AUTOMATIC GRAIN DRYER

Axial Fan / Centrifugal Fan
QuadraTouch Pro Dryer Control System
Under EU & UKCA Declarations of Incorporation

OWNER'S OPERATION MANUAL

Sukup Manufacturing Co.
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Manual L2412D
04/04/2024

Thank you for purchasing a Sukup Grain Dryer. At Sukup Manufacturing Co., we strive to provide our customers with the best products available. It's important to us that you get the best value for your money. That means producing top-quality products that will provide you with many years of satisfied ownership.

We back our products with experienced staff and the best customer service in the industry. Our dedicated employees have done their best to ensure that your Sukup Grain Dryer provides a hassle-free grain drying experience. With proper installation and use, it will serve you for many years.

Thank you again for your purchase. We wish you many years of profitable, safe use of your Sukup Grain Dryer.

Steve, Emily, Matt, Andy, Nick,
Charles, Jonathan, Andrew and
The Entire Sukup Family

Sukup Manufacturing Co.
Sheffield, Iowa, USA

Automatic Grain Dryer Owner's Operation Manual

This manual covers installation and operation of axial-fan dryers and centrifugal-fan dryers. It is comprised of several tabbed sections. The first provides safety information and identifies components of dryer. Others provide instructions for installation, operation, service and maintenance of dryer, and troubleshooting. Please read entire manual thoroughly before installation or operation. Check with dealer before each drying season for important updates.

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IMPORTANT: Please quote full serial number in any correspondence regarding this dryer.

Preliminary Information

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04/04/2024 –	Updated warranty	2
	Minor editing to improve clarity	5, 20, 21, 23, 25, 26, 30, 31 & 33
	Added reference to Parts section for location of centrifugal-fan heater orifice	23
04/13/2023 –	Added references throughout to UKCA (United Kingdom Conformity Assessed) certification	
	Edited risk reduction instructions for clarity	7
	Updated safety decals & safety labels as needed	8-9, 12-13
	Updated photos of System Control switch & front of centrifugal-fan dryer	16, 18
	Updated statements on inspecting wiring & limiting electromagnetic interference	19
	Added notes on appearance & location of vapor over-temp switch	20-21

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MIXED-FLOW & CROSS-FLOW DRYER LIMITED WARRANTY

SUKUP MANUFACTURING CO. (Sukup) warrants to original retail purchaser that within time limits set forth, new equipment shall be free from defects in material and workmanship. A part will not be considered defective if it substantially fulfills performance specifications, including, but not limited to, parts with cosmetic (appearance) issues that will not affect life of product. Should any part prove defective within warranty period, part will be replaced or repaired without charge F.O.B. Sukup Manufacturing Co., Sheffield, Iowa USA or Distribution Centers - Arcola, Illinois; Aurora, Nebraska; Cameron, Missouri; Defiance, Ohio; Jonesboro, Arkansas; Watertown, South Dakota. To claim warranty, a copy of original invoice is required.

THE FOREGOING LIMITED WARRANTY IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES OF MERCHANTABILITY, FITNESS FOR PARTICULAR PURPOSE AND OF ANY OTHER TYPE, WHETHER EXPRESS OR IMPLIED. Sukup neither assumes nor authorizes anyone to assume for it any other obligation or liability in connection with said part, and will not be liable for incidental or consequential damages. THE REMEDIES STATED HEREIN SHALL BE THE EXCLUSIVE REMEDIES AVAILABLE UNDER THIS LIMITED WARRANTY.

Sukup reserves the right to change specifications, add improvements or discontinue manufacture of any of its equipment without notice or obligation to purchasers of its equipment. This warranty gives you specific legal rights. You may also have other rights which vary according to state or province.

WARRANTY EXCLUSIONS - Labor, transportation, or any cost related to a service call is not provided by Sukup. This Limited Warranty does not apply to damage resulting from misuse, neglect, normal wear, accident or improper installation or maintenance. ITEMS NOT MANUFACTURED BY SUKUP (e.g., belts, motors) ARE COVERED UNDER WARRANTIES OF THEIR RESPECTIVE MANUFACTURERS AND ARE EXCLUDED FROM COVERAGE UNDER THE SUKUP WARRANTY. SUKUP MANUFACTURING CO. MAKES NO WARRANTY, EXPRESS OR IMPLIED, OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

Upon taking delivery of product, purchaser (dealer and/or end user) assumes responsibility for proper storage of all materials. Proper storage includes dry, temperature and humidity-controlled facilities that eliminate the potential of moisture, including condensation, from causing white rust and/or corrosion of any sort. Warranty does not extend to defects, damage or cosmetic (appearance) issues caused by improper storage or handling.

GRAIN DRYER WARRANTY PERIOD - Sukup warrants mixed-flow and cross-flow grain dryers (single module and stacked units) for a period of two years (24 months) from date of purchase.

REPLACEMENT PARTS WARRANTY PERIOD - Sukup warrants replacement parts (e.g., belts, sensors, rotating contacts, gearmotors, switches) purchased from Sukup for one (1) full drying season following purchase.

ELECTRIC MOTOR WARRANTY - Manufacturers of electric motors warranty them for at least 1 year from installation date or 2 years from motor manufacture date. Process for repairing or replacing motor depends on motor manufacturer and horsepower. Contact motor manufacturer for terms. If motor warranty is refused, use the following procedure: Have motor repair shop fill out the warranty report form as if they were providing warranty service. State on report reason for refusal. Send report, motor nameplate, and proof of purchase date (invoice from Sukup and invoice for your customer) to Sukup. Sukup will attempt to obtain warranty from motor manufacturer. Any credit obtained will be passed on. Warranty may also be obtained by returning motor to Sukup Manufacturing Co. or Distribution Center with prior authorization. **NOTE**: Sukup will not be responsible for unauthorized motor replacement or repair. Labor for removal of motor not included.

WARRANTY CERTIFICATION - Warranty must be registered within one month of product shipment from Sukup facility or customer pickup from the facility to certify warranty coverage. See QR code at front of product manual for details.

UNAPPROVED PARTS OR MODIFICATION - All obligations of Sukup under this warranty are terminated if equipment is modified or altered in any way not approved by Sukup or if parts that do not conform to specifications of original parts are used.

Purchaser must adhere to applicable safety regulations and federal, state and local codes in the location, installation, and use of this product. Sukup assumes no responsibility for property damages or personal injuries.

7/10/23

Read manual before installing or using product. Failure to follow instructions and safety precautions in manual can result in death or serious injury. Keep manual in a safe location for future reference.

On safety decals and throughout this manual, this symbol and the signal words Danger, Warning, Caution and Notice draw your attention to important instructions regarding safety. They indicate potential hazards and levels of intensity.

DANGER **DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING **WARNING** indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION **CAUTION** indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE **NOTICE** alerts you to practices unrelated to personal injury, such as messages related to property damage.

IMPORTANT: To prevent death or serious injury to you or your family, it is essential that safety decals are clearly visible, in good condition, and applied to the appropriate equipment.

FOLLOW MANUAL & SAFETY DECAL MESSAGES

Carefully read this manual and all safety decals on your equipment. Safety decals must be kept in good condition. Replace missing or damaged safety decals free of charge by contacting Sukup Manufacturing Co. by mail at Box 677, Sheffield, Iowa 50475; by phone at 641-892-4222; or by email at info@sukup.com.

It is the responsibility of the owner/operator to know what specific requirements, precautions, and work hazards exist. It is also the responsibility of the owner/operator to inform anyone operating or working in area of this equipment of the hazards and safety precautions that need to be taken to avoid personal injury or death. Always keep children away from bins and vehicles with flowing grain. **An example training register is printed in this section to assist in that process.**

Make no unauthorized modifications to machine. Modifications may endanger function and/or safety of unit. Keep unit well maintained according to procedures in Service and Maintenance section. Keep shields in place. Replace worn or missing shields free of charge by contacting Sukup Manufacturing Co.

⚠ WARNING

TRANSPORTING THIS EQUIPMENT ON PUBLIC ROADS REQUIRES PRECAUTIONARY MEASURES IN ORDER TO PREVENT AN ACCIDENT.

IMPORTANT: Trucker-transporter must provide approved safety chain when towing dryer.

If road travel is required, it is essential that safety measures are taken.

The following list offers helpful information, but it is best to consult state and local regulations to ensure complete compliance.

- Read and understand operator's manual
- Use required emblems or lights
- Travel at a reasonable and safe speed. Reduce speed and/or use lower gear on rough ground or slopes.
- Stop gradually
- Have extended rear angle mirrors on vehicles
- Signal and check behind you when turning
- Use safety chain when towing dryer
- Read safety procedures before moving units

Always strive to prevent accidents! Watch out for other vehicles. Use good judgment when transporting.

CHECK FOR OTHER VEHICLES WHEN TURNING

Be aware that two-thirds of roadway farm accidents occur while turning.

- Use mirrors
- Be sure to have clear visibility
- Use signal lights

DO NOT TRANSPORT UNIT IF VISIBILITY IS IMPAIRED

These conditions may include, but are not limited to:

- Hills or curves that obstruct vision
- Poor weather
- Darkness

FAILURE TO FOLLOW SAFETY GUIDELINES COULD CAUSE AN ACCIDENT RESULTING IN DEATH OR SERIOUS INJURY.

WARNING: PREVENT EXPLOSION OR FIRE

- Carefully review operator's manual
- Keep dryer clean inside and out, as fines may cause a fire
- Check for gas leaks. Spray soapy solution on piping and joints
- Run fan at least half a minute before starting heater
- NEVER start heater if you smell gas or hear a hissing sound
- NEVER run heater with inspection door open

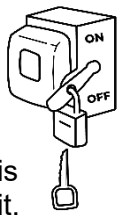
Failure to heed these warnings may cause death or serious injury.

USE PROPER LOCKOUT PROCEDURES. Facility management needs to proactively train employees to ensure use of proper lockout procedures while working on dryer. Management also needs to inspect this unit for any covers or guards not in proper place. It is everyone's responsibility to report any missing grates, guards, equipment failures or failures to lock out. Make certain that no cover is removed unless power is locked out.

To avoid electric shock or electrocution, all equipment must be properly wired and grounded according to electrical codes. Have unit wired by qualified electrician.

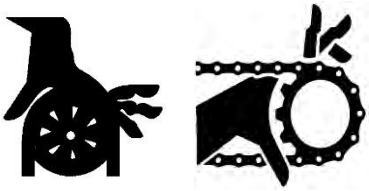
IMPORTANT: Supporting electrical panels or combinations of electrical components supplied by the end user must be compliant with current editions of BS EN 60204-1.

Mains Isolater must be located outside of bin. It must be easily accessible from ground level and must be lockable in off position. Mark clearly as to equipment it operates. See Mains Isolater decal placement information later in this section.



Always LOCK OUT main power switch (Mains Isolater) whenever equipment is not in use or when servicing unit. Check with voltage meter before servicing unit.

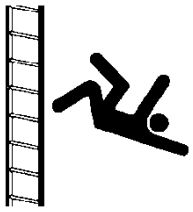
WARNING: KEEP CLEAR OF ALL MOVING PARTS



Keep people (ESPECIALLY YOUTH) away from equipment, particularly during operation. Keep away from all moving parts. Entanglement can cause death or serious injury. Keep fan screen guards and all shields in place and in good working condition. Replacement screen guards and shields are available from Sukup Manufacturing Co. at no charge. **Failure to heed these warnings may result in death or serious injury.**

WARNING: Load/unload systems, fans and heaters will start without warning at appropriate times. Please use caution around dryer. **Failure to heed this warning may result in death or serious injury.**

WARNING: USE SAFE CLIMBING PROCEDURES



Inspect ladder carefully before use. Never climb deteriorated, damaged or improperly assembled ladder components. Maintain secure hand and foothold when climbing. Metal is slippery when wet. Never carry items while climbing. Use safety harness and safety line as required by safety regulations. **Failure to heed these warnings may cause death or serious injury.**

CAUTION: Metal edges are sharp. To avoid injury, wear protective clothing and handle equipment and parts with care. Failure to do so may result in minor or moderate injury.

Refer to OSHA 1910.132 (Personal Prot. Equip.)

PERSONAL PROTECTIVE EQUIPMENT

Owners/Operators are responsible for developing site-specific personal protective equipment standards.

These include, but are not limited to, personal protective equipment for eyes, face, head, and extremities, as well as protective clothing and respiratory devices.

For a complete listing of OSHA's personal protective equipment standards go to www.osha.gov (29CFR 1910.132).

Basic Safety Rules

1. Learn how to use controls and operate equipment.
2. Do not let anyone operate unit without thorough training in basic operating and safety procedures. **Always follow a proper lockout procedure.**
3. Periodically check all mechanical and electrical components. Keep unit in good working condition.
4. Handle equipment and parts with care. **Wear protective clothing** to avoid injury from sharp metal edges.
5. Wear Personal Protective Equipment (PPE) such as safety glasses, gloves, hardhat, steel-toe boots, ear protection and dust mask as required by local, state and national regulations.

Keep unit well maintained according to procedures outlined elsewhere in this manual.

SAFETY QUESTIONS OR CONCERNS

Please contact Sukup Manufacturing Co. with any specific safety questions about dryer or its use!

Good housekeeping practices and correct safety procedures will help protect lives, jobs, property and profits.

EMERGENCIES - KNOW WHAT TO DO

Have emergency numbers and written directions to your location near your telephone in case of emergency. An area to record emergency information is provided below.

Emergency Information

Farm rescue team: _____

Local EMS team: _____

Address of work site:_____

Directions to work site:_____

Risk Reduction for Servicing Dryer

IMPORTANT: Conditions in dryer plenum may vary greatly from ambient.

Please follow these safety guidelines before entering dryer:

- Appoint a responsible person to remain outside of dryer during servicing.
- Ensure all fuel and power to dryer is turned off.
- Ensure operator is in good physical condition and at low risk of medical problems such as asthma and cardiac problems.
- Ensure dryer is empty of grain; avoid entry when dryer is full.
- Do not close doors while inside dryer. This ensures proper airflow and vents toxic gasses.
- Have a lifting device nearby that can reach dryer platforms in case of emergency.
- Have adequate tools on hand for quick removal of ladder in case of emergency.
- Carry a cell phone to use in case of emergency and ensure proper signal is available.
- Wear personal protection equipment such as safety glasses, gloves, dust mask, steel-toe boots, ear protectors, safety harness, and hardhat as required.
- Consider additional risks when performing maintenance that includes cutting or welding (fire, fumes and dust). Ensure quick access to an ABC (dry chemical) fire extinguisher.
- Assess climatic conditions: If weather is undesirable (icy platforms, extreme heat) reduce risk by servicing when climate improves.

Follow additional safety guidelines when servicing top conveyor and wet bin drive on outside of dryer:

- Use a lifting device with safety cage to safely reach upper areas of dryer.
- Wear relevant personal protective equipment such as hardhat, safety harness and safety glasses when accessing and servicing these areas.

In case of minor injury (minor cuts and scrapes):

- Ensure first aid kit is available on site and workers are trained to treat minor injuries.
- Avoid first aid on platforms due to height and limited workspace.
- Contact emergency services if injury prevents descending from dryer platform.

In case of serious injury (loss of consciousness or serious cut):

- Contact emergency services immediately.
- In case of rescue from inside of dryer, ladder may hinder rescue. **Ladder and cage may be removed by cutting or by unbolting attachment brackets.**

To prevent death or serious injury to people involved in operation of this equipment, it is essential that these safety decals be mounted on dryer. Check that all are in place according to decal placement drawing and are legible when dryer is installed.

IMPORTANT: If a suggested location is not clearly visible, place decal in a more visible spot. Never cover up another safety decal.

Make sure location for decal is free from grease, oil and dirt. Remove backing from decal and place in proper position. Replace missing or damaged safety decals or shields free of charge by contacting Sukup Manufacturing Co. by mail at Box 677, Sheffield, Iowa 50475; by phone at 641-892-4222; or by e-mail at info@sukup.com. Please specify item number when ordering.

1. **Decal L0281 – WARNING:** To avoid death or serious injury, follow general safety regulations.

2. **Decal L02741 – DANGER:** Keep away from any electrical lines, especially when moving unit.

3. **Decal L0234 – WARNING:** Do not allow rear door to close with someone inside; lock out power; do not bypass interlock switch. **NOTE:** Switch appearance is different than shown in decal.

4. **Decal L0166 – WARNING:** Keep guards and screens in place. Disconnect electricity. Check fan blade.

5. **Decal L0271 – DANGER:** Shield missing, do not operate!

6. **Decal L0284 – WARNING:** Keep away from all moving parts.

7. **Decal L0285 – WARNING:** Not intended for use on public roads. If road travel is required, take these precautions:

8. **Decal L02831 – WARNING:** Lower and secure parking stands before unhitching unit.

9. **Decal L03061 – DANGER:** Keep away when auger is running! Entanglement will cause death or serious injury!

10. **Decal L0520 – CAUTION:** Failure to keep unit clean may cause fire and death or serious injury.

11. **Decal L0164 – WARNING:** Ladder safety – falling from heights hazard. Overall precautions for ladder safety.

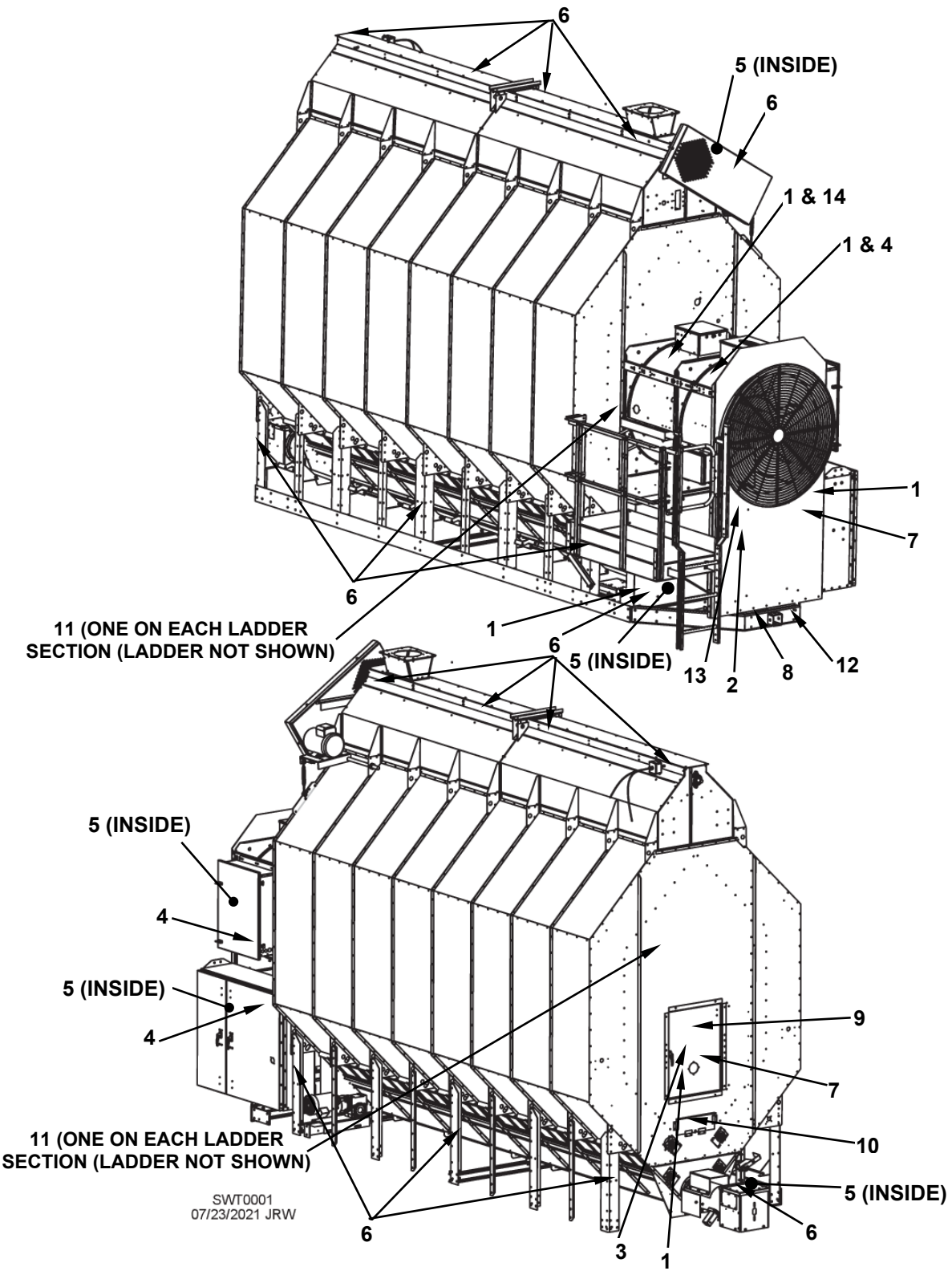
12. **Decal L0512 – WARNING:** Use safety chain when towing unit to eliminate detachment hazard.

13. **Decal L0062 – DANGER:** Never run fan without screen guard; Stay clear from front of fan; Follow correct procedure when installing fan blade.

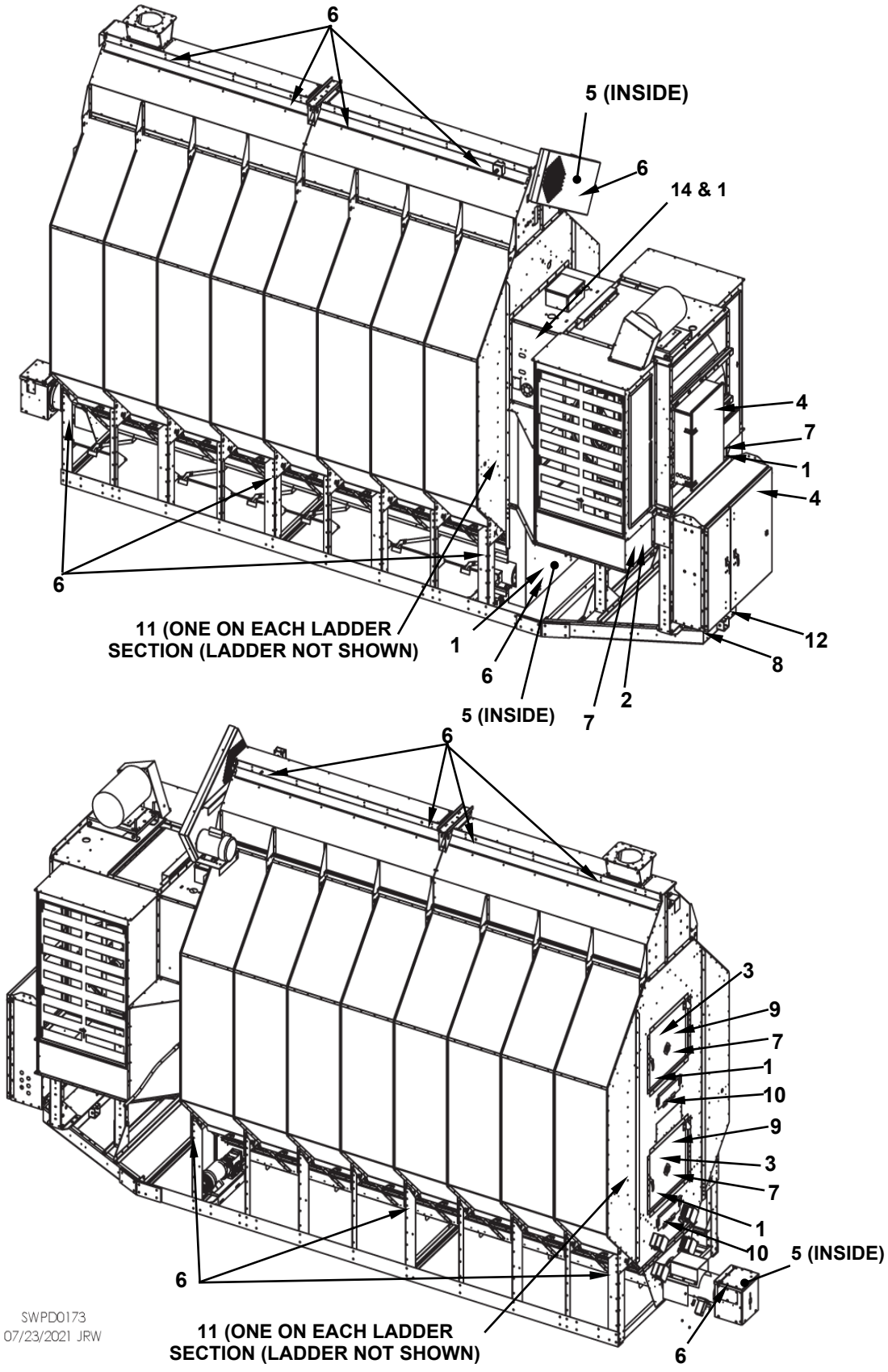
14. **Decal L0165 – WARNING:** Disconnect Electricity; Bleed gas; etc.

15. **Decal L0204 – DANGER:** Do not operate with service door removed.

AXIAL-FAN GRAIN DRYER SAFETY DECAL PLACEMENT



CENTRIFUGAL-FAN GRAIN DRYER SAFETY DECAL PLACEMENT



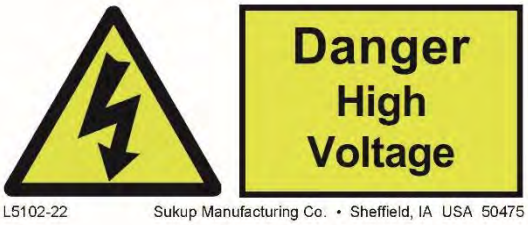
EU & UKCA SAFETY LABELS

To prevent death or serious injury to you or your family, it is essential that these safety decals be mounted on your dryer.

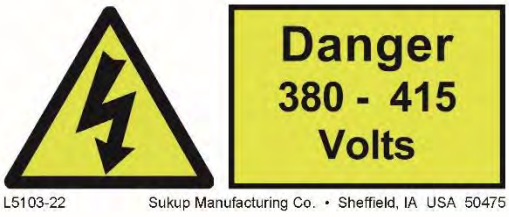
Make sure location for decal is free from grease, oil and dirt. Remove backing from decal and place in proper position. Replace missing or damaged safety decals or shields free of charge by contacting Sukup Manufacturing Co. by mail at PO Box 677, Sheffield, Iowa 50475; by phone at 641-892-4222; or by e-mail at info@sukup.com. Please specify computer number.

Label L5100 – Place inside power box of dryer and on dryer where electrical precautions are needed.

Label L5101 – Place near power disconnect of dryer.



Label L5102 – Place near main power source of dryer.



Label L5103 – Place near main power source of dryer.

Label L5104 - Place at dryer rear access door (entrance to plenum).

Label L5105 – Place at dryer rear access door (entrance to plenum).

Label L5106 – Place near shut off to power source.

Label L5107 – Place near main power shut off.

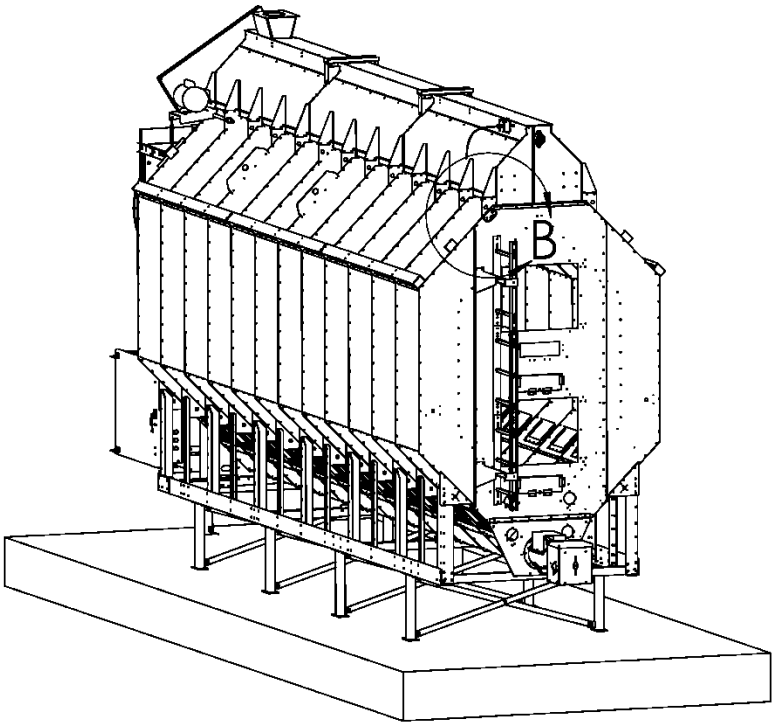
Label L5109 – Place near main power panel.

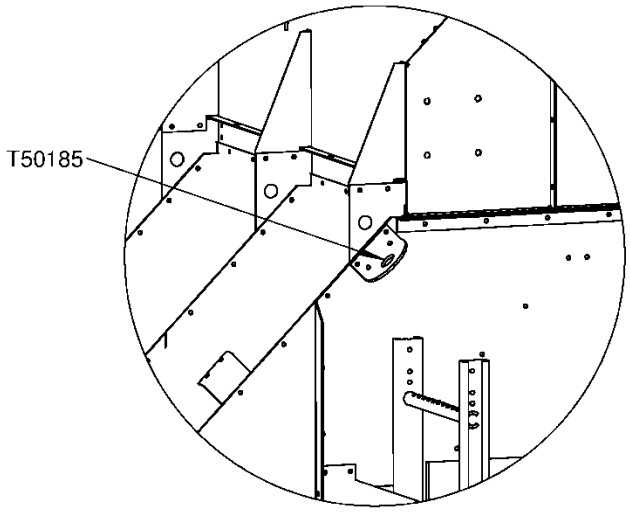
Label L5108 - Placed on axial fans.

Label L5111 - Place at dryer rear access door (entrance to plenum).

NOTE: See harness anchor point bracket placement drawing on next page.

HARNESS ANCHOR POINT BRACKET PLACEMENT





DETAIL B
SCALE 1 : 15

INSTALATION SHOWN ON SINGLE MODULE DRYER.

SWCD0077
12/16/2011MCM

Training Register – Continuous Flow Grain Dryer

Training in operation of a Sukup Grain Dryer and related equipment is paramount to ensuring safe and successful use of the dryer.

This training register is to be used in conjunction with the general operation and maintenance instructions to emphasize the importance of safety. Use additional spaces for elements unique to your dryer.

NOTE: It is the owner's responsibility to give adequate training to employees and to assess their ability to safely use the equipment.

ELEMENT	DATE	COMMENTS
Check unit prior to start-up		
Power shut off Fuel system shut off		
Action in event of emergency/fire		Use of ABC (dry chemical) fire extinguisher
PPE (Personal Protective Equipment)		
Cleaning/maintenance and safe access to plenum		
Entry into confined spaces Authorized personnel only Safe practice and access		
Maintenance of the dryer - Safe isolation - Problem solving - Authorized personnel only to work on gas train/electrical - Top conveyor and wet bin drive		- Use lifting device with safety cage to access top sections outside of dryer.
Best practices for grain drying		Sunflower seeds require a low temperature setting

Emergency Shutdown Locations

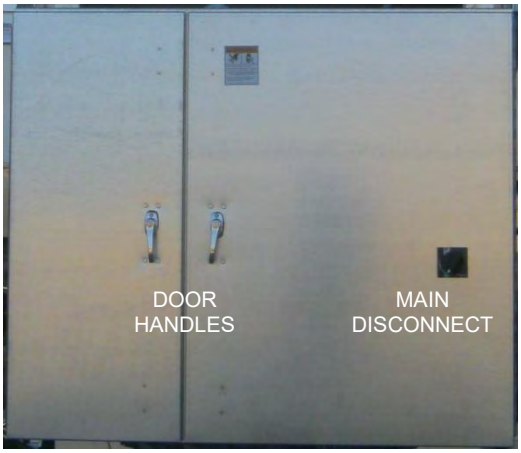


Image 1 – Power distribution box

Power distribution box is located at front of dryer. It contains all main power distribution components, with higher voltage on right and lower voltage on left. Door handles secure doors and can be locked. Main Disconnect switch prevents opening of power box while power is present in system.

WARNING: High voltage will still be present on bottom terminals of main switch in power distribution box even if Main Disconnect is in "Off" position. To remove this voltage from power box, shut off main breaker ahead of dryer. Failure to follow this procedure could cause electrocution or shock resulting in death or serious injury.

Image 2 – Main Disconnect

Image 2 shows Main Disconnect in "Off" position. Power is not present in system except as noted in warning above.

IMPORTANT: Turn switch off when dryer is not in use. This will cut power to programmable logic control (PLC) and other components, protecting them from potential damage in case of a power surge.

Image 3 – Emergency Stop & System Control switches

Emergency Stop switch is located on side of power box. See Image 3. During operation, switch is pulled out and red knob is illuminated. Pressing Emergency Stop Switch or switching Main Disconnect to "Off" position will shut off power to control system. Power will still be present inside main power box as noted in warning above.

System Control switch is used to select QuadraTouch Pro (using touch screen) operation of dryer. Turning System Control switch to "Off" position will shut down power to control system. Power will still be present inside main power box as noted in warning above.

Axial-Fan Dryer Component Identification

Images 4 and 5 identify components on front (upper left) and back (lower right) of a single fan dryer.

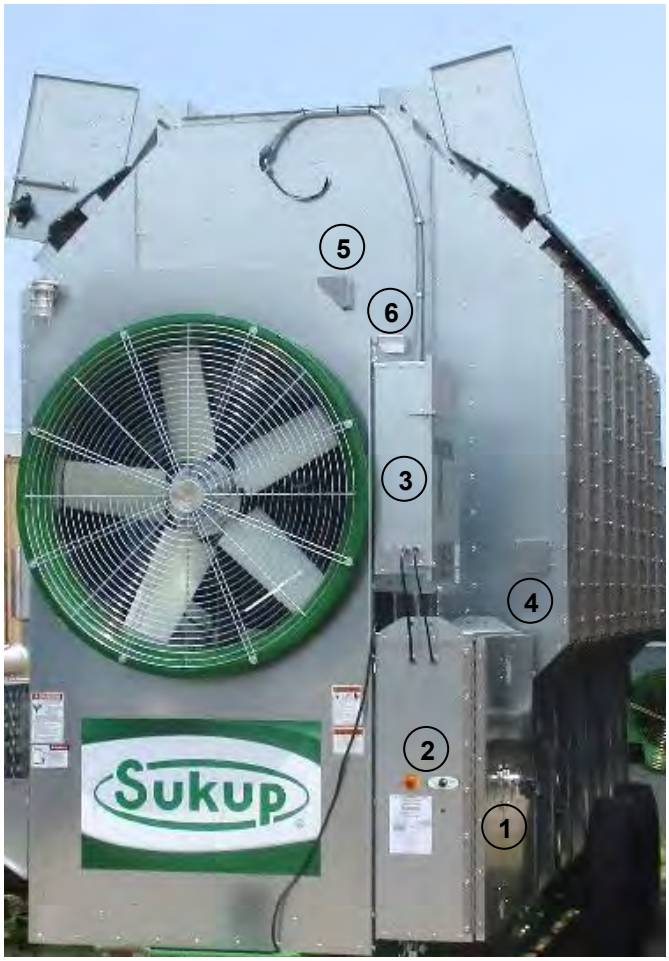


Image 4 – Front of single-fan axial dryer

1. Main power box
2. Emergency Stop & System Control switches
3. Auxiliary equipment power box
4. Column over-temp capillary
5. Plenum high limit switch
6. RTD (plenum thermometer) box

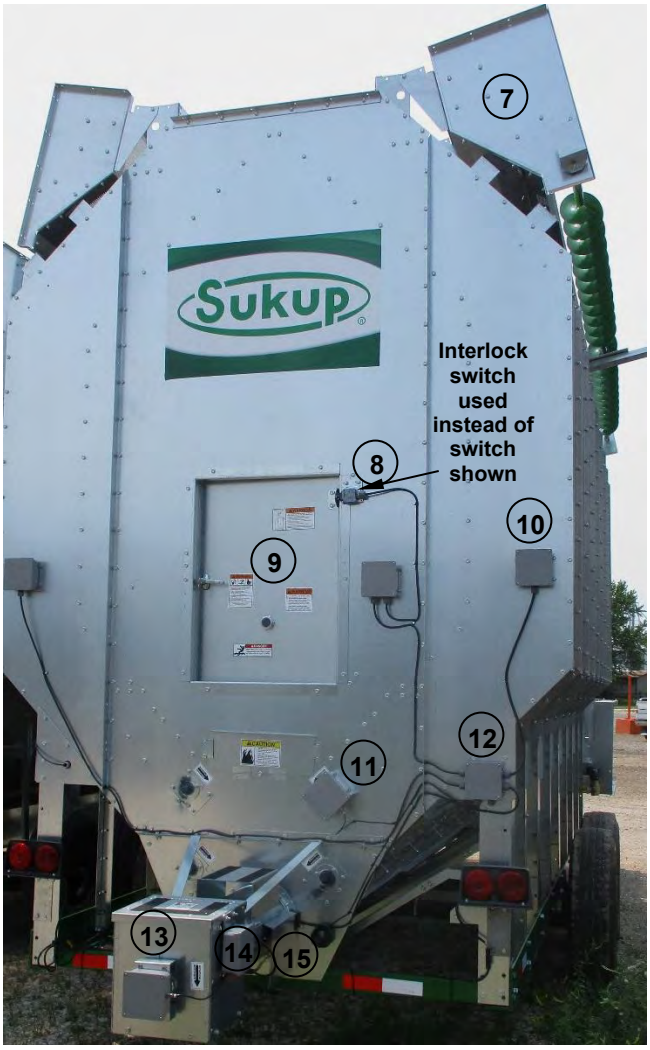


Image 5 – Back of single-fan axial dryer

7. Wet bin (in transport position)
8. Rear door switch
9. Plenum access door w/ viewing port
10. Column over-temp switch
11. Meter roll proximity switch
12. Rear junction box
13. Unload auger proximity switch
14. Discharge chute switch
15. Discharge moisture sensor (Bottom of discharge tube)

Centrifugal-Fan Dryer Component Identification

Images 6 and 7 identify components on front (upper left) and back (lower right) of dryer.

Image 6 – Front of centrifugal-fan dryer

1. Main power box (E-Stop & System Control Switch are on left side of box)
2. Drive-chain access door
3. Auxiliary equipment power box
4. Heater box
5. Fan motor
6. Air inlet louvers

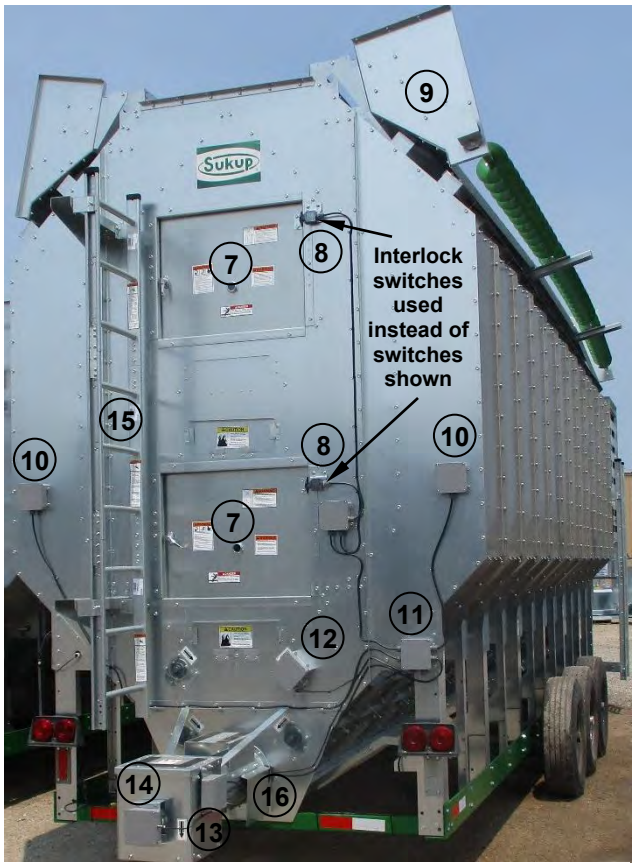


Image 7 – Back of centrifugal dryer

7. Plenum access door with viewing port
8. Rear door switch
9. Wet bin (in transport position)
10. Column over-temp switch
11. Rear junction box
12. Meter roll proximity switch
13. Discharge chute switch
14. Unload auger proximity switch
15. Access ladder
16. Discharge moisture sensor (Bottom of discharge tube)

Power Box Component Location

Image 8 identifies components in main power box on a two-fan dryer. There will be a separate starter protector and fan contactor for each fan on dryer.

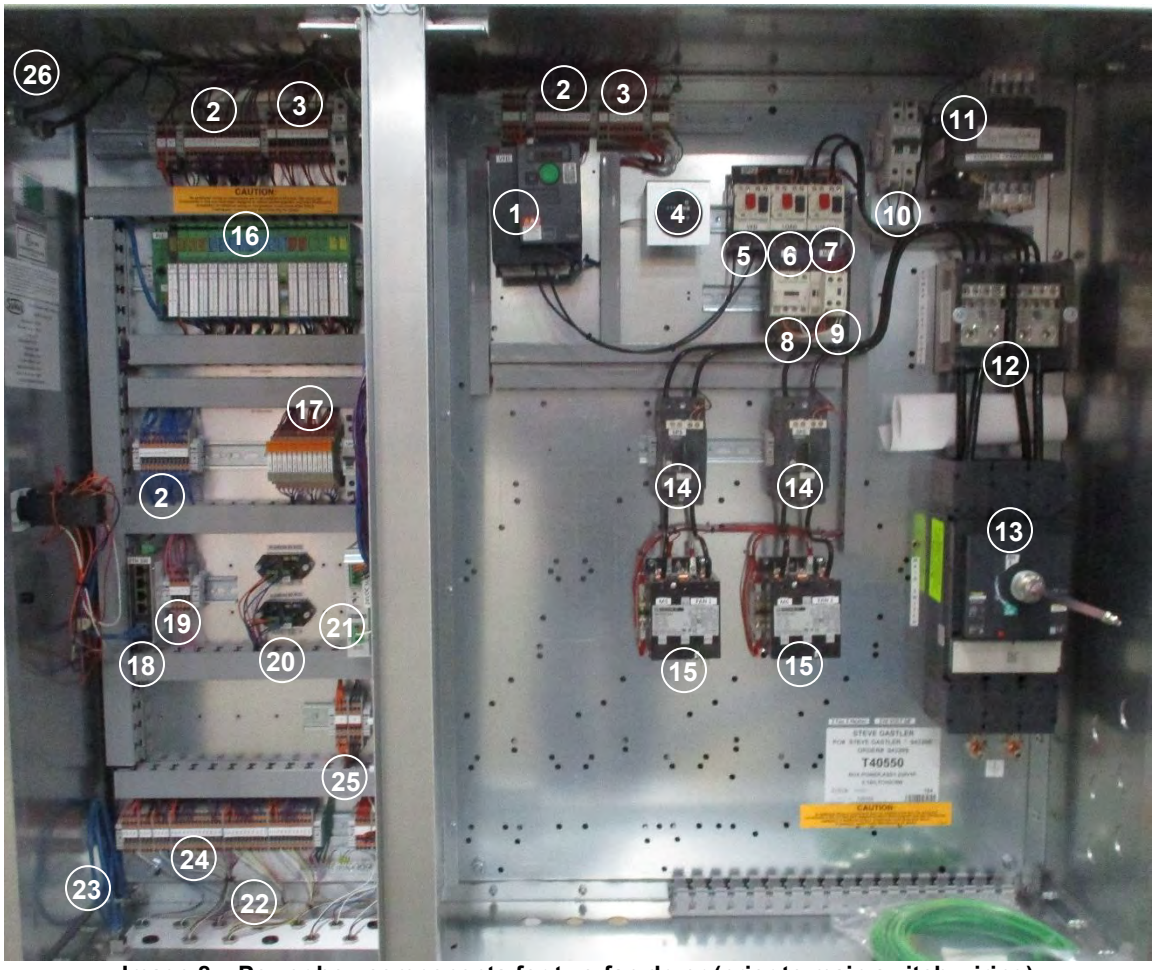


Image 8 – Power box components for two-fan dryer (prior to main switch wiring)

1. Variable frequency drive
2. DC feed-through terminals
3. AC feed-through terminals
4. Hour meter
5. VFD starter protector
6. Load starter protector
7. Unload starter protector
8. Load contactor
9. Unload contactor
10. Circuit breaker
11. Control transformer
12. Power distribution block
13. Main switch
14. Fan starter protector
15. Fan contactor
16. Programmable logic control (PLC)
17. 24VDC relays
18. Ethernet switch
19. RTD terminals
20. RTD transmitters
21. 24VDC power supply
22. Bulkheads for M12 cables
23. Ethernet cable
24. Input/output DC terminals
25. Input/output AC terminals
26. Auxiliary power box connections

IMPORTANT: During initial setup or after relocation of dryer, ALL main power box wiring connections should be inspected. Wires are tightened at factory; but connections should be checked after transport and retightened as needed.

NOTICE Low-voltage components (left side) are separated from high-voltage (right side) in power box to minimize electromagnetic interference on left side. Always maintain high/low voltage and AC/DC separation and practice good wire maintenance.

Axial-Fan Dryer Pipe Train Component Identification

Image 9 identifies components of liquid pipe train (1-6) and vapor pipe train (8-13) on axial-fan heater. Components will vary for natural gas pipe trains. See Parts/Assemblies section.

WARNING: Check pipe train before each use to ensure components are properly connected and in good working order. Fuel leak could result in fire or explosion causing death or serious injury.

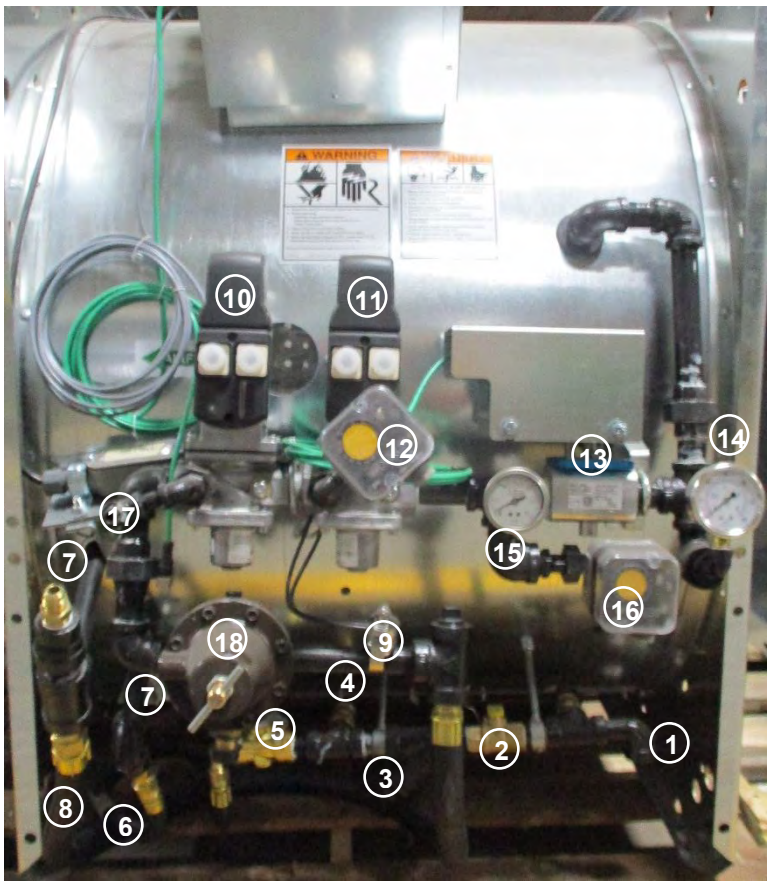


Image 9 – Pipe train components on axial-fan heater

1. LP inlet
2. Shut-off valve
3. Wye strainer
4. High-pressure pop-off valve
5. Liquid solenoid valve
6. Liquid vaporizer hose
7. LP vaporizer inlet (lower) & outlet (upper)
8. Vapor hose
9. Vapor over-temp switch location.
10. Main (upstream) gas valve & actuator
11. Blocking (downstream) gas valve & actuator
12. High-pressure gas switch
13. Electronic actuator (under cover) & butterfly valve
14. Pressure gauge
15. Pressure gauge
16. Valve-proving switch
17. Low pressure switch
18. Regulator

Centrifugal-Fan Dryer Pipe Train Component Identification

Image 10 identifies components of liquid pipe train (1-6) and vapor pipe train (8-13) on centrifugal-fan heater. Components will vary for natural gas pipe trains. See Parts/Assemblies section.

WARNING: Check pipe train before each use to ensure components are properly connected and in good working order. Fuel leak could result in fire or explosion causing death or serious injury.

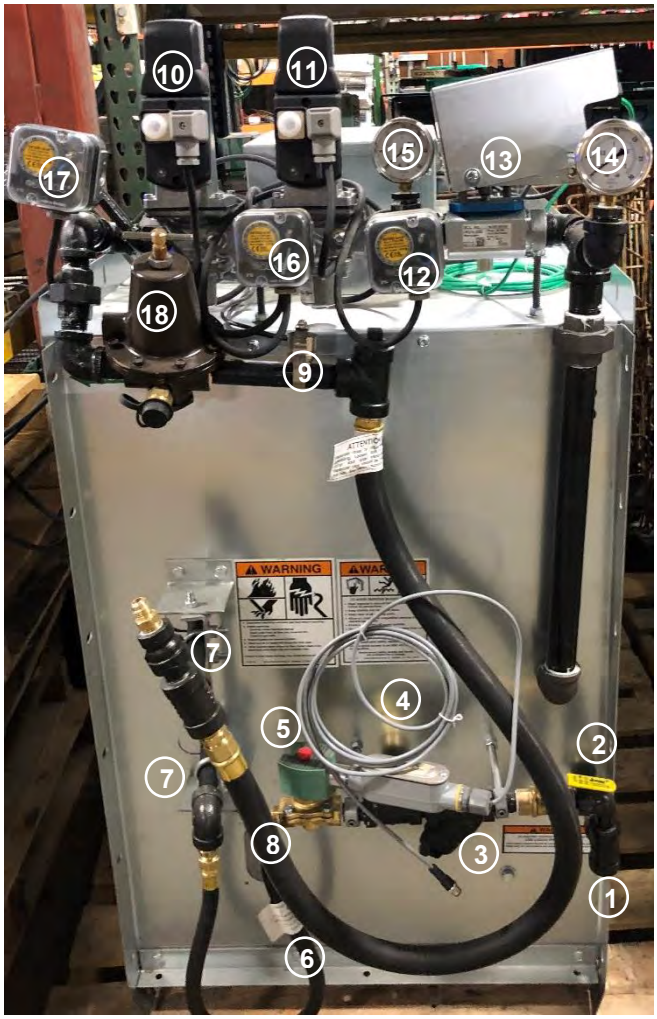


Image 10 – Pipe train components on centrifugal-fan heater

1. LP inlet
2. Shut-off valve
3. Wye strainer
4. High-pressure pop-off valve
5. Liquid solenoid valve
6. Liquid propane hose
7. LP vaporizer inlet (lower) & outlet (upper)
8. Vapor hose
9. Vapor over-temp switch location
10. Main (upstream) gas valve & actuator
11. Blocking (downstream) gas valve & actuator
12. High-pressure gas switch
13. Electronic actuator & butterfly valve
14. Pressure gauge
15. Pressure gauge
16. Valve-proving switch
17. Low pressure switch
18. Regulator

Axial-Fan Dryer Heater Component Identification

Image 11 – Burner, vaporizer coil and flame sensor rod

Image 11 shows octagon burner and vaporizer coil in axial-fan dryer. Also shown are flame sensor rod, spark plug/igniter and orifice location, all circled, and vane for side-to-side air flow/temperature adjustment.

NOTE: 28” fan uses a hexagon burner. Flame sensor rod, spark plug/igniter and orifice locations are all similar to parts circled in Image 11.

Centrifugal-Fan Dryer Heater Component Identification

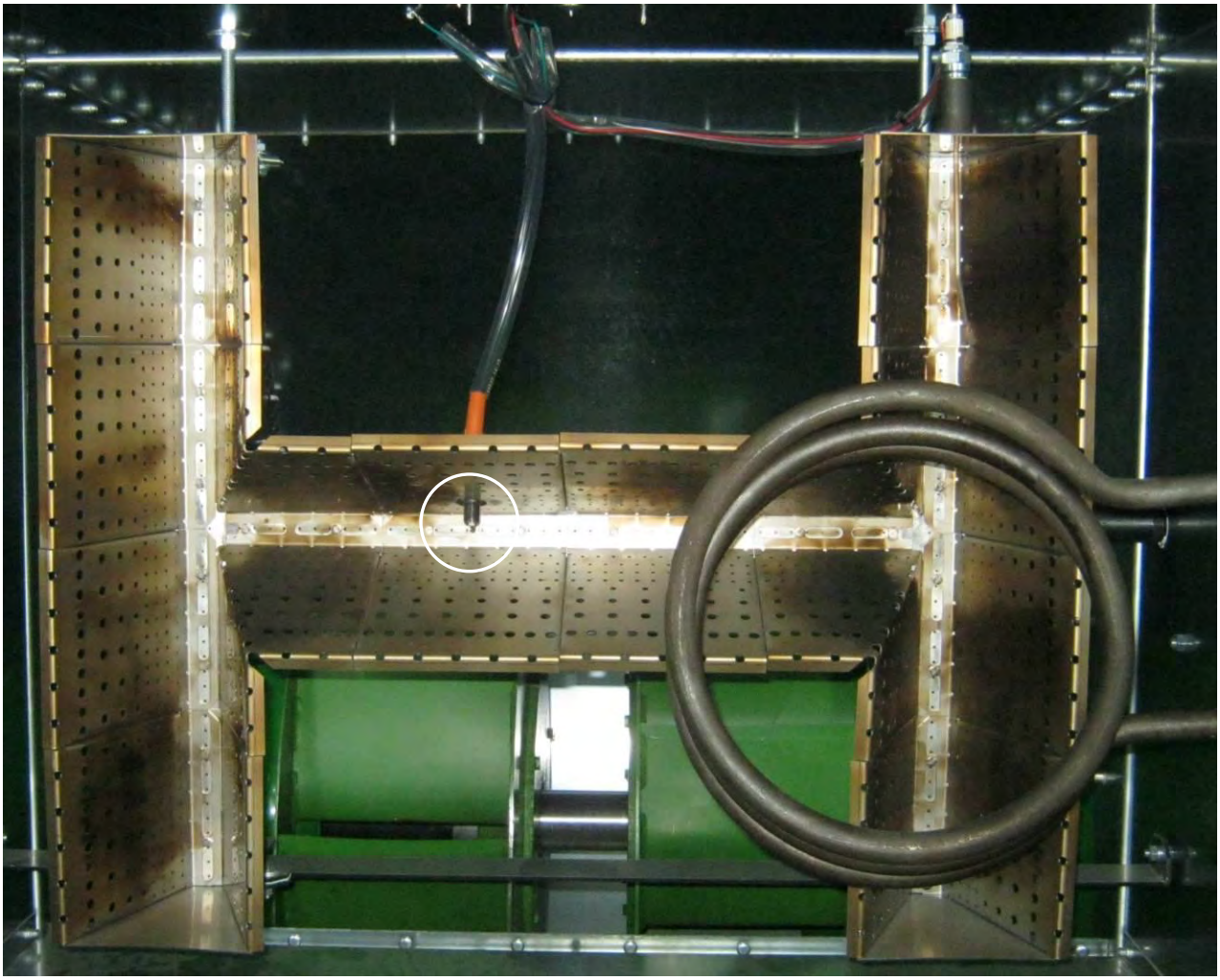


Image 12 – Burner, vaporizer coil & spark plug (circled)

Image 12 shows burner in centrifugal-fan dryer. Vaporizer coil and spark plug/igniter (circled) are shown. **NOTE:** Spark plug may be in different location depending on burner.

See Parts/Assemblies section for drawing of orifice used to restrict flow and build pressure.

Heater Component Identification

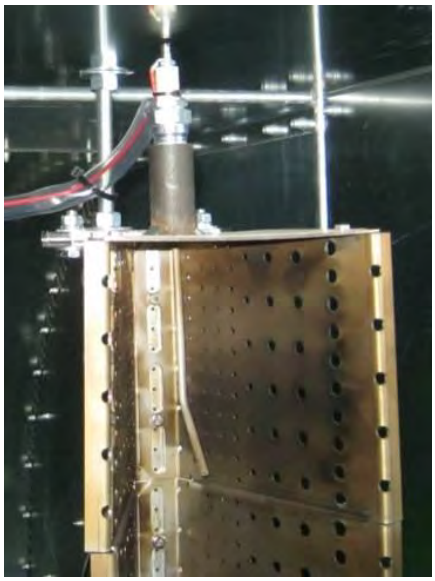


Image 13 – Flame sensor on H burner

Image 13 shows flame sensor in H burner on centrifugal dryer.

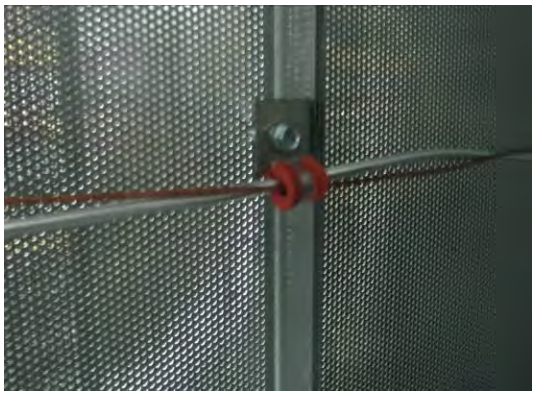


Image 14 – Plenum RTD (silver) and over-temp capillary (copper)

Image 14 shows plenum RTD (Resistance Temperature Detector) aluminum tube and plenum over-temp capillary (copper).

Door Switch & Unload Auger Proximity Switch & Moisture Sensor

Images 15 & 16 – Interlock switch (left) & key w/ chain (right)

Image 15 shows rear door interlock switch. There is one for each door.

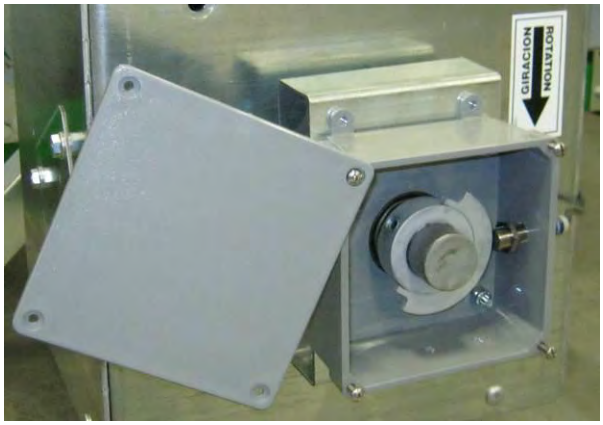


Image 17 – Unload proximity switch

Image 17 shows unload auger proximity switch (at right in box) and rotating target.

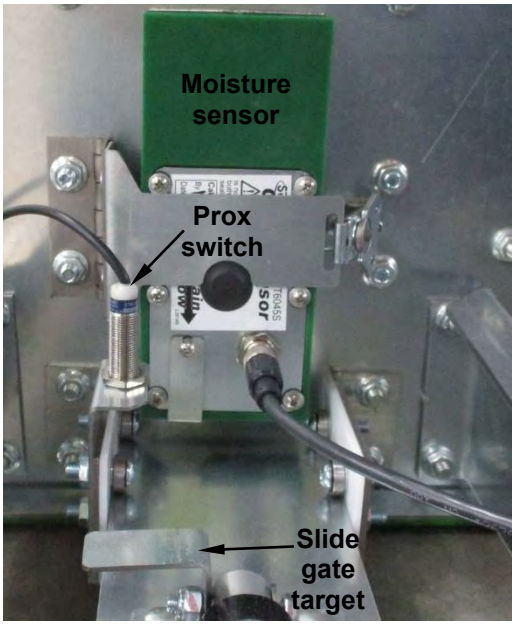


Image 18 – Proximity switch & moisture sensor in optional static sample box

Image 18 shows proximity switch and discharge moisture sensor in optional static sample box.

Moisture Sensor, Paddle Switch Box

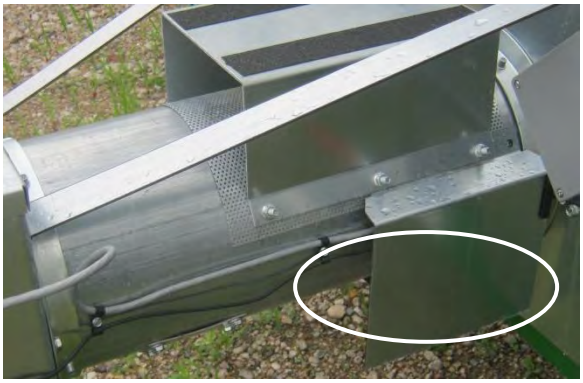


Image 19 – Discharge moisture sensor location

Image 19 shows location of discharge moisture sensor (behind rain shield). Sensor is mounted on bottom of discharge chute.

Image 20 – Paddle switch box

Image 20 shows paddle switch box. It is placed on opposite end of dryer from fill hopper on auger-fill dryer.

Unload Auger, Meter Roll Motor & Proximity Switch

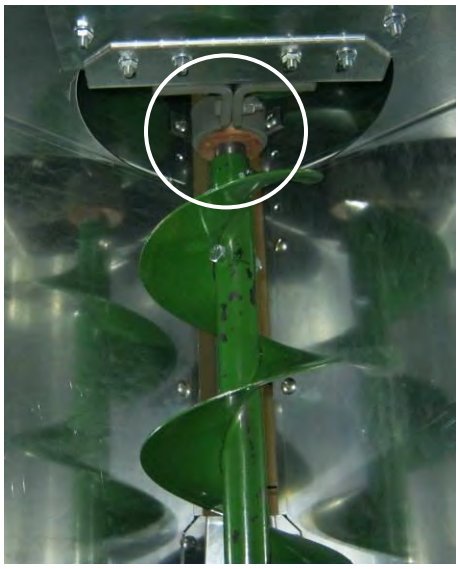


Image 21 – Unload auger

Image 21 shows unload auger with hanger bearing (circled).

Image 22 – Meter roll motor

Image 22 shows meter roll motor with gear reducer.

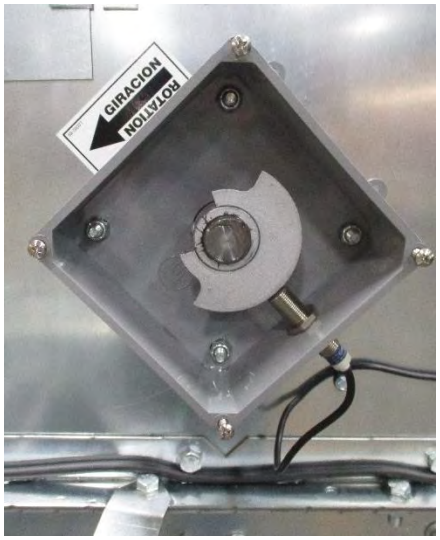


Image 23 – Meter roll proximity switch

Image 23 shows meter roll proximity switch.

Service Doors, Shields

Image 24 – Unload auger/meter roll drive service door

Image 24 shows unload auger/meter roll drive service door. It is located at lower front of dryer, shielding belts for unload auger and chains for meter rolls.

Image 25 – Unload auger service door

Image 25 shows unload auger rear service door. It is located at rear of dryer and also serves as a step (note traction tape) for accessing plenum doors and view ports. Hinged door opens upward.

Image 26 – Load auger shield

Image 26 shows load auger shield. It is installed in field after motor is installed.

Centrifugal-Fan Dryer Lower Plenum Vacuum Cool Door

Image 27 – Vacuum door closed

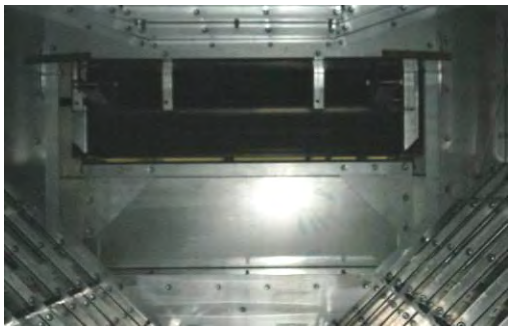


Image 28 – Vacuum door open

Image 27 shows lower plenum vacuum-cool door in closed position. Image 28 shows it in open position. Door must be open when vacuum-cool mode is used, and closed in full-heat mode.

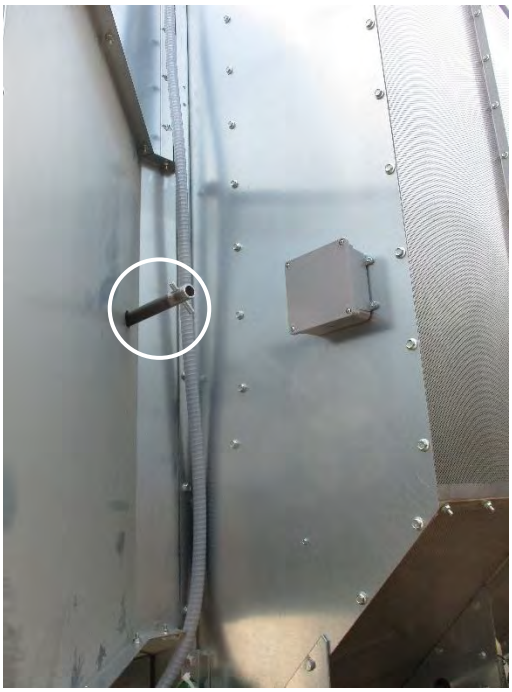


Image 29 – Vacuum-cool door opener handle attachment location

Image 29 shows location (circled) on outside of dryer for attachment of handle to open lower plenum vacuum-cool inlet door.

Cleanouts

Image 30 – Outer grain column cleanout door

Image 30 shows outer grain column cleanout door. Hardware used to lock door closed is circled.

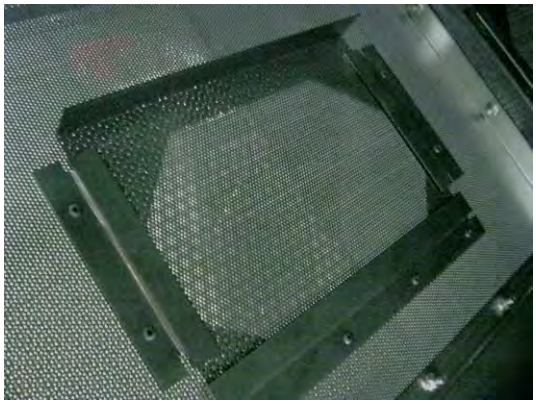


Image 31 – Inner grain column cleanout door

Image 31 shows inner grain column cleanout door.

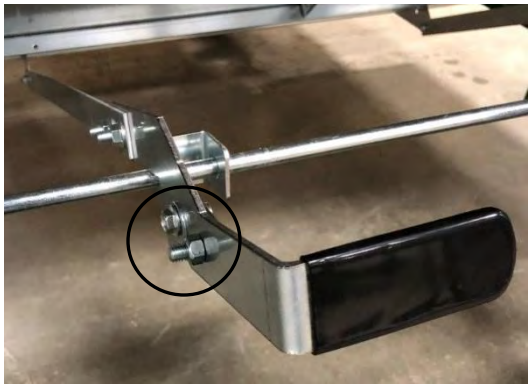


Image 32 – Unload auger cleanout door handle

Image 32 shows handle for unload auger cleanout door. Hardware used to lock door closed is circled.

Image 33 – Plenum cleanout/blowout door

Image 33 shows partially open rear door for plenum cleanout/blowout.

Centrifugal-Fan Dryer Vacuum-Cool, Cleanout & Plenum Divider Doors

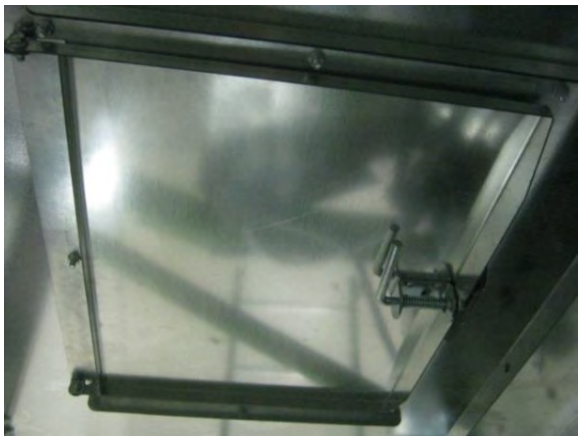


Image 34 – Cleanout door under vacuum-cool duct

Image 34 shows cleanout door under vacuum-cool duct.

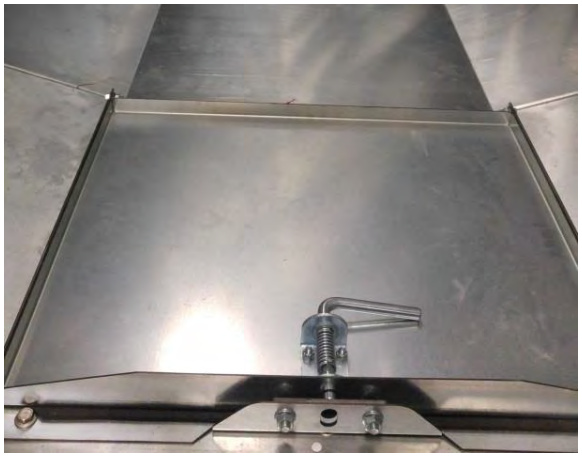


Image 35 – Plenum divider door

Image 35 shows plenum divider door. It should be closed when dryer is run in heat-cool mode. Remove door for operation in full-heat mode.

Image 36 – Plenum divider door by burner

Image 36 shows plenum divider door that is closest to burner. It is propped open for use of dryer in full-heat mode. Close door for operation in heat-cool mode.

Centrifugal-Fan Dryer Control Boxes, Air Inlets, Fan Motor

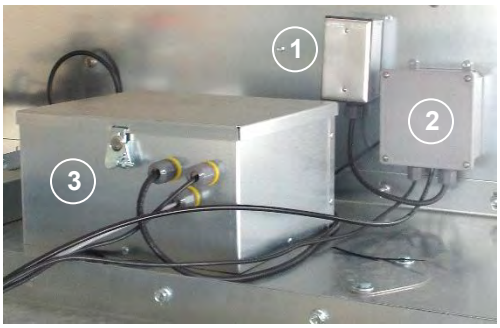


Image 37 – Control boxes on top of heater housing

Image 37 shows:
1. Plenum RTD box.
2. Plenum high limit switch.
3. Heater housing high-limit switch (manual reset) location.

Image 38 – Air inlet louvers

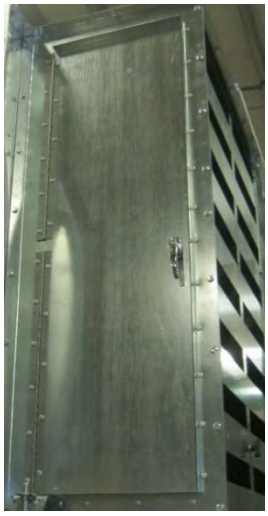


Image 39 – Inlet door

Image 38 shows centrifugal fan air inlet louvers in open (full-heat) position.

Image 39 shows inlet door. There is one on each side of fan. Both doors should be open when dryer is running in full-heat mode.

Image 40 – Fan motor and drive shield

Image 40 shows centrifugal fan motor and drive shield.

QuadraTouch Pro Controller

Image 41 – QuadraTouch Pro controller

QuadraTouch Pro controller (Image 41) should be mounted away from dryer and connected by shielded, direct-bury Ethernet cable.

Main power switch is near bottom right corner. When turned on, switch will illuminate. Panel will boot up shortly and connect with PLC inside main power box.

To communicate with dryer, dryer must be powered up and System Control switch on main power box should point to QuadraTouch Pro.

Back of panel is accessible by removing screws on bottom corners of hinged panel.

Installation Guide

Table of Contents

DATE	REVISION	PAGE
04/13/2023	Added reference to L19876 for installation of single-point grain temp sensors	2
	Updated motor mount attachment instructions	27
	Updated instructions for attachment of grounding wire to static sample box	31

Pre-Installation Requirements

Location

Numerous factors need to be taken into consideration when determining where to install dryer. Important factors to consider when selecting site are:

1. Wet grain supply
2. Dry grain discharge
3. Location of storage bins
4. Other grain handling equipment
5. Maintaining minimum of 914.4mm (3 feet) clearance from other structures on side of dryer and 1524mm (5 feet) minimum clearance from other structures at fan inlet
6. Minimizing handling distances needed for load and unload systems
7. Locating dryer and storage bins in a well-drained area
8. Electrical requirements

Warning: Do not install dryer inside a building or any other area where fuel installation regulations and/or electrical codes and/or insurance requirements do not allow.

Warning: Do not operate dryer in an area where combustible material can be drawn into fan (.914mm [3-feet] minimum clearance), or where load section can contact power line.

Failure to heed these warnings could result in death or serious injury.

Foundation

DISCLAIMER: Sukup Manufacturing Co. assumes no responsibility regarding foundation drawings provided in this document. These are not engineered foundations and shall not be constructed as such. The specifications given are intended for quoting and estimating purposes only. It shall be the sole responsibility of the customer to obtain actual foundation drawings designed by and constructed to the specifications of a licensed professional structural engineer with knowledge of the actual soil and load specific to the project and location. Consideration should also include, but not be limited to, live loads, dead loads, wind loads, soil bearing loads, seismic zone, proper moisture run-off on top of base, and types of aeration applied for the project.

Sukup Manufacturing Co. will not be responsible for any damage to a product, including, but not limited to, any damage that results from poor soil conditions or inadequate concrete type, grade, bearing strength, and construction method. Soil bearing tests must be performed by a competent, independent, engineering firm. Concrete foundation construction must be done by a competent concrete contractor.

Single-Point Column Temperature Sensors

See Assembly Instructions L19876 for installation of single-point column temperature sensors (Standard on stacked dryers; optional on single-module dryers).

Concrete Pad for Single-Module Dryers

A reinforced concrete pad is recommended for dryer stability. Tables 2-1 and 2-2 provide basic quoting guidelines for materials required for each size dryer pad. Quantities are approximate and requirements may vary due to site elevations. See Fig. 2-1 for foundation rebar quoting specifications.

See Pages 2-10 and 2-11 for support leg locations for axial dryers and Pages 2-12 and 2-13 for centrifugal dryers.

DRYER SIZE IN FEET	CONCRETE PAD SIZE CENTIMETERS (FEET)	CUBIC METERS (YARDS) OF CONCRETE
16’	366 cm x 792 cm (12’ x 26’)	5.6 (7.3)
20’	366 cm x 914 cm (12’ x 30’)	6.4 (8.4)
24’	366 cm x 1036 cm (12’ x 34’)	7.2 (9.4)
28’	366 cm x 1158 cm (12’ x 38’)	8.0 (10.5)

Table 2-1 – Concrete pad dimensions for single-module axial dryer

DRYER SIZE IN FEET	CONCRETE PAD SIZE CENTIMETERS (FEET)	CUBIC METERS (YARDS) OF CONCRETE
16’	366 cm x 853 cm (12’ x 28’)	6 (7.8)
20’	366 cm x 975 cm (12’ x 32’)	7 (8.9)
24’	366 cm x 1097 cm (12’ x 36’)	7.6 (9.9)

Table 2-2 – Concrete pad dimensions for single-module centrifugal dryer

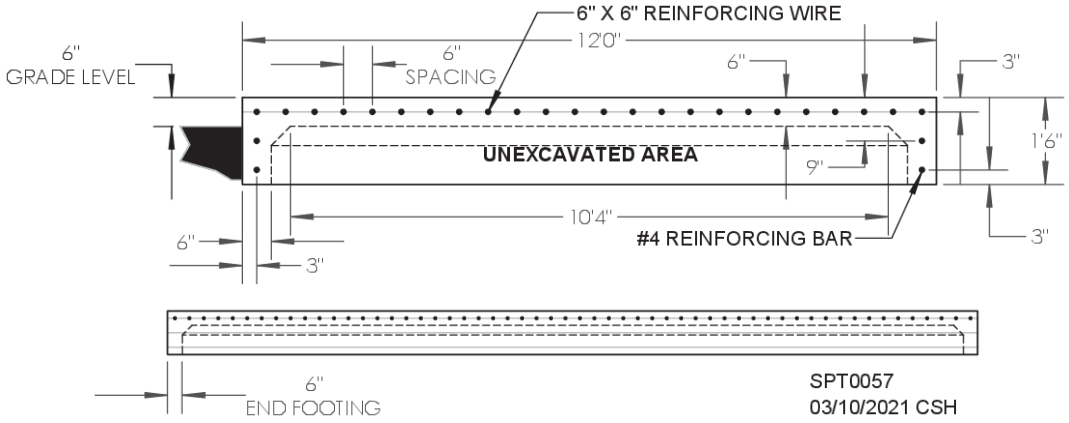


Fig. 2-1 – Foundation specifications for single-module axial or centrifugal dryer

Sukup Manufacturing Co. recommends using Hilti KB-TZ anchors. Table 2-3 shows number of anchors by dryer length. All anchor bolts are 1/2" x 5-1/2”. Total includes two anchors for front leg. Follow Hilti installation instructions provided with anchors.

DRYER LENGTH	ANCHOR QTY.	ANCHOR PART #
16’	14	J07781
20’	18	J07781
24’	18	J07781
28’	22	J07781

Table 2-3 – Anchor bolts by dryer length

Concrete Pad for Stacked Dryers

A reinforced concrete pad is mandatory for dryer stability. Tables 2-4 and 2-5 provide basic quoting guidelines for materials required for each size dryer pad. Quantities are approximate and requirements may vary due to site elevations. See Fig. 2-2 for foundation rebar quoting specifications.

See Pages 2-10 and 2-11 for support leg locations for axial dryers and Pages 2-12 and 2-13 for centrifugal dryers.

DRYER SIZE IN FEET	CONCRETE PAD SIZE CENTIMETERS (FEET)	CUBIC METERS (YARDS) OF CONCRETE
16’	366 cm x 792 cm (12’ x 26’)	17.8 (23.3)
20’	366 cm x 914 cm (12’ x 30’)	20.4 (26.7)
24’	366 cm x 1036 cm (12’ x 34’)	23 (30.1)

Table 2-4 – Pad dimensions for stacked axial dryer

DRYER SIZE IN FEET	CONCRETE PAD SIZE CENTIMETERS (FEET)	CUBIC METERS (YARDS) OF CONCRETE
16’	366 cm x 853 cm (12’ x 28’)	19.1 (25.0)
20’	366 cm x 975 cm (12’ x 32’)	21.7 (28.4)
24’	366 cm x 1097 cm (12’ x 36’)	24.3 (31.8)

Table 2-5 – Pad dimensions for stacked centrifugal dryer

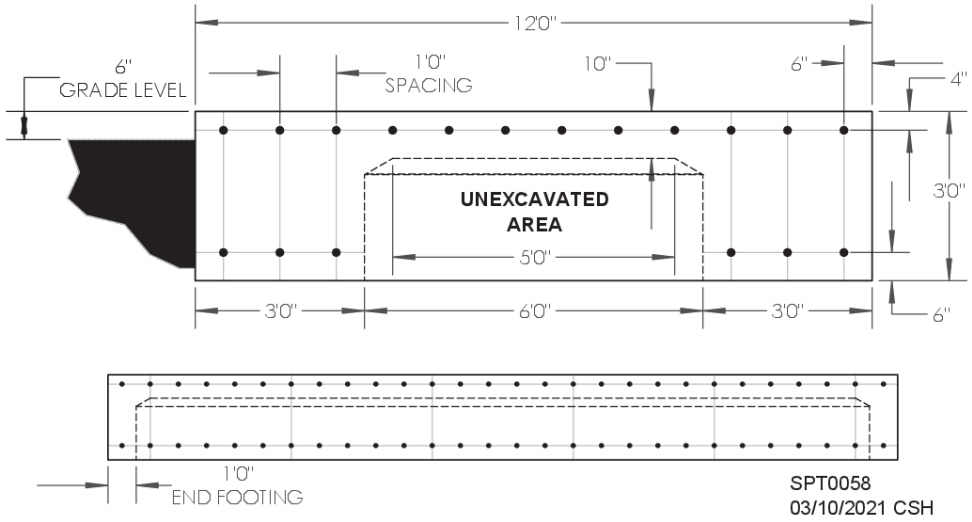


Fig. 2-2 – Foundation specifications for stacked axial or stacked centrifugal dryer Sukup Manufacturing Co. recommends using Hilti HIT-Z anchors with HY 200 adhesive. Table 2-6 shows number of anchors by dryer length, and part number of anchor kit. All anchor bolts are 3/4" x 9-3/4”.

DRYER LENGTH	ANCHOR QTY.	ANCHOR KIT #
16’	16	B1624
20’	20	B1626
24’	24	B1628

Table 2-6 – Anchor bolts by dryer length

Also, all dryers require two 1/2" x 5-1/2” anchors (J07781) to anchor front leg. Follow Hilti installation instructions provided with anchors.

Plan View for Single-Module Dryers

Axial Dryer

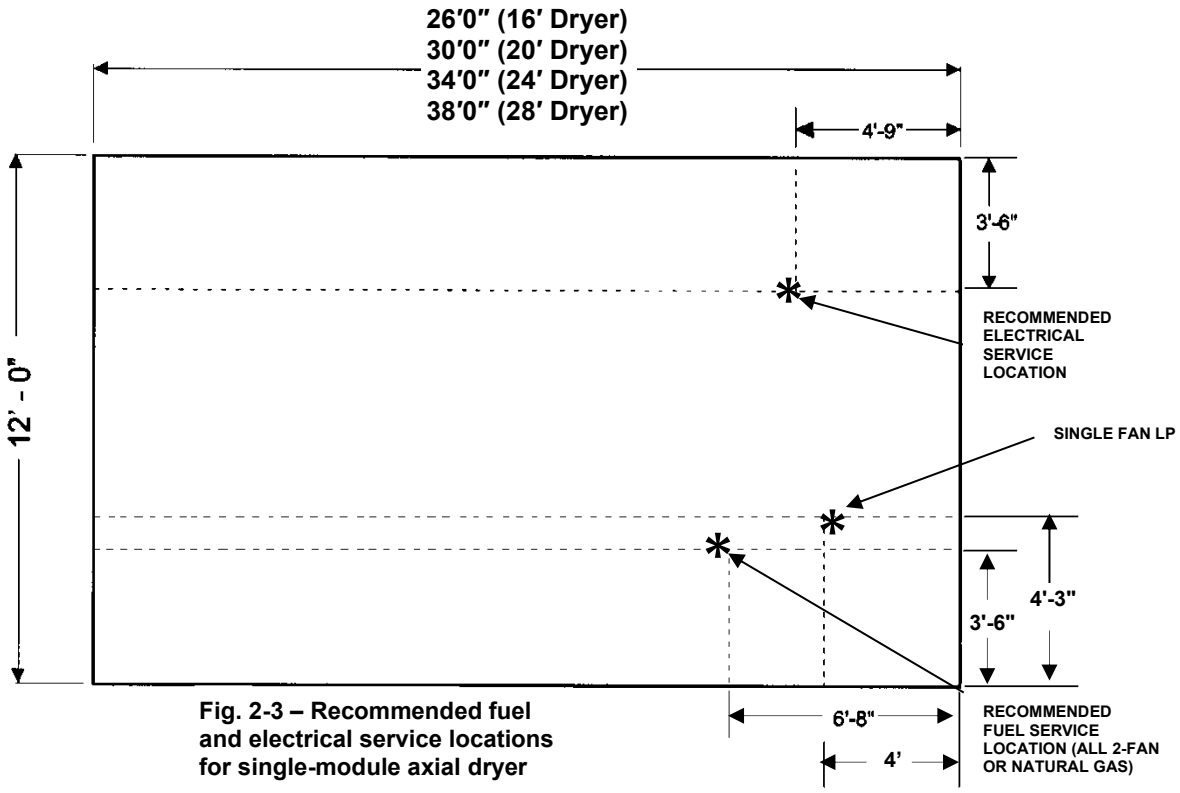
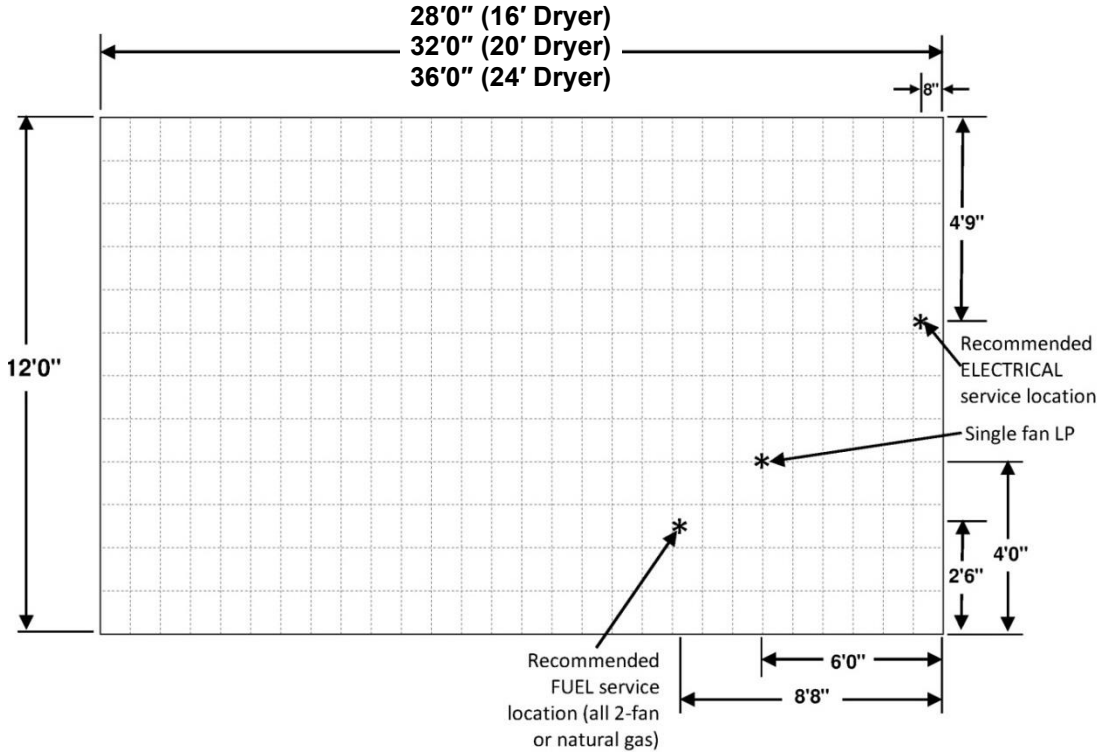


Fig. 2-3 – Recommended fuel and electrical service locations for single-module axial dryer

Centrifugal Dryer



Plan View for Stacked Dryers

1. Pad must be 10″ deep with 36″ wide by 36″ deep footings along each side.
2. Use #4 reinforcing rods (1/2″ or 12.7 mm) 1 ft. on centers. Use in both directions in pad and bottom of footing.
3. Minimum soil bearing capacity = 2000 PSF
4. Concrete specifications:
   A. Compressive strength at 28 days = 4000PSI
   B. Minimum cement content = six (6) sacks per yard
   C. Maximum slump = 4” inches +/- 1 foot

See Fig. 2-5 for minimum rebar specifications and recommended fuel and electrical service locations for **stacked axial dryer**.

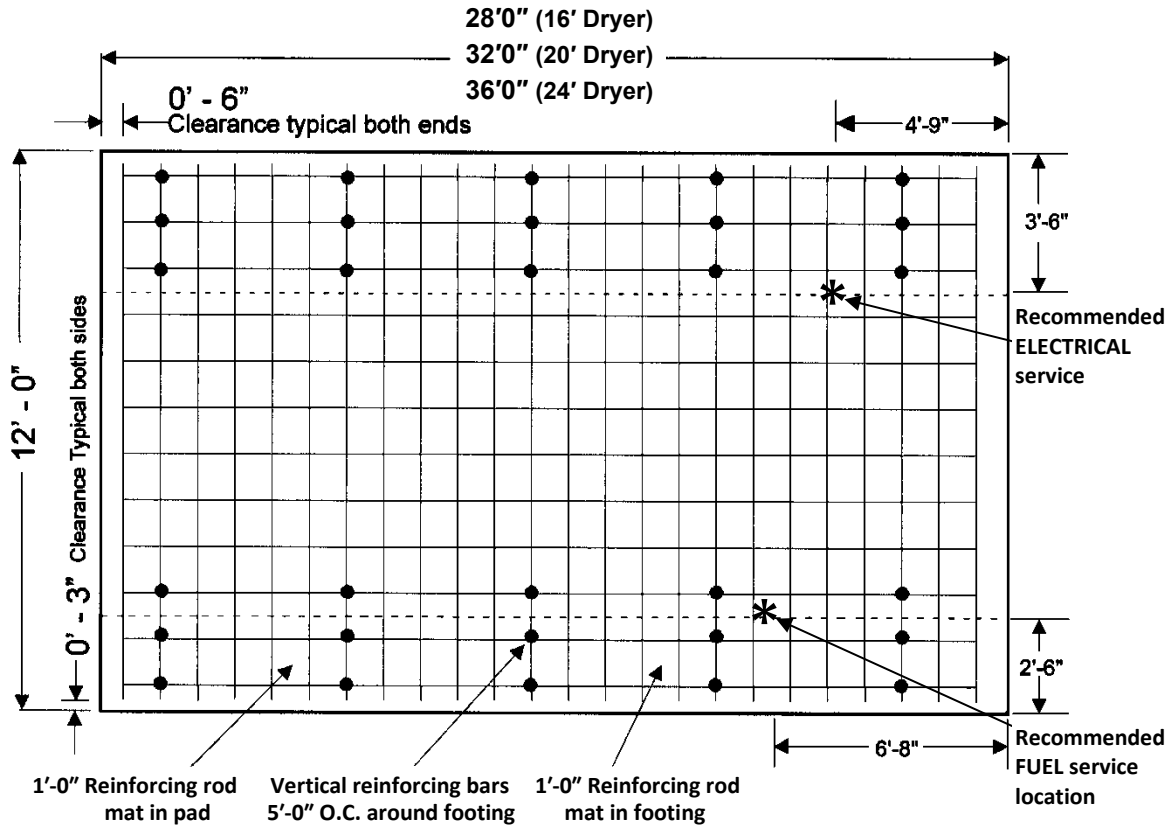


Fig. 2-5 – Minimum rebar specifications and recommended fuel and electrical service locations for stacked axial dryer

See Fig. 2-6 for minimum rebar specifications and recommended fuel and electrical service locations for **stacked centrifugal dryer**.

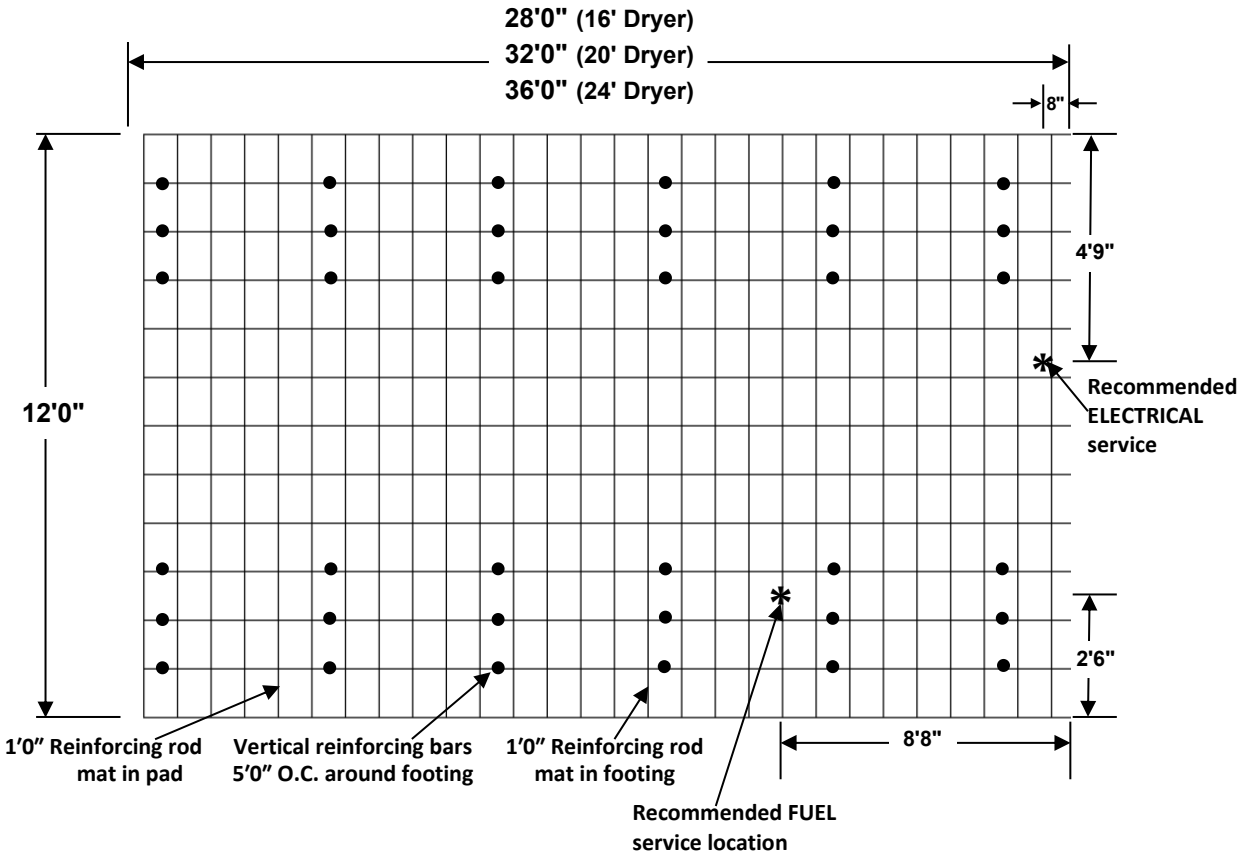


Fig. 2-6 – Minimum rebar specifications and recommended fuel and electrical service locations for stacked centrifugal dryer

Dimensions

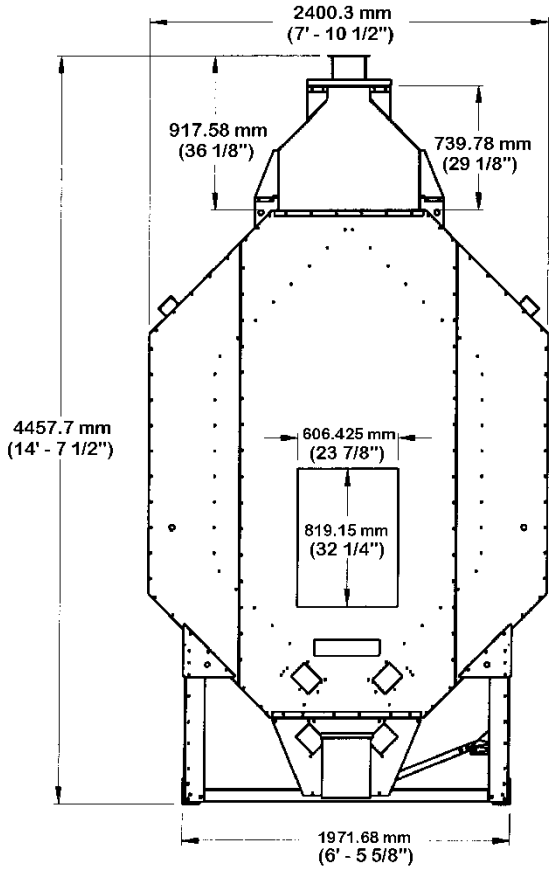


Fig. 2-7 – View from back of dryer

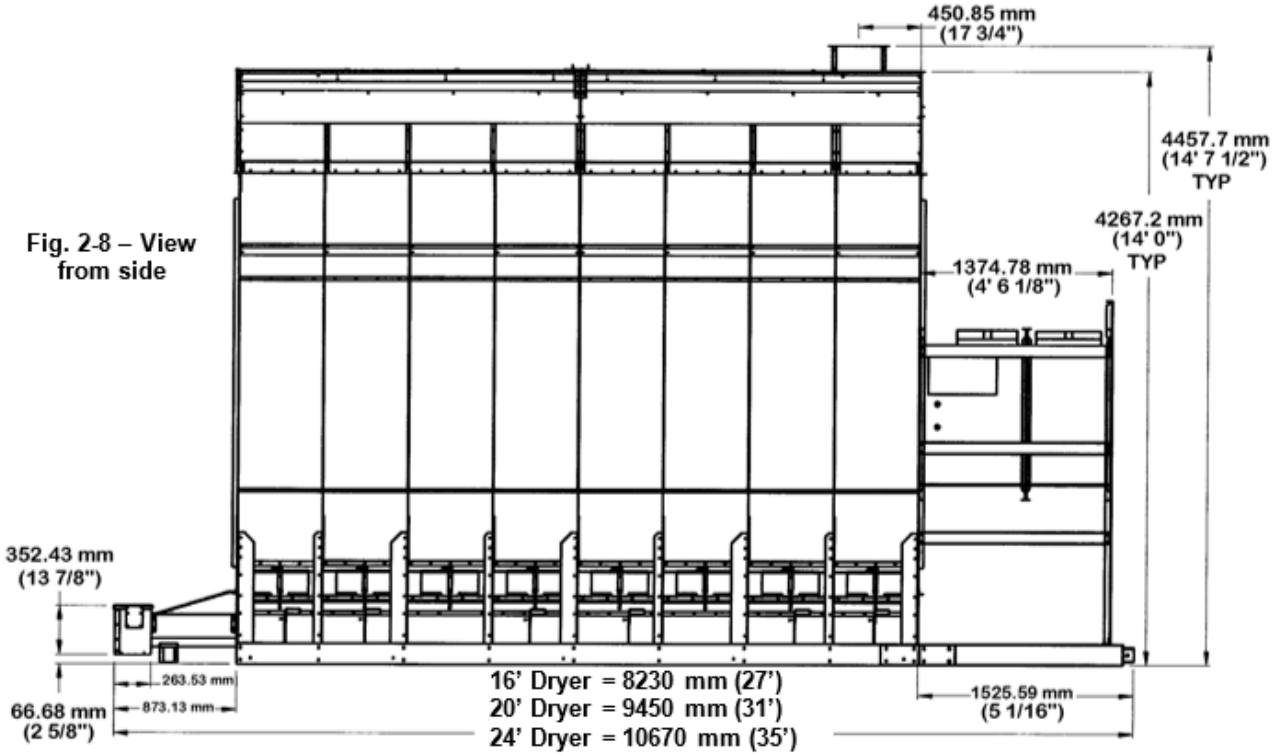


Fig. 2-8 – View from side

Dryer Set-up/Supports

NOTICE Wheel transport kit is for transport only and is NOT to be used when operating dryer. Dryer MUST be mounted and supported in an approved manner. See Fig. 2-9.

Dryer must be mounted a minimum of 406.4 mm (16 inches) above surface to allow for clean-out.

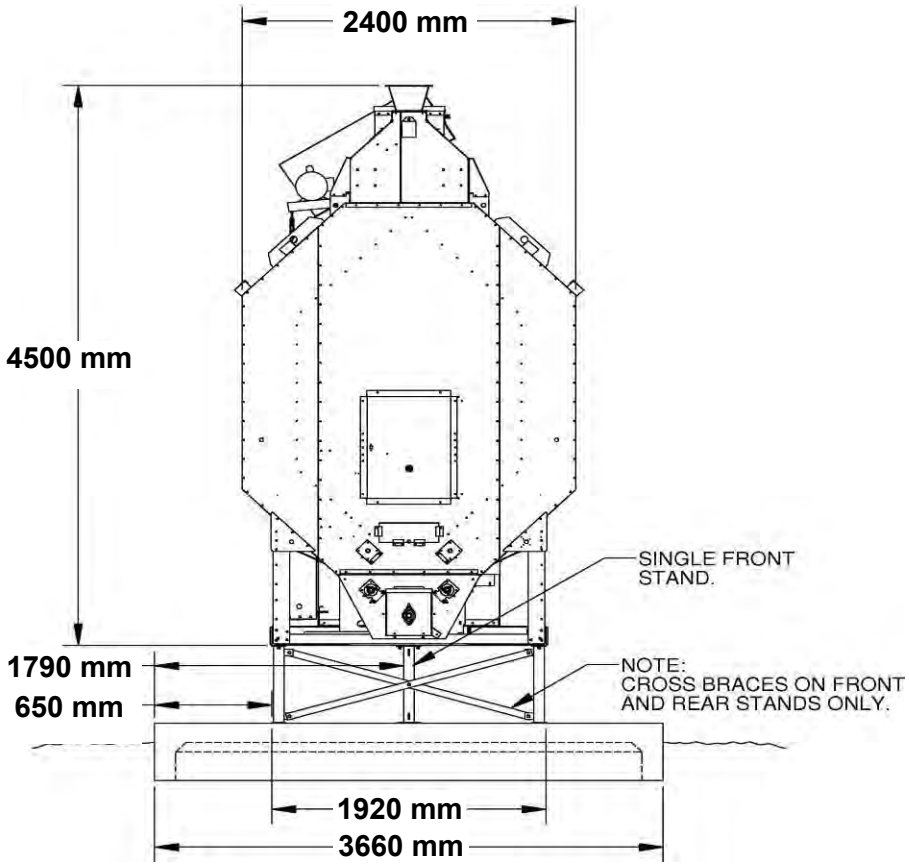


Fig. 2-9 - Cross support braces and rear stand

If dryer is not mounted using Sukup Manufacturing Co. supports, these guidelines must be followed:

- Supports under grain columns must be at least every 1828.8 mm (6 feet).
- Support under front hitch
- Fasten dryer to foundation using brackets or turnbuckles.

Dryer legs are available from Sukup Manufacturing Co. in 2-foot, 3-foot, and 4-foot lengths. Support kits come with necessary hardware to attach legs to dryer frame. Customer must supply hardware to attach to concrete pad. (Required minimum sizes are 1/2″ or 5/8″ hardware).

Optional dryer ladder extensions are available from Sukup in 838mm (33-inch) and 1118mm (44-inch lengths.

Contact your Sukup dealer to order supports and/or extra ladder extensions.

See L2051 to install pipe train access platform on axial-fan dryer.

Support Leg Locations & Dimensions for Axial-Fan Dryers

Drawings on this and following pages show support leg locations and dimensions for 16', 20', 24' & 28' axial dryers.

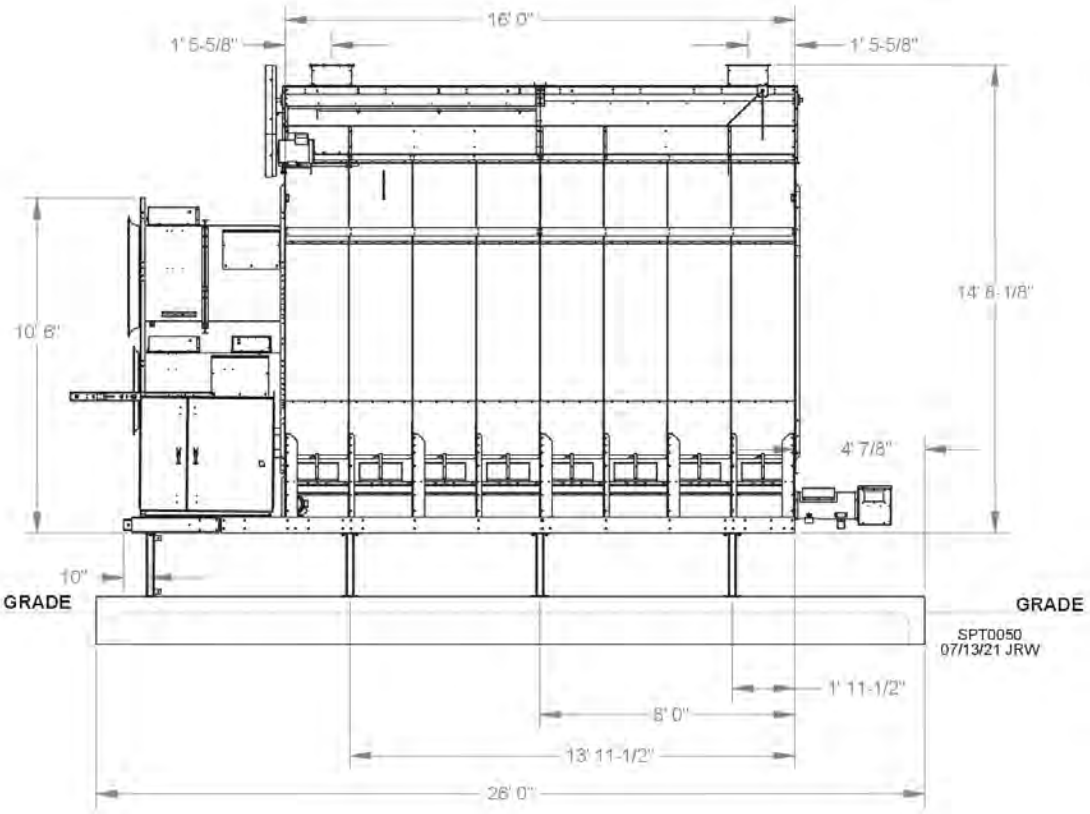


Fig. 2-10 – Leg locations & dimensions for 16' axial dryer

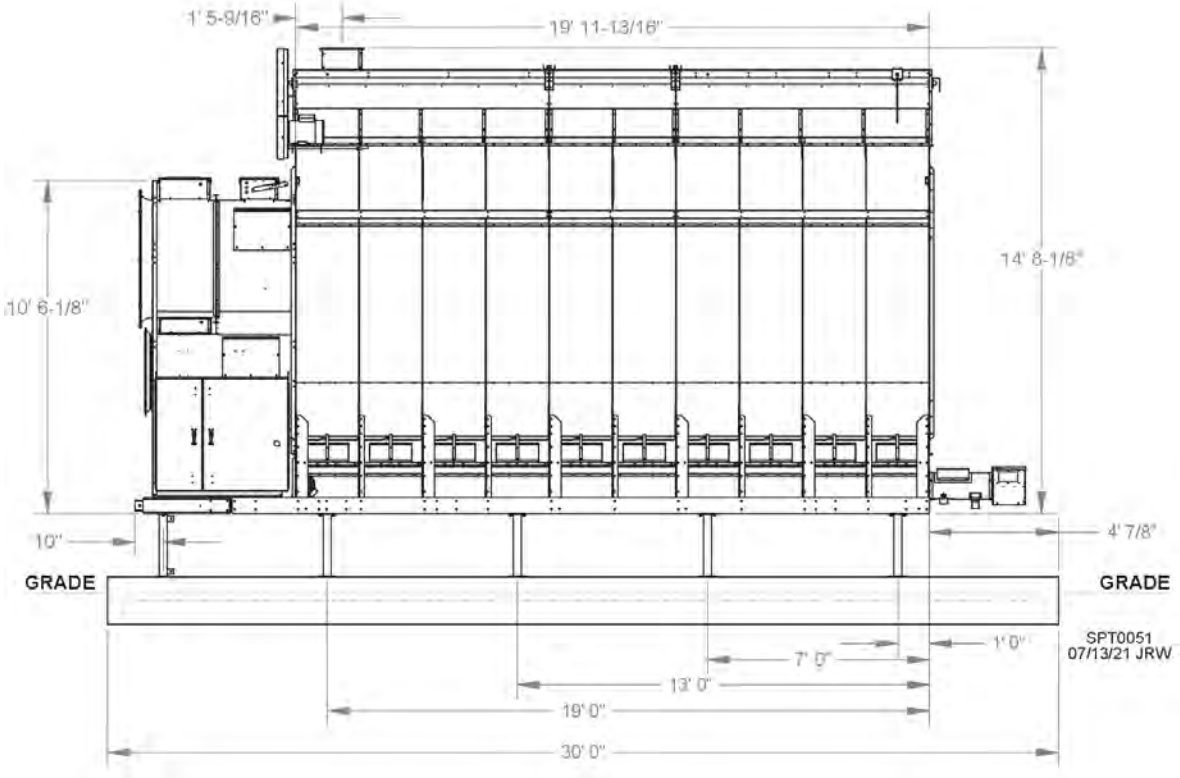


Fig. 2-11 – Leg locations & dimensions for 20' axial dryer

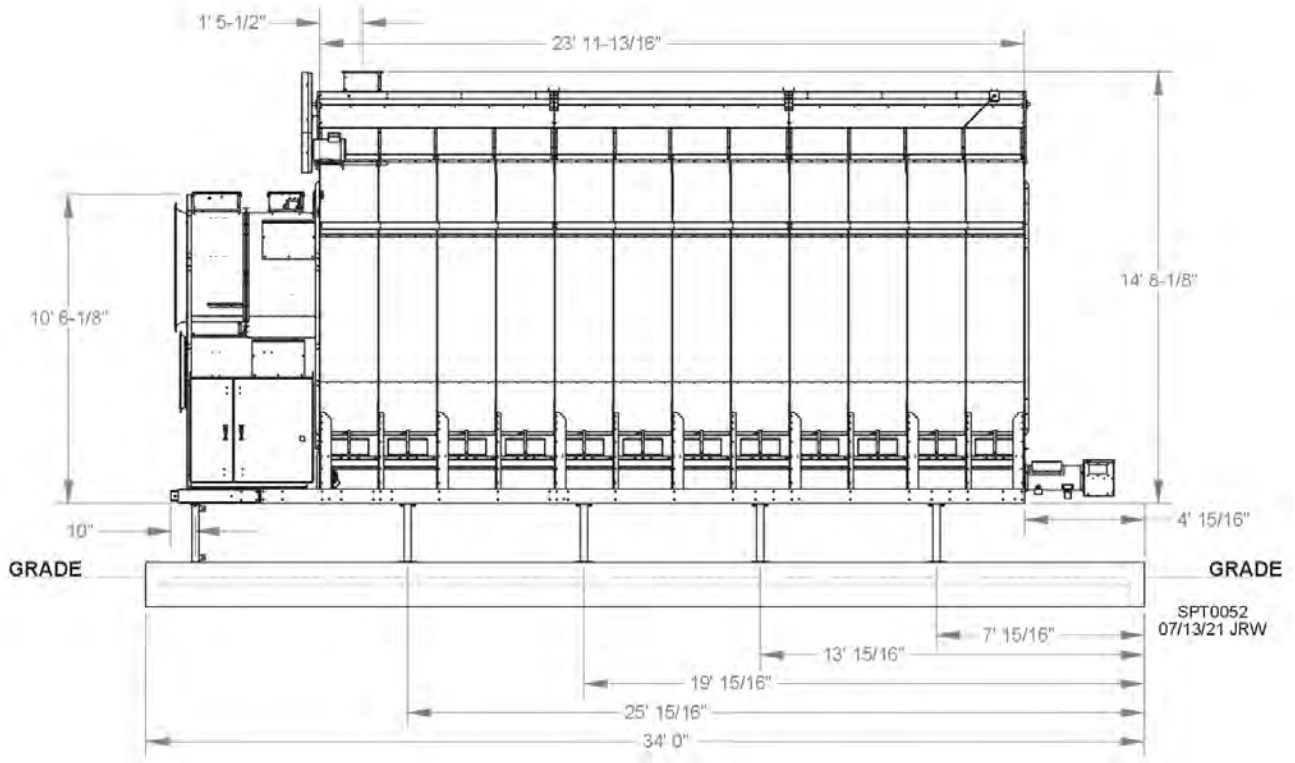


Fig. 2-12 – Leg locations & dimensions for 24' axial dryer

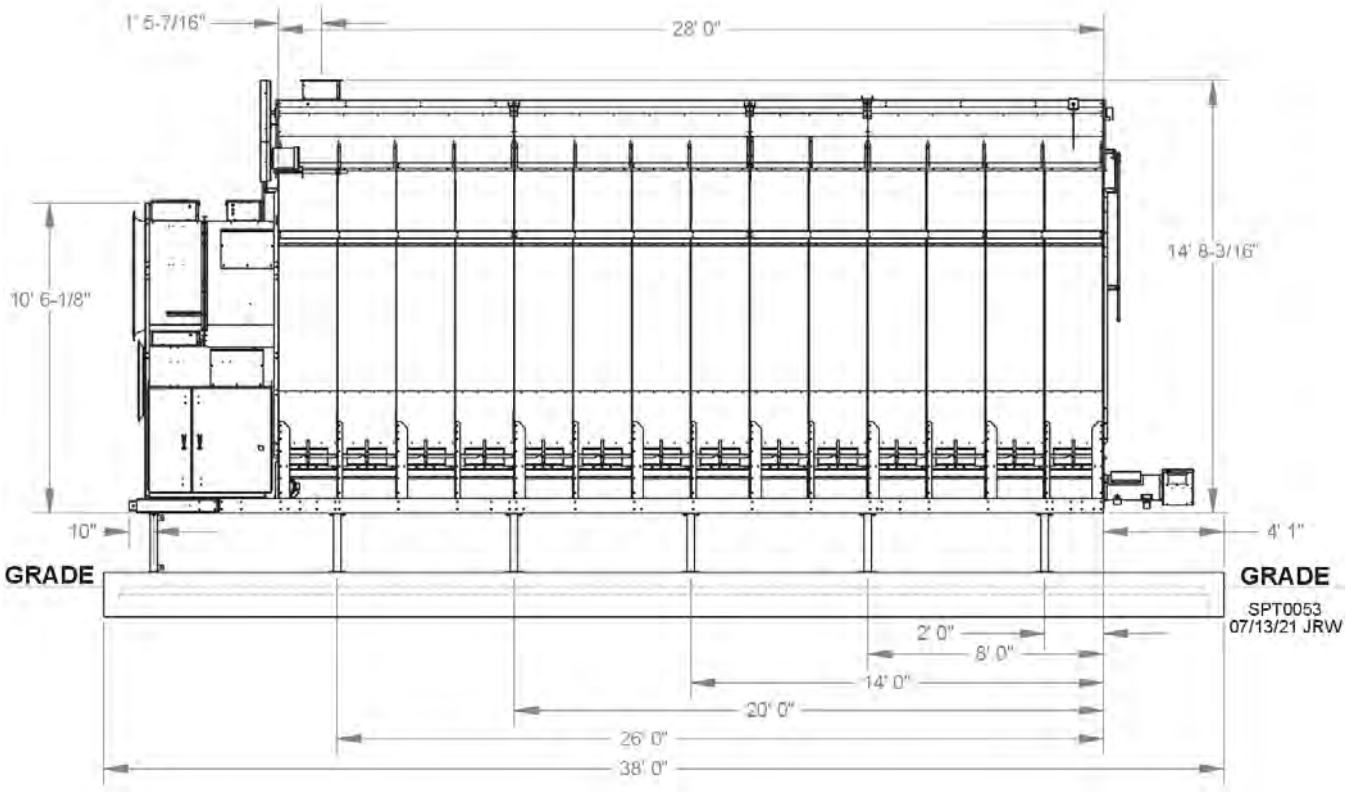


Fig. 2-13 – Leg locations & dimensions for 28' axial dryer

Support Leg Locations & Dimensions for Centrifugal-Fan Dryers

The following drawings show support leg locations and dimensions for 16-, 20- and 24-foot dryers.

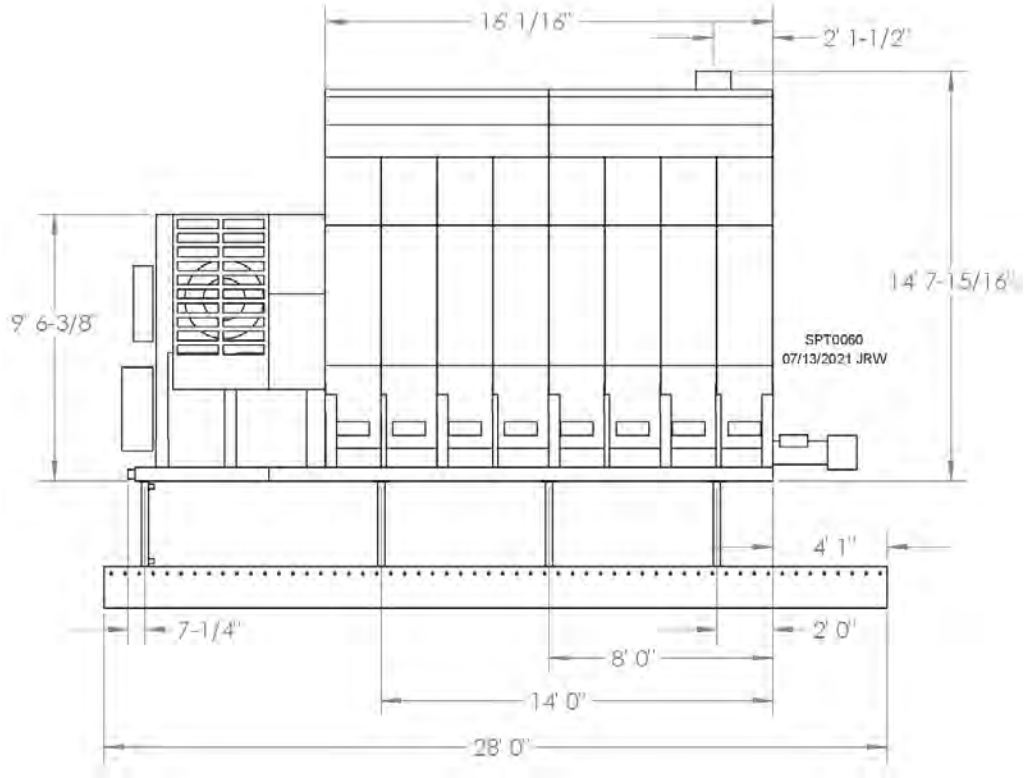


Fig. 2-14 – Support leg locations & dimensions (16' dryer)

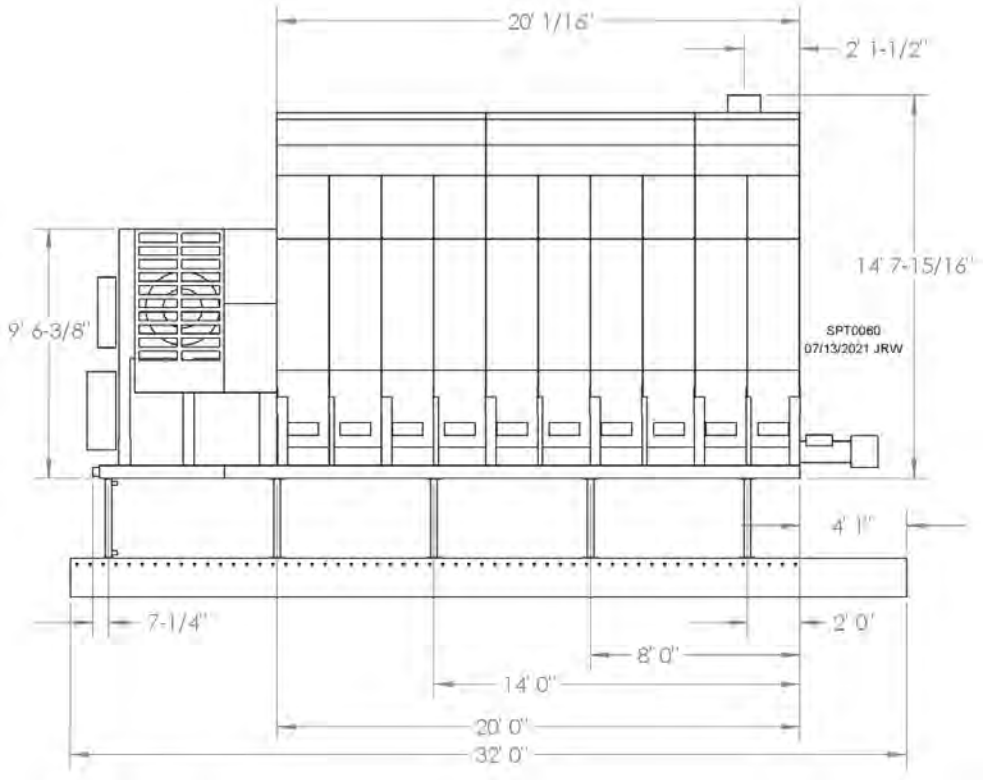


Fig. 2-15 – Support leg locations & dimensions (20' dryer)

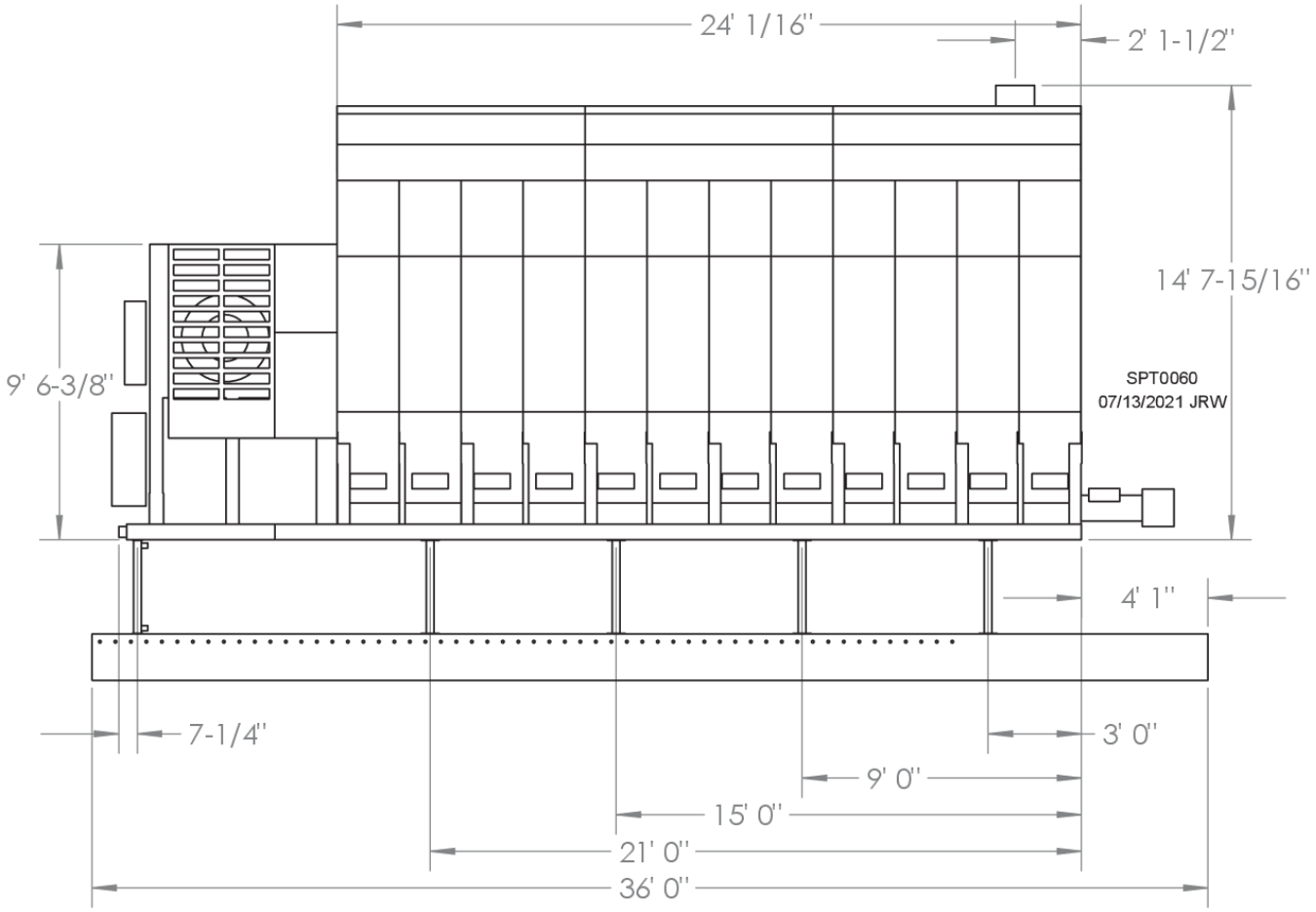


Fig. 2-16 – Support leg locations & dimensions (24’ dryer)

Front Support Leg Installation

Attach support leg to front of dryer using 1/2” hardware and spacers (T42243) as needed to ensure dryer is level. On axial-fan dryer, center of leg should be 10” from end of tongue. See Fig. 2-17. On centrifugal-fan dryer, center of leg should be 7-1/4” from end of tongue. See Fig. 2-18. In both cases, use one spacer above hitch and others as needed below, between leg and hitch tongue to ensure dryer is level.

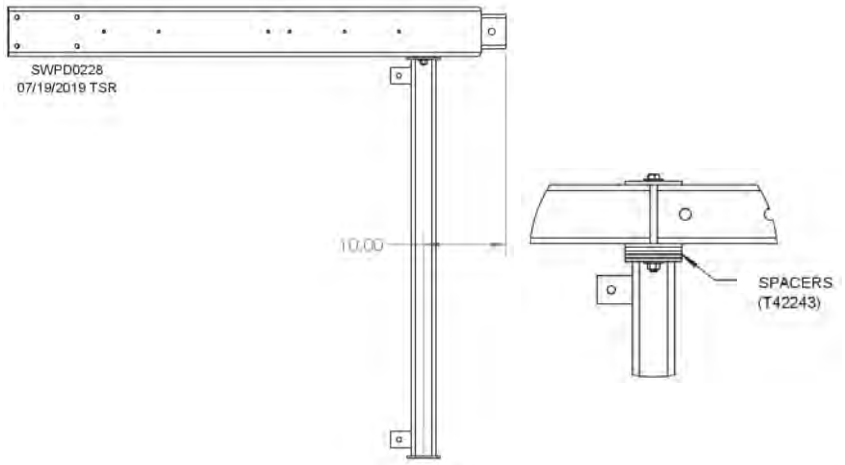


Fig. 2-17 – Attaching front leg of axial-fan dryer
(View from side of hitch and close-up of spacers)

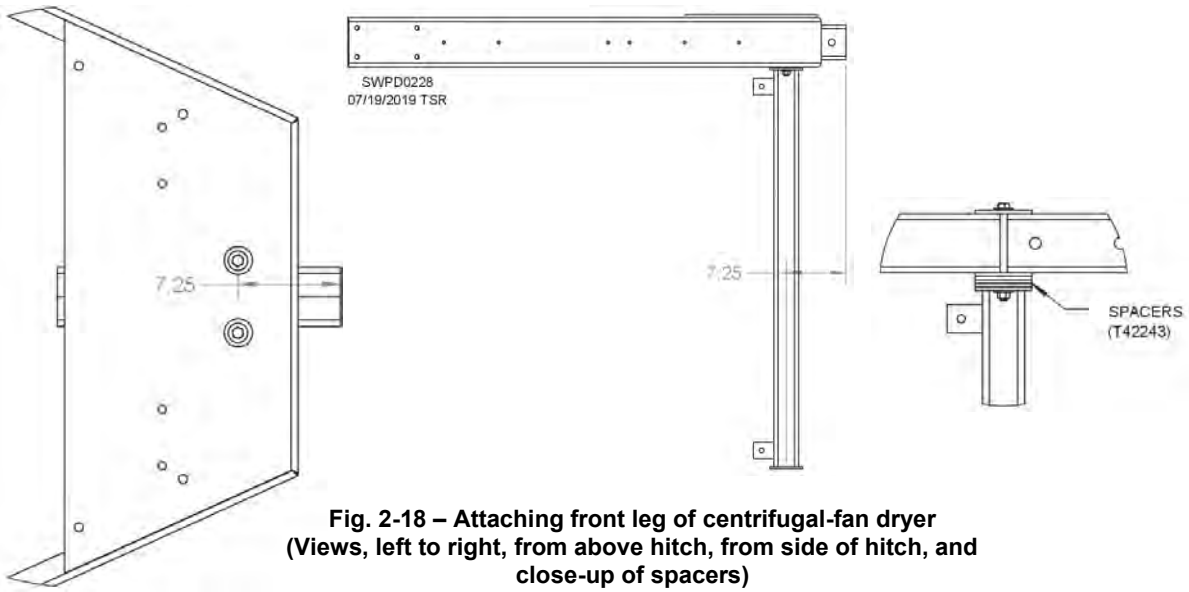


Fig. 2-18 – Attaching front leg of centrifugal-fan dryer
(Views, left to right, from above hitch, from side of hitch, and close-up of spacers)

Lift Bracket Locations for Axial Dryers

WARNING: Do not station a crew member at a location where he/she could be struck by a module that is being lowered into place. Wind can blow modules lifted by crane, potentially striking or crushing a person. Failure to follow this precaution could result in death or serious injury.

Drawings on this and following pages show proper lift bracket locations for 16', 20', 24' and 28' axial-fan dryers. Lift ONLY with Sukup lift bracket or equivalent.

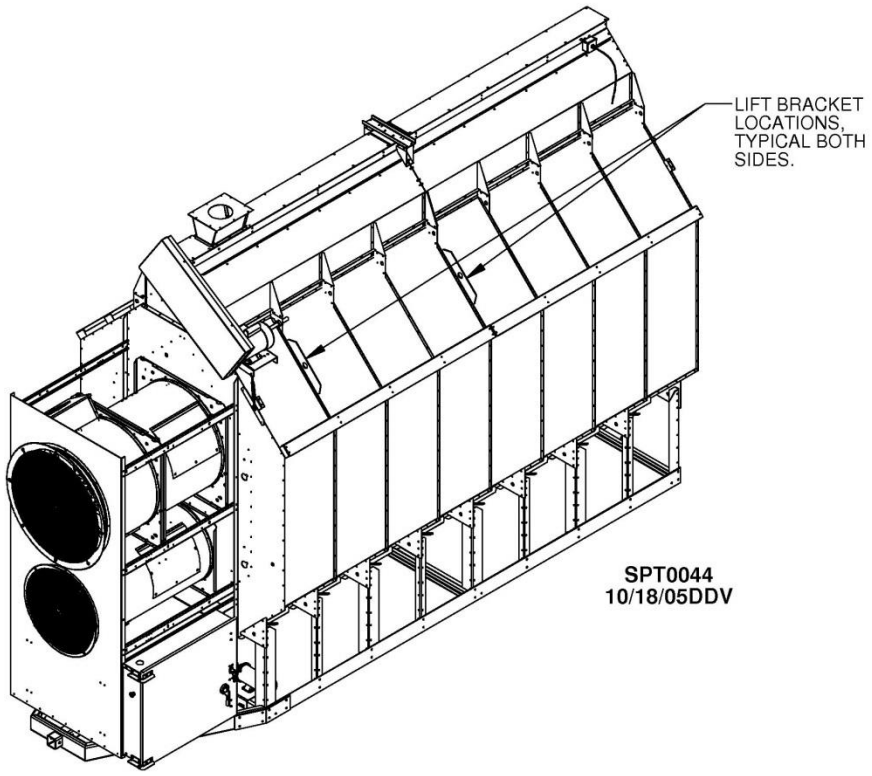


Fig. 2-19 – Lift bracket locations for 16' axial dryer
Approx. dryer weight: 4,082 kg (9,000 lbs.)

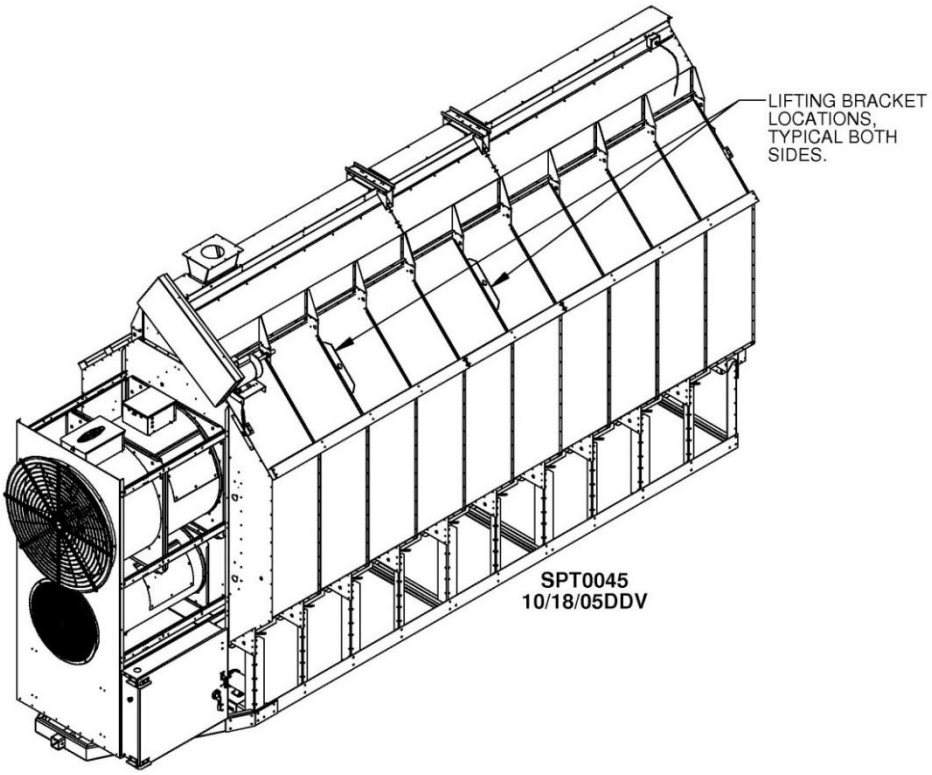


Fig. 2-20 – Lift bracket locations for 20' axial dryer
Approx. dryer weight: 5,443 kg (12,000 lbs.)

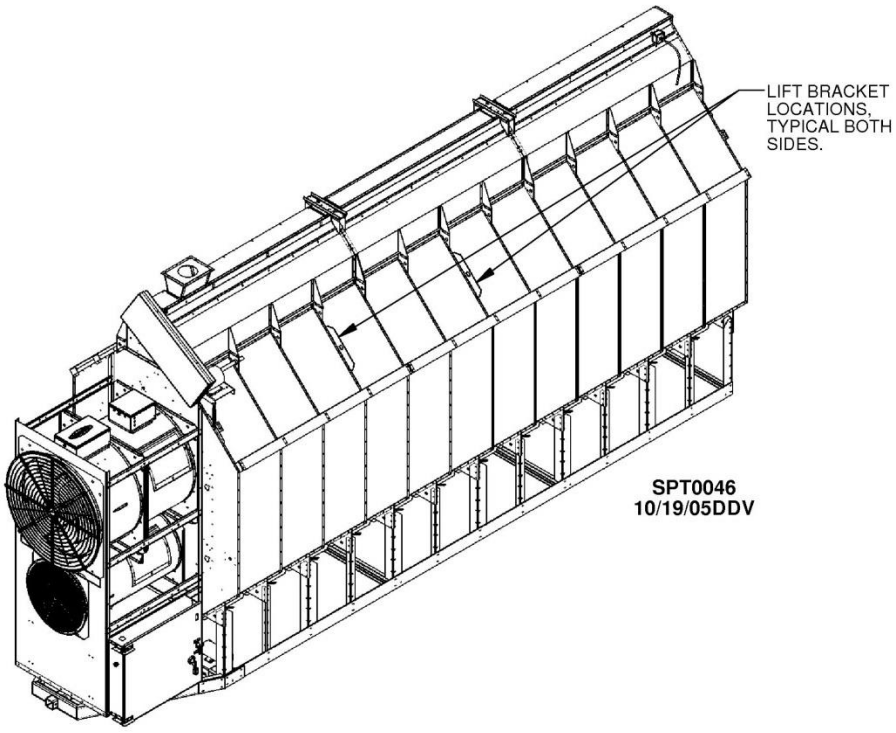


Fig. 2-21 – Lift bracket locations for 24' axial dryer
Approx. dryer weight: 6,350 kg (14,000 lbs.)

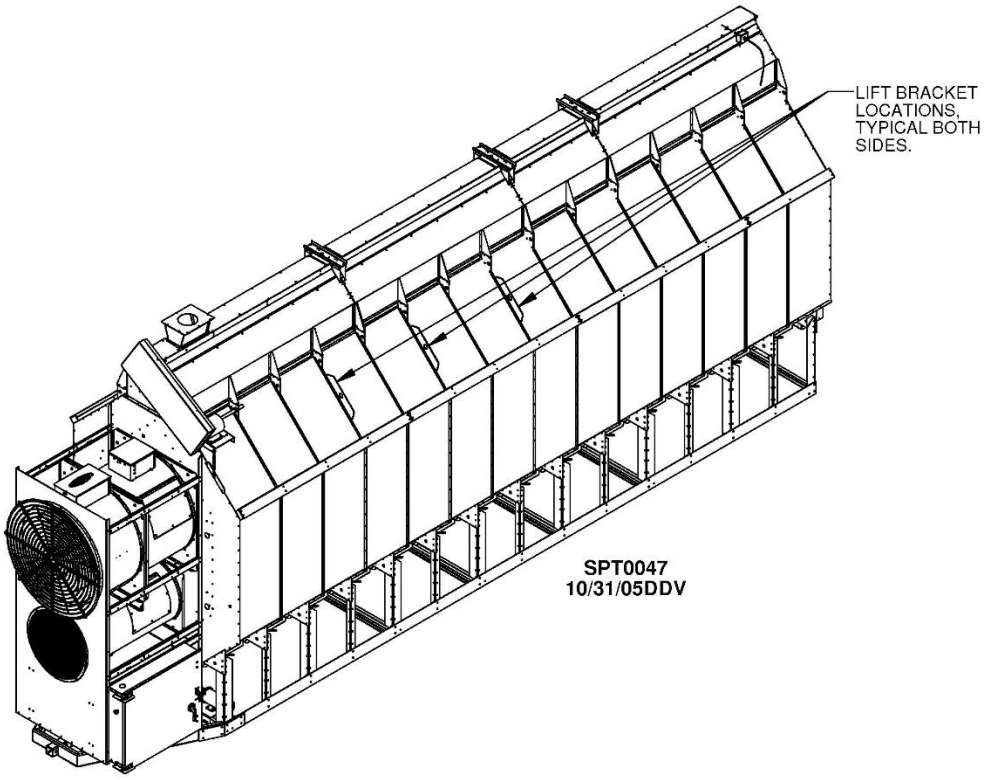


Fig. 2-22 - Lift bracket locations for 28' axial dryer
6 lift points are required.
Approx. dryer weight: 7,257 kg (16,000 lbs.)

Lift Bracket Locations for Centrifugal Dryers

WARNING: Do not station a crew member at a location where he/she could be struck by a module that is being lowered into place. Wind can blow modules lifted by crane, potentially striking or crushing a person. Failure to follow this precaution could result in death or serious injury.

Drawings on this and following page show proper lift bracket locations for 16', 20' and 24' centrifugal dryers. Lift ONLY with Sukup lift bracket or equivalent.

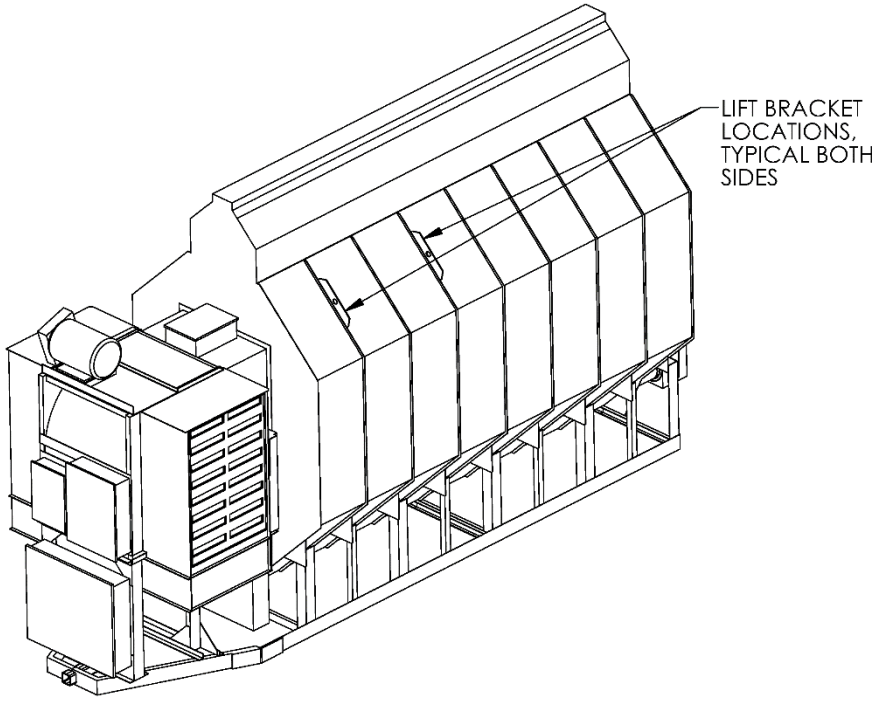


Fig. 2-23 – Lift bracket locations (16' dryer)
Approx. dryer weight: 4,536 kg (10,000 lbs.)

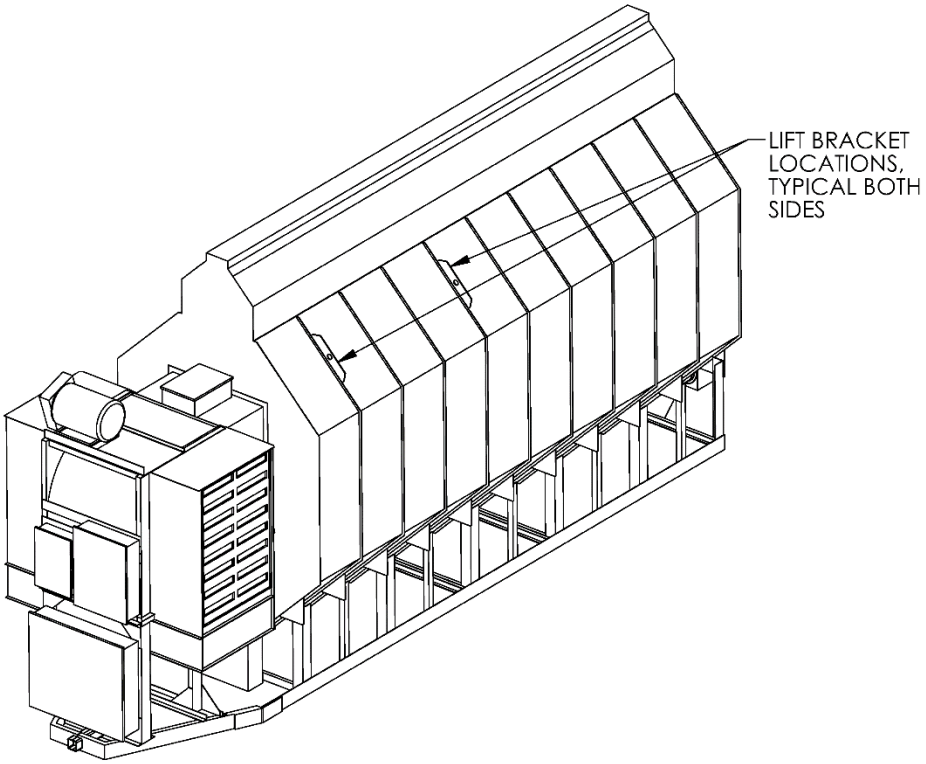


Fig. 2-24 – Lift bracket locations (20' dryer)
Approx. dryer weight: 5,443 kg (12,000 lbs.)

