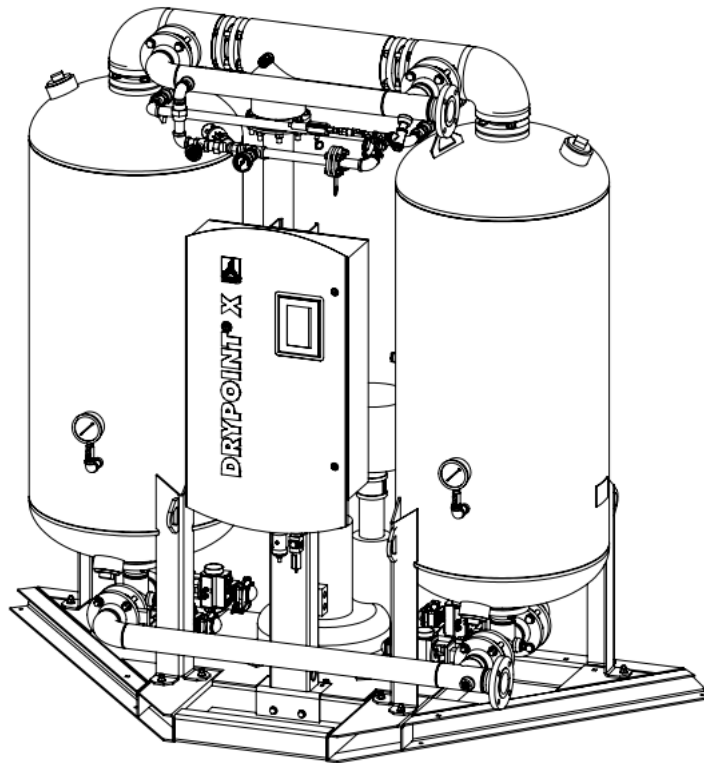


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Installation and Operating Manual

Heated Blower Purge Regenerated Dryer



DRYPOINT® XFe & Xi 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	General Warning: Risk of damage or injury	Electrical Hazard: Possibility of electro-cution	Warning: Under pressure	Warning: High temperature	Warning: Non-breathable air
					
Warning: Water cannot be used to extinguish fire	Warning: Do not operate if parts are missing or have been tampered with	Warning: Machine level noise may exceed 85 dBA	Warning: Personal protection required	Warning: All work to be performed by qualified personnel only	Operations that can be performed by qualified operators ¹
					
Compressed air inlet connection		Compressed air outlet connection		Connection point for condensate drain	

¹ 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



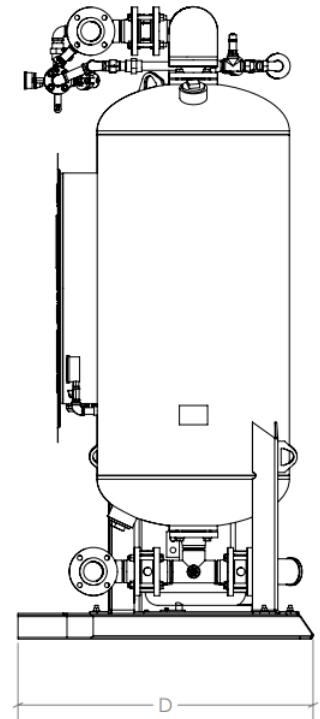
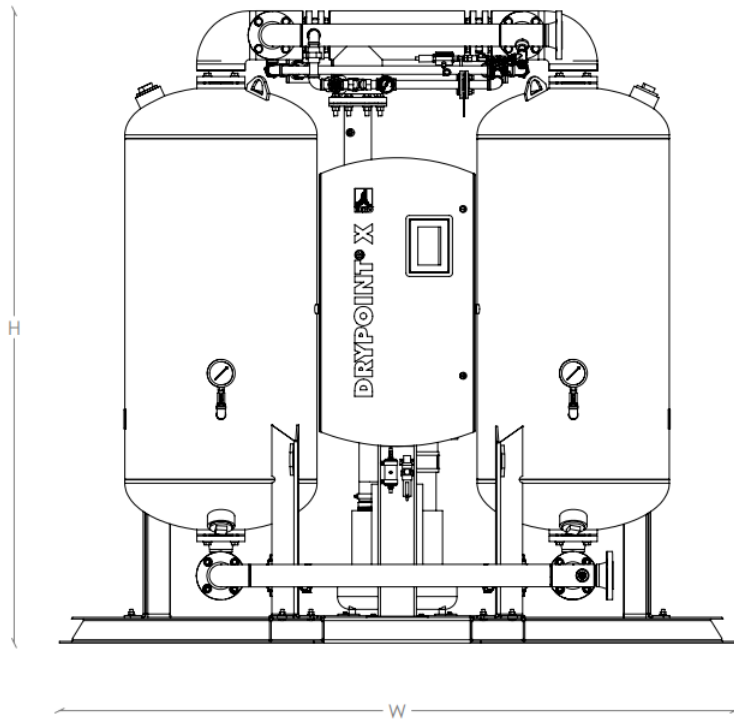
Nominal dryer ratings adhere to the following inlet conditions @ seal level per ISO 7183, Table 2, Option A2:

- + 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
Flow Rate	scfm	800	1000	1200	1500	1800
Inlet / Outlet Connection	150# ANSI Flange	2.5	2.5	3	3	4
Height (H)	in.	110	112	116	102	119
Width (W)	in.	97	97	108	108	128
Depth (D)	in.	40	40	48	48	56
Empty Weight	Lbs.	1,805	2,091	2,306	2,472	2,992
Max. Power Consumption	kW	23	24	29	40	52
Avg. Power Consumption*	kW	15	15.6	18.9	26.2	33.8

DRYPOINT® XF	Model Size	2300	2800	3300	4000	5000	6000
Flow Rate	scfm	2300	2800	3300	4000	5000	6000
Inlet / Outlet Connection	150# ANSI Flange	4	4	6	6	6	6
Height (H)	in.	115	128	123	140	139	138
Width (W)	in.	128	128	150	150	194	194
Depth (D)	in.	56	56	73	73	67	67
Empty Weight	Lbs.	3,504	3,967	5,446	6,299	7,047	7,509
Max. Power Consumption	kW	64	74	109	109	137	157
Avg. Power Consumption*	kW	41.4	47.9	70.6	70.6	89.2	102.2

*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.

By design one heater and one blower are required for the for the XF dryer models 800 to 2800. Two heaters and two blowers are required for XF dryer models 3300 to 6000 for the dryer to function as intended. The dual heaters and blowers are turned on/off at the same time during each vessel's heating/cooling cycle. Note that both blowers and heaters do not function independently of each other and as a result they cannot be enabled or disabled independently of each other. The "Home" HMI screen images for the single and dual heater/blower models reflect the heater/blower configuration on the screen.

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.

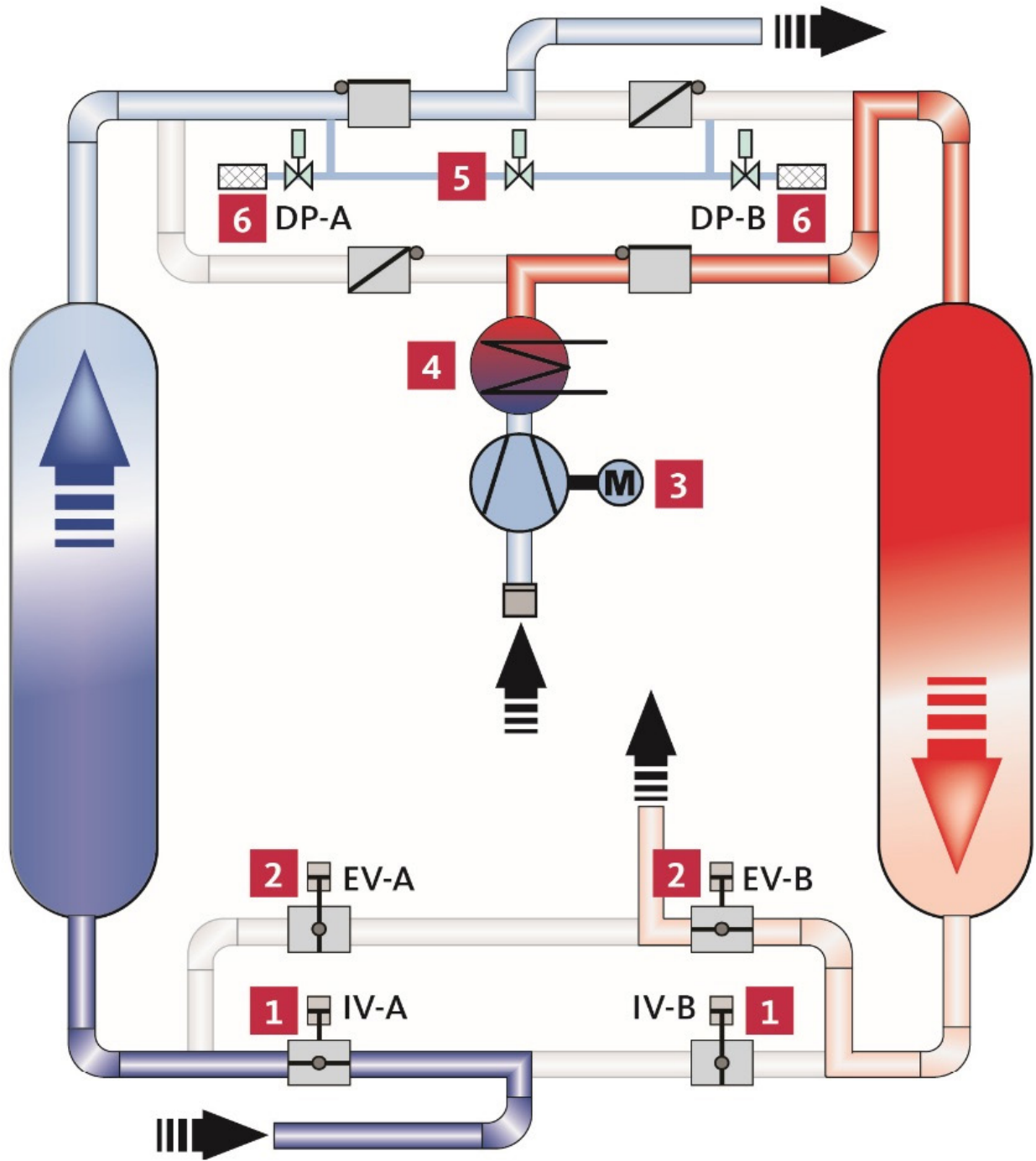
The desiccant beds will now switch functions where the fresh desiccant bed is now drying and the saturated bed is now regenerating.

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).

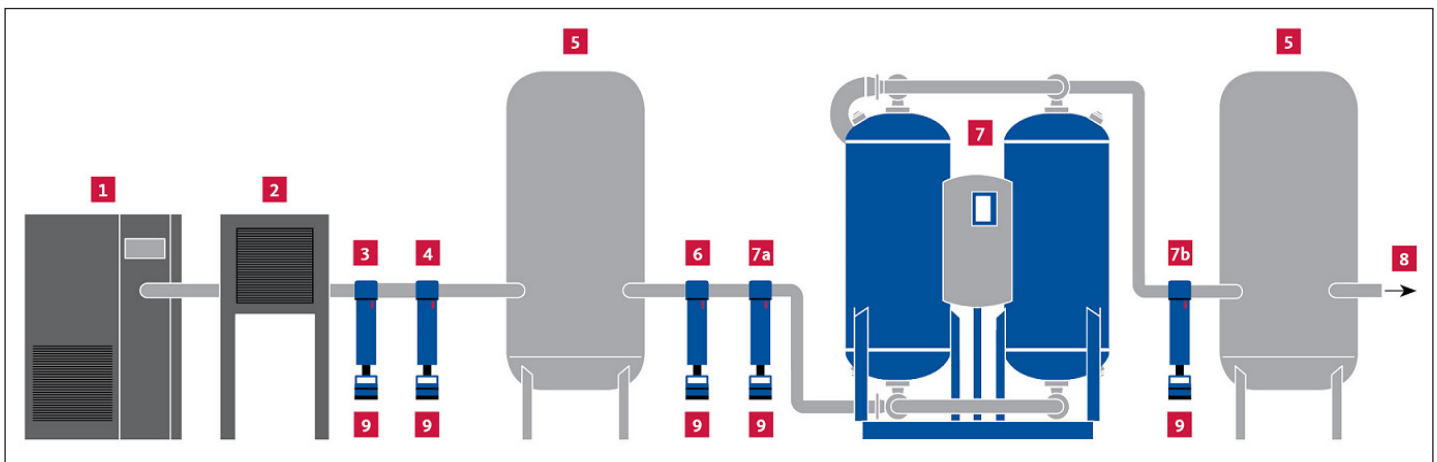


4. **IMPORTANT!** Bypass piping is necessary. Only bubble tight valves should be used.
5. Make the required electrical connections; please refer the type plate of your dryer. The end user is responsible for providing short circuit protection for the dryer.
6. Points of access should be provided upstream 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® In-line 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.

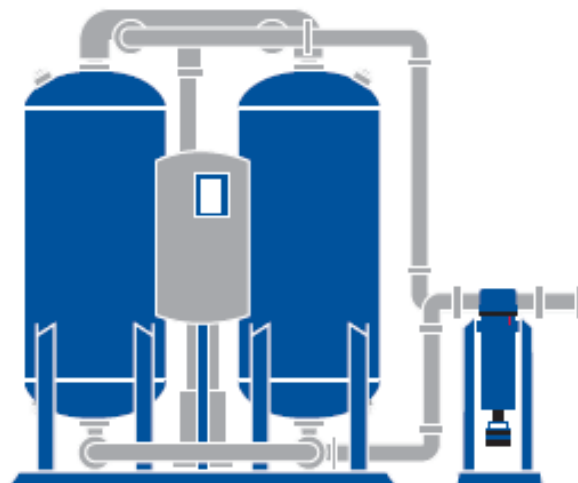


We recommend the dryer be installed with a 0.01 micron CLEARPOINT® coalescing pre-filter at the inlet and a 1 micron CLEARPOINT® particulate post-filter at the outlet. It is recommended to install both 5 micron and 1 micron filters upstream of the dryer in order to maintain the operational lifespan of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

2.4 Filters and Bypass

An optional standalone skid mounted filtration package with the pre- and post-filters is available for the DRYPOINT XF dryers. An additional option for a three-valve bypass system is also available. The three-valve bypass system 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	1,260
XF 1000	1,570
XF 1200	1,890
XF 1500	2,370
XF 1800	2,840
XF 2300	3,640
XF 2800	4,390
XF 3300	5,180
XF 4000	6,260
XF 5000	7,820
XF 6000	9,380

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.

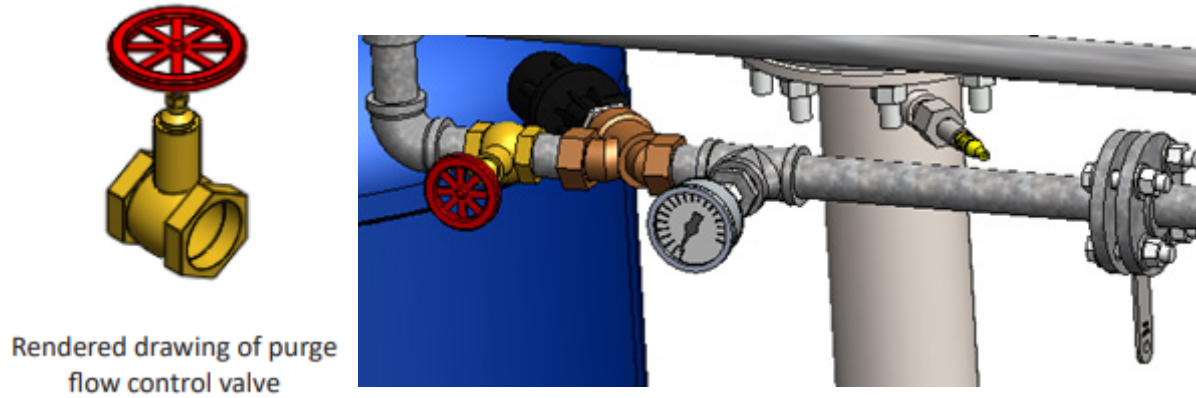
5.1.4 General Operation Information

- + 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 arrangement of the equipment in the purge flow line is shown below. The purge flow control valve is first followed by an actuated shutoff valve, then the purge pressure gauge, and finally to the purge orifice plate. The orifice diameter is based on the dryer size as seen in Table 5.2.1 below.

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



Rendered drawing of purge flow control valve

The procedure is as follows:

1. Verify orifice size; this value is etched on the paddle handle
2. Fully close the valve by turning the knob clockwise until rotation stops
3. During the cooling portion of the cycle (either first time through, or by manually advancing through program), open the valve by rotating the knob counterclockwise until the gauge pressure reading matches the value in the table below
4. Record the data in the Purge Adjustment Data section

Purge Adjustment, Table 5.2.1

Dryer Size	Purge Flow Rate [scfm]	Orifice Diameter [in]	Gauge Reading [psig]
800	131	0.406	65
1000	164	0.453	65
1200	196	0.5	64
1500	245	0.563	63
1800	295	0.641	57
2300	376	0.703	62
2800	458	0.75	67
3300	540	0.844	61
4000	655	0.938	60
5000	818	1.016	65
6000	982	1.047	63

Purge Adjustment Data

Model: _____
 Serial Number: _____
 Inlet Pressure: _____
 Purge Rate: _____
 Purge Gage 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

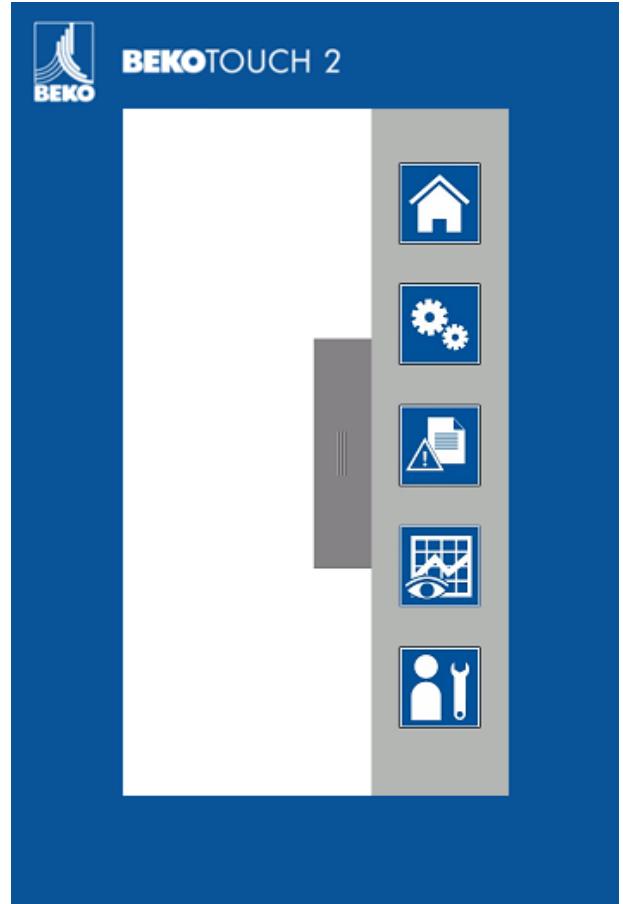
5.4.1 Display Overview

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

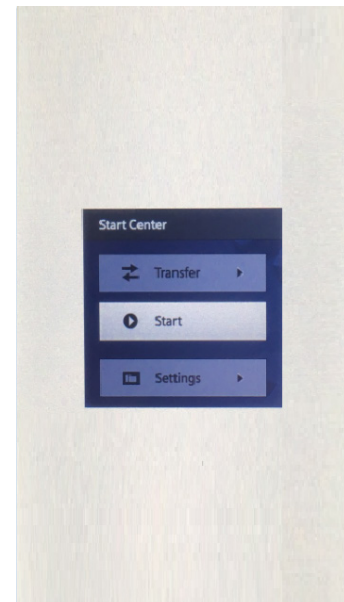
System Boot-up

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.



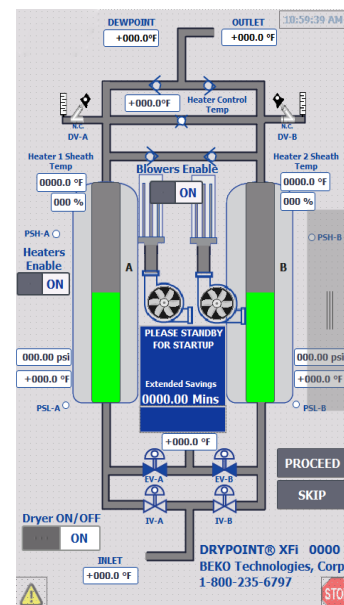
Start Center

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

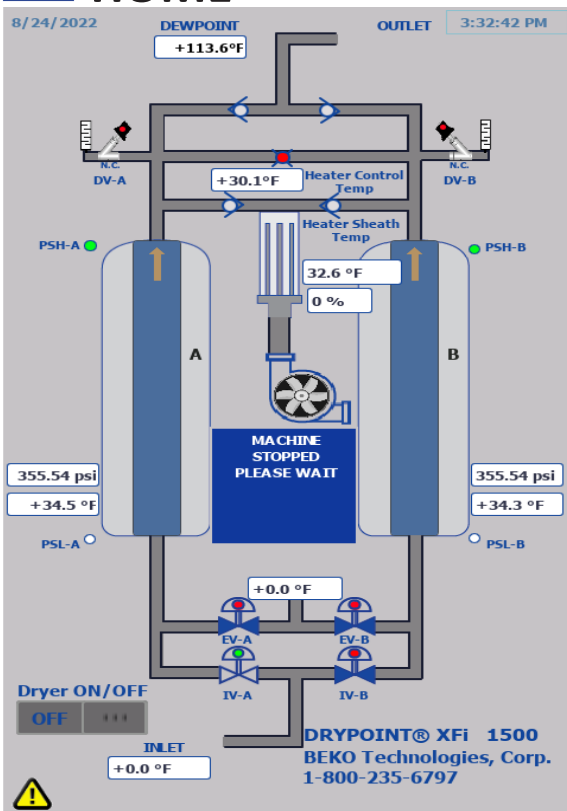
The START screen is only displayed for 3 seconds, after which, the HOME screen will be displayed and the controller will automatically begin in Start-up before the drying sequence commences.



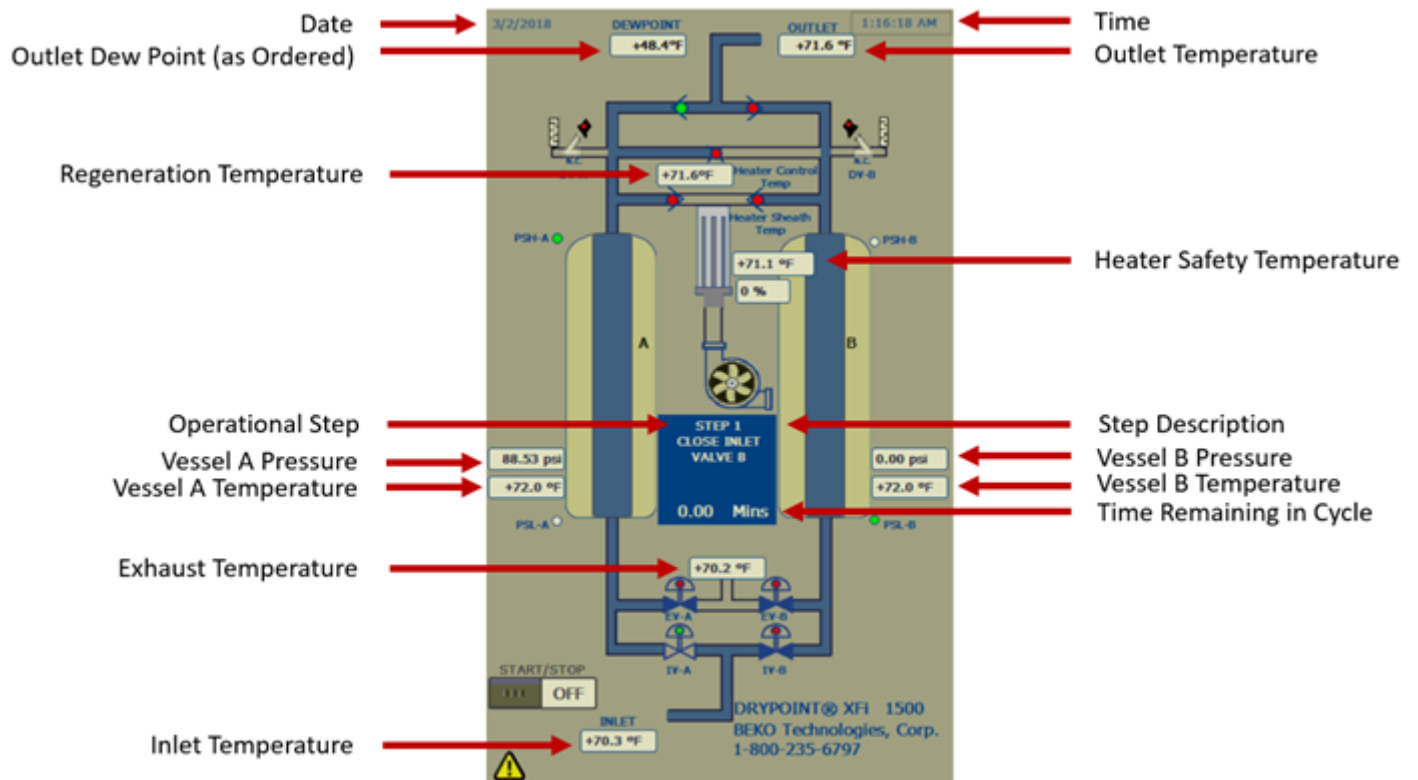
5.4.3 Home Screen



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.



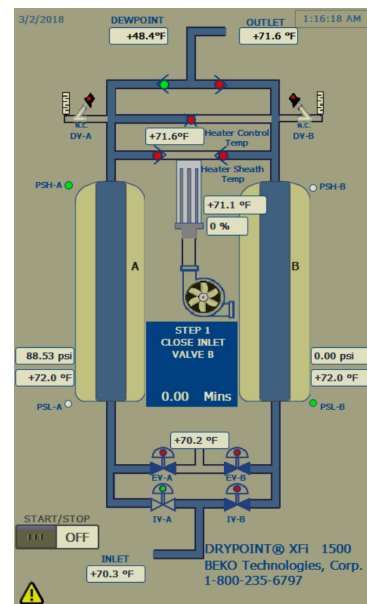
The controller provides the system information along with an animation of the drying process based on its current operational sequence. Each step is detailed below along with a screen shot of the process.

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

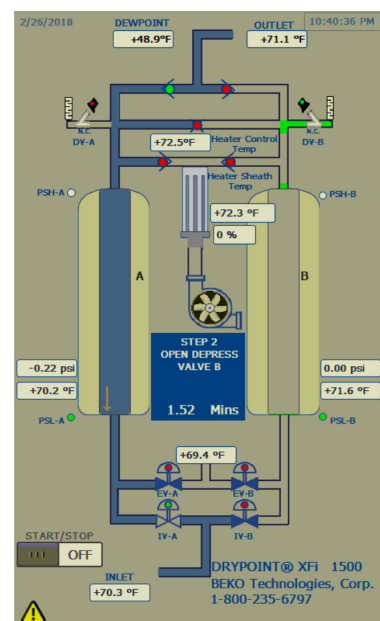
Step 1: Vessel B Close Inlet Valve (2.5 seconds)

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



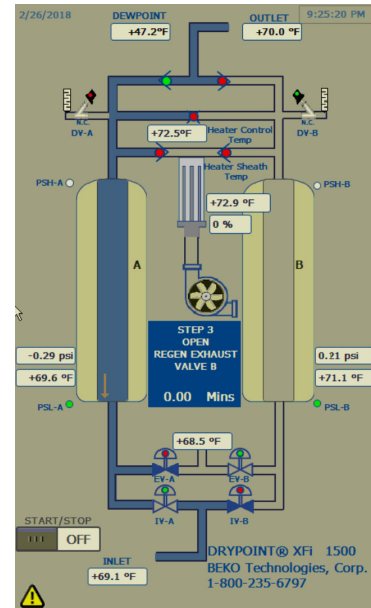
Step 2: Vessel B Open Depressurization Valve (2 minutes)

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.



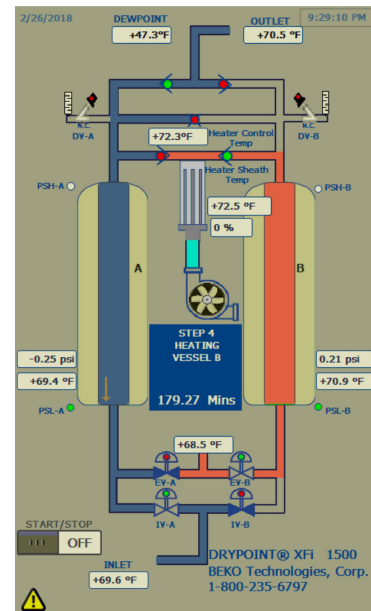
Step 3: Vessel B Open Regeneration Valve

Vessel B regeneration exhaust valve opens.



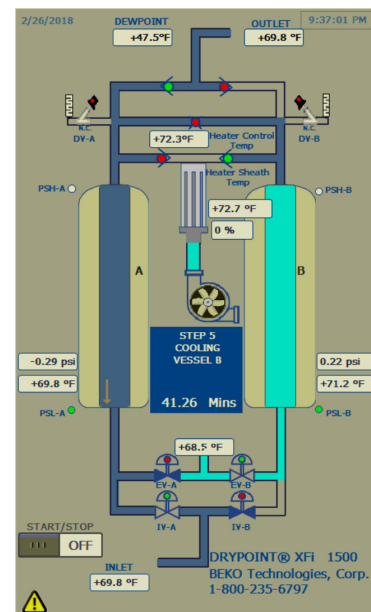
Step 4: Start Vessel B Heating Period - Regeneration (180 minutes)

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)

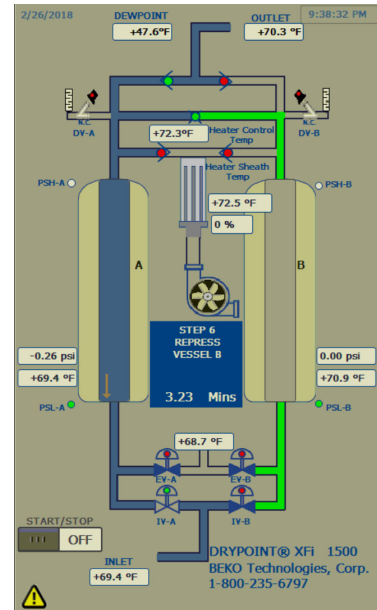
The heater turns off while the blower remains on and cools the heater. After the set temperature is reached, the blower turns off and the purge valve opens and additional desiccant bed cooling takes place. At the end of this step the adsorption material of Vessel B is completely regenerated.



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

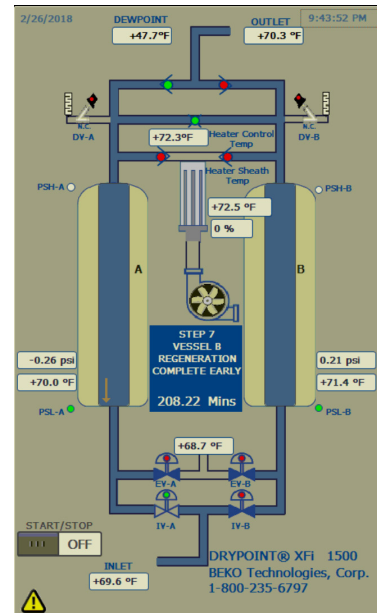
Vessel B Regeneration exhaust valve closes, thus the Vessel is repressurized to full working pressure.

