAJOR-</b> During regeneration, pressure was not maintained below the LOW threshold, check for obstruction in exhaust system.
206	<b>Vessel A Depress Failure -MAJOR-</b> Vessel A is not fully depressurized. Make sure Vessel A's pressure has dropped to the appropriate low pressure threshold. There may be blockage causing the pressure build up.
207	<b>Vessel B Depress Failure -MAJOR-</b> Vessel B is not fully depressurized. Make sure Vessel B's pressure has dropped to the appropriate low pressure threshold. There may be blockage causing the pressure build up.
208	<b>Vessel A Repress Failure -MAJOR-</b> Vessel A repressurization failure, check to make sure operation of purge/repress valve is normal and that manual throttling valve is open to ensure fill up.



209	<b>Vessel B Repress Failure -MAJOR-</b> Vessel B repressurization failure, check to make sure operation of purge/repress valve is normal and that manual throttling valve is open to ensure fill up.
210	<b>No Air Pressure -MINOR-</b> Check system air pressure. There is no air pressure detected and could be a problem in main air circuit or trouble with compressor operation.

#### Temperature Alarm

Alarm ID	Description
300	<b>Heater Sheath Over Temperature -MAJOR-</b> The heater temperature has surpassed the threshold. Check operation of blower, position of blower discharge slide gate damper, and control settings for heater control.
301	<b>Low Regeneration Temperature -MINOR-</b> Temperature is below 300 degrees F after 1 hour of heating. Check heater.
302	<b>Vessel Exceeding Temperature -MINOR-</b> Vessel is heating too much too fast.
303	<b>Vessel Heating Too Slow -MINOR-</b> Vessel is not heating fast enough
304	<b>Enclosure High Temperature Alarm -MINOR-</b> Enclosure temperature is too high, ensure vortex cooler delivery is adequate.
305	<b>Dryer Inlet Temperature High -MINOR-</b> Dryer Inlet Temperature High, this could result in water overloading to desiccant column and create wetter dew point.

#### Sensor Failure Alarms

Alarm ID	Description
400	<b>Outside Humidity Sensor Failure -MINOR-</b> Outside humidity has malfunctioned.
401	<b>Dew point Sensor Failure -MINOR-</b> Dew point Sensor has malfunctioned.
402	<b>Regeneration Outlet Thermocouple Failure -MAJOR-</b> Regeneration outlet thermocouple has malfunctioned.
403	<b>Dryer Outlet Thermocouple Failure -MINOR-</b> Dryer Inlet thermocouple has malfunctioned.
404	<b>Vessel A Lower Thermo-well Sensor Failure -MAJOR-</b> Vessel A lower thermo-well sensor has malfunctioned
405	<b>Vessel B Lower Thermo-well Sensor Failure -MAJOR-</b> Vessel B lower thermo-well sensor has malfunctioned.



Alarm ID	Description
406	<b>Enclosure Humidity Sensor Failure -MINOR-</b> Enclosure humidity sensor has malfunctioned.
407	<b>Enclosure Temperature Sensor Failure -MINOR-</b> Enclosure temperature sensor has malfunctioned.
408	<b>Vessel A Upper Thermo-well Sensor Failure -MAJOR-</b> Vessel A Upper Thermo-well Sensor has malfunctioned.
409	<b>Vessel B Upper Thermo-well Sensor Failure -MAJOR-</b> Vessel B Upper Thermo-well Sensor has malfunctioned

#### Limit Switch Alarms

Alarm ID	Description
500	<b>Failure To Close Vessel A Inlet Valve -MAJOR-</b> Vessel A inlet valve didn't close. Check vessel A inlet valve.
501	<b>Failure To Close Vessel B Inlet Valve -MAJOR-</b> Vessel B inlet valve didn't close. Check vessel B inlet valve.
502	<b>Failure To Open Vessel A Inlet Valve -MAJOR-</b> Vessel A inlet valve didn't close. Check vessel A inlet valve.
503	<b>Failure To Open Vessel B Inlet Valve -MAJOR-</b> Vessel B inlet valve didn't close. Check vessel B inlet valve.
504	<b>Failure To Open Vessel A Regen Outlet Valve -MAJOR-</b> Malfunction with Vessel A regen outlet valve. Make sure limit switch at V5 is open. Solenoid V25 should be enabled.
505	<b>Failure To Open Vessel B Regen Outlet Valve -MAJOR-</b> Malfunction with Vessel B regen outlet valve. Make sure limit switch at V4 is open. Solenoid V26 should be enabled.

#### Limit Switch Alarms

Alarm ID	Description
600	<b>Outside High Humidity Alarm -MINOR-</b> Outside humidity has surpassed threshold.
601	<b>High Dew point Alarm -MINOR-</b> Dew point value is too low.
602	<b>Enclosure High Humidity Alarm -MINOR-</b> Enclosure humidity is too high.



## Maintenance Reminders

Alarm ID	Description
700	<b>Pre-Filter Alarm -MINOR-</b> The recommended maintenance timer interval for the pre-filter change is due soon.
701	<b>Post -Filter Alarm -MINOR-</b> The recommended maintenance timer interval for the pre-filter change is overdue.
702	<b>Service Pre-Filter Soon -MINOR-</b> The recommended maintenance timer interval for the pre-filter change is due soon.
703	<b>Service Pre-Filter Overdue -MINOR-</b> The recommended maintenance timer interval for the pre-filter change is overdue.
704	<b>Service Post-Filter Soon -MINOR-</b> The recommended maintenance timer interval for the post-filter change is due soon.
705	<b>Service Post-Filter Overdue -MINOR-</b> The recommended maintenance timer interval for the pre-filter change is overdue.
706	<b>Service Desiccant Media Soon -MINOR-</b> The recommended maintenance timer interval for desiccant change is due soon.
707	<b>Service Desiccant Overdue -MINOR-</b> The recommended maintenance timer interval for desiccant change is overdue.

When an alarm is triggered, it will appear as a red flash in the background of the controller screen regardless of the active screen with the date, time and type of alarm shown in the top center of the screen. When an alarm is active, it will remain on the screen until it is addressed. To find out additional detail and to how to address an alarm, go to the **ALARMS** screen.





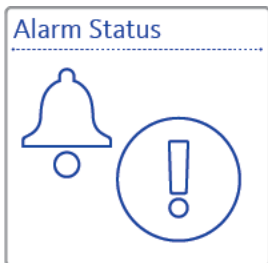
On the **ALARM HISTORY** screen, all previous alarms are shown along with the current active alarm. The alarms are shown in descending order with the most recent at the top of the screen.

Incoming messages have an 'I' designation immediately following the date and time when the alarm was triggered. Messages that have been acknowledged and addressed have an 'IO' after the date and time indicating the moment in time when the alarm was reset.

Highlighting the alarm then tapping the help button will provide a brief information text.