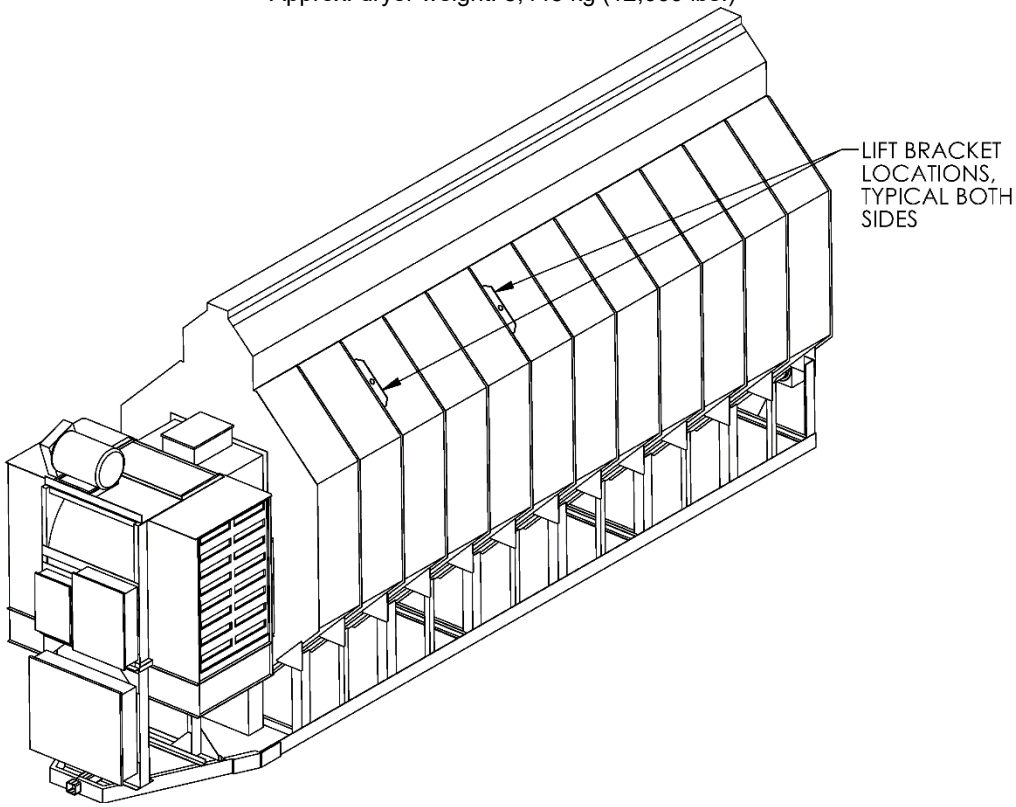


Fig. 2-25 – Lift bracket locations (24' dryer)
Approx. dryer weight: 5,897 kg (13,000 lbs.)

Gas and Electric Hookup

Initial gas and electric hookups should be performed only by qualified gas and electrical service technicians in accordance with all applicable local and national code requirements.

Supporting electrical panels or combinations of electrical components supplied by end user must be compliant with current editions of **BS EN 60204-1.**

Fuel Information

LIQUID PROPANE

Sukup dryers using liquid propane must be connected to a supply tank to draw liquid from bottom of tank. Tank should be 3785.4 liters (1,000 gallons). Connection to dryer should be with a flexible hose designed for LP gas. Have LP gas supplier make proper connections and install safety controls.

Do not use tanks that have previously been used for ammonia or fertilizer solutions. These substances are extremely corrosive and can damage fuel supply and burner parts.

Water in supply tank may freeze in pipe train or controls, causing damage. To ensure tank is free of moisture, the best precaution is to purge with methanol. Check with gas supplier if this needs to be done. Do not use tanks with an accumulation of oil or heavy hydrocarbons from long use on a vapor withdrawal system.

If more than one tank is needed to supply liquid propane to dryer, vapor lines of tanks must be connected together to equalize pressure from each tank. Have LP gas supplier make proper connections and install safety controls to meet local codes and national fire protection standards.

LIQUID PROPANE FUEL SYSTEM SPECIFICATIONS FOR AXIAL DRYERS

DRYER SIZE	MAXIMUM HEAT CAPACITY (BTU/HR)	MAXIMUM FUEL FLOW L/HR (GAL/HR)	FUEL LINE SIZE (MINIMUM UP TO 100') MM (IN)
16 FT, SINGLE HEATER	6,000,000	246 (65)	12.7 (1/2")
16 FT, 2 MODULE	13,000,000	537.5 (142)	19.1 (3/4")
20 FT, SINGLE HEATER	7,000,000	287.7 (76)	12.7 (1/2")
20 FT, 2 MODULE	16,500,000	681.4 (180)	19.1 (3/4")
24 FT, SINGLE HEATER	10,000,000	412.6 (109)	19.1 (3/4")
24 FT, 2 MODULE	20,000,000	825.2 (218)	25.4 (1")

Table 2-7 – Liquid propane specifications

Image 2-1 – Liquid propane inlet

1. See Table 2-7 for recommended fuel line size.
2. DO NOT use a pressure regulator at supply tank.
3. Open LP shut-off valves slowly to prevent inadvertent closing of excess flow valves.
4. Fuel flow and line size in Table 2-7 assume a temperature of -12.2°C (10°F) or higher.

NATURAL GAS

Sukup dryers for natural gas use are designed to function at a heat value of approximately 1000 BTU per cubic foot. A regulated pressure of 1 bar (15 PSI) must be provided for connection to dryer. **IMPORTANT: Regulator must be in accordance with standard BS EN 88 or BS EN 334.** Ensure also that sufficient volume is maintained for correct operating pressure.

NATURAL GAS FUEL SYSTEM RECOMMENDATIONS FOR AXIAL DRYERS

DRYER SIZE	MAXIMUM HEAT CAPACITY (BTU/HR)	MAXIMUM FUEL FLOW L/HR (CUBIC FEET/HR)	FUEL LINE SIZE Minimum up to 100' MM (IN)
16 FT, SINGLE HEATER	6,000,000	169,901 (6000)	38.1 (1-1/2")
16 FT, 2 MODULE	13,000,000	368,119 (13,000)	63.5 (2-1/2")
20 FT, SINGLE HEATER	7,000,000	198,218 (7000)	50.8 (2")
20 FT, 2 MODULE	16,500,000	467,228 (16,500)	63.5 (2-1/2")
24 FT, SINGLE HEATER	10,000,000	283169 (10,000)	50.8 (2")
24 FT, 2 MODULE	20,000,000	566,337 (20,000)	63.5 (2-1/2")

Table 2-8 – Natural gas specifications

See Table 2-8 for recommended fuel line size.

Image 2-2 – Natural gas inlet

LIQUID PROPANE FUEL SYSTEM SPECIFICATIONS FOR CENTRIFUGAL DRYERS

DRYER SIZE	MAXIMUM HEAT CAPACITY (BTU/HR)	MAXIMUM FUEL FLOW L/HR (GAL/HR)	FUEL LINE SIZE (MINIMUM UP TO 100') MM (IN)
16 FT, SINGLE HEATER	6,000,000	246 (65)	12.7 (1/2")
16 FT, 2 MODULE	13,000,000	537.5 (142)	19.1 (3/4")
20 FT, SINGLE HEATER	7,000,000	287.7 (76)	12.7 (1/2")
20 FT, 2 MODULE	16,500,000	681.4 (180)	19.1 (3/4")
24 FT, SINGLE HEATER	10,000,000	412.6 (109)	19.1 (3/4")
24 FT, 2 MODULE	20,000,000	825.2 (218)	25.4 (1")

Table 2-9 – Liquid propane specifications

Image 2-3 – Liquid propane inlet

1. See Table 2-9 for recommended fuel line size.
2. DO NOT use a pressure regulator at supply tank.
3. Open LP shut-off valves slowly to prevent inadvertent closing of excess flow valves.
4. Fuel flow and line size in Table 2-9 assume a temperature of -12.2°C (10°F) or higher.

NATURAL GAS

Sukup dryers for natural gas use are designed to function at a heat value of approximately 1000 BTU per cubic foot. A regulated pressure of 1 bar (15 PSI) must be provided for connection to the dryer. **IMPORTANT: Regulator must be in accordance with standard BS EN 88 or BS EN 334.** Ensure also that sufficient volume is maintained for the correct operating pressure.

NATURAL GAS FUEL SYSTEM RECOMMENDATIONS FOR CENTRIFUGAL DRYERS

DRYER SIZE	MAXIMUM HEAT CAPACITY (BTU/HR)	MAXIMUM FUEL FLOW L/HR (CUBIC FEET/HR)	FUEL LINE SIZE Minimum up to 100' MM (IN)
16 FT, SINGLE HEATER	6,000,000	169,901 (6000)	38.1 (1-1/2")
16 FT, 2 MODULE	13,000,000	368,119 (13,000)	63.5 (2-1/2")
20 FT, SINGLE HEATER	7,000,000	198,218 (7000)	50.8 (2")
20 FT, 2 MODULE	16,500,000	467,228 (16,500)	63.5 (2-1/2")
24 FT, SINGLE HEATER	10,000,000	283169 (10,000)	50.8 (2")
24 FT, 2 MODULE	20,000,000	566,337 (20,000)	63.5 (2-1/2")

Table 2-10 – Natural gas specifications

Image 2-4 – Natural gas inlet

See Table 2-10 for recommended fuel line size.

Wet Bin Assembly

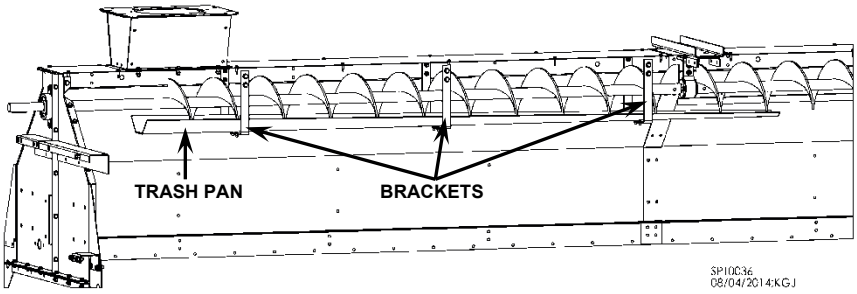


Fig. 2-26 – Trash pan and bracket installation

1. Bolt trash pan brackets to wet bin on filling end of dryer. Bolt trash pan to trash pan brackets. See Fig. 2-26.
2. Position the half of the wet bin without the auger into upright position. Pivot the side with the auger into upright position. Bolt wet bin together at end plate seams, side seams, pivot seams, and top hanger support.
3. Attach fill auger paddle switch assembly. Locate holes for paddle switch in wet bin on end opposite of filling end. See Fig. 2-27.

NOTICE **Holes are pre-punched for mounting paddle switch at either end. Remove desired plastic plugs. Leave plugs in end not being used.**

NOTICE **Any open bolt holes in wet bin should be filled with bolts and secured with nuts to prevent grain leakage.**

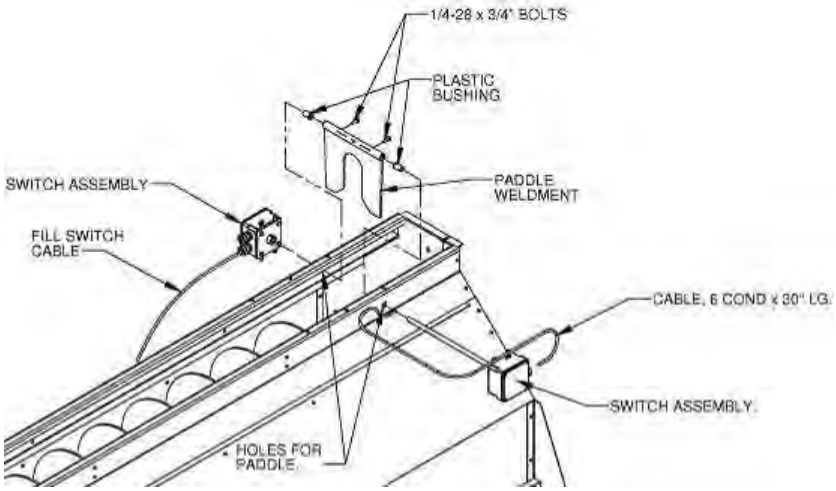


Fig. 2-27 – Paddle switch installation

NOTE: Paddle switches must be placed on end of dryer opposite of fill hopper.

4. Slide a plastic bushing on each side of wet bin from inside out. Slide shaft with tilt switch box through bushing on one side of wet bin. Position paddle weldment inside of wet bin and slide shaft through pipe of paddle weldment. Slide shaft through bushing on other side of wet bin. Attach other switch to shaft, ensuring both switch boxes are aligned. Tighten setscrews of paddle weldment onto shaft, making sure paddle and boxes on shaft are square and paddle can pivot freely. See Fig. 2-27.

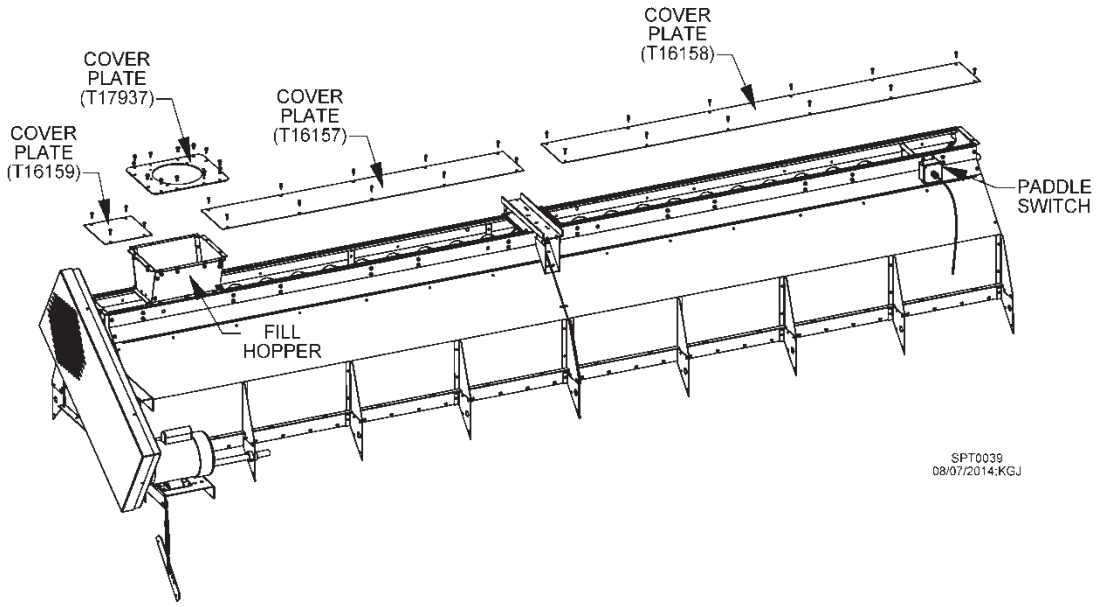


Fig. 2-28 – Fill hopper installation at front of wet bin (16' dryer shown)

5. Bolt fill hopper to top of wet bin on filling end of dryer. Place cover plates on top and attach with 1/4 x 1" self-drill screws. See Fig. 2-28 for front-fill and Fig. 2-29 for rear-fill dryer.

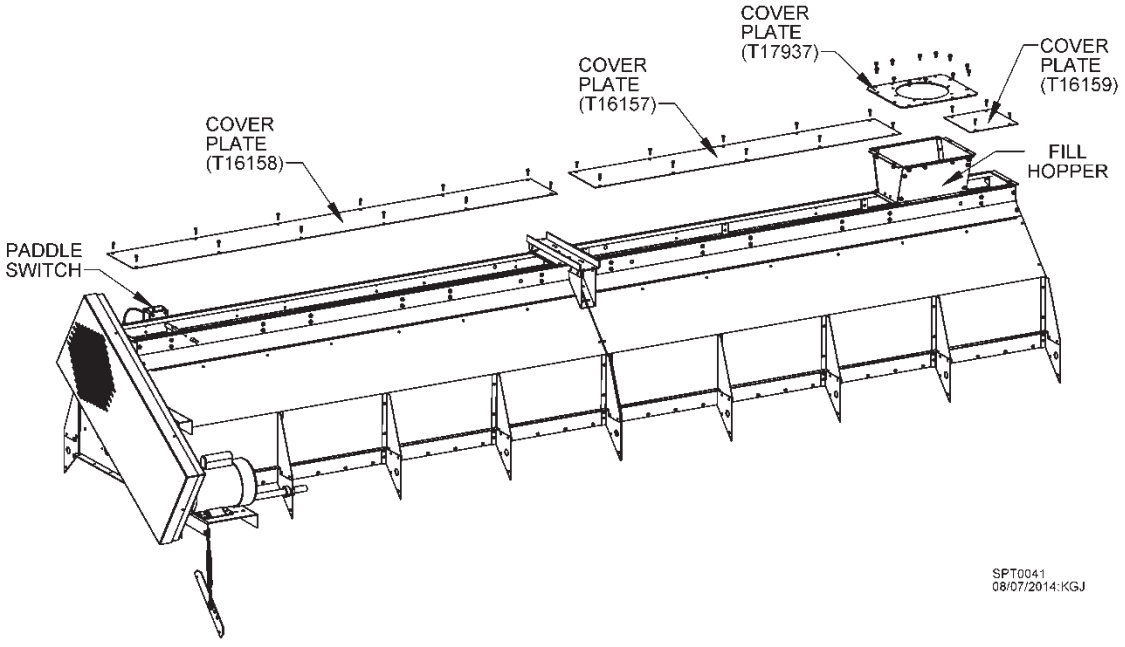


Fig. 2-29 – Fill hopper installation at rear of wet bin (16' dryer shown)

Top Load Auger Motor and Shields

Fig. 2-30 shows components of top load auger drive assembly. Follow Steps 1-12 to assemble.

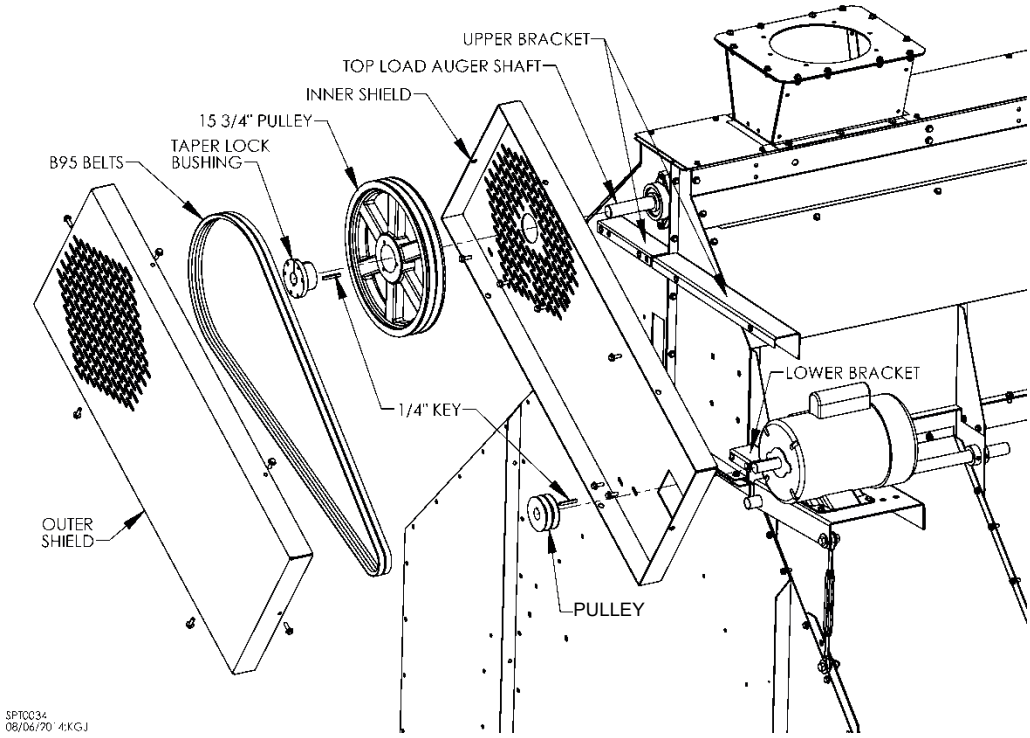


Fig. 2-30 – Top load auger components

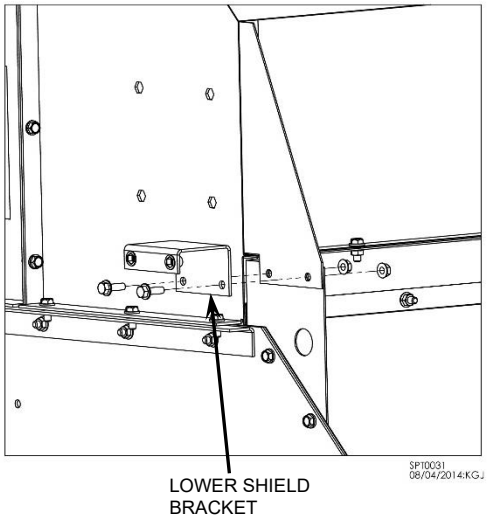


Fig. 2-31 – Lower shield bracket installation

1. Bolt lower shield bracket to end of dryer using 5/16 x 1” bolts and 5/16 nuts. See Fig. 2-31.

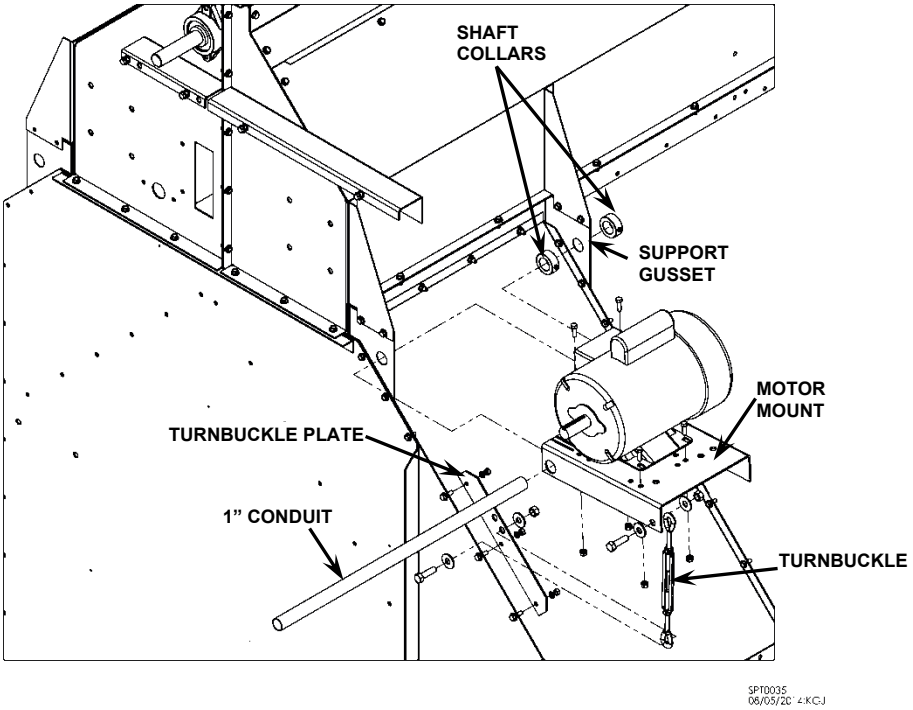


Fig. 2-32 - Motor mount components

2. Align motor mount conduit holes with holes in support gussets. Slide a 1" conduit tube through gussets and motor mount as shown in Fig. 2-32.
3. Position shaft collars on each side of gusset as shown in Fig. 2-32.
4. Tighten shaft collars on each side of gusset as shown in Image 2-5. Make sure motor mount can pivot.

Image 2-5 – Motor mount shaft collars, installed

5. Bolt turnbuckle plate to side of dryer. See Fig. 2-32.
6. Bolt turnbuckle to motor mount and to turnbuckle plate using 1/2 x 1-3/4" bolts, 1/2" flat washers and 1/2" lock nuts. See Fig. 2-32.
7. Bolt motor to motor mount using 5/16 x 1" bolts and 5/16" nuts and washers. See Fig. 2-32.
8. Bolt inner shield to upper and lower brackets using 5/16" bolts, washers, and nuts. See Fig. 2-30.
9. Attach small pulley to motor shaft with a key and attach pulley to top load auger with a taper lock bushing. See Fig. 2-30. Use straight edge to align pulleys. Attach two B95 belts between auger pulley and motor pulley. Tighten turnbuckle to tighten belts. **Tension belts so it takes about 2.7 kg. (6 lbs.) pressure to deflect belt 1/2" at center of belt span.**
10. Final assembly should appear as in Fig. 2-33 (Shown without front shield).

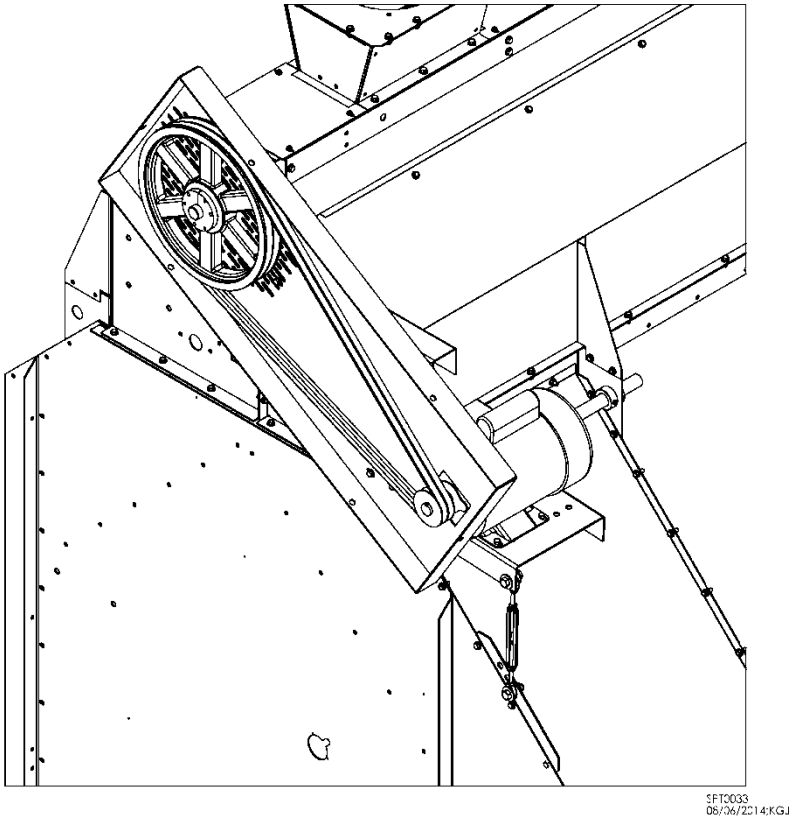


Fig. 2-33 – Final assembly (without front shield)

11. Slide outer shield around inner shield and attach with six (6) 5/16 x 1" bolts. See Fig. 2-30.
12. Check and retighten all fasteners.

Wiring Load Auger Motor

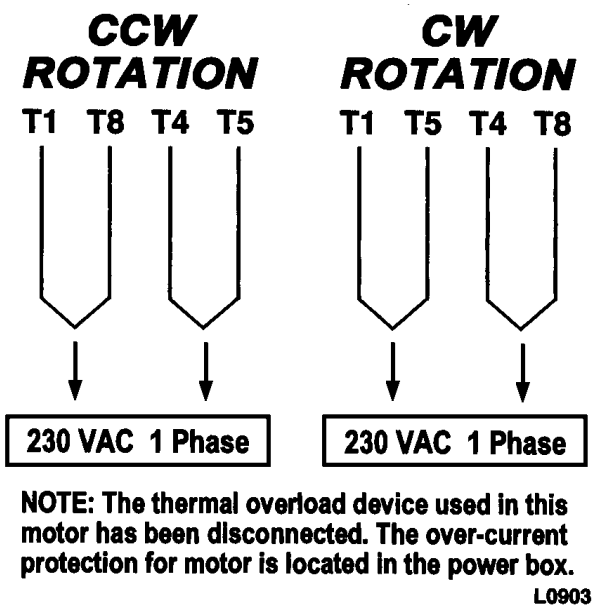


Fig. 2-34 – Sticker L0903

Overload circuit is intentionally disconnected in motor because overload protection (starter protector) is located in power box on dryer. A sticker, L0903, is attached to motor showing how to make wiring connections. See Fig. 2-34.

QuadraTouch Pro Controller

Image 2-6 – QuadraTouch Pro controller

Design of QuadraTouch Pro controller allows for easy installation. However, there are a few things to keep in mind when choosing an installation location:

1. QuadraTouch Pro controller will need its own 100 – 240VAC power source. Choose a location where electricity can be easily accessed. At 120VAC, unit pulls less than 1A. Using an appropriate extension cord is acceptable as long as standard electrical codes are followed.

2. Industrial Ethernet cable ordered with dryer is available in four (4) lengths:

Cable Length		Part #
Meters	Feet	
15	50'	J8720
30.5	100'	J8721
46	150'	J8722
61	200'	J8723

Table 2-11 – Ethernet cable lengths & part numbers

Cable length determines how far away controller can be mounted from dryer. Standard length is 50 feet.

3. Although QuadraTouch Pro controller is contained in a sealed enclosure, it's a good idea to mount controller in a shed or other shelter.
   QuadraTouch Pro controller has an operating temperature of -12°C to 57°C (10°F to 135°F) and a storage temperature of -20°C to 66°C (-4°F to 150°F). Outdoor placement is acceptable in most locations, but controller must not be left where temperature may be outside of storage range above. Cover of controller must be closed when unit is not in use.

4. QuadraTouch Pro controller comes with molded mounting brackets. These allow controller to be mounted directly onto wall or bench using four (4) screws.

NOTICE **NOTE: If location where controller is mounted is not heated, unit must be taken into a temperature-controlled environment when not in use.**

Ground Rod Requirements

Image 2-7 – Wires clamped to ground rod

A grounding kit (T18529) is supplied with each dryer. It includes a clamp (J5723), two terminal rings (J3808), and two green grounding wires. Kit can be found in main power box. An 8’ long grounding rod (J5722) can be found in packed materials.

Proper grounding will provide added safety in case of any short or lightning strike. Installation of ground rod and ground wires must conform to local and national electrical codes.

Dryer should be grounded at two locations; one at main power box and the other near discharge moisture sensor.

Crimp a terminal ring onto one end of each grounding wire. Attach one wire to back of main power box as shown in Image 2-8.

Image 2-8 – Grounding at main power box

Location of other grounding wire will depend on location of moisture sensor. If sensor is on discharge tube, bolt grounding to tube as shown in Image 2-9. If dryer has a static sample box, attach grounding wire using existing hardware to left of moisture sensor. See Image 2-10.

Pound entire rod into ground within 2.44m (8 feet) of dryer, even if rod must be at an angle. Clamp ends of wires to rod as shown in Image 2-7.

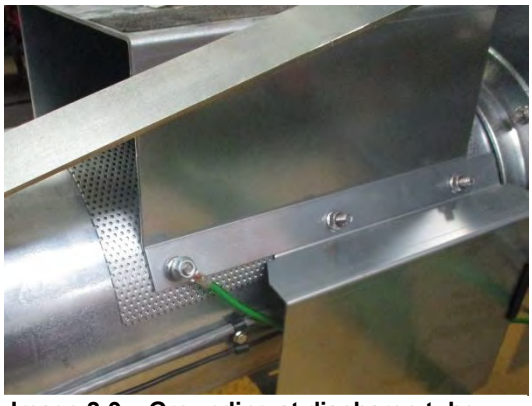


Image 2-9 – Grounding at discharge tube

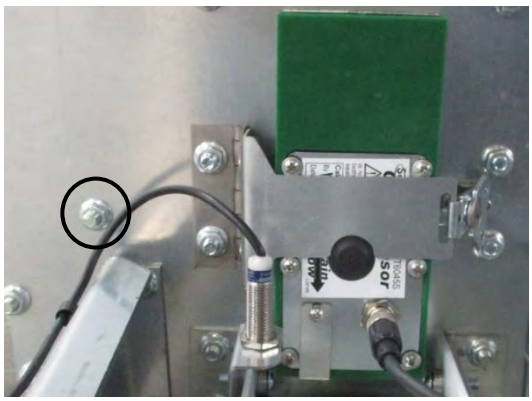


Image 2-10 – Grounding at sample box

WARNING: Make sure no utilities are buried under ground. Contact with buried electrical wire could result in death or serious injury.

NOTE: Ground rod at power pole will **not** provide sufficient grounding for dryer.

IMPORTANT: Ground rod must be installed to validate dryer warranty.

Operation

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04/04/2024	– Updated reference to photo showing hinged cleanout door under vacuum-cool duct	7
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Make sure to go through the Dryer Startup procedures in Appendix E before seasonal operation.

To ensure quality operation, gas and electrical installations must be completed by qualified service technicians in accordance with local and national regulations.

Introduction

Sukup Grain Dryers are equipped with several advanced features to ensure an effective and hassle-free drying season. However, it's important to understand some of the key features and operating procedures before starting operation.

There are many different ways to run a Sukup Grain Dryer. QuadraTouch Pro™ control system is easy to use, with a menu-driven interface. It guides the operator through each mode of operation with simple, clear instructions. **Make sure to read Software Manual in appendices of this manual.** Most every question can be answered by consulting that section.

NOTE: Grain variety, maturity level, cleanliness, weather conditions and operation can all affect performance and/or capacity of dryer. To the extent possible, be aware of different varieties of grain being fed into dryer, as no two varieties dry identically.

DISCLAIMER: In addition to general capacity ratings and disclaimers, drying capacity of centrifugal dryer may decrease significantly from values in product literature as air intake louvers increase vacuum pressure. Adjust louvers to achieve optimal levels of grain temperature and moisture content.

General Dryer Operation

This section briefly describes normal dryer operations.

IMPORTANT: Before starting dryer, refer to Dryer Startup section in Appendix E. To follow processes step by step, consult Software Manual in appendices of this manual.

Continuous Flow

Continuous Flow operation requires creating a gradient of moisture from top of dryer to bottom and is accomplished by three main functions: Initial Dry, Stabilization, and Continuous Flow. Before drying begins, user must enter moisture of incoming grain and desired moisture of outgoing grain into QuadraTouch Pro controller. These moistures are used to calculate the time necessary to perform initial dry at 160°F. No grain is unloaded from dryer when in Initial Dry mode.

After Initial Dry phase is complete, user will set desired plenum drying temperatures. Controller then calculates a meter roll speed corresponding to plenum drying temperatures entered. Dryer then performs a stabilization routine. During Stabilization, a gradient of moisture is established in dryer by drying and unloading one full load of grain without adjusting meter roll speed.

After Stabilization, dryer enters its Continuous Flow mode. During this phase, dryer adjusts meter roll speed for variances seen in average output moisture compared to desired output moisture.

NOTE: Initial Dry and Stabilization times are based on corn ONLY.

Calibrating Optional Incoming Moisture Sensor

If dryer has an incoming moisture sensor, enter temperature of incoming grain on QuadraTouch Pro touch screen. Follow directions on touch screen to calibrate.

Calibrating Discharge Moisture Sensor

IMPORTANT: Calibrating discharge moisture sensor to desired output moisture will help ensure proper drying of grain. It works best to calibrate sensor when actual grain moisture is as close to desired target moisture as possible. For instance, if 16% corn is desired, sensor should be calibrated when actual grain moisture is 16%.

It may be necessary to do an initial calibration when actual grain moisture is wetter or dryer than desired target, then another calibration when grain is at or near target moisture. Do this by running dryer in Continuous Flow for 30 minutes (or after Stabilization period) and then taking a sample from spout and checking it with an external moisture sensor known to be accurate. If readout is more than half a percentage point different than what dryer is showing (for instance, 17.5% moisture vs. 16.5%), dryer's sensor must be recalibrated. See recalibration steps under Tools Menu heading in Software Manual (Appendix G).

Take samples and check dryer's moisture sensor a few times a day. If it's off by .5% or more, put unload on pause, remove sensor from dryer and check for any dust or debris buildup on sensor or metal tube around sensor. Replace sensor and resume unloading. Check moisture again. If it's still off by .5% or more, calibrate sensor again.

During Continuous Flow mode, QuadraTouch Pro controller plots a data point every minute of average discharge moisture, plenum temperature, and meter roll speed. Each of these graphs can be accessed while dryer is running. Refer to Software Manual for further instruction.

When wet bin is empty or user is ready to dry final batch of season, user simply enters Final Dry function and follows instructions on control panel screen.

When resuming a drying operation after dryer has run out of grain or has been shut down, it is often desirable to run with settings as before the shutdown. Therefore, quick methods of restarting dryer have been developed. Restarting dryer with or without stabilization, depending upon the situation, can be accomplished by following a short series of steps displayed on control screen during normal startup.

Automatic Batch

Automatic Batch is a standard feature of the Sukup Automatic Grain Dryer. Batch operations enable operators to dry grain in a manner they have become accustomed to; enable them to dry extremely wet grain; allow single-fan dryers to be operated in a heat/cool manner; and make it possible to dry grains that require a low plenum temperature.

Two controlling operations of Automatic Batch drying have been developed. The first method dries batches according to time entries. Operator enters times into control panel for when dryer will heat, cool, and unload grain. During unload, dryer calculates the average moisture of each batch. Operator can then adjust time entries according to desired output moisture, or have the control system automatically recalculate the time. The second method of operation requires purchasing the temperature control option. Operator enters a desired grain temperature value into control panel. When grain temperature in column reaches the set temperature, the dryer proceeds to cool the grain, if necessary, and then unload it. The set variables may be changed to operator's choosing at any time during Automatic Batch operation. New settings take effect on next batch.

Grain Transfer

Operators commonly use dryers to transfer grain to storage facilities. The Grain Transfer mode simplifies this process. The control panel steps the user through a simple process to begin and end the procedure. Refer to software manual for additional options in this mode.

Manual Operation using QuadraTouch Pro

Manual operation using QuadraTouch Pro serves many purposes. If operator wants complete control of dryer, Manual Operation fulfills this need. After pressing Start on main screen, user can select Manual Operation to run dryer as desired. User can turn on fan(s), heater(s), load and unload motors. **Dryer uses paddle switches to automatically load dryer during manual operation while user has control of meter roll speeds and plenum temperature.**

Final Dry

In Final Dry mode, dry time and unload time are set by operator to finish drying grain. Temperature is based on previous settings. When wet bin is empty and dryer can no longer be filled with wet grain, Final Dry is used to dry last batch of grain through drying system. Dryer will heat the last batch and then shut fans and heaters off and unload the grain.

Dry Fire

Dry Fire mode provides a way to run dryer when there is no grain. It is recommended this mode be used to test dryer at start of **EVERY SEASON**. Dry Fire allows use of burner without need for air switch to confirm air pressure. This mode is NOT to be used for drying grain; only as a means of inspecting pipe train for leaks and component integrity and confirming overall heater operation.

Operation

Follow instructions below if dryer is equipped with four single-point column temperature sensors (Optional on single-module dryers; standard on stacked).

1. Run dryer in Manual mode at unload speed from applicable drying table in Appendix A or based on past experience.
2. When four-point average temperature of columns is within about 3°F to 5°F of target temp (likely 110°F to 130°F), switch to Automatic, Temp-Based mode and run for about an hour.
3. Enter target temp based on past experience or an educated estimate (120°F is a good place to start).
4. Change unload Multiplier or Gain setting to 100. Change Deadband settings to 0 and 0.
5. As dryer settles in on target temp, take moisture samples and increase or decrease target temp as needed in 30- to 60-minute increments (2°F temp changes recommended). If grain is too dry, decrease temperature setpoint. If grain is too wet, increase column setpoint.

Vaporizer Coil Adjustment (LP Models Only)

CAUTION: If vaporizer is not adjusted correctly, piping could be hot. Ensure proper adjustment to avoid burn resulting in minor or moderate injury.

Image 3-1 – Vaporizer bracket on axial-fan dryer

NOTE: Instructions are same for axial and centrifugal dryers.

Select Dry Fire mode using touch screen to operate fan and heater when there is no grain in dryer. After dryer has been allowed to run and plenum temperature has stabilized, vaporizer outlet (top) should be warm but not hot to touch.

Fault Condition
Vapor Over-Temp

If vapor side of pipe train is hot, or if dryer has shut down due to a Vapor Over-Temp fault, vaporizer may need to be moved away from flame. To move vaporizer, loosen pivot bracket bolts (circled in Images 3-1 & 3-2). Move vaporizer coil away from flame as necessary. Retighten bolts and recheck temperature at vaporizer outlet. Repeat adjustment process as needed.

Image 3-2 – Vaporizer bkt. on centrifugal-fan dryer

U-bolts that hold vaporizer to adjustment bracket can also be loosened and vaporizer can be moved in or out.

Viewing hole is provided to watch vaporizer adjustment.

If vaporizer is freezing up, loosen bolts as described above and move vaporizer toward flame instead of away from it.

Tighten all hardware after adjustment.

Adjusting Louvers & Doors on Centrifugal-Fan Dryer

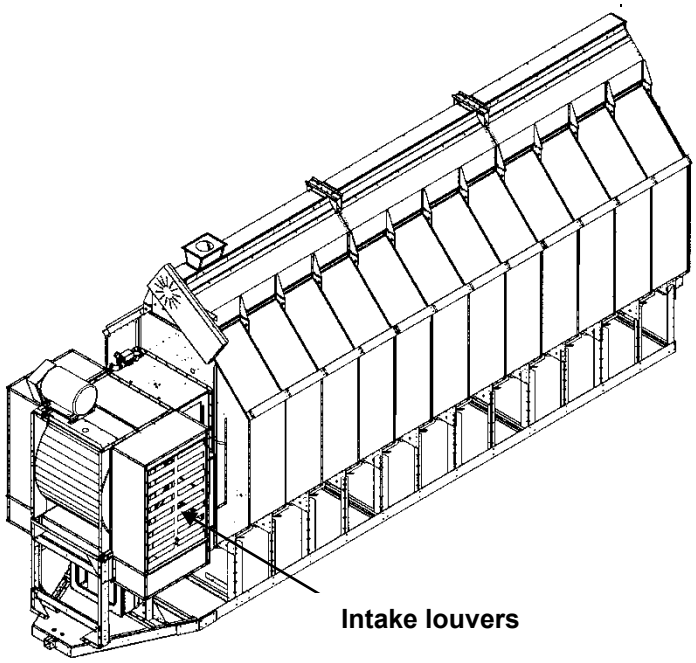


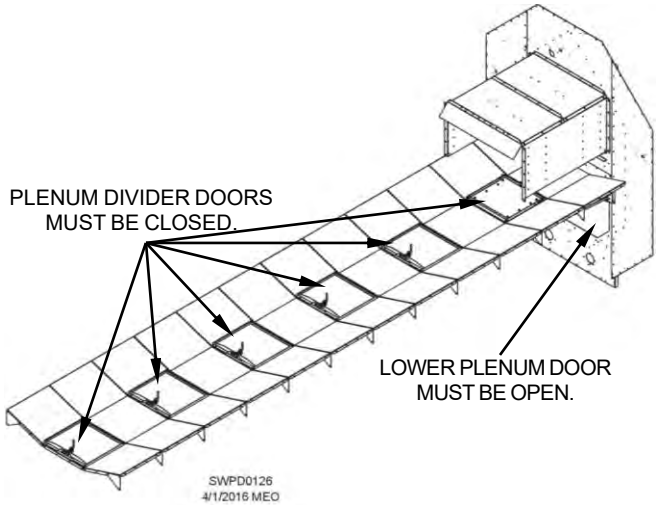
Image 3-3 – Adjustable louvers

Suction-Cool Mode

Louver slots should be narrow to create more suction in bottom cooling plenum, but slots should not be fully closed. Start with a 3/4" to 1" opening and adjust from there. Closing louvers more will increase efficiency and pull more heated air into fan, but will decrease capacity. Opening louvers more will increase capacity, but will decrease efficiency. Less-heated air will be pulled into fan.

As shown below, all plenum divider doors must be closed and front door cover must be open.

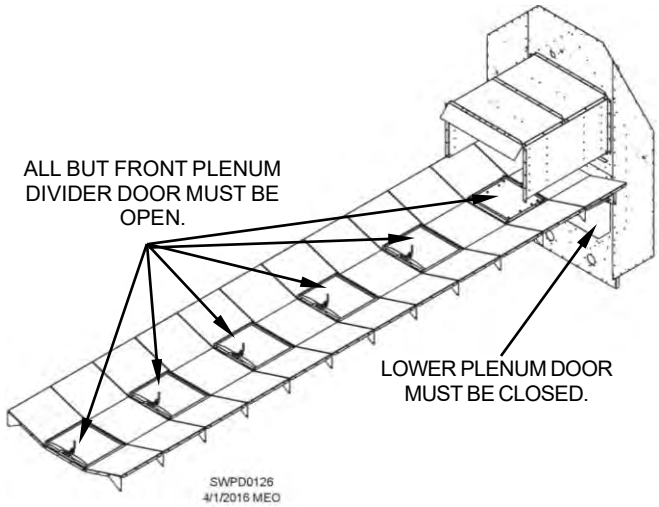
See additional instructions on next page.



Full-Heat Mode

Louvers should be fully open as shown in Image 3-3. As described below, all but front plenum divider door must be open and lower plenum door must be closed.

See additional instructions on next page.



Intake doors must be open during operation in Full-Heat mode. Use spring pins to hold doors open. See Images 3-4 and 3-5. Doors should be closed when operating in Suction-Cool mode.

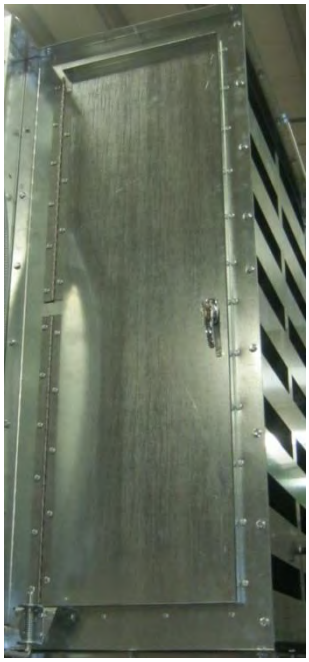


Image 3-4 – Intake door

Image 3-5 – Spring pin on intake door

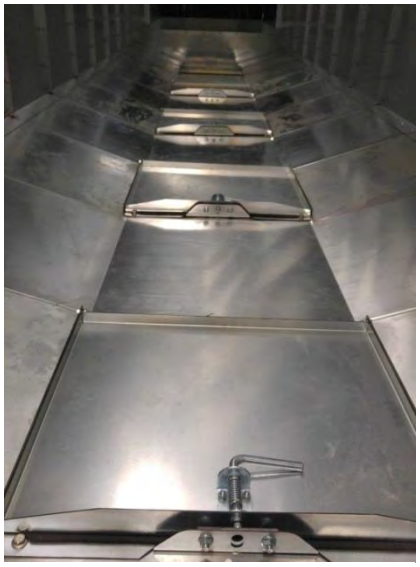


Image 3-6 – Plenum divider doors

Open hinged cleanout door under vacuum-cool duct if running in Full-Heat mode. See Image 35 in Component Identification section. Door should be closed if running in Suction-Cool mode.

Close plenum divider doors for operation in Suction-Cool mode. See Image 3-6. Doors must be open if operating in Full-Heat mode.

Use vacuum pressure gauge (Image 3-7) to aid in adjusting airflow rates and plenum pressures. When drying corn, pressure in heat plenum is commonly around 2” W.C. and negative pressure in cooling plenum is normally around 1.5” to 2” W.C. A good starting point for the louvers is normally 3/4” to 1” open. Louvers can be adjusted from there to achieve desired operating conditions.

Image 3-7 – Vacuum pressure gauge

Burner Operations

Parts listed below can be found in gas pipe train, heater box or ignition box.

- Valve Proving Pressure Switch – low and high – between upstream and downstream valves on pipe train
- EU Gas Burner Control – LME73.840 – heater box
- High Pressure Switch – pipe train – after downstream valve
- Heater Housing High Temperature Switch – Igniter box
- Differential Air Switch – heater box
- Vapor Over-Temp Switch (on LP systems) – pipe train
- Ignition Transformer – Igniter box
- Main – Upstream Gas Valve – pipe train
- Blocking – Downstream Gas Valve – pipe train
- Electronic Modulating Gas Valve (EMOV) – pipe train

Burner Operation

On heaters *not* requiring valve proving control (28" heater), once burner control relay is energized, 120VAC flows through heater housing Over-Temp switch and the high-pressure switch before being applied to the EU heater control unit (LME73.840). Parameter 241.00 is set to 0 by manufacturer.

On heaters requiring valve proving control, burner control relay is energized the same as above. Parameter 241.00 is set to 1 by manufacturer. Default settings will conduct valve proving upon shutdown.

The LME73.840 conducts valve proving and EU Gas Burner Control. When conducting valve proving, there are two valve tests.

In TEST 1, the **upstream** valve is energized for 2.6 seconds, which pressurizes piping between the two valves. If a decrease in pressure is detected by valve-proving pressure switch, TEST 1 will fail and lockout will occur. The valve proving control can be reset by pressing the far right button on LME73, or by pressing RESET on QuadraTouch Pro touch screen. If TEST 1 has not failed, TEST 2 will begin.

During TEST 2, the **downstream** valve is energized for 2.6 seconds, evacuating all gas pressure between upstream and downstream valves. This test is used to determine if an increase in pressure is detected between the two valves by the valve proving pressure switch. If an increase in pressure is detected, TEST 2 will FAIL, and lockout will occur. The valve proving control can be reset by pressing the far right button on LME73, or by pressing RESET on QuadraTouch Pro touch screen.

The main power will energize and initialize the controls. After user has selected a drying operation, the call for heat comes from PLC at the appropriate time. The valve proving test is conducted each time there is a call for heat. (The main power and the call for heat are separate.)

Upon supplying voltage to burner control unit, ignition sequence on next page takes place.

Heater Ignition Sequence

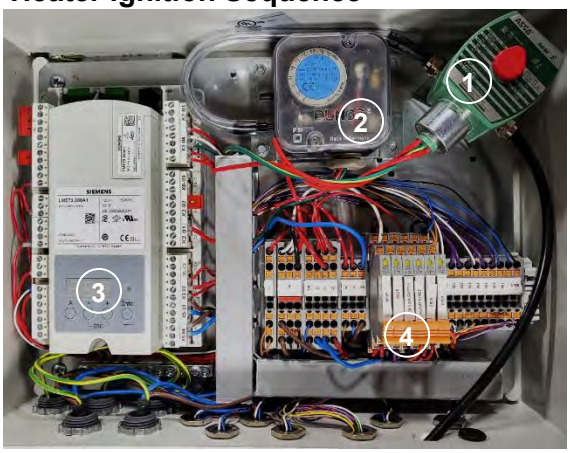


Image 3-8 – Burner control box

REF. #	DESCRIPTION	PART #
1	Air switch solenoid, 1/4"	J6032
2	Air switch, Dungs	J5868
3	Burner control unit, LME73	J57146
4	Relays, 120VAC	J8774

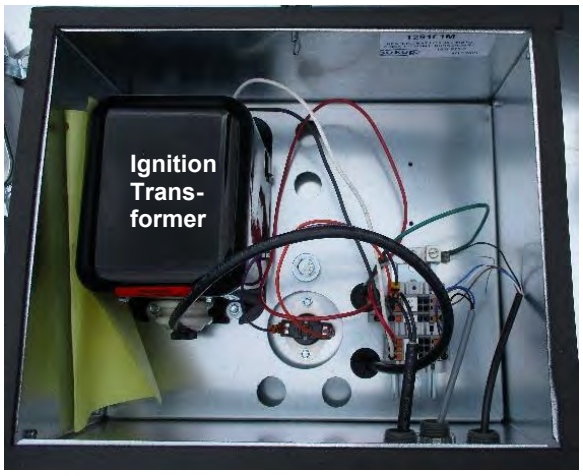


Image 3-9 – Ignition box

1. 120VAC is supplied to terminal X5-03.1 of burner control LME73.840. The fan ON control signal is enabled. This voltage is output on terminal X2-01.3 of burner control.
2. Within 5 seconds of fan ON signal being enabled, differential air switch must close a set of N.O. contacts, which applies this same voltage to terminal X3-02.1. This indicates that air movement has been detected. If this signal is not detected, unit will go into an alarm.
3. Once differential air switch is closed, unit goes into a 30-second pre-purge time delay.
4. Following purge time, ignition transformer (See Image 3-9) is energized. After a 6.1-second pre-ignition time, fuel valve opens.
5. Ignition transformer remains energized for additional 2.2 seconds (Total of 8.3 sec.)
6. Flame must be detected within 2.2 seconds or unit will go into an alarm.
7. Flame signal must be maintained for additional 9.4 seconds before opening other fuel valves.

Loss of flame will cause burner control to lock out fuel. LME73.840 can be reset by pressing far right button for about 2 seconds.

Electronic modulating valve is in low-fire position for ignition sequence. After flame has been established, main control system on dryer will send a signal to valve, which will open or close to maintain temperature set by user.

NOTE: This is a general description of burner operation. For specific details of LME73.840, please refer to Siemens technical bulletin CC1A7105.28en 17.04.2018.

Service & Maintenance

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04/04/2024	Updated grain discharge box switch replacement & calibration instructions	3 & 16
04/13/2023	Minor editing changes	5, 8, 11, 12, 14, 19, 21, 22, 25 & 26
	Updated instructions for vapor over-temperature switch	6
	Added instructions for single-point grain temperature sensors	9
	Added metric settings for flow gates	17

Sensor Removal and Installation

Discharge Moisture Sensor (T6045S)

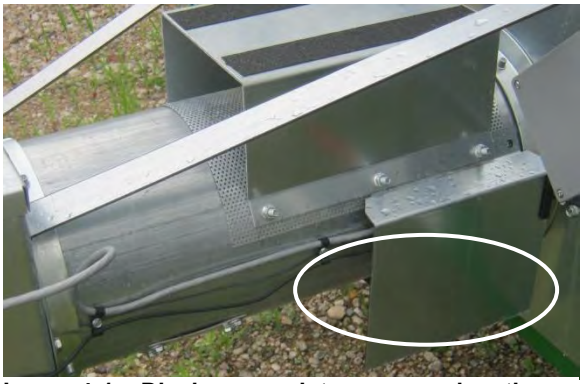


Image 4-1 – Discharge moisture sensor location

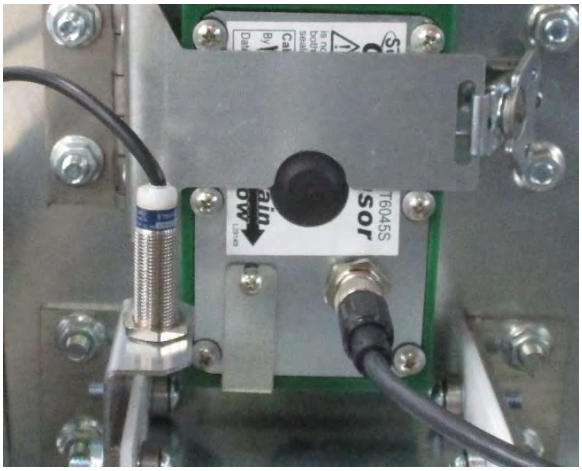


Image 4-2 – Discharge moisture sensor in optional static sample box under discharge chute

Image 4-3 – Cable connector capped

This sensor is used to monitor grain moisture as it exits dryer. Sensor is located under discharge tube as shown in Image 4-1. See Image 4-2 for location of sensor on dryer with optional static sample box under discharge chute.

Removal:

1. Remove rain shield (if applicable).
2. Release sensor retaining clamp and remove sensor.
3. Disconnect cable from sensor.
4. Replace protective caps on sensor and cable. Image 4-3 shows cap on sensor.

Installation:

1. Remove protective caps from cable and sensor.
2. Finger-tighten cable to quick-connect coupler on new sensor.
3. Place new sensor into retaining clamp. Secure sensor by tightening clamp.

Grain Discharge Box Interlock Switch (J4473)

Image 4-4 – Grain discharge box interlock switch

This device is used to detect a take-away system malfunction. If discharge box overflows and lid is pushed up, a signal will be sent to stop dryer.

Removal:

1. Turn power off at main power box.
2. Locate grain discharge box interlock switch. See drawing in Parts/Assemblies section of this manual.
3. Remove cover of interlock switch.
4. Disconnect switch wires 18 and 42. See Image 4-4.
5. Remove switch.

Installation:

1. Attach new switch to discharge box in same way as switch that was removed.
2. Connect wires 18 and 42 as shown in Image 4-4.
3. Reinstall switch cover when finished. See Discharge Box Interlock Switch Adjustment in Component Calibration section to calibrate.

Grain Level Switches (Upper – T162441; Lower - T162442)

These devices are used to detect when dryer is full of or needs grain.

Removal:

1. Turn power off at main power box.
2. Locate paddle switch boxes. See Fig. 4-1.
3. Remove cover of box to be replaced.
4. Disconnect wires from switch box after noting connections.
5. Remove switch box from shaft.

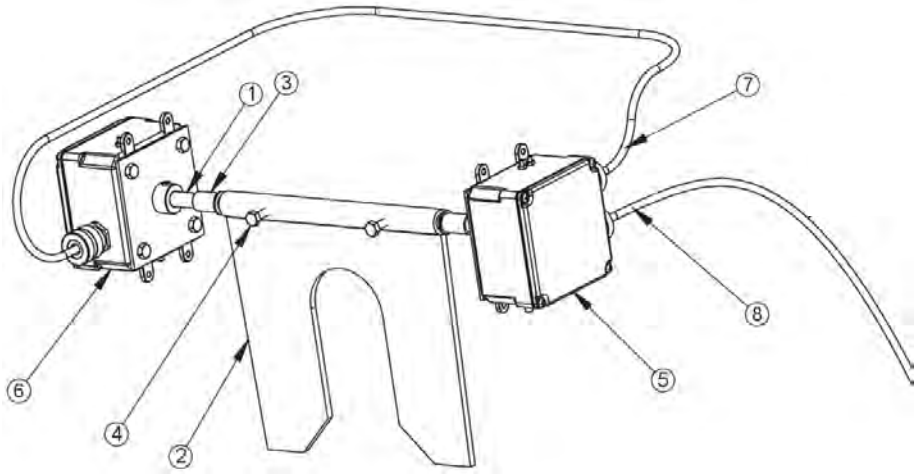


Fig. 4-1 & Table 1 – Grain level switches

REF. #	DESCRIPTION	QTY.	PART #
1	Shaft	1	T16250
2	Paddle	1	T16245
3	Bushing, plastic, 1/2" ID, 5/8” OD	2	J00832
4	Bolt, 1/4 - 28 x 3/4"	2	J0509
5	Wet bin empty switch assy.	1	T162442
6	Wet bin full switch assy.	1	T162441
7	Cable, 6-conductor, 30” long	1	K6623-2.5
8	Cable, 6-conductor, 41’ 8” long	1	T24325

Installation:

1. Attach new switch box to shaft and remove cover of box.
2. Connect wires in same manner as on old switch.
3. Reinstall switch box cover.

IMPORTANT: Switches must be installed as shown in Fig. 4-1. If not installed properly, dryer will not function correctly.

Unload Auger Proximity Switch (J4493)

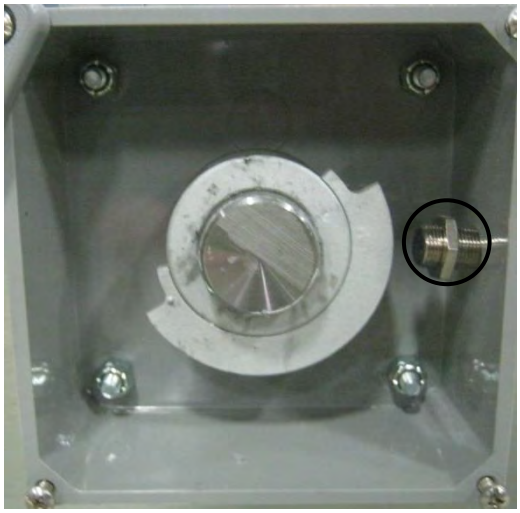


Image 4-5 – Unload auger proximity switch before adjustment

This device monitors rotation of unload auger. If unload auger stops turning, a fault message will appear on touch screen and dryer will stop.

Removal:

1. Turn power off at main power box.
2. Locate unload auger proximity switch at end of grain discharge box.
3. Remove switch box cover.
4. Loosen and remove inside lock nut and remove proximity switch from box. See Image 4-5.
5. Follow wiring to nearby junction box and disconnect proximity switch wires after noting connections.

Installation:

1. Remove lock nut closest to end of new switch. Slide switch into hole in switch box and loosely secure with lock nut just removed.
2. Adjust gap between proximity switch and rotating target. **IMPORTANT:** Gap between tip of switch and rotating target must be no more than 1.6mm (approximate width of Kroner or Euro).
3. Route prox switch cable to junction box in same manner as before and connect switch wires in same way as wires from switch that was removed.
4. Turn power on at main power box and turn System Control switch to QuadraTouch Pro. Go to Start Menu on touch screen and select Manual Operation. Touch Unload button. Unload auger should now be turning. If installation was NOT successful, a fault message will appear on touch screen and unload auger will shut down. Correct as needed.
5. Reinstall box covers.

Vapor Over-Temperature Switch (T96124)

Image 4-6 - Vapor OT switch

This device monitors vapor temperature after it exits vaporizer coil. If temperature exceeds 60°C (140°F), a fault message appears on touch screen and dryer will stop.

Removal:

1. Turn power off at main power box.
2. Locate vapor over-temperature switch on heater pipe train. See Image 4-6.
3. Loosen screws on clamps that hold switch in place.
4. Remove switch.
5. Disconnect switch wires in heater box.

Installation:

1. Put new over-temperature switch in same position as old switch. Secure by tightening clamp screws. Be careful not to over-tighten.
2. In heater box, attach one wire from new switch to circuit 18, one to circuit X02, and ground to ground.

Rear Door Interlock Switch (J4487); Key w/ chain (F6991)

Images 4-7 & 4-8 – Interlock switch (left) & key w/ chain (right)

Body of switch is mounted next to door, with interlock key chain attached to door. Key must be removed from switch before door can be opened. If key has been removed from switch, a fault will be displayed and dryer will not start.

Removal:

1. Turn off power to dryer.
2. Pull interlock key out of switch.
3. Remove screw holding cover to switch body.
4. Loosen wire terminals and remove wires.
5. Remove two mounting screws holding switch to dryer.
6. Loosen collar and pull wiring from switch.
7. Remove switch from dryer.
8. Remove collar from bottom of switch.

Installation:

1. Position new switch in same location as old switch.
2. Remove cover of switch.
3. Feed wires through collar and up into switch.
4. Attach wires to top two terminals (N.C.).
5. Attach switch to dryer using two previously removed screws.
6. Close switch cover and secure with previously removed screw.
7. Check interlock key. It may require changing depending on key design.
8. Insert interlock key into switch.

Grain Column Over-Temperature Switch (J4532 - 16', J4533 - 24', J4534 - 28')

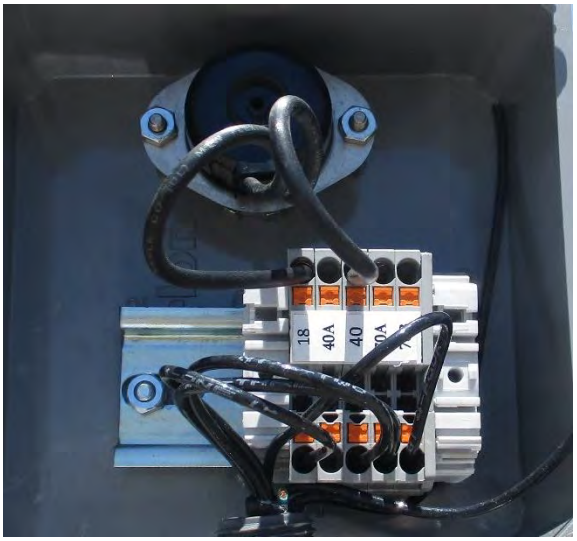


Image 4-9 – Grain column over-temp switch

There is one on each side of dryer. Copper capillary connected to switch runs through a conduit to monitor temperature in grain columns. Boxes containing switches are located on back of dryer.

Procedures for removing and replacing are identical for both switches.

Removal:

1. Remove switch box cover.
2. Remove switch wires from terminals.
3. Remove fasteners holding switch in junction box. See Image 4-9.
4. Before removing switch and attached copper capillary, go to junction box on opposite end of dryer and uncoil any excess capillary.
5. Remove switch and copper capillary from back of dryer, coiling capillary for easy handling.

Installation:

1. Install new switch by carefully feeding small copper capillary into conduit inside of switch box. Be careful not to kink capillary.
2. Attach switch to box using previously removed fasteners.
3. Reconnect wires. On right side of dryer (as viewed from rear), one wire will plug into circuit 18 and other to 40 as shown in Image 4-9. On left side, one wire from switch goes to 18 and the other to 41.
4. Reinstall switch box cover.
5. Coil up excess capillary and leave in front box, then reinstall box cover.

Single-Point Grain Temperature Sensor (TM91320)

Image 4-10 – Single-point grain temp sensor

Stacked dryers have four single-point grain temperature sensors. They are optional on single-module dryers. Readings from the four sensors, which are spread out equidistantly on dryer, are averaged and then fed into dryer control system to help improve performance.

Removal:

1. Remove cover and disconnect wires after noting connections.
2. Unscrew sensor from holder.

Installation:

1. Screw in new sensor (shown in Image 4-10).
2. Connect wires as they were in old sensor.

Heater Housing High-Limit Switch (J5772)

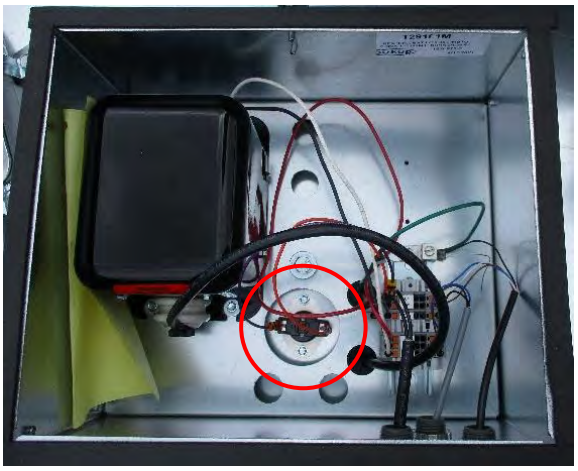


Image 4-11 – Heater housing high-limit switch

Heater housing high-limit switch (Circled in Image 4-11) is located inside of a box on top of heater housing. Switch monitors temperature of heater housing. Switch is set for 93°C (200°F).

Removal:

1. Disconnect power to dryer.
2. Open box cover.
3. Locate heater housing high-limit switch.
4. Remove wires from switch by pulling on crimped connectors.
5. Remove both hold-down screws.
6. Remove switch.

Installation:

1. Position new switch and secure with two screws.
2. Attach crimped connectors to tabs on switch. There should be a purple X03 on one side and an orange 18 on other side of heater housing high-limit switch.
3. Reinstall junction box cover.

Plenum Temperature Sensor RTD (Resistance Temperature Detector) J5642 – 16', J5646 – 20', J5643 – 24', J5648 – 28'

Image 4-12 – Plenum temperature sensor RTD

This sensor monitors temperature in plenum. If temperature exceeds value set by user, a fault message will appear on touch screen and dryer will stop. Image 4-12 shows inside of box and Image 4-13 shows transmitter in main power box.

Removal:

1. Turn off power at main power box.
2. Locate sensor box near heater.
3. Open box and disconnect sensor wires after noting connections.
4. Remove cable from sensor box.
5. Remove self-drilling screws holding sensor box to dryer. Remove box.
6. Remove sensor tube (silver) from clips holding it (and copper capillary) to inside wall of plenum.
7. Pull RTD tube out. Coil for ease of removal.

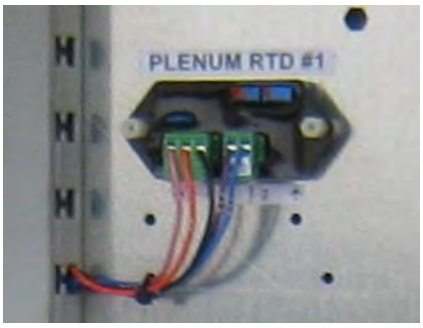


Image 4-13 – Plenum temperature sensor (RTD) transmitter in main power box.

Installation:

1. Uncoil new sensor tube carefully. Any kinks will damage it.
2. Feed tube into plenum.
3. Attach tube to inside wall of plenum in same manner as old tube was attached.
4. Ensure plenum over-temperature capillary is held by same clips in plenum as new RTD tube.
5. Attach new RTD sensor box to dryer.
6. Connect cable to box and attach wires to sensor in same way previous sensor wires were connected.
7. Attach lid to sensor box.

Meter Roll Proximity Switch (J4493)

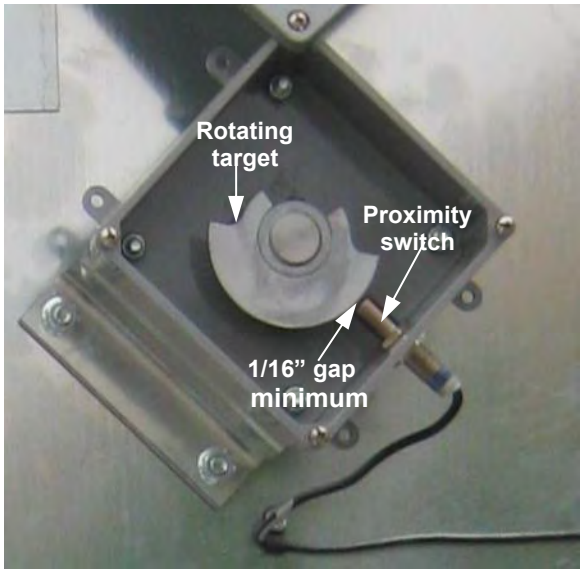


Image 4-14 – Meter roll proximity switch

This device monitors rotation of meter rolls. During operation, light on proximity switch and input 93 on PLC will flash to indicate rotation. Light may flash slowly due to slow rotation of meter rolls. **NOTE:** If target must be replaced, use fresh anti-seize compound on new one.

Removal:

1. Remove cover to meter roll switch box at rear of dryer. See Image 4-14.
2. Remove lock nut (inside box) on prox switch.
3. Remove switch.
4. Remove cover of right rear junction box and disconnect prox switch wires after noting connections.

Installation:

1. Install new proximity switch by reversing steps used to remove old one.
   NOTICE: Adjustment of proximity switch is critical. Gap between tip of switch and rotating target must be no less than 1.6mm (1/16”) and no greater than 3.2mm (1/8”). See Image 4-14. Damage to proximity switch may occur if it comes into contact with rotating target.
2. Reinstall box covers.

Differential Air Pressure Switch (J5868); Switch w/ mount bracket & wires (T80333)

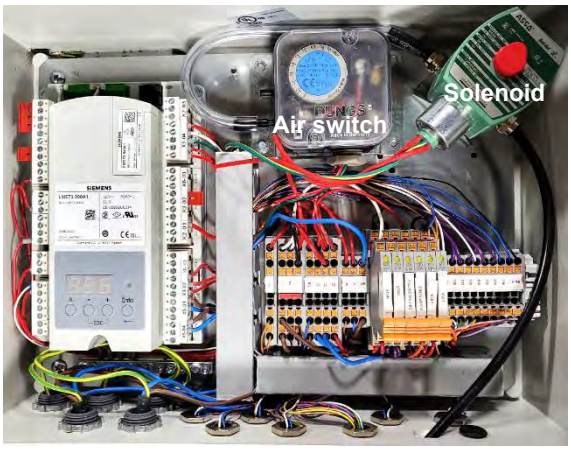


Image 4-15 – Differential air pressure switch

Differential air pressure switch ensures that there is enough air flow to use heater safely. Image 4-15 shows location of switch in heater box.

Removal:

1. Locate heater box (near pipe train).
2. Remove cover and disconnect switch wires from terminals.
3. Remove hose from air switch.
4. Remove switch.

Installation:

1. New switch should be pre-calibrated and ready for installation.
2. Install new switch by reversing steps used to remove old one.
3. Replace heater box cover.

Plenum Over-Temperature Switch (J6795 – 16', J6796 – 24', & J67961 – 28')

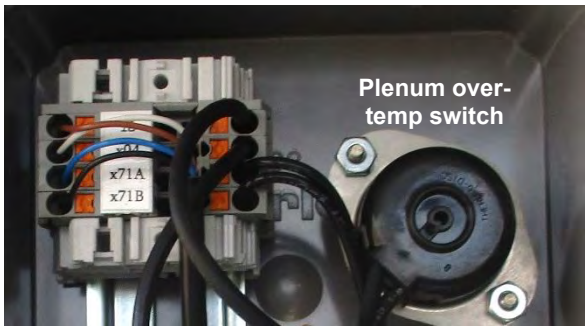


Image 4-16 – Plenum over-temperature switch

Plenum over-temperature switch trips when temperature in plenum rises above 163°C (325°F).

Removal:

1. Locate switch box on front of dryer.
2. Remove switch box cover and disconnect switch wires from terminals.
3. Remove switch capillary (copper) from clips holding it to inside wall of plenum. Leave plenum RTD tube (silver) in clips.
4. Remove switch from box and pull out copper capillary.

NOTE: If need be, uncoil end of capillary to ease removal.

Installation:

1. Uncoil copper capillary from new switch carefully to avoid kinks.
2. Feed new capillary through switch box and into plenum.
3. Clip capillary to inside wall of plenum along with silver RTD tube.
4. Attach switch wires in same manner as on old switch.
5. Replace switch box cover.

Component Calibration

Meter Roll Proximity Switch (J4493)

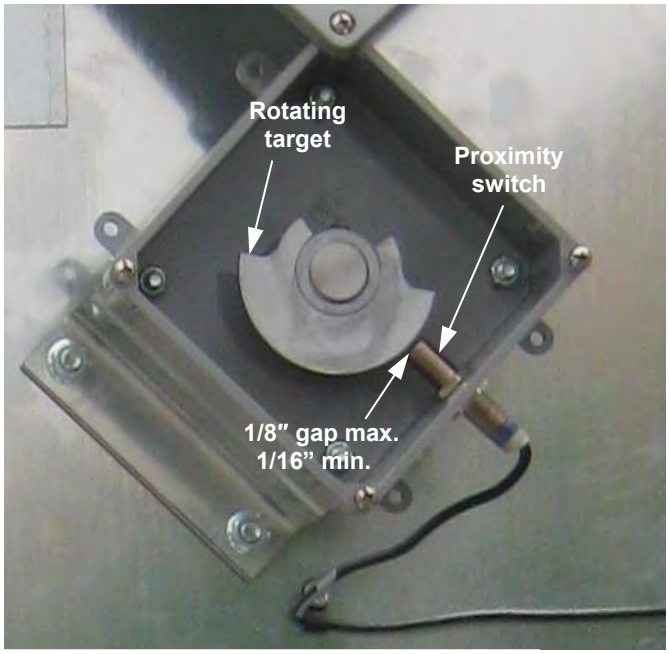


Image 4-17 – Meter roll proximity switch

1. Locate proximity switch box on back of dryer. Proximity switch and rotating target are inside of box.
2. To calibrate proximity switch, loosen lock nuts on switch.
3. Adjust switch so tip is no more than 3.2mm (1/8”) and no less than 1.6mm (1/16″) from target. See Image 4-17. This distance is important for reliable sensing.
4. After switch is in place, tighten lock nuts and replace cover on box.

IMPORTANT: Ensure target will not strike or contact end of proximity switch during operation.

Grain Discharge Box Interlock Switch Adjustment

Image 4-18 – Grain discharge box interlock switch

1. Locate switch on discharge box at rear of dryer. See drawing in Parts/Assemblies section. Switch is shown in Image 4-18.
2. Loosen screw holding rotating arm of switch to hinged lid on discharge box.
3. Adjust so that when lid is opened 51mm-76mm (2″ to 3″), a fault occurs. Once position has been found, tighten screw holding arm to lid.

Adjusting Meter Roll Flow Gates

Flow gates in columns of axial and centrifugal dryers are factory-set as shown in Fig. 4-2 and Table 4-2.

Sukup Manufacturing Co. is not responsible for damage resulting from improper adjustment of flow gates.

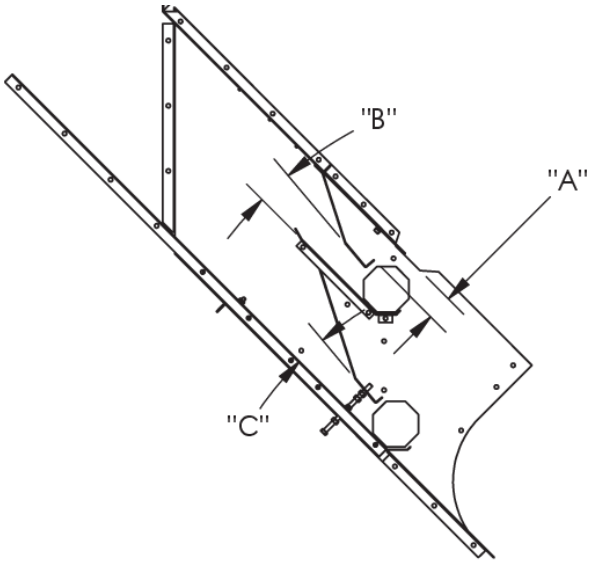


Fig 4-2 – Flow gates in axial & centrifugal dryers

DRYER LENGTH	COLUMN	DIM. A		DIM. C	
16'	Front 6	2"	5.08cm	1-3/4"	4.45cm
	Rear 2	1-3/4"	4.45cm	2"	5.08cm
20'	Front 7	2"	5.08cm	1-3/4"	4.45cm
	Rear 3	1-3/4"	4.45cm	2"	5.08cm
24'	Front 9	2"	5.08cm	1-3/4"	4.45cm
	Rear 3	1-3/4"	4.45cm	2"	5.08cm
28'	Front 11	2"	5.08cm	1-3/4"	4.45cm
	Rear 3	1-3/4"	4.45cm	2"	5.08cm

Table 4-2 – Flow gate settings for axial & centrifugal dryers

NOTE: One full turn of adjustment bolt changes flow gate opening 1.6mm (1/16"). Outer flow gate adjustment bolt turns clockwise to open outer flow gate. Inner flow gate adjustment bolt turns counterclockwise to open inner flow gate.

NOTICE: If Dim. A reaches 8.25cm (3-1/4") or Dim C reaches 7.94cm (3-1/8"), a free-flow condition may occur. It must be avoided as it will impair dryer operation.

Reinstall cleanout/access doors after adjustments are made.

NOTE: If dryer has small-grain flow control gates, see Assembly Instructions L1896.

Axial Fan Blade Replacement & Maintenance

Follow these instructions when replacing fan blades on dryer or maintaining blades at start of drying season. Sukup axial-fan dryers use Trantorque GT keyless bushings, which offer flexible and easy installation while providing exceptional holding power. To ensure a Trantorque GT unit performs as specified, it must be installed properly.

DANGER: Failure to properly tighten blades may cause death or serious injury:

- **USE TORQUE WRENCH** with settings capable of attaining correct torque specifications.
- **DO NOT** over-tighten. It may cause hub to crack and threads to strip.
- **NEVER** run fan without screen guard properly installed.
- **DO NOT** stand in front of fan when running.

1. Insert Trantorque GT unit into fan hub, making sure mating hub is flush against shoulder at hex flats. See Fig. 4-3. ***NOTICE:*** Do not lubricate Trantorque GT bushing or shaft. Use of any lubricant on contact surfaces could result in bushing failure and will void all warranties.

2. Hand-tighten nut (clockwise) until assembly becomes snug on shaft. ***NOTICE:*** Do not hammer or use any type of impact to force Trantorque GT assembly along shaft.

IMPORTANT: Shaft must fully engage gripping area of Trantorque GT unit.

3. Using a torque wrench, tighten nut to proper installation torque. See Table 4-3 for required torque. Hex flats on outer ring are provided for counter-torque, eliminating need to hold component or shaft while applying installation torque. ***NOTICE:*** Over-tightening nut could damage Trantorque GT unit and/or mounted component, resulting in slippage of fan blade from shaft.

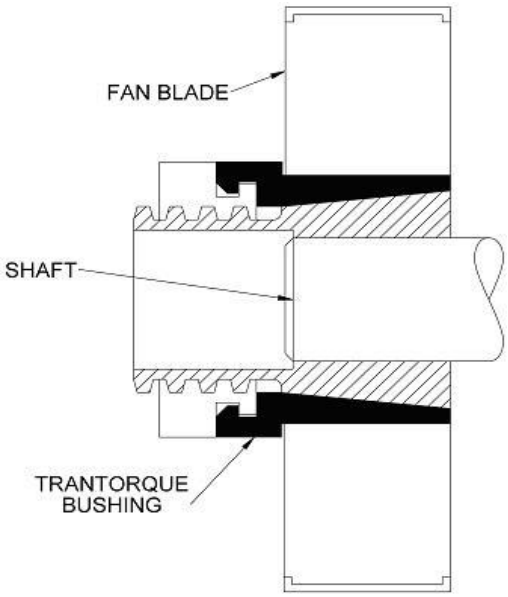


Fig. 4-3 – Attaching fan blade with Trantorque GT bushing

NOTE: At full installation torque, assembly will have moved approximately 1.6mm (1/16”) axially along shaft away from nut. If axial position is critical, it may be necessary to loosen nut and reposition assembly.

4. Install screen guard and run fan for a minute. Remove screen and re-check torque. Inspect hub for cracks.

DANGER: Make sure screen guard is in place before operation. Contact with spinning blades will cause death or serious injury.

PART #	FAN SIZE	HP	BORE SIZE	NUT SIZE	TORQUE
J0436	28”	15	1-1/8”	1-3/4”	165 FT-LBS
J0437	28”	20	1-3/8”	2”	190 FT-LBS
J0437	38”	10	1-3/8	2”	190 FT-LBS
J0435	38”	15	1-5/8”	2-1/4”	230 FT-LBS
J0435	38”	20	1-5/8”	2-1/4”	230 FT-LBS
J0435	44”	15	1-5/8”	2-1/4”	230 FT-LBS
J04371	44”	30	1-7/8”	2-1/2”	400 FT-LBS
J04372	44”	40	2-1/8”	2-3/4”	440 FT-LBS

Table 4-3 – Required torque for Trantorque bushings

Preventive Maintenance

Preventive maintenance is very important. It can help ensure dryer will perform well throughout drying season. Maintenance steps presented here are minimum procedures to be performed.

IMPORTANT: See Appendix F – Parts/Assemblies – for part numbers.

WARNING: When using ladder attached to dryer, make sure ladder is dry before climbing. Ladder may be slippery when wet. Falling from ladder could cause death or serious injury.

All bolts used to keep enclosures locked MUST be tightened after dryer maintenance to prevent undesired access.

Check and retighten all fasteners.

WARNING: Lock out electrical power before removing any safety shields. Contact with moving parts could cause death or serious injury.

Physical Inspection

1. Remove fan inlet screens. Check for foreign material on fan blades. Ensure fan rotates freely.
2. Check ventilation openings in motor for any blockage. Pay close attention to inside of fan hub. Reinstall fan inlet screens.

DANGER: NEVER run fan without screen guard securely attached to fan housing! Contact with spinning fan will cause death or serious injury.

3. Check wiring of fan and heater. Look for loose connections, bare wires or rodent damage. Be sure to check flame rod wire and spark plug wire for damage or short to ground.

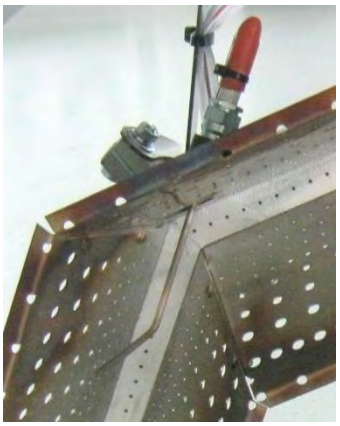


Image 4-19 – Flame rod (shown on octagon burner)

Image 4-20 – Spark plug (shown on H burner)

4. Examine flame rod (J5747) for cracked porcelain insulation and verify it is not touching metal burner. See Image 4-19.
5. Examine spark plug (J5739) for proper gap. See Image 4-20. Clean electrodes if required. Gap should be minimum of 1.6mm (1/16”). Spark plug and flame rod should be examined periodically throughout drying season.

6. Remove gas strainer shown in Fig. 4-4 and clean it.

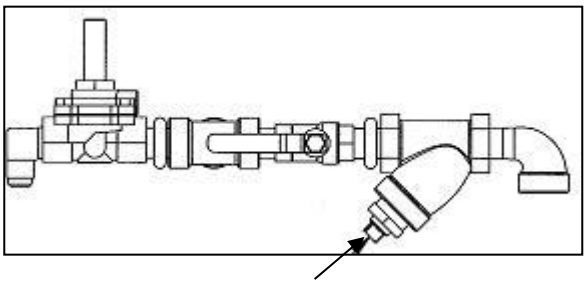
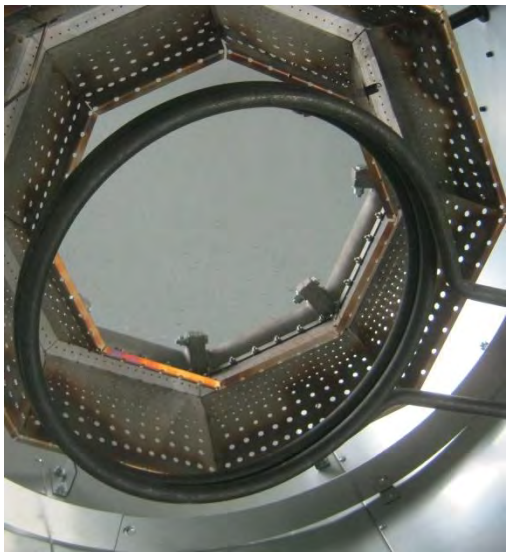


Fig. 4-4 – Remove gas strainer/filter at hex nut

7. Inspect all pipe train components for physical integrity. See Pipe Train Component Identification page elsewhere in this manual.

8. Inspect all pipe train connections for tightness and leaks. Spraying soapy water on connections and looking for bubbles is a good way to detect leaks.

9. Check vaporizer coil for leaks yearly. See Images 4-21 and 4-22. Vaporizer coil should be replaced every five (5) years.



Images 4-21 & 4-22 – Vaporizer coil (shown on octagon burner, left, and on H burner, right)

WARNING: One drop of liquid propane will expand 270 times as it converts to vapor. It is very dangerous to have vaporizer coil develop a leak during heater operation. Gas leak could cause explosion or fire resulting in death or serious injury.

10. Check bearings. Load and unload auger bearings (J0010), centrifugal fan bearings (J0048) are factory greased. They are sealed bearings. It is critical that they not be over-greased or seal could be blown. If it appears grease is needed, use a small amount of a lithium complex grease such as Shell Alvania RL2 that is rated for an operating temperature range of -23.3°C (-10°F) to 126.6°C (260°F). Use no more than 3 grams (0.15 ounce) for J0010 bearings and no more than 5 grams (0.18 ounce) for J0048 and J00722 bearings.

Daily Maintenance Requirements

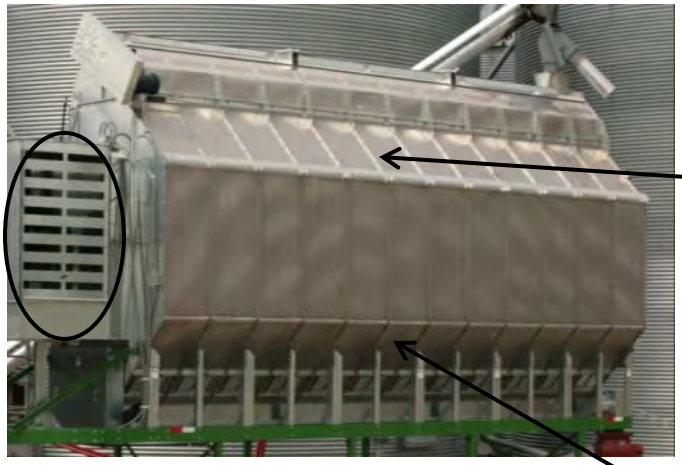


Image 4-23 – Fan inlet, top exhaust slope and lower grain column slope

This assumes 24-hour per day operation during harvest.

1. Clean foreign material from fan air inlets (in oval).
2. Sweep off perforated exhaust slope where fines may have accumulated. Pay attention to area directly under wet holding portion of dryer, where excessive amounts of fines and foreign material can accumulate.
3. Visually inspect for even grain movement in all lower grain columns. If grain in one column is not moving or is moving slower than grain in other columns, check for obstructions in flow gate area or columns.
4. **Turn off dryer** and close rear access door(s). Insert interlock key(s) into switch(es).

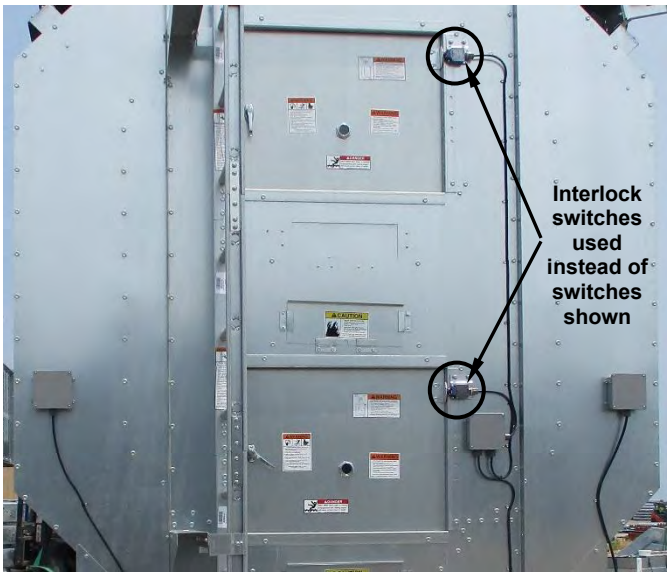


Image 4-24 – Rear access doors & switches

Image 4-25 – Rear cleanout door

1. Open rear cleanout door(s). See Image 4-25. Sweep all fines and debris from front of plenum(s) to rear. Exit dryer and close rear access door(s).
2. Run fan in Dry Fire mode until no more debris comes out of rear cleanout door(s).
3. Turn fan off.
4. Close rear clean-out door(s).
5. Sweep debris off discharge tube screen. See Image 4-26.

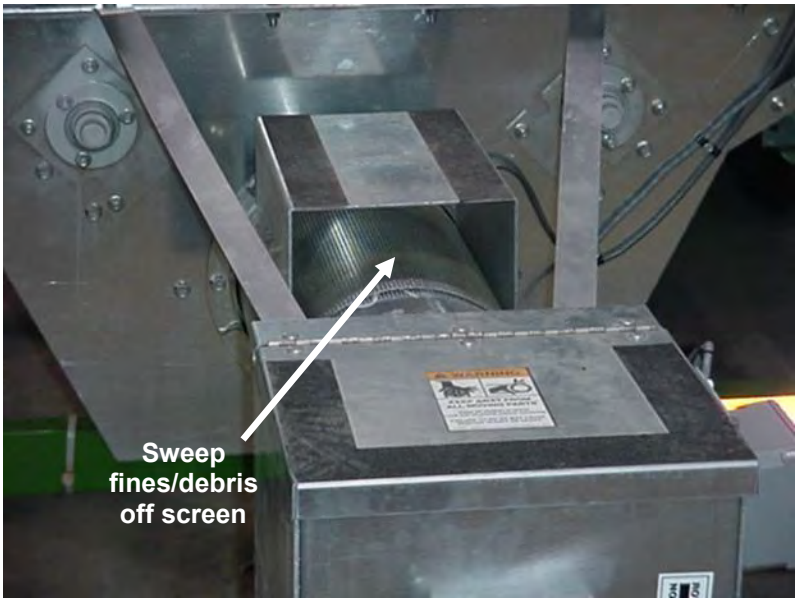


Image 4-26 – Grain discharge chute screen

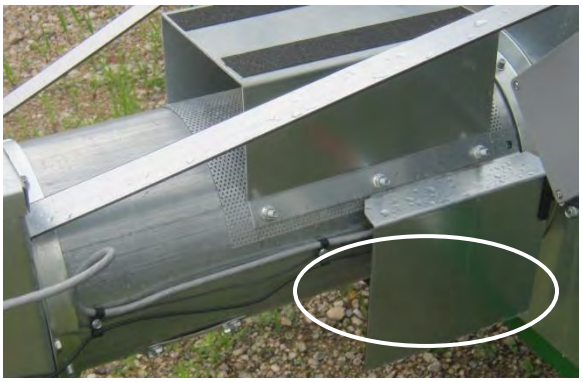


Image 4-27 – Discharge moisture sensor location

6. Remove discharge moisture sensor located under discharge tube as shown in Image 4-27 or on optional static sample box.
7. Clean sensor flag and tube. See Image 4-28. Reinstall moisture sensor.

NOTE: See Image 4-2 for location of discharge moisture sensor on dryer with optional static sample box. Clean as described above.

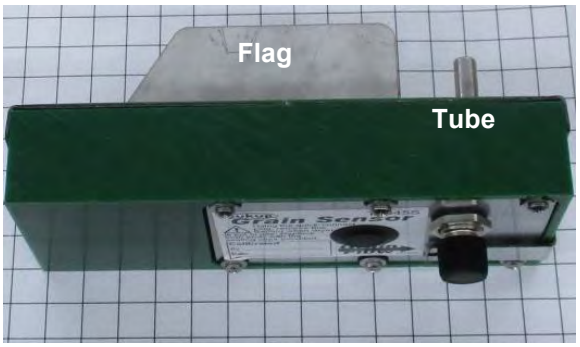


Image 4-28 – Moisture sensor flag & tube

8. Inspect temperature sensor tube (silver) shown in Image 4-29. Clean if necessary.

9. Restart dryer via touch screen using Automatic or Manual control.

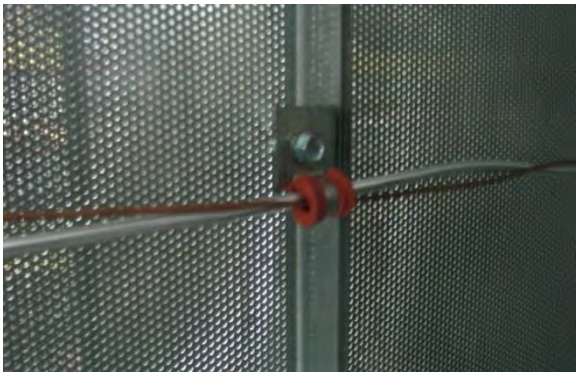


Image 4-29 – RTD temperature sensor tube

Semi-weekly Maintenance Requirements

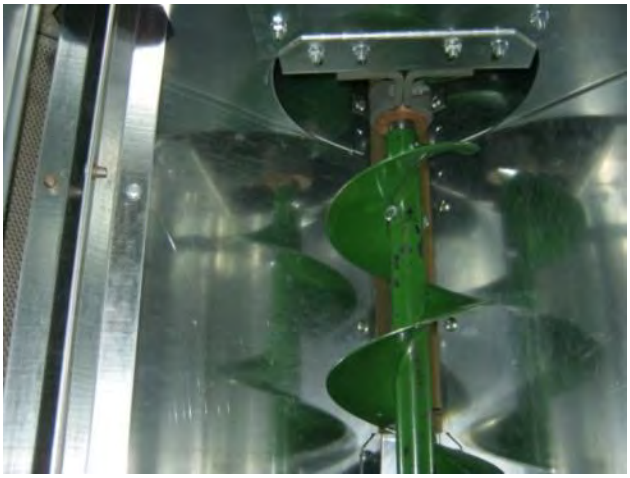


Image 4-30 – Unload auger

1. Perform all steps of daily maintenance listed in previous section except Step 13, restarting dryer.

2. Remove floor plates and open outside access/cleanout doors. Inspect unload auger area for obstructions, fines and debris. Clean as necessary. Replace floor plates and close outside access/cleanout doors. See Images 4-30 and 4-31.

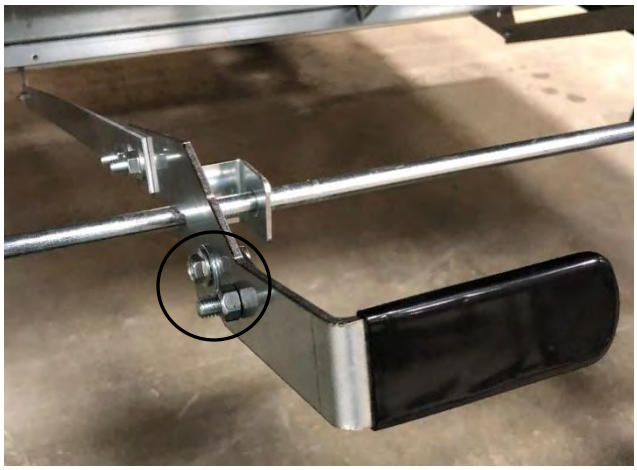


Image 4-31 – Unload auger outside access/cleanout door handle

IMPORTANT: After cleaning, lock outside access/cleanout doors shut using fasteners on handles. See Fig. 4-31.

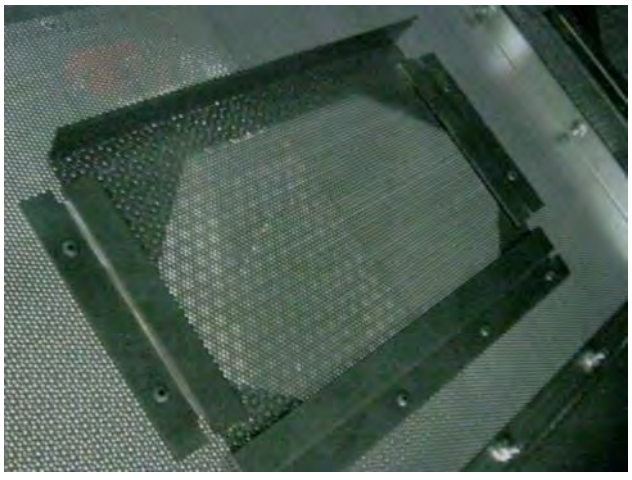


Image 4-32 – Inner grain column cleanout door

3. Open inner and outer grain column cleanout doors and remove debris. Close doors. See Images 4-32 and 4-33.

Image 4-33 – Outer grain column cleanout door

Image 4-34 – Vacuum-cool duct cleanout door (only on centrifugal-fan dryer)

IMPORTANT: After cleaning, lock outside cleanout doors shut using fasteners on handles. See Fig. 4-33.

4. Remove plenum divider door (not shown), if applicable, and clean out any debris. Replace door.

5. On centrifugal-fan dryer, remove vacuum-cool duct door and clean out any debris. Replace door. See Image 4-34.

6. Restart dryer via touch screen using Automatic or Manual control.

Weekly Maintenance Requirements

1. Unload grain from dryer by performing Final Dry in Automatic mode.
2. Perform all steps from Daily and Semi-weekly requirements except for restarting dryer.
3. Thoroughly inspect grain columns for accumulation of debris and fines. Remove if found.
4. Check tension of drive belts.
5. Restart dryer via touch screen using Automatic controls (Initial Load, Initial Dry).

End-of-Season Maintenance Requirements

1. After dryer is unloaded for last time of season, open all access doors and panels. Thoroughly clean entire dryer by sweeping and using compressed air. Power washing may be required after unusually dirty drying season. Clean wet bin trash pan.

NOTICE: Do not blow compressed air directly into air pressure switch hose. Damage to switch may occur.

2. Perform all steps listed under Preventive Maintenance.
3. **Leave Unload Auger clean-out doors open for water drainage.**
4. Lock out electrical power.
5. Install a cover over each axial fan inlet screen to keep debris from entering fan. ***NOTICE:*** Never place obstacles in way of fan to stop rotation.
6. Remove moisture sensor(s) from dryer and store in a cool, dry place. Be sure to cap both coupler fittings as shown in Images 4-35 and 4-36.

NOTICE: Sensor could be damaged by water if left on dryer.

Image 4-35 – Moisture sensor cable capped

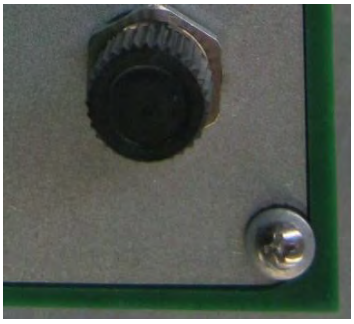


Image 4-36 – Cable connector capped

7. Ensure that cover of QuadraTouch Pro console is closed. Remove Ethernet cable, disconnect from power, and store control unit indoors during offseason.

Troubleshooting Guide

Table of Contents

DATE	REVISION	PAGE
04/04/2024 –	Updated grain discharge box switch instructions	2
	Updated references to M12 cable Service Guide L1986	2-10, 12 & 13
	Minor editing to improve clarity	12, 14-16 & 18
	Added QR code for more information on fixing a communication error	15
04/13/2023 –	Minor editing changes throughout	
	Updated vapor over-temperature switch photo	5
	Added instructions & resistance values for single-point grain sensor RTDs	14 & 17

Fault Troubleshooting

Grain Discharge Box Interlock Switch

Image 4-18 – Grain discharge box interlock switch

Grain discharge box interlock switch detects discharge box lid opening during operation. This fault usually indicates a problem with take-away system, and will stop dryer.

Fault Condition
Discharge Chute is Open
All dryer models use circuit 42

1. Is discharge box lid open? Remove any obstructions and close lid.
2. Is switch arm out of adjustment? This can be determined by watching input light 42 on PLC. Adjust switch arm after placing lid at desired height for fault to occur (51mm to 76mm [2” to 3”]). PLC input light turns off when a fault occurs.
3. If unable to adjust switch arm and turn on PLC input light, use a voltmeter to determine if switch is malfunctioning. Remove switch cover and locate the two wires coming from switch. Check for 24VDC from wire 18 to ground.
4. If 24VDC is found on circuit 18, check for voltage on circuit 42. If unable to detect 24VDC on circuit 42, switch must be replaced.
5. If 24VDC is present on circuit 42, but PLC input light is still off, go to main power box and check terminal 42 for 24VDC. If unable to detect 24VDC on terminal 42, check connections between discharge box switch and power box.
6. If 24VDC was present on terminal 42 in power box, check PLC input where circuit 42 wire goes into PLC. If 24VDC is present on input on PLC but light is OFF, then PLC is malfunctioning.

NOTE: For more on signal routing, see M12 Cable Service Guide, L1986.

Grain Level Ball Switches

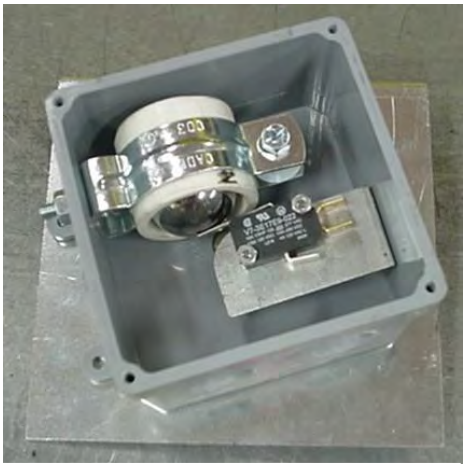


Image 5-2 - Grain level ball switch

Grain Level Ball Switches are located on top of dryer, connected to paddle. Switches are used to indicate when dryer is running low or out of grain, if dryer is full, or if filling has not occurred within amount of time previously set by operator. A fault will be displayed when any of these conditions occur.

Fault Condition
Message Depends on Fail Type
All dryer models use circuits 44 & 53

1. Is wet bin out of grain? If this is last load for season, press RESET and Start→Final Dry.
2. Has an auxiliary load malfunctioned? Repair cause of load failure and press RESET.
3. If wet grain is available and load auxiliaries are functioning, is paddle bound up? If so, free paddle and repair cause.
4. Are both PLC input lights off? (Both lights should be off when dryer is calling for grain – paddle down.)
   Are both PLC input lights on? (Both lights should be on when dryer is full – paddle up.)
   If not, remove cover from paddle switch box and visually check switches for proper placement in their respective holders.
5. Check PLC input lights 44 and 53 while someone moves paddle from down position to up position. If either PLC input light does not turn on, check for 24VDC on wire 18 to ground. (Touch black probe from meter to dryer frame.)
6. If 24VDC is detected on wire 18, check for 24VDC on other wire going to switch.
   a. With paddle switch in up position, 24VDC should be detected on circuits 44 and 53.
   b.If not, replace respective switch and recheck for voltage.
7. If paddle is in up position and 24VDC is present on both switches, but one or both PLC input lights are off, check voltage on respective terminals in main power box. If 24VDC is not detected on respective terminal, check wiring connections between paddle switch box and terminals in main power box.
8. If 24VDC is detected at terminal in power box and PLC input lights are not on, PLC may be malfunctioning.

NOTE: For more on signal routing, see M12 Cable Service Guide, L1986.

Unload Auger Proximity Switch

Image 5-3 – Unload auger proximity switch

Unload auger proximity switch is located on discharge box at end of unload auger. This device monitors unload auger and will give a fault and stop dryer if unload auger stops turning. When properly installed, switch should be between 1.6mm (1/16”) and 3mm (1/8”) from rotating target.

Fault Condition
Unload Prox Failure
All dryer models use circuit 96

1. Visually inspect auger for problems.
   a. Are belts tight and in good condition?
   b. Does motor smell or feel hot?
   c. Is a Motor Overload fault being displayed along with Unload Auger fault? If so, do not restart unload motor until a definite cause for overload has been determined. After repairing cause of fault, reset motor overload. Then press RESET on touch screen.
2. If no fault is being displayed, go to Manual on touch screen and turn on Unload and check for rotation.
   a. While auger is rotating, check PLC input light. It should be flashing at a regular rate, indicating rotation.
   b. If PLC input light is not flashing, check auger for rotation. If auger is not rotating, find cause and repair it.
3. If rotating, look at back of switch. A small light should be flashing on and off.
4. If light on back of switch is not flashing, follow wires to junction box and remove cover.
   a. Locate brown, black and blue wires coming from unload auger switch. Check for 24VDC on wire 18 (brown), with respect to wire 96 (blue).
   b. If 24VDC is not found on wire 18, go to main power box and check for 24VDC on terminal 18.
   c. If 24VDC is not found on circuit 18 in main power box, check for 24VDC on topside of PLC.

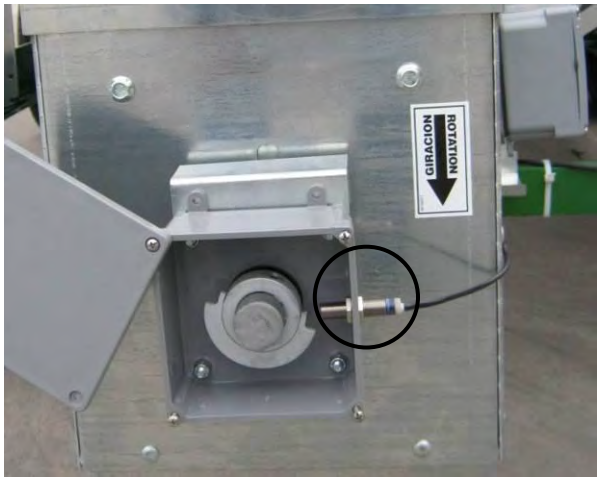


Image 5-4 – Unload auger proximity switch

5. If possible, position target over switch. Light on back of switch should be on.
   a. Check for 24VDC on output wire (circuit 96). If light is on but 24VDC is not found on circuit 96, switch is malfunctioning.
   b. If 24VDC is found on circuit 96, go to PLC in main power box. Check PLC input light. It should be on when switch light is on.
   c. If 24VDC is found on circuit 96, but PLC input light is not on, check for 24VDC on power box terminal. If 24VDC is not found, check wiring connections between junction box and power box.

NOTE: For more on signal routing, see M12 Cable Service Guide, L1986.

Vapor Over-Temperature Switch

Image 5-5 - Vapor OT switch

On an LP dryer, vapor over-temp switch is located on pipe train for heater. Its purpose is to detect gas that is overheated and could damage heater components. Fault message will appear and dryer will shut down if vapor temp gets above 60°C (140°F). Vapor pipe train should be warm but not too hot to touch.

Fault Condition

Vapor Over-Temp

6th switch uses circuit 602
5th switch uses circuit 502
4th switch uses circuit 402
3rd switch uses circuit 302
2nd switch uses circuit 202
1st switch (bottom) uses circuit 102

1. Check fuel supply. Is tank low on fuel? If so, fill tank.
2. Is there an air inlet obstruction? Clean debris from fan grill.
3. Vaporizer coil might be too close to flame. Adjust vaporizer coil. See instructions in Operation section.
4. Has vaporizer coil had sufficient time to cool down?
   If so, remove cover of switch box and press reset button.
5. Is PLC input light on?
   a. After device has cooled down and has been reset, PLC input light should be on.
   b. If not, follow wire to heater box or junction box and check for 24VDC on terminal 18.
6. If 24VDC is not found on terminal 18, go to main power box and check for 24VDC on terminal.
   If 24VDC is found on terminal 18 in main power box, check wiring connections from heater box to power box.
7. With 24VDC being found on circuit 18 for vapor O/T switch, and after device has cooled down to ambient temperature, check for 24VDC on X02 circuit coming from O/T switch.
   a. If 24VDC is NOT found on X02 circuit, O/T switch must be replaced.
   b. If 24VDC is found on X02 circuit serving O/T switch, take note of terminal point and go to main power box and check for 24VDC on respective terminal.
   c. If 24VDC is NOT found on power box terminal, check wiring connections between power box and heater box.
   d. If 24VDC is found on input terminal, input light is NOT on, and fault message is still being displayed (after switch has been reset), then PLC is malfunctioning.

NOTE: For more on signal routing, see M12 Cable Service Guide, L1986.

Rear Door Interlock Switch

Images 5-6 & 5-7 – Interlock switch (left) & key w/ chain (right)

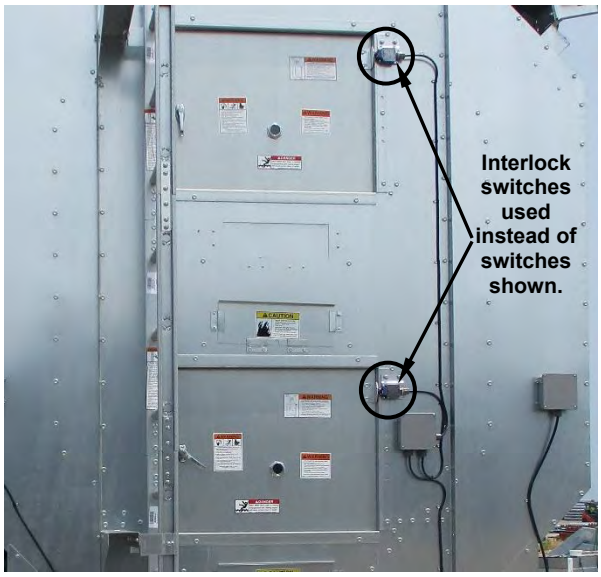


Image 5-8 – Rear access doors & switches

Rear door interlock switch is located to right of each rear door on dryer. This switch prevents dryer from running when door is open and someone might be in plenum of dryer.

Fault Condition
Rear Door is Open
All dryer models use circuit 36

1. Check rear door or doors to be sure no one is inside and doors are closed.
2. If all doors are closed, check that PLC input light is on. If light is not on, go to junction box on back of dryer that contains wire from switches. Remove cover and check for 24VDC on input wire.

NOTE: Circuit 18 serves interlock switch. If there is more than one plenum, switches are connected in series (36, 36A, 36B & 36C) in DS junction box, then route back to PLC.

3. If 24VDC is not present on PLC input wire, check that 24VDC is present on terminal 18.
   a. If 24VDC is present on input wire, but PLC input light is not on, check for 24VDC returning from all switches.
   b. If 24VDC is not returned from door switches, check voltage on wire coming from each switch.
4. If 24VDC is returned from last switch, check for 24VDC on power box terminal 36.
   a. If 24VDC is not found on power box terminal 36, check wiring connections between junction box and power box.
   b. If 24VDC is found on power box terminal 36, check input 36 on PLC for 24VDC.
5. If 24VDC is found on PLC input 36 but input light is not on and there is a rear door fault message, PLC is malfunctioning.

NOTE: For more on signal routing, see M12 Cable Service Guide, L1986.

Grain Column Over-Temperature Switch

Image 5-9 – Grain column over-temp switch

There are two grain column over-temperature switches on dryer. Each has a sensor in a conduit running horizontally through grain columns. These sensors monitor temperature in grain columns. Switch will turn dryer off if columns reach 149°C (210°F). Multiple switches on same side of a stacked dryer will be wired in series.

Fault Condition
Right Column Over-Temp
All dryers use circuit 40 for right side

Fault Condition
Left Column Over-Temp
All dryers use circuit 41 for left side

1. Check all grain columns for obstruction that would prevent grain from flowing through column. If obstruction is found, do not restart dryer until it has been cleared.

NOTE: To check for an obstruction, go to Manual operation using touch screen and turn unload on. Run unload long enough for grain level in columns to drop at least 1 foot. Observe grain level in each column. Any column with an obstruction will be readily visible. Remove any obstruction.

2. If no obstruction is found and grain is flowing freely through each column, plenum temperature may need to be reduced.
3. If column temperature has cooled down and RESET button has been pressed on touch screen and fault message is still displayed, remove switch box cover and check for 24VDC on terminal 18.
4. At this point, 24VDC should be present on circuit 18 at O/T switch. Check for 24VDC on other circuit (40 or 41) from switch.
   a. If 24VDC is NOT found, O/T switch is defective.
   b. If 24VDC is found on wire coming from O/T switch but PLC input light is NOT on, note wire number and go to main power box and check for 24VDC on terminal 40/41.
   c. If 24VDC is NOT found on 40/41, check wiring between switch box and power box.
   d. If 24VDC is detected on 40/41 in power box, go to PLC and check for 24VDC on input terminal.
   e. If 24VDC is detected on PLC input terminal, and input light is not on, and fault message is still displayed (after pressing RESET on touch screen), PLC is malfunctioning.

NOTE: For more on signal routing, see M12 Cable Service Guide, L1986.

Heater Housing High-Limit Switch

Image 5-10 – Heater housing high-limit switch

Heater housing high-limit switch is in a box mounted above heater. See Image 5-13 or 5-14. Switch trips when heater reaches a temperature of 93°C (200°F).

Fault Condition
Heater Housing Over-Temp
6th switch uses circuit 603
5th switch uses circuit 503
4th switch uses circuit 403
3rd switch uses circuit 303
2nd switch uses circuit 203
1st switch (bottom) uses circuit 103

1. Check for proper fan operation and airflow.
   a. Check ignition harness for burned wires. Replace as needed.
   b. Check for plugged fan inlet and remove any debris.
   c. Remove cover from box of faulted heater high-limit switch and push red reset button on switch. See Image 5-10.
   d. Go to Manual on touch screen and turn on fan. Ensure it is running at proper speed.
   e. Turn burner switch to ON and observe burner for proper operation.
2. After allowing time to cool, push red reset button on high-limit switch so it latches.
   a. If red button will not latch, high-limit switch is defective.
   b. If red button will latch but fault remains after RESET is pressed on touch screen, check voltage.
3. Locate wires attached to high-limit switch. Check for 24VDC on wire 18.
   a. If 24VDC is not present on wire 18, go to respective X03 circuit in main power box and check for 24VDC on terminal 18.
   b. If 24VDC is present on terminal 18, check wiring connections between heater box and main power box.
4. At this point, 24VDC should be present on circuit 18 at high-limit switch.
   a. Check for 24VDC on circuit X03 at high-limit switch. With red reset button latched in, 24VDC should be present.
   b. If 24VDC is NOT found, high-limit switch is defective.
   c. If 24VDC is found but PLC input light is not on, take note of wire number and go to power box and check for 24VDC on respective X03 circuit.
   d. If 24VDC is NOT found on respective X03 circuit, check wiring connections between switch and main power box.
   e. If 24VDC is found on respective X03 circuit in main power box, go to PLC input terminal and check for 24VDC.
   f. If 24VDC is NOT found on PLC input terminal, check wiring connections from PLC input terminal to respective X03 circuit in main power box.
   g. If 24VDC is found on PLC input terminal but input light is NOT on, and fault message is still displayed after pressing RESET on touch screen, PLC is malfunctioning.

NOTE: For more on signal routing, see M12 Cable Service Guide 1986.

Meter Roll Proximity Switch

Image 5-11 – Meter roll proximity switch

Meter roll proximity switch is in a box at back of dryer. Switch monitors meter rolls for rotation. If rolls stop turning, a fault message will appear and dryer will shut down.

Fault Condition
Metering Roll Prox Failure
All dryer models use circuit 93

1. Go to Start Menu and select Manual Operation.
2. Set Meter Roll speed to 15%.
3. Touch Unload button.
4. Observe meter rolls drive chain.
   a. If chain is moving, check to see if meter rolls are turning.
   b. If meter rolls are not turning, check for a broken chain.
5. If meter rolls are turning, go to back of dryer and see if light on meter roll switch is turning on and off.
   a. Check PLC input to see if light is turning on and off.
   b. After determining which meter roll input signal is missing, remove cover from box housing proximity switch. Make sure end of switch is no more than 3.2mm (1/8") of rotating target and no less than 1.6mm (1/16"). If not, adjust before proceeding. Turn unload off when meter roll target is positioned above proximity switch head. Light on back of proximity switch should now be on.
   c. If light is not on, follow wire from proximity switch to junction box. Remove junction box cover.
   d. Check for 24VDC on circuit 18.
   e. If 24VDC is not found on circuit 18, go to main power box and check for 24VDC on terminal 18.
   f. If 24VDC is found on power box terminal, check wiring connections between junction box and power box.
6. At this point, 24VDC should be present on circuit 18 in junction box on back of dryer (brown sensor wire). This voltage is referenced to ground (blue wire).
7. Light on proximity switch should be on and 24VDC should be present on output (black wire). If not, switch is defective.
8. If 24VDC is found on output (black) wire, go to power box and check PLC input light. It should be on when switch light is on.
   a. If 24VDC is found on black wire but PLC input light is not on, go to power box and check for 24VDC on circuit 93.
   b. If 24VDC is NOT found in power box on circuit 93, check wiring connections between junction box and power box.
   c. If 24VDC is found in power box on circuit 93, go to PLC and check for 24VDC on PLC input terminal.
   d. If 24VDC is found on PLC input terminal but light is NOT on, PLC is malfunctioning.

NOTE: Prox switch on dryer w/ optional static sample box is in same area and functions in same way.

NOTE: For more on signal routing, see M12 Cable Service Guide, L1986.

Differential Air Pressure Switch

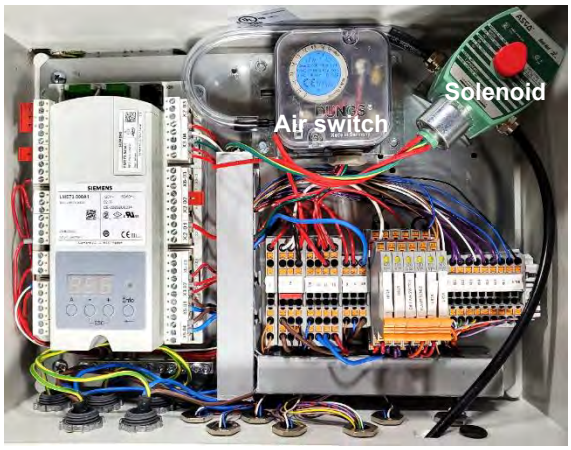


Image 5-12 – Differential air pressure switch

Differential air pressure switch ensures there is enough air flow to use heater safely and will shut down dryer if there is not enough pressure.

Fault Condition

No Static Air Pressure

6th switch uses circuit 605
5th switch uses circuit 505
4th switch uses circuit 405
3rd switch uses circuit 305
2nd switch uses circuit 205
1st switch (bottom) uses circuit 105

1. Ensure that air hose fits tightly to switch.
2. Ensure switch wiring is secure in heater box and elsewhere.
3. Using Manual Operation on touch screen, turn Fan ON. Check fan for proper operation and airflow.
4. If a fault message appears, air switch may not be adjusted properly. Open cover of box containing air switch. See Image 5-12.
5. An obvious sign of differential air switch problem is if LME controller locks out on Code P21 or P22 (after P24).
   a. If LME locks out after P21, wiring on air switch might be backwards.
   b. If LME locks out after P22, either air solenoid or air switch could be the problem.
6. Relay light on heater box should turn on while air switch is closed, while fan is running and power is being sent to air solenoid from LME terminal block X2-01, pin 3.
7. Adjust air hose near venturi to get proper vacuum.
8. Make sure pressure switch setting is about 0.8 mbar.
9. Make sure the following wires and hoses are connected properly:
   a. Differential air switch #3 (wire 1A) is connected to LME terminal block X3-02, pin 2.
   b. Differential air switch #2 (wire 1B) is connected to Neutral (terminal 2).
   c. Air solenoid live terminal is connected to LME terminal block X2-01, pin 3.
   d. Air solenoid neutral terminal is connected to Neutral (terminal 2).
   e. Hose from venturi is connected to Port 2 on air solenoid.
   f. Hose from Port 2 on air solenoid is connected to negative pressure barb on air switch.

NOTE: For more on signal routing, see M12 Cable Service Guide, L1986.

Image 5-13 – Locations on axial dryer of plenum temp sensor RTD, plenum over-temp switch & heater housing high-limit switch

Image 5-13 shows locations on axial-fan dryer of:

1. Plenum temp sensor RTD
2. Plenum over-temp switch
3. Heater housing high-limit switch

.

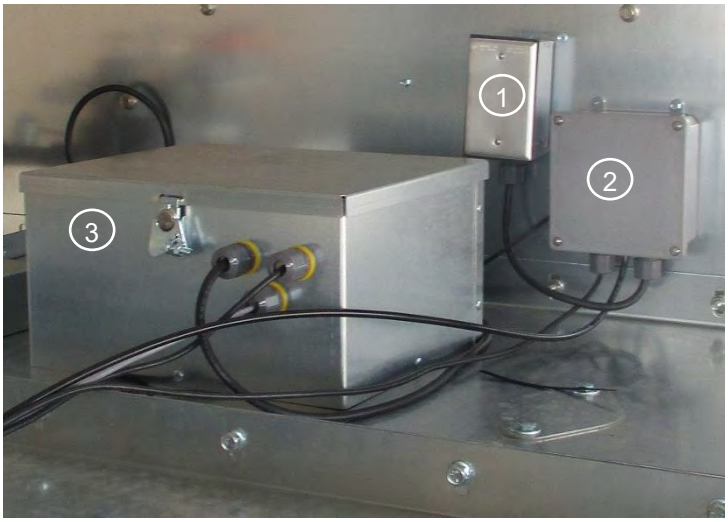


Image 5-14 – Locations on centrifugal dryer of plenum temp sensor RTD, plenum over-temp switch & heater housing high-limit switch

Image 5-14 shows locations on centrifugal-fan dryer of:

1. Plenum temp sensor RTD.
2. Plenum over-temp switch.
3. Heater housing high-limit switch.

Plenum Over-Temperature Switch

Image 5-15 – Plenum over-temp switch

Plenum over-temp switch capillary runs through plenum of dryer. Its purpose is to protect plenum from overheating. See previous page for location of switch.

Fault Condition

Plenum Over-Temp

6th switch uses circuit 604
5th switch uses circuit 504
4th switch uses circuit 404
3rd switch uses circuit 304
2nd switch uses circuit 204
1st switch (bottom) uses circuit 104

1. Check fan for obstruction and remove if found.
2. With dryer turned off, open door and inspect plenum for any problems.
3. After plenum has cooled down, press RESET on touch screen and fault should clear.
   NOTE: Switch will reset automatically when temperature drops to an acceptable level.
4. If fault has not cleared, remove cover from box containing plenum O/T switch and check for 24VDC on circuit 18.
5. If 24VDC is NOT detected, check connection with terminal 18 in main power box.
6. Check for 24VDC on other side of switch.
   a. If O/T switch has cooled down and 24VDC is NOT found on respective X04 circuit, then switch is defective.
   b. If 24VDC is found on respective X04 circuit, go to PLC and check input light. If input light is on, press RESET on touch screen and fault should clear.
   c. If input light is not on, take note of number of wire coming out of O/T switch. Go to power box and check for 24VDC on respective X04 circuit.
   d. If 24VDC is NOT found on respective X04 circuit in power box, check wiring connections between switch box and power box.
   e. If 24VDC is found on respective X04 circuit in power box, check for 24VDC on PLC input terminal.
   f. If 24VDC is found on PLC terminal and input light is off and fault message is still displayed, PLC is malfunctioning.

NOTE: For more on signal routing, see M12 Cable Service Guide, L1986.

Discharge Moisture Sensor

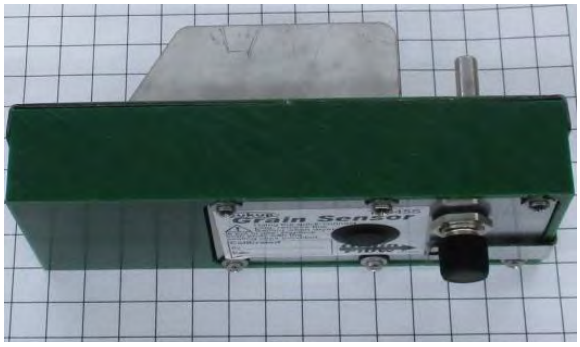


Image 5-16 – Discharge moisture sensor

Discharge moisture sensor is found under discharge chute at rear of dryer. It senses moisture and temperature of grain as it is discharged from dryer.

Fault Condition
Moisture Sensor Not Found

Follow steps below if “Moisture Sensor Not Found” error message appears.

1. In main power box, find cable used by moisture sensor. Wire colors are brown, blue, black and white.
2. Remove moisture sensor from tube. Check for DC voltage between black and white wires. It should be between 8.7 and 9.0 VDC. If voltage is out of range, sensor is out of calibration. Replace sensor or send to Sukup Manufacturing Co. for recalibration.
3. To check temperature monitoring function of sensor, measure between blue and white wires. Sensor output is (10mv/°F), so if ambient temperature is 21°C (70°F), output voltage will be .7VDC. If voltage is off by more than 6.5 degrees C (20 degrees F), sensor is out of calibration. Replace sensor or send to Sukup Manufacturing Co. for recalibration.

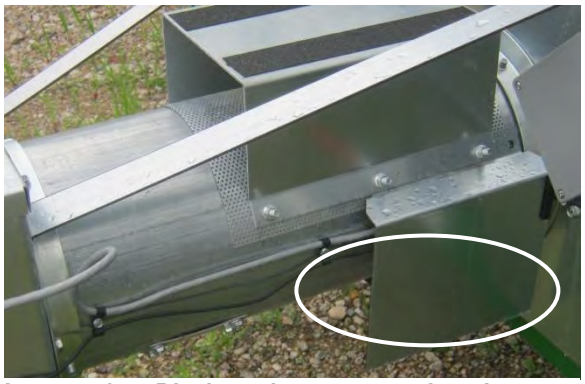


Image 5-17 – Disch. moisture sensor location

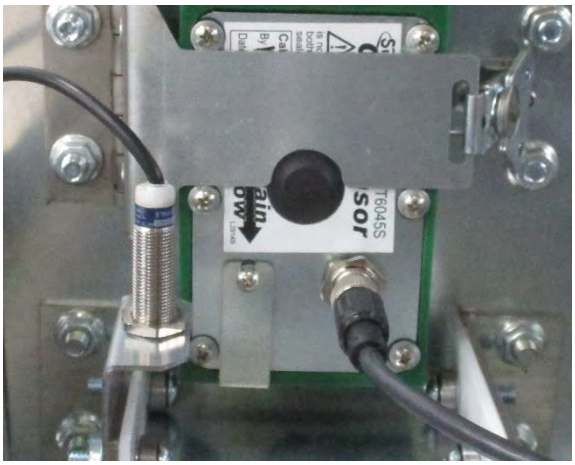


Image 5-18 – Discharge moisture sensor in optional static sample box under discharge chute

If dryer has optional static sample box at discharge find discharge moisture as shown in Image 5-18.

NOTE: If dryer has optional incoming moisture sensor on wet bin and malfunction is suspected, remove sensor and remove its wires from nearby junction box. Check voltage between black and white wires. It should be between 8.7 and 9.0VDC. If voltage is out of range, sensor is out of calibration. Replace sensor or send to Sukup Manufacturing Co. for recalibration.

NOTE: For more on signal routing, see M12 Cable Service Guide, L1986.

Single-Point Grain Sensor RTD (Resistance Temperature Detector)

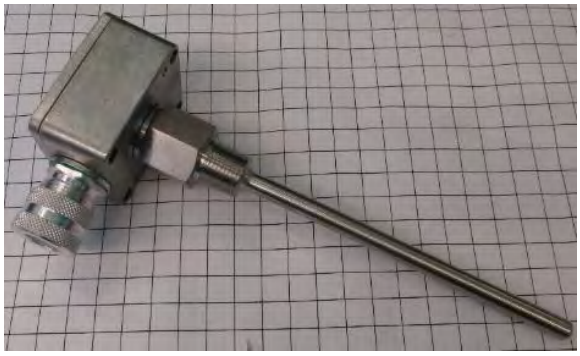


Image 5-19 – Single-point grain sensor RTD

Four single-point grain sensor RTDs (See Image 5-19) are used to monitor grain temperatures in columns of stacked dryer (optional on single-module). They are spread out equidistantly to provide average temperature readings to operating system, helping to improve dryer performance. Follow steps below if malfunction is suspected.

1. In main power box, disconnect RTDs in sequence from terminal block. See Fig. 5-1.
2. Test resistance of each RTD with an Ohm meter. Compare to applicable value in table on Page 17. If reading corresponds to applicable value, RTD is OK.
3. If an RTD is outside of range, it is likely defective and may need to be replaced. (One bad RTD in circuit will cause reading to be incorrect.)
4. If an RTD is suspected of being defective, remove cover from sensor and ensure wires are securely connected. Use Ohm meter to test resistance between leads. If connections are tight and resistance is out of range, replace sensor.

NOTE: If blue and purple transmitter wires are removed from terminal block, resistance can be checked across entire bridge at those points to see if resistance is within range. If it is, and transmitter is still out of range, transmitter may be faulty. Voltage between terminals 70 and 95 of transmitter should be between .75 and 4.5. If voltage on PLC doesn't match voltage found at transmitter, check all connections between PLC and transmitter terminals.

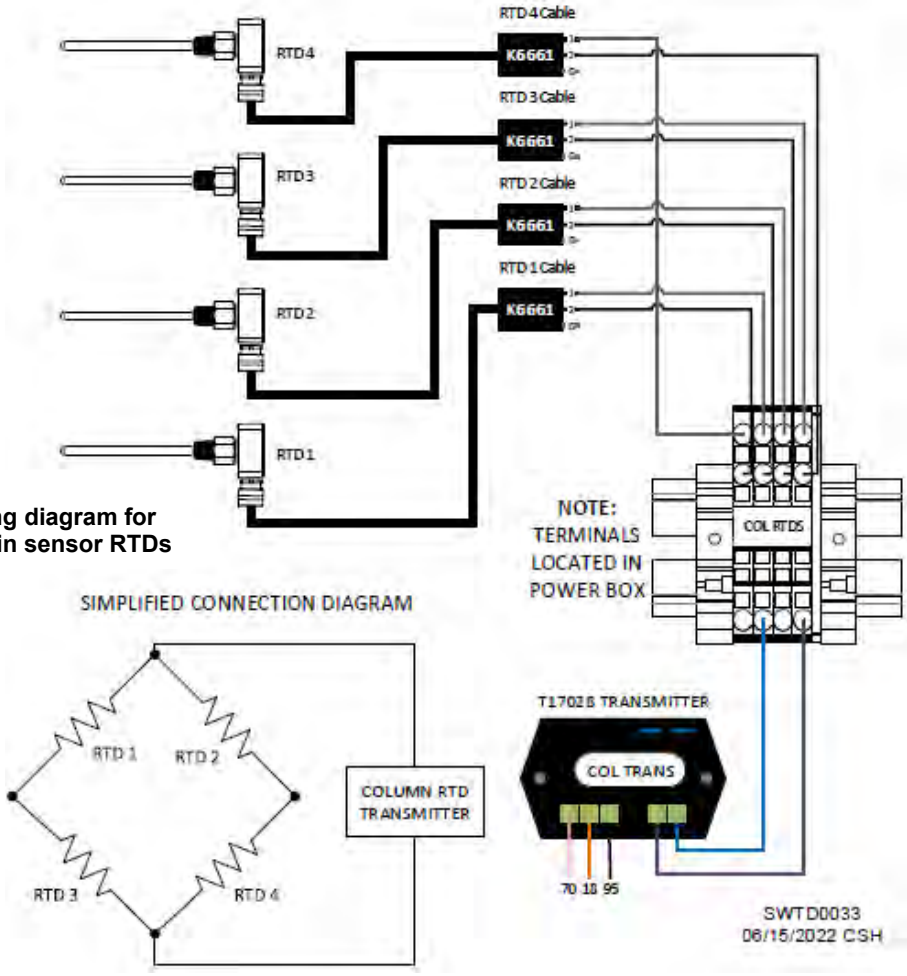


Fig. 5-1 – Wiring diagram for single-point grain sensor RTDs

QuadraTouch Pro Controller

If connection between QuadraTouch Pro panel and PLC is lost, Communication Error screen will appear.

Fixing a Communication Error

Make sure touch-screen and PLC are both on.

- On main power box, make sure E-Stop is pulled out and illuminated RED, and that System Control Switch points to QuadraTouch Pro. Make sure PLC lights are on.
- Check link lights on Ethernet ports of both QuadraTouch Pro console and PLC. To check on console, loosen thumb screws below touch-screen and lift screen. Ethernet cable should be plugged into the “X2 ETH” port.
- If link light on either the X2 ETH port or PLC is illuminated, Ethernet cable should be good.
- If one of the Ethernet couplers is bad, both link lights will be off.
- If link light is lit on one device (PLC or console) but not the other, use a cable known to be good and connect the device with no lit link light into another device such as a laptop computer. If no light illuminates, Ethernet port on checked device (PLC or console) is likely bad.

Checking Communications Settings on QuadraTouch Pro

- Ensure that Ethernet cable connecting dryer to QuadraTouch Pro console is plugged into port “X2 ETH” and that link lights on PLC and console are both on.
- If another cable is plugged into “X3 ETH,” unplug it and reconnect after the communication error has been resolved.
- Go to Tools→Connectivity Tools Menu→Network Repair Utility→Start Network Repair. This will reset the touch-screen console’s Ethernet ports to factory settings.
- After process is complete, press RESET to return to main page.

For more information, scan QR code below.

Device Troubleshooting

Plenum Temperature Sensor RTD & Transmitter

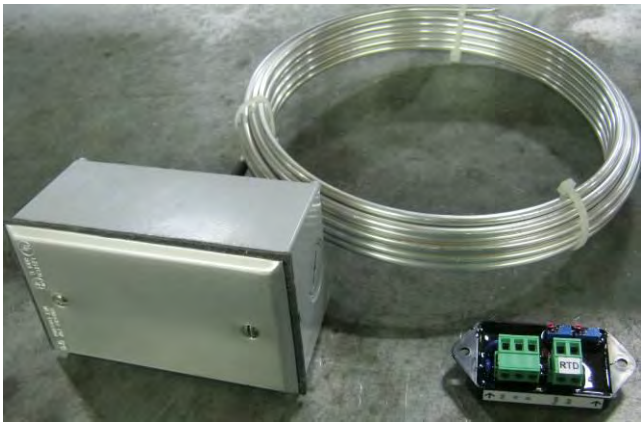


Image 5-20 – Plenum temperature sensor RTD and transmitter

Plenum temperature sensor consists of RTD (Resistance Temperature Detector) and transmitter.

RTD measures average resistance over length of tube.

RTD is used with a transmitter that converts resistance into a 1 to 5 VDC signal. This voltage is then fed into PLC and displayed on QuadraTouch Pro screen.

If RTD is in question, a voltage and resistance comparison can be made to determine if unit is defective.

1. Begin by locating RTD transmitter. It is mounted in main power box. A white label should be attached to bottom of transmitter. Two small terminal blocks are located on transmitter. See Image 5-20.

   IMPORTANT: Above two-pin terminal block are two small adjustment screws. NEVER adjust either of these screws. If moved, transmitter will not work correctly until a factory calibration is performed.

2. Remove two wires coming from RTD (blue and purple) and take a resistance reading between wires. Resistance of RTD is directly related to temperature of RTD. **NOTE:** This reading should be taken with dryer cooled down and at ambient temperature.
   a. If reading shows infinite (open) resistance, RTD is defective.
   b. Compare resistance reading to table on next page to determine if resistance is reasonable. If resistance compares to ambient temperature around dryer, and voltage on output wire is close to ambient temperature, then transmitter and RTD are functioning correctly.

3. On three-pin terminal block, check for 24VDC on terminals 18 and 95.
   a. If 24VDC is not present, check for voltage in terminals where other ends of wires are plugged in.
   b. If 24VDC is present at transmitter terminals 18 and 95, use terminals marked Pink and 95 to check output voltage. Voltage between 1.0VDC and 5.0VDC should be found.
      i. If 24VDC is present on terminals 18 and 95 but voltage is not found between terminals marked Pink and 95, transmitter is defective.
      ii. If voltage is detected, use table on next page to determine if resistance is close to temperature shown. If not, RTD sensor is defective and must be replaced.

TEMPERATURE	RESISTANCE (1,000 OHM) OF PLENUM RTD	RESISTANCE (100 OHM) OF SINGLE-POINT COLUMN RTD	VOLTAGE
10F (-12C)	952	95.2	1.16
15F (-9C)	963	96.3	1.24
20F (-7C)	974	97.4	1.32
25F (-4C)	984	98.4	1.40
30F (-1C)	995	99.5	1.48
35F (2C)	1006	100.6	1.56
40F (4C)	1017	101.7	1.64
45F (7C)	1028	102.8	1.72
50F (10C)	1039	103.9	1.80
55F (13C)	1049	104.9	1.88
60F (16C)	1060	106.0	1.96
65F (18C)	1071	107.1	2.04
70F (21C)	1082	108.2	2.12
75F (24C)	1093	109.3	2.20
80F (27C)	1103	110.3	2.28
85F (29C)	1114	111.4	2.36
90F (32C)	1125	112.5	2.44
95F (35C)	1136	113.6	2.52
100F (38C)	1146	114.6	2.60
105F (41C)	1157	115.7	2.68
110F (43C)	1168	116.8	2.76
115F (46C)	1178	117.8	2.84
120F (49C)	1189	118.9	2.92
125F (52C)	1200	120.0	3.00
130F (54C)	1211	121.1	3.08
135F (57C)	1221	122.1	3.16
140F (60C)	1232	123.2	3.24
145F (63C)	1243	124.3	3.32
150F (66C)	1253	125.3	3.40
155F (68C)	1264	126.4	3.48
160F (71C)	1275	127.5	3.56
165F (74C)	1285	128.5	3.64
170F (77C)	1296	129.6	3.72
175F (79C)	1306	130.6	3.80
180F (82C)	1317	131.7	3.88
185F (85C)	1328	132.8	3.96
190F (88C)	1338	133.8	4.04
195F (91C)	1349	134.9	4.12
200F (93C)	1359	135.9	4.20
205F (96C)	1370	137.0	4.28
210F (99C)	1380	138.0	4.36
215F (102C)	1391	139.1	4.44
220F (104C)	1402	140.2	4.52
225F (107C)	1412	141.2	4.60
230F (110C)	1422	142.2	4.68
235F (113C)	1433	143.3	4.76
240F (116C)	1443	144.3	4.84
245F (118C)	1454	145.4	4.92
250F (121C)	1464	146.4	5.00

Table 5-1

Electronic Modulating Valve

Overview

A plenum RTD and transmitter are required. Transmitter generates a 1 to 5 VDC signal that is sent to PLC.
A Belimo actuator is connected to a butterfly valve that opens or closes to control temperature of plenum. Belimo actuator requires a 24 VDC power source and accepts a 2VDC to 10VDC control signal. Signal comes from PLC.
Troubleshooting modulating valve requires a familiarity with software being used to control the valve. See Image 5-21 and Steps 1-8 for setting mod valve position.

Setting EMOV

1. Press Settings → Fan/Heat Settings → EMOV Settings.
2. Write down values that are displayed for each valve.
3. Reset both numbers for each valve to 25% and select Done.
4. Press BACK or RESET to return to main screen.
5. Press Start → Dry Fire and select FAN and HEAT for each fan available.
6. Upon heater ignition, verify that each heater is operating at a pressure of 4 to 5 PSI. If pressure is less than 4 PSI, or exceeds 5 PSI, loosen nuts on U-bolt that connects actuator to butterfly valve shaft and rotate valve shaft until gas pressure reading is between 4 and 5 PSI.
7. When finished adjusting all valves, press RESET to turn off all fans and heaters and return to main screen.
8. Set EMOV Min and Max values back to settings written down in Step 2.

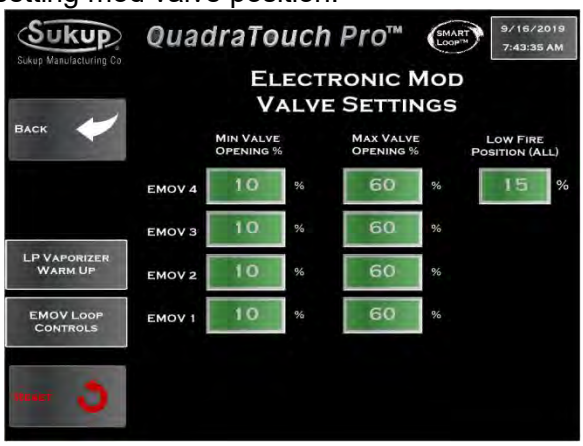


Image 5-21 – Setting EMOV Min & Max openings

Troubleshooting

The first step in troubleshooting an EMOV problem is to determine whether the problem is with just one heater or with all heaters.
If problem is with all heaters, check for 24VDC coming from power supply. This is the supply voltage to all of the Belimo actuators.
If 24VDC is present, check voltage on each actuator's signal wire. If actuator is not receiving a 2VDC to 10VDC reference signal, go to main power box.