Purge valve closes once repressurization is complete



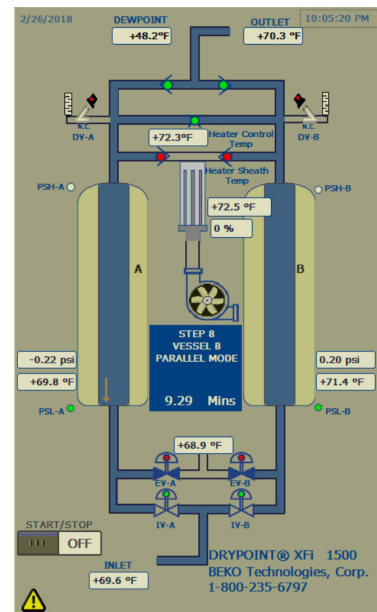
Step 7: Vessel B Energy Savings (16 hours max)

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



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; Languages
- + Intelligent Menus: Admin Settings; Regeneration Settings; 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 that this is accurate.

If power is removed from the controller, the Date and Time are maintained in the memory.

Language



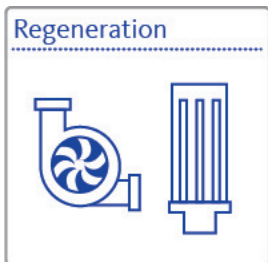
Currently only English and Spanish are active in the controller.

Intelligent Menus

Admin Settings



This function is locked and not accessible.



Performance

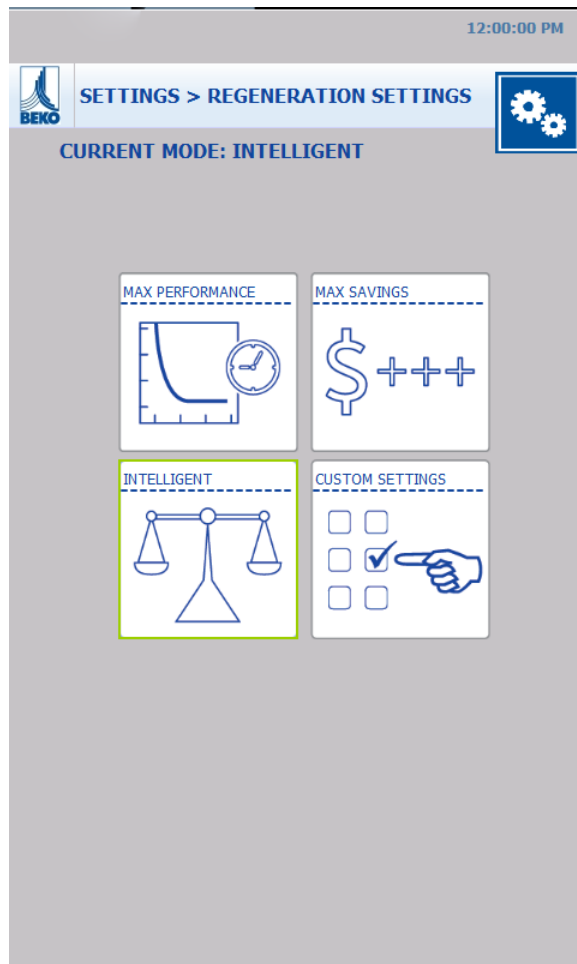
The Regeneration menu allows for selection of different operating modes. The operating mode changes the functional setting for both the Heating Phase and Cooling Phase.

MAX PERFORMANCE: Longest durations for heating and cooling phases

MAX SAVINGS: Shortest durations for heating and cooling phases

INTELLIGENT: (XFi only) Balanced performance (see Section 5.5.1)

CUSTOM SETTINGS: Custom settings (consult factory)



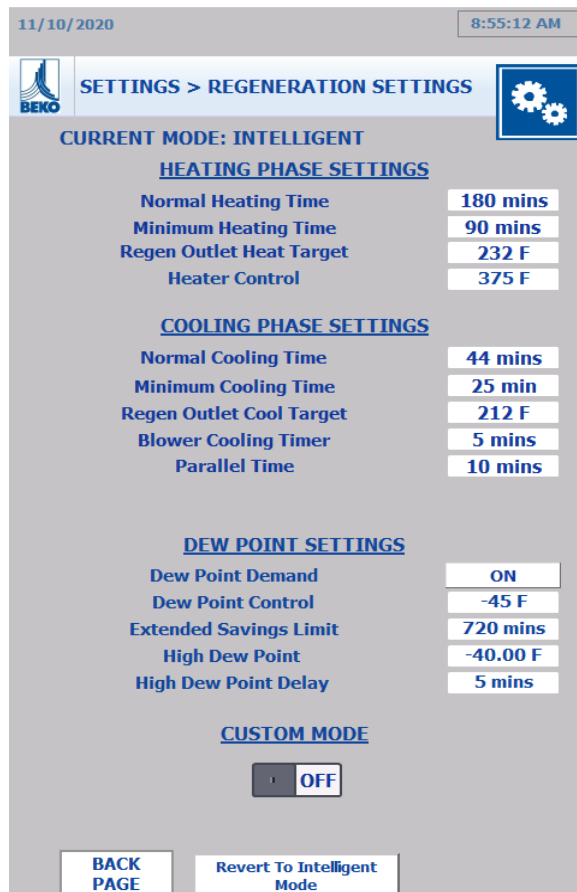
Selecting an operating mode within the Regeneration menu will display a screen showing default parameters for both Heating Phase and Cooling Phase for the selected mode.

Note that adjustments to these set points are locked and only accessible through an administrative password. Furthermore, adjustments to these settings are only allowed within a predetermined range (limits set by factory).

Dew Point Demand (Standard XFi / Optional XFe)

This feature is managed using the Dew Point Settings section of this screen. Here the Dew Point Demand control function can be enabled, assigned set points and time delay settings.

When selected ON, the Dew Point Demand sequence of operations will control the dryer to provide energy savings. When selected OFF, the dryer will run in the fixed time mode sequence of operations.

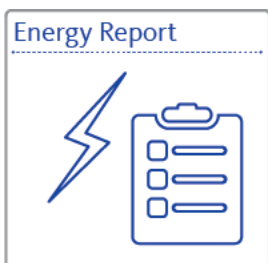




Communication

The Communication screen displays the default IP addresses of the PLC and HMI. These are only displays for the IP addresses. Updates attempted in using this screen will not change the actual IP address. Changing the IP addresses must be done through a web browser.

The MODBUS SETTINGS display and configuration is also included in this section. The MODBUS communications is enabled by selection the Modbus Comm, OK radio button. The Holding Registers are activated by entering 1 to make that register Active and 0 to make it Inactive.



Energy Report (XFi ecoIntelligent only)

Energy Report is where Energy Savings calculator is located and managed. This program calculates and displays the weekly, monthly, and yearly operational costs for the blower, heater and purge energy usage based on a user entered energy cost rate in \$/KW. Also, calculated and displayed is the cost savings when compared to the previous time period's operational cost.

SETTINGS > COMMUNICATION

Address Records & Modbus Information

PLC Programmable Logic Controller
...

HMI Human Machine Interface
...

Modbus Comm. OK

MODBUS SETTINGS

Values Legend
 Active: 1
 Inactive: 0

Holding Registers	Description	Values
40001 (1st byte,bit 0)	Major Regeneration Alarm	0
40001 (1st byte,bit 1)	Major Pressure Alarm	0
40001 (1st byte,bit 2)	Major Sensor Failure Alarm	0
40001 (1st byte,bit 3)	Major Limit Switch Alarm	0
40001 (1st byte,bit 5)	Minor Maintenance Alarm	0
40001 (1st byte,bit 6)	Minor Pressure Alarm	0
40001 (1st byte,bit 7)	Minor Sensor Failure Alarm	0
40001 (2nd byte,bit 0)	Minor Temperature Alarm	0
40001 (2nd byte,bit 1)	Major Temperature Alarm	0

BACK NEXT

SETTINGS > ENERGY SAVINGS

Energy Savings

0000.00 USD [This Week's Operational Cost](#)

0000.00 USD [Last Week's Operational Cost](#)

0000.00 USD [Last Week's Savings](#)

0000.00 USD [This Month's Operational Cost](#)

0000.00 USD [Last Month's Operational Cost](#)

0000.00 USD [Last Month's Savings](#)

00000.00 USD [This Year's Operational Cost](#)

00000.00 USD [Last Year's Operational Cost](#)

00000.00 USD [Last Year's Savings](#)

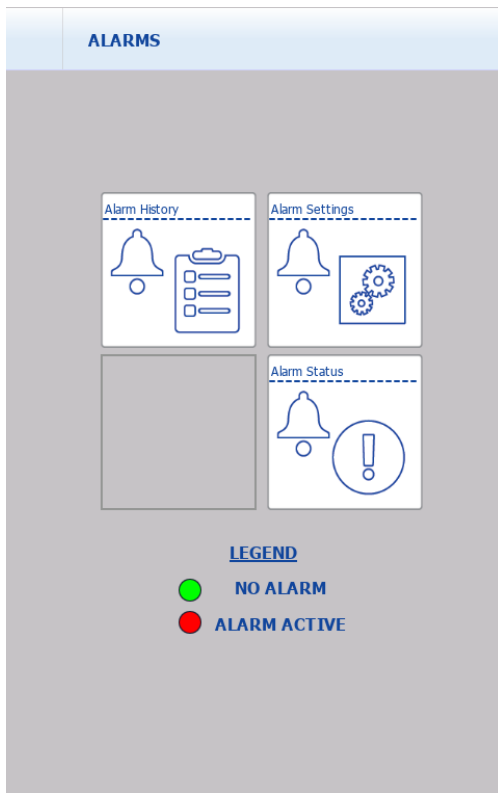
RESET

BACK PAGE CONFIG. STOP

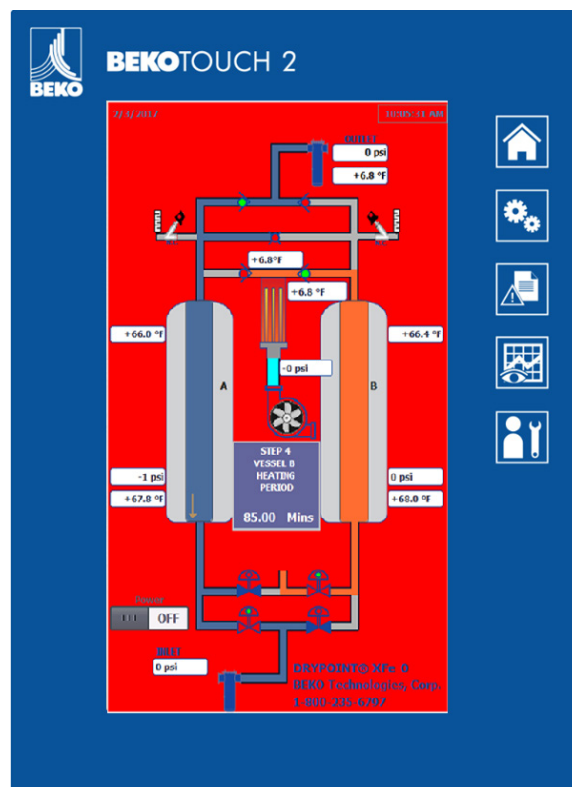
5.4.5 Alarms










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

	<p>Regeneration Alarm Regeneration Alarm is an alarm that directly affects the regeneration cycle of the dryer.</p>
	<p>Pressure Alarm Pressure Alarm is an alarm monitored by a pressure switch or pressure transducer.</p>
	<p>Temperature Alarm Temperature Alarm is an alarm monitored by a thermocouple.</p>
	<p>Sensor Failure Alarm 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.</p> <p>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.</p>
	<p>Limit Switch Alarm Limit Switch Alarm is an alarm from a limit switch.</p>
	<p>Moisture Alarm Dew point or humidity alarm of process air, cabinet enclosure or ambient conditions.</p>
	<p>Maintenance Alarm Maintenance alarms are based solely on system timers.</p>

Alarm Failure Types

	<p>Major Alarm 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.</p>
	<p>Minor Alarm 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.</p>

Regeneration Alarm

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

Pressure Alarm

Alarm ID	Description
200	Vessel A High Pressure Alarm -MINOR- Vessel A pressure is higher than normal operation, please monitor for safety.
201	Vessel B High Pressure Alarm -MINOR- Vessel B pressure is higher than normal operation, please monitor for safety.
203	Loss of Pressure Alarm -MAJOR- Pressure fell below HIGH threshold on process drying side during regeneration, check air delivery from supply/compressor(s).
204	Pressure Not Equal -MAJOR- Pressure fell below HIGH threshold during Standby and/or Parallel, check air delivery from supply / compressor(s).
205	Pressure Equal During Regeneration -MAJOR- During regeneration, pressure was not maintained below the LOW threshold, check for obstruction in exhaust system.
206	Vessel A Depress Failure -MAJOR- 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	Vessel B Depress Failure -MAJOR- 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	Vessel A Repress Failure -MAJOR- 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	Vessel B Repress Failure -MAJOR- 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	No Air Pressure -MINOR- 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	Heater Sheath 1 Over Temperature -MAJOR- 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	Low Regeneration Temperature -MINOR- Temperature is below 300 degrees F after 1 hour of heating. Check heater.
302	Vessel Exceeding Temperature -MINOR- Vessel is heating too much too fast.
304	Enclosure High Temperature Alarm -MINOR- Enclosure temperature is too high, ensure vortex cooler delivery is adequate.
305	Dryer Inlet Temperature High -MINOR- Dryer Inlet Temperature High, this could result in water overloading to desiccant column and create wetter dew point.
306	Heater Sheath 2 Over Temperature This alarm is for XF3300 and larger.

Sensor Failure Alarms

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

Alarm ID	Description
406	Enclosure Humidity Sensor Failure -MINOR- Enclosure humidity sensor has malfunctioned.
407	Enclosure Temperature Sensor Failure -MINOR- Enclosure temperature sensor has malfunctioned.
408	Vessel A Upper Thermo-well Sensor Failure -MAJOR- Vessel A Upper Thermo-well Sensor has malfunctioned.
409	Vessel B Upper Thermo-well Sensor Failure -MAJOR- Vessel B Upper Thermo-well Sensor has malfunctioned
410	Heater Control Thermocouple Failure
411	Heater Sheath 1 Thermocouple Failure
412	Regen Outlet & Inlet Thermocouple Failure
414	Heater Sheath 2 Thermocouple Failure This alarm is for XF3300 and larger.

Limit Switch Alarms

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

506	Failure To Close Vessel A Regen Outlet Valve
507	Failure To Close Vessel B Regen Outlet Valve

Limit Switch Alarms

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

Maintenance Reminders

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



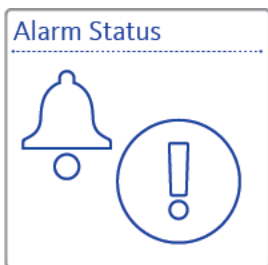
On the **ALARM HISTORY** screen, all previous alarms are shown along with the current active alarm. The alarms are shown in descending order with the most recent at the top of the screen.

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.

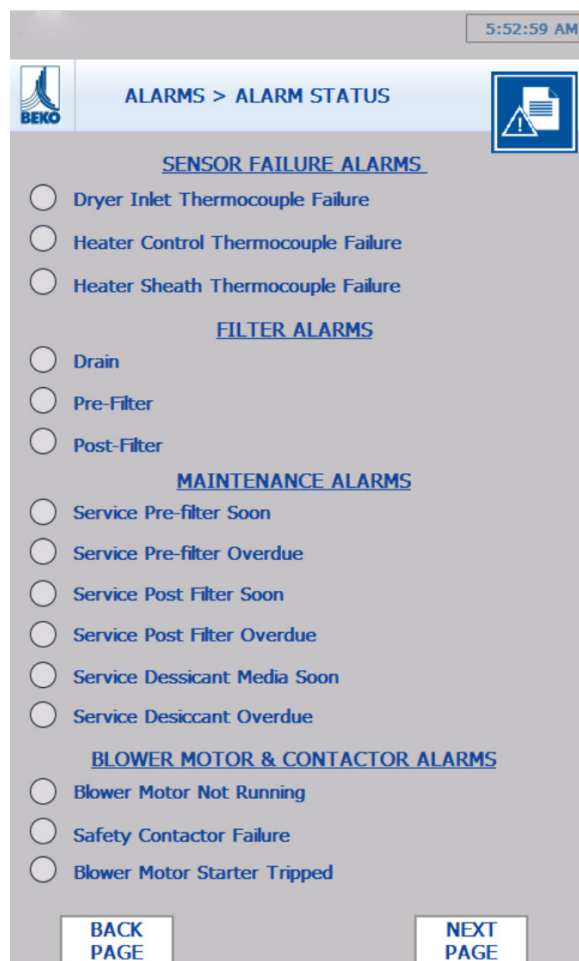
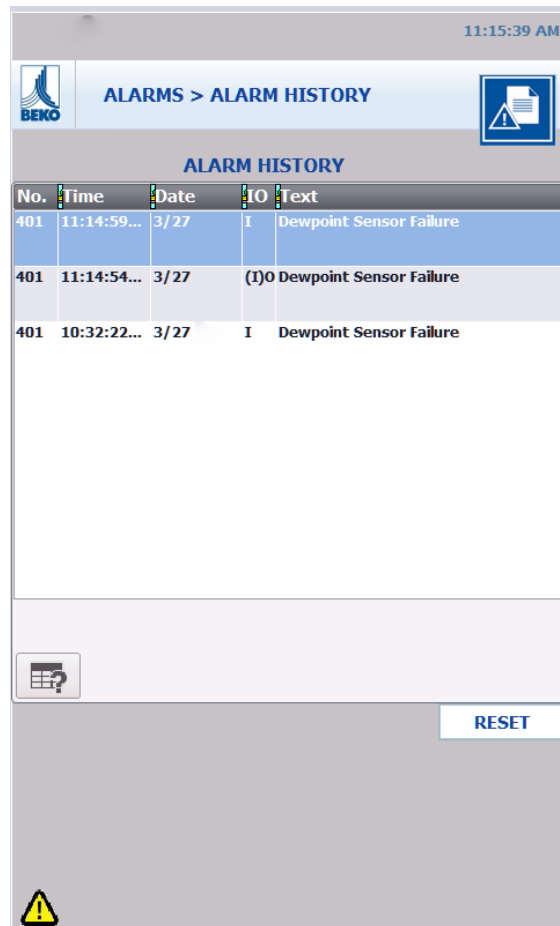
You can also download a log of the alarm history which can be sent to a BEKO Technologies Service Technician for further review.

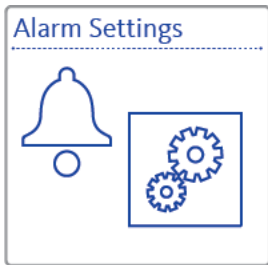
Notices that all past alarms are stored as history in the controller as well as when the alarm was reset.



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

Note: there are multiple pages of alarms.





In **ALARM SETTINGS**, adjustments to the set point of an alarm or time delay for the alarm can be made.

6:52:18 AM

BEKO ALARMS > ALARM SETTINGS


REGENERATION TEMPERATURE ALARM SETTINGS

High Regeneration Temperature	415 F
High Regeneration Temperature Delay	1 mins
Heater Sheath Over Temperature	1200 F
Heater Sheath Over Temperature Delay	3 secs
Low Regeneration Temperature	300 F
Low Regeneration Temperature Delay	15 mins

DEW POINT ALARM SETTINGS

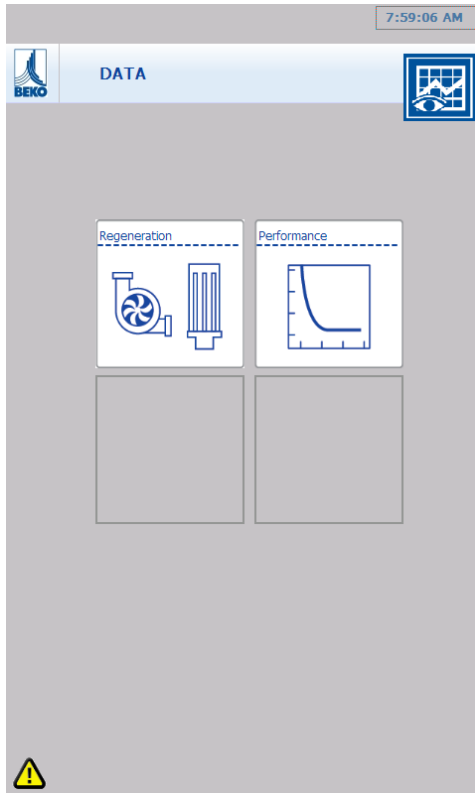
High Dew Point	-40 F
High Dew Point Delay	300 secs

Reset Settings To Defaults NEXT PAGE

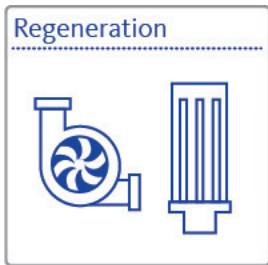




GRAPHS and DATA

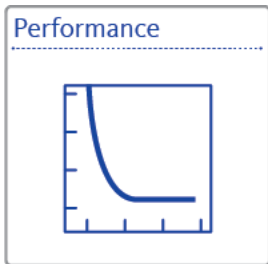
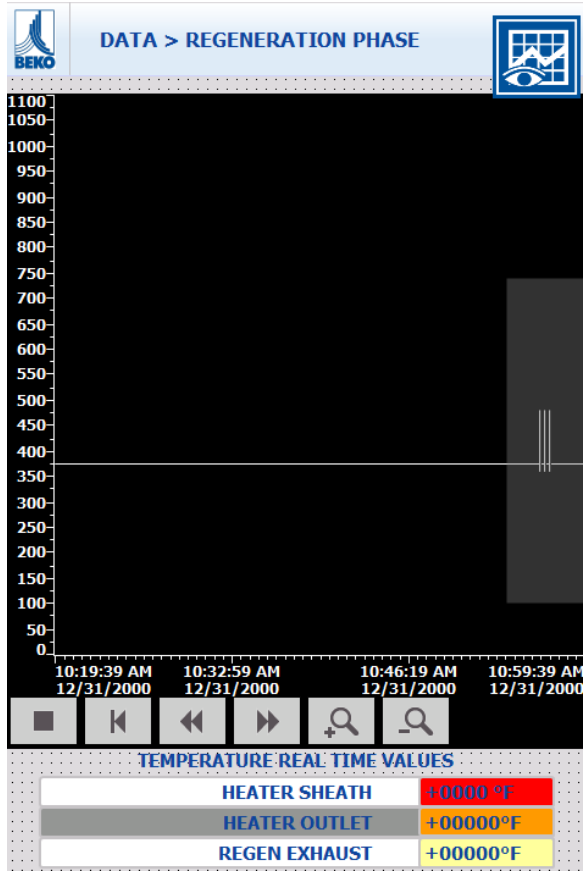


The **GRAPHS & DATA** screen allow access to real time performance data and graphs. This data is captured and logged and available for download.



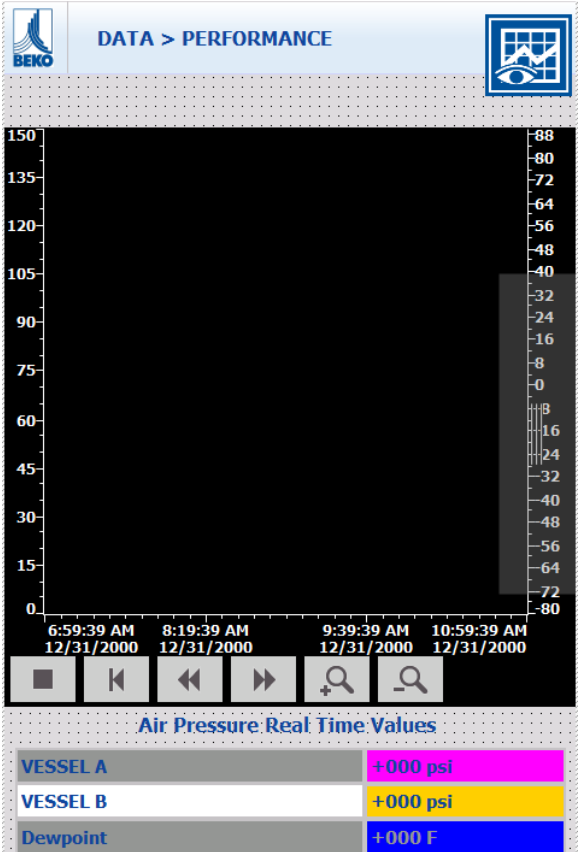
The **Regeneration Phase** shows real time temperatures of the regeneration phase.

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



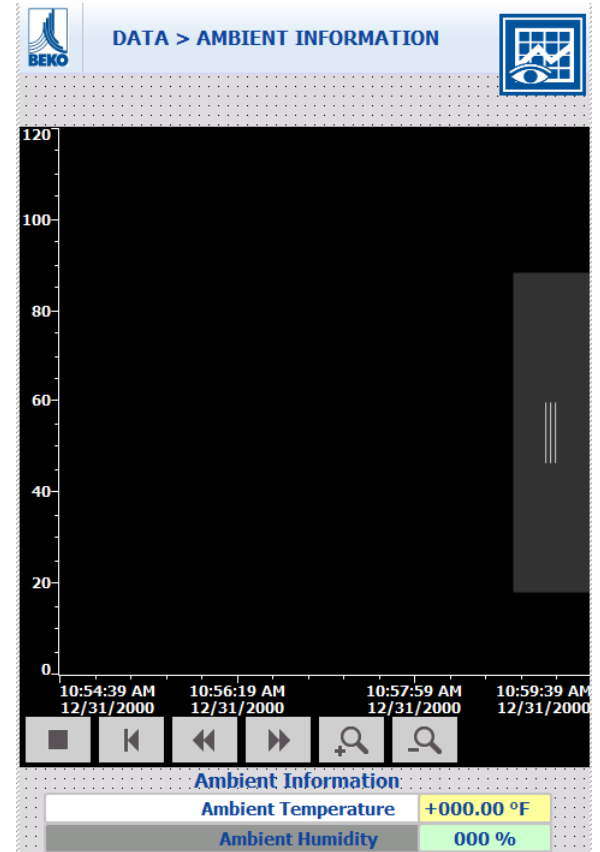
The **Performance** shows real time pressure of the system.

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



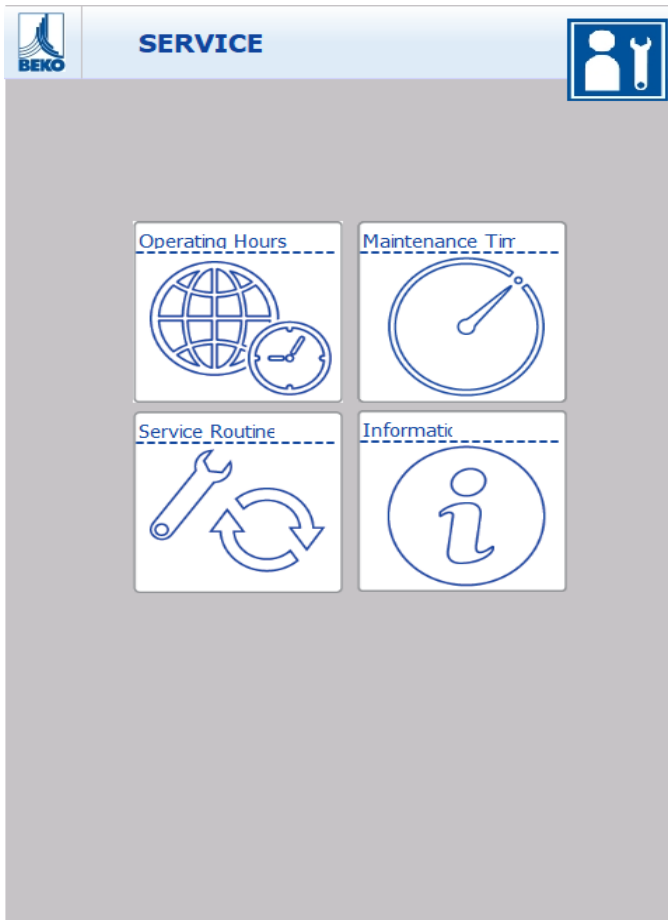
The **Enclosure / Ambient Info** shows real time temperature and humidity from the controls enclosure and ambient environment.

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





SERVICE & MAINTINANCE



Service and Maintenance provides access to information for:

- + 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.

10:59:49 AM

SERVICE > OPERATING HOURS

Status: Please Standby...

[Vessel A](#)

No.	Heating	Cooling	Savings	Parallel
1	000.00 min	000.00 min	00000.00 min	00.00 min
2	000.00 min	000.00 min	00000.00 min	00.00 min
3	000.00 min	000.00 min	00000.00 min	00.00 min
4	000.00 min	000.00 min	00000.00 min	00.00 min
5	000.00 min	000.00 min	00000.00 min	00.00 min
6	000.00 min	000.00 min	00000.00 min	00.00 min

Status: Please Standby...

[Vessel B](#)

No.	Heating	Cooling	Savings	Parallel
1	000.00 min	000.00 min	00000.00 min	00.00 min
2	000.00 min	000.00 min	00000.00 min	00.00 min
3	000.00 min	000.00 min	00000.00 min	00.00 min
4	000.00 min	000.00 min	00000.00 min	00.00 min
5	000.00 min	000.00 min	00000.00 min	00.00 min
6	000.00 min	000.00 min	00000.00 min	00.00 min

DESCRIPTION	TIMES/COUNTS
Operation Time	000000 hrs



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

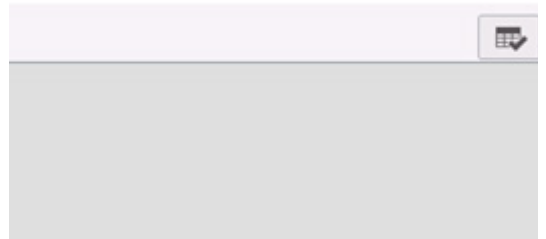
Each timer comes preset and can be adjusted if desired by pressing the individual value. If it is desired to return to the factory settings press **DEFAULT VALUES**.

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

	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 functions can be made for service and testing.

3/24/2017 10:02:41 AM

SERVICE > FACTORY SERVICE

Service Mode

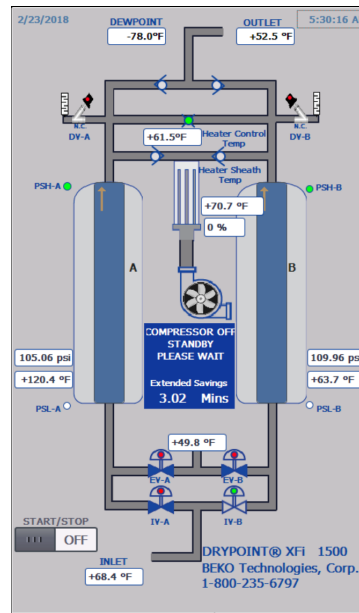
ON [Indicator]

- HEATER ON
- BLOWER OFF
- REPRESS SWITCH CLOSED
- Limit Switches Bypassed
- Pressure Sensor Bypass ON
- Reset System To Defaults

Exit Runtime [Arrow]

5.4.8 Compressor Synchronization (Remote Start/Stop)

The controller has the capability to synchronize the dryer with the 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 will present 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 fixed 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 fixed 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 and optional for the XFe 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 blower intake filter element(s)
- + Replace the pilot air filter-regulator element
- + Replace the dew point sensor filter element (if equipped)
- + 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 inlet/exhaust butterfly valve seal kits
- + Install depressurization valve service kit
- + Install purge 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 use of BEKO TECHNOLOGIES original OEM parts is required to maintain the warranty status.

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.