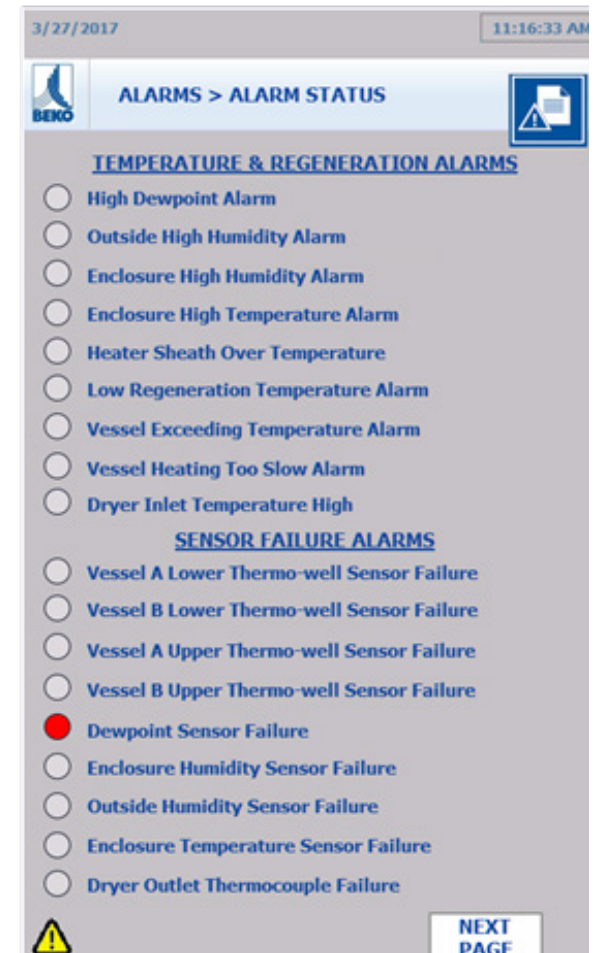
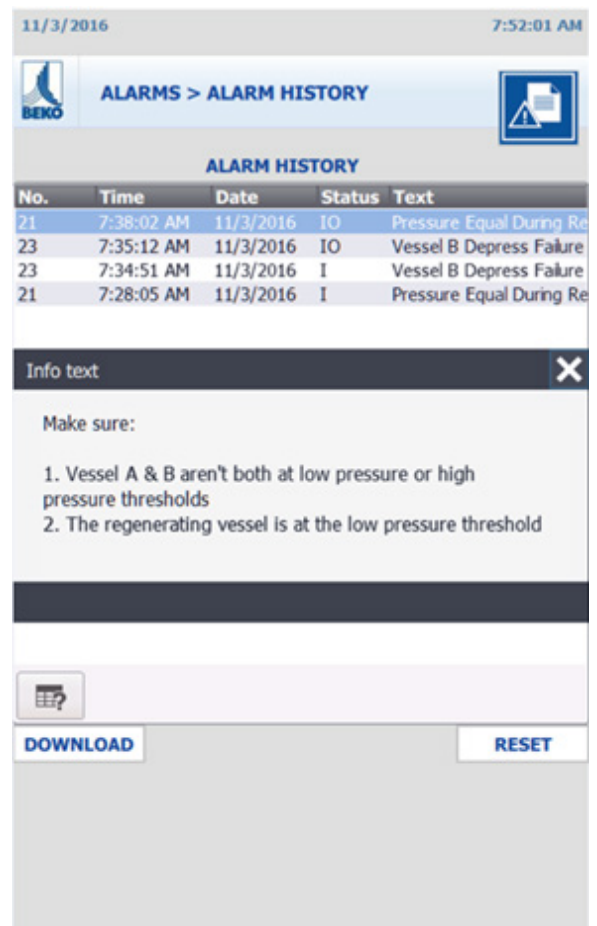
You can also download a log of the alarm history which can be sent to a BEKO Technologies Service Technician for further review.

Notices that all past alarms are stored as history in the controller as well as when the alarm was reset.

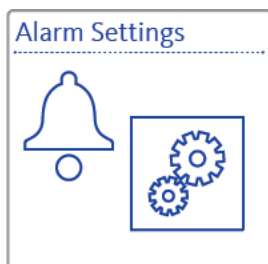


**ALARM STATUS** shows any overview of all active alarm categories whether major or minor.

Note: there are multiple pages of alarms.







In **ALARM SETTINGS**, adjust to the set point of an alarm or delay timer can be adjusted.

11/3/2016 7:52:51 AM

BEKO ALARMS > ALARM SETTINGS

ALARM SETTINGS

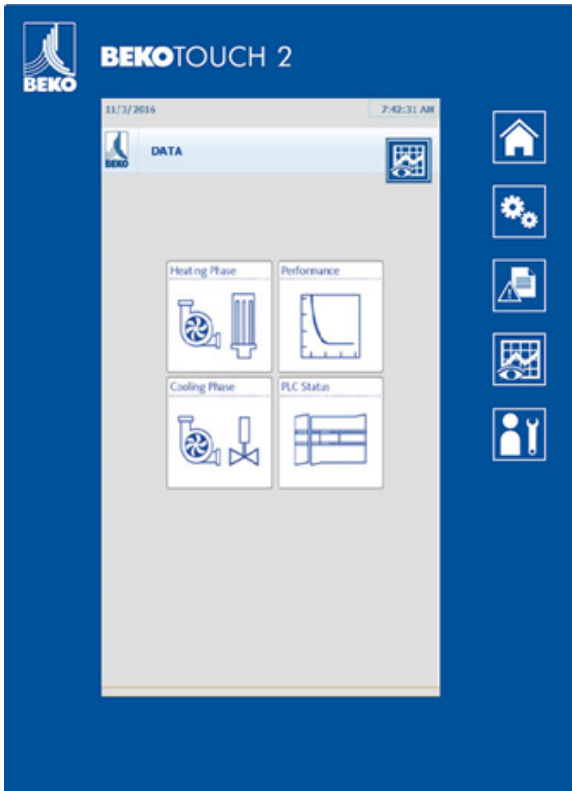
Loss Of Pressure During Parallel	0
Failure To Switch Alarm	0
Blower Motor Running Alarm	0
Heater Sheath Overtemperature	0
Dewpoint High	0
Low Regeneration Temperature	0
Vessel 1 Bed Temperature Failure	0
Vessel 1 Bed Temp Sensor Failure	0
Vessel 2 Bed Temperature Failure	0
Vessel 2 Bed Temp Sensor Failure	0
Repressurization Failure	0
Depressurization Failure	0
Low Regeneration Temperature	0