1. Measure DC voltage on power box terminals, (between Ground & 95) and signal wire going to that actuator (161, 261, 361, 461, 561, or 661). Low-fire position of EMOV is factory defaulted at 4.0VDC. This opens valve 25%. Terminals 161, 261, etc., should all have 4.0VDC (if the low fire position is set to 25%) when burners are OFF. If so, PLC is operating correctly. Check connections between power box terminals and actuators. If there is 0VDC on terminals 161, 261, etc., there may be a problem with PLC or its yellow analog output card.
2. If burner fires and modulating valve does not open, it's likely that a problem with flame sense circuit on heater board. FLAME ON signal (106, 206, etc.) tells PLC to start controlling plenum temperature by adjusting EMOV. If this signal doesn't come back from heater box, valve will not operate.
3. If reference voltage of 2VDC to 10VDC is present at valve, but valve did not open or close, re-confirm there is 24VDC power to valve. If 24VDC is present, press black clutch-release button and check that valve shaft spins freely by hand. If it does not, butterfly valve is likely defective. If shaft does spin freely, actuator is probably defective. If U-bolt that connects valve to butterfly shaft is loose, it needs to be tightened.

Automatic Grain Dryer

QuadraTouch Pro Dryer Control System

Appendices

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Appendix A

Specifications

Electrical Usage
Metric Tonnes per Hour
Determining Unload Speed
Dryer Stabilization
Holding Capacities

DATE	REVISION	PAGE
04/04/2024	Updated statement on specifications	A-1

Specifications for axial and centrifugal dryers are provided in tables on following pages. Many factors, such as grain variety, maturity levels, grain cleanliness, weather conditions and operation/management, can affect the performance of your dryer and results may vary. This information is calculated and is not a guarantee of product specifications or performance. Based on these factors, Sukup specifications should only be used as estimates, and not as a warranty, express or implied, of how a particular Sukup unit will perform under your operating conditions. Because we are continually advancing Sukup products, changes may occur that may not be reflected in the specifications.

Electrical Usage

Table below shows electrical usage specifications.

Min. Amps = SFA of all motors. Max. Amps = Main switch size.

	Min Amps (SFA of all dryer motors added together)	Max Amps (Main switch size)
Dryer Model	**380V 50Hz 3Ph**	**380V 50Hz 3Ph**
T08	40	250
T12	40	250
T13	45	250
T20	69	250
T24	76	250
T163	64	250
T202	64	250
T203	64	250
T242	73	250
T243	93	250
T283	97	250
T165	78	250
T205	121	250
T206	116	250
T245	137	250
T246	134	250
T168	110	250
T208	169	250
T209	151	250
T248	208	400
T249	174	400
TC16	69	250
TC163	69	250
TC20	80	250
TC203	80	250
TC24	89	250
TC243	89	250
TC165	121	250
TC205	140	250
TC245	158	250
TC248	238	400
TH165	97	250
TH205	133	250
TH245	149	250
TH208	196	400
TH248	220	400

Metric Tonnes per Hour – Axial

Estimated Drying Capacities	Single Axial Fan/Heater Dryer Models						
	Metric Tonnes/Hour						
	T16	T20	T24	T163	T203	T243	T283
Full Heat 20% - 15%	up to 16.5	up to 23.5	up to 26.7	up to 18.8	up to 24.6	up to 26	Up to 30.5
Full Heat 25% - 15%	up to 10.3	up to 14.6	up to 16.8	up to 11.4	up to 15.2	up to 18	Up to 19.7

Estimated Drying Capacities	Two Module Axial Fan/Heater Dryer Models		
	Metric Tonnes/Hour		
	T165	T205	T245
Full Heat 20% - 15%	up to 36.6	up to 51.3	up to 62.2
Full Heat 25% - 15%	up to 25.4	up to 31.8	up to 38.7
Pressure Heat/Vacuum Cool 20% - 15%	up to 27.4	up to 35.1	up to 42.4
Pressure Heat/Vacuum Cool 25% - 15%	up to 17.3	up to 21.8	up to 26.2

Numbers in tables above are APPROXIMATE

Metric Tonnes per Hour - Centrifugal

Estimated Drying Capacities	Single Centrifugal Fan/Heater Dryer Models					
	Metric Tonnes/Hour					
	TC16	TC20	TC24	TC163	TC203	TC243
Full Heat 20% - 15%	up to 18.8	up to 24.6	up to 26	up to 18.8	up to 24.6	up to 26
Full Heat 25% - 15%	up to 11.4	up to 15.2	up to 18	up to 11.4	up to 15.2	up to 18
Pressure Heat/Vacuum Cool 20% - 15%	---	---	---	up to 11.2	up to 14.7	up to 17.5
Pressure Heat/Vacuum Cool 25% - 15%	---	---	---	up to 7.1	up to 9	up to 11

Estimated Drying Capacities	Two Module Centrifugal & Hybrid Fan/Heater Dryer Models					
	Metric Tonnes/Hour					
	TC165	TC205	TC245	TH165	TH205	TH245
Full Heat 20% - 15%	up to 40.6	up to 51.3	up to 62.2	up to 40.6	up to 51.3	up to 62.2
Full Heat 25% - 15%	up to 25.4	up to 31.8	up to 38.7	up to 25.4	up to 31.8	up to 38.7
Pressure Heat/Vacuum Cool 20% - 15%	up to 27.4	up to 35.1	up to 42.4	up to 27.4	up to 35.1	up to 42.4
Pressure Heat/Vacuum Cool 25% - 15%	up to 17.3	up to 21.8	up to 26.2	up to 17.3	up to 21.8	up to 26.2

Numbers in tables above are APPROXIMATE

Determining Unload Speed

Use tables below and on following pages to select unload speed **starting point** percentage, based on plenum temperature and moisture to be removed in dryer. **NOTE:** Grain variety, maturity level, cleanliness, weather conditions and operation can all affect performance of dryer. To the extent possible, be aware of different varieties of grain being fed into dryer, as well as other factors that may affect performance.

Tables below are to be used for CORN only.

If it is necessary to run meter rolls slower than 5%, Auto Batch must be used.

Percentages in tables below are approximate.

Single Module

Single-Module, Axial-Fan, Full-Heat		Plenum Temperature								
		140 ° (60°C)F	150 °F (66°C)	160°F (71°C)	170°F (77°C)	180°F (82°C)	190°F (88°C)	200°F (93°C)	210°F (99°C)	220°F (104°C)
Moisture Removal	18-17%	24	28	32	36	40	44	48	52	56
	19-17%	20	23	26	29	33	36	39	43	46
	20-17%	17	20	23	26	28	31	34	37	40
	21-17%	15	18	20	23	25	28	30	33	35
	22-17%	14	16	18	21	23	25	27	30	32
	23-17%	13	15	17	19	21	23	25	27	29
	24-17%	12	14	15	17	19	21	23	25	27
	25-17%	11	13	14	16	18	20	21	23	25
	26-17%	10	12	13	15	17	18	20	22	23
	27-17%	9	11	12	14	15	17	19	20	22
	28-17%	9	10	12	13	14	16	17	19	20
	29-17%	8	9	11	12	13	15	16	18	19
	30-17%	8	9	10	11	13	14	15	16	18

Double-Stack, Axial-Fan, Full-Heat		Plenum Temperature								
		140 ° (60°C)F	150 °F (66°C)	160°F (71°C)	170°F (77°C)	180°F (82°C)	190°F (88°C)	200°F (93°C)	210°F (99°C)	220°F (104°C)
Moisture Removal	18-17%	38	44	50	57	63	69	75	82	88
	19-17%	31	36	41	46	51	56	61	66	72
	20-17%	27	31	35	40	44	49	53	57	62
	21-17%	24	28	31	35	39	43	47	51	55
	22-17%	21	25	28	32	36	39	43	46	50
	23-17%	19	23	26	29	32	36	39	42	45
	24-17%	18	21	24	27	30	33	36	39	42
	25-17%	17	19	22	25	28	30	33	36	39
	26-17%	15	18	20	23	26	28	31	33	36
	27-17%	14	17	19	21	24	26	28	31	33
	28-17%	13	15	18	20	22	24	27	29	31
	29-17%	12	14	16	19	21	23	25	27	29
	30-17%	12	13	15	17	19	21	23	25	27

50/50 Split - Heat & Pressure Cool		Plenum Temperature								
		140 ° (60°C)F	150 °F (66°C)	160°F (71°C)	170°F (77°C)	180°F (82°C)	190°F (88°C)	200°F (93°C)	210°F (99°C)	220°F (104°C)
Moisture Removal	16-15%	18	20	23	26	29	32	35	38	41
	17-15%	14	16	19	21	23	26	28	30	33
	18-15%	12	14	16	18	20	22	24	26	28
	19-15%	10	12	14	16	17	19	21	23	24
	20-15%	9	11	12	14	15	17	19	20	22
	21-15%	8	10	11	12	14	15	17	18	19
	22-15%	8	9	10	11	13	14	15	16	18
	23-15%	7	8	9	10	11	13	14	15	16
	24-15%	6	7	8	9	10	11	12	13	15
	25-15%	6	7	8	9	9	10	11	12	13
	26-15%	5	6	7	8	9	10	10	11	12
	27-15%	5	6	6	7	8	9	9	10	11
	28-15%	5	5	6	6	7	8	9	9	10
	29-15%	5	5	5	6	7	7	8	9	9
	30-15%	5	5	5	5	6	7	7	8	8

2/3-1/3 Split - Heat & Pressure Cool		Plenum Temperature								
		140 ° (60°C)F	150 °F (66°C)	160°F (71°C)	170°F (77°C)	180°F (82°C)	190°F (88°C)	200°F (93°C)	210°F (99°C)	220°F (104°C)
Moisture Removal	16-15%	21	24	28	31	35	38	42	45	49
	17-15%	17	19	22	25	28	31	33	36	39
	18-15%	14	17	19	21	24	26	29	31	33
	19-15%	13	15	17	19	21	23	25	27	29
	20-15%	11	13	15	17	19	21	22	24	26
	21-15%	10	12	13	15	17	19	20	22	24
	22-15%	9	11	12	14	15	17	18	20	21
	23-15%	8	10	11	13	14	15	17	18	20
	24-15%	8	9	10	12	13	14	15	17	18
	25-15%	7	8	9	11	12	13	14	15	16
	26-15%	6	8	9	10	11	12	13	14	15
	27-15%	6	7	8	9	10	11	12	13	14
	28-15%	5	6	7	8	9	10	11	12	13
	29-15%	5	6	7	8	8	9	10	11	12
	30-15%	5	5	6	7	8	9	9	10	11

Centrifugal Heat & Vacuum Cool		Plenum Temperature								
		140 ° (60°C)F	150 °F (66°C)	160°F (71°C)	170°F (77°C)	180°F (82°C)	190°F (88°C)	200°F (93°C)	210°F (99°C)	220°F (104°C)
Moisture Removal	16-15%	19	22	25	28	31	34	37	41	44
	17-15%	15	18	20	23	25	28	30	33	35
	18-15%	13	15	17	19	21	23	26	28	30
	19-15%	11	13	15	17	19	21	23	24	26
	20-15%	10	12	13	15	17	18	20	22	23
	21-15%	9	11	12	14	15	17	18	20	21
	22-15%	8	10	11	12	14	15	17	18	19
	23-15%	8	9	10	11	13	14	15	16	18
	24-15%	7	8	9	10	11	13	14	15	16
	25-15%	6	7	8	9	11	12	13	14	15
	26-15%	6	7	8	9	10	11	12	13	14
	27-15%	5	6	7	8	9	10	11	12	12
	28-15%	5	6	7	7	8	9	10	11	11
	29-15%	5	5	6	7	8	8	9	10	11
	30-15%	5	5	6	6	7	8	8	9	10

Centrifugal Full-Heat		Plenum Temperature								
		140 ° (60°C)F	150 °F (66°C)	160°F (71°C)	170°F (77°C)	180°F (82°C)	190°F (88°C)	200°F (93°C)	210°F (99°C)	220°F (104°C)
Moisture Removal	18-17%	22	26	30	34	37	41	45	48	52
	19-17%	19	22	25	28	31	34	38	41	44
	20-17%	17	19	22	25	28	31	33	36	39
	21-17%	15	18	20	23	25	28	30	33	35
	22-17%	14	16	19	21	23	26	28	30	33
	23-17%	13	15	17	20	22	24	26	28	30
	24-17%	12	14	16	18	20	22	24	26	29
	25-17%	12	13	15	17	19	21	23	25	27
	26-17%	11	13	15	16	18	20	22	24	25
	27-17%	10	12	14	16	17	19	21	22	24
	28-17%	10	12	13	15	16	18	20	21	23
	29-17%	9	11	13	14	16	17	19	20	22
	30-17%	9	10	12	13	15	16	18	19	21

Two Module

Double-Stack, Axial-Fan, Full-Heat		Plenum Temperature								
		140 ° (60°C)F	150 °F (66°C)	160°F (71°C)	170°F (77°C)	180°F (82°C)	190°F (88°C)	200°F (93°C)	210°F (99°C)	220°F (104°C)
Moisture Removal	18-17%	38	44	50	57	63	69	75	82	88
	19-17%	31	36	41	46	51	56	61	66	72
	20-17%	27	31	35	40	44	49	53	57	62
	21-17%	24	28	31	35	39	43	47	51	55
	22-17%	21	25	28	32	36	39	43	46	50
	23-17%	19	23	26	29	32	36	39	42	45
	24-17%	18	21	24	27	30	33	36	39	42
	25-17%	17	19	22	25	28	30	33	36	39
	26-17%	15	18	20	23	26	28	31	33	36
	27-17%	14	17	19	21	24	26	28	31	33
	28-17%	13	15	18	20	22	24	27	29	31
	29-17%	12	14	16	19	21	23	25	27	29
	30-17%	12	13	15	17	19	21	23	25	27

Double-Stack Heat & Pressure Cool		Plenum Temperature								
		140 ° (60°C)F	150 °F (66°C)	160°F (71°C)	170°F (77°C)	180°F (82°C)	190°F (88°C)	200°F (93°C)	210°F (99°C)	220°F (104°C)
Moisture Removal	16-15%	34	40	46	51	57	63	68	74	80
	17-15%	27	32	36	41	45	50	54	59	64
	18-15%	23	27	31	35	39	42	46	50	54
	19-15%	20	24	27	30	34	37	41	44	47
	20-15%	18	21	24	27	30	33	36	39	42
	21-15%	16	19	22	24	27	30	33	35	38
	22-15%	15	17	20	22	25	27	29	32	34
	23-15%	13	16	18	20	22	25	27	29	31
	24-15%	12	14	16	18	20	22	24	26	28
	25-15%	11	13	15	17	19	20	22	24	26
	26-15%	10	12	14	15	17	19	20	22	24
	27-15%	9	11	12	14	16	17	19	20	22
	28-15%	9	10	11	13	14	16	17	18	20
	29-15%	8	9	10	12	13	14	16	17	18
	30-15%	7	8	9	11	12	13	14	15	17

Centrifugal-Stack Heat & Vac-Cool		Plenum Temperature								
		140 ° (60°C)F	150 °F (66°C)	160°F (71°C)	170°F (77°C)	180°F (82°C)	190°F (88°C)	200°F (93°C)	210°F (99°C)	220°F (104°C)
Moisture Removal	16-15%	34	40	46	51	57	63	68	74	80
	17-15%	27	32	36	41	45	50	54	59	64
	18-15%	23	27	31	35	39	42	46	50	54
	19-15%	20	24	27	30	34	37	41	44	47
	20-15%	18	21	24	27	30	33	36	39	42
	21-15%	16	19	22	24	27	30	33	35	38
	22-15%	15	17	20	22	25	27	29	32	34
	23-15%	13	16	18	20	22	25	27	29	31
	24-15%	12	14	16	18	20	22	24	26	28
	25-15%	11	13	15	17	19	20	22	24	26
	26-15%	10	12	14	15	17	19	20	22	24
	27-15%	9	11	12	14	16	17	19	20	22
	28-15%	9	10	11	13	14	16	17	18	20
	29-15%	8	9	10	12	13	14	16	17	18
	30-15%	7	8	9	11	12	13	14	15	17

Three Module

Triple-Stack Full-Heat		Plenum Temperature								
		140 ° (60°C)F	150 °F (66°C)	160°F (71°C)	170°F (77°C)	180°F (82°C)	190°F (88°C)	200°F (93°C)	210°F (99°C)	220°F (104°C)
Moisture Removal	18-17%	55	65	74	83	92	100	100	100	100
	19-17%	45	53	60	68	75	83	90	98	100
	20-17%	39	45	52	58	65	71	78	84	91
	21-17%	35	40	46	52	58	64	69	75	81
	22-17%	31	37	42	47	52	57	63	68	73
	23-17%	29	33	38	43	48	52	57	62	67
	24-17%	26	31	35	40	44	48	53	57	61
	25-17%	24	28	32	37	41	45	49	53	57
	26-17%	23	26	30	34	38	41	45	49	53
	27-17%	21	25	28	32	35	39	42	46	49
	28-17%	20	23	26	29	33	36	39	42	46
	29-17%	18	21	24	27	31	34	37	40	43
	30-17%	17	20	23	26	29	31	34	37	40

Triple-Stack Heat & Pressure Cool		Plenum Temperature								
		140 ° (60°C)F	150 °F (66°C)	160°F (71°C)	170°F (77°C)	180°F (82°C)	190°F (88°C)	200°F (93°C)	210°F (99°C)	220°F (104°C)
Moisture Removal	16-15%	45	53	60	68	76	83	91	98	100
	17-15%	36	42	48	54	60	66	72	78	84
	18-15%	31	36	41	46	51	57	62	67	72
	19-15%	27	32	36	41	45	50	54	59	63
	20-15%	24	28	32	36	40	44	48	52	56
	21-15%	22	25	29	33	36	40	43	47	51
	22-15%	20	23	26	29	33	36	39	43	46
	23-15%	18	21	24	27	30	33	36	39	42
	24-15%	16	19	22	24	27	30	33	35	38
	25-15%	15	17	20	22	25	27	30	32	35
	26-15%	14	16	18	21	23	25	27	30	32
	27-15%	13	15	17	19	21	23	25	27	29
	28-15%	11	13	15	17	19	21	23	25	27
	29-15%	10	12	14	16	17	19	21	23	24
	30-15%	10	11	13	14	16	18	19	21	22

Dryer Stabilization Using Manual Mode in QuadraTouch Pro

IMPORTANT: Let dryer stabilize after making any adjustments to meter roll. DO NOT make any further adjustments until dryer has turned grain over completely one time. To determine length of time to turn grain over one time, refer to table below.

Unload Time Based on Meter Roll Speed Percentage

Meter Roll Setting	Minutes to Unload Entire Dryer	Meter Roll Setting	Minutes to Unload Entire Dryer
10%	165.0	60%	27.5
15%	110.0	65%	25.4
20%	82.5	70%	23.6
25%	66.0	75%	22.0
30%	55.0	80%	20.6
35%	47.1	85%	19.4
40%	41.3	90%	18.3
45%	36.7	95%	17.4
50%	33.0	100%	16.5
55%	30.0		

Dryer Holding Capacities

Dryer Size	Holding Capacity	
	Bushels	Metric Tonnes
16’	440	11.2
20’	550	13.9
24’	660	16.8
28’	770	19.6

Appendix B

Electrical Requirements

Axial Dryers

Centrifugal Dryers

Electrical Load Requirements, Three-Phase Axial Dryers (50Hz)

IMPORTANT: Grain Dryer power box contains a molded case disconnect switch for incoming power. **IT IS NOT A CIRCUIT BREAKER!** A service-rated, fused disconnect needs to be installed ahead of grain dryer power distribution box. This disconnect is not included with dryer and should be installed by a qualified electrician in accordance with local and national standards. **Grain Dryer should be only device connected to this disconnect.**

Standard electrical safety practices and codes should be used. **IMPORTANT: Any supporting electrical panels or combinations of electrical components supplied by end user must be compliant with current local and national standards.**

All electrical work should be completed by a qualified electrician.

Tables below and on next page provide information for electrician wiring dryer. Contact local power supplier and have a representative inspect installation to see that wiring is compatible with their system and that sufficient power is supplied.

Dryer Electrical Specifications:

SINGLE-FAN MODELS – AXIAL FAN

TE1211D – 12-Ft. Dryer - Single Fan/Heater - 380 Volt - 3 Phase - 50HZ - LP
Main Switch = 250 Amps

	Top Auger	Bottom Auger	Fan 38”	Minimum Amps	Maximum Amps
Motor/Wire	3 Kw/#14 5 FLA	3 Kw/#14 5 FLA	15 Kw/#10 28 FLA	38 Amps	250 Amps

TWO-FAN MODELS – AXIAL FAN

TE1631D – 16-Ft. Dryer - 2 Fan / 2 Heater, 2/3 - 1/3 Plenum, 380V - 3 Phase – 50 Hz - LP
Main Switch = 250 Amps

	Top Auger	Bottom Auger	Upper Fan 38”	Lower Fan 28”	Minimum Amps	Maximum Amps
Motor/Wire	3 Kw/#14 5 FLA	3 Kw/#14 5 FLA	15 Kw/#10 28 FLA	15 Kw/#10 28 FLA	66 Amps	250 Amps

TE2831D – 28-Ft. Dryer - 2 Fan / 2 Heater, 2/3 - 1/3 Plenum, 380 Volt - 3 Phase - 50 Hz - LP
Main Switch = 250 Amps

	Top Auger	Bottom Auger	Upper Fan 44”	Lower Fan 28”	Minimum Amps	Maximum Amps
Motor/Wire	5.5 Kw/#10 11.1 FLA	5.5 Kw/#10 11.1 FLA	30 Kw/#3 55 FLA	18.5 Kw/#4 35 FLA	112 Amps	250 Amps

SINGLE-MODULE DRYERS - CENTRIFUGAL

TC1631DW (LP) or TC1632DW (NG) – 16-Ft. Dryer, 1 Fan/Heater, 2/3 – 1/3 Plenum, 380Volt, 3 Phase, 50 Hz, Main Switch = 250 Amps

	Top Auger	Bottom Auger	Fan	Minimum Amps	Maximum Amps
Motor/Wire Amps	3Kw/ #14 5 FLA	3Kw/ #14 5 FLA	30Kw/ #6 55 Amps	65 Amps	250 Amps

TC2031D (LP) – 20-Ft. Dryer, 1 Fan/Heater, 2/3 – 1/3 Plenum, 380Volt, 3 Phase, 50 Hz, Main Switch = 250 Amps

	Top Auger	Bottom Auger	Fan	Minimum Amps	Maximum Amps
Motor/Wire Amps	4Kw/ #14 8.5 FLA	4Kw/ #14 8.5 FLA	37Kw/ #4 66 Amps	83 Amps	250 Amps

TC2431DW (LP) or TC2432DW (NG) – 24-Ft. Dryer, 1 Fan/Heater, 2/3 – 1/3 Plenum, 380Volt, 3 Phase, 50 Hz, Main Switch = 250 Amps

	Top Auger	Bottom Auger	Fan	Minimum Amps	Maximum Amps
Motor/Wire Amps	5.5Kw/ #10 13 FLA	5.5Kw/ #10 13 FLA	45Kw/ #4 80 Amps	106 Amps	250 Amps

TWO-MODULE DRYERS - CENTRIFUGAL

TC2451DW (LP) or TC2452DW (NG) – 24-Ft. Dryer, 2 Fan, Stacked Module, 380Volt, 3 Phase, 50 Hz, Main Switch = 250 Amps

	Top Auger	Bottom Auger	Fan	Fan	Minimum Amps	Maximum Amps
Motor/Wire Amps	5.5Kw 13 FLA	5.5Kw 13 FLA	45Kw 80 FLA	45Kw 80 FLA	186 Amps	250 Amps

Appendix C

Optional Dryer Accessories

Creating MySukup.com Account

Personalized Sign

Aspirator

DATE	REVISION	PAGE
04/13/2023 –	Removed reference to discontinued GSM modem	
	Added Step 1d to order MySukup.com service; added T-shooting instructions	C-2, C-4 & C-5
	Added references to separate documents for aspirator & airlock assembly instructions	C-6

Creating/Managing MySukup.com Account & Connecting Devices

Follow instructions below to create and manage a MySukup.com account and connect devices to it. If you already have an account you can just log in to manage, even if you are the owner of another site. There is no reason to have two My Sukup accounts.

Internet Setup for QuadraTouch Pro Console or Master Site Controller:

1. Connect internet service to X3 Ethernet port on bottom of touch panel. See picture.
   NOTE: Internet should not be hooked up to switch in main power box of dryer. If there is a cable running to switch in dryer power box and one to X3 port, it can cause issues with network repair utility.
2. If required, run Network Repair Utility and enable "Check for Internet" function. This fixes 99% of problems.
   a. In rare instances, IT personnel may be needed to set up a custom configuration.

X3 Ethernet port (circled) in touch panel box

NOTE: Purchase and install Ethernet coupler, cap & housing (J8715) to ensure watertight connection of internet cable to touch panel box. Purchase 3' cable (J8717) to run from coupler to X3 port.

Connecting Dryer or Entire Site to New MySukup.com Account:

1. On the QuadraTouch Pro console (for Dryer-Only Site) or the Master Site Controller (if available):
   a. Click Tools → Connectivity Tools → Remote Access Menu → Disabled to Enable Remote Access
   b. Click "I Accept" to the GDPR Statement.
   c. Click "Setup My Sukup Connection" to obtain the Device ID and Device PIN.
   d. Share Device ID with your Sukup Dryer dealer, who will need it to order the service (found on Dealer Portal under Maintenance → Purchase Remote Web Access).

NOTES:

- If QuadraTouch Pro touchscreen console is connected to Internet, it may automatically download a Windows update and reboot, which will shut down the dryer. To prevent this on Version 3.0 software, go to: Tools → Update Tools → Disable Windows Update.
- Imaging a touchscreen will re-enable Windows updates. To disable, unplug console from Internet. Perform imaging as described in Installation Instructions L1931. When imaging is complete, follow process above to disable updates. After disabling updates, reconnect Internet.
- Windows updates may be necessary to prevent problems such as computer viruses. If Windows updates are disabled during drying season, enable them and leave touchscreen on for a week prior to next drying season.

2. Open a web browser and go to http://www.mysukup.com/
3. Click “Create an Account”
    a. Read Terms and Conditions and check “I Accept”.
    b. After following directions to create an account, you will be sent a confirmation email.
    c. Open email and click link provided.
    d. Your account is now verified.

4. Log in to your My Sukup account.
5. On the right, click “Add New Site”. It will ask for the Device ID and Device PIN (obtained in Step 1.c.)
6. On the My Sukup website, enter Device ID and Device PIN in the fields provided.
7. Confirm that you entered them correctly and accept the terms and conditions.
8. Click “Finish”.
9. Congratulations! Your site is now connected to your My Sukup account.

NOTE: It might take up to two minutes to link the site with internet access.

Transferring Site to New Owner:

1. Open a web browser and go to http://www.mysukup.com/
2. Log in as site owner.
3. Find the site you wish to transfer.
4. Next to site name there is a drop-down arrow. Click it and click on “Manage Users”.
5. Find the user you wish to make a site owner. If user is not listed, follow Add User instructions.
6. Click “Edit Symbol” under Role. (Symbol is a pencil in a box.)
7. Change Role to Site Owner.
8. Click “Save Role”.
9. That user can then log in and remove you as the owner to complete the process.

NOTE: Sites can have more than one owner. They may have to logout/login to update permissions.

Adding User/Viewer to Your Site:

1. Open a web browser and go to http://www.mysukup.com/
2. Log in as Site Owner.
3. Find the site for which you wish to add a user.
4. Next to site name there is a drop-down arrow. Click it and click on “Invite”.
5. Enter name and email address of the person you wish to add to the site.

NOTE: Person being added does not have to have a My Sukup account yet, but it is OK if he/she does.

6. Click “Send Invitation”.
7. The user will be added after the user creates an account (if needed) and logs in and clicks “I Accept” in their notifications.

NOTE: Invites will time out after 72 hours (three days).

Editing Permissions for a User:

1. Open a web browser and go to http://www.mysukup.com/
2. Log in as site owner.
3. Find the site for which you wish to edit a user permission.
4. Next to site name there is a drop-down arrow. Click it and click on “Manage Users”.
5. Find the user whose role you wish to edit.
6. Click “Edit Symbol” under Role. (Symbol is a pencil in a box.)
7. Change permission.
8. Click “Save Role”.
9. User permissions have been changed.

Removing a User from Site:

1. Open a web browser and go to http://www.mysukup.com/
2. Log in as site owner.
3. Find the site for which you wish to remove a user.
4. Next to site name there is a drop-down arrow. Click it and click on “Manage Users”.
5. Find the user whose role you wish to edit.
6. Click “Remove Symbol” under Name. (Red box with person icon and an “x”.)
7. Click “Yes, remove ‘User Name’.
8. User has been removed from site.

Setting up Site Alerts:

1. Open a web browser and go to http://www.mysukup.com/
2. Log in.
3. In top right of the screen click person icon and click “Profile Settings”.
4. Enter mobile phone number in field provided.
5. Select mobile carrier.
6. Enter your email address in Confirm Email field provided.
7. Click “Save.”
8. Find site for which you wish to set up alerts.
9. Next to site name there is a drop-down arrow. Click it and click “Manage Site Alarm”.
10. At top right, click on Site Alarm Settings.
11. Click “Set Site Alarm to Default”.
12. Site alarms have been configured, you may customize as you see fit.

Troubleshooting

1. Make sure software is updated to V3.01 on both HMI and PLC. There were many connectivity improvements in V3.01. **Please don’t call for help with mysukup.com before updating to V3.01 since update may solve problem.**
2. Go to Tools → Connectivity Tools → Get Public IP. If an IP address appears within 15 seconds and all lights below it are green, there is a good Internet connection to dryer. If no IP address appears, select Network Repair Utility under the Connectivity Tools menu and follow directions on screen. If you cannot get IP address and all lights below it are green, contact your IT professional.

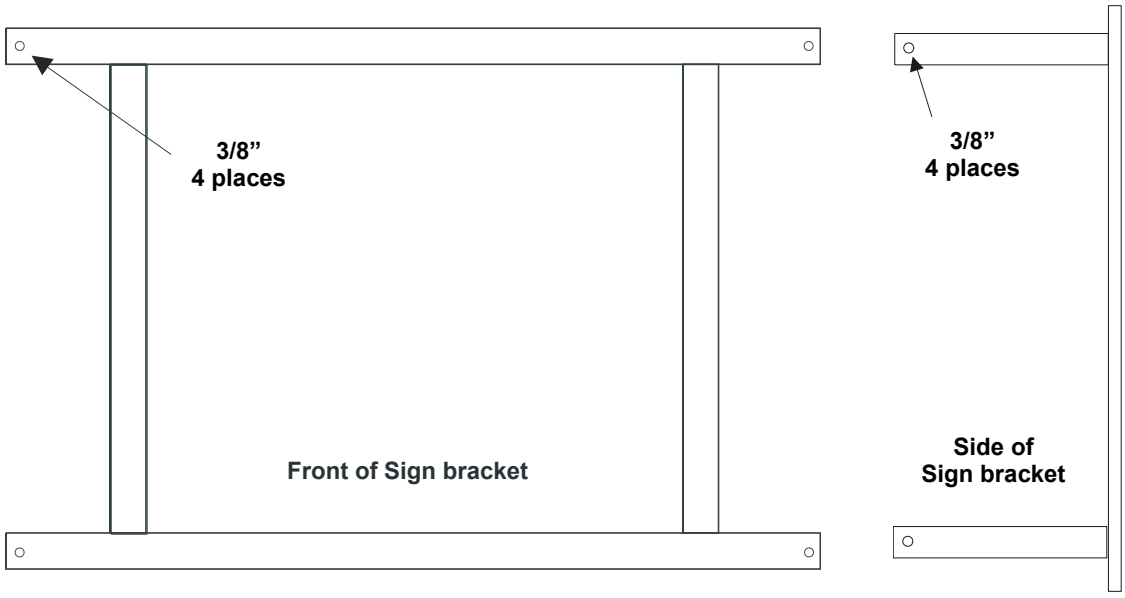
3. On your mobile device, signed into your MySukup.com account, select Home button and refresh your Internet browser. You should see your Site Name. If it is in a green box, go to Step 4. If it is in a red box, perform Step 4 and then Step 5.
4. If your dryer site is shown in green on Home screen and was previously working but stopped, reboot router, wait 2 minutes and reboot touchscreen.
5. If dryer site is shown in red on Home screen, it is not linked to dryer.
   a. On touchscreen, select Tools → Connectivity Tools Menu → Remote Access Menu. Make sure red box says Enabled, then click Setup MySukup Connection and see if it shows the Device ID or a Site ID. If Site ID, this means someone else has connected using the Device ID and blocked your access.
   b. Click back and select Enable button to change it to Disable. Wait 10 seconds. This unlinks the dryer from the MySukup account. Then push Disable, change it back to Enable, click Setup MySukup Connection and wait 1 minute for it to connect.
   c. If screen changes and shows a Site ID, then refresh browser on your device and see if site turns green on home screen. If not, repeat these steps until site on your device turns green, or until touchscreen stops showing a Site ID. Then do Repair/Replace on your site.

TROUBLESHOOTING NOTES:

- When adding another person or account to a dryer, site owner must invites that person by going to HOME on MySukup, clicking on drop-down menu and selecting Invite. New user will get an email with a link to connect.

- If another user tried to add dryer to his or her MySukup account by clicking Add New Site and using the Device ID, it will disconnect the original site owner. In this case, original site owner must select Repair & Replace from drop-down menu on Home screen.

Personalized Sign



Sukup Manufacturing Co. provides a sign for portable dryers at no additional charge. Sign shows customer name or farm name and/or dealer name. Dealer will order sign if desired, furnishing appropriate information for printing.

Bracket shown above can be mounted to outside of dryer on any two-foot grain column section. Sign is then mounted to bracket. It can also be mounted under fan(s) on a sheet metal support.

Aspirator Assembly & Operation

See Assembly Instructions L0550 for installation and operation of aspirator.

Airlock Adapter Attachment

See Assembly Instructions L2074 for attachment of pneumatic system airlock using Kit N5570.

Appendix D

Soft Start & VFD Programming & Troubleshooting

ATS22 Soft Start

Altivar 320 Variable Frequency Drive

DATE	REVISION	PAGE
04/04/2024 –	Updated ATS22 soft start programming instructions & added factory reset instructions	D-2
	Updated ATV320 VFD programming instructions & added factory reset instructions	D-5
04/13/2023 –	Updated Altivar VFD troubleshooting pages	D-7 – D-11

Programming ATS22 Soft Start

See table to program ATS 22 Soft Start. See below for key to controls.

- Up/Down arrows – Use for navigation
- ENT – Press to enter setting
- ESC – Return to previous menu

MENU	MENU DESCRIPTION	SUB-MENU	SETTING
Conf	Configuration menu	Uln (Line voltage)	Motor voltage*
Conf	Configuration menu	In (Motor rated current)	FLA of motor
Conf	Configuration menu	LAC (Advanced mode)	on
Set	Settings menu	t90 (Initial voltage %)	50
Set	Settings menu	tLS (Max start time in sec)	50
Set	Settings menu	ACC (Acceleration time in sec)	15
Set	Settings menu	tHP (Motor thermal protection)	20
Adj**	Advanced adjustments	SSC (Start/Stop control)	off
Adj**	Advanced adjustments	Snb (Number of starts)	6
Adj**	Advanced adjustments	SLg (Start period)	5
IO**	Input-Output adjustments	r1	Tr Ip
IO**	Input-Output adjustments	r2	run
Pro**	Advanced protection	Ith	Erun (only changed on Towers)

***If dryer voltage is 380V, set to 400. Press ENT to set voltage.**

****Menus only available after enabling Advanced Settings**

Turn power off and then back on after programming.

Soft Start Full Load Amps

Table below shows approximate Soft Start Full Load Amps for 380VAC 50Hz motors depending on horsepower.

5HP	9.2	**40HP**	62
7-1/2HP	13	**50HP**	78
10HP	16	**60HP**	93
15HP	25	**75HP**	116
20HP	32	**100HP**	150
25HP	41	**125HP**	189
30HP	48		

Restoring Factory Defaults

Hold ESC and Up arrow at same time for 5 seconds. Display will show Util. Press ENT. Scroll to FCS. Press ENT. Display will show SurE. Press ENT again. Factory-default settings are now restored.

Troubleshooting ATS22 Soft Start

NOTE: The following pages are from Altistart 22 Soft Start User Manual, BBV51330, dated 09/2015. A complete copy can be found on Sukup website and at www.schneider-electric.com

Diagnostics / Troubleshooting

Soft starter does not start, no trip code displayed

- No display:
  - check that the line supply is present on the control supply CL1/CL2,
  - check if a short circuit is not existing on the Modbus network cable (especially between RJ45 pin 7 and RJ45 pin3 or pin8. See pages 35 and 36).
- Check that the code displayed does not correspond to the normal state of the soft starter (see page 46).
- Check for the presence of the RUN/STOP commands (see page 37).

Soft starter does not start, trip code displayed

- Trip code flashes on the display.
- Storing of the last 7 trips, visible with SoMove software workshop.
- The soft starter locks and the motor stop with to freewheel mode.

⚠⚠ DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH

- Read and understand the precautions in "Before you begin" chapter, before performing any procedure in this section.

Failure to follow these instructions will result in death or serious injury.

Trip code displayed	Name	Remedy
bPF	Bypass contactor detected fault	• Switch-off the soft starter and contact Schneider Electric services.
CFF	Invalid configuration on power-up	• Revert to the factory setting in the soft starter UtL menu • Reconfigure the soft starter
EtF	External detected fault	• Clear the cause of the detected fault
GrdF	Ground leakage current detected fault	• Check the electrical insulation of the motor • Check the installation • Check the values of Grdd, Grdt parameters in PrO menu page 57
InF	Internal detected fault	• Disconnect and reconnect the control supply. If the detected fault persists, contact Schneider Electric product support
OCF	Motor overcurrent	• Check the values of OCd and OCt parameters in PrO menu page 56
OHF	Over heat detected fault Low temperature detected fault	• Check the sizing of the soft starter in relation to the motor and the mechanical requirement • Check the operation of the fan (if the Altistart 22 used has one), ensuring that the air passage is not obstructed in any way and the heatsink is clean. Ensure that the mounting recommendations are observed • Wait for the Altistart 22 cooling before restarting, keeping the starter powered on
OLF	Overload motor	• Check the mechanism (wear, mechanical play, lubrication, blockages, etc.) • Check the sizing of the soft starter motor in relation to the mechanical requirement • Check the value of tHP parameter in SEt menu page 52 and In parameter in conF menu page 50 • Wait for the motor to cool before restarting
OSF	Overvoltage	• Check ULn parameter in conF menu • Check the power supply circuit and voltage • Check OSd and OSt parameters in PrO menu
OtF	Motor Over Temperature • Motor thermal trip detected by the PTC probes	• Check the mechanism (wear, mechanical play, lubrication, blockages, etc.) • Check the sizing of the soft starter motor in relation to the mechanical requirement • Check the value of PtC setting in PrO menu page 59 • Wait for the motor to cool before restarting

Diagnostics / Troubleshooting

Trip code displayed	Name	Remedy
PHbd	Phase unbalance	• Check the line voltage. • Check the values of Ubd, Ubt parameters in PrO menu page 57.
PHF	Loss of a line phase	• Check the line voltage, the connection to the soft starter and any isolating devices located between the line and the soft starter (contactors, fuses, circuit breakers, etc.). • Check the motor connection and any isolating devices located between the soft starter and the motor (contactors, circuit breakers, etc.). • Check the motor state.
	Line frequency, out of tolerance This detected fault can be configured in PrO menu	• Check the line frequency. • Check the configuration of PHL.
P IF	Phase inversion Line phase inversion does not conform to the selection made by PHr in PrO menu	• Invert two lines phases or set PHr = oFF.
trAP	Trap code	• Disconnect and reconnect the control supply. If the detected fault persists, contact Schneider Electric support.
SCF	Short circuit: • short-circuit on soft starter output	• Switch-off the soft starter. • Check the motor connections and the motor insulation. • If connections and insulation are OK, contact Schneider Electric services.
SLF	Modbus Time Out	• Serial link detected fault. Check the RS485 connection.
SnbF	Too many starts	• The number of soft starts has exceeded the maximum allowed by Snb in SLG period. See Snb page 53.
SSCr	Shorted thyristor or wrong connection	• Switch-off the soft starter. • Check the motor connections and the motor insulation. • If connections and insulation are OK, contact Schneider Electric services.
StF	Starting time detected fault • Too long start time	• Check the mechanism (wear, mechanical play, lubrication, blockages, etc.) • Check that tLS (Max start time) is bigger than ACC (Acceleration time). See SEt menu page 51. • Check the sizing of the soft starter motor in relation to the mechanical requirement • Check ILt value : if the value is too low, the motor may not reach acceleration and full speed.
tbS	Too many starts	• Wait 5 minutes for frame size A. • Wait 15 minutes for frame sizes B, C, D and E. tbS appears after SnbF trip message, when trying to reset the soft starter before end of the timer.
UCF	Motor underload (undercurrent)	• Check the values of UId and UIt parameters in PrO menu page 57.
USF	Under voltage or no voltage	• Check UIn, USd and USt parameters in PrO menu • Check line voltage.

Remote keypad messages

Display		Message	Description
InIt		On initializing itself	Microcontroller initializing. Communication configuration searching.
COME	flashing	Communication interruption	It has 50 ms time out. This message is shown after 20 times retrying.
A - 17	flashing	Key alarm	• Key has been held consecutively more than 10 seconds. • Membrane switch disconnected. • Keypad waked up while a key is holding.
CLr	flashing	Confirm trip reset	This is shown when : First time STOP key has been pressed while the soft starter has tripped in detected fault.
dEUE	flashing	Soft starter mismatch	Soft starter type (brand) did not match with keypad type (brand).
rOME	flashing	ROM trip	Keypad ROM detected fault.
rAME	flashing	RAM trip	Keypad RAM detected fault.
CPUE	flashing	CPU trip	Keypad CPU detected fault.

Programming Altivar 320 Variable Frequency Drive

See table to program ATV 320 Variable Frequency Drive. See below for key to controls.

- Green jog dial – Use for navigation by turning clockwise or counterclockwise. Press dial to make a selection or confirm information.
- ESC – Press to quit a menu or parameter or to clear value displayed in order to revert to value in memory.

MENU	SECONDARY MENU	SUB-MENU	SETTINGS MENU	SETTING
Conf	Full	Sin	unS (motor voltage)	380
Conf	Full	drC	bFr (motor frequency)	50hz

Restoring Factory Defaults

Navigate to Conf menu, FCS secondary menu, then Fry sub-menu. Select ALL so that hash marks to right of ALL move from Unit to Value. See images below. Press ESC once and then scroll to GFS. Select yes. Press/hold dial until LEDs stop flashing.

Troubleshooting Altivar 320 Variable Speed Drive

NOTE: The following pages are from Altivar Machine ATV320 Variable Frequency Drives Programming Manual, NVE41295, dated 09/2021. A complete copy can be found on Sukup website and at www.schneider-electric.com

Error code

- If the display does not light up, check the power supply to the drive.
- The assignment of the Fast stop or Freewheel functions will help to prevent the drive starting if the corresponding logic inputs are not powered up. The ATV320 then displays **[Freewheel]** (nSt) in freewheel stop and **[Fast stop]** (FSt) in fast stop. This is normal since these functions are active at zero so that the drive will be stopped if there is a wire break.
- Check that the run command input is activated in accordance with the selected control mode (**[2/3 wire control]** (tCC) and **[2 wire type]** (tCt) parameters, page 93).
- If an input is assigned to the limit switch function and this input is at zero, the drive can only be started up by sending a command for the opposite direction (see page 236).
- If the reference channel or command channel is assigned to a communication bus, when the power supply is connected, the drive will display **[Freewheel]** (nSt) and remain in stop mode until the communication bus sends a command.

Code	Name / Description
dGt-	**[DIAGNOSTICS]** This menu can only be accessed with the graphic display terminal. It displays detected faults and their cause in plain text and can be used to carry out tests, see page 72.

Clearing the detected fault

In the event of a non resettable detected fault:

- Disconnect all power, including external control power that may be present.
- Lock all power disconnects in the open position.
- Wait 15 minutes to allow the DC bus capacitors to discharge (the drive LEDs are not indicators of the absence of DC bus voltage).
- Measure the voltage of the DC bus between the PA/+ and PC/– terminals to ensure that the voltage is less than 42 Vdc.
- If the DC bus capacitors do not discharge completely, contact your local Schneider Electric representative. Do not repair or operate the drive.
- Find and correct the detected fault.
- Restore power to the drive to confirm the detected fault has been rectified.

In the event of a resettable detected fault, the drive can be reset after the cause is cleared:

- By switching off the drive until the display disappears completely, then switching on again.
- Automatically in the scenarios described for the **[AUTOMATIC RESTART]** (Atr-) function, page 266.
- By means of a logic input or control bit assigned to the **[FAULT RESET]** (rSt-) function, page 265.
- By pressing the STOP/RESET key on the graphic display keypad if the active channel command is the HMI (see **[Cmd channel 1]** (Cd1) page 164).

Fault detection codes which require a power reset after the detected fault is cleared

The cause of the detected fault must be removed before resetting by turning off and then back on.

ASF, brF, SoF, SPF and EnF detected faults can also be cleared remotely by means of a logic input or control bit ([Fault reset] (rSF) parameter, page 265).

Detected Fault	Name	Probable cause	Remedy
AnF	[Load slipping]	• The difference between the output frequency and the speed feedback is not correct.	• Check the motor, gain and stabillity parameters. • Add a braking resistor. • Check the size of the motor/drive/load. • Check the encoder's mechanical coupling and its wiring. • Check the setting of parameters
ASF	[Angle Error]	• This occurs during the phase-shift angle measurement, if the motor phase is disconnected or if the motor inductance is too high.	• Check the motor phases and the maximum current allowed by the drive.
bLF	[Brake control]	• Brake release current not reached. • Brake engage frequency threshold [Brake engage freq] (bEn) only regulated when brake logic control is assigned.	• Check the drive/motor connection. • Check the motor windings. • Check the [Brake release I FW] (ibr) and [Brake release I Rev] (ird) settings page 206. • Apply the recommended settings for [Brake engage freq] (bEn).
brF	[Brake feedback]	• The brake feedback contact does not match the brake logic control. • The brake does not stop the motor quickly enough (detected by measuring the speed on the "Pulse input" input).	• Check the feedback circuit and the brake logic control circuit. • Check the mechanical state of the brake. • Check the brake linings.
CrF1	[Precharge]	• Charging relay control detected fault or charging resistor damaged.	• Turn the drive off and then turn on again. • Check the internal connections. • Contact Schneider Electric Product Support.
EEF1	[Control Eeprom]	• Internal memory detected fault, control block.	• Check the environment (electromagnetic compatibility). • Turn off, reset, return to factory settings. • Contact Schneider Electric Product Support.
EEF2	[Power Eeprom]	• Internal memory detected fault, power card.	
FCF1	[Out. contact. stuck]	• The output contactor remains closed although the opening conditions have been met.	• Check the contactor and its wiring. • Check the feedback circuit.
HdF	[IGBT desaturation]	• Short-circuit or grounding at the drive output.	• Check the cables connecting the drive to the motor, and the motor insulation.
iLF	[internal com. link]	• Communication interruption between option card and drive.	• Check the environment (electromagnetic compatibility). • Check the connections. • Replace the option card. • Contact Schneider Electric Product Support.
inF1	[Rating error]	• The power card is different from the card stored.	• Check the reference of the power card.
inF2	[Incompatible PB]	• The power card is incompatible with the control block.	• Check the reference of the power card and its compatibility.
inF3	[Internal serial link]	• Communication interruption between the internal cards.	• Check the internal connections. • Contact Schneider Electric Product Support.
inF4	[Internal-mftg zone]	• Internal data inconsistent.	• Recalibrate the drive (performed by Schneider Electric Product Support).
inF6	[Internal - fault option]	• The option installed in the drive is not recognized.	• Check the reference and compatibility of the option. • Check that the option is well inserted into the ATV320.
inF9	[Internal- I measure]	• The current measurements are incorrect.	• Replace the current sensors or the power card. • Contact Schneider Electric Product Support.
inFA	[Internal-mains circuit]	• The input stage is not operating correctly.	• Contact Schneider Electric Product Support.
inFb	[Internal- th. sensor]	• The drive temperature sensor is not operating correctly.	• Replace the drive temperature sensor. • Contact Schneider Electric Product Support.

Detected Fault	Name	Probable cause	Remedy
inFE	[internal- CPU]	• Internal microprocessor detected fault.	• Turn off and reset. • Contact Schneider Electric Product Support.
SAFF	[Safety fault]	• Debounce time exceeded. • SS1 threshold exceeded. • Wrong configuration. • SLS type overspeed detected.	• Check the safety functions configuration. • Check the ATV320 Integrated safety Functions manual • Contact Schneider Electric Product Support.
SoF	[Overspeed]	• Instability or driving load too high. • If a downstream contactor is used, the contacts between the motor and the drive have not been closed before applying a Run command. • The overspeed threshold (corresponding to 110 % of [Max frequency] (tFr)) has been reached.	• Check the motor, gain and stability parameters. • Add a braking resistor. • Check the size of the motor/drive/load. • Check the parameters settings for the [FREQUENCY METER] (F9F-) function page 280, if it is configured. • Verify and close the contacts between the motor and the drive before applying a Run command. • Verify the consistency between [Max frequency] (tFr) and [High Speed] (HSP). It is recommended to have at least [Max frequency] (tFr) ≥ 110% * [High Speed] (HSP).
SPF	[Speed fdback loss]	• Signal on "Pulse input" missing, if the input is used for speed measurement. • Encoder feedback signal missing	• Check the wiring of the input cable and the detector used. • Check the configuration parameters of the encoder. • Check the wiring between the encoder and the drive. • Check the encoder.

Fault detection codes that can be cleared with the automatic restart function after the cause has disappeared

These detected faults can also be cleared by turning on and off or by means of a logic input or control bit ([Fault reset] (rSF) parameter page 265).

Detected Fault	Name	Probable cause	Remedy
CnF	[Com. network]	• Communication interruption on communication card.	• Check the environment (electromagnetic compatibility). • Check the wiring. • Check the time-out. • Replace the option card. • Contact Schneider Electric Product Support.
CoF	[CANopen com.]	• Communication interruption on the CANopen® bus.	• Check the communication bus. • Check the time-out. • Refer to the CANopen® User's manual.
EPF1	[External flt-LI/Bit]	• Event triggered by an external device, depending on user.	• Check the device which caused the triggering and reset.
EPF2	[External fault com.]	• Event triggered by a communication network.	• Check for the cause of the triggering and reset.
FbES	[FB stop flt.]	• Function blocks have been stopped while motor was running.	• Check [Stop FB Stop motor] (FbSM) configuration.
FCF2	[Out. contact. open.]	• The output contactor remains open although the closing conditions have been met.	• Check the contactor and its wiring. • Check the feedback circuit.
LCF	[input contactor]	• The drive is not turned on even though [Mains V. time out] (LCt) has elapsed.	• Check the contactor and its wiring. • Check the time-out. • Check the supply mains/contactor/drive connection.
LFF3	[AI3 4-20mA loss]	• Loss of the 4-20 mA reference on analog input AI3.	• Check the connection on the analog inputs.
obF	[Overbraking]	• Braking too sudden or driving load. • Supply voltage too high.	• Increase the deceleration time. • Install a braking resistor if necessary. • Activate the [Dec ramp adapt.] (brA) function page 181, if it is compatible with the application. • Check the supply voltage.
oCF	[Overcurrent]	• Parameters in the [SETTINGS] (SEt-) and [MOTOR CONTROL] (drC-) menus are not correct. • Inertia or load too high. • Mechanical locking.	• Check the parameters. • Check the size of the motor/drive/load. • Check the state of the mechanism. • Decrease [Current limitation] (CLI). • Increase the switching frequency.
oHF	[Drive overheat]	• Drive temperature too high.	• Check the motor load, the drive ventilation and the ambient temperature. Wait for the drive to cool down before restarting.
oLC	[Proc. overload flt]	• Process overload.	• Check and remove the cause of the overload. • Check the parameters of the [PROCESS OVERLOAD] (oLd-) function, page 286.
oLF	[Motor overload]	• Triggered by excessive motor current.	• Check the setting of the motor thermal protection, check the motor load. Wait for the motor to cool down before restarting.
oPF1	[1 output phase loss]	• Loss of one phase at drive output.	• Check the connections from the drive to the motor.

Detected Fault	Name	Probable cause	Remedy
oPF2	[3 motor phase loss]	• Motor not connected or motor power too low. • Output contactor open. • Instantaneous instability in the motor current.	• Check the connections from the drive to the motor. • If an output contactor is being used, set [Output Phase Loss] (oPL) to [Output cut] (oAC), page 270. • Test on a low power motor or without a motor: In factory settings mode, motor phase loss detection is active [Output Phase Loss] (oPL) = [Yes] (YES). To check the drive in a test or maintenance environment, without having to use a motor with the same rating as the drive (in particular for high power drives), deactivate motor phase loss detection [Output Phase Loss] (oPL) = [No] (noo), see instructions given page 270. • Check and optimize the following parameters: [IR compensation] (uFr) page 99, [Rated motor volt.] (uns) and [Rated mot. current] (nCr) page 94 and perform [Auto tuning] (tun) page 95.
oSF	[Mains overvoltage]	• Supply voltage too high. • Disturbed mains supply.	• Check the supply voltage.
otFL	[LI6=PTC overheat]	• Overheating of PTC probes detected on input LI6.	• Check the motor load and motor size. • Check the motor ventilation. • Wait for the motor to cool before restarting. • Check the type and state of the PTC probes.
PtFL	[LI6=PTC probe]	• PTC probe on input LI6 open or short-circuited.	• Check the PTC probe and the wiring between it and the motor/drive.
SCF1	[Motor short circuit]	• Short-circuit or grounding at the drive output.	• Check the cables connecting the drive to the motor, and the motor insulation. • Reduce the switching frequency. • Connect chokes in series with the motor. • Check the adjustment of speed loop and brake. • Increase the [Time to restart] (tAr), page 109. • Increase the switching frequency.
SCF3	[Ground short circuit]	• Significant earth leakage current at the drive output if several motors are connected in parallel.	• Check the cables connecting the drive to the motor, and the motor insulation. • Reduce the switching frequency. • Connect chokes in series with the motor. • Check the adjustment of speed loop and brake. • Increase the [Time to restart] (tAr), page 109. • Reduce the switching frequency.
SCF4	[IGBT short circuit]	• Power component detected fault.	• Contact Schneider Electric Product Support.
SCF5	[Motor short circuit]	• Short-circuit at drive output.	• Check the cables connecting the drive to the motor, and the motor's insulation. • Contact Schneider Electric Product Support.
SLF1	[Modbus com.]	• Communication interruption on the Modbus bus.	• Check the communication bus. • Check the time-out. • Refer to the Modbus User's manual.
SLF2	[PC com.]	• Communication interruption with PC Software.	• Check the PC Software connecting cable. • Check the time-out.
SLF3	[HMI com.]	• Communication interruption with the graphic display terminal or remote display terminal.	• Check the terminal connection • Check the time-out.
SSF	[Torque/current lim]	• Switch to torque or current limitation.	• Check if there are any mechanical problems. • Check the parameters of [TORQUE LIMITATION] (tOL-) page 228 and the parameters of the [TORQUE OR I LIM. DETECT.] (tId-), page 278.
tJF	[IGBT overheat]	• Drive overheated.	• Check the size of the load/motor/drive. • Reduce the switching frequency. • Wait for the motor to cool before restarting.
tnF	[Auto-tuning]	• Special motor or motor whose power is not suitable for the drive. • Motor not connected to the drive. • Motor not stopped	• Check that the motor/drive are compatible. • Check that the motor is present during auto-tuning. • If an output contactor is being used, close it during auto-tuning. • Check that the motor is stopped during tune operation.
uLF	[Proc. underload Flt]	• Process underload.	• Check and remove the cause of the underload. • Check the parameters of the [PROCESS UNDERLOAD] (uLd-) function, page 284.

Fault detection codes that are cleared as soon as their cause disappears

Detected Fault	Name	Probable cause	Remedy
CFF	[Incorrect config.]	• Option card changed or removed. • Control block replaced by a control block configured on a drive with a different rating. • The current configuration is inconsistent.	• Check that there are no card errors. • In the event of the option card being changed/removed deliberately, see the remarks below. • Check that there are no card errors. • In the event of the control block being changed deliberately, see the remarks below. • Return to factory settings or retrieve the backup configuration, if it is valid (see page 89).
CFi CFi2	[Invalid config.]	• Invalid configuration. The configuration loaded in the drive via the bus or communication network is inconsistent.	• Check the configuration loaded previously. • Load a compatible configuration.
CSF	[Ch. Sw. fault]	• Switch to not valid channels.	• Check the function parameters.
dLF	[Dynamic load fault]	• Abnormal load variation.	• Check that the load is not blocked by an obstacle. • Removal of a run command causes a reset.
FbE	[FB fault]	• Function blocks error.	• See [FB Fault] (FbFt) for more details.
HCF	[Cards pairing]	• The [CARDS PAIRING] (PPi-) function page 283 has been configured and a drive card has been changed.	• In the event of a card error, reinsert the original card. • Confirm the configuration by entering the [Pairing password] (PPi) if the card was changed deliberately.
PHF	[Input phase loss]	• Drive incorrectly supplied or a fuse blown. • One phase missing. • 3-phase ATV320 used on a single-phase supply mains. • Unbalanced load. This protection only operates with the drive on load.	• Check the power connection and the fuses. • Use a 3-phase supply mains. • Disable the detected fault by [Input phase loss] (iPL) = [No] (no) page 94.
USF	[Undervoltage]	• Supply mains too low. • Transient voltage dip.	• Check the voltage and the parameters of [UNDERVOLTAGE MGT] (USb-), page 273.

Option card changed or removed

When an option card is removed or replaced by another, the drive locks in [Incorrect config.] (CFF) fault mode on power-up. If the card has been deliberately changed or removed, the detected fault can be cleared by pressing the ENT key twice, which causes the factory settings to be restored (see page 89) for the parameter groups affected by the card. These are as follows:

Card replaced by a card of the same type

- Communication cards: only the parameters that are specific to communication cards

Control block changed

When a control block is replaced by a control block configured on a drive with a different rating, the drive locks in [Incorrect config.] (CFF) fault mode on power-up. If the control block has been deliberately changed, the detected fault can be cleared by pressing the ENT key twice, which **causes all the factory settings to be restored.**

Fault detection codes displayed on the remote display terminal

Code	Name	Description
init	[Initialization in progress]	The microcontroller is initializing. Search underway for communication configuration.
CoM.E (1)	[Communication error]	Time out detected fault (50 ms). This message is displayed after 20 attempts at communication.
A-17 (1)	[Alarm button]	A key has been held down for more than 10 seconds. The keypad is disconnected. The keypad wakes up when a key is pressed.
CLr (1)	[Confirmation of detected fault reset]	This is displayed when the STOP key is pressed once if the active command channel is the remote display terminal.
dEv.E (1)	[Drive disparity]	The drive brand does not match that of the remote display terminal.
roM.E (1)	[ROM anomaly]	The remote display terminal detects a ROM anomaly on the basis of checksum calculation.
rAM.E (1)	[RAM anomaly]	The remote display terminal detects a RAM anomaly.
CPu.E (1)	[Other detected faults]	Other detected faults.

(1) Flashing

Appendix E

Dryer Startup

Actions Required to Start Dryer

DATE	REVISION
04/13/2023 – Removed sample copy of Dryer Startup Checklist	

Dryer Startup

Following are minimum actions required to successfully start dryer. **See Software Manual for detailed instructions.**

IMPORTANT: Augers, fan(s) and heater(s) on dryer, along with auxiliary fill and take-away equipment, will start without warning during dryer operation. Use extreme caution around grain handling system.

1. Open power box and ensure that all internal breakers and starter protectors are turned on. Close door to power box, close latch, and turn Main Disconnect to “ON”.
2. Pull Emergency Stop button out. It should illuminate red. Turn System Control Switch needs to “QuadraTouch Pro” position. The System Control switch will illuminate when power has been applied.
3. Turn on QuadraTouch Pro control unit using rocker switch on bottom right of console. All faults must be cleared before dryer can start.
4. Press “Start” to choose an operation. Display will give options of selecting Continuous Flow, Manual Operation, Grain Transfer, Dry Fire, Final Dry and Auto Batch.

NOTE: Press “Reset” to abort dryer startup or to stop any operation in progress.

NOTE: Please refer to Software Manual for a detailed description of each operation mode. Software is updated frequently, so content may differ slightly from descriptions in this manual.

Manual Operation (Check Motor Rotations)

1. Press “Start” on touch screen and choose “Manual Operation”.
2. Press “Load” to turn on load auger. Make sure load auger turns on (rotating in proper direction), followed by any auxiliary load devices controlled by dryer (K6 and K7 relays).
3. Press “Load” again to turn load system off.
4. Press “Unload” to turn on unload motor and meter rolls. Ensure unload motor rotates in proper direction and any auxiliary unload devices are also energized. Confirm metering rolls are turning.
5. Press “Unload” to turn off unload system.
6. Press “Fan 1” to turn Fan #1 on. Ensure fan motor rotates in proper direction.
7. Press “Fan 1” again to turn it off.
8. Repeat Steps 6 and 7 for any additional fans.

Dry Fire

"Dry Fire" mode of operation enables operator a means of running dryer when there is no grain. This provides a great way of testing dryer before seasonal operation. This mode is recommended **EVERY SEASON** before dryer is to be used.

To operate dryer in "Dry Fire" mode, ensure red emergency stop button is pulled out and main power is ON. Emergency stop button should illuminate red, indicating control power is available. In addition to main power switch and emergency stop button, there is a System Control Switch. This switch should be turned to "QuadraTouch Pro" when using touch screen controller. It will illuminate when in "QuadraTouch Pro" position.

CAUTION: Excessive noise is present while dryer is running. Use protection to avoid damage to ears. Failure to do so could result in minor or moderate injury.

- To access Dry Fire mode, press "Start" on main screen and select "Dry Fire." A screen similar to the following will appear:

Fan Only

- Selecting "Fan 1" and pressing "Next" will energize fan(s) only. Static air pressure switch(es) is/are deactivated during "Dry Fire" mode. All other monitored safeties are operational at this time.

Fan and Heater

- Selecting "Fan 1" and "Heat 1" and pressing "Next" will apply power to fan and heater. Fan will come on, followed by heater after a 30-second purge delay. Static air pressure switch(es) is/are deactivated during "Dry Fire" mode. Flame sensor will still be active.

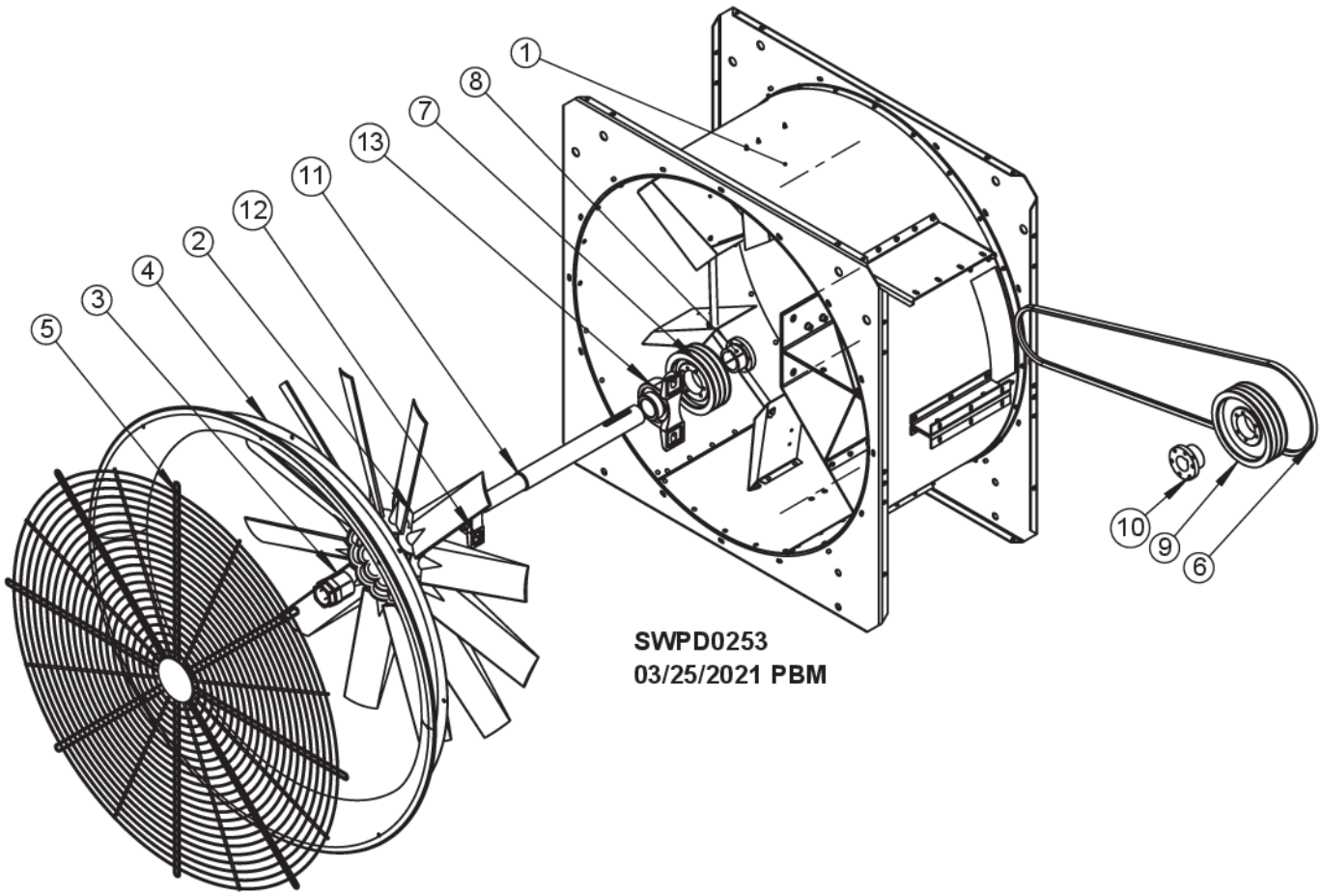
Appendix F

Axial Dryer Parts/Assemblies

DATE	REVISION	PAGE
04/04/2024 –	Added discharge box assy. drawing & parts list	45
04/13/2023 –	Updated drawing & parts list for LP manifold for bottom module of stacked dryer	17
	Updated description of shaft T16436	19, 21, 23, 25, 27, 40-43
	Updated parts descriptions for flow gate w/ angle flow gate seal	33

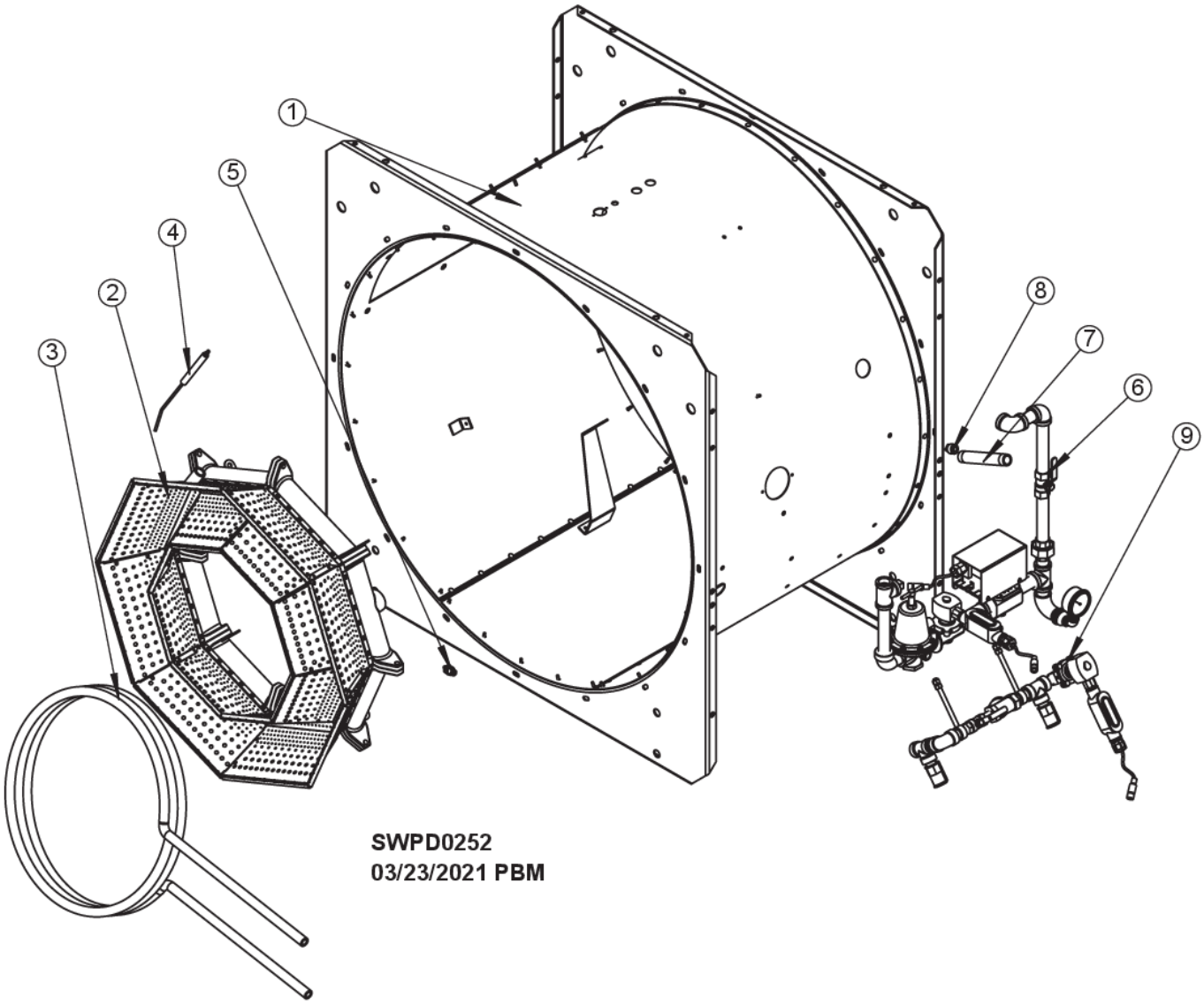
TABLE OF CONTENTS

FAN PARTS



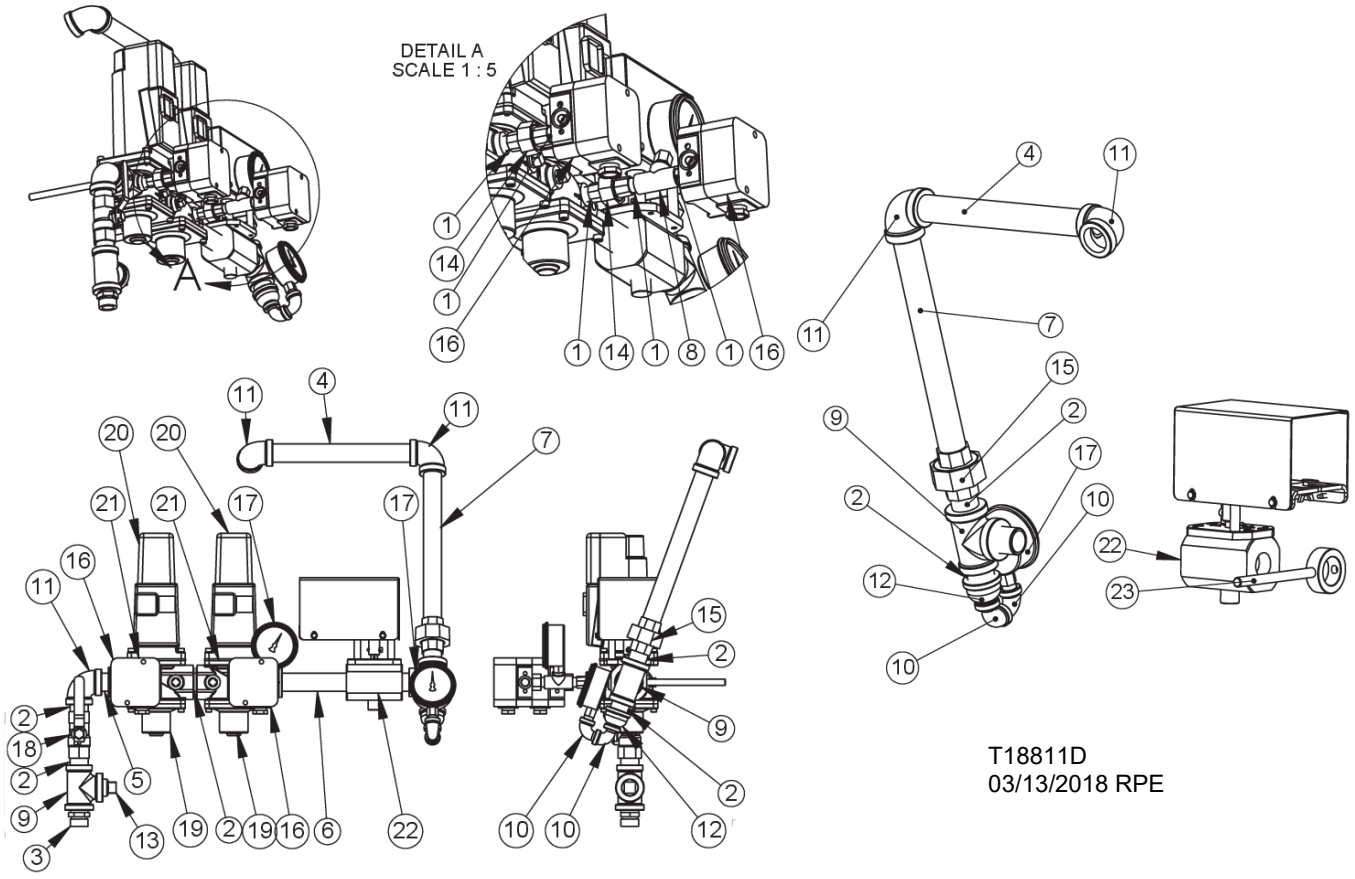
REF. #	DESCRIPTION	28" 20HP 50Hz	28" 25HP 50Hz	38" 20HP 50Hz	44" 40HP 50Hz
1	Housing	T28660	T28660	T21970	T21910
2	Blade	J3058	J3059	J3050	J3067
3	Blade bushing	J0436	J0436	J0435	J04371
4	Venturi	J3080	J3080	J3085	J3090
5	Inlet screen	D3824	D3824	J3132	J2957
6	Belt	J0228	J002281	J02542	J02801
7	Fan pulley	J03381	J03381	J03457	J03493
8	Pulley bushing	J04241	J04241	J04289	J0432
9	Motor pulley	J0358	J0358	J0358	J0356
10	Pulley bushing	J04273	J04274	J04273	J04277
11	Shaft	T28681	T28681	T21986	T21933
12	Shaft bearing	J0008	J0008	J0047	J0048
13	Shaft bearing	J00081	J00081	J0047	J0048
	Complete fan	T25250D	T25251D	T17187E	T21904

HEATER PARTS



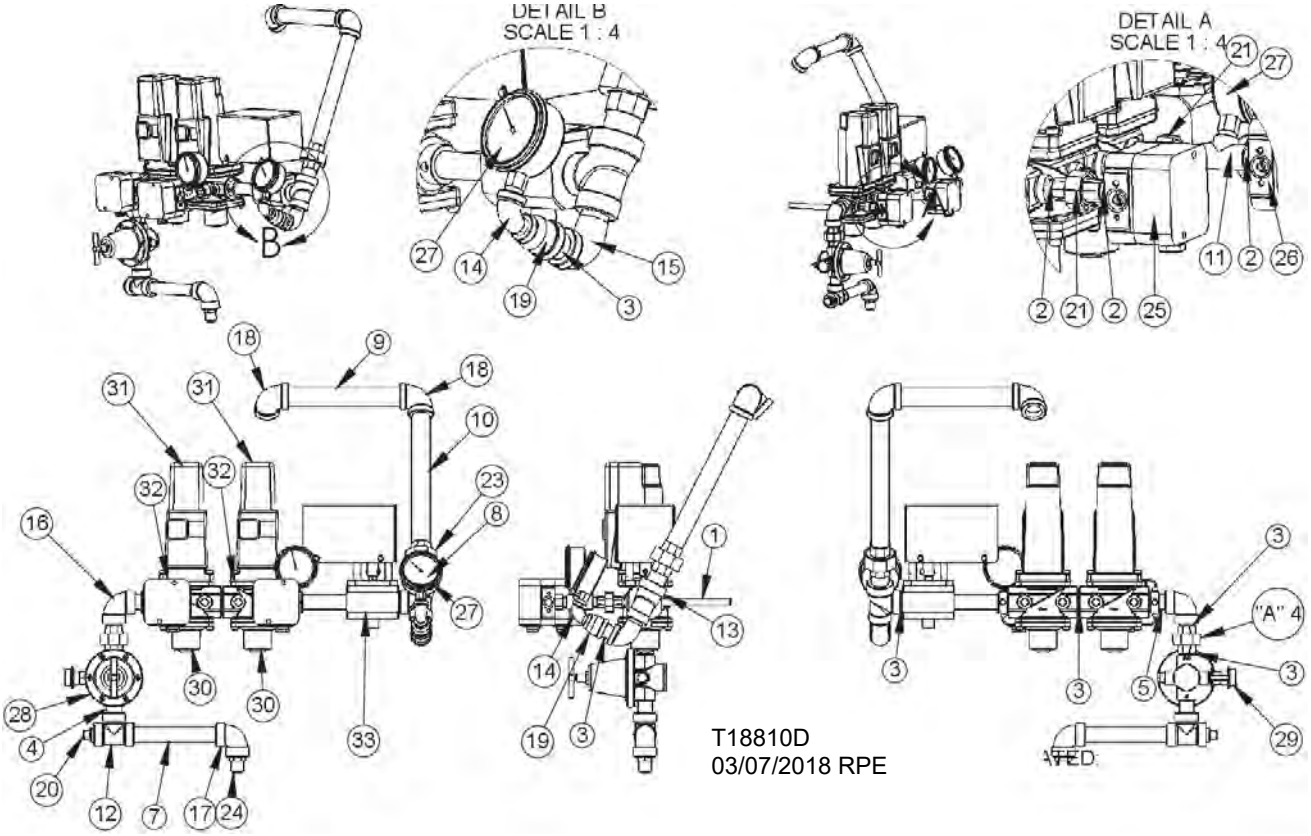
REF. #	DESCRIPTION	28"LP	28"NG	38"LP	38"NG	44"LP	44"NG
1	Housing	T28660	T28660	T12995	T12995	T16995	T16995
2	Burner	D4017	D4017	T29800	T29800	T29800	T29800
3	Vaporizer	D70321	---	D7034	---	T16194	---
4	Flame sensor	J5747	J5747	J5747	J5747	J5747	J5747
5	Spark plug	J5739	J5739	J5739	J5739	J5739	J5739
6	Vapor pipe train	T18810D	T18811D	T18812D	T18813D	T18812D	T18814D
7	Orifice pipe	D7119	D7119	D7119	D71191	D7124	D71192
8	Orifice	D7125	D7112	D7110	D71131	D7112	D71129
9	Liquid pipe train	T20200D	---	T161872D	---	T161872D	---

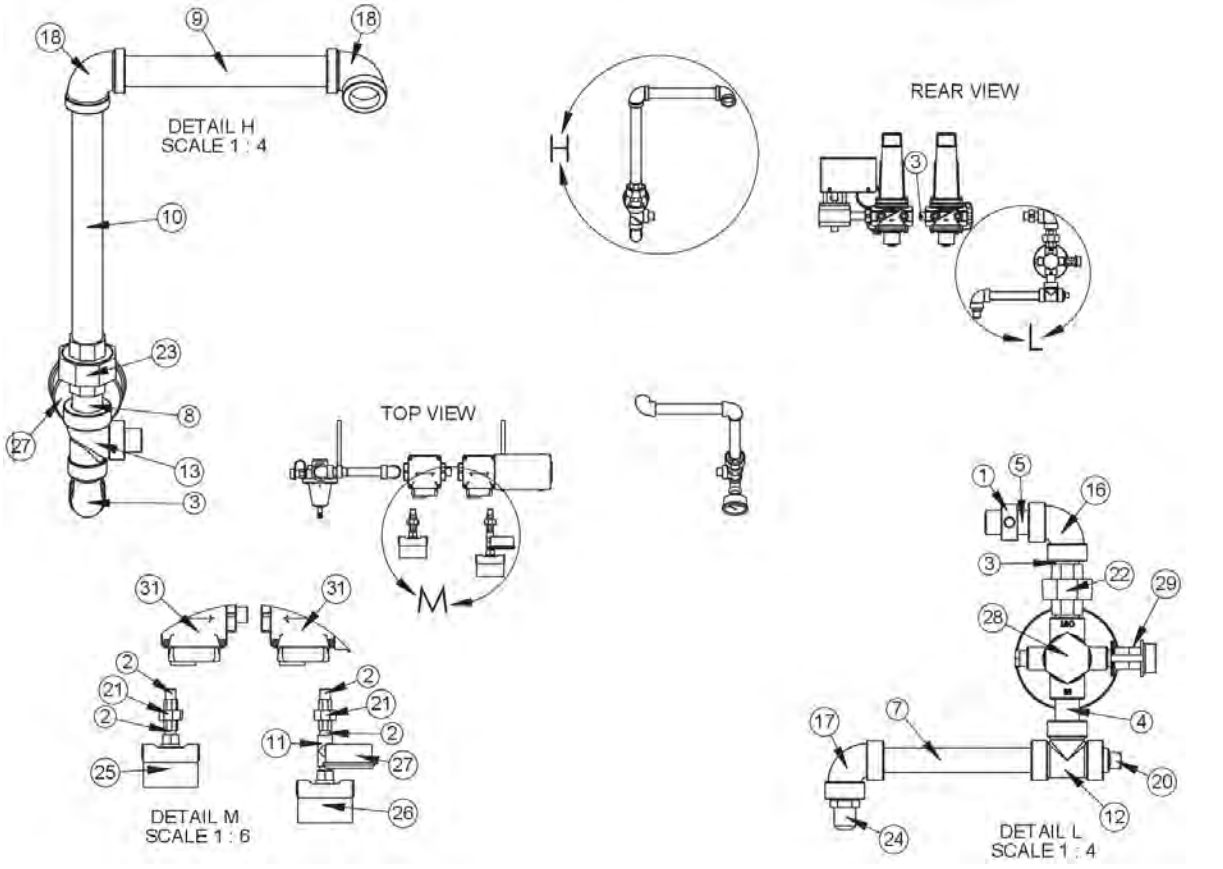
NATURAL GAS PIPE TRAIN, 3/4”, 28”



REF. #	DESCRIPTION	QTY.	PART #
1	Nipple, 1/4” x 7/8”, Sch40	5	J24003
2	Nipple, 3/4 x Close, Sch40	6	J2410
3	Nipple, 3/4 x Cls, Brs, Hex	1	J2416
4	Pipe, 3/4 x 9, Sch40	1	J24181
5	Nipple, 3/4”, x 2”, Sch40	1	J2420
6	Pipe, 3/4 x 5, Sch40	1	J2426
7	Pipe, 3/4 x 10, Sch40	1	J2429
8	Tee, 1/4” x 1/4” x 1/4”	1	J2469
9	Tee, 3/4 x 3/4 x 3/4	2	J2485
10	Elbow, Street, 1/4, 90 Deg	2	J2517
11	Elbow, 3/4, 90 Deg,	3	J2525
12	Coupling, Reducing, 3/4 x 1/4	1	J2574
13	Plug, 3/4, Pipe	1	J2620
14	Union, 1/4”, Sch40	2	J2703
15	Union, 3/4, Black	1	J2710
16	Switch, Press, Dungs, GW2000	2	J4437
17	Gauge, Pressure, 0-15, Liq, 1/4”	2	J5967
18	Valve, 3/4”, Ball	1	J6083
19	Valve, Gas, 3/4” Single	2	J6236
20	Actuator, SKP15.001E1	2	J6240
21	Kit, NEMA 4, AGA66	2	J6241
22	Valve, Butterfly, 3/4”, Scc	1	T161916NN
23	Eyebolt, Pipe train, 4.75”	2	T18810

VAPOR PROPANE PIPE TRAIN, 1/2”

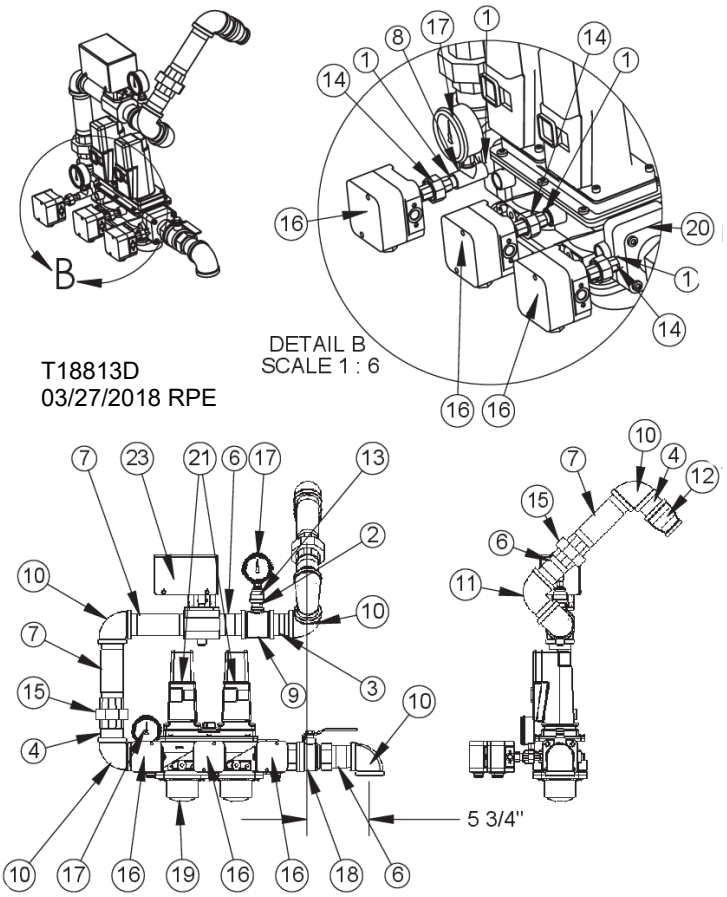




VAPOR PROPANE PIPE TRAIN, 1/2”

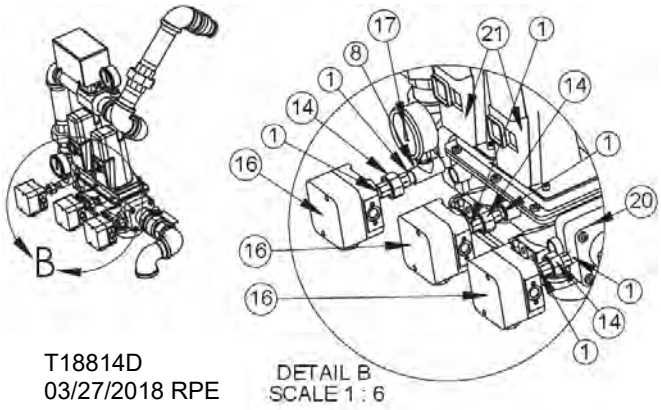
REF. #	DESCRIPTION	QTY.	PART #
1	Eyebolt, Pipe train, 7/8” Collar	2	D71161
2	Nipple, 1/4” x 7/8”, Sch40	5	J24003
3	Nipple, 1/2 x Close, Sch40	5	J2405
4	Nipple, 1/2 x 1 1/2, Sch80	1	J2406
5	Nipple, 1/2 x 2, Sch40	1	J24061
6	Nipple, 1/2 x 4.5, Sch40	1	J24085
7	Nipple, 1/2 x 6, Sch80	1	J24093
8	Nipple, 3/4 x Close, Sch40	1	J2410
9	Nipple, 3/4 x 8, Sch40	1	J2418
10	Pipe, 3/4 x 10, Sch40	1	J2429
11	Tee, 1/4” x 1/4” x 1/4”, Sch40	1	J2469
12	Tee, 1/2 x 1/2 x 1/2, Sch80	1	J2472
13	Tee, Reducing, 3/4 x 1/2 x 1/2, Sch40	1	J2481
14	Elbow, Street, 1/4, 90 Deg, Sch40	1	J2517
15	Elbow, Street, 1/2, 90 Deg, Sch40	1	J2520
16	Elbow, 1/2 x 90 Deg, Sch40	1	J2522
17	Elbow, 1/2 x 90 Deg, Sch80	1	J2523
18	Elbow, 3/4, 90 Deg, Sch40	2	J2525
19	Coupling, Reducing, 1/2 x 1/4	1	J2572
20	Plug, 1/2, Sq Hd, Black	1	J2617
21	Union, 1/4”, Sch40	2	J2703
22	Union, 1/2”, Sch40	1	J2705
23	Union, 3/4, Black, #150	1	J2710
24	Union, 1/2 Fl x 1/2 Nip	1	J2840
25	Switch, Press, Dungs, GW2000	1	J4437
26	Switch, Press, Dungs, GW6000	1	J4443
27	Gauge, Pres, 0-30, Liq, 1/4 BTM	2	J5960
28	Regulator, 1/2” X1584YN	1	J6110
29	Valve, 1/4”, Relief, A1325	1	J6171
30	Valve, Gas, 1/2”, Single, VGG10.1544	2	J6235
31	Actuator, SKP15.001E1	2	J6240
32	Kit, NEMA 4, AGA66	2	J6241
33	Valve, Butterfly, 1/2”, SCC	1	T161918NN

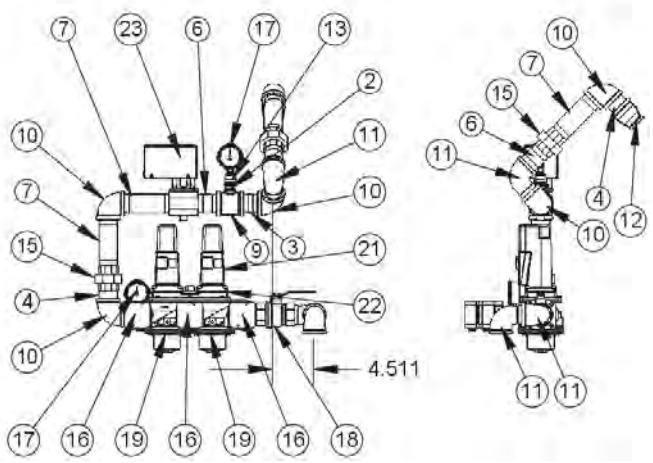
NATURAL GAS PIPE TRAIN, 1 1/2”, 38”



REF. #	DESCRIPTION	QTY.	PART #
1	Nipple, 1/4” x 7/8”, Sch 40	7	J24003
2	Nipple, 1/2 x Close, Sch 40	1	J2405
3	Nipple, 1 1/2 x 2 1/2, Sch 40	1	J24084
4	Nipple, 1 1/2” x Close, Sch 40	3	J2431
5	Nipple, 1 1/2 x 2, Sch 40	1	J2432
6	Nipple, 1.5 x 3”, Sch 40	3	J2433
7	Nipple, 1.5” x 6”, Sch 40	3	J2437
8	Tee, 1/4” x 1/4” x 1/4”	1	J2469
9	Tee, Reduce, 1 1/2 x 1 1/2 x 1/2	1	J2479
10	Elbow, 1 1/2”, 90 Deg, Sch 40	5	J2541
11	Elbow, Street, 1.5”, 90 Deg, Sch 40	1	J2542
12	Coupling, Red, 1 1/2” x 1”	1	J2553
13	Coupling, Reducing, 1/2 x 1/4	1	J2572
14	Union, 1/4”, Sch 40	3	J2703
15	Union, 1 1/2”, Sch 40	2	J2707
16	Switch, Press, Dungs, GW2000	3	J4437
17	Gauge, Pressure, 0-15, Liq	2	J5967
18	Valve, 1 1/2”, Ball	1	J6087
19	Valve, Gas, 1 1/2, DBL	1	J6237
20	Flange set, 1 1/2 NPT	2	J6239
21	Actuator, SKP15.001E1	2	J6240
22	Kit, NEMA 4, AGA66	2	J6241
23	Valve, Butterfly, 1.5”, SCC	1	T161917NN

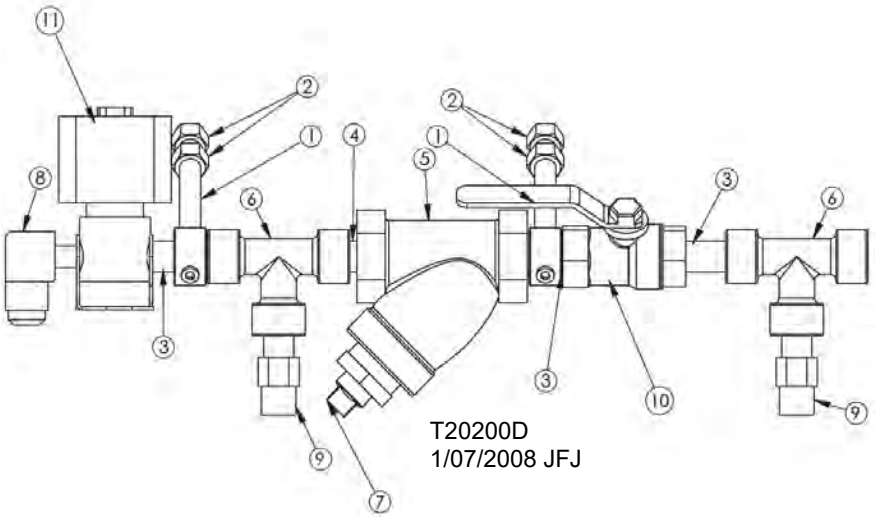
NATURAL GAS PIPE TRAIN, 1 1/2”, 44”





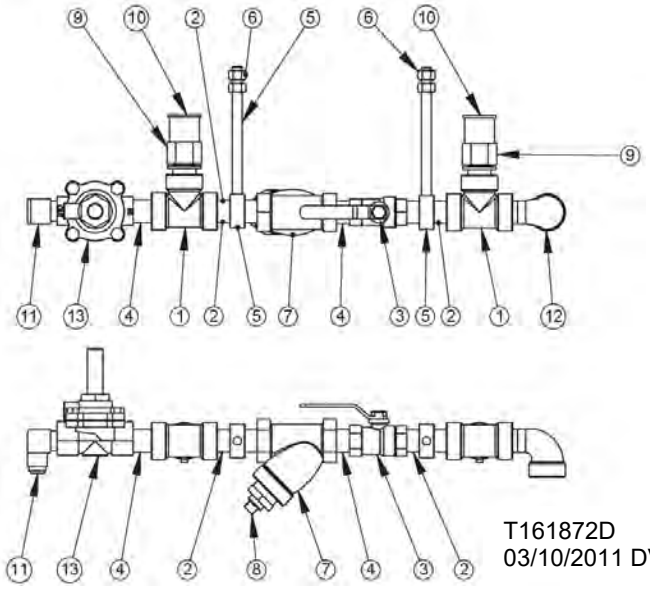
REF. #	DESCRIPTION	QTY.	PART #
1	Nipple, 1/4” x 7/8”, Sch 40	7	J24003
2	Nipple, 1/2 x Close, Sch 40	1	J2405
3	Nipple, 1 1/2 x 2 1/2, Sch 40	1	J24084
4	Nipple, 1 1/2” x Close, Sch 40	3	J2431
5	Nipple, 1 1/2 x 2, Sch 40	1	J2432
6	Nipple, 1.5 x 3”, Sch 40	2	J2433
7	Nipple, 1.5” x 6”, Sch 40	3	J2437
8	Tee, 1/4” x 1/4” x 1/4”	1	J2469
9	Tee, Reduce, 1 1/2 x 1 1/2 x 1/2	1	J2479
10	Elbow, 1 1/2”, 90 Deg, Sch 40	4	J2541
11	Elbow, Street, 1.5”, 90 Deg, Sch 40	3	J2542
12	Coupling, Red, 1 1/2” x 1”	1	J2553
13	Coupling, Reducing, 1/2 x 1/4	1	J2572
14	Union, 1/4”, Sch 40	3	J2703
15	Union, 1 1/2”, Sch 40	2	J2707
16	Switch, Press, Dungs, GW2000	3	J4437
17	Gauge, Pressure, 0-15, Liq	2	J5967
18	Valve, 1 1/2”, Ball	1	J6087
19	Valve, Gas, 1 1/2, DBL	1	J6237
20	Flange set, 1 1/2 NPT	2	J6239
21	Actuator, SKP15.001E1	2	J6240
22	Kit, NEMA 4, AGA66	2	J6241
23	Valve, Butterfly, 1.5”, SCC	1	T161917NN

1/4” LIQUID PROPANE PIPE TRAIN



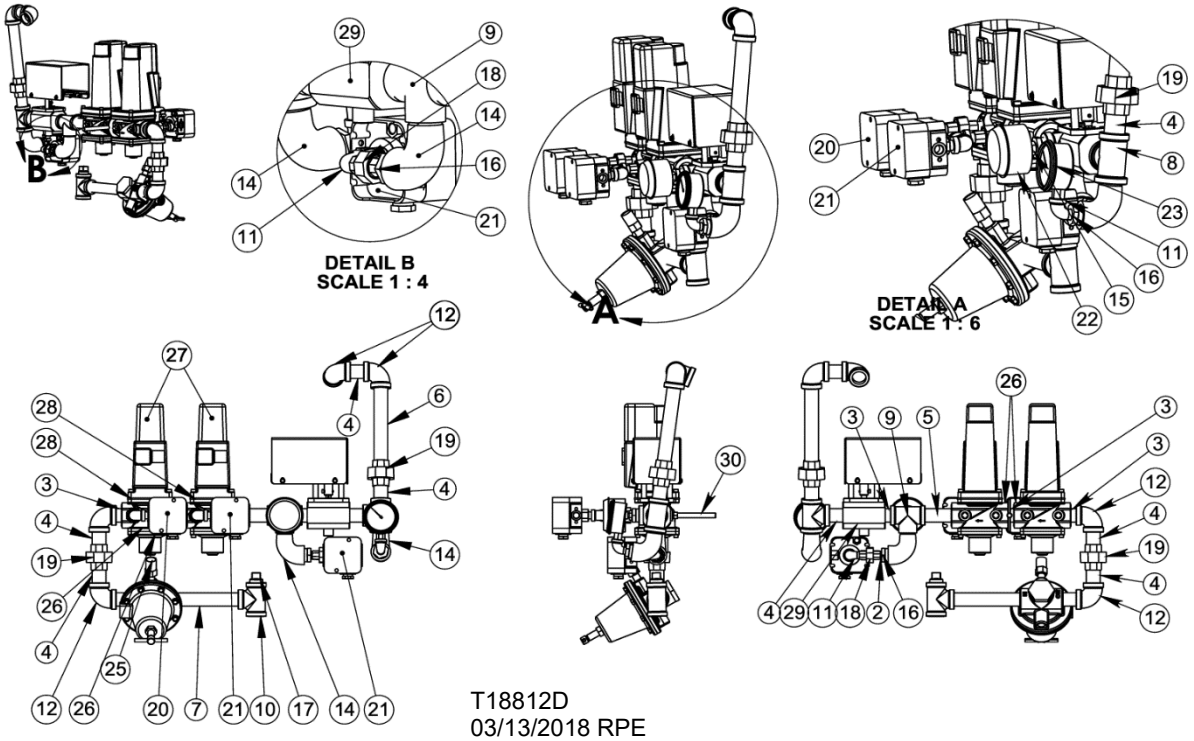
REF. #	DESCRIPTION	QTY.	PART #
1	Eyebolt, Pipe train, 5/8” Shaft Collar	2	D71162
2	Nut, Hex, 3/8 – 16	4	J1020
3	Nipple, 1/4”, 1 1/2”, Blk Pipe, Sch 80	3	J2400
4	Nipple, 1/4” x 7/8”, Sch 40	1	J24003
5	Strainer, Liq, 1/4”	1	J5990
6	Tee, 1/4 x 1/4 x 1/4, Sch 80	2	J2470
7	Plug, 3/8, Pipe, Blk	1	J2610
8	Elbow, 3/8 Fl x 1/4 Mip	1	J2740
9	1/4”, Relief Valve	2	J6050
10	Valve, 1/4”, Ball, ITT 1550	1	J6080
11	Conduit with J6035 Solenoid, Liquid	1	T17092

1/2” LIQUID PROPANE PIPE TRAIN



REF. #	DESCRIPTION	QTY.	PART #
1	Tee, 1/2 x 1/2 x 1/2, Sch 80	2	J2472
2	Nipple, 1/2 x 2, Sch 80	2	J24071
3	Valve, 1/2”, Ball, ITT 1550	1	J6082
4	Nipple, 1/2 x 1 1/2	2	J2406
5	Eyebolt, Pipe train, 7/8”	2	D71161
6	Nut, Hex, 3/8 - 16	4	J1020
7	Strainer, Liq, 1/2”	1	J5992
8	Plug, 3/8, Pipe, Blk	1	J2610
9	Valve, 1/2”, Relief	2	J6170
10	Rain Cap, 7545-10	2	J6200
11	Elbow, 1/2 Fl x 1/2 Mip	1	J2745
12	Elbow, Street, 1/2, 90 Deg	1	J2519
13	Conduit with J6257 Solenoid, Liquid	1	T17097

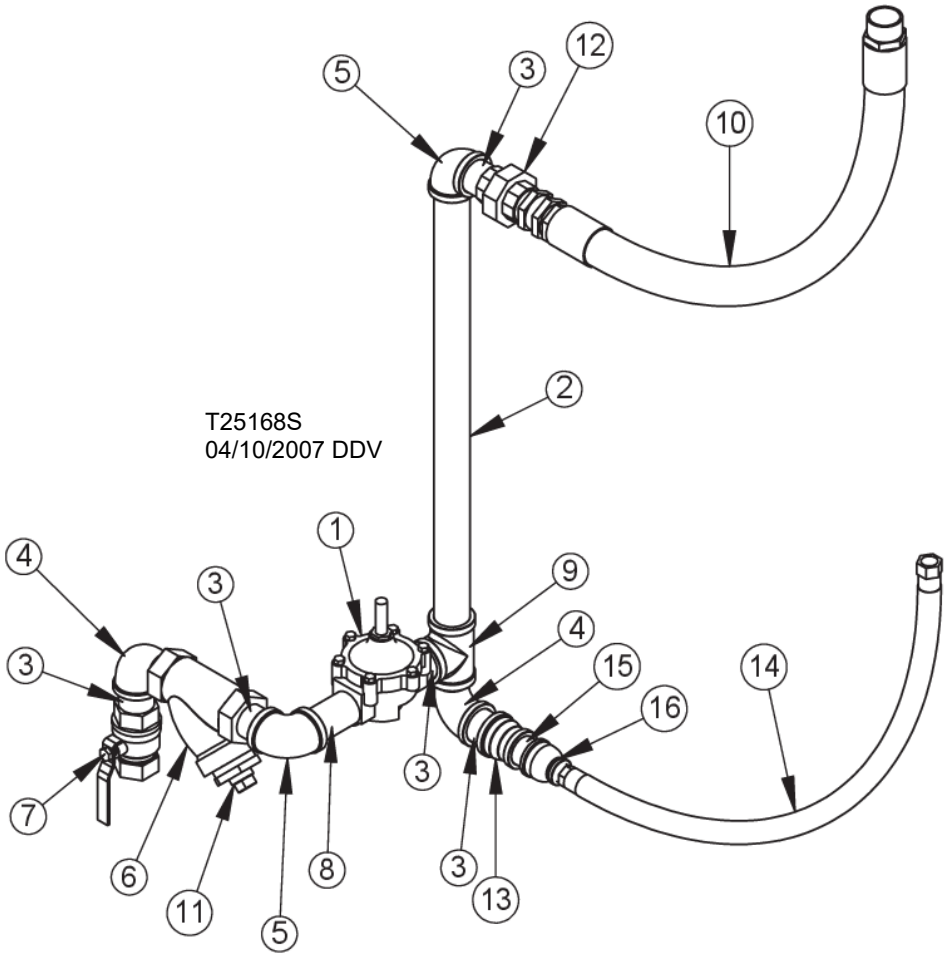
3/4” VAPOR PROPANE PIPE TRAIN



T18812D
03/13/2018 RPE

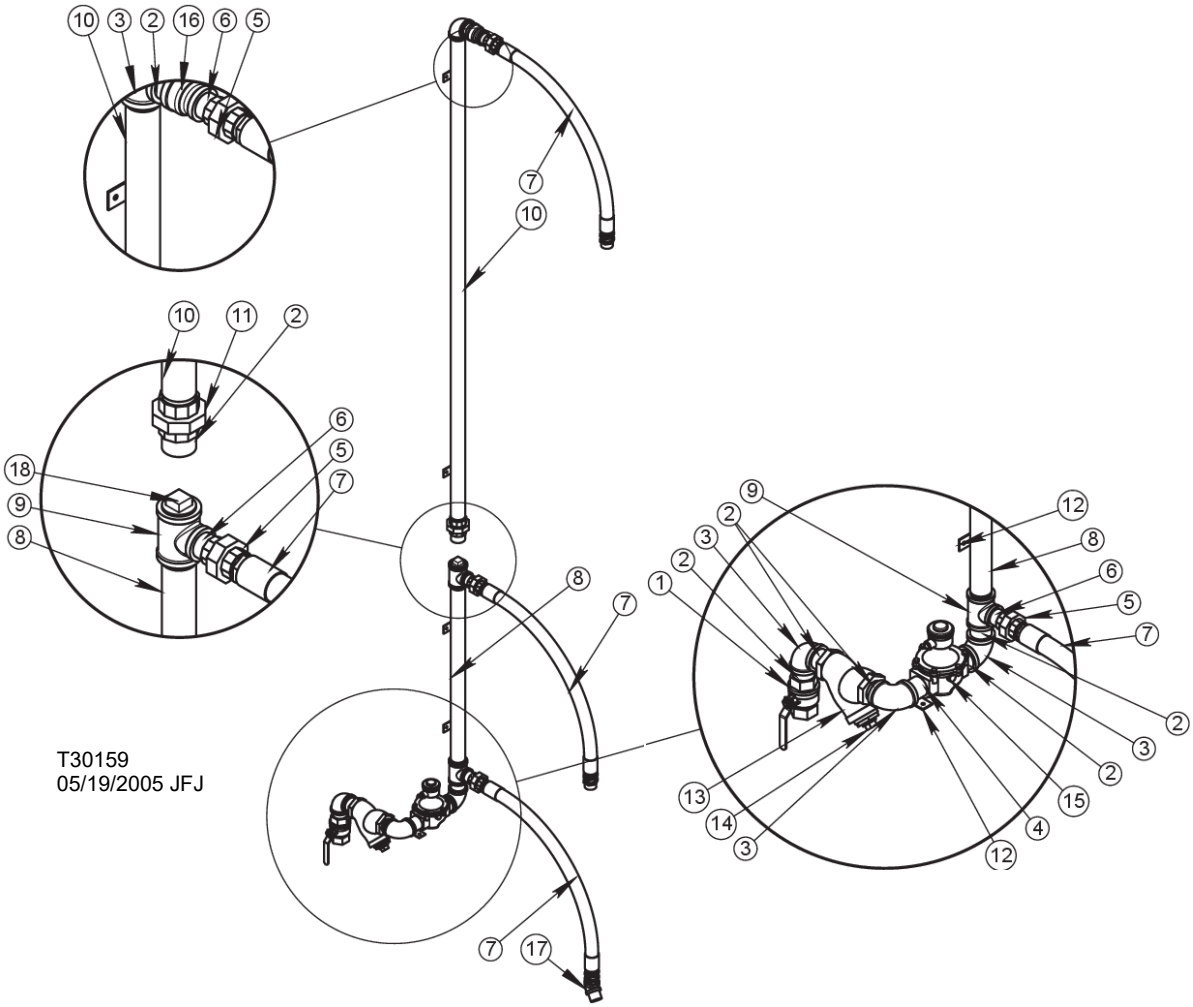
REF. #	DESCRIPTION	QTY.	PART #
1	Nipple, 1/4” x 1 1/2”, Sch 40	2	J24001
2	Nipple, 1/4” x 7/8”, Sch 80	8	J24003
3	Nipple, 3/4 x Close, Sch 40	3	J2410
4	Nipple, 3/4”, x 2”, Sch 40	6	J2420
5	Nipple, 3/4” x 3”	1	J2423
6	Nipple, 3/4 x 6 1/2”, Sch 40	1	J2427
7	Nipple, 3/4 x 6, Sch 80	1	J2428
8	Tee, 3/4 x 3/4 x 3/4	1	J2485
9	Tee, Side Outlet, 3/4 Black	1	J2490
10	Tee, 3/4 x 3/4 x 3/4	1	J2491
11	Elbow, Street, 1/4, 90 Deg	2	J2517
12	Elbow, 3/4, 90 Deg, Sch 40	4	J2525
13	Elbow, 1/4 x 90, Sch 40	4	J2526
14	Elbow, Street, 3/4”, 90 Deg	2	J2530
15	Bushing, Reducing, 1/4 x 1/8	1	J2560
16	Bushing, Reducing, 3/4 x 1/4	3	J2570
17	Plug, 3/4, Pipe	1	J2620
18	Union, 1/4”, Sch 40	3	J2703
19	Union, 3/4, Black, #150	2	J2710
20	Switch, Press, Dungs, GW2000	1	J4437
21	Switch, Press, Dungs, GW6000	2	J4443
22	Gauge, Pres, 30PSI	1	J5959
23	Gauge, Pres, 0-30, Liq	1	J5960
24	Regulator, 3/4”	1	J6163
25	Valve, 1/4”, Relief, A1325	1	J6171
26	Valve, Gas, 3/4” Single	2	J6236
27	Actuator, SKP15.001E1	2	J6240
28	Kit, Gasket, NEMA 4	2	J6241
29	Valve, Butterfly, 3/4”, SCC	1	T161916NN
30	Eyebolt, Pipe train, Heater	1	T16224

NG MANIFOLD, 1-1/2”, 2/3-1/3



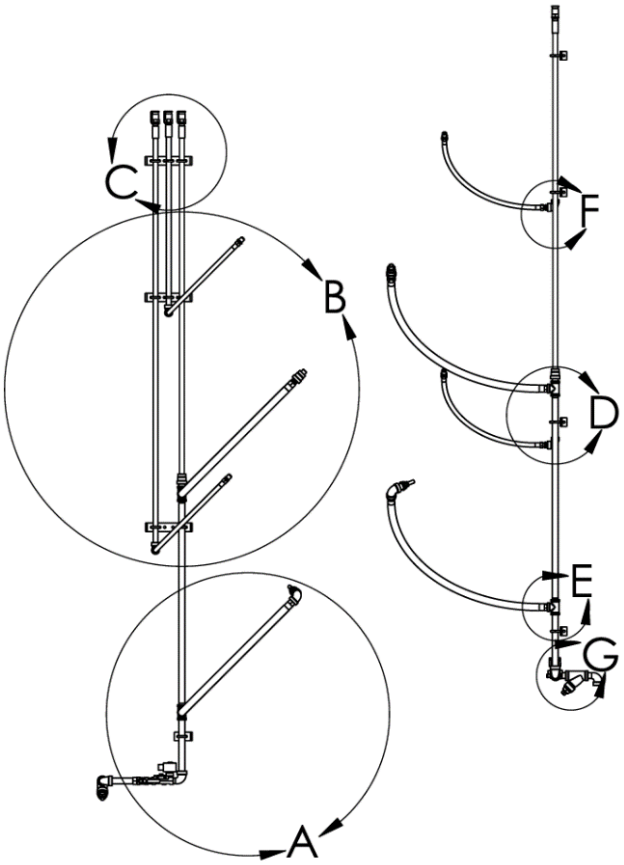
REF. #	DESCRIPTION	QTY.	PART #
1	Solenoid Assy, NG, 1 1/2”	1	T25163S
2	Pipe, 1 1/2 x 29”, Sch 40	1	T25164
3	Nipple, 1 1/2”x Close, Sch 40	5	J2431
4	Elbow, Street, 1.5”, 90 Deg, Sch 40	2	J2542
5	Elbow, 1 1/2”, 90 Deg, Sch 40	2	J2541
6	Strainer, 1 1/2”	1	J6232
7	Valve, 1 1/2”, Ball	1	J6087
8	Nipple, 1.5 x 4”, Sch 40	1	J2436
9	Tee, 1 1/2 x 1 1/2 x 1 1/2	1	J2476
10	Hose, NG, 1 1/2 x 36”	1	J5935
11	Plug, 1”	1	J2625
12	Union, 1 1/2”, Sch 40	1	J2707
13	Coupling, Reduce, 1 1/2 x 1 1/4	1	J2555
14	Hose, High Pressure, 3/4” x 48”	1	J5928
15	Nipple, 1.25 x Close	1	J2500
16	Coupling, Reducing, 1 1/4 x 3/4	1	J2576

2-MODULE STACKED NG DRYER MANIFOLD, 2”

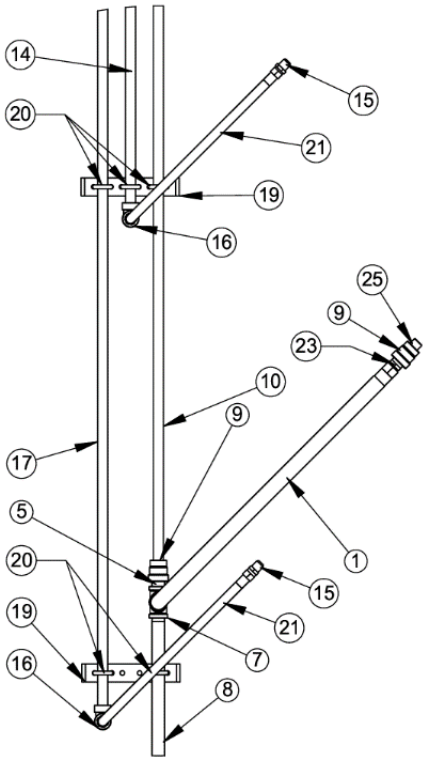


REF. #	DESCRIPTION	QTY.	PART #
1	Valve, 2”, Ball	1	J6088
2	Nipple, 2 x Close	7	J2440
3	Elbow, 2”, 90 Deg,	4	J2543
4	Nipple, 2 x 3	1	J2441
5	Union, 1-1/2”	3	J2707
6	Nipple, 1-1/2”x Close	4	J2431
7	Hose, NG, 1-1/2	3	J5935
8	Pipe, 2”, 37”	1	T30162
9	Tee, 2 x 2 x 1-1/2	2	J2497
10	Pipe, 2”, 99”	1	T30163
11	Union, 2”	1	J2709
12	Bracket, Manifold, NG	5	T24183
13	Strainer, 2”, 100 Mesh	1	J6234
14	Plug, 1-1/4	1	J2626
15	Valve, Solenoid, Comp, 2”	1	T30166
16	Coupling, Reducing, 2 x 1.5	1	J2586
17	Elbow, 1.50, 45 Deg	1	J2537
18	Plug, 2”, Pipe, Iron	1	J2621

LP MANIFOLD, 2/3 - 1/3, 3/4”

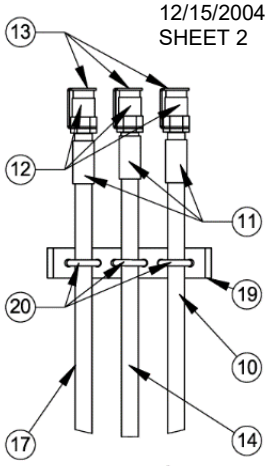


REF. #	DESCRIPTION	QTY.	PART #
1	Hose, High Pressure, 3/4” x 48”	2	J5928
2	Solenoid Assy, LP, 3/4”	1	T24166C
3	Elbow, Street, 3/4, 90 Deg	3	J2532
4	Valve, 3/4”, Ball	1	J6083
5	Nipple, 3/4 x Close	3	J2415
6	Pipe, 3/4 x 10	1	J2429
7	Tee, 3/4 x 3/4 x 3/4	2	J2491
8	Pipe, Threaded, 3/4”	1	QS23970
9	Coupling, Reducing, 3/4 x 1/2	2	J25751
10	Pipe, 1/2” x 5	1	T24162
11	Coupling, 1/2”	3	J2577
12	Valve, 1/2”, Relief	3	J6170
13	Rain Cap	3	J6200
14	Pipe, 1/2” x 2 1/2	1	T24161
15	Union, 1/2 Fl x 1/2	4	J2840
16	Elbow, 1/2 x 90	2	J2523
17	Pipe, 1/2” x 6	1	T24163
18	Bracket Short, Manifold	1	T24184
19	Bracket Long, Manifold	3	T24185
20	U-bolt, 5/16 - 18	9	J0810
21	Hose, CGA x 28 1/2”	2	J5938
22	Pipe, 3/4 x 4 1/2	1	J24251
23	Nipple, 3/4 x Close	2	J2416
24	Elbow, 3/4, 90 Deg	1	J2531
25	Nipple, 1/2” x Close	1	J2407
26	Strainer, 3/4”	1	J6230
27	Coupling, Reducing, 3/4 x 1/4	1	J25741
28	Plug, 1/2, Sq Hd, Black	1	J2617
29	Nipple, 1/4” x 1 1/2”	1	J2400

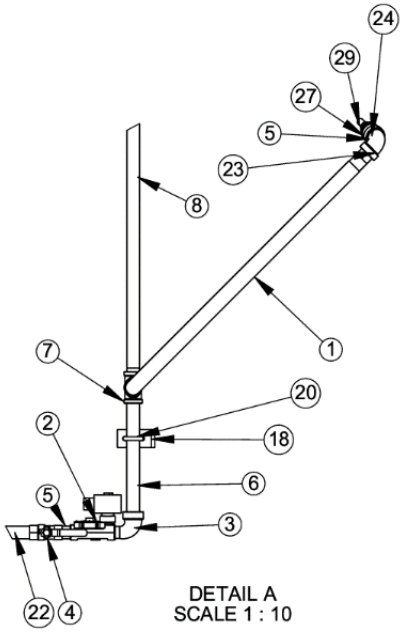


DETAIL B
SCALE 1 : 10

T24159C
12/15/2004 DDV
SHEET 2

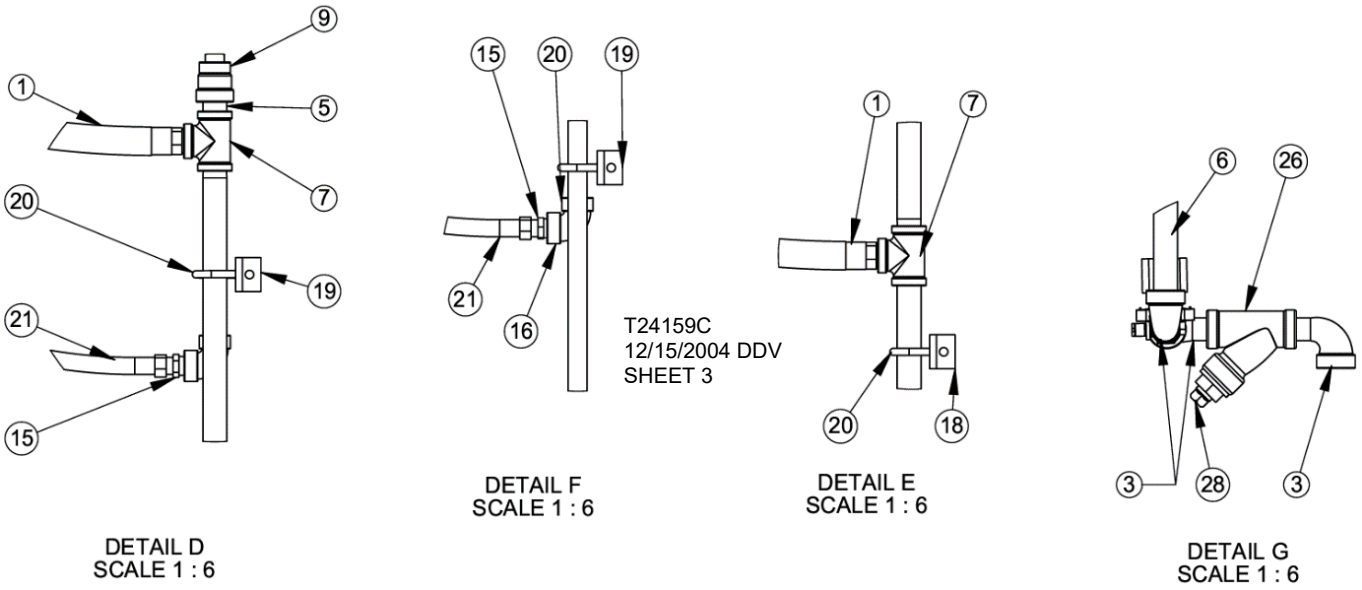


DETAIL C
SCALE 1 : 6

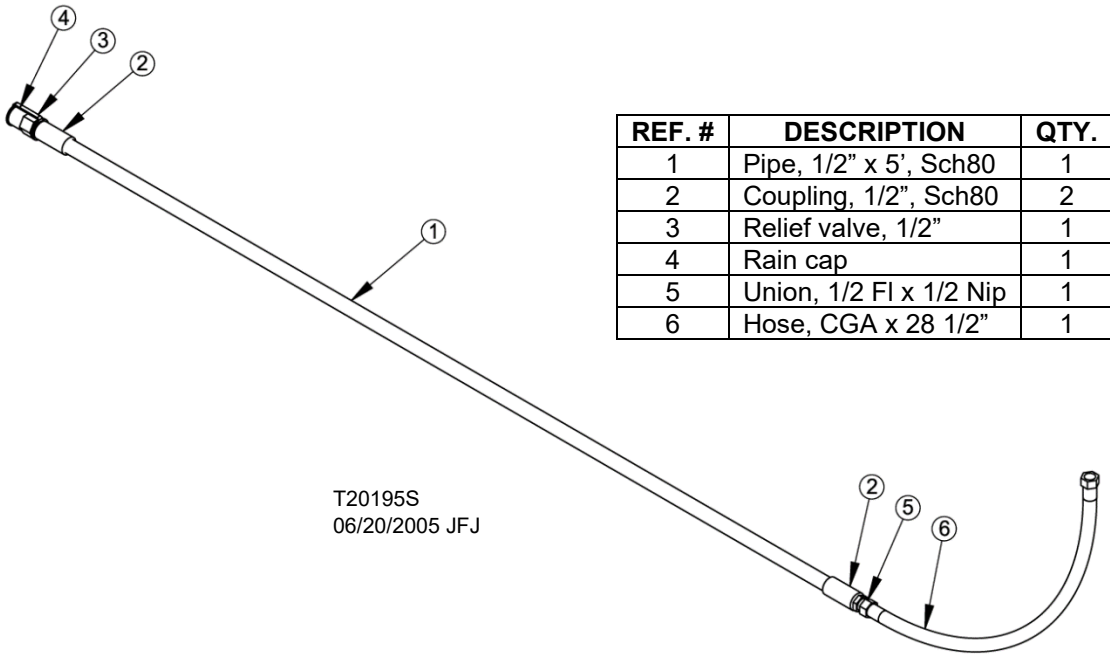


DETAIL A
SCALE 1 : 10

LP MANIFOLD, 2/3 - 1/3, 3/4”

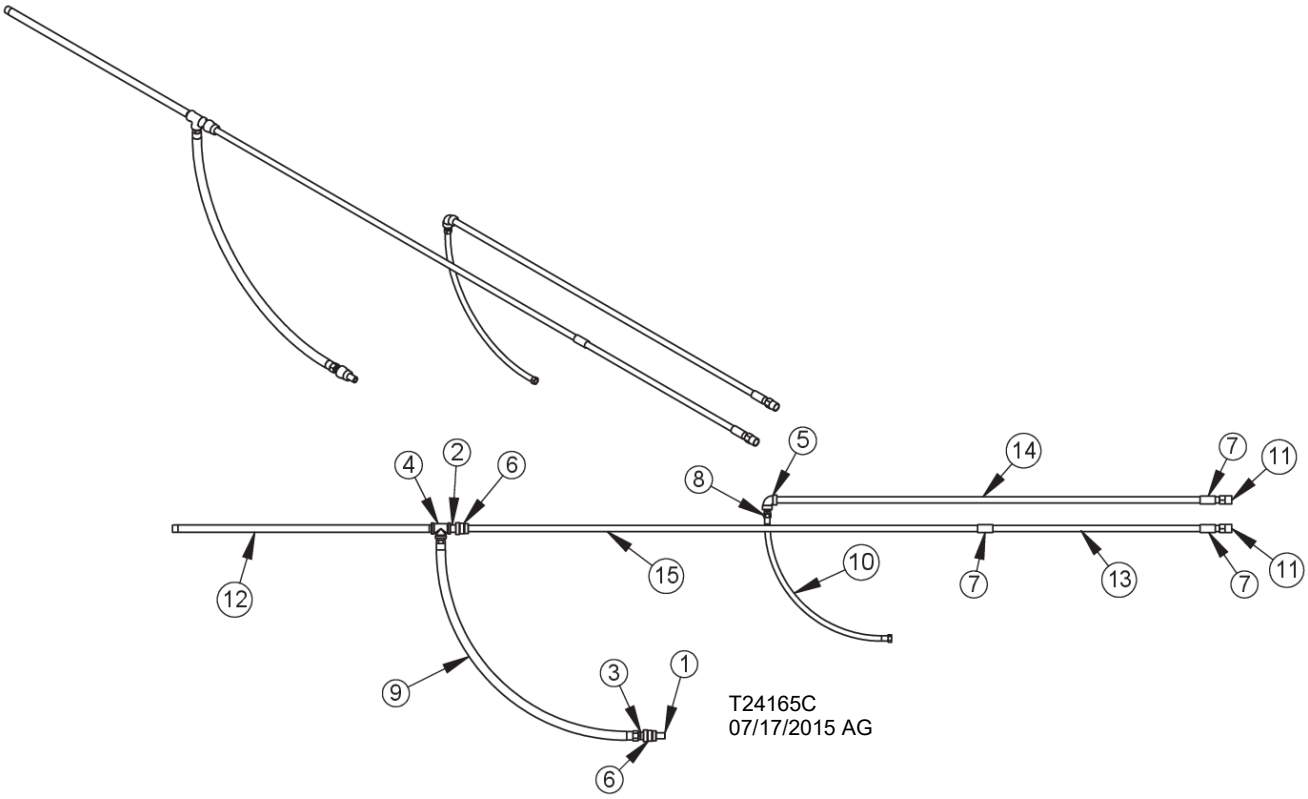


LP MANIFOLD, SINGLE HEATER



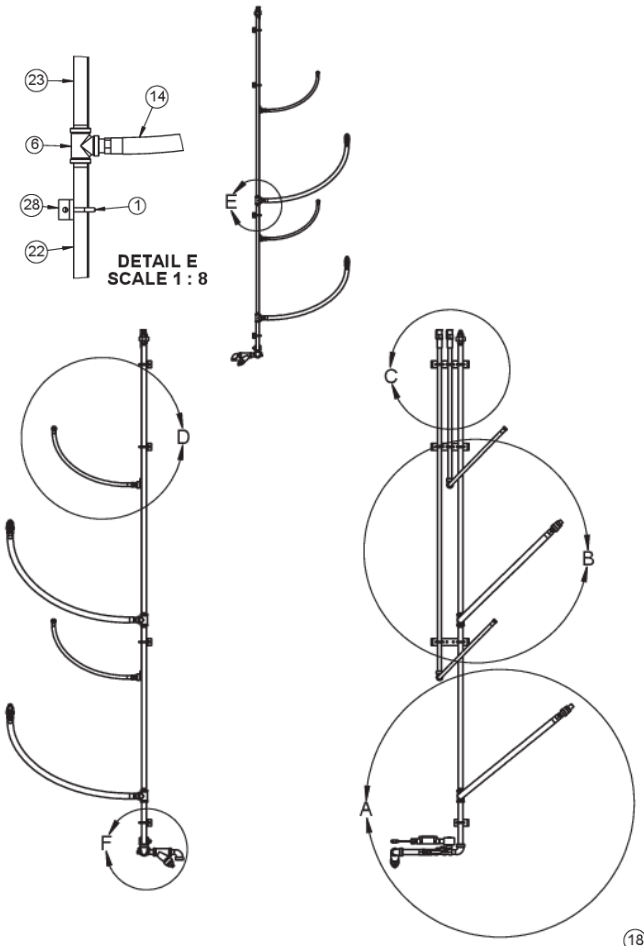
REF. #	DESCRIPTION	QTY.	PART #
1	Pipe, 1/2” x 5’, Sch80	1	T24162
2	Coupling, 1/2”, Sch80	2	J2577
3	Relief valve, 1/2”	1	J6170
4	Rain cap	1	J6200
5	Union, 1/2 Fl x 1/2 Nip	1	J2840
6	Hose, CGA x 28 1/2”	1	J5938

TOP MANIFOLD, STACKED, LP

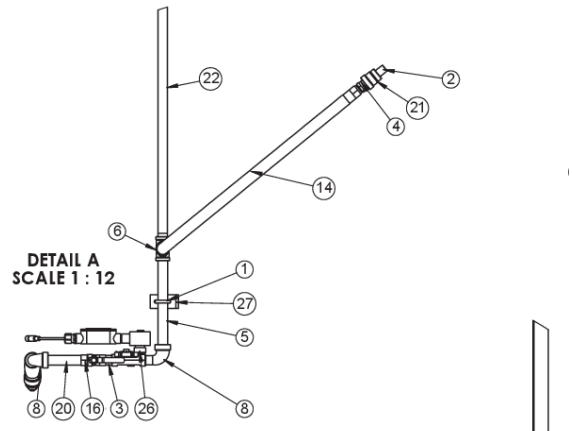


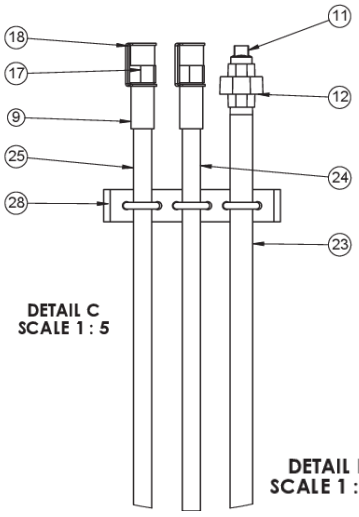
REF. #	DESCRIPTION	QTY.	PART #
1	Nipple, 1/2 x 1-1/2”, Sch 80	1	J2406
2	Pipe, 3/4 x 1-1/2”, Sch 80	1	J2419
3	Nipple, 3/4” x Close	1	J2416
4	Tee, 3/4 x 3/4 x 3/4”, Sch 80	1	J2491
5	Elbow, 1/2” x 90 Deg, Sch 80	1	J2523
6	Coupling, Reducing, 3/4 x 1/2”, Sch 80	2	J25751
7	Coupling, 1/2”, Sch 80	3	J2577
8	Union, 1/2 FL x 1/2", NIP	1	J2840
9	Hose, High Pressure, 3/4 x 48”	1	J5928
10	Hose, CGA x 28-1/2”	1	J5938
11	Relief valve, 1/2"	2	J6170
12	Pipe, threaded, 3/4" ID, 36-3/4”	1	QS23970
13	Pipe, 1/2 x 2-1/2”, Sch 80	1	T24161
14	Pipe, 1/2 x 5”, Sch 80	1	T24162
15	Pipe, 1/2 x 6”, Sch 80	1	T24163

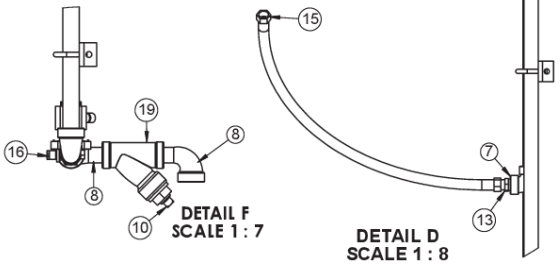
LP MANIFOLD FOR BOTTOM MODULE OF STACKED DRYER

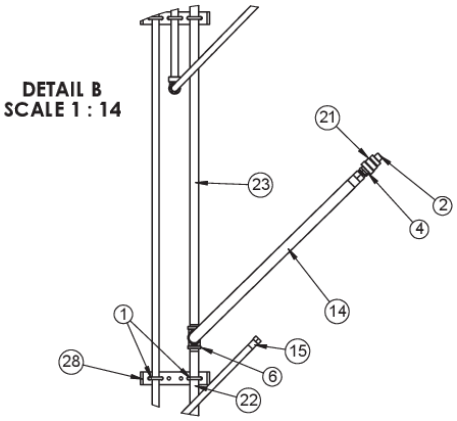


REF. #	DESCRIPTION	QTY.	PART #
1	U-bolt, 5/16 – 18, 1 1/16”	9	J0810
2	Nipple, 1/2”x Close	2	J2407
3	Nipple, 3/4 x Close, Sch80	1	J2415
4	Nipple, 3/4, Close	2	J2416
5	Pipe, 3/4 x 10, Sch40	1	J2429
6	Tee, 3/4, 3/4, 3/4	2	J2491
7	Elbow, 1/2 x 90 Deg	2	J2523
8	Elbow, Street, 3/4, 90 Deg	3	J2532
9	Coupling, 1/2”	2	J2577
10	Plug, 1/2, Black	1	J2617
11	Plug, 3/4”, Pipe	1	J2620
12	Union, 3/4, Sch80	1	J2704
13	Union, 1/2 Fl x 1/2	2	J2840
14	Hose, High Pressure, 3/4” x 48”	2	J5928
15	Hose, CGA x 28 1/2”	2	J5938
16	Valve, 3/4”, Ball	1	J6083
17	Valve, 1/2”, Relief	2	J6170
18	Rain cap	2	J6200
19	Strainer, 3/4”	1	J6230
20	Pipe, 3/4 x 4-1/2	1	J24251
21	Coupling, Reducing, 3/4 x 1/2	2	J25751
22	Pipe, Threaded, 3/4”	1	QS23970
23	Pipe, 3/4” ID	1	T24152
24	Pipe, 1/2” x 2 1/2”	1	T24161
25	Pipe, 1/2” x 6	1	T24163
26	Solenoid Assy, LP, 3/4”	1	T961561
27	Bracket short, Manifold	1	T24184
28	Bracket long, Manifold	3	T24185



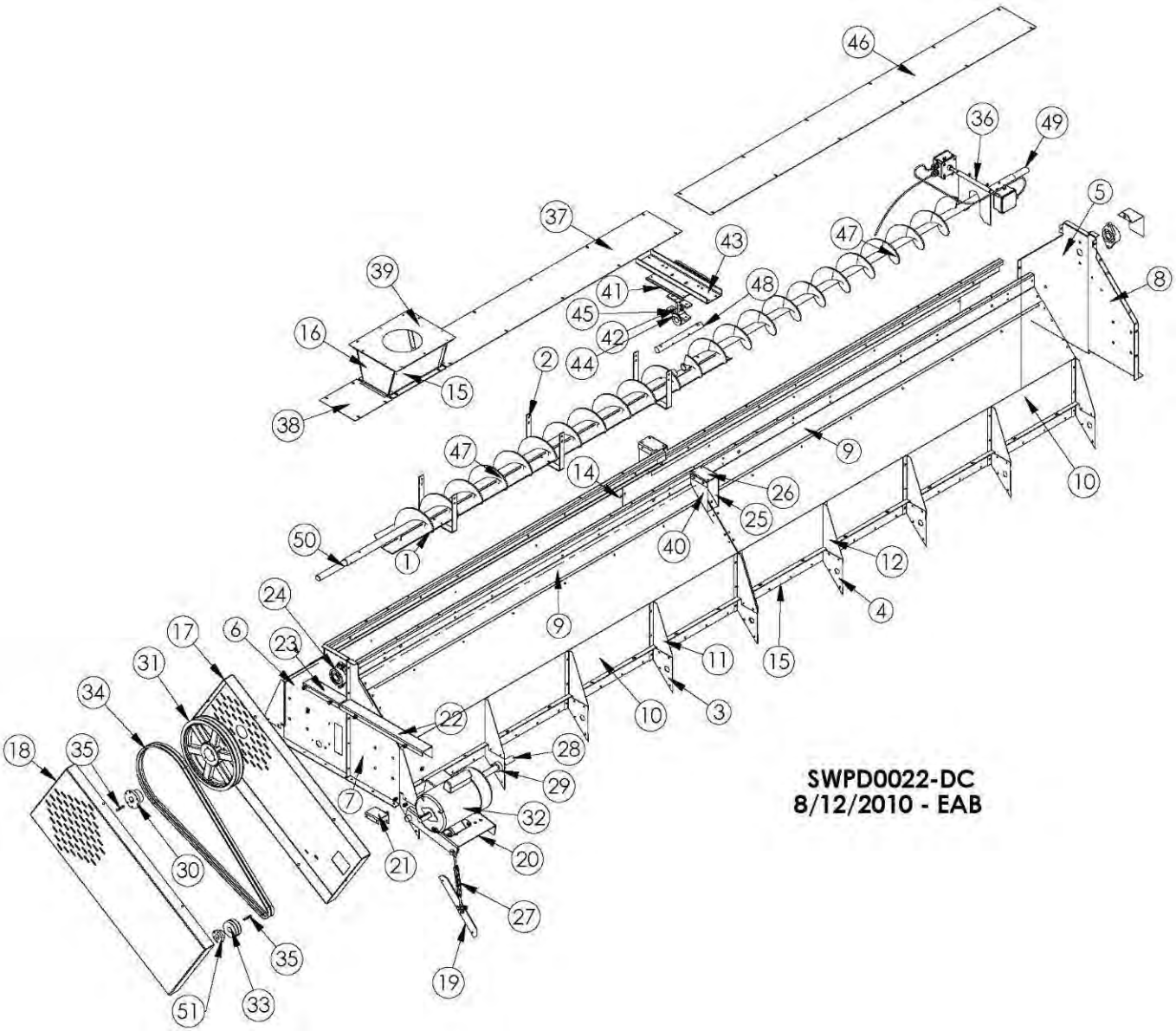






T24150C
04/01/2022 JPH

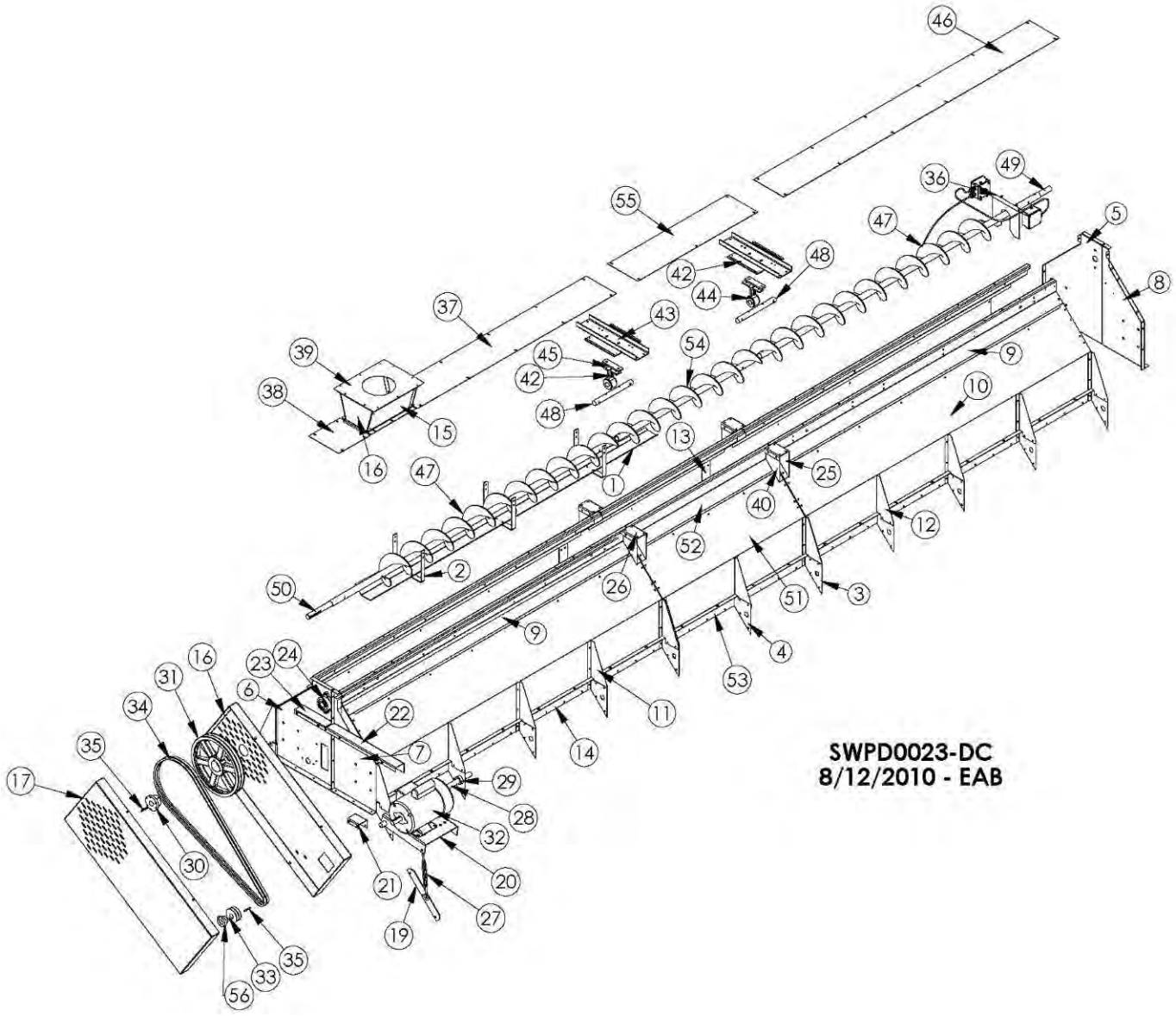
16’ WET BIN



16’ WET BIN

REF. #	DESCRIPTION	QTY.	PART #
1	Trash Pan	1	T16235
2	Support, Trash Pan	3	T16236
3	Left Support Gusset	12	T16117
4	Right Support Gusset	8	T16118
5	RR Wet Bin End Plate	1	T17401
6	RF Wet Bin End Plate	1	T17400
7	LF Wet Bin End Plate	1	T17402
8	LR Wet Bin End Plate	1	T17403
9	Top 8’ Panel Fill Switch	4	T17457
10	Wet Bin Side (Stainless, Perf)	4	T17450S
	Wet Bin Side (.094, Galvanized, Perf)	4	T17450
	Wet Bin Side (.063, Galvanized, Perf)	4	T17441W
11	LT Pivot Brace Wet Bin	12	T17410
12	RT Pivot Brace Wet Bin	8	T17411
13	Splice, Wet Bin Side	2	T17412
14	Bolt Down Lip 8’, 2000	4	T17453
15	Hopper Side	2	T17935
16	Hopper End	2	T17936
17	Top Auger Shield (Inner)	1	T16256
18	Top Auger Shield (Outer)	1	T16255
19	Plate, Turnbuckle, Connector	1	T16283
20	Top Motor Mount	1	T16277
21	Top Shield Brace	1	T16258
22	Bracket, LF Top Auger Shield	1	T16861
23	Bracket, RF Top Auger Shield	1	T16860
24	Bearing, 1.25, FLG, W/LC, HCFTS207 - 20	2	J0010
25	Splice Gusset Right	2	T16145
26	Channel, Splice, Short	2	T16146
27	Turnbuckle, 3/8” x 6”	1	J0904
28	Pivot, Motor Mount, Top	1	T18150
29	Collar, Shaft, 1-3/16”	2	J1338
30	Bushing, 1.25 SK	1	J0410
31	Pulley, 15.75OD, Double “B” Gr. SK	1	J03992
32	Motor (US only)	-	-
33	Pulley, 4.15 OD, Double, B, Cast	1	J03352
34	Belt, B95	2	J0252
35	Key, 1/4 x 1/4 x 2	2	F4499
36	Paddle, Assembly, D-C	1	T18262E
37	Lid, Wet Holding Bin	1	T16157
38	Lid, 10.5”, Extension, Wet Bin	1	T16159
39	Cover, Hopper	1	T17937
40	Splice Gusset Left	2	T16144
41	Crimp Plate	1	T16142
42	Hanger, Auger, T, 6CH2203	1	J0097
43	Splice Channel	1	T16143
44	Bushing, Wood, 1.25” ID	1	J0096
45	Spacer, T-Hanger, Top auger	1	T16096
46	Lid, 92-1/2” Wet Holding Bin	1	T16158
47	Top Auger	2	T16428
48	Shaft, 8’ Hanger Bearing	1	F4720
49	Shaft, 1.25” x 9”	1	G73291
50	Shaft, Top Front, 13-1/4”	1	T16436
51	Bushing, 28 mm	1	J04275