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	<ul style="list-style-type: none"> ⇒ No power ⇒ Valve problem ⇒ No pilot control air ⇒ Solenoid valves ⇒ Controller ⇒ Compressor off 	<ul style="list-style-type: none"> ⇒ 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	<ul style="list-style-type: none"> ⇒ Faulty inlet valve ⇒ Faulty signal ⇒ Faulty Outlet valve ⇒ Pneumatic 	<ul style="list-style-type: none"> ⇒ 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	<ul style="list-style-type: none"> ⇒ High dew point ⇒ Overloaded 	<ul style="list-style-type: none"> ⇒ Ensure operation sequence and purge setting ⇒ Check capacity versus operating conditions
❖ Depressurization	<ul style="list-style-type: none"> ⇒ No power ⇒ Flow control valve ⇒ No pilot control air ⇒ Exhaust Silencers 	<ul style="list-style-type: none"> ⇒ 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	<ul style="list-style-type: none"> ⇒ Purge Exhaust Valve ⇒ Purge line ⇒ Purge Valve ⇒ Inlet Valve 	<ul style="list-style-type: none"> ⇒ 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	<ul style="list-style-type: none"> ⇒ Purge Valve ⇒ Exhaust Silencers ⇒ Desiccant ⇒ Purge Exhaust Valve ⇒ Low Pressure ⇒ High Flow ⇒ High Temperature ⇒ Inlet Valve ⇒ Power ⇒ Controller 	<ul style="list-style-type: none"> ⇒ 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	<ul style="list-style-type: none"> ⇒ Desiccant ⇒ Pre-filter ⇒ Post-filter ⇒ Capacity ⇒ Desiccant screens ⇒ Purge Exhaust valve 	<ul style="list-style-type: none"> ⇒ 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	<ul style="list-style-type: none"> ⇒ Purge muffler fouled ⇒ Vessel screen ⇒ Restricted purge piping ⇒ Bad Purge Exhaust Valve 	<ul style="list-style-type: none"> ⇒ Replace with new ⇒ Empty Vessels, remove screens and clean ⇒ Clean ⇒ See purge Exhaust Valve troubleshooting
❖ Failure to Switch	<ul style="list-style-type: none"> ⇒ Purge Exhaust Valve ⇒ Purge line ⇒ Purge Valve ⇒ Inlet Valve 	<ul style="list-style-type: none"> ⇒ 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	<ul style="list-style-type: none"> ⇒ Setting ⇒ Damaged ⇒ Dirty 	<ul style="list-style-type: none"> ⇒ ensure proper setting from table xx ⇒ replace valve ⇒ open full for clean out or dismantle and clean
COMPONENT TROUBLE	POSSIBLE CAUSE	SUGGESTED ACTION
❖ Sensor Failure	<ul style="list-style-type: none"> ⇒ Sensor ⇒ Electrical ⇒ Pneumatic ⇒ Controller 	<ul style="list-style-type: none"> ⇒ ⇒ 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	<ul style="list-style-type: none"> ⇒ Setting ⇒ Damaged ⇒ Dirty 	<ul style="list-style-type: none"> ⇒ ensure proper setting from table xx ⇒ replace valve ⇒ open full for clean out or dismantle and clean

❖ Purge Exhaust Valve	<ul style="list-style-type: none"> ⇒ Worn seals ⇒ Pneumatic ⇒ Electrical ⇒ Restriction 	<ul style="list-style-type: none"> ⇒ 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	<ul style="list-style-type: none"> ⇒ Worn seals ⇒ Pneumatic ⇒ Electrical ⇒ Restriction 	<ul style="list-style-type: none"> ⇒ 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	<ul style="list-style-type: none"> ⇒ Restriction ⇒ Damaged Seal 	⇒ SERVICEABLE ONLY BY QUALIFIED TECHNICIAN
❖ Drain	<ul style="list-style-type: none"> ⇒ Application ⇒ Electrical ⇒ Contaminated ⇒ Drain 	<ul style="list-style-type: none"> ⇒ 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	<ul style="list-style-type: none"> ⇒ Application ⇒ Dirty element ⇒ Electrical ⇒ Differential pressure gauge 	<ul style="list-style-type: none"> ⇒ Failure with upstream bulk water separator ⇒ Contaminated filter, replace element ⇒ Faulty electrical signal ⇒ Clean, check and or replace
❖ Post-Filter	<ul style="list-style-type: none"> ⇒ Dryer dusting ⇒ Dirty element ⇒ Electrical ⇒ Differential pressure gauge 	<ul style="list-style-type: none"> ⇒ Ensure proper dryer sequence ⇒ Contaminated filter, replace element ⇒ Faulty electrical signal ⇒ Clean, check and or replace
❖ Controller	<ul style="list-style-type: none"> ⇒ Defective ⇒ No power supply ⇒ Loose connection 	<ul style="list-style-type: none"> ⇒ Replace controller ⇒ Ensure voltage supply ⇒ Check connections
❖ Relief Valve	<ul style="list-style-type: none"> ⇒ Over pressure ⇒ Leak ⇒ Over temperature 	<ul style="list-style-type: none"> ⇒ Check system pressure and correct ⇒ Replace valve ⇒ Ensure system temperature or fire has not occurred
❖ Solenoid	<ul style="list-style-type: none"> ⇒ Electrical ⇒ Pneumatic ⇒ Defective 	<ul style="list-style-type: none"> ⇒ Ensure connections and signal are adequate ⇒ Ensure pilot supply is good and valve is clean ⇒ Replace with new

. 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.

9. 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


 **Condensate drainage**
BEKOMAT®

 **Filtration**
CLEARPOINT®

 **Measurement technology**
METPOINT®

 **Condensate processing**
ÖWAMAT® | QWIK-PURE® | BEKOSPLIT®

 **Drying**
DRYPOINT®

 **Process technology**
BEKOKAT®



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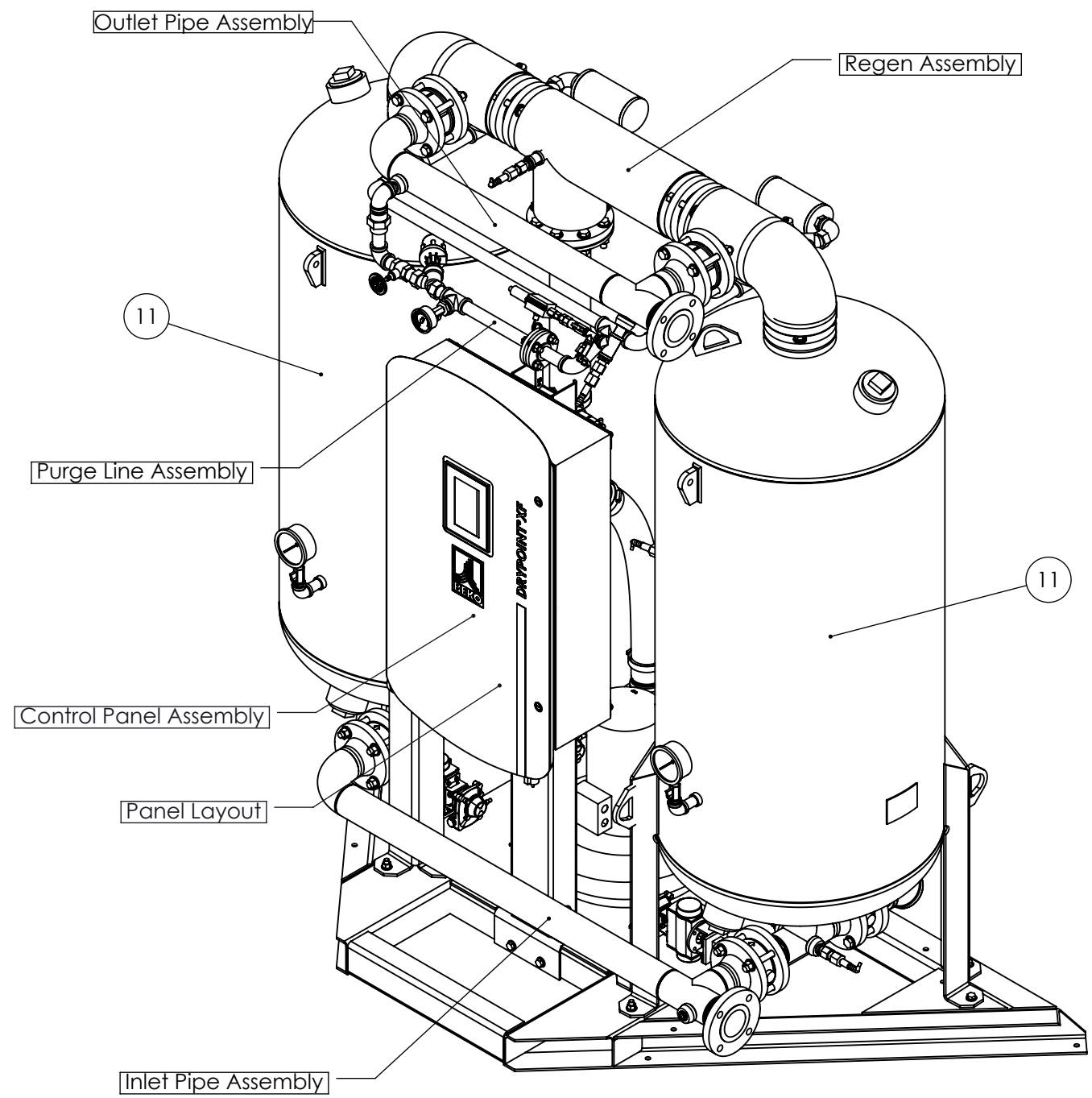


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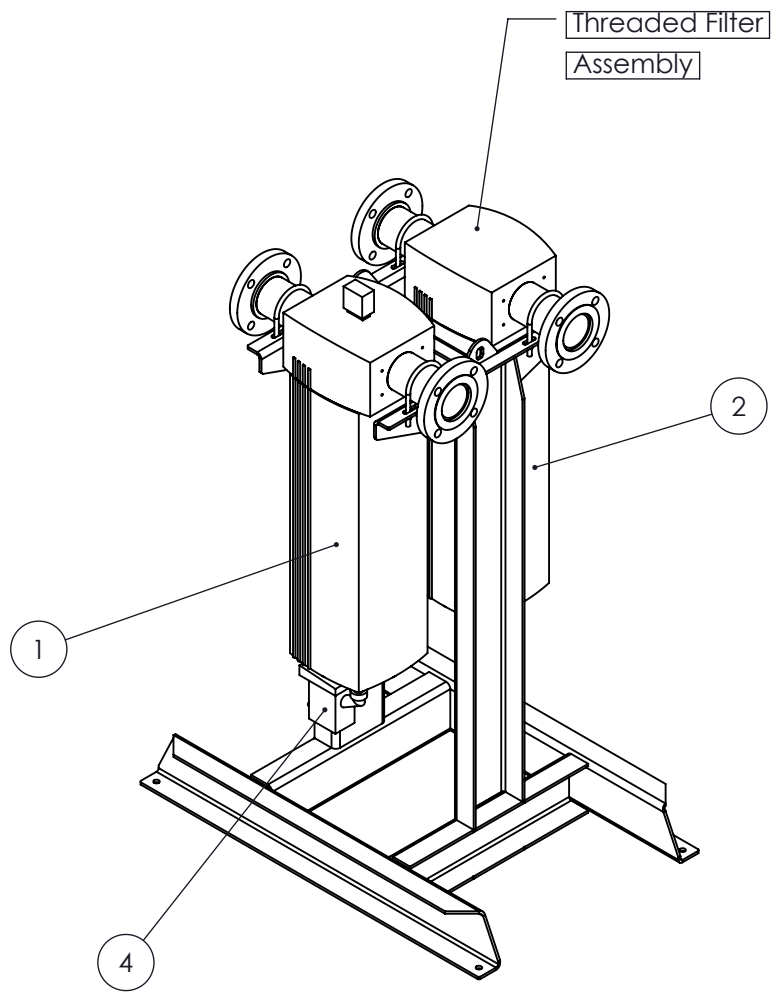
APPENDIX A

MAINTENANCE/SPARE PARTS ID DRAWINGS

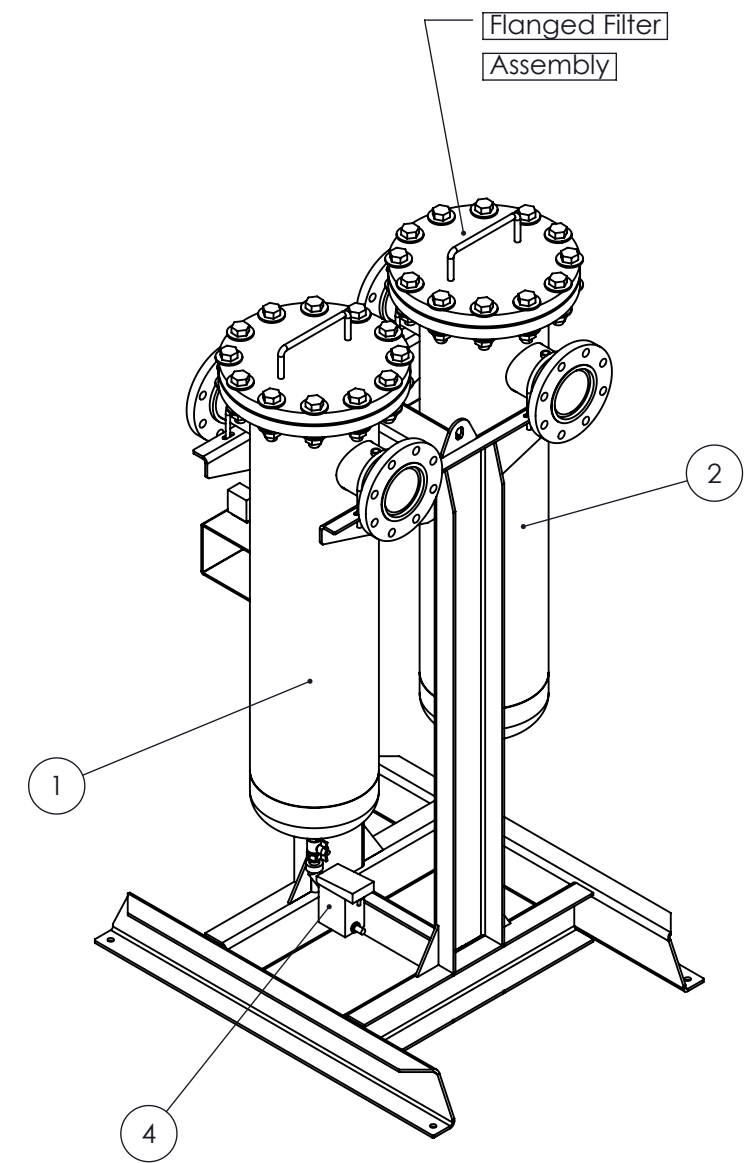
Rev	EWO Number	Change Notes	Date	Approved
A.00	0261	Released	8/9/2022	JSC
B.00	-	Added PDP Sensor spare part numbers (59 & 60)	1/30/2023	ATH



XF 800 - XF 2800



XF 800 - XF 1500



XF 1800 - XF 2300

Notes:

1. XFi version shown for clarity, parts not included with XFe version will be indicated with [1].



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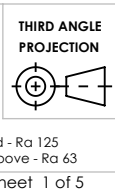
UNLESS OTHERWISE SPECIFIED:
 Linear dimensions INCHES
 Weights in US POUND
 Break all rough edges

Denotes INSPECTION DIM
 Denotes REFERENCE DIM

Tolerances:
 Linear ±1/4
 Angular ±2°

Surfaces:
 Machined - Ra 125
 O-ring Groove - Ra 63

Size: B Scale 1:16 Sheet 1 of 5



Created: JC
Date: 05/27/2021

Checked:
Date:

Engineer 1:

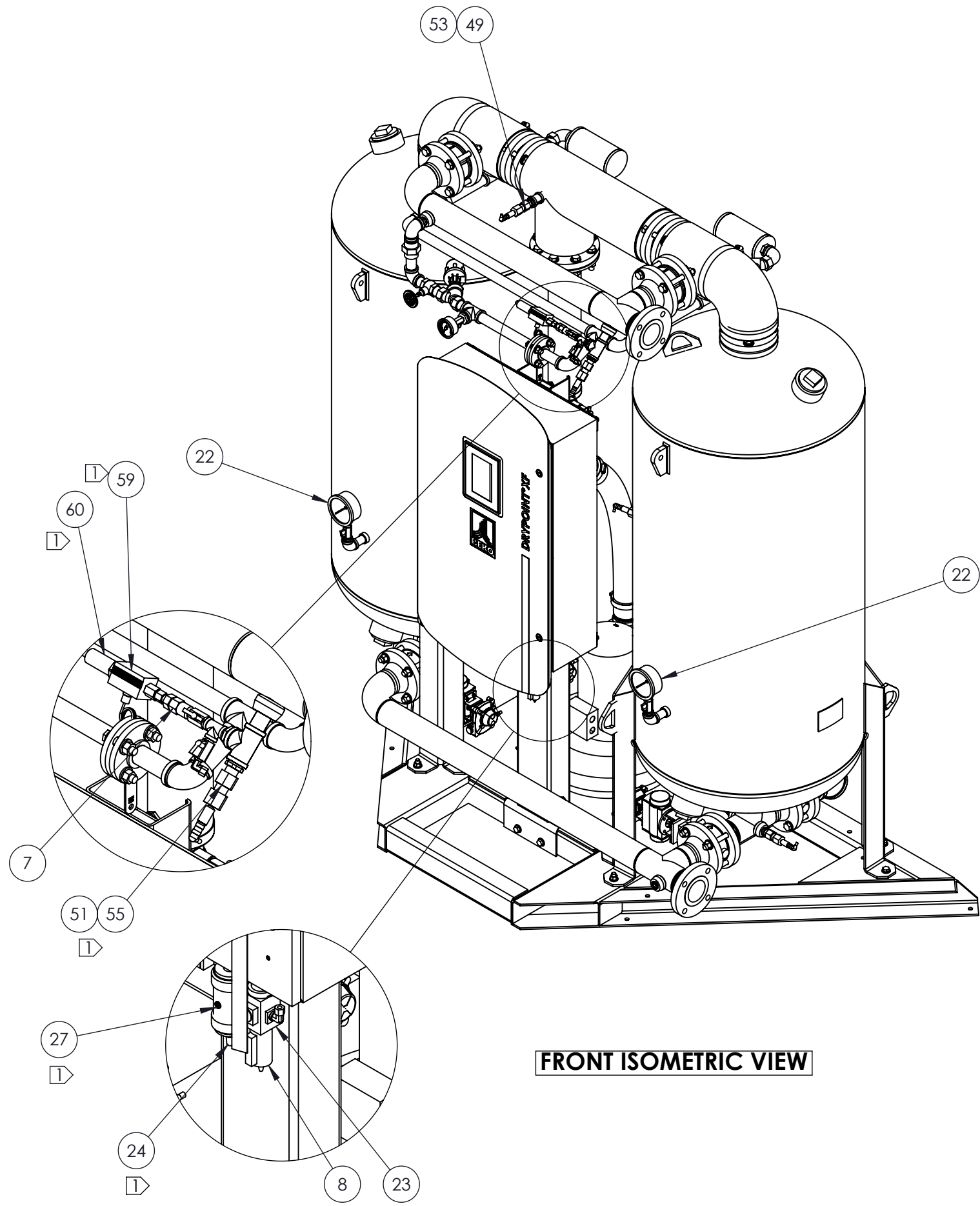
Engineer 2:

Doc No: 0002671
Cat: 08C **SAP:** N/A

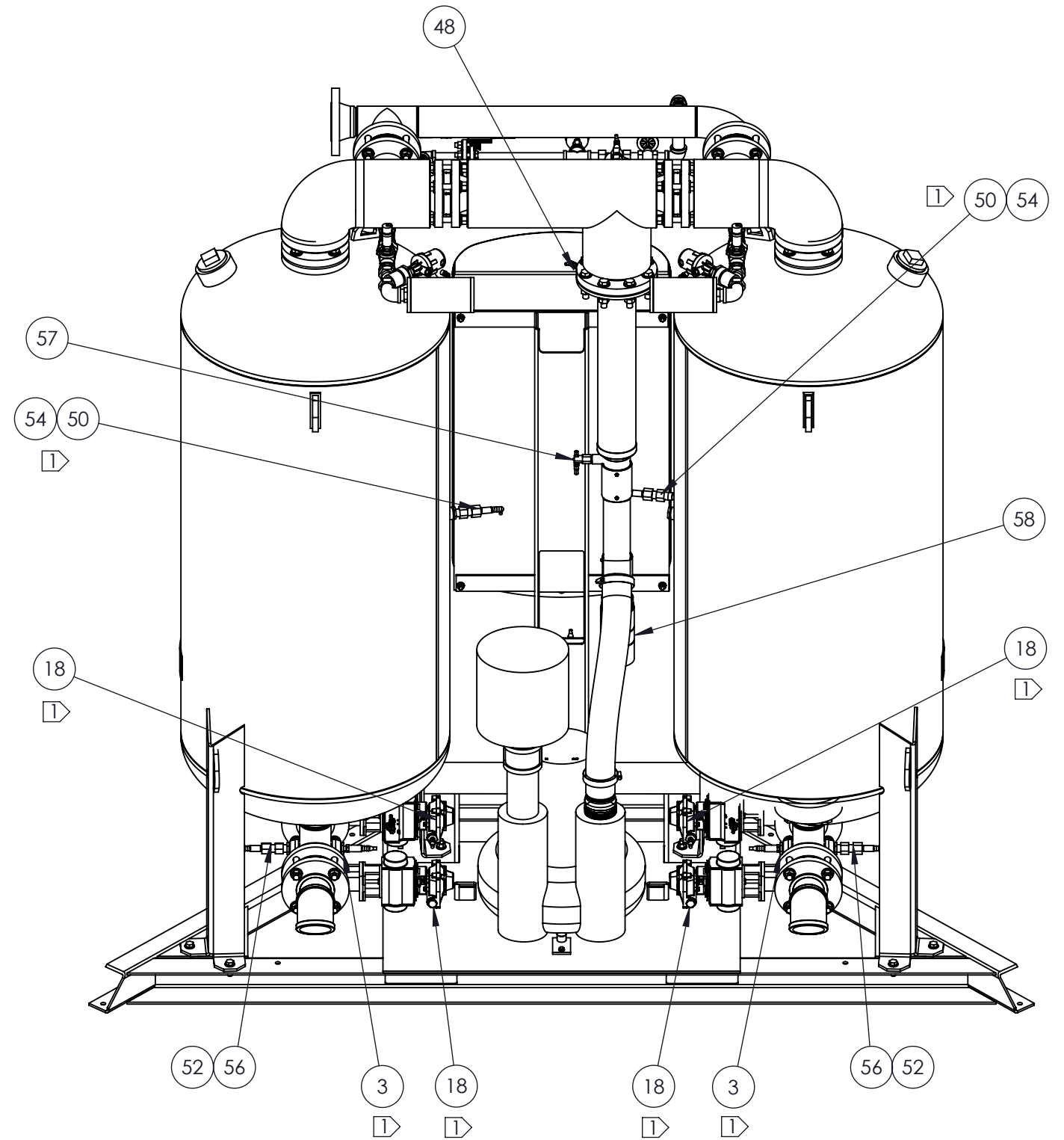
Title: XF 800-2800 Spare Parts Identification
Description: Spare Parts Identification Drawing

Rev: B.00

Sheet Name: Sheet1



FRONT ISOMETRIC VIEW



REAR ROTATED VIEW



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 Linear dimensions INCHES
 Weights in US POUND
 Break all rough edges

⊕ Denotes INSPECTION DIM
 () Denotes REFERENCE DIM

Tolerances:
 Linear ±1/4
 Angular ±2°
 Surfaces:
 Machined - Ra 125
 O-ring Groove - Ra 63

Size: B Scale 1:16 Sheet 2 of 5

THIRD ANGLE PROJECTION

Created: JC
Date: 05/27/2021

Checked:
Date:

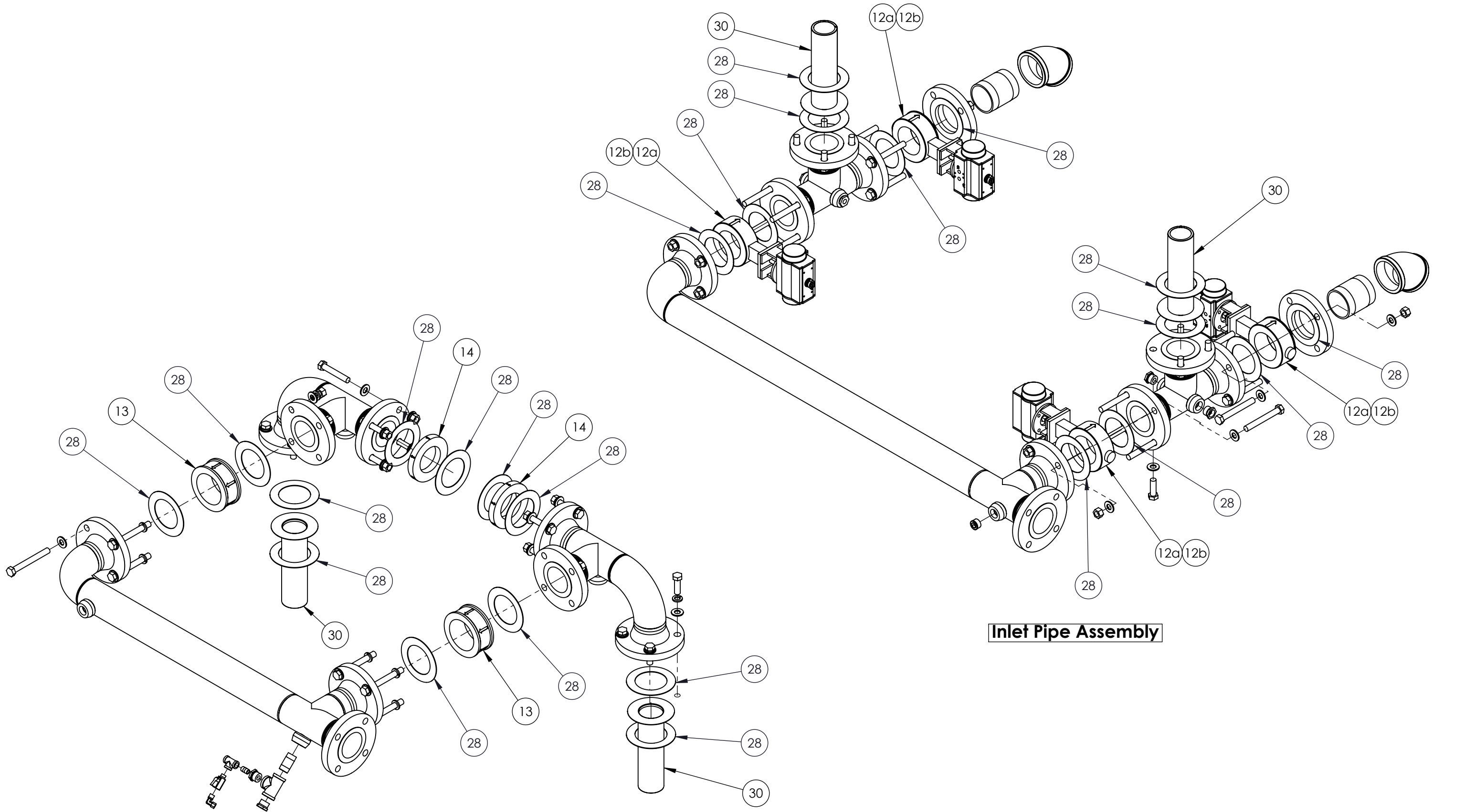
Engineer 1:

Engineer 2:

Doc No: 0002671
Cat: 08C **SAP:** N/A **Rev:** B.00

Title: XF 800-2800 Spare Parts Identification
Description: Spare Parts Identification Drawing

Sheet Name: Sheet2



Inlet Pipe Assembly

Outlet Pipe Assembly



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 Linear dimensions INCHES
 Weights in US POUND
 Break all rough edges

⊕ Denotes INSPECTION DIM
 () Denotes REFERENCE DIM

Tolerances:
 Linear ±1/4
 Angular ±2°

Surfaces:
 Machined - Ra 125
 O-ring Groove - Ra 63

Size: B Scale 1:10 Sheet 3 of 5

THIRD ANGLE PROJECTION

Created: JC
Date: 05/27/2021

Checked:
Date:

Engineer 1:

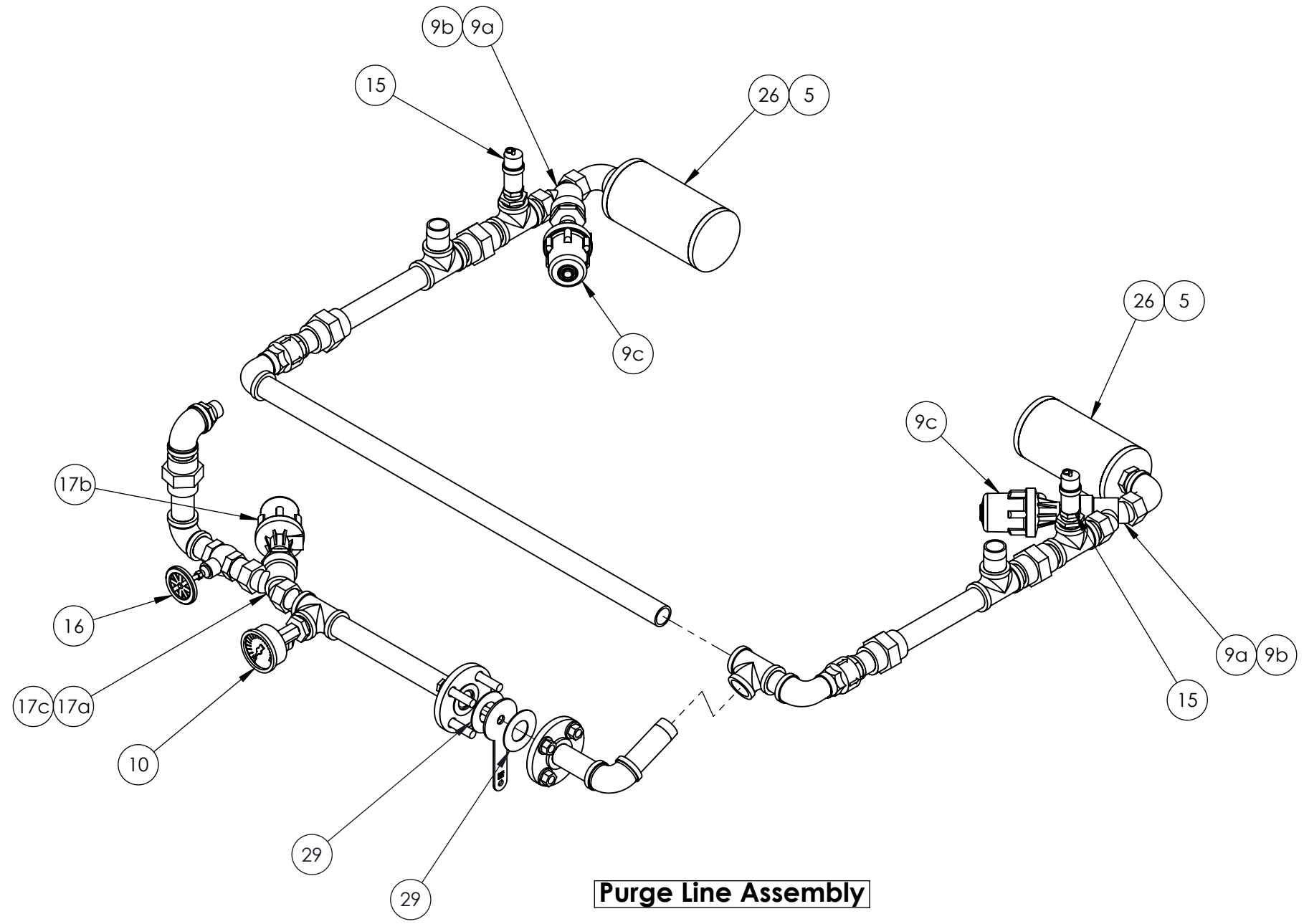
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Doc No: 0002671
Cat: 08C **SAP:** N/A