BACK NEXT



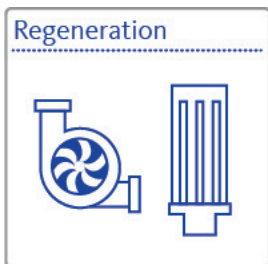


# GRAPHS and DATA



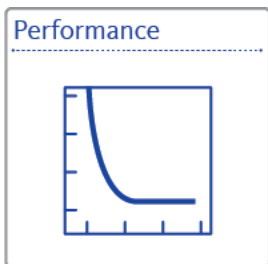
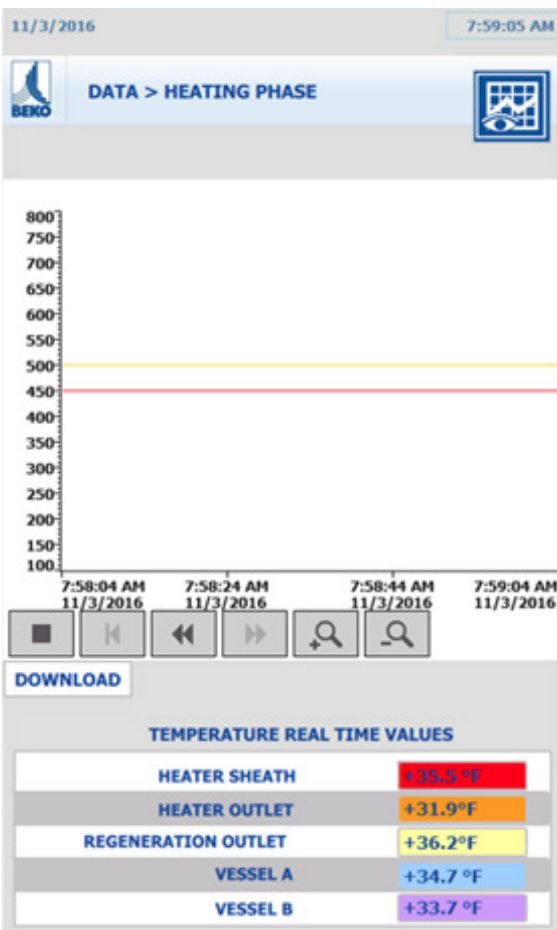
The **GRAPHS & DATA** screen allow access to real time performance data and graphs. This data is captured and logged and available for download.





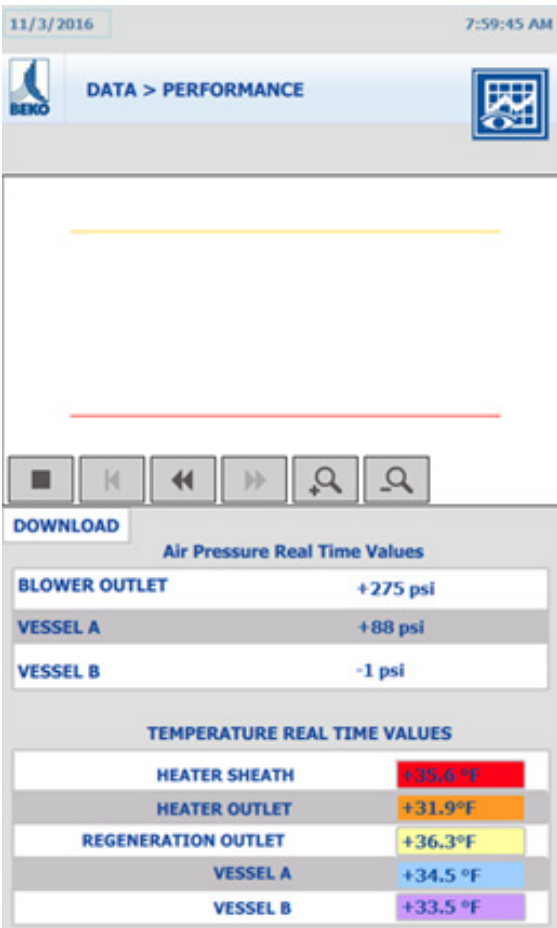
The **Regeneration Phase** shows real time temperatures of the regeneration phase.

The temperatures are recorded every minute and displayed in a graph.



The **Performance** shows real time pressure of the system.

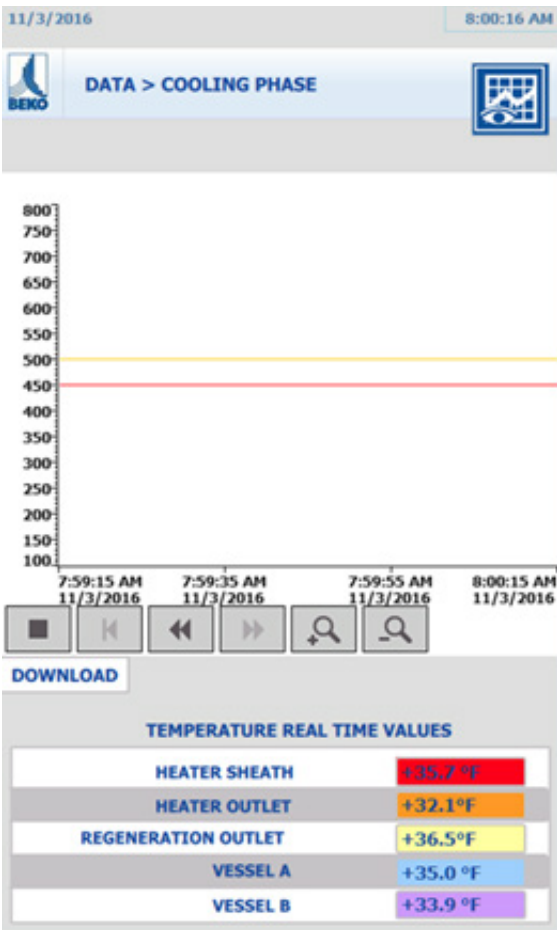
The pressures are recorded every minute and displayed in a graph.





The **Enclosure / Ambient Info** shows real time temperature, humidity from the controls enclosure and ambient environment.

The temperature and humidity are recorded every minute and displayed in a graph.







# SERVICE & MAINTINANCE



**Service and Maintenance** allows the access to information such as:

- + Maintenance and spare part order numbers
- + Setting maintenance interval reminders
- + General system information





**Operating Hours** show time related information of the dryer, including:

- + Comparison of the current time cycle for the major steps to the previous time cycle: heating, cooling, and drying.
- + Total operating hours of the dryer.

3/27/2017

11:40:57 AM

BEKO

SERVICE > OPERATING HOURS

Vessel A			
	Current	Previous	
Heating	0.00 mins	0.00 mins	Status Vessel A Drying
Cooling	0.00 mins	0.00 mins	
Parallel	0.02 mins	9.59 mins	
Drying	0.26 mins	0.00 mins	
Savings	0.00 mins	0.00 mins	
Vessel B			
	Current	Previous	
Heating	0.00 mins	0.00 mins	Status Vessel B Regen
Cooling	0.00 mins	0.00 mins	
Parallel	0.00 mins	0.00 mins	
Drying	0.35 mins	0.35 mins	
Savings	0.06 mins	0.00 mins	

DESCRIPTION	TIMES/COUNTS
Operation Time	10 HOURS
Machine Power Startups	0 POWER CYCLES





The **Information** shows:

- + Controller software version
- + PLC serial number
- + Manufacturing date

In addition to the contact information of BEKO Technologies, Corp.

11/3/2016

8:05:07 AM

BEKO

SERVICE > INFORMATION

PLC Program Information

SW Version: DHL\_160120\_V13\_SP1

PLC Serial # 6ES7211-1BE40-OXBO

HMI Serial # 6AV6 647-OAK11-3AXO

Technical Support Contact

Manufacturer: BEKO Technologies, Corp.