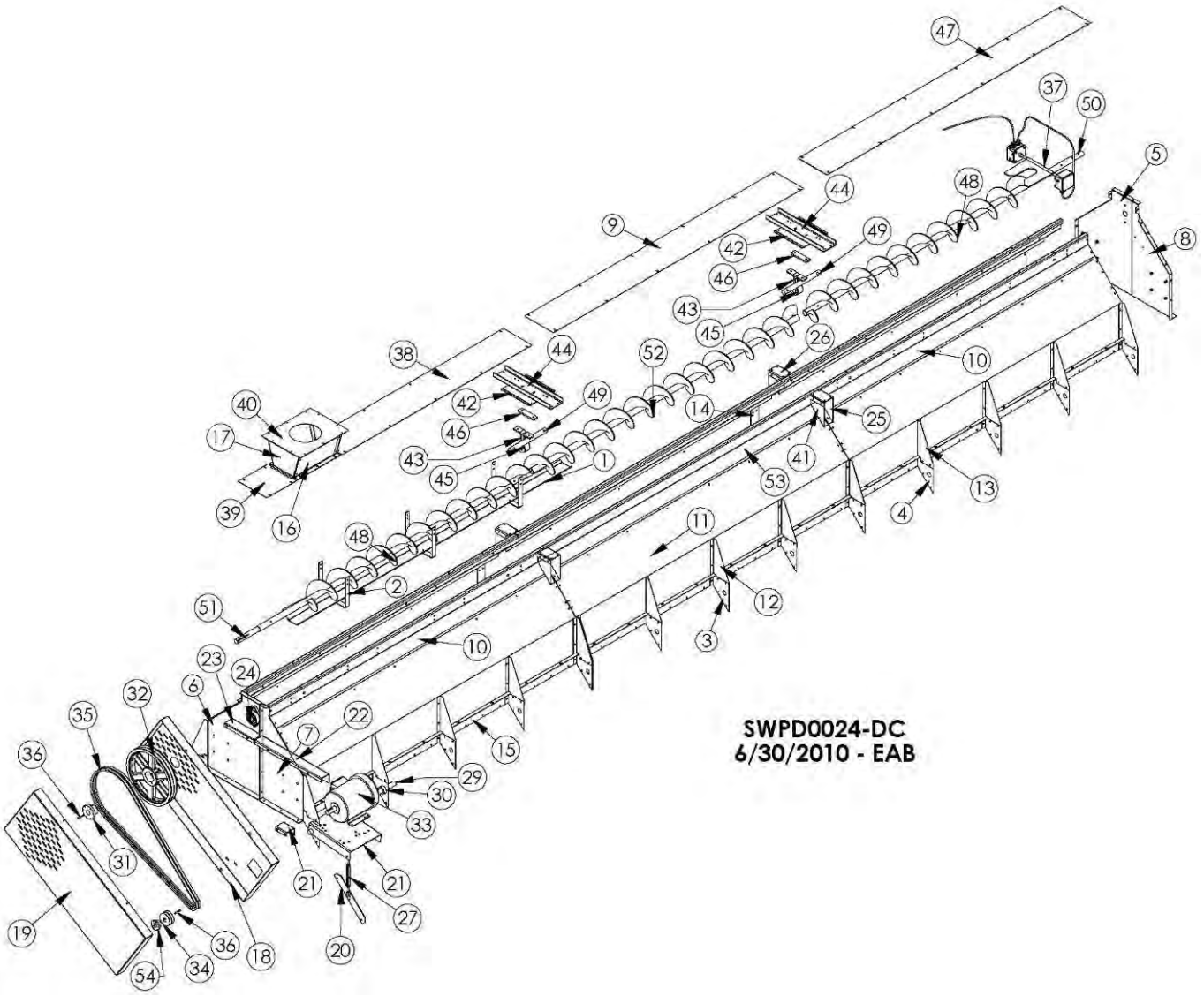
20’ WET BIN



20’ WET BIN

REF. #	DESCRIPTION	QTY.	PART #
1	Trash Pan	1	T16235
2	Support, Trash Pan	3	T16236
3	Left Support Gusset	16	T16117
4	Right Support Gusset	10	T16118
5	RR Wet Bin End Plate	1	T17401
6	RF Wet Bin End Plate	1	T17400
7	LF Wet Bin End Plate	1	T17402
8	LR Wet Bin End Plate	1	T17403
9	Top 8’ Panel Fill Switch	4	T17457
10	Wet Bin Side (Stainless, Perf)	4	T17450S
	Wet Bin Side (.094, Galvanized, Perf)	4	T17450
	Wet Bin Side (.063, Galvanized, Perf)	4	T17441W
11	LT Pivot Brace Wet Bin	12	T17410
12	RT Pivot Brace Wet Bin	8	T17411
13	Splice, Wet Bin Side	2	T17412
14	Bolt Down Lip 8’, 2000	4	T17453
15	Hopper Side	2	T17935
16	Hopper End	2	T17936
17	Top Auger Shield (Inner)	1	T16256
18	Top Auger Shield (Outer)	1	T16255
19	Plate, Turnbuckle, Connector	1	T16283
20	Top Motor Mount	1	T16277
21	Top Shield Brace	1	T16258
22	Bracket, LF Top Auger Shield	1	T16861
23	Bracket, RF Top Auger Shield	1	T16860
24	Bearing, 1.25, FLG, W/LC, HCFTS207 - 20	2	J0010
25	Splice Gusset Right	2	T16145
26	Channel, Splice, Short	2	T16146
27	Turnbuckle, 3/8” x 6”	1	J0904
28	Pivot, Motor Mount, Top	1	T18150
29	Collar, Shaft, 1-3/16”	2	J1338
30	Bushing, 1.25 SK	1	J0410
31	Pulley, 15.75OD, Double “B” Gr. SK	1	J03992
32	Motor (US only)	-	-
33	Pulley, 4.15 OD, Double, B, Cast	1	J03352
34	Belt, B95	2	J0252
35	Key, 1/4 x 1/4 x 2	2	F4499
36	Paddle, Assembly, D-C	1	T18262E
37	Lid, Wet Holding Bin	1	T16157
38	Lid, 10.5”, Extension, Wet Bin	1	T16159
39	Cover, Hopper	1	T17937
40	Splice Gusset Left	2	T16144
41	Crimp Plate	1	T16142
42	Hanger, Auger, T, 6CH2203	1	J0097
43	Splice Channel	1	T16143
44	Bushing, Wood, 1.25” ID	1	J0096
45	Spacer, T-Hanger, Top auger	1	T16096
46	Lid, 92-1/2” Wet Holding Bin	1	T16158
47	Top Auger	2	T16428
48	Shaft, 8' Hanger Bearing	2	F4720
49	Shaft, 1.25” x 9”	1	G73291
50	Shaft, Top Front, 13-1/4”	1	T16436
51	Side, Wet Bin, 4’, 2000	2	T12525
	Side, Wet Bin, 4' (.063, Galvanized, Perf)	2	T12536W
52	Top 4’ Panel (LR) 12’	2	T20526
53	Bolt Down Lip, 4’	2	T12524
54	Top Middle Auger 20’	1	T16427
55	Lid, Wet Holding Bin 20’	1	T20158
56	Bushing, 28 mm	1	J04275

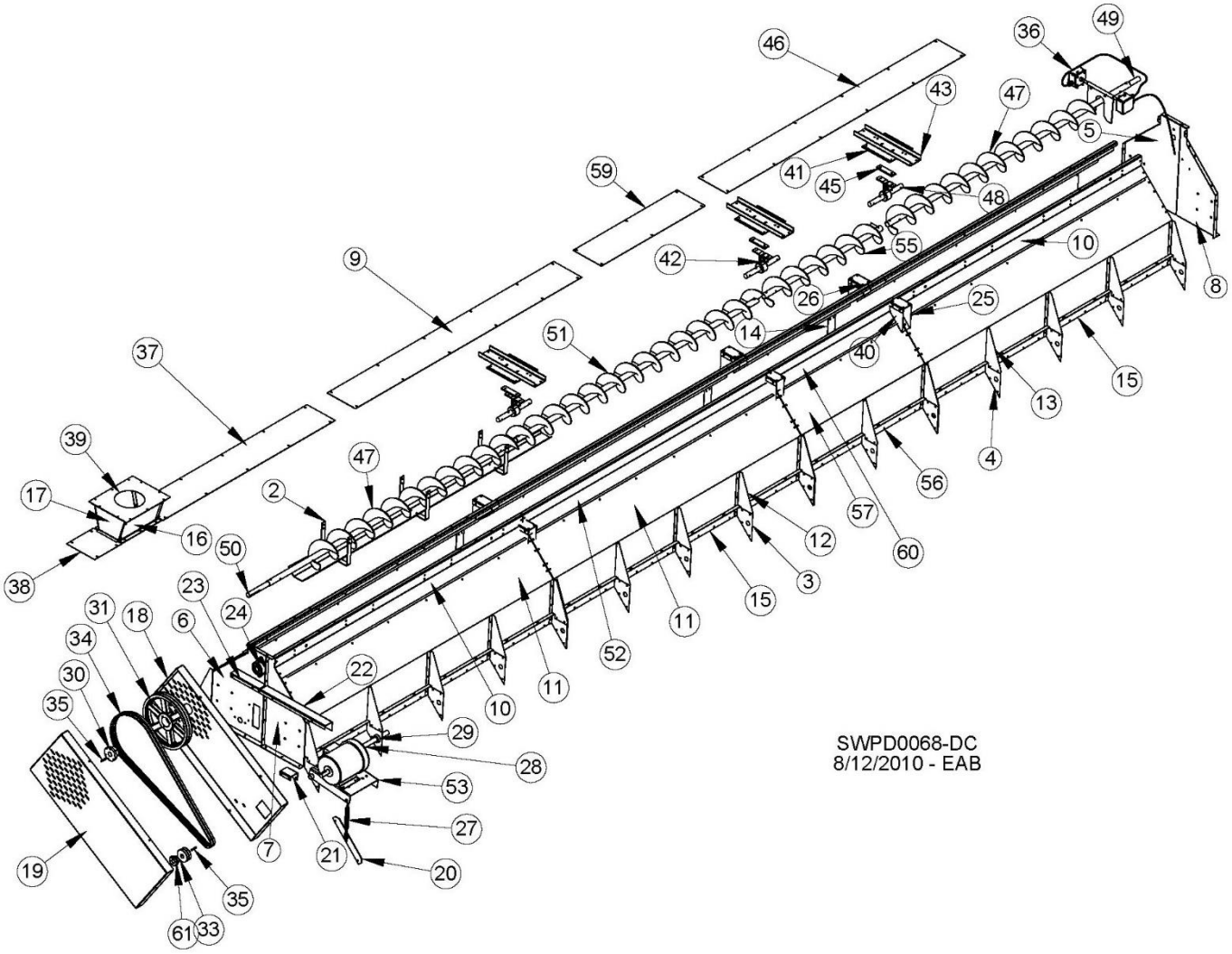
24’ WET BIN



24’ WET BIN

REF. #	DESCRIPTION	QTY.	PART #
1	Trash Pan	1	T16235
2	Support, Trash Pan	3	T16236
3	Left Support Gusset	18	T16117
4	Right Support Gusset	12	T16118
5	RR Wet Bin End Plate	1	T17401
6	RF Wet Bin End Plate	1	T17400
7	LF Wet Bin End Plate	1	T17402
8	LR Wet Bin End Plate	1	T17403
9	Lid, 87-3/4” Wet Holding Bin	1	T16167
10	Top 8’ Panel Fill Switch	4	T17457
11	Wet Bin Side (Stainless, Perf)	6	T17450S
	Wet Bin Side (.094, Galvanized, Perf)	6	T17450
	Wet Bin Side (.063, Galvanized, Perf)	6	T17441W
12	LT Pivot Brace Wet Bin	18	T17410
13	RT Pivot Brace Wet Bin	12	T17411
14	Splice, Wet Bin Side	4	T17412
15	Bolt Down Lip 8’, 2000	6	T17453
16	Hopper Side	2	T17935
17	Hopper End	2	T17936
18	Top Auger Shield (Inner)	1	T16256
19	Top Auger Shield (Outer)	1	T16255
20	Plate, Turnbuckle, Connector	1	T16283
21	Top Motor Mount	1	T16277
22	Top Shield Brace	1	T16258
23	Bracket, LF Top Auger Shield	1	T16861
24	Bracket, RF Top Auger Shield	1	T16860
25	Bearing, 1.25, FLG, W/LC, HCFTS207 - 20	2	J0010
26	Splice Gusset Right	4	T16145
27	Channel, Splice, Short	4	T16146
28	Turnbuckle, 3/8” x 6”	1	J0904
29	Pivot, Motor Mount, Top	1	T18150
30	Collar, Shaft, 1-3/16”	2	J1338
31	Bushing, 1.25 SK	1	J0410
32	Pulley, 15.75OD, Double “B” Gr. SK	1	J03992
33	Motor (US only)	-	-
34	Pulley, 4.15 OD, Double, B, Cast	1	J03352
35	Belt, B95	2	J0252
36	Key, 1/4 x 1/4 x 2	2	F4499
37	Paddle, Assembly, D-C	1	T18262E
38	Lid, Wet Holding Bin	1	T16157
39	Lid, 10.5”, Extension, Wet Bin	1	T16159
40	Cover, Hopper	1	T17937
41	Splice Gusset Left	4	T16144
42	Crimp Plate	2	T16142
43	Hanger, Auger, T, 6CH2203	2	J0097
44	Splice Channel	2	T16143
45	Bushing, Wood, 1.25” ID	2	J0096
46	Spacer, T-Hanger, Top auger	2	T16096
47	Lid, 92-1/2” Wet Holding Bin	1	T16158
48	Top Auger	2	T16428
49	Shaft, 8’ Hanger Bearing	2	F4720
50	Shaft, 1.25” x 9”	1	G73291
51	Shaft, Top Front, 13-1/4”	1	T16436
52	Auger, Bottom Front, 93-1/2”	1	T16430
53	Top 8’ Panel (LR&RF) 2000	2	T24451
54	Bushing, 28 mm	1	J04275

28’ WET BIN

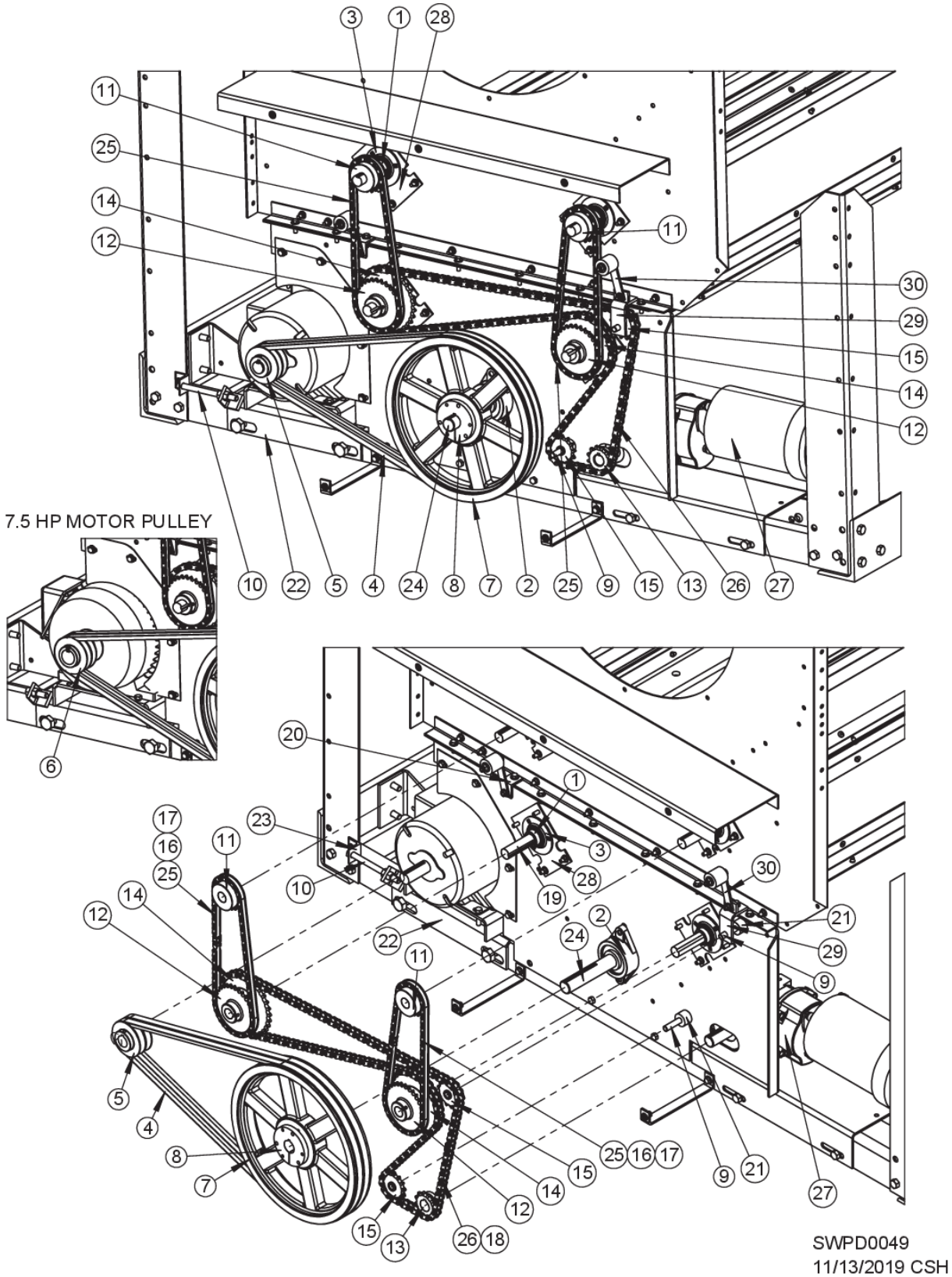


28’ WET BIN

REF #	DESCRIPTION	QTY	PART #	REF #	DESCRIPTION	QTY	PART #
1	Trash Pan	1	T16235	32	Motor (Us Only)	-	-
2	Support, Trash Pan	3	T16236	33	Pulley, 4.15 Od, Dbl, B, Cast	1	J03352
3	Left Support Gusset	20	T16117	34	Belt, B95	2	J0252
4	Right Support Gusset	16	T16118	35	Key, ¼ X ¼ X 2	2	F4499
5	Rr Wet Bin End Plate	1	T17401	36	Paddle, Assy, D-C	1	T18262E
6	Rf Wet Bin End Plate	1	T17400	37	Lid, Wet Holding Bin	1	T16157
7	Lf Wet Bin End Plate	1	T17402	38	Lid, 10.5”, Extension, Wet Bin	1	T16159
8	Lr Wet Bin End Plate	1	T17403	39	Cover, Hopper	1	T17937
9	Lid 87-3/4" Wet Holding Bin	1	T16167	40	Splice Gusset Left	6	T16144
10	Top 8’ Panel	4	T17457	41	Crimp Plate	3	T16142
11	Wet Bin Side Perf, 2000	6	T17450S	42	Hanger, Auger, T, 6ch2203	3	J0097
	Wet Bin Side (.063, Galv, Perf)	6	T17441W	43	Splice Channel	3	T16143
12	Lt Pivot Brace Wet Bin	20	T17410	44	Bushing, Wood, 1.25” I.D.	3	J0096
13	Rt Pivot Brace Wet Bin	16	T17411	45	Spacer, T-Hanger, Top Auger	3	T16096
14	Splice, Wet Bin Side	6	T17412	46	Lid 92 ½” Wet Holding Bin	2	T16158
15	Bolt Down Lip 8’ 2000	6	T1745.	47	Top Auger	2	T16428
16	Hopper Side	2	T17935	48	Shaft, 8” Hanger Bearing	3	F4720
17	Hopper End	2	T17936	49	Shaft, 1.25” X 9”	1	G73291
18	Top Auger Shield (Inner)	1	T16256	50	Shaft, Top Front, 13-1/4”	1	T16436
19	Top Auger Shield (Outer)	1	T16255	51	Auger, Bottom Front, 93 ½”	1	T16430
20	Plate, Turnbuckle, Mtr Mnt	11	T16283	52	Top 8’ Panel	2	T24451
21	Top Shield Brace	1	T16258	53	Motor Mount, Top Load	1	T16277
22	Bracket, Lf Top Auger Shield	1	T16861	54	Plate, Cover Rf Garner End	1	T17415
23	Bracket, Lf Top Auger Shield	1	T16860	55	Top Middle Auger (20 Ft)	1	T16427
24	Bracket, Rf Top Auger Shield	2	J0010	56	Bolt Down Lip, 4 Ft 2000	2	T12524
25	Splice Gusset Right	6	T16145	57	Side, Wet Bin, 4ft 2000	2	T12525
26	Channel, Splice, Short	6	T16146		Side, Wet Bin, 4' (.063, Galv, Perf)	2	T12536W
27	Turnbuckle, 3/8” X 6”	1	J0904	58	Plate, Short Splice	6	T16141
28	Pivot, Motor Mount, Top	1	T18150	59	Lid, Wet Hold Bin 40.25"	1	T20158
29	Collar, Shaft, 1 3/16”	2	J1338	60	Top 4’ Panel (Lr) 12ft 2000	2	T20526
30	Bushing, 1 ¼” Sk	1	J0410	61	Bushing, 28 Mm	1	J04275
31	Pulley, 15.75od, Dbl “B” Gr, Sk	1	J03992				

FRONT (DRIVE) END OF DRYER

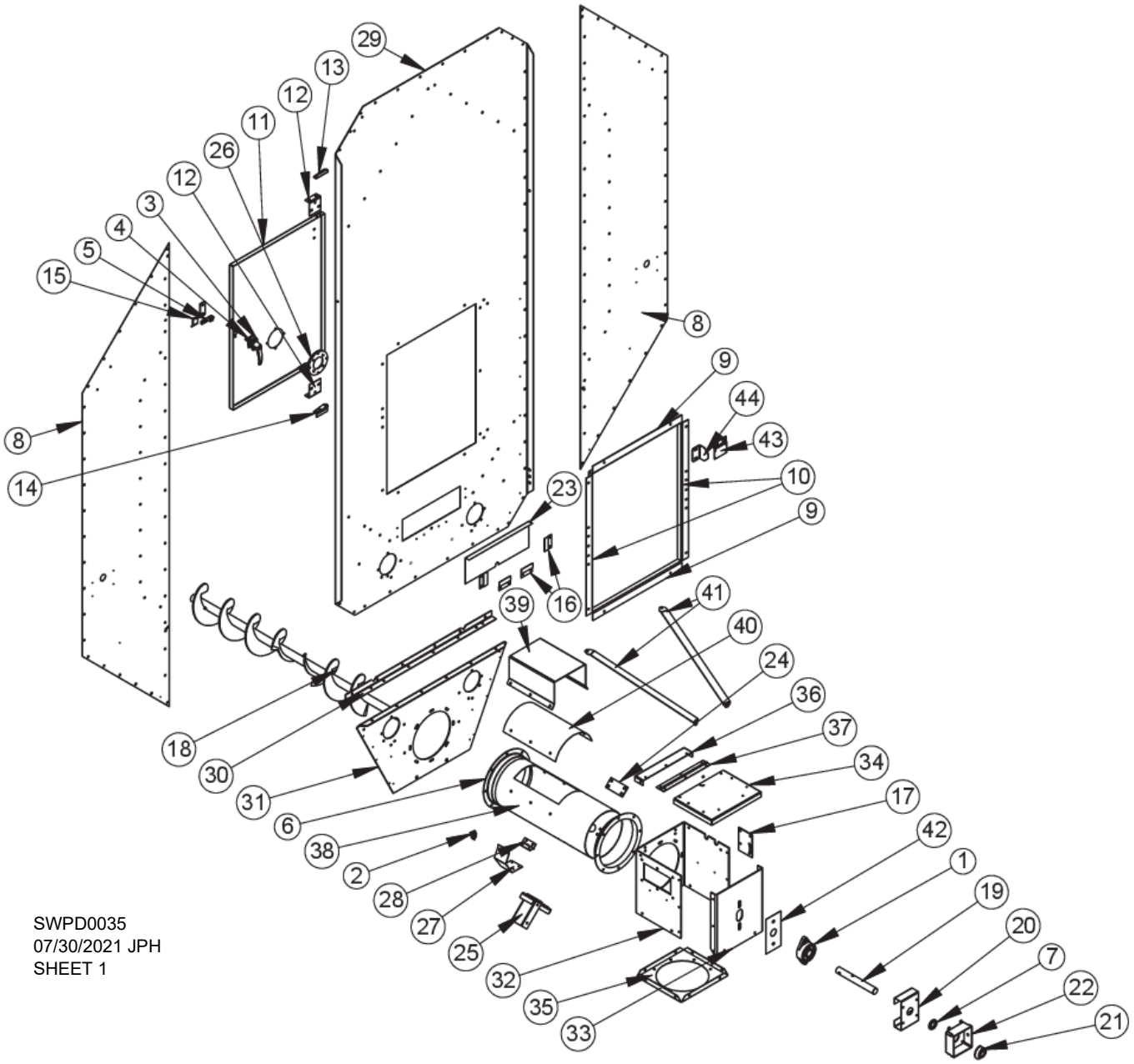
3-5 HP AUGER UNLOAD DRIVE COMPONENTS



PARTS FOR FRONT (DRIVE) END OF DRYER

REF. #	DESCRIPTION	3-5HP QTY.	7.5HP QTY.	PART #
1	Bearing, 1”, w/ lock collar	4	4	J0005
2	Flange bearing, 1-1/4", w/ lock collar	1	1	J0010
3	Bearing flangette, 3-hole	8	8	J0098
4	Belt, BX72, 15-3/4 x 3-1/2”	2	2	J0246
5	Pulley, 3-1/2” OD, 1-1/8”, double	1	-	J0317
6	Pulley, 3-1/2” OD, 1-3/8”, double	-	1	J0318
7	Pulley, 15-3/4” OD, double	1	1	J03992
8	Bushing, 1-1/4”	1	1	J0410
9	Screw, 1/2 - 13 x 3”	2	2	J0750
10	Bolt, 1/2 - 13 x 6”	1	1	J0765
11	Sprocket, 40B, 20-tooth, 1” bore, keyed	2	2	J16487
12	Sprocket, 40B, 30-tooth, 1” bore	2	2	J1649
13	Sprocket, 50B, 12-tooth, 1-1/8” bore	1	1	J16612
14	Sprocket, 50B, 30-tooth, 1” bore	2	2	J1678
15	Sprocket, idler, 50B, 13-tooth	2	2	J1685
16	Chain link, #40 connector	2	2	J1745
17	Chain link, #40 offset, 1/2 link	2	2	J1750
18	Chain link, #50 connector	2	2	J1760
19	Front shaft, meter roll	4	4	T16266
20	Chain tightener bracket	1	1	T16274
21	Spacer, sprocket	2	2	T16282
22	Unload motor mount weldment	1	1	T16290
23	Tightener angle	1	1	T16329
24	Shaft, top front, 13-1/4”	1	1	T16436
25	Chain, #40, 73 links	2	2	T16800
26	Chain, #50,157 links	1	1	T16803
27	Reducer with A/C motor & mount assy.	1	1	T17282AM
28	Meter plate	4	4	T17920
29	Bracket weldment, idler sprocket	1	1	T17965
30	Chain tightener	2	2	T7367

BACK (DISCHARGE) END OF FULL-PLENUM DRYER

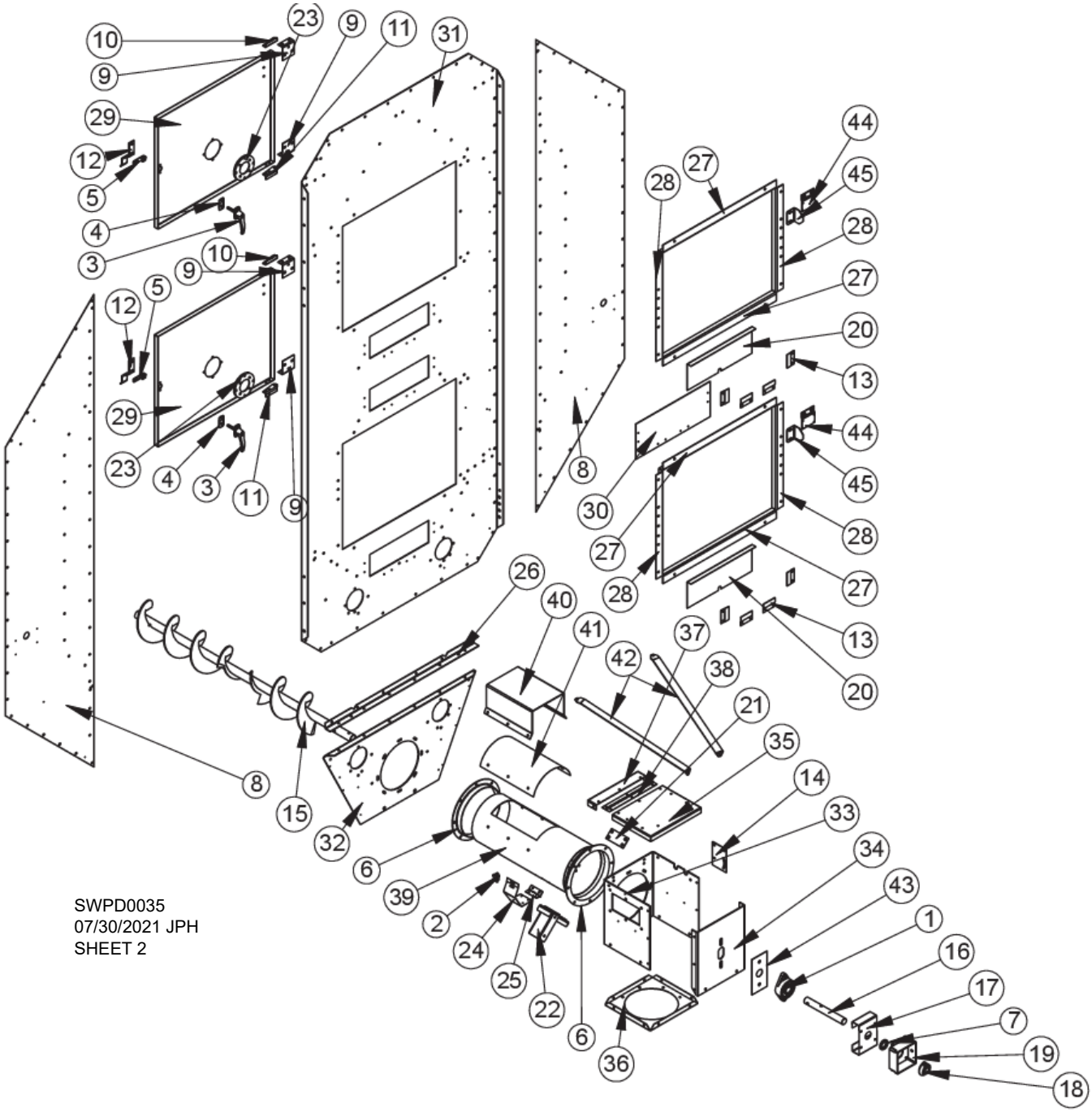


SWPD0035
07/30/2021 JPH
SHEET 1

PARTS FOR BACK (DISCHARGE) END OF FULL-PLENUM DRYER

REF. #	DESCRIPTION	QTY.	PART #
1	Flange bearing, 1-1/4”, w/ lock collar	1	J0010
2	Latch	1	J2310
3	Locking handle	1	J2313
4	Handle gasket	1	J2314
5	Adjustable latch	1	J2318
6	Flange ring, 10"	2	J6610
7	Seal, 2" OD, 1-1/4” ID	1	J7023
8	Side end plate	2	T16101
9	Door edging, top & bottom	2	T16136
10	Door edging, sides	2	T16137
11	Access door	1	T16147
12	Hinge bracket	2	T16148
13	Top hinge	1	T16149
14	Bottom hinge	1	T16150
15	Rear catch	1	T16151
16	Blowout door side rail	4	T16154
17	Switch plate	1	T16358
18	Bottom rear auger	1	T16431
19	Bottom auger shaft, 1-1/4 x 10”	1	T17251
20	Proximity switch bracket	1	T17252
21	Proximity switch target	1	T17256
22	Proximity switch box	1	T17263
23	Blowout door	1	T17658
24	Sample spout cover	1	T17663
25	Sample spout	1	T17668
26	Sight glass assy., 2-1/2", 5" OD	1	T17688
27	Moisture sensor strap	1	T17850
28	Moisture sensor hinge	1	T17851
29	Rear end plate	1	T17916
30	Bottom splice angle	1	T17925
31	Rear bottom end plate	1	T25521
32	Sump box front & sides	1	T25670
33	Sump box rear plate	1	T25671
34	Sump box lid	1	T25672
35	Sump box bottom	1	T25674
36	Sump box lid side hinge	1	T25675
37	Sump box hinge	1	T25676
38	Discharge tube	1	T25677
39	Unload tube step	1	T25678
40	Unload tube cover	1	T25679
41	Unload tube brace	2	T25681
42	Bearing shim plate	1	T25682
43	Switch mounting bracket	1	T80215
44	Switch angle	1	T80216

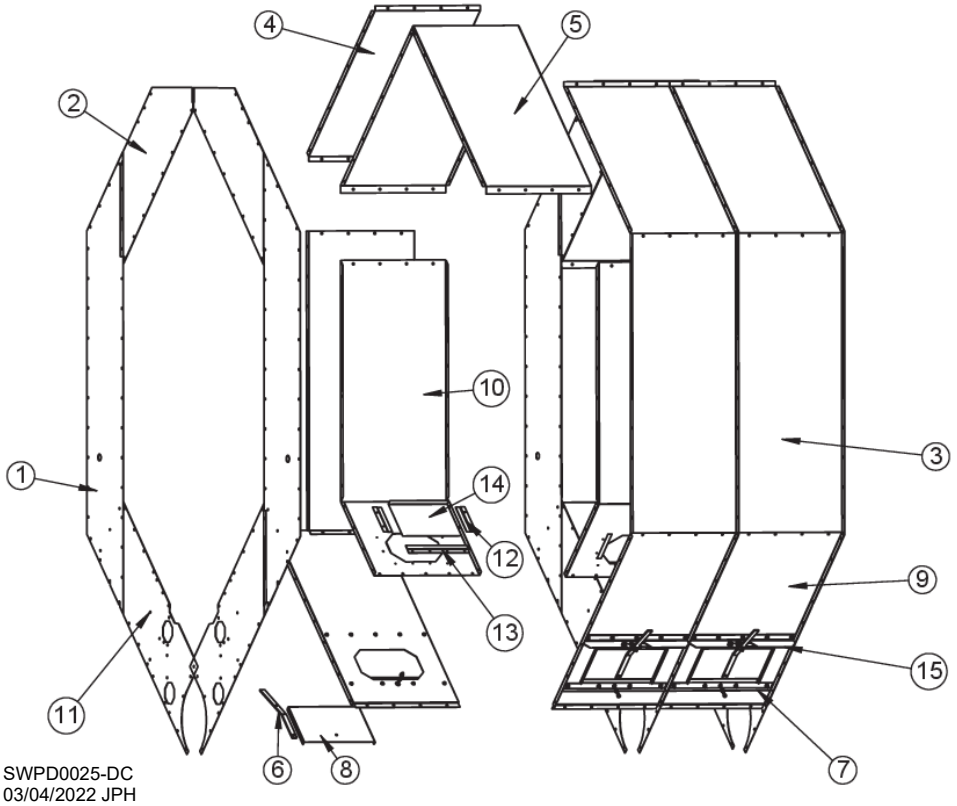
BACK (DISCHARGE) END OF SPLIT-PLENUM DRYER



PARTS FOR BACK (DISCHARGE) END OF SPLIT-PLENUM DRYER

REF. #	DESCRIPTION	QTY.	PART #
1	Flange bearing, 1-1/4”, w/ lock collar	1	J0010
2	Latch	1	J2310
3	Locking handle	2	J2313
4	Handle gasket	2	J2314
5	Adjustable latch	2	J2318
6	Flange ring, 10"	2	J6610
7	Seal, 2" OD, 1-1/4” ID	1	J7023
8	Side end plate	2	T16101
9	Hinge bracket	4	T16148
10	Top hinge	2	T16149
11	Bottom hinge	2	T16150
12	Rear catch	2	T16151
13	Blowout door side rail	8	T16154
14	Switch plate	1	T16358
15	Bottom rear auger	1	T16431
16	Bottom auger shaft, 1-1/4 x 10”	1	T17251
17	Proximity switch bracket	1	T17252
18	Proximity switch target	1	T17256
19	Proximity switch box	1	T17263
20	Blowout door	2	T17658
21	Sample spout cover	1	T17663
22	Sample spout	1	T17668
23	Sight glass assy., 2-1/2", 5" OD	2	T17688
24	Moisture sensor strap	1	T17850
25	Moisture sensor hinge	1	T17851
26	Bottom splice angle	1	T17925
27	Door edging, top & bottom	4	T24136
28	Door edging, sides	4	T24137
29	Access door	2	T24147
30	Blowout door cover	1	T24602
31	Rear end plate	1	T24916
32	Rear bottom end plate	1	T25521
33	Sump box front & sides	1	T25670
34	Sump box rear plate	1	T25671
35	Sump box lid	1	T25672
36	Sump box bottom	1	T25674
37	Sump box lid side hinge	1	T25675
38	Sump box hinge	1	T25676
39	Discharge tube	1	T25677
40	Unload tube step	1	T25678
41	Unload tube cover	1	T25679
42	Unload tube brace	2	T25681
43	Bearing shim plate	1	T25682
44	Switch mounting bracket	2	T80215
45	Switch angle	2	T80216

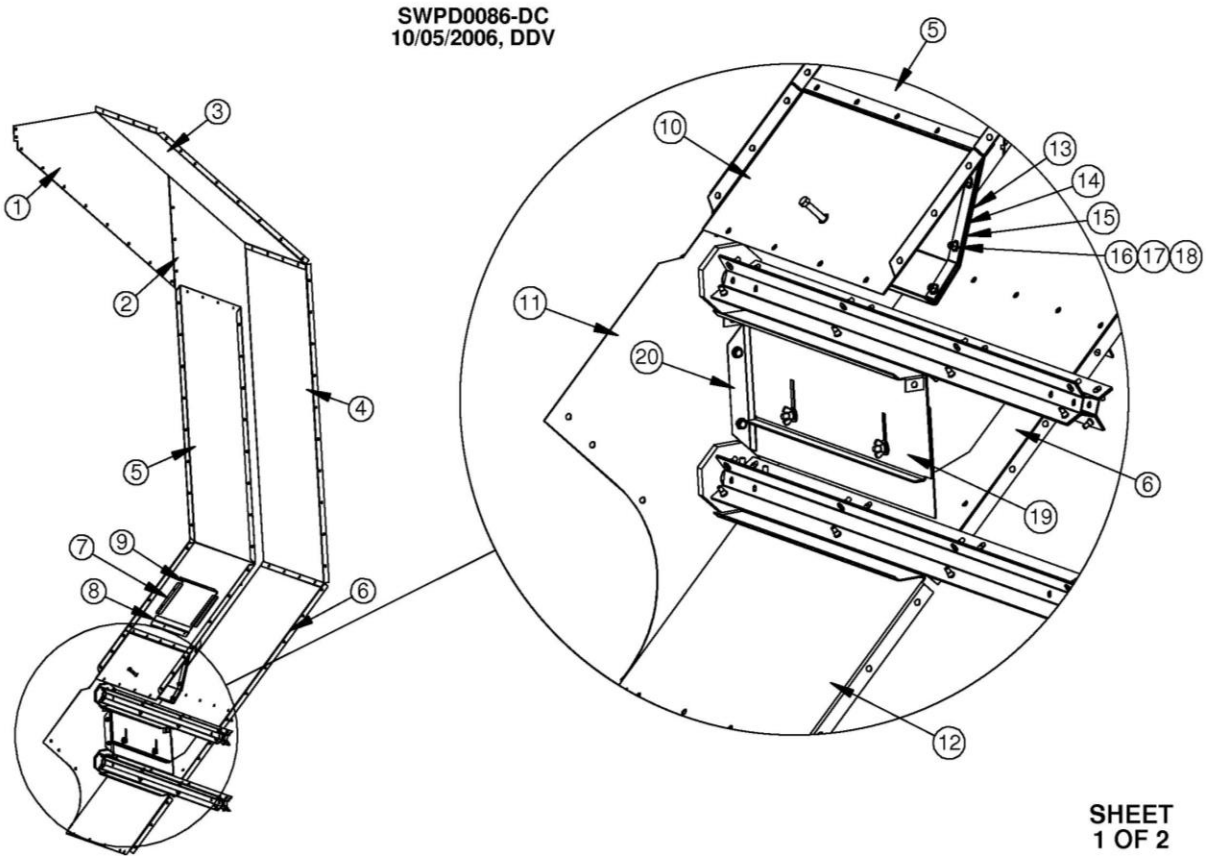
COLUMN PARTS



SWPD0025-DC
03/04/2022 JPH

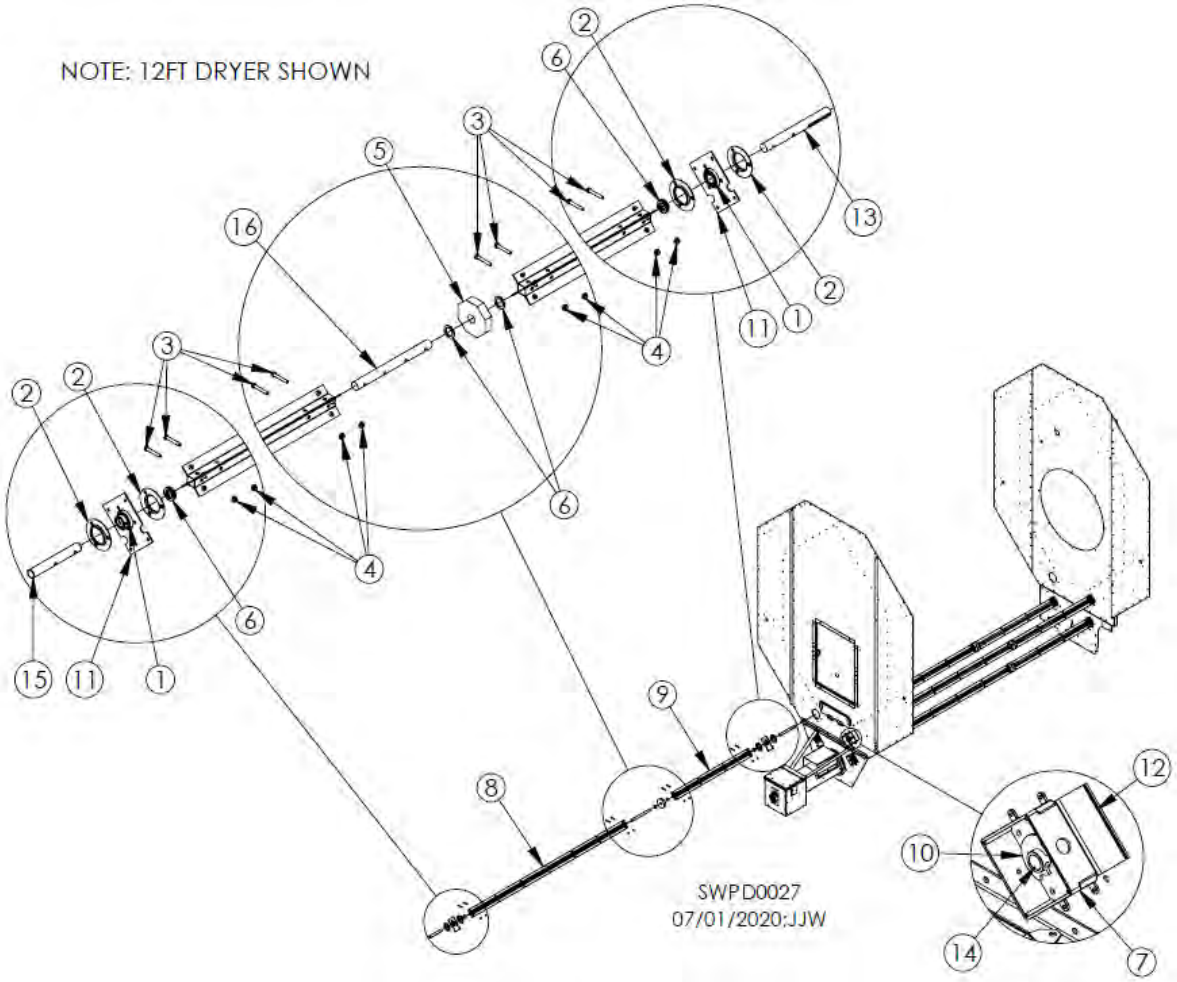
REF. #	DESCRIPTION	16'		20'		24'		28"	
		QTY.	PART #	QTY.	PART #	QTY.	PART #	QTY.	PART #
1	Side divider	14	T16110	18	T16110	22	T16110	26	T16110
2	Upper divider	14	T16111	18	T16111	22	T16111	26	T16111
3	Outside middle panel, .094" perf.	16	T16104	20	T16104	24	T16104	28	T16104
	Outsd. mid. panel, .094" perf., SS	16	T16104S	20	T16104S	24	T16104S	28	T16104S
	Outside middle panel, .063" perf.	16	T17504W	20	T17504W	24	T17504W	28	T17504W
4	Outside top panel, .094" perf.	16	T16105	20	T16105	24	T16105	28	T16105
	Outside top panel, .094" perf., SS	16	T16105S	20	T16105S	24	T16105S	28	T16105S
	Outside top panel, .063" perf.	16	T17504W	20	T17504W	24	T17504W	28	T17504W
5	Top inner panel, .094" perf.	8	T16114	20	T16114	24	T16114	28	T16114
	Top inner panel, .063" perf.	8	T17414W	20	T17414W	24	T17414W	28	T17414W
6	Latch	16	T17906	20	T17906	24	T17906	28	T17906
7	Support latch strap	16	T17907	20	T17907	24	T17907	28	T17907
8	Outer cleanout door	16	T17908	20	T17908	24	T17908	28	T17908
	Outer cleanout door, .063" perf.	16	T17913W	20	T17913W	24	T17913W	28	T17913W
9	Btm. outer panel, .094" perf,	16	T17909	20	T17909	24	T17909	28	T17909
	Btm. outer panel, .094" perf, SS	16	T17909S	20	T17909S	24	T17909S	28	T17909S
	Btm. outer panel, .063" perf.	16	T17919W	20	T17919W	24	T17919W	28	T17919W
10	Inner side panel, .094" perf.	16	T17910	20	T17910	24	T17910	28	T17910
	Inner side panel, .063" perf.	16	T17510WAM	20	T17510WAM	24	T17510WAM	28	T17510WAM
11	Lower divider	14	T17924	18	T17924	22	T17924	28	T17924
12	Side rail, inner access door	32	T16219	36	T16219	40	T16219	56	T16219
13	Bottom rail, inner access door	16	T16220	20	T16220	24	T16220	28	T16220
14	Inner access door, .094" perf.	16	T16221	20	T16221	24	T16221	28	T16221
	Inner access door, .063" perf.	16	T16225W	20	T16225W	24	T16225W	28	T16225W
15	Door latch bracket	16	T17657	20	T17657	24	T17657	28	T17657

FLOW GATE WITH ANGLE FLOW GATE SEAL



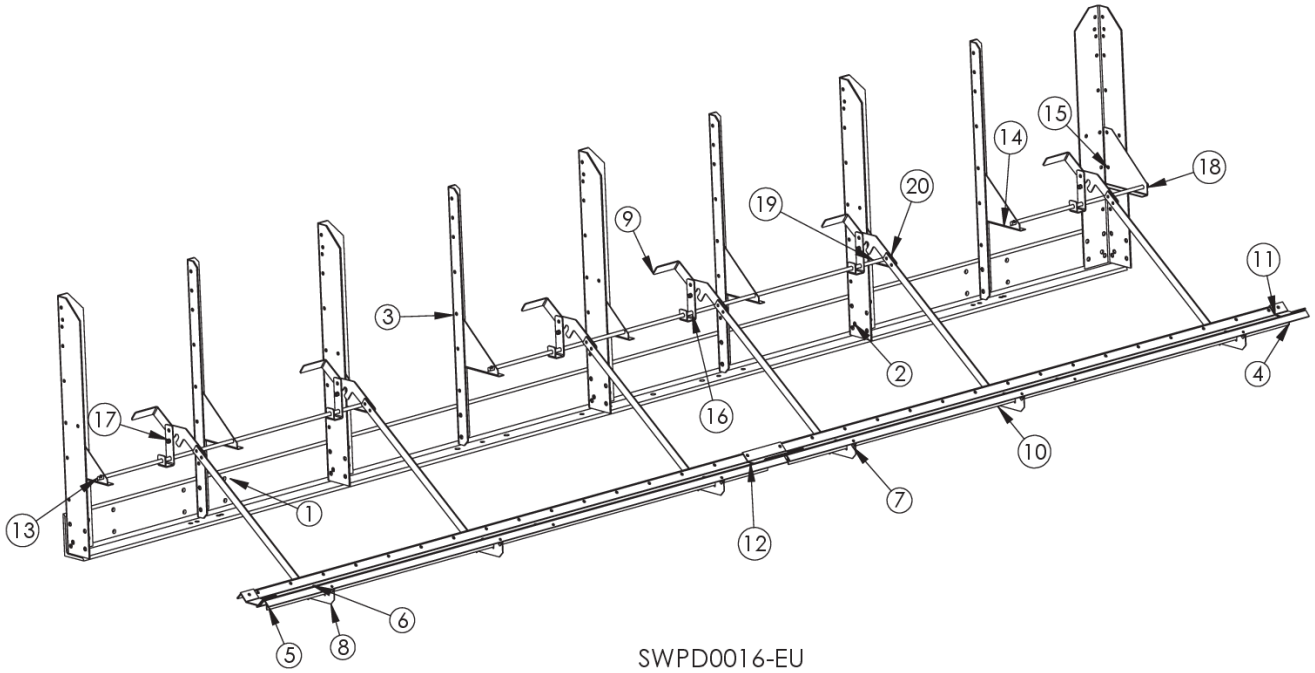
REF. #	DESCRIPTION	PART #
1	Upper divider	T16111
2	Side divider,	T16110
3	Top outside perforated panel, SS	T16105S
4	Middle outside perf. panel, SS	T16104S
5	Inner side perf sheet	T17910
6	Bottom outer perf. panel	T17909S
7	Inner access door side rail	T16219
8	Inner access door bottom rail	T16220
9	Inner access door	T16221
10	Rigid adjustment plate	T17903
11	Lower divider	T17924K
12	Bottom rigid door	T17904
13	Top flow control gate, small grain	T17902D
14	Backup strip, top flow gate	T17898
15	Top flow gate seal	T17899
16	Flat washer, 1/4"	J1105
17	Lock nut, 1/4" – 20	J0992
18	Bolt, 1/4-20 x 3/4"	J0505
19	Flow control gate	T17880K
20	Flow gate seal angle	T17886

METERING ROLLS



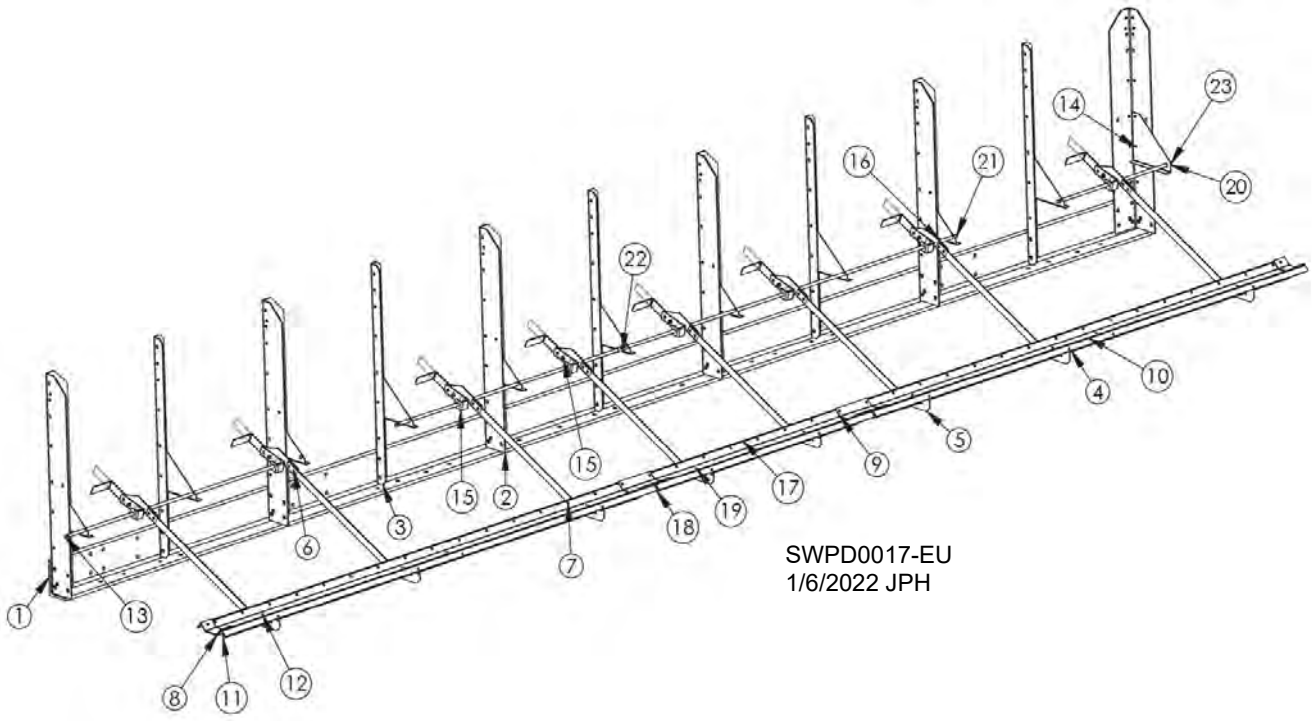
REF. #	DESCRIPTION	16' QTY.	20' QTY.	24' QTY.	28' QTY.	PART #
1	Bearing, 1", w/ lock collar	8	8	8	8	J00058
2	Flangette, 3-hole	16	16	16	16	J0098
3	Screw, 5/16 – 18 x 2”	32	48	48	64	J0585
4	Whiz nut, 5/16” - 18	32	48	48	64	J1110
5	Wooden bushing, 1" ID	4	8	8	12	J1245
6	Machine bushing, 1”, 18ga	80	96	96	112	J1266
7	Box, 5” x 5”	1	1	1	1	T16265
8	Metering roll assy., 8'	8	8	12	12	J3033
9	Metering roll assy., 4'	0	4	0	4	J3032
10	Target	1	1	1	1	T17281
11	Meter plate	8	8	8	8	T17920
12	Encoder bracket	1	1	1	1	T17921
13	Front shaft	4	4	4	4	T18266
14	Rear shaft, top	1	1	1	1	T18267
15	Rear shaft, bottom	3	3	3	3	T18268
16	Connecting shaft	4	8	8	12	T18269

16’ CAM LOCK ASSEMBLY



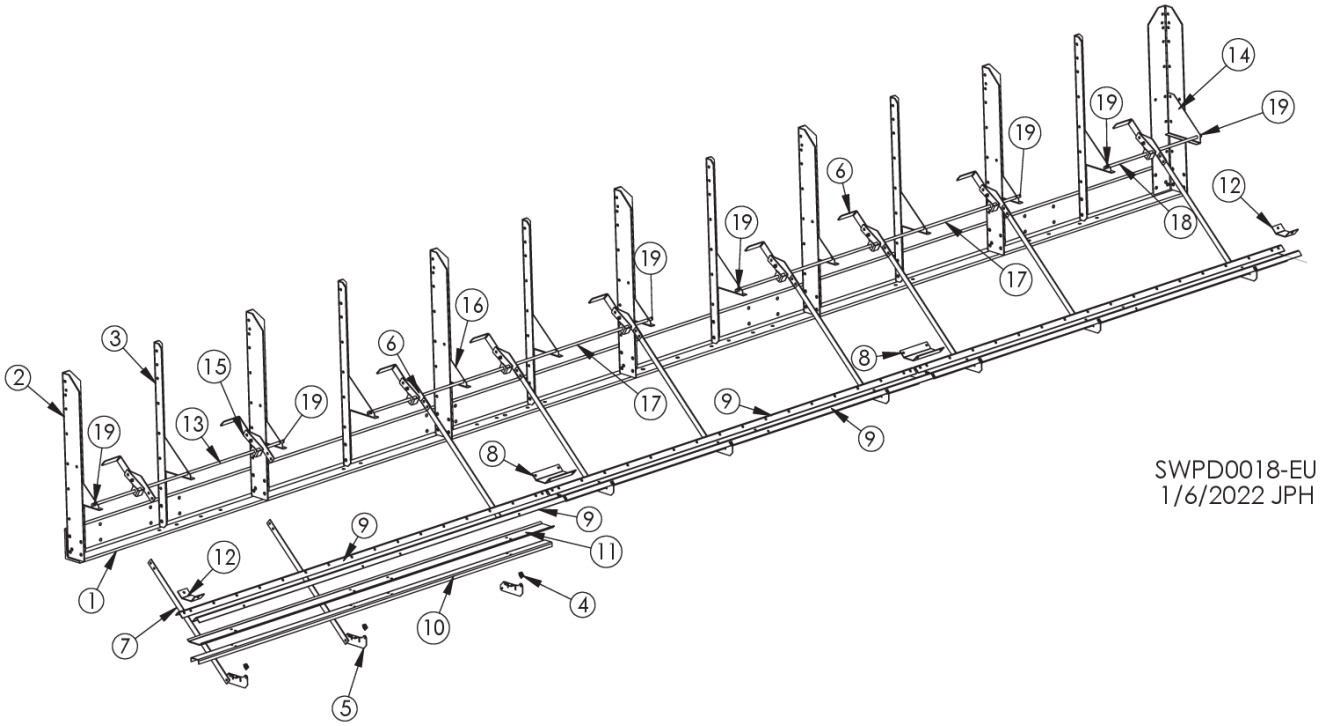
REF. #	DESCRIPTION	QTY.	PART #
1	Right frame angle	1	T16320
2	Wide vertical support	5	T16322
3	Narrow vertical support	4	T16323
4	Door support, 92-1/8”	2	T17454
5	Angle, 95-1/2”	4	T17456
6	Door, 92-1/8”	2	T17455
7	Pivot bracket	6	T16393
8	Hinge	6	T16387
9	Handle	6	T16382
10	Extension arm	6	T16386
11	Seal plate, end	2	T16398
12	Seal plate, middle	1	T16390
13	Shaft, 49-3/4”	1	T16400
14	Front gusset	8	T16380
15	Rear gusset	1	T16381
16	Pivot arm assy.	6	T16383
17	Rivet nut, 5/16" - 18	6	J1007
18	Shaft, 25”	1	T20401
19	Shaft, 74”	1	T12516
20	Cotter pin, 1/8” x 1”	6	J1420

20’ CAM LOCK ASSEMBLY



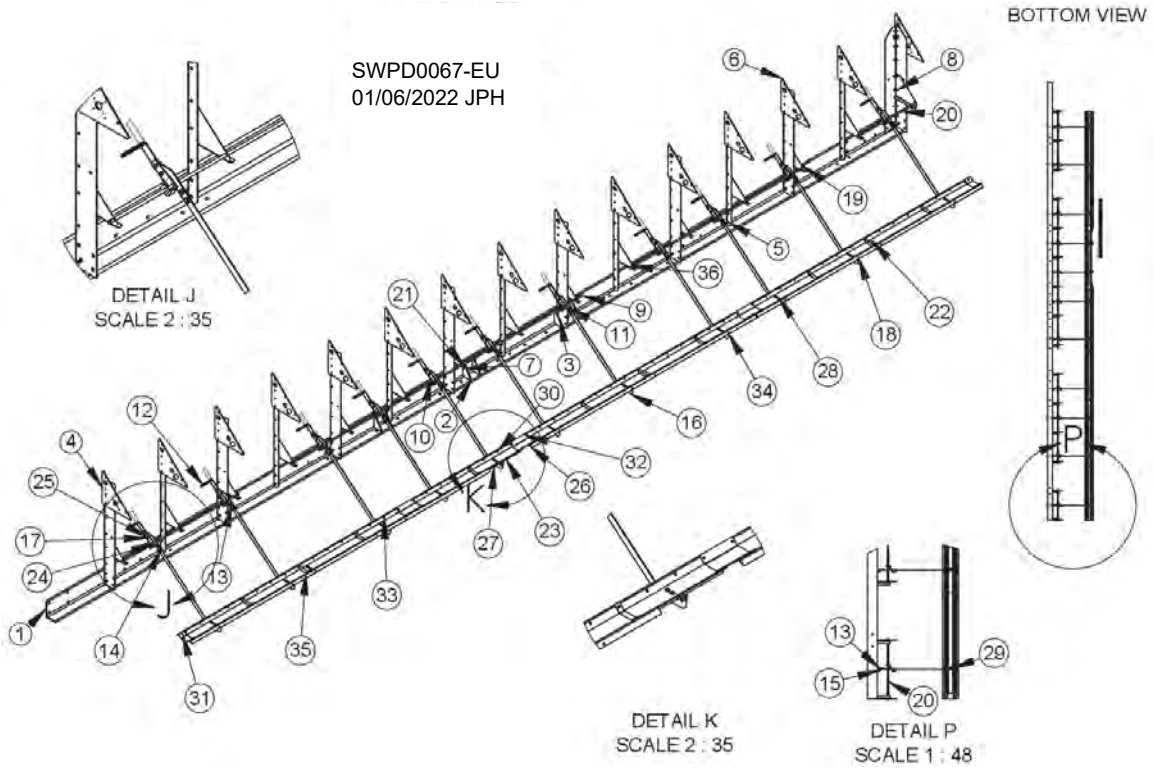
REF. #	DESCRIPTION	QTY.	PART #
1	Right frame angle	1	T20319
2	Wide vertical support	6	T16322
3	Narrow vertical support	5	T16323
4	Pivot bracket	8	T16393
5	Hinge	8	T16387
6	Handle	8	T16382
7	Extension arm	8	T16386
8	Seal plate, end	2	T16398
9	Seal plate, middle	2	T16390
10	Angle, 95-1/2”	4	T17456
11	Door support, 92-1/8”	2	T17454
12	Door, 92-1/8”	2	T17455
13	Shaft, 49-3/4”	2	T16400
14	Rear gusset	1	T16381
15	Pivot arm assy.	8	T16383AM
16	Front gusset	10	T16380
17	Angle, 47-5/8”	2	T12529
18	Door support, 44-1/8”	1	T12530
19	Door, 44-1/8”	1	T12528
20	Shaft, 25”	1	T20401
21	Shaft, 74”	1	T12516
22	Connector shaft	1	T20403
23	Cotter pin, 1/8” x 1”	8	J1420

24’ CAM LOCK ASSEMBLY



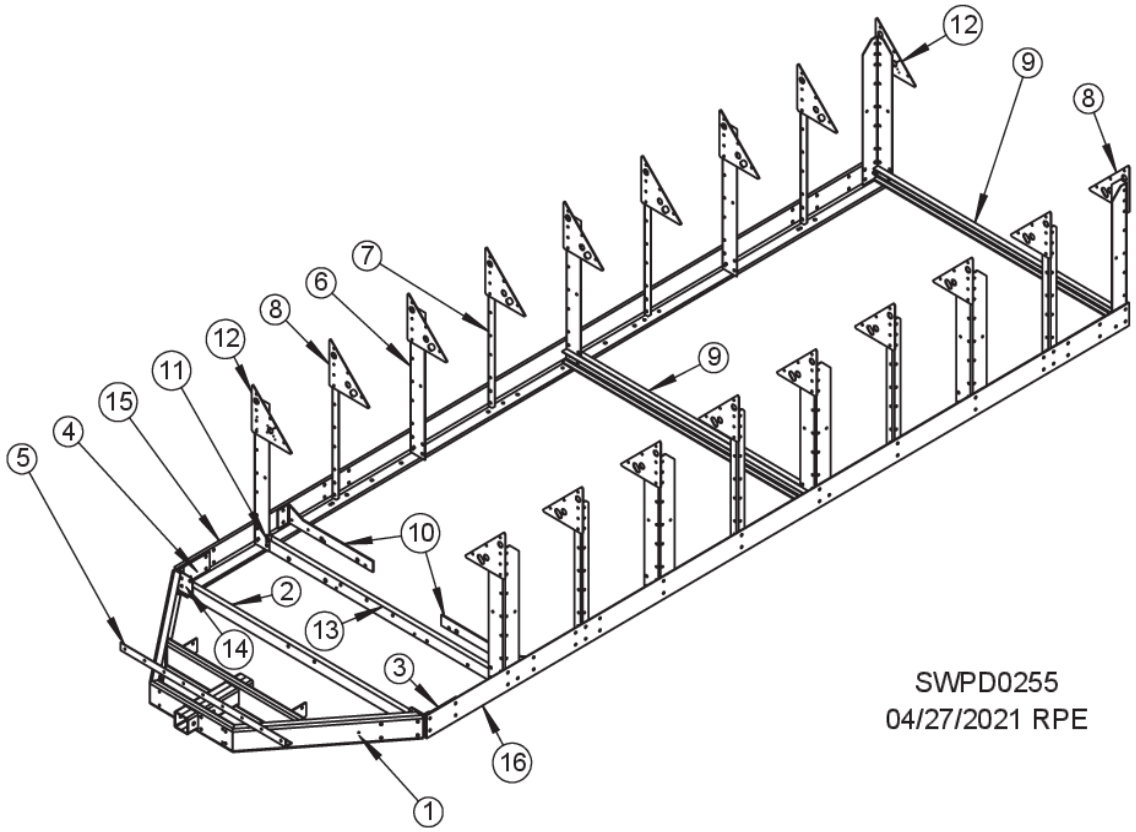
REF. #	DESCRIPTION	QTY.	PART #
1	Right frame angle	1	T24319
2	Wide vertical support	7	T16322
3	Narrow vertical support	8	T16323
4	Pivot bracket	9	T16393
5	Hinge	9	T16387
6	Handle	9	T16382
7	Extension arm	9	T16386
8	Seal plate, middle	2	T16390
9	Angle, 95-1/2”	6	T17456
10	Door support, 92-1/8”	3	T17454
11	Door, 92-1/8”	3	T17455
12	Seal plate, end	2	T16398
13	Shaft, 49-3/4”	1	T16400
14	Rear gusset	1	T16381
15	Pivot arm assy.	9	T16383AM
16	Front gusset	12	T16380
17	Shaft, 74”	2	T12516
18	Shaft, 25”	1	T20401
19	Cotter pin, 1/8” x 1”	8	J1420

28’ CAM LOCK ASSEMBLY



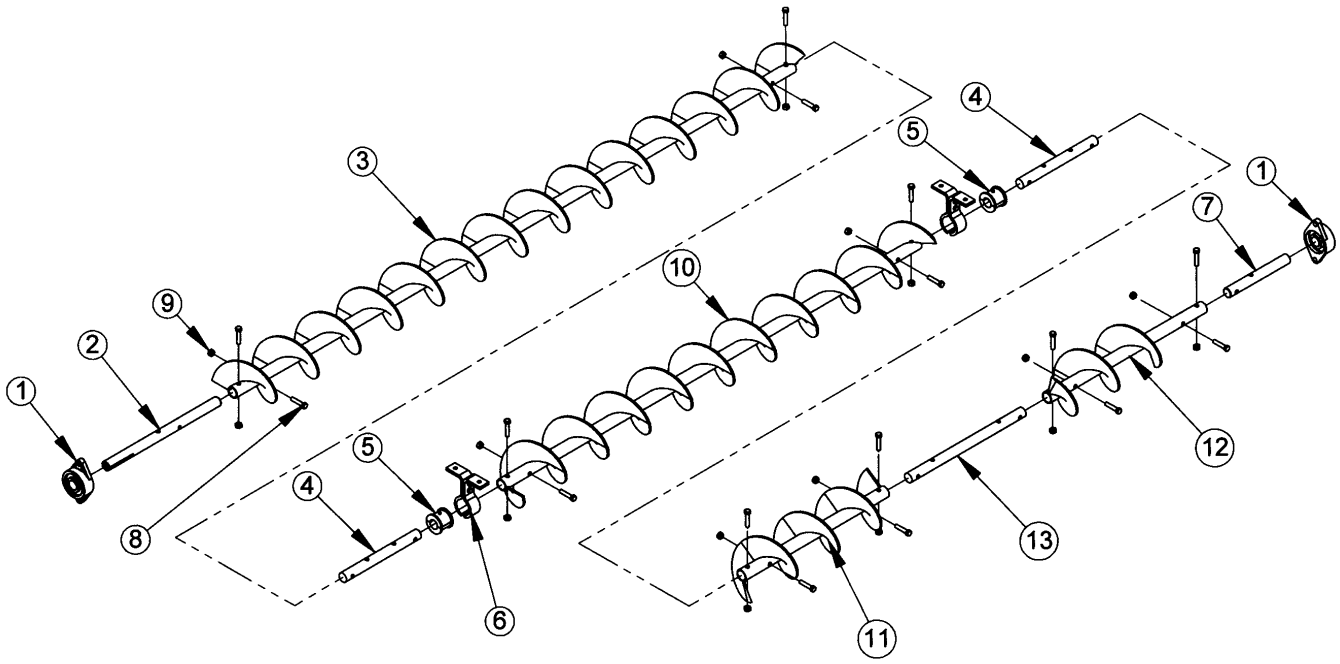
REF. #	DESCRIPTION	QTY.	PART #	REF. #	DESCRIPTION	QTY.	PART #
1	Right frame angle	1	T28419	19	Shaft, 74”	2	T12516
2	Frame gusset	6	T28317-01	20	Shaft, 25”	1	T20401
3	Wide vertical support	8	T16322	21	Connector shaft	1	T20403
4	Conduit box connector plate	2	T16331	22	Door, 92-1/8”	3	T17455
5	Narrow vertical support	7	T16323	23	Door, 44-1/8”	1	T12528
6	Main connector plate	13	T16324	24	Pivot arm	11	T16383
7	Front gusset	14	T16380	25	Rivet nut, 5/16" - 18	11	J1007
8	Rear gusset	1	T16381	26	Door support, 92-1/8”	3	T17454
9	Shaft, 49-3/4”	2	T16400	27	Door support, 44-1/8”	1	T12530
10	Handle	11	T16382	28	Screw, 5/16 – 18 x 1”	24	J0528
11	Extension arm	11	T16386	29	Whiz nut, 5/16” - 18	24	J1110
12	Handle cover	11	J23182	30	Angle, 47-5/8”	2	T12529
13	Screw, 3/8 -16 x 1”	33	J06063	31	Seal plate, end	2	T16398
14	Flange whiz nut, 3/6” - 16	22	B5962	32	Seal plate, middle	3	T16390
15	Lock nut, 3/8” - 16	11	J1025	33	Angle, 95-1/2”	6	T17456
16	Hinge	11	T16387	34	Pivot bracket	11	T16393
17	Screw, 5/16 – 18 x 3/4"	23	J0536	35	Connecting bracket	10	T16399
18	Lock nut, 5/16” - 18	22	J1010	36	Cotter pin, 1/8” x 1”	8	J1420

FRAME FOR STANDARD & STACKED DRYERS
16’, 20’, 24’ & 28’



REF. #	DESCRIPTION	16' DRYER		20' DRYER		24' DRYER		28’ DRYER	
		QTY.	PART #	QTY.	PART #	QTY.	PART #	QTY.	PART #
1	Hitch receiver weldment	1	T15320D	1	T15320D	1	T15320D	1	T15320D
2	Cross channel, front, 74-13/16"	1	T15321	1	T15321	1	T15321	1	T15321
3	Hitch connector plate, LH	1	T15322	1	T15322	1	T15322	1	T15322
4	Hitch connector plate, RH	1	T15323	1	T15323	1	T15323	1	T15323
5	Fan support angle	1	T15324	1	T15324	1	T15324	1	T15324
6	Wide vertical support	10	T16322	12	T16322	14	T16322	16	T16322
7	Narrow vertical support	8	T16323	10	T16323	12	T16323	14	T16323
8	Main connector plate	16	T16324	20	T16324	24	T16324	28	T16324
9	Cross channel	3	T16325	5	T16325	5	T16325	7	T16325
10	Motor brace	2	T16328	2	T16328	2	T16328	2	T16328
11	Tightener angle	1	T16329	1	T16329	1	T16329	1	T16329
12	Conduit box connector plate	2	T16331	2	T16331	2	T16331	2	T16331
13	Front cross channel	1	T16333	1	T16333	1	T16333	1	T16333
14	Cross channel bracket	2	T80147	2	T80147	2	T80147	2	T80147
15	Right frame angle	1	T80205	1	T20419	1	T24419	1	T28318
16	Left frame angle	1	T80206	1	T20420	1	T24420	1	T28317

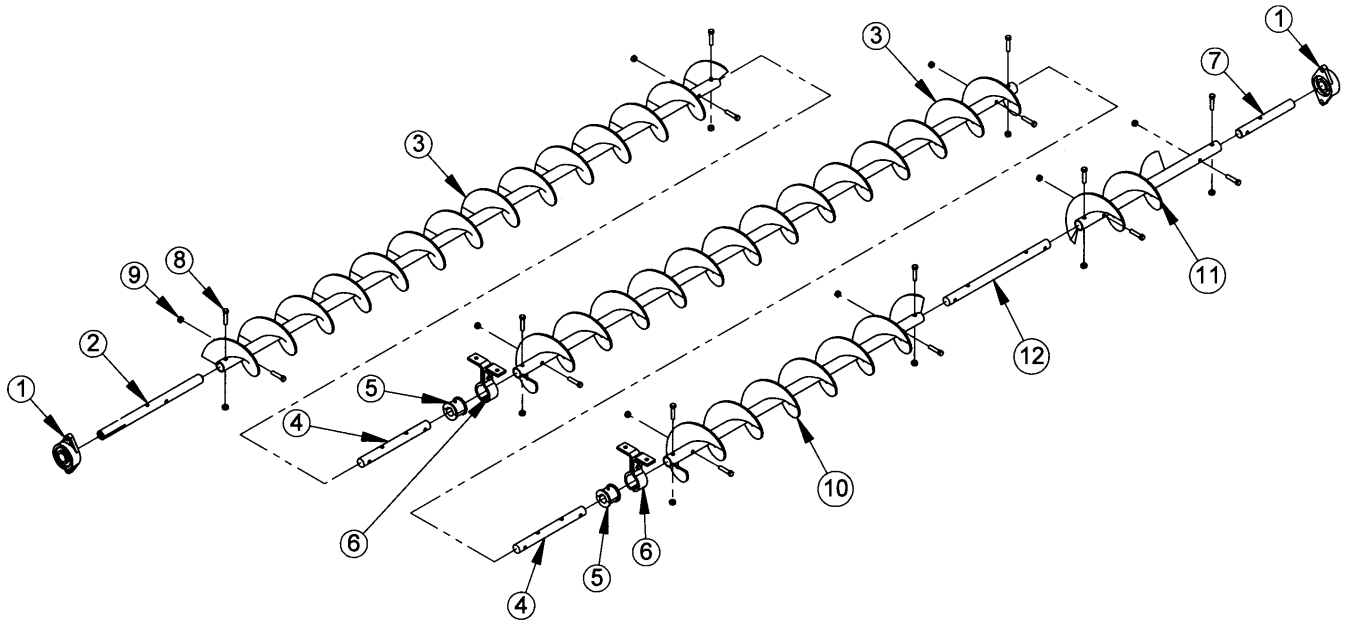
16’ BOTTOM AUGER



SWPD0032

REF. #	DESCRIPTION	QTY.	PART #	
			SINGLE MODULE/DOUBLE STACK	TRIPLE STACK
1	Flange bearing, 1-1/4”, w/ lock collar	2	J0010	J0010
2	Shaft, front, 13-1/4″	1	T16436	T16436
3	Front auger, 93-1/2″	1	T16430	---
	Front auger, 93-1/2″, 8″ OD	2	---	T17430
4	Hanger bearing shaft, 8″	2	F4720	F4720
5	Wooden bushing, 1-1/4” ID	2	J0096	J0096
6	Auger hanger	2	J0097	J0097
7	Shaft, 1-1/4” x 10″	1	T17251	T17251
8	Screw, 7/16 – 14 x 2”	16	J0718	J0718
9	Lock nut, 7/16” - 14	16	J1034	J1034
10	Middle auger, 69-1/2″	1	T16432	---
	Middle auger, 69-1/2″, 8″ OD	1	---	T17432
11	Rear auger, 24″	1	T12498	---
	Rear auger, 24″, 8″	1	---	T17434
12	Auger extension	1	T12493	---
	Auger extension	1	---	T17435
13	Shaft, 19”	1	F4723	F4723

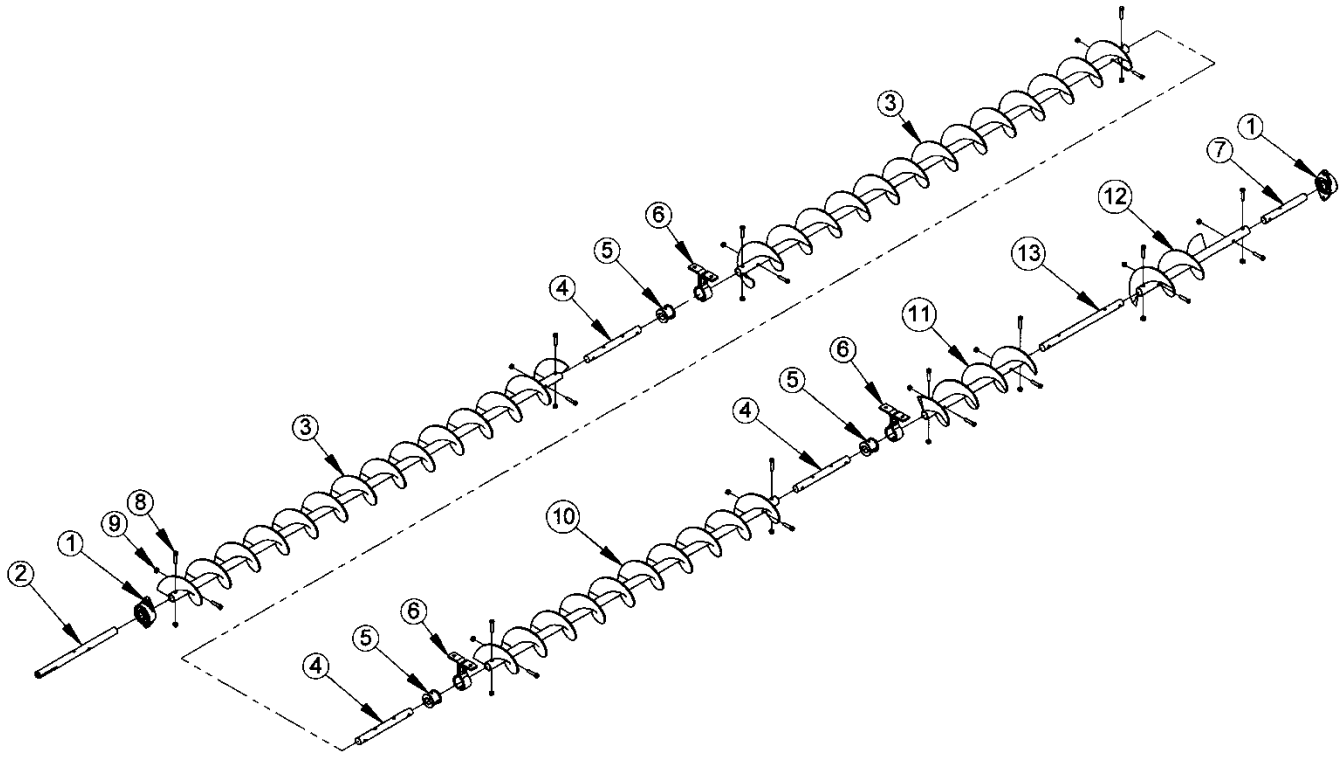
20’ BOTTOM AUGER



SWPD0033

REF. #	DESCRIPTION	QTY.	PART #	
			SINGLE MODULE/DOUBLE STACK	TRIPLE STACK
1	Flange bearing, 1-1/4”, w/ lock collar	2	J0010	J0010
2	Shaft, front, 13-1/4″	1	T16436	T16436
3	Front auger, 93-1/2″	2	T16430	---
	Front auger, 93-1/2″, 8″ OD	2	---	T17430
4	Hanger bearing shaft, 8″	2	F4720	F4720
5	Wooden bushing, 1-1/4” ID	2	J0096	J0096
6	Auger hanger	2	J0097	J0097
7	Shaft, 1-1/4” x 10″	1	T17251	T17251
8	Screw, 7/16 – 14 x 2”	16	J0718	J0718
9	Lock nut, 7/16” - 14	16	J1034	J1034
10	Rear auger, 47-1/2″	1	T12492	---
	Rear auger, 47-1/2″, 8″	1	---	T17438
11	Auger extension	1	T12493	---
	Auger extension	1	---	T17435
12	Shaft, 19”	1	F4723	F4723

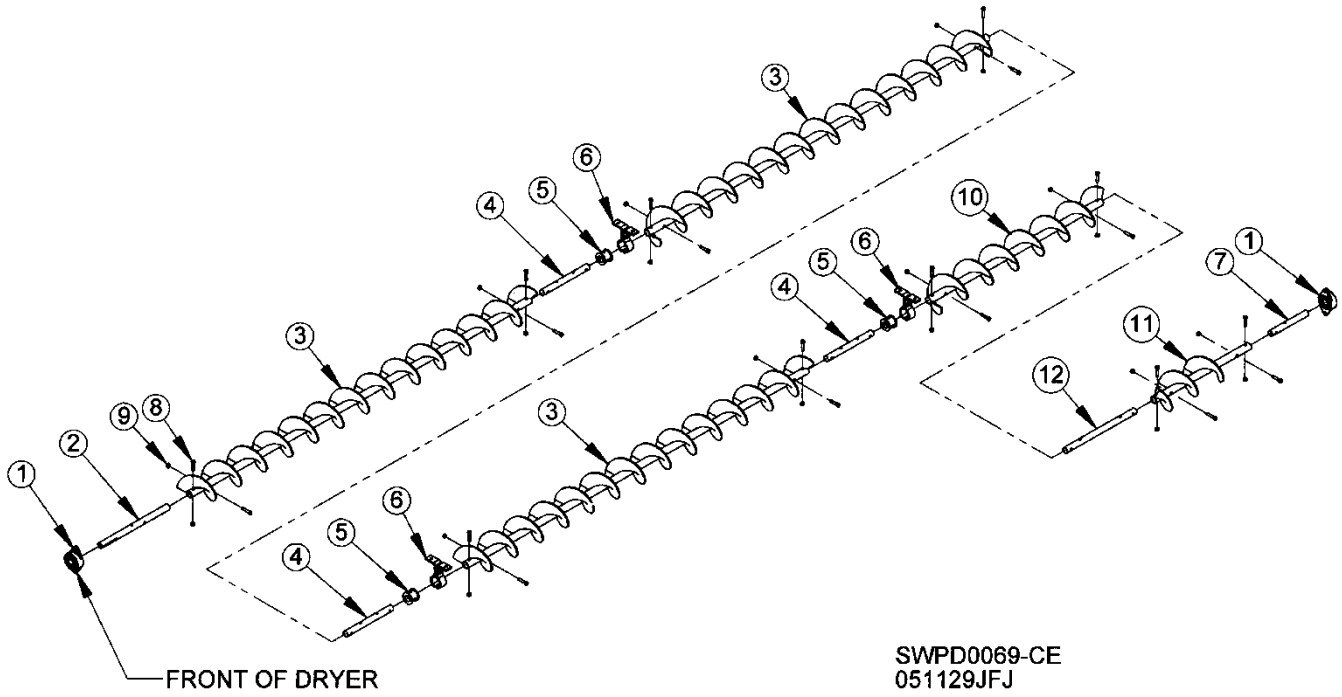
24’ BOTTOM AUGER



SWPD0034

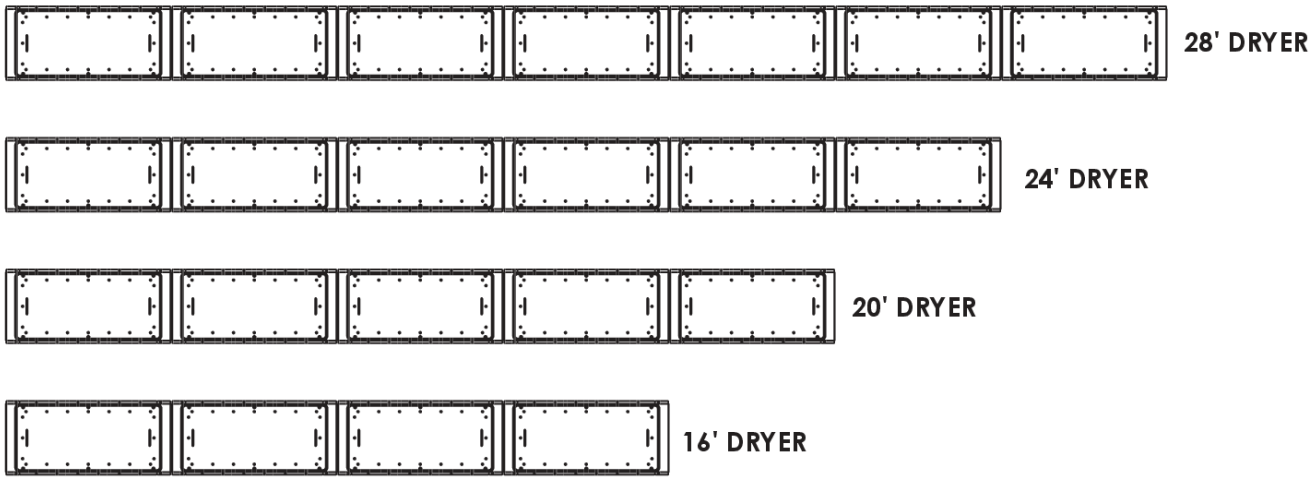
REF. #	DESCRIPTION	QTY.	PART #	
			SINGLE MODULE/DOUBLE STACK	TRIPLE STACK
1	Flange bearing, 1-1/4”, w/ lock collar	2	J0010	J0010
2	Shaft, front, 13-1/4″	1	T16436	T16436
3	Front auger, 93-1/2″	2	T16430	---
	Front auger, 93-1/2″, 8″ OD	2	---	T17430
4	Hanger bearing shaft, 8″	3	F4720	F4720
5	Wooden bushing, 1-1/4” ID	3	J0096	J0096
6	Auger hanger	3	J0097	J0097
7	Shaft, 1-1/4” x 10″	1	T17251	T17251
8	Screw, 7/16 – 14 x 2”	20	J0718	J0718
9	Lock nut, 7/16” - 14	20	J1034	J1034
10	Middle auger, 69-1/2″	1	T16432	---
	Middle auger, 69-1/2″, 8″ OD	1	---	T17432
11	Rear auger, 24″	1	T12498	---
	Rear auger, 24″, 8″	1	---	T17434
12	Auger extension	1	T12493	---
	Auger extension	1	---	T17435
13	Shaft, 19”	1	F4723	F4723

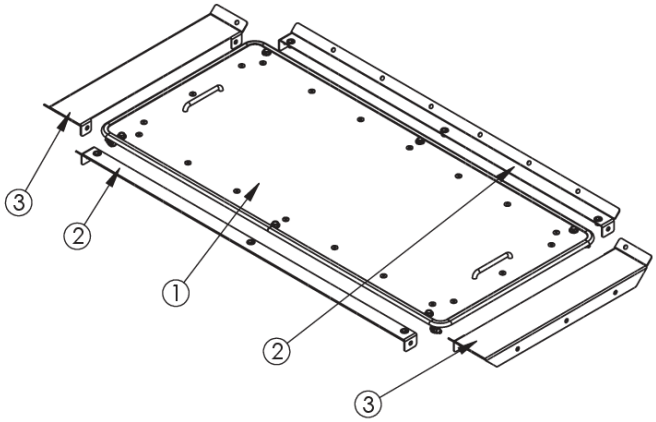
28’ BOTTOM AUGER



REF. #	DESCRIPTION	QTY.	PART #
1	Flange bearing, 1-1/4”, w/ lock collar	2	J0010
2	Shaft, front, 13-1/4″	1	T16436
3	Front auger, 93-1/2″	3	T16430
4	Hanger bearing shaft, 8″	3	F4720
5	Wooden bushing, 1-1/4” ID	3	J0096
6	Auger hanger	3	J0097
7	Shaft, 1-1/4” x 10″	1	T17251
8	Screw, 7/16 – 14 x 2”	20	J0718
9	Lock nut, 7/16” - 14	20	J1034
10	Rear auger, 47.50"	1	T12492
11	Auger extension	1	T12493
12	Shaft, 19”	1	F4723

INNER CLEANOUT PANEL ASSEMBLY

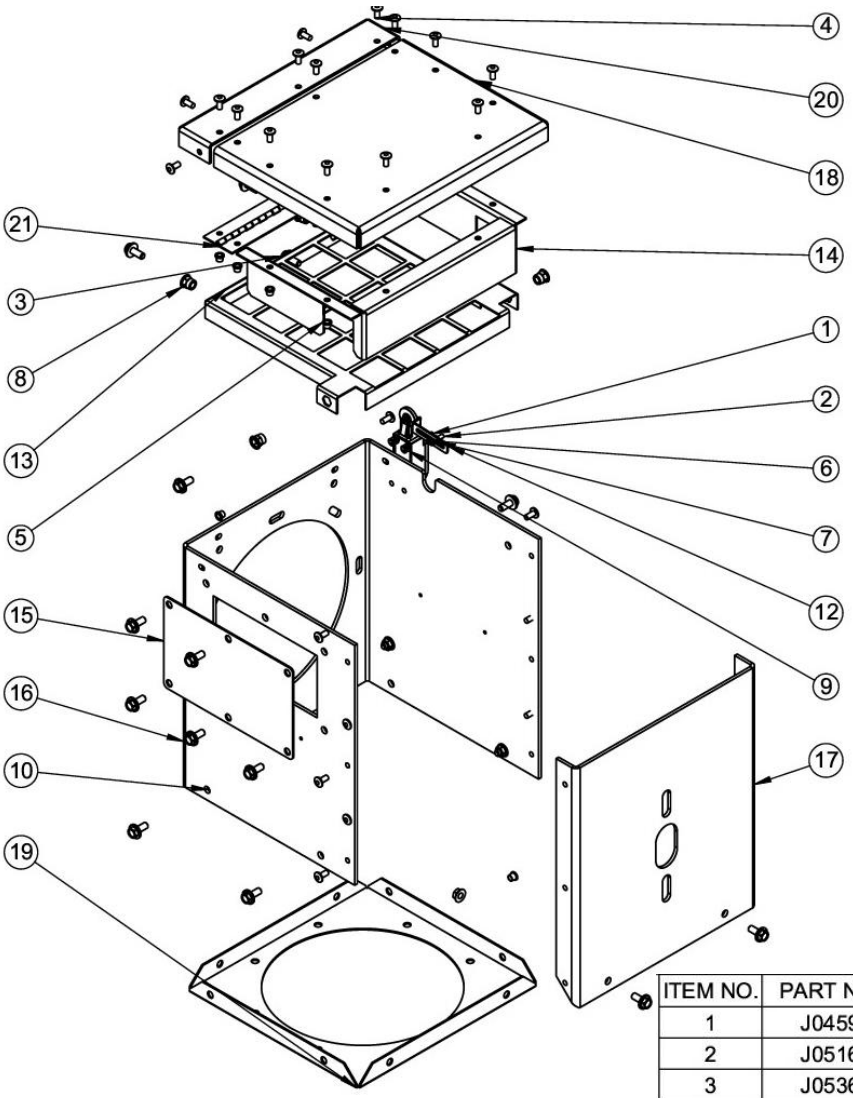




SWPD0162
11/08/2018 TSR

REF. #	DESCRIPTION	QTY.	PART #
1	Bolt-on plenum floor assy.	1	T17212
2	Side frame	2	T17204AM
3	End frame	2	T17205

DISCHARGE BOX ASSY.



T17669AM
11/09/2021 PBM

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	J0459	SCREW,#6-32,2.00,PLT,SLT,RHMS	2
2	J0516	SCREW, #10-24, 3/4, PLT, SLT, RHMS	1
3	J0536	SCREW,5/16-18,3/4",PLT,GR5,HHWZ	18
4	J0892	1/4" X 5/8" HUCKBOLT	24
5	J0893	SLEEVE, HUCKBOLT, 1/4"	22
6	J0982	NUT,HEX,6-32,PLT,MS	4
7	J0987	NUT,#10-24,NYLOCK	1
8	J1007	NUT,RIVET,5/16"-18	4
9	J1104	WASHER,FLAT,#6	12
10	J1110	NUT, WHIZ, 5/16-18	14
11	J4096	CABLE GLAND,0.12-0.28",1/2"	1
12	J4473	SWITCH,SAFETY INTERLOCK,HINGED	1
13	T25652	SCREEN,COVER,SUMP BOX	1
14	T25653	PREVENTER,SPILL,LID,SUMP BOX	1
15	T256704	PLATE,COVER,VENT,PRESS RELIEF	1
16	T25670AM	FRONT-SIDES, SUMP BOX	1
17	T25671	REAR PLATE, SUMP BOX	1
18	T25672AM	LID, SUMP BOX	1
19	T25674	BOTTOM, SUMP BOX	1
20	T25675	LID HINGE SIDE, SUMP BOX	1
21	T25676	HINGE, SUMP BOX	1

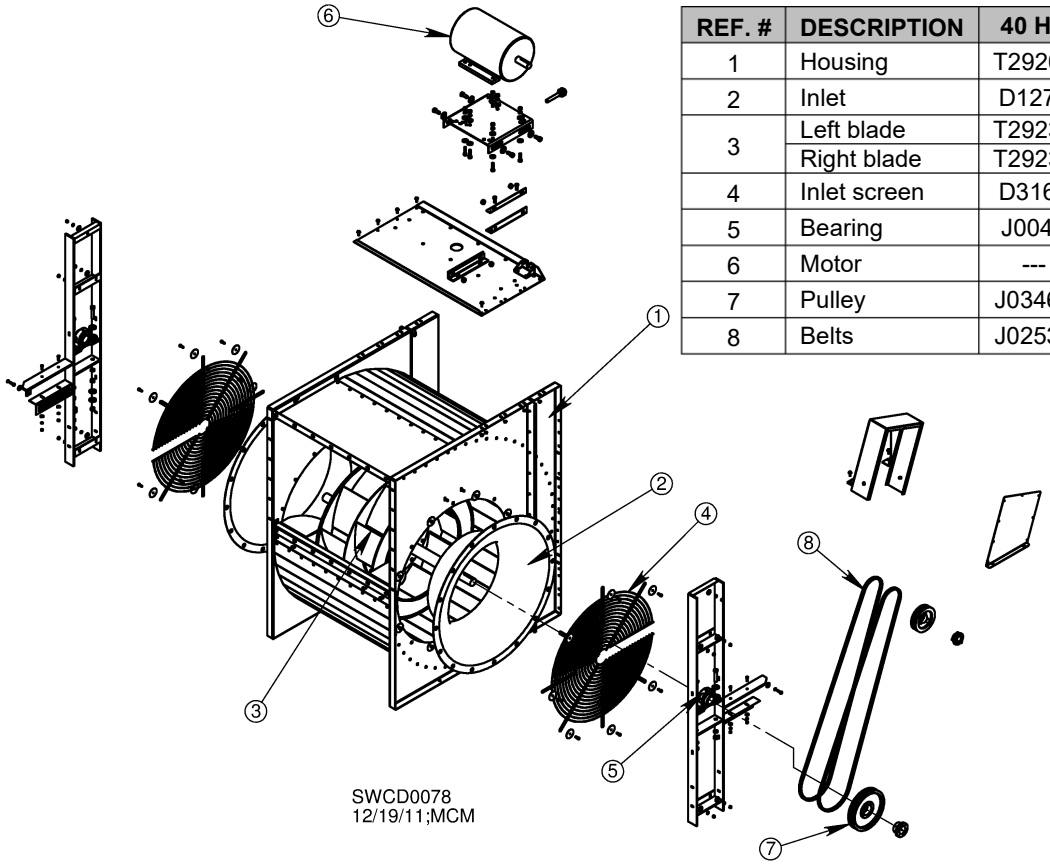
Appendix F

Centrifugal Dryer Parts/Assemblies

DATE	REVISION	PAGE
04/04/2024 –	Updated drawing & parts list for heater	4
	Updated entry pipe drawings & parts lists	6 & 8
	Added main power box mounting frame drawing & parts list	51
	Added discharge box assy. drawing & parts list	52
04/13/2023 –	Updated description of shaft T16436	19, 21, 23, 25, 32-34

TABLE OF CONTENTS

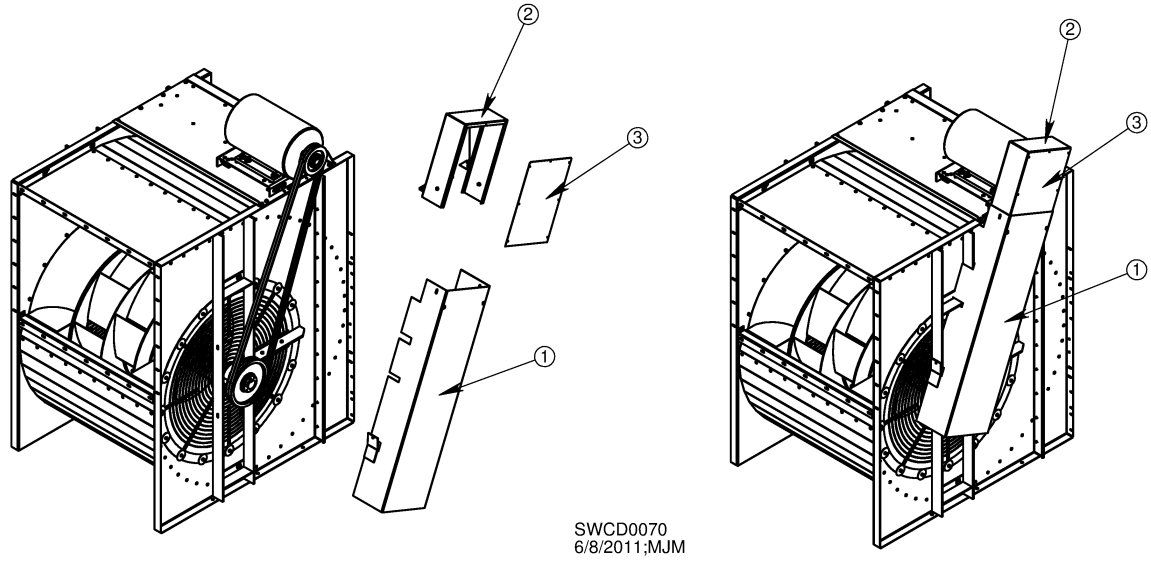
FAN PARTS



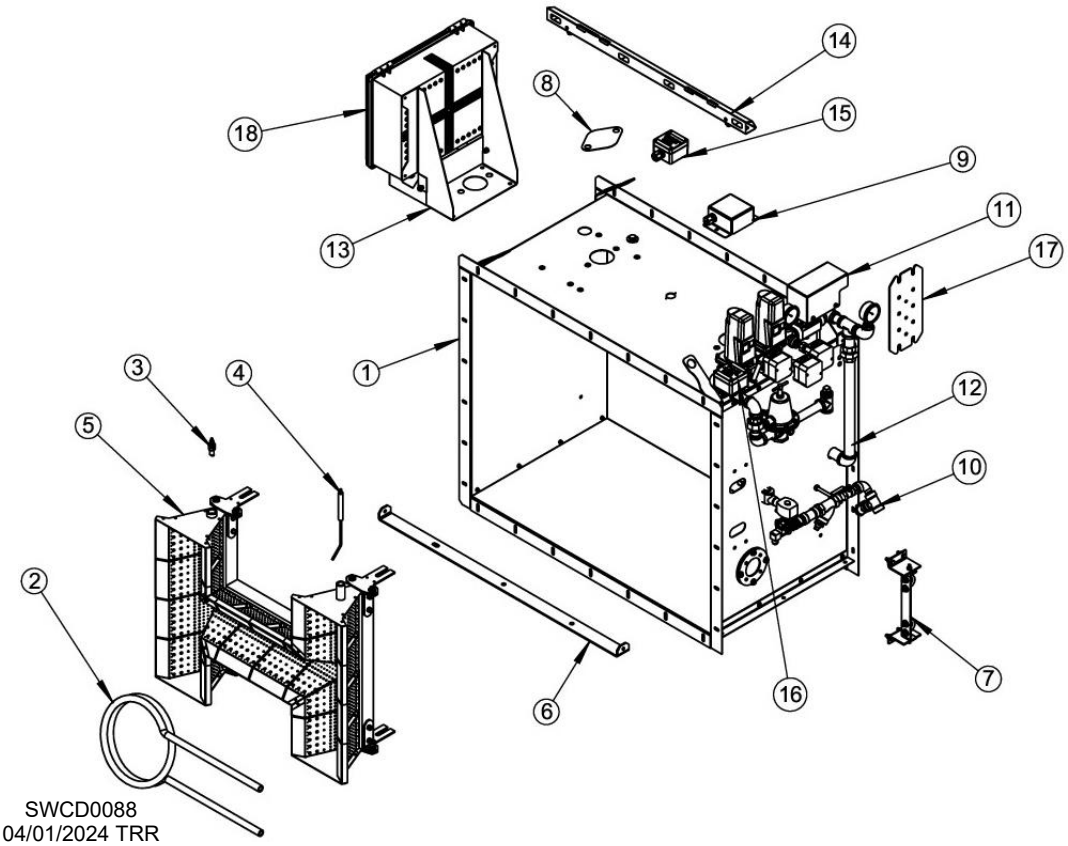
REF. #	DESCRIPTION	40 HP	50 HP	60 HP
1	Housing	T29201	T29201	T29201
2	Inlet	D1275	D1275	D1275
3	Left blade	T29238	T29333	T29333
	Right blade	T29239	T29334	T29334
4	Inlet screen	D3165	D3165	D3165
5	Bearing	J0048	J0048	J0048
6	Motor	---	---	---
7	Pulley	J03462	J0357	J03462
8	Belts	J02537	J02537	J02537

FULL HEAT FAN BELT SHIELD ASSY.

	PART NUMBER	DESCRIPTION	QTY
1	T29190	SHIELD, ASSY, BELT, LOWER	1
2	T29195	SHIELD, ASSY, UPPER	1
3	T29143	COVER, BELT SHIELD	1

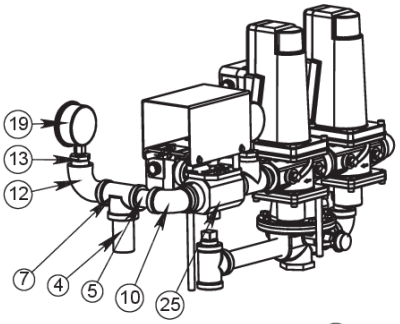


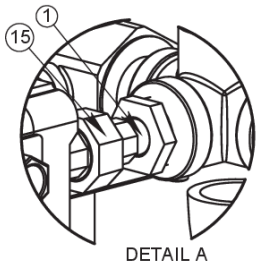
HEATER PARTS, T31020D (LP) & T31120 (NG)



REF. #	DESCRIPTION	LP PART #	NG PART #	QTY.
1	HOUSING,BURNER,CENT,GALV,H	T29187	T29187	1
2	VAPORIZER,2 COIL,10.5" ID,EXT	D70324	--	1
3	SPARK PLUG,#64	J5739	J5739	1
4	SENSOR,FLAME,5-1/2",COMP MOUNT	J5747	J5747	1
5	BURNER ELEMENT,ALUMINUM,H,ASSY	T29630	T29630	1
6	STRAP,MOUNT,BURNER,H-BURNER	T291875	T291875	1
7	ASSY,PIVOT BRACKET,VAP,90 DEG	D6322	--	1
8	COVER,DOOR,ACCESS,FLAME SENSE	T29629	T29629	1
9	COVER, FLAME SENSOR,#30,H-BURN	T291255	T291255	1
10	PIPE TRAIN,LIQ,1/2, CENTRV,D-C	T17132D	--	1
11	PIPE TRAIN,ELMOD,3/4",LP,DC	T17223D	T18823D	1
12	PIPE,ENTRY,HOUSING,LP,DOMESTIC	T30312M	T30322M	1
13	MOUNT, HEATER BOX ASSY	T29790	T29790	1
14	TRAY, CABLE ROUTING. 35”	T29793	T29793	1
15	SWITCH, HOUSING OVERTEMP	T96139	T96139	1
16	SWITCH, LP VAPOR OVERTEMP ASSY	T96126	--	1
17	PLATE, ORIFICE, HIGH RANGE, LP	D7175	D7176	1
18	BOX, W/ HARNESS, CENT, CE	T96012	T96012	1

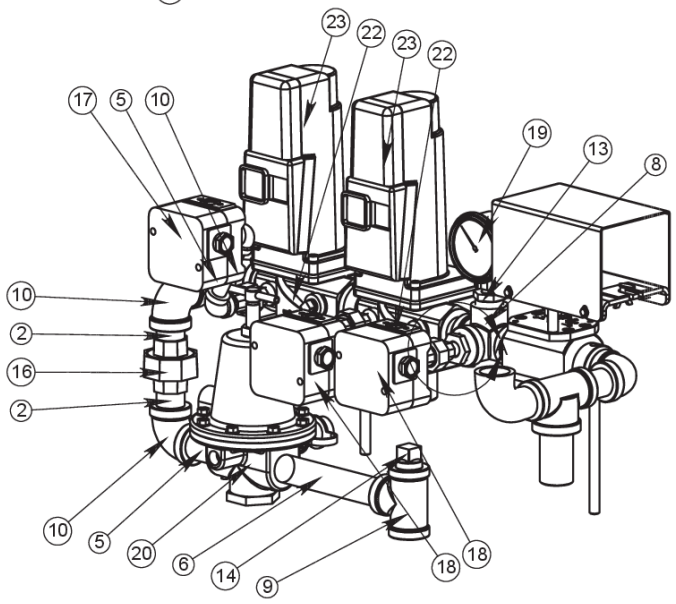
LP 3/4" MOD VALVE PIPE TRAIN



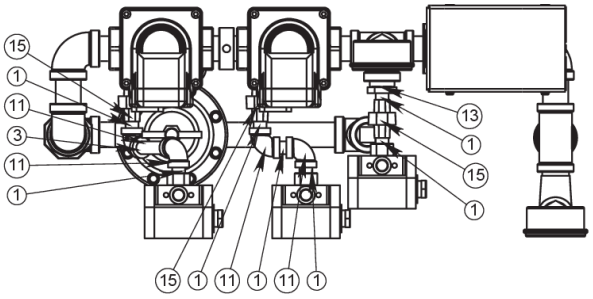


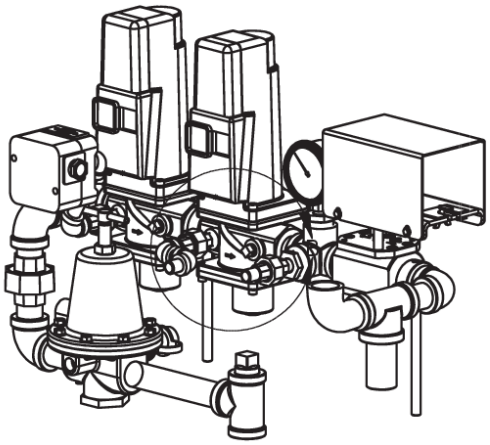
DETAIL A
SCALE 1 : 2

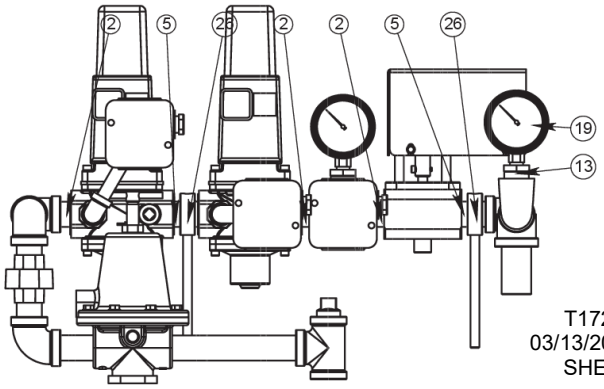
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	J24003	NIPPLE, 1/4" X 7/8", SCH 40	9
2	J2410	NIPPLE, 3/4 x CLOSE, SCH 40	5
3	J2411	NIPPLE, 1/4" X 3", SCH 40	1
4	J24173	NIPPLE,1.00 X 2.5 SCH40	1
5	J2420	NIPPLE, 3/4" X 2", SCH40	5
6	J2428	NIPPLE, 3/4 x 6, SCH 80	1
7	J24811	TEE,3/4 X 3/4 X 1, SCH40	1
8	J2490	TEE, SIDE OUTLET, 3/4 BLACK	1
9	J2491	TEE,3/4 X 3/4 X 3/4, SCH80	1
10	J2525	ELBOW,3/4, 90 DEG.,SCH40	4
11	J2526	ELBOW, 1/4 x 90, SCH 40	4
12	J2530	ELBOW,STREET,3/4", 90 DEG,SCH 40	1
13	J2570	BUSHING, REDUCING, 3/4 X 1/4, SCH40	3
14	J2620	PLUG, 3/4, PIPE	1
15	J2703	UNION, 1/4",SCH40	3
16	J2710	UNION, 3/4, BLACK,#150	1
17	J4437	SWITCH, PRESS., DUNGS, GW2000 A4	1
18	J4443	SWITCH, PRESS., DUNGS, GW6000 A4H	2
19	J5960	GAUGE,PRES,0-30,LIQ,1/4BTM,MT	2
20	J6163	REGULATOR,3/4",1586VN	1
21	J6171	VALVE, 1/4", RELIEF, A1325, H120	1
22	J6236	VALVE,GAS, 3/4" SINGLE, VGG10.2044	2
23	J6240	ACTUATOR, SKP15.001E1	2
24	J6241	KIT,GASKET,NEMA 4,AGA66	2
25	T161916NN	VALVE,BUTTERFLY,3/4",SCC,W/MNT	1
26	T18810	EYEBOLT,PIPE TRAIN,4.75"THREAD	2



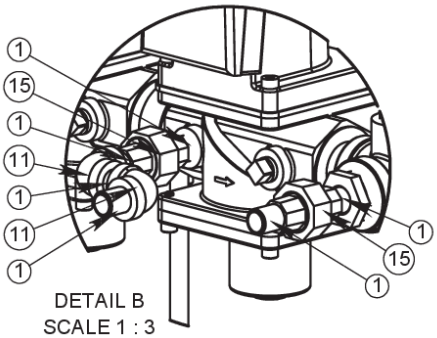
T17223D
03/13/2018 RPE
SHEET 1







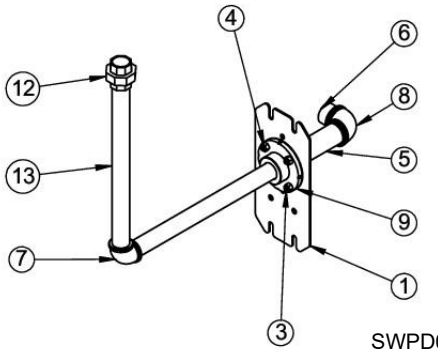
T17223D
03/13/2018 RPE
SHEET 2



DETAIL B
SCALE 1 : 3

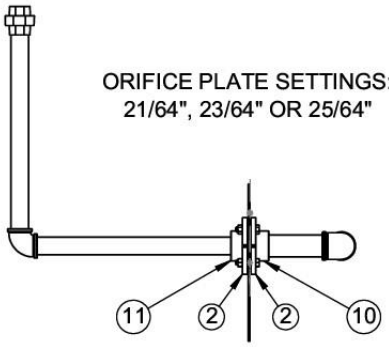
LP H-BURNER ENTRY PIPE

T30312M



SWPD0272
03/19/2024 JPH
SHEET 4

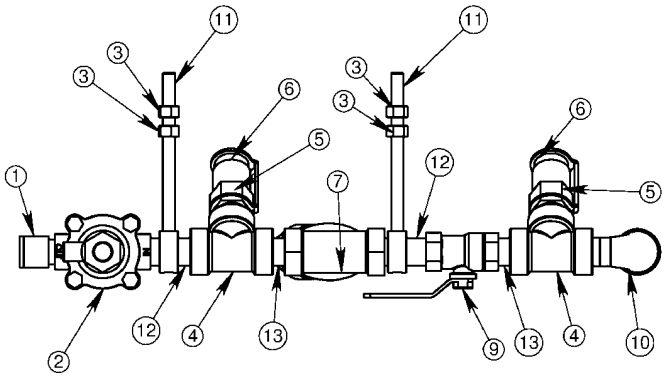
ORIFICE PLATE SETTINGS:
21/64", 23/64" OR 25/64"



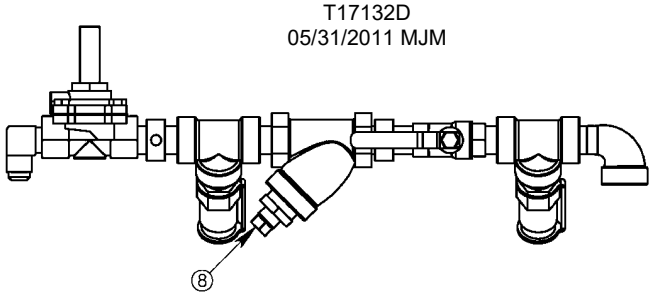
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	D7175	PLATE,ORIFICE,HIGH RANGE,LP	1
2	D7179	FLANGE,PIPE,CLASS 150,2 1/4"	2
3	J0627	SCREW, 3/8-16, 1.50, GR 5 HHCS	4
4	J1020	NUT, HEX, 3/8-16,PLT	4
5	J2435	NIPPLE,1.25 X 5" SCH 40	1
6	J2500	NIPPLE,1.25 X CLOSE	1
7	J25251	ELBOW, 1, 90 DEG., SCH40	1
8	J2540	ELBOW, 1 1/4, 90 DEG, SCH40	1
9	J2601	GASKET,FLANGE ORIFICE	2
10	J2602	ADAPTER, 1 1/4" NPT BUTT WELD	1
11	J2603	ADAPTER,1" NPT BUTT WELD	1
12	J2696	UNION, 1" SCH40	1
13	T17218	PIPE,1" X 15.5", SCH 40	2

Order D7171 to receive flange assy. D7179 w/ adapter J2603.
Order D7172 to receive flange assy. D7179 w/ adapter J2602.

1/2" LIQUID PIPE TRAIN

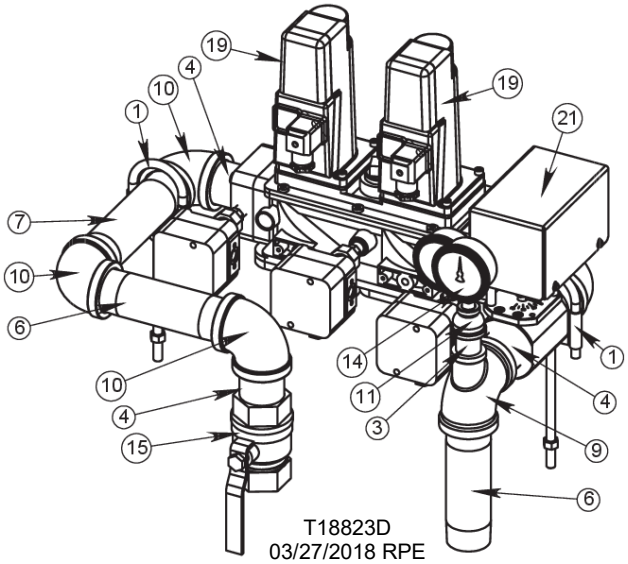


T17132D
05/31/2011 MJM



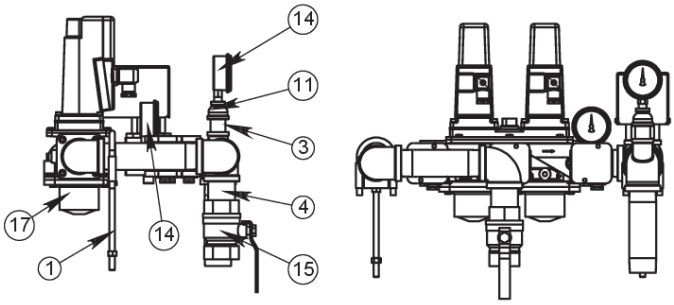
ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	J2745	ELBOW, 1/2 FL X 1/2 MIP, 90 DEG, E1-8D	1
2	T17097	CONDUIT WITH J6257 SOLENOID, LIQUID W/WRS, VA, D-C	1
3	J1020	NUT, HEX, 3/8-16,PLT	4
4	J2472	TEE,1/2 X 1/2 X 1/2, SCH80	2
5	J6170	VALVE, 1/2", RELIEF, 3129G,H135-2	2
6	J6200	RAIN CAP, 7545-10	2
7	J5992	STRAINER, LIQ, 1/2"	1
8	J2610	PLUG, 3/8, PIPE, BLK	1
9	J6082	VALVE, 1/2", BALL, ITT 1550	1
10	J2519	ELBOW,STREET,1/2, 90 DEG., SCH80	1
11	D71161	EYEBOLT, PIPE TRAIN, 7/8" SHAFT COLLAR	2
12	J24071	NIPPLE, 1/2 x 2, SCH 80	2
13	J2407	NIPPLE, 1/2" x CLOSE ,SCH 80	2

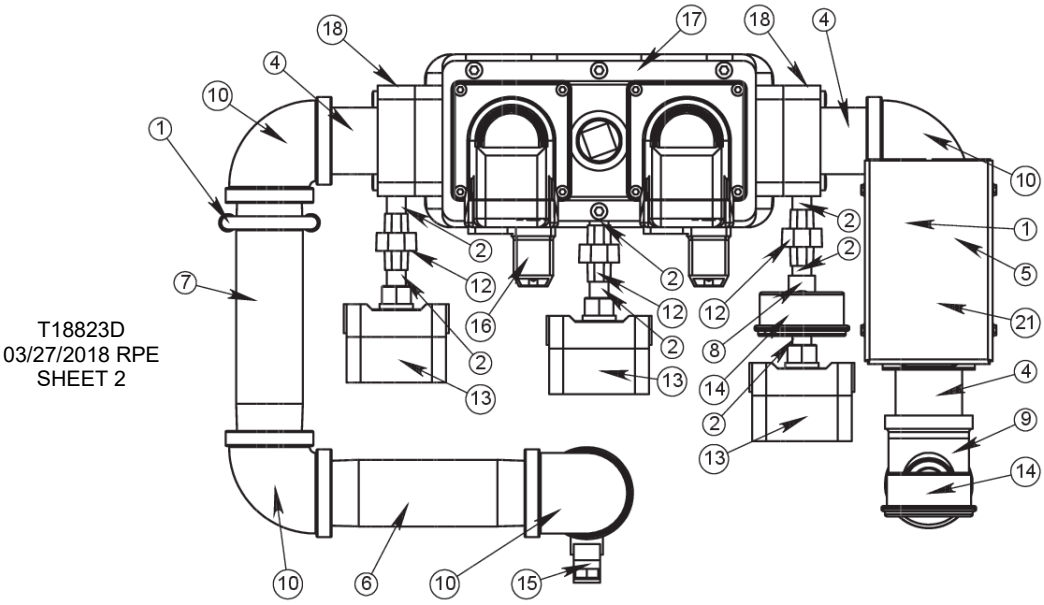
NG MOD VALVE PIPE TRAIN



T18823D
03/27/2018 RPE
SHEET 1

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	D71163	CLAMP, PIPE TRAIN, 2"	2
2	J24003	NIPPLE, 1/4" X 7/8", SCH 40	7
3	J2410	NIPPLE, 3/4 x CLOSE, SCH 40	1
4	J2431	NIPPLE,1 1/2"XCLOSE SCH 40	4
5	J2432	NIPPLE, 1 1/2 x 2, SCH 40	1
6	J2437	NIPPLE,1.5 X 6" SCH40	2
7	J2445	NIPPLE, 1 1/2" x 7", SCH 40	1
8	J2469	TEE, 1/4" X 1/4" X 1/4", SCH40	1
9	J2477	TEE, 1 1/2 x 3/4 x 1 1/2, SCH 40	1
10	J2541	ELBOW,1 1/2",90 DEG, SCH40	4
11	J2574	COUPLING,REDUCING,3/4X1/4 SC40	1
12	J2703	UNION, 1/4",SCH40	3
13	J4437	SWITCH, PRESS., DUNGS, GW2000 A4	3
14	J5967	GAUGE,PRESSURE,0-15,LIQ,1/4"BTM,MT	2
15	J6087	VALVE,1 1/2", BALL	1
16	J6229	CONNECTOR, DIN, ACTUATOR (SWITCH), AGA65	2
17	J6237	VALVE, GAS, 1 1/2, DBL, VGD20.403	1
18	J6239	FLANGE SET, 1 1/2 NPT, AGA4U	2
19	J6240	ACTUATOR, SKP15.001E1	2
20	J6241	KIT, NEMA 4, AGA66	2
21	T161917NN	VALVE,BUTTERFLY,1.5"SCC,W/MNT	1

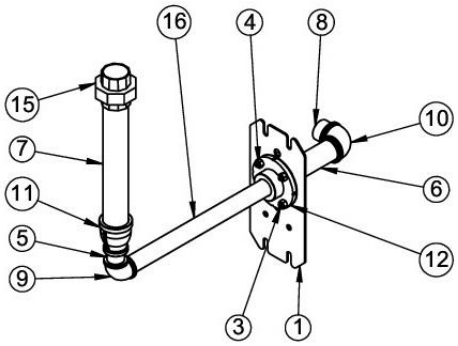




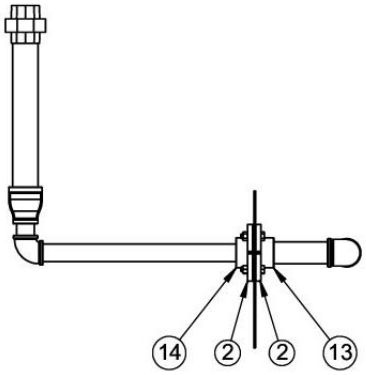
T18823D
03/27/2018 RPE
SHEET 2

NG H-BURNER ENTRY PIPE

T30322M



ORIFICE PLATE SETTINGS:
1/2", 9/16" OR 5/8"

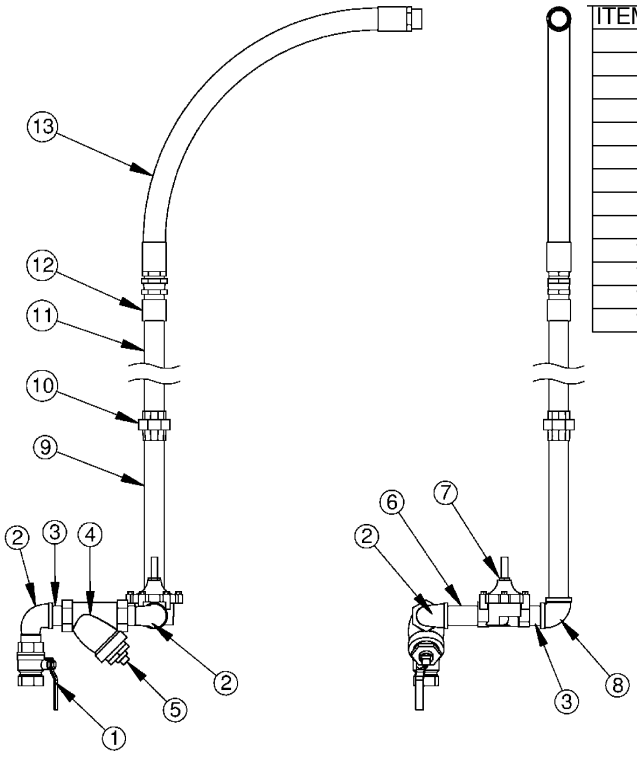


SWPD0272
03/19/2024 JPH
SHEET 8

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	D7176	PLATE,ORIFICE,HIGH RANGE,NG	1
2	D7179	FLANGE,PIPE,CLASS 150,2 1/4"	2
3	J0627	SCREW, 3/8-16, 1.50, GR 5 HHCS	4
4	J1020	NUT, HEX, 3/8-16,PLT	4
5	J24172	NIPPLE, 1 X 2", SCH 40	1
6	J2435	NIPPLE,1.25 X 5" SCH 40	1
7	J24391	NIPPLE,1.5 X 12" SCH 40, BLACK	1
8	J2500	NIPPLE,1.25 X CLOSE	1
9	J25251	ELBOW, 1, 90 DEG., SCH40	1
10	J2540	ELBOW, 1 1/4, 90 DEG, SCH40	1
11	J2553	COUPLING, RED., 1 1/2" X 1", SCH 40	1
12	J2601	GASKET,FLANGE ORIFICE	2
13	J2602	ADAPTER, 1 1/4" NPT BUTT WELD	1
14	J2603	ADAPTER,1" NPT BUTT WELD	1
15	J2707	UNION,1 1/2", SCH40	1
16	T17218	PIPE,1" X 15.5", SCH 40	1

Order D7171 to receive flange assy. D7179 w/ adapter J2603.
Order D7172 to receive flange assy. D7179 w/ adapter J2602.