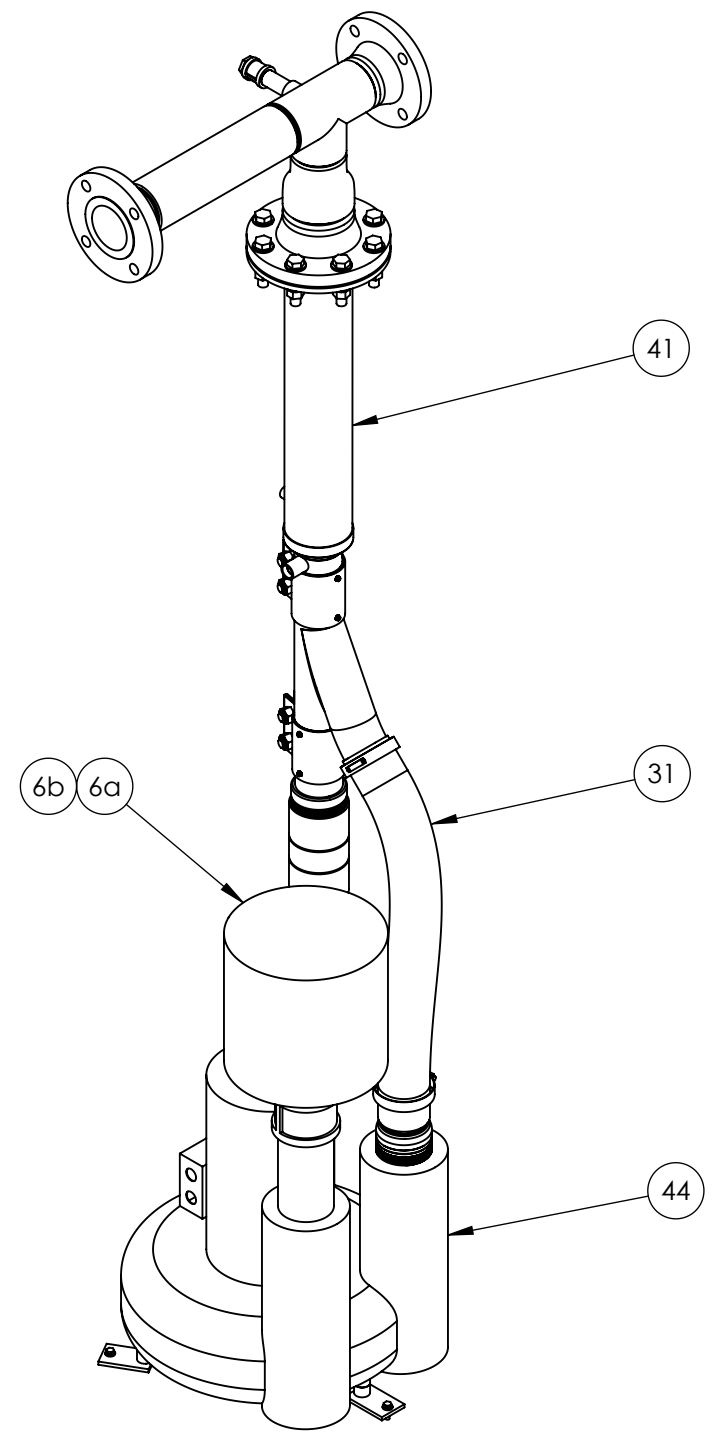
Rev: B.00

Title: XF 800-2800 Spare Parts Identification
Description: Spare Parts Identification Drawing



Sheet Name: Sheet3

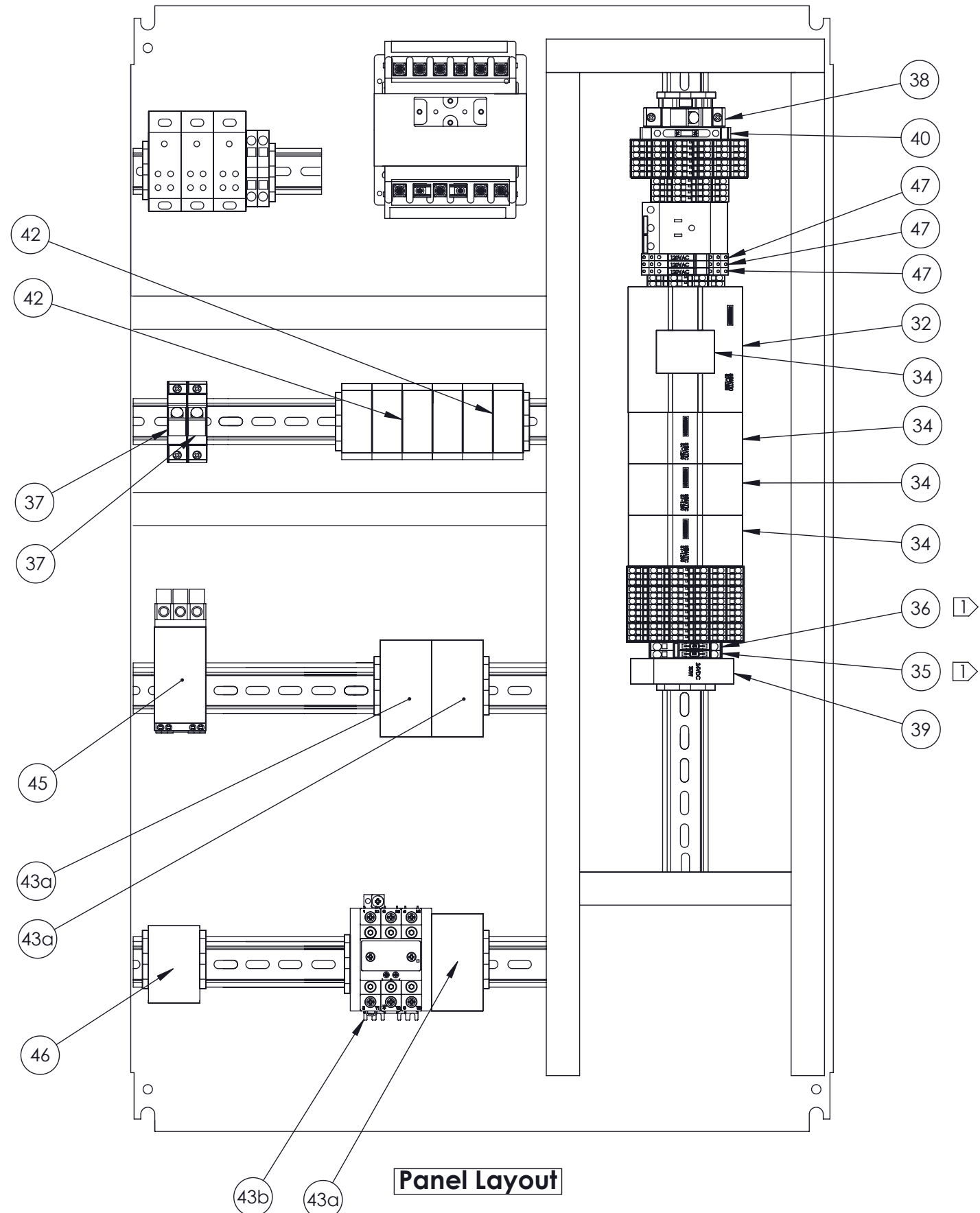


Purge Line Assembly

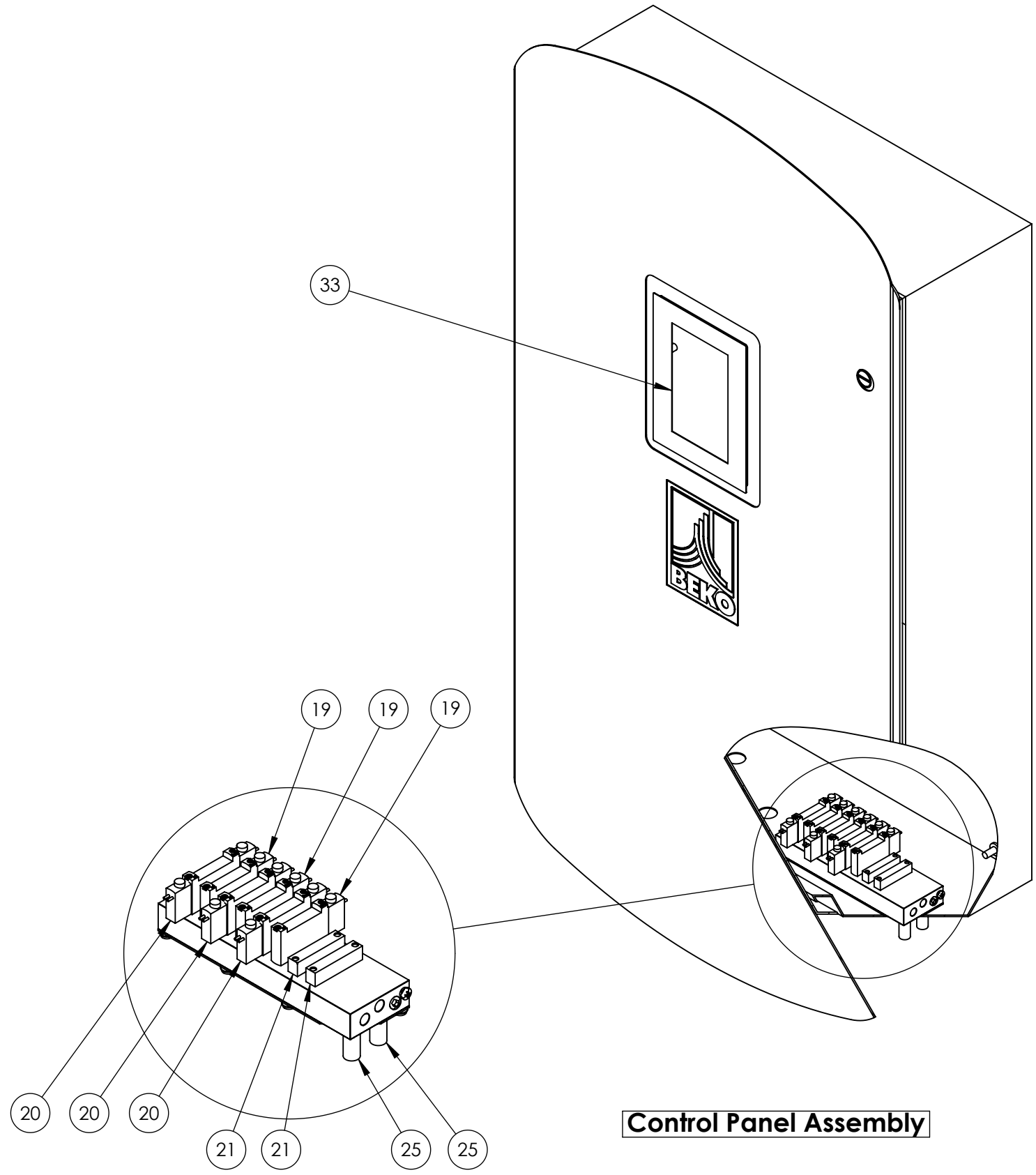


Regen Assembly

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	<p>900 Great SW Pkwy, Atlanta, GA 30336 Ph: (800) 235-6797 www.bekousa.com</p>	<p>Tolerances: Linear ±1/4 Angular ±2°</p>	<p>Surfaces: Machined - Ra 125 O-ring Groove - Ra 63</p>	<p>Checked: Date:</p>	<p>Cat: 08C SAP: N/A</p>	<p>Title: XF 800-2800 Spare Parts Identification Description: Spare Parts Identification Drawing</p>
	<p>Size: B Scale 1:8 Sheet 4 of 5</p>	<p>Engineer 1:</p>	<p>Engineer 2:</p>	<p>Sheet Name: Sheet4</p>		



Panel Layout



Control Panel Assembly



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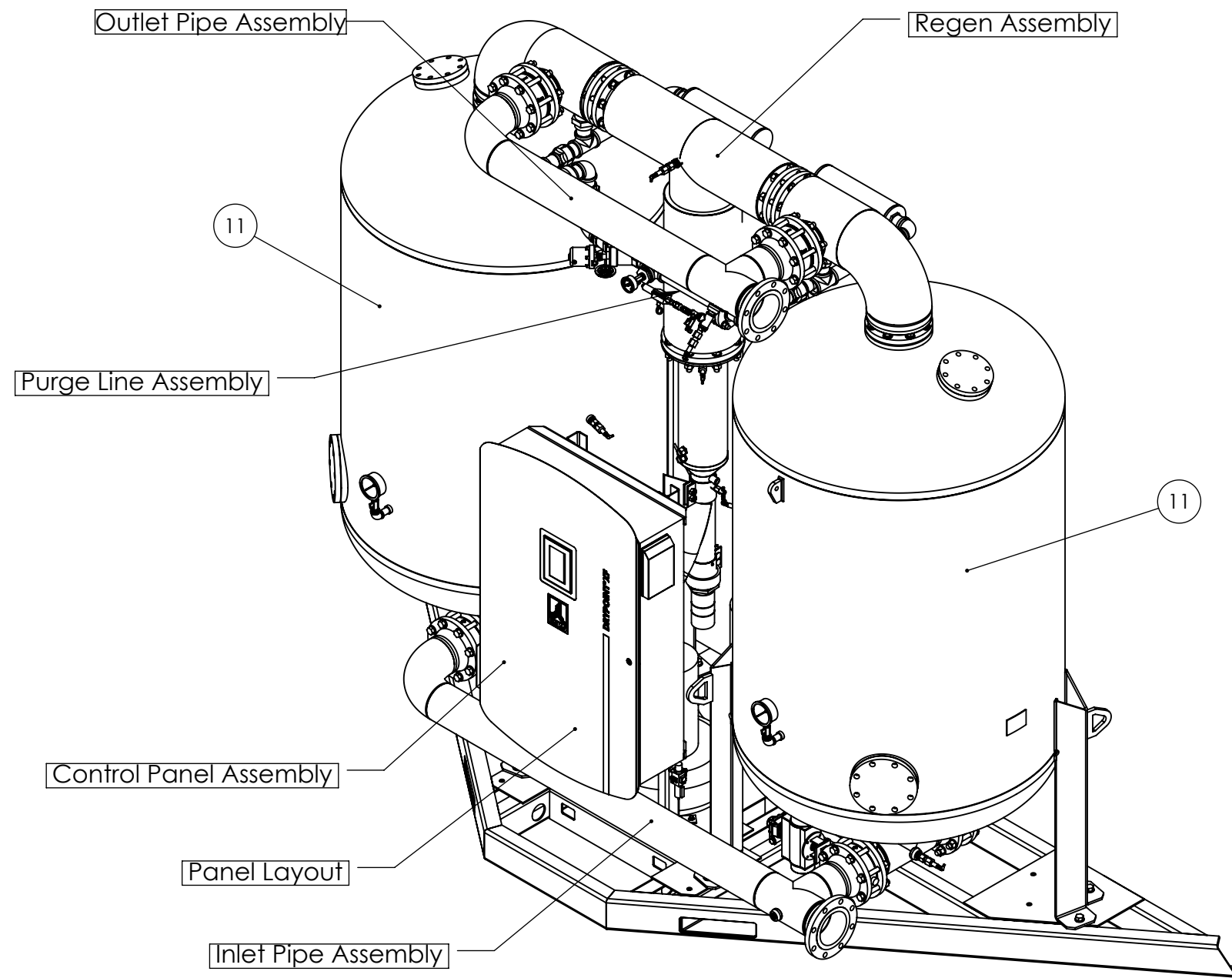
UNLESS OTHERWISE SPECIFIED:
 Linear dimensions INCHES
 Weights in US POUND
 Break all rough edges
 () Denotes INSPECTION DIM
 () Denotes REFERENCE DIM
Tolerances:
 Linear ±1/4
 Angular ±2°
 Surfaces:
 Machined - Ra 125
 O-ring Groove - Ra 63

THIRD ANGLE PROJECTION

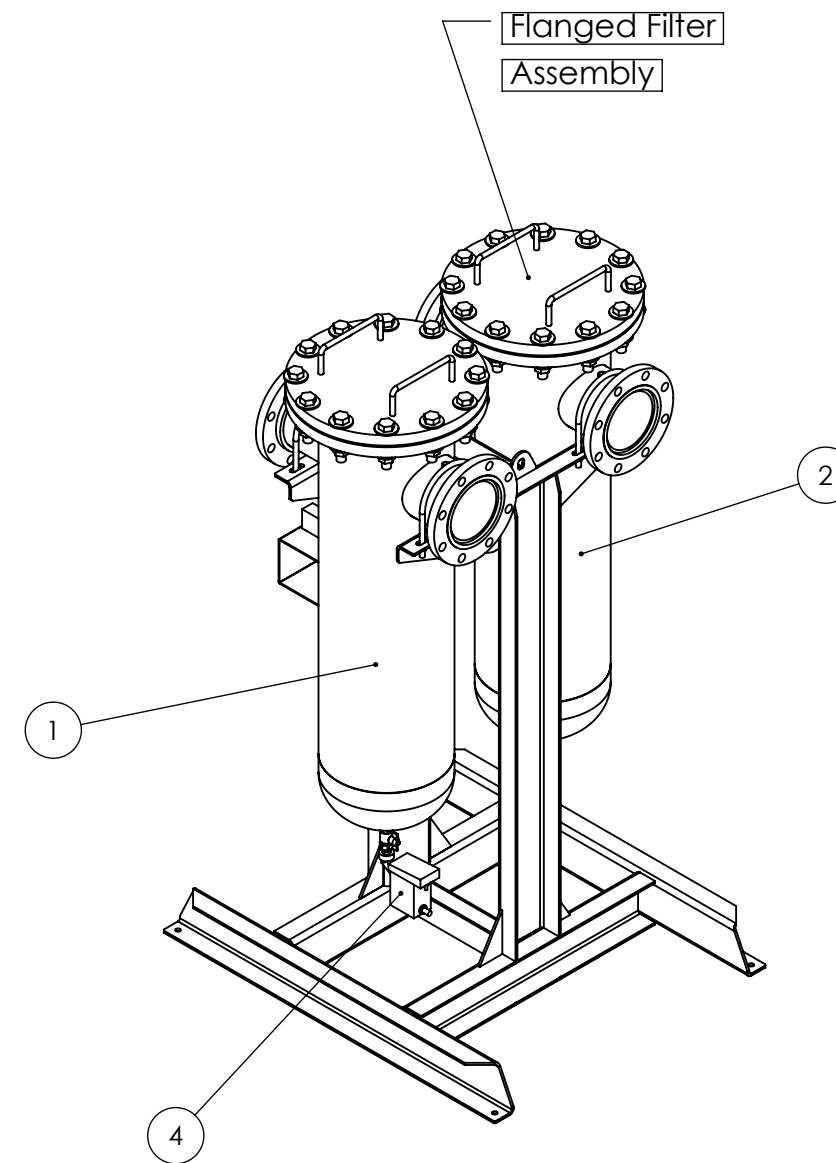
Created: JC
Date: 05/27/2021
Checked:
Date:
Engineer 1:
Engineer 2:

Doc No: 0002671
Cat: 08C **SAP:** N/A
Title: XF 800-2800 Spare Parts Identification
Description: Spare Parts Identification Drawing
Rev: B.00
Sheet Name: Sheet5

Rev	EWO Number	Change Notes	Date	Approved
A.00	0261	Released	8/9/2022	JSC
B.00	-	Added PDP Sensor (Parts 59 & 60)	1/31/2023	ATH



XF 3300 - XF 6600



XF 3300 - XF 6600

Notes:

1. XFi version shown for clarity, parts not included with XFe version will be indicated with .



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 Linear dimensions INCHES
 Weights in US POUND
 Break all rough edges

Denotes INSPECTION DIM
 Denotes REFERENCE DIM

Tolerances:
 Linear: $\pm 1/4$
 Angular: $\pm 2^\circ$

Surfaces:
 Machined - Ra 125
 O-ring Groove - Ra 63

Size: B Scale 1:24 Sheet 1 of 5

THIRD ANGLE PROJECTION

Created: JC
Date: 08/06/2022

Checked:
Date:

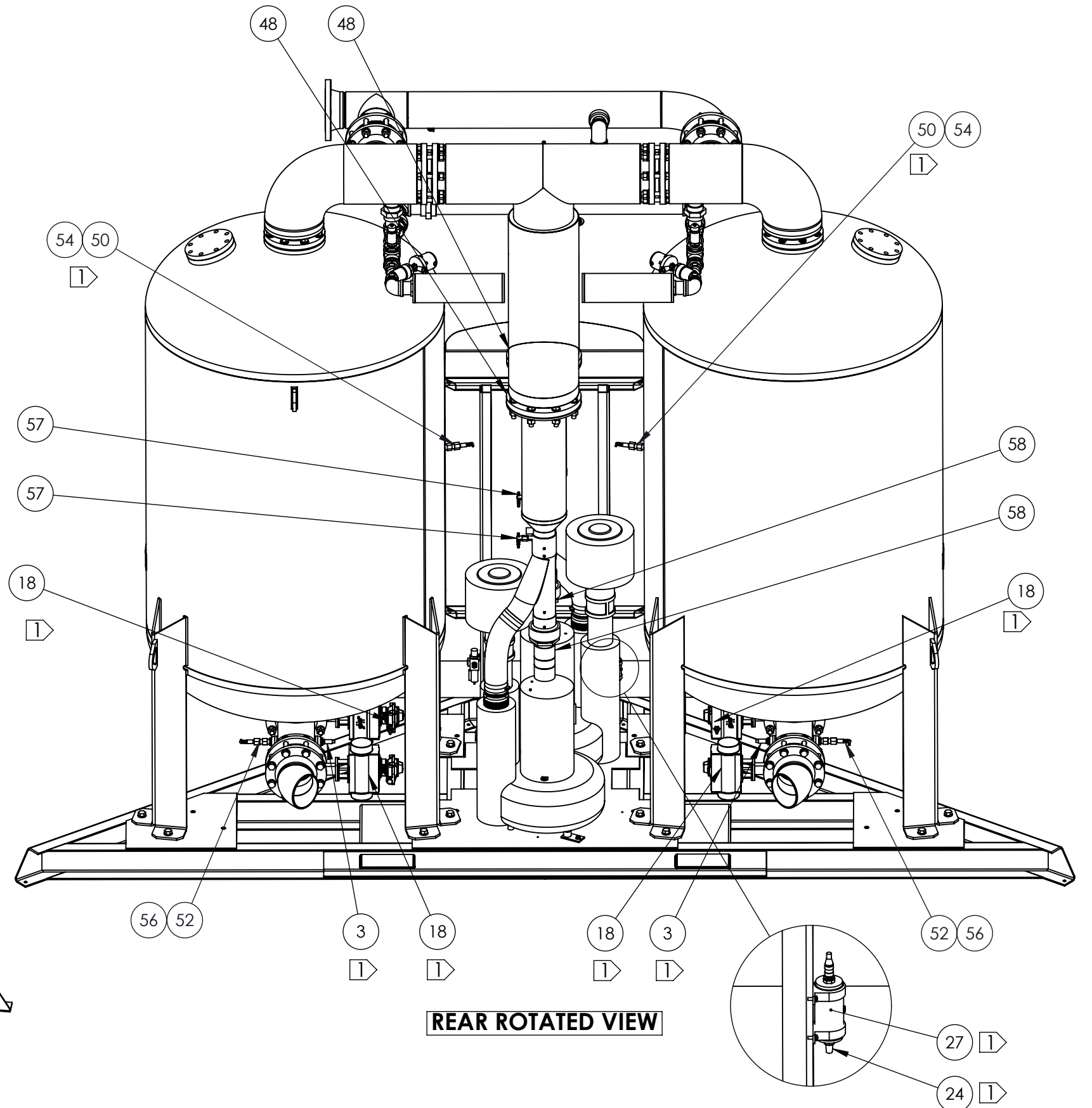
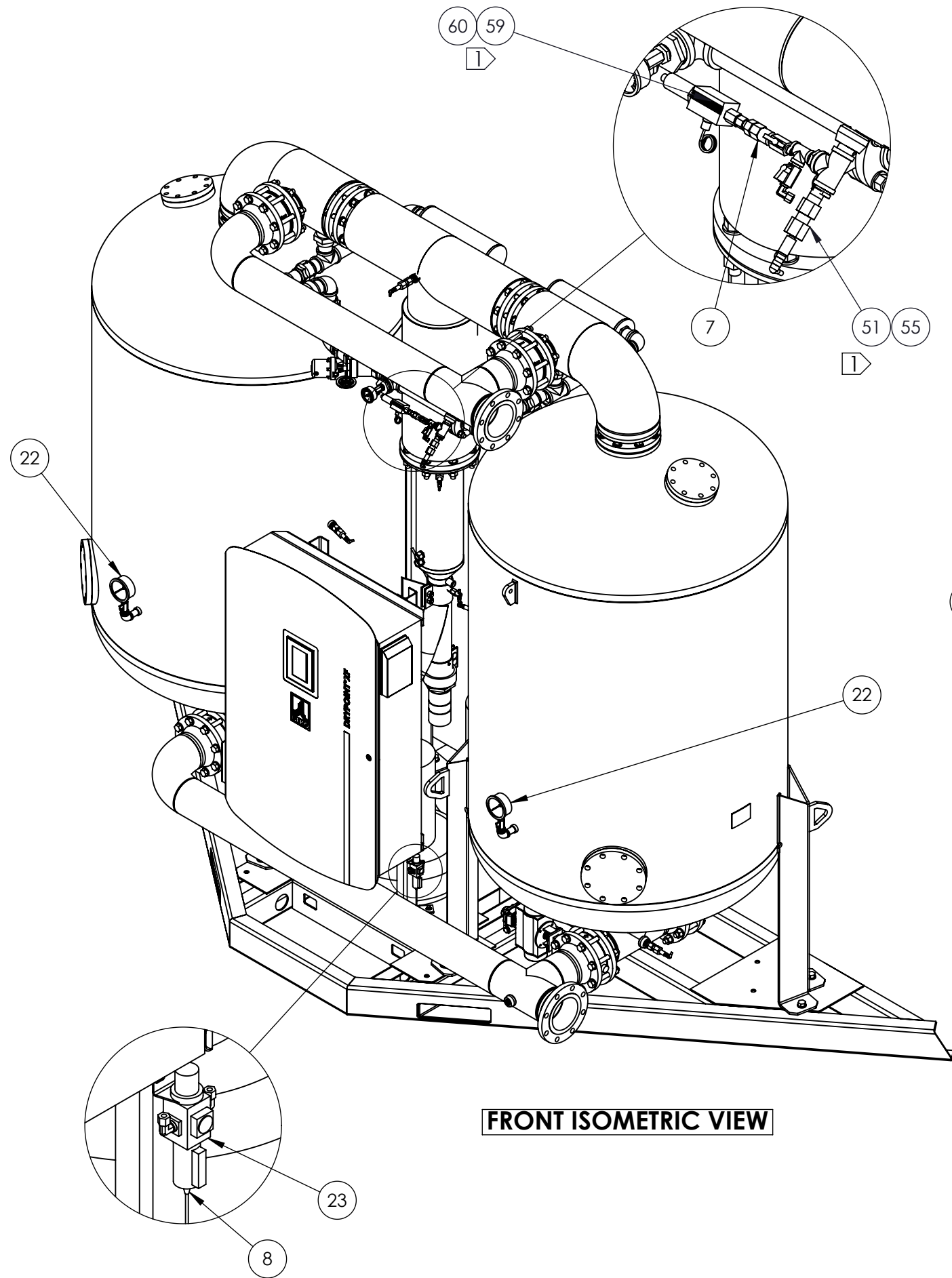
Engineer 1:



Engineer 2:

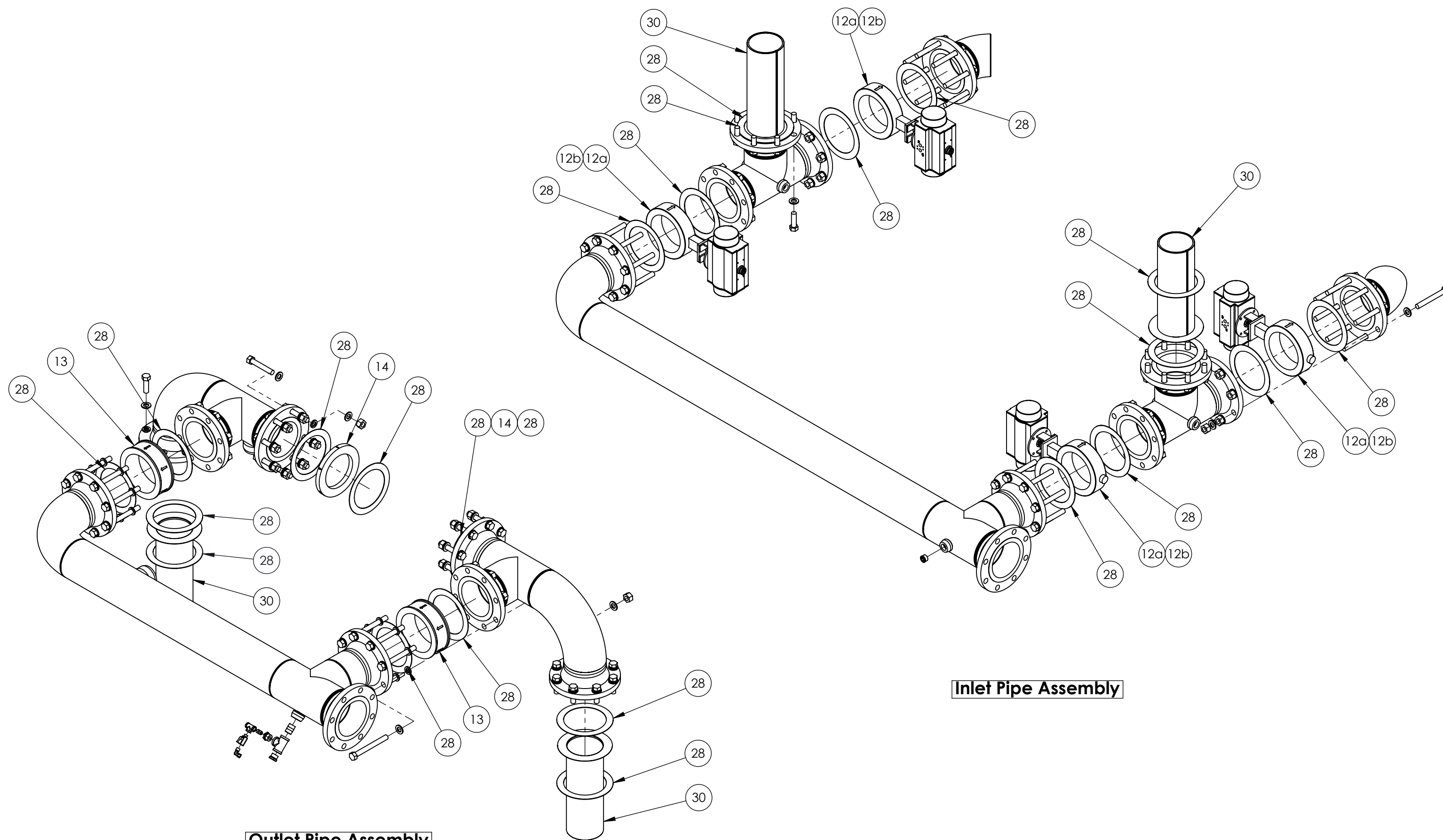
Doc No: 0003156
Cat: 08C **SAP:** N/A **Rev:** B.00

Title: XF 3300-6000 Spare Parts Identification
Description: Spare Parts Identification Drawing