Phone: 1-800-235-6797

Website: beko-technologies.us

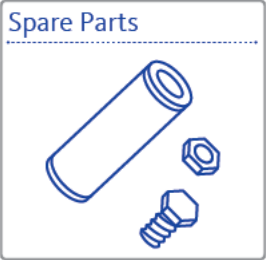
Distributor: enter distributor

Phone: 1.800.xxx.xxxx

Website:

Date of Manufacture: 09/22/2016

HOURS OF OPERATION: 0 HOURS



**Spare Parts** provides an abbreviated spare parts list for the dryer with description and part number that can be used to order from customer service.

10/16/2017

8:09:46 AM

BEKO

SERVICE > SPARE PARTS

DRYPOINT® XFe #####

Part Name	Part Number	Qty
<b>Angle Body</b>		
1/2 Angle Body Seal Kit	On Request	
1/2 Angle Body Actuator Assembly	On Request	
<b>Brass Cone Silencer</b>		
1/4 NPT Brass Cone Silencer	4026418	1
1/8 NPT Silencer	4037651	1
<b>Component Filler Elements</b>		
Blower Filter Element	On Request	
Dew Point Filter Element	4038241	1
Pilot Air Filter Element	4038242	1
<b>Dessicant Adsorption Material</b>		
1/8 Activated Alumina (lbs)	4027022	1570
<b>Electrical Components</b>		
Contactors	4034799	2
Motor Starter	4034806	1
Relay	4034796	2
Power Supply	4034834	1
Thermocouple, In Vessel Bed	On Request	
Thermocouple, Inlet/Outlet	On Request	
Thermocouple, Regen Exhaust	On Request	
<b>Electronic Controller</b>		
BEKOTOUCH 2 Controller / PLC	4034816	1
BEKOTOUCH 2 Display Screen	4037589	1
<b>EMS Sensor</b>		
Replacement EMS Sensor	On Request	

NEXT





The **Maintenance Timers** button allows the user to observe (in hours):

- Initial maintenance alarm for the listed characters
- The alarm reminder interval after initial alarm triggers
- The total time, counting up, since the last reset

Each timer comes preset and can be adjusted if desired by pressing the individual value. If it is desired to return to the factory settings press **DEFAULT VALUES**.

To reset the total time counter, press **RESET**.

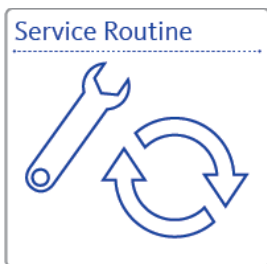
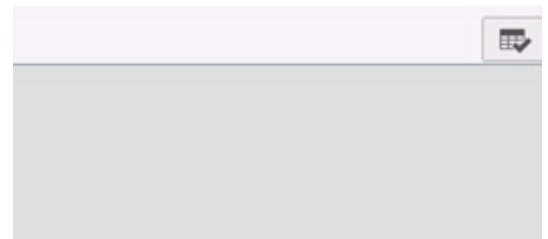
11/3/2016 8:03:13 AM

**SERVICE > MAINTENANCE TIMERS**

	INITIAL ALARM	REMINDER	TOTAL	
PRE-FILTER	+8000	+800	+4	RESET
POST FILTER	+8000	+800	+4	RESET
DESSICANT	+24000	+2400	+4	RESET
				RESET

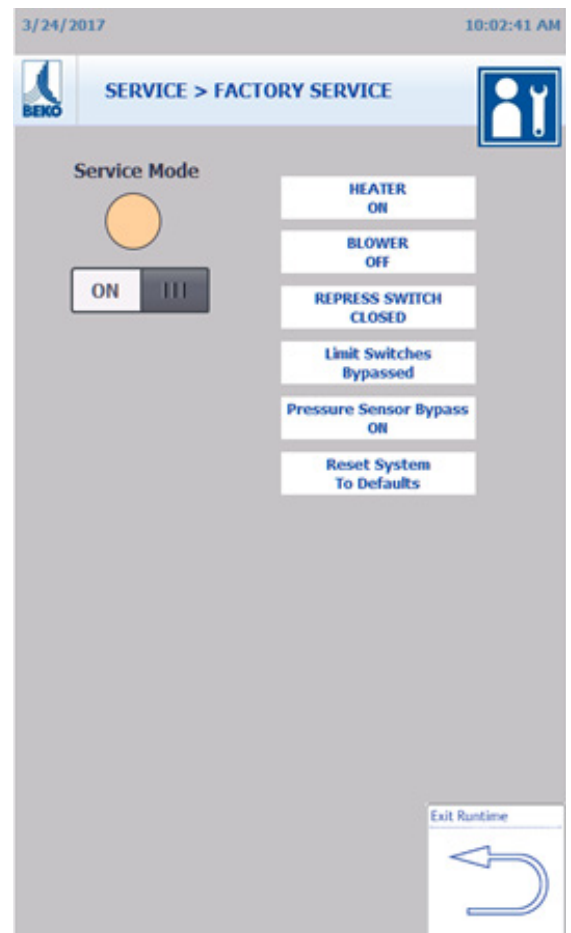
**DEFAULT VALUES**

Time	Date	Maintenance Alarm
------	------	-------------------



**Service Routine** is a locked function and should only be accessed by qualified personnel to carry out service on the dryer. Observance of all safety precautions and procedures must be taken.

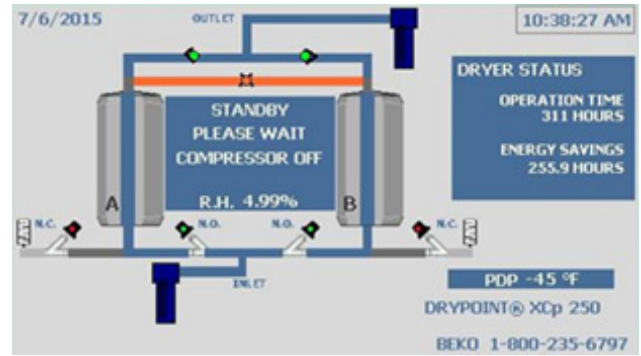
Manipulation of the heater, blower and switches can be made for service and testing.





#### 5.4.8 Compressor Synchronization (Remote Start/Stop)

The controller has the capability to synchronize the dryer with compressor when the compressor switches ON and OFF. This is detailed in Section 5.5: Standard and Optional Features. When synchronization occurs and the compressor is OFF, the controller display screen shows this information.



#### 5.4.9 Power Requirements

Each DRYPOINT XF dryer operate using: 460VAC / 60Hz / 3ph. Connecting electricity to the dryer must be done by a qualified electrician after review of the electrical requirements schematic and installed to the National Electric Code.



**The optional BEKOMAT® on the pre-filter at the dryer inlet is supplied according to the power voltage indicated in the order; verify its compatibility with the information given on the type plate.**

#### 5.4.10 Network Connection

The XFi controller is fitted with a PC Ethernet port that allows for a network connection. The PLC has connection features standard from Siemens that allow the PLC to be monitored for status. The XFe controller requires an optional kit that contains an Ethernet switch in order to support networking.

For additional information on how to use the controller network capability, contact your local distributor. For technical support contact BEKO Technologies, Corp.