NG MANIFOLD, 1-1/2”

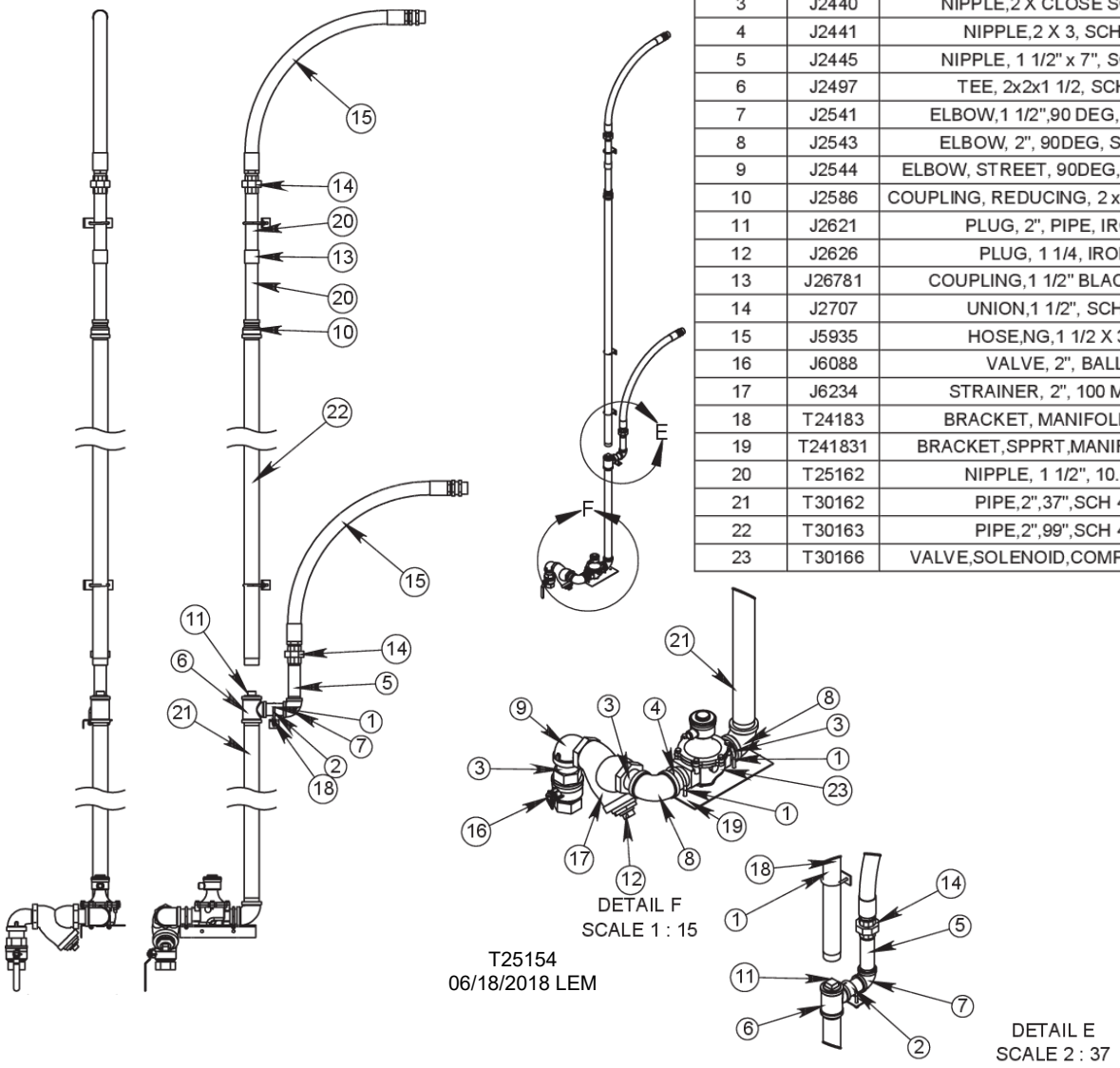


ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	J6087	VALVE,1 1/2", BALL (FIREING)	1
2	J2542	ELBOW,STREET,1.5",90 DEG,SCH40	2
3	J2431	NIPPLE,1.5XCLOSE SCH40	2
4	J6232	STRAINER,1 1/2"	1
5	J2625	PLUG, 1"	1
6	J2436	NIPPLE,1.5 X 4" SCH40	1
7	T25163S	SOLENOID ASSY, NG, 1 1/2", MNFLD	1
8	J2541	ELBOW,1 1/2",90 DEG, SCH40	1
9	T25167	PIPE,1 1/2 X 16", SCH40	1
10	J2707	UNION,1 1/2", SCH40	1
11	T25164	PIPE,1 1/2 X 29", SCH40	1
12	J26781	COUPLING,1 1/2" BLACK PIPE	1
13	J5935	HOSE,NG,1 1/2 X 36"	1

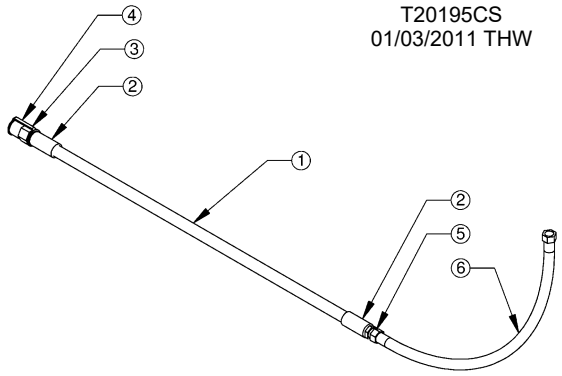
T25152
01/13/2011 DDV

NG MANIFOLD, 2”, STACKED DRYER

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	J08101	U-BOLT,5/16-18 X 2 9/16ID, 2 7/8 DEEP	6
2	J2436	NIPPLE,1.5 X 4" SCH40	1
3	J2440	NIPPLE,2 X CLOSE SCH 40	3
4	J2441	NIPPLE,2 X 3, SCH 40	1
5	J2445	NIPPLE, 1 1/2" x 7", SCH 40	1
6	J2497	TEE, 2x2x1 1/2, SCH 40	1
7	J2541	ELBOW,1 1/2",90 DEG, SCH40	1
8	J2543	ELBOW, 2", 90DEG, SCH 40	2
9	J2544	ELBOW, STREET, 90DEG, 2" SCH 40	1
10	J2586	COUPLING, REDUCING, 2 x 1.5, SCH 40	1
11	J2621	PLUG, 2", PIPE, IRON	1
12	J2626	PLUG, 1 1/4, IRON	1
13	J26781	COUPLING,1 1/2" BLACK PIPE	1
14	J2707	UNION,1 1/2", SCH40	2
15	J5935	HOSE,NG,1 1/2 X 36"	2
16	J6088	VALVE, 2", BALL	1
17	J6234	STRAINER, 2", 100 MESH	1
18	T24183	BRACKET, MANIFOLD, NG	4
19	T241831	BRACKET,SPPRT,MANIFOLD,NG	1
20	T25162	NIPPLE, 1 1/2", 10.5"L	2
21	T30162	PIPE,2",37",SCH 40	1
22	T30163	PIPE,2",99",SCH 40	1
23	T30166	VALVE,SOLENOID,COMP,2",ASCO	1

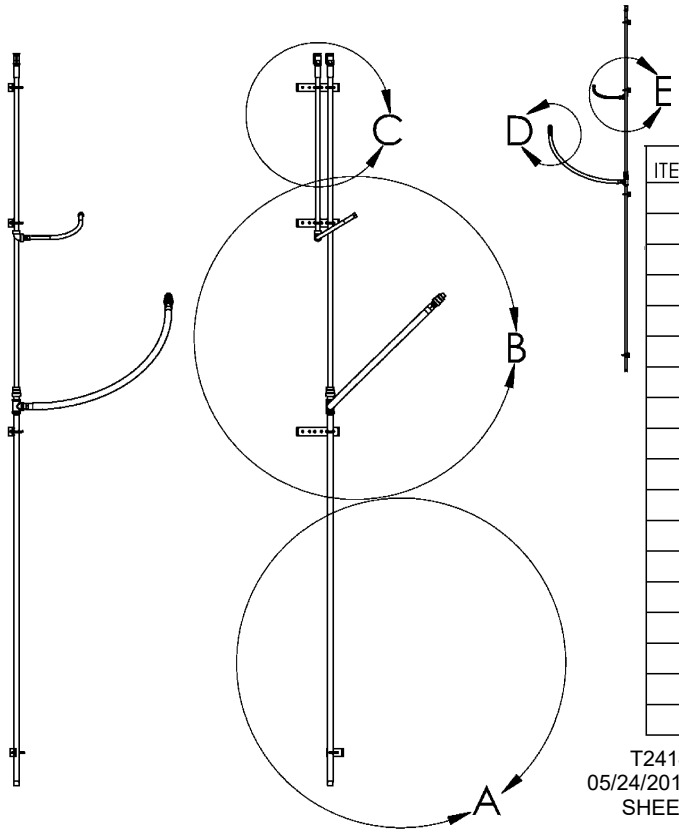


1/2" MANIFOLD RELIEF VALVE



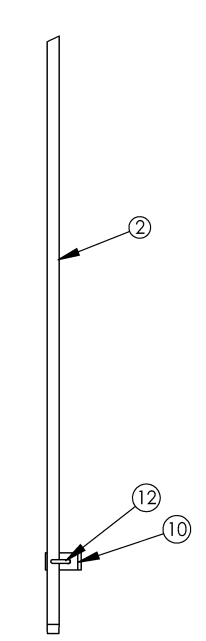
ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	T24161	PIPE,1/2" X 2 1/2', SCH 80
2	2	J2577	COUPLING,1/2", SCH 80
3	1	J6170	VALVE, 1/2", RELIEF, 3129G,H135-2
4	1	J6200	RAIN CAP, 7545-10
5	1	J2840	UNION, 1/2 FL X 1/2 NIP
6	1	J5938	HOSE, CGA x 28 1/2", 7000808-886

LP MANIFOLD, UPPER MODULE OF STACKED DRYER

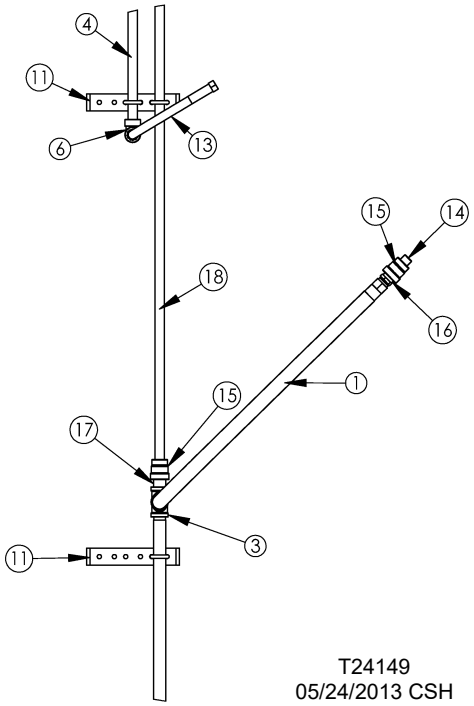


ITEM NO.	QTY.	PART NO.	DESCRIPTION
1	1	J5928	HOSE, HIGH PRESSURE,3/4" X 48"
2	1	T24144	PIPE, THREADED, 3/4 X 6' SCH 80
3	1	J2491	TEE,3/4 X 3/4 X 3/4, SCH80
4	1	T24161	PIPE,1/2" X 2 1/2', SCH 80
5	1	J2840	UNION, 1/2 FL X 1/2 NIP
6	1	J2523	ELBOW 1/2 X 90° SCH80
7	2	J2577	COUPLING,1/2", SCH 80
8	2	J6170	VALVE, 1/2", RELIEF, 3129G,H135-2
9	2	J6200	RAIN CAP, 7545-10
10	1	T24184	BRACKET SHORT, MANIFOLD, LP
11	3	T24185	BRACKET LONG, MANIFOLD, LP
12	6	J0810	U-BOLT,5/16-18,1 1/16"ID 1.75D
13	1	J5936	HOSE, HIGH PRESSURE, 3/8" X 28"
14	1	J2407	NIPPLE, 1/2" x CLOSE ,SCH 80
15	2	J25751	COUPLING, REDUCING, 3/4 X 1/2 SCH80
16	1	J2416	NIPPLE, 3/4 X CLS, BRS, HEX
17	1	J2415	NIPPLE, 3/4 X CLOSE, SCH 80
18	1	T24162	PIPE,1/2" X 5', SCH 80

T24149
05/24/2013 CSH
SHEET 1

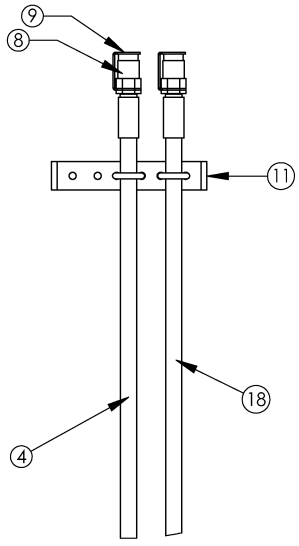


DETAIL A
SCALE 1 : 10

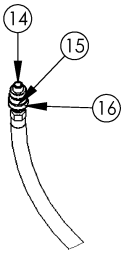


DETAIL B
SCALE 1 : 10

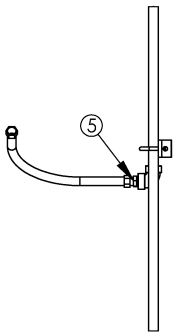
T24149
05/24/2013 CSH
SHEET 2



DETAIL C
SCALE 1 : 6

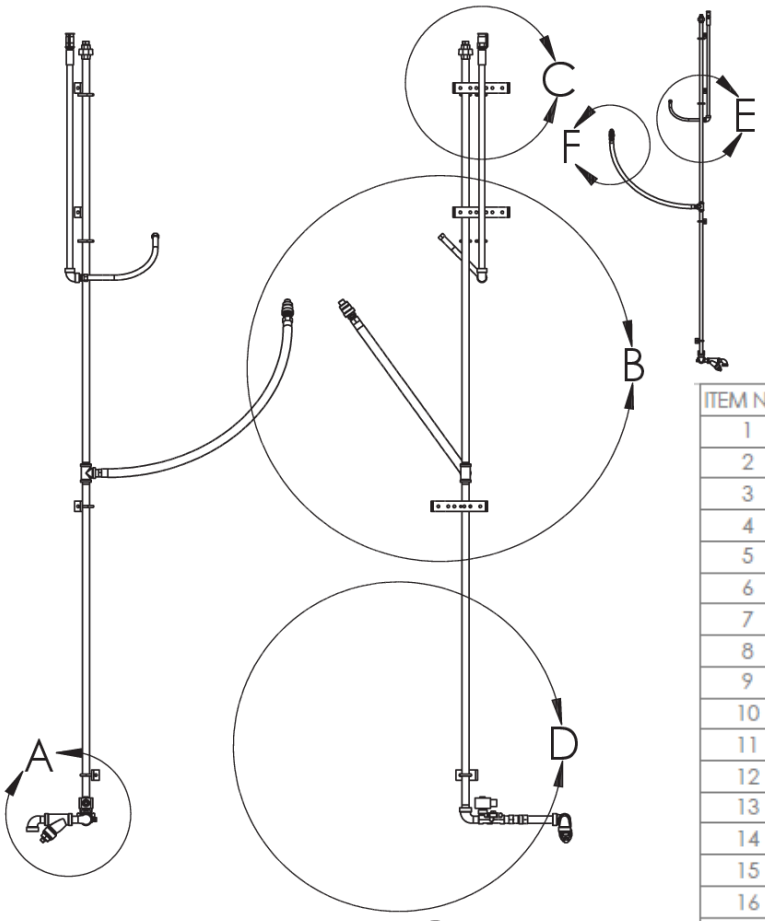


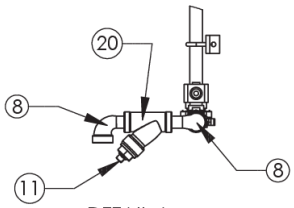
DETAIL D
SCALE 1 : 10



DETAIL E
SCALE 1 : 10

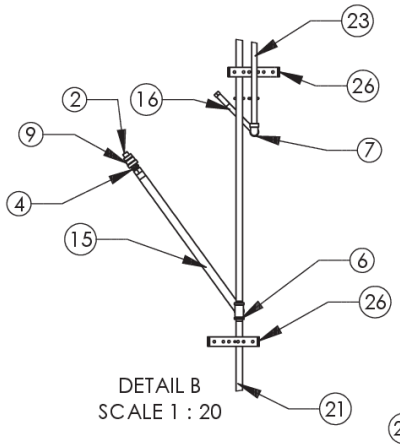
LP MANIFOLD, LOWER MODULE OF STACKED DRYER





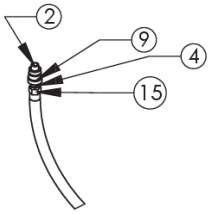
DETAIL A
SCALE 1 : 10

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	J0810	U-BOLT,5/16-18,1 1/16"ID 1.75D	6
2	J2407	NIPPLE, 1/2" x CLOSE ,SCH 80	1
3	J2415	NIPPLE, 3/4 X CLOSE, SCH 80	1
4	J2416	NIPPLE, 3/4 X CLS, BRS, HEX	1
5	J24251	PIPE, 3/4 X 4 1/2, SCH 80	1
6	J2491	TEE,3/4 X 3/4 X 3/4, SCH80	1
7	J2523	ELBOW 1/2 X 90° SCH80	1
8	J2532	ELBOW,STREET,3/4, 90 DEG.,EX HVY	3
9	J25751	COUPLING, REDUCING, 3/4 X 1/2 SCH80	1
10	J2577	COUPLING,1/2", SCH 80	1
11	J2617	PLUG, 1/2, SQ HD, BLACK	1
12	J2620	PLUG, 3/4, PIPE	1
13	J2704	UNION, 3/4, SCH 80	1
14	J2840	UNION, 1/2 FL X 1/2 NIP	1
15	J5928	HOSE, HIGH PRESSURE,3/4" X 48"	1
16	J5936	HOSE, HIGH PRESSURE, 3/8" X 28"	1
17	J6083	VALVE, 3/4", BALL	1
18	J6170	VALVE, 1/2", RELIEF, 3129G,H135-2	1
19	J6200	RAIN CAP, 7545-10	1
20	J6230	STRAINER, 3/4 "	1
21	T24143	PIPE, THREADED, 3/4" X 4', SCH 80	1
22	T24152	PIPE, 3/4" ID, SCH 80, 5'	1
23	T24161	PIPE,1/2" X 2 1/2', SCH 80	1
24	T24166C	SOLENOID ASSY, LP, 3/4", MANIFOLD	1
25	T24184	BRACKET SHORT, MANIFOLD, LP	1
26	T24185	BRACKET LONG, MANIFOLD, LP	3

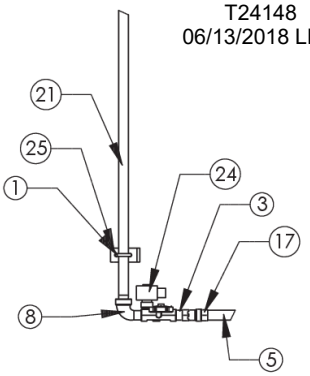


DETAIL B
SCALE 1 : 20

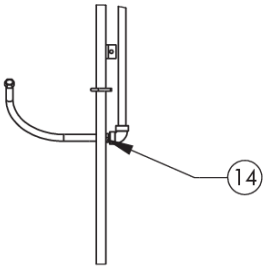
T24148
06/13/2018 LEM



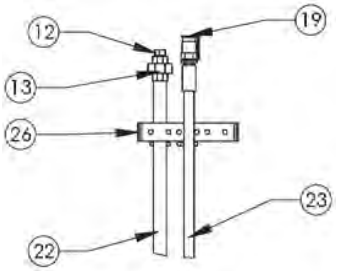
DETAIL F
SCALE 1 : 15



DETAIL D
SCALE 1 : 13

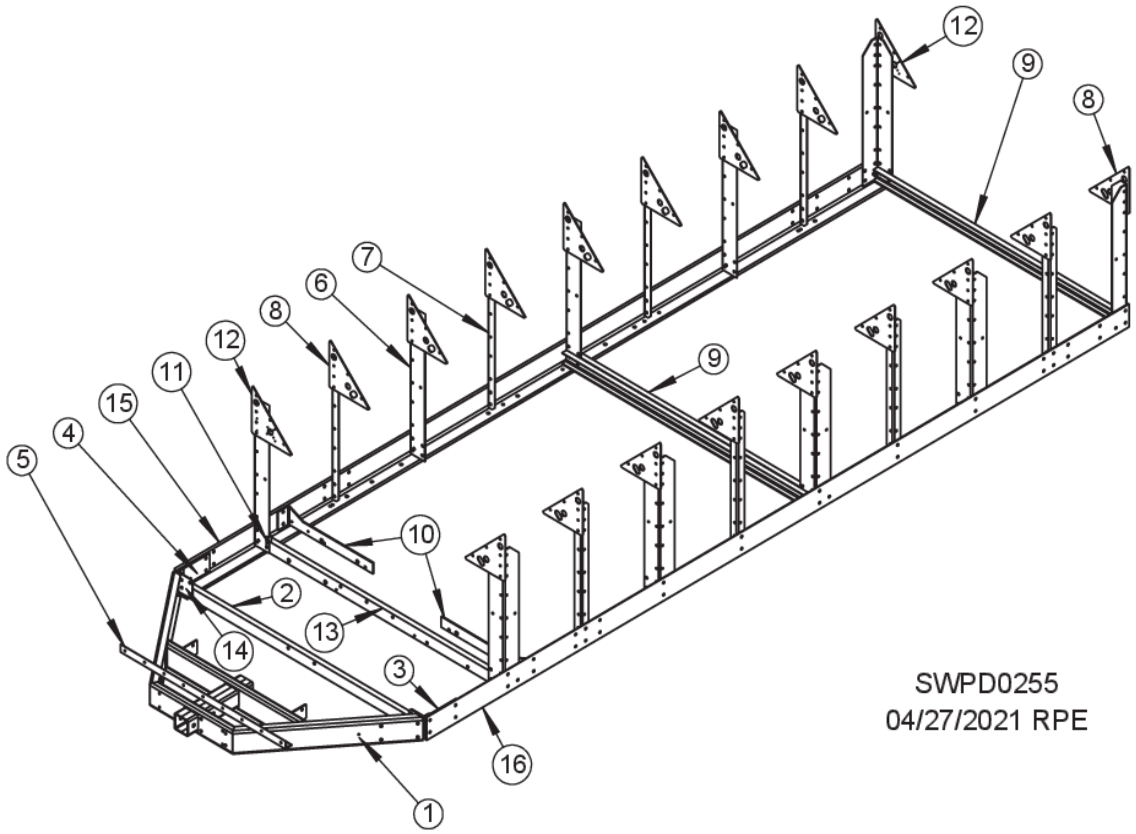


DETAIL E
SCALE 1 : 15



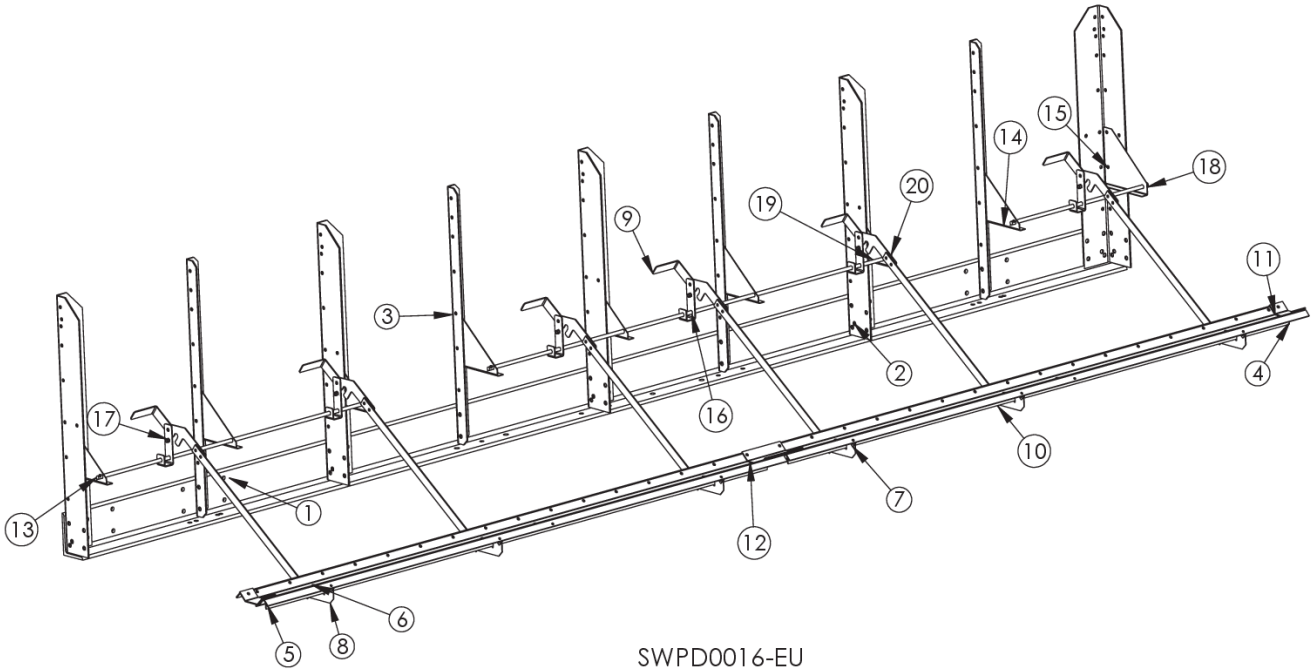
DETAIL C
SCALE 1 : 10

FRAME FOR STANDARD & STACKED DRYERS
16', 20' & 24'



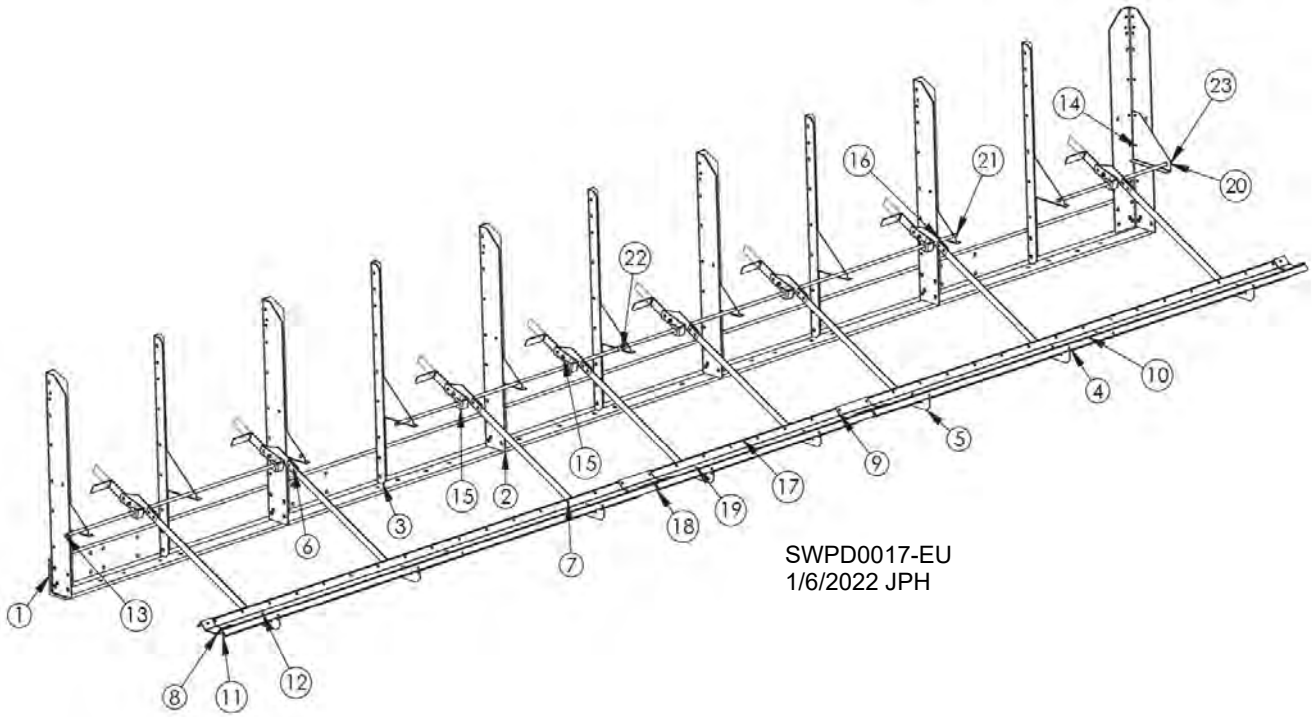
REF. #	DESCRIPTION	16' DRYER		20' DRYER		24' DRYER	
		QTY.	PART #	QTY.	PART #	QTY.	PART #
1	Hitch receiver weldment	1	T15320D	1	T15320D	1	T15320D
2	Cross channel, front, 74-13/16"	1	T15321	1	T15321	1	T15321
3	Hitch connector plate, LH	1	T15322	1	T15322	1	T15322
4	Hitch connector plate, RH	1	T15323	1	T15323	1	T15323
5	Fan support angle	1	T15324	1	T15324	1	T15324
6	Wide vertical support	10	T16322	12	T16322	14	T16322
7	Narrow vertical support	8	T16323	10	T16323	12	T16323
8	Main connector plate	16	T16324	20	T16324	24	T16324
9	Cross channel	3	T16325	5	T16325	5	T16325
10	Motor brace	2	T16328	2	T16328	2	T16328
11	Tightener angle	1	T16329	1	T16329	1	T16329
12	Conduit box connector plate	2	T16331	2	T16331	2	T16331
13	Front cross channel	1	T16333	1	T16333	1	T16333
14	Cross channel bracket	2	T80147	2	T80147	2	T80147
15	Right frame angle	1	T80205	1	T20419	1	T24419
16	Left frame angle	1	T80206	1	T20420	1	T24420

16′ CAM LOCK ASSEMBLY



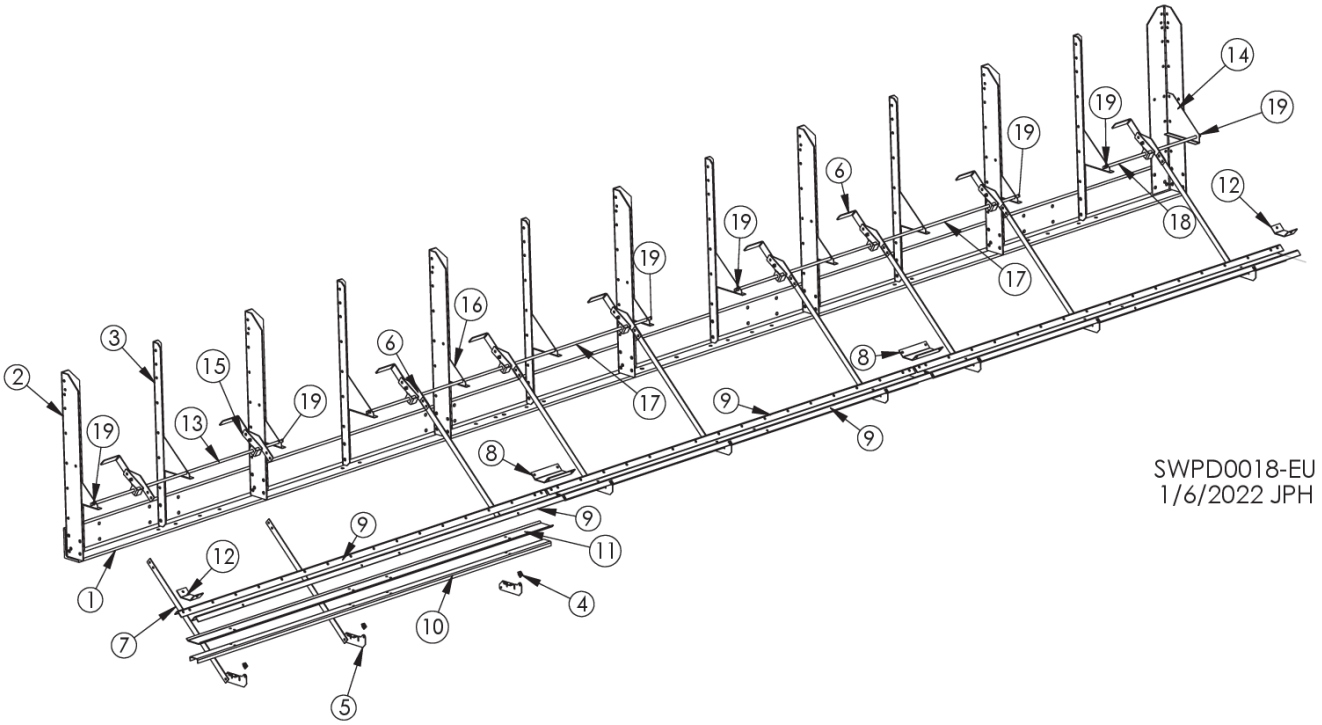
REF. #	DESCRIPTION	QTY.	PART #
1	Right frame angle	1	T16320
2	Wide vertical support	5	T16322
3	Narrow vertical support	4	T16323
4	Door support, 92-1/8”	2	T17454
5	Angle, 95-1/2”	4	T17456
6	Door, 92-1/8”	2	T17455
7	Pivot bracket	6	T16393
8	Hinge	6	T16387
9	Handle	6	T16382
10	Extension arm	6	T16386
11	Seal plate, end	2	T16398
12	Seal plate, middle	1	T16390
13	Shaft, 49-3/4”	1	T16400
14	Front gusset	8	T16380
15	Rear gusset	1	T16381
16	Pivot arm assy.	6	T16383
17	Rivet nut, 5/16" - 18	6	J1007
18	Shaft, 25”	1	T20401
19	Shaft, 74”	1	T12516
20	Cotter pin, 1/8” x 1”	6	J1420

20′ CAM LOCK ASSEMBLY



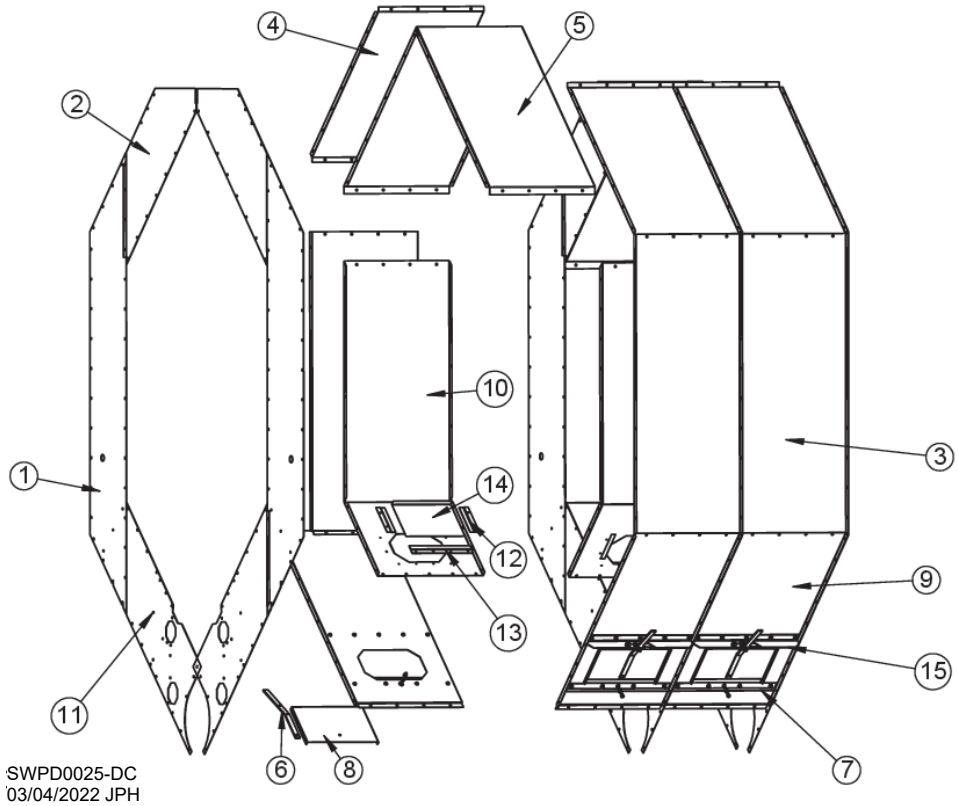
REF. #	DESCRIPTION	QTY.	PART #
1	Right frame angle	1	T20319
2	Wide vertical support	6	T16322
3	Narrow vertical support	5	T16323
4	Pivot bracket	8	T16393
5	Hinge	8	T16387
6	Handle	8	T16382
7	Extension arm	8	T16386
8	Seal plate, end	2	T16398
9	Seal plate, middle	2	T16390
10	Angle, 95-1/2”	4	T17456
11	Door support, 92-1/8”	2	T17454
12	Door, 92-1/8”	2	T17455
13	Shaft, 49-3/4”	2	T16400
14	Rear gusset	1	T16381
15	Pivot arm assy.	8	T16383AM
16	Front gusset	10	T16380
17	Angle, 47-5/8”	2	T12529
18	Door support, 44-1/8”	1	T12530
19	Door, 44-1/8”	1	T12528
20	Shaft, 25”	1	T20401
21	Shaft, 74”	1	T12516
22	Connector shaft	1	T20403
23	Cotter pin, 1/8” x 1”	8	J1420

24′ CAM LOCK ASSEMBLY



REF. #	DESCRIPTION	QTY.	PART #
1	Right frame angle	1	T24319
2	Wide vertical support	7	T16322
3	Narrow vertical support	8	T16323
4	Pivot bracket	9	T16393
5	Hinge	9	T16387
6	Handle	9	T16382
7	Extension arm	9	T16386
8	Seal plate, middle	2	T16390
9	Angle, 95-1/2”	6	T17456
10	Door support, 92-1/8”	3	T17454
11	Door, 92-1/8”	3	T17455
12	Seal plate, end	2	T16398
13	Shaft, 49-3/4”	1	T16400
14	Rear gusset	1	T16381
15	Pivot arm assy.	9	T16383AM
16	Front gusset	12	T16380
17	Shaft, 74”	2	T12516
18	Shaft, 25”	1	T20401
19	Cotter pin, 1/8” x 1”	8	J1420

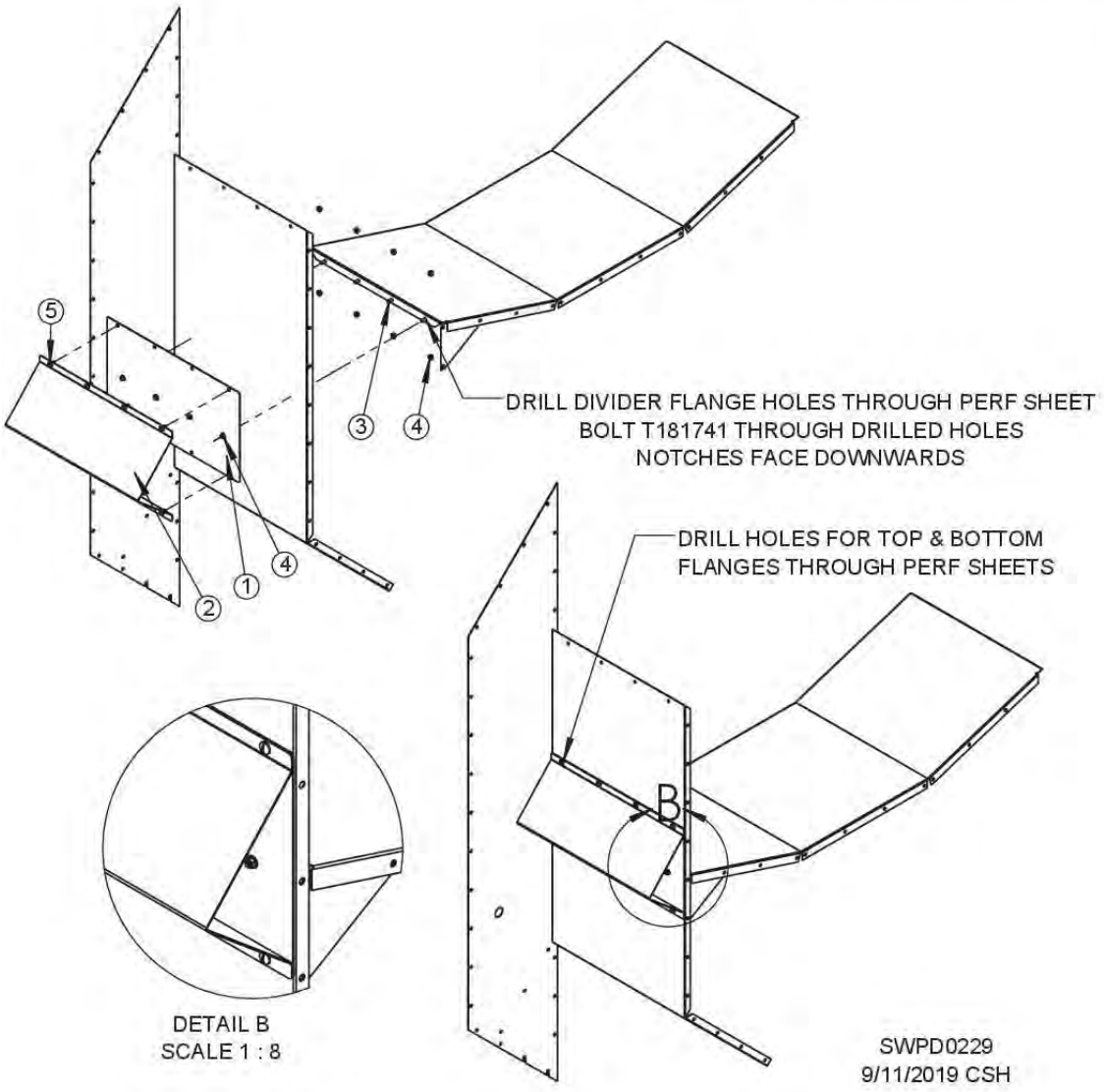
COLUMN PARTS



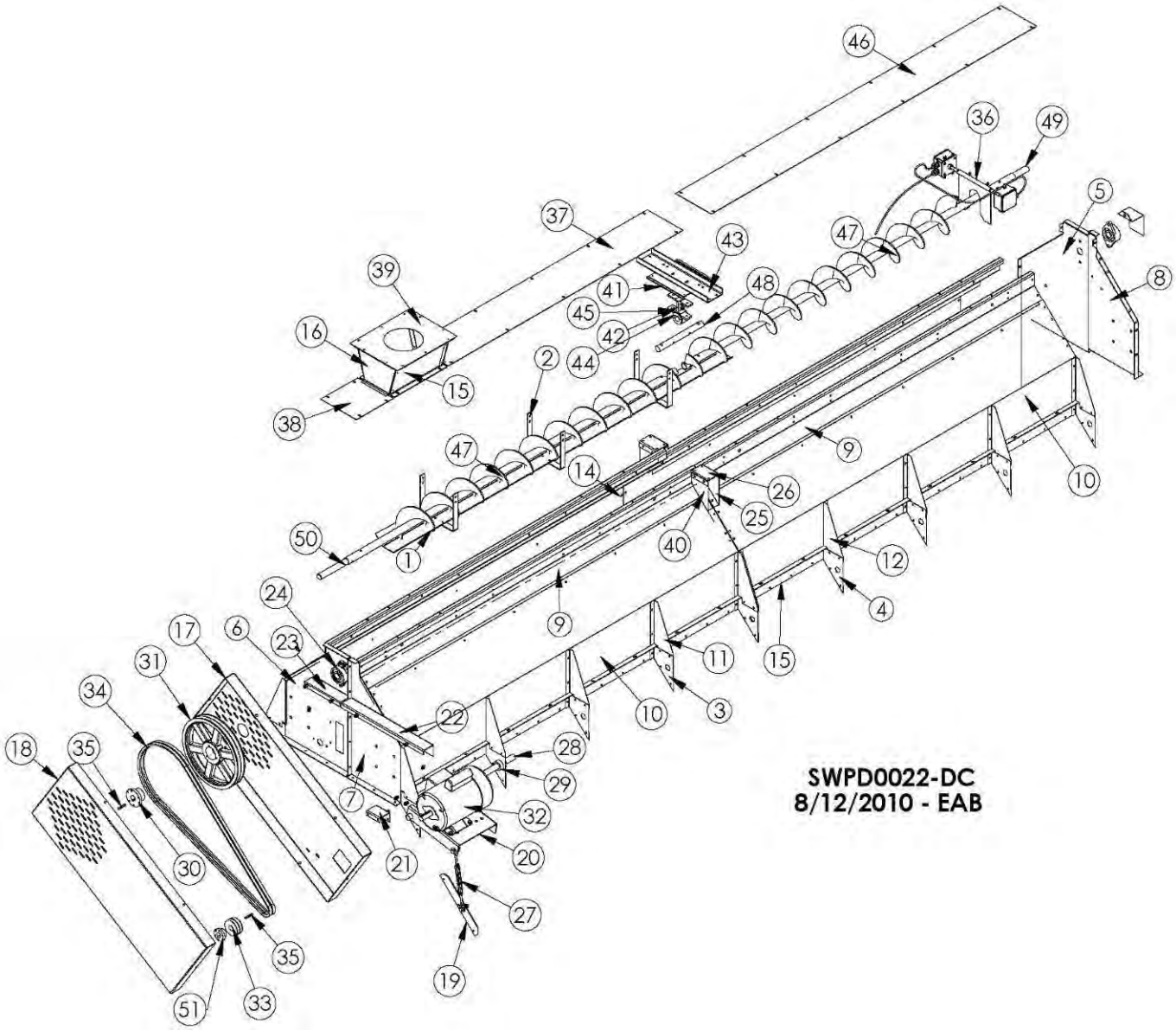
REF. #	DESCRIPTION	16'		20'		24'	
		QTY.	PART #	QTY.	PART #	QTY.	PART #
1	Side divider	14	T16110	18	T16110	22	T16110
2	Upper divider	14	T16111	18	T16111	22	T16111
3	Outside middle panel, .094" perf.	16	T16104	20	T16104	24	T16104
	Outsd. mid. panel, .094" perf., SS	16	T16104S	20	T16104S	24	T16104S
	Outside middle panel, .063" perf.	16	T17504W	20	T17504W	24	T17504W
4	Outside top panel, .094" perf.	16	T16105	20	T16105	24	T16105
	Outside top panel, .094" perf., SS	16	T16105S	20	T16105S	24	T16105S
	Outside top panel, .063" perf.	16	T17504W	20	T17504W	24	T17504W
5	Top inner panel, .094" perf.	8	T16114	20	T16114	24	T16114
	Top inner panel, .063" perf.	8	T17414W	20	T17414W	24	T17414W
6	Latch	16	T17906	20	T17906	24	T17906
7	Support latch strap	16	T17907	20	T17907	24	T17907
8	Outer cleanout door	16	T17908	20	T17908	24	T17908
	Outer cleanout door, .063" perf.	16	T17913W	20	T17913W	24	T17913W
9	Btm. outer panel, .094" perf,	16	T17909	20	T17909	24	T17909
	Btm. outer panel, .094" perf, SS	16	T17909S	20	T17909S	24	T17909S
	Btm. outer panel, .063" perf.	16	T17919W	20	T17919W	24	T17919W
10	Inner side panel, .094" perf.	16	T17910	20	T17910	24	T17910
	Inner side panel, .063" perf.	16	T17510WAM	20	T17510WAM	24	T17510WAM
11	Lower divider	14	T17924	18	T17924	22	T17924
12	Side rail, inner access door	32	T16219	36	T16219	40	T16219
13	Bottom rail, inner access door	16	T16220	20	T16220	24	T16220
14	Inner access door, .094" perf.	16	T16221	20	T16221	24	T16221
	Inner access door, .063" perf.	16	T16225W	20	T16225W	24	T16225W
15	Door latch bracket	16	T17657	20	T17657	24	T17657

COLUMN NARROWER

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	T181741	COLUMN NARROWER BACK PLATE	1
2	T181731	COLUMN NARROWER	1
3	J0536	SCREW,5/16-18,3/4",PLT,GR5,HHWZ	4
4	J1110	NUT, WHIZ, 5/16-18	12
5	J0529	SCREW,5/16-18X.75,TRS HG WZLK	8



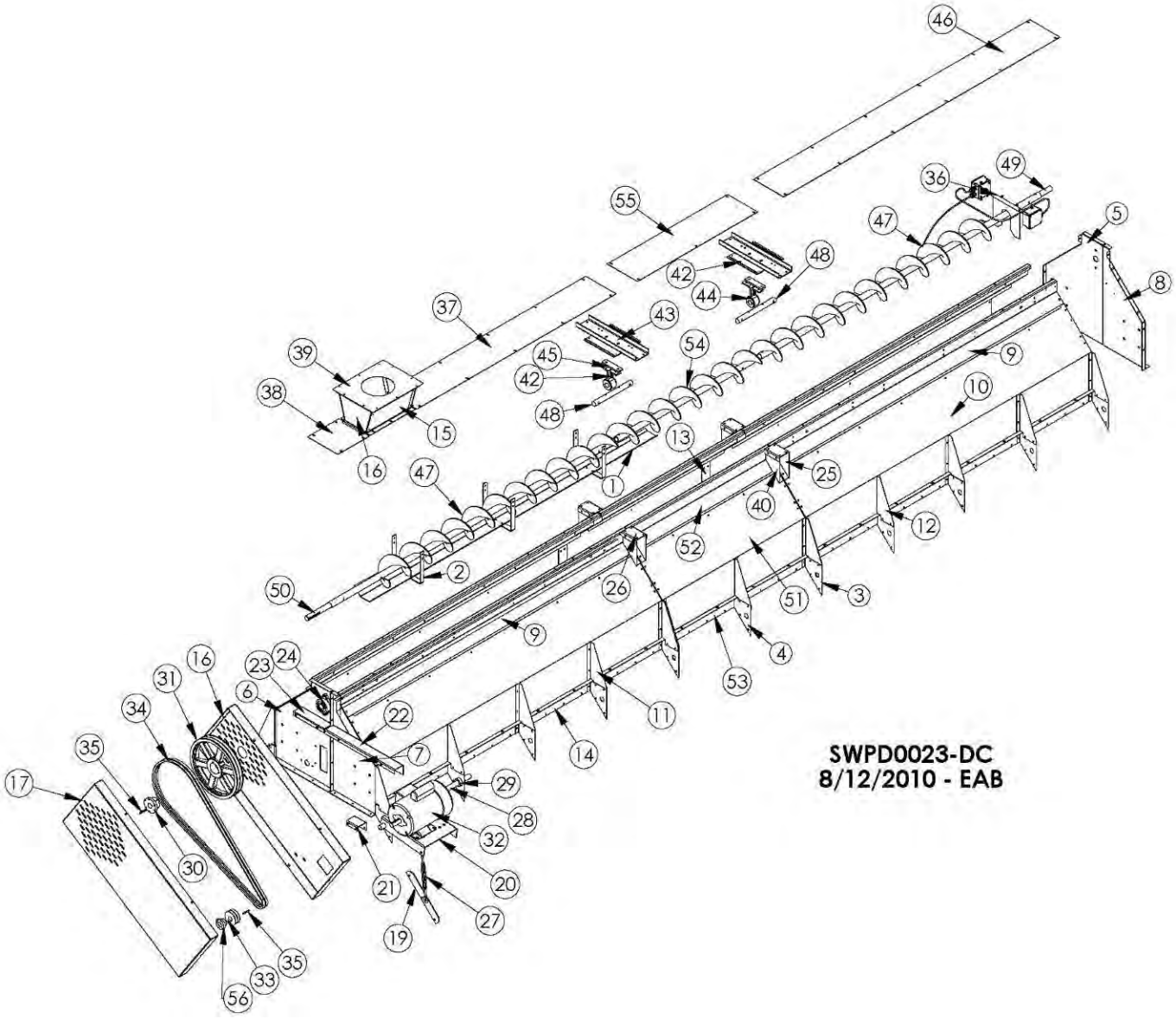
16′ WET BIN



16′ WET BIN PARTS

REF. #	DESCRIPTION	QTY.	PART #
1	Trash Pan	1	T16235
2	Support, Trash Pan	3	T16236
3	Left Support Gusset	12	T16117
4	Right Support Gusset	8	T16118
5	RR Wet Bin End Plate	1	T17401
6	RF Wet Bin End Plate	1	T17400
7	LF Wet Bin End Plate	1	T17402
8	LR Wet Bin End Plate	1	T17403
9	Top 8’ Panel Fill Switch	4	T17457
10	Wet Bin Side (Stainless, Perf)	4	T17450S
	Wet Bin Side (.094, Galvanized, Perf)	4	T17450
	Wet Bin Side (.063, Galvanized, Perf)	4	T17441W
11	LT Pivot Brace Wet Bin	12	T17410
12	RT Pivot Brace Wet Bin	8	T17411
13	Splice, Wet Bin Side	2	T17412
14	Bolt Down Lip 8’, 2000	4	T17453
15	Hopper Side	2	T17935
16	Hopper End	2	T17936
17	Top Auger Shield (Inner)	1	T16256
18	Top Auger Shield (Outer)	1	T16255
19	Plate, Turnbuckle, Connector	1	T16283
20	Top Motor Mount	1	T16277
21	Top Shield Brace	1	T16258
22	Bracket, LF Top Auger Shield	1	T16861
23	Bracket, RF Top Auger Shield	1	T16860
24	Bearing, 1.25, FLG, W/LC, HCFTS207 - 20	2	J0010
25	Splice Gusset Right	2	T16145
26	Channel, Splice, Short	2	T16146
27	Turnbuckle, 3/8” x 6”	1	J0904
28	Pivot, Motor Mount, Top	1	T18150
29	Collar, Shaft, 1-3/16”	2	J1338
30	Bushing, 1.25 SK	1	J0410
31	Pulley, 15.75OD, Double “B” Gr. SK	1	J03992
32	Motor (US only)	-	-
33	Pulley, 4.15 OD, Double, B, Cast	1	J03352
34	Belt, B95	2	J0252
35	Key, 1/4 x 1/4 x 2	2	F4499
36	Paddle, Assembly, D-C	1	T18262E
37	Lid, Wet Holding Bin	1	T16157
38	Lid, 10.5”, Extension, Wet Bin	1	T16159
39	Cover, Hopper	1	T17937
40	Splice Gusset Left	2	T16144
41	Crimp Plate	1	T16142
42	Hanger, Auger, T, 6CH2203	1	J0097
43	Splice Channel	1	T16143
44	Bushing, Wood, 1.25” ID	1	J0096
45	Spacer, T-Hanger, Top auger	1	T16096
46	Lid, 92-1/2” Wet Holding Bin	1	T16158
47	Top Auger	2	T16428
48	Shaft, 8’ Hanger Bearing	1	F4720
49	Shaft, 1.25” x 9”	1	G73291
50	Shaft, Top Front, 13-1/4”	1	T16436
51	Bushing, 28 mm	1	J04275

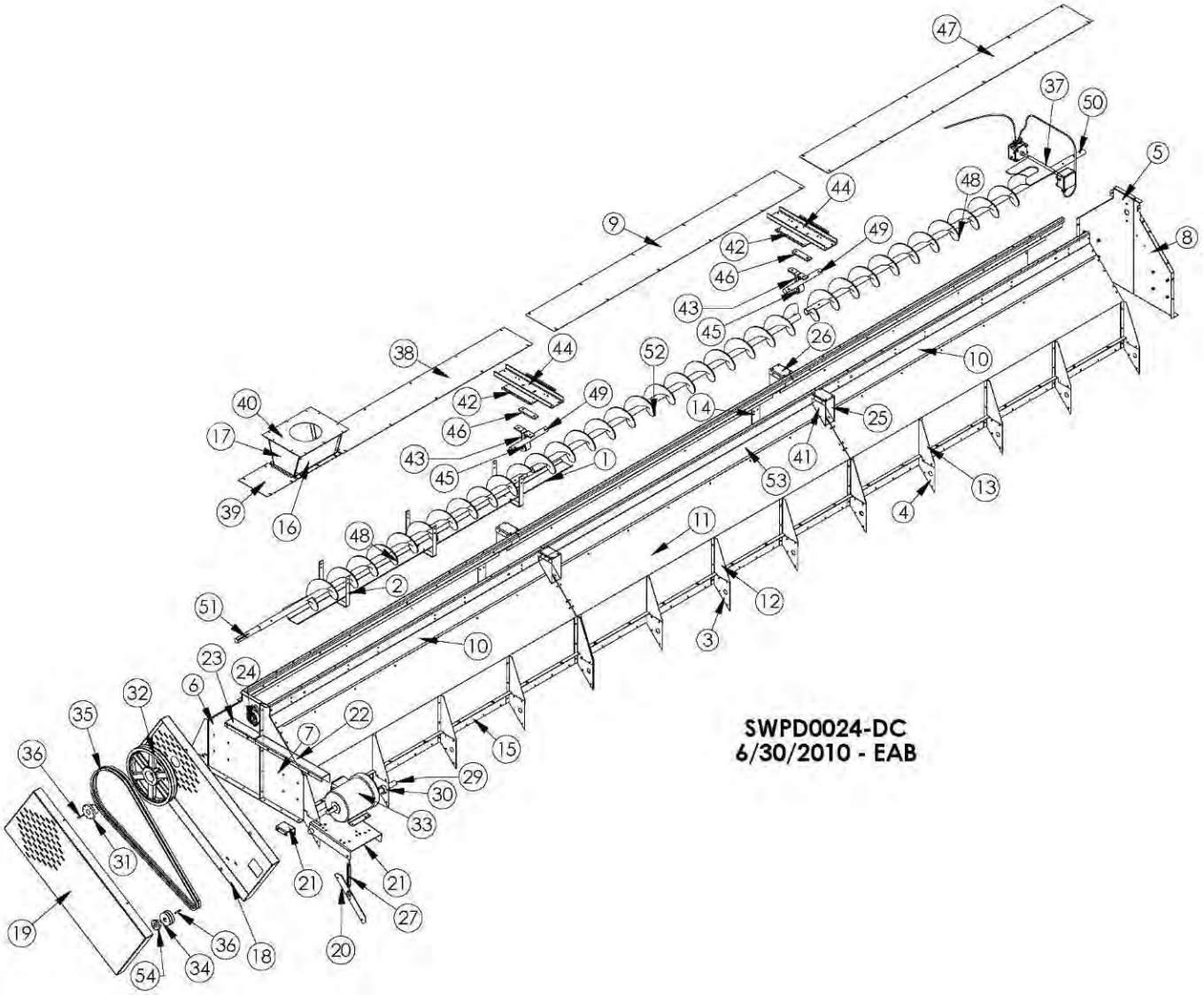
20′ WET BIN



20′ WET BIN PARTS

REF. #	DESCRIPTION	QTY.	PART #
1	Trash Pan	1	T16235
2	Support, Trash Pan	3	T16236
3	Left Support Gusset	16	T16117
4	Right Support Gusset	10	T16118
5	RR Wet Bin End Plate	1	T17401
6	RF Wet Bin End Plate	1	T17400
7	LF Wet Bin End Plate	1	T17402
8	LR Wet Bin End Plate	1	T17403
9	Top 8’ Panel Fill Switch	4	T17457
10	Wet Bin Side (Stainless, Perf)	4	T17450S
	Wet Bin Side (.094, Galvanized, Perf)	4	T17450
	Wet Bin Side (.063, Galvanized, Perf)	4	T17441W
11	LT Pivot Brace Wet Bin	12	T17410
12	RT Pivot Brace Wet Bin	8	T17411
13	Splice, Wet Bin Side	2	T17412
14	Bolt Down Lip 8’, 2000	4	T17453
15	Hopper Side	2	T17935
16	Hopper End	2	T17936
17	Top Auger Shield (Inner)	1	T16256
18	Top Auger Shield (Outer)	1	T16255
19	Plate, Turnbuckle, Connector	1	T16283
20	Top Motor Mount	1	T16277
21	Top Shield Brace	1	T16258
22	Bracket, LF Top Auger Shield	1	T16861
23	Bracket, RF Top Auger Shield	1	T16860
24	Bearing, 1.25, FLG, W/LC, HCFTS207 - 20	2	J0010
25	Splice Gusset Right	2	T16145
26	Channel, Splice, Short	2	T16146
27	Turnbuckle, 3/8” x 6”	1	J0904
28	Pivot, Motor Mount, Top	1	T18150
29	Collar, Shaft, 1-3/16”	2	J1338
30	Bushing, 1.25 SK	1	J0410
31	Pulley, 15.75OD, Double “B” Gr. SK	1	J03992
32	Motor (US only)	-	-
33	Pulley, 4.15 OD, Double, B, Cast	1	J03352
34	Belt, B95	2	J0252
35	Key, 1/4 x 1/4 x 2	2	F4499
36	Paddle, Assembly, D-C	1	T18262E
37	Lid, Wet Holding Bin	1	T16157
38	Lid, 10.5”, Extension, Wet Bin	1	T16159
39	Cover, Hopper	1	T17937
40	Splice Gusset Left	2	T16144
41	Crimp Plate	1	T16142
42	Hanger, Auger, T, 6CH2203	1	J0097
43	Splice Channel	1	T16143
44	Bushing, Wood, 1.25” ID	1	J0096
45	Spacer, T-Hanger, Top auger	1	T16096
46	Lid, 92-1/2” Wet Holding Bin	1	T16158
47	Top Auger	2	T16428
48	Shaft, 8’ Hanger Bearing	2	F4720
49	Shaft, 1.25” x 9”	1	G73291
50	Shaft, Top Front, 13-1/4”	1	T16436
51	Side, Wet Bin, 4’, 2000	2	T12525
	Side, Wet Bin, 4' (.063, Galvanized, Perf)	2	T12536W
52	Top 4’ Panel (LR) 12’	2	T20526
53	Bolt Down Lip, 4’	2	T12524
54	Top Middle Auger 20’	1	T16427
55	Lid, Wet Holding Bin 20’	1	T20158
56	Bushing, 28 mm	1	J04275

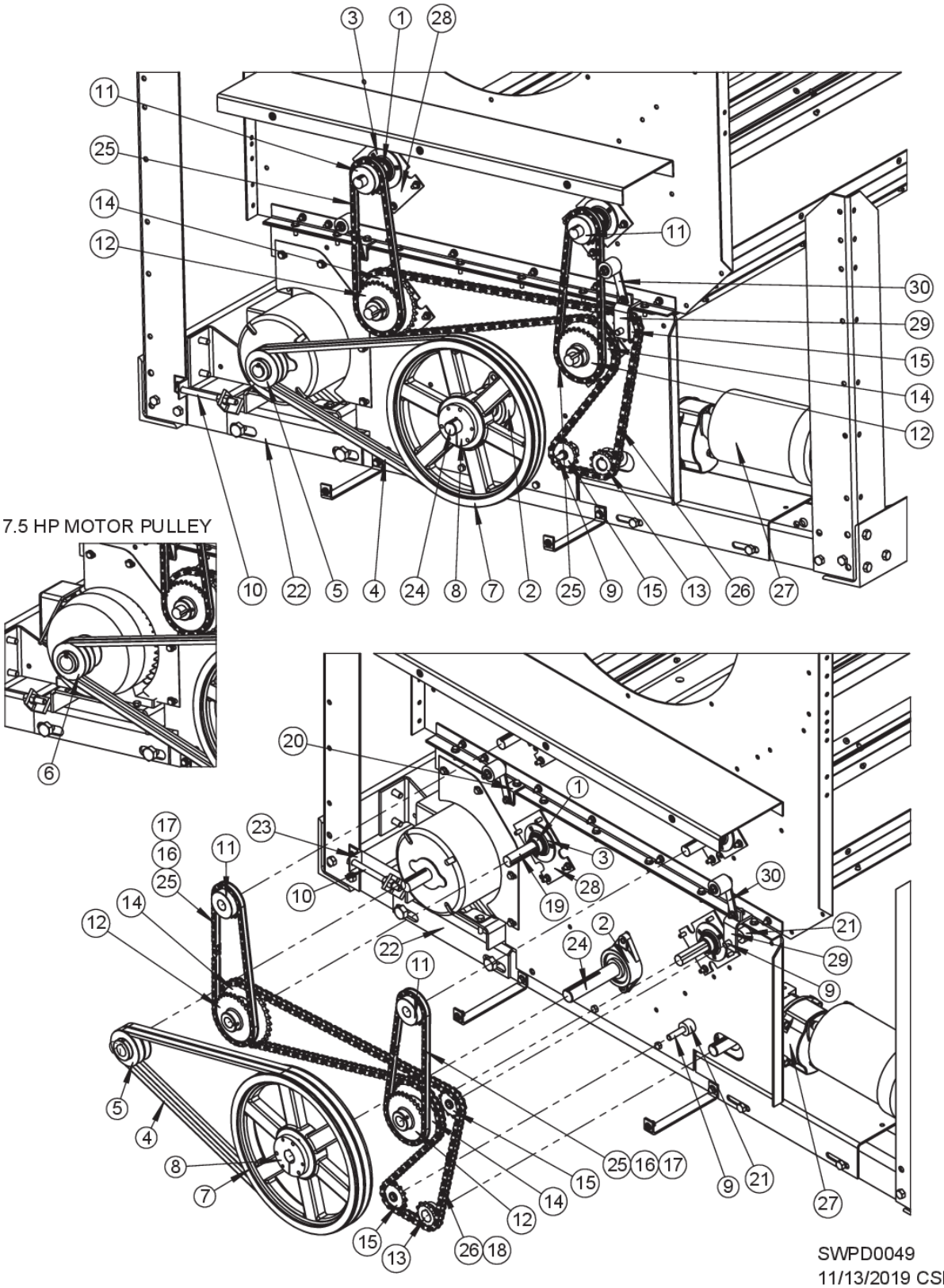
24′ WET BIN



24′ WET BIN PARTS

REF. #	DESCRIPTION	QTY.	PART #
1	Trash Pan	1	T16235
2	Support, Trash Pan	3	T16236
3	Left Support Gusset	18	T16117
4	Right Support Gusset	12	T16118
5	RR Wet Bin End Plate	1	T17401
6	RF Wet Bin End Plate	1	T17400
7	LF Wet Bin End Plate	1	T17402
8	LR Wet Bin End Plate	1	T17403
9	Lid, 87-3/4” Wet Holding Bin	1	T16167
10	Top 8’ Panel Fill Switch	4	T17457
11	Wet Bin Side (Stainless, Perf)	6	T17450S
	Wet Bin Side (.094, Galvanized, Perf)	6	T17450
	Wet Bin Side (.063, Galvanized, Perf)	6	T17441W
12	LT Pivot Brace Wet Bin	18	T17410
13	RT Pivot Brace Wet Bin	12	T17411
14	Splice, Wet Bin Side	4	T17412
15	Bolt Down Lip 8’, 2000	6	T17453
16	Hopper Side	2	T17935
17	Hopper End	2	T17936
18	Top Auger Shield (Inner)	1	T16256
19	Top Auger Shield (Outer)	1	T16255
20	Plate, Turnbuckle, Connector	1	T16283
21	Top Motor Mount	1	T16277
22	Top Shield Brace	1	T16258
23	Bracket, LF Top Auger Shield	1	T16861
24	Bracket, RF Top Auger Shield	1	T16860
25	Bearing, 1.25, FLG, W/LC, HCFTS207 - 20	2	J0010
26	Splice Gusset Right	4	T16145
27	Channel, Splice, Short	4	T16146
28	Turnbuckle, 3/8” x 6”	1	J0904
29	Pivot, Motor Mount, Top	1	T18150
30	Collar, Shaft, 1-3/16”	2	J1338
31	Bushing, 1.25 SK	1	J0410
32	Pulley, 15.75OD, Double “B” Gr. SK	1	J03992
33	Motor (US only)	-	-
34	Pulley, 4.15 OD, Double, B, Cast	1	J03352
35	Belt, B95	2	J0252
36	Key, 1/4 x 1/4 x 2	2	F4499
37	Paddle, Assembly, D-C	1	T18262E
38	Lid, Wet Holding Bin	1	T16157
39	Lid, 10.5”, Extension, Wet Bin	1	T16159
40	Cover, Hopper	1	T17937
41	Splice Gusset Left	4	T16144
42	Crimp Plate	2	T16142
43	Hanger, Auger, T, 6CH2203	2	J0097
44	Splice Channel	2	T16143
45	Bushing, Wood, 1.25” ID	2	J0096
46	Spacer, T-Hanger, Top auger	2	T16096
47	Lid, 92-1/2” Wet Holding Bin	1	T16158
48	Top Auger	2	T16428
49	Shaft, 8’ Hanger Bearing	2	F4720
50	Shaft, 1.25” x 9”	1	G73291
51	Shaft, Top Front, 13-1/4”	1	T16436
52	Auger, Bottom Front, 93-1/2”	1	T16430
53	Top 8’ Panel (LR&RF) 2000	2	T24451
54	Bushing, 28 mm	1	J04275

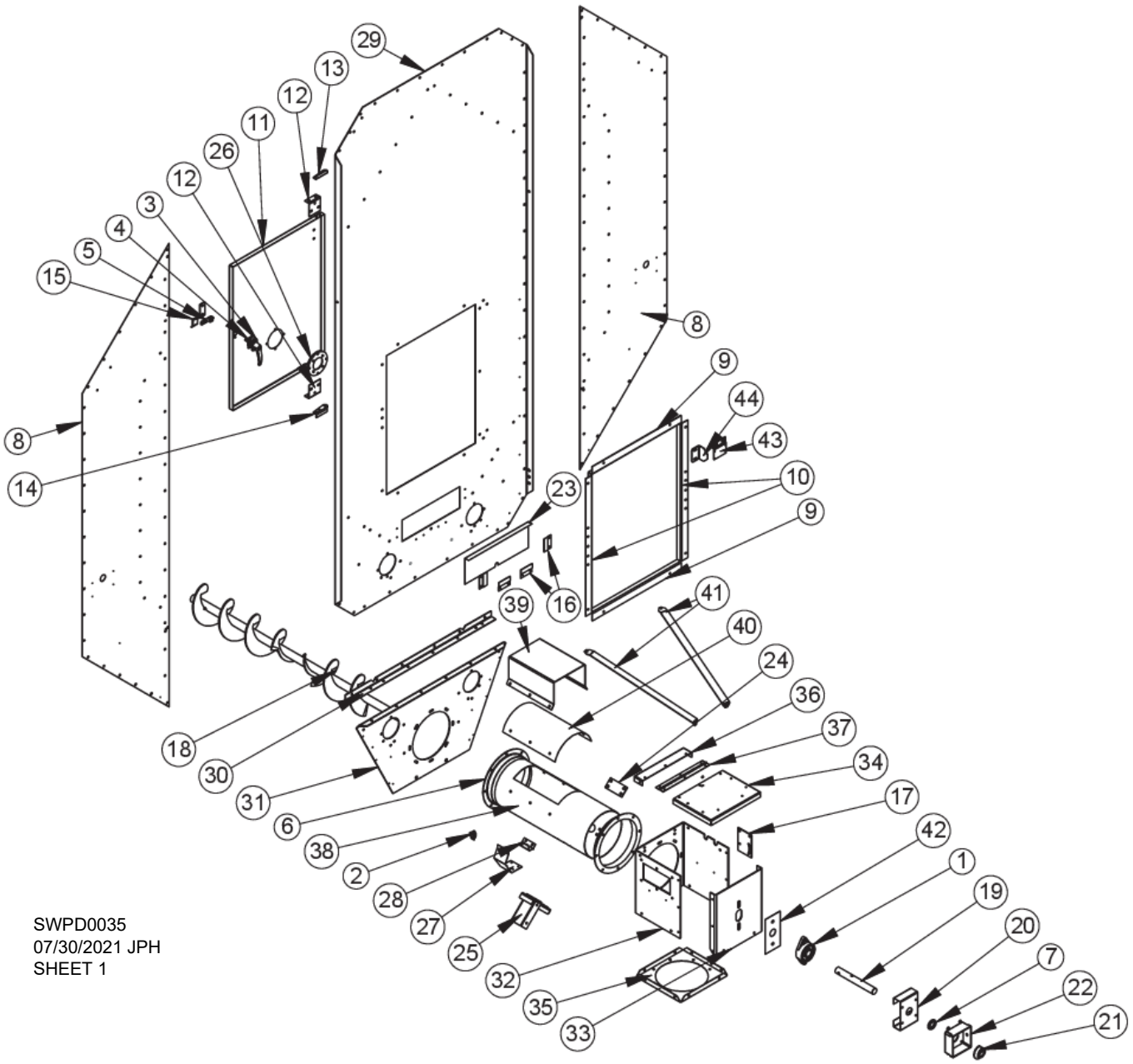
FRONT (DRIVE) END OF DRYER
3-5 HP AUGER UNLOAD DRIVE COMPONENTS



PARTS FOR FRONT (DRIVE) END OF DRYER

REF. #	DESCRIPTION	3-5HP QTY.	7.5HP QTY.	PART #
1	Bearing, 1”, w/ lock collar	4	4	J0005
2	Flange bearing, 1-1/4", w/ lock collar	1	1	J0010
3	Bearing flangette, 3-hole	8	8	J0098
4	Belt, BX72, 15-3/4 x 3-1/2”	2	2	J0246
5	Pulley, 3-1/2” OD, 1-1/8”, double	1	-	J0317
6	Pulley, 3-1/2” OD, 1-3/8”, double	-	1	J0318
7	Pulley, 15-3/4” OD, double	1	1	J03992
8	Bushing, 1-1/4”	1	1	J0410
9	Screw, 1/2 - 13 x 3”	2	2	J0750
10	Bolt, 1/2 - 13 x 6”	1	1	J0765
11	Sprocket, 40B, 20-tooth, 1” bore, keyed	2	2	J16487
12	Sprocket, 40B, 30-tooth, 1” bore	2	2	J1649
13	Sprocket, 50B, 12-tooth, 1-1/8” bore	1	1	J16612
14	Sprocket, 50B, 30-tooth, 1” bore	2	2	J1678
15	Sprocket, idler, 50B, 13-tooth	2	2	J1685
16	Chain link, #40 connector	2	2	J1745
17	Chain link, #40 offset, 1/2 link	2	2	J1750
18	Chain link, #50 connector	2	2	J1760
19	Front shaft, meter roll	4	4	T16266
20	Chain tightener bracket	1	1	T16274
21	Spacer, sprocket	2	2	T16282
22	Unload motor mount weldment	1	1	T16290
23	Tightener angle	1	1	T16329
24	Shaft, front, 13-1/4”	1	1	T16436
25	Chain, #40, 73 links	2	2	T16800
26	Chain, #50,157 links	1	1	T16803
27	Reducer with A/C motor & mount assy.	1	1	T17282AM
28	Meter plate	4	4	T17920
29	Bracket weldment, idler sprocket	1	1	T17965
30	Chain tightener	2	2	T7367

BACK (DISCHARGE) END OF FULL-PLENUM DRYER

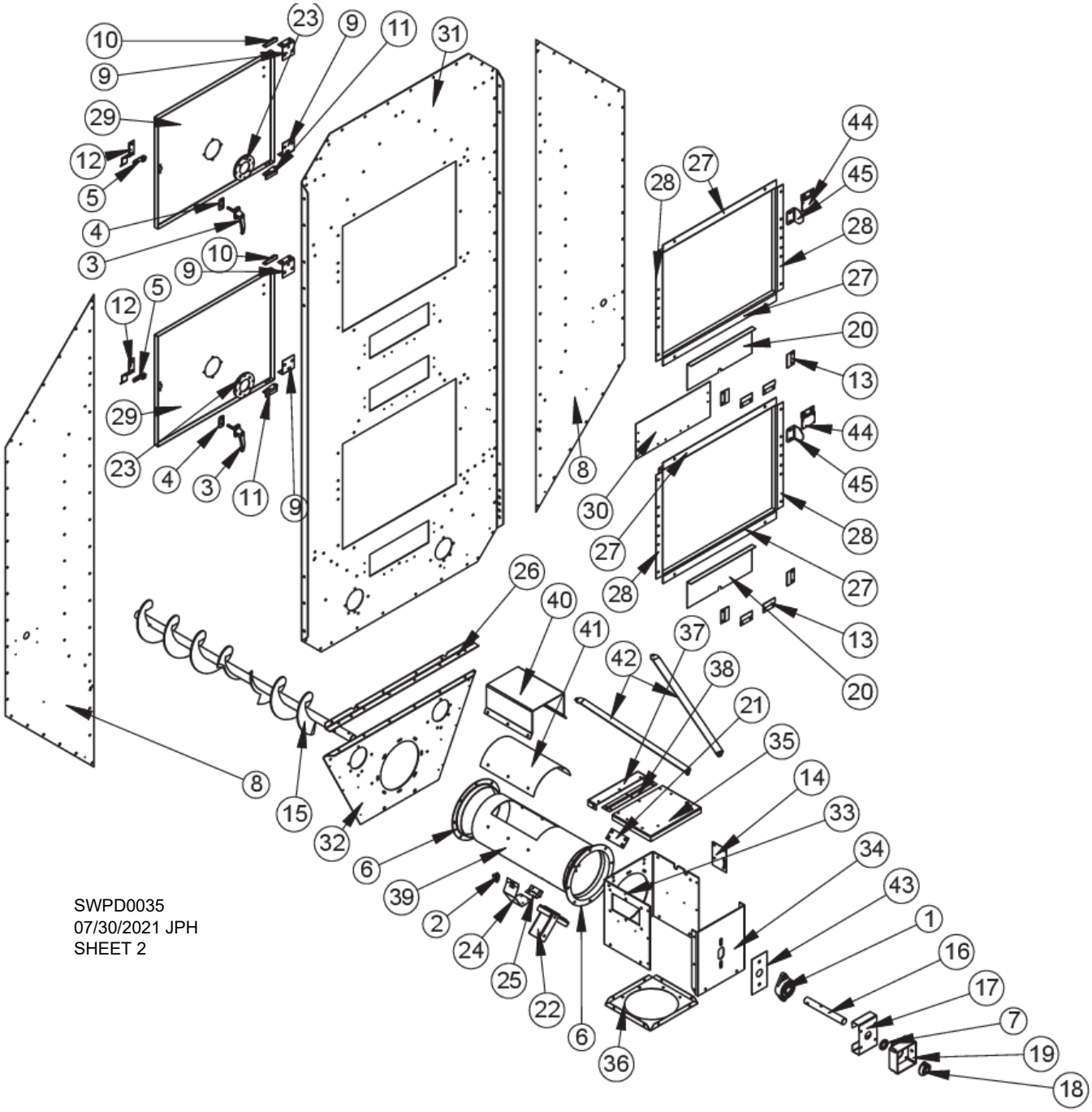


SWPD0035
07/30/2021 JPH
SHEET 1

PARTS FOR BACK (DISCHARGE) END OF FULL-PLENUM DRYER

REF. #	DESCRIPTION	QTY.	PART #
1	Flange bearing, 1-1/4”, w/ lock collar	1	J0010
2	Latch	1	J2310
3	Locking handle	1	J2313
4	Handle gasket	1	J2314
5	Adjustable latch	1	J2318
6	Flange ring, 10"	2	J6610
7	Seal, 2" OD, 1-1/4” ID	1	J7023
8	Side end plate	2	T16101
9	Door edging, top & bottom	2	T16136
10	Door edging, sides	2	T16137
11	Access door	1	T16147
12	Hinge bracket	2	T16148
13	Top hinge	1	T16149
14	Bottom hinge	1	T16150
15	Rear catch	1	T16151
16	Blowout door side rail	4	T16154
17	Switch plate	1	T16358
18	Bottom rear auger	1	T16431
19	Bottom auger shaft, 1-1/4 x 10”	1	T17251
20	Proximity switch bracket	1	T17252
21	Proximity switch target	1	T17256
22	Proximity switch box	1	T17263
23	Blowout door	1	T17658
24	Sample spout cover	1	T17663
25	Sample spout	1	T17668
26	Sight glass assy., 2-1/2", 5" OD	1	T17688
27	Moisture sensor strap	1	T17850
28	Moisture sensor hinge	1	T17851
29	Rear end plate	1	T17916
30	Bottom splice angle	1	T17925
31	Rear bottom end plate	1	T25521
32	Sump box front & sides	1	T25670
33	Sump box rear plate	1	T25671
34	Sump box lid	1	T25672
35	Sump box bottom	1	T25674
36	Sump box lid side hinge	1	T25675
37	Sump box hinge	1	T25676
38	Discharge tube	1	T25677
39	Unload tube step	1	T25678
40	Unload tube cover	1	T25679
41	Unload tube brace	2	T25681
42	Bearing shim plate	1	T25682
43	Switch mounting bracket	1	T80215
44	Switch angle	1	T80216

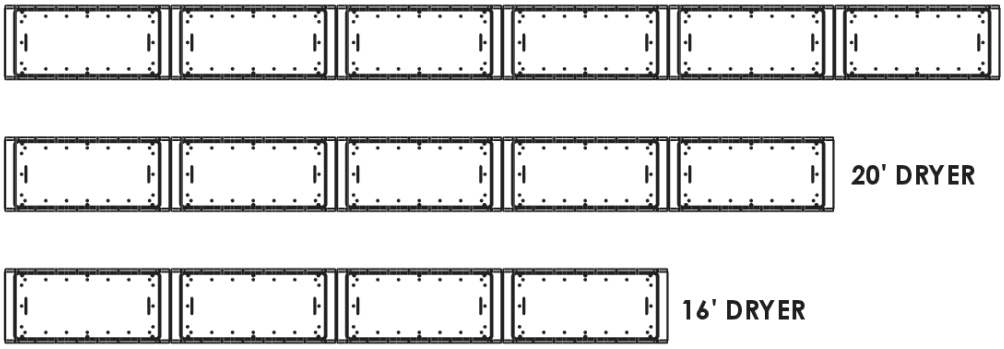
BACK (DISCHARGE) END OF SPLIT-PLENUM DRYER

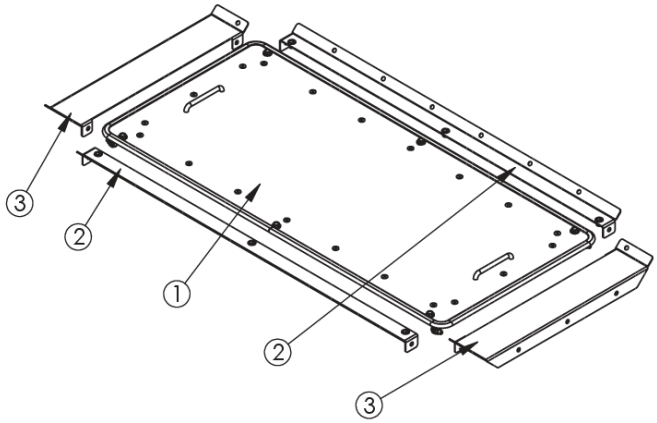


PARTS FOR BACK (DISCHARGE) END OF SPLIT-PLENUM DRYER

REF. #	DESCRIPTION	QTY.	PART #
1	Flange bearing, 1-1/4”, w/ lock collar	1	J0010
2	Latch	1	J2310
3	Locking handle	2	J2313
4	Handle gasket	2	J2314
5	Adjustable latch	2	J2318
6	Flange ring, 10"	2	J6610
7	Seal, 2" OD, 1-1/4” ID	1	J7023
8	Side end plate	2	T16101
9	Hinge bracket	4	T16148
10	Top hinge	2	T16149
11	Bottom hinge	2	T16150
12	Rear catch	2	T16151
13	Blowout door side rail	8	T16154
14	Switch plate	1	T16358
15	Bottom rear auger	1	T16431
16	Bottom auger shaft, 1-1/4 x 10”	1	T17251
17	Proximity switch bracket	1	T17252
18	Proximity switch target	1	T17256
19	Proximity switch box	1	T17263
20	Blowout door	2	T17658
21	Sample spout cover	1	T17663
22	Sample spout	1	T17668
23	Sight glass assy., 2-1/2", 5" OD	2	T17688
24	Moisture sensor strap	1	T17850
25	Moisture sensor hinge	1	T17851
26	Bottom splice angle	1	T17925
27	Door edging, top & bottom	4	T24136
28	Door edging, sides	4	T24137
29	Access door	2	T24147
30	Blowout door cover	1	T24602
31	Rear end plate	1	T24916
32	Rear bottom end plate	1	T25521
33	Sump box front & sides	1	T25670
34	Sump box rear plate	1	T25671
35	Sump box lid	1	T25672
36	Sump box bottom	1	T25674
37	Sump box lid side hinge	1	T25675
38	Sump box hinge	1	T25676
39	Discharge tube	1	T25677
40	Unload tube step	1	T25678
41	Unload tube cover	1	T25679
42	Unload tube brace	2	T25681
43	Bearing shim plate	1	T25682
44	Switch mounting bracket	2	T80215
45	Switch angle	2	T80216

INNER CLEANOUT PANELS

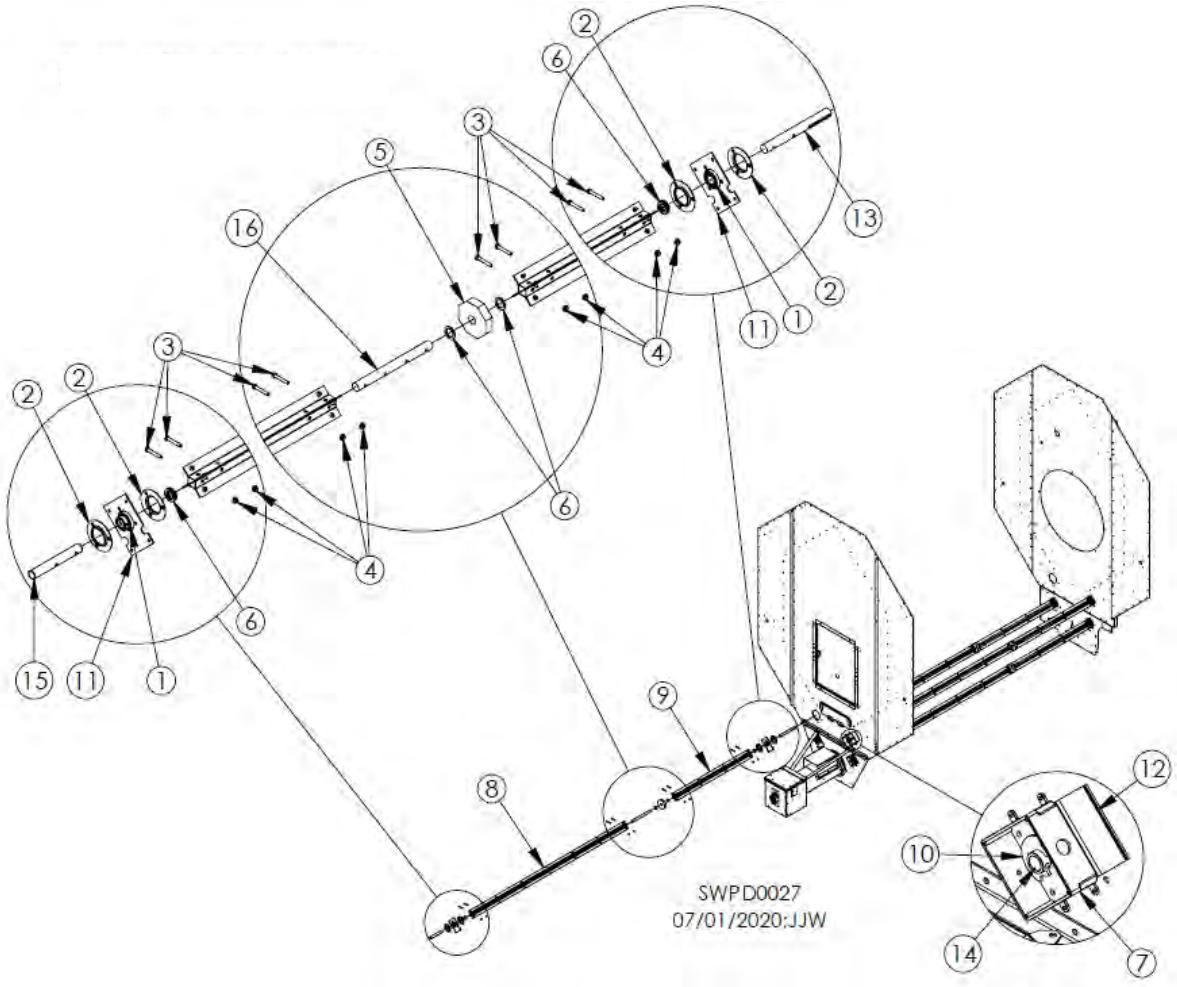




SWPD0162
11/08/2018 TSR

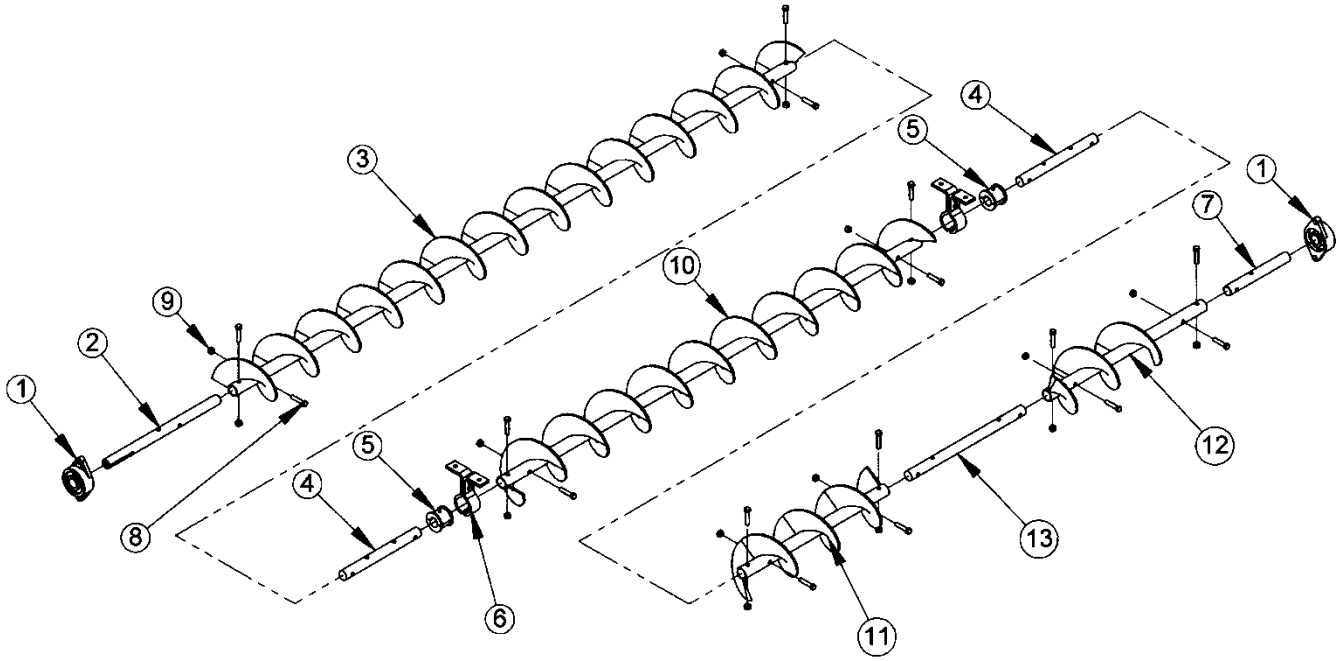
REF. #	DESCRIPTION	QTY.	PART #
1	Bolt-on plenum floor assy.	1	T17212
2	Side frame	2	T17204AM
3	End frame	2	T17205

METERING ROLLS



REF. #	DESCRIPTION	16' QTY.	20' QTY.	24' QTY.	PART #
1	Bearing, 1", w/ lock collar	8	8	8	J00058
2	Flangette, 3-hole	16	16	16	J0098
3	Screw, 5/16 – 18 x 2”	32	48	48	J0585
4	Whiz nut, 5/16” - 18	32	48	48	J1110
5	Wooden bushing, 1" ID	4	8	8	J1245
6	Machine bushing, 1”, 18ga	80	96	96	J1266
7	Box, 5” x 5”	1	1	1	T16265
8	Metering roll assy., 8'	8	8	12	J3033
9	Metering roll assy., 4'	0	4	0	J3032
10	Target	1	1	1	T17281
11	Meter plate	8	8	8	T17920
12	Encoder bracket	1	1	1	T17921
13	Front shaft	4	4	4	T18266
14	Rear shaft, top	1	1	1	T18267
15	Rear shaft, bottom	3	3	3	T18268
16	Connecting shaft	4	8	8	T18269

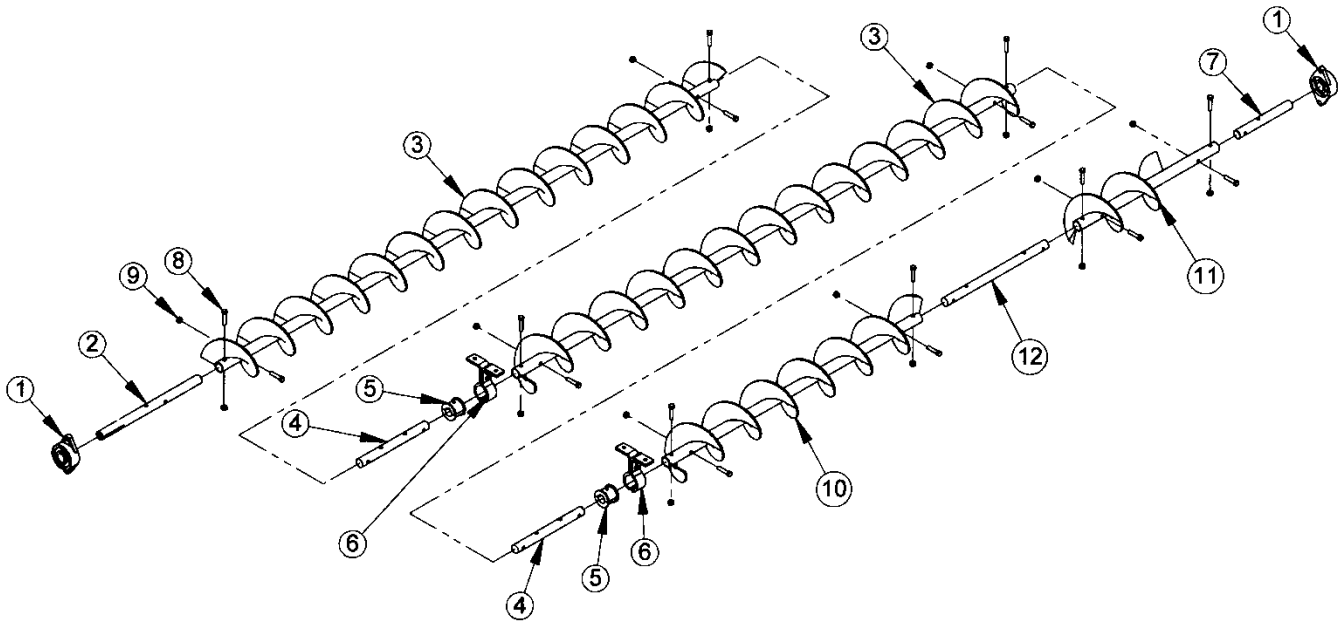
16′ BOTTOM AUGER



SWPD0032

REF. #	DESCRIPTION	QTY.	PART #	
			SINGLE MODULE/DOUBLE STACK	TRIPLE STACK
1	Flange bearing, 1-1/4”, w/ lock collar	2	J0010	J0010
2	Shaft, front, 13-1/4”	1	T16436	T16436
3	Front auger, 93-1/2″	1	T16430	---
	Front auger, 93-1/2″, 8″ OD	2	---	T17430
4	Hanger bearing shaft, 8″	2	F4720	F4720
5	Wooden bushing, 1-1/4” ID	2	J0096	J0096
6	Auger hanger	2	J0097	J0097
7	Shaft, 1-1/4” x 10″	1	T17251	T17251
8	Screw, 7/16 – 14 x 2”	16	J0718	J0718
9	Lock nut, 7/16” - 14	16	J1034	J1034
10	Middle auger, 69-1/2″	1	T16432	---
	Middle auger, 69-1/2″, 8″ OD	1	---	T17432
11	Rear auger, 24″	1	T12498	---
	Rear auger, 24″, 8″	1	---	T17434
12	Auger extension	1	T12493	---
	Auger extension	1	---	T17435
13	Shaft, 19”	1	F4723	F4723

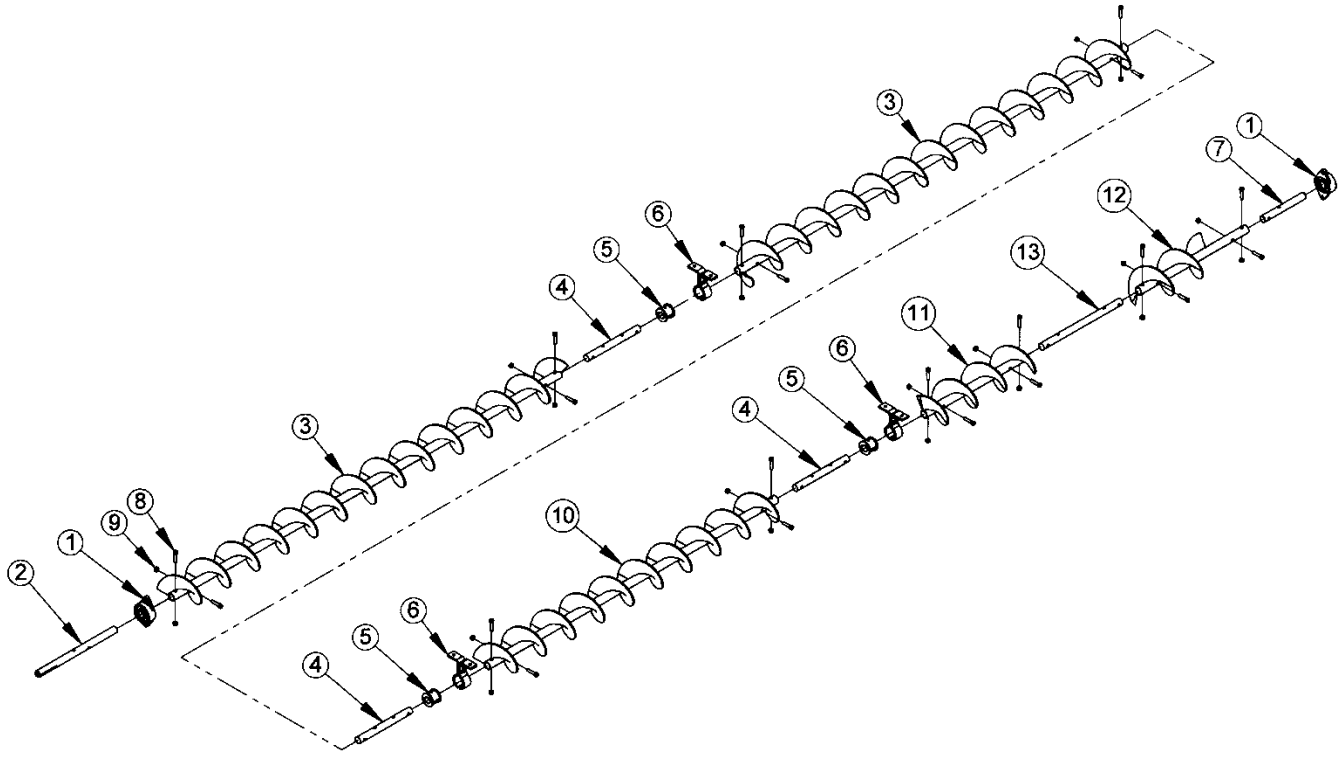
20′ BOTTOM AUGER



SWPD0033

REF. #	DESCRIPTION	QTY.	PART #	
			SINGLE MODULE/DOUBLE STACK	TRIPLE STACK
1	Flange bearing, 1-1/4”, w/ lock collar	2	J0010	J0010
2	Shaft, front, 13-1/4”	1	T16436	T16436
3	Front auger, 93-1/2″	2	T16430	---
	Front auger, 93-1/2″, 8″ OD	2	---	T17430
4	Hanger bearing shaft, 8″	2	F4720	F4720
5	Wooden bushing, 1-1/4” ID	2	J0096	J0096
6	Auger hanger	2	J0097	J0097
7	Shaft, 1-1/4” x 10″	1	T17251	T17251
8	Screw, 7/16 – 14 x 2”	16	J0718	J0718
9	Lock nut, 7/16” - 14	16	J1034	J1034
10	Rear auger, 47-1/2″	1	T12492	---
	Rear auger, 47-1/2″, 8″	1	---	T17438
11	Auger extension	1	T12493	---
	Auger extension	1	---	T17435
12	Shaft, 19”	1	F4723	F4723

24′ BOTTOM AUGER



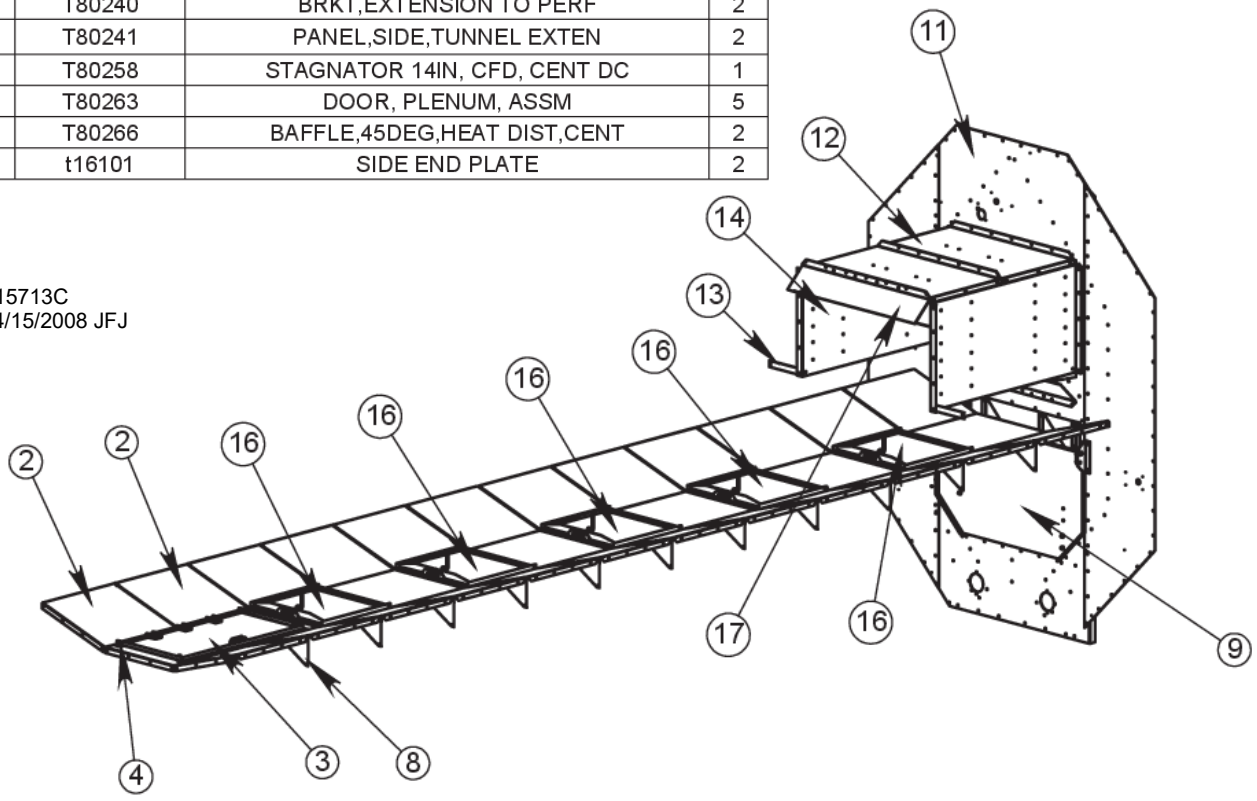
SWPD0034

REF. #	DESCRIPTION	QTY.	PART #	
			SINGLE MODULE/DOUBLE STACK	TRIPLE STACK
1	Flange bearing, 1-1/4”, w/ lock collar	2	J0010	J0010
2	Shaft, front, 13-1/4”	1	T16436	T16436
3	Front auger, 93-1/2″	2	T16430	---
	Front auger, 93-1/2″, 8″ OD	2	---	T17430
4	Hanger bearing shaft, 8″	3	F4720	F4720
5	Wooden bushing, 1-1/4” ID	3	J0096	J0096
6	Auger hanger	3	J0097	J0097
7	Shaft, 1-1/4” x 10″	1	T17251	T17251
8	Screw, 7/16 – 14 x 2”	20	J0718	J0718
9	Lock nut, 7/16” - 14	20	J1034	J1034
10	Middle auger, 69-1/2″	1	T16432	---
	Middle auger, 69-1/2″, 8″ OD	1	---	T17432
11	Rear auger, 24″	1	T12498	---
	Rear auger, 24″, 8″	1	---	T17434
12	Auger extension	1	T12493	---
	Auger extension	1	---	T17435
13	Shaft, 19”	1	F4723	F4723

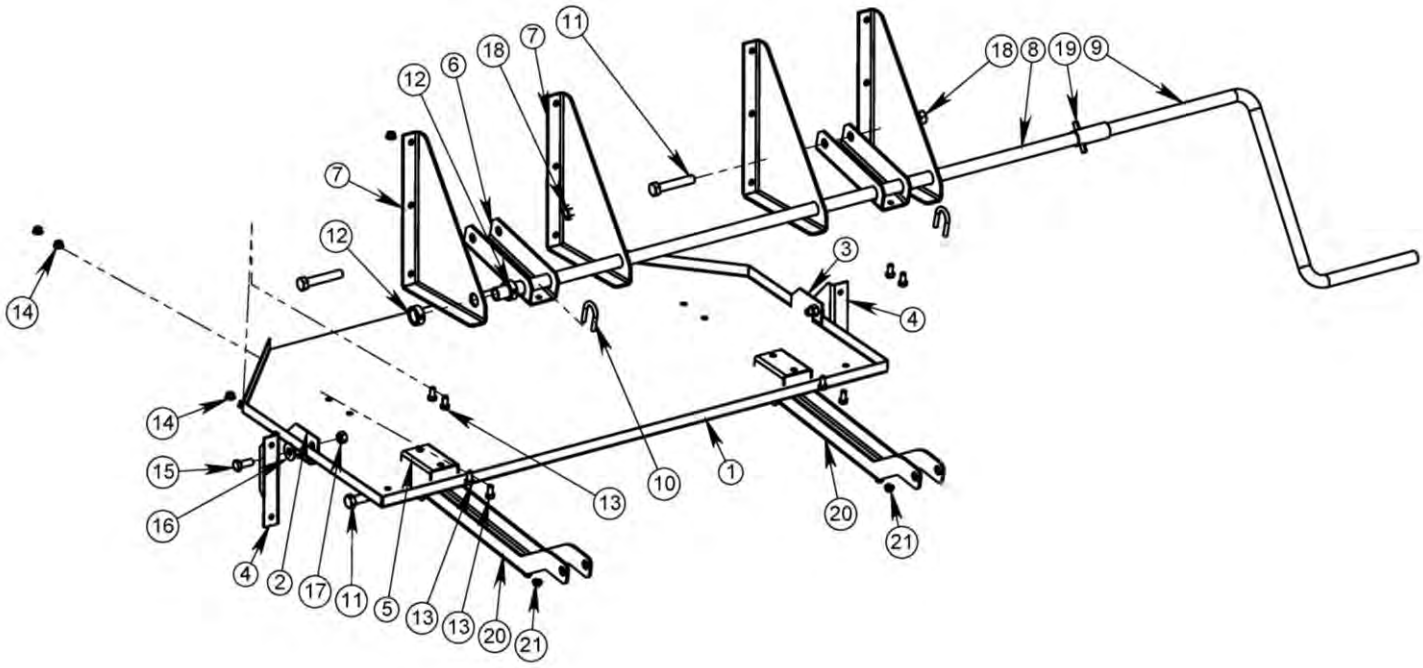
T15713C, PLENUM DIVIDER

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	J1317	COLLAR, SHAFT, 5/16"	2
2	T17380	DIVIDER,PLENUM,REAR,DOOR	2
3	T17381	DOOR,REAR,PLENUM,HINGED,ASSY	1
4	T17384	CLIP,HINGE,ROD,DOOR,REAR	2
5	T17385	CLIP,UNDER,REAR,CATCH,LATCH	2
6	T17386	ROD,HINGE,DOOR,REAR,41"	1
7	T24600	DIVIDER, PLENUM	5
8	T24601	GUSSET, PLENUM DIVIDER	22
9	T43940	AIR BAFFLE ASSEMBLY	1
10	T80144AM	DIVIDER WITH HOLE ASSM, WITH NUT INSERTS	5
11	T80150	PLATE,FRONT END,CENT FAN	1
12	T80151	TOP PANEL, HEATER SHIELD	2
13	T80240	BRKT,EXTENSION TO PERF	2
14	T80241	PANEL,SIDE,TUNNEL EXTEN	2
15	T80258	STAGNATOR 14IN, CFD, CENT DC	1
16	T80263	DOOR, PLENUM, ASSM	5
17	T80266	BAFFLE,45DEG,HEAT DIST,CENT	2
18	t16101	SIDE END PLATE	2

T15713C
04/15/2008 JFJ

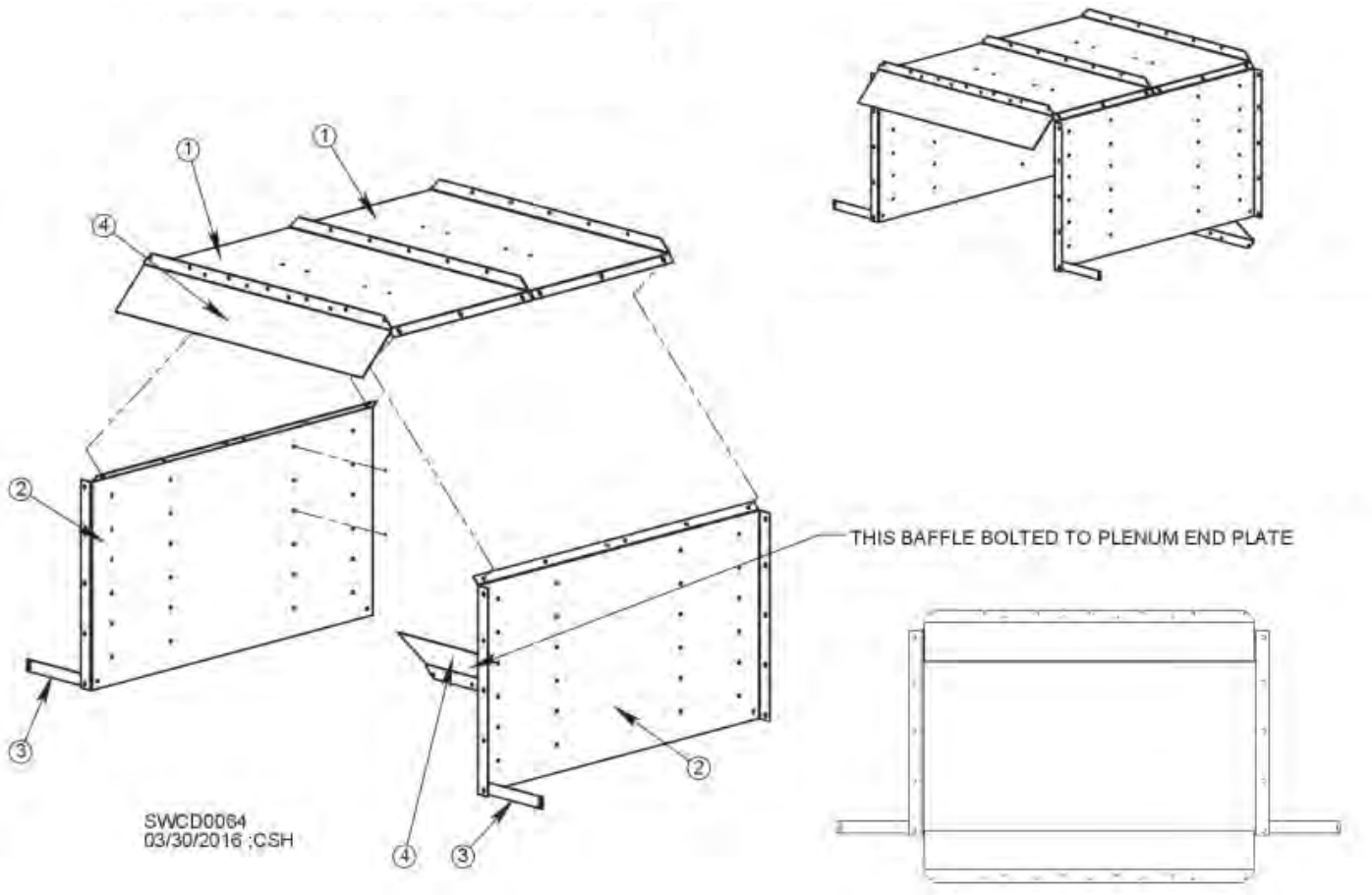


AIR BAFFLE



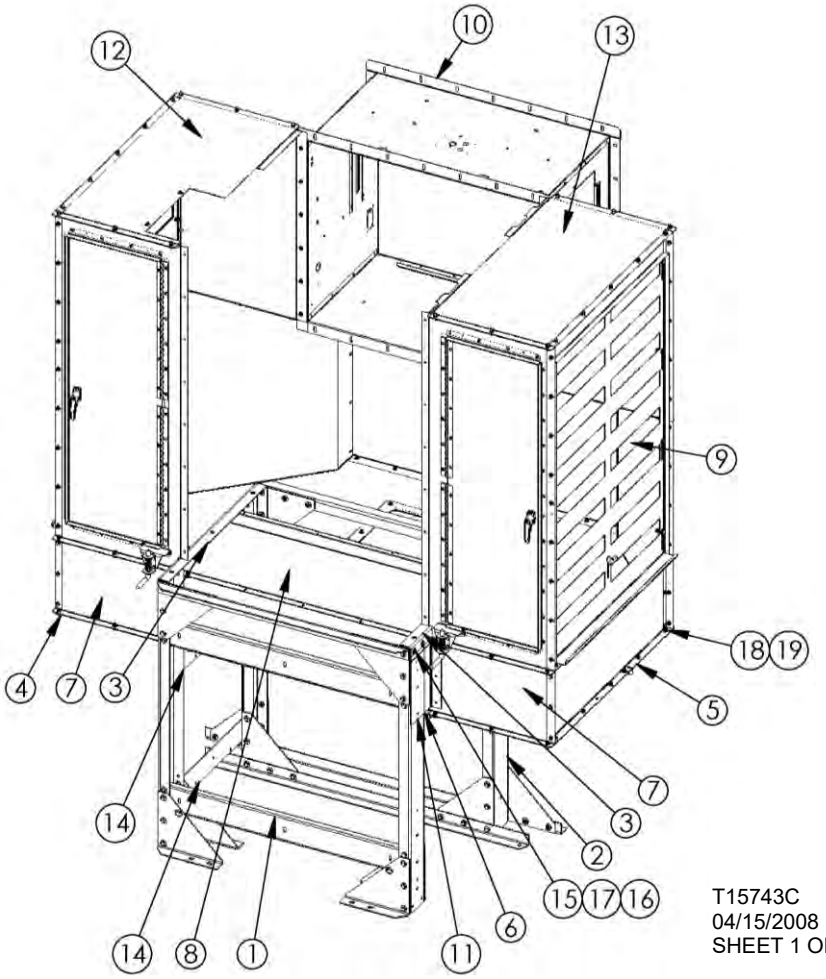
REF. #	DESCRIPTION	QTY.	PART #
1	Baffle panel	1	T43941
2	Hinge baffle panel, right	1	T43942
3	Hinge baffle panel, left	1	T43943
4	Hinge, front end plate	2	T43944
5	Linkage bracket, panel	2	T43945
6	Linkage arm short	2	T43946
7	Pivot bracket	4	T43948
8	Pivot rod	1	T43949
9	Pivot handle weldment	1	T43952
10	U-bolt, 5/16” - 18, 1-1/16” ID 1-3/4” dia.	2	J0810
11	Screw 5/8-11x3-1/2	4	J0795
12	1″ shaft collar	2	J1335
13	Screw, 3/8 – 16 x 3/4"	8	J0605
14	Whizlok flange nut, 3/8” - 16	8	J1017
15	Screw, 1/2 – 13 x 1-1/4”	2	J0728
16	Flat washer, 1/2”	2	J1125
17	Lock nut, 1/2" – 13	2	J1042
18	Lock nut, 5/8” - 11	4	J1047
19	Roll pin, 3/8 x 2-1/2”	1	J1513
20	Linkage arm, long	2	T43947
21	Whiz nut, 5/16” - 18	4	J1110

PLENUM DUCTWORK



REF. #	DESCRIPTION	QTY.	PART #
1	Top panel, heater shield	2	T80151
2	Panel, side, tunnel extension	2	T80241
3	Bracket, extension to perf	2	T80240
4	Baffle, 45°, heat dist, cent	2	T80266

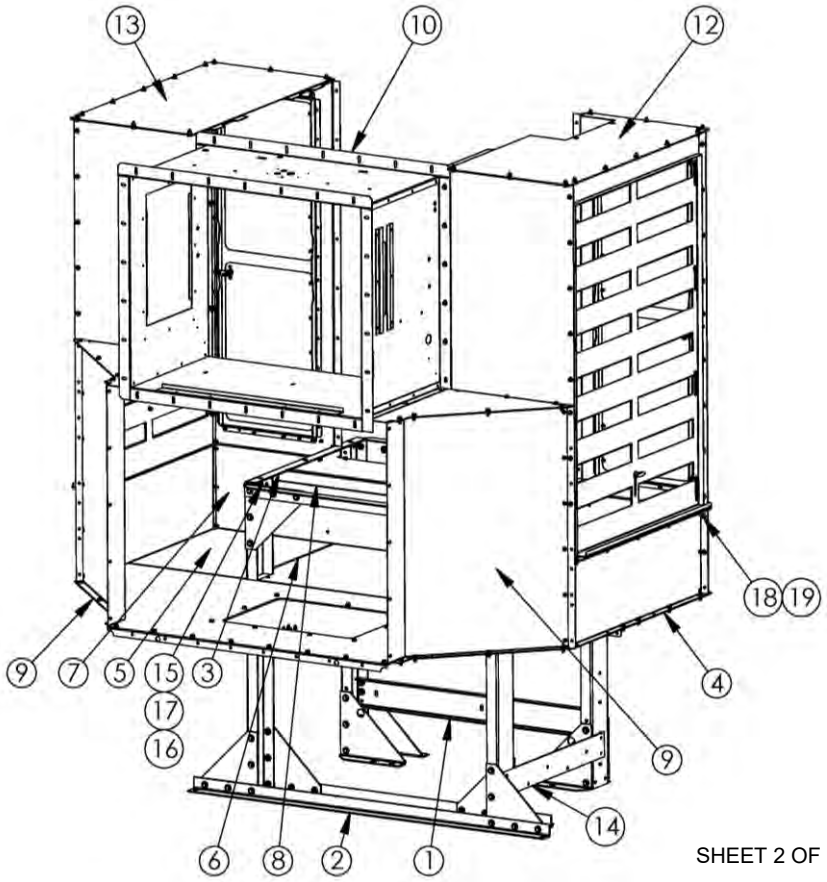
FAN SUPPORT (T15743C), FRONT VIEW



T15743C
04/15/2008 DJB
SHEET 1 OF 5

REF. #	DESCRIPTION	QTY.	PART #
1	Frame, heater support, back	1	T80160
2	Frame, heater support, front	1	T80161
3	Horiz side, blower mount frame	2	T80139
4	Lower panel assy, rh	1	T801052
5	Lower panel assy, lh	1	T80105
6	Bottom center panel, blower duct	1	T80123
7	Front panel, blower intake duct	1	T80115
8	Upper mid panel, blower intake duct	1	T80116
9	Ductwork, suct cool connection	1	T80164
10	Housing, burner, cent, galv, rev	1	T29181
11	Bracket, dryer ductwork front support	2	T80200
12	Intake plenum, rh	1	T80163
13	Intake plenum, lh	1	T80162
14	Mounting plate, manual control box	2	T80219
15	Screw, 3/8 – 16 x 1”	8	J0606
16	Lock nut, 3/8” – 16	8	J1025
17	Flat washer, 3/8”	16	J1117
18	Screw, 5/16 – 18 x 3/4"	106	J0536
19	Whiz nut, 5/16” - 18	106	J1110

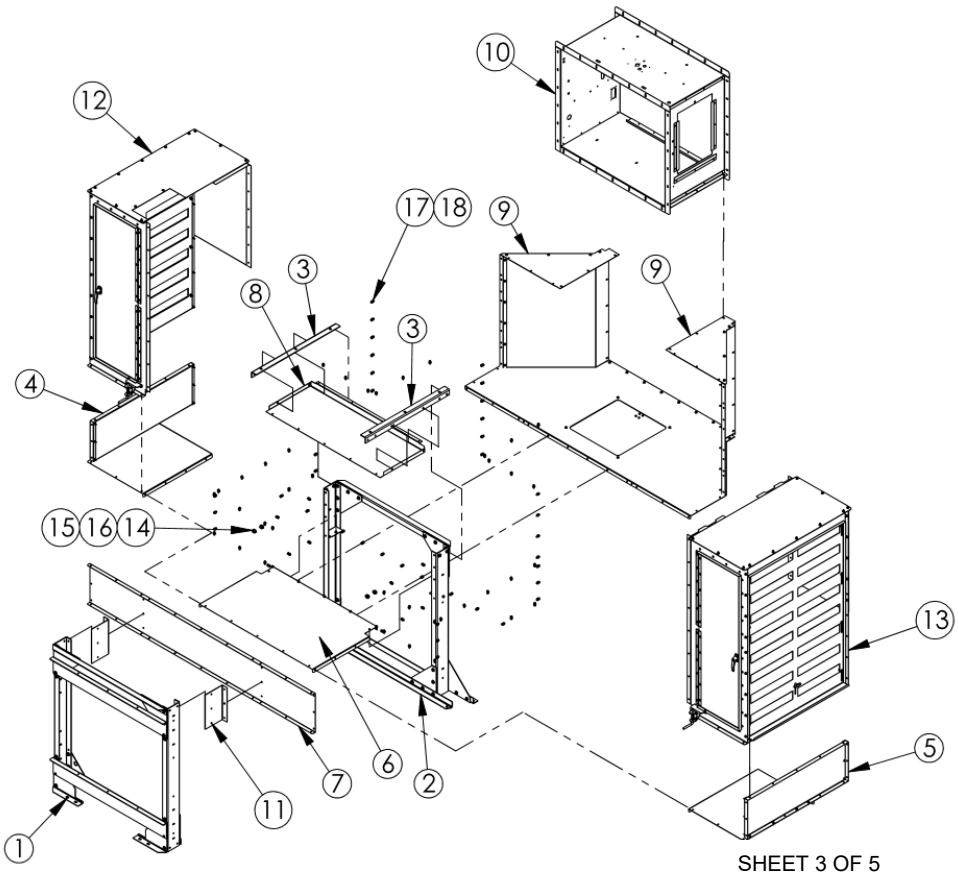
FAN SUPPORT (T15743C), REAR VIEW



SHEET 2 OF 5

REF. #	DESCRIPTION	QTY.	PART #
1	Frame, heater support, back	1	T80160
2	Frame, heater support, front	1	T80161
3	Horiz side, blower mount frame	2	T80139
4	Lower panel assy, rh	1	T801052
5	Lower panel assy, lh	1	T80105
6	Bottom center panel, blower duct	1	T80123
7	Front panel, blower intake duct	1	T80115
8	Upper mid panel, blower intake duct	1	T80116
9	Ductwork, suction cool connection	1	T80164
10	Housing, burner, cent, galv, rev	1	T29181
11	Bracket, dryer ductwork front support	2	T80200
12	Intake plenum, rh	1	T80163
13	Intake plenum, lh	1	T80162
14	Mounting plate, manual control box	2	T80219
15	Screw, 3/8 – 16 x 1”	8	J0606
16	Lock nut, 3/8” - 16	8	J1025
17	Flat washer, 3/8”	16	J1117
18	Screw, 5/16 – 18 x 3/4"	106	J0536
19	Whiz nut, 5/16” - 18	106	J1110

FAN SUPPORT (T15743C), EXPLODED FRONT VIEW



SHEET 3 OF 5

REF. #	DESCRIPTION	QTY.	PART #
1	Frame, heater support, back	1	T80160
2	Frame, heater support, front	1	T80161
3	Horiz side, blower mount frame	2	T80139
4	Lower panel assy, rh	1	T801052
5	Lower panel assy, lh	1	T80105
6	Bottom center panel, blower duct	1	T80123
7	Front panel, blower intake duct	1	T80115
8	Upper mid panel, blower intake duct	1	T80116
9	Ductwork, suction cool connection	1	T80164
10	Housing, burner, cent, galv, rev	1	T29181
11	Bracket, dryer ductwork front support	2	T80200
12	Intake plenum, rh	1	T80163
13	Intake plenum, lh	1	T80162
14	Mounting plate, manual control box	2	T80219
15	Screw, 3/8-16, 1, plt	8	J0606
16	Nut, hex, 3/8-16, plt lock	8	J1025
17	Washer, flat, 3/8, plt	16	J1117
18	Screw, 5/16-18, 3/4″, plt, gr5, hhwz	106	J0536
19	Nut, whiz, 5/16-18	106	J1110

FAN SUPPORT (T15743C) PARTS

REF. #	DESCRIPTION	QTY.	PART #
1	Frame, heater support, back	1	T80160
	Front leg, blower mount frame	2	T80137
	Lf bracket, front legs, blower mnt frm	2	T80155
	Channel, power box mount	2	T80135
	Gusset plate, blower mount frame	2	T80138
	Hozt base 1, blower mount frame	1	T80140
	Rt bracket, front legs, blower mnt frm	2	T80156
	Washer, flat, 3/8, plt	52	J1117
	Nut, hex, 3/8-16, plt lock	26	J1025
	Screw, 3/8-16, 1.25, plt, gr5, hhcs	26	J0616
2	Frame, heater support, front	1	T80161
	Rear leg, blower mount frame	2	T80136
	Gusset plate, blower mount frame	6	T80138
	Clip, center bottom panel, blower duct	2	T80126
	Hozt base 1, blower mount frame	1	T80140
	Hozt base 2, blower mount frame	1	T80141
	Hozt base 3, blower mount frame	1	T80142
	Screw, 3/8-16, 1-25, plt, gr5, hhcs	20	J0616
	Nut, hex, 3/8-16, plt lock	30	J1025
	Washer, flat, 3/8, plt	60	J1117
	Screw, 3/8-16, 1, plt	10	J0606
	Screw, 5/16-18, 3/4", plt, gr5, hhwz	2	J0536
	Nut, whiz, 5/16-18	2	J1110
3	Hozt side, blower mount frame	2	T80139
4	Lower panel assy, rh	1	T801052
	Lower panel assemby	1	T801051
	End flange	2	T80107
	Sleeve, huckbolt, 1/4"	6	J0893
	1/4" x 5/8” huckbolt	6	J0892
	Lower panel	1	T80106
	Bottom left panel, blower duct	1	T80124
	Screw, 5/16-18, 3/4", plt, gr5, hhwz	4	J0536
	Nut, whiz, 5/16-18	4	J1110
5	Lower panel assy, lh	1	T80105
	Lower panel assembly	1	T801051
	End flange	2	T80107
	Sleeve, huckbolt, 1/4"	6	J0893
	1/4" x 5/8” huckbolt	6	J0892
	Lower panel	1	T80106
	Bottom right panel, blower duct	1	T80125
	Screw, 5/16-18, 3/4", plt, gr5 hhwz	4	J0536
	Nut, whiz, 5/16-18	4	J1110
6	Bottom center panel, blower duct	1	T80123
7	Front panel, blower intake duct	1	T80115
8	Upper mid panel, blower intake duct	1	T80116
9	Ductwork, suction cool connection	1	T80164
	Transition top panel	2	T80111
	Bottom angle, blower trans end plt	1	T80121
	Bottom panel, blower transition	1	T80122
	Transition side panel w/hole	1	T80146
	Panel, transition side, whole	1	T80157
	End flange, transition side panel	1	T80114
	1/4" x 5/8” huckbolt	6	J0892
	Sleeve, huckbolt, 1/4"	6	J0893
	Transition side panel	1	T80112
	Panel, transition side panel	1	T80113
	End flange, transition side panel	1	T80114
	1/4” x 5/8” huckbolt	6	J0892

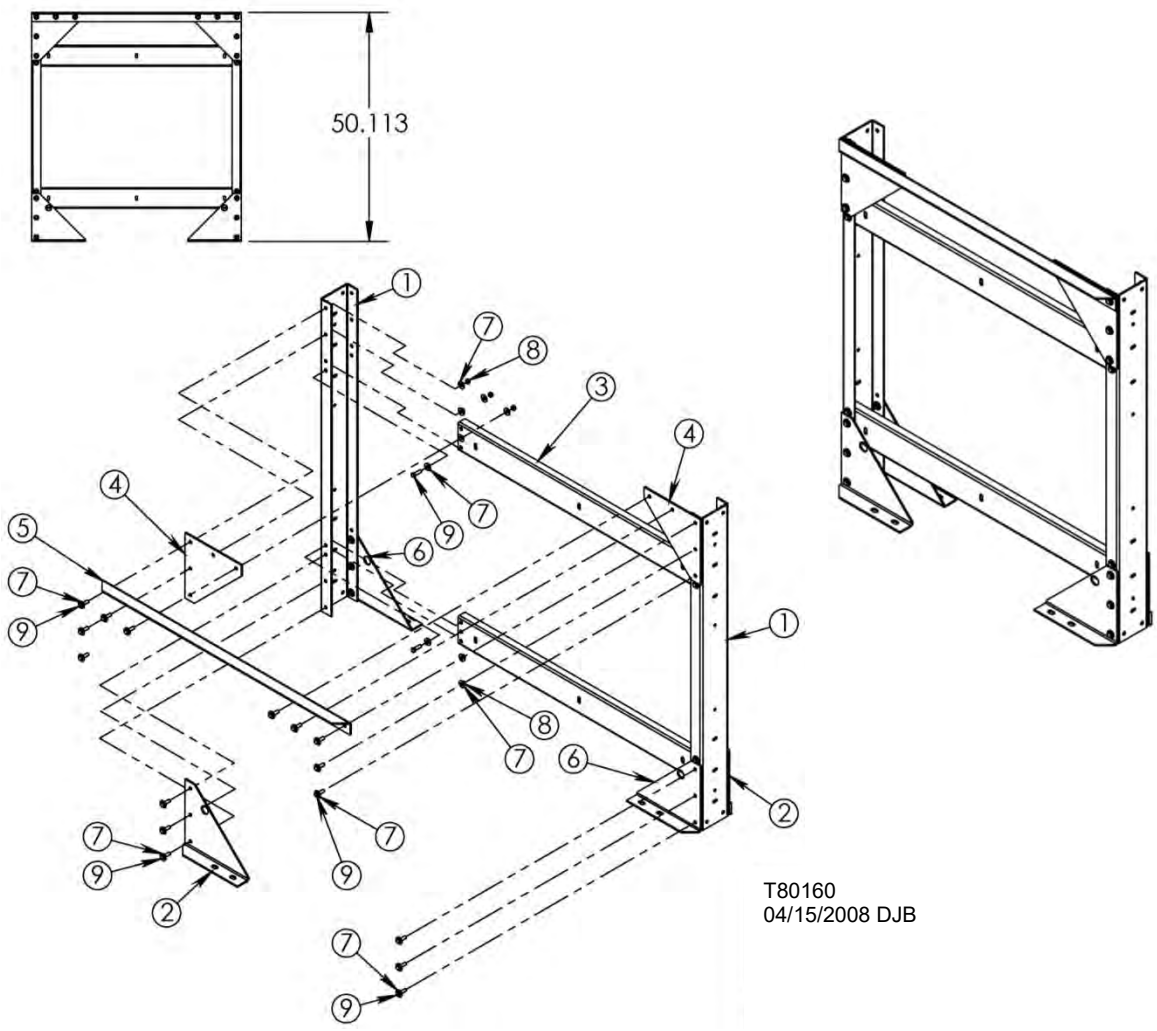
FAN SUPPORT (T15743C) PARTS

REF. #	DESCRIPTION	QTY.	PART #
9 (cont.)	Sleeve, huckbolt, 1/4"	6	J0893
	Screw, 5/16-18, 3/4", plt, gr5, hhwz	33	J0536
	Nut, whiz, 5/16-18	33	J1110
	Panel, door, bottom, assy	1	T80245
	Panel, door frame, bottom	1	T80243
	Panel, door, bottom	1	T80244
	Latch, spring bolt	1	J2294
	Plate, adjuster, door access	1	V01040-01
	Nut, 3/8-16 flange whizlok	2	J1017
	Nut, lock, 5/16-18, plt	2	J1010
	Screw, 5/16-18, 3/4", plt, gr5, hhwz	2	J0536
	1/4" x 5/8" huckbolt	4	J0892
	Sleeve, huckbolt, 1/4"	4	J0893
	Bolt, 3/8" x 3/4" carriage	2	J0609
10	Housing, burner, cent, galv, rev	1	T29181
	Vaporizer side, 40hp, bolt, galv, rev	1	T29184
	Top heater house, rev	1	T29182
	Door side, heater house	1	T29185
	Bottom, heater house	1	T29183
	Vane slide	1	D7066-06
	Door slides, heater, galv	5	D7055-03
	Flange, duct trans, heater housing	2	T29186
11	Bracket, dryer duct work, front support	2	T80200
12	Intake plenum, rh	1	T80163
	Air panel, stationary assembly	1	T80101
	Air panel, stationary	1	T80102
	End flange, air panel	2	J80103
	1/4" x 5/8" huckbolt	12	J0892
	Sleeve, huckbolt, 1/4"	12	J0893
	Nut, rivet, 5/16"-18	9	J1007
	Knob, plastic, 5/16-18x3/4"	1	T4167
	Air panel, adjustable	1	T80104
	Door assy, cent, front, right	1	T80246
	Panel, right, door, cent, front	1	T802465
	Frame, door, short, cent dry front	2	T802464
	Frame, door, long, cent dry front	2	T802463
	Holder, latch, right, door, front	1	T802467
	Door, right, front, cent dryer	1	T802466
	Spacer, door, cent dryer, front	2	T802462
	Hinge, door, cent dryer, front	2	J802461
	Hinge, stnless, a-803, 2" wide, .120 pin	1	J2271-26
	Hinge, stainless, half	2	J2271-01-26
	Screw, #10-24, 3/4, plt, slt, rhms	2	J0516
	Washer, lock, #10 ext tooth	2	J1190
	Nut, hex, 10-24, plt, ms	2	J0985
	1/4" x 5/8" huckbolt	44	J0892
	Sleeve, huckbolt, 1/4"	44	J0893
	Latch, spring bolt	1	J2294
	Bolt 1/4-20x3/4	4	J0505
	Nut, lock, 1/4-20, plt	4	J0992
	Handle, locking, #gd303	1	J2313
	Latch, adjustable, #5559	1	J2318
	Screw, #10-16,1/2, plt, selfdrill	1	J0467
	Gasket, #g-2, for gd303 handle (j2313)	1	T2314
	Rt side panel, blower intake duct	1	T80110
	Rt top panel, blower intake duct	1	J80117
	Nut, whiz, 5/16-18	25	J1110
	Screw, 5/16-18, 3/4", plt, gr5, hhwz	25	J0536
	Nut, rivet, 5/16-18	2	J1007

FAN SUPPORT (T15743C) PARTS

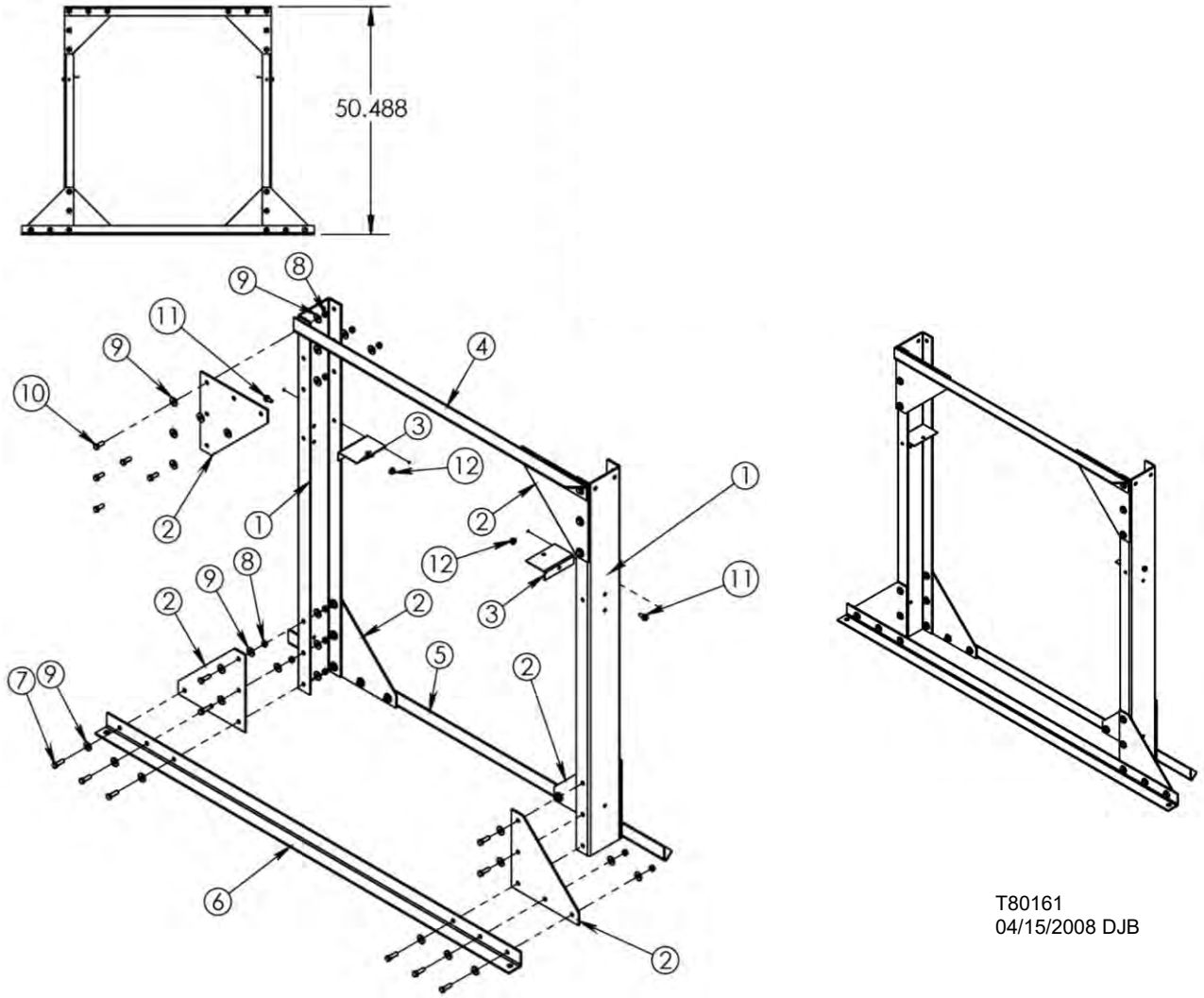
REF. #	DESCRIPTION	QTY.	PART #
12 (cont.)	Screw, 5/16-18, 1.25, plt, gr5	8	J0550
	Washer, flat, 5/16	16	J1111
	Nut, lock, 5/16-18, plt	8	J1010
13	Intake plenum, lh	1	T80162
	Air panel, stationary assembly	1	T80101
	Air panel, stationary	1	T80102
	End flange, air panel	2	T80103
	1/4" x 5/8" huckbolt	12	J0892
	Sleeve, huckbolt, 1/4"	12	J0893
	Nut, rivet, 5/16-18	9	J1007
	Door assy, cent, front, left	1	T80247
	Panel, left, door, cent, front	1	T802471
	Holder, latch, left, door, front	1	T802473
	Frame, door, short, cent dryer front	2	T802464
	Frame, door, long, cent dryer front	2	T802463
13	Hinge, door, cent dryer, front	2	T802461
	Hinge, stnless, a-803, 2" wide, .120 pin	1	J2271-26
	Hinge, stainless, half	2	J2271-01-26
	Spacer, door, cent dryer, front	2	T802462
	Door, left, front, cent dryer	1	T802472
	Screw, #10-24, 3/4, plt, slt, rhms	2	J0516
	Washer, lock, #10 ext tooth	2	J1190
	Nut, hex, 10-24, plt, ms	2	J0985
	1/4" x 5/8" huckbolt	44	J0892
	Sleeve, huckbolt, 1/4"	44	J0893
	Latch, spring bolt	1	J2294
	Bolt, 1/4-20, plt	4	J0992
	Gasket, #g-2, for gd303 handle (j2313)	1	J2314
	Handle, locking, #gd303	1	J2313
	Latch, adjustable, #5559	1	J2318
	Screw, #10-16, 1/2, plt, selfdrill	1	J0467
	Air panel, adjustable	1	T80104
	Lt side panel, blower intake duct	1	T80119
	Lt top panel, blower intake duct	1	T80120
	Knob, plastic, 5/16-18 x 3/4"	1	J4167
	Nut, lock, 5/16-18, plt	8	J1010
	Screw, 5/16-18, 1.25, plt, gr5	8	J0550
	Washer, flat, 5/16	16	J1111
	Nut, whiz, 5/16-18	25	J1110
	Screw, 5/16-18, 3/4", plt, gr5, hhwz	25	J0536
14	Mounting plate, manual control box	2	T80219
15	Screw, 3/8-16, 1, plt	8	J0606
16	Nut, hex, 3/8-16, plt lock	8	J1025
17	Washer, flat, 3/8, plt	16	J1117
18	Screw, 5/16-18, 3/4", plt, gr5, hhwz	106	J0536
19	Nut, whiz, 5/16-18	106	J1110

FAN SUPPORT FRAME (T80160), BACK



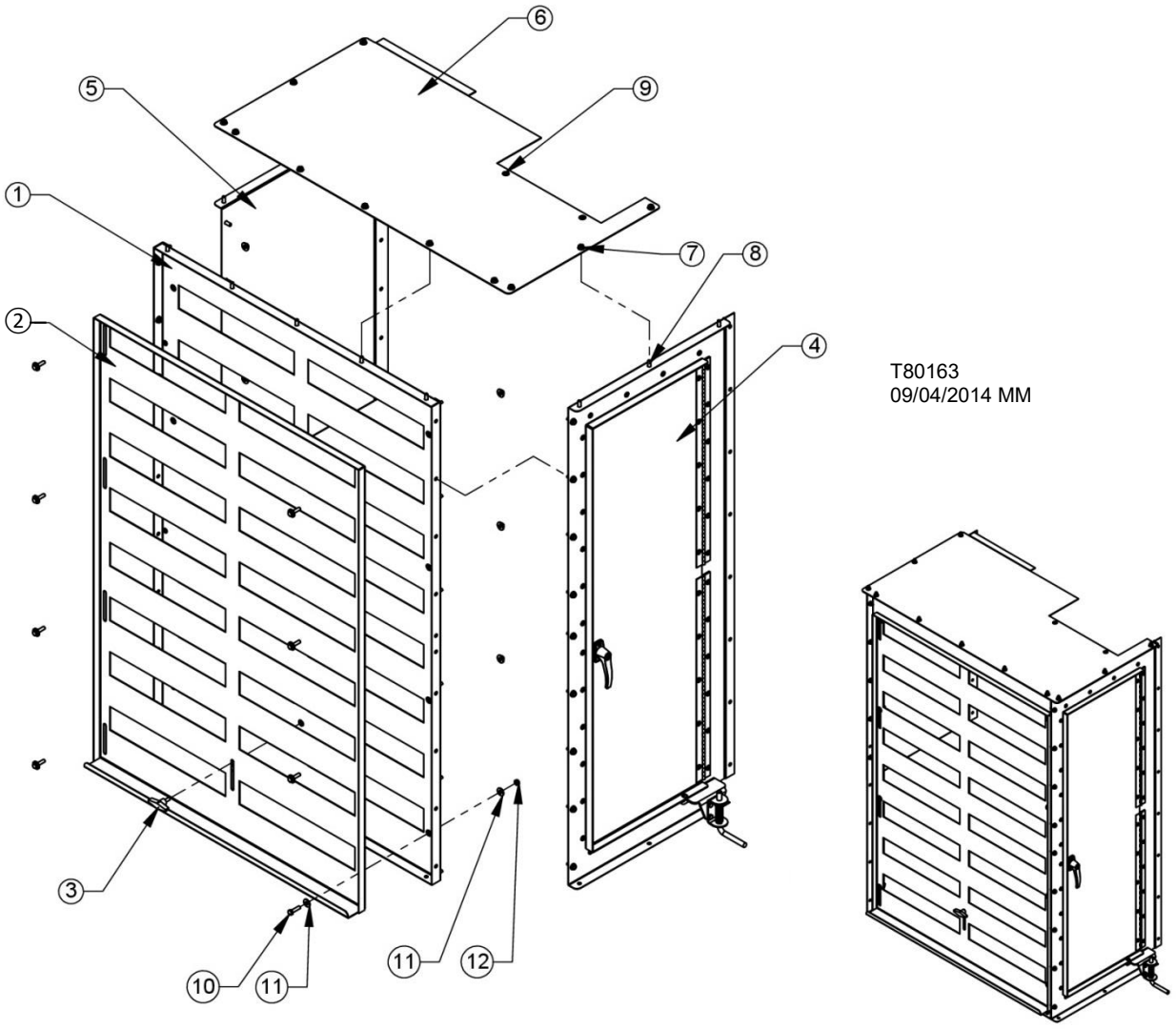
REF. #	DESCRIPTION	QTY.	PART #
1	Front leg, blower mount frame	2	T80137
2	Lf bracket, front legs, blower mnt frm	2	T80155
3	Channel, power box mount	2	T80135
4	Gusset plate, blower mount frame	2	T80138
5	Horiz base 1, blower mount frame	1	T80140
6	Rt bracket, front legs, blower mnt frm	2	T80156
7	Washer, flat, 3/8, plt	52	J1117
8	Nut, hex, 3/8-16, plt lock	26	J1025
9	Screw, 3/8-16, 1.25, plt, gr5, hhcs	26	J0616

FAN SUPPORT FRAME (T80161) FRONT



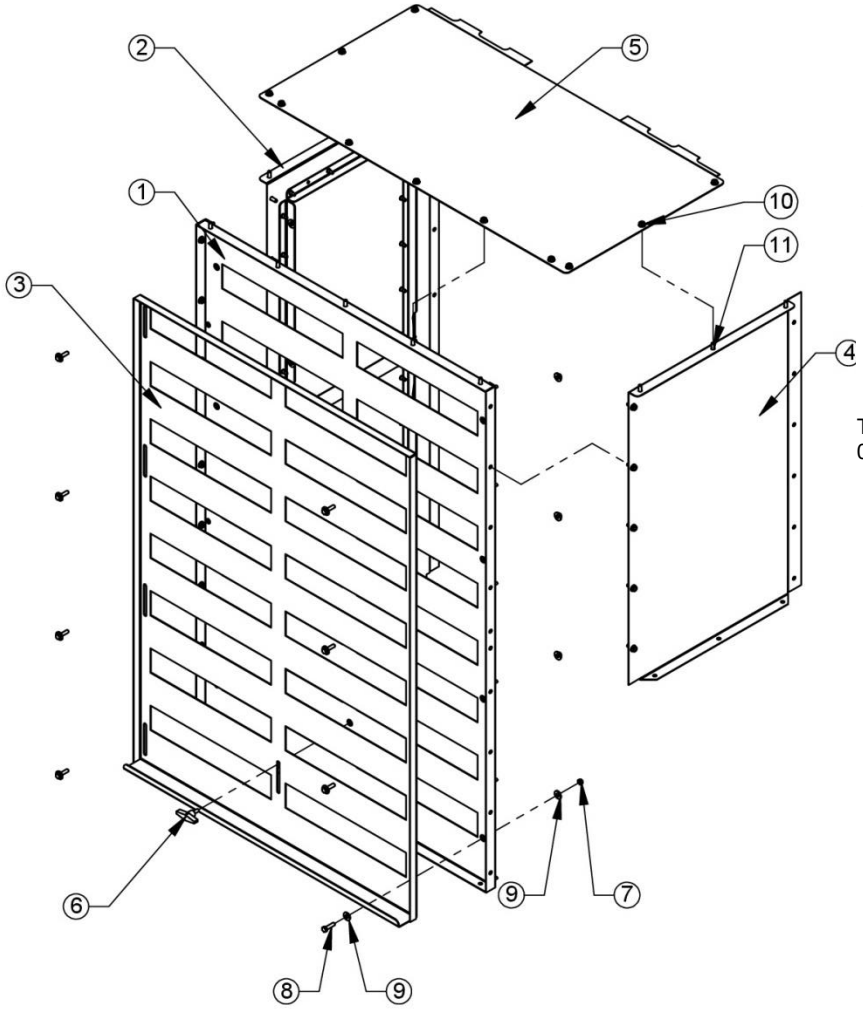
REF. #	DESCRIPTION	QTY.	PART #
1	Rear leg, blower mount frame	2	T80136
2	Gusset plate, blower mount frame	6	T80138
3	Clip, center bottm panel, blower duct	2	T80126
4	Horiz base 1, blower mount frame	1	T80140
5	Horiz base 2, blower mount frame	1	T80141
6	Horiz base 3, blower mount frame	1	T80142
7	Screw, 3/8-16, 1.25, plt, gr5, hhcs	20	J0616
8	Nut, hex, 3/8-16, plt lock	30	J1025
9	Washer, flat, 3/8, plt	60	J1117
10	Screw, 3/8-16, 1, plt	10	J0606
11	Screw, 5/16-18, 3/4″, plt, gr5, hhwz	2	J0536
12	Nut, whiz, 5/6-18	2	J1110

PLENUM AIR INTAKE (T80163), RIGHT

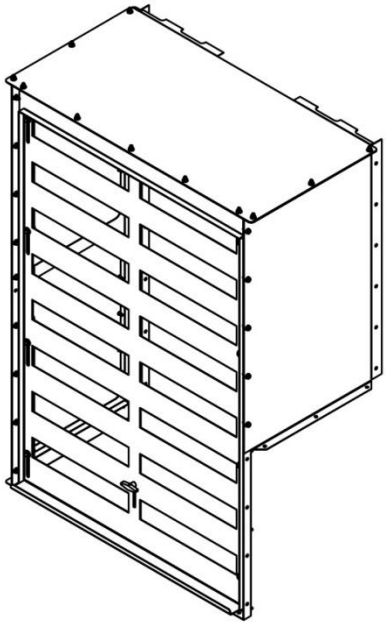


REF. #	DESCRIPTION	QTY.	PART #
1	Air panel, stationary assembly	1	T80101
2	Air panel, adjustable	1	T80104
3	Knob, plastic, 5/16-18 x 3/4″	1	J4167
4	Door assy, cent, front, right	1	T80246
5	Rt side panel, blower intake duct	1	T80110
6	Rt top panel, blower intake duct	1	T80117
7	Nut, whiz, 5/16-18	25	J1110
8	Screw, 5/16-18, 3/4″, plt gr5, hhwz	25	J0536
9	Nut, rivet, 5/16″-18	2	J1007
10	Screw, 5/16-18, 1.25, plt, gr5	8	J0550
11	Washer, flat, 5/16	16	J1111
12	Nut, lock, 5/16-18, plt	8	J1010

PLENUM AIR INTAKE (T80162), LEFT

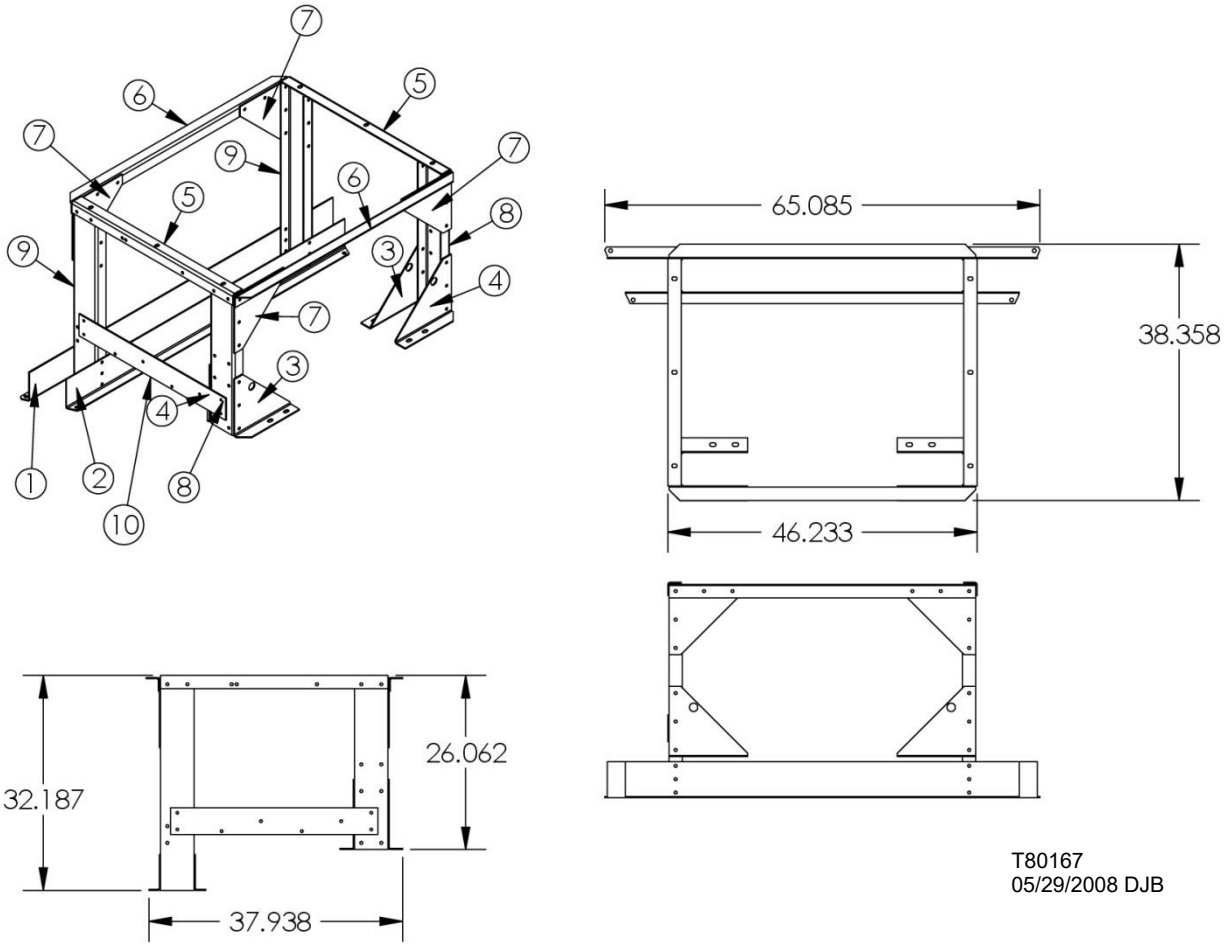


T80162
09/04/2014 MM



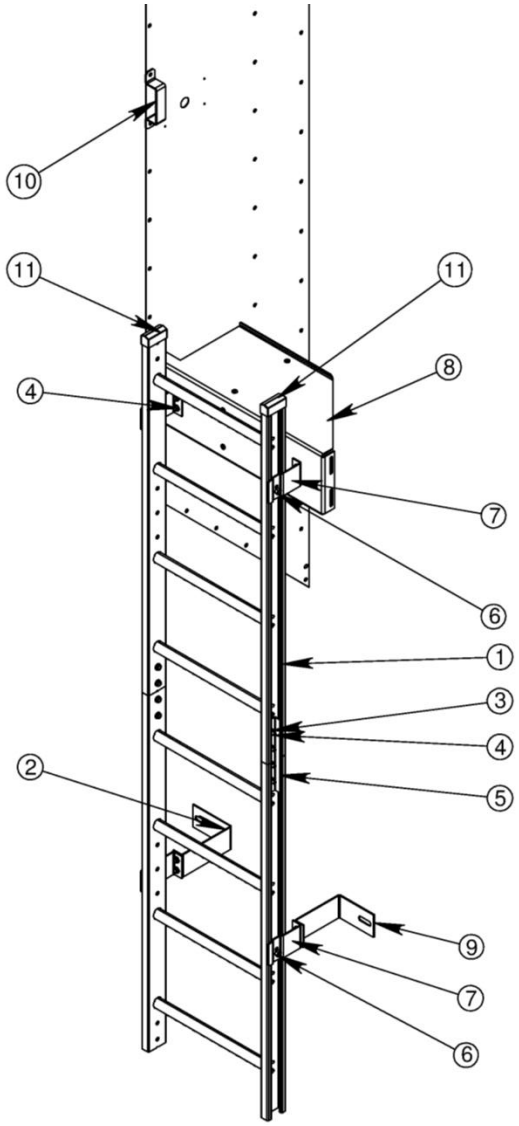
REF. #	DESCRIPTION	QTY.	PART #
1	Air panel, stationary assembly	1	T80101
2	Door assy, cent, front, left	1	T80247
3	Air panel, adjustable	1	T80104
4	Lt side panel, blower intake duct	1	T80119
5	Lt top panel, blower intake duct	1	T80120
6	Knob, plastic, 5/16-18 x 3/4″	1	J4167
7	Nut, lock, 5/16-18, plt	8	J1010
8	Screw, 5/16-18, 1.25″, plt gr5	8	J0550
9	Washer, flat, 5/16	16	J1111
10	Nut, whiz, 5/16″-18	25	J1110
11	Screw, 5/16-18, 3/4″, plt, gr5, hhwz	25	J0536

BLOWER MOUNTING FRAME (T80167), FULL HEAT



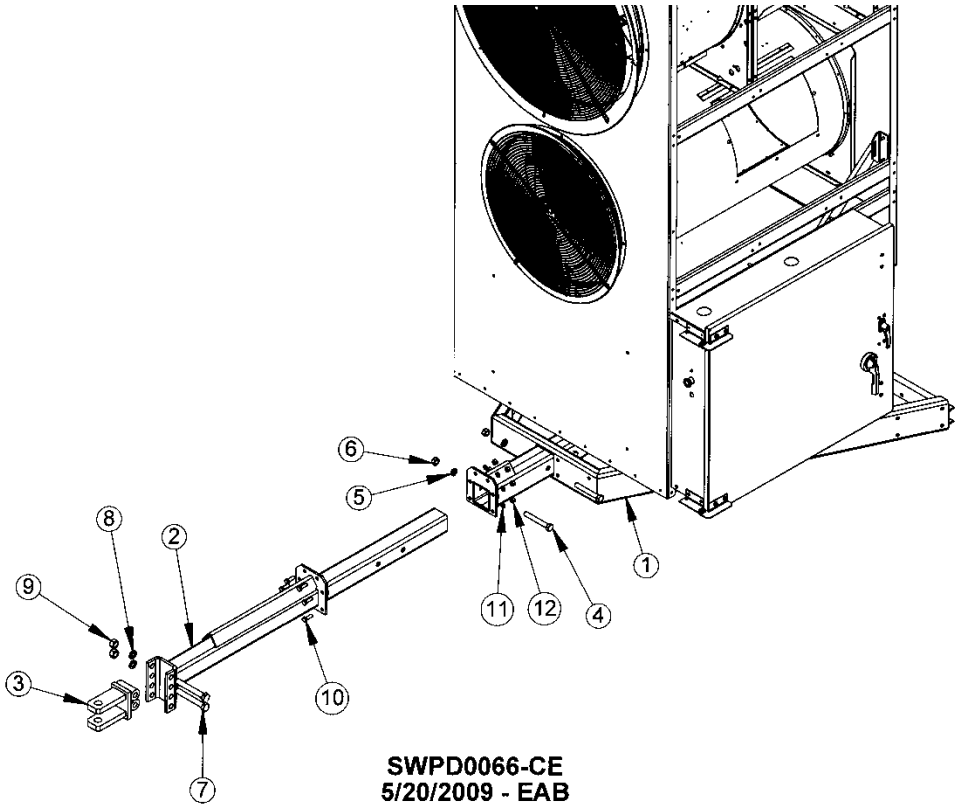
REF. #	DESCRIPTION	QTY.	PART #
1	Rear horiz support b, blower mnt frame	1	T80172
2	Rear horiz support a, blower mnt frame	1	T80170
3	Lf bracket, front legs, blower mnt frm	2	T80155
4	Rt bracket, front legs, blower mnt frm	2	T80156
5	Horiz side, blower mount frame	2	T80139
6	Horiz base 1, blower mount frame	2	T80140
7	Gusset plate, blower mount frame	4	T80138
8	Front leg, blower mount frame	2	T80168
9	Rear leg, blower mount frame	2	T80169
10	Mounting plate, manual control box	1	T80219

FRONT LADDER PARTS



REF. #	DESCRIPTION	QTY.	PART #
1	Ladder, 44″	2	B5084
2	Bracket, ladder, front stack cent dryer	1	T80222
3	Nut, whiz, 5/16-13	16	J1110
4	Screw, 5/16-18, 3/4″, plt, gr5, hhwz	16	J0536
5	Splice, ladder	2	T25545
6	Clip & bolt, ladder	4	B5008
7	Bracket, ladder, rear platform	4	T35515
8	Platform assy, ladder support, suction cool dryer	1	T28151
9	Bracket, ladder, front stack cent dryer	1	T80223
10	Handle, dryer front	1	T28152
11	Cap, ladder, vinyl	2	J5065

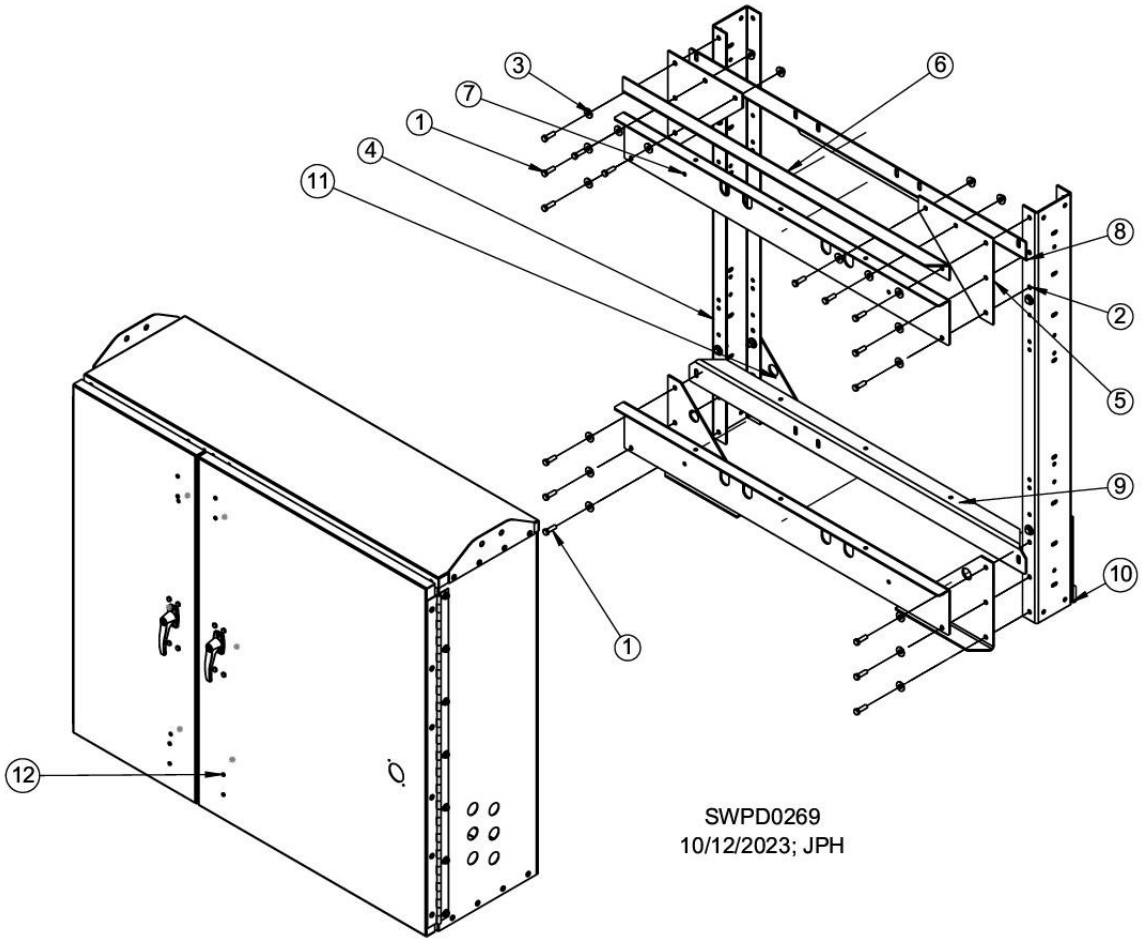
DRYER HITCH W/ 24” EXTENSION



SWPD0066-CE
5/20/2009 - EAB

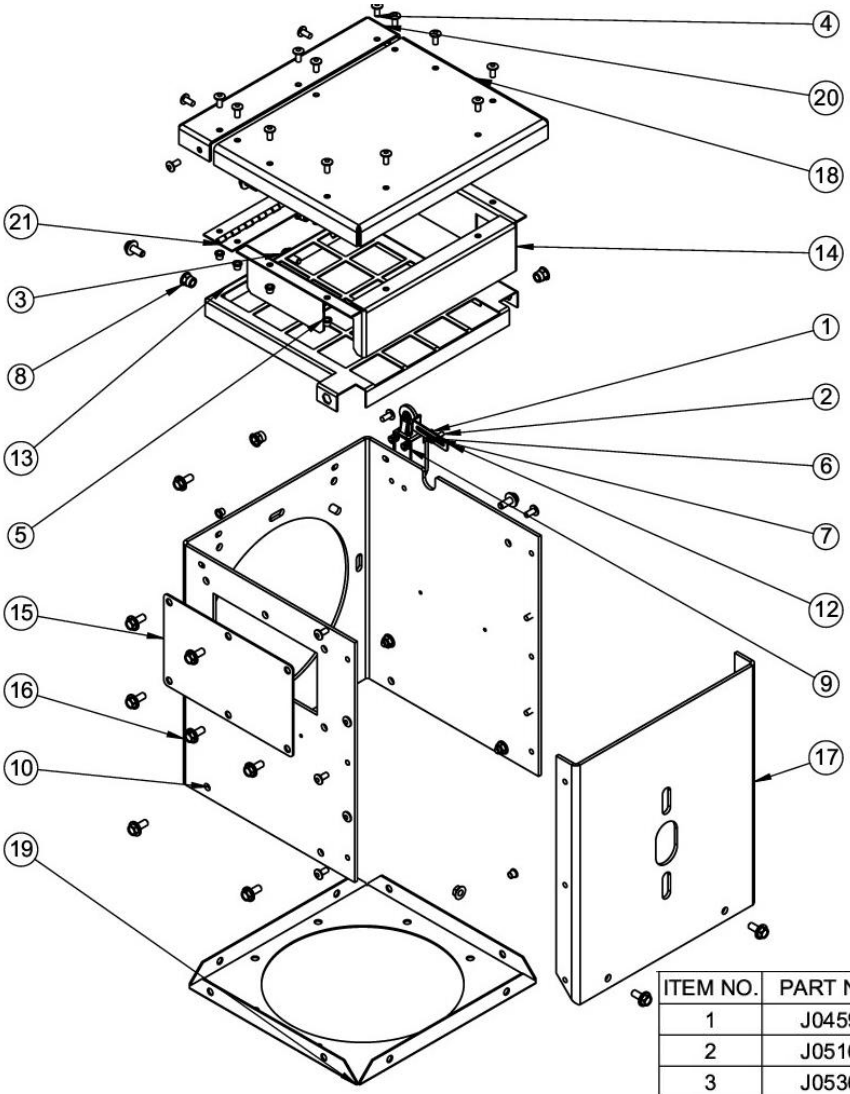
REF. #	DESCRIPTION	QTY.	PART #
1	Hitch, receiver weldmt, jack	1	T16310D
2	Hitch insert weld, 24” ext	1	T43711
3	Clevis weld	1	T4372
4	Screw, 3/4"-10.x 5” lg	3	J0822
5	3/4" lockwasher	3	J1220
6	3/4" hex nut	3	J1051
7	Bolt, 7/8-9 x 6 1/2" lg	2	J08361
8	7/8” lockwasher	2	J1222
9	7/8-9 hex nut	2	J1059
10	Screw, ½-13, 1.50, plt, gr5, hhcs	6	J0730
11	1/2" lockwasher, plt, split	6	J1215
12	Nut, ½-13, plt, gd5, hex	6	J1040

MAIN POWER BOX MOUNTING FRAME



REF. #	DESCRIPTION	QTY.	PART #
1	SCREW, 3/8-16, 1-1/4, PLT	26	J0616
2	NUT, HEX, 3/8-16, PLT LOCK	26	J1025
3	WASHER, FLAT, 3/8, PLT	52	J1117
4	FRONT LEG, BLOWER MOUNT FRAME	2	T80137
5	GUSSET PLATE, BLOWER MOUNT FRAME	2	T80138
6	HORIZ BASE, BLOWER MOUNT FRAME	1	T80140
7	BRACE,PBOX,MOUNT,SUPPORT	2	T80290
8	BRACE,TOP,PBOX,DAMPEN	1	T80291
9	BRACE,BTM,PBOX,DAMPEN	1	T80292
10	BRACKET,LEFT,FRONT LEGS, BLOWER	2	TM07157
11	BRACKET,RT,FRONT LEGS, BLOWER	2	TM07158
12	BOX,POWER,LARGE,DIVIDED,2017	1	TPBOX5

DISCHARGE BOX ASSY.