Sheet Name: Sheet1



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	<p>900 Great SW Pkwy, Atlanta, GA 30336 Ph: (800) 235-6797 www.bekousa.com</p>	<p>Tolerances: Linear: ±1/4 Angular: ±2°</p>	<p>Surfaces: Machined - Ra 125 O-ring Groove - Ra 63</p>	<p>Checked: Date:</p>	<p>Title: XF 3300-6000 Spare Parts Identification Description: Spare Parts Identification Drawing</p>	<p>Engineer 1:</p>	<p>Sheet Name: Sheet2</p>
	<p>Size: B Scale 1:22 Sheet 2 of 5</p>	<p>Denotes INSPECTION DIM Denotes REFERENCE DIM</p>	<p>Denotes REFERENCE DIM</p>	<p>Engineer 2:</p>	<p>Sheet Name: Sheet2</p>		



Inlet Pipe Assembly

Outlet Pipe Assembly



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 Break all rough edges

⊕ Denotes INSPECTION DIM
 () Denotes REFERENCE DIM

Tolerances:
 Linear ±1/4
 Angular ±2°

Surfaces:
 Machined - Ra 125
 O-ring Groove - Ra 63

Size: B Scale 1:14 Sheet 3 of 5

THIRD ANGLE PROJECTION

Created: JC
Date: 08/06/2022

Checked:
Date:

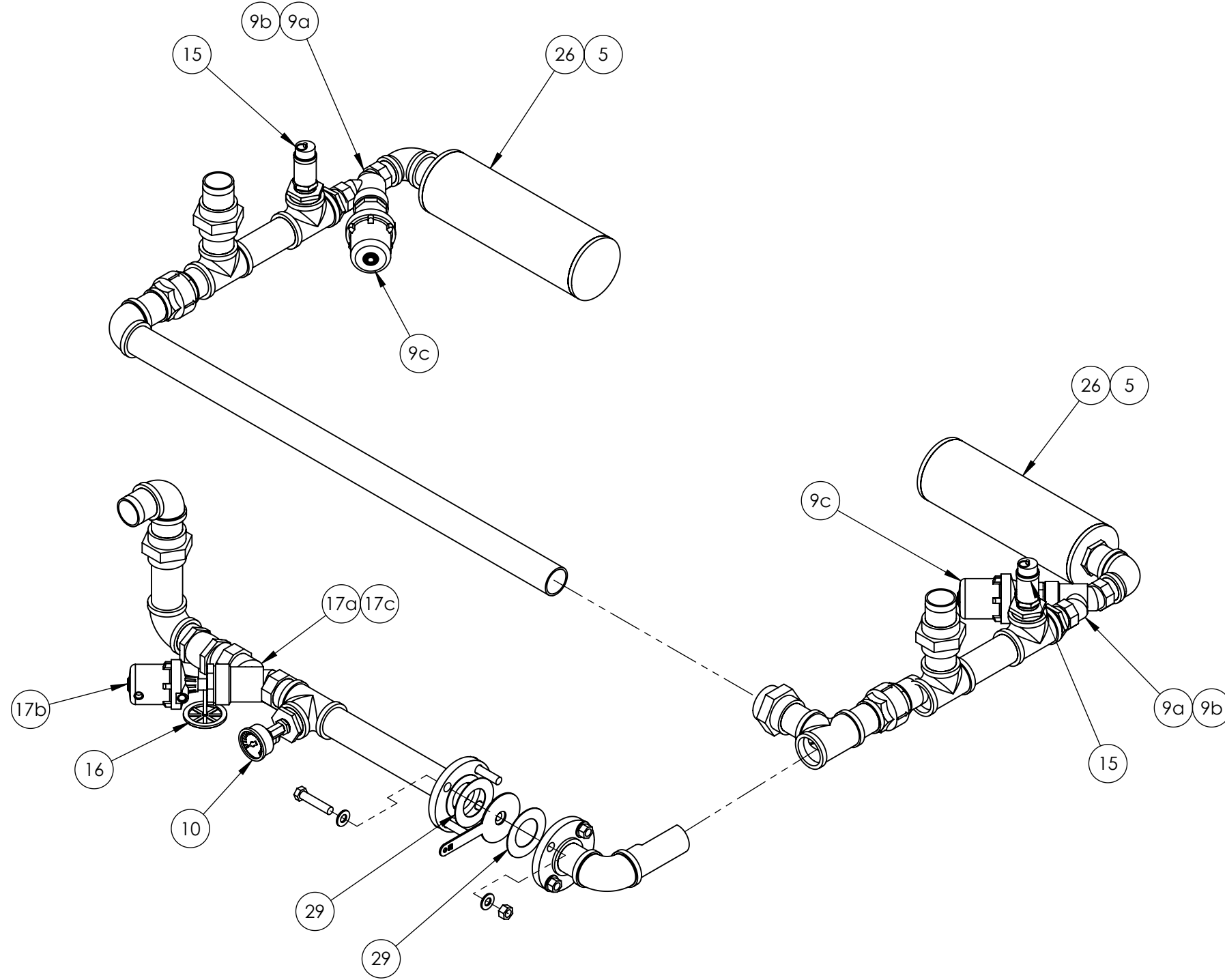
Engineer 1:

Engineer 2:

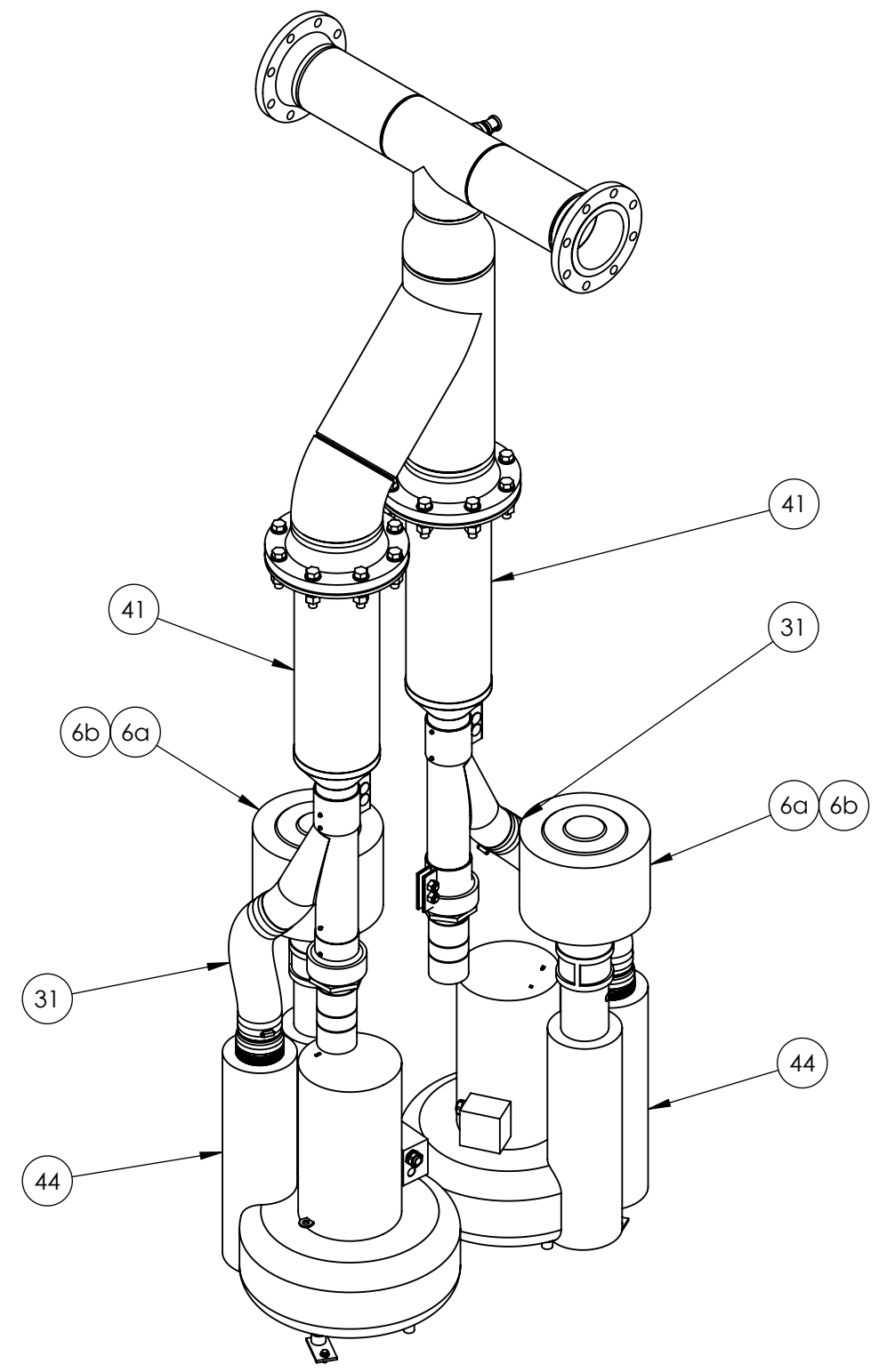
Doc No: 0003156
Cat: 08C **SAP:** N/A **Rev:** B.00

Title: XF 3300-6000 Spare Parts Identification
Description: Spare Parts Identification Drawing


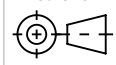
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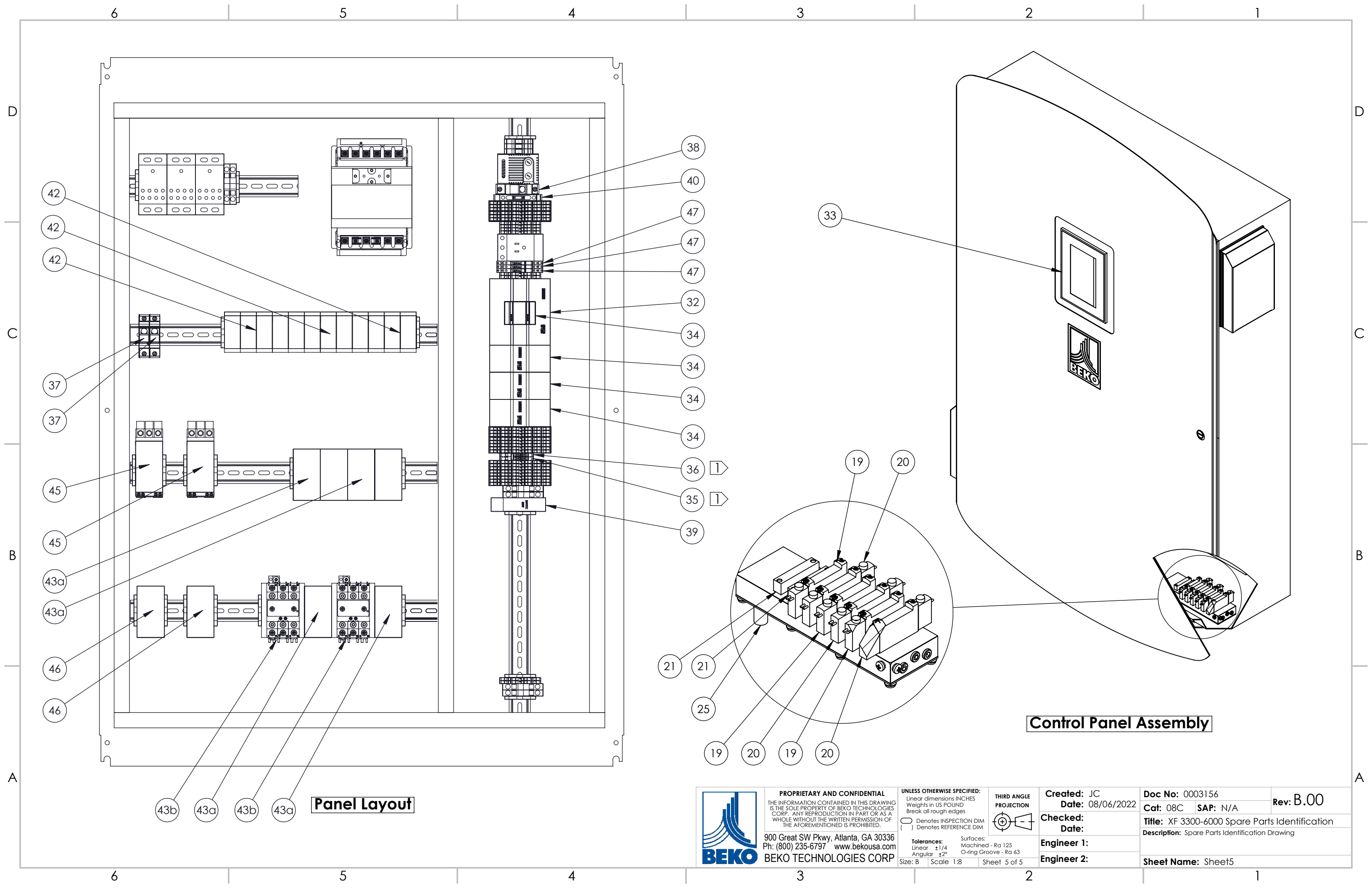


Purge Line Assembly





Regen Assembly

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	<p>900 Great SW Pkwy, Atlanta, GA 30336 Ph: (800) 235-6797 www.bekousa.com BEKO TECHNOLOGIES CORP</p>	<p>Tolerances: Linear ±1/4 Angular ±2°</p>	<p>Surfaces: Machined - Ra 125 O-ring Groove - Ra 63</p>	<p>Checked: Date:</p>	<p>Title: XF 3300-6000 Spare Parts Identification Description: Spare Parts Identification Drawing</p>
	<p>Size: B Scale 1:10 Sheet 4 of 5</p>	<p>Engineer 1: Engineer 2:</p>	<p>Sheet Name: Sheet4</p>		



Panel Layout

Control Panel Assembly

 <p>BEKO</p>	<p>PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BEKO TECHNOLOGIES CORP. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF THE AFOREMENTIONED IS PROHIBITED.</p>	<p>UNLESS OTHERWISE SPECIFIED: Linear dimensions INCHES Weights in US POUND Break all rough edges</p>	<p>THIRD ANGLE PROJECTION</p> 	<p>Created: JC Date: 08/06/2022</p>	<p>Doc No: 0003156 Rev: B.00</p>	
	<p>900 Great SW Pkwy, Atlanta, GA 30336 Ph: (800) 235-6797 www.bekousa.com BEKO TECHNOLOGIES CORP</p>	<p>Tolerances: Linear ±1/4 Angular ±2°</p>	<p>Surfaces: Machined - Ra 125 O-ring Groove - Ra 63</p>	<p>Checked: Date:</p>	<p>Cat: 08C SAP: N/A</p>	<p>Title: XF 3300-6000 Spare Parts Identification Description: Spare Parts Identification Drawing</p>
	<p>Size: B Scale 1:8 Sheet 5 of 5</p>	<p>Denotes INSPECTION DIM Denotes REFERENCE DIM</p>	<p>Engineer 1: Engineer 2:</p>	<p>Sheet Name: Sheet5</p>		

APPENDIX B

MAINTENANCE/SPARE PARTS

Item #	Frequen	Item	Details	SAP#	800	1000	1200	1500	1800	2300	2800	3300	4000	5000	6000	Std: XFi	Std: Xfe	Opt: XFe	
44	(spare)	Blower	6.4hp	4034376				X											
	(spare)	Blower	8.9hp	4034377					X			2X	2X						
	(spare)	Blower	17.7hp	4048387						X	X			2X	2X				
	(spare)	Blower	20hp	4034379															
	(spare)	Blower	25hp	4034380															
45	(spare)	Manual Motor Protector	6.3A	4049781	X														
	(spare)	Manual Motor Protector	6.3-10A	4034810		X	X												
	(spare)	Manual Motor Protector	8.0A-12A	4034811				X											
	(spare)	Manual Motor Protector	10A-16A	4034806					X										
	(spare)	Manual Motor Protector	16A-20A	4034805								2X	2X						
	(spare)	Manual Motor Protector	25A-32A	4034809						X	X				2X	2X			
	(spare)	Manual Motor Protector																	
46	(spare)	Motor Contactor	7.0A - 20A	4034800	X														
	(spare)	Motor Contactor	9A-20A	4040826		X	X												
	(spare)	Motor Contactor	12-20A	4040827				X											
	(spare)	Motor Contactor	16-20A	4040828								2X	2X						
	(spare)	Motor Contactor	15.5A-20A	4034798					X										
	(spare)	Motor Contactor	32A-40A	4034801						X	X				2X	2X			
	(spare)	Motor Contactor																	
47	(spare)	Control Relay	120VAC	4034796	3X	3X	3X	3X	3X	3X	3X	3X	3X	3X	3X				
48	(spare)	RTD, Probe Only, Heater	J-Type, 2.06", Exposed Junction	4056357	X	X	X	X	X	X	X	X	X	X	X				
49	(spare)	RTD, Probe Only, Heater Outlet	J-Type, 7.5", Spring Loaded	4057481	X	X	X	X	X	X	X	X	X	X	X				
50	(spare)	RTD, Probe Only, Bed	J-Type, 13.5", Spring Loaded	4057487	2X	2X	2X	2X								Y	N	N	
	(spare)	RTD, Probe Only, Bed	J-Type, 19.5", Spring Loaded	4057489					2X	2X	2X	2X	2X	2X	2X	Y	N	N	
51	(spare)	RTD, Probe Only, Dryer Outlet	J-Type, 7.5", Spring Loaded	4057481	X	X	X	X	X	X	X	X	X	X	X	Y	N	N	
52	(spare)	RTD, Probe Only, Inlet/Regen Exhaust	J-Type, 3.5", Spring Loaded	4057478	2X	2X	2X	2X											
	(spare)	RTD, Probe Only, Inlet/Regen Exhaust	J-Type, 5.5", Spring Loaded	4057480					2X	2X	2X	2X	2X	2X	2X				
53	(spare)	RTD & Thermowell Assy, Heater Outlet	0.5NPT, 6.0in TW Insertion, 7.5in TC	4056354	X	X	X	X	X	X	X	X	X	X	X				
54	(spare)	RTD & Thermowell Assy, Bed	0.5NPT, 12.0in TW Insertion, 13.5in TC	4056355	2X	2X	2X	2X								Y	N	N	
	(spare)	RTD & Thermowell Assy, Bed	0.5NPT, 18.0in TW Insertion, 19.5in TC	4056356					2X	2X	2X	2X	2X	2X	2X	Y	N	N	
55	(spare)	RTD & Thermowell Assy, Dryer Outlet	0.5NPT, 6.0in TW Insertion, 7.5in TC	4056354	X	X	X	X	X	X	X	X	X	X	X	Y	N	N	
56	(spare)	RTD & Thermowell Assy, Inlet/Regen Exhaust	0.5NPT, 2.0in TW Insertion, 3.5in TC	4056352	2X	2X	2X	2X											
	(spare)	RTD & Thermowell Assy, Inlet/Regen Exhaust	0.5NPT, 4.0in TW Insertion, 5.5in TC	4056353					2X	2X	2X	2X	2X	2X	2X				
57	(spare)	Flow Switch, Heater	0.5NPT, NO	4054638	X	X	X	X	X	X	X	2X	2X	2X	2X				
58	(spare)	(PRV) Pressure Reducing Valve	3", 300-500scfm, PC 91-Z	4055114	N/A	N/A	N/A	X	X	X	X	2X	2X	2X	2X				
59	(spare)	Pressure Dew Point Measuring Chamber		4029196	X	X	X	X	X	X	X	X	X	X	X	Y	N	Y	
60	(spare)	SD21 PDP Transmitter		4024282	X	X	X	X	X	X	X	X	X	X	X	Y	N	Y	

Rev. 231115

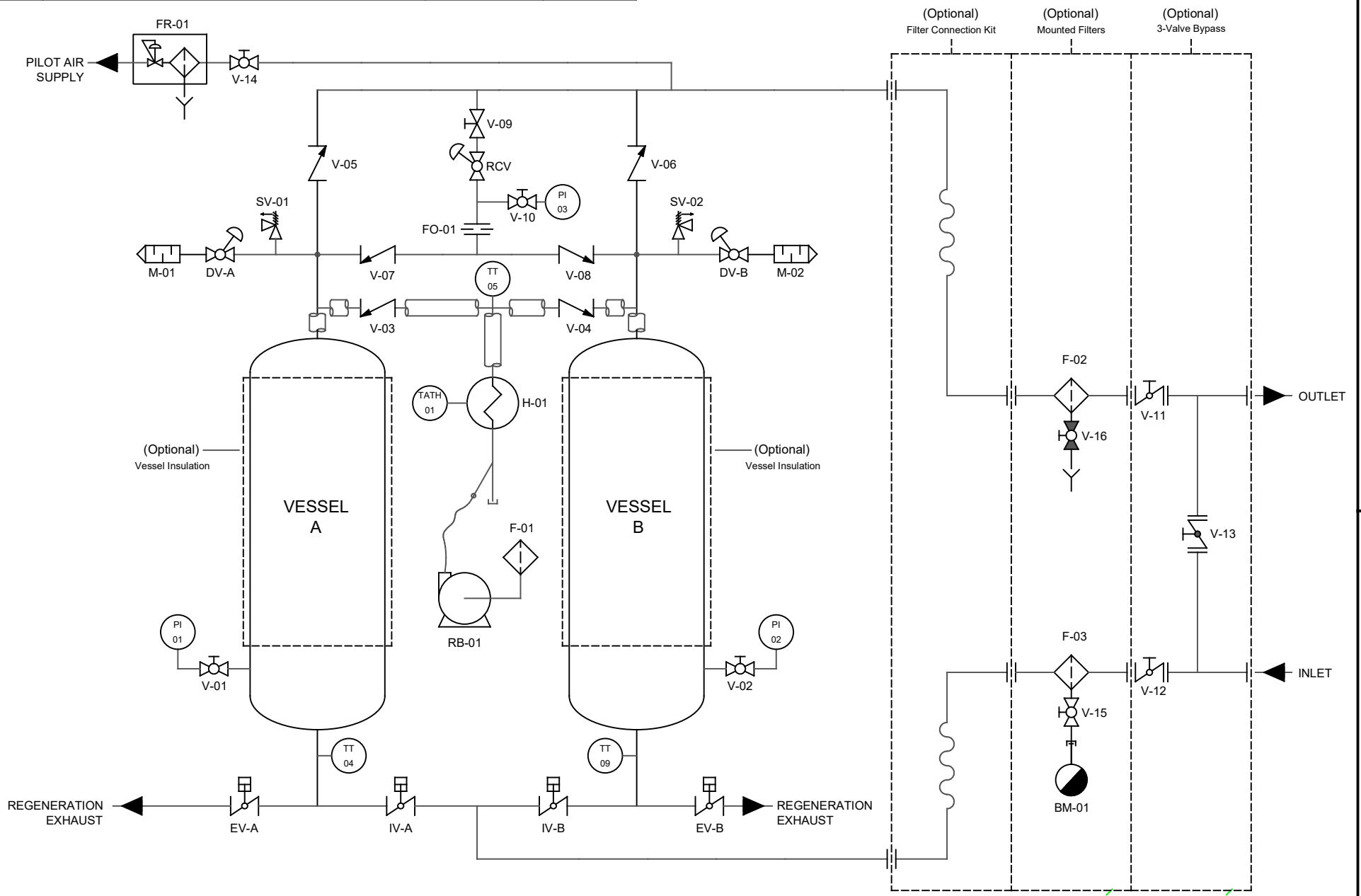
NOTE: Always provide equipment serial number with parts inquiries.

*should be checked monthly

APPENDIX C

WIRING DIAGRAM/P&ID DRAWING /SALES DRAWING

Rev	EWO Number	Change Notes	Date	Approved
A.00	PRJ0081	Production Release	6/29/2021	JSC



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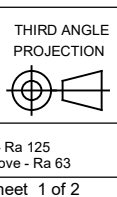
UNLESS OTHERWISE SPECIFIED:
 Linear dimensions INCHES
 Weights in US POUND
 Break all rough edges

⊕ Denotes INSPECTION DIM
 () Denotes REFERENCE DIM

Tolerances:
 Linear ±1/4
 Angular ±2°

Surfaces:
 Machined - Ra 125
 O-ring Groove - Ra 63

Size: A Scale 1:1 Sheet 1 of 2



Created: JC
 Date: 06/21/21

Checked: BM
 Date: 06/28/21

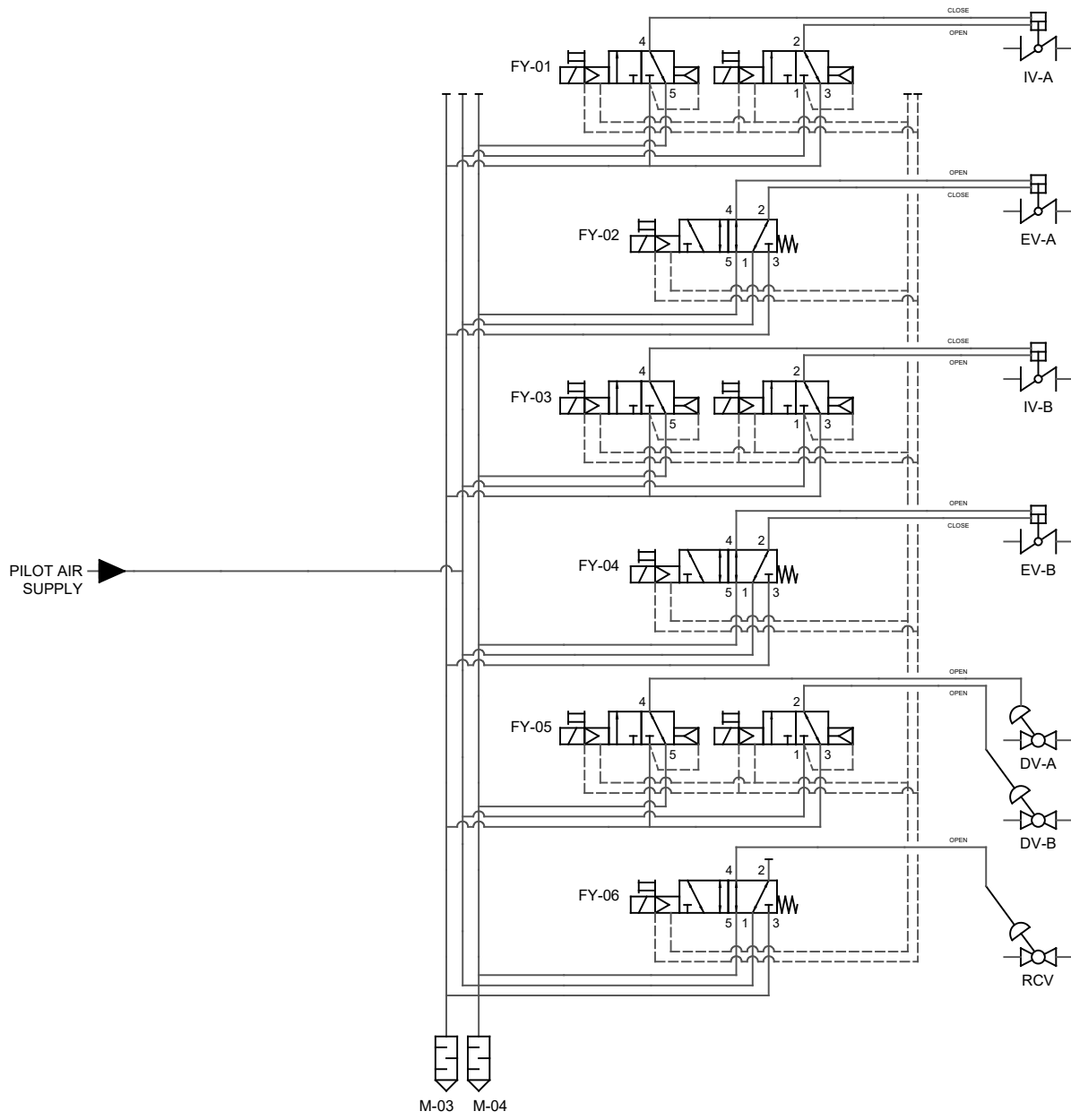
Engineer 1:
 Engineer 2:

Doc No: 0002560
 Cat: 08C SAP:

Rev: **A.00**

Title: XFe 800 - 2800 Blower Purge P&ID
 Description: P&ID for Economy Version of XFe 800 - 2800 with Options

Sheet Name: Sheet 1



Item	Description
BM-01	Drain, Condensate, BEKOMAT
EV-A	Pneumatic butterfly valve, Vessel A, Regeneration exhaust
EV-B	Pneumatic butterfly valve, Vessel B, Regeneration exhaust
DV-A	Angle seat valve, Vessel A, Depressurization valve
DV-B	Angle seat valve, Vessel B, Depressurization valve
F-01	Filter, Blower intake
F-02	Filter, Dryer outlet, 1 micron
F-03	Filter, Dryer inlet, .01 micron
FO-01	Flow orifice, Purge/repressurization
FR-01	Filter regulator, Pilot air
FY-01	Solenoid valve, IV-A pilot air
FY-02	Solenoid valve, EV-A pilot air
FY-03	Solenoid valve, IV-B pilot air
FY-04	Solenoid valve, EV-B pilot air
FY-05	Solenoid valve, DV-A / DV-B pilot air
FY-06	Solenoid valve, RCV pilot air
H-01	Heater, Regeneration
IV-A	Pneumatic butterfly valve, Vessel A, Dryer inlet
IV-B	Pneumatic butterfly valve, Vessel B, Dryer inlet
M-01	Muffler, Vessel A, Depressurization silencer
M-02	Muffler, Vessel B, Depressurization silencer
M-03	Muffler, Pilot valve exhaust
M-04	Muffler, Pilot valve exhaust
PI-01	Pressure gauge, Vessel A
PI-02	Pressure gauge, Vessel B
PI-03	Pressure gauge, Purge/repressurization
RB-01	Blower, Regeneration
RCV	Angle seat valve, Purge/repressurization
SV-01	Safety relief valve, Vessel A, Overpressure
SV-02	Safety relief valve, Vessel B, Overpressure
TATH-01	Thermocouple, Heater
TT-04	Thermocouple, Vessel A, Inlet/Regeneration exhaust
TT-05	Thermocouple, Heater outlet
TT-09	Thermocouple, Vessel B, Inlet/Regeneration exhaust
V-01	Ball valve, Vessel A, Pressure gauge isolation
V-02	Ball valve, Vessel B, Pressure gauge isolation
V-03	Check valve, Vessel A, Regeneration control
V-04	Check valve, Vessel B, Regeneration control
V-05	Check valve, Vessel A, Outlet
V-06	Check valve, Vessel B, Outlet
V-07	Check valve, Vessel A, Purge/repressurization
V-08	Check valve, Vessel B, Purge/repressurization
V-09	Gate valve, Purge stripping flow control
V-10	Ball valve, Pressure gauge isolation
V-11	Butterfly valve, Dryer inlet isolation
V-12	Butterfly valve, Dryer inlet isolation
V-13	Butterfly valve, Dryer bypass isolation
V-14	Ball valve, Pilot air isolation
V-15	Ball valve, BEKOMAT isolation
V-16	Ball valve, Filter drain

PILOT AIR SUPPLY

M-03 M-04



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 Weights in US POUND
 Break all rough edges
 () Denotes INSPECTION DIM
 () Denotes REFERENCE DIM
 Tolerances: Surfaces:
 Linear ±1/4 Machined - Ra 125
 Angular ±2° O-ring Groove - Ra 63