**Only qualified personnel may carry out the service for the network connection of the dryer. Before any service make sure that no parts of the machine are powered.**



## 5.5 Standard and Optional Features

### 5.5.1 ecoIntelligent Control (*Standard - XFi only*)

The ecoIntelligent Control provides the user with: performance selection, system monitoring, optimized energy savings and detailed reporting.

#### *Performance Selection*

Performance selection of the dryer is done mainly through the Dew point Demand (described in section 5.5.2) integrated into the ecoIntelligent Control. In summary, the user selects the outlet dew point performance desired by the dryer.

#### *System Monitoring*

Sensors are placed throughout the dryer to monitor the system for both the process and ambient conditions: process dew point, pressures and temperatures and ambient: humidity and temperature. These sensors continually monitor and input information to the ecoIntelligent Control.

The user performance selection and system monitoring provide the foundation for the dryer ecoIntelligent Control software programmed to optimize energy savings and provide detailed reporting on the dryer.

#### *Optimized Energy Savings*

Energy savings is optimized based on the user performance selection and ecoIntelligent Control algorithm:

- + During drying, through Dew point Demand, the vessel will stay in the drying phase until the outlet dew point target is reached. Extending the drying cycle delays regeneration, equating to a reduced number of regeneration cycles as a function of time. For more information see Dew point Demand (described in section 5.5.2).
- + During regeneration, the ecoIntelligent Control is monitoring the desiccant bed temperature. When the set point for proper regeneration is met, the heater and blower will turn off thus saving energy over a fix time cycle dryer.
- + During cooling, the selection between purge cooling or ambient air cooling is made based on the process and ambient conditions monitored and inputted to the ecoIntelligent Control. If the ambient humidity and temperature allow the proper cooling of the desiccant bed (and don't cause resaturation of the desiccant from a high ambient humidity), ambient air cooling is selected over purge air as used in standard blower purge dryers. In addition, and independent of the purge or ambient air cooling selection, the system is monitoring the desiccant bed temperature. When the set point for proper cooling is met, the cooling process is complete, further saving energy over a fix time dryer.

#### *Detailed Reporting*

The ecoIntelligent Control displays real time sensor information from the system monitoring, computes the data for optimized energy savings and provides detailed reports.

- + The **HOME** screen shows these real time values on a general P&ID of the dryer.
- + **GRAPHS & DATA** shows trending of the blower and heater performance and on/off time.
- + In **SETTINGS**, the Energy Report of the dryer can be viewed.

Once the performance selection is made, the ecoIntelligent Control works autonomously in its operation to monitor the system, optimize energy savings and provide detailed reporting.



### 5.5.2 Dew point Demand (*Standard -XFi / Optional - XFe*)

Dew Point Demand is a standard feature included with the DRYPOINT XFi dryer in order to provide both performance monitoring and energy savings.

Dryer outlet dew point is continually read by the BEKO METPOINT SD 21 dew point sensor and transmitted to the BEKOTOUCH 2 controller. This data is displayed in real time on the **HOME** screen and also displayed as a trend line in the **GRAPHS & DATA** tab on the controller. This allows the user to track possible dew point fluctuations after vessel switchover or during the drying cycle, for example.

In addition to dew point monitoring, the Dew Point Demand feature serves as a strong and reliable method of reducing excess energy consumption. Under **REGENERATION** in the **SETTINGS** screen of the controller, the user may set a target outlet dew point not to be exceeded. If at the end of a normal drying cycle the outlet dew point is below this target value, the dryer will postpone regeneration of the drying vessel and wait until it has reached its moisture capacity (or a fixed maximum time) relative to the desired outlet dew point. The result is fewer regeneration cycles per day and a significant energy savings for the user, especially in the case of widely varying airflow demand.

Another capability of the Dew Point Demand feature is the use of a high dew point alarm, which can also be set by the user on the controller **SETTINGS** screen.

If for any reason the user wishes to temporarily disable Dew Point Demand control, this feature can be switched OFF. The system will default back to a fixed time cycle.

### 5.5.3 Compressor Synchronization or Remote Start/Stop (*Standard*)

The controller has the capability to synchronize the dryer with the compressor when the compressor switches ON and OFF (i.e. Remote Stop/Start). Hence, it prevents a situation where the dryer continues to operate and use purge air from the compressed air network though there is no supply of compressed air. When voltage (24V DC) is applied at the PLC input, the dryer will stop and the exhaust valve on the drying tower will close immediately. However, if the regenerating tower is in heating phase when the 24V DC signal is applied, the heating phase will continue until that step is complete.

After the compressor signal comes back online, the drying cycle is continued from the same point, meaning that the last open valve also opens again. Note two exceptions:

- + This is not valid if the remaining regeneration time is less than 30 seconds, in which case it immediately switches over to the other drying column, which means the other valve is opened.
- + If the compressor is switched off for more than 24 hours, then the device is completely restarted.

### 5.5.4 Regeneration Pipe Insulation (*Standard*)

Insulation on the regeneration piping is included as a standard feature with the dryer. Fiberglass insulation with aluminum cladding is installed over the pipework from the heater pipe housing to the regeneration pipe header going into vessel 'A' and 'B'. This limits heat dissipation off the pipe thus retaining thermal energy for better efficiency.

### 5.5.5 Tower Insulation (*Optional*)

Insulation on the vessels is an option with the dryer. This is a fiberglass insulation with aluminum cladding around the vessels approximately 2/3 of the length. Note that the vessel lower 1/3 is left exposed. This insulation prevents heat dissipation off the vessel wall thus retaining thermal energy for better efficiency.

### 5.5.6 Failure to Switch (*Standard*)

Failure to Switch is a feature provided by monitoring the pressure swing through the dryer sequence. Each dryer's vessel pressure is monitored continuously by pressure transducers which transmits data directly and continuously to the BEKOTOUCH 2 controller. A major alarm will be triggered if the controller determines a vessel has not properly pressurized or depressurized. This major alarm stops the dryer so that further damage does not occur.



### **5.5.7 Valve Position Indicators (*Standard - XFi / Optional - XFe*)**

Valve position indicators are mounted on the inlet and regeneration exhaust valves of the dryer. These provide a visual indication of the valve state (open or closed) and an electrical signal into the dryer's BEKOTOUCH 2 controller. If the valve is detected in the improper state based on the sequence step, the dryer will alarm.

### **5.5.8 Filter Contamination (*Optional*)**

Filter Contamination is detected for either the Pre or Post filter by using the CLEARPOINT® pressure differential gauge along with electrical contacts. When the pressure differential across the element is too great an electrical signal is generated to the PLC providing a minor alarm message to change the media or check for trouble.

### **5.5.9 Drain Alarm (*Standard*)**

Drain Alarm is a feature that is provided for customers by utilizing the BEKOMAT drain alarm features. The BEKOMAT is able to flag the PLC and indicate a contaminated status, in trouble or simply reached its service interval. The drain thus provides a signal to the PLC generating a minor alarm to notify the customer of the date and time of the event.

## **5.6 Electrical Wiring Diagram**

Please see supplementary document for electrical drawings.



## 6. MAINTENANCE AND SERVICE

### 6.1 Maintenance and Service Information

#### 6.1.1 Routine Maintenance



The service must be carried out only by a qualified technician.