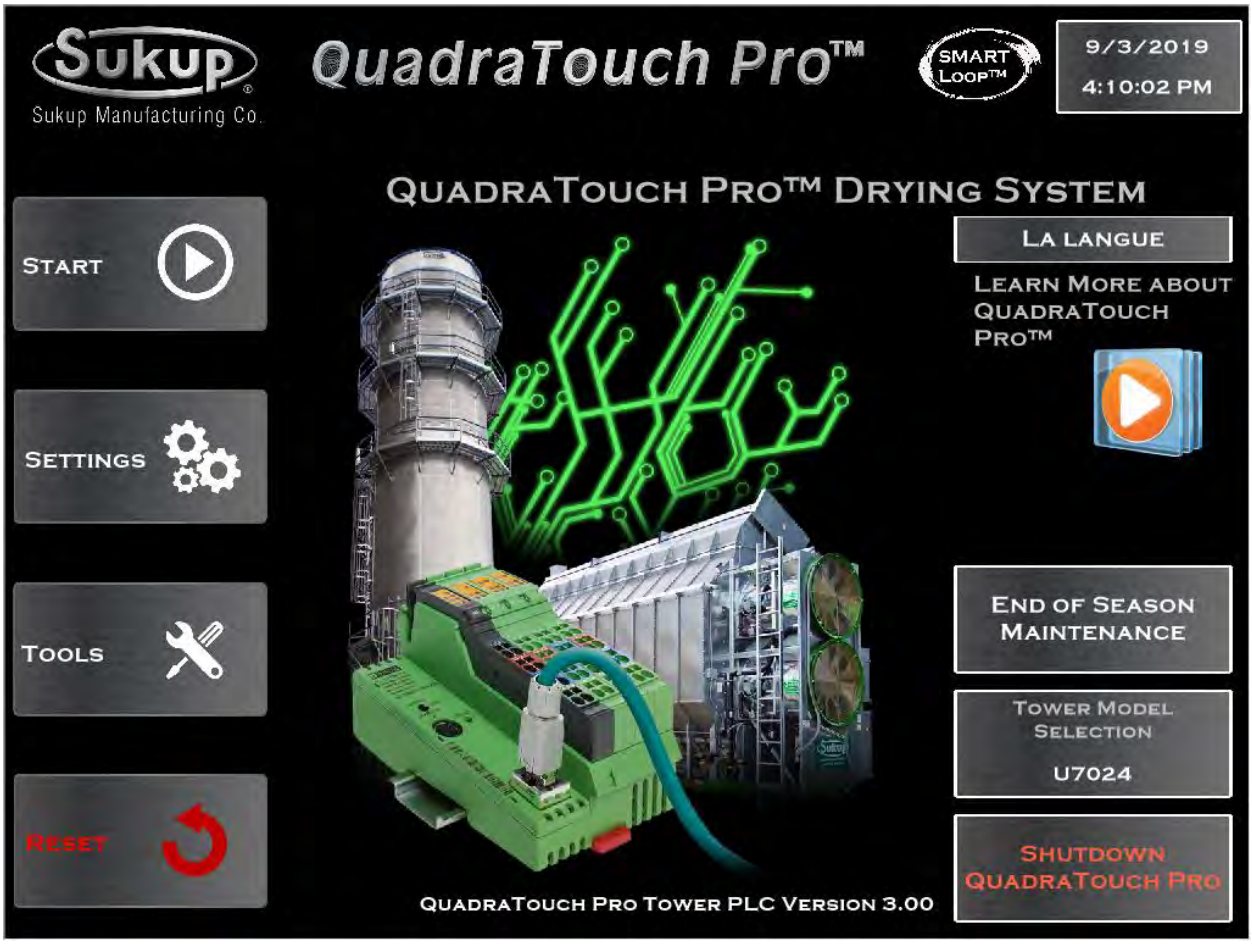


T17669AM
11/09/2021 PBM

ITEM NO.	PART NO.	DESCRIPTION	QTY.
1	J0459	SCREW,#6-32,2.00,PLT,SLT,RHMS	2
2	J0516	SCREW, #10-24, 3/4, PLT, SLT, RHMS	1
3	J0536	SCREW,5/16-18,3/4",PLT,GR5,HHWZ	18
4	J0892	1/4" X 5/8" HUCKBOLT	24
5	J0893	SLEEVE, HUCKBOLT, 1/4"	22
6	J0982	NUT,HEX,6-32,PLT,MS	4
7	J0987	NUT,#10-24,NYLOCK	1
8	J1007	NUT,RIVET,5/16"-18	4
9	J1104	WASHER,FLAT,#6	12
10	J1110	NUT, WHIZ, 5/16-18	14
11	J4096	CABLE GLAND,0.12-0.28",1/2"	1
12	J4473	SWITCH,SAFETY INTERLOCK,HINGED	1
13	T25652	SCREEN,COVER,SUMP BOX	1
14	T25653	PREVENTER,SPILL,LID,SUMP BOX	1
15	T256704	PLATE,COVER,VENT,PRESS RELIEF	1
16	T25670AM	FRONT-SIDES, SUMP BOX	1
17	T25671	REAR PLATE, SUMP BOX	1
18	T25672AM	LID, SUMP BOX	1
19	T25674	BOTTOM, SUMP BOX	1
20	T25675	LID HINGE SIDE, SUMP BOX	1
21	T25676	HINGE, SUMP BOX	1

QuadraTouch Pro™ Software Manual

Control System for Cross-Flow (Axial/Centrifugal), Mixed-Flow & Tower Dryers



Software changes often. To obtain the latest version, download at:

http://www.sukup.com/Products/QuadraTouch

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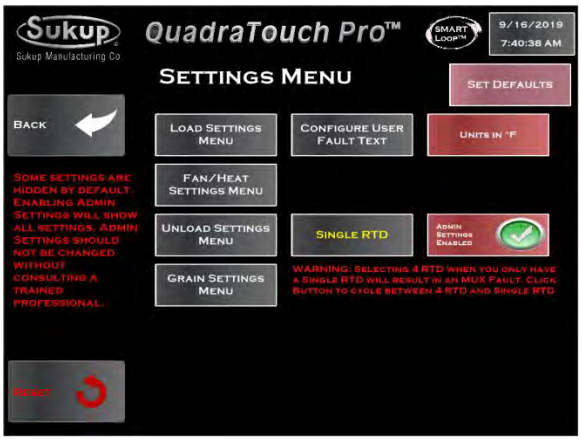
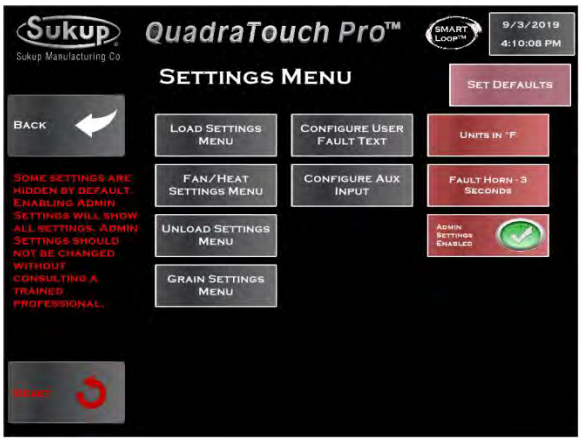


Settings

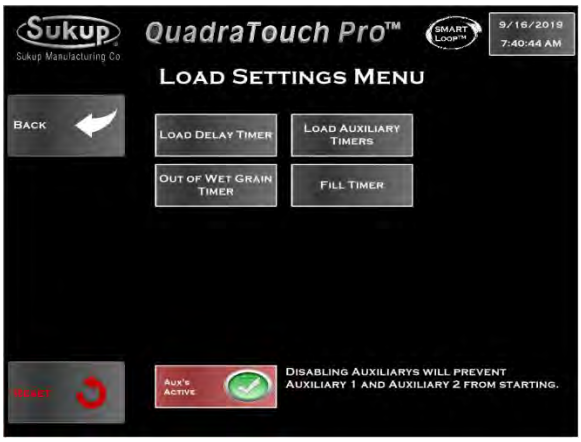
Cross-Flow/Mixed-Flow

Settings Menu for cross-flow and mixed-flow dryers shows most drying settings that are commonly used during operation.



Tower

Settings Menu for tower dryers shows most drying settings that are commonly used during operation.

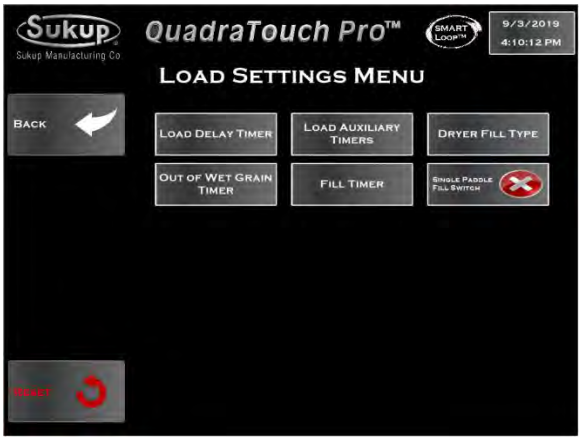


Load Settings

Cross-Flow/Mixed-Flow

Settings → Load Settings Menu

Load Settings Menu for cross-flow and mixed-flow dryers provides access to set load timers and to enable load auxiliaries.



Tower

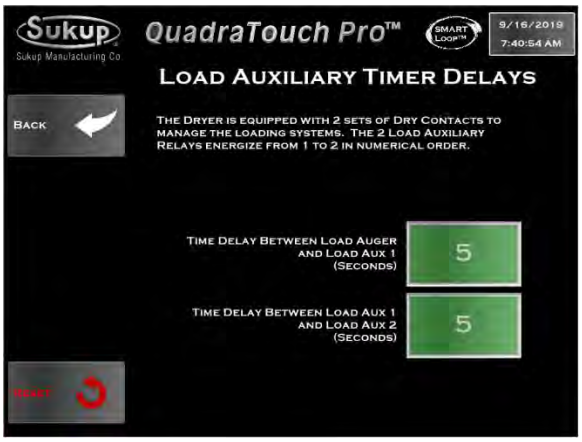
Settings → Load Settings Menu

Load Settings Menu for tower dryers provides access to set load timers, dryer fill type, and extended wet bin dual paddle switch operation.

All Dryers

Settings → Load Settings Menu → Load Delay Timer

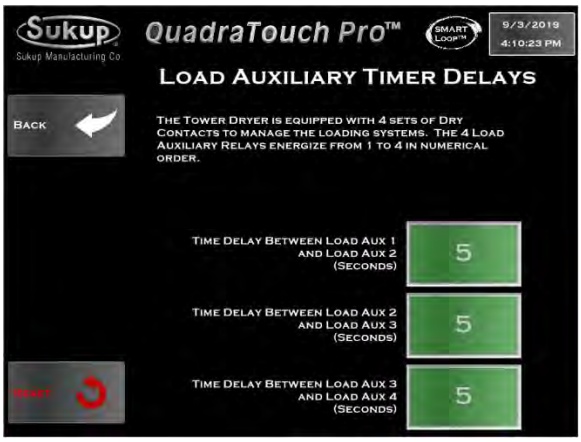
Set Load Delay Timer to prevent overload from auxiliary equipment starting too often.



Cross-Flow/Mixed-Flow

Settings → Load Settings Menu → Load Auxiliary Timers

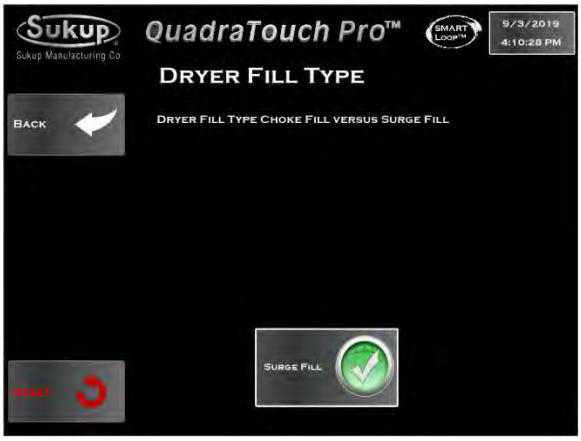
Time delays between load auxiliaries for cross-flow and mixed-flow dryers can be set here.



Tower

Settings → Load Settings Menu → Load Auxiliary Timers

Time delays between load auxiliaries for tower dryers can be set here.



Tower

Settings → Load Settings Menu → Dryer Fill Type

Set dryer fill type (choke-fill vs. surge-fill) here for tower dryers.

All Dryers

Settings → Load Settings Menu → Out of Wet Grain Timer

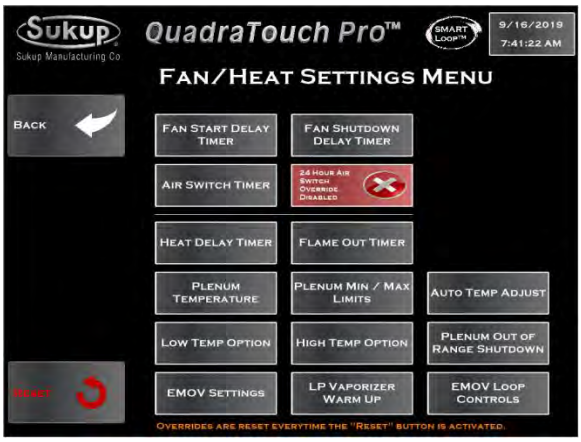
This timer begins counting when dryer is calling for more grain and will trigger a fault condition if dryer fill switch is not satisfied within user-set period of time.

All Dryers

Settings → Load Settings Menu → Fill Timer

This timer counts when fill switch senses grain. Timer resets when dryer calls for grain. It will trigger a fault message when user-set time expires if dryer has not called for grain.

NOTE: Dryers without fill augers use single rotary fill switches.

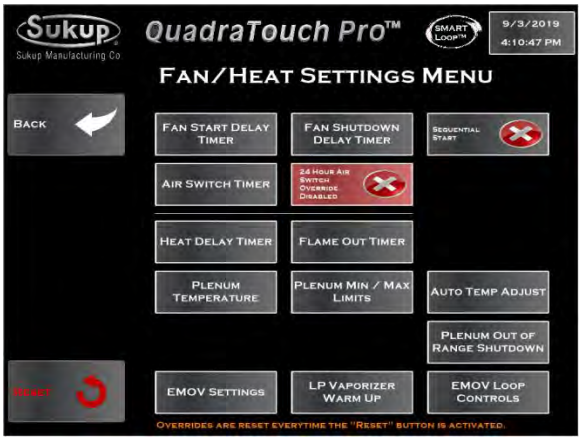


Fan/Heat Settings

Cross-Flow/Mixed-Flow

Settings → Fan/Heat Settings Menu

Fan/Heat Settings Menu for cross-flow and mixed-flow dryers shows settings associated with fans and heaters on dryer.



Tower

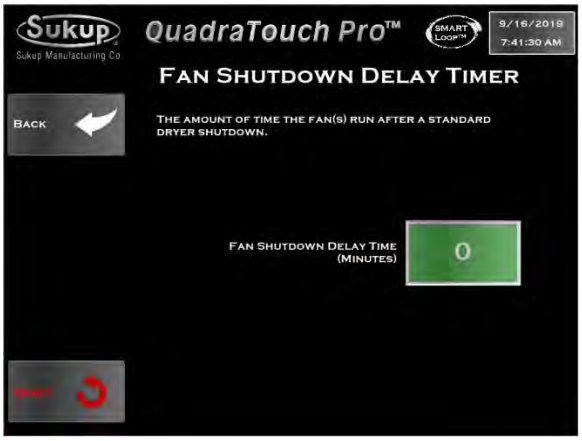
Settings → Fan/Heat Settings Menu

Fan/Heat Settings Menu for tower dryers shows settings associated with fans and heaters.

All Dryers

Settings → Fan/Heat Settings → Fan Start Delay Timer

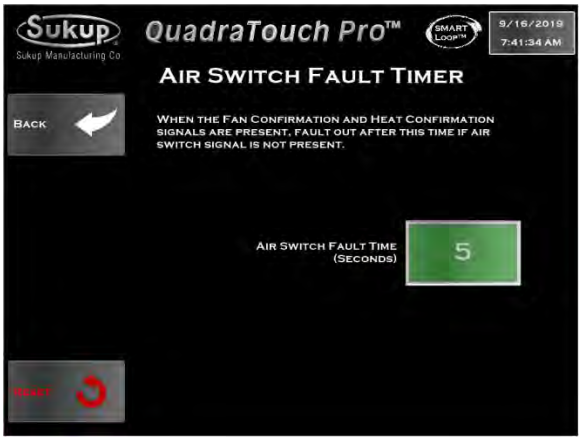
This setting dictates amount of time between fan starts on all dryers. A longer delay may be a good idea if power is limited or motor current draws are very high.



All Dryers

Settings → Fan/Heat Settings → Fan Shutdown Delay Timer

In addition to standard 3-second fan shutdown delay, additional time can be added to cool off grain when stopping operation or to stop fault shutdowns that aren't related to temperature or safety.

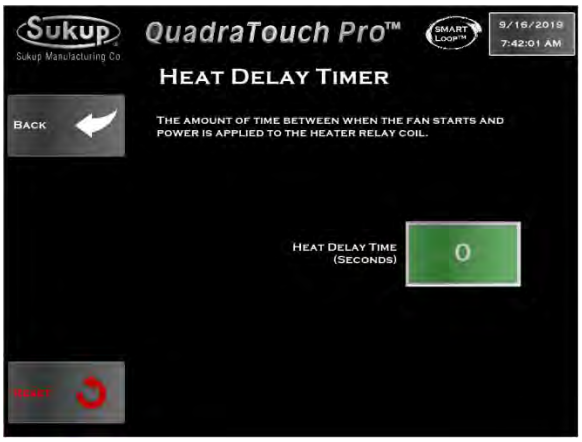


All Dryers

Settings → Fan/Heat Settings → Air Switch Timer

Air switch must sense pressure within a user-set number of seconds of fan contactor closing. With a Soft Start, air switch is given until fan reaches run state. If fan doesn't get up to speed during that amount of time, this timer can be adjusted to allow for longer ramp time.

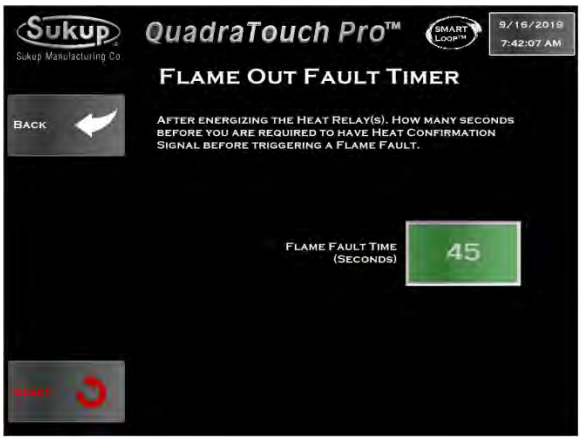
There is a 24-Hour Air Switch Override that resets every time user presses Reset button. This allows continued operation while user waits for parts, for example.



All Dryers

Settings → Fan/Heat Settings → Heat Delay Timer

Set delay time between fan start and power signal to heater box. This is in addition to required minimum time.



All Dryers

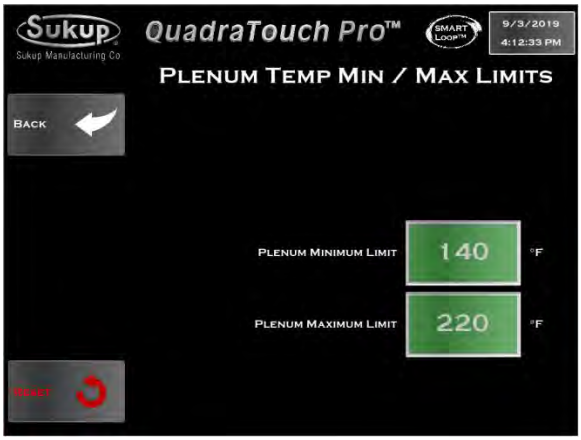
Settings → Fan/Heat Settings → Flame Out Timer

A longer flame fault time may be needed if heater ignition isn't occurring before the time entered. Applies to LME69, LME71, & LME73 controllers which require manual reset.

All Dryers

Settings → Fan/Heat Settings → Plenum Temperature

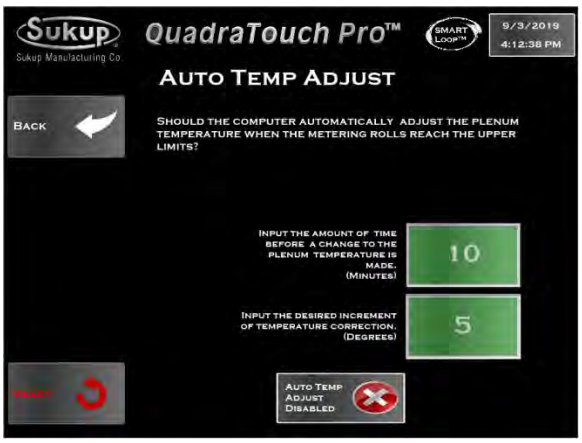
Plenum Temperature page is starting point to set temperatures for each plenum. There is one plenum on a tower dryer. Temperatures for up to six plenums can be set for other dryers.



All Dryers

Settings → Fan/Heat Settings → Plenum Min/Max Limits

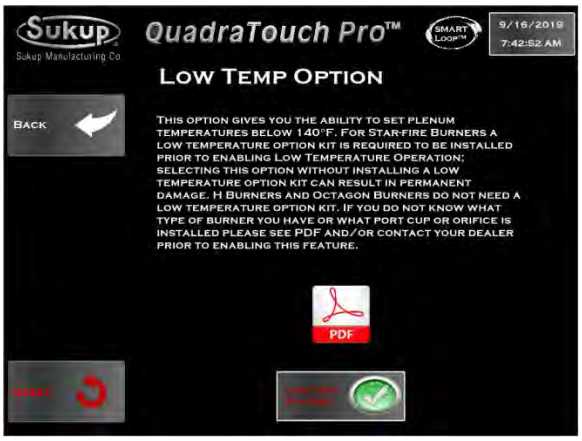
Minimum and maximum plenum temperatures can be found here. Low temp/high temp option can allow for larger value ranges.

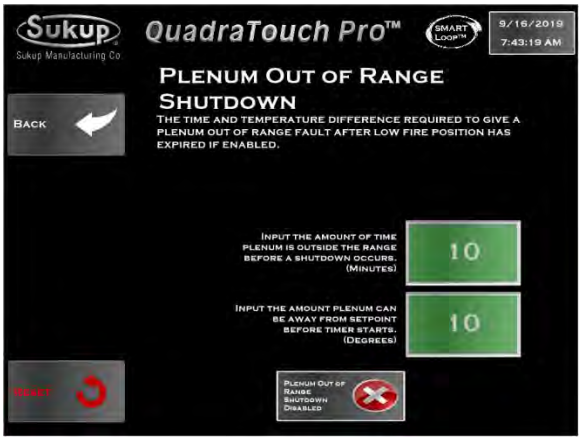


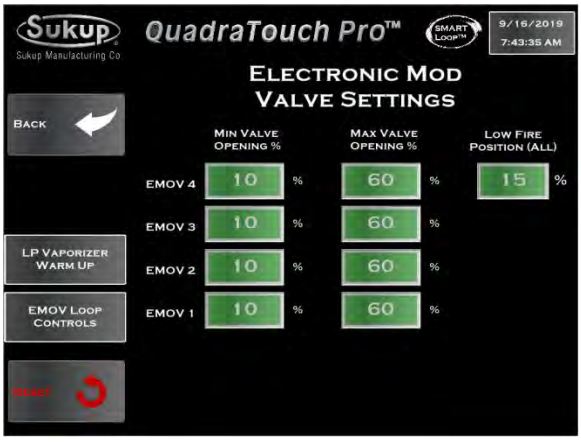
All Dryers

Settings → Fan/Heat Settings → Auto Temp Adjust

If enabled, this feature will turn down temperature inside plenum(s) when dryer reaches its upper speed limit.







Cross-Flow/Mixed-Flow

Cross-Flow/Mixed-Flow

Settings → Fan/Heat Settings → Low Temp Option

If enabled on cross-flow or mixed-flow dryer, Low Temp Option allows plenum temp to be set as low as 100°F. Permanent damage may result if a low-temp kit (orifice and port cup) is not installed in starfire burner used with 28” axial fan.

Cross-Flow/Mixed-Flow

Settings → Fan/Heat Settings → High Temp Option

If enabled on cross-flow or mixed-flow dryer, High Temp Option allows plenum temp to be set above 220°F. Drying at temperatures above 220°F increases chance of having a fire in dryer and of having plenum and column over-temp faults.

All Dryers

Settings → Fan/Heat Settings → Plenum Out of Range Shutdown

Use this feature to set amount of time and/or temperature that plenum temperature can be out of range/off of setpoint.

All Dryers

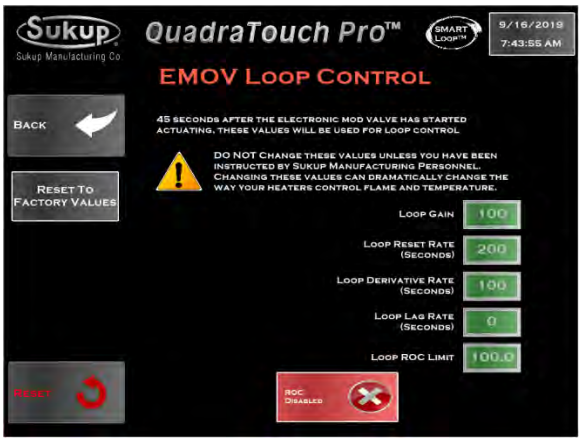
Settings → Fan/Heat Settings → EMOV Settings

Electronic mod valve settings generally do not need to be touched, but can be if needed. Minimum opening should be 10% for all. Maximum opening should be 80-100% on tower dryers and 60% for all others. Low Fire Position is the percentage that valve stem will be open when heater ignition takes place.

All Dryers

Settings → Fan/Heat Settings → EMOV Settings → LP Vaporizer Warmup

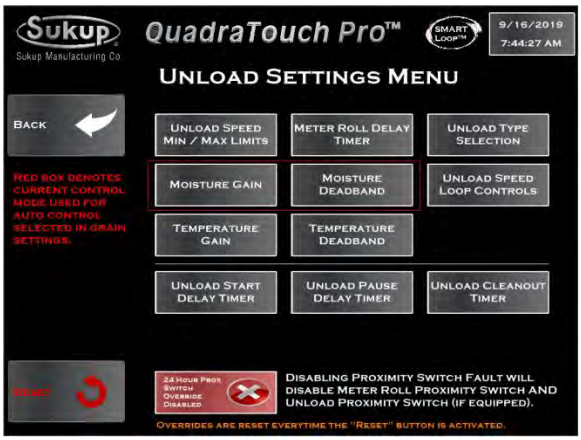
Amount of time that EMOV will stay open in Low-Fire position after lighting can be adjusted to give vaporizer more time to warm up. Default time is 20 seconds for all dryers.

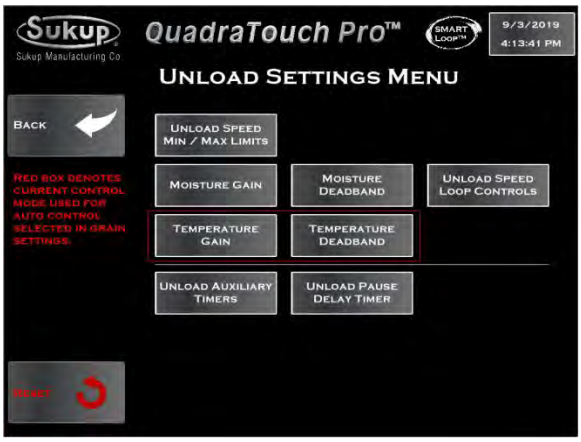


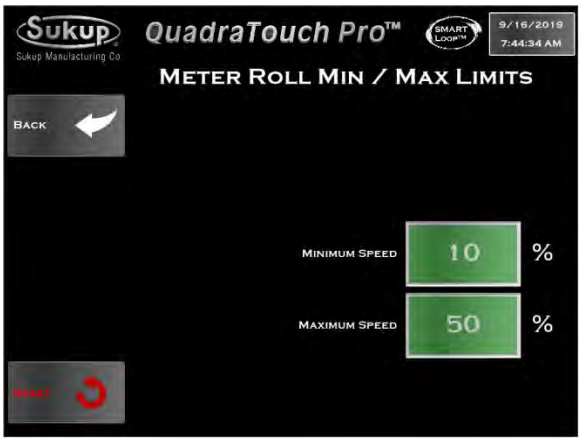
All Dryers

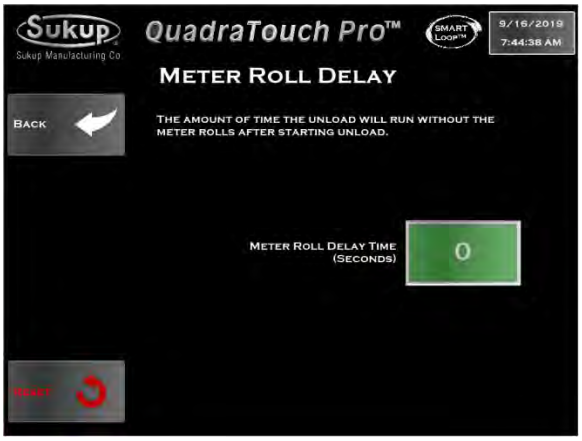
Settings → Fan/Heat Settings → EMOV Settings → EMOV Loop Controls

On all dryers, 45 seconds after EMOV actuation has begun, values shown in screen at left will be used for SMART Loop control of dryer. DO NOT CHANGE unless instructed to do so by Sukup Manufacturing Co.









Unload Settings

Cross-Flow/Mixed-Flow

Settings → Unload Settings Menu

Unload Settings Menu for cross-flow and mixed-flow dryers shows settings that are commonly used during operation.

Tower

Settings → Unload Settings Menu

Unload Settings Menu for tower dryer shows settings that are commonly used during operation.

All Dryers

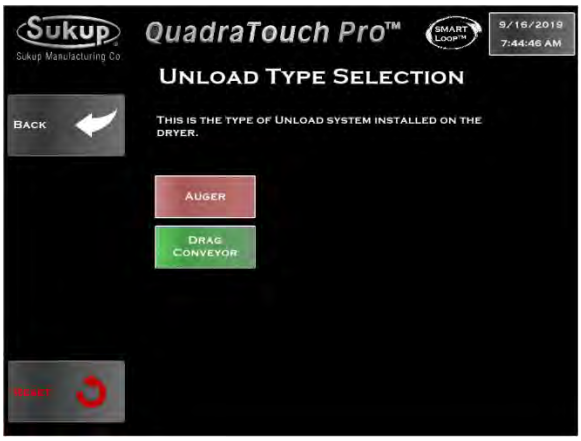
Settings → Unload Settings Menu → Meter Roll Min/Max Limits

Press Unload Speed Min / Max button shown on previous screento set Meter Roll Min / Max Limits. Minimum and maximum settings dictate how fast or slow dryer is capable of running. Never unload faster than take-away system is capable of running.

Cross-Flow/Mixed-Flow

Settings → Unload Settings Menu → Meter Roll Delay Timer

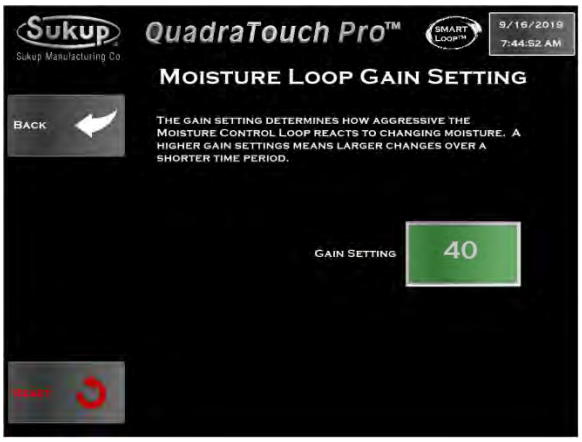
Set amount of time that unload system will run without meter rolls after starting of unload system.



Cross-Flow/Mixed-Flow

Settings → Unload Settings Menu → Unload Type Selection

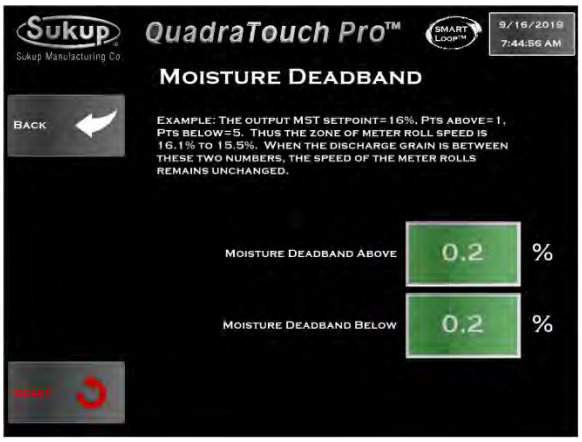
Select type of unload system – Auger or conveyor.



All Dryers

Settings → Unload Settings Menu → Moisture Gain

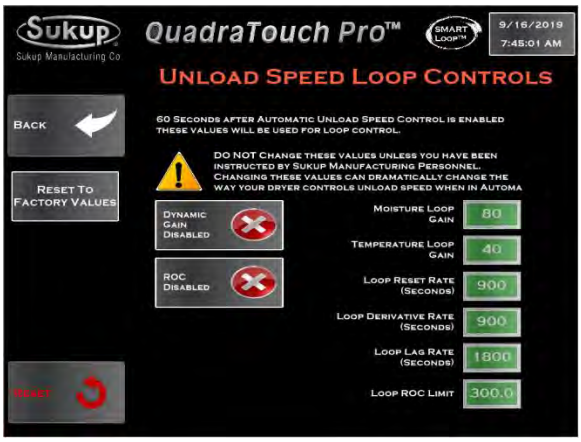
Moisture Loop Gain settings are important for optimum operation when discharging based on moisture. Choosing a higher setting will mean more aggressive changes in a shorter amount of time. When dryer is running at slower speeds, this number should stay around 40 or so. Conversely, at higher speeds, it may yield better control to boost this setting higher.



All Dryers

Settings → Unload Settings Menu → Moisture Deadband

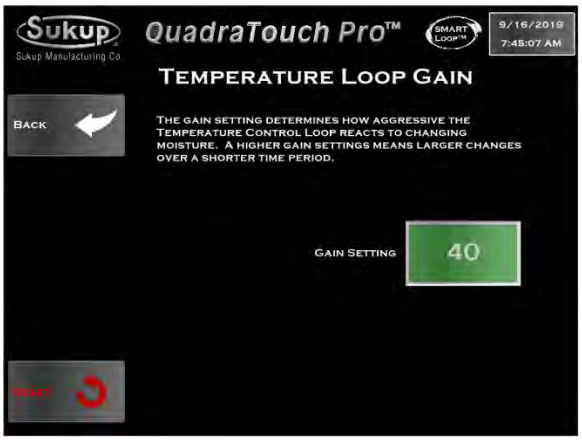
For some systems, it may be preferable to lock in the unload speed when grain is discharging very near the target setpoint. This is referred to as the loop deadband.



All Dryers

Settings → Unload Settings Menu → Unload Speed Loop Controls

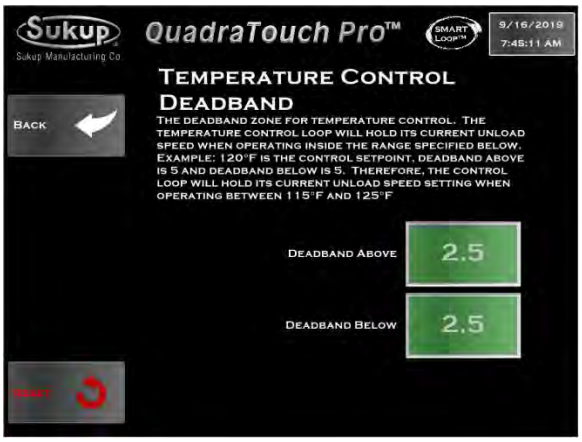
Sixty seconds after Automatic Unload Speed Controls is enabled, these values will be used for SMART Loop control. DO NOT change unless instructed to do so by Sukup Manufacturing Co.



All Dryers

Settings → Unload Settings Menu → Temperature Gain

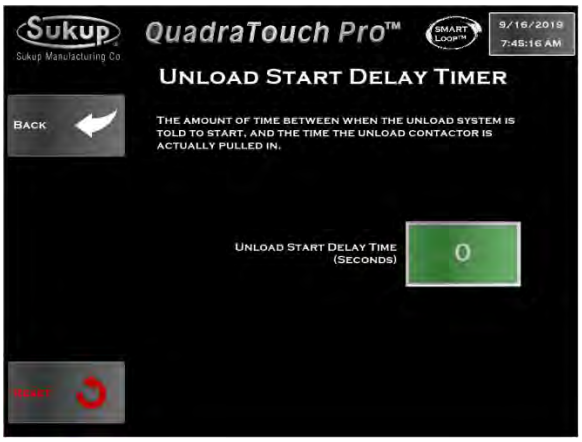
Temperature Gain settings are important for optimum operation when discharging based on temperature. Choosing a higher setting will mean more aggressive changes in a shorter amount of time. When dryer is running at slower speeds, this number should stay around 40 or so. Conversely, at higher speeds, it may yield better control to boost this setting higher.



All Dryers

Settings → Unload Settings Menu → Temperature Deadband

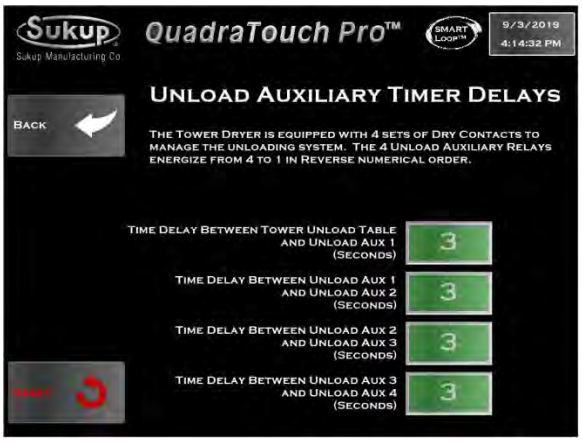
For some systems, it may be preferable to lock in the unload speed when grain is discharging very near the target setpoint. This is referred to as the loop deadband.



Cross-Flow/Mixed-Flow

Settings → Unload Settings Menu → Unload Start Delay Timer

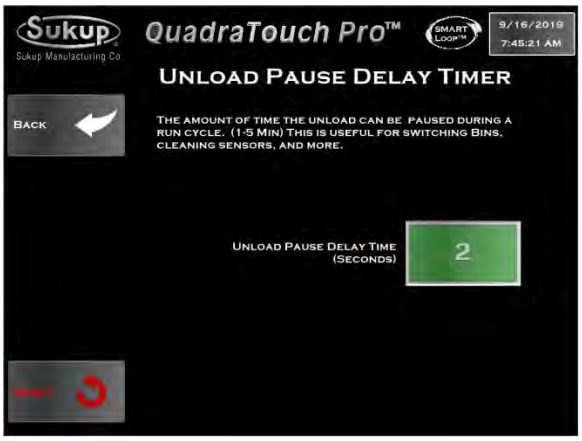
Set length of delay between point at which dryer is ready to start and point at which unload system starts.



Tower

Settings → Unload Settings Menu → Unload Auxiliary Timers

Time delays between unload auxiliaries can be programmed here.



All Dryers

Settings → Unload Settings Menu → Unload Pause Delay Timer

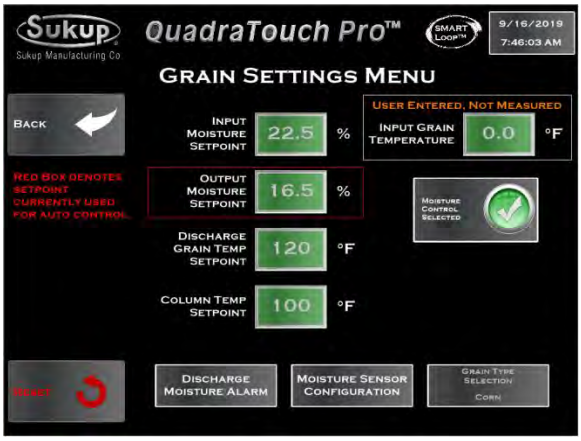
Set amount of time that unload can be paused during a run cycle (1 to 5 minutes). This is useful for cleaning sensors and switching bins.

Cross-Flow/Mixed-Flow

Settings → Unload Settings Menu → Unload Cleanout Timer

If desired, set additional time for unload system to run after a standard shutdown. It provides time for unload system to clean itself out before shutting down. **NOTE:** Applicable only to dryers with unload augers, not those with conveyors.

Proximity Switch Override may be used to troubleshoot a faulty Proximity Switch or allow temporary continued operation while waiting for a part, for example.

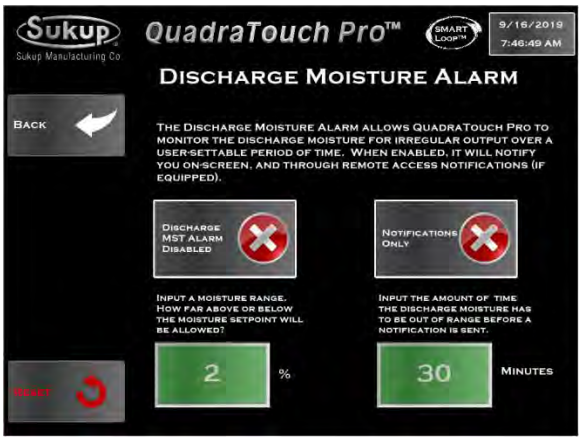


Grain Settings

All Dryers

Settings → Grain Settings Menu

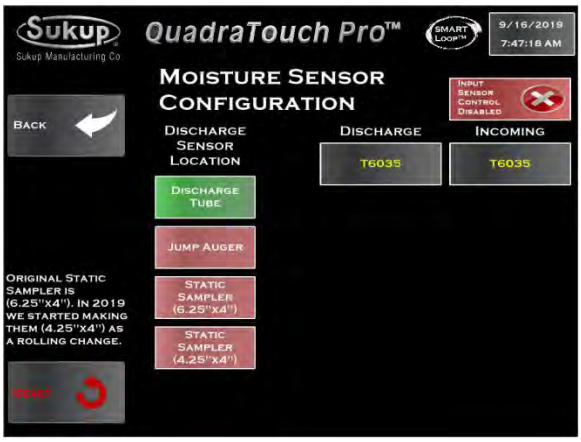
Enter moisture content and temperature of incoming grain, and desired output moisture content and temperature, as well as column temperature setpoint .**NOTE:** Discharge Grain Temp not available on Tower Dryers



All Dryers

Settings → Grain Settings Menu → Discharge Moisture Alarm

When enabled, this feature will send notification if discharge moisture sensor detects irregular output for a user-set amount of time. Range of acceptable moisture can also be set.

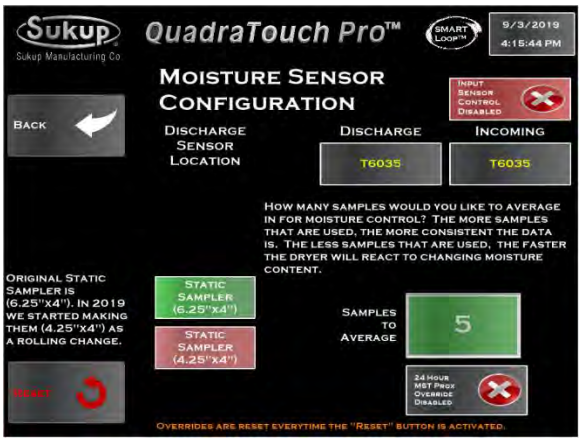


Cross-Flow/Mixed-Flow

Settings → Grain Settings Menu → Moisture Sensor Configuration

Dryer's moisture sensor(s) are configured here. Enter type and location of each sensor; recalibrate each; set sample frequency.

Enable 24 Hour MST Prox Override to allow for operation in manual mode only while waiting on parts, for example.

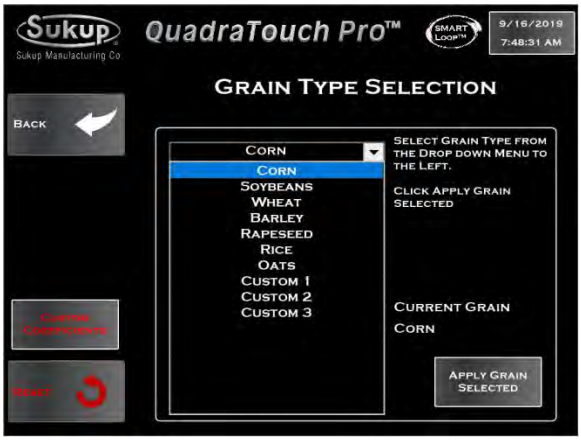


Tower

Settings → Grain Settings Menu → Moisture Sensor Configuration

Dryer's moisture sensor(s) are configured here. Enter type and location of each sensor; recalibrate each; set sample frequency

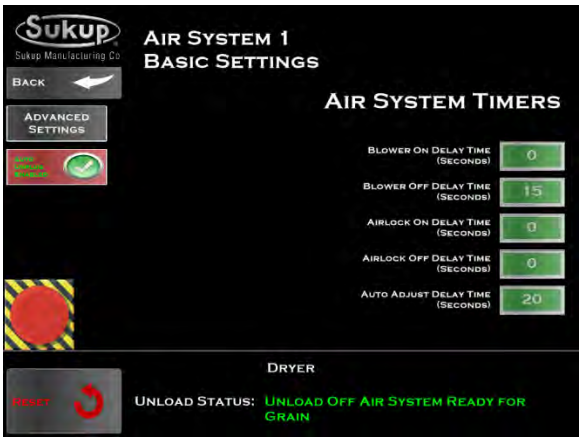
Enable 24 Hour MST Prox Override to allow for operation in manual mode only while waiting on parts, for example..



All Dryers

Settings → Grain Settings Menu → Grain Type Selection

Enter type of grain that is to be dried. Note that changing grain type, temperature measurement scale, or discharge moisture sensor type or location will remove configuration of moisture sensor.



Air System Settings

Cross-Flow/Mixed-Flow

Settings → Air System Settings

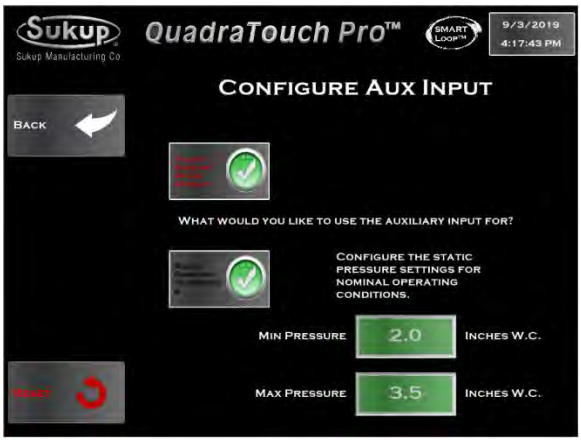
If using air system with dryer, set operating parameters for each. See Cyclone Installation & Operation Manual, L1396.

Configure User Fault Text

All Dryers

Settings → Configure User Fault Text

If desired, change User Fault message wording.



Configure Aux Input

Tower Dryer

Settings → Configure Aux Input

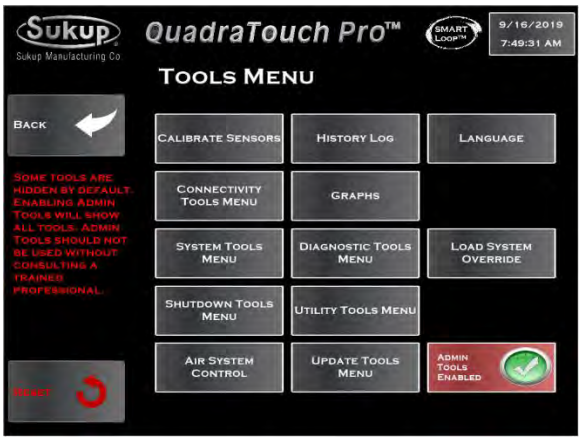
Analog input can be configured for an additional temperature sensor or static air pressure sensor.

Fault Horn

Tower Dryer

Settings → Fault Horn

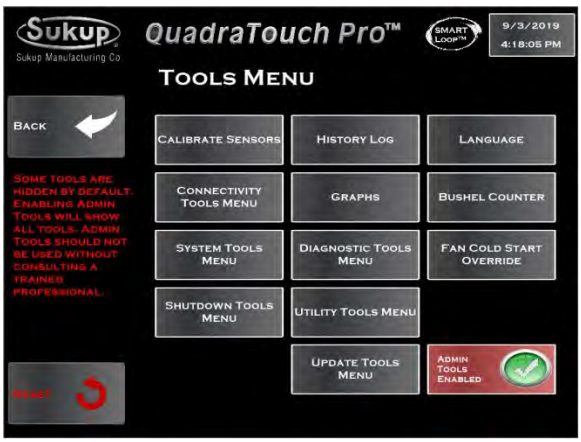
Fault horn can be set to sound for 3 seconds or continuously.



Tools

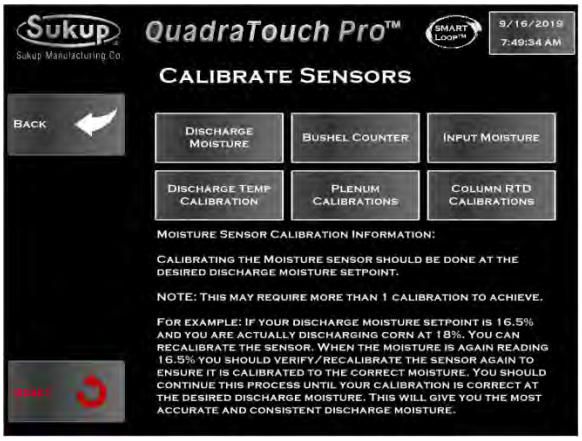
Cross-Flow/Mixed-Flow

Tools menu provides access to options to help improve drying, including moisture sensor calibration, air system controls, a history log, graphs, load system override, remote access and use of GSM modem.
Make sure Admin Tools are enabled to see tools that would otherwise be hidden.



Tower

Tools menu provides access to options to help improve drying, including moisture sensor calibration, a history log, graphs, cold start override, remote access and use of GSM modem.
Make sure Admin Tools are enabled to see tools that would otherwise be hidden.

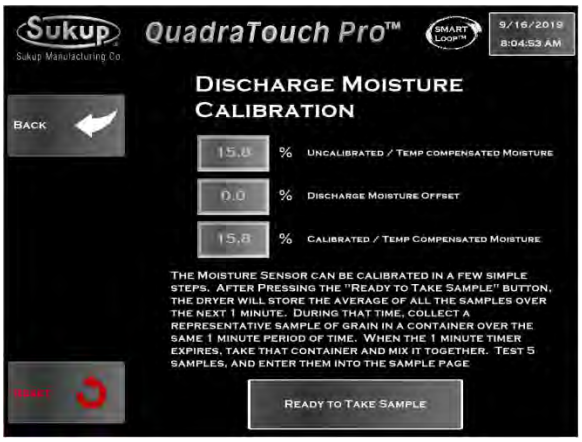


Calibrate Sensors

All Dryers

Tools → Calibrate Sensors

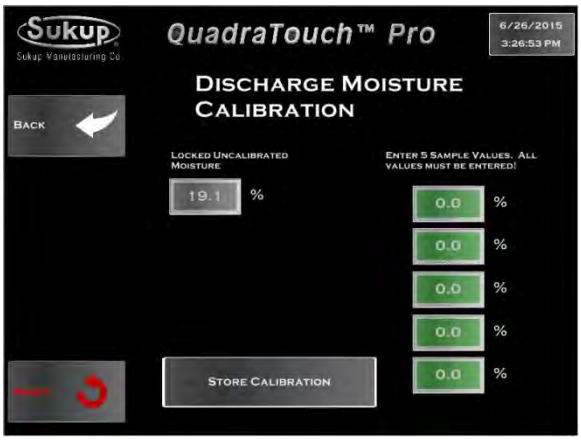
The dryer's moisture sensor(s), Plenum RTD's, and column RTD's, as well as bushel counter, can be calibrated here. Bushel counter must be calibrated in order to access the counting and bushel shutdown features shown in the Tools Menu.



All Dryers

Tools → Calibrate Sensors → Discharge Moisture

Discharge moisture sensor may need to be calibrated during operation to ensure dryer is operating with accurate data. Press "Ready to Take Sample" button. Dryer will calculate the average of all samples it takes over the next minute. During that time, collect a sample. Do this five times.



All Dryers

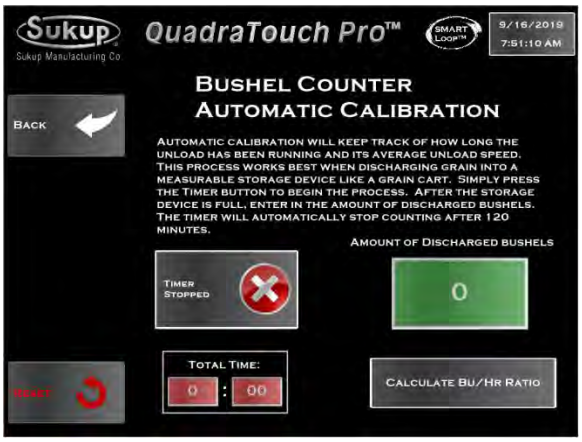
Tools → Calibrate Sensors → Discharge Moisture

Enter results of five samples on touch screen. The Locked, Uncalibrated Moisture value is what the dryer's sensor recorded over the past minute. Dryer will compare its data with your data and will store the calibration.

All Dryers

Tools → Calibrate Sensors → Bushel Counter

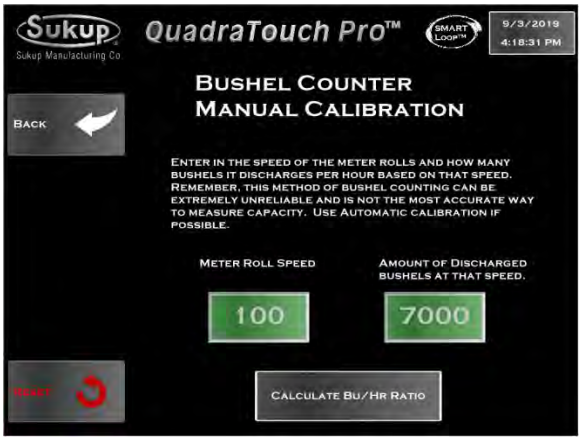
Bushel counter can be calibrated automatically or manually. Automatically is generally the most accurate. Dryer must be discharging grain into a cart or truck where quantity can be measured.



All Dryers

Tools → Calibrate Sensors → Bushel Counter→ Automatic Calibration

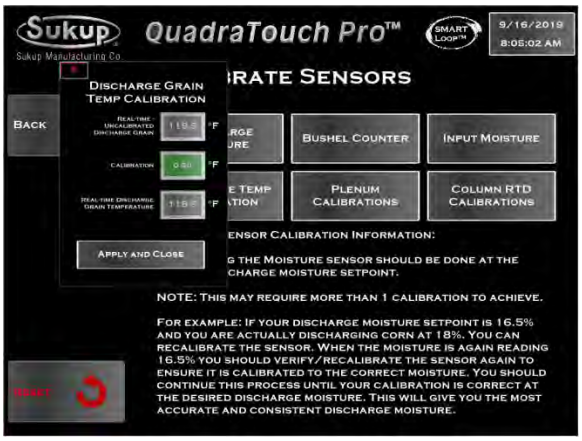
Press button to start timer. When load is finished, press it again to stop timer. Enter the number of bushels discharged during that time. Dryer will calculate and store the bu/hr rate.



All Dryers

Tools → Calibrate Sensors → Bushel Counter→ Manual Calibration

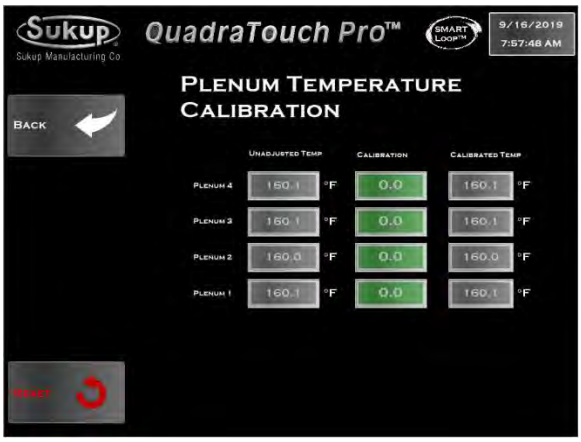
Use Manual Calibration only if Automatic is not possible. In Manual, user must enter meter roll speed and an approximate yield at that speed. Dryer will calculate and store the bu/hr rate.



All Dryers

Tools → Calibrate Sensors → Discharge Temp Calibration

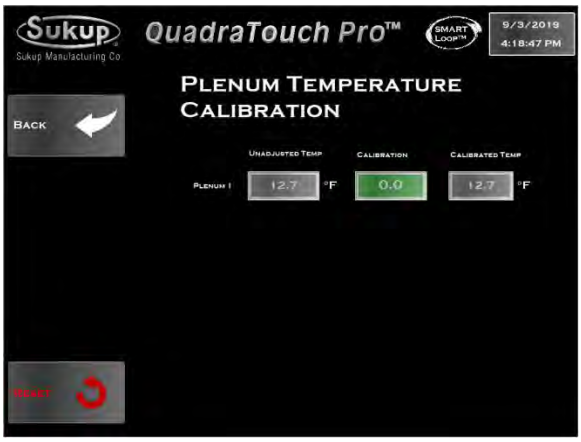
Press Calibration button to enter offset value. If dryer sensor is showing 120°F and user wants it to read 125°F, he/she would enter in 5. This sensor is generally very accurate, so exercise caution when adjusting this value.



Cross-Flow/Mixed-Flow

Tools → Calibrate Sensors → Plenum Calibration

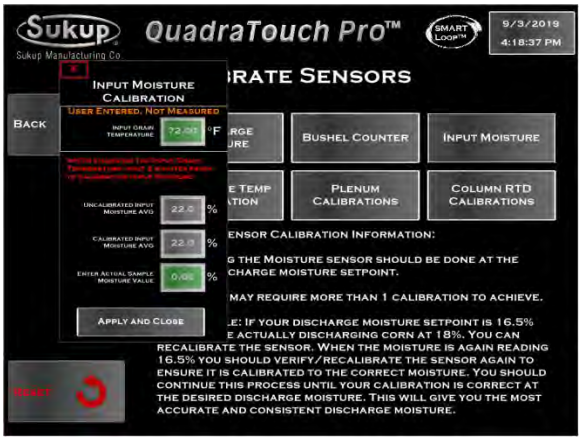
Press Plenum Calibration to enter calibration for each plenum temperature. These sensors are generally very accurate, so exercise caution when adjusting these values.



Tower

Tools → Calibrate Sensors → Plenum Temperature Calibration

Press Plenum Calibration to enter calibration for plenum temperature. This sensor is generally very accurate, so exercise caution when adjusting.



All Dryers

Tools → Calibrate Sensors → Input Moisture Sensor

Enter average of moisture content of multiple samples of grain. **NOTE:** Auger-fill cross-flow dryers do not have incoming moisture sensors unless specially ordered.

All Dryers

Tools → Calibrate Sensors → Column RTD Calibrations

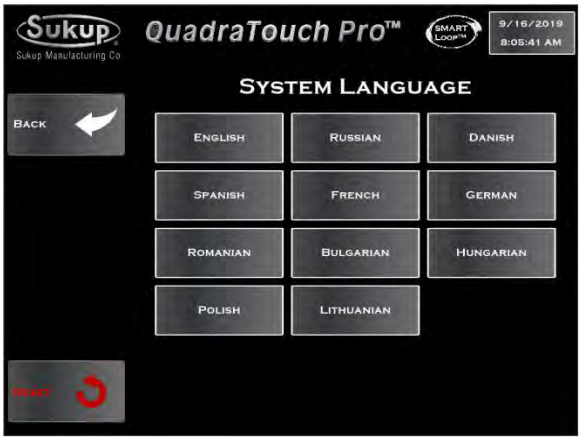
Enter calibration for column RTD. This sensor is generally very accurate, so exercise caution when adjusting.

History Log

All Dryers

Tools → History Log

History log contains all alarms, settings changes, and fault history of dryer.

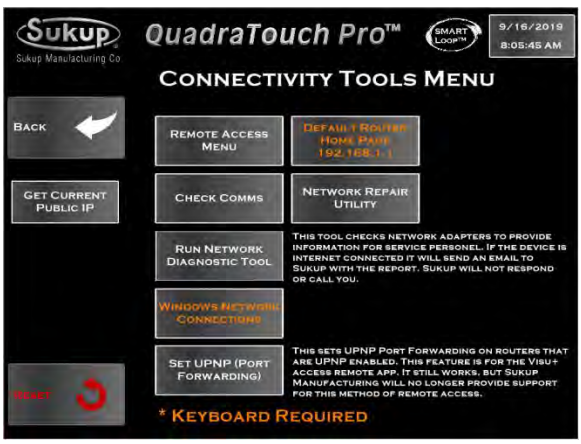


System Language

All Dryers

Tools → Language

Select language used by dryer operator.

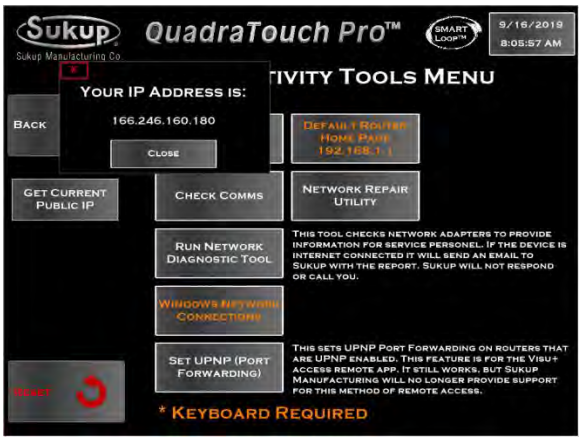


Connectivity Tools

All Dryers

Tools → Connectivity Tools Menu

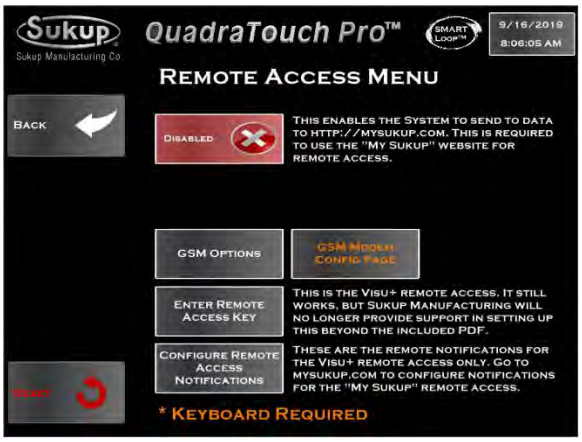
This page provides access to various connectivity tools including setup of remote access via MySukup.com or GSM modem. Additionally, use of Network Diagnostic Tool and Network Repair Utility can be initiated here. **NOTE:** Keyboard is required for some functions.



All Dryers

Tools → Connectivity Tools Menu → Get Current Public IP

Press Get Current Public IP button on left to obtain Internet Protocol Address.



All Dryers

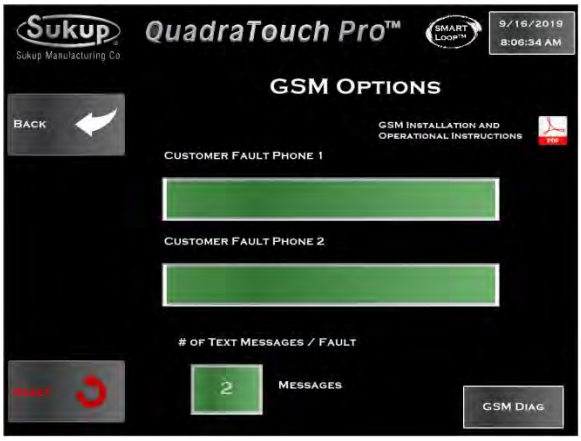
Tools → Connectivity Tools Menu →Remote Access Menu

If remote access is desired, press red button to obtain Personal Information Agreement.

All Dryers

Tools → Connectivity Tools Menu →Remote Access Menu

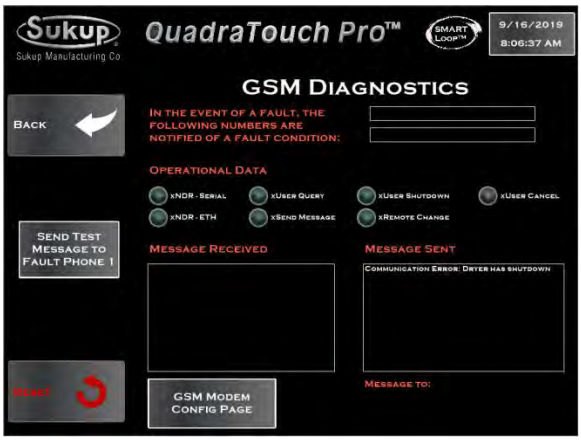
Read agreement and indicate preference on acceptance.



All Dryers

Tools → Connectivity Tools Menu →Remote Access Menu →GSM Options

Follow steps as prompted to set up MySukup.com or GSM connection. Image at left shows screen for entering phone numbers for GSM control. Press GSM Diag. box on lower right to get to diagnostics page.



All Dryers

Tools → Connectivity Tools Menu →Remote Access Menu →GSM Options → GSM Diagnostics

GSM Diagnostics page helps with first-time setup to ensure modem is operating correctly.

All Dryers

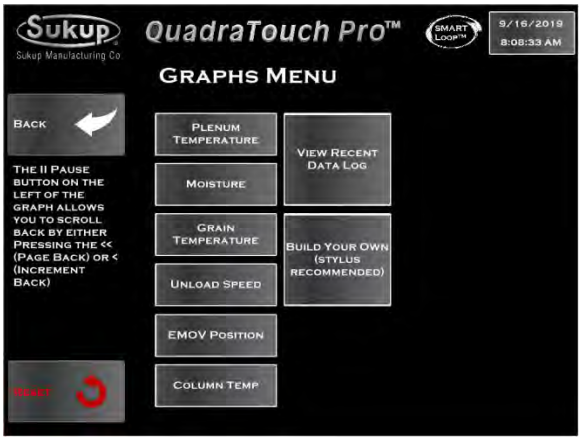
Tools → Connectivity Tools Menu →Check Comms

Pressing Check Comms button enables user to check connectivity with dryer's programmable logic controls and with air system if one is connected. The xPLC Toggle Bit button will turn on and off when PLC and touch panel are communicating.

All Dryers

Tools → Connectivity Tools Menu →Network Repair Utility

This utility attempts to diagnose and repair networking and communication errors. Activate by pressing button at lower right.

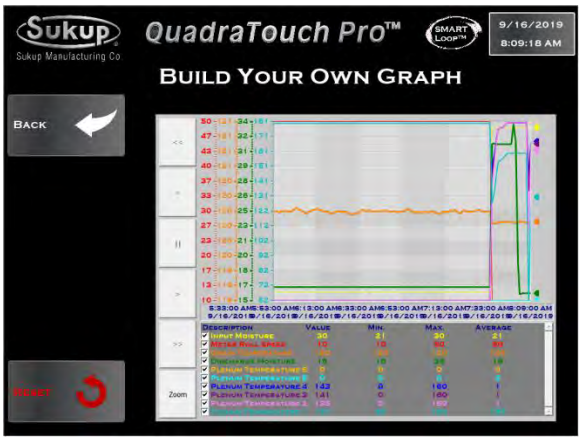


Graphs

All Dryers

Tools → Graphs

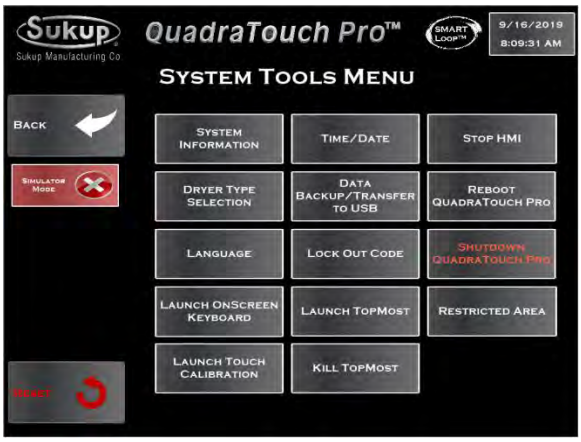
QuadraTouch Pro operating system allows dryer user to look at graphs both in real-time and for past. **NOTE:** Since some screens contain a lot of data, use of a stylus will be helpful.



All Dryers

Tools → Graphs → Build Your Own Graph

Users can build their own graphs to compare multiple factors.

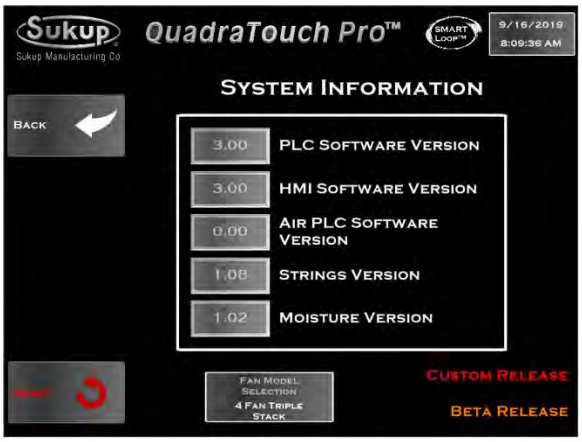


System Tools

All Dryers

Tools → System Tools Menu

This menu provides access to a wide range of functions and has many features that help maintain and update QuadraTouch Pro operating system.



All Dryers

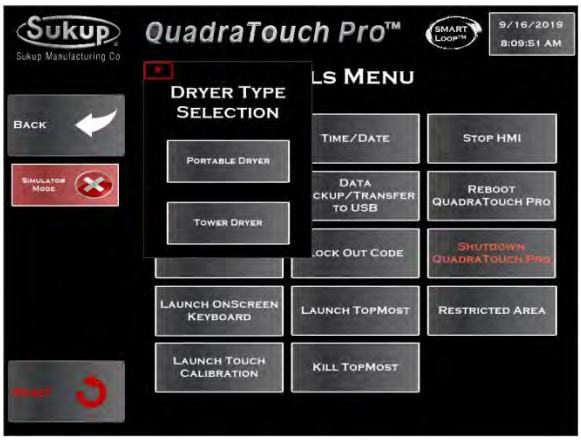
Tools → System Tools Menu→ System Information

This page prompts user to input software versions for PLC, touch screen and air system if dryer is so equipped.

All Dryers

Tools → System Tools Menu→ Time/Date

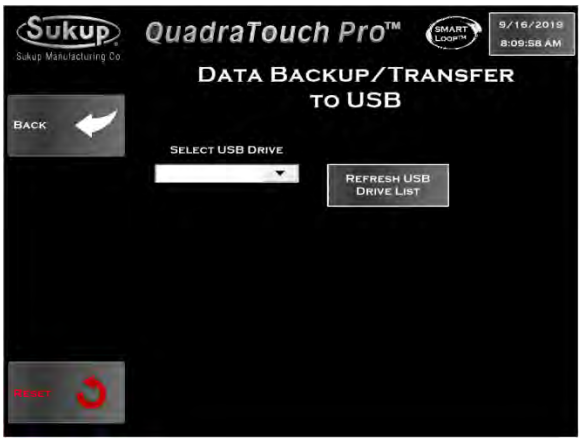
Enter current time and date.



All Dryers

Tools → System Tools Menu→ Dryer Type Selection

Enter type of dryer and number of fans if a cross-flow dryer. Enter model number if a tower dryer. For mixed-flow dryer, follow prompts to enter dryer characteristics.



All Dryers

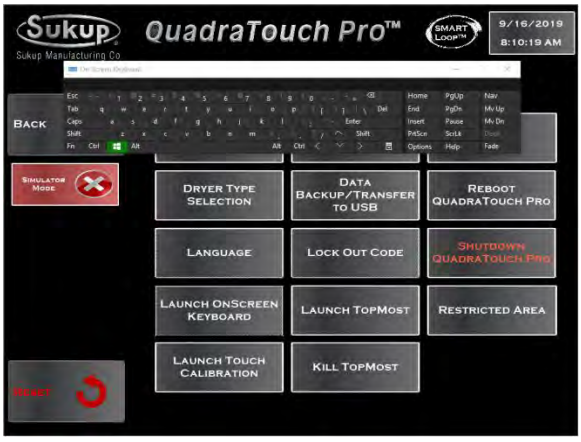
Tools → System Tools Menu→ Data Backup/Transfer to USB

Enter USB drive to be used for data backup.

All Dryers

Tools → System Tools Menu→ Lock Out Code

Enter a four-digit lock-out code (Personal Idenfication Number). After proceeding, touch screen will be disabled unless code is entered.



All Dryers

Tools → System Tools Menu→ Launch OnScreen Keyboard

Press Launch On-Screen Keyboard button to get pop-up keyboard.

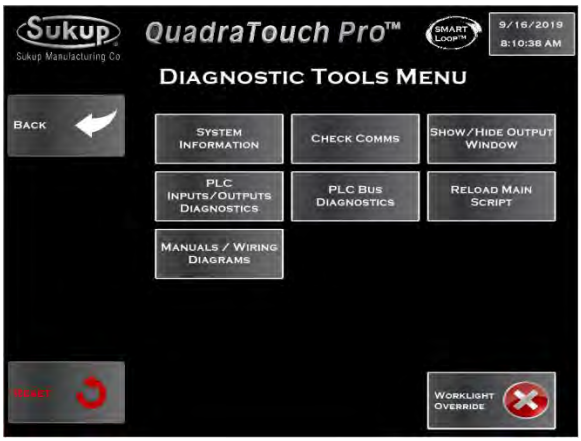
All Dryers

Tools → System Tools Menu→ Restricted Area

This page allows access to hidden screens for Sukup Personnel only.

All Dryers

Other System Tools include Touch Screen Calibration, Stop HMI (turn off touch panel), Reboot QuadraTouch Pro, Shutdown QuadraTouch Pro, Launch Topmost, Kill Topmost, Simulator Mode. See Page 20 to set language.

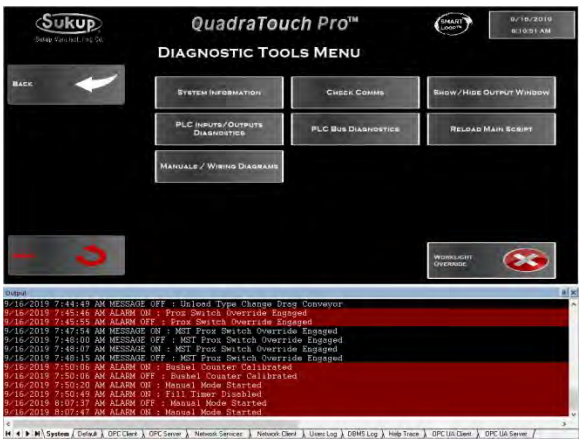


Diagnostic Tools

All Dryers

Tools → Diagnostic Tools Menu

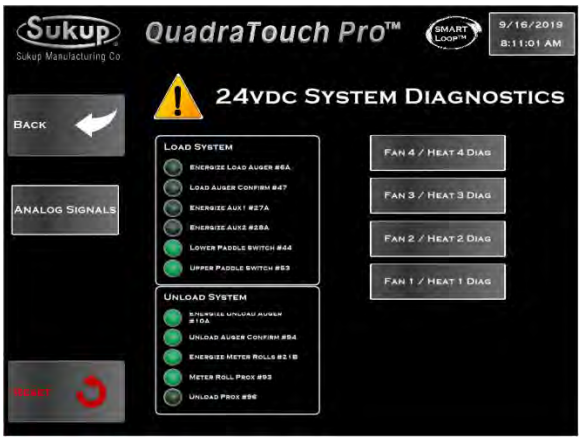
Screen shows diagnostic tools that can be used. See Page 22 to Check Comms (communication between devices) and Page 23 for input of System Information if not done already.



All Dryers

Tools → Diagnostic Tools Menu → Show/Hide Output Window

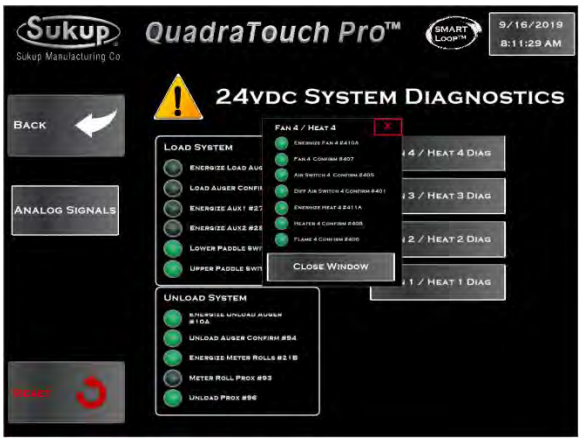
Pressing Show/Hide Output Button shows output window. It may look different than shown and can be dragged to other location on touch screen by pressing on Output bar.



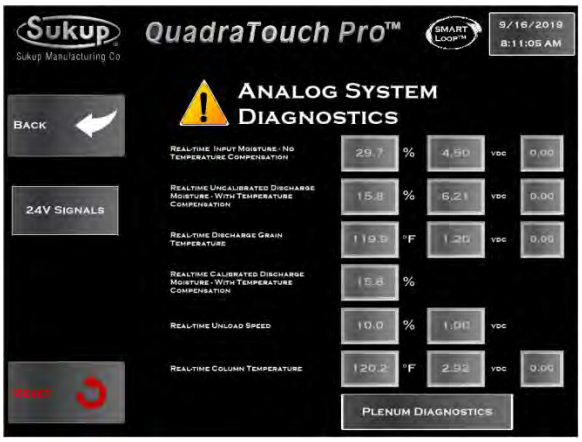
PLC Inputs/Outputs for All Dryers

Tools → Diagnostic Tools Menu → PLC Inputs/Outputs Diagnostics

This page provides an overview of load and unload systems, fans and heaters. A green light means the circuit has 24VDC on it. This menu can be accessed at almost any time by pressing Sukup logo (top left of screen) two times.

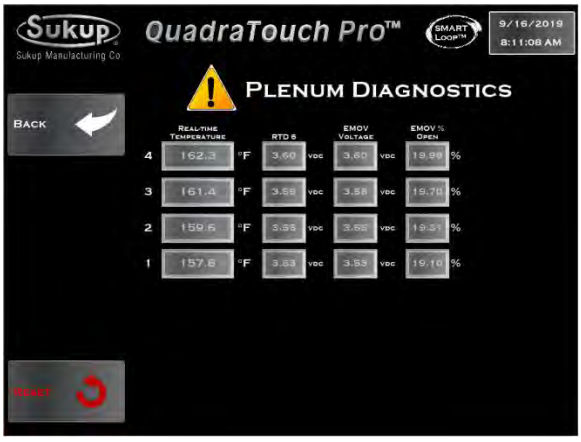


Individual fan inputs/outputs are shown in pop-up windows by pressing corresponding buttons.



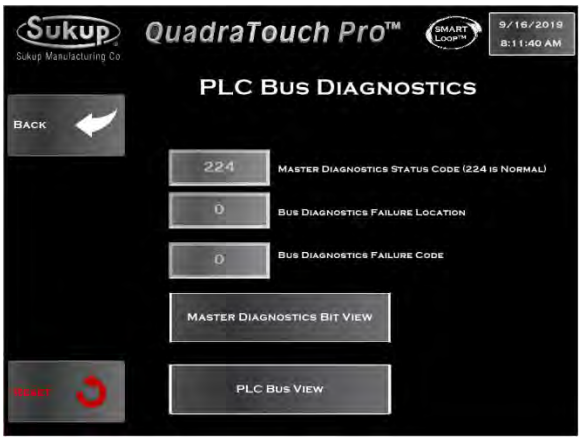
Tools → Diagnostic Tools Menu → Analog System Diagnostics

Press Analog Signals button on left of previous screen to get real-time readings on all analog input sensors and output reference signals. See image at left. This menu can be accessed at almost anytime by pressing SUKUP logo once at top left of touch screen.



Tools → Diagnostic Tools Menu → Analog System Diagnostics→ Plenum Diagnostics

Pressing Plenum Diagnostics button at bottom of previous screen will show each plenum feedback value, the reference signal and percentage opening on the EMOV. See image at left. This menu can be accessed at almost anytime by pressing SUKUP logo at top left of touch screen thee times.



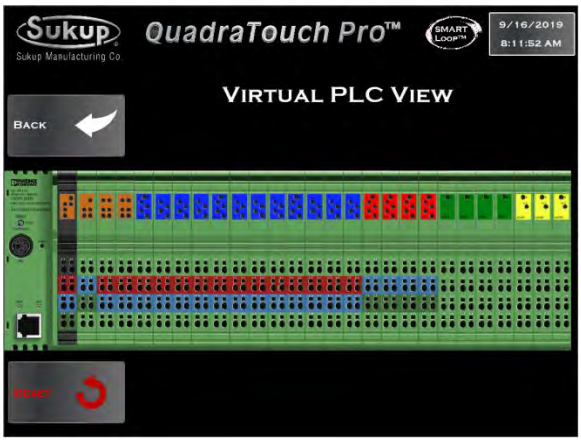
PLC Bus Diagnostics for All Dryers

Tools → Diagnostic Tools Menu → PLC Bus Diagnostics

This section provides critical information about PLC. This menu would only need to be accessed in the event of a PLC or I/O card failure.

Tools → Diagnostic Tools Menu → PLC Bus Diagnostics → Master Diagnostics Bit View

Press Master Diagnostic Bit View button to get pop-up window showing status of various diagnostics. Information contained here will most likely only be needed by a Sukup service technician.



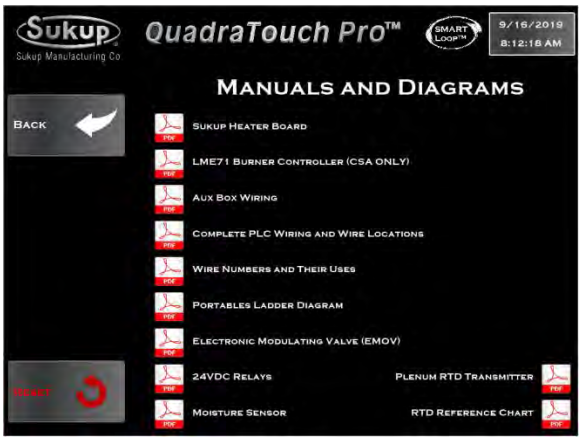
Tools → Diagnostic Tools Menu → PLC Bus Diagnostics → PLC Bus View

Press PLC Bus View for a view of dryer's PLC and identification of any problems with it. If a device is not functioning properly, it will be highlighted for easy identification.

All Dryers

Tools → Diagnostic Tools Menu → Reload Main Script

Press Reload Main Script button to restart the Main Script if it crashes and sends an error message. If that doesn't work, restart dryer.



All Dryers

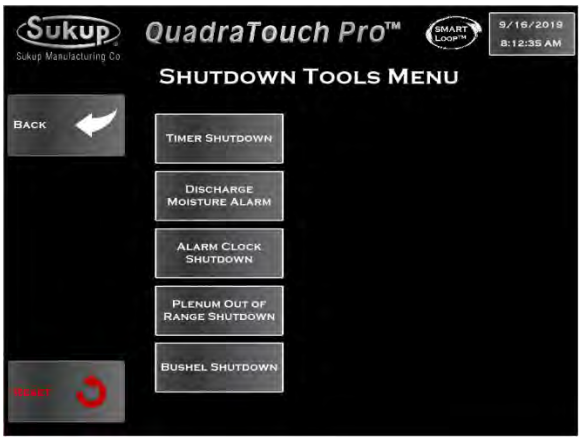
Tools → Diagnostic Tools Menu → Manuals/Wiring Diagrams

Entire copies of system manuals and wiring diagrams can be found here, including information related to specific components and frequently asked questions.

All Dryers

Tools → Diagnostic Tools Menu → Worklight Override

Press Worklight Override button at bottom right of Diagnostic Tools Menu page to energize worklight when a fault is preset. When in Override mode, worklight will not shut off if a fault occurs.



Shutdown Tools

All Dryers

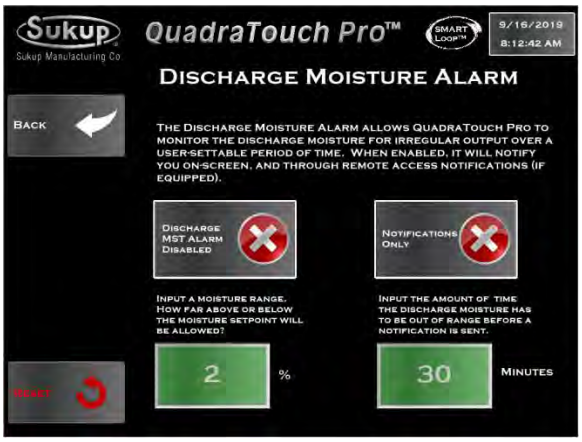
Tools → Shutdown Tools Menu

This menu provides access for shutdown settings. User can specify amount of time for each function.

All Dryers

Tools → Shutdown Tools Menu → Timer Shutdown

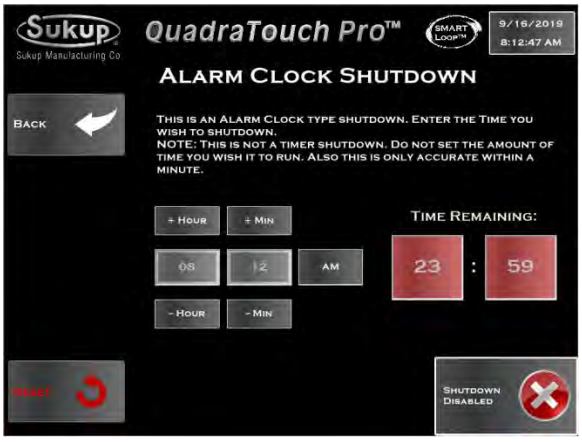
Enter amount of time for dryer to run before shutting down.



All Dryers

Tools → Shutdown Tools Menu → Discharge Moisture Alarm

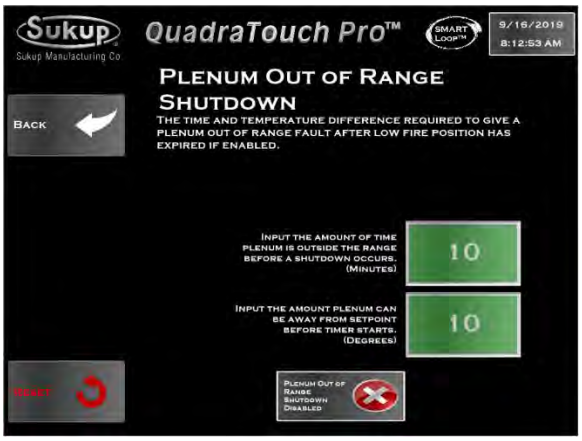
Enter acceptable range of discharge grain moisture and amount of time it must be out of range before a shutdown occurs.



All Dryers

Tools → Shutdown Tools Menu → Alarm Clock Shutdown

Enter time at which you want dryer to shut down within next 24 hours



All Dryers

Tools → Shutdown Tools Menu → Plenum Out of Range Shutdown

Enter amount of time that plenum temperature can be out of range before a shutdown occurs. Also input acceptable temperature range.

All Dryers

Tools → Shutdown Tools Menu → Bushel Shutdown

Enter number of bushels to be dried before dryer shuts down. NOTE: This feature is only available after calibrating bushel counter

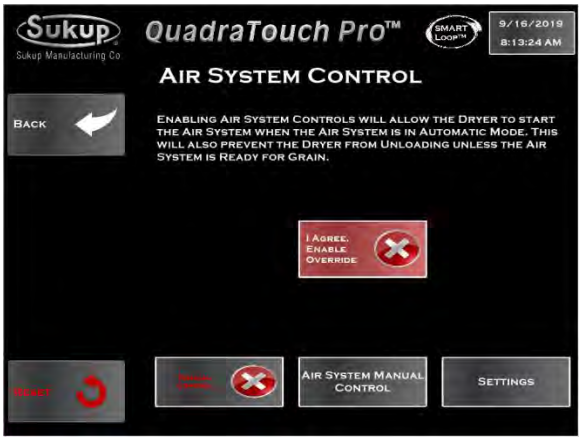
Utility Tools

All Dryers

Tools → Utility Tools Menu

Press IP Assign button to use IP Assignment Wizard to assign an IP address to a new out-of-box PLC.

Press PLC Start/Stop Tool to force a PLC program to start/stop.

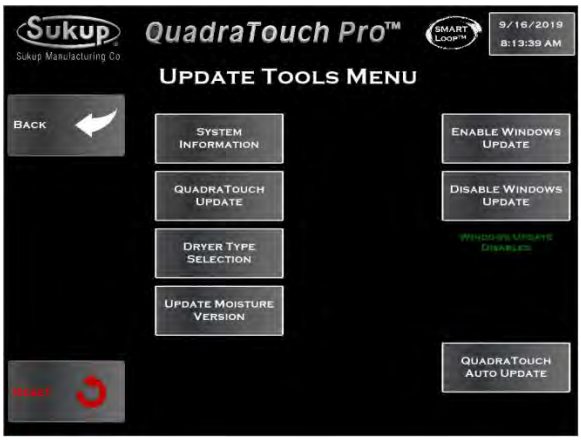


Air System Control

Cross-Flow/Mixed-Flow

Tools → Air System Control

Enabling Air System Controls will allow dryer to start air system when air system is in Automatic mode. This will prevent dryer from unloading unless air system is ready for grain. See Cyclone Installation & Operation Manual, L1396.

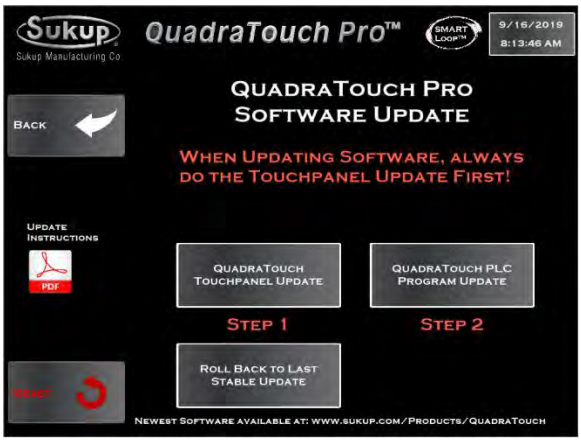


Update Tools

All Dryers

Tools → Update Tools Menu

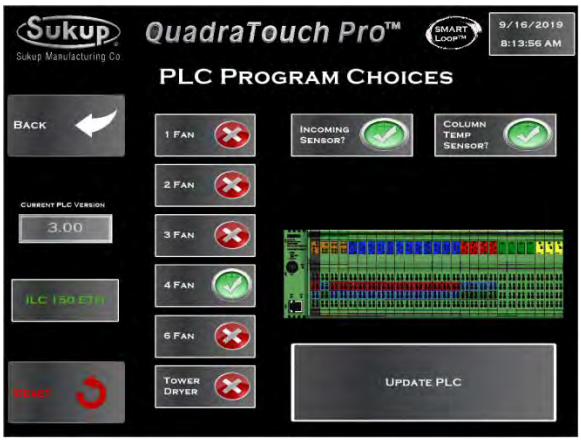
This page provides access to enter system information (See Page 23), update QuadraTouch Pro software, enter type of dryer (See Page 24) and update version of moisture sensor(s).



All Dryers

Tools → Update Tools Menu→ QuadraTouch Update

Follow prompts on this page to update QuadraTouch Pro software.



All Dryers

Tools → Update Tools Menu → QuadraTouch Update → PLC Program Choices

Follow prompts on this page to update PLC.

All Dryers

Tools → Update Tools Menu → QuadraTouch Update → Update Moisture Version

Follow prompts on this page to update moisture sensor version.

All Dryers

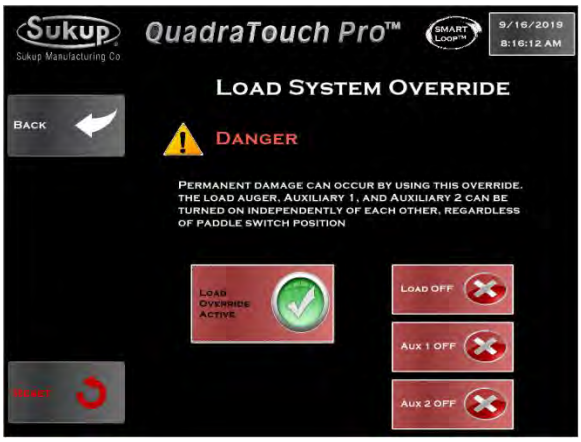
Tools → Update Tools Menu

Press Enable Windows Update or Disable Windows Update on right side of Update Tools Menu as desired.

All Dryers

Tools → Update Tools Menu → QuadraTouch Auto Update

Press QuadraTouch Auto Update at bottom right of screen and follow prompts to update software automatically.



Load System Override

Cross-Flow/Mixed-Flow

Tools → Load System Override

Sometimes it is necessary to run load auger or auxiliary devices independently of one another irrespective of the fill switch status. This mode allows that. However, permanent damage can occur if it's not used properly.

Tower Cold Start Fan Override

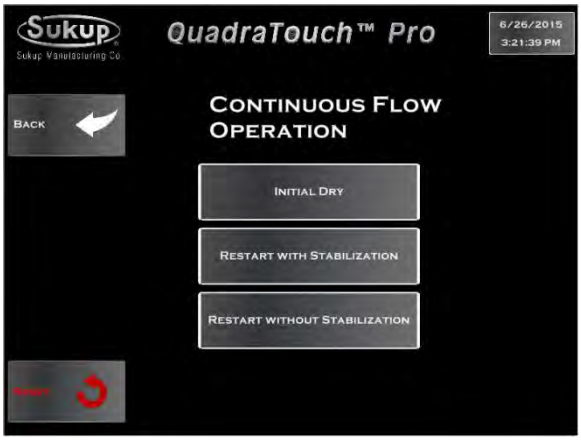
Tower

Tools → Tower Cold Start Fan Override

Fans on a tower dryer typically start in staged order. Use buttons on this page to start fans independently. Use this option only to warm up fans in very cold weather. Admin Tools must be enabled.

Cross-Flow/Mixed-Flow Operation

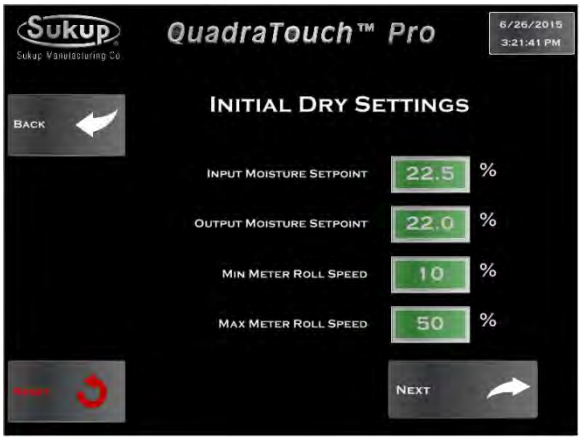
Pressing Start on main screen will bring up Start Menu. Dryer can be used in many different drying modes, the most common of which is Continuous Flow. This section will describe each mode and how it's accessed.



Continuous Flow (Automatic)

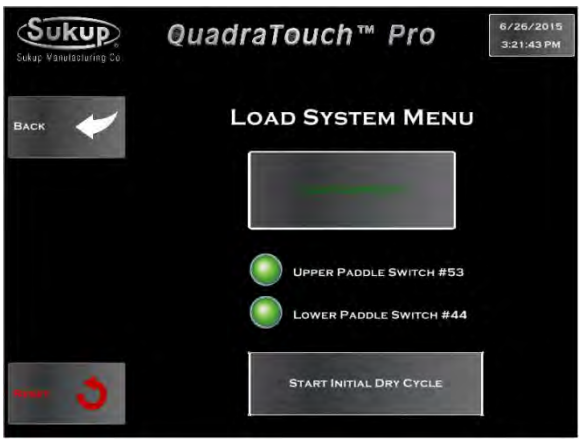
Start → Continuous Flow

Continuous Flow is divided into three processes when grain is loaded into dryer for the first time. Initial Dry essentially warms up the grain for a set period of time depending on user input. Fans and heaters will turn on and a timer will appear on the screen. This is essential for creating a steady flow of grain through the next step, Stabilization.



Start → Continuous Flow → Initial Dry

To begin Initial Dry, the dryer needs some information to get started. To give it an idea of how long to heat the first batch of grain, enter in the values of the incoming and desired output moisture. Press Next to continue on to the loading phase.

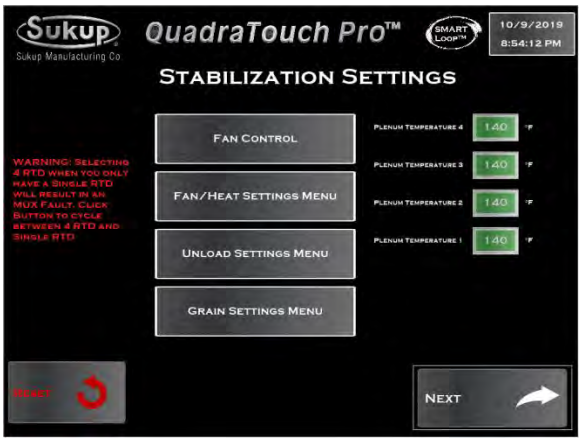


Start → Continuous Flow → Initial Dry → Next

Now that dryer has been programmed with a few basic settings, it is ready to be loaded with grain and to start Initial Dry. After loading, a button will appear to start Initial Dry cycle.

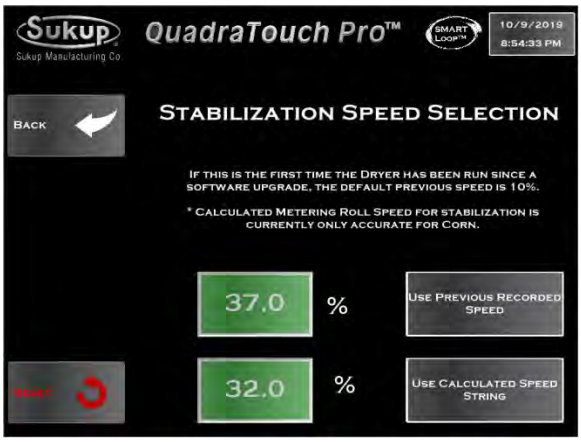
Start → Continuous Flow → Restart with Stabilization → Fan/Heat Control

After Initial Dry is finished, Stabilization is the next phase of Continuous Flow Mode. Stabilization is designed to go through one full cycle of grain, discharging at a calculated roll speed. **NOTE:** Warmup is used for cold climates to thaw frozen grain systems. The first step of stabilization is to select which fans and heaters should be used. **NOTE:** A heater will not be enabled unless its corresponding fan is used.



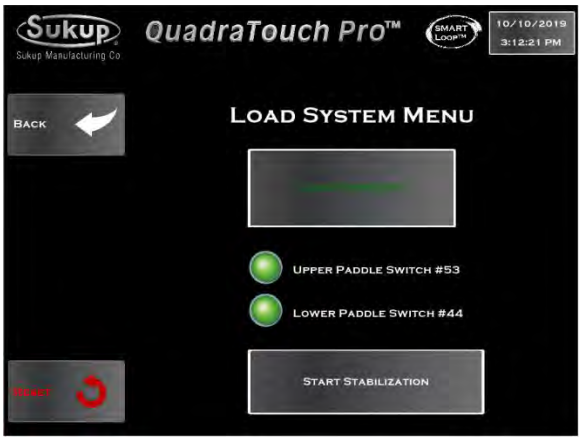
Start → Continuous Flow → Restart with Stabilization → Fan/Heat Control → Stabilization Settings

All previous settings will be stored from last time dryer was run, so make any changes necessary on this page before calculating the stabilization speed.



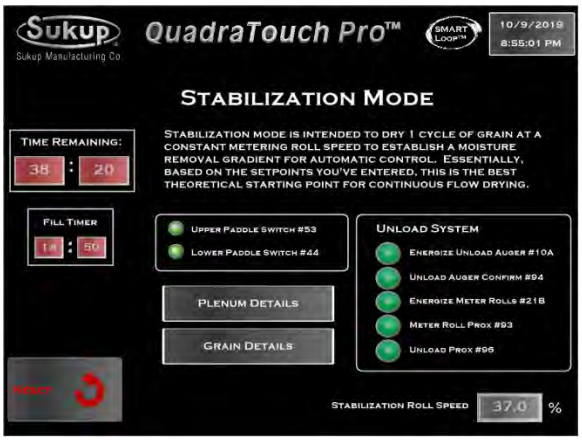
Start → Continuous Flow → Restart with Stabilization → Fan/Heat Control → Stabilization Settings → Next

On Stabilization Settings page, press Next button at lower right. Stabilization speed in green box is the last recorded speed when the dryer was running in Continuous Flow mode. If dryer was running well the last time it was used, using this value for Stabilization is recommended.



Start → Continuous Flow → Restart with Stabilization → Fan/Heat Control → Stabilization Settings → Next → Use Calculated Speed String

If dryer is coming out of Initial Dry, the screen will automatically switch to Stabilization mode. If Initial Dry has not been performed, the Load System Menu will appear. After dryer has been loaded with grain, a button will appear to start Stabilization.



Start → Continuous Flow → Restart with Stabilization → Fan/Heat Control → Stabilization Settings → Next → Use Calculated Speed String → Start Stabilization

Plenum temperature and discharge moisture setpoint can be confirmed or changed.

Dry Fire

Start → Dry Fire

Dry Fire mode allows the dryer to turn its fan(s) and heater(s) on when the dryer is empty. This mode should be run every year before operation to test for functionality. Be sure to inspect each heater and pipe train for component integrity and functionality.

Start → Dry Fire → Dry Fire Mode

Dry Fire mode lasts for 10 minutes. Status of the signals will be displayed. When dryer is empty, the air switch will most likely not be closed.

Final Dry

Start → Final Dry

Final Dry mode is used to finish off the last "batch" when there is no more grain to dry in continuous flow. The dryer will batch dry the last grain in the dryer, then turn its fan(s) and heater(s) off and unload the dryer for a set period of time.

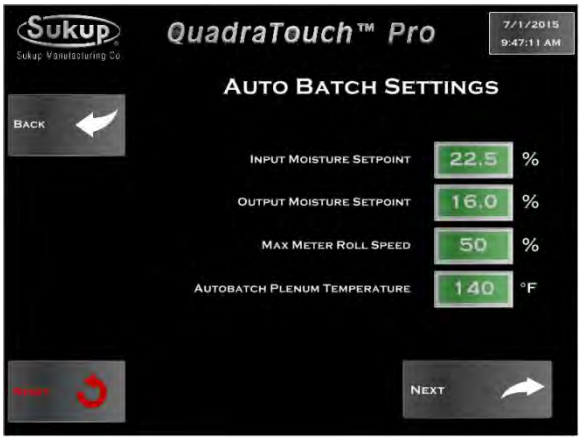
Start → Final Dry → Start Dry Fire

Final Dry mode will automatically exit when the timers have expired.

Auto Batch

Start → Auto Batch

Due to very high moisture content, Auto Batch mode may be required. After selecting Auto Batch, the system will prompt user about restarting from the last batch. If no previous batch has been recorded, it will start from the new batch settings.



Start → Auto Batch → Start New Batch

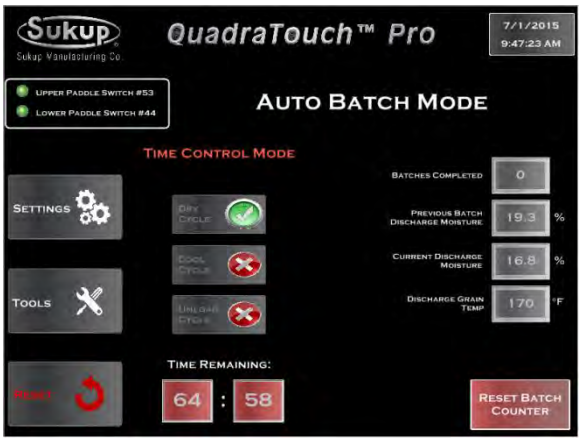
Enter settings for Auto Batch.

Start → Auto Batch → Start New Batch → Auto Batch Settings

Choose heat or heat/cool operation and control method.

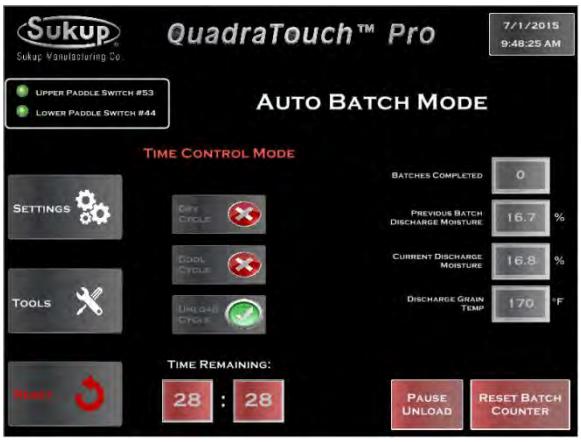
Start → Auto Batch → Start New Batch → Auto Batch Settings

Based on entered settings, dryer will calculate a base point to start from.



Start → Auto Batch

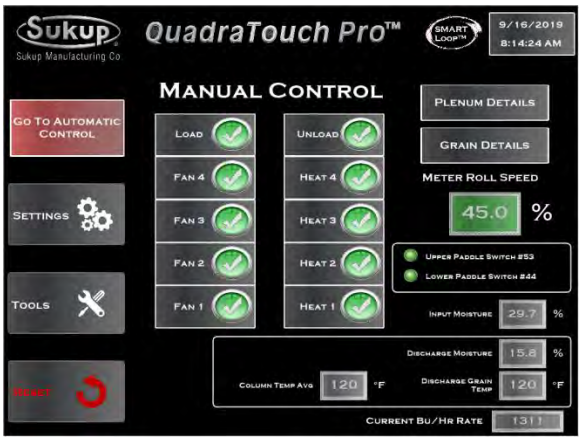
Auto Batch will start with the Dry Cycle. After the timer expires, the Cool Cycle will be used (if heat/cool operation was selected), then the dryer will start unloading the batch.



Start → Auto Batch

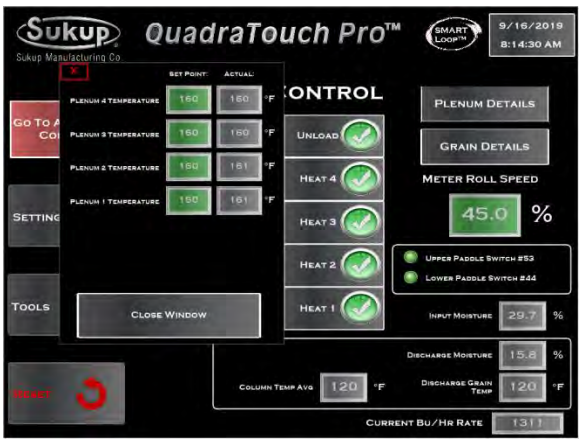
The Unload Cycle can be paused during operation, but needs to be resumed before the next cycle starts. Each of the mode times can be changed using the settings menu.

Manual Operation of Cross-Flow/Mixed-Flow Dryers



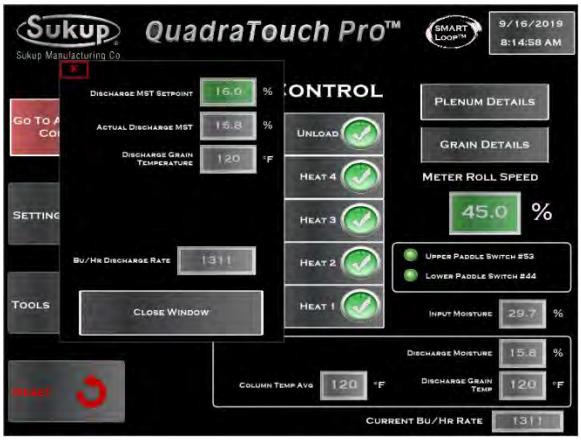
Start → Manual Operation

Plenum temperature and discharge moisture setpoints can be set.



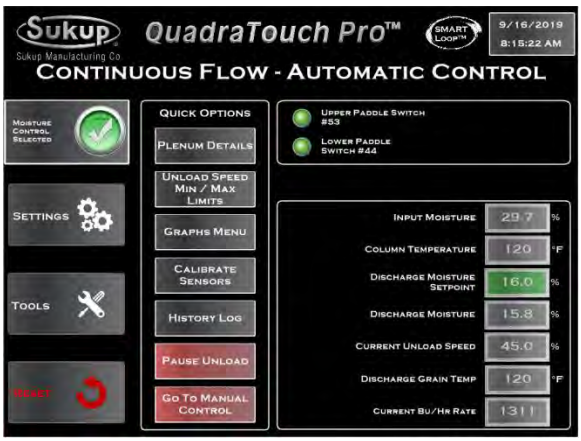
Start → Manual Operation

Press Plenum Details to get a pop-up window to enter plenum temperature setpoint.



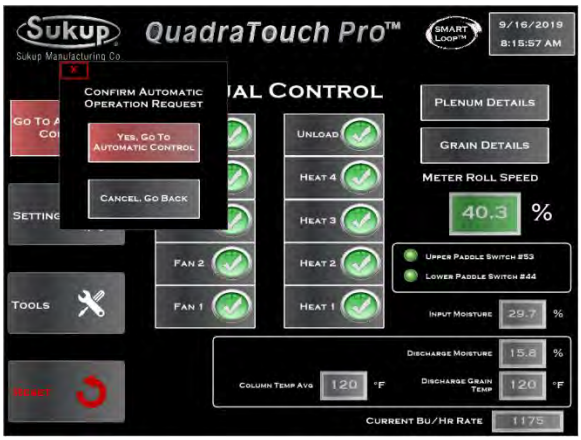
Start → Manual Operation

Press Grain Details to get a pop-up window to enter discharge moisture setpoint.



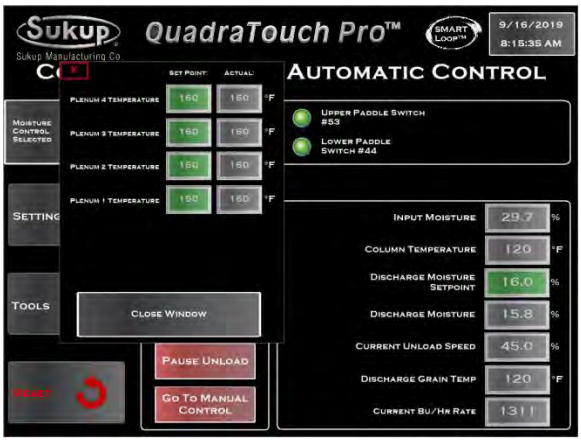
Start → Manual Operation

Press Go to Automatic Control button to get to Continuous Flow Automatic Control page.



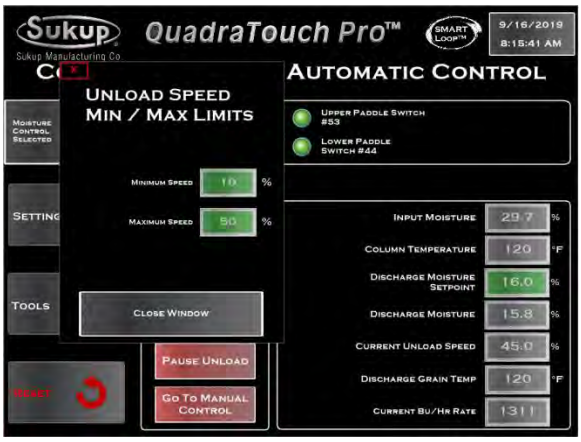
Start → Manual Operation → Go to Automatic Control → Confirm Automatic Operation Request

Press Yes if automatic control is desired, then press Plenum Details.



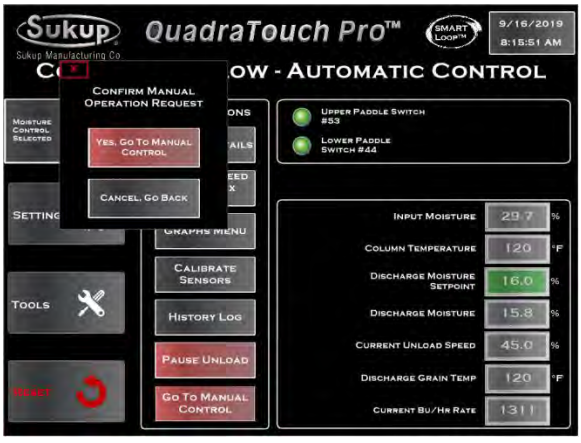
Start → Manual Operation → Go to Automatic Control → Plenum Details

Press Plenum Details button to reset plenum setpoint(s) if desired.



Start → Manual Operation → Go to Automatic Control → Unload Speed Min/Max Limits

Press Unload Speed Min/Max Limits to reset unload speeds if desired.

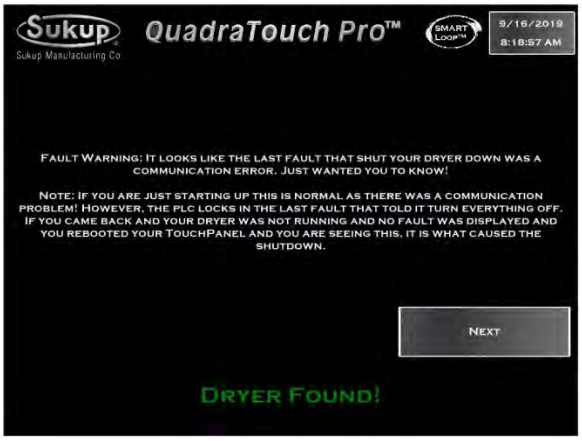


Press Go to Manual Control button at bottom of screen and confirm in pop-up window.

Resetting to QuadraTouch Pro Home Page

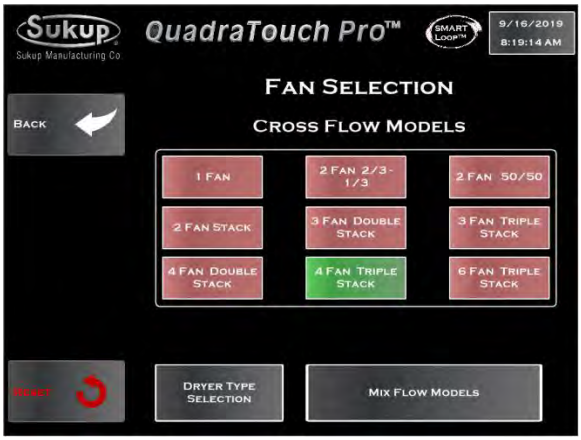
All Dryers

Pressing red Reset button will bring user back to home page. This image will appear in screen while touch panel is resetting.



All Dryers

When first powering up dryer it will attempt initial connection. If initial connection fails it will say dryer not found. If a connection is made it will say dryer found.



Fan/Model Selection

All Dryers

On home page, press Fan Model Selection in lower right corner. Follow prompts to enter type of dryer and number of fans. Image at left shows fan-selection page for cross-flow dryer. Press “Back” after making selection.

Press Dryer Type Selection and Tower Dryer to select tower dryer model (See below), or Mix Flow Models to set type of mixed-flow dryer (See next page).

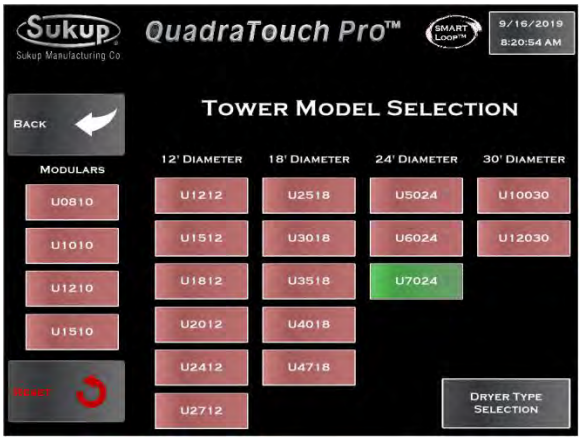


Image at left shows model selection page for tower dryer. Press “Back” after making selection.

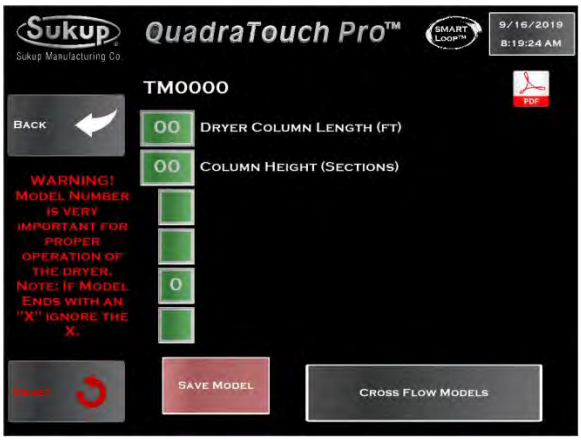


Image at left shows screen for entering dryer length and column height (tiers) for mixed-flow dryers.

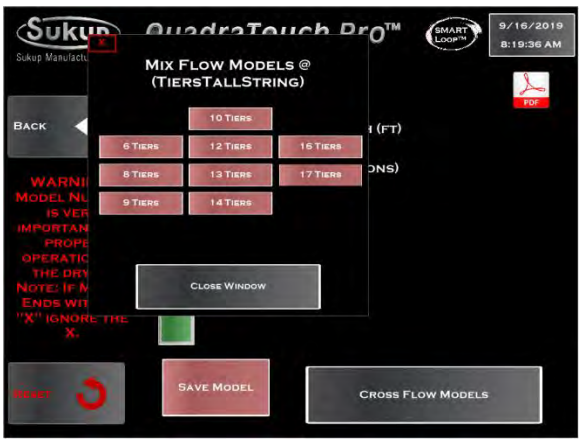


Image at left shows pop-up window for entering number of (tiers) for mixed-flow dryer.

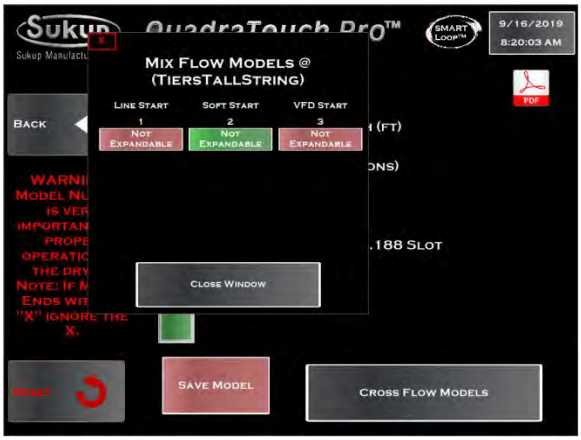


Image at left shows pop-up window for entering start type (Soft start, line start, VFD start) and expandability of dryer.

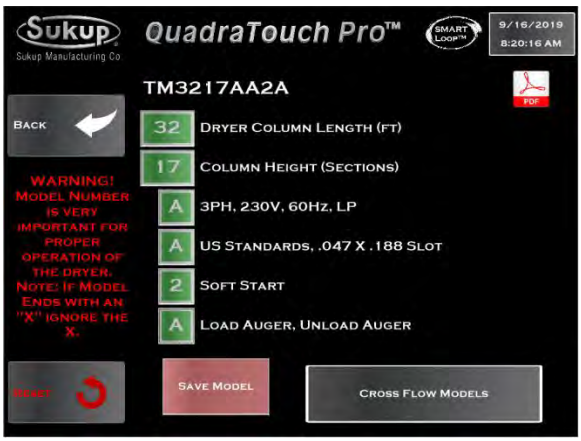
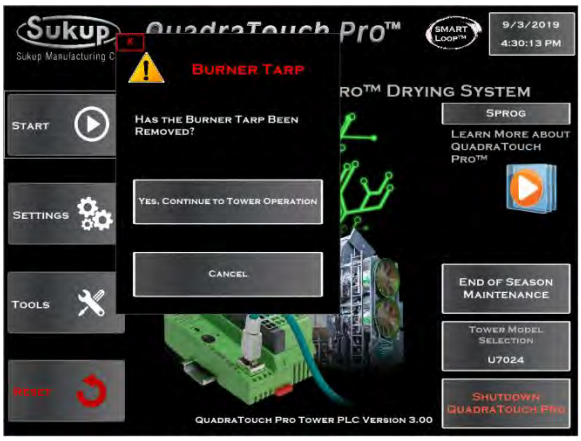
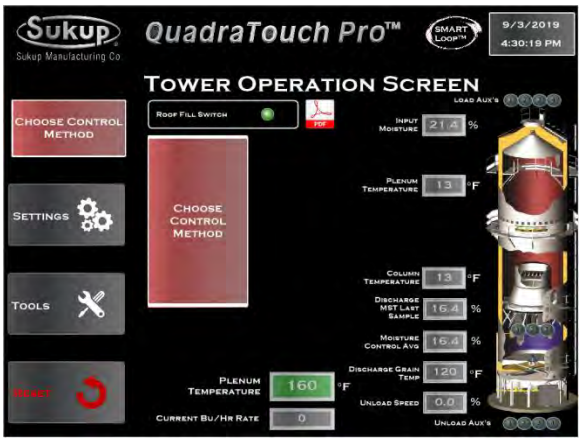


Image at left shows dryer identification screen after entry of all parameters. Press “Save Model” after confirming selections.



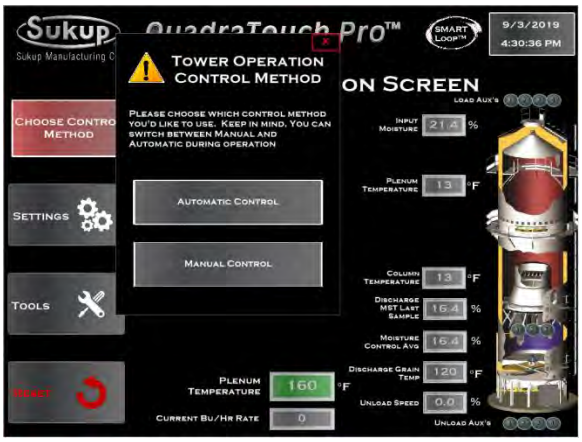
Tower Dryer Operation

When operating Tower Dryer, the program flow is similar to that found on previous pages for cross-flow/mixed-flow dryers, with a few exceptions. They are described here.
The first key difference is in the Start menu. It will prompt you to answer if the burner tarp has been removed.

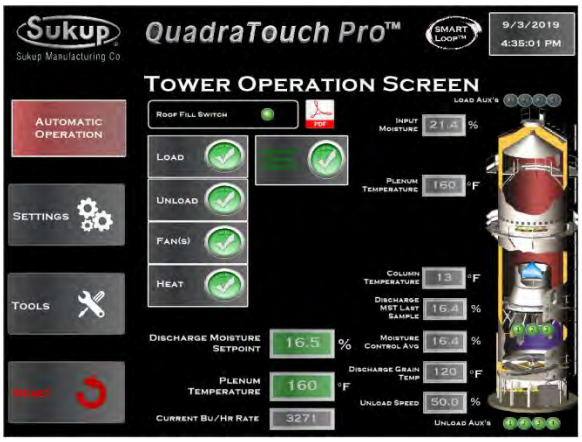


Choosing Control Method

In Tower Operation, choose the control method (automatic or manual). The control method can be changed by pressing either of the two red rectangles.

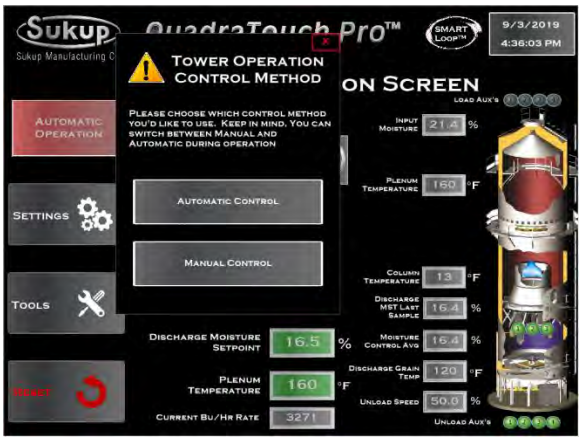


Choose how you'd like to operate the Tower Dryer, Automatic or Manual.



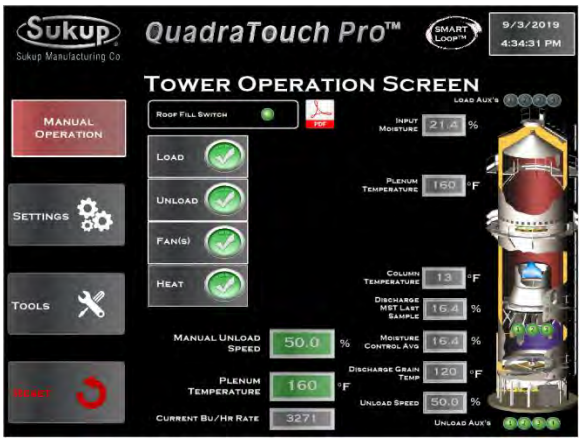
Automatic Operation

Choosing Automatic Operation, the larger of the two red rectangles disappears, leaving the controls for the load and unload systems, fan(s) and heater(s).
Notice there is a blinking button indicating you are discharging based on moisture or grain column temperature.



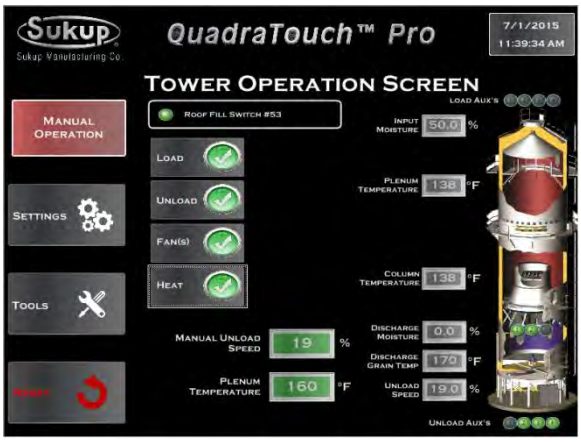
Changing from Moisture to Temperature Control

Toggling the blinking button will change from moisture to temperature control. You'll notice the temperature setpoint will appear on the bottom in place of the moisture setpoint.

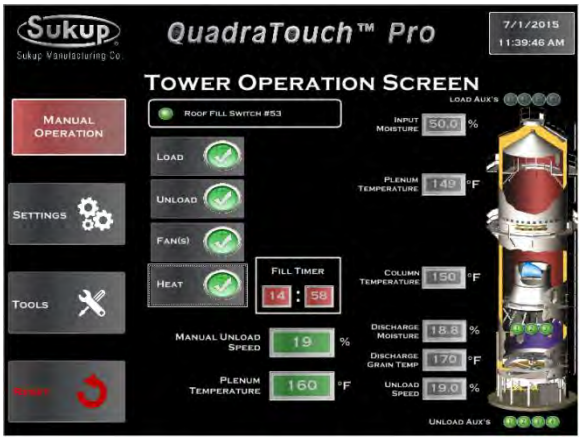


Manual Operation

Choosing the red rectangle, you can change the operation method to Manual as shown here. Notice the moisture and temperature setpoints are removed, and they are replaced with a manual unload speed setting.



Turning the load, unload, fan(s), and heat on, you can see the devices turning on in order. The fans will start up in sequence along with the load and unload systems. An animated blue flame will show up when the burner control unit senses flame.



As soon as the unload table has started, any applicable countdown timers will be displayed. Notice the Fill Timer displayed in the bottom center of the screen.