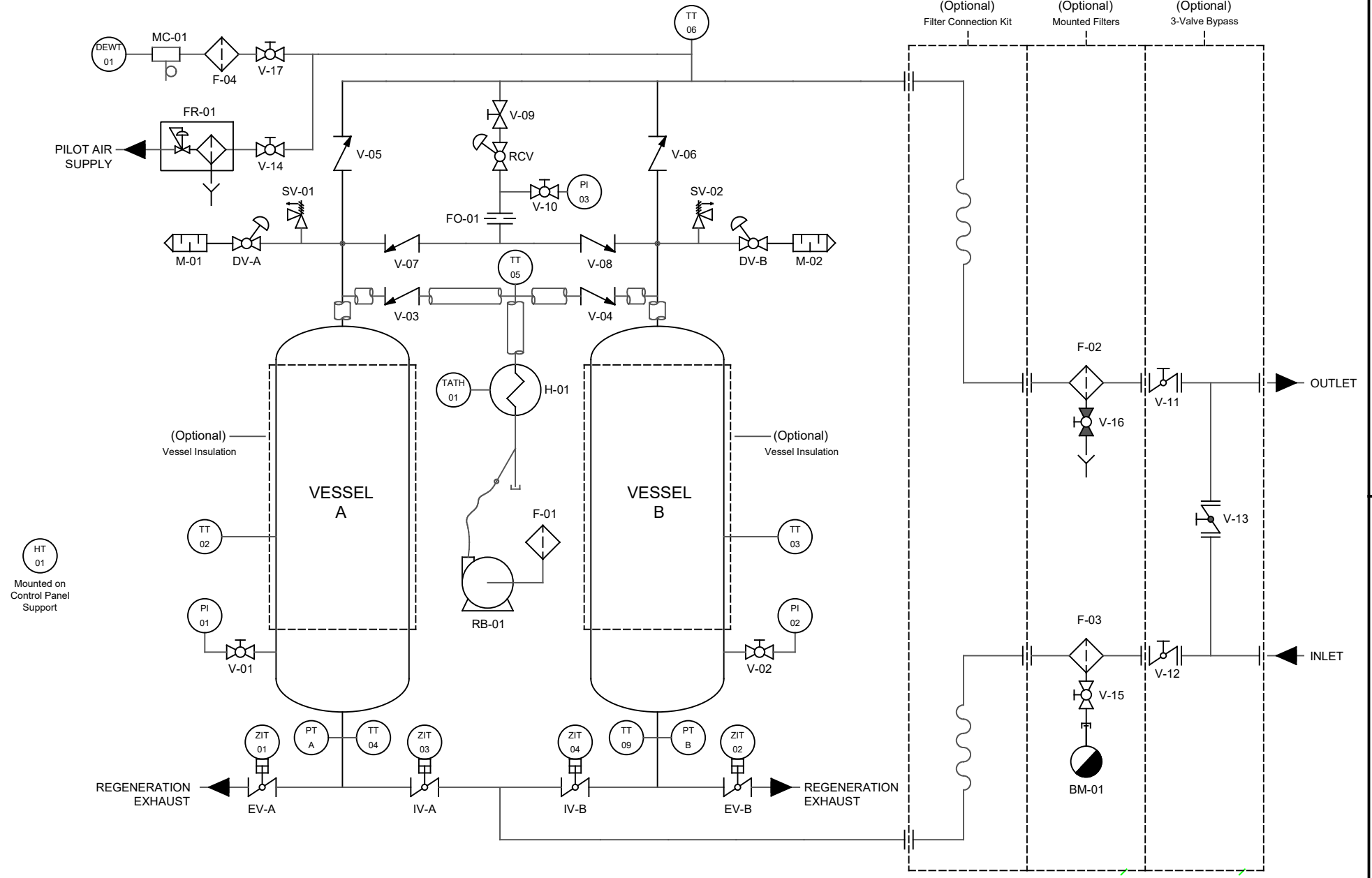


Created: JC
 Date: 06/21/21
 Checked: BM
 Date: 06/28/21
 Engineer 1:
 Engineer 2:

Doc No: 0002560
 Cat: 08C | SAP:
 Title: XFe 800 - 2800 Blower Purge P&ID
 Description: P&ID for Economy Version of XFe 800 - 2800 with Options
 Sheet Name: Sheet 2

Rev: A.00

Rev	EWO Number	Change Notes	Date	Approved
A.00	PRJ0081	Production Release	6/29/2021	JSC

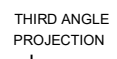


HT 01
Mounted on Control Panel Support



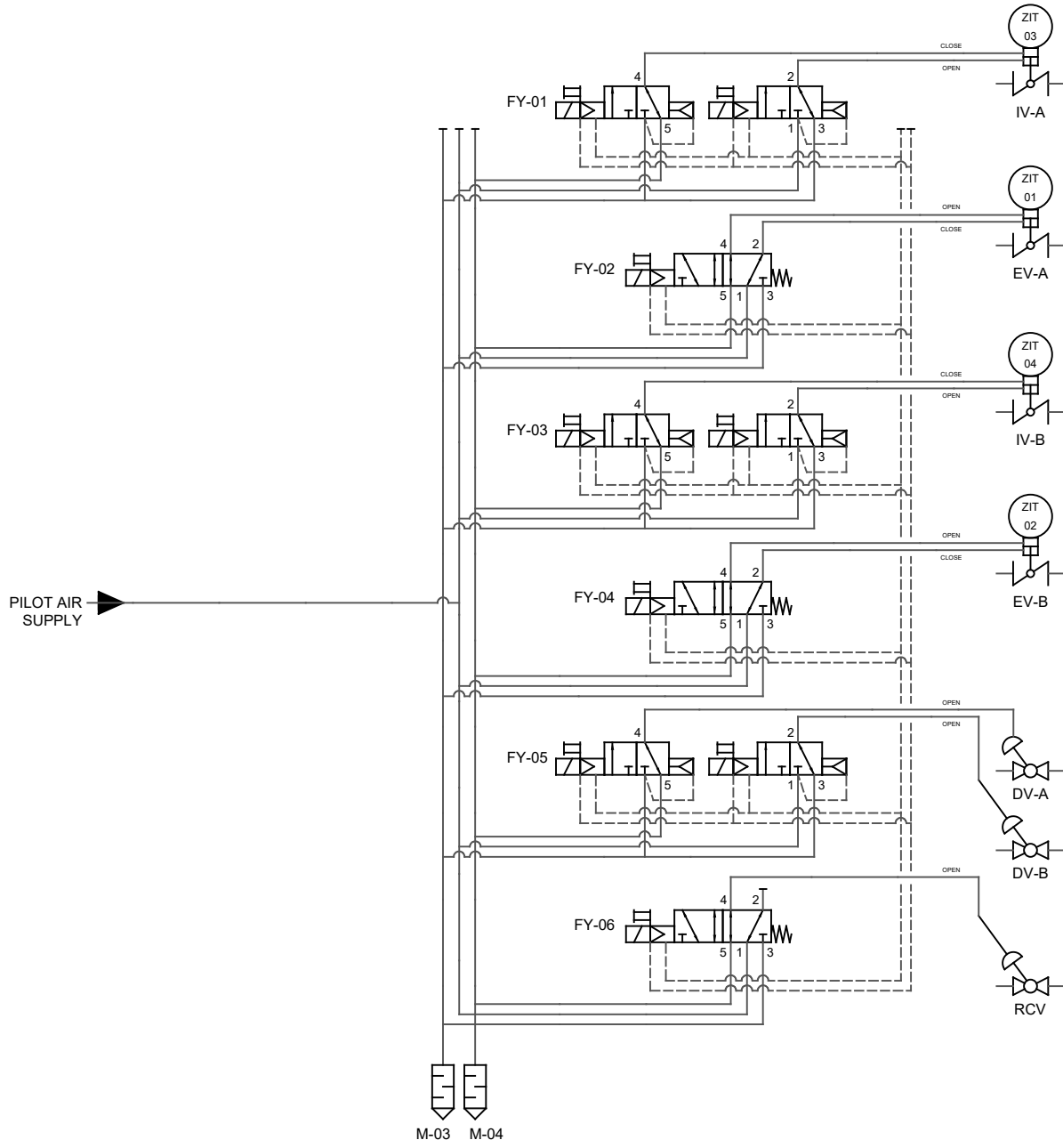
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 () Denotes REFERENCE DIM
 Tolerances:
 Linear ±1/4
 Angular ±2°
 Surfaces:
 Machined - Ra 125
 O-ring Groove - Ra 63
 Size: A Scale 1:1 Sheet 1 of 2



Created: JC
 Date: 06/21/21
 Checked: BM
 Date: 06/28/21
 Engineer 1:
 Engineer 2:

Doc No: 0002561
 Cat: 08C SAP:
 Title: XFi 800 - 2800 Blower Purge P&ID
 Description: P&ID for Intelligent Version of XFi 800 - 2800 with Options
 Sheet Name: Sheet 1
 Rev: **A.00**



Item	Description
BM-01	Drain, Condensate, BEKOMAT
EV-A	Pneumatic butterfly valve, Vessel A, Regeneration exhaust
EV-B	Pneumatic butterfly valve, Vessel B, Regeneration exhaust
DEWT-01	Pressure dewpoint transmitter
DV-A	Angle seat valve, Vessel A, Depressurization valve
DV-B	Angle seat valve, Vessel B, Depressurization valve
F-01	Filter, Blower intake
F-02	Filter, Dryer outlet, 1 micron, manual drain
F-03	Filter, Dryer inlet, .01 micron, BEKOMAT drain
F-04	Filter, Dewpoint sensor
FO-01	Flow orifice, Purge/repressurization
FR-01	Filter regulator, pilot air
FY-01	Solenoid valve, IV-A pilot air
FY-02	Solenoid valve, EV-A pilot air
FY-03	Solenoid valve, IV-B pilot air
FY-04	Solenoid valve, EV-B pilot air
FY-05	Solenoid valve, DV-A / DV-B pilot air
FY-06	Solenoid valve, RCV pilot air
H-01	Heater, Regeneration
HT-01	Humidity sensor, Ambient temperature
IV-A	Pneumatic butterfly valve, Vessel A, Dryer inlet
IV-B	Pneumatic butterfly valve, Vessel B, Dryer inlet
M-01	Muffler, Vessel A, Depressurization silencer
M-02	Muffler, Vessel B, Depressurization silencer
M-03	Muffler, Pilot valve exhaust
M-04	Muffler, Pilot valve exhaust
MC-01	Measuring chamber, Pressure dewpoint transmitter
PI-01	Pressure gauge, Vessel A
PI-02	Pressure gauge, Vessel B
PI-03	Pressure gauge, Purge/repressurization
PT-A	Pressure Transmitter, Vessel A
PT-B	Pressure Transmitter, Vessel B
RB-01	Blower, Regeneration
RCV	Angle seat valve, Purge/repressurization
SV-01	Safety relief valve, Vessel A, Overpressure
SV-02	Safety relief valve, Vessel B, Overpressure
TATH-01	Thermocouple, Heater
TT-02	Thermocouple, Vessel A, Vessel temperature sensor
TT-03	Thermocouple, Vessel B, Vessel temperature sensor
TT-04	Thermocouple, Vessel A, Inlet/Regeneration exhaust
TT-05	Thermocouple, Heater outlet
TT-06	Thermocouple, Outlet
TT-09	Thermocouple, Vessel B, Inlet/Regeneration exhaust
V-01	Ball valve, Vessel A, Pressure gauge isolation
V-02	Ball valve, Vessel B, Pressure gauge isolation
V-03	Check valve, Vessel A, Regeneration control
V-04	Check valve, Vessel B, Regeneration control
V-05	Check valve, Vessel A, Outlet
V-06	Check valve, Vessel B, Outlet
V-07	Check valve, Vessel A, Purge/repressurization
V-08	Check valve, Vessel B, Purge/repressurization
V-09	Gate valve, Purge stripping flow control
V-10	Ball valve, Pressure gauge isolation
V-11	Butterfly valve, Dryer outlet isolation
V-12	Butterfly valve, Dryer inlet isolation
V-13	Butterfly valve, Dryer bypass isolation
V-14	Ball valve, Pilot air isolation
V-15	Ball valve, BEKOMAT isolation
V-16	Ball valve, Filter drain
V-17	Ball valve, Pressure dewpoint transmitter isolation
ZIT-01	Limit switch, EV-A open/close
ZIT-02	Limit switch, EV-B open/close
ZIT-03	Limit switch, IV-A open/close
ZIT-04	Limit switch, IV-B open/close



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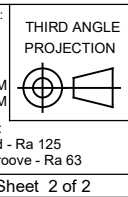
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 Weights in US POUND
 Break all rough edges

Denotes INSPECTION DIM
 Denotes REFERENCE DIM

Tolerances:
 Linear ±1/4
 Angular ±2°

Surfaces:
 Machined - Ra 125
 O-ring Groove - Ra 63

Size: A Scale 1:1 Sheet 2 of 2



Created: JC
 Date: 06/21/21

Checked: BM
 Date: 06/28/21

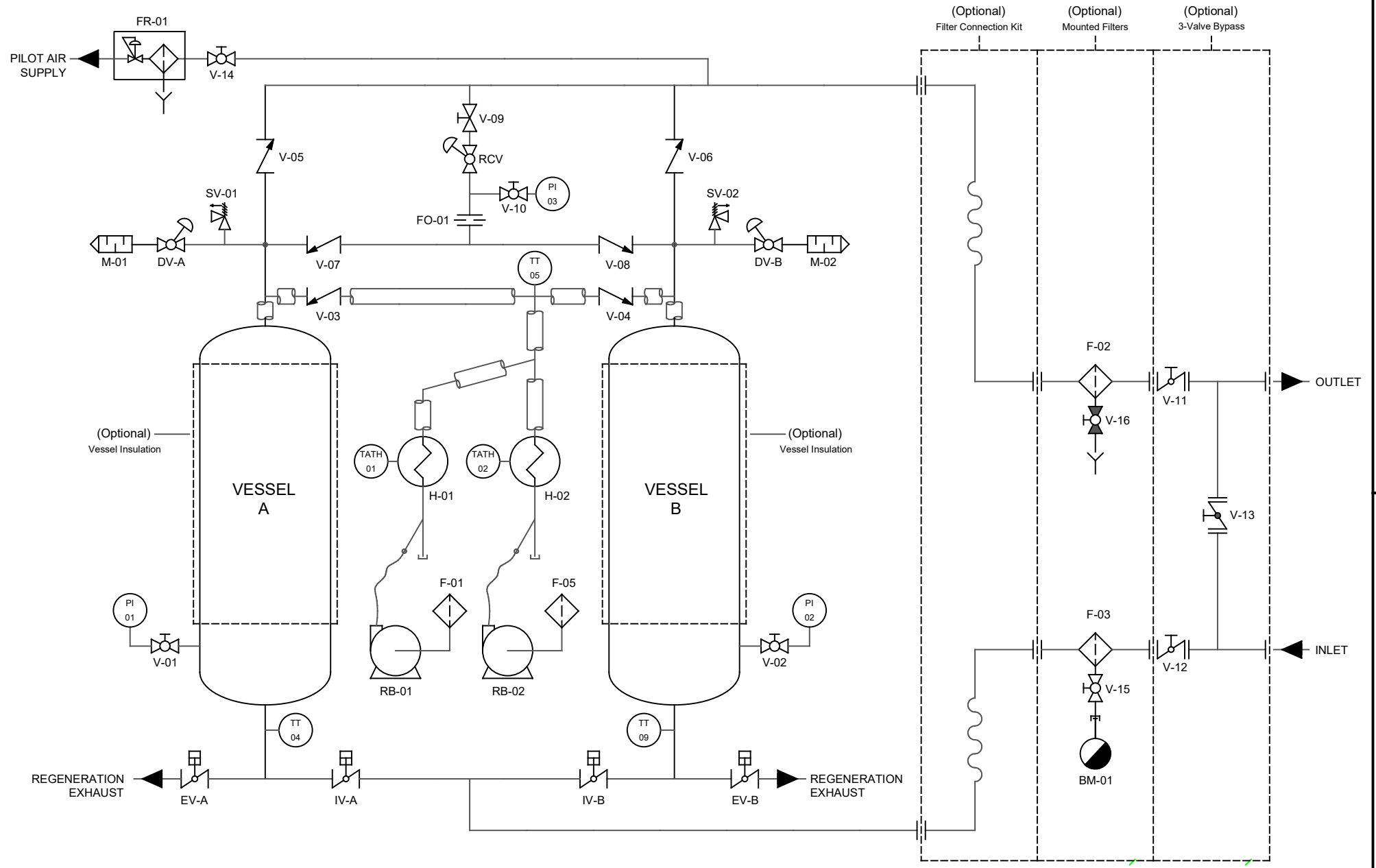
Engineer 1:
 Engineer 2:

Doc No: 0002561
 Cat: 08C SAP:
 Rev: A.00

Title: XFi 800 - 2800 Blower Purge P&ID
 Description: P&ID for Intelligent Version of XFi 800 - 2800 with Options

Sheet Name: Sheet 2

Rev	EWO Number	Change Notes	Date	Approved
A.00	PRJ0081	Production Release	6/29/2021	JSC



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THIRD ANGLE PROJECTION

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 Denotes REFERENCE DIM

Tolerances:
 Linear ±1/4
 Angular ±2°

Surfaces:
 Machined - Ra 125
 O-ring Groove - Ra 63

Size: A Scale 1:1 Sheet 1 of 2

Created: JC
 Date: 06/28/21

Checked: BM
 Date: 06/28/21

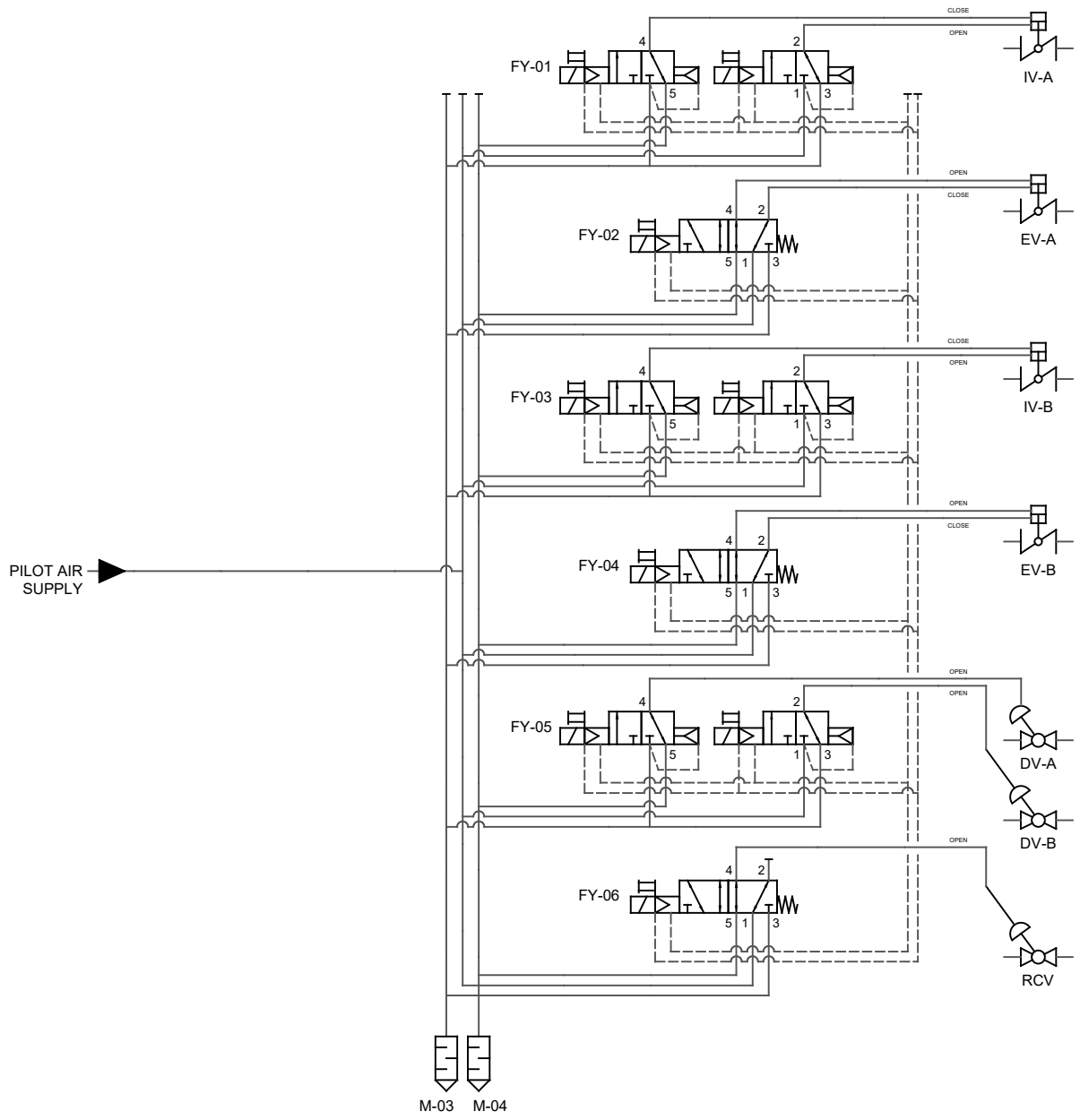
Engineer 1:
 Engineer 2:

Doc No: 0002711
 Cat: 08C SAP:

Rev: A.00

Title: XFe 3300 - 6000 Blower Purge P&ID
 Description: P&ID for Economy Version of XFe 3300 - 6000 with Options

Sheet Name: Sheet 1



Item	Description
BM-01	Drain, Condensate, BEKOMAT
EV-A	Pneumatic butterfly valve, Vessel A, Regeneration exhaust
EV-B	Pneumatic butterfly valve, Vessel B, Regeneration exhaust
DV-A	Angle seat valve, Vessel A, Depressurization valve
DV-B	Angle seat valve, Vessel B, Depressurization valve
F-01	Filter, Blower intake
F-02	Filter, Dryer outlet, 1 micron
F-03	Filter, Dryer inlet, .01 micron
F-05	Filter, Blower intake
FO-01	Flow orifice, Purge/repressurization
FR-01	Filter regulator, Pilot air
FY-01	Solenoid valve, IV-A pilot air
FY-02	Solenoid valve, EV-A pilot air
FY-03	Solenoid valve, IV-B pilot air
FY-04	Solenoid valve, EV-B pilot air
FY-05	Solenoid valve, DV-A / DV-B pilot air
FY-06	Solenoid valve, RCV pilot air
H-01	Heater, Regeneration
H-02	Heater, Regeneration
IV-A	Pneumatic butterfly valve, Vessel A, Dryer inlet
IV-B	Pneumatic butterfly valve, Vessel B, Dryer inlet
M-01	Muffler, Vessel A, Depressurization silencer
M-02	Muffler, Vessel B, Depressurization silencer
M-03	Muffler, Pilot valve exhaust
M-04	Muffler, Pilot valve exhaust
PI-01	Pressure gauge, Vessel A
PI-02	Pressure gauge, Vessel B
PI-03	Pressure gauge, Purge/repressurization
RB-01	Blower, Regeneration
RB-02	Blower, Regeneration
RCV	Angle seat valve, Purge/repressurization
SV-01	Safety relief valve, Vessel A, Overpressure
SV-02	Safety relief valve, Vessel B, Overpressure
TATH-01	Thermocouple, Heater
TATH-02	Thermocouple, Heater
TT-04	Thermocouple, Vessel A, Inlet/Regeneration exhaust
TT-05	Thermocouple, Heater outlet
TT-09	Thermocouple, Vessel B, Inlet/Regeneration exhaust
V-01	Ball valve, Vessel A, Pressure gauge isolation
V-02	Ball valve, Vessel B, Pressure gauge isolation
V-03	Check valve, Vessel A, Regeneration control
V-04	Check valve, Vessel B, Regeneration control
V-05	Check valve, Vessel A, Outlet
V-06	Check valve, Vessel B, Outlet
V-07	Check valve, Vessel A, Purge/repressurization
V-08	Check valve, Vessel B, Purge/repressurization
V-09	Gate valve, Purge stripping flow control
V-10	Ball valve, Pressure gauge isolation
V-11	Butterfly valve, Dryer outlet isolation
V-12	Butterfly valve, Dryer inlet isolation
V-13	Butterfly valve, Dryer bypass isolation
V-14	Ball valve, Pilot air isolation
V-15	Ball valve, BEKOMAT isolation
V-16	Ball valve, Filter drain



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THIRD ANGLE PROJECTION

Denotes INSPECTION DIM
 Denotes REFERENCE DIM

Tolerances:
 Linear ±1/4
 Angular ±2°

Surfaces:
 Machined - Ra 125
 O-ring Groove - Ra 63

Size: A Scale 1:1 Sheet 2 of 2

Created: JC
 Date: 06/28/21

Checked: BM
 Date: 06/28/21

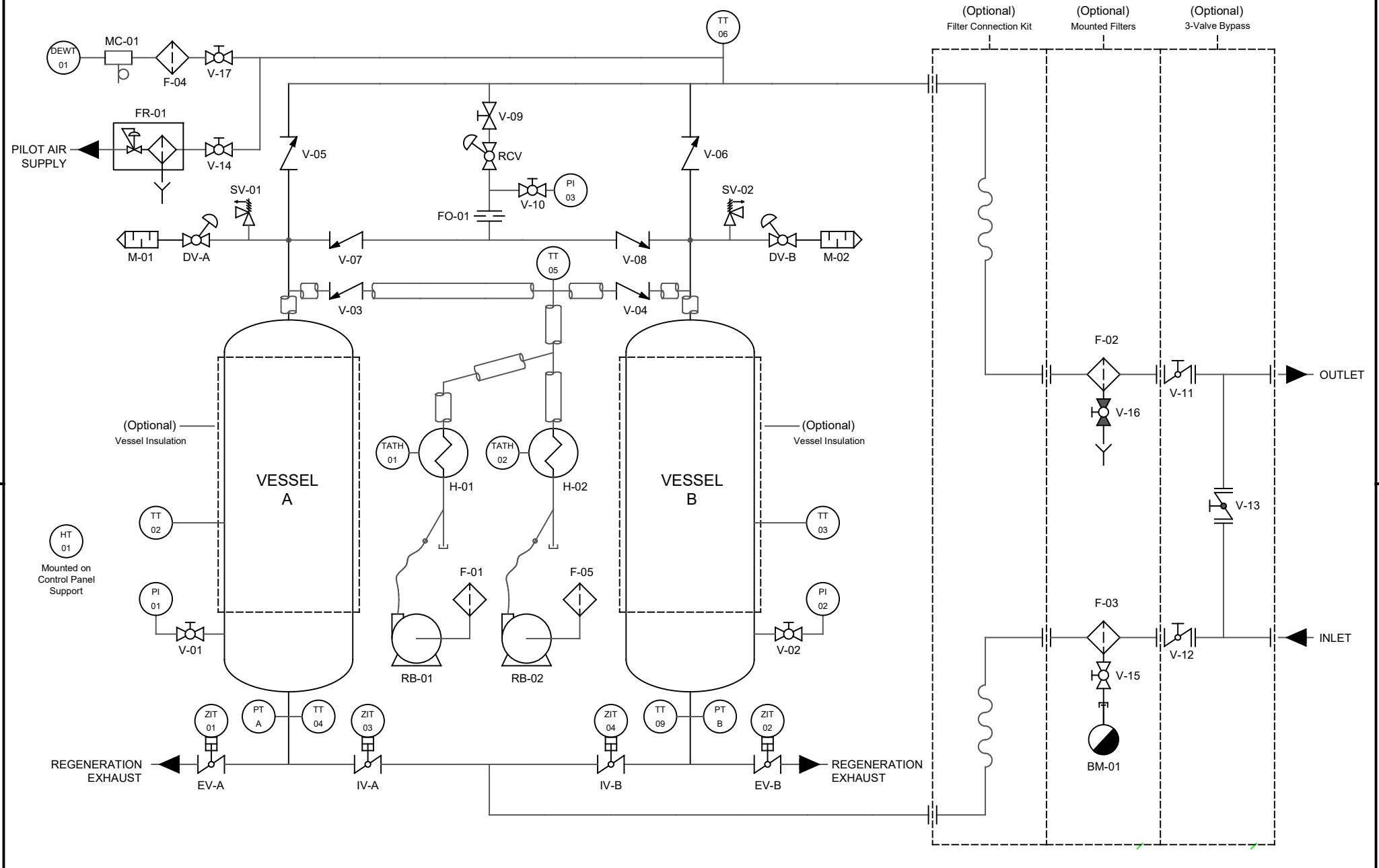
Engineer 1:
 Engineer 2:

Doc No: 0002711
 Cat: 08C SAP:
 Title: XFe 3300 - 6000 Blower Purge P&ID
 Description: P&ID for Economy Version of XFe 3300 - 6000 with Options

Rev: A.00

Sheet Name: Sheet 2

Rev	EWO Number	Change Notes	Date	Approved
A.00	PRJ0081	Production Release	6/29/2021	JSC



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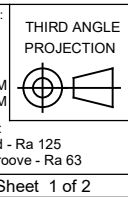
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 Weights in US POUND
 Break all rough edges

Denotes INSPECTION DIM
 Denotes REFERENCE DIM

Tolerances:
 Linear ±1/4
 Angular ±2°

Surfaces:
 Machined - Ra 125
 O-ring Groove - Ra 63

Size: A Scale 1:1 Sheet 1 of 2



Created: JC
 Date: 06/28/21

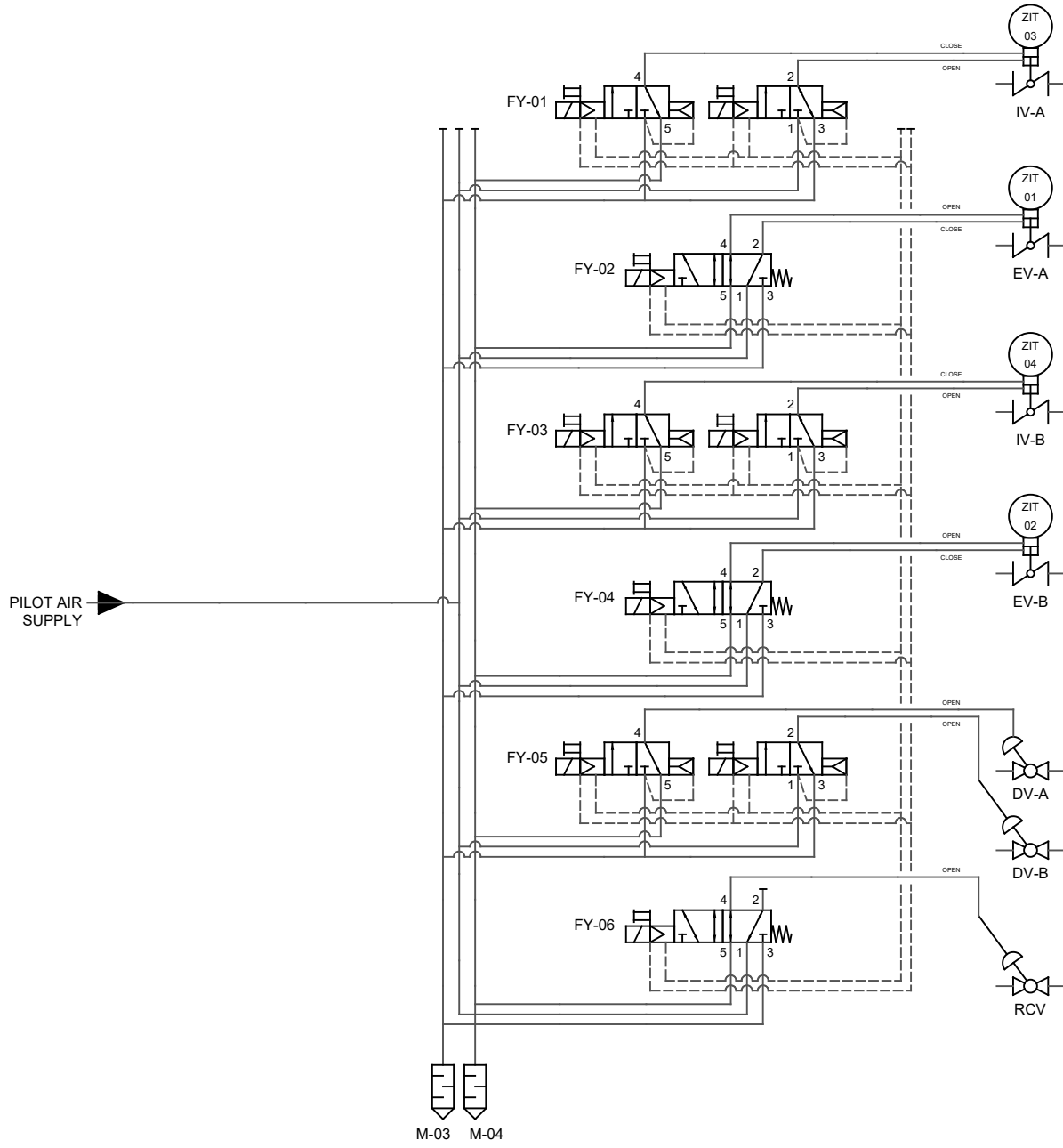
Checked: BM
 Date: 06/28/21

Engineer 1:
 Engineer 2:

Doc No: 0002712
 Cat: 08C SAP:
 Rev: **A.00**

Title: XFi 3300 - 6000 Blower Purge P&ID
 Description: P&ID for Intelligent Version of XFi 3300 - 6000 with Options

Sheet Name: Sheet 1



Item	Description
BM-01	Drain, Condensate, BEKOMAT
EV-A	Pneumatic butterfly valve, Vessel A, Regeneration exhaust
EV-B	Pneumatic butterfly valve, Vessel B, Regeneration exhaust
DEWT-01	Pressure dewpoint transmitter
DV-A	Angle seat valve, Vessel A, Depressurization valve
DV-B	Angle seat valve, Vessel B, Depressurization valve
F-01	Filter, Blower intake
F-02	Filter, Dryer outlet, 1 micron, manual drain
F-03	Filter, Dryer inlet, .01 micron, BEKOMAT drain
F-04	Filter, Dewpoint sensor
F-05	Filter, Blower intake
FO-01	Flow orifice, Purge/repressurization
FR-01	Filter regulator, pilot air
FY-01	Solenoid valve, IV-A pilot air
FY-02	Solenoid valve, EV-A pilot air
FY-03	Solenoid valve, IV-B pilot air
FY-04	Solenoid valve, EV-B pilot air
FY-05	Solenoid valve, DV-A / DV-B pilot air
FY-06	Solenoid valve, RCV pilot air
H-01	Heater, Regeneration
H-02	Heater, Regeneration
HT-01	Humidity sensor, Ambient temperature
IV-A	Pneumatic butterfly valve, Vessel A, Dryer inlet
IV-B	Pneumatic butterfly valve, Vessel B, Dryer inlet
M-01	Muffler, Vessel A, Depressurization silencer
M-02	Muffler, Vessel B, Depressurization silencer
M-03	Muffler, Pilot valve exhaust
M-04	Muffler, Pilot valve exhaust
MC-01	Measuring chamber, Pressure dewpoint transmitter
PI-01	Pressure gauge, Vessel A
PI-02	Pressure gauge, Vessel B
PI-03	Pressure gauge, Purge/repressurization
PT-A	Pressure Transmitter, Vessel A
PT-B	Pressure Transmitter, Vessel B
RB-01	Blower, Regeneration
RB-02	Blower, Regeneration
RCV	Angle seat valve, Purge/repressurization
SV-01	Safety relief valve, Vessel A, Overpressure
SV-02	Safety relief valve, Vessel B, Overpressure
TATH-01	Thermocouple, Heater
TATH-02	Thermocouple, Heater
TT-02	Thermocouple, Vessel A, Vessel temperature sensor
TT-03	Thermocouple, Vessel B, Vessel temperature sensor
TT-04	Thermocouple, Vessel A, Inlet/Regeneration exhaust
TT-05	Thermocouple, Heater outlet
TT-06	Thermocouple, Outlet
TT-09	Thermocouple, Vessel B, Inlet/Regeneration exhaust
V-01	Ball valve, Vessel A, Pressure gauge isolation
V-02	Ball valve, Vessel B, Pressure gauge isolation
V-03	Check valve, Vessel A, Regeneration control
V-04	Check valve, Vessel B, Regeneration control
V-05	Check valve, Vessel A, Outlet
V-06	Check valve, Vessel B, Outlet
V-07	Check valve, Vessel A, Purge/repressurization
V-08	Check valve, Vessel B, Purge/repressurization
V-09	Gate valve, Purge stripping flow control
V-10	Ball valve, Pressure gauge isolation
V-11	Butterfly valve, Dryer outlet isolation
V-12	Butterfly valve, Dryer inlet isolation
V-13	Butterfly valve, Dryer bypass isolation
V-14	Ball valve, Pilot air isolation
V-15	Ball valve, BEKOMAT isolation
V-16	Ball valve, Filter drain
V-17	Ball valve, Pressure dewpoint transmitter isolation
ZIT-01	Limit switch, EV-A open/close
ZIT-02	Limit switch, EV-B open/close
ZIT-03	Limit switch, IV-A open/close
ZIT-04	Limit switch, IV-B open/close



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 Denotes REFERENCE DIM

Tolerances: Surfaces:
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 Angular ±2° O-ring Groove - Ra 63

THIRD ANGLE PROJECTION

Size: A Scale 1:1 Sheet 2 of 2

Created: JC
 Date: 06/28/21

Checked: BM
 Date: 06/28/21

Engineer 1:
 Engineer 2:

Doc No: 0002712
 Cat: 08C SAP:
 Rev: A.00

Title: XFi 3300 - 6000 Blower Purge P&ID
 Description: P&ID for Intelligent Version of XFi 3300 - 6000 with Options

Sheet Name: Sheet 2

REV	CHANGE NO.	DESCRIPTION	DATE	APPROVAL
D.00		Added RTD module and cable schematics and removed Thermocouple and cable schematics	12/07/2022	JJ/JW
00	50000000019	Numerical Revision Conversion for SAP Initial Upload	4/24/2023	Admin
01	50000000053	Added notes for Valve limit switches and Vessel pressure switches options	8/21/2023	JLW

DRYPOINT® X


HEATED BLOWER PURGE REGENERATED DRYER WIRING DIAGRAM

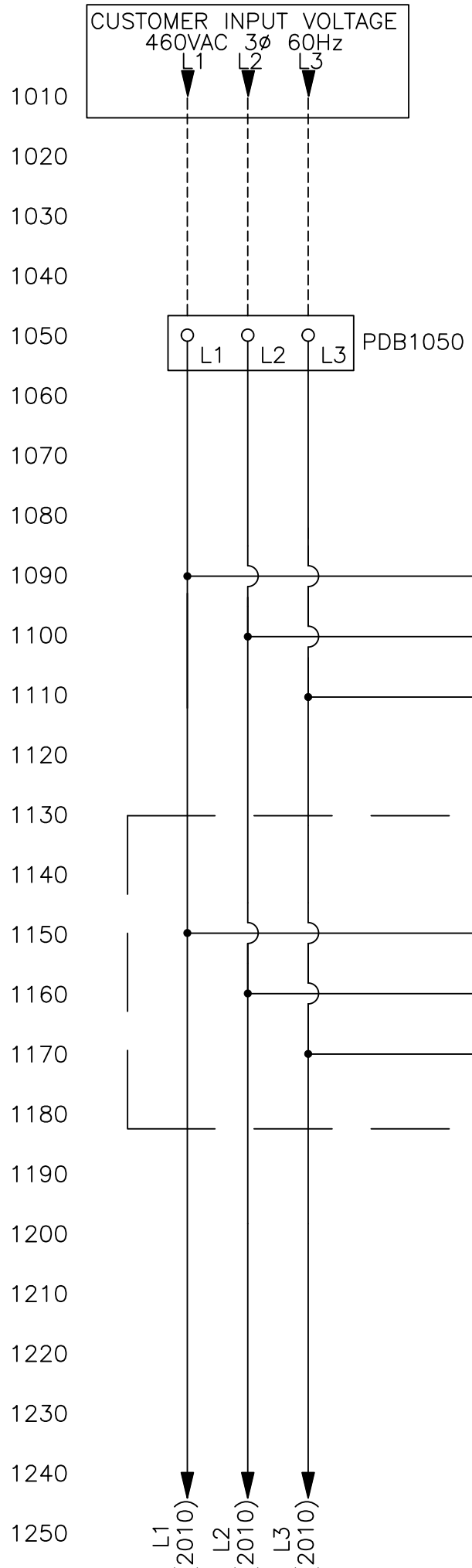
SCHEMATIC TYPICAL INDEX

- POWER DISTRIBUTION/BRANCH CIRCUITS
- PLC BASE UNIT INPUT/OUTPUTS
- PLC OUTPUT CARD
- PLC RTD CARD

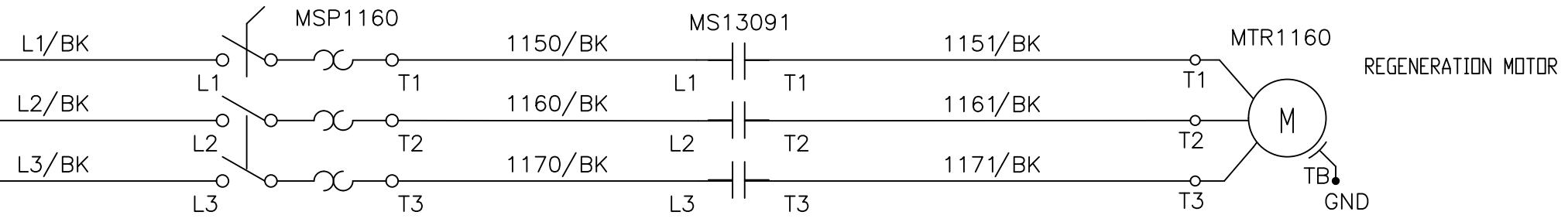
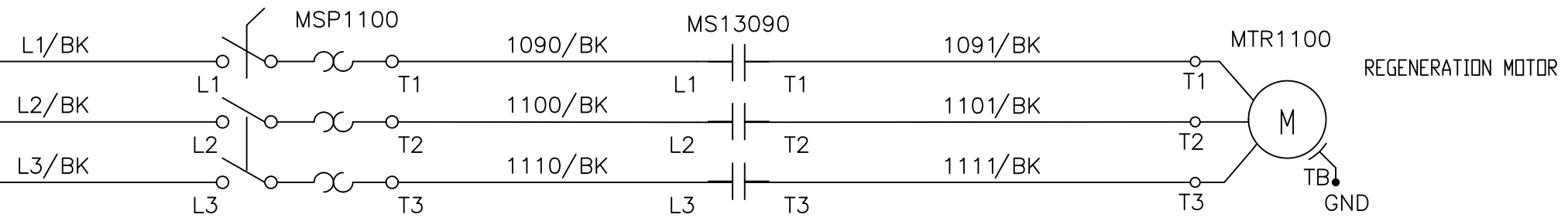
WIRING METHODS

- POWER 460V = BLACK THHN
- 120VAC = RED
- NEUTRAL = WHITE
- 24VDC = BLUE
- 24V COMMON = WHITE/BLUE
- GROUND = GREEN
- (SEE NEC TABLE 310.15 (B)(16) FOR WIRE GAUGES)

INV. CONTROLLED:	SAP: N/A	CAT: 08C	ID# 0001974
SERIAL TRACKED:	REVISION: 01	TITLE: XF Wiring Diagram	
DRAWN BY: JJ	12/07/2022	DESCRIPTION: XF HEATER BLOWER PURGE DRYER WIRING DIAGRAMS	
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900 Great SW Pkwy Atlanta, GA 30336 Ph: (800) 235-6797 F.o.x: (404) 629-6666 www.bekousa.com		SHEET 1 OF 18	
			

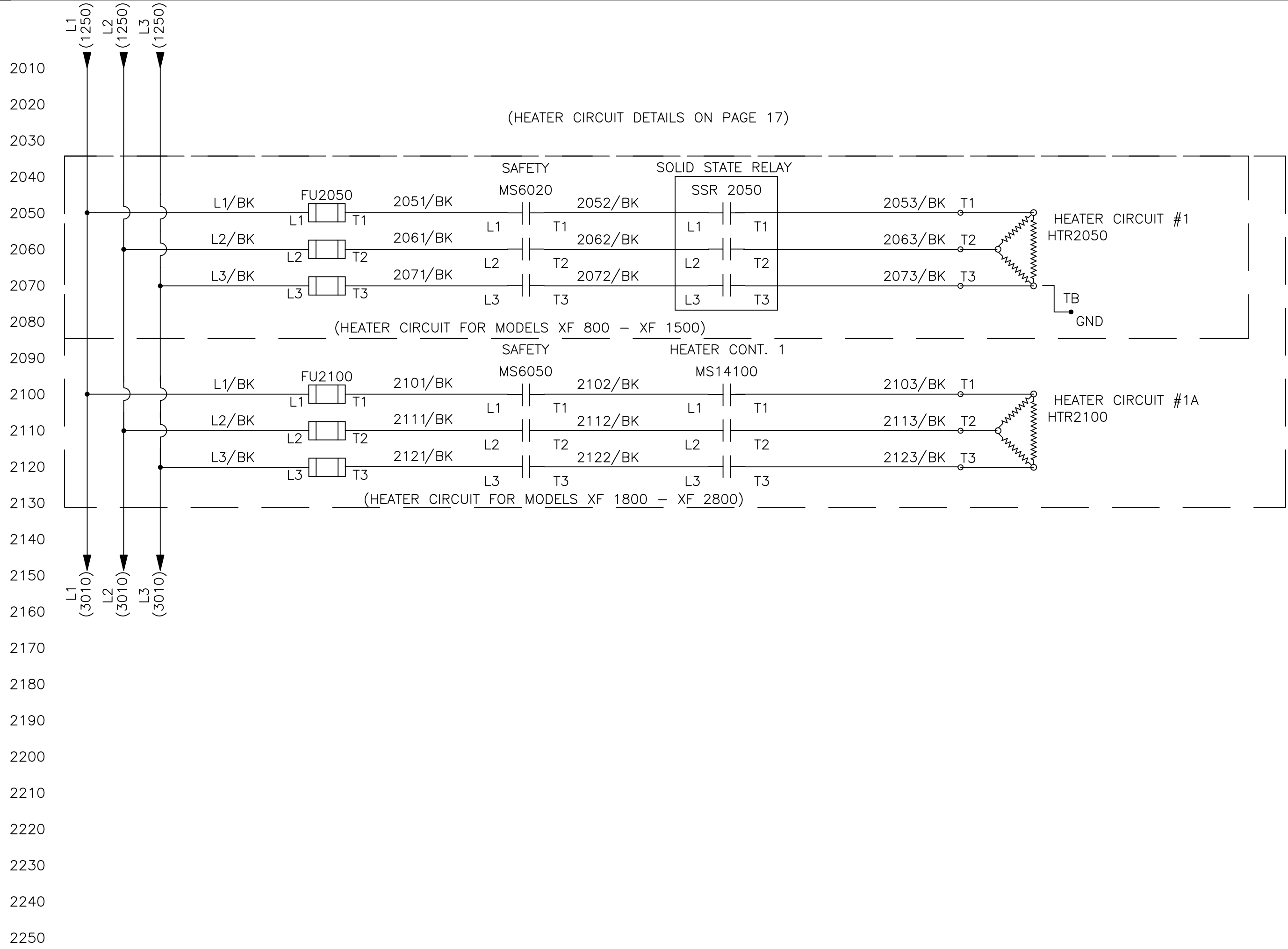


MODEL	TOTAL SYSTEM KW	TOTAL SYSTEM A	XFe SCCR RATING kA	XFi SCCR RATING kA
800	23	31	65	65
1000	24	32	65	65
1200	29	39	65	65
1500	40	53	18	42
1800	52	69	18	42
2300	64	86	18	18
2800	74	98	18	18
3300	109	143	18	18
4000	109	143	18	18
5000	137	184	18	18
6000	157	209	65	65



ADDITIONAL BLOWER CIRCUIT FOR XF MODELS (3300-6000)
(BLOWER CIRCUIT DETAILS ON PAGE 17)

INV. CONTROLLED:	SERIAL TRACKED:	DRAWN BY: JJ	12/07/2022	CAT: 08C	ID# 0001974
 BEKO TECHNOLOGIES CORP				TITLE: XF Wiring Diagram DESCRIPTION: SUPPLY 3 PHASE VOLTAGE, BLOWER, AC CIRCUITS	
900 Great SW Pkwy Atlanta, GA 30336 Ph: (800) 235-6797 Fax: (404) 629-6666 www.bekousa.com				SAP: N/A	REVISION: 01
<small> PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BEKO TECHNOLOGIES CORP. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF THE AFOREMENTIONED IS PROHIBITED. </small>				SIZE: B	SCALE: SHEET 2 OF 18




2010
2020
2030
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L1 (1250)
L2 (1250)
L3 (1250)

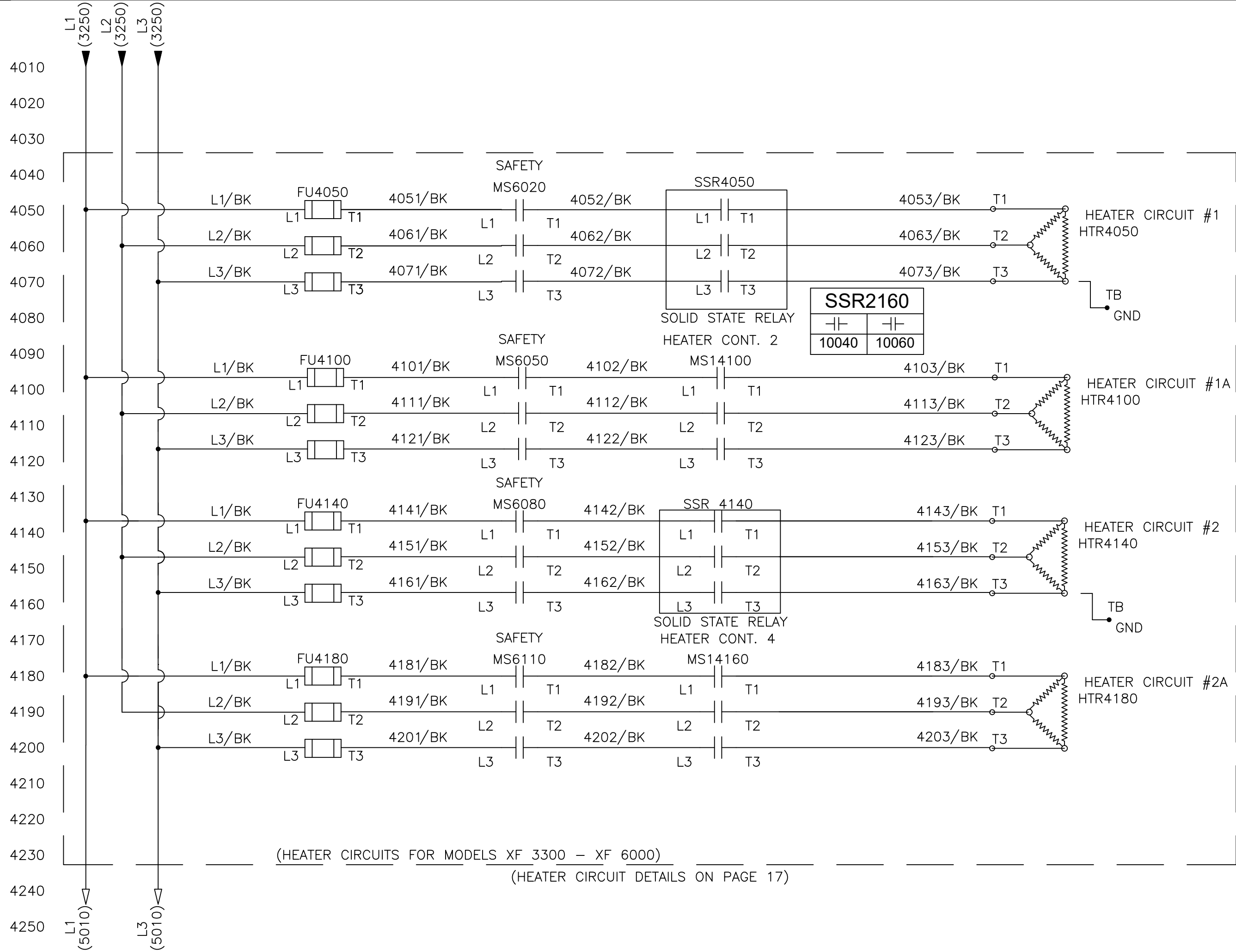
L1 (3010)
L2 (3010)
L3 (3010)


INV. CONTROLLED:	SAP: N/A	CAT: 08C	ID# 0001974
SERIAL TRACKED:	REVISION: 01	TITLE: XF Wiring Diagram	
DRAWN BY: JJ	12/07/2022	DESCRIPTION: HEATER CIRCUITS FOR MODELS XF 800 - XF 2800	
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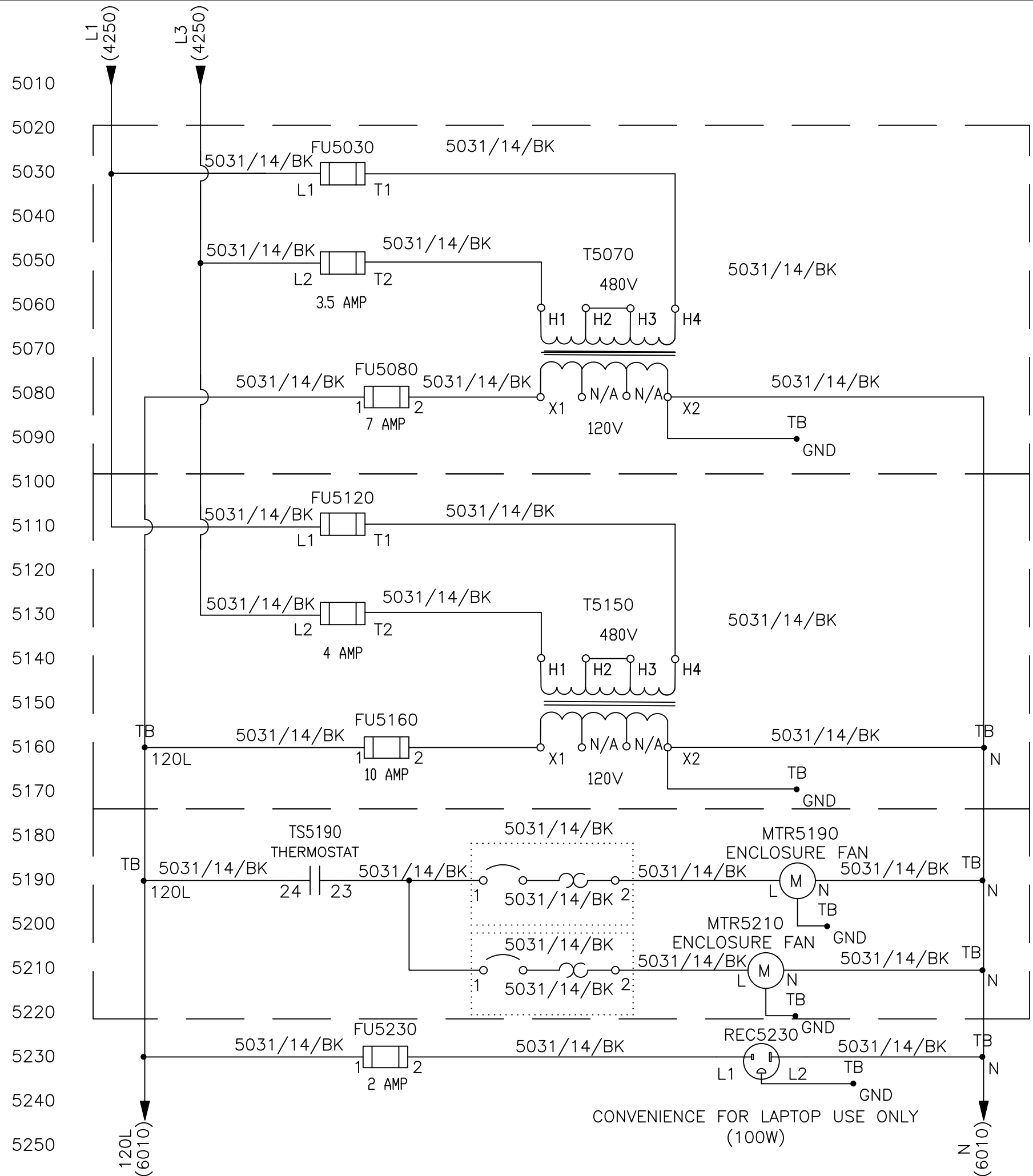


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SERIAL TRACKED:	REVISION: 01	TITLE: XF Wiring Diagram	
DRAWN BY: JJ	12/07/2022	DESCRIPTION: HEATER CIRCUITS FOR MODELS XF 3300 - XF 6000	
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5031/14/BK

5031/14/BK

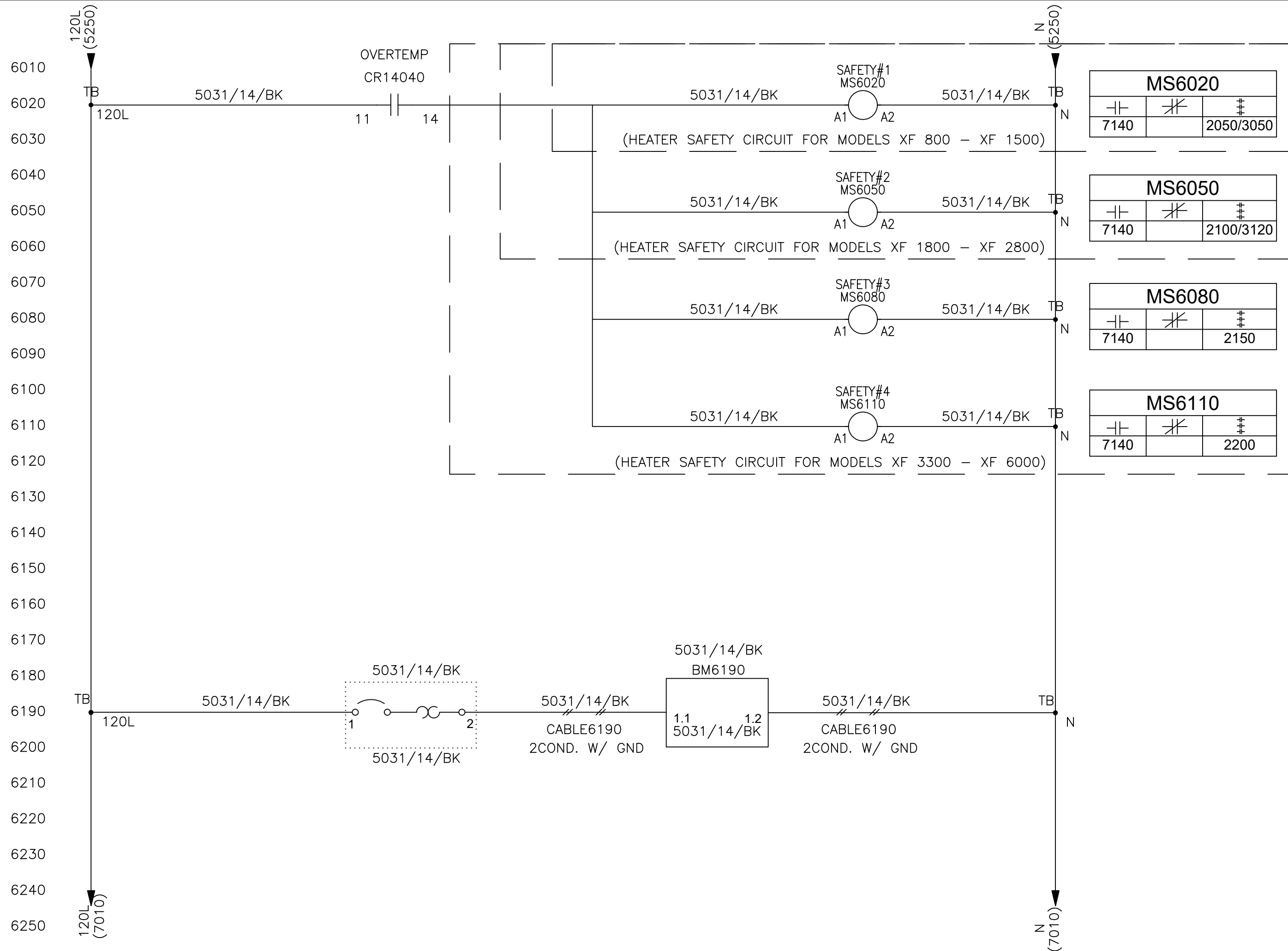
5031/14/BK

INV. CONTROLLED:	SAP: N/A	CAT: 08C	ID# 0001974
SERIAL TRACKED:	REVISION: 01	TITLE: XF Wiring Diagram	
DRAWN BY: JJ	12/07/2022	DESCRIPTION: TRANSFORMER CIRCUITS, ENCLOSURE FAN CIRCUIT, RECEPTACLE CIRCUIT	
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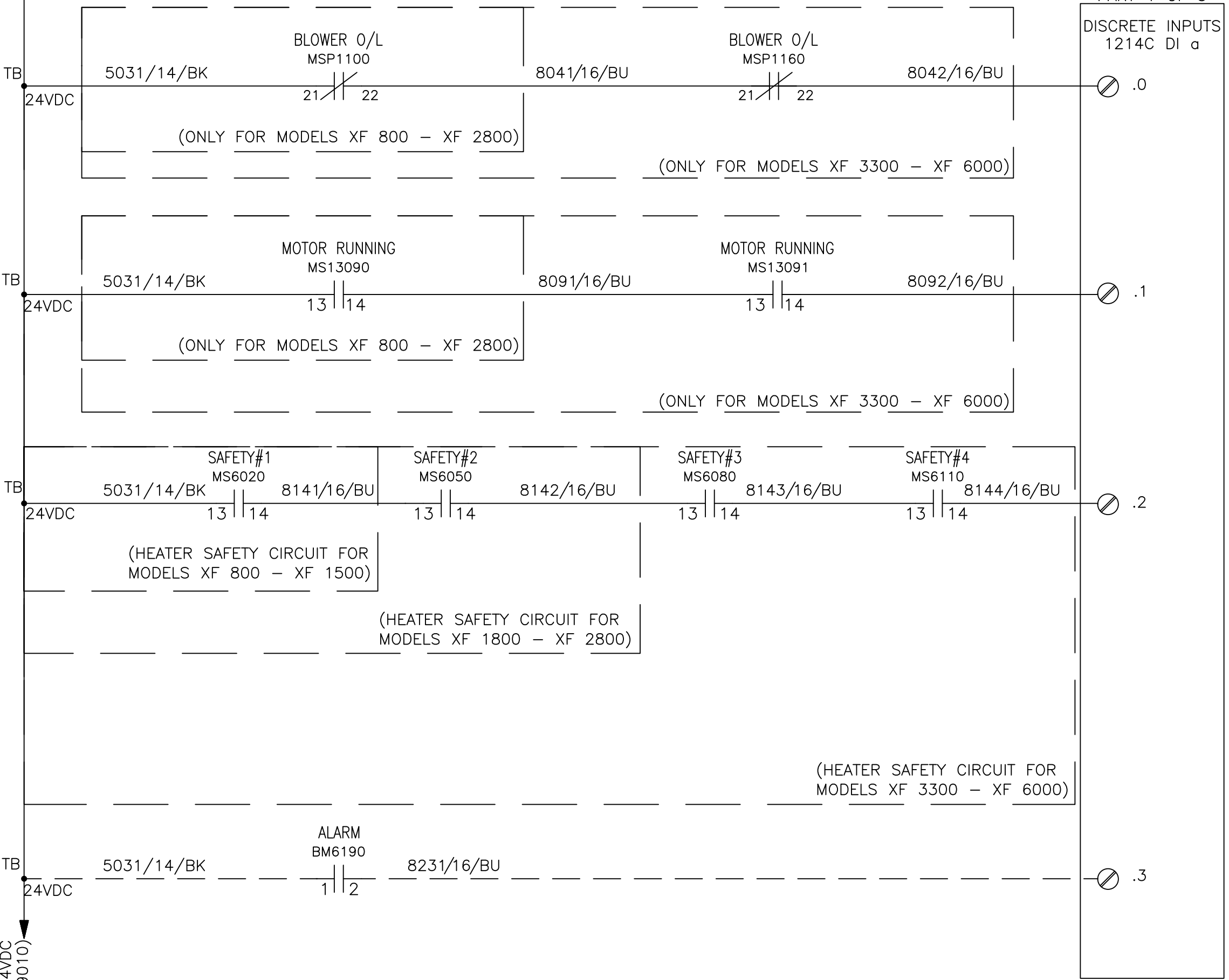