**Before any service is carried out, always verify that:**

- + **The power has been disconnected following proper Lock-out, Tag-out procedures**
- + **Depressurize the unit and ensure the unit is isolated from the compressed air system** (see Section 5.3: Isolation and Shut Down Procedure)
- + **The dryer is at ambient temperature**



The technician that services the machine must wear hearing and eye protection while servicing the dryer. Each employee must select a proper personal protection device (PPD) hearing protector such as earmuffs, ear canal caps or earplugs in order to prevent permanent hearing damage or loss.

#### DAILY



- + Check that pre-filter condensate drain is working properly
- + Check the differential pressure of any installed pre and post filtration
- + Check that the Vessel switching operation takes place correctly at the set cycle times.
- + Check that the Vessel pressure gauge of the regenerating Vessel reads 0 psig while the drying Vessel reads full line pressure

#### ANNUALLY



- + Replace the pre and post filter elements
- + Replace the depressurization silencers
- + Replace the pre-filter float drain or BEKOMAT® service unit
- + Check if the solenoid valves are working properly
- + Check if all screws of the electrical wiring are securely tightened
- + Verify operation of the dryer

#### EVERY 3 YEARS

In addition to the scheduled annual maintenance:



- + Install depressurization valve service kit
- + Replace the desiccant adsorption material in both vessels
- + The estimated average lifespan of the adsorption material is 3-5 years. In all cases, the lifetime of desiccant material is heavily dependent on the quality and temperature of the inlet air and ensuring that scheduled maintenance is consistently carried out.
- + Verify operation of the dryer



### 6.1.2 Maintenance and Service Intervals

Preventative maintenance of the pre- and post-filter element, and desiccant material is required.

The controller monitors the dryers operating hours and will activate the maintenance alarms when certain values are reached.

	Initial Alarm	Reminder
Pre-filter	Every 8,000 hours	Every 800 hours
Post-filter		
Desiccant Material	Every 24,000 hours	Every 1,500 hours

**NOTE:** The maintenance alarms (reminders) do not change the operation of the controller in any way.

### 6.1.3 Desiccant Replacement



**CAUTION:** Activated alumina desiccant dust is considered a nuisance dust. Proper precautions should be taken prior to replacing the desiccant material in the dryer. Please refer to the Material Safety Data Sheet (MSDS).



1. Isolate and shut down the dryer (see *Isolation and Shutdown Procedure*).
2. Place a suitable container at the edge of each drain port on the bottom of the Vessels that are located on the sides, facing outward.
3. Open the drain ports on the bottom of the Vessels and catch the desiccant in the containers.
4. Refill each Vessel with the recommended type, size and quantity of desiccant. Only use manufacturer supplied desiccant, which is high quality, high capacity desiccant designed and sized for the dryers (see *Desiccant Fill Procedure*).
5. Carefully knock on the sides of the Vessel chambers while filling so that the desiccant will pack tightly. Some settling may be required in order to fit the specified fill amount into the Vessel. Tank sizes may be the same for multiple models, so do not be concerned if the Vessel is not entirely full.
6. Desiccant that has been contaminated with oil or other substances may require different disposal methods and procedures than desiccant that is being replaced due to aging. Consult the appropriate MSDS and follow all applicable laws and regulations regarding disposal.

### 6.1.4 Inlet and Exhaust Valve Repair



1. Isolate and shut down the dryer (see *Isolation and Shutdown Procedure*).
2. Make certain that there are no “pockets” of pressure contained by the various valves.
3. Open the bleed valve on the bottom of the control air filter housing.
4. Loosen the “one touch” pneumatic fitting (no tools required) that attaches the control air tubing to the valve body. Carefully move the tubing aside and out of the way.
5. Disassemble the valve for cleaning or repair. Service kits are available for all valves (see page 30).
6. Reassemble the valve and ensure that all O-rings, gaskets and components have reassembled or replaced accordingly.



## 6.2 Maintenance and Spare Parts

We strongly recommend stocking the suggested spare parts to help enable you to promptly carry out any required maintenance and/or replace any parts that may fail without having to wait for the parts to be delivered. If you need to replace any other parts, please contact your local distributor or BEKO Technologies, Corp. Technical Service Department at +1 (800) 235-6797 for assistance.

### 6.2.1 Required Maintenance Parts

Interval	DESCRIPTION	Order No.	800	1000	1200	1500	1800	2300	2800	3300	4000	5000	6000
Annual	<i>Pre-filter Element 0.01 µm</i>												
	25SX	4038116	◆										
	30SX	4038155				◆							
	88SX	4038117											◆
	<i>Post-filter Element 1.0 µm</i>												
	25FX	4038109	◆										
	30FX	4038146				◆							
	88FX	4038110											◆
	<i>Depressurization Silencer Element</i>												
	1/2" NPT	4039962	◆										
	3/4" NPT	4029615				◆							
	2" NPT	4029619											◆
	<i>Component Filter Elements</i>												
	Blower Filter Element	4034372	◆										
	Blower Filter Element	On Request				◆							
	Blower Filter Element	4038239											◆
	Dew point Filter Element	4038240				◆							◆
	Pilot Air Filter Element	4038241	◆			◆							◆
	<i>Float Drain for CLEARPOINT® (Standard)</i>												
	FAD050 Float Drain	4025536											◆
	<i>Service Unit for CLEARPOINT® with BEKOMAT®</i>												
	BEKOMAT® 31 Service Unit	4025061	◆										
	BEKOMAT® 32 Service Unit	4025061				◆							
	BEKOMAT® 13	4011612											◆
3 Years	<i>Angle Body</i>												
	½" Angle Body Seal Kit	4039968	◆										
	¾" Angle Body Seal Kit	4027898				◆							
	1.25" Angle Body Seal Kit	4027900											◆
	½" Angle Body Actuator Assembly	On Request	◆										
	¾" Angle Body Actuator Assembly (NC)	4027887				◆							
	1.25" Angle Body Actuator Assembly	4027889											◆
	<i>Inlet/Exhaust Butterfly Valve Disc Seals</i>												
	2 1/2"	4039963	◆										
	3"	4039964				◆							
	6"	On Request											◆
	<i>Desiccant Adsorption Material</i>												
	⅛" Activated Alumina (total weight in lbs. per dryer)	4027022	1,260			2,370							9,380