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Appendix H

Electrical Drawings

For Axial/Centrifugal & Mixed-Flow Dryers

Wire numbers and uses

Electrical drawings

DATE	REVISIONS	PAGE
07/29/2022	Updated static moisture sampler drawing (101.19) with SWPD0300	H-25
07/30/2021	Edited listings & formatting; corrected page numbers as needed	H-2 – H-8

Wire Numbers & Uses – QuadraTouch Pro, 2015 to Present

Common System Wires		
Wire #	**Description**	**Use**
LINE	110VAC supply from transformer to CB8	Line power from transformer
0	110VAC from bottom of CB8 to E-Stop	Conductor between CB8 and E-Stop
1	110VAC supply after E-Stop	Emergency switched control supply
2	Neutral wire	Provides return for 110V circuits
5	5 second load auxiliary 1 – Supply side	Voltage supplied to 5 will relay to 7 upon K6 PLC relay being activated (27A).
6	110V load contactor	110V present energizes load contactor
6A	24VDC K1 PLC load relay coil	24VDC present energizes PLC load relay K1
7	5 second load auxiliary 1 – Coil side	Connect 7 to coil on load auxiliary 1 contactor.
8	10 second load auxiliary 2 – Supply side	Voltage supplied to 8 will relay to 9 upon K7 PLC relay being activated (28A).
9	10 second load auxiliary 2 – Coil side	Connect 9 to the coil on load auxiliary 2 contactor.
10	110V unload power ON	110V present energizes unload contactor
10A	24VDC K2 PLC unload relay coil	24VDC present energizes PLC unload relay K2
14	Dry contact unload auxiliary – Supply side	Voltage supplied to 14 will relay to 15 upon Load contactor being energized.
15	Dry contact unload auxiliary – Coil side	Connect auxiliary device to 15 and voltage from 14 will pass to 15 when unload coil is energized.
17	Meter roll reference voltage	0 to 10 volt reference for AC drive, 1V=10% meter roll, 10V=100% meter roll
17B	Manual backup reference AC drive voltage	0 to 10 volt reference for AC drive, 1V=10% meter roll, 10V=100% meter roll
17C	PLC reference AC drive voltage	0 to 10 volt reference for AC drive, 1V=10% meter roll, 10V=100% meter roll
18	24V supply	Powered from PLC DC supply, provides voltage for sensors
19	110V switch leg for work light	Provides switched 110V for work light (110V present, work light ON)
19A	24VDC K5 PLC work light relay coil	24VDC present energizes PLC work light relay K5
21B	PLC AC drive ON signal	24VDC present tells AC Drive to turn meter rolls in forward direction.
21C	Manual backup AC drive ON signal	24VDC present tells AC drive to turn meter rolls in forward direction.
21D	AC drive ON signal	24VDC present tells AC drive to turn meter rolls in forward direction.
27A	24VDC K6 PLC load aux 1 relay coil	24VDC present energizes PLC load aux 1 relay K6
28A	24VDC K7 PLC load aux 2 relay coil	24VDC present energizes PLC load aux 2 relay K7
30	Special aux unload – Supply side	Potential free contact with 31
31	Special aux unload – Coil side	Potential free contact with 30
32	Special aux unload – Supply side	24VDC supplied to 32 and factory jumper between 32 & 33.
33	Special aux unload – Coil side	33 carries 24VDC and goes through special aux unload relay and energizes K2 unload relay

Wire Numbers & Uses – QuadraTouch Pro, 2015 to Present

Common System Wires		
Wire #	**Description**	**Use**
36	Rear door signal wire	24V present = Door closed, provides voltage at PLC for rear door status (Doors are in series)
40	Right grain column over-temperature	24V present = Status OK, provides voltage at PLC for plenum high temperature status
41	Left grain column over-temperature	24V present = Status OK, provides voltage at PLC for plenum high temperature status
42	Grain discharge chute	24V present = Status OK, provides voltage back to PLC for grain discharge chute status
44	Lower grain paddle switch	24V present = Status grain not empty, lower grain switch
47	PLC load ON input	24V present = Load auger ON, provides PLC with status of load operation (on or off)
49A	Motor overload – Meter rolls	24V present = Status OK, provides voltage back to PLC for overload status of meter rolls
49B	Motor overload – Load motor	24V present = Status OK, provides voltage back to PLC for overload status of load motor
49C	Motor overload – Unload motor	24V present = Status OK, provides voltage back to PLC for overload status of unload motor
49D	Motor overload – Auxiliary box	24V present = Status OK, provides voltage back to PLC for overload status of device(s) in auxiliary box (series wired)
53	Upper grain paddle switch	24V present = Status Dryer FULL
70	Automatic batch RTD signal wire	Provides signal to processor for Autobatch temperature drying, 0 – 5 volt DC reference
93	Meter roll proximity signal wire	24VDC oscillating square wave = meter roll rotation confirmed.
94	Unload ON signal	24VDC = Unload coil has been energized.
95	Common reference on PLC for 24V supply	24VDC ground. DC Common.
96	Unload auger proximity signal wire	24VDC oscillating square wave = unload auger rotation confirmed.
U	User Fault circuit	24VDC = User Fault OK – Jumped out from factory.
D3	Discharge moisture sensor blue, 0V to 3VDC temperature signal to PLC	Provides processor with a voltage signal corresponding to temperature
D4	Discharge moisture sensor black, 0 to 9VDC moisture signal to PLC	Provides processor with a voltage signal corresponding to moisture
D5	Incoming moisture sensor black, 0 to 9VDC moisture signal to PLC	Provides processor with a voltage signal corresponding to moisture
116	110V Main gas valve ON	110V present energizes main gas valve (2-fan & up)
116A	24VDC K10 PLC Main gas valve relay	24VDC present energizes main gas valve relay K10

Wire Numbers & Uses – QuadraTouch Pro, 2015 to Present

Fan/Heat 1		
Wire #	**Description**	**Use**
100	Fan soft start monitoring (Pos. 1)	24V = Status OK, provides voltage at PLC for soft start trip monitoring
101	Air switch (Pos. 1)	24V = Status OK, provides voltage at PLC for air switch closure
102	Vapor high limit switch (Pos. 1)	24V = Status OK, provides voltage at PLC for vapor high temperature
103	Housing high limit switch (Pos. 1)	24V = Status OK, provides voltage at PLC for heater housing high temperature
104	Plenum over-temp switch (Pos. 1)	24V = Status OK, provides voltage at PLC for plenum high temperature
105	Plenum static air switch (Pos. 1)	24V present = Status OK, provides voltage back to PLC for static air status
106	Heater flame sense (Pos. 1)	24V present = Status OK, provides voltage back to PLC for flame sense status
107	PLC fan ON input (Pos. 1)	24V present = Fan ON, provides PLC with status of fan operation
108	PLC heat ON input (Pos. 1)	24V present = ON, tells PLC that system is calling for heater to turn on
109	Motor overload fan (Pos. 1)	24V present = ON, tells PLC that fan breaker is OK
110A	24VDC from PLC to K3 Fan 1 relay	24V present energizes Fan 1 relay K3
110C	110V power from K3 Fan1 relay to Fan 1 coil	110V present energizes Fan 1 contactor or soft start and supply power Fan 1 NO contact
110H	110V power from Fan 1 NO contact to K4A Heat 1 relay	110V present supplies 110V power to K4A Heat 1
111	110V power from Heat 1A relay to CB9 breaker	110V present supplies CB9 with power
111A	24VDC from PLC to K4A, K4B Heat 1 relay	24V present energizes Heat 1 relays K4A, K4B
112	110V from CB9 breaker to heater box (Pos. 1)	110V present heater circuit will begin firing sequence
161	EMOV (2-10V) (Pos. 1)	Reference voltage for EMOV

Wire Numbers & Uses – QuadraTouch Pro, 2015 to Present

Fan/Heat 2		
Wire #	**Description**	**Use**
200	Fan soft start monitoring (Pos. 2)	24V = Status OK, provides voltage at PLC for soft start trip monitoring
201	Differential air switch (Pos. 2)	24V = Status OK, provides voltage at PLC for differential air switch closure
202	Vapor high limit switch (Pos. 2)	24V = Status OK, provides voltage at PLC for vapor high temperature
203	Housing high limit switch (Pos. 2)	24V = Status OK, provides voltage at PLC for heater housing high temperature
204	Plenum over-temp switch (Pos. 2)	24V = Status OK, provides voltage at PLC for plenum high temperature
205	Plenum static air switch (Pos. 2)	24V present = Status OK, provides voltage back to PLC for static air status
206	Heater flame sense (Pos. 2)	24V present = Status OK, provides voltage back to PLC for flame sense status
207	PLC fan ON input (Pos. 2)	24V present = Fan ON, provides PLC with status of fan operation
208	PLC heat ON input (Pos. 2)	24V present = ON, tells PLC that system is calling for heater to turn on
209	Motor overload fan (Pos. 2)	24V present = ON, tells PLC that fan breaker is OK
210A	24VDC from PLC to K8 Fan 2 relay	24V present energizes Fan 2 relay K8
210C	110V power from K8 Fan 2 relay to Fan 2 coil	110V present energizes Fan 2 contactor or soft start and supply power Fan 2 NO contact
210H	110V power from Fan 2 NO contact to K9A Heat 2 relay	110V present supplies 110V power to K9A Heat 2
211	110V power from Heat 9A relay to CB10 breaker	110V present supplies CB10 with power
211A	24VDC from PLC to K9A, K9B Heat 2 relay	24V present energizes Heat 2 relays K9A, K9B
212	110V power from CB10 breaker to heater box (Pos. 2)	110V present heater circuit will begin firing sequence
261	EMOV (2-10V) (Pos. 2)	Reference voltage for EMOV

Wire Numbers & Uses – QuadraTouch Pro, 2015 to Present

Fan/Heat 3		
Wire #	**Description**	**Use**
300	Fan soft start monitoring (Pos. 3)	24V = Status OK, provides voltage at PLC for soft start trip monitoring
301	Differential air switch (Pos. 3)	24V = Status OK, provides voltage at PLC for differential air switch closure
302	Vapor high limit switch (Pos. 3)	24V = Status OK, provides voltage at PLC for vapor high temperature
303	Housing high limit switch (Pos. 3)	24V = Status OK, provides voltage at PLC for heater housing high temperature
304	Plenum over-temp switch (Pos. 3)	24V = Status OK, provides voltage at PLC for plenum high temperature
305	Plenum static air switch (Pos. 3)	24V present = Status OK, provides voltage back to PLC for static air status
306	Heater flame sense (Pos. 3)	24V present = Status OK, provides voltage back to PLC for flame sense status
307	PLC fan ON input (Pos. 3)	24V present = Fan ON, provides PLC with status of fan operation
308	PLC heat ON input (Pos. 3)	24V present = ON, tells PLC that system is calling for heater to turn on
309	Motor overload fan (Pos. 3)	24V present = ON, tells PLC that fan breaker is OK
310A	24VDC from PLC to K11 Fan 3 relay	24V present energizes Fan 3 relay K11
310C	110V power from K11 Fan 3 relay to Fan 3 coil	110V present energizes Fan 3 contactor or soft start and supply power Fan 3 NO contact
310H	110V power from Fan 3 NO contact to K12A Heat 3 relay	110V present supplies 110V power to K12A Heat 3
311	110V power from Heat 12A relay to CB11 breaker	110V present supplies CB11 with power
311A	24VDC from PLC to K12A, K12B Heat 3 relay	24V present energizes Heat 3 relays K12A, K12B
312	110V power from CB11 breaker to heater box (Pos. 3)	110V present heater circuit will begin firing sequence
361	EMOV (2-10V) (Pos. 3)	Reference voltage for EMOV

Wire Numbers & Uses – QuadraTouch Pro, 2015 to Present

Fan/Heat 4		
Wire #	**Description**	**Use**
400	Fan soft start monitoring (Pos. 4)	24V = Status OK, provides voltage at PLC for soft start trip monitoring
401	Differential air switch (Pos. 4)	24V = Status OK, provides voltage at PLC for differential air switch closure
402	Vapor high limit switch (Pos. 4)	24V = Status OK, provides voltage at PLC for vapor high temperature
403	Housing high limit switch (Pos. 4)	24V = Status OK, provides voltage at PLC for heater housing high temperature
404	Plenum over-temp switch (Pos. 4)	24V = Status OK, provides voltage at PLC for plenum high temperature
405	Plenum static air switch (Pos. 4)	24V present = Status OK, provides voltage back to PLC for static air status
406	Heater flame sense (Pos. 4)	24V present = Status OK, provides voltage back to PLC for flame sense status
407	PLC fan ON input (Pos. 4)	24V present = Fan ON, provides PLC with status of fan operation
408	PLC heat ON input (Pos. 4)	24V present = ON, tells PLC that system is calling for heater to turn on
409	Motor overload fan (Pos. 4)	24V present = ON, tells PLC that fan breaker is OK
410A	24VDC from PLC to K13 Fan 4 relay	24V present energizes Fan 4 relay K13
410C	110V power from K13 Fan 4 relay to Fan 4 coil	110V present energizes Fan 4 contactor or soft start and supply power Fan 4 NO contact
410H	110V power from Fan 4 NO contact to K12A Heat 4 relay	110V present supplies 110V power to K12A Heat 4
411	110V power from Heat 14A relay to CB12 breaker	110V present supplies CB12 with power
411A	24VDC from PLC to K14A, K14B Heat 4 relay	24V present energizes Heat 4 relays K14A, K14B
412	110V power from CB12 breaker to heater box (Pos. 4)	110V present heater circuit will begin firing sequence
461	EMOV (2-10V) (Pos. 4)	Reference voltage for EMOV

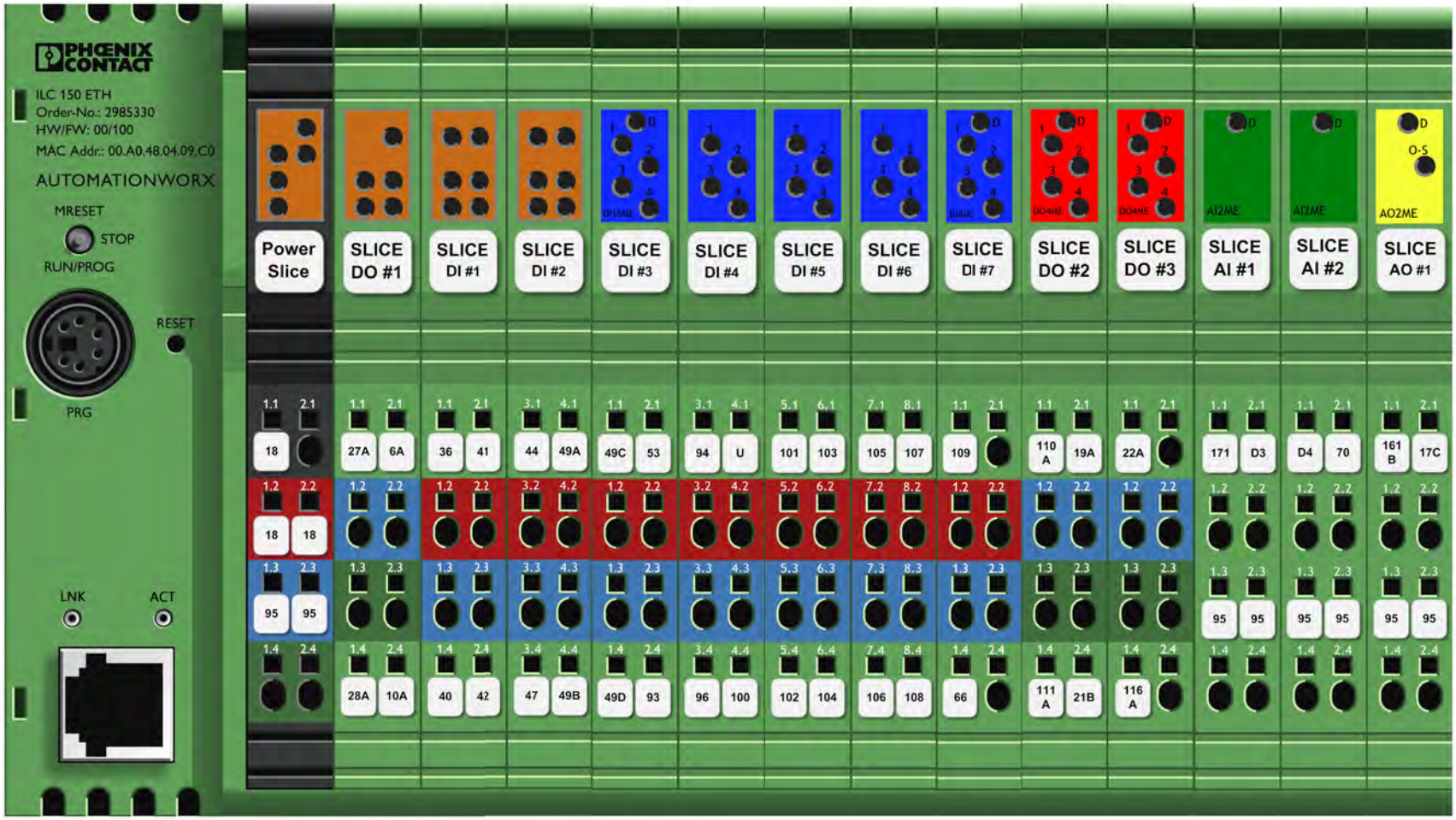
Wire Numbers & Uses – QuadraTouch Pro, 2015 to Present

Fan/Heat 5		
Wire #	**Description**	**Use**
500	Fan soft start monitoring (Pos. 5)	24V = Status OK, provides voltage at PLC for soft start trip monitoring
501	Differential air switch (Pos. 5)	24V = Status OK, provides voltage at PLC for differential air switch closure
502	Vapor high limit switch (Pos. 5)	24V = Status OK, provides voltage at PLC for vapor high temperature
503	Housing high limit switch (Pos. 5)	24V = Status OK, provides voltage at PLC for heater housing high temperature
504	Plenum over-temp switch (Pos. 5)	24V = Status OK, provides voltage at PLC for plenum high temperature
505	Plenum static air switch (Pos. 5)	24V present = Status OK, provides voltage back to PLC for static air status
506	Heater flame sense (Pos. 5)	24V present = Status OK, provides voltage back to PLC for flame sense status
507	PLC fan ON input (Pos. 5)	24V present = Fan ON, provides PLC with status of fan operation
508	PLC heat ON input (Pos. 5)	24V present = ON, tells PLC that system is calling for heater to turn on
509	Motor overload fan (Pos. 5)	24V present = ON, tells PLC that fan breaker is OK
510A	24VDC from PLC to K15 Fan 5 relay	24V present energizes Fan 5 relay K15
510C	110V power from K15 Fan 5 relay to Fan 5 coil	110V present energizes Fan 5 contactor or soft start and supply power Fan 5 NO contact
510H	110V power from Fan 5 NO contact to K16A Heat 5 relay	110V present supplies 110V power to K16A Heat 5
511	110V power from Heat 16A relay to CB13 breaker	110V present supplies CB13 with power
511A	24VDC from PLC to K16A, K16B Heat 5 relay	24V present energizes Heat 5 relays K16A, K16B
512	110V power from CB13 breaker to heater box (Pos. 5)	110V present heater circuit will begin firing sequence
561	EMOV (2-10V) (Pos. 5)	Reference voltage for EMOV

Wire Numbers & Uses – QuadraTouch Pro, 2015 to Present

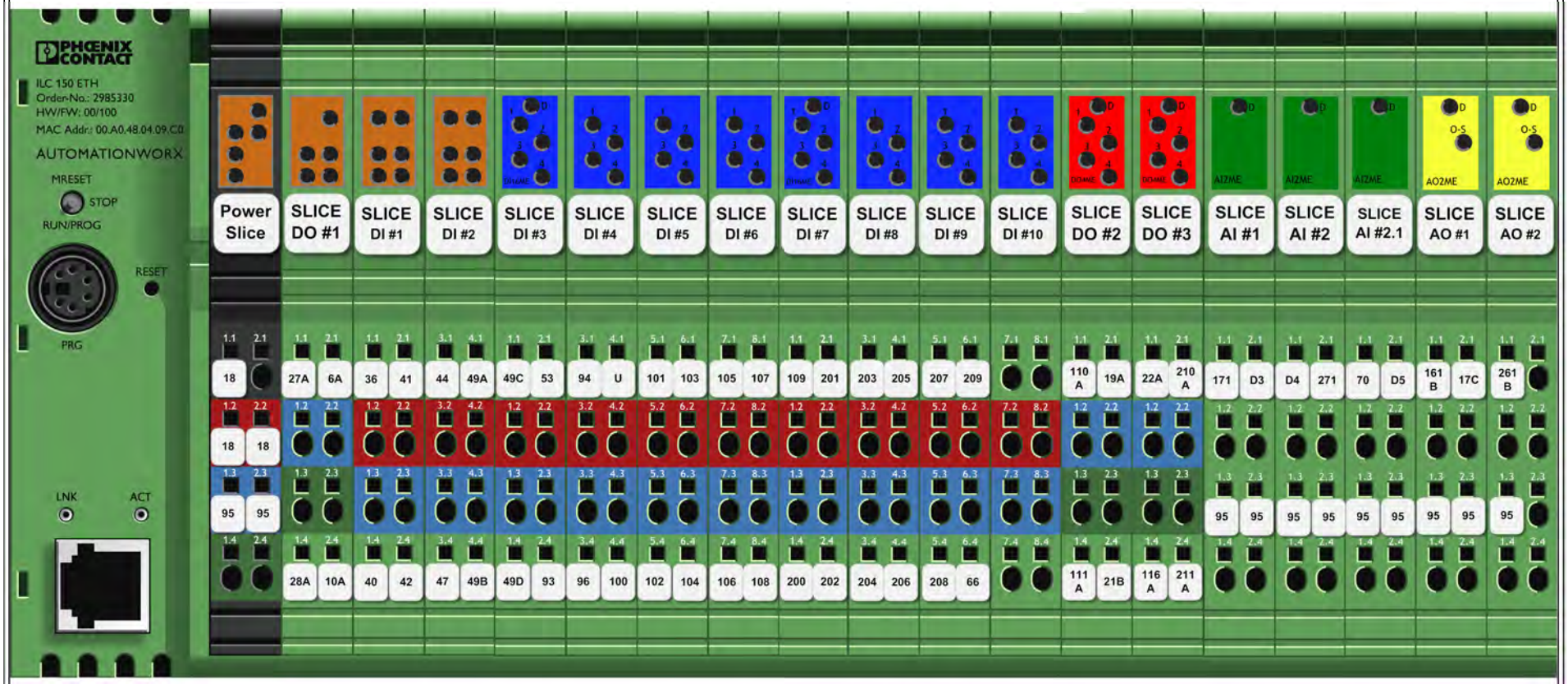
Fan/Heat 6		
Wire #	**Description**	**Use**
600	Fan soft start monitoring (Pos. 6)	24V = Status OK, provides voltage at PLC for soft start trip monitoring
601	Differential air switch (Pos. 6)	24V = Status OK, provides voltage at PLC for differential air switch closure
602	Vapor high limit switch (Pos. 6)	24V = Status OK, provides voltage at PLC for vapor high temperature
603	Housing high limit switch (Pos. 6)	24V = Status OK, provides voltage at PLC for heater housing high temperature
604	Plenum over-temp switch (Pos. 6)	24V = Status OK, provides voltage at PLC for plenum high temperature
605	Plenum static air switch (Pos. 6)	24V present = Status OK, provides voltage back to PLC for static air status
606	Heater flame sense (Pos. 6)	24V present = Status OK, provides voltage back to PLC for flame sense status
607	PLC fan ON input (Pos. 6)	24V present = Fan ON, provides PLC with status of fan operation
608	PLC heat ON input (Pos. 6)	24V present = ON, tells PLC that system is calling for heater to turn on
609	Motor overload fan (Pos. 6)	24V present = ON, tells PLC that fan breaker is OK
610A	24VDC from PLC to K17 Fan 6 relay	24V present energizes Fan 6 relay K17
610C	110V power from K17 Fan 6 relay to Fan 6 coil	110V present energizes Fan 6 contactor or soft start and supply power Fan 6 NO contact
610H	110V power from Fan 6 NO contact to K18A Heat 6 relay	110V present supplies 110V power to K18A Heat 6
611	110V power from Heat 18A relay to CB14 breaker	110V present supplies CB14 with power
611A	24VDC from PLC to K18A, K18B Heat 6 relay	24V present energizes Heat 6 relays K18A, K18B
612	110V power from CB14 breaker to heater box (Pos. 6)	110V present heater circuit will begin firing sequence
661	EMOV (2-10V) (Pos. 6)	Reference voltage for EMOV

1 Fan PLC Setup



Title:	PORTABLE DRYER: 1 FAN PLC Setup		
Author:	SUKUP MFG CO - MRK		
Date:	3/15	Sheet:	101.1
Revision:	3/18/2019 - DWS (1)		

2 Fan PLC Setup



Title:	PORTABLE DRYER: 2 FAN PLC Setup		
Author:	SUKUP MFG CO - MRK		
Date:	3/15	Sheet:	101.2
Revision:	3/18/2019 - DWS (1)		

Emergency Stop and System Control Switch Wiring

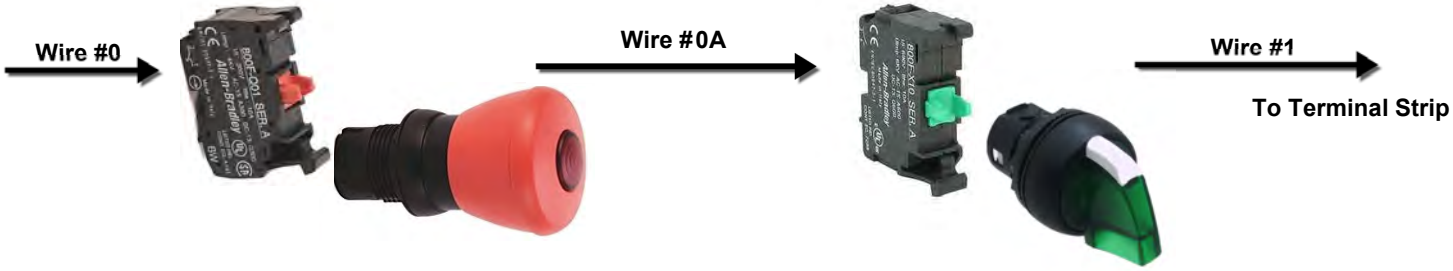
Main Supply Voltage
(From Distribution Block)

2 Pole Primary,
High Side Breaker

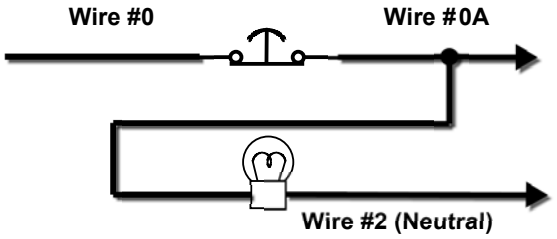
Control Transformer
(High Voltage to 120VAC)

1 Pole Secondary,
Low Side Breaker

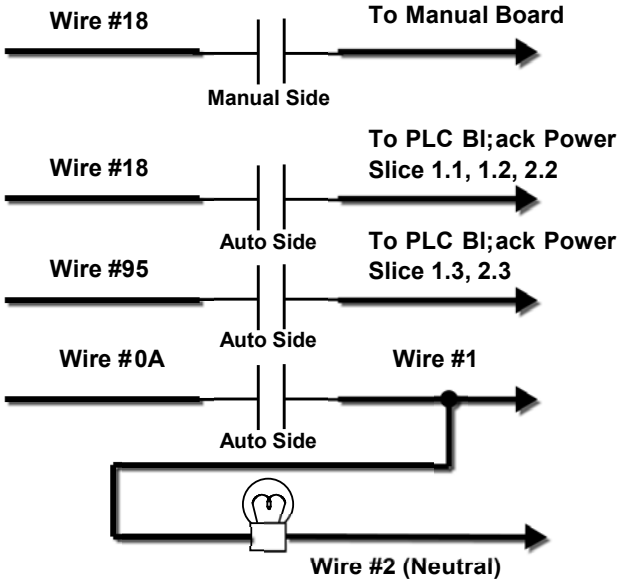
NOTE: 575VAC is Fused
Instead of 2 Pole breaker shown



E-STOP
(Emergency Stop Switch)

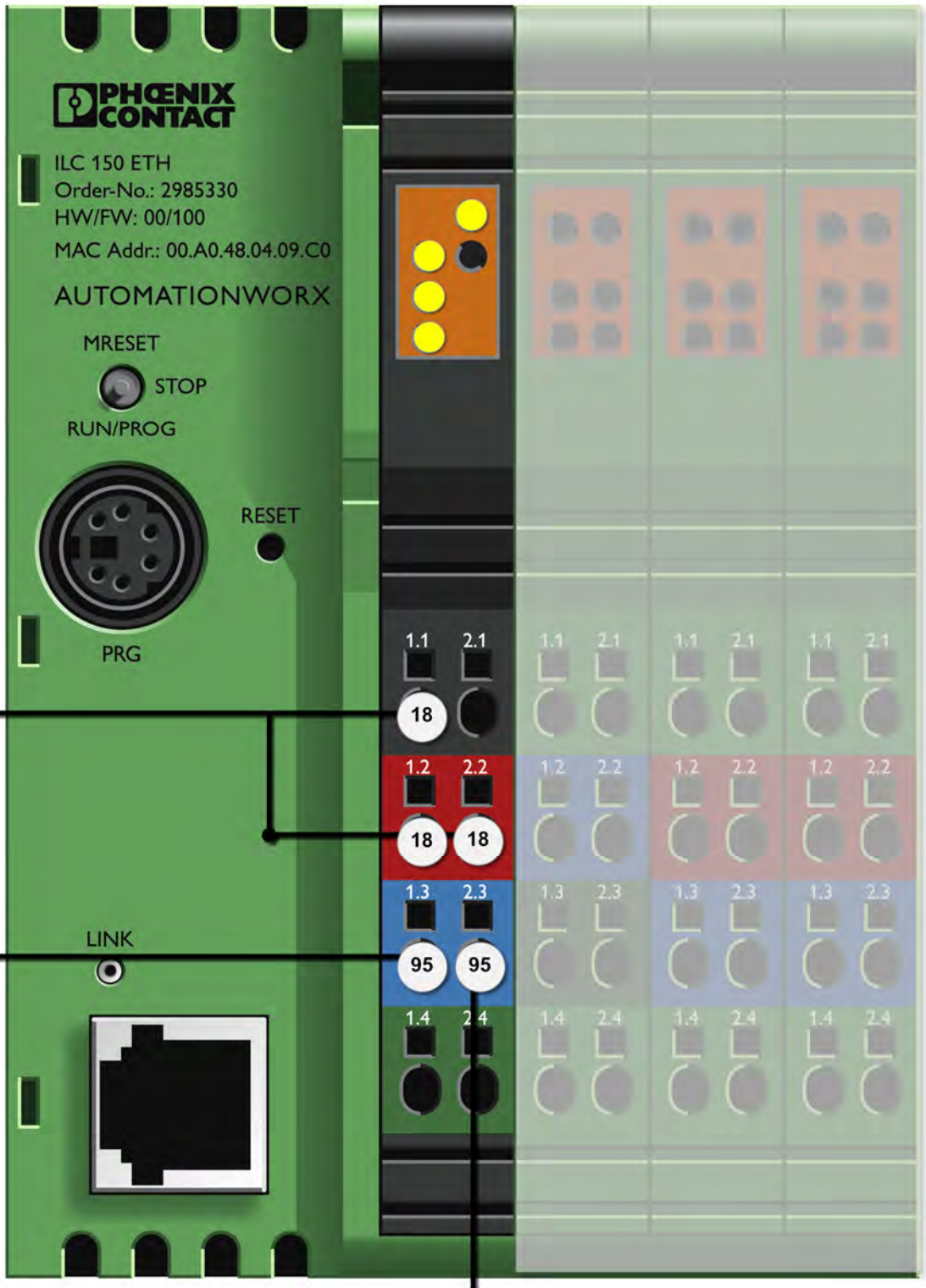


System Control Switch
Manual ---- OFF ----- Auto
(3 Position)



Title: PORTABLE DRYER: Emergency Stop and System Control Switch Wiring	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 101.3
Revision: 8/17/2017 - DWS (1)	

PLC POWER SLICE (Designated by Black Wiring Arm)



18
+ 24 VDC

MAIN SWITCH - CLOSED WHEN IN AUTOMATIC (101.3)

PLC Power Slice 1.1, 1.2, 2.2

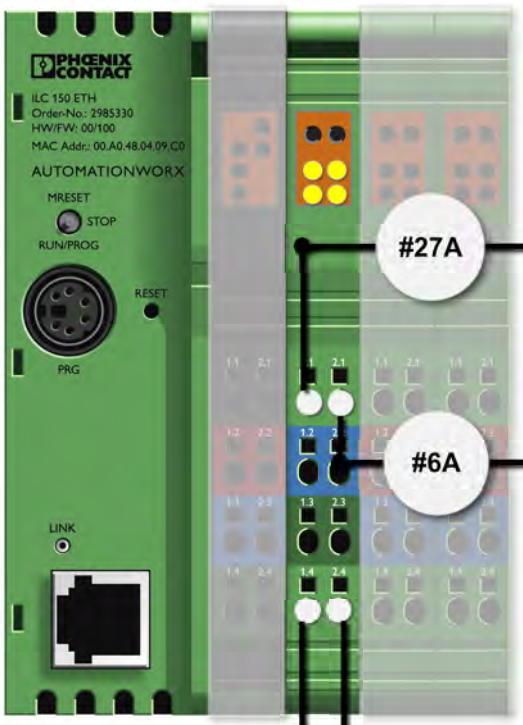
PLC Power Slice 1.3

MAIN SWITCH - CLOSED WHEN IN AUTOMATIC (101.3)

PLC Power Slice 2.3

Title: PORTABLE DRYER: SINGLE FAN & HEAT PLC - ILC150, 24VDC POWER SUPPLY	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 101.7
Revision:	

PLC DO SLICE #1 (Digital Output Card #1 - same as red cards)



#27A

Terminal Block

K6 - Aux 1 Relay Coil A1

#6A

Terminal Block

K1 - Load Relay Coil A1

#10A

Terminal Block

K2A&B Unload Relay Coil A1

#28A

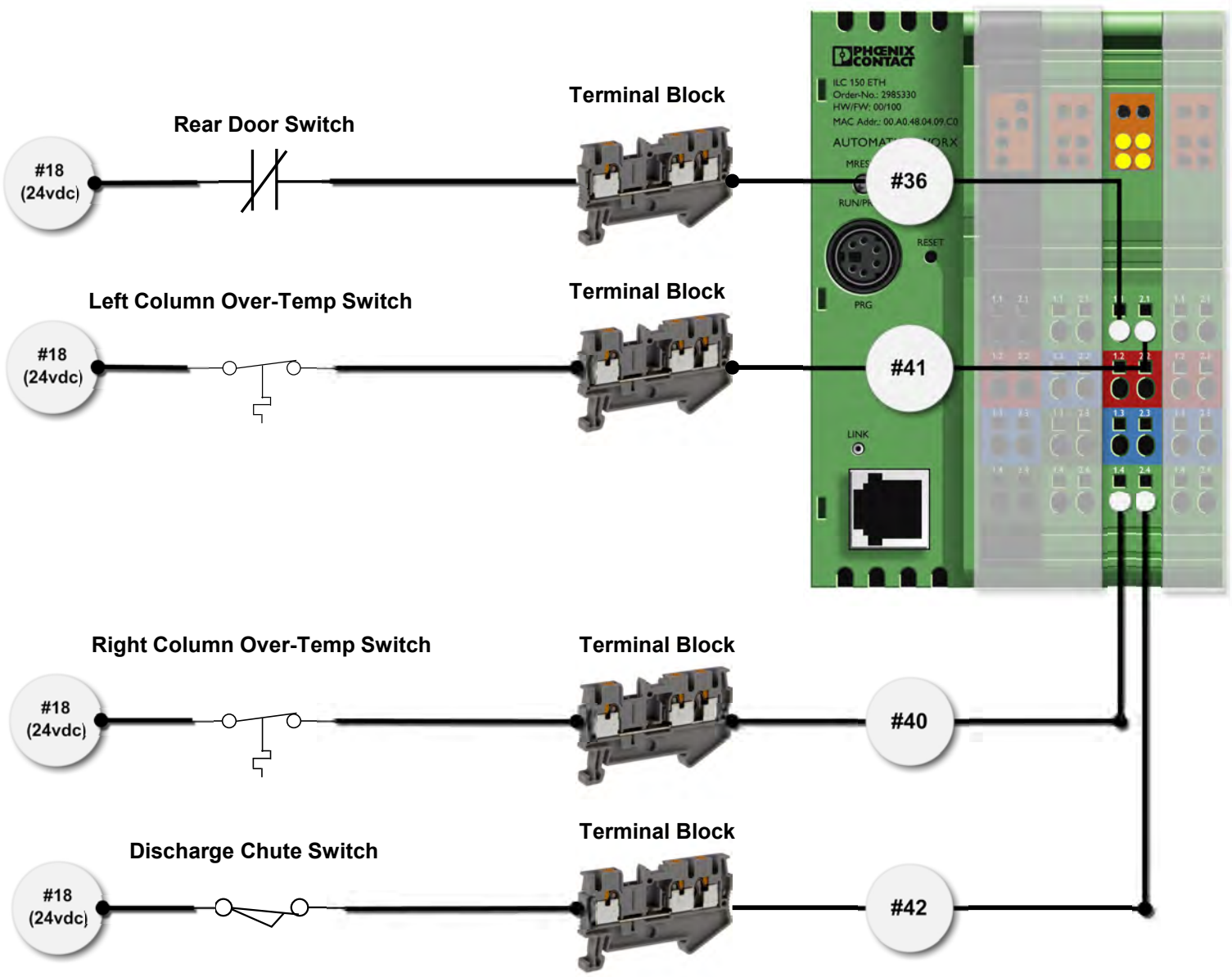
Terminal Block

K7 - Aux 2 Relay Coil A1

All Digital Output cards *SEND* 24Vdc from the PLC to a certain device. Typically they are used to energize a relay or provide an interlock or "GO" signal to a process.

Title: PORTABLE DRYER: Digital Output Slice #1	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 101.8
Revision:	

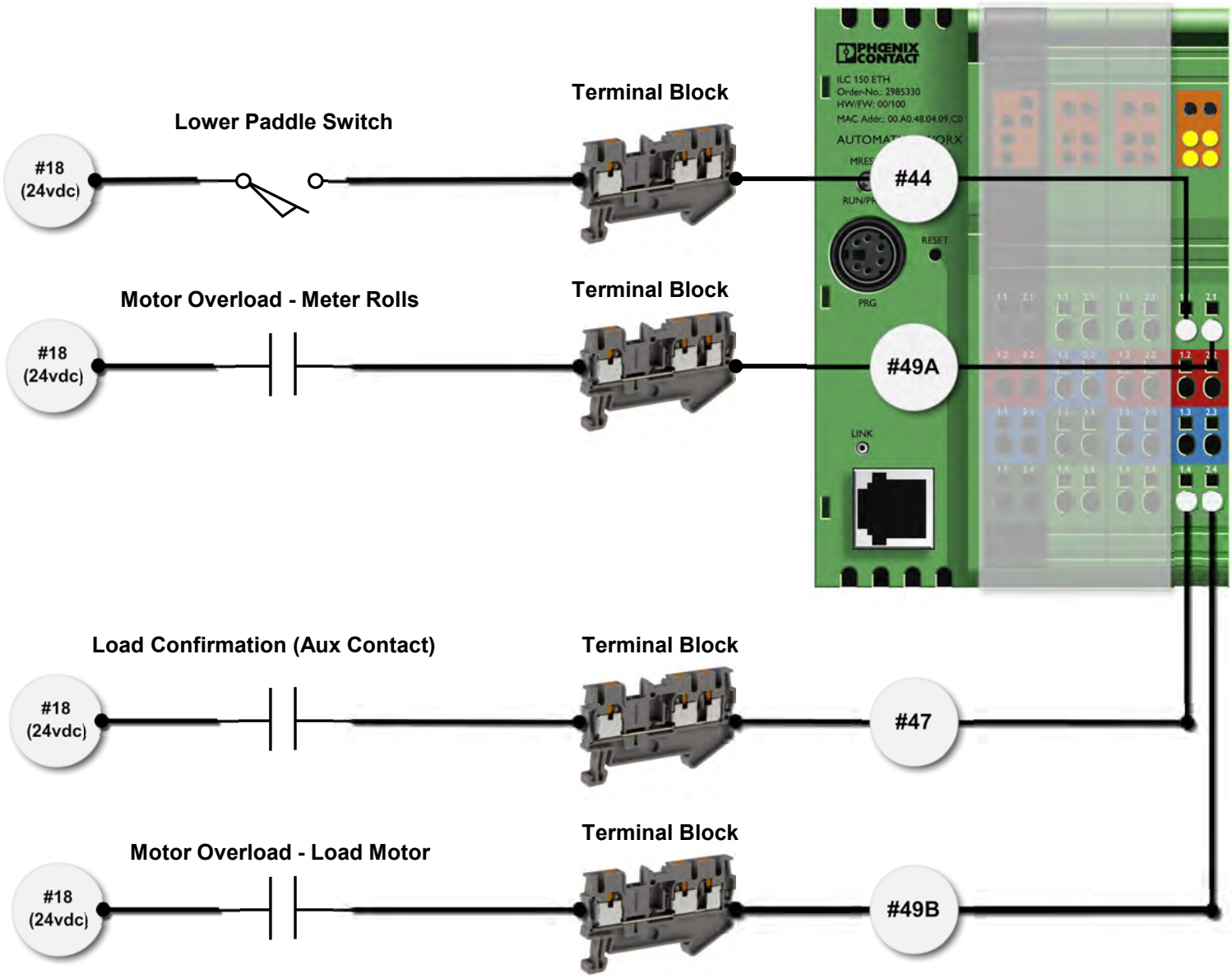
PLC DI SLICE #1 (Digital Input Card #1 - same as blue cards)



All Digital Input cards *RECEIVE* 24Vdc into the PLC from certain device. Typically they are receiving the ON/OFF status of a switch on the dryer.

Title: PORTABLE DRYER: Digital Input Slice #1	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 101.9
Revision: 6/6/2017 - DWS (1)	

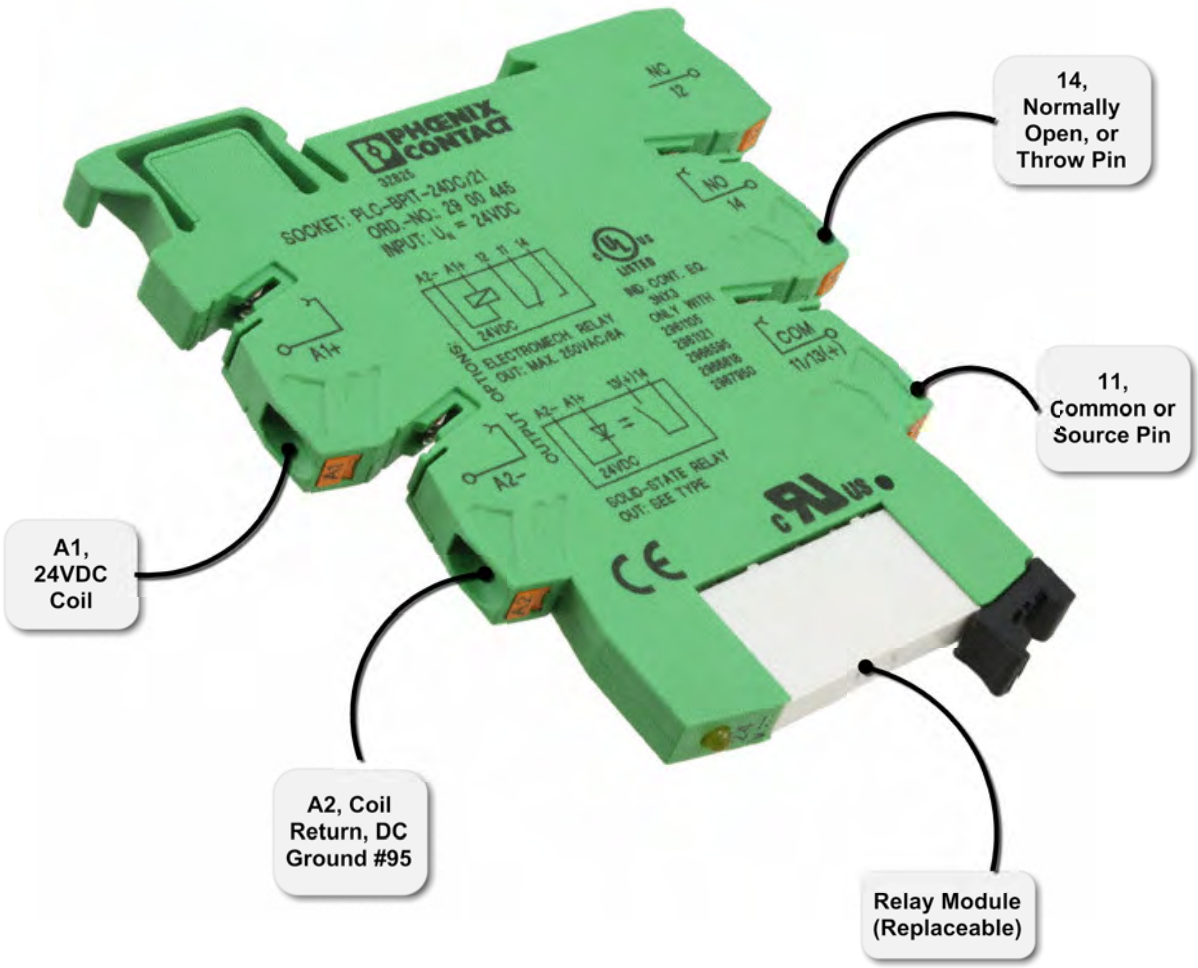
PLC DI SLICE #2 (Digital Input Card #2- same as blue cards)



All Digital Input cards *RECEIVE* 24Vdc into the PLC from certain device. Typically they are receiving the ON/OFF status of a switch on the dryer.

Title: PORTABLE DRYER: Digital Input Slice #2	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 101.10
Revision: 6/6/2017 - DWS (1)	

24VDC PLC Relay



Title: PORTABLE DRYER: PLC Relays	
Author: SUKUP MFG CO - MRK	
Date: 3/15	Sheet: 101.11
Revision:	

1-6 Fan PLC Relay Wiring

From PLC Slice DO #1
Output #1
(Top Left Output 1.1)

#27A

K6 - Aux #1

A1 - #27A
A2 - #95
11 - #5 (Aux#1 Com Pin -Factory Dry Contact)
14 - #7 (Aux#1 NO Pin -Factory Dry Contact)

From PLC Slice DO #1
Output #3
(Bottom Left Output 1.4)

#28A

K7 - Aux #2

A1 - #28A
A2 - #95
11 - #8 (Aux#2 Com Pin -Factory Dry Contact)
14 - #9 (Aux#2 NO Pin -Factory Dry Contact)

From PLC Slice DO #1
Output #2
(Top Right Output 2.1)

#6A

K1 - Load

A1 - #6A
A2 - #95
11 - #1 (110VAC)
14 - #6 to Load Coil M2

From PLC Slice DO #1
Output #4
(Bottom Right Output 2.4)

#10A

K2A - Unload

A1 - #10A
A2 - #95
11 - #1 (110VAC)
14 - #10 to Unload Coil M3

From PLC Slice DO #1
Output #4
(Bottom Right Output 2.4)

#10A

K2B - Unload

A1 - #10A
A2 - #95
11 - #21C (from Manual Board)
14 - #21D (24Vdc to VFD LI1)

From PLC Slice DO #2
Output #1
(Top Left Output 1.1)

#110A

K3 - Fan #1

A1 - #110A
A2 - #95
11 - #1
14 - #110C to Fan Coil M5 or SS#1 - LI2

From PLC Slice DO #2
Output #3
(Bottom Left Output 1.4)

#111A

K4A - Heat #1

A1 - #111A
A2 - #95
11 - #110H (Fan Interlock) (CE --- #1C)
14 - #111 (110VAC to top of CB#9) (CE----#1D)

From PLC Slice DO #2
Output #3
(Bottom Left Output 1.4)

#111A

K4B - Heat #1

A1 - #111A
A2 - #95
11 - #18 (24Vdc)
14 - #108 (to PLC Slice DI #7 Input 1 T.L.)

Title: PORTABLE DRYER: PLC Relay Wiring	
Author: SUKUP MFG CO - MRK	
Date: 3/15	Sheet: 101.12
Revision: 6/7/2017 - DWS (1)	

1-6 Fan PLC Relay Wiring

From PLC Slice DO #3
Output #1
(Top Left Output 1.1)

#22A

Unused (Future Use)

From PLC Slice DO #3
Output #3
(Bottom Left Output 1.4)

#116A

K10 - Main Gas Valve

A1 - #116A
A2 - #95
11 - #1 (120VAC)
14 - #116 (to Coil of Main Gas Valve)

1 Fan - Stop Here

From PLC Slice DO #3
Output #2
(Top Right Output 2.1)

#210A

K8 - Fan #2

A1 - #210A
A2 - #95
11 - #1 (120VAC)
14 - #210 to Fan Coil M6 or SS#2 LI1

From PLC Slice DO #3
Output #4
(Bottom Right Output 2.4)

#211A

K9A - Heat #2

A1 - #211A
A2 - #95
11 - #210H (Fan Interlock) (CE --- #2C)
14 - #211 (110VAC to top of CB#10) (CE----#2D)

From PLC Slice DO #3
Output #4
(Bottom Right Output 2.4)

#211A

K9B - Heat #2

A1 - #211A
A2 - #95
11 - #18 (24vdc)
14 - #208 (to PLC Slice DI #9 Input 3 B.L.)

2 Fan - Stop Here

From PLC Slice DO #4
Output #1
(Top Left Output 1.1)

#310A

K11 - Fan #3

A1 - #310A
A2 - #95
11 - #1 (120VAC)
14 - #310 to Fan Coil M7 or SS#3 LI1

From PLC Slice DO #4
Output #3
(Bottom Left Output 1.4)

#311A

K12A - Heat #3

A1 - #311A
A2 - #95
11 - #310H (Fan Interlock) (CE --- #3C)
14 - #311 (110VAC to top of CB#11) (CE----#3D)

From PLC Slice DO #4
Output #3
(Bottom Left Output 1.4)

#311A

K12B - Heat #3

A1 - #311A
A2 - #95
11 - #18 (24vdc)
14 - #308 (to PLC Slice DI #11 Input 4 B.R.)

3 Fan - Stop Here

Title: PORTABLE DRYER: PLC Relay Wiring	
Author: SUKUP MFG CO - MRK	
Date: 3/15	Sheet: 101.13
Revision:	

1-6 Fan PLC Relay Wiring

From PLC Slice DO #4
Output #2
(Top Right Output 2.1)

#410A

K13 - Fan #4
A1 - #410A
A2 - #95
11 - #1 (120VAC)
14 - #410 to Fan Coil M8 or SS#4 LI2

From PLC Slice DO #4
Output #4
(Bottom Right Output 2.4)

#411A

K14A - Heat #4
A1 - #411A
A2 - #95
11 - #410H (Fan Interlock) (CE --- #4C)
14 - #411 (110VAC to top of CB#12) (CE--#4D)

From PLC Slice DO #4
Output #4
(Bottom Right Output 2.4)

#411A

K14B - Heat #4
A1 - #411A
A2 - #95
11 - #18 (24vdc)
14 - #408 (to PLC Slice DI #14 Input 3 B.L.)

4 Fan - Stop Here

From PLC Slice DO #5
Output #1
(Top Left Output 1.1)

#510A

K15- Fan #5
A1 - #510A
A2 - #95
11 - #1 (120VAC)
14 - #510 to Fan Coil M9 or SS#5 LI2

From PLC Slice DO #5
Output #3
(Bottom Left Output 1.4)

#511A

K16A - Heat #5
A1 - #511A
A2 - #95
11 - #510H (Fan Interlock) (CE --- #5C)
14 - #511 (110VAC to top of CB#13) (CE--#5D)

From PLC Slice DO #5
Output #3
(Bottom Left Output 1.4)

#511A

K16B - Heat #5
A1 - #511A
A2 - #95
11 - #18 (24vdc)
14 - #508 (to PLC Slice DI #16 Input 4 B.R.)

From PLC Slice DO #5
Output #2
(Top Right Output 2.1)

#610A

K17 - Fan #6
A1 - #610A
A2 - #95
11 - #1 (120VAC)
14 - #610 to Fan Coil M10 or SS#6 LI2

From PLC Slice DO #5
Output #4
(Bottom Right Output 2.4)

#611A

K18A - Heat #6
A1 - #611A
A2 - #95
11 - #610H (Fan Interlock) (CE --- #6C)
14 - #611 (110VAC to top of CB#14) (CE--#6D)

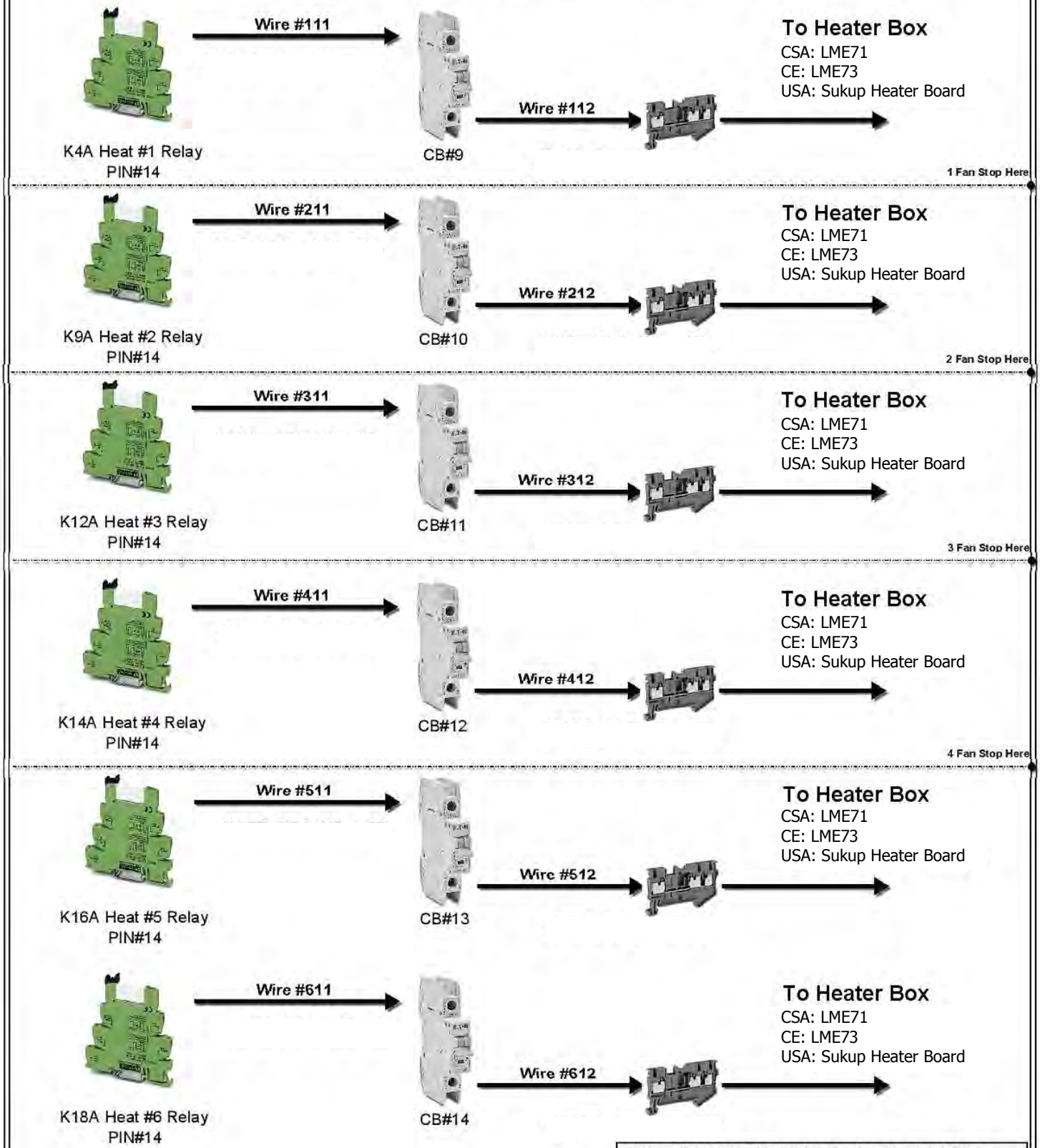
From PLC Slice DO #5
Output #4
(Bottom Right Output 2.4)

#611A

K18B - Heat #6
A1 - #611A
A2 - #95
11 - #18 (24vdc)
14 - #608 (to PLC Slice DI #19 Input 3 B.L.)

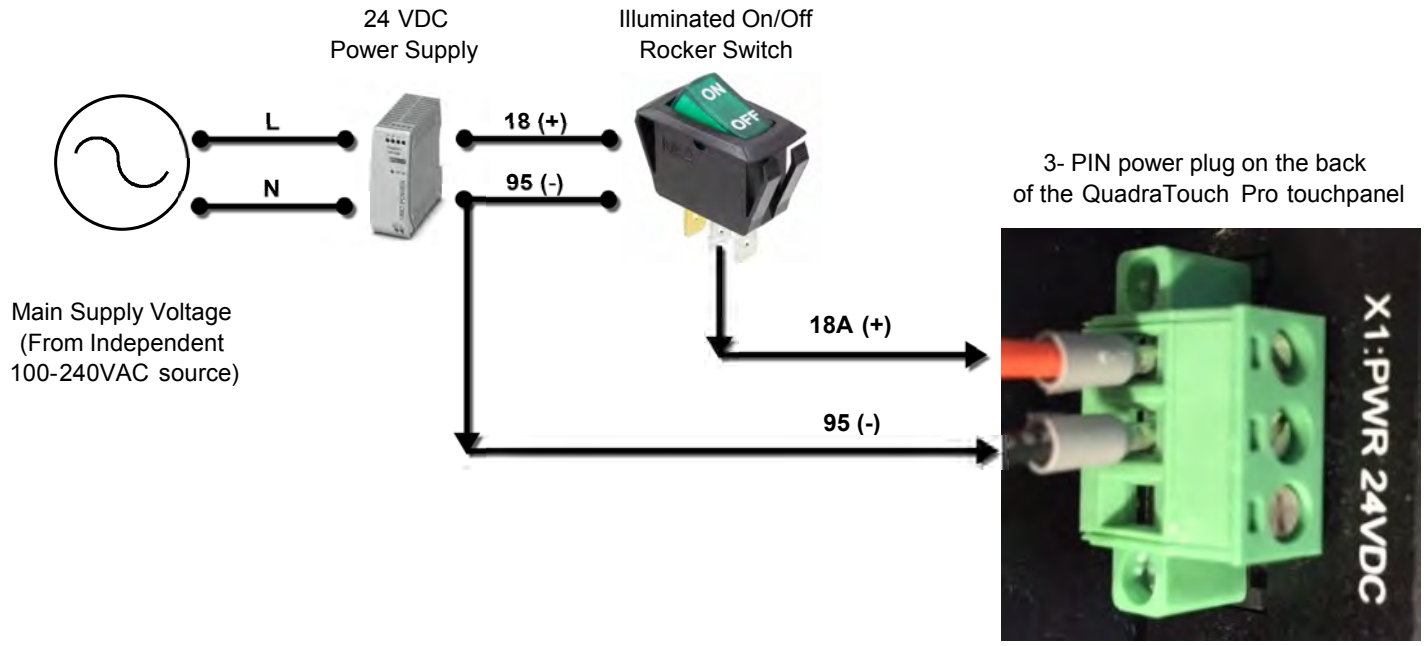
Title: PORTABLE DRYER: PLC Relay Wiring	
Author: SUKUP MFG CO - MRK	
Date: 3/15	Sheet: 101.14
Revision:	

Heater Relay and Heater Breaker Wiring



Title: PORTABLE DRYER: Heater Breaker Wiring	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 101.16
Revision:	Rev: 12/01/18

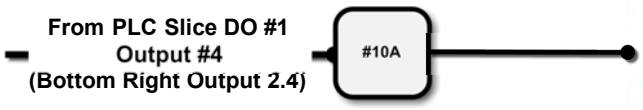
2016 QuadraTouch Pro™ Wiring



Title: T23476/U23476: QuadraTouch Pro™ Wiring	
Author: SUKUP MFG CO - MRK	
Date: 10/15	Sheet: 101.17
Revision:	

SUA Relay Wiring

The SUA (special unload auxiliary) relays A&B are used to turn on an auxiliary unloading system before the dryer's unload system starts discharging grain.

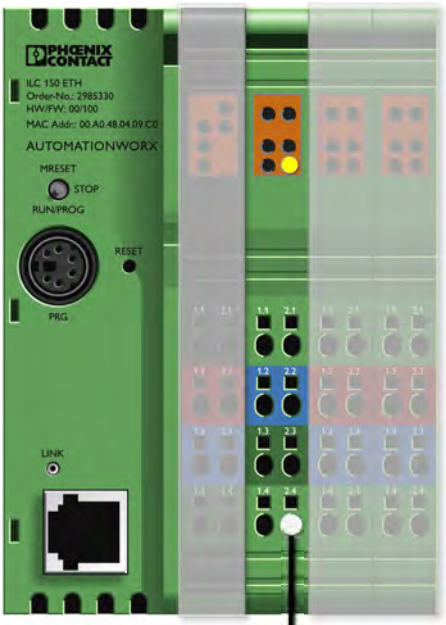


SUA-A

A1 - #10A
A2 - #95
11 - #30 (Common Pin - Factory Dry Contact)
14 - #31 (NO Pin - Factory Dry Contact)

SUA-B

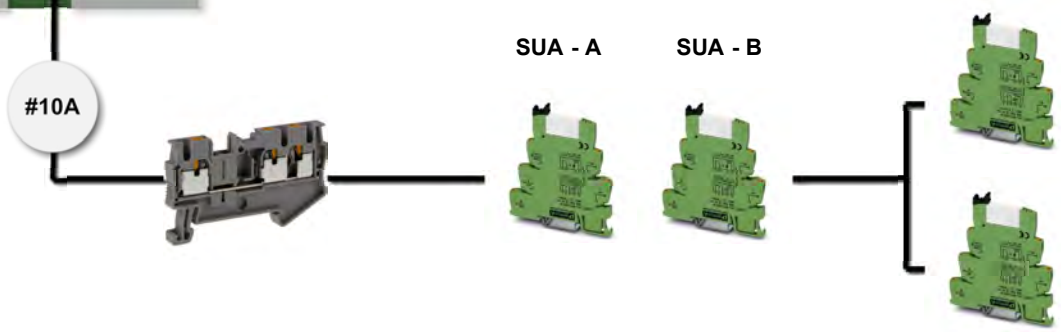
A1 - #33 (From Auxiliary Unload System 24VDC)
A2 - #95
11 - #10A (Common Pin - 24vdc From PLC)
14 - #10B (NO Pin - To K2A&B PIN A1)



The Output 10A from the PLC energizes the SUA-A, A1 coil. Wire 30 is connected to wire 31 (factory dry contact). This is the "GO" command for the auxiliary unloading system. This system needs to close a contact (wires 32 & 33) when it's ready for the dryer to unload in to the auxiliary unload system. Wire 32 is supplied with 24vdc from Sukup Manufacturing. When 32 and 33 are connected together (by a contact on the auxiliary unload system) it will energize SUA - B which will start the dryer's unload system.

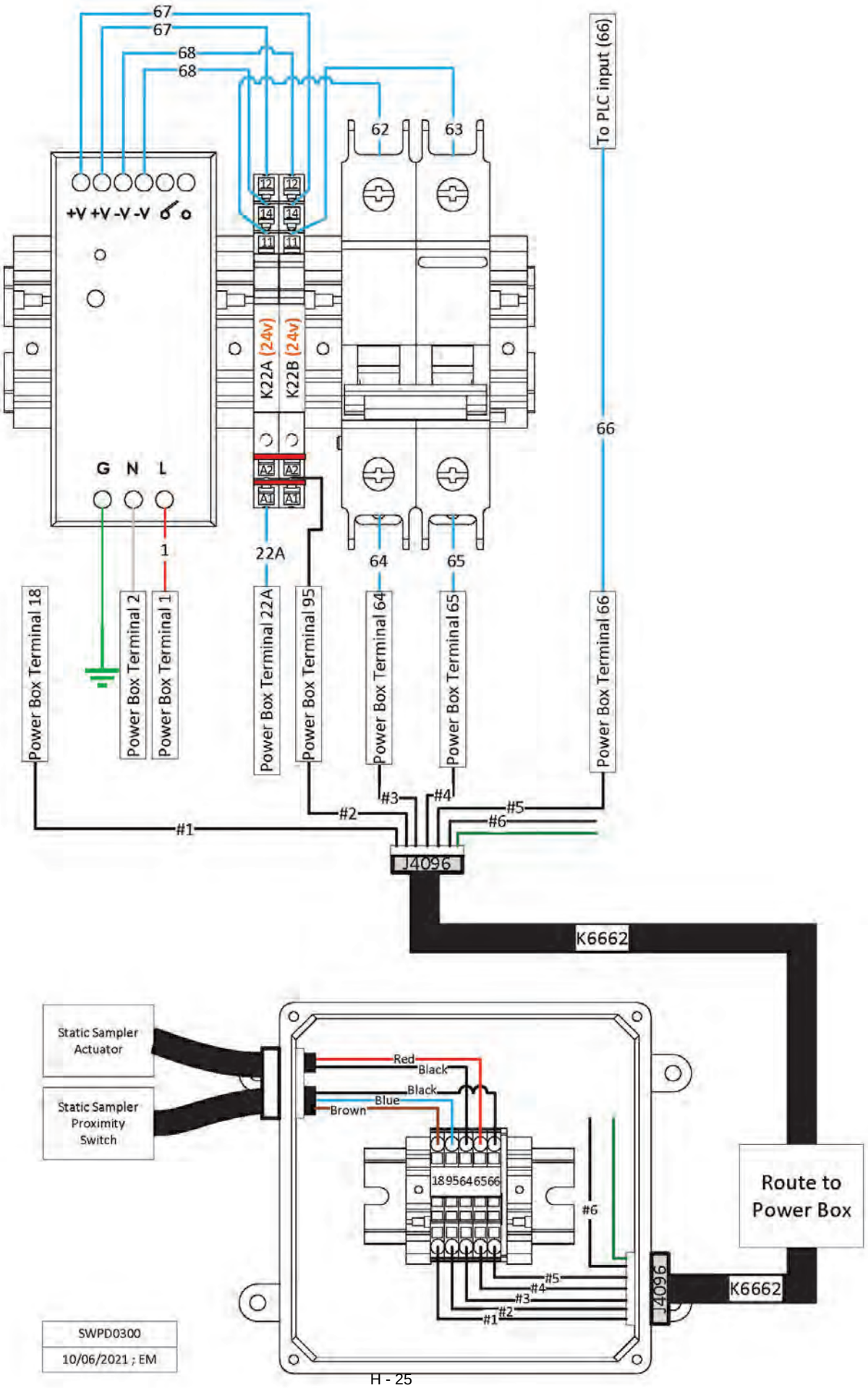
K2A&B Unload Relay Coil A1

SUA - A **SUA - B**

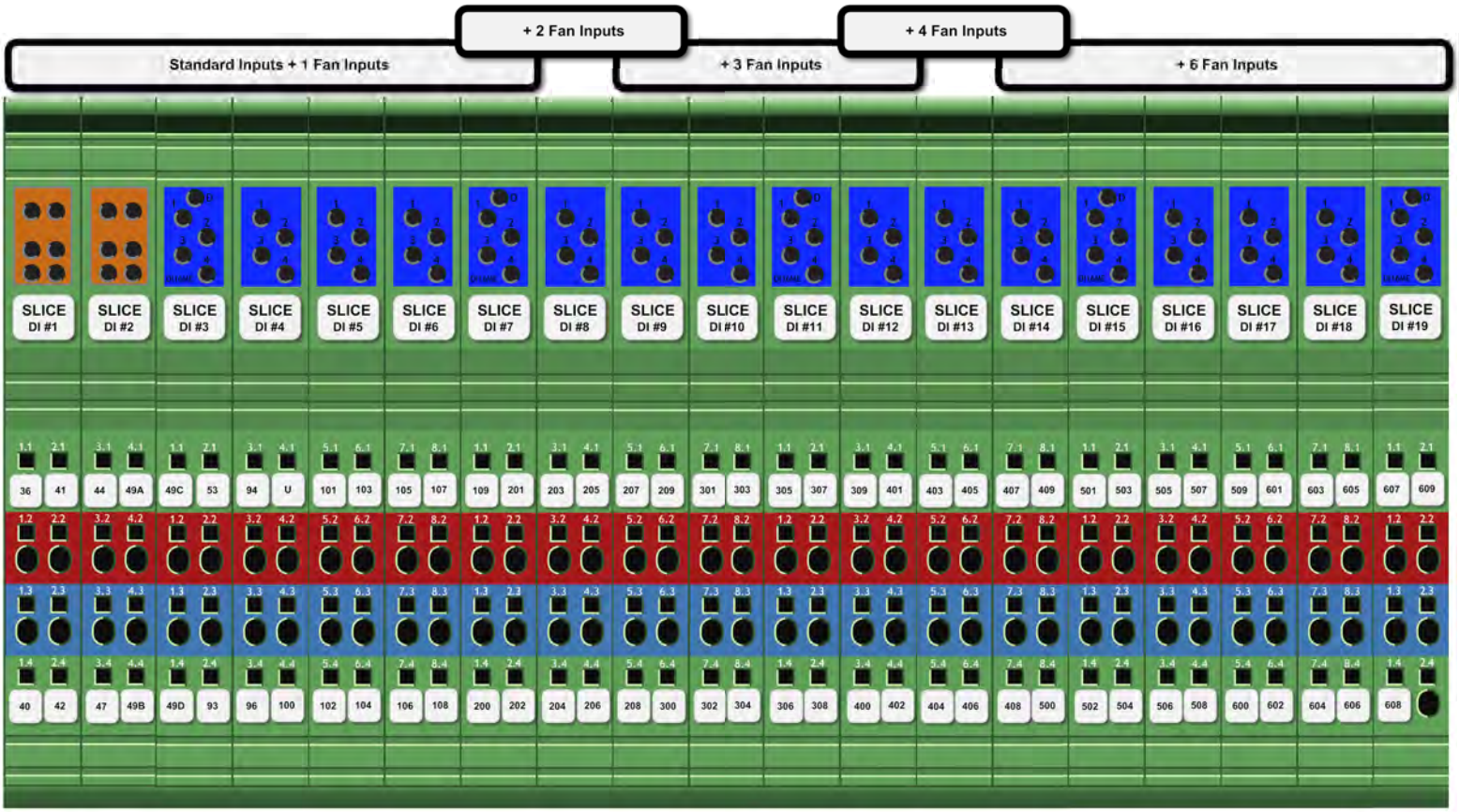


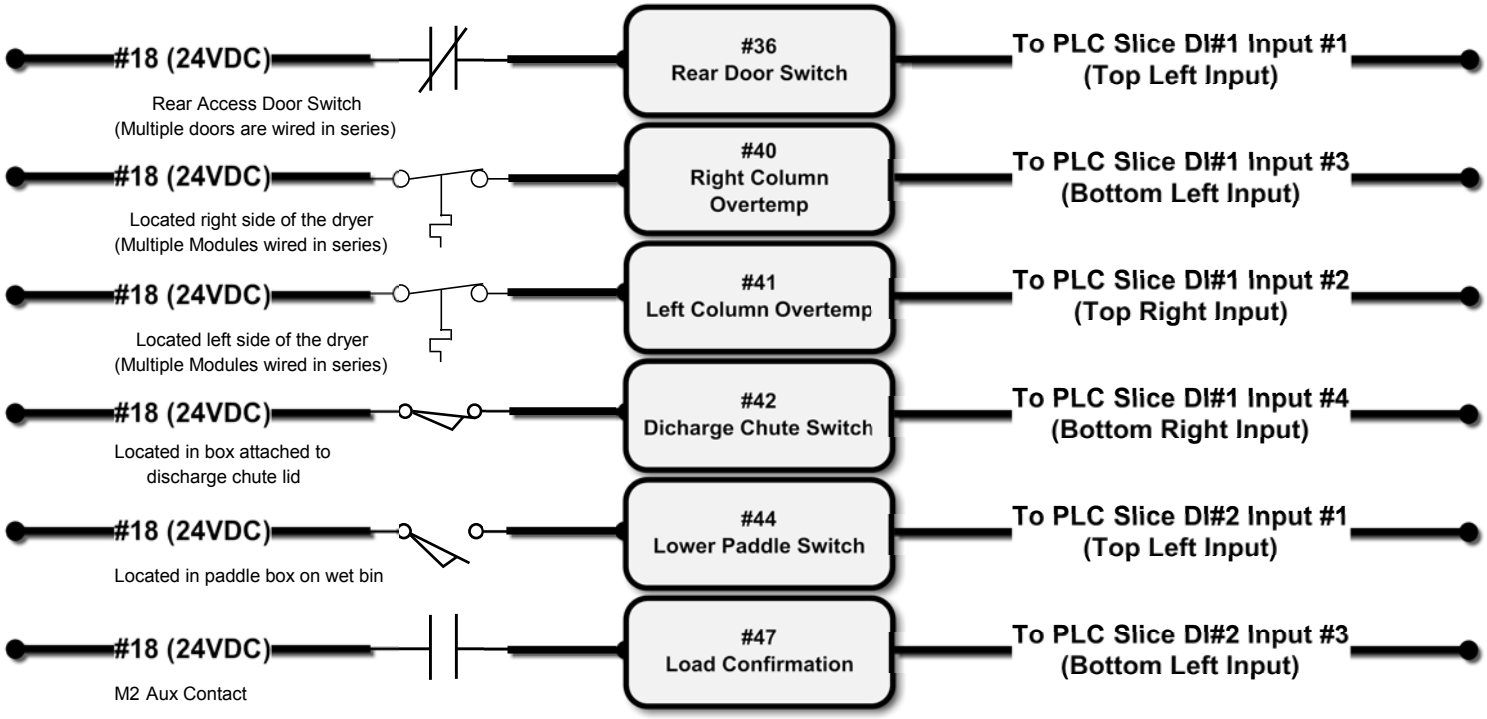
Title: PORTABLE DRYER: SUA Relay Wiring	
Author: SUKUP MFG CO - MRK	
Date: 10/15	Sheet: 101.18
Revision:	

Static Sample Circuit Diagram (MF/Portables)



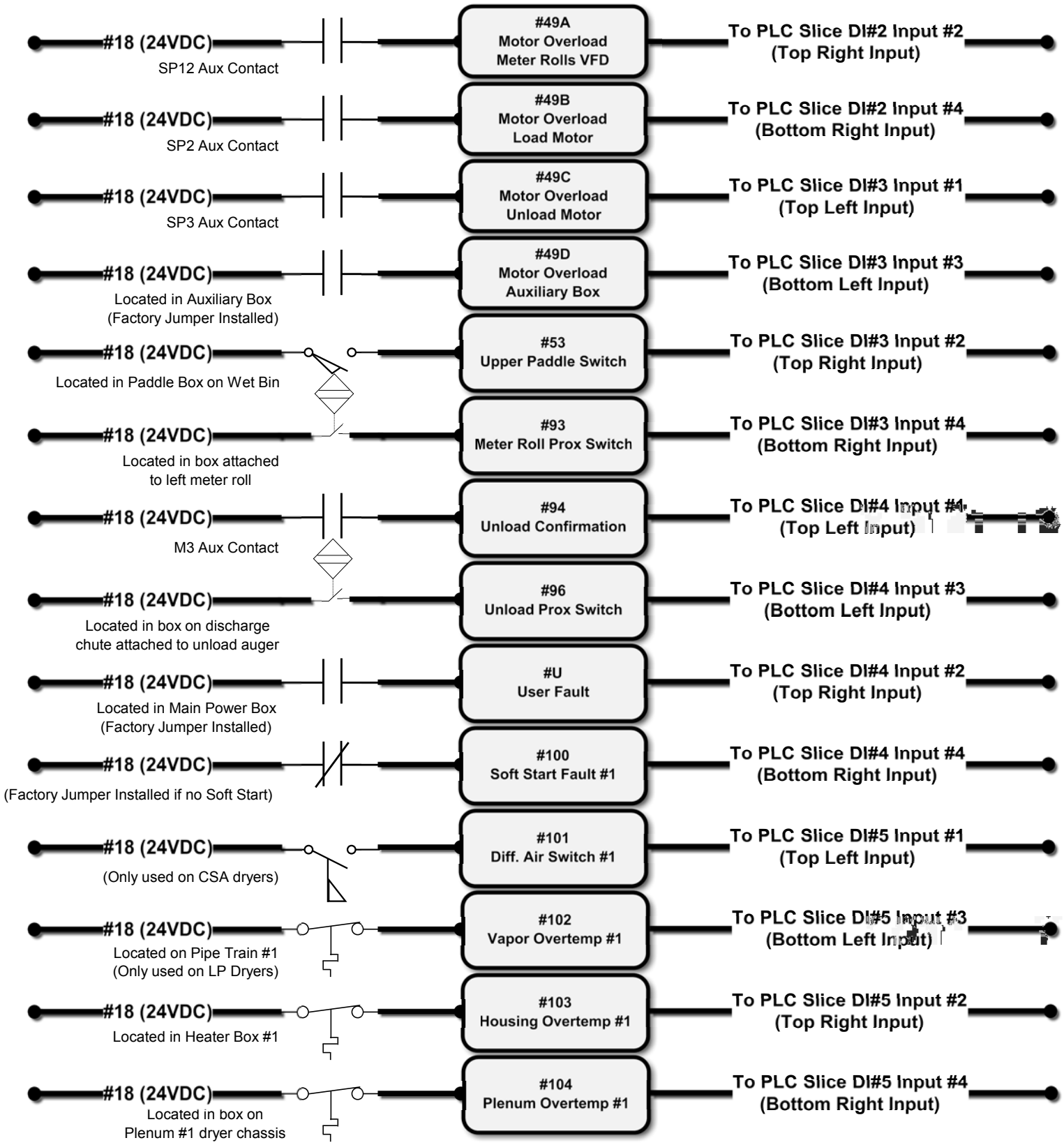
PLC Digital Inputs 1-6 Fan





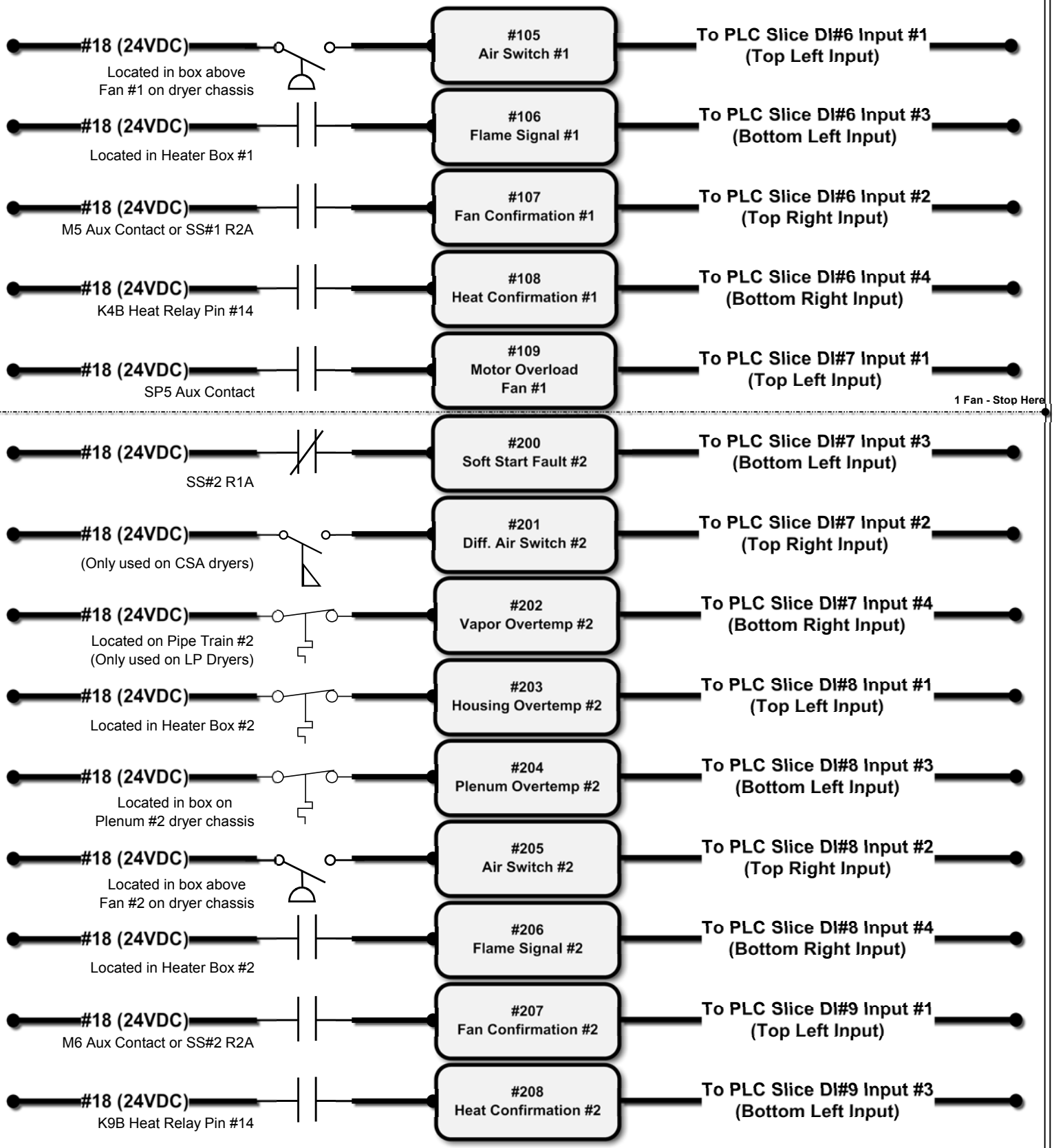
Title: PORTABLE DRYER: Digital Input Line Diagram	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 102.1
Revision: 6/7/2017 - DWS (1)	

PLC Digital Inputs 1-6 Fan



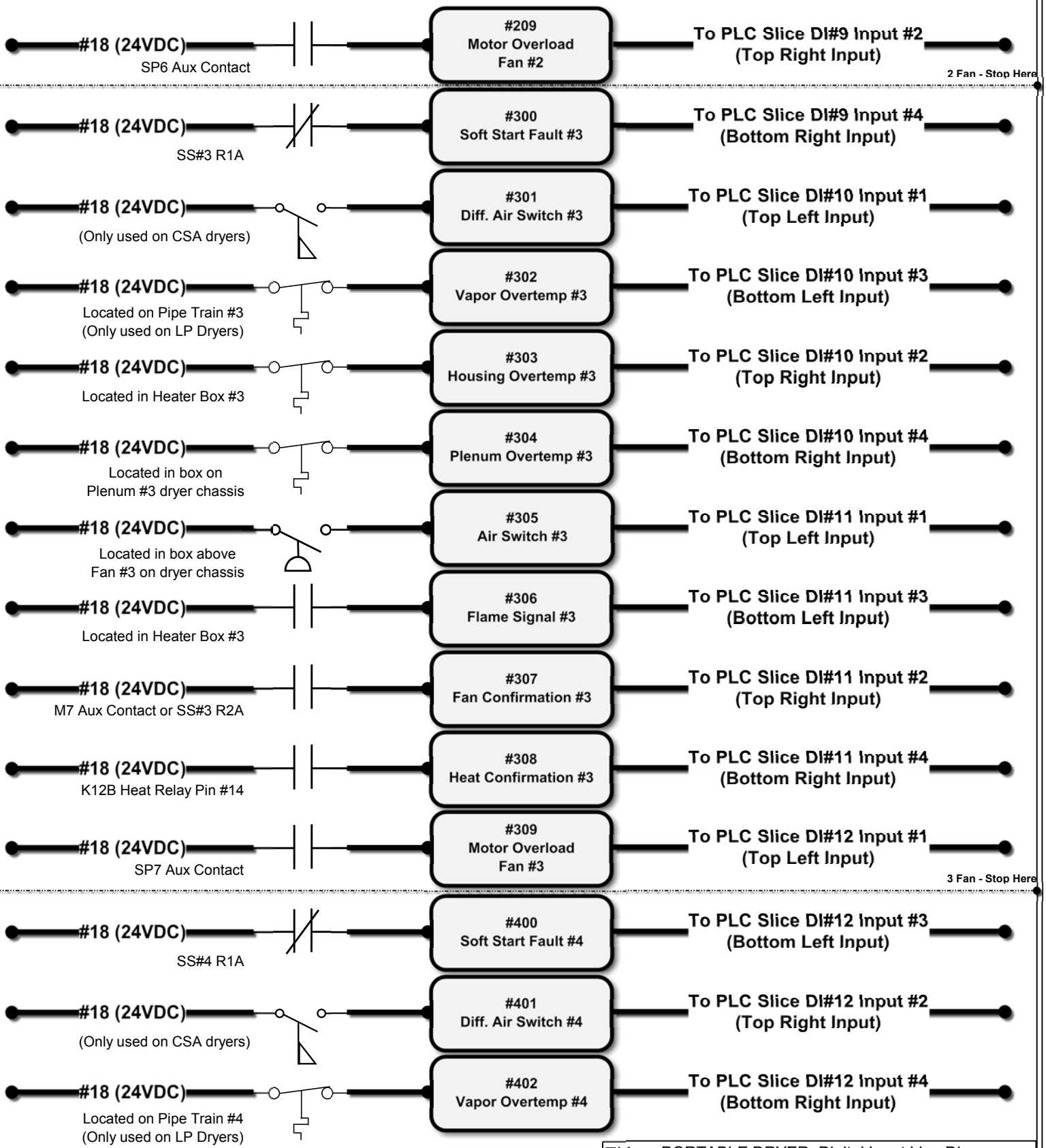
Title: PORTABLE DRYER: Digital Input Line Diagram	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 102.2
Revision: 8/23/2017 - DWS (2)	

PLC Digital Inputs 1-6 Fan



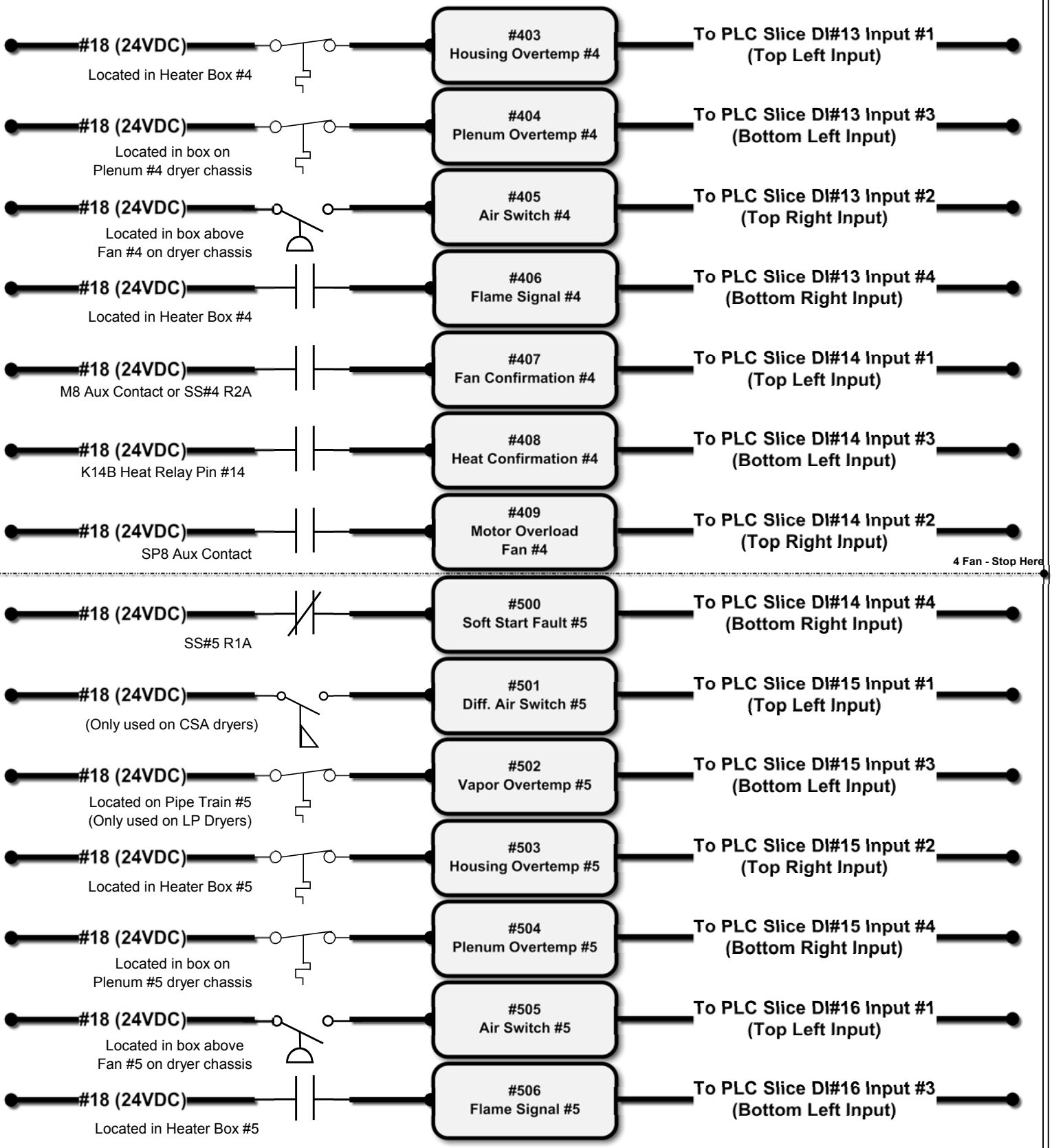
Title: PORTABLE DRYER: Digital Input Line Diagram	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 102.3
Revision: 8/23/2017 - DWS (2)	

PLC Digital Inputs 1-6 Fan



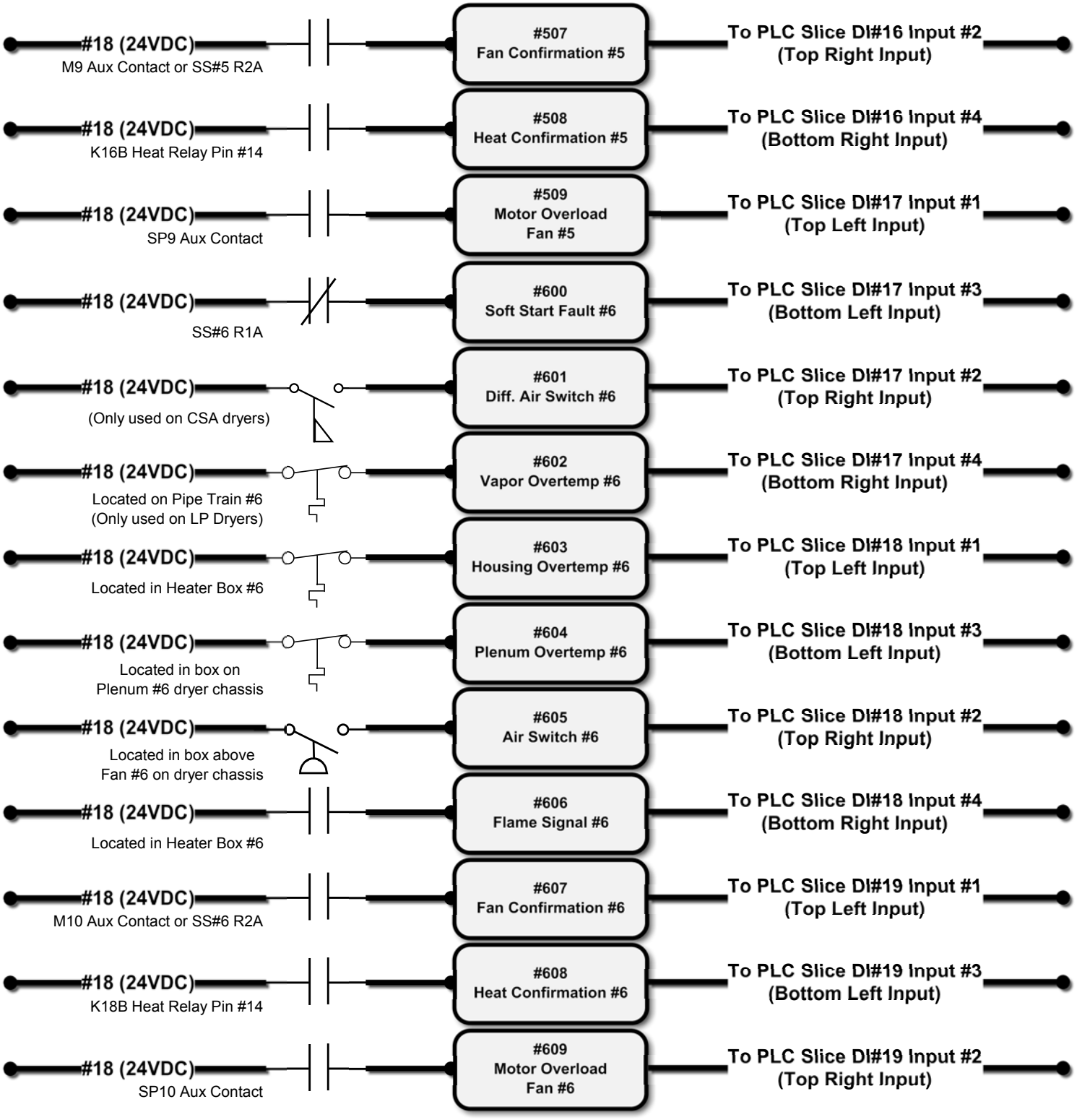
Title: PORTABLE DRYER: Digital Input Line Diagram	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 102.4
Revision: 6/7/2017 - DWS (1)	

PLC Digital Inputs 1-6 Fan



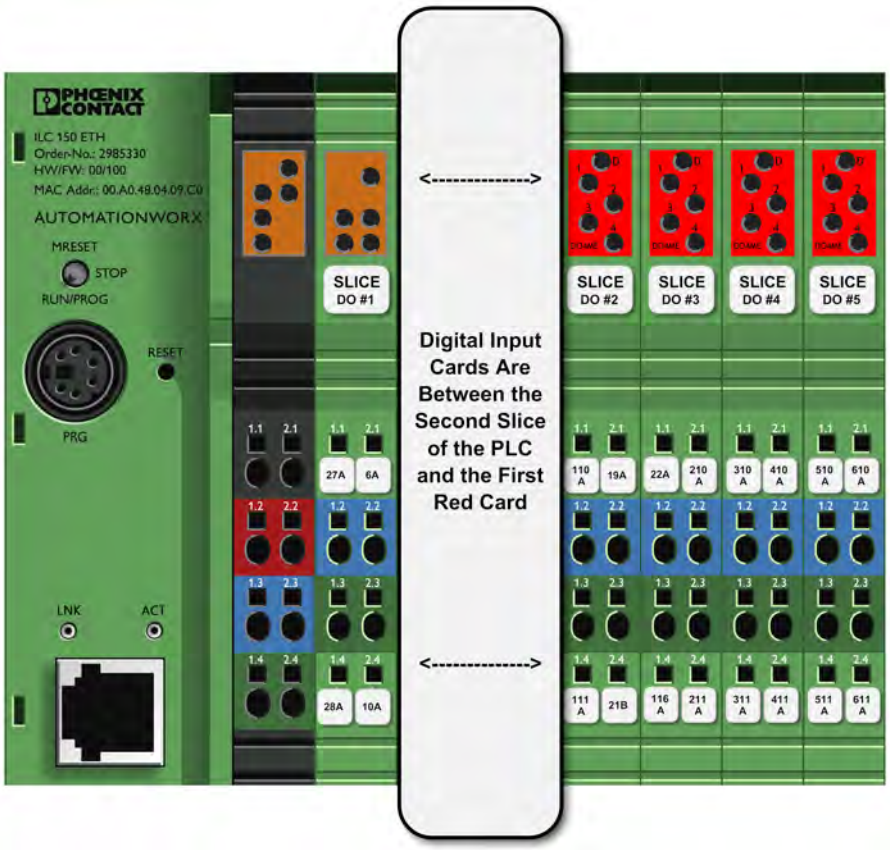
Title: PORTABLE DRYER: Digital Input Line Diagram	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 102.5
Revision: 6/7/2017 - DWS (1)	

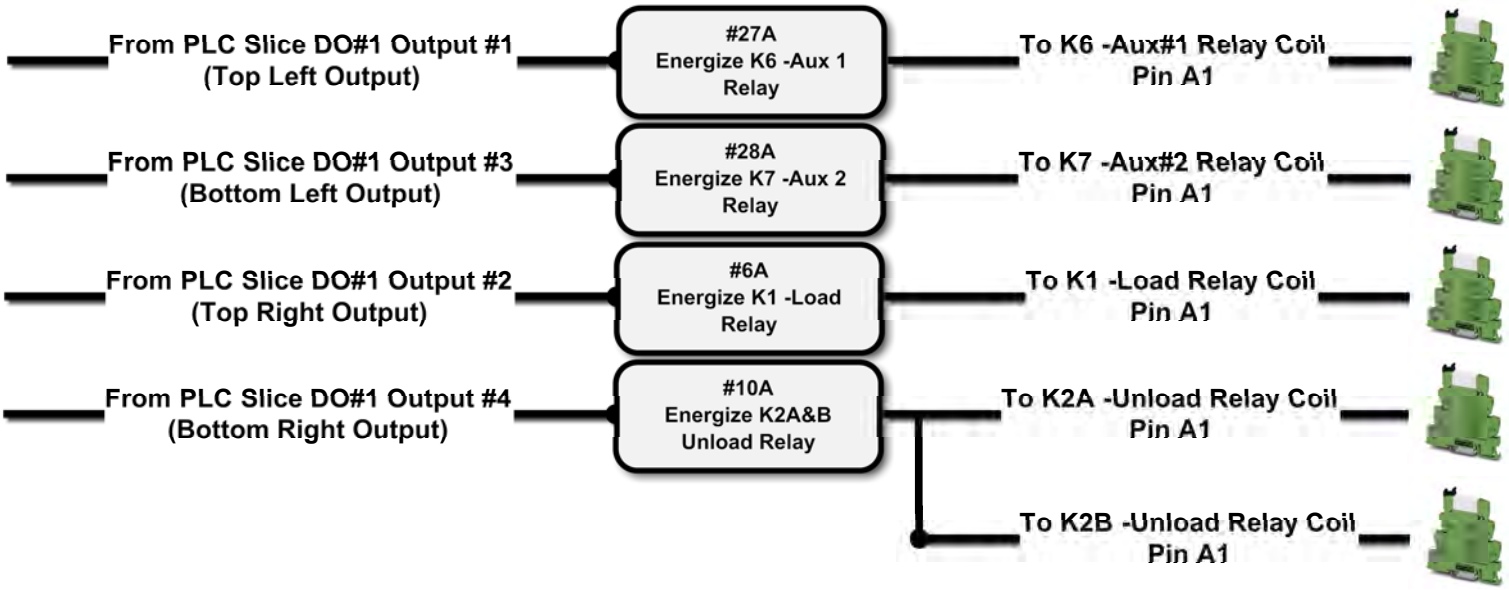
PLC Digital Inputs 1-6 Fan



Title: PORTABLE DRYER: Digital Input Line Diagram	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 102.6
Revision: 6/7/2017 - DWS (1)	

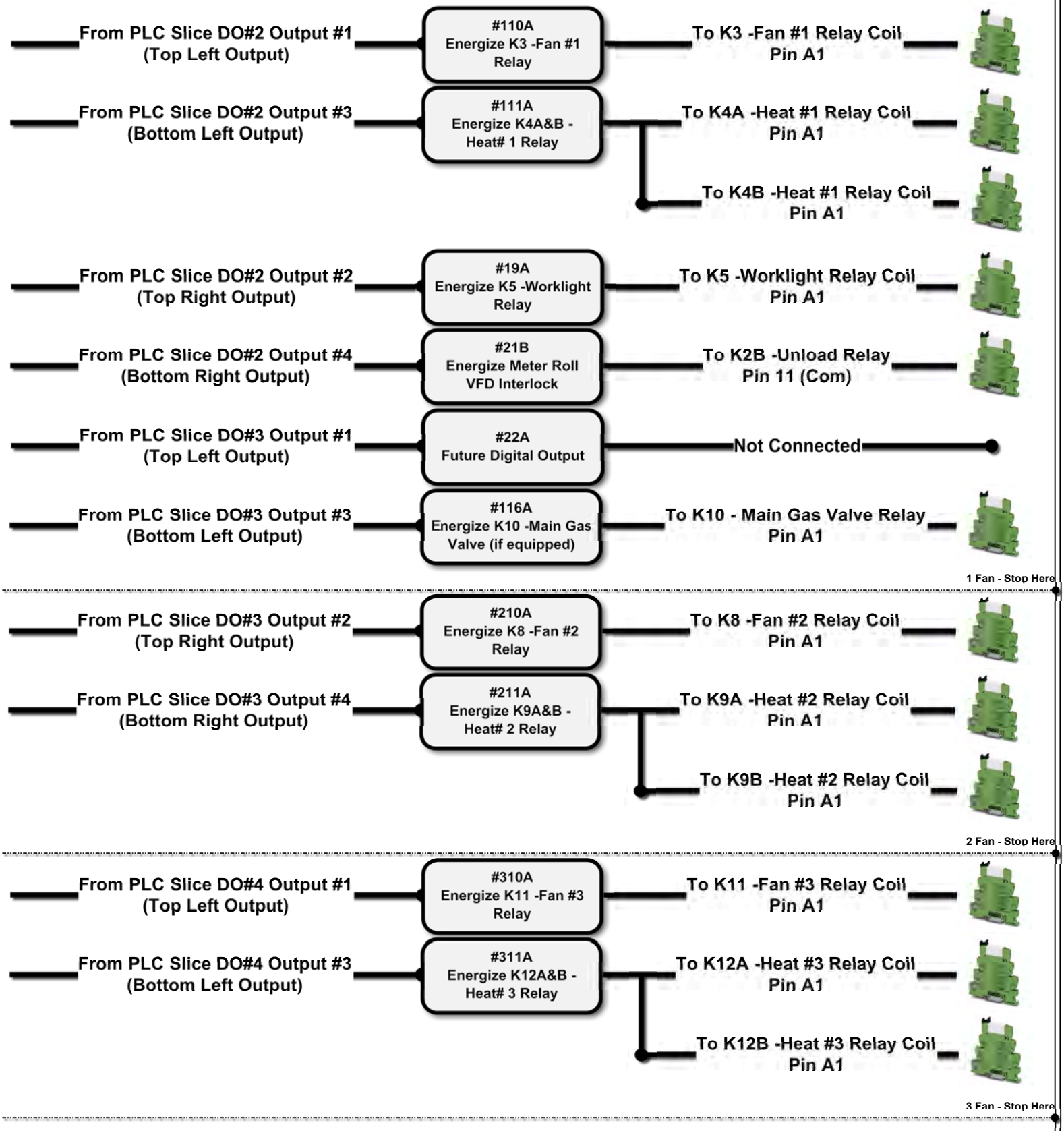
PLC Digital Outputs 1-6 Fan





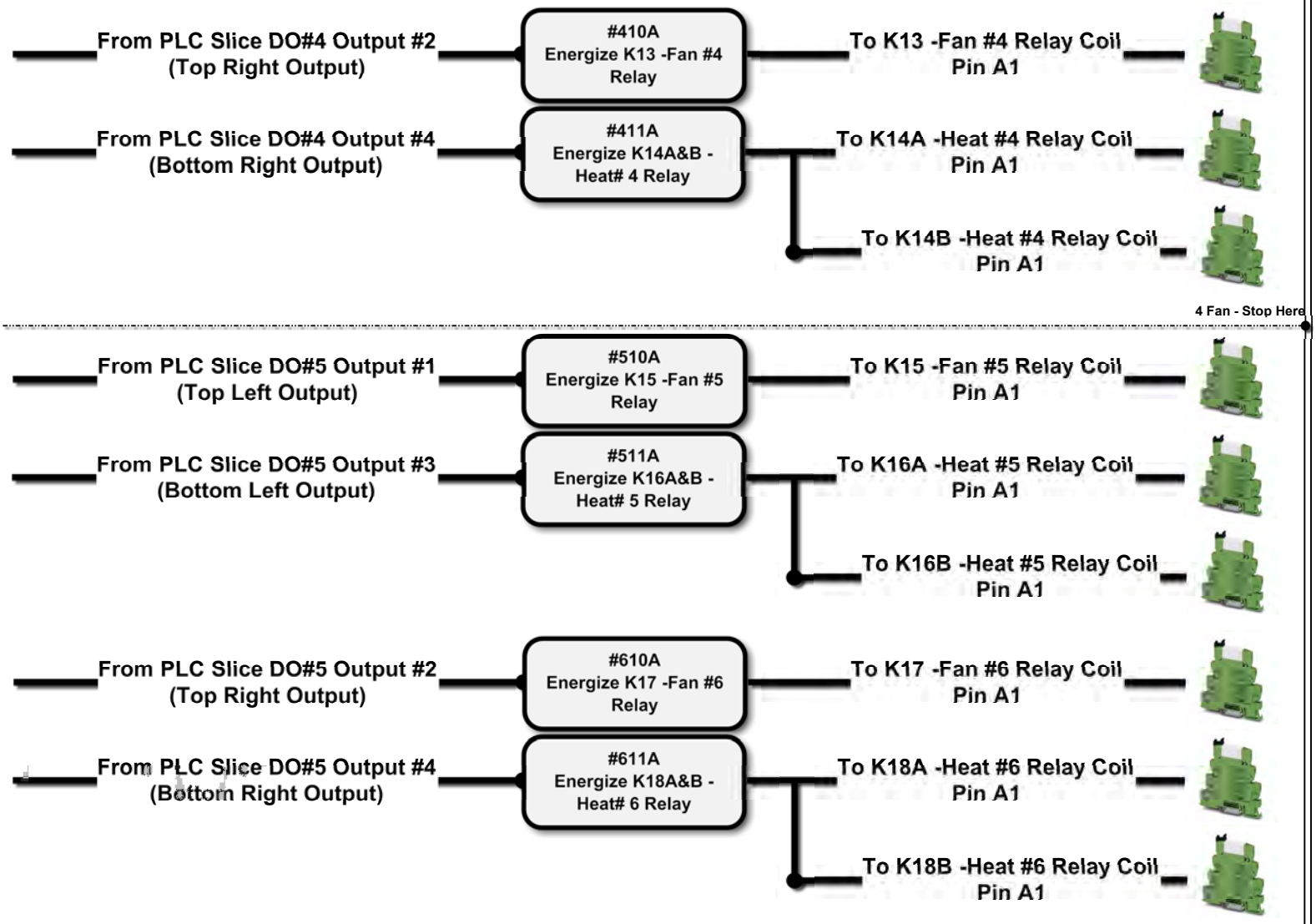
Title: PORTABLE DRYER: Digital Output Line Diagram	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 103.1
Revision:	

PLC Digital Outputs 1-6 Fan



Title: PORTABLE DRYER: Digital Output Line Diagram	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 103.2
Revision:	

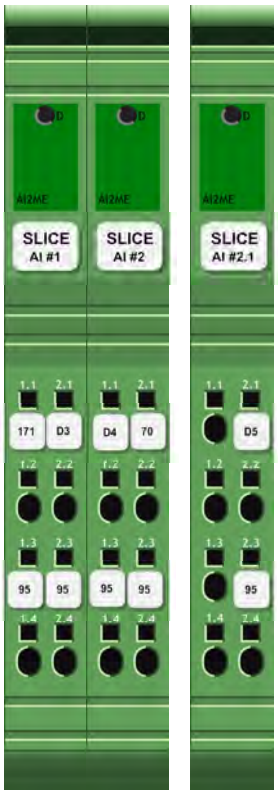
PLC Digital Outputs 1-6 Fan



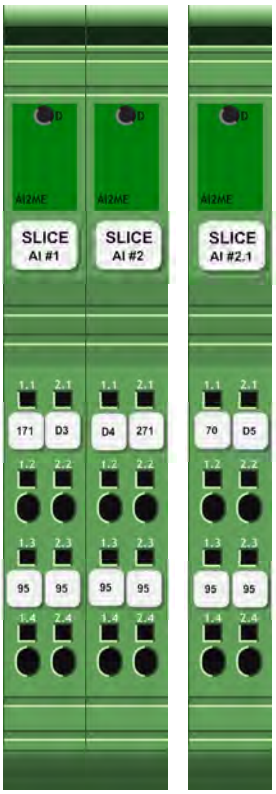
Title: PORTABLE DRYER: Digital Output Line Diagram	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 103.3
Revision:	

PLC Analog Inputs 1-6 Fan

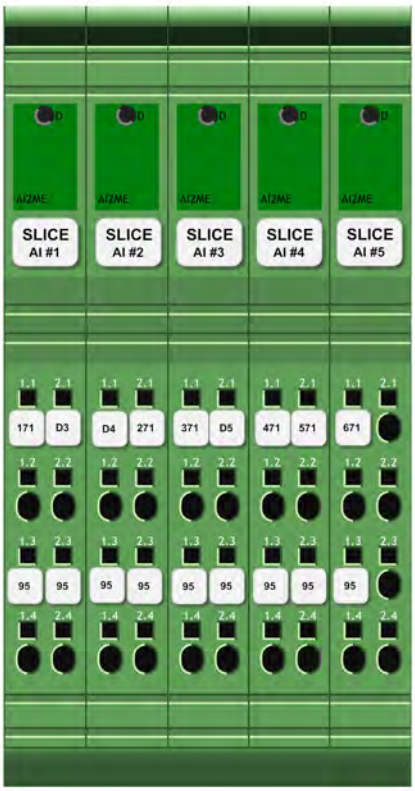
1 Fan



2 Fan



3-6 Fan



From Plenum #1 RTD Transmitter (Located in Power Box) → **#171 Plenum RTD1 Feedback Voltage 1-5Vdc** → **To PLC Slice AI #1 Input #1 (Top Left Input 1.1)**

From Moisture Sensor (Located in Discharge Chute) → **#D3 Grain Temperature Voltage 0-3Vdc** → **To PLC Slice AI #1 Input #2 (Top Right Input 2.1)**

From Moisture Sensor (Located in Discharge Chute) → **#D4 Discharge Moisture Voltage 0-9Vdc** → **To PLC Slice AI #2 Input #1 (Top Left Input 1.1)**

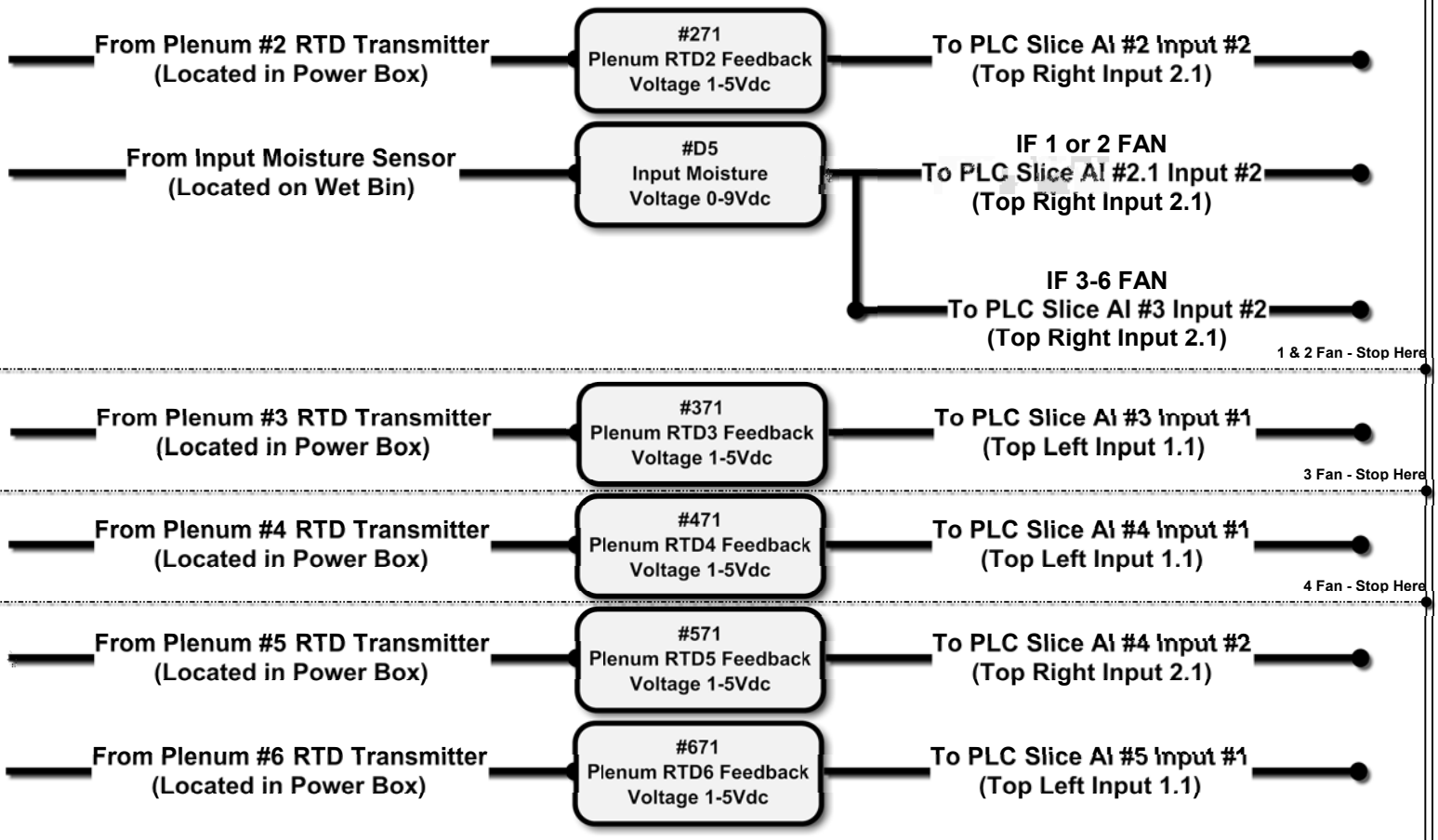
From Column RTD Transmitter (Located in Power Box) → **#70 Column Temp Feedback Voltage 1-5Vdc** → **IF 1 FAN To PLC Slice AI #2 Input #2 (Top Right Input 2.1)**

IF 2 FAN To PLC Slice AI #2.1 Input #1 (Top Left Input 1.1)

1 Fan without 2.1 (Input MST Sensor) - Stop Here

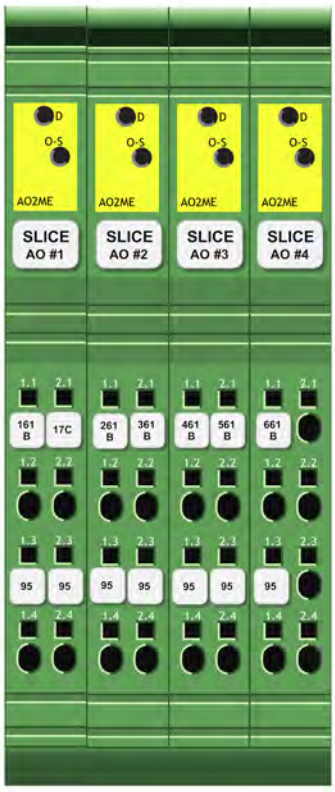
Title: PORTABLE DRYER: Analog Input Line Diagram	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 104.1
Revision:	

PLC Analog Inputs 1-6 Fan



Title: PORTABLE DRYER: Analog Input Line Diagram	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 104.2
Revision:	

PLC Analog Outputs 1-6 Fan



From PLC Slice AO #1 Output #1 (Top Left Output 1.1) → #161B Electronic Mod Valve#1 Reference 2-10 Vdc → To Manual Board (Make sure switch is in AUTO) → To Heater Box #1 EMOV Ref Voltage

From PLC Slice AO #1 Output #2 (Top Right Output 2.1) → #17C Meter Roll VFD Reference 0-10 Vdc → To Manual Board (Make sure switch is in AUTO) → To Meter Roll VFD Pin AI1 Reference Voltage

1 Fan - Stop Here

From PLC Slice AO #2 Output #1 (Top Left Output 1.1) → #261B Electronic Mod Valve#2 Reference 2-10 Vdc → To Manual Board (Make sure switch is in AUTO) → To Heater Box #2 EMOV Ref Voltage

2 Fan - Stop Here

From PLC Slice AO #2 Output #2 (Top Right Output 2.1) → #361B Electronic Mod Valve#3 Reference 2-10 Vdc → To Manual Board (Make sure switch is in AUTO) → To Heater Box #3 EMOV Ref Voltage

3 Fan - Stop Here

From PLC Slice AO #3 Output #1 (Top Left Output 1.1) → #461B Electronic Mod Valve#4 Reference 2-10 Vdc → To Manual Board (Make sure switch is in AUTO) → To Heater Box #4 EMOV Ref Voltage

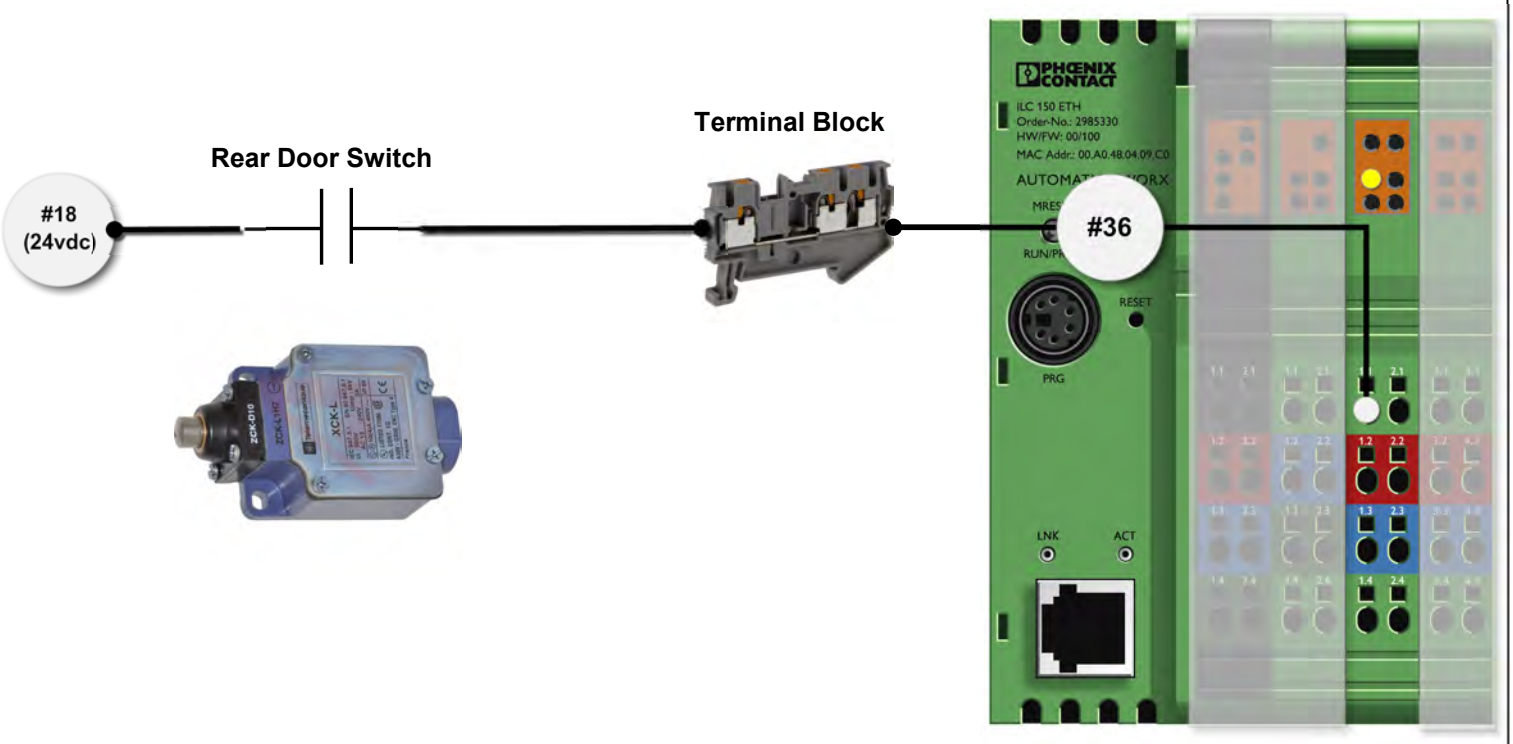
4 Fan - Stop Here

From PLC Slice AO #3 Output #2 (Top Right Output 2.1) → #561B Electronic Mod Valve#5 Reference 2-10 Vdc → To Manual Board (Make sure switch is in AUTO) → To Heater Box #5 EMOV Ref Voltage

From PLC Slice AO #4 Output #1 (Top Left Output 1.1) → #661B Electronic Mod Valve#6 Reference 2-10 Vdc → To Manual Board (Make sure switch is in AUTO) → To Heater Box #6 EMOV Ref Voltage

Title: PORTABLE DRYER: Analog Input Line Diagram	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 105.1
Revision:	

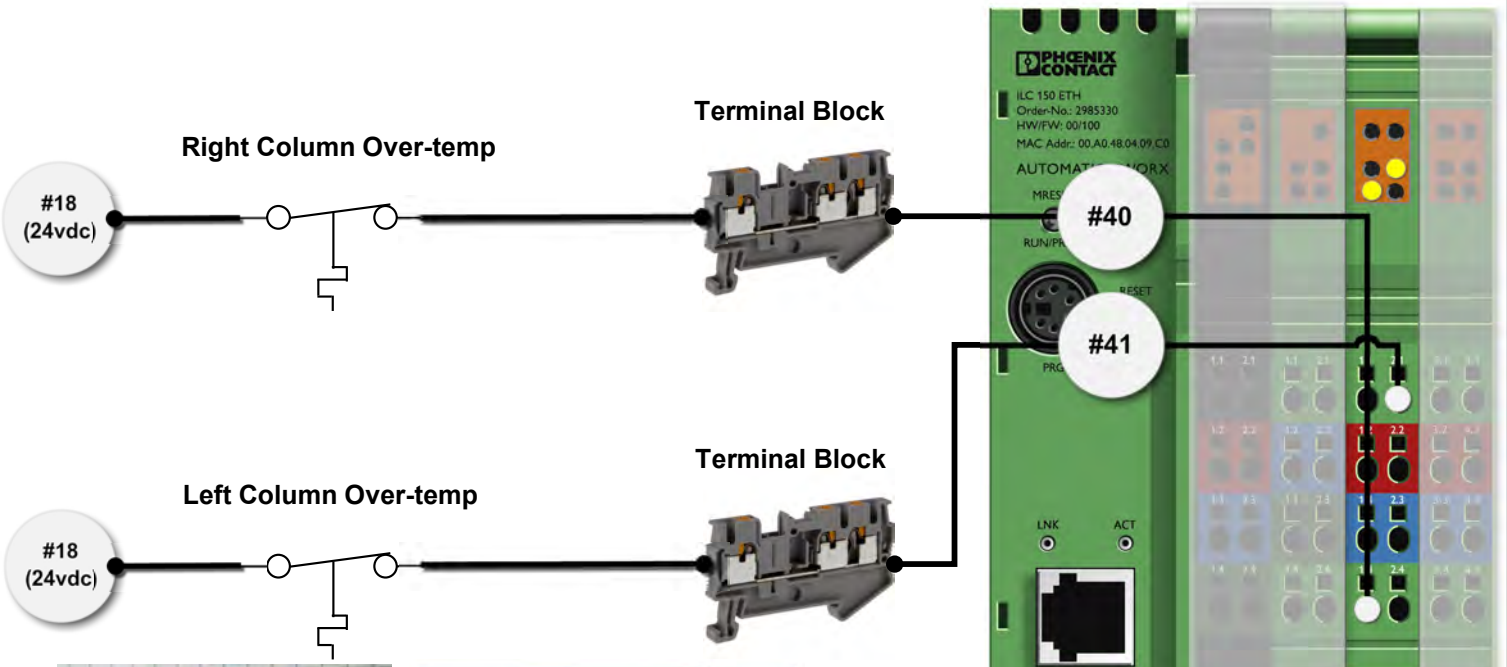
Rear Door Circuit #36



The Rear Door Switch circuit starts in the power box. 24vdc is sent to the rear junction box on wire #18. From there, 24vdc is sent to the rear door switch. When the switch is depressed, it completes the circuit and sends 24vdc back to the rear junction box on wire #36. From there, wire #36 goes back to the power box, and into the PLC on Slice DI #1, input 1 (1.1 top left). If there are multiple door switches on the dryer, they are wired in series before returning #36 to the rear junction box.

Title: PORTABLE DRYER: Rear Door Circuit #36	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: Rear Door #36
Revision: 6/7/2017 - DWS (1)	106.1

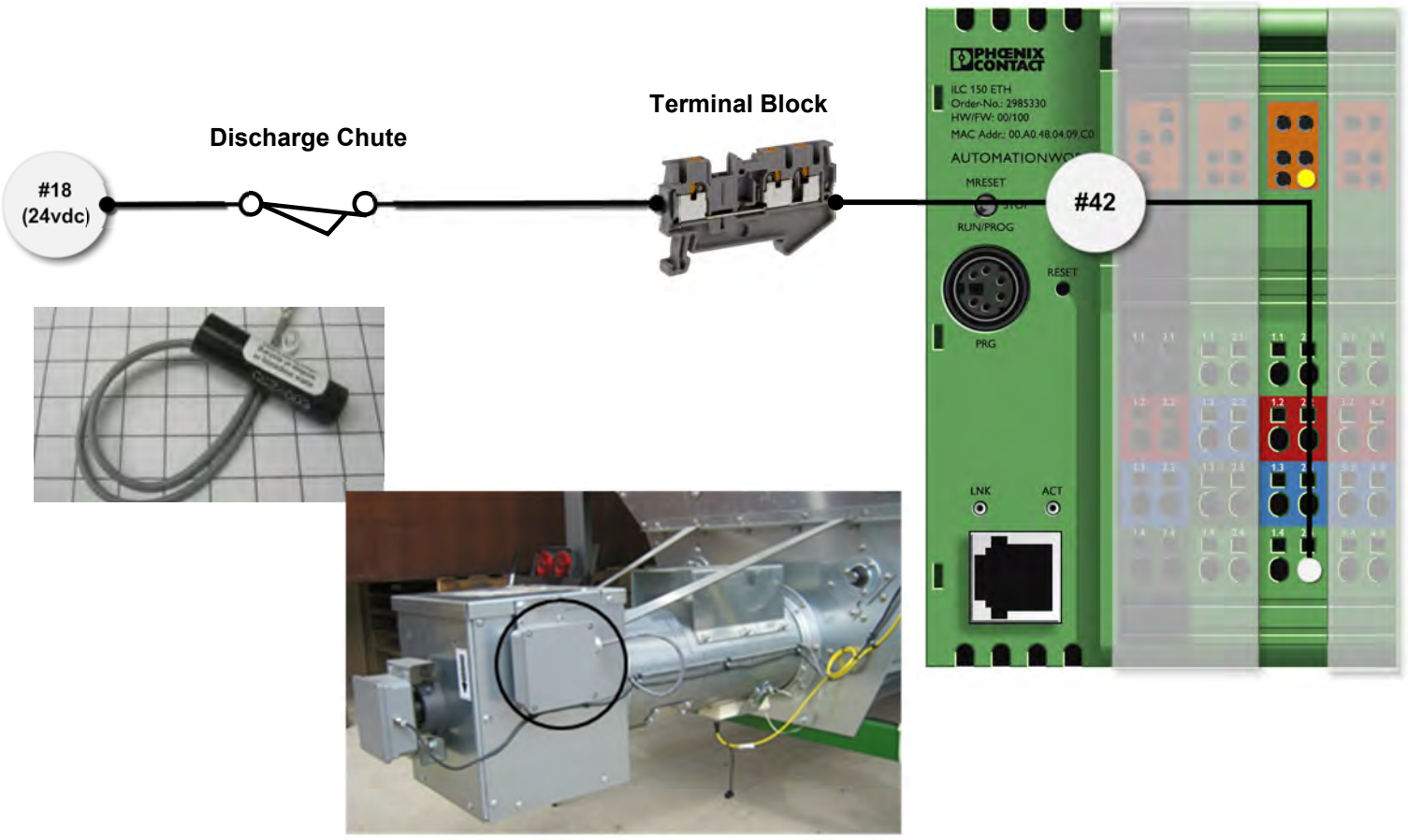
Column High-Limit Circuits #40 and #41



The Right and Left Column High-Limit (Over-temp) Circuits are designed to detect dangerously high temperatures in their respective grain columns. When the column temperature is too high, the switch opens, interrupting the 24vdc back to inputs #40 or #41.

Title: PORTABLE DRYER: Column Overtemp Circuits	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: Column Overtemp #40, #41
Revision: 6/17 DWS	106.2

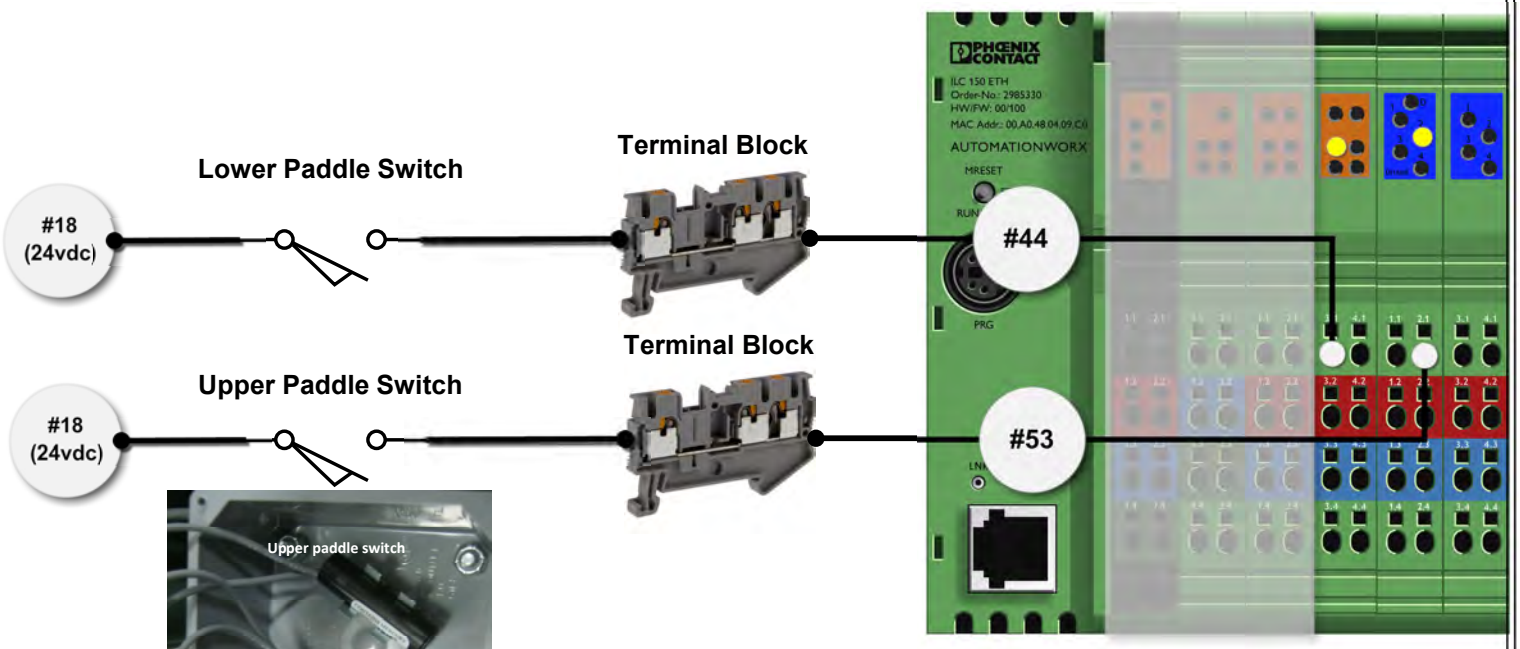
Rear Discharge Chute #42

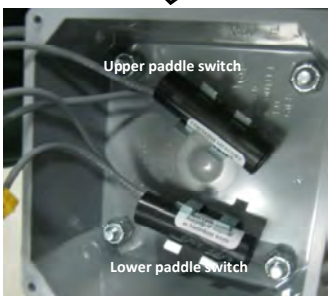


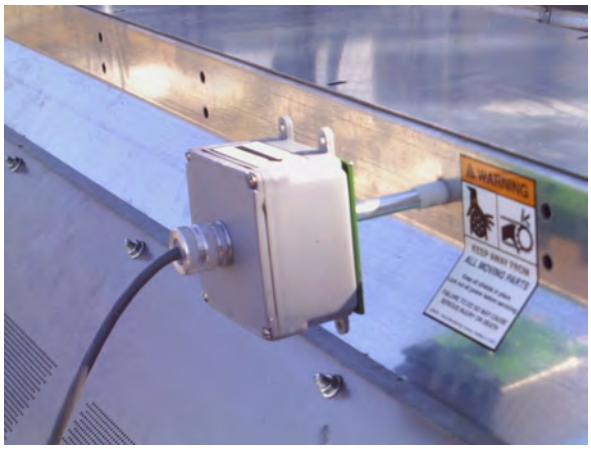
The Rear Discharge Chute Circuit is located on the back of the dryer, directly above the discharge point of grain. Intended to detect the backup of grain, the lid is attached to a gray plastic box containing a tilt switch. When the lid is lifted open, the switch opens, interrupting the flow of 24vdc on wire #42.

Title: PORTABLE DRYER: Rear Discharge Chute	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: Disharge Chute #42
Revision: 6/17 DWS	106.3

Paddle Switches #44 & #53



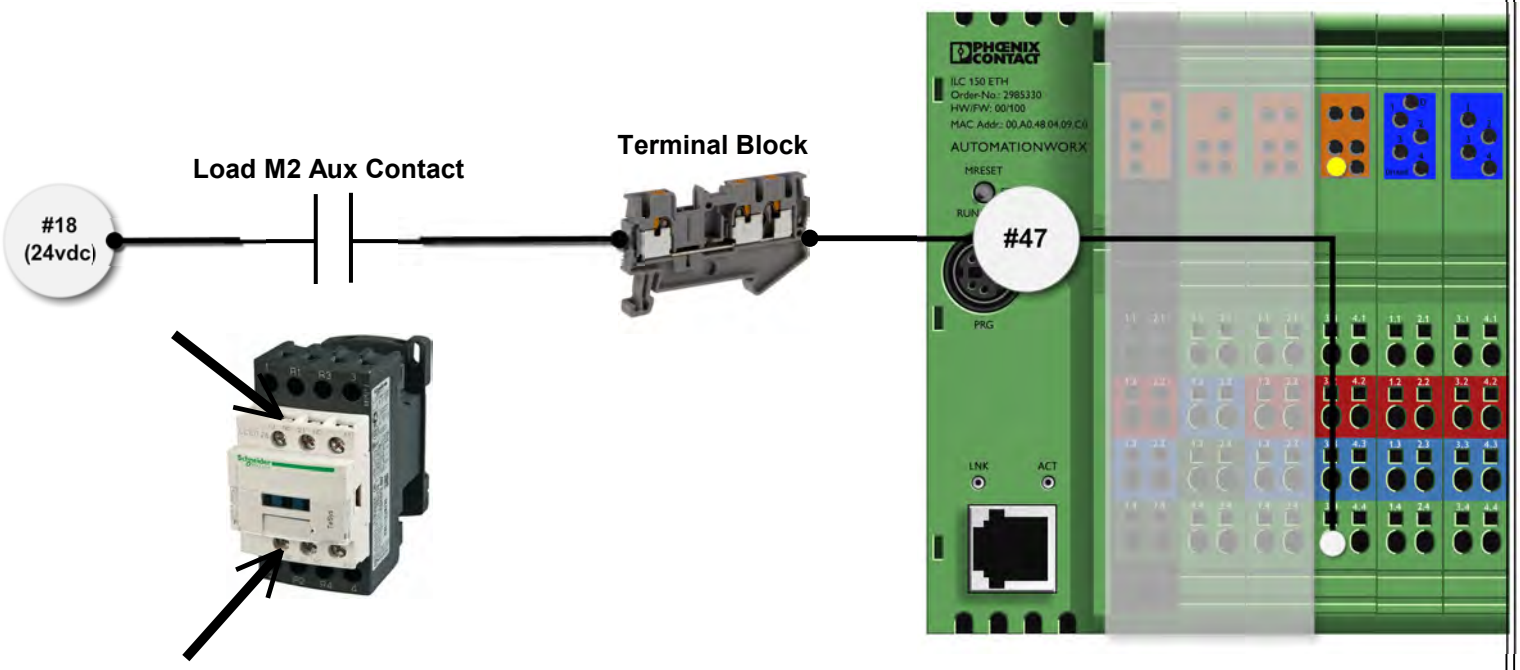




The Paddle Switch on the dryer is a 2-position switch that helps the dryer with its automated loading procedure. It also assists in telling the dryer when the wet bin is empty or full for too long. As grain fills the wet bin, the lower paddle switch (#44) will gently lift up and close the circuit (24vdc). This will also tell the dryer to disengage the Aux #2 relay K7. Next, as the wet bin is almost full, the upper paddle switch (#53) will gently lift up and close the circuit (24vdc). When the upper paddle switch closes, the Load Relay K1 and Aux #1 Relay will also disengage.

Title: PORTABLE DRYER: Paddle Switch Circuit	
Author: SUKUP MFG CO - MRK	
Date: 03/15	
Revision: 6/7/2017 - DWS (1)	106.4

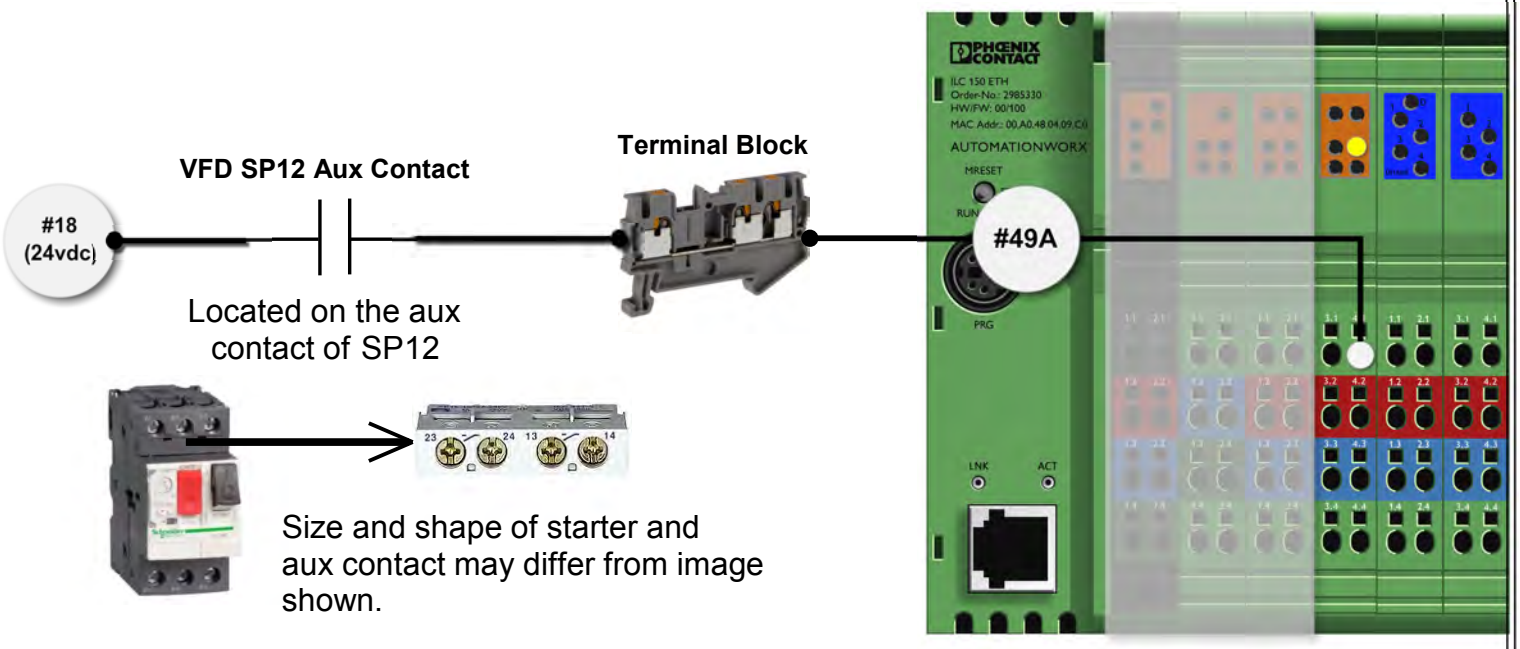
Load Confirmation #47



The Load Confirmation Circuit closes when the Load contactor is energized by the K1 Load Relay. When the contactor pulls in (sending voltage to the unload motor) the normally open auxiliary contact on the M2 Load Contactor closes - thus sending 24vdc back to the PLC on wire #47.

Title: PORTABLE DRYER: Load Confirmation #47	
Author: SUKUP MFG CO - MRK	
Date: 03/15	
Revision: 6/7/2017 - DWS (1)	106.5

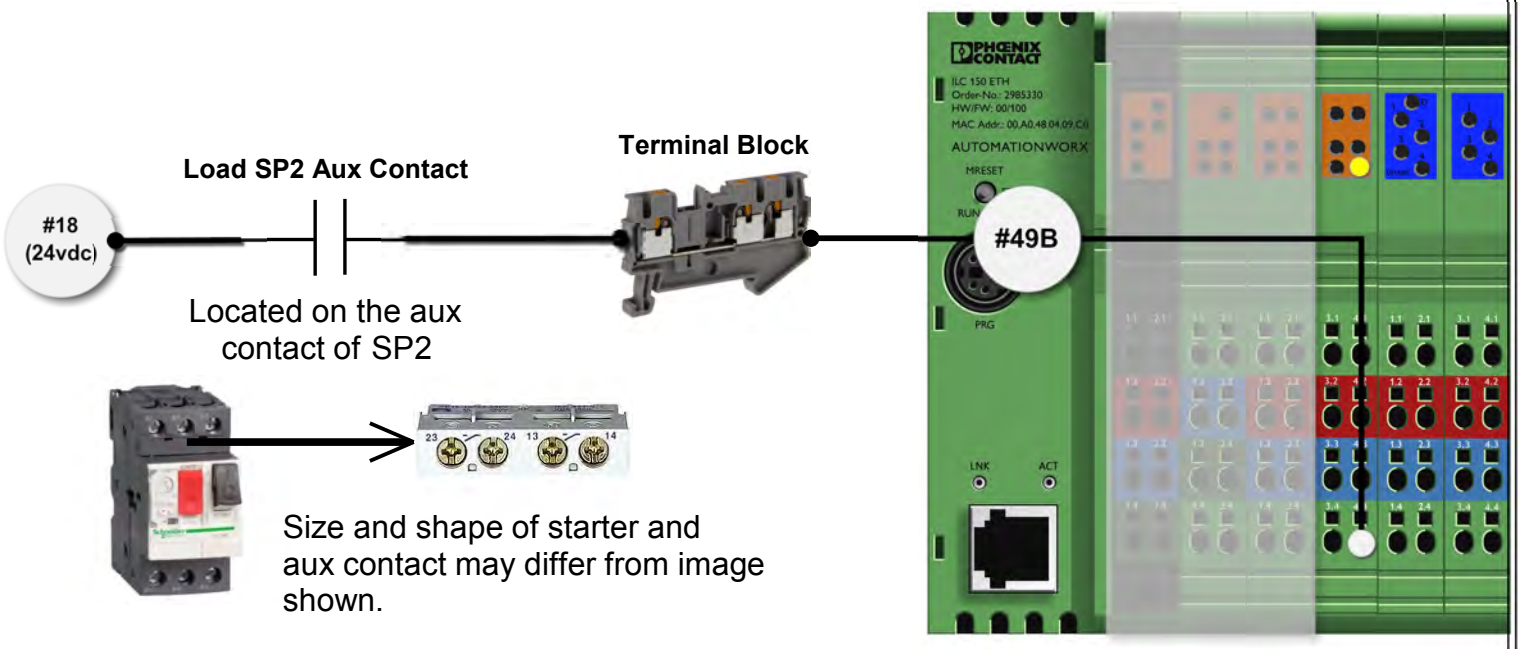
Motor Overload VFD #49A



The Motor Overload VFD circuit is designed to monitor the starter protector for the VFD which operates the meter roll motor. The circuit is closed under normal operating conditions. It is open during a trip or overload condition.

Title: PORTABLE DRYER: Motor Overload VFD #49A	
Author: SUKUP MFG CO - MRK	
Date: 03/15	
Revision: 6/7/2017 - DWS (1)	106.6

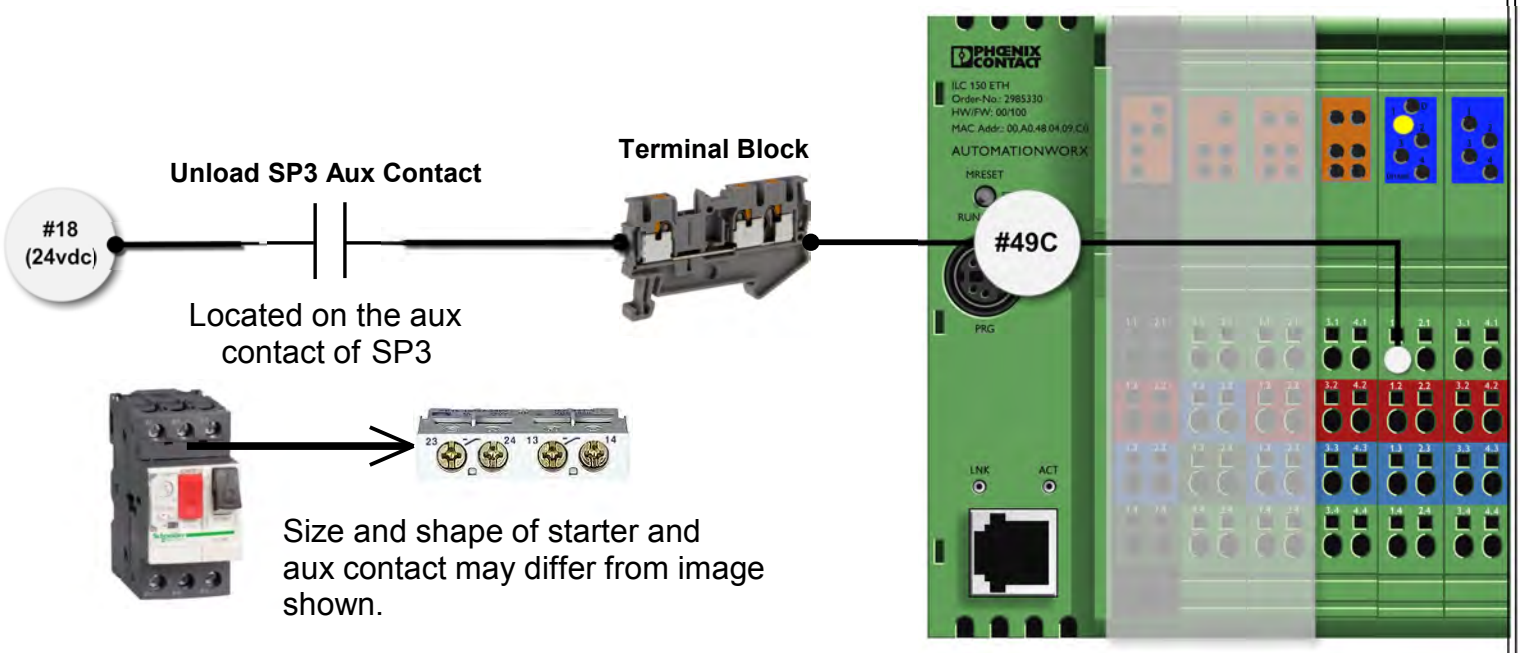
Motor Overload Load #49B



The Motor Overload Load circuit is designed to monitor the starter protector for the Load which operates the leveling auger on the top of the dryer. The circuit is closed under normal operating conditions. It is open during a trip or overload condition.