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INV. CONTROLLED:	SAP: N/A	CAT: 08C	ID# 0001974
SERIAL TRACKED:	REVISION: 01	TITLE: XF Wiring Diagram	
DRAWN BY: JJ	12/07/2022	DESCRIPTION: HEATER SAFETY CONTACTOR CIRCUITS AND BEKOMAT POWER CIRCUIT	
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<p>PROPRIETARY AND CONFIDENTIAL THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BEKO TECHNOLOGIES CORP. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF THE AFOREMENTIONED IS PROHIBITED.</p>			<p>SCALE: SIZE: B</p> <p>SHEET 6 OF 18</p>

24VDC (7250)
 8010
 8020
 8030
 8040
 8050
 8060
 8070
 8080
 8090
 8100
 8110
 8120
 8130
 8140
 8150
 8160
 8170
 8180
 8190
 8200
 8210
 8220
 8230
 8240
 8250
 24VDC (9010)




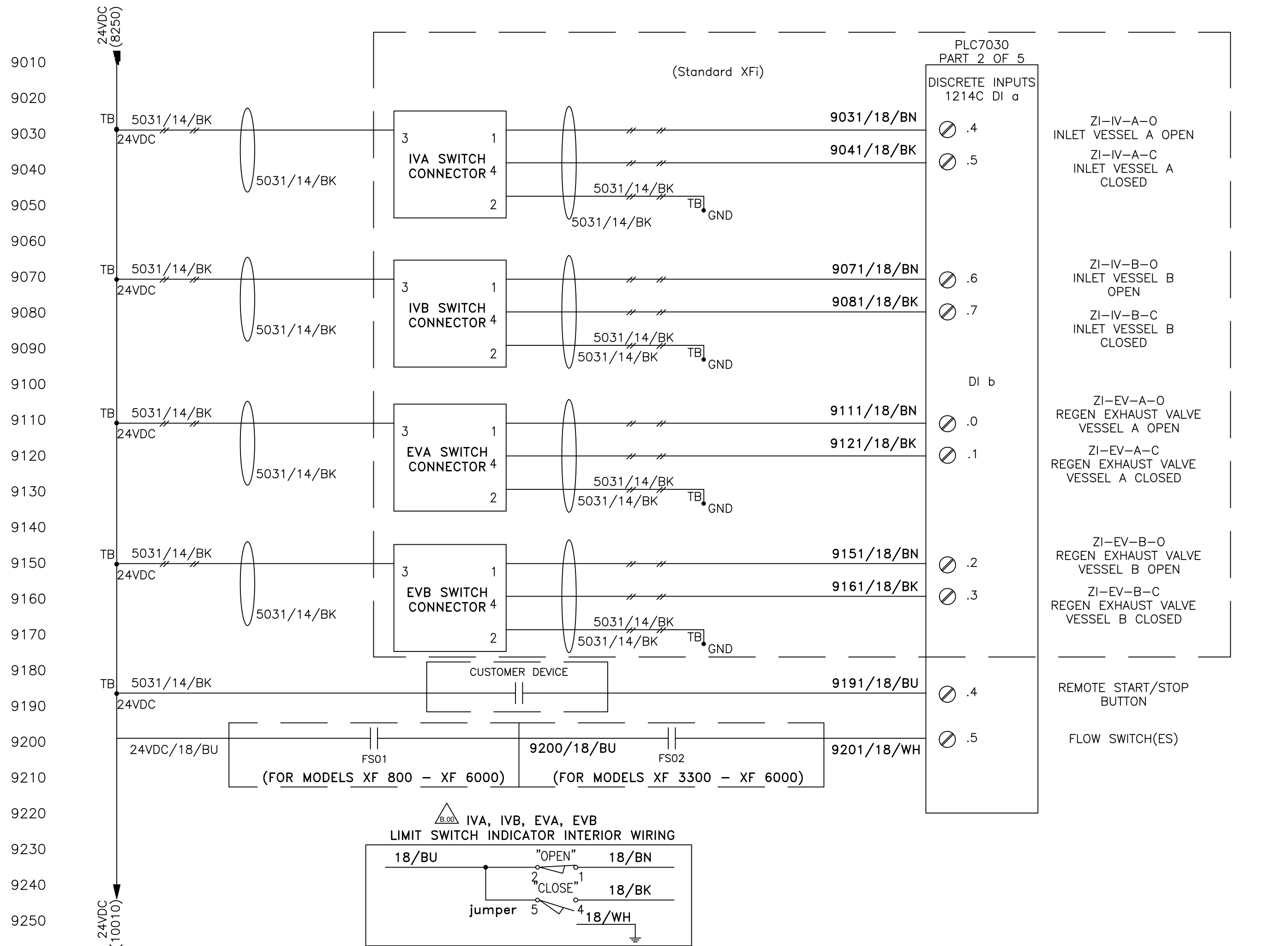
MTR OK BLOWER

BLOWER RUNNING

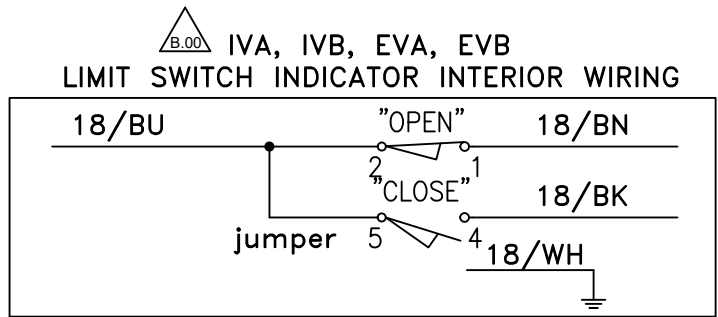
HEATER OVERTEMP

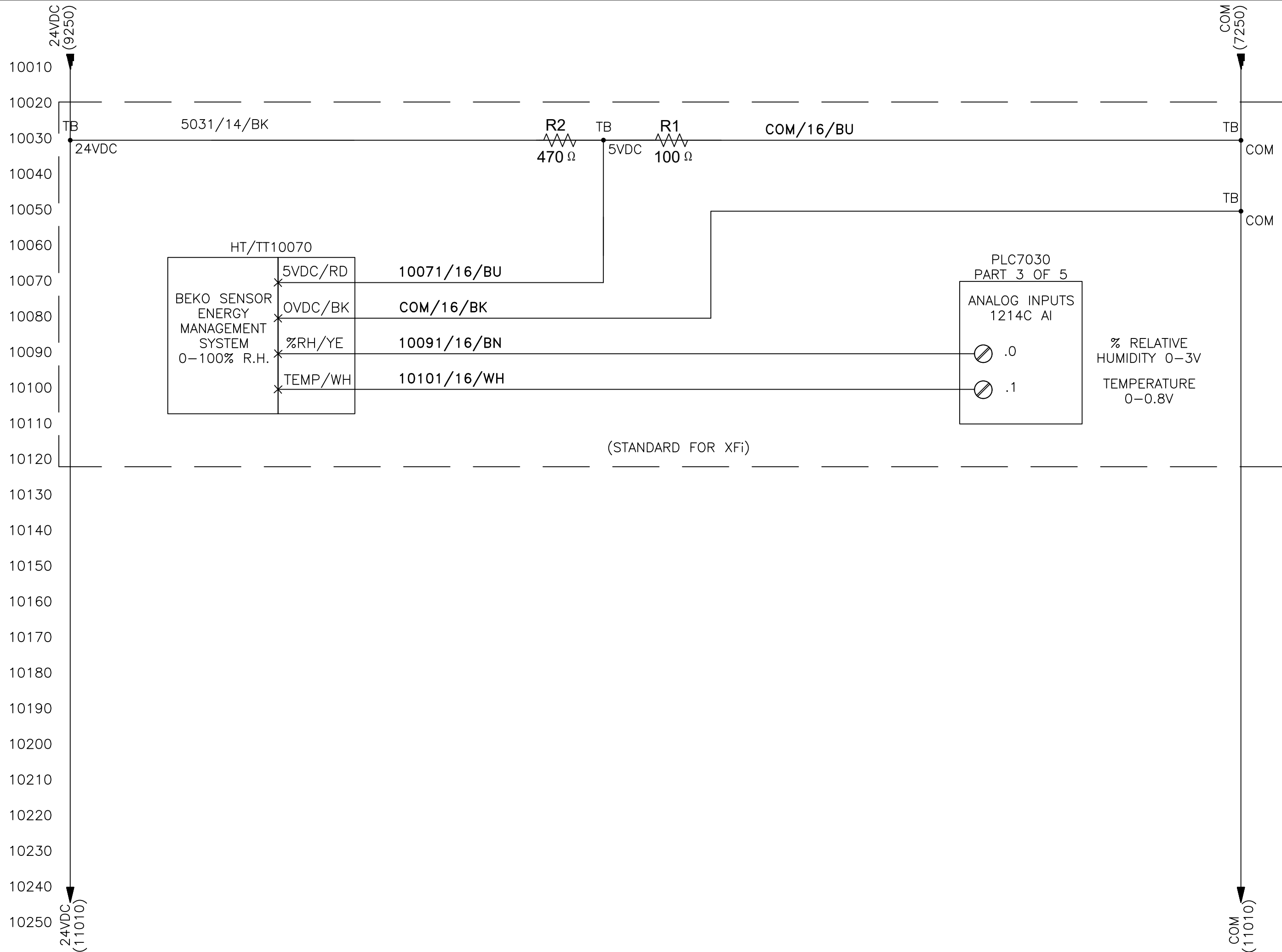
BEKOMAT ALARM (OPTIONAL)

INV. CONTROLLED:	ID# 0001974	TITLE: XF Wiring Diagram	DESCRIPTION: DISCRETE INPUTS - BLOWER INPUTS, HEATER OVERTEMP, BEKOMAT ALARM	SHEET 8 OF 18
SERIAL TRACKED:	CAT: 08C			
DRAWN BY: JJ	SAP: N/A	REVISION: 01		SCALE:
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DRAWN BY: JJ		12/07/2022		900 Great SW Pkwy Atlanta, GA 30336 Ph: (800) 235-6797 Fax: (404) 629-6666 www.bekousa.com BEKO TECHNOLOGIES CORP			
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DESCRIPTION: DISCRETE INPUTS - XFI LIMIT SWITCH INDICATORS (OPTIONAL FOR XFe) AND REMOTE START/STOP BUTTON							SHEET 9 OF 18

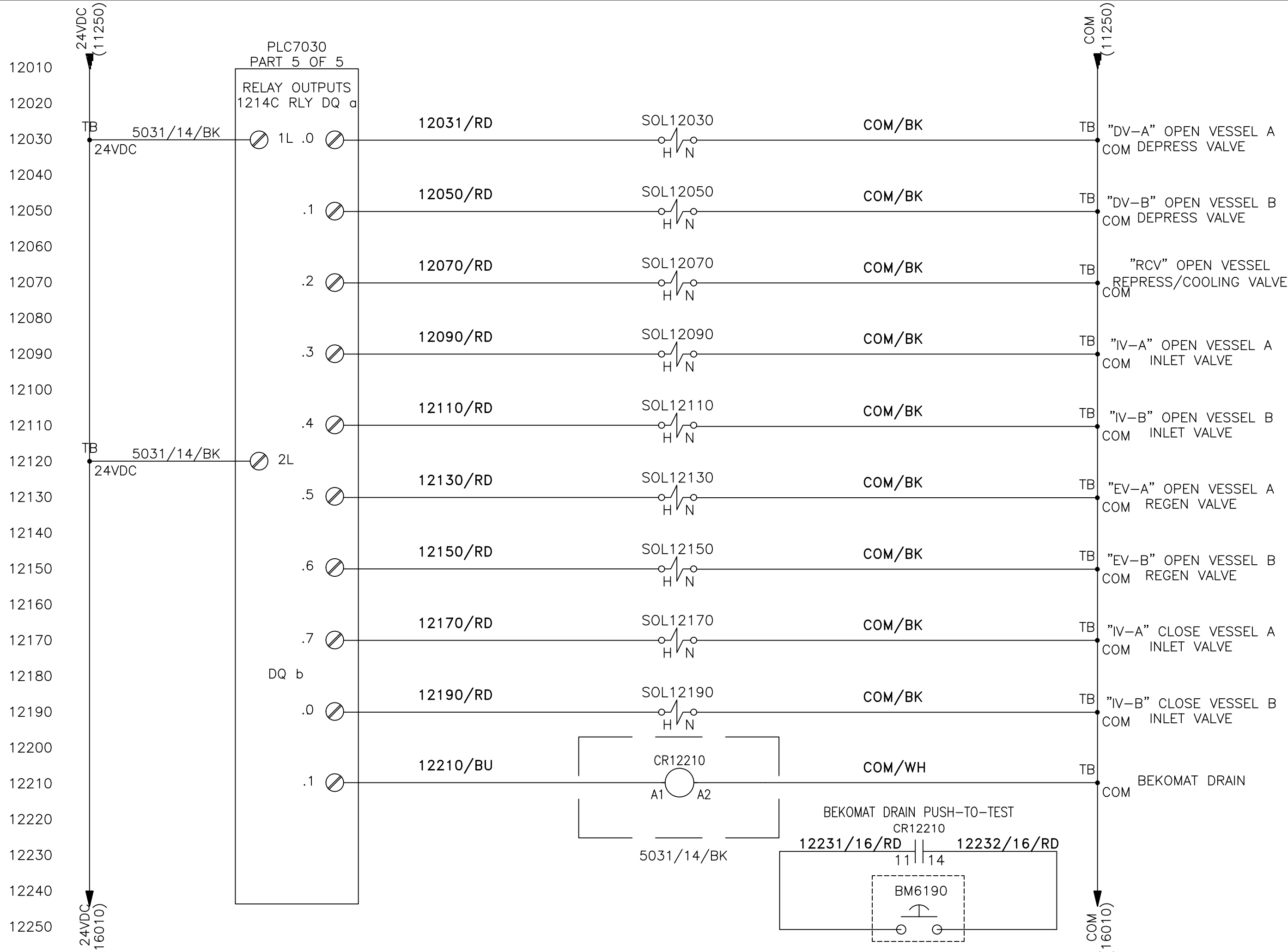




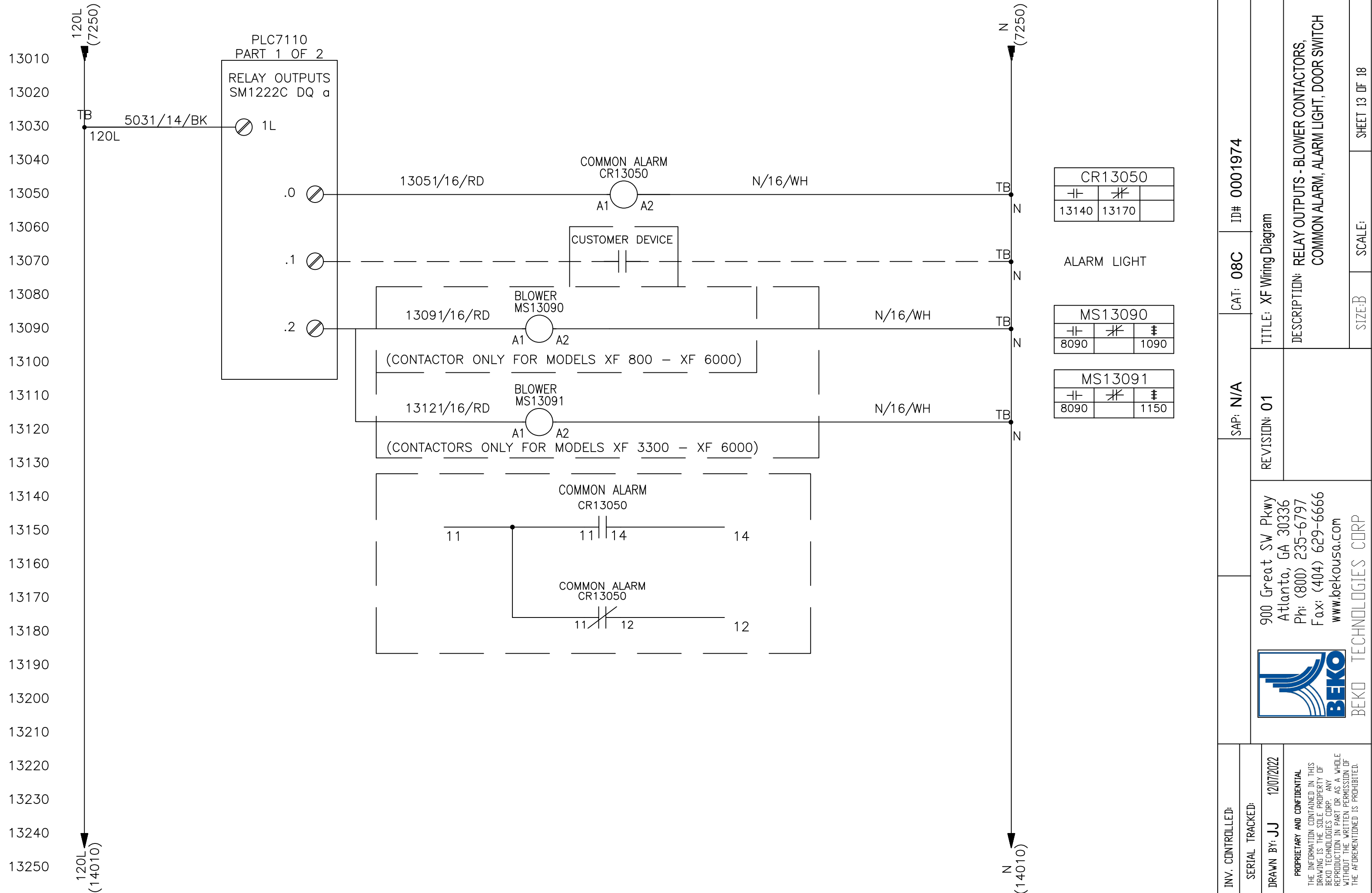
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SERIAL TRACKED:	REVISION: 01	TITLE: XF Wiring Diagram	
DRAWN BY: JJ 12/07/2022	900 Great SW Pkwy Atlanta, GA 30336 Ph: (800) 235-6797 Fax: (404) 629-6666 www.bekousa.com		
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	SIZE: B	SCALE:	SHEET 10 OF 18




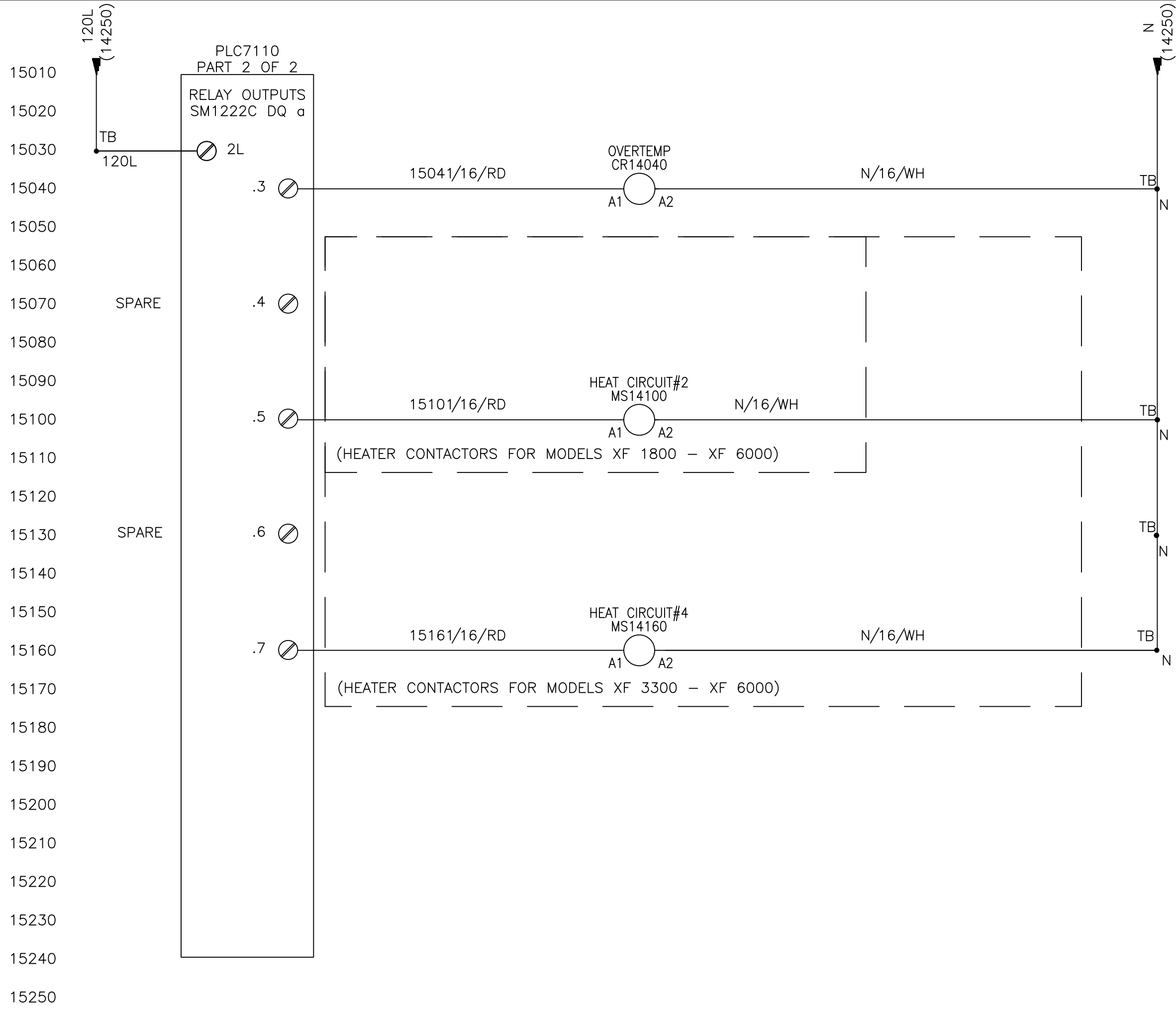
BEKO TECHNOLOGIES CORP



INV. CONTROLLED:	ID# 0001974	TITLE: XF Wiring Diagram	DESCRIPTION: SOLENOID & BEKOMAT DRAIN OUTPUTS
SERIAL TRACKED:	CAT: 08C		
DRAWN BY: JJ	SAP: N/A	REVISION: 01	SIZE: B
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		SHEET 12 OF 18	



INV. CONTROLLED:	SAP: N/A	CAT: 08C	ID# 0001974
SERIAL TRACKED:	REVISION: 01	TITLE: XF Wiring Diagram	
DRAWN BY: JJ 12/07/2022	900 Great SW Pkwy Atlanta, GA 30336 Ph: (800) 235-6797 Fax: (404) 629-6666 www.bekousa.com		
			
BEKO TECHNOLOGIES CORP DESCRIPTION: RELAY OUTPUTS - BLOWER CONTACTORS, COMMON ALARM, ALARM LIGHT, DOOR SWITCH			
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CR14040		
⎓	⎓	
6020		

MS14100		
⎓	⎓	⎓
		2100/ 2210/ 3090/ 4100

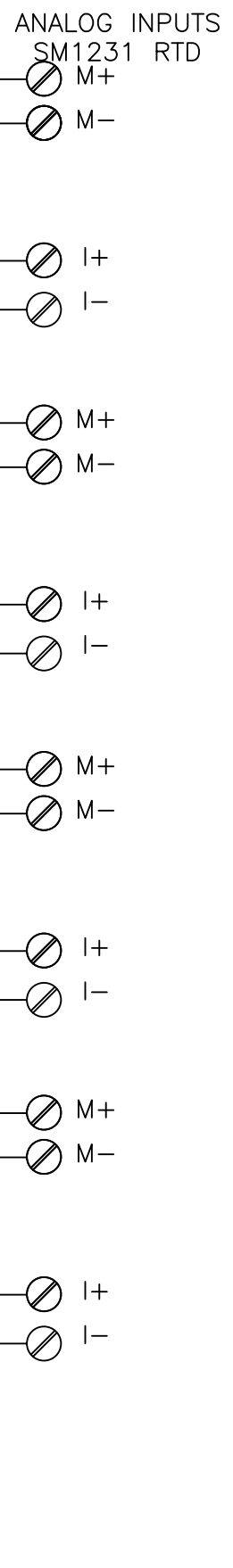
MS14130		
⎓	⎓	⎓
		3130/ 4140

MS14160		
⎓	⎓	⎓
		3170/ 4180

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17010
17020
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17070
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PLC7170
PART 1 OF 2



HEATER OUTLET

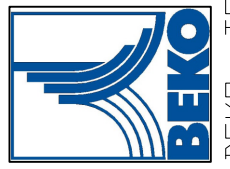
DRYER OUTLET
(XFi 800 - 6000)

VESSEL A INLET
&
REGENERATION EXHAUST

VESSEL B INLET
&
REGENERATION EXHAUST

INV. CONTROLLED:	SAP: N/A	CAT: 08C	ID# 0001974
SERIAL TRACKED:	REVISION: 01	TITLE: XF Wiring Diagram	
DRAWN BY: JJ	12/07/2022	DESCRIPTION: TEMPERATURE SENSORS - REGENERATION TEMPERATURES X	
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			SHEET 16 OF 18

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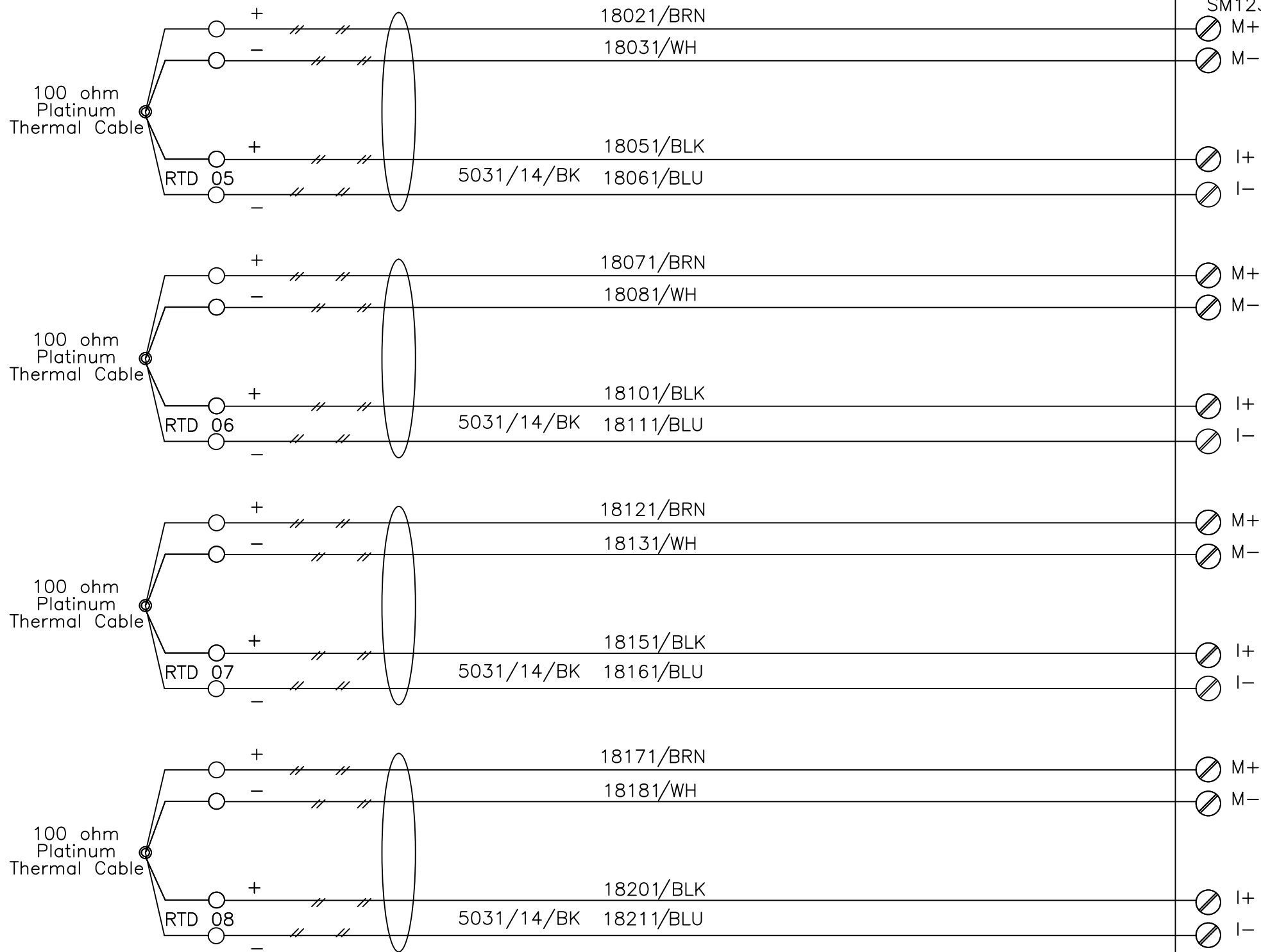


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18010
18020
18030
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PLC7170
PART 2 OF 2

ANALOG INPUTS
SM1231 TC



VESSEL A BED
(XFi 800 - 6000)

VESSEL B BED
(XFi 800 - 6000)

HEATER SHEATH
(XF 800 - 6000)

HEATER SHEATH
(XF 3300 - 6000)

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SAP: N/A

CAT: 08C

ID# 0001974

REVISION: 01

TITLE: XF Wiring Diagram

DESCRIPTION: TEMPERATURE SENSORS - SENSORS USED ON
XF DRYER MODELS

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SIZE: B SCALE:

SHEET 17 OF 18

BLOWER CIRCUIT								
MODE	MOTOR HP	MOTOR kW	MOTOR FULL LOAD		MOTOR WIRE SIZE		MOTOR CONTACTORS	
			CURRENT (A)	RPM @ 60Hz	(AWG)	MSP (A)	MSP Setpoint	(A)
800	3.60	2.65	4.40	3510	12	4-6.3	6	7
1000	4.80	3.60	6.25	3530	12	6-10	8	9
1200	4.80	3.60	6.25	3530	12	6-10	8	9
1500	6.40	4.80	8.25	3520	12	8-12	11	12
1800	8.90	6.60	11.50	3520	12	10-16	14	15
2300	17.70	13.20	21.90	3525	10	25-32	28	32
2800	17.70	13.20	21.90	3525	10	25-32	28	32
3300	12.10	17.80	13.90	3505	10	16-20	19	25
4000	12.10	17.80	13.90	3505	10	16-20	19	25
5000	17.70	26.40	21.90	3525	10	25-32	28	32
6000	17.70	26.40	21.90	3525	10	25-32	28	32

Table 1.

HEATER CIRCUITS											
MODE	NUMBER OF HEATERS	TOTAL POWER (kW)	# OF CIRCUITS PER HEATER	POWER PER HEATER [kW]	HEATER LOAD [A]	CIRCUIT LOAD [A]	WIRE SIZE (AWG)	CONTACTORS (A)	FUSING (A)	SSR [XFi ONLY]	
										HEATER	[kW]
800	1	20	1	20	25.13	25.13	8	25	30	30	
1000	1	20	1	20	25.13	25.13	8	25	30	30	
1200	1	25	1	25	31.41	31.41	8	30	40	30	
1500	1	35	1	35	43.98	43.98	6	40	50	40	
1800	1	45	2	45	56.55	28.27	8	30	40	30	
2300	1	50	2	50	62.83	31.41	8	30	40	30	
2800	1	60	2	60	75.40	37.70	6	40	50	40	
3300	2	90	2	45	56.55	28.27	8	30	40	30	
4000	2	90	2	45	56.55	28.27	8	30	40	30	
5000	2	110	2	55	69.11	34.56	6	40	45	40	
6000	2	130	2	65	81.68	40.84	6	40	50	40	

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											CAT: 08C

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