## 6.2.2 Spare Parts

DESCRIPTION	Order No.	800	1000	1200	1500	1800	2300	2800	3300	4000	5000	6000
<i>Wafer Check Valve</i>												
2 1/2"	4029374	2◆										
3"	4029375	2◆										
4"	4029376				2◆							
6"												2◆
8"												2◆
<i>Pressure Relief Safety Valve</i>												
1/2" Pressure Relief Safety Valve	4026667	2◆										
3/4" Pressure Relief Safety Valve	4026668				2◆							
1 1/4" Pressure Relief Safety Valve	4026670											2◆
<i>Purge Flow Control</i>												
3/4" Purge Flow Control Valve	4032820	◆			◆							
3/4" Purge On/Off Valve	4034368	◆			◆							
1 1/4" Purge Flow Control Valve	4032822											◆
1 1/4" Purge On/Off Valve	4034370											◆
<i>Muffler Assembly</i>												
1/2" NPT	4034634	2◆										
3/4" NPT	4020833				2◆							
2" NPT	4020836											2◆
<i>Electronic Controller</i>												
BEKOTOUCH 2 Controller / PLC	4034816	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
BEKOTOUCH 2 Display Screen	4034813	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
<i>Solenoid Valve Assembly</i>												
Complete FESTO 5/2 Valve	4034568	3◆			3◆							4◆
Complete FESTO 2 x 3/2 Valve	4034567	3◆			3◆							3◆
FESTO Blank Plate	4034569	2◆										
Complete FESTO Vortex Cooler Valve	4037562											◆
<i>Vessel Pressure Gauge</i>												
4" 0-160 psig Pressure Gauge	4034195	2◆	2◆	2◆	2◆	2◆	2◆	2◆	2◆	2◆	2◆	2◆
<i>FRL Combo Package</i>												
1/4" 20-130 psig Filter Regulator Combo	4026419	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
<i>Brass Cone Silencer</i>												
1/4" NPT Replacement Brass Cone Silencer	4026418	2◆										◆
1/8" NPT Silencer	4037651	2◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆



DESCRIPTION	Order No.	800	1000	1200	1500	1800	2300	2800	3300	4000	5000	6000
<i>System Fuses</i>												
Transformer Fuse, 3.5A	4035455	2◆										
Transformer Fuse, 8A	4035464											2◆
Heater Fuse, 30A	4035619	3◆										
Heater Fuse, 50A	4035623	3◆										
Low Voltage Fuse, 7A	4035462	◆										
Low Voltage Fuse, 17.5A	4035469											◆
Receptacle Fuse, 2A	4027880	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
<i>Common Alarm</i>												
Alarm Light	4037788											◆
<i>On / Off Switch</i>												
Replacement On / Off Switch	4029399	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
<i>EMS Sensor</i>												
Replacement EMS Sensor	On Request	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
<i>Pressure Sensor</i>												
Replacement Pressure Sensor	4024284	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
Replacement Tube Fitting Package	On Request	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆
<i>Vessel Screen</i>												
2 1/2" Flanged Screen	4029150	2◆										
3" Flanged Screen	4029151				2◆							
6" Flanged Screen	4036449											2◆
<i>System Resistors</i>												
Humidity Sensor Resistor, 100 Ohm	4027707	◆										2◆
Humidity Sensor Resistor, 470 Ohm	4027881	◆										2◆
<i>High Temp Flexible Hose</i>												
High Temperature Flexible Blower Hose	On Request	◆	2◆	2◆	2◆	2◆	2◆	2◆	2◆	2◆	2◆	2◆
<i>Additional Electrical Components</i>												
Complete Solid State Relay Assembly	4037790											◆
Motor Contactor, 9A	4040826	◆										
Contactors	4034802				◆							9◆
Motor Starter	4034806	◆										
Motor Starter	4034809				◆							
Motor Starter	4037780											◆
Relay	4034796	2◆	2◆	2◆	2◆	2◆	2◆	2◆	2◆	2◆	2◆	2◆
Power Supply	4034837	◆										
Power Supply	4034834				◆							
Power Supply	4037781											◆
Heater Contactor, 32A	4034801	2◆										
Blower, 4.8 hP	4035241	◆										
Manual Moor Protector, 10A	4034810	◆										
Thermocouple, In Vessel Bed	On Request	2◆										4◆
Thermocouple, Inlet / Outlet	On Request	◆			2◆							◆
Thermocouple, Regen Exhaust	On Request	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆	◆

**NOTE: When inquiring about any other part always indicate the data listed on the identification plate.**



## 7. TROUBLESHOOTING GUIDE



The troubleshooting and the eventual checks must be performed by qualified personnel only.



The technician that services the machine must wear hearing and eye protection while servicing the dryer. Each employee must select a proper personal protection device (PPD) hearing protector such as earmuffs, ear canal caps or earplugs in order to prevent permanent hearing damage or loss.

SYSTEM TROUBLE	POSSIBLE CAUSE	SUGGESTED ACTION
❖ Dryer stopped	⇒ No power ⇒ Valve problem ⇒ No pilot control air ⇒ Solenoid valves  ⇒ Controller ⇒ Compressor off	⇒ Check power and electric ⇒ Check the operation of inlet and purge exhaust valves ⇒ Ensure Control pilot air is delivering at 80 psi ⇒ Ensure DIN connectors are properly attached to solenoid valves  ⇒ See controller troubleshooting ⇒ Check if compressor Sync is commanding dryer off
❖ All the inlet air is discharged through the silencers	⇒ Faulty inlet valve ⇒ Faulty signal  ⇒ Faulty Outlet valve  ⇒ Pneumatic	⇒ The inlet valves are blocked – open and clean ⇒ The controller continuously supplies solenoid valve PVA and/or PVB – check the electric wiring and if necessary replace ⇒ Outlet Check valve(s) stuck open – serviceable only by qualified technician ⇒ Ensure tube routing matches diagram
❖ Liquid comes out of the silencers	⇒ High dew point ⇒ Overloaded	⇒ Ensure operation sequence and purge setting ⇒ Check capacity versus operating conditions
❖ Depressurization	⇒ No power ⇒ Flow control valve  ⇒ No pilot control air ⇒ Exhaust Silencers	⇒ Check purge exhaust valve for normal operation ⇒ Ensure that the purge exhaust valve actuators is not closed ⇒ Ensure pilot air reading is 80 psi ⇒ Replace silencer filter elements if clogged
❖ Repressurization	⇒ Purge Exhaust Valve ⇒ Purge line  ⇒ Purge Valve ⇒ Inlet Valve	⇒ See purge Exhaust Valve troubleshooting ⇒ Purge setting or clog, full open purge valve to clean out and then set according to table xx ⇒ See Purge valve troubleshooting ⇒ See Inlet Valve Failure troubleshooting