Title: PORTABLE DRYER: Motor Overload Load #49B	
Author: SUKUP MFG CO - MRK	
Date: 03/15	
Revision: 6/7/2017 - DWS (1)	106.7

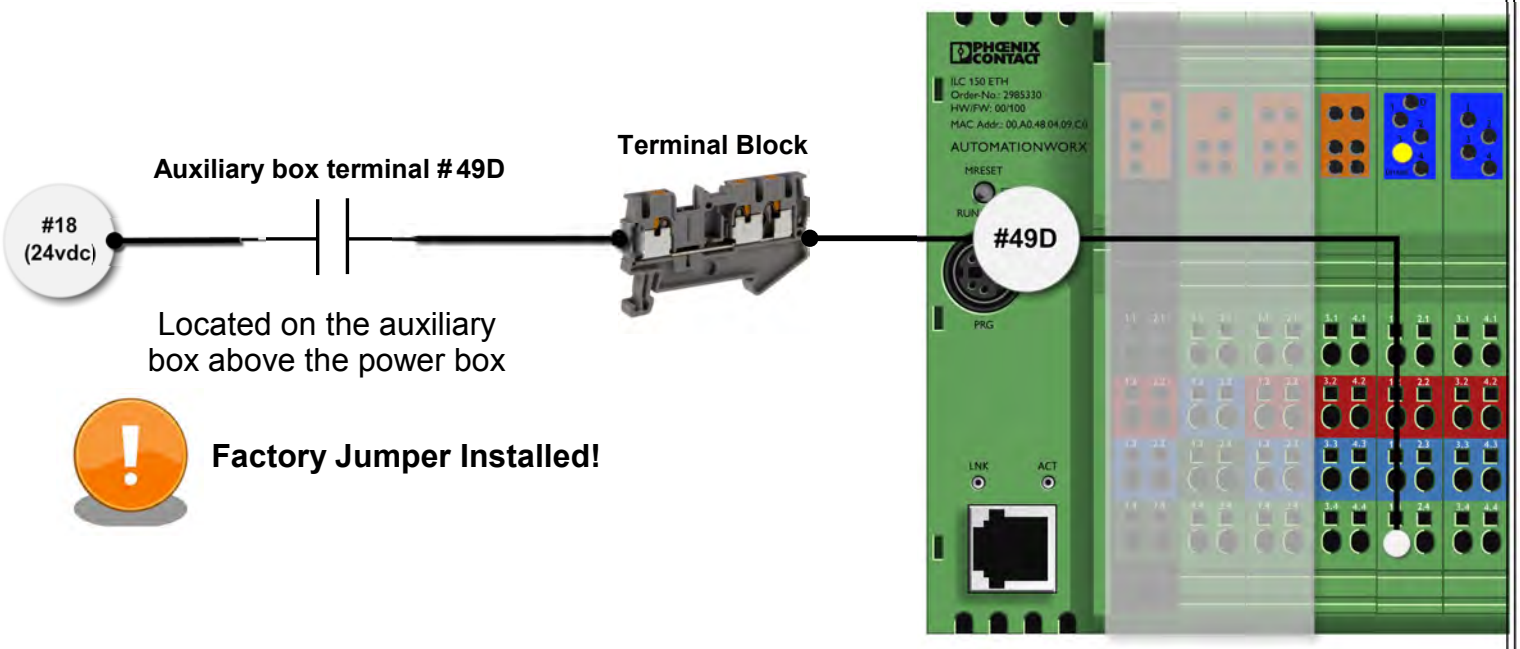
Motor Overload Unload #49C



The Motor Overload Unload circuit is designed to monitor the starter protector for the unload which operates the auger on the bottom of the dryer. The circuit is closed under normal operating conditions. It is open during a trip or overload condition.

Title: PORTABLE DRYER: Motor Overload Unload #49C	
Author: SUKUP MFG CO - MRK	
Date: 03/15	
Revision: 6/7/2017 - DWS (1)	106.8

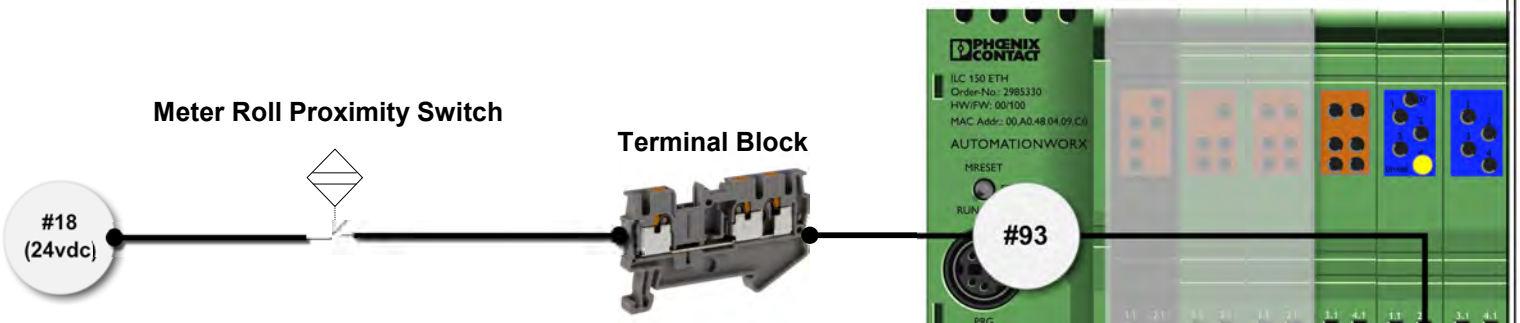
Motor Overload Auxiliary Box #49D



The Motor Overload Auxiliary Box circuit is designed to monitor and additional starter protectors which typically assist in loading and unloading the dryer. If multiple starters are used, they need to be wired in series. The circuit is closed under normal operating conditions. It is open during a trip or overload condition.

Title: PORTABLE DRYER: Motor Overload Aux #49D	
Author: SUKUP MFG CO - MRK	
Date: 03/15	
Revision: 6/7/2017 - DWS (1)	106.9

Meter Roll Proximity Switch #93

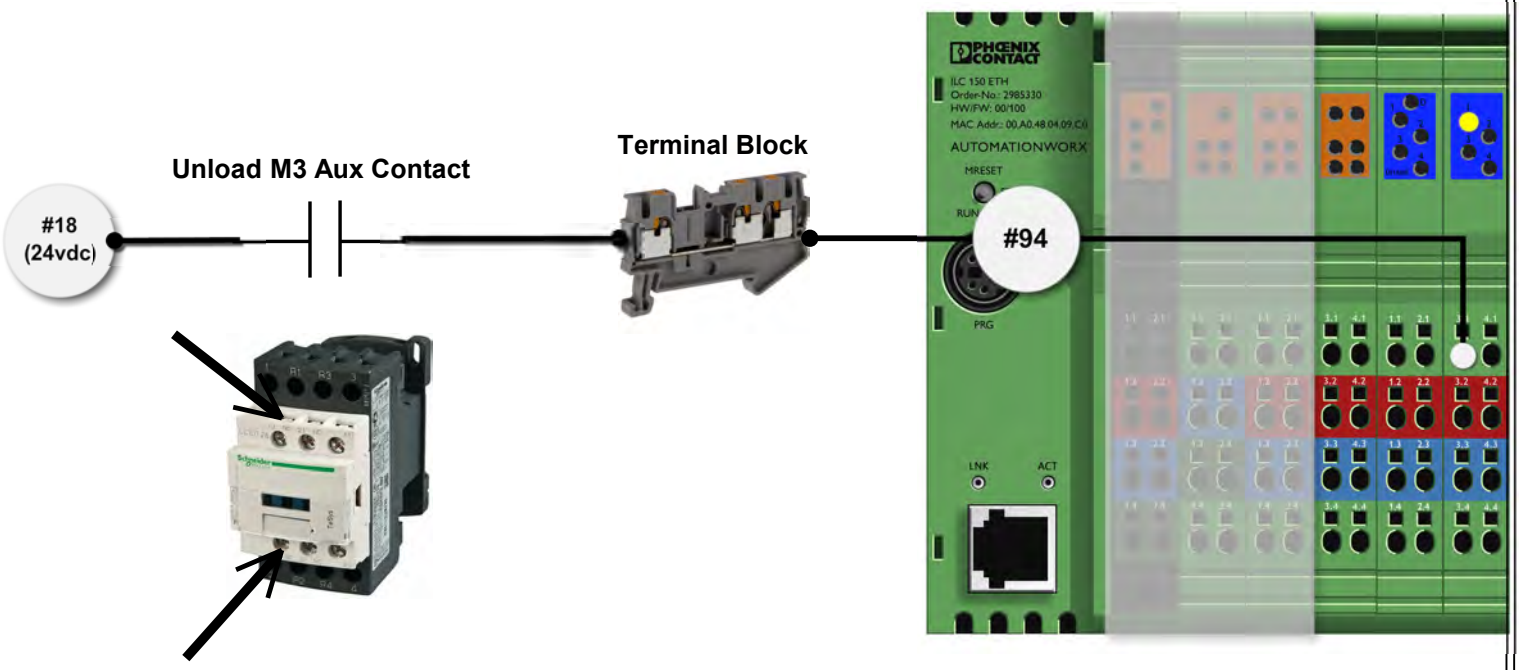


Blue -------#95
Brown-----#18
Black------#93

The Meter Roll Proximity Switch Circuit is designed to confirm rotation of the metering rolls when the VFD has been energized. The circuit will close when the proximity switch is in close contact with the flag or target. It will open when it is not. During operation, the meter roll proximity signal #93 needs to turn off and back on every 2 minutes.

Title: PORTABLE DRYER: Meter Roll Prox Switch #93	
Author: SUKUP MFG CO - MRK	
Date: 03/15	
Revision: 6/7/2017 - DWS (1)	106.10

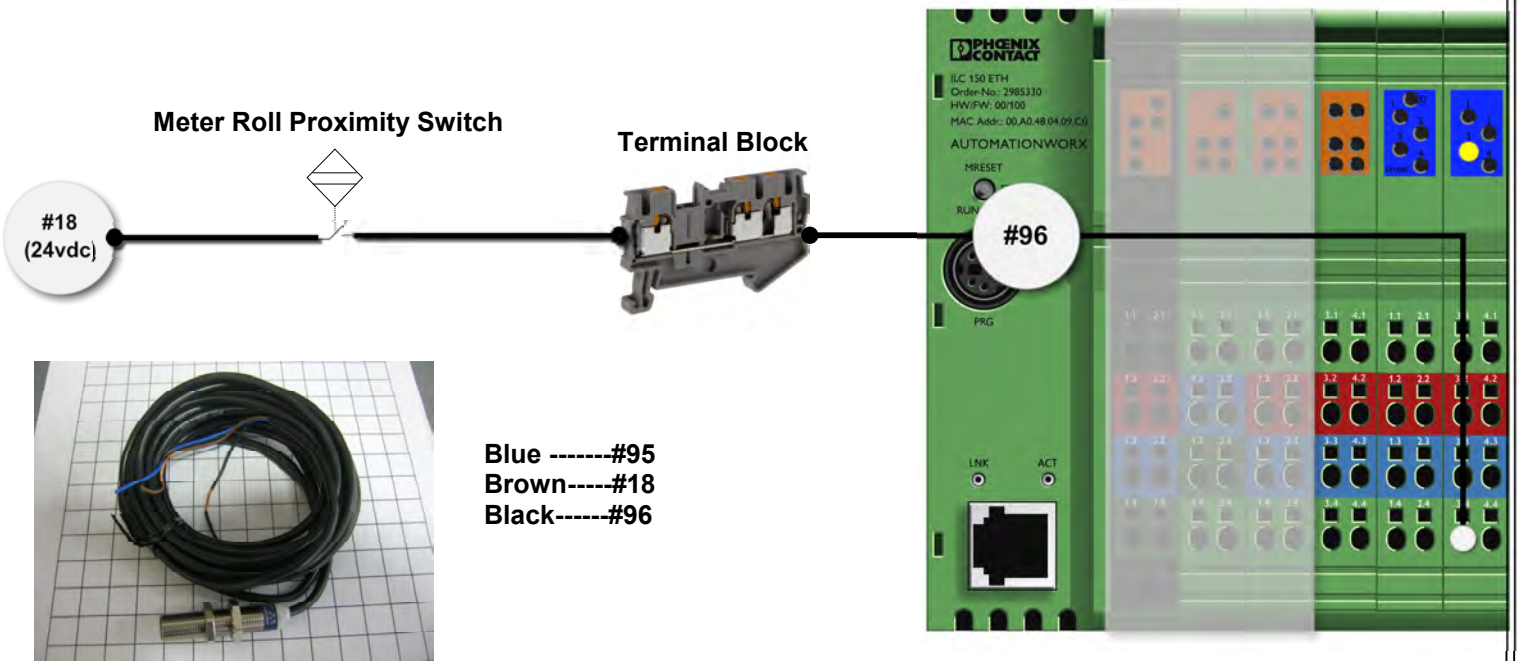
Unload Confirmation #94



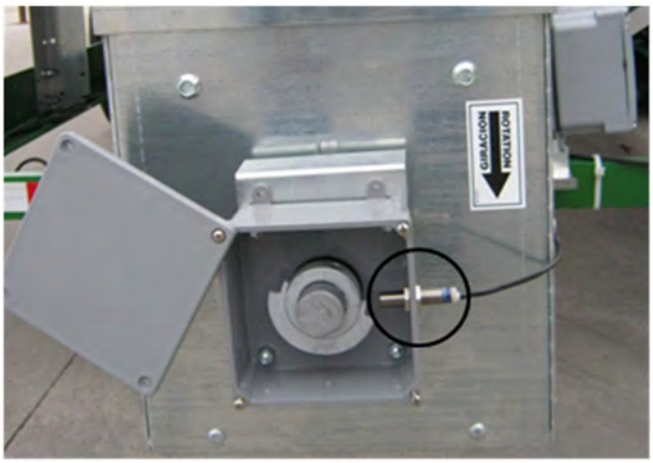
The Unload Confirmation Circuit closes when the unload contactor is energized by the K2A Unload Relay. When the contactor pulls in (sending voltage to the unload motor) the normally open auxiliary contact on the M3 unload contactor closes - thus sending 24vdc back to the PLC on wire #94.

Title: PORTABLE DRYER: Unload Confirmation #94	
Author: SUKUP MFG CO - MRK	
Date: 03/15	
Revision: 6/7/2017 - DWS (1)	106.11

Unload Proximity Switch #96



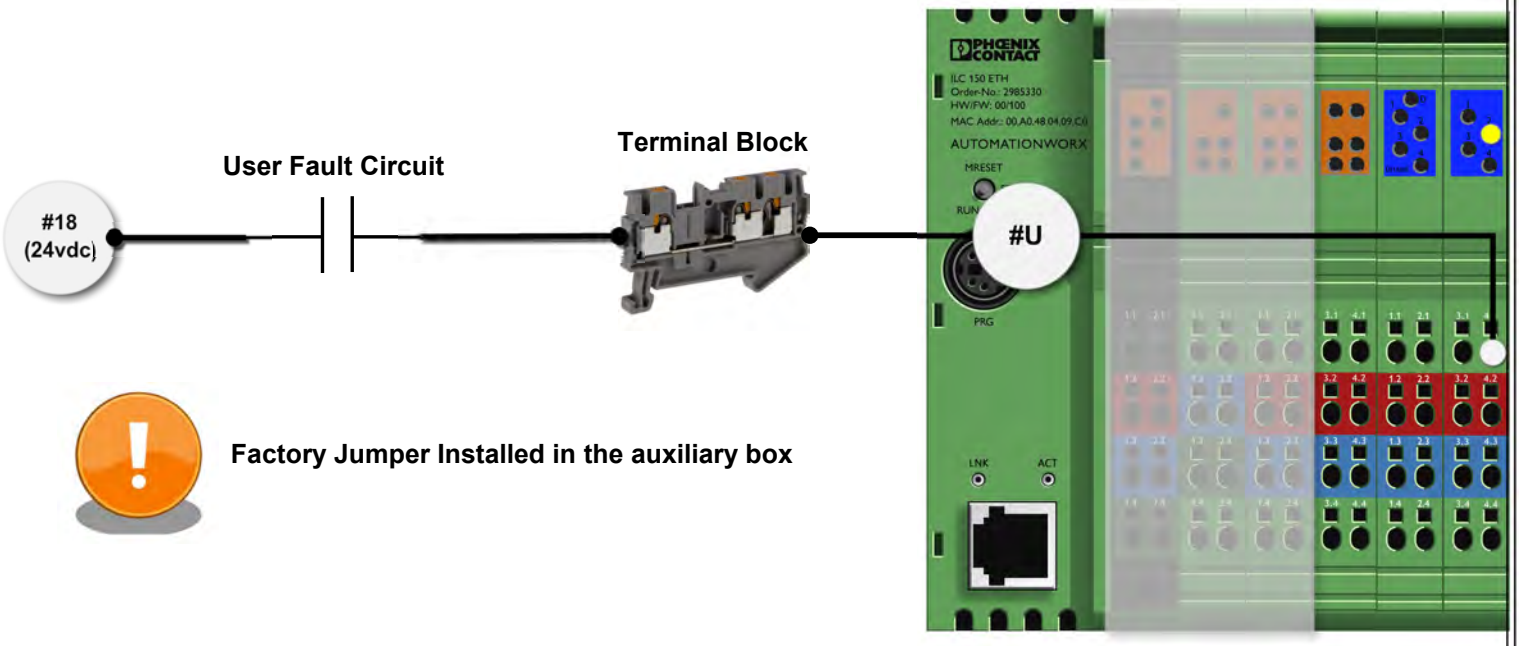
Blue -------#95
Brown-----#18
Black------#96



The Unload Proximity Switch Circuit is designed to confirm rotation of the unload auger when the K2A Unload Relay has been energized. The circuit will close when the proximity switch is in close contact with the flag or target. It will open when it is not. During operation, the unload proximity signal #96 needs to turn off and back on every 5 seconds.

Title: PORTABLE DRYER: Unload Prox #96	
Author: SUKUP MFG CO - MRK	
Date: 03/15	
Revision: 6/7/2017 - DWS (1)	106.12

User Fault Circuit #U

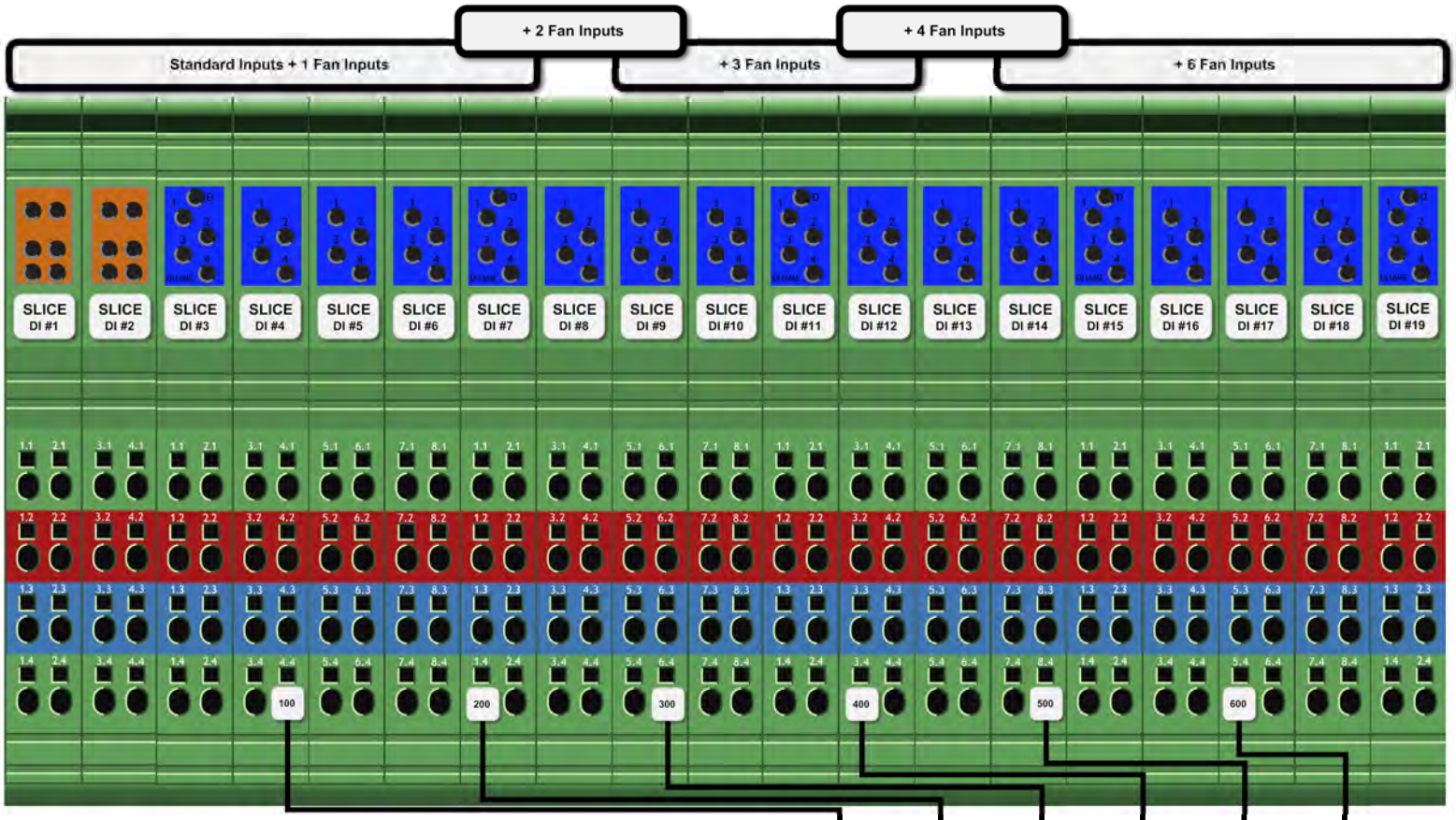


Factory Jumper Installed in the auxiliary box

The User Fault Circuit #U is an additional fault circuit provided to the dryer operator for additional equipment monitoring. For example, the dryer operator has a custom unload system that needs to be running in order for the dryer to keep running. The operator can interlock the unload system with the user fault circuit. 24vdc needs to be present under normal operating conditions. An open circuit results in dryer shutdown.

Title: PORTABLE DRYER: User Fault Circuit #U	
Author: SUKUP MFG CO - MRK	
Date: 03/15	
Revision: 6/7/2017 - DWS (1)	106.13

Soft Start Fault #100, #200, #300, #400, #500, #600



Soft Start Fault Circuit

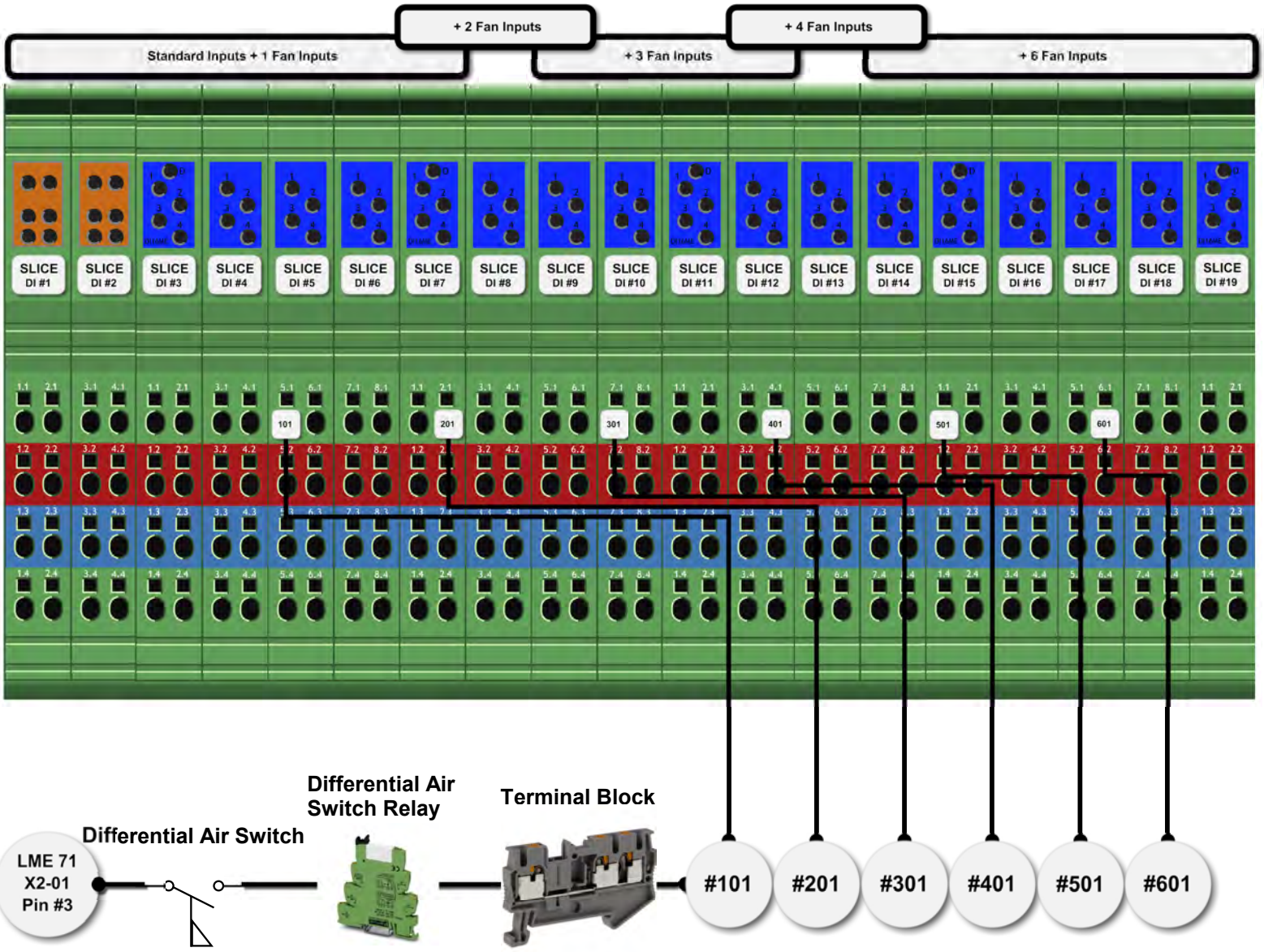
Terminal Block

Located on the white terminal strip of each soft start. Contacts R1C (24vdc) and R1A.

The Soft Start Fault Circuit is designed to monitor each soft start for any failures. In the event the soft start faults, the contact on R1A opens, and the dryer will shutdown.

Title: PORTABLE DRYER: Soft Start Fault Circuit	
Author: SUKUP MFG CO - MRK	
Date: 03/15	
Revision: 6/7/2017 - DWS (1)	106.14

Differential Air Switch Circuits #101, #201, #301, #401, #501, #601



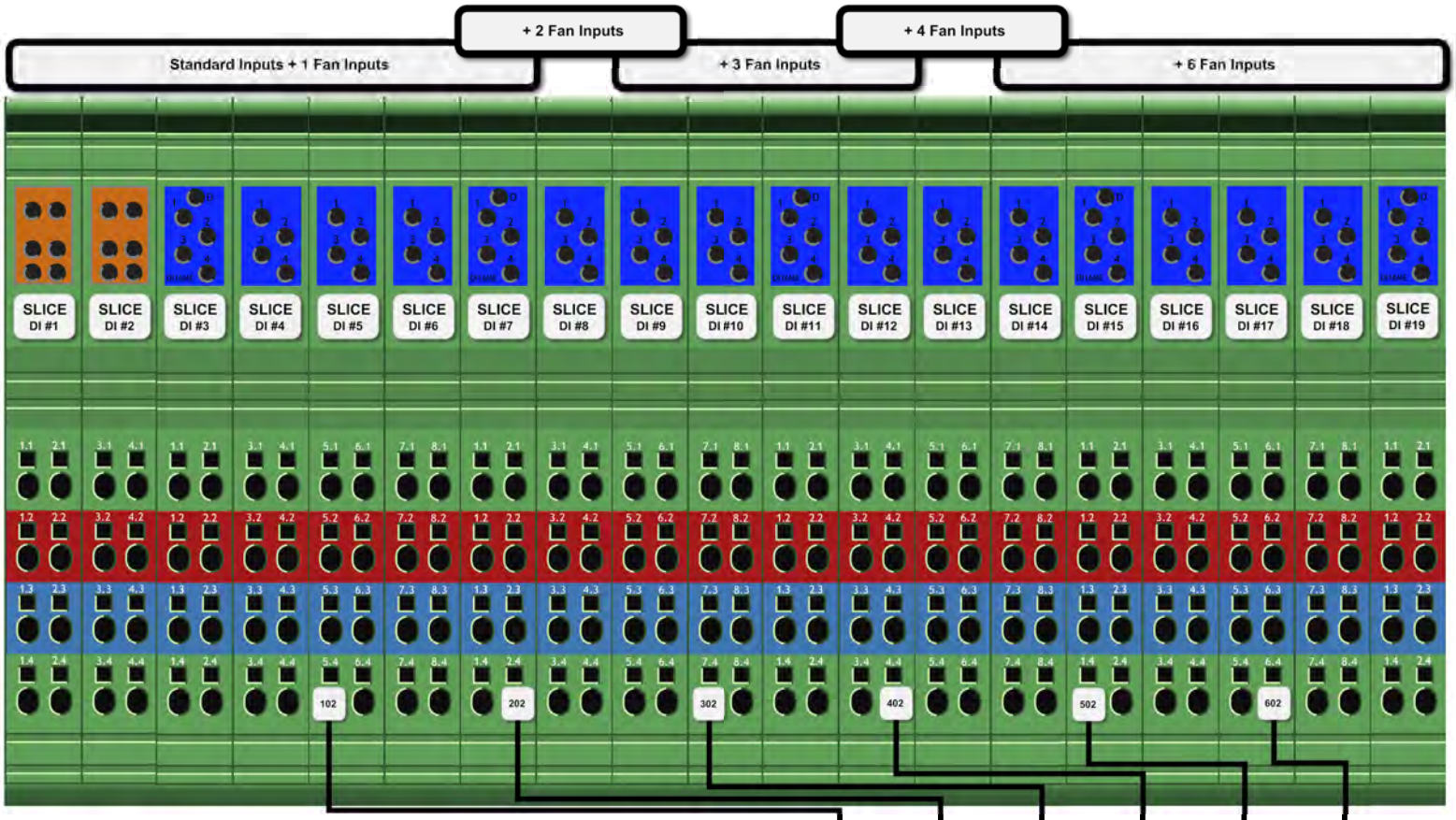
A1 - #NO side of Differential Air Switch
A2 - #2 (Neutral)
11 - #18 (24VDC)
14 - #X01 to PLC (Differential Air Switch Relay Confirmation)

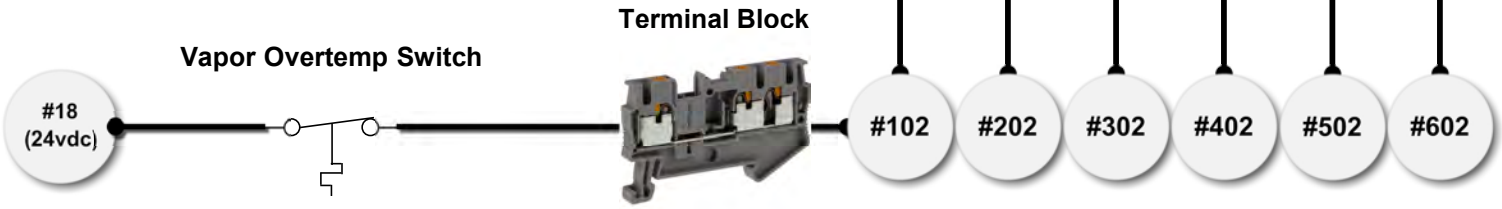
CSA Dryers ONLY
Domestic USA and International CE dryers have factory jumper installed

The Differential Air Switch Circuit is Closes when the differential air switch (Located in the heater box) closes, thus closing a 110VAC relay. The relay allows 24vdc to flow back to the PLC indicating the differential air switch is closed, indicating suction. This differential air switch is only used on CSA dryers, and domestic and CE have a factory jumper installed.

Title: PORTABLE DRYER: Differential Air Switch Circuit	
Author: SUKUP MFG CO - MRK	
Date: 05/16	
Revision: 6/7/2017 - DWS (1)	106.15

Vapor Over-Temp Circuits #102, #202, #302, #402, #502, #602



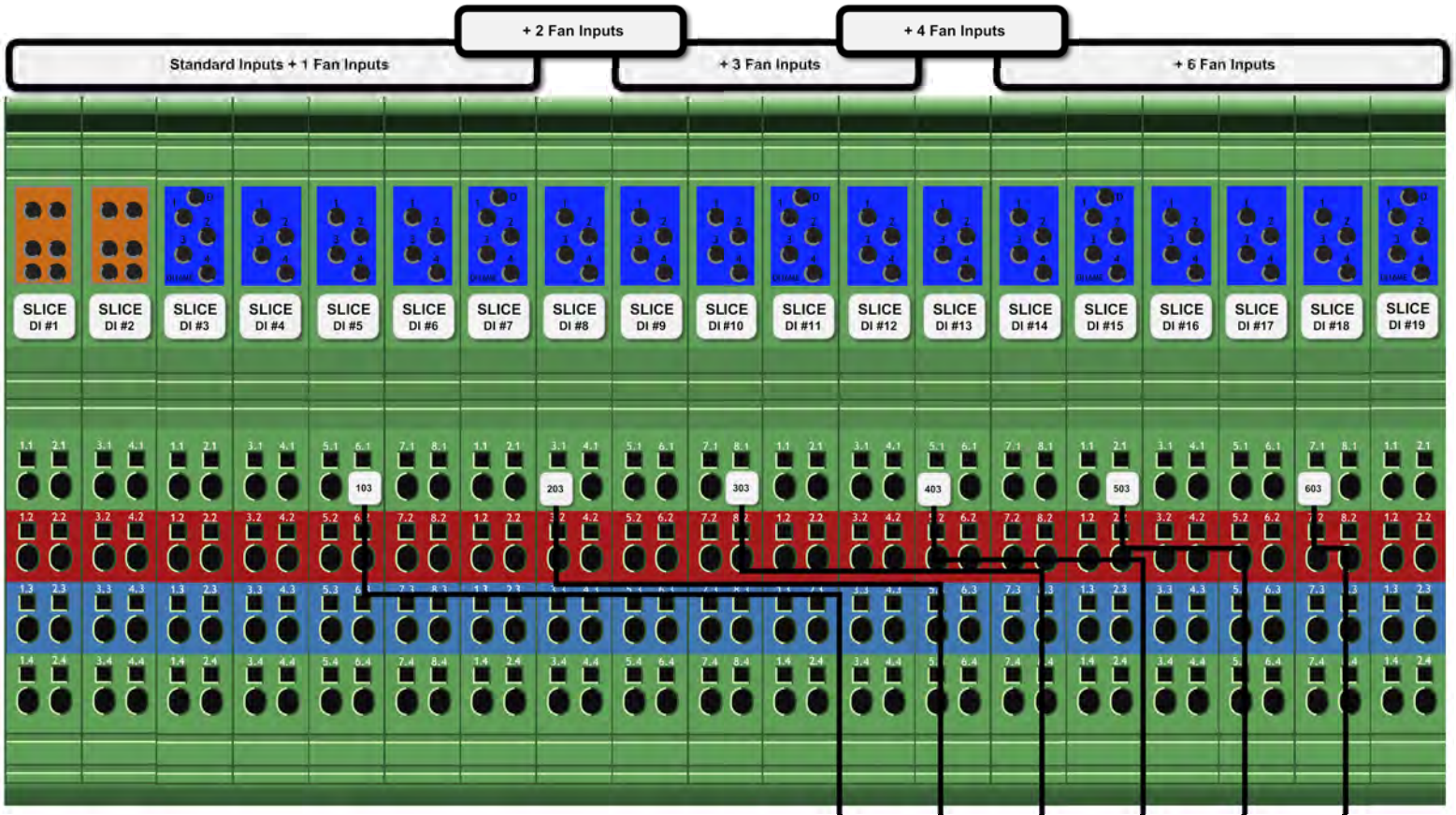


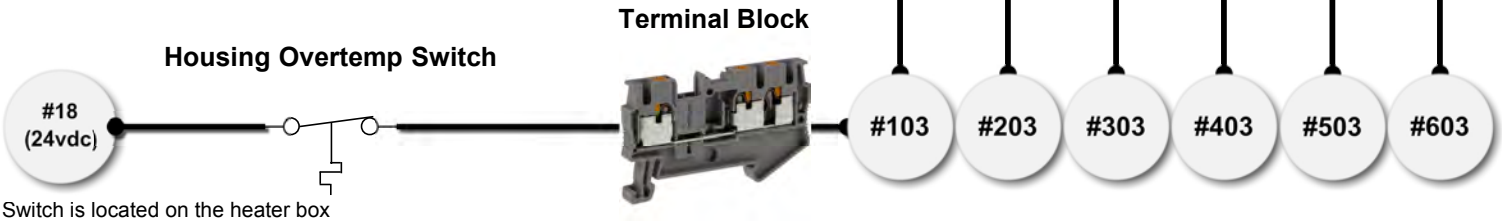
Switch is located on the Pipe Train then junctioned in each respective heater box.

The Vapor Over-Temp Circuit is designed to detected excessive gas temperatures (>140°F) in the vapor lines of each heater. Each vaporizer coil can be independently adjusted, and they should be warm/hot to the touch, but not to the point it will burn your hand. In the event you cannot get the vapor overtemp switch from tripping after coil adjustment, a defector cone may need to be used to keep the vapor from getting too hot.

Title: PORTABLE DRYER: Vapor Over-Temp Circuit	
Author: SUKUP MFG CO - MRK	
Date: 03/15	
Revision: 6/7/2017 - DWS (1)	106.16

Housing High-Limit Circuits #103, #203, #303, #403, #503, #603



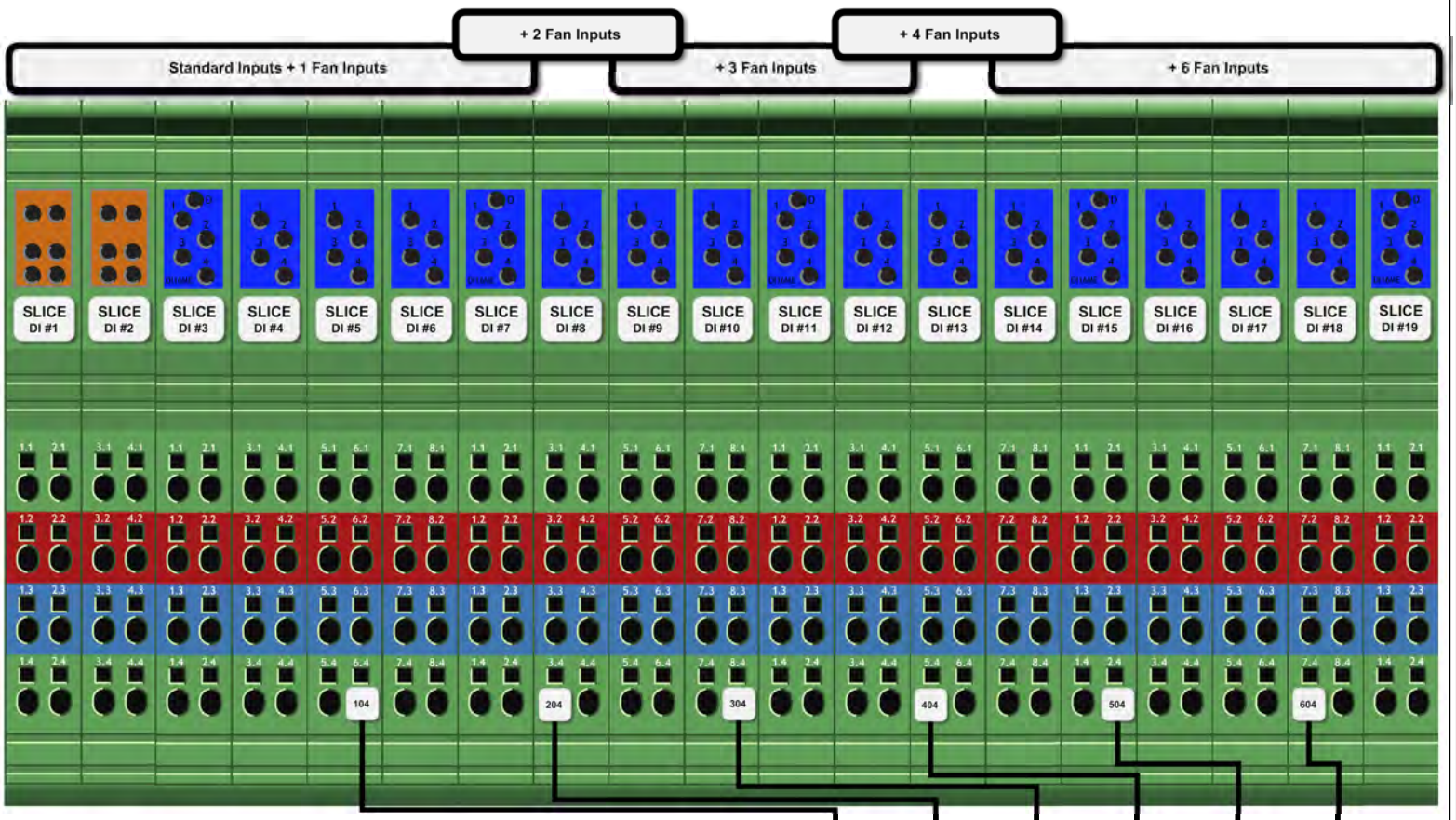


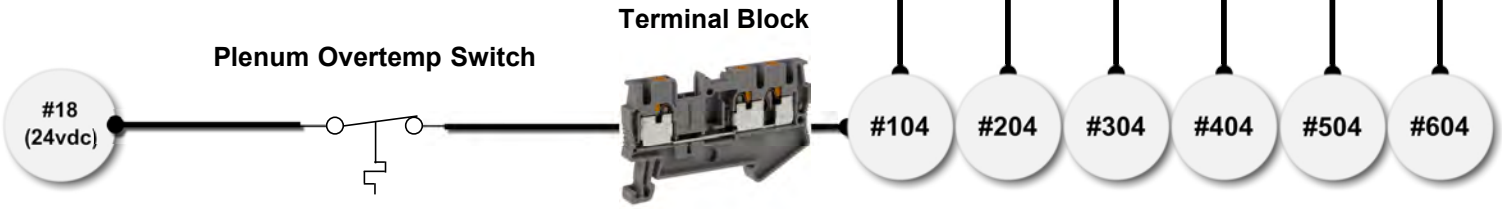
Switch is located on the heater box of each respective fan/heater.

The Housing Over-Temp Circuit is designed to detect excessive temperatures in the heater housing itself. This circuit serves as a backup to the fan monitoring circuits. If the fan stops working during operation, heat will rapidly rise inside the heater housing, thus shutting down the dryer. This is a manual reset circuit. Depress the button on the middle of the switch to reset it.

Title: PORTABLE DRYER: Housing Over-Temp Circuit	
Author: SUKUP MFG CO - MRK	
Date: 03/15	
Revision: 6/7/2017 - DWS (1)	106.17

Plenum Over-Temp Circuits #104, #204, #304, #404, #504, #604



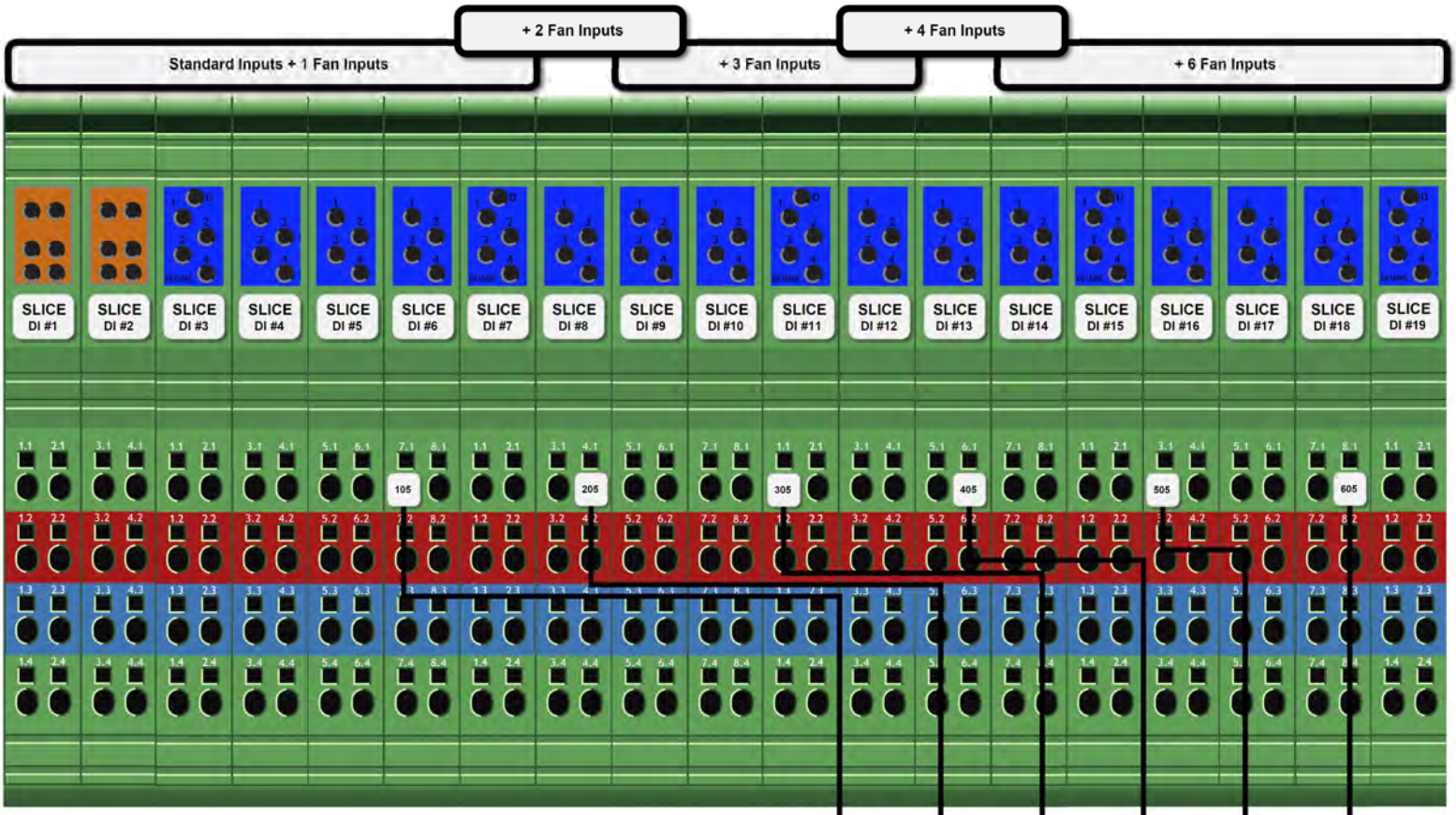


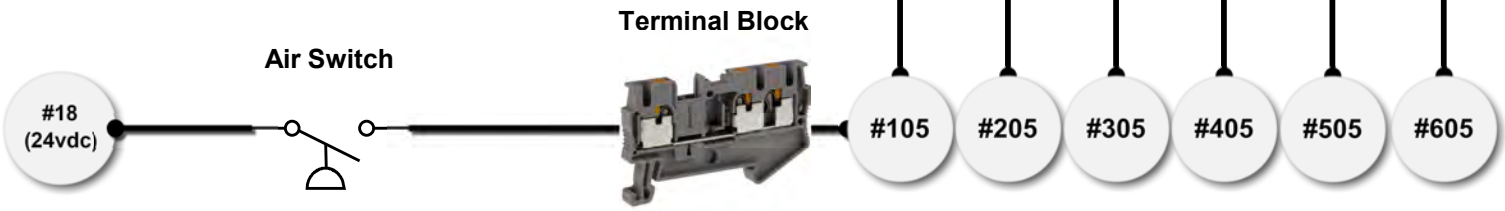
Switch is located in a box with the air switch on the chassis of the dryer above each fan/ heater housing

The Plenum Over-Temp Circuit is designed to detected excessive temperatures (>325°F) in the plenum of each fan/heater. This circuit serves as a fire detection system as well as a backup in the event of a loss in control of the electronic modulating valve in each respective pipe train.

Title: PORTABLE DRYER: Plenum Overtemp Circuit	
Author: SUKUP MFG CO - MRK	
Date: 03/15	
Revision: 6/7/2017 - DWS (1)	106.18

Air Switch Circuits #105, #205, #305, #405, #505, #605





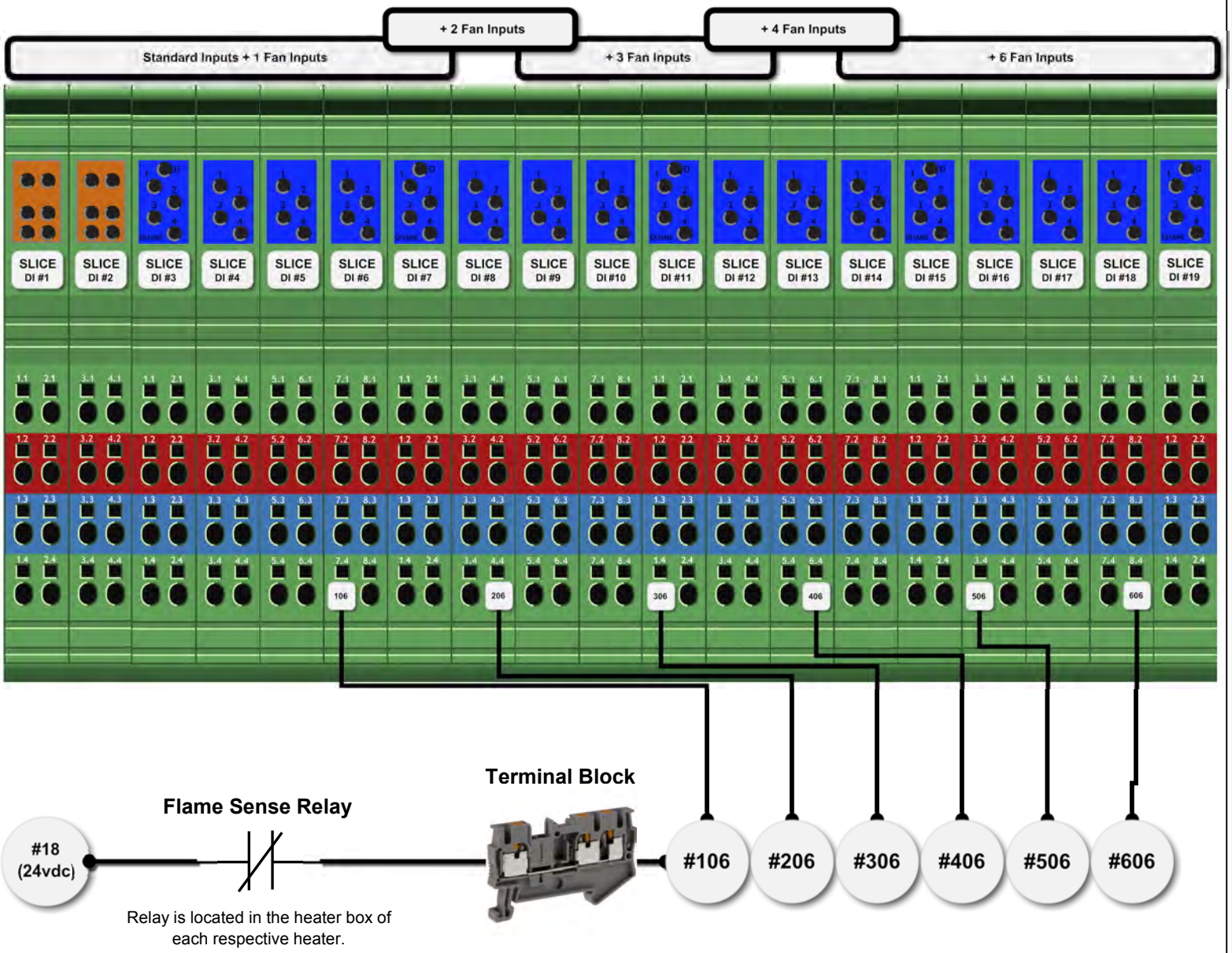
Switch is located above the fan housing or on the chassis of the respective plenum.

Calibrated Switch - T58620
Retrofit Kit from Old Air Switch - TM95298

The Air Switch Circuit is designed to detect a rise in static pressure inside the plenum of each respective fan/heater. When the dryer is full of grain, and the fan is on, the air switch will close sending 24vdc to the PLC indicating it sees increased static air pressure.

Title: PORTABLE DRYER: Air Switch Circuit	
Author: SUKUP MFG CO - MRK	
Date: 03/15	
Revision: 7/23/2020 - DWS (2)	106.19

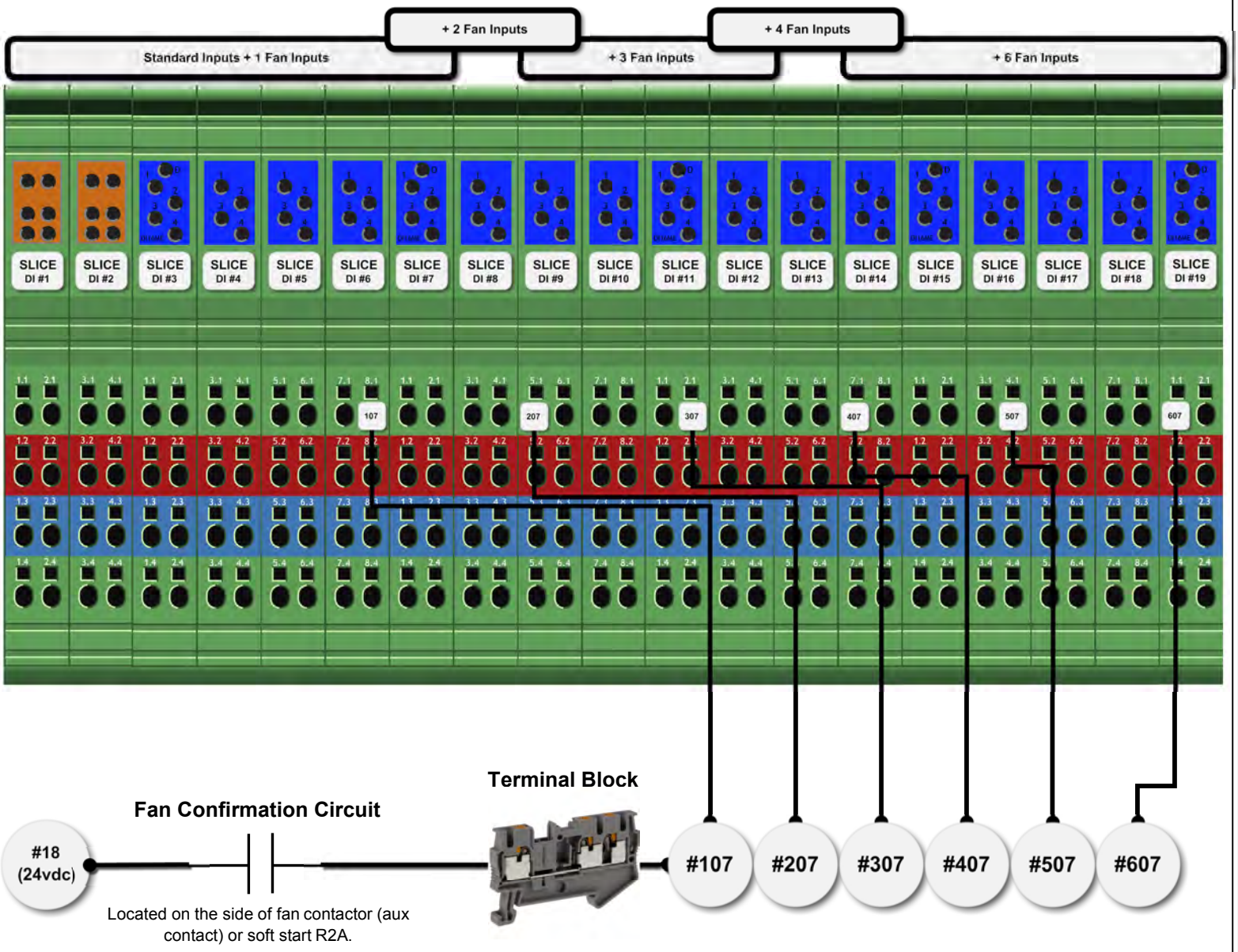
Flame Sense Circuits #106, #206, #306, #406, #506, #606



The Flame Sense Circuit is designed to detect flame in each respective heater. During heater board ignition, the heater board waits for the flame probe to confirm micro current in the flame. Upon confirmation, the heater board closes the flame sense relay, sending 24vdc back to the PLC on the flame sense circuit wire.

Title: PORTABLE DRYER: Flame Sense Circuit	
Author: SUKUP MFG CO - MRK	
Date: 03/15	
Revision: 6/7/2017 - DWS (1)	106.20

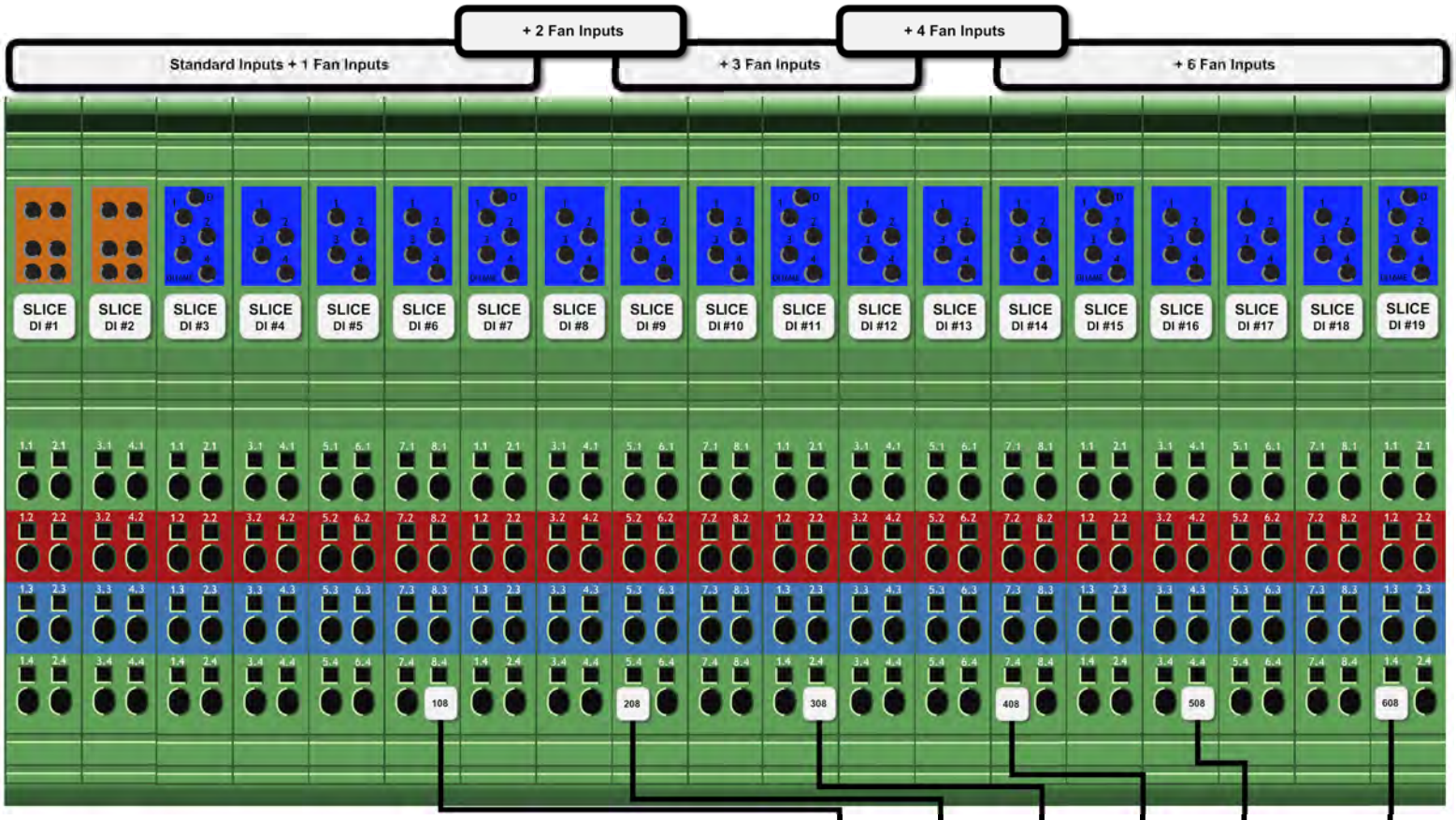
Fan Confirmation Circuits #107, #207, #307, #407, #507, #607

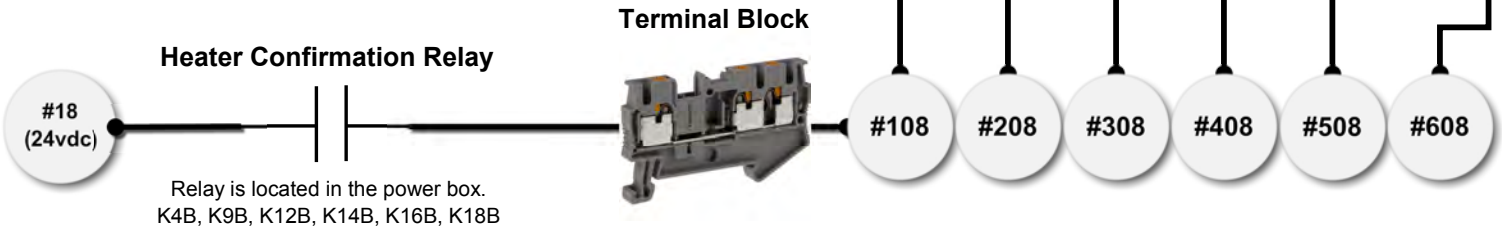


The Fan Confirmation Circuit is designed to tell the PLC that the contactor has been pulled in, and voltage should be flowing to the motor. This signal also triggers the timer for the air switch and serves as a software interlock for heater power. On Soft Starts, the fan confirmation signal will not close until the fan is up to speed.

Title: PORTABLE DRYER: Fan Confirmation Circuit	
Author: SUKUP MFG CO - MRK	
Date: 03/15	
Revision: 6/7/2017 - DWS (1)	106.21

Heater Confirmation Circuits #108, #208, #308, #408, #508, #608



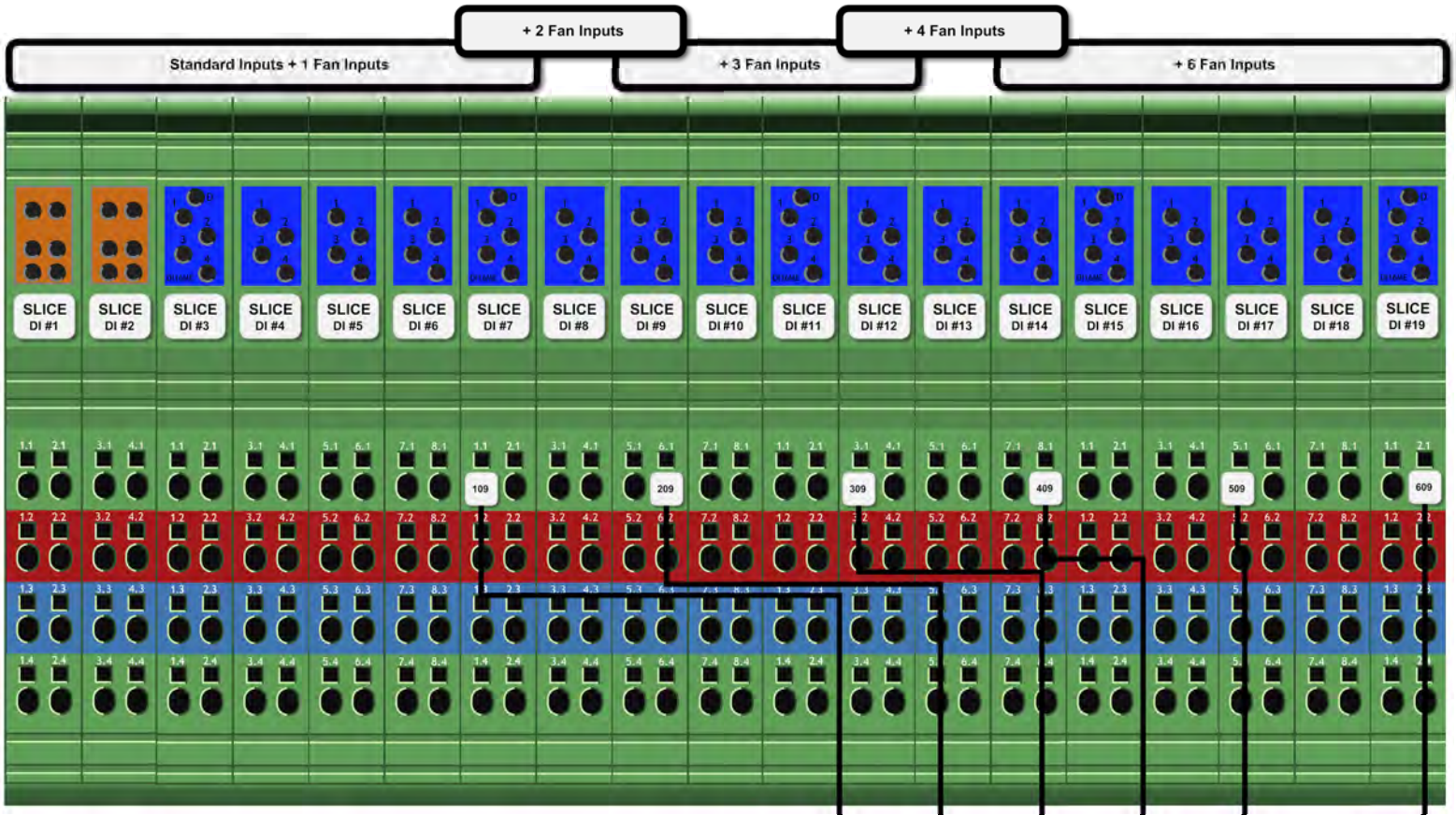


Relay is located in the power box.
K4B, K9B, K12B, K14B, K16B, K18B

The Heater Confirmation Relay tells the PLC that it has energized the Heater Relays, and power is intended to be sent to the heater box. This will start the Flame Out Timer. If the flame signal doesn't come on before the timer expires, the dryer will fault on a Flame Timeout.

Title: PORTABLE DRYER: Heater Confirmation Circuit	
Author: SUKUP MFG CO - MRK	
Date: 03/15	
Revision: 6/7/2017 - DWS (1)	106.22

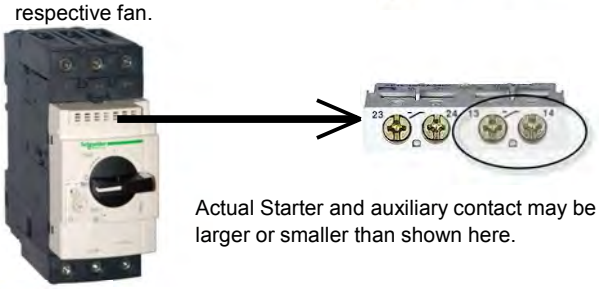
Fan Motor Overload Circuits #109, #209, #309, #409, #509, #609



Terminal Block

Fan Motor Overload

Located on the auxiliary contact of each Motor Starter Protector on each respective fan.



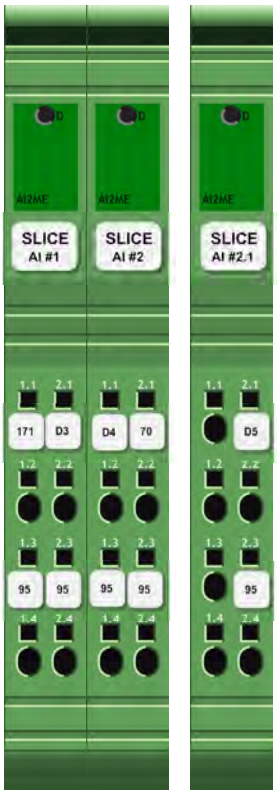
Actual Starter and auxiliary contact may be larger or smaller than shown here.

The Fan Motor Overload Circuits are located on each of the fan starter protectors. When the starter is in operational mode, the circuit is complete. When the starter is in trip position, the circuit is open.

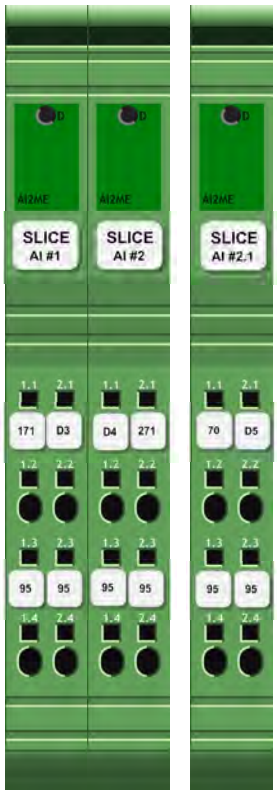
Title: PORTABLE DRYER: Fan Motor Overload Circuit	
Author: SUKUP MFG CO - MRK	
Date: 03/15	
Revision: 6/7/2017 - DWS (1)	106.23

Plenum RTD Transmitter

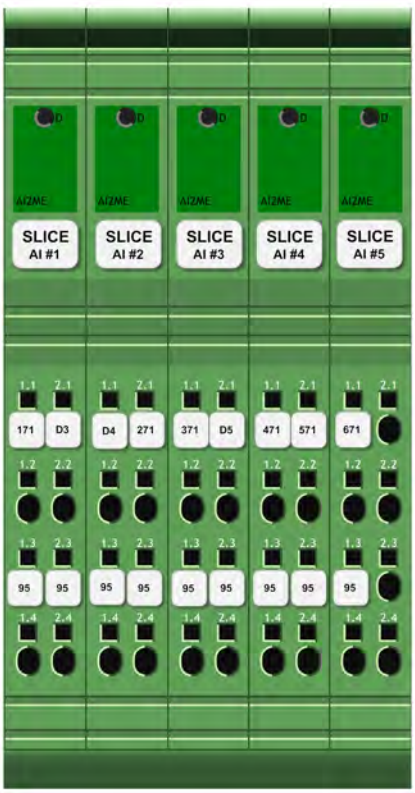
1 Fan

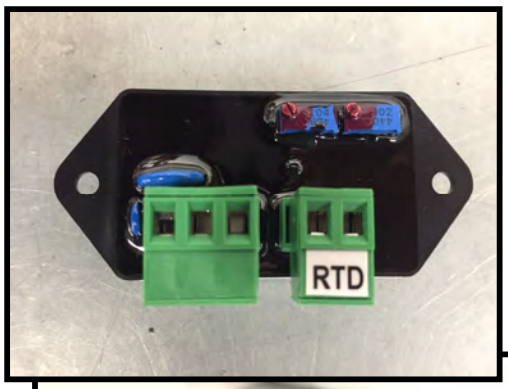


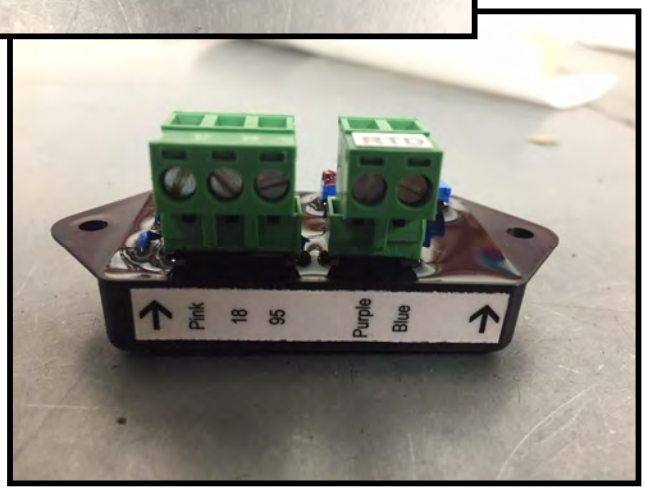
2 Fan



3-6 Fan







Pink - DC voltage Reference to PLC (171, 271, 371, 471, 571, 671)

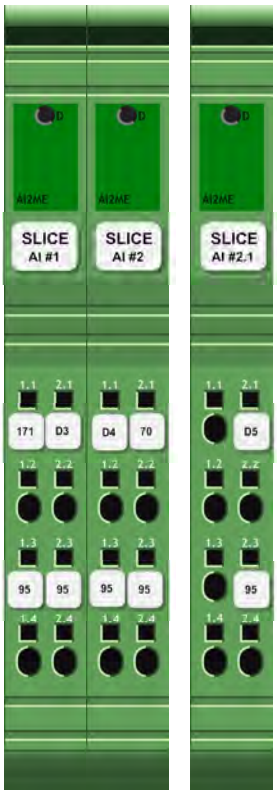
Wire #18 - 24vdc Power
Wire #95 - dc common (-)

Purple - Resistance from RTD
Blue - Resistance from RTD

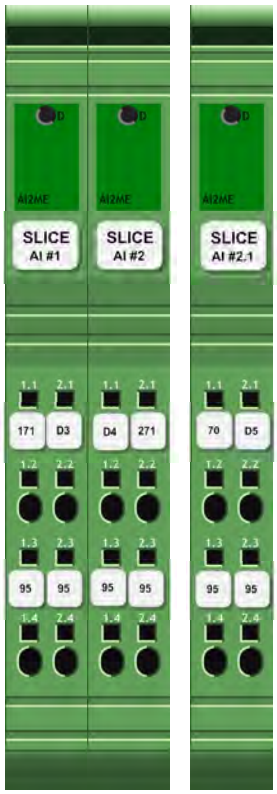
Title: PORTABLE DRYER: Plenum RTD Transmitter	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 106.24
Revision:	

Moisture Sensor

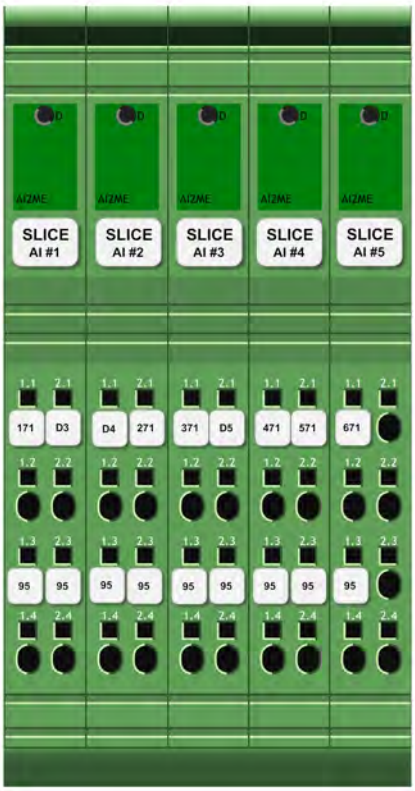
1 Fan

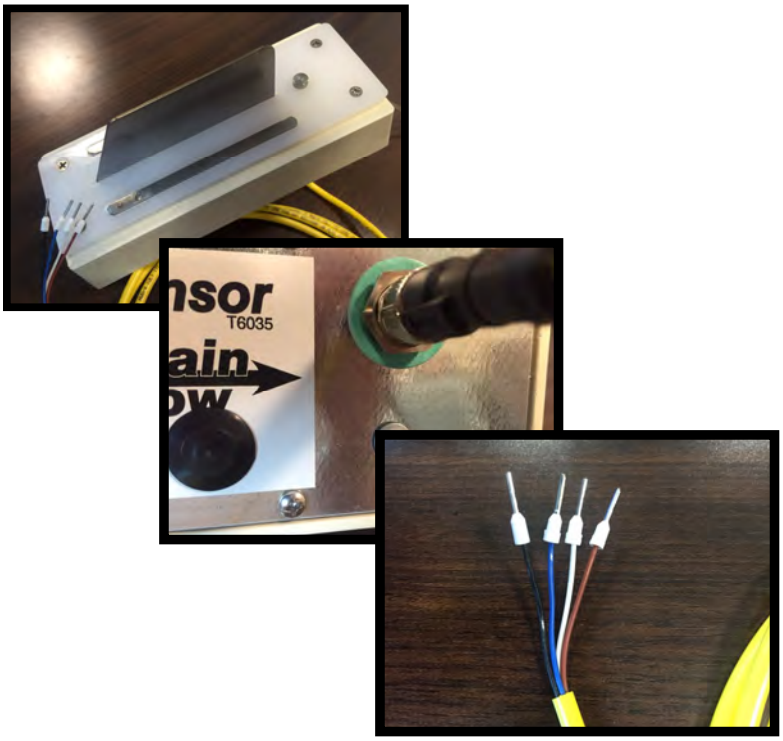


2 Fan



3-6 Fan





Pinout:

Black Wire: Moisture Reference (D4 or D5)

Blue Wire: Temperature Reference (D3)

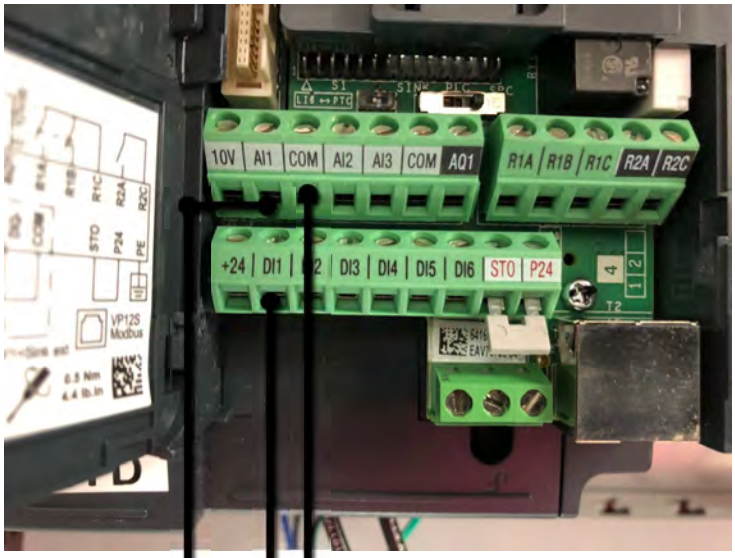
Brown: #18 - 24vdc Supply

White: #95 - DC common (-)

Important: take advantage of the quick connect plug, take the sensor inside during the off-season!

Title: PORTABLE DRYER: Moisture Sensor	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 106.25
Revision:	

ATV 320 VFD Wiring Diagram



#95 Black → COM
#17 Gray → AI1
#21D Blue → DI1

#17 Meter Roll
Reference Voltage

#17

K2B Relay Pin#14

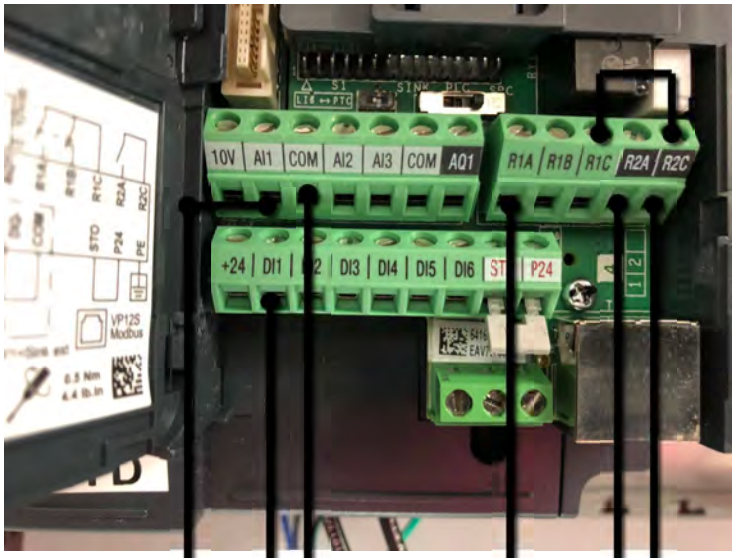
#21D

#95 DC Common (-)

#95

Title: VFD Control Wiring ATV320	
Author: SUKUP MFG CO - MRK	
Date: 03/16	
Revision:	106.26

ATV 320 VFD Wiring Diagram Drag Unload



#95 Black → COM
#17 Gray → AI1
#21D Blue → DI1
#18 Orange → R1C & R2C
#49A Purple → R1A
#94 Purple → R2A

#17 Meter Roll Reference Voltage — #17

K2B Relay Pin#14

#21D

#95 DC Common (-) — #95

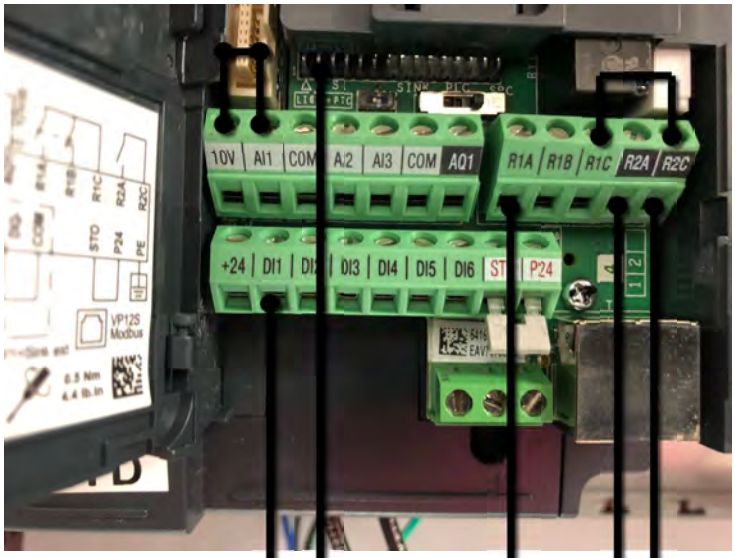
#49A VFD Motor Overload — #49A

#94 Unload Confirmation — #94

#18 24vdc (+) — #18

Title: VFD Control Wiring ATV320 Drag	
Author: SUKUP MFG CO - MRK	
Date: 03/2018	
Revision:	106.27

ATV 320 VFD Wiring Diagram Fan Motor



#95 Black → COM
10V → AI1
#X10D Blue → DI1
#18 Orange → R1C & R2C
#X09 Purple → R1A
#X07 Purple → R2A

Fan Relay Pin#14 → #X10 D

#95 DC Common (-) → #95

#X09 VFD Motor Overload → #X09

#X07 Fan Confirmation → #X07

#18 24vdc (+) → #18

From VFD Pin R2A → #X07

K2X Heater Interlock

A1 - #X07
A2 - #95
11 - #X10C
14 - #x10H

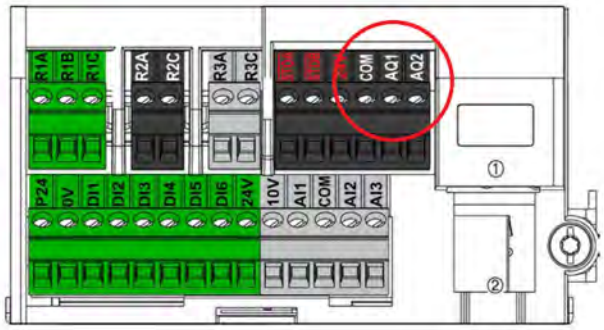
Special Note:

R2A - Wire #X07 (VFD in RUN mode - Confirmation of full run speed)

#X07 also energizes a 24VDC relay that acts as an auxiliary contact for the VFD. When energized, it serves the purpose of the heater interlock for X10C and X10H. (K21 for Fan 1, K22 Fan 2, K23 Fan 3, K24 Fan 4)

Title: VFD Control Wiring ATV320 Fan Motor	
Author: SUKUP MFG CO - MRK	
Date: 08/2019	
Revision:	106.28

ATV 630 VFD Wiring Diagram Fan Motor



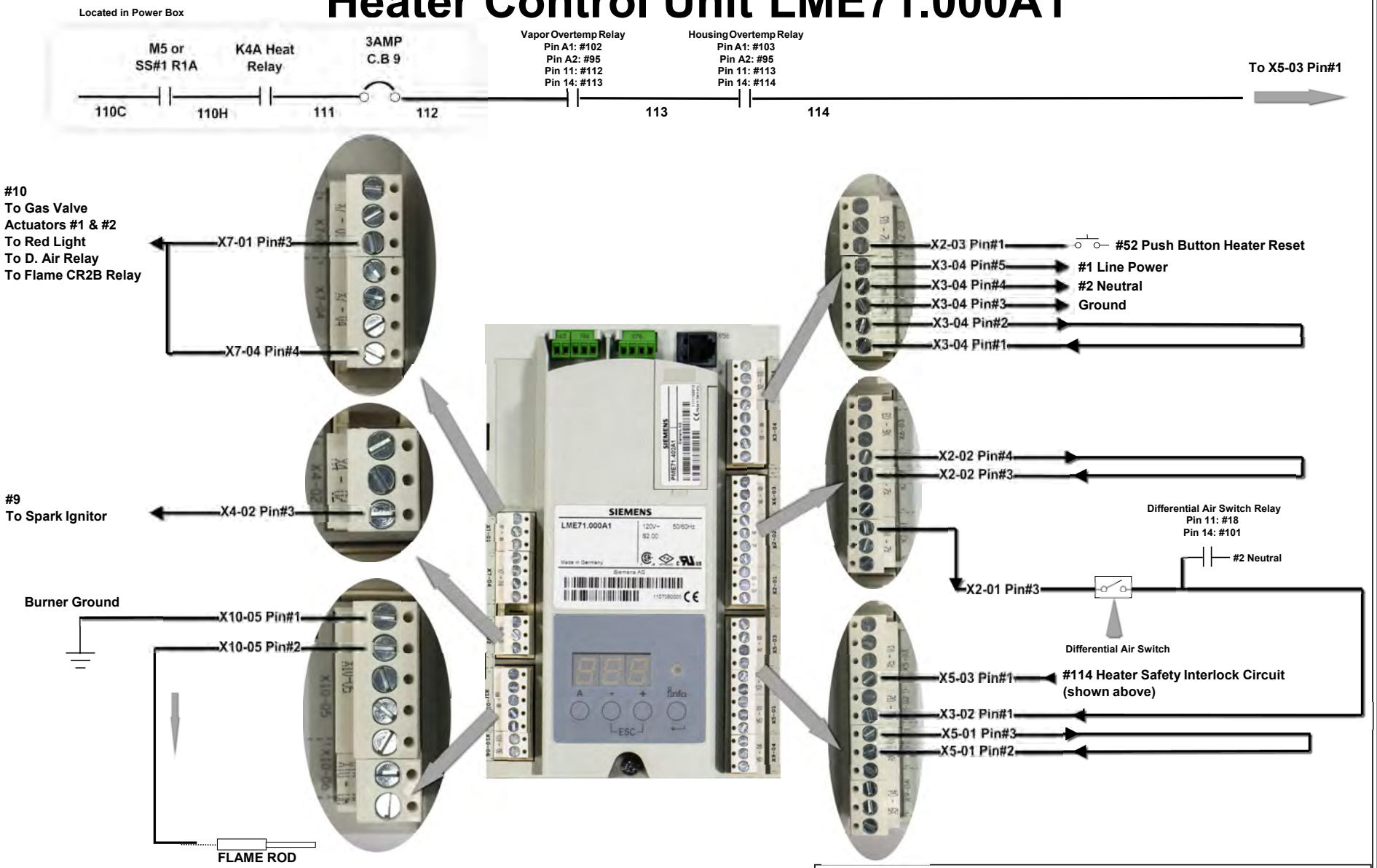
Blue #X10D ------ DI1
Black #95 -------- COM (Next to AI1)
Orange #18 ----- R1C
Purple #X00 ---- R1A (VFD/Soft Start Fault)
Orange #18 ----- R2C (Jumped from R1C)
Purple #X07 ---- R2A (Motor Running)
Red #X10C ----- R3C (Heater Interlock Circuit)
Red #X10H ----- R3A (Heater Interlock Circuit))
10V Jumer to AI1

Special Note:

The ATV 630 has a 3rd programmable relay, so the heater interlock circuit is run through the R3 contact unlike the ATV320 and the ATS22.

Title: VFD Control Wiring ATV630 Fan Motor	
Author: SUKUP MFG CO - MRK	
Date: 08/2019	
Revision:	106.29

Heater Control Unit LME71.000A1



Title: Portable Dryer Heater Control Unit - LME71 CSA	
Author: SUKUP MFG CO - MRK	
Date: 6/15	Sheet: 107.7
Revision:	

Sukup Heater Ignition Board - D3948 & D39481

Located in Power Box - Heater Pos. 1 Shown

Red Wires are 110VAC
Gray Wires are AC Neutral
Orange Wires are 24VDC
Blue Wires are 24VDC
Purple Wires are 24VDC

M5 or SS#1 R1A — K4A Heat 1 Relay — 3AMP C.B 9

110C — 110H — 111 — 112 — (120VAC)

Heater Board Until 2019 D3948

Heater Board 2019-Present D39481

C — S — FLAME ROD

Wire #18 24vdc

Vapor Over-Temp #X02 — To PLC

Housing Over-Temp #X03 — To PLC

Flame Relay #X06

7 — 2 — To PLC

Electronic Actuator (EMOV) J6124

Left to Right
Pin 1: #95
Pin 2: #18
Pin 3: DC Reference

2 — 8 — 7 — ON Signal From Power Box

Spark XFMR

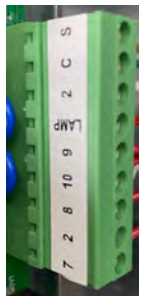
9 — 10 — (120VAC)

Liquid Solenoid (LP ONLY)

Vapor Solenoid

2 — Lamp

D39481 has a pluggable harness (shown below) that has the same function as the previous D3948 board.



2

Title:	Sukup Heater Ignition Board D3948 & D39481		
Author:	SUKUP MFG CO - MRK		
Date:	5/2015	Sheet:	107.8
Revision:	8/14/2020 - MRK (3)		

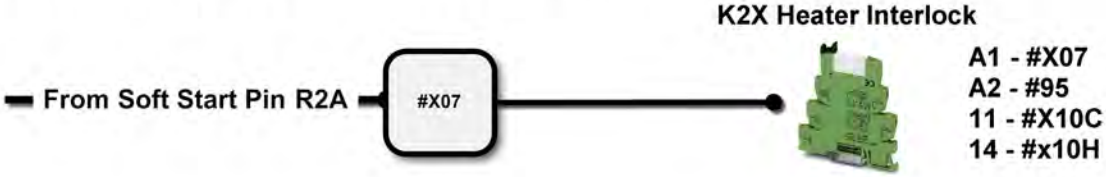
ATS22 Soft Start Wiring

CL1 - Wire #1 (Line, 110VAC)
CL2 - Wire #2 (Neutral)
R1C - Wire #18 (24vdc)
R1A - Wire #(X00) (Soft Start Fault Monitoring)
R2C - Wire #18 (24vdc)
R2A - Wire #X07 (Soft Start in RUN mode - Confirmation of full run speed)
LI1 - Wire #1 (Line, 110VAC)
LI2 - Wire #X10C (110Vac Run Command from Fan X Relay)
COM- Wire #2 (Neutral)

Special Note:

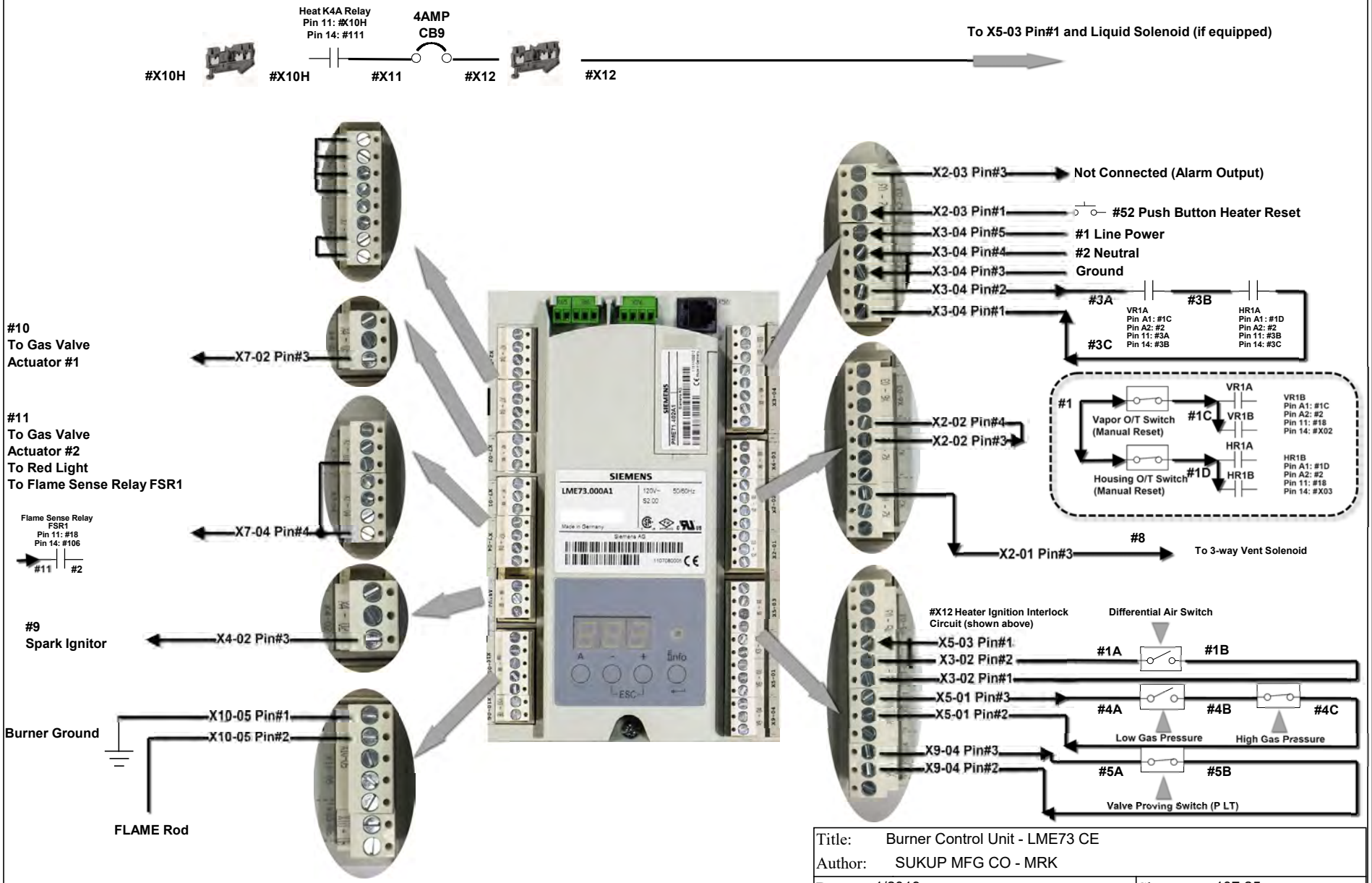
R2A - Wire #X07 (Soft Start in RUN mode - Confirmation of full run speed)

#X07 also energizes a 24VDC relay that acts as an auxiliary contact for the Soft Start. When energized, it serves the purpose of the heater interlock for X10C and X10H. (K21 for Fan 1, K22 Fan 2, K23 Fan 3, K24 Fan 4)



Title: ATS22 Soft Start Wiring	
Author: SUKUP MFG CO - MRK	
Date: 6/16	
Revision: 3/24/2020 - MRK (1)	107.24

Heater Control Unit LME73.000A1



Title:	Burner Control Unit - LME73 CE		
Author:	SUKUP MFG CO - MRK		
Date:	1/2019	Sheet:	107.25
Revision:			

Fan / Heater Interlock Circuit

"X" is dictated by the Fan Position. Fan #1 is always the lowest fan. Fans are counted from the ground up, like floors on a building. Pictures of components like relays, contactors, and auxiliary contacts may vary from your actual product.

Fan X Relay

From PLC Digital Output — #X10A

A1 - #X10A
A2 - #95
11 - #1 (120VAC)
14 - #X10C (To Fan X Coil)

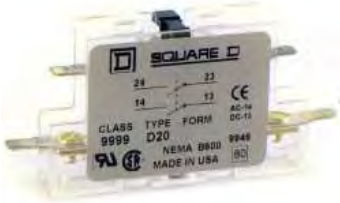
Fan X Contactor

From Fan X Relay Pin 14 — #X10C

A1 - #X10C
A2 - #2

***2 N.O. Aux Contact Mounted on the side of the Fan X contactor**

24- #X10C
23- #X10H
14- #18
13- #X07



Heat X A Relay

A1 - #X11A
A2 - #95
11 - #X10H (From Fan Contactor Aux Contact)
14 - #X11 (To Top of Heater Breaker)

Heater #X
Circuit Breaker

Heater #X 120V ON

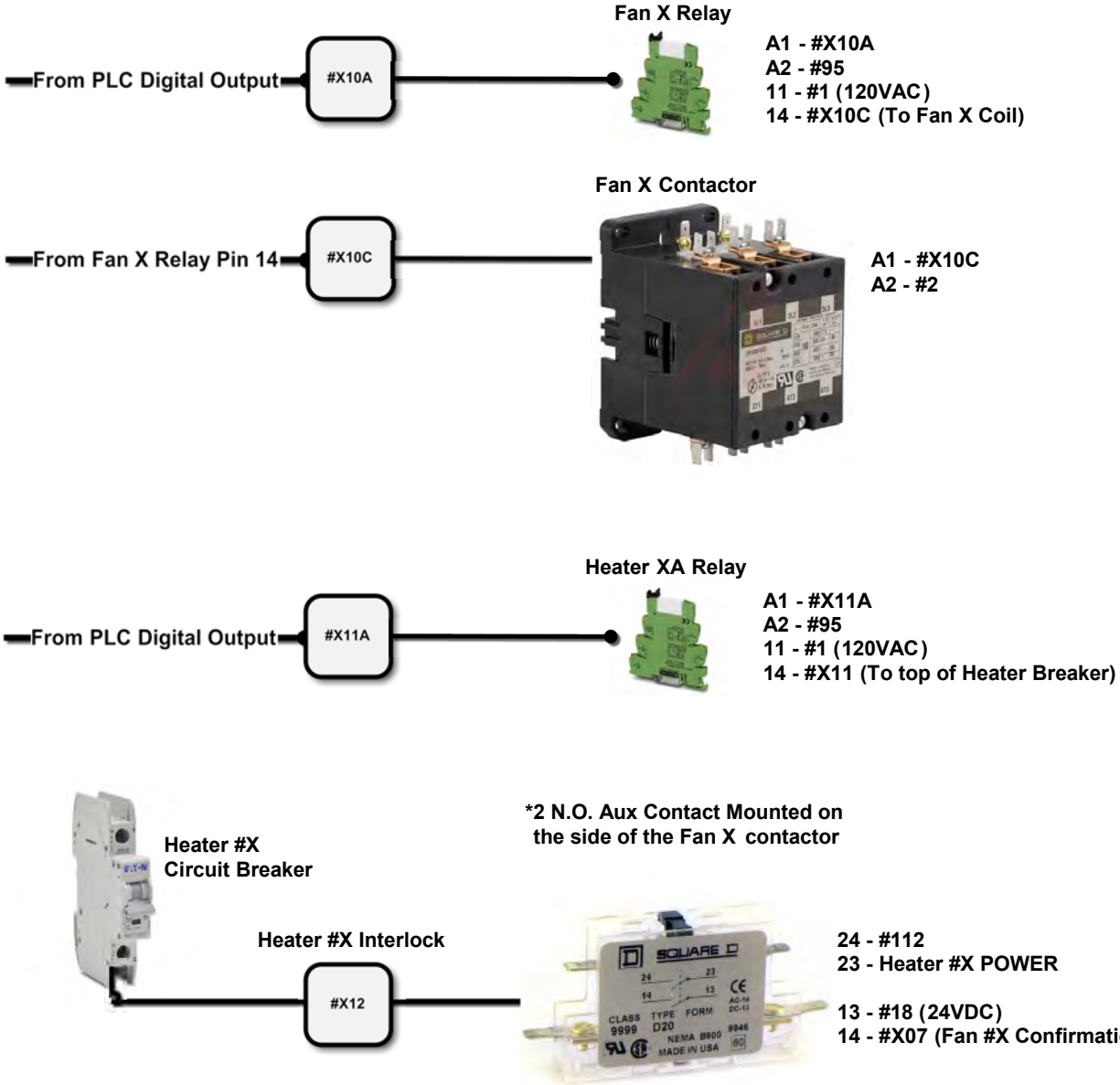
#X12

***Older Dryers that do not have thermal magnetic breakers with Fault monitoring (Prior to MY 2008) will require a 240VAC relay in place of the 2 N.O. Auxiliary Contact to avoid possible contactor closure without power present.**

Title: PORTABLE DRYER: Fan/Heater Wiring	
Author: SUKUP MFG CO - MRK	
Date: 3/16	Sheet: 113.1
Revision:	

Retrofit Fan / Heater Interlock Circuit

"X" is dictated by the Fan Position. Fan #1 is always the lowest fan. Fans are counted from the ground up, like floors on a building. Pictures of components like relays, contactors, and auxiliary contacts may vary from your actual product.



***Older Dryers that do not have thermal magnetic breakers with Fault monitoring (Prior to MY 2008) will require a 240VAC relay in place of the 2 N.O. Auxiliary Contact to avoid possible contactor closure without power present.**

Title: PORTABLE DRYER: Retrofit Fan/Heater Wiring	
Author: SUKUP MFG CO - MRK	
Date: 3/16	Sheet: 113.2
Revision:	

Emergency Stop and AC System Control Switch Wiring

2 Pole Primary,
High Side Breaker
*Note 1

Control
Transformer
(High Voltage
to 120VAC)

1 Pole Secondary,
Low Side Breaker

Dashed wires are for 3 phase only

Main Dryer
Disconnect
2 - Pole on Single Phase

L1 L1A
L2 L2A

Line
(120VAC)

Wire #0

Wire # 2 Neutral

2

Main Supply
(To Dryer)

Wire #0

E-STOP
(Emergency
Stop Switch)

System Control Switch
3 Position
Only AC Shown

Auto
Off
Manual

Wire #1

To Terminal Strip

Wire # 0A

Wire #0

#2

#2

1

NOTE 1: 575VAC is Fused Instead of 2 Pole breaker shown

Red Wires are 110VAC
Gray Wires are AC Neutral
Orange Wires are 24VDC
Blue Wires are 24VDC
Purple Wires are 24VDC
Black Wires are DC Ground

Title: PORTABLE DRYER: Emergency Stop and System Control Switch Wiring	
Author: SUKUP MFG CO - MRK	
Date: 03/15	Sheet: 115.1
Revision: 6/7/2017 - DWS (1)	

DC Power Supply & PLC Power Supply Wiring

1 18A
18
2
95

24VDC Power Supply

#18 Supply

System Control Switch
3 Position
Only DC Contacts Shown

+
+
+
-
-

#95

L
N
G

Closed when in
Manual Position

#18

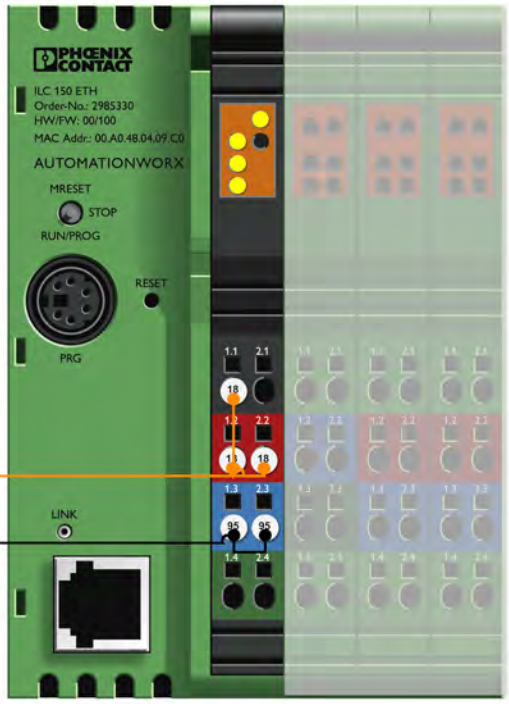
Closed when in
Auto Position

Ground

#2

To Manual Board
Supply

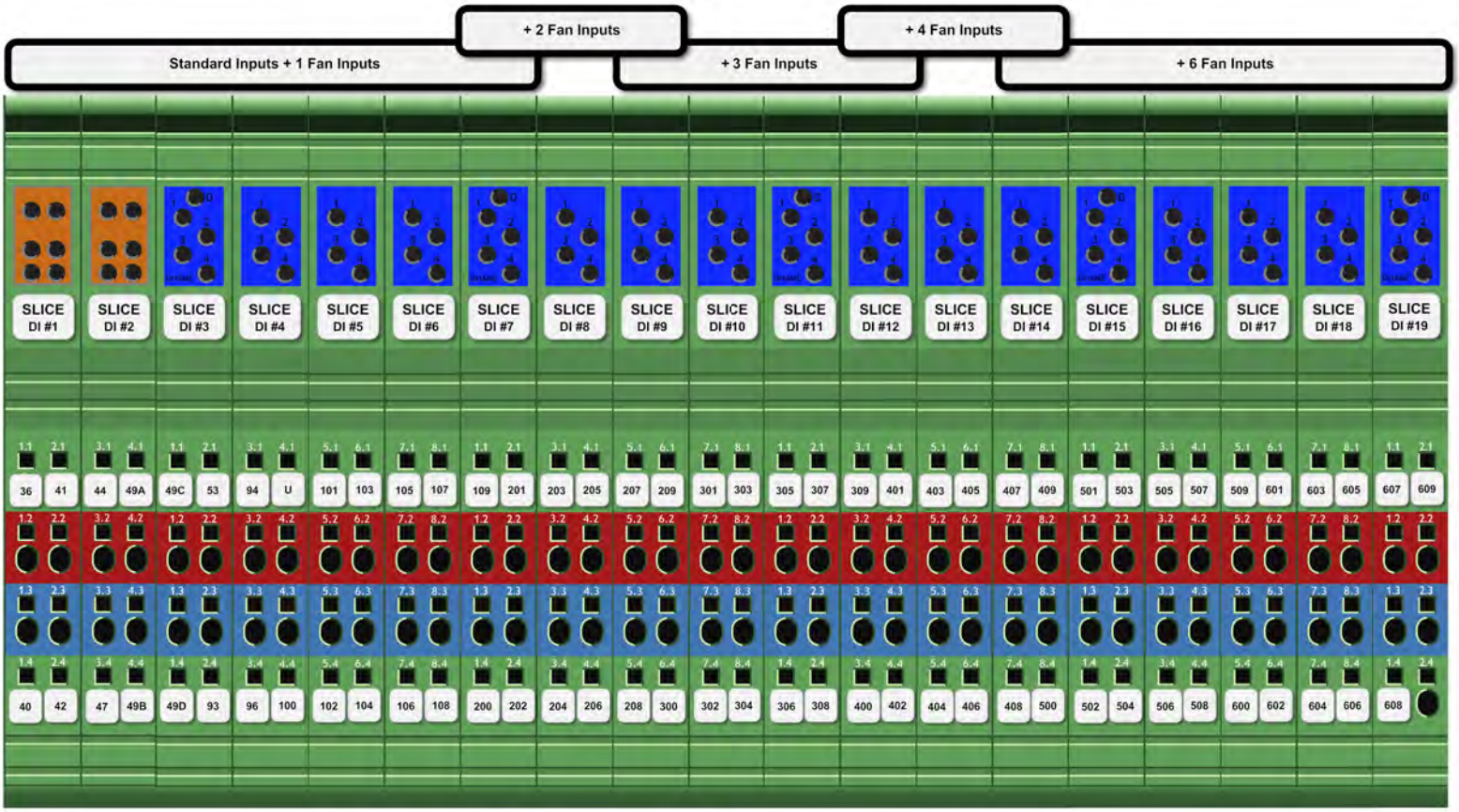
#1

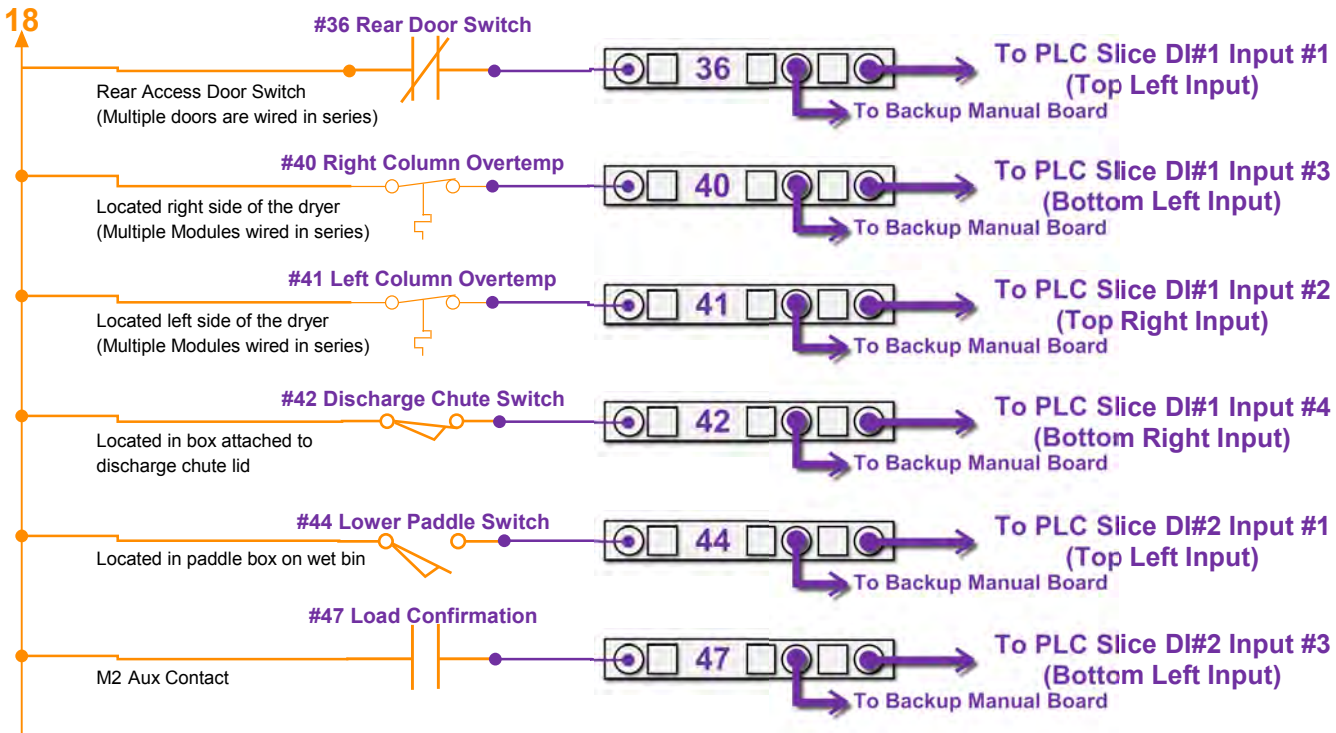


Red Wires are 110VAC
Gray Wires are AC Neutral
Orange Wires are 24VDC
Blue Wires are 24VDC
Purple Wires are 24VDC
Black Wires are DC Ground

Title: PORTABLE DRYER: DC Power Ladder Diagram	
Author: SUKUP MFG CO - DWS	
Date: 6/7/2017	Sheet: 115.2
Revision: 11/17/2017 - DWS(1)	

PLC Digital Inputs 1-6 Fan



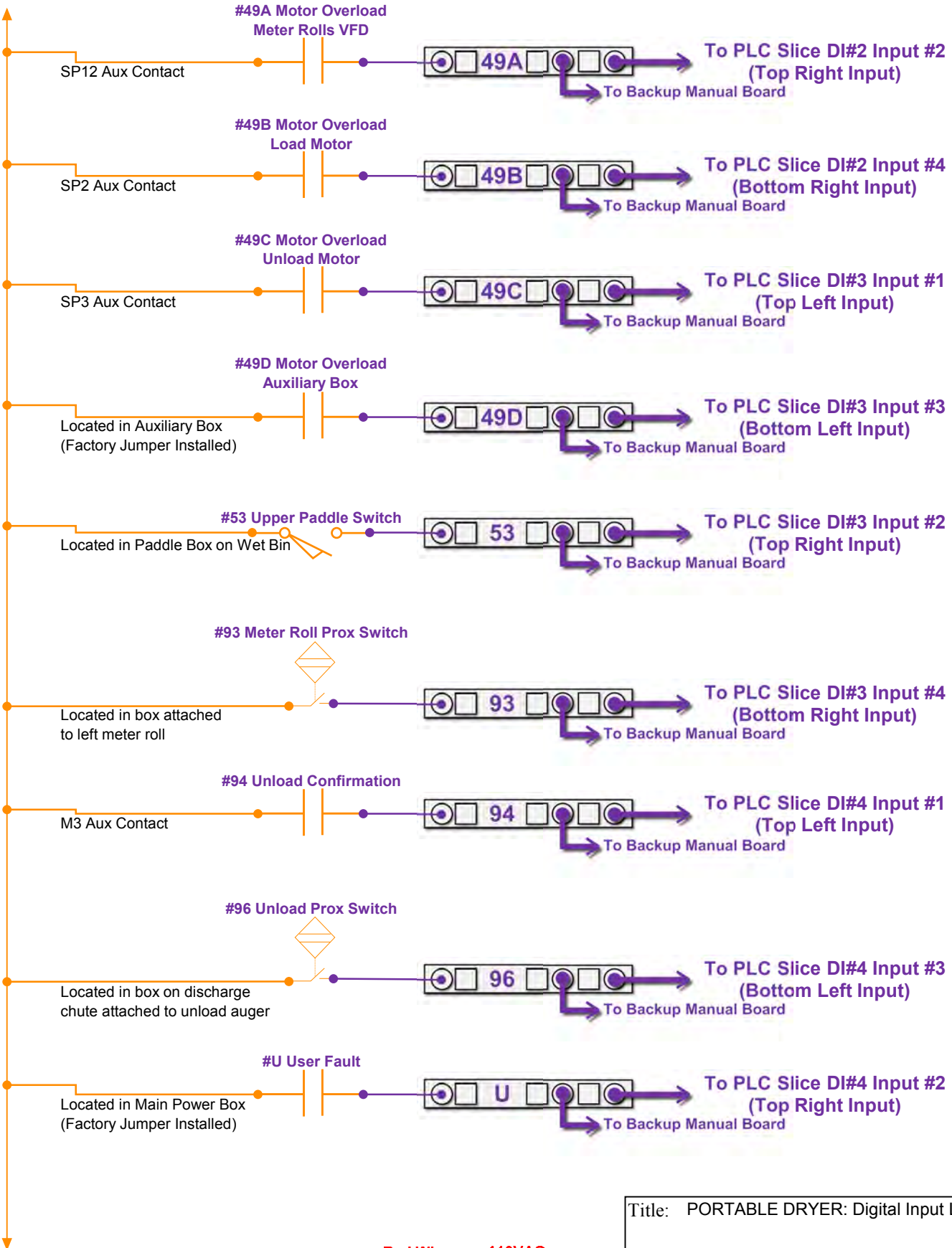


Red Wires are 110VAC
Gray Wires are AC Neutral
Orange Wires are 24VDC
Blue Wires are 24VDC
Purple Wires are 24VDC
Black Wires are DC Ground

Title: PORTABLE DRYER: Digital Input Ladder Diagram	
Author: SUKUP MFG CO - DWS	
Date: 6/7/2017	Sheet: 115.3
Revision:	

PLC Digital Inputs 1-6 Fan (Continued - 2)

18

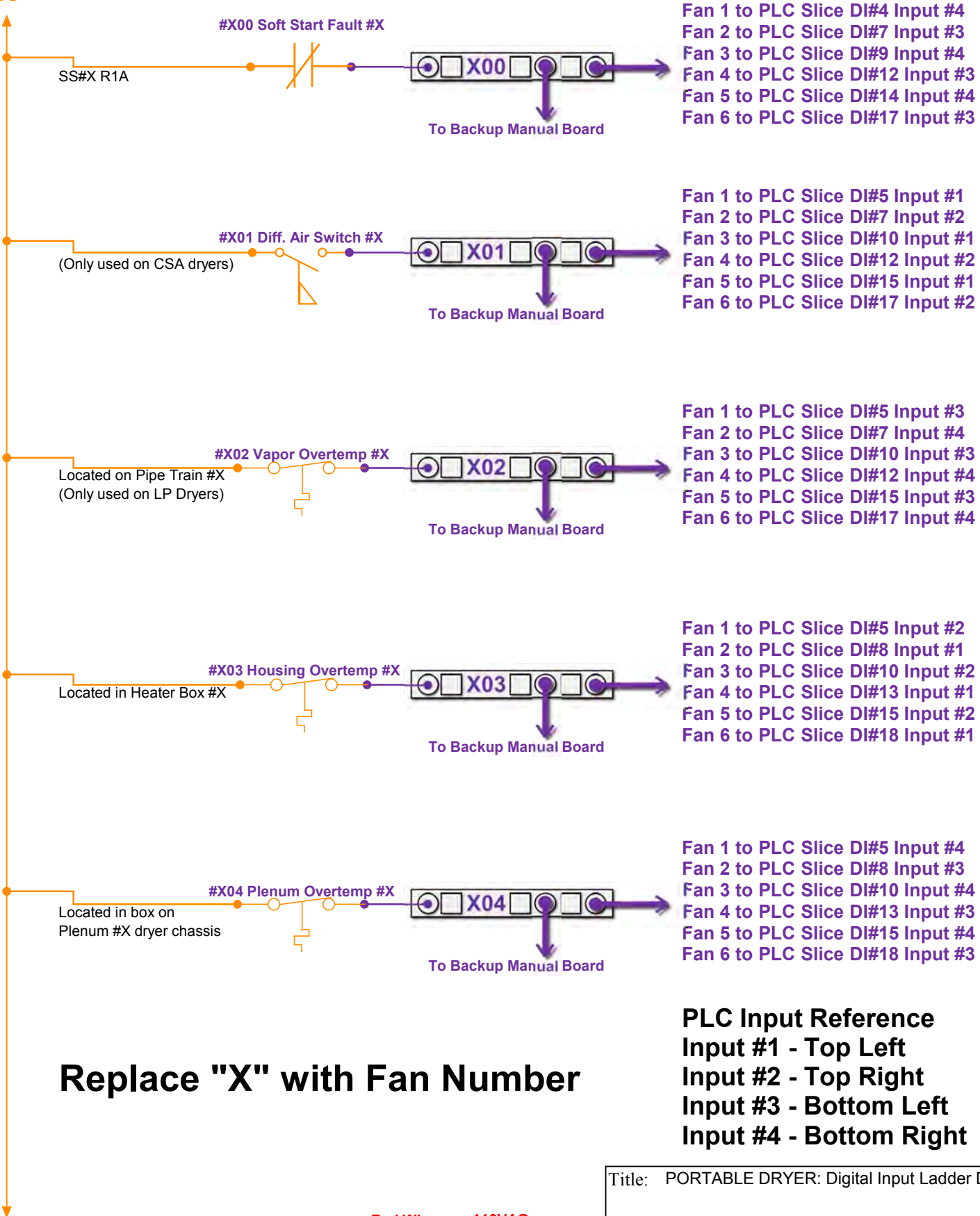


Red Wires are 110VAC
Gray Wires are AC Neutral
Orange Wires are 24VDC
Blue Wires are 24VDC
Purple Wires are 24VDC
Black Wires are DC Ground

Title: PORTABLE DRYER: Digital Input Ladder Diagram	
Author: SUKUP MFG CO - DWS	
Date: 6/7/2017	Sheet: 115.4
Revision:	

PLC Digital Inputs 1-6 Fan (Continued - 3)

18



Replace "X" with Fan Number

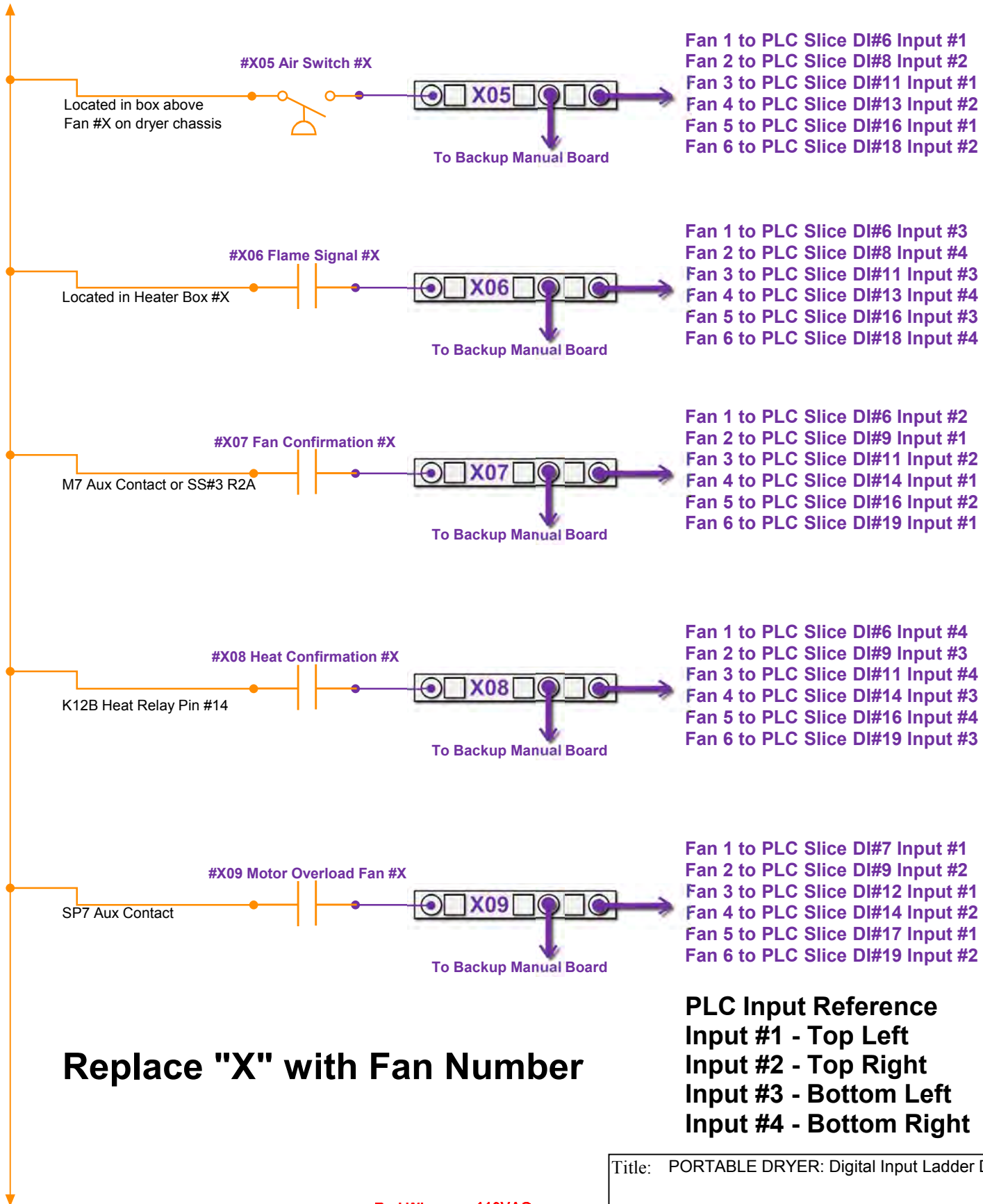
PLC Input Reference
Input #1 - Top Left
Input #2 - Top Right
Input #3 - Bottom Left
Input #4 - Bottom Right

Red Wires are 110VAC
Gray Wires are AC Neutral
Orange Wires are 24VDC
Blue Wires are 24VDC
Purple Wires are 24VDC
Black Wires are DC Ground

Title: PORTABLE DRYER: Digital Input Ladder Diagram	
Author: SUKUP MFG CO - DWS	
Date: 6/7/2017	Sheet: 115.5
Revision:	

PLC Digital Inputs 1-6 Fan (Continued - 4)

18



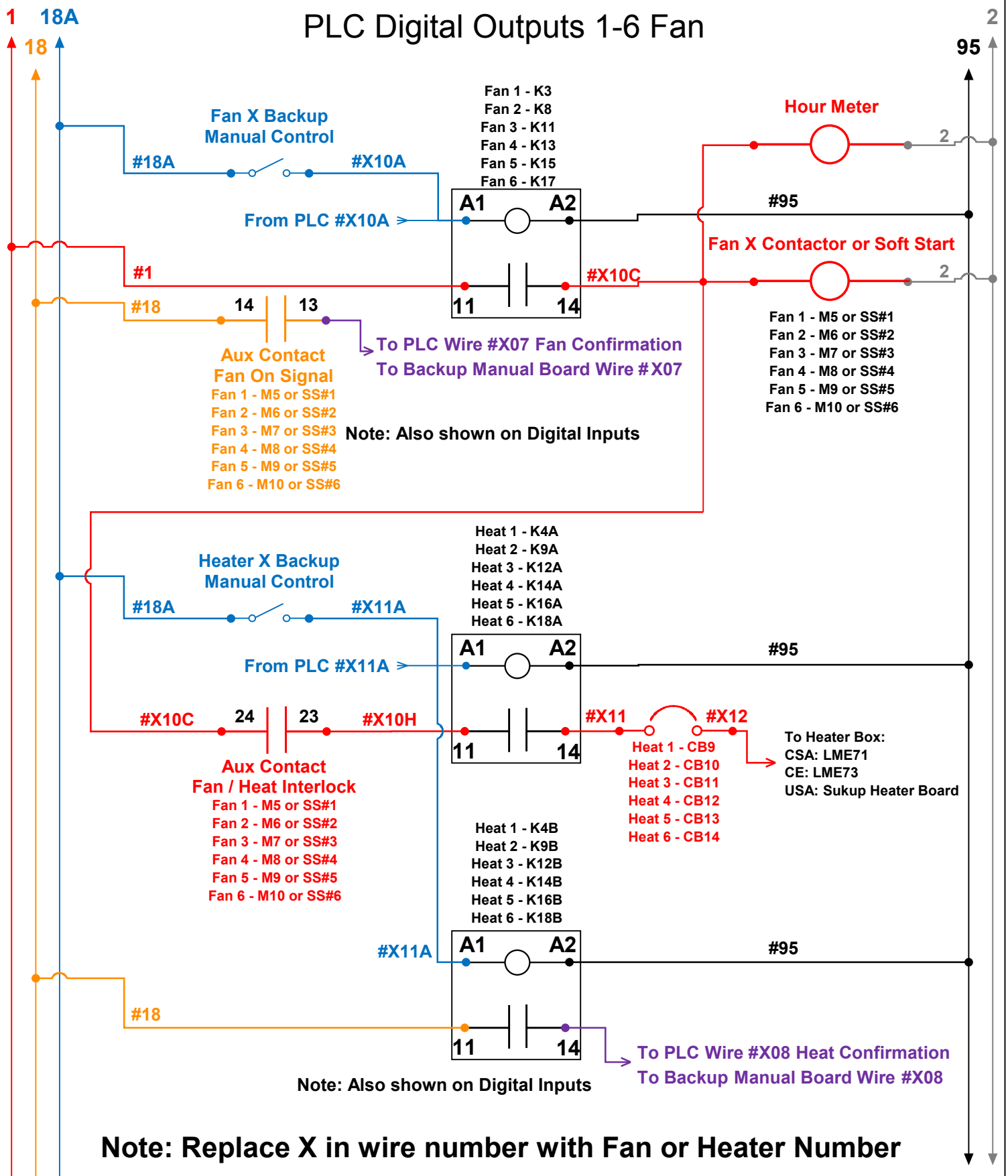
Replace "X" with Fan Number

PLC Input Reference
Input #1 - Top Left
Input #2 - Top Right
Input #3 - Bottom Left
Input #4 - Bottom Right

Red Wires are 110VAC
Gray Wires are AC Neutral
Orange Wires are 24VDC
Blue Wires are 24VDC
Purple Wires are 24VDC
Black Wires are DC Ground

Title: PORTABLE DRYER: Digital Input Ladder Diagram	
Author: SUKUP MFG CO - DWS	
Date: 6/7/2017	Sheet: 115.6
Revision:	

PLC Digital Outputs 1-6 Fan

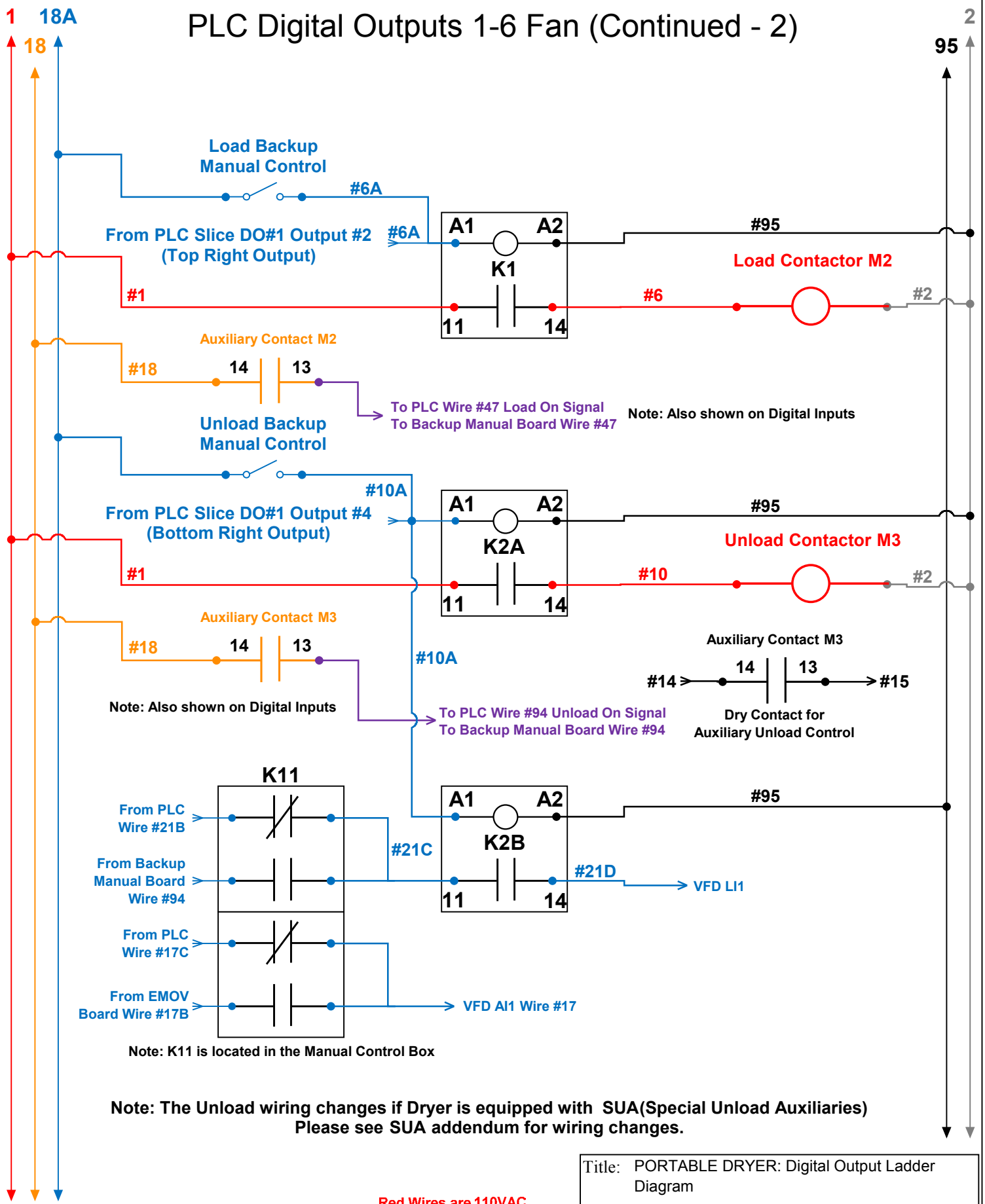


Note: Replace X in wire number with Fan or Heater Number

Red Wires are 110VAC
Gray Wires are AC Neutral
Orange Wires are 24VDC
Blue Wires are 24VDC
Purple Wires are 24VDC
Black Wires are DC Ground

Title: PORTABLE DRYER: Digital Output Ladder Diagram	
Author: SUKUP MFG CO - DWS	
Date: 6/7/2017	Sheet: 115.7
Revision: 11/26/2018 - DWS(1)	

PLC Digital Outputs 1-6 Fan (Continued - 2)

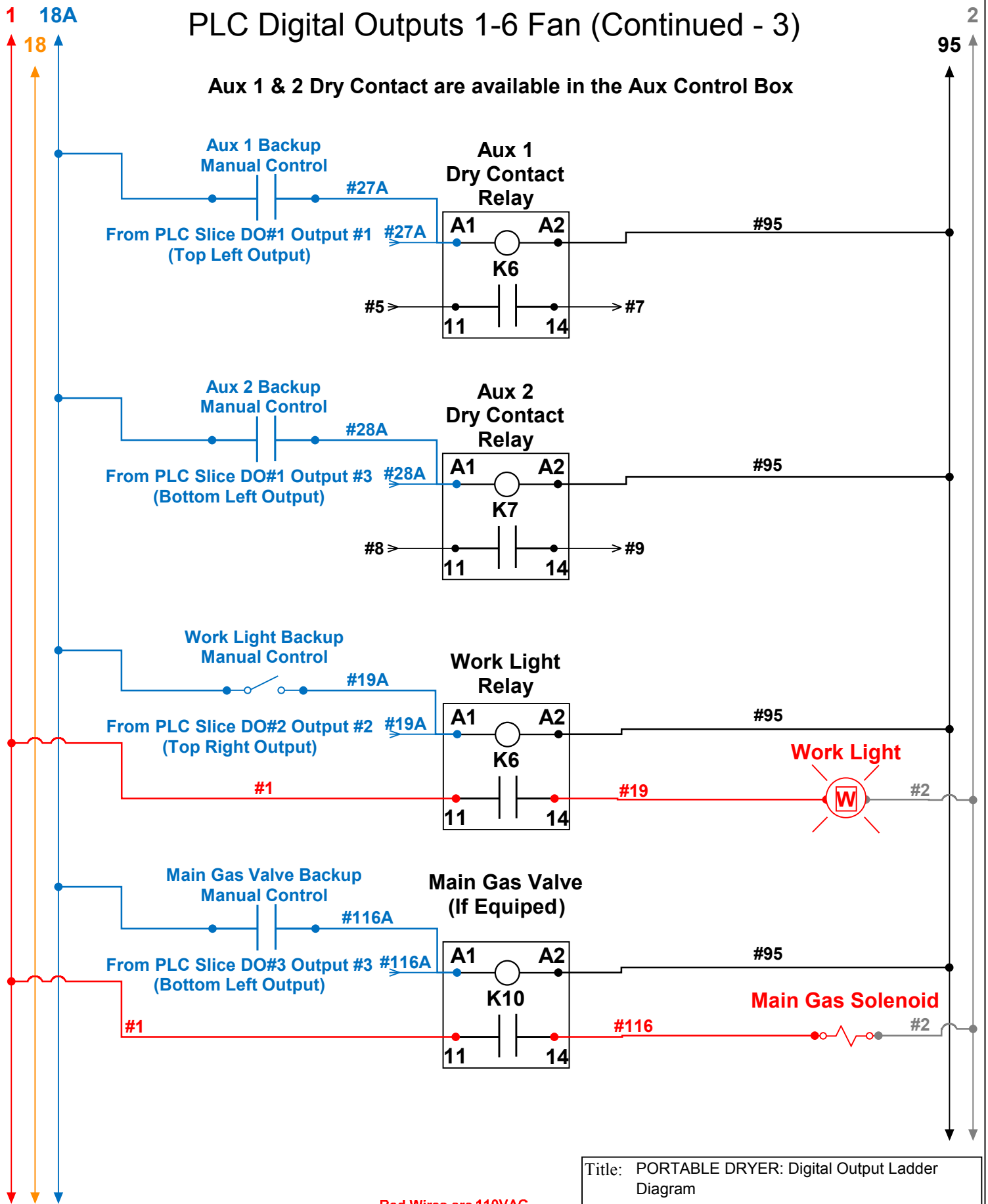


Note: The Unload wiring changes if Dryer is equipped with SUA(Special Unload Auxiliaries) Please see SUA addendum for wiring changes.

Red Wires are 110VAC
Gray Wires are AC Neutral
Orange Wires are 24VDC
Blue Wires are 24VDC
Purple Wires are 24VDC
Black Wires are DC Ground

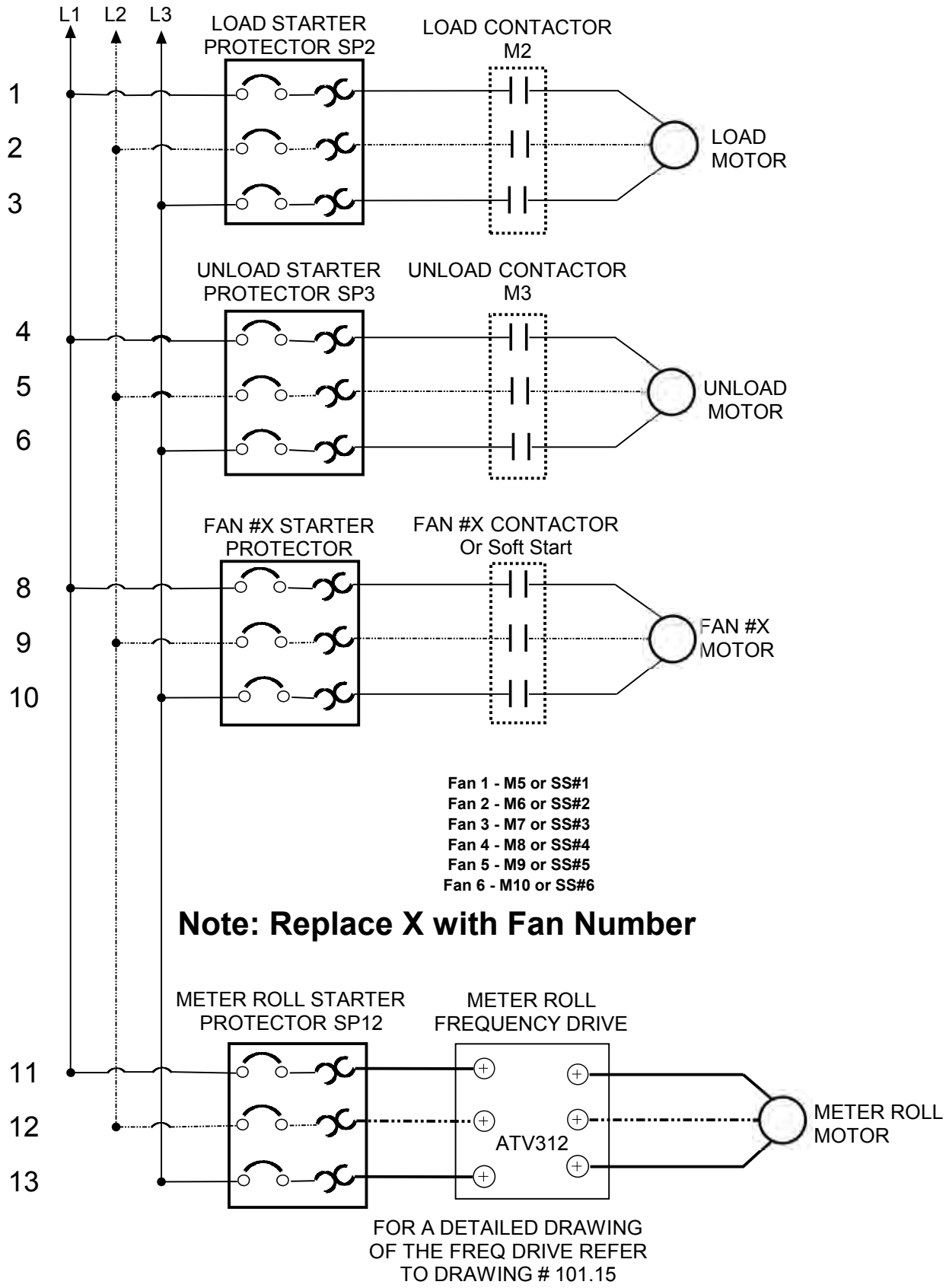
Title: PORTABLE DRYER: Digital Output Ladder Diagram	
Author: SUKUP MFG CO - DWS	
Date: 6/7/2017	Sheet: 115.8
Revision:	

PLC Digital Outputs 1-6 Fan (Continued - 3)



Red Wires are 110VAC
Gray Wires are AC Neutral
Orange Wires are 24VDC
Blue Wires are 24VDC
Purple Wires are 24VDC
Black Wires are DC Ground

Title: PORTABLE DRYER: Digital Output Ladder Diagram	
Author: SUKUP MFG CO - DWS	
Date: 6/7/2017	Sheet: 115.9
Revision:	



Note: Dotted/Dashed Lines are for 3 Phase Only

Title: PORTABLE DRYER: 1-6 FAN MOTOR CONTACTOR & RELAY WIRING	
Author: SUKUP MFG - DWS	
Date: 10/4/2017	Sheet: 115.10
Revision:	