❖ High Dewpoint	⇒ Purge Valve ⇒ Exhaust Silencers ⇒ Desiccant ⇒ Purge Exhaust Valve ⇒ Low Pressure ⇒ High Flow ⇒ High Temperature ⇒ Inlet Valve ⇒ Power ⇒ Controller	⇒ Adjust and ensure correct setting based on table XX ⇒ Backpressure due to clog, install new mufflers ⇒ Media is fouled, replace new ⇒ See Purge Exhaust Valve troubleshooting ⇒ Increase to rated pressure ⇒ ensure air inlet flow does not exceed dryer capacity ⇒ ensure air inlet temperature does not exceed dryer capacity ⇒ See purge Inlet Valve troubleshooting ⇒ Ensure that the controller has correct voltage ⇒ See controller troubleshooting
❖ High Pressure Drop	⇒ Desiccant ⇒ Pre-filter ⇒ Post-filter ⇒ Capacity  ⇒ Desiccant screens ⇒ Purge Exhaust valve	⇒ Replace fouled desiccant ⇒ Contaminated inlet pre-filter, replace ⇒ Contaminated outlet post- filter, replace ⇒ Overflow, ensure air inlet flow does not exceed dryer capacity  ⇒ Remove desiccant/screens and clean screens ⇒ See purge exhaust troubleshooting
❖ Back pressure	⇒ Purge muffler fouled ⇒ Vessel screen ⇒ Restricted purge piping ⇒ Bad Purge Exhaust Valve	⇒ Replace with new ⇒ Empty Vessels, remove screens and clean ⇒ Clean ⇒ See purge Exhaust Valve troubleshooting
❖ Failure to Switch	⇒ Purge Exhaust Valve ⇒ Purge line  ⇒ Purge Valve ⇒ Inlet Valve	⇒ See purge Exhaust Valve troubleshooting ⇒ Purge setting or clog, full open purge valve to clean out and then set according to table (Sec. 4) ⇒ See Purge valve troubleshooting ⇒ See Inlet Valve Failure troubleshooting
❖ Purge control Valve	⇒ Setting ⇒ Damaged ⇒ Dirty	⇒ ensure proper setting from table xx ⇒ replace valve ⇒ open full for clean out or dismantle and clean
<b>COMPONENT TROUBLE</b>	<b>POSSIBLE CAUSE</b>	<b>SUGGESTED ACTION</b>
❖ Sensor Failure	⇒ Sensor ⇒ Electrical ⇒ Pneumatic  ⇒ Controller	⇒ ⇒ Check at atmosphere ⇒ Check electrical connections for short ⇒ Ensure sampling of mid-Vessel thru pneumatic check valves and plumbing ⇒ Faulty controller, replace after factory consultation
❖ Purge control Valve	⇒ Setting ⇒ Damaged ⇒ Dirty	⇒ ensure proper setting from table xx ⇒ replace valve ⇒ open full for clean out or dismantle and clean



❖ Purge Exhaust Valve	⇒ Worn seals ⇒ Pneumatic  ⇒ Electrical ⇒ Restriction	⇒ Install service kit ⇒ check pilot valve, pilot air supply, pilot air filter, flow control valve on actuator  ⇒ Check power to solenoid valves ⇒ Backpressure – silencers or mufflers are clogged, install new muffler elements
❖ Inlet Valve	⇒ Worn seals ⇒ Pneumatic  ⇒ Electrical ⇒ Restriction	⇒ Install service kit ⇒ check pilot valve, pilot air supply, pilot air filter, flow control valve on actuator  ⇒ Check power to solenoid valves ⇒ Backpressure – silencers or mufflers are clogged, install new muffler elements
❖ Outlet Check Valve	⇒ Restriction ⇒ Damaged Seal	⇒ SERVICEABLE ONLY BY QUALIFIED TECHNICIAN
❖ Drain	⇒ Application  ⇒ Electrical ⇒ Contaminated ⇒ Drain	⇒ Overloaded with water, check pre-filter and upstream bulk water separator ⇒ Check electrical connections ⇒ Clean drain and plumbing ⇒ Install service drain kit or replace entire unit
❖ Pre-Filter	⇒ Application ⇒ Dirty element ⇒ Electrical ⇒ Differential pressure gauge	⇒ Failure with upstream bulk water separator ⇒ Contaminated filter, replace element ⇒ Faulty electrical signal ⇒ Clean, check and or replace
❖ Post-Filter	⇒ Dryer dusting ⇒ Dirty element ⇒ Electrical ⇒ Differential pressure gauge	⇒ Ensure proper dryer sequence ⇒ Contaminated filter, replace element ⇒ Faulty electrical signal ⇒ Clean, check and or replace
❖ Controller	⇒ Defective ⇒ No power supply ⇒ Loose connection	⇒ Replace controller ⇒ Ensure voltage supply ⇒ Check connections
❖ Relief Valve	⇒ Over pressure ⇒ Leak ⇒ Over temperature	⇒ Check system pressure and correct ⇒ Replace valve ⇒ Ensure system temperature or fire has not occurred
❖ Solenoid	⇒ Electrical ⇒ Pneumatic ⇒ Defective	⇒ Ensure connections and signal are adequate ⇒ Ensure pilot supply is good and valve is clean ⇒ Replace with new



## 11. DISMANTLING OF THE DRYER

If the dryer is to be dismantled and disposed of then it must be split into groups of materials of construction.

Part	Material
Desiccant material	Activated alumina, Oil contaminated
Frame and supports	Carbon steel, Powder coated
Piping	Galvanized steel, Galvanized malleable iron, Brass, Aluminum
Towers and screens	Carbon steel, Stainless steel
Valves	Brass, Stainless steel, Bronze, Plastic, Aluminum
Filter housing	Carbon Steel, Epoxy paint
Filter cartridge	Filtering material, PVC, Oil
Solenoid valve	Bronze, Steel, Techno-polymer, PVC
Condensate Drain	PVC, Aluminum, Steel, Bronze
Silencers	Aluminum, Stainless steel
Safety Valves	Brass, Bronze
Gaskets and O-Ring	Graphite, Synthetic elastomer
Electric cables	Copper, PVC
Electric Parts	PVC, Copper, Bronze, Silicon



We recommend complying with the safety rules and regulations for the disposal of each type of material. The adsorption material and the filter cartridge will contain droplets of lubrication oil. Do not dispose of these materials in the environment. All local Governmental laws and regulations must be followed in disposing of the above listed materials.



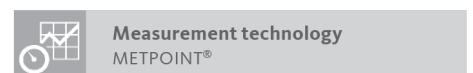
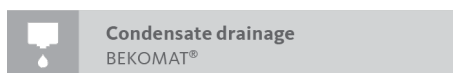
### 13. GENERAL DESCRIPTION OF PARTS

- + **Desiccant** – An adsorbent used for drying air or gases. The proper quantity, size and type are necessary.
- + **Inlet Valve** – Normally open air operated switching valves used to direct air flow through the towers.
- + **Exhaust Valve** – Normally closed air operated switching valves used to exhaust purge air, hold air in the on-line tower and exhaust air from the tower ready to be regenerated.
- + **Outlet and Regeneration Check Valves** – Valves that allow full flow in one direction and no flow in the opposite direction. These valves are used in conjunction with the inlet and exhaust valves to control the desired flow of process air through the dryer.
- + **Safety Relief Valves** – Valves on each tower to protect the vessels from overpressure situations. The setting is indicated on each valve.
- + **Depressurization Valves** – Normally closed air operated switching valves used to depressurize the offline Vessel prior to regeneration.
- + **Depressurization Silencer** – Installed to reduce exhaust noise during Vessel depressurization for the protection all personnel and to comply with OSHA standards. Silencers are non-mechanical, but must be maintained.
- + **Purge Flow Control Valve** – Valve that allows the adjustment and regulation of purge air flow used for the regeneration and repressurization processes.
- + **BEKOTOUCH 2 Controller** – Electronic controller that provides an interface between the operator and dryer, provides dryer cycle control, operates the electric solenoid valves, provides indicator lights and alarm controls. All hard wired connections, including the power connections during installation are made to this device.
- + **Electric Solenoid** – An electromechanical device used for controlling the flow of air.
- + **Blower** – Creates higher than atmospheric pressure used to move air through the regenerating vessel.
- + **Heater** – Used to regenerate the desiccant by heating the air being moved by the blower.



***For technical product support please call +1 (800) 235-6797 and select Option 2***

## The product categories